OPERATION & MAINTENANCE MANUAL

DFI No.: D00174
Facility Type: Detention Tank/Pipe

JULY, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00174**
Facility Type:	Detention Tank/Pipe
Construction Drawings:	(V-File Number) 37V-041
Location:	District: 2B (Old 2A)
	Highway No.: 047
	Mile Post: 65.83/65.87 (beg./end)
	Description: This facility is located north of the westbound lanes of US26 (Hwy 047) between Bethany Boulevard and Cornell Road. Access to the facility can be obtained from the unobstructed shoulder of westbound US26 (Hwy 047).

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, P.E., (503) 731-8319
Facility Construction:	2004
Contractor:	Mowat 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 located north of the westbound lanes of US26 (Hwy 047) between Cornell Road and Bethany Boulevard. Access to the facility may be obtained from the unobstructed shoulder off these lanes.

This detention facility consists of 197 feet of 48-inch diameter pipe and three manholes, each 8 feet in diameter. The facility's total length is 221 feet.

This detention facility receives treated water from the adjacent water quality biofiltration swale (DFI D00171) at three inlets near the center of the swale (Points A, B, C on Operational Plan in Appendix A). Water is directed from the easternmost and westernmost inlets (Points A, B), via 18-inch diameter pipes, to the central inlet (Point C). From the central inlet, another 18-inch pipe conveys water to the central manhole of the detention facility (Point D). The water is then detained in the detention facility's pipes and manholes.

The westernmost manhole contains the flow control device, which detains flow (Point E). The flow control device consists of a flow restricting orifice and an overflow weir wall. After detention, flow exits through the orifice, and a 24-inch diameter storm pipe conveys the runoff to a manhole (Point F). From there, the water is discharged into a 24-inch diameter storm pipe, which conveys the water northwards.

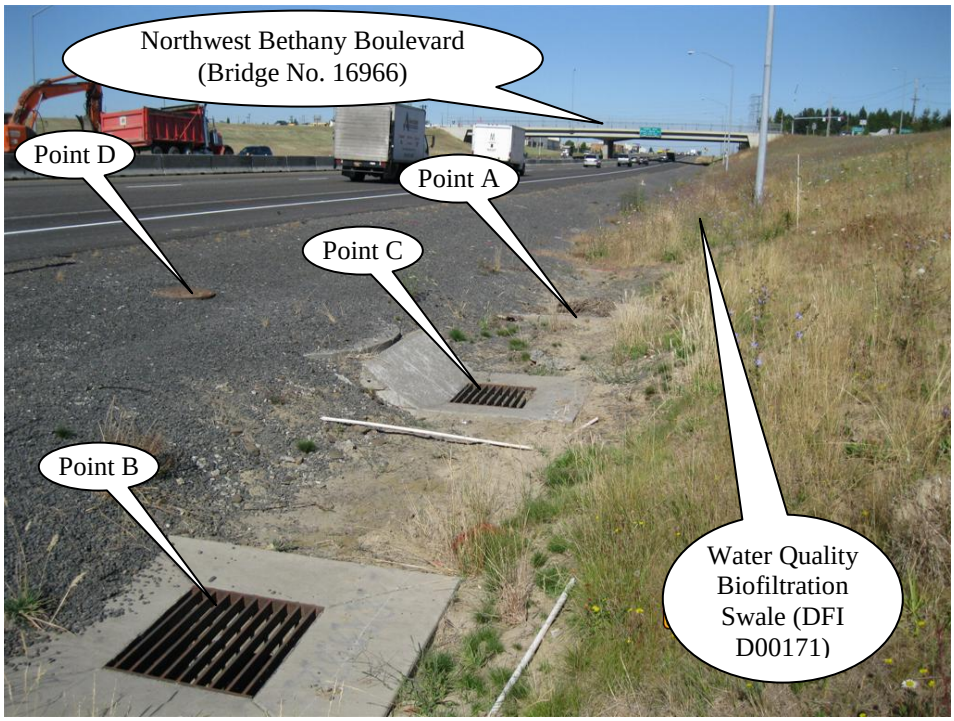


Photo 1: The central manhole of the detention facility (**Point D**) is adjacent to the inlets associated with a nearby water quality swale (DFI D00171) (**Points A, B, C**). Photo taken facing west.

