OPERATION & MAINTENANCE MANUAL

DFI No. : D00170
Facility Type: Detention Tank/Pipe

JUNE, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00170**
Facility Type:	Detention Tank/ Pipe
Construction Drawings:	(V-File Number) 37V-041
Location:	District: 2B (Old 2A)
	Highway No.: 047
	Mile Post: 66.55/66.56 (beg./end)
	Description: This facility is located on the south side of the eastbound travel lanes of US26 (Hwy 047). Facility access can be obtained from the right shoulder US26.

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:	2004
Contractor:	Mowatt Construction Company.

4. Storm Drain System and Facility Overview

A detention facility is designed to control the quantity of runoff, by reducing the peak discharge and only detaining runoff for some short period of time. These facilities are designed to store and gradually release or attenuate stormwater runoff via a control structure or release mechanism, and completely drain after the design storm has passed. The most common detention facilities include:

- Dry ponds - these are depressed storage areas that store runoff during wet weather and are dry the rest of the time. Usually they are earthen depressions.
- Tanks - these are underground storage facilities that are typically constructed from large diameter pipe.
- Vaults - these are enclosed underground storage facilities. They are typically constructed from reinforced concrete.

This detention facility is composed of a 90-foot long 48-inch diameter pipe located within the right shoulder of eastbound US26 (Hwy 047); see Operational Plans, Appendix A, and Photo 2. Access to the facility can be obtained from the right shoulder of US26, but will require closing the rightmost lane of traffic. The high flow from two upstream inlets is directed into the detention pipe. The upstream inlets are diversion inlets associated with a water quality facility (DFI D00169).

After detention, the flow is directed into a manhole where it is combined with the flow from two upstream water quality facilities (DFI D00169 and DFI D00168). The water is then released into a nearby wetland, approximately 62-feet downstream of the detention facility.

A. Maintenance equipment access:
Access is obtained from the right shoulder of the eastbound travel lanes of US26 (Hwy 047). Because the manhole is located on the fog line (Photo 1), traffic control is required.

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☐ Porous Pavers
☐ Liners
☐ Underdrains

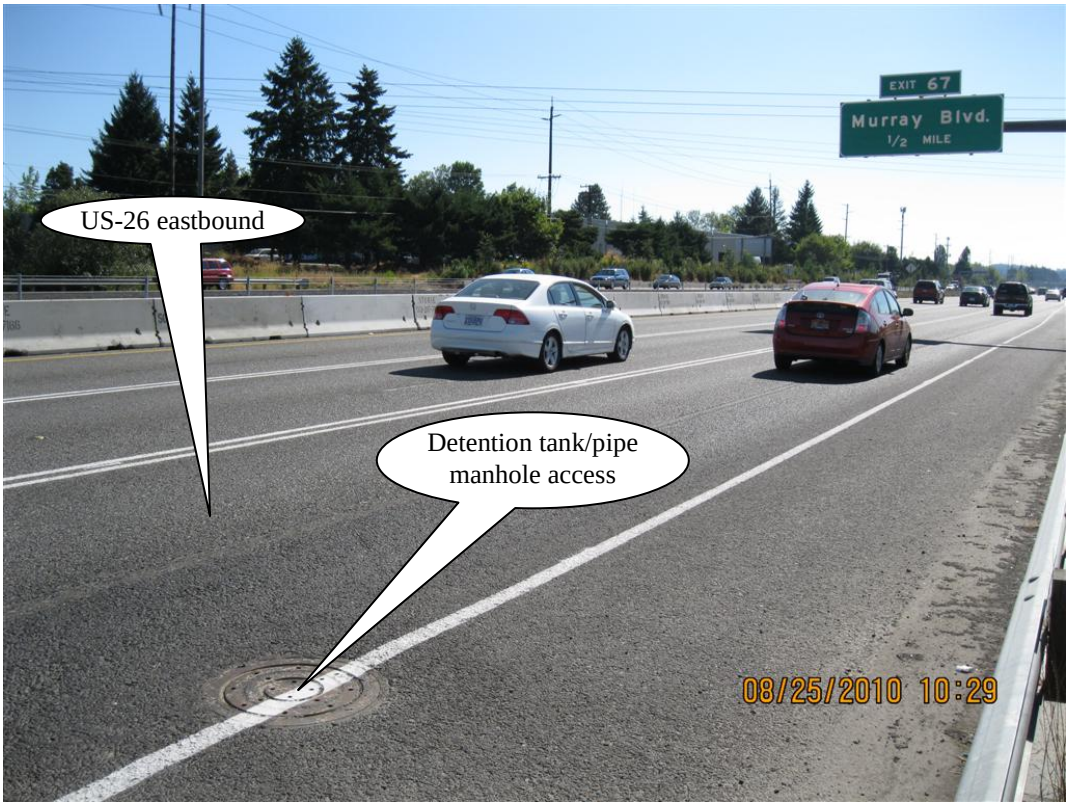


Photo 1: Detention tank/pipe manhole access looking east along US26

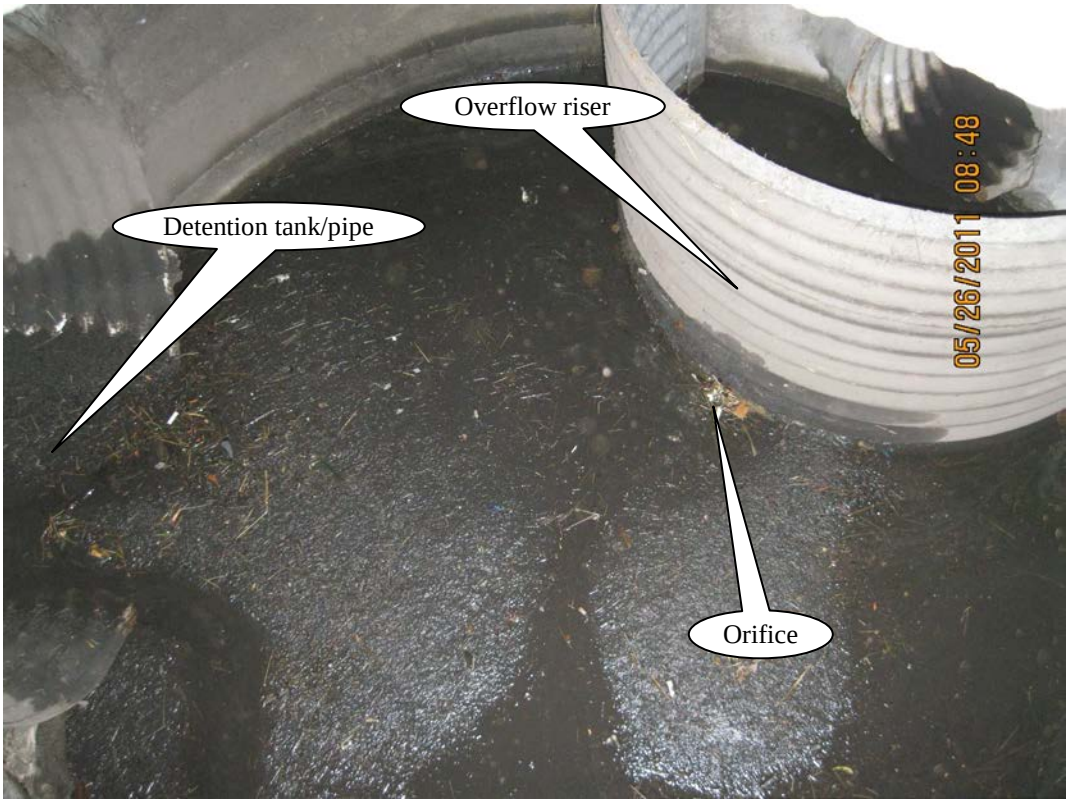


Photo 2: Flow control manhole

5. Facility Haz Mat Spill Feature(s)

The detention tank/pipe can be used to store a volume of liquid by blocking one of two outlets. The first is an 18-inch diameter outlet pipe located at the outlet of the detention tank/pipe. This pipe is noted as point B of the Operational Plan, Appendix A. The second option is blocking the 18-inch outfall pipe noted as Point E.

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 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
There is a flow control manhole (Point D of the Operational Plan, Appendix A and Photo 2) located at the west end of the detention tank/pipe. In the event of high flows, stormwater overtops the high flow bypass and exits the facility through an 18-inch pipe.

☐ 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

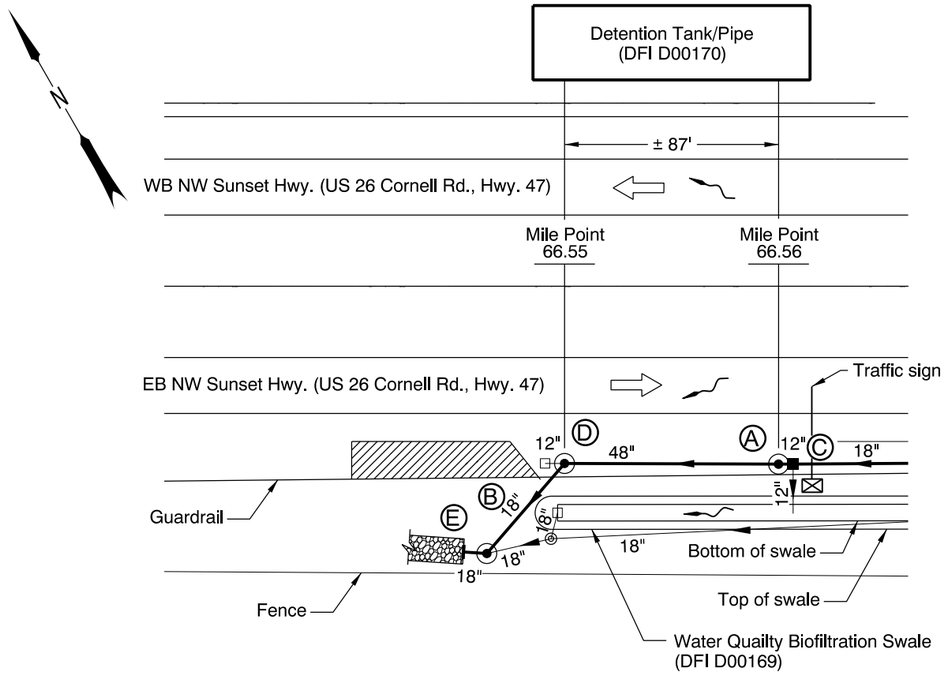
Contact any of the following for more detailed information about management of waste materials found on site:

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

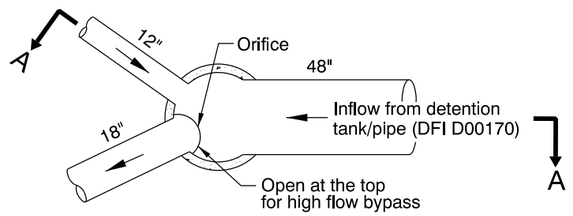
Appendix A

Content:

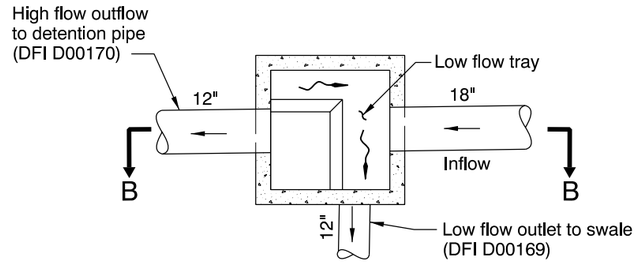
- **Operational Plan and Profile Drawing(s)**



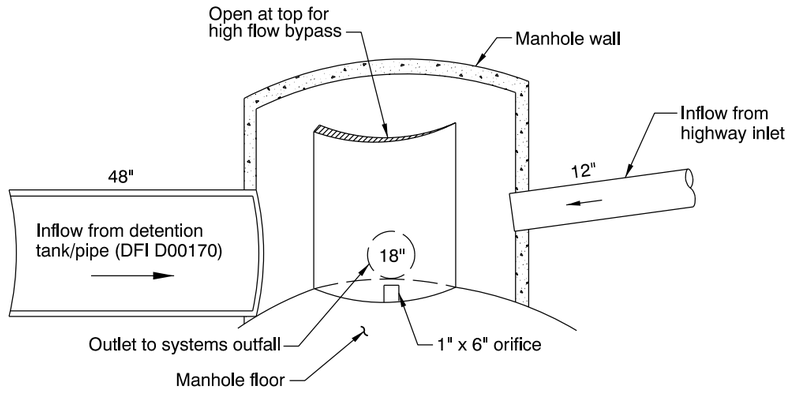
PLAN
N.T.S.



FLOW CONTROL MANHOLE DETAIL AT POINT Ⓓ
N.T.S.



FLOW SPLITTER/DIVERSION PLAN AT POINTⒸ
N.T.S.