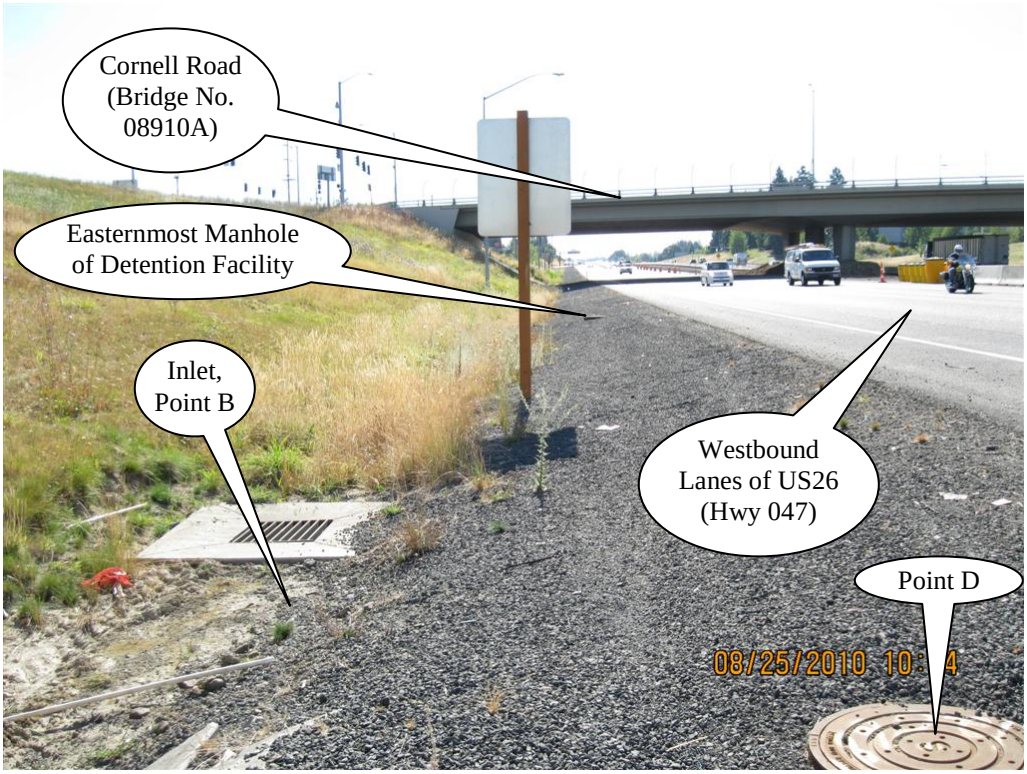


Photo 2: The central manhole of this detention facility is shown in foreground (**Point D**). The easternmost manhole of the detention facility is shown in the background. Westbound lanes of US 26 (Hwy 47) are on the right. Photo taken facing east.

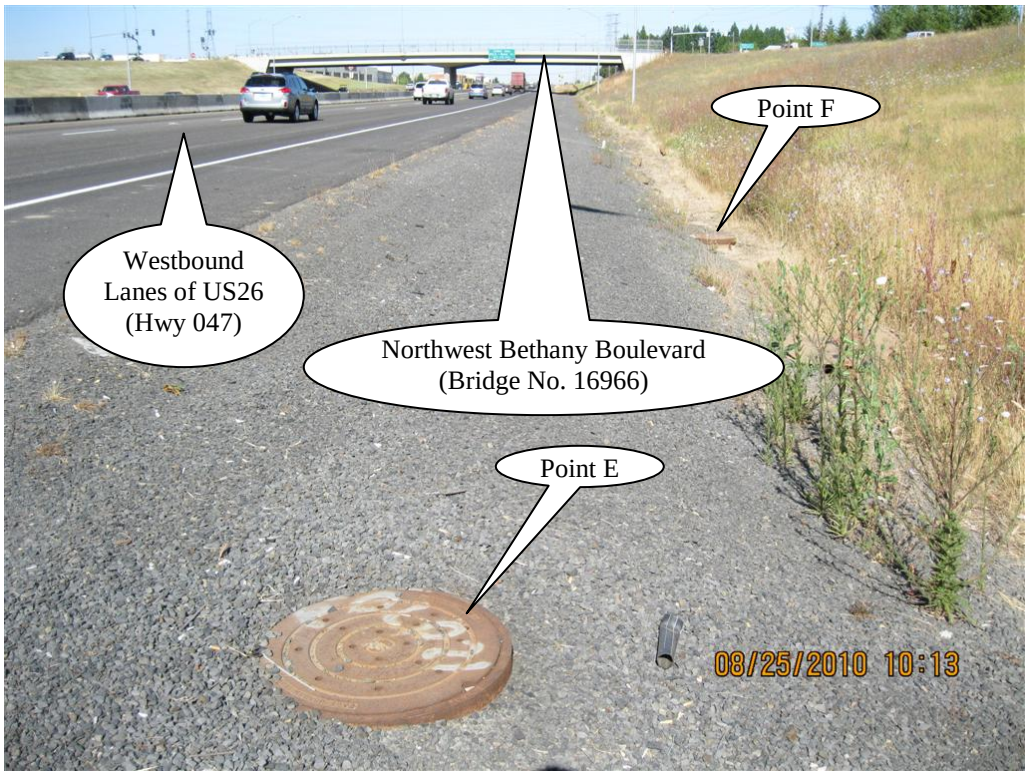


Photo 3: The westernmost manhole for the detention facility contains the flow control device (**Point E**). After detention the water is directed by a 24-inch storm pipe to a manhole (**Point F**). Photo taken facing west.

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 for maintenance from the unobstructed shoulder of US26 (Hwy 047) westbound.

B. Heavy equipment access into facility:

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

C. Special Features:

   ☐ Amended Soils
   ☐ Porous Pavers
   ☐ Liners
   ☐ Underdrains

5. Facility Haz Mat Spill Feature(s)

This facility is not suitable for capturing hazardous materials.

However, action to contain hazardous materials may be taken at the inlets of the adjacent water quality biofiltration swale (DFI D00171) (Points A, B, C). If these inlets at the middle of the swale are blocked, the swale can effectively store a volume of liquid. Metal plates or sandbags can be used to block these inlets.

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 overflow 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 - An overflow weir wall is located in the westernmost manhole of the detention facility (Point E). If the restricting orifice becomes plugged or if flows exceed the anticipated high flow, excess water overtops the weir wall and exits the detention facility through the outlet pipe.