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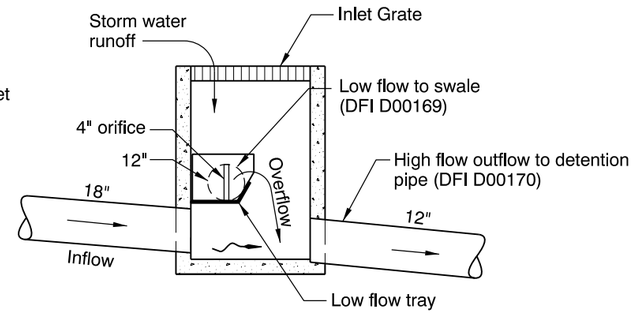

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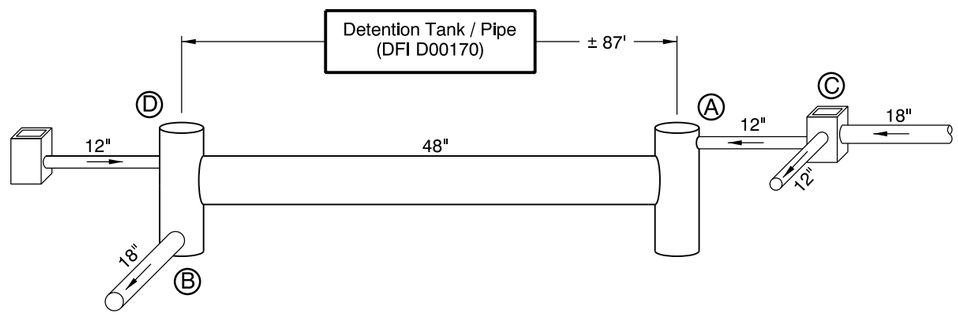


SCHEMATIC OF PIPE DRAINAGE SYSTEM
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Pipe Inlet
- Ⓑ Pipe Outlet
- Ⓒ Flow Splitter / Diversion Inlet
- Ⓓ Flow Control Manhole
- Ⓔ Riprap Outfall
- ◉ and/or ◎ Manhole
- ■ and/or □ Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Maintenance Access

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Craig Fox

Drafted By: M. Bunde/D.Claycomb

DFI D00170
MAINTENANCE DISTRICT 2B HWY 47
DETENTION TANK/PIPE
SUNSET HIGHWAY MP 66.55-66.56
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

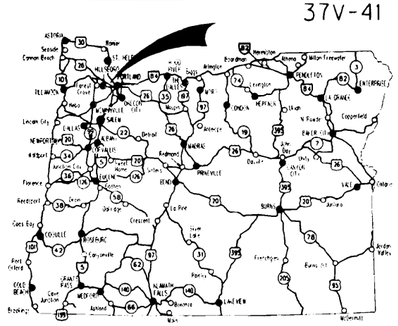
PLANS FOR PROPOSED PROJECT

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

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

SUNSET HIGHWAY

WASHINGTON COUNTY
MARCH 2004

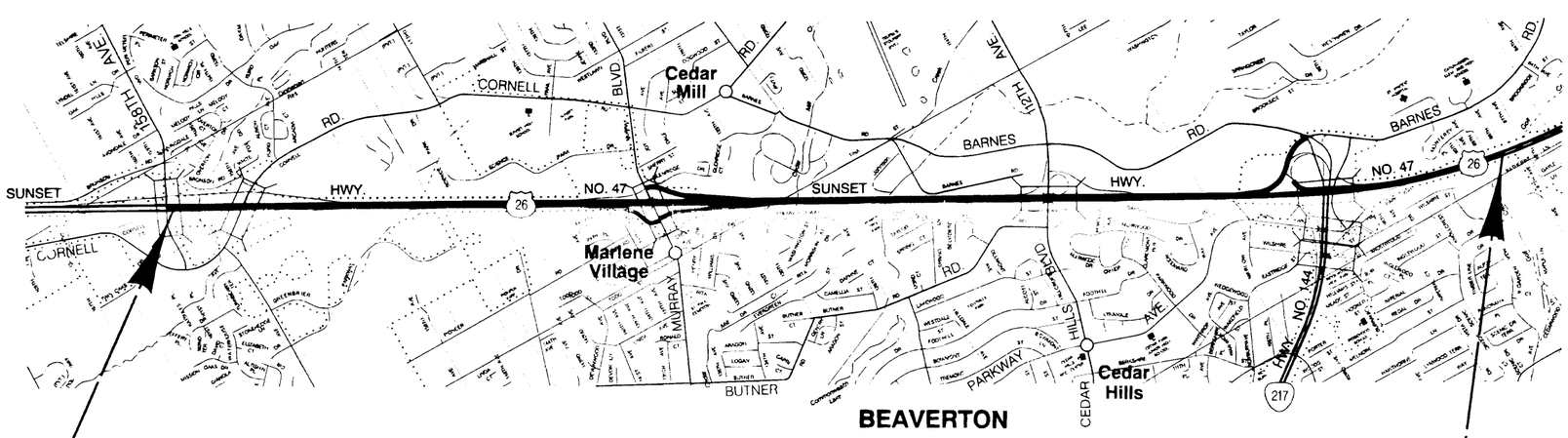


Overall Length Of Project - 6.51 km (4.05 Miles)

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)