☐Other, as noted –

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: None

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

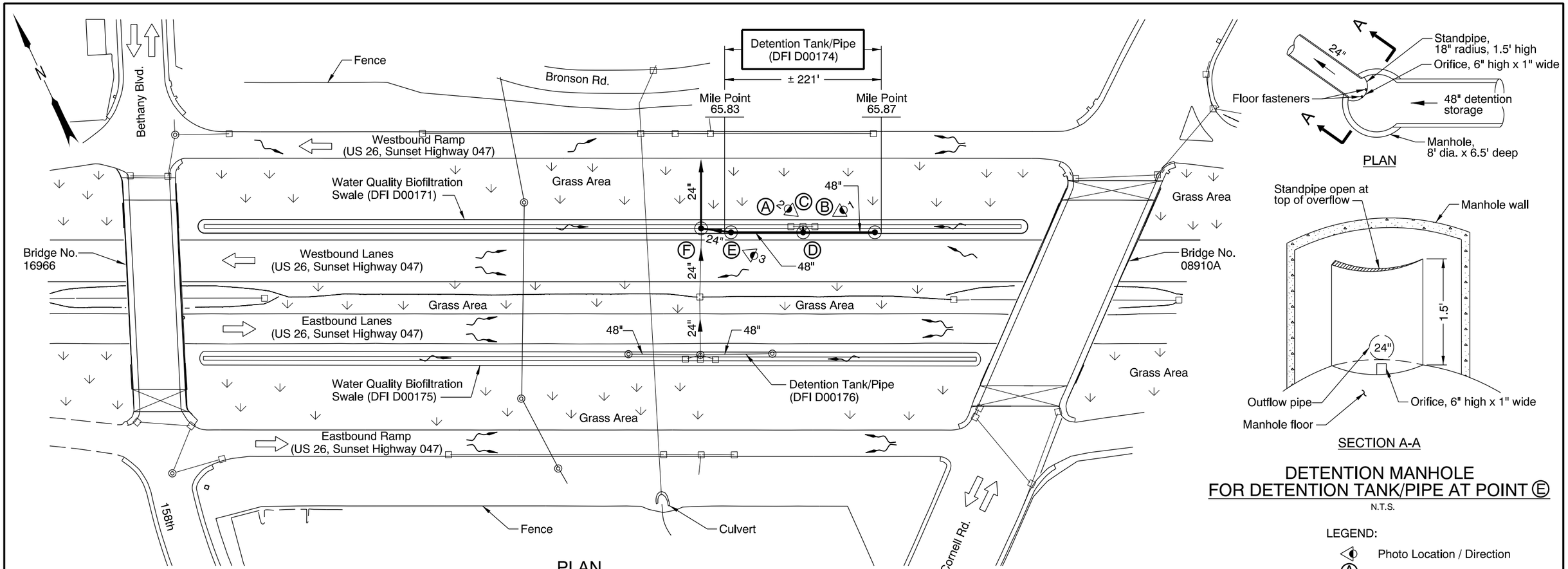
Contact any of the following for more detailed information about management of waste materials found on site:

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

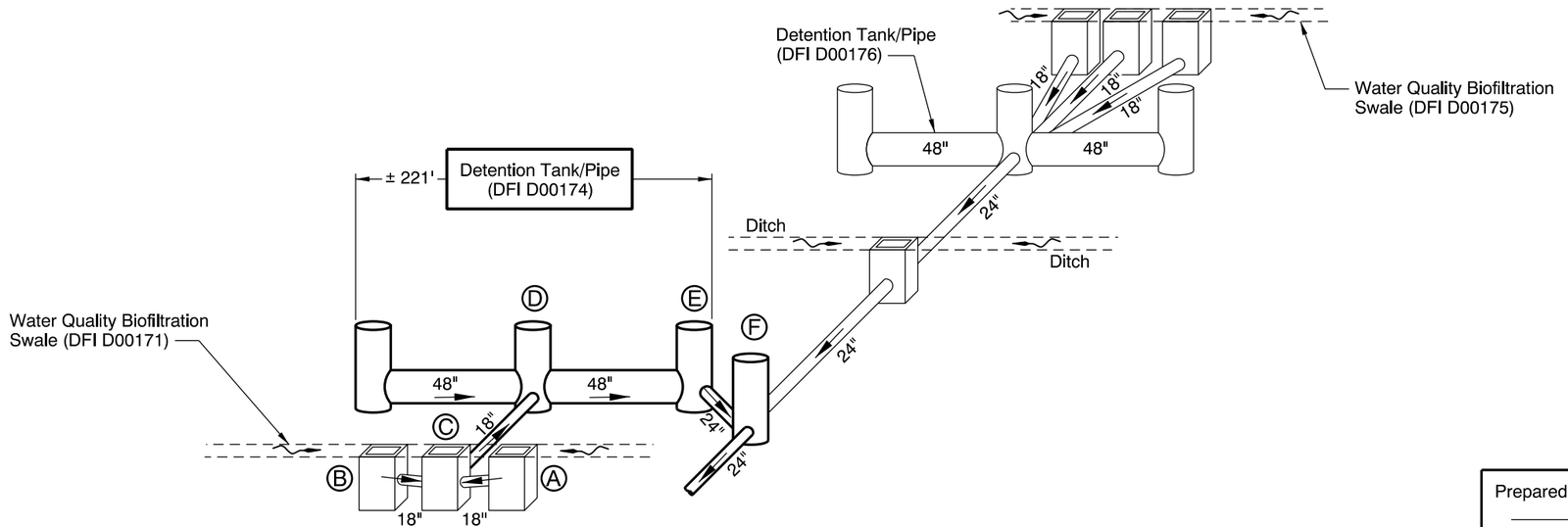
Appendix A

Content:

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



PLAN
N.T.S.



PIPE SCHEMATIC OF DRAINAGE SYSTEM SECTION
N.T.S.

PLAN

SECTION A-A

DETENTION MANHOLE FOR DETENTION TANK/PIPE AT POINT Ⓔ

N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Western Inlet
- Ⓑ Eastern Inlet
- Ⓒ Central Inlet
- Ⓓ Manhole Connected To Central Inlet By Pipe
- Ⓔ Detention Manhole
- Ⓕ Manhole Connecting Detention Tank/Pipe To Conveyance Line
- ◉ and or ◎ Manhole
- ■ and or □ Inlet
- Traffic Flow / Direction
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Wynee Hu

Drafted By: Mathew Bunde

DFI D00174
MAINTENANCE DISTRICT 2B HWY 047
DETENTION TANK/PIPE
SUNSET HIGHWAY MP 65.83-65.87
WASHINGTON COUNTY

Z:\Hydraulics\Hydraulics OM\Completed_Facility_Files_READY to QAQC\Dist_2B\Hwy_047\2B_047_D00174\Operational Plan\DFI_D00174.dgn :: Sheet 2/20/2014 9:56:35 AM hwyr33e