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

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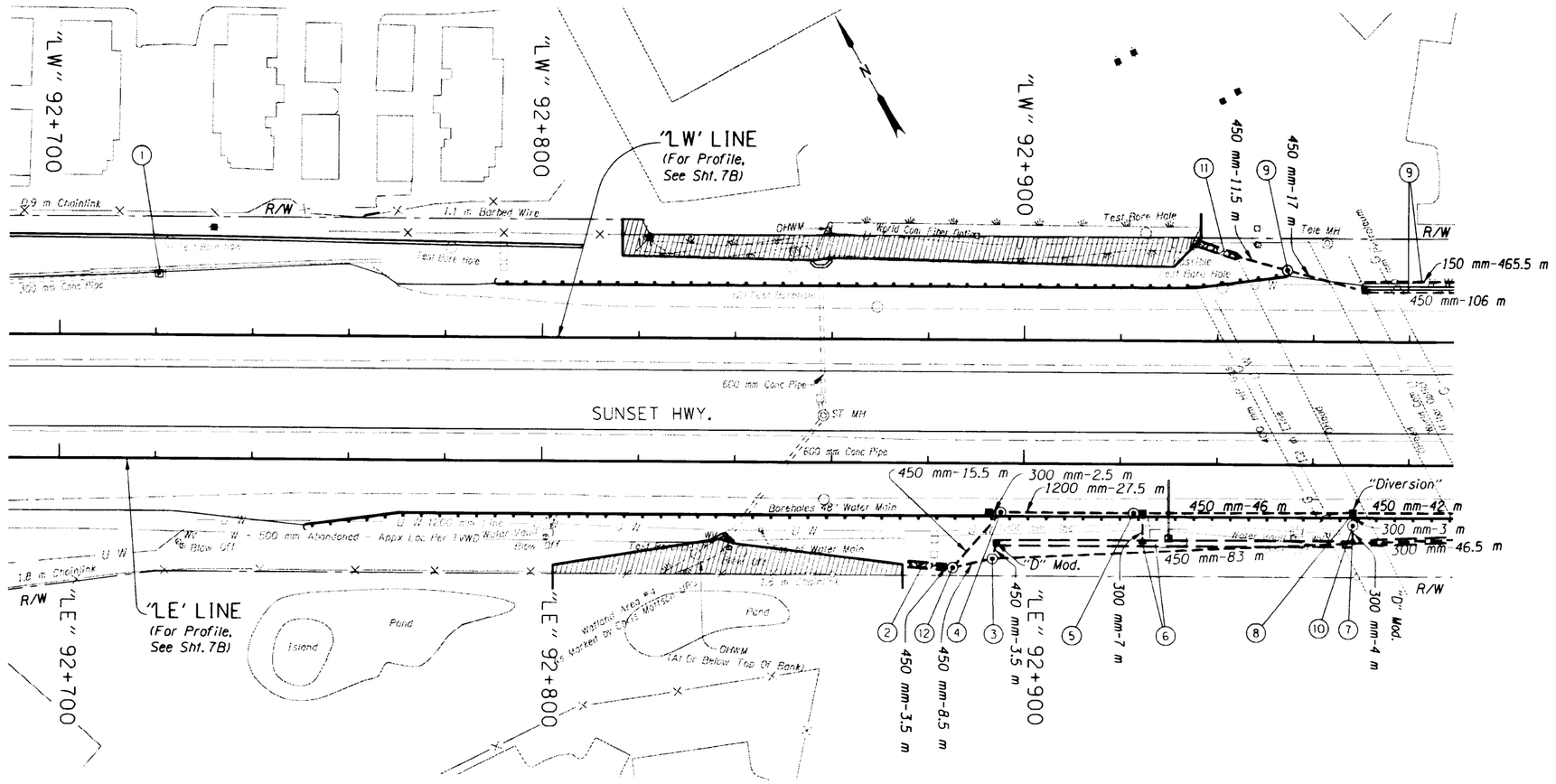
Sec. 32, T. 1N, R. 1W, W.M.



(1) *Adjust Inlet*
Const. Open Grade HMAC Mod. Inlet

(2) *Sta. "LE" 92+882.236, 21.425 m Rt.*
Const. Ditch
0.6 m Flat Bottom, 1:2 Slopes
Inst. 450 mm Storm Sew. Pipe - 3.5 m
1.5 m Depth
Const. Paved End Slope - 4.3 m²
Const. Loose Riprap (Class 25) - 31 MG
Riprap Geotextile Matl., Type "1" - 49 m²
Dt. Exc. - 23 m³
(For Details, See Sht. GHJ-8)

(3) *Sta. "LE" 92+893.492, 19.724 m Rt.*
Const. Manhole
Const. Type "D" Mod. Inlet - 2
Const. Water Quality Swale "WC2A"
0.6 m Flat Bottom
Inst. 450 mm Storm Sew. Pipe - 86.5 m
1.5 m Depth
(For Details, See Sht. GHJ-35)

(4) *Sta. "LE" 92+895.233, Rt.*
Const. Detention Manhole, Large, 2400 mm Dia.
Const. Type "G-2" Open Grade HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 2.5 m
1.5 m Depth
Inst. 1200 mm Storm Sew. Pipe - 27.5 m
3 m Depth
(For Details, See Sht. GHJ-11)

(5) *Sta. "LE" 92+922.789, Rt.*
Const. Manhole, Large, 2400 mm Dia.
Const. Type "G-2" Open Grade HMAC
Diversion Mod. Inlet
Inst. 450 mm Storm Sew. Pipe - 46.0 m
1.5 m Depth
(For Details, See Sht. GHJ-14)

(6) *Sta. "LE" 92+922.787, 16.504 m Rt.*
Const. Paved End Slope - 3.1 m²
Const. Water Quality Swale "WC2B"
Inst. 300 mm Storm Sew. Pipe - 7.0 m
1.5 m Depth
(For Details, See Shts. R-28 & GHJ-36)

(7) *Sta. "LE" 92+968.367, 16.341 m Rt..*
Inst. 300 mm Storm Sew. Pipe - 4.0 m
1.5 m Depth
Const. Paved End Slope - 3.1 m²

(8) *Sta. "LE" 92+968.400, Rt.*
Const. Type "G-2" Open Grade HMAC Diversion Mod. Inlet
Inst. 450 mm Storm Sew. Pipe - 42.0 m
3 m Depth
(For Details, See Sht. GHJ-14)

(9) *Sta. "LW" 92+967.593, 14.937 m Lt.*
Const. Pollution Control Manhole
Const. Type "G-2" Open Grade HMAC Inlet - 5
Inst. 300 mm Storm Sew. Pipe - 256.5 m
1.5 m Depth
Inst. 450 mm Storm Sew. Pipe - 123.0 m
1.5 m Depth
Const. Conc. Barrier Drain - 465.5 m
(For Details, See Sht. GHJ-1)

(10) *Sta. "LE" 92+968.387, 12.435 m Rt.*
Const. Pollution Control Manhole
Inst. 300 mm Storm Sew. Pipe - 3.0 m
1.5 m Depth
(For Details, See Sht. GHJ-31)

(11) *Sta. "LW" 92+964.843, 15.383 m Lt.*
Const. Ditch
0.6 m Flat Bottom , 1:2 Slopes
Inst. 450 mm Storm Sew. Pipe - 11.5 m
1.5 m Depth
Const. Paved End Slope - 4.3 m²
Const. Loose Riprap (Class 25) - 33 MG
Riprap Geotextile Matl., Type "1" - 51 m²
Dt. Exc. - 24 m³
(For Details, See Sht. GHJ-8)

(12) *Sta. "LE" 92+885.229, 21.626 m Rt.*
Const. Manhole
Inst. 450 mm Storm Sew. Pipe - 8.5 m
1.5 m Depth
Inst. 450 mm Storm Sew. Pipe - 15.5 m
3 m Depth

Wetland Area No Work Zone, Shown Thus:

REGISTERED PROFESSIONAL ENGINEER
19156
S. Council
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
Expires Dec. 31, 2005

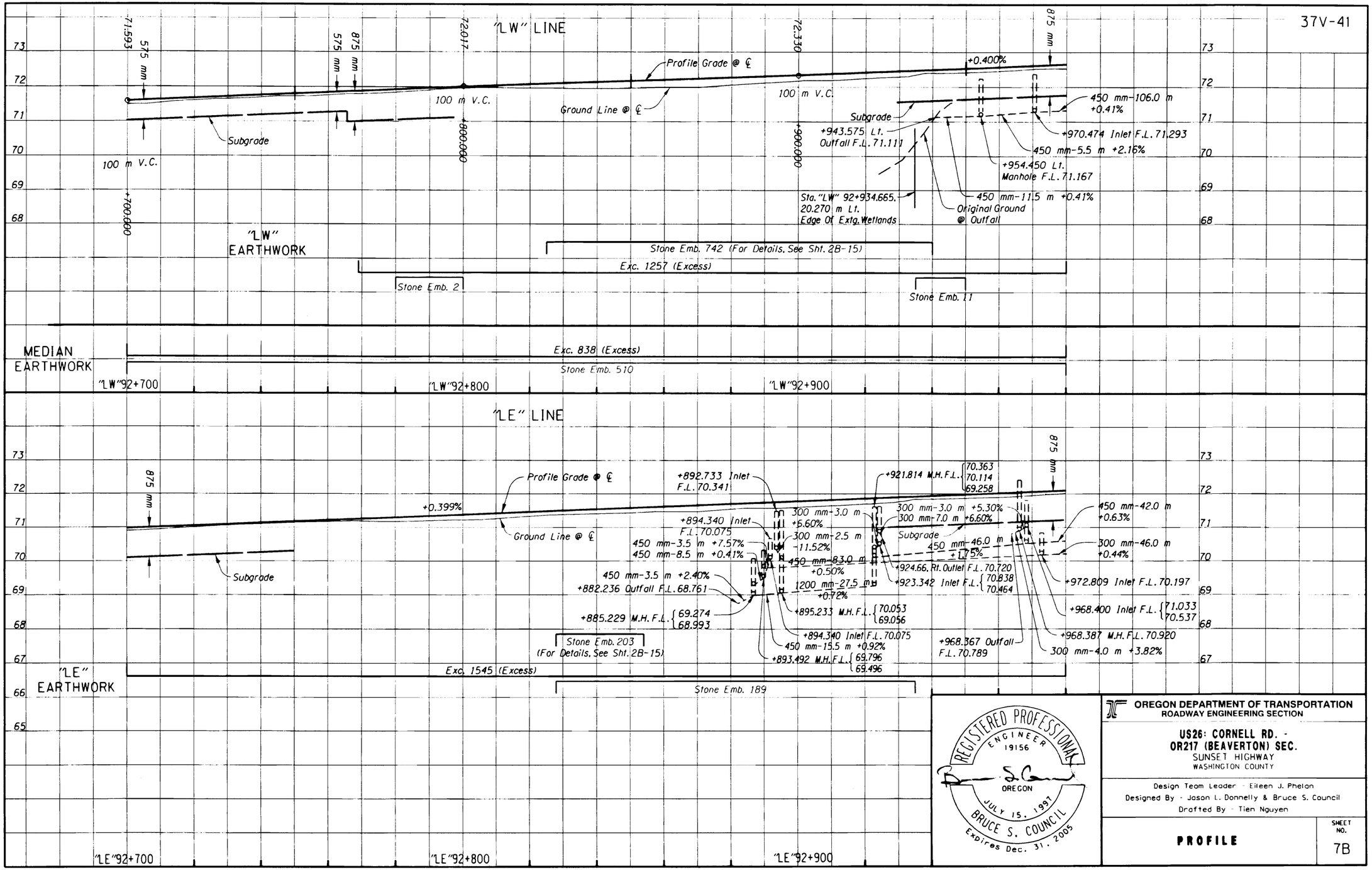
OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

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

Design Team Leader - Eileen J. Phelan
Designed By - Bruce S. Council
Drafted By - Tien Nguyen

DRAINAGE & UTILITIES

SHEET NO. 7A



REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2005

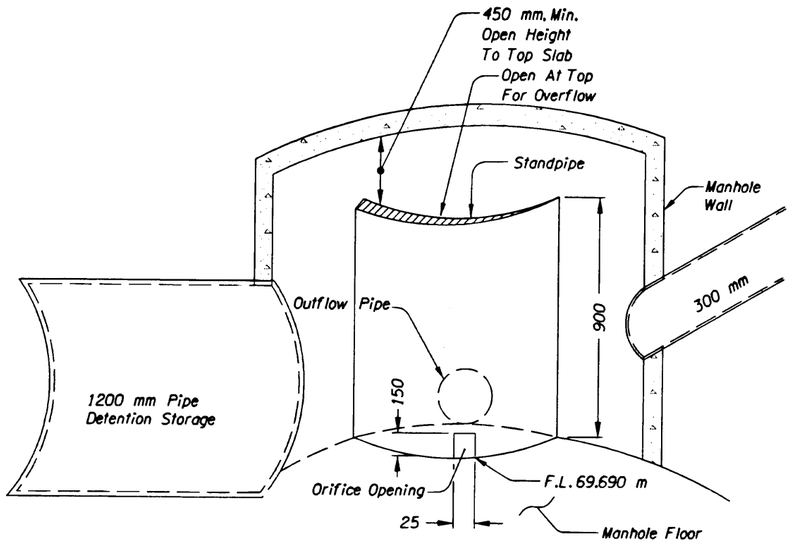
OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

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

Design Team Leader - Eileen J. Phelan
Designed By - Jason L. Donnelly & Bruce S. Council
Drafted By - Tien Nguyen

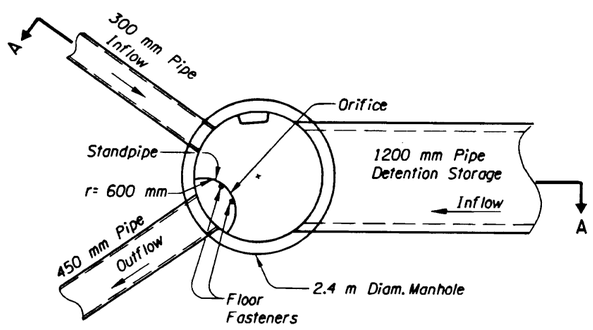
PROFILE

SHEET NO. 7B



Note: For Details Not Shown, See Sht. GHJ-13

SECTION A-A



PLAN

DETENTION MANHOLE

Sta. "LE" 92+895.23, Rt.