DFI_D00174.dgn

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

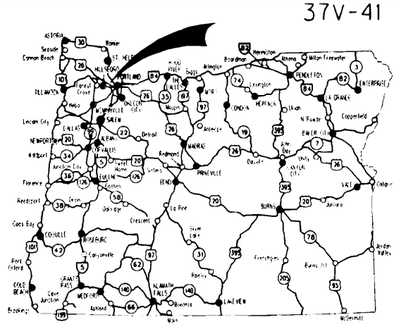
PLANS FOR PROPOSED PROJECT

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

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

SUNSET HIGHWAY

WASHINGTON COUNTY
MARCH 2004

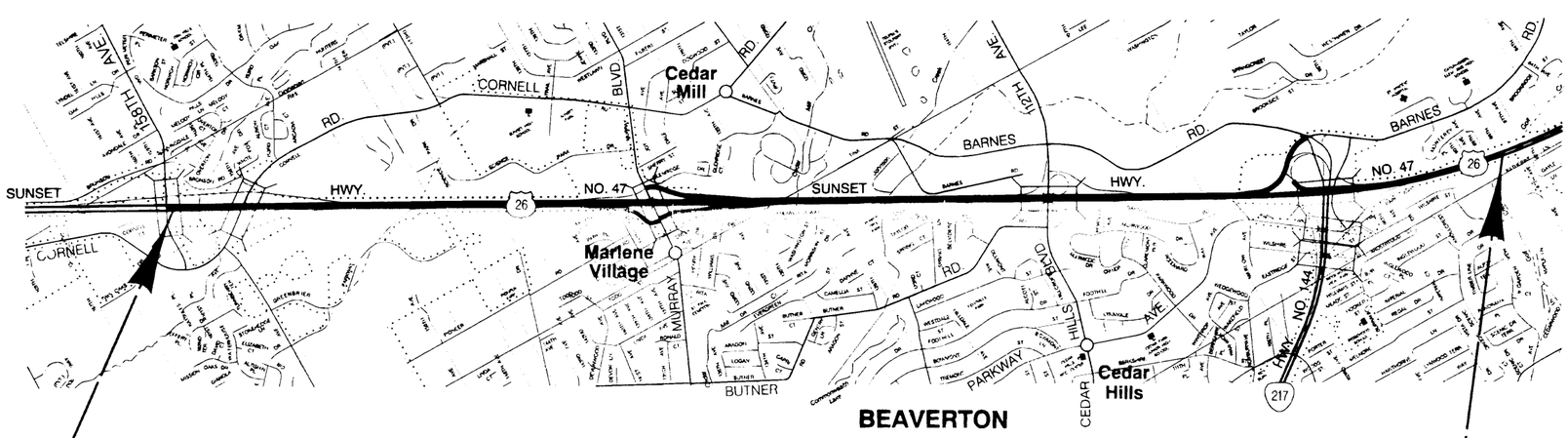


Overall Length Of Project - 6.51 km (4.05 Miles)

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

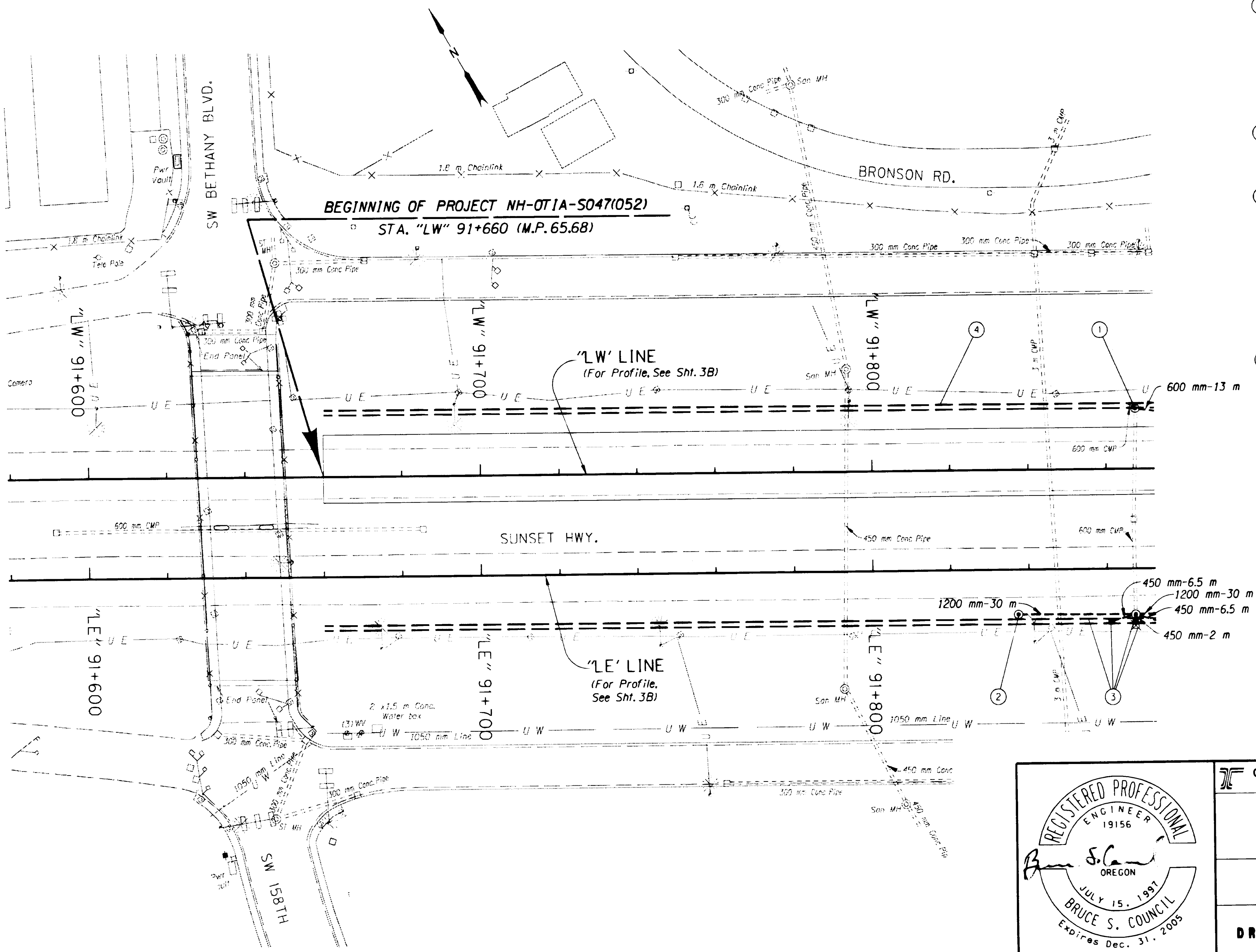
US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