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

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL 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 - Bruce S. Council
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-11

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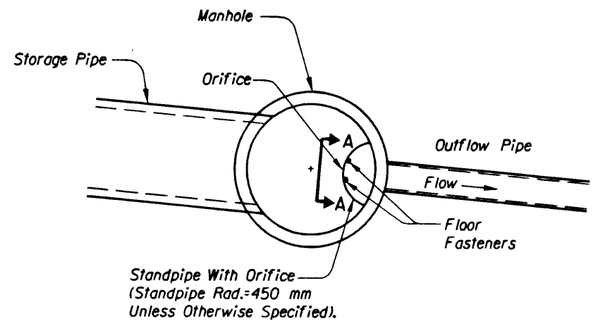
VIEW 3

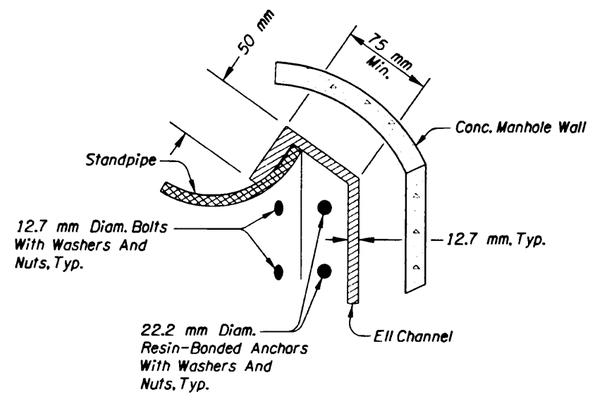
VIEW 3

DETENTION MANHOLE GENERAL DETAILS

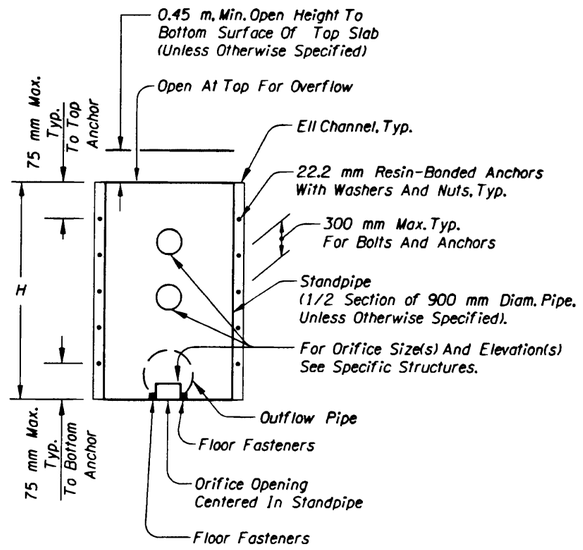


PLAN

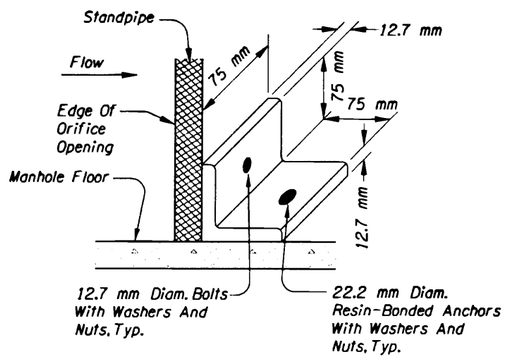
DETENTION MANHOLE



STANDPIPE CONNECTION TO MANHOLE WALL



SECTION A-A



FLOOR FASTENER

NOTES:
1. Permanent Waterproof Seal All Edges Of Standpipe Contacting Floor And Wall.
2. Standpipe Shall Be 2.77 mm (12 Gage) Thick Metal, Or HDPE SDR26. Gage, Min.
3. Place Floor Fasteners That Are Next To The Orifice Opening Inside The Standpipe, One On Each Side Of Opening.
4. Orifice Opening(s) Are Centered In The Standpipe And In Line With The Outflow Pipe.
5. All Hardware Shall Be Stainless Steel Or Hot Dipped Galvanized.
6. For Other Bolt, Anchor And Support Details, Not Shown See Sht. GHJ-20.
7. 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-13

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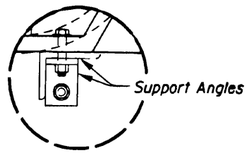
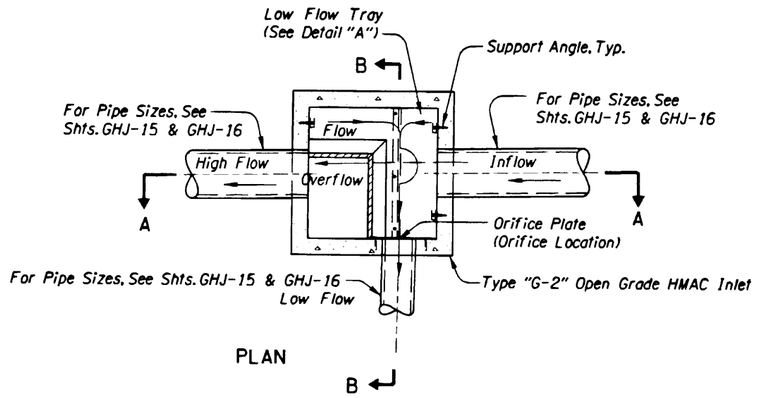
VIEW 1

VIEW 1

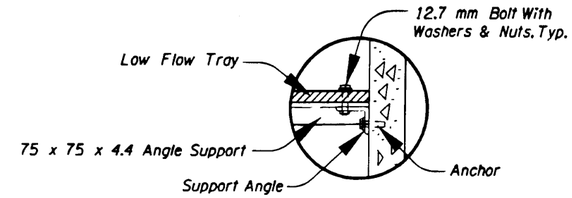
DIVERSION TYPE "G-2" INLET HIGH-LOW, ORIFICE PLATE, AND LOW FLOW GENERAL DETAILS



DETAIL "C"



PLAN



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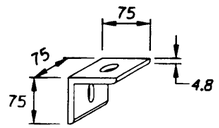
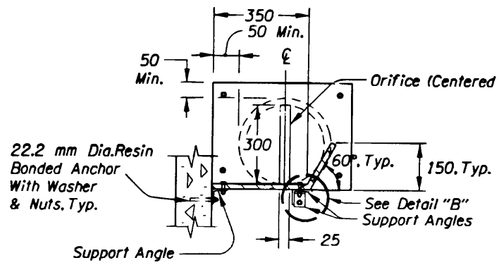
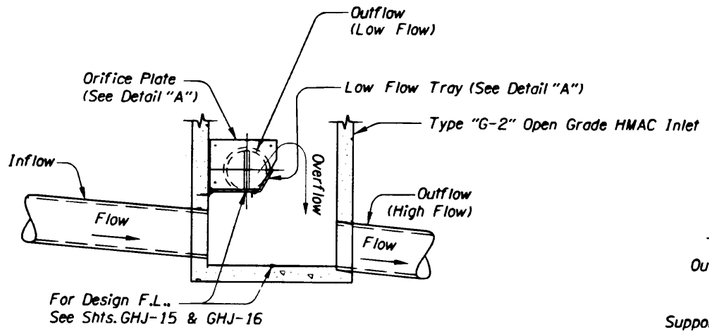