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



1. Sta. "LW" 91+867.478, 15.633 m Lt.
   Const. Manhole
   Connect To Extg. 600 mm CMP
   Inst. 600 mm Storm Sew. Pipe - 13.0 m
   3 m Depth
   (See Drg. Nos. RD300, RD336, RD344, RD356, & RD360)

2. Sta. "LE" 91+837.186, 11.250 m Rt.
   Const. Manhole, Large, 2400 mm Dia.
   (See Drg. No. 346)

3. Sta. "LE" 91+867.185, 11.508 m Rt.
   Remove Inlet
   Const. Water Quality Swale "WCE"
   Const. Detention Manhole 2.4 m
   Const. Type "G-2MA" Inlet - 3
   Inst. 450 mm Storm Sew. Pipe - 15.0 m
   1.5 m Depth
   Inst. 1200 mm Storm Pipe - 60.0 m
   3 m Depth
   (For Details, See Shts. R-28, GHJ-11, & GHJ-33)
   (See Drg. No. RD364)

4. See Sht. 4A, Note 2

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

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

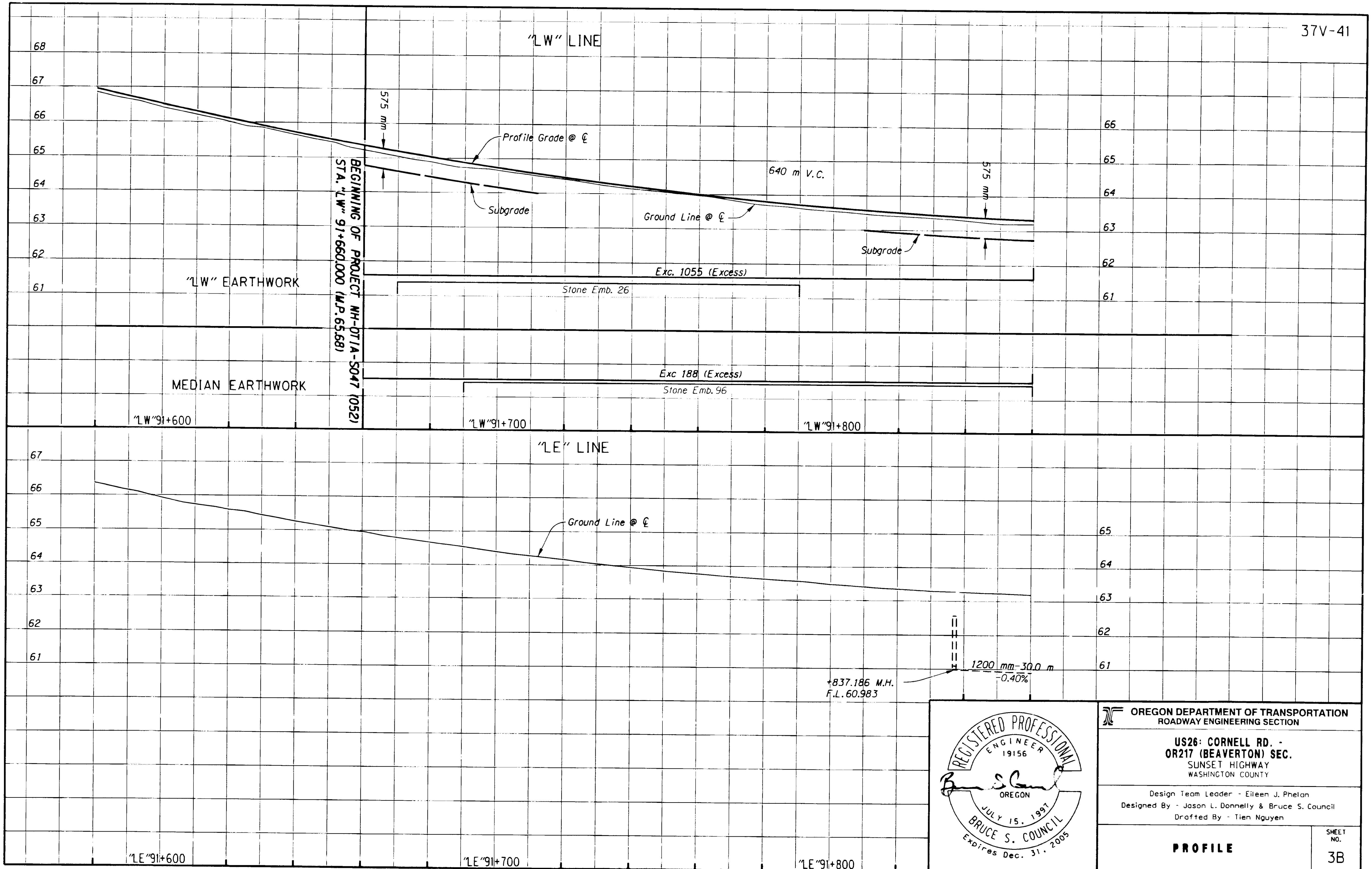
US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

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

DRAINAGE & UTILITIES

SHEET NO. 3A

37V-41


"LW" LINE
Profile Grade @ ℄
575 mm
640 m V.C.
575 mm
Subgrade
Ground Line @ ℄
Subgrade
Exc. 1055 (Excess)
Stone Emb. 26
"LW" EARTHWORK
BEGINNING OF PROJECT NH-OTIA-S047 (052)
STA. "LW" 91+660.000 (M.P. 65.68)
Exc 188 (Excess)
Stone Emb. 96
MEDIAN EARTHWORK
"LW"91+600
"LW"91+700
"LW"91+800
"LE" LINE
Ground Line @ ℄
+837.186 M.H.
F.L. 60.983
1200 mm-30.0 m
-0.40%
"LE"91+600
"LE"91+700
"LE"91+800
REGISTERED PROFESSIONAL ENGINEER 19156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