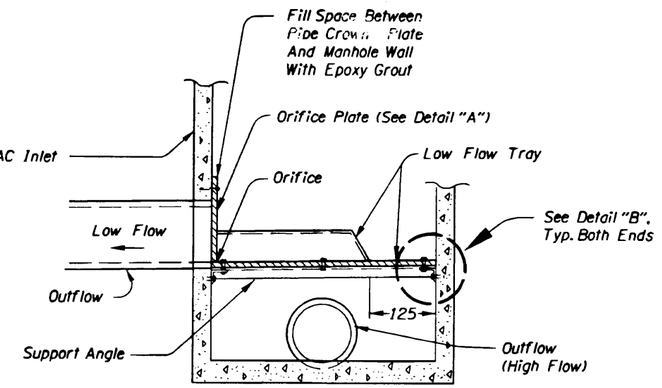
Support Angle



DETAIL "A"



SECTION A-A



SECTION B-B

Notes:
1. When Connecting To Extg. Pipes Their Sizes, Types, And Invert Elevations Are To Be Verified In The Field.
2. Orifice Plate, Low Flow Tray, And Support Angles Shall Be Steel And Shall Be At Least 9.5 mm Thick.
3. 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.
4. For Resin-Bonded Anchors, Use Steel Threaded Rods.
5. Anchors Shall Be 25 mm, Min., Inside Orifice Plate, And Support Angle Edges.
6. Hole Diameters In The Plates And Angles For The Anchors And Bolts Shall Be 3.2 mm Larger Than The Anchor Or Bolt Diameters.
7. Metal Plates And All Hardware Shall Be Stainless Steel Or Hot-Dipped Galvanized.
8. Permanent Waterproof Seal All Edges Of, And All Bolt Holes Through Low Flow Tray.
9. For Other Bolt, Anchor, And Support Details Not Shown, See Sht. GHJ-20, Details "A" & "B".
10. All Dimensions Are In Millimeters (mm) Unless Otherwise Noted.
11. For INlet Details Not Shown, See RD364.

(For Details Not Shown, See Sht. GHJ-20)

DIVERSION "G-2" INLET "HIGH-LOW", LOW FLOW TO SIDE

REGISTERED PROFESSIONAL ENGINEER
19156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION

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

Project Leader - Naveen Chandra
Designed By - Bruce S. Council
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-14

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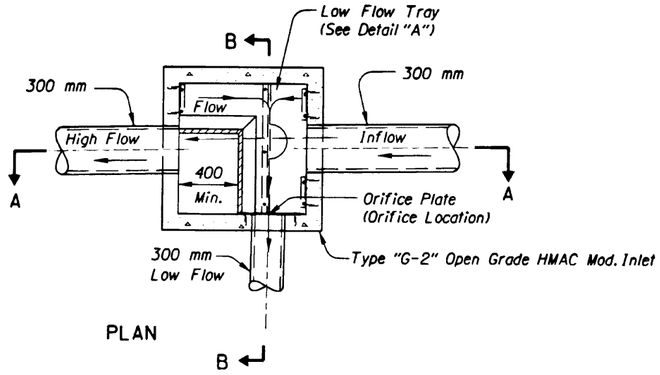
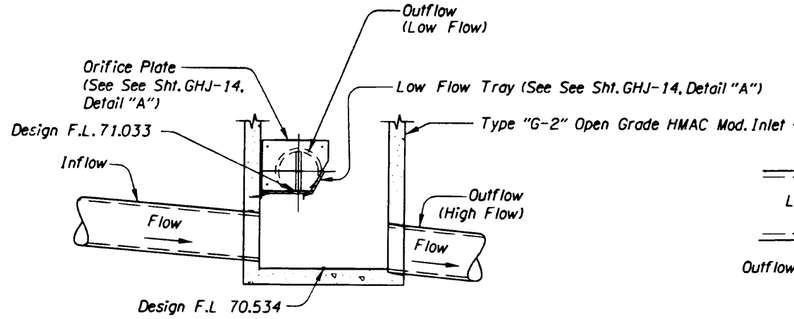
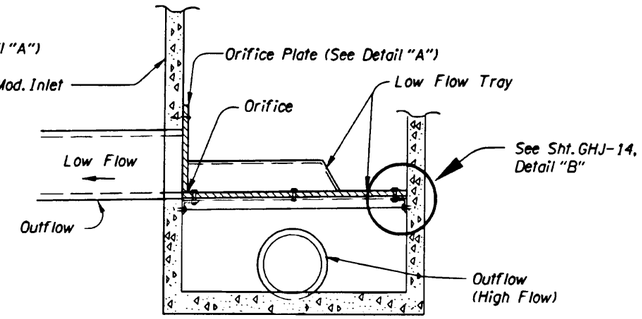


PLAN



SECTION A-A

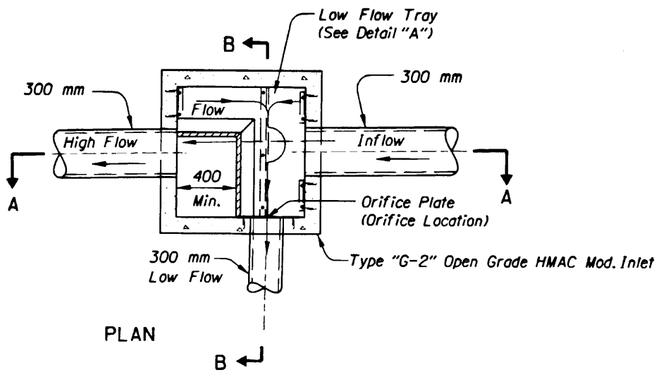


SECTION B-B

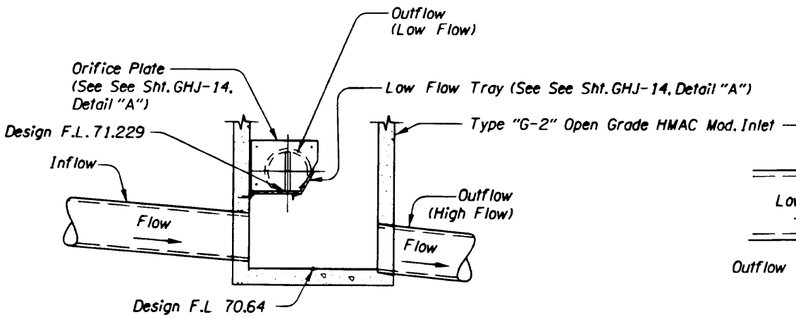
(For Details Not Shown, See Shts. GHJ-14 & GHJ-20)

DIVERSION "G-2" INLET "HIGH-LOW", LOW FLOW TO SIDE

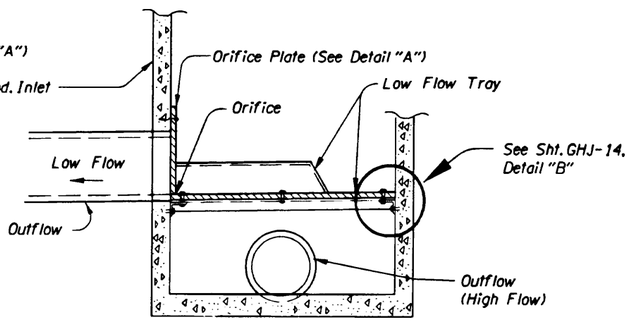
Sta. "LE" 92+968.40, Rt.



PLAN



SECTION A-A



SECTION B-B

(For Details Not Shown, See Shts. GHJ-14 & GHJ-20)

DIVERSION "G-2" INLET "HIGH-LOW", LOW FLOW TO SIDE

Sta. "LE" 92+923.34, Rt.

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION

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

Project Leader - Naveen Chandra
Designed By - Bruce S. Council
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-15

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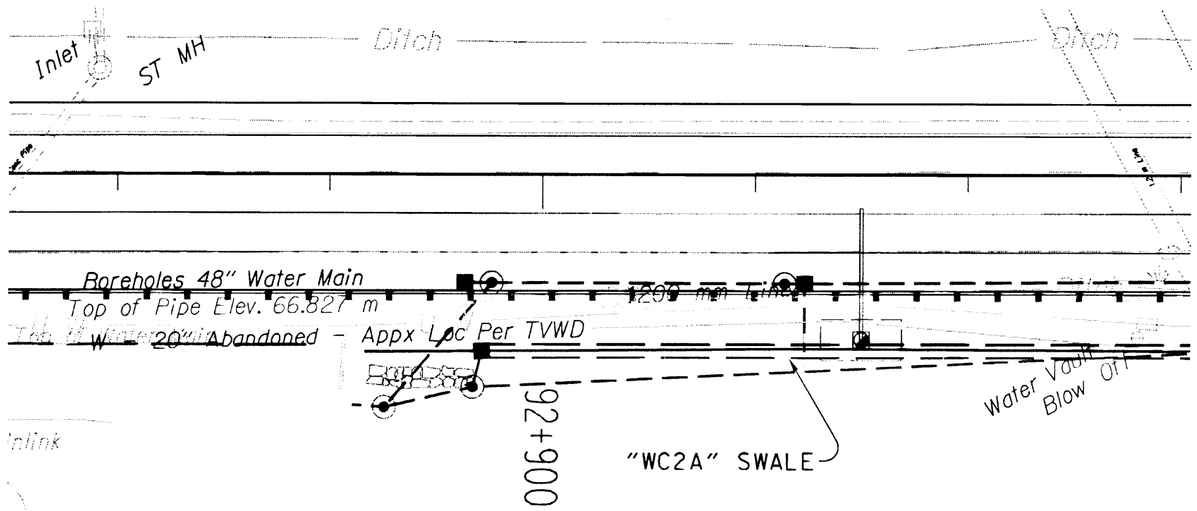

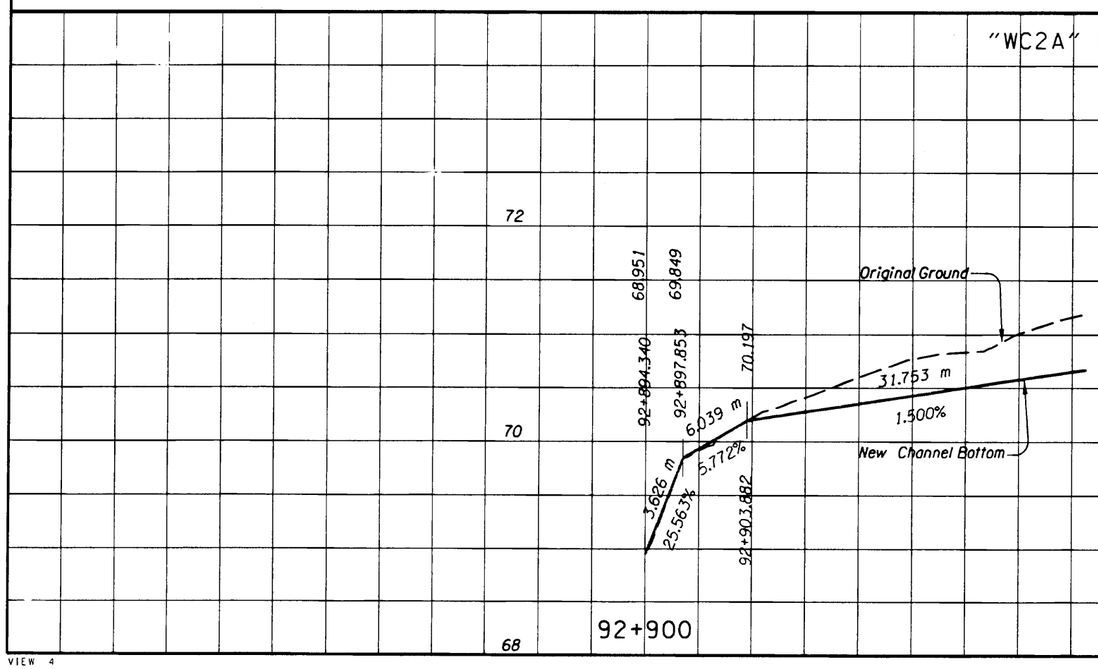

Notes:
1. *All Dimensions Are In Meters (m) Unless Otherwise Noted.*
2. *For Details, See Shts. GHJ-48 & GHJ-49*

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

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

Project Leader - Naveen Chandra
Designed By - Bruce S. Council
Drafted By - Martin G. Casillas

WATER QUALITY PLAN

SHEET NO. GHJ-35

1:1000

VIEW 4