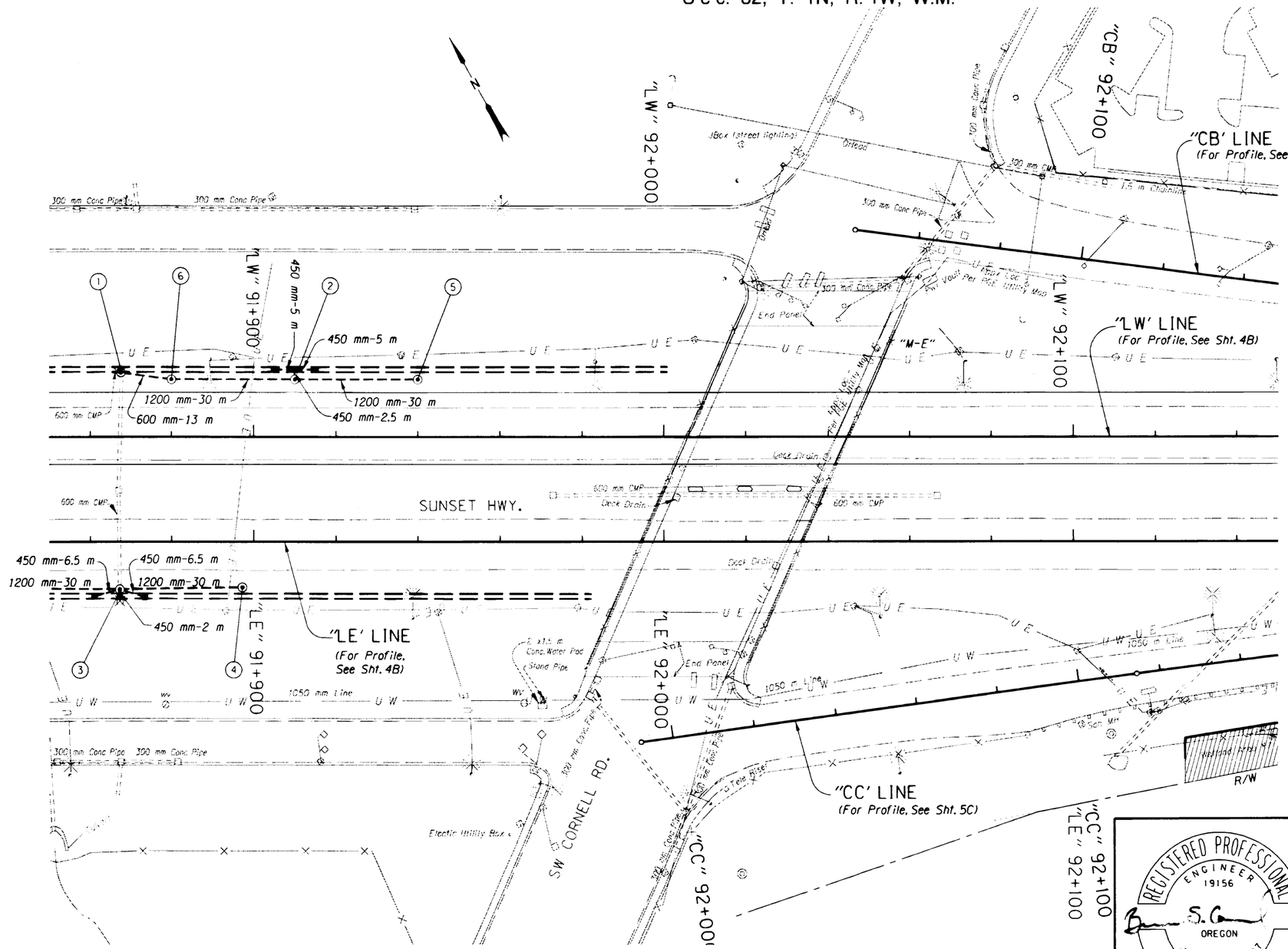
US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

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

PROFILE

SHEET NO. 3B

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



Wetland Area No Work Zone, Shown Thus: ▨

① See Sht. 3A, Note 1

② Sta. "LW" 91+910.035, 13.984 m Lt.
Const. Water Quality Swale "WCW"
Const. Manhole, Large, 2400 mm Dia.
Const. Type "G-2MA" Inlet - 2
Inst. 450 mm Storm Sew. Pipe - 12.5 m
1.5 m Depth
Inst. 1200 mm Storm Sew. Pipe - 30.0 m
3 m Depth

③ See Sht. 3A, Note 3

④ Sta. "LE" 91+897.190, 11.057 m Rt.
Const. Manhole, Large, 2400 mm Dia.

⑤ Sta. "LW" 91+939.953, 13.998 m Lt.
Const. Manhole, Large, 2400 mm Dia.

⑥ Sta. "LW" 91+879.953, 13.998 m Lt.
Const. Detention Manhole, 2400 Dia.
Inst. 1200 mm Storm Sew. Pipe - 30.0 m
3 m Depth
(For Details, See Shts. R-28, GHJ-10, & GHJ-32)

Registered Professional Engineer
19156
Oregon
July 15, 1997
Bruce S. Council
Expires Dec. 31, 2005

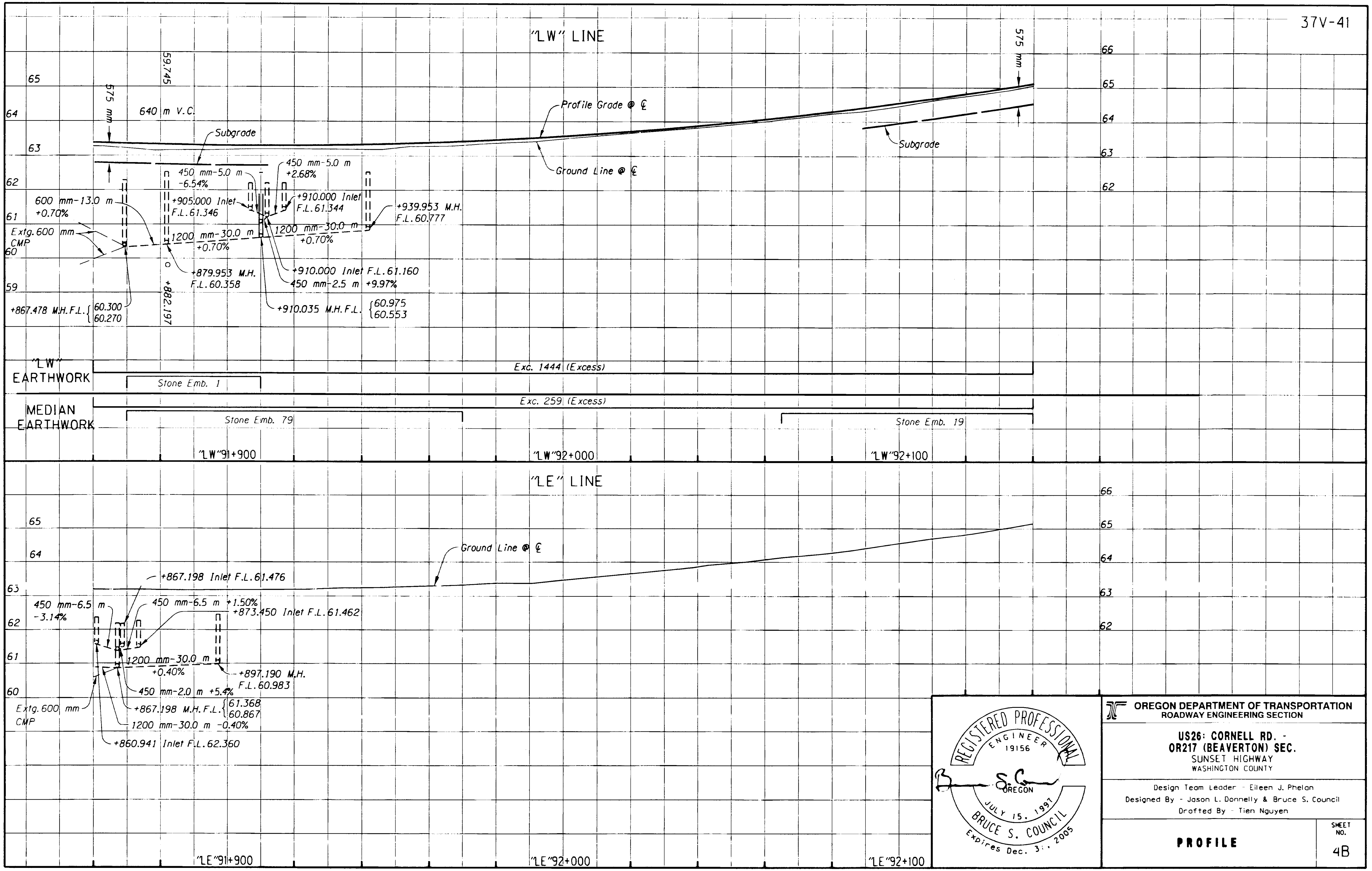
OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

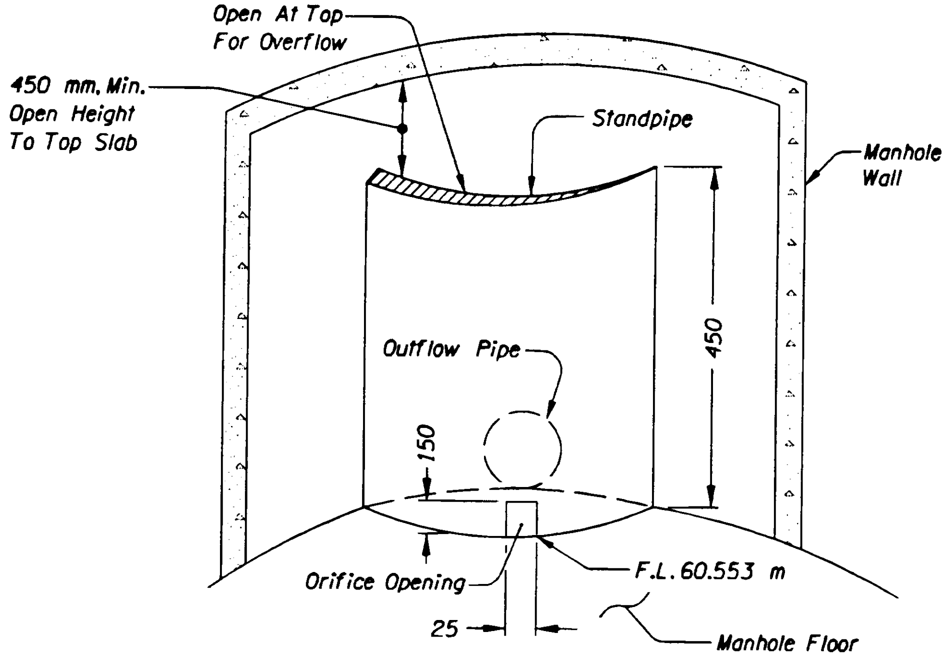
US26: CORNELL RD. -
OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

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

DRAINAGE & UTILITIES

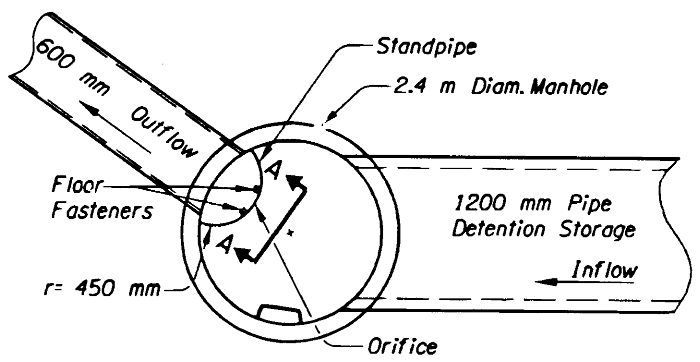
SHEET NO.
4A


37V-41
"LW" LINE
575 mm
59.745
640 m V.C.
Profile Grade @ ℄
Subgrade
Ground Line @ ℄
450 mm-5.0 m -6.54%
450 mm-5.0 m +2.68%
600 mm-13.0 m +0.70%
Extg. 600 mm CMP
+905.000 Inlet F.L. 61.346
+910.000 Inlet F.L. 61.344
+939.953 M.H. F.L. 60.777
1200 mm-30.0 m +0.70%
1200 mm-30.0 m +0.70%
+879.953 M.H. F.L. 60.358
+910.000 Inlet F.L. 61.160
450 mm-2.5 m +9.97%
+867.478 M.H. F.L. {60.300 60.270
+882.197
+910.035 M.H. F.L. {60.975 60.553
"LW" EARTHWORK
Exc. 1444 (Excess)
Stone Emb. 1
MEDIAN EARTHWORK
Exc. 259 (Excess)
Stone Emb. 79
Stone Emb. 19
"LW"91+900
"LW"92+000
"LW"92+100
"LE" LINE
Ground Line @ ℄
+867.198 Inlet F.L. 61.476
450 mm-6.5 m -3.14%
450 mm-6.5 m +1.50%
+873.450 Inlet F.L. 61.462
1200 mm-30.0 m +0.40%
+897.190 M.H. F.L. 60.983
450 mm-2.0 m +5.4%
Extg. 600 mm CMP
+867.198 M.H. F.L. {61.368 60.867
1200 mm-30.0 m -0.40%
+860.941 Inlet F.L. 62.360
"LE"91+900
"LE"92+000
"LE"92+100
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.
4B
1:1000 - 2



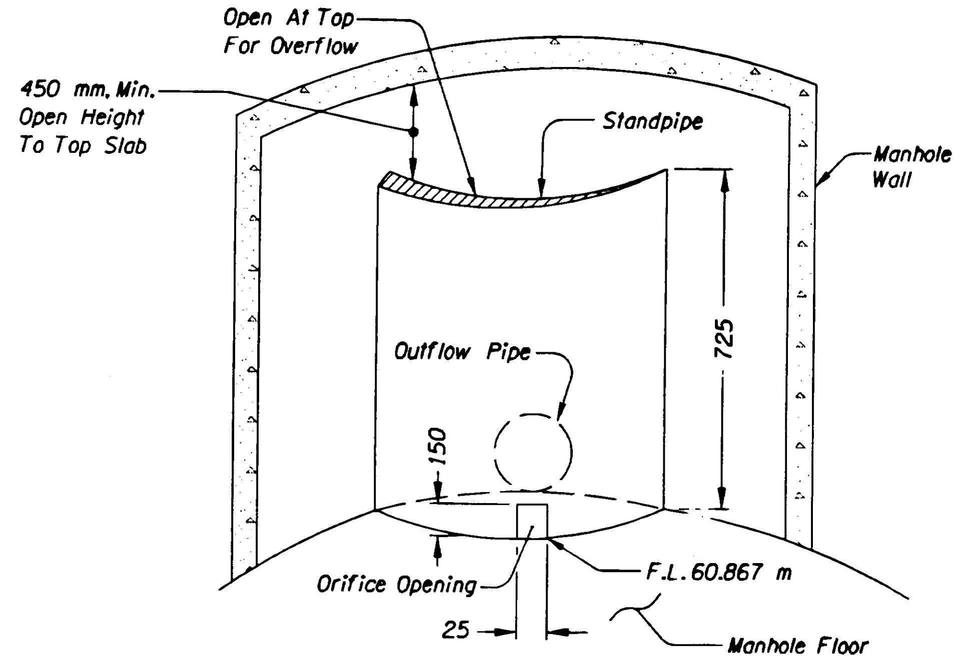
Note: For Details Not Shown, See Sht. GHJ-13

SECTION A-A



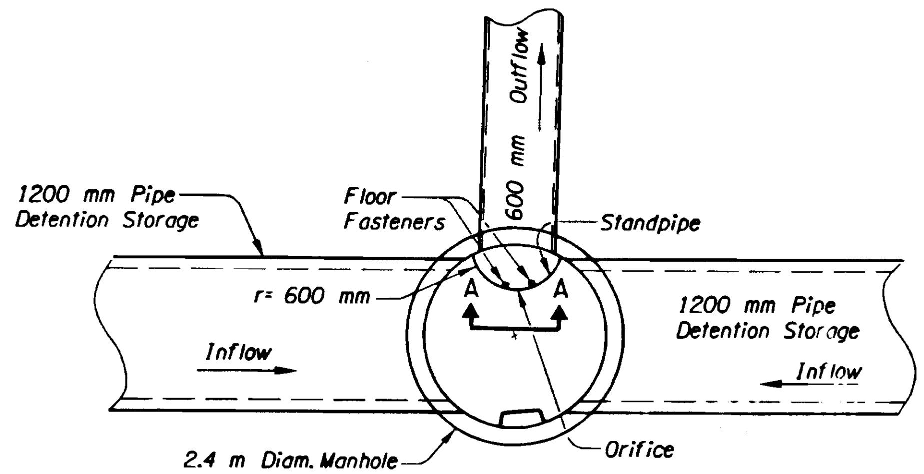
PLAN

DETENTION MANHOLE
Sta. "LW"91+910.04, Lt.



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

SECTION A-A



PLAN

DETENTION MANHOLE
Sta. "LE"91+867.19, 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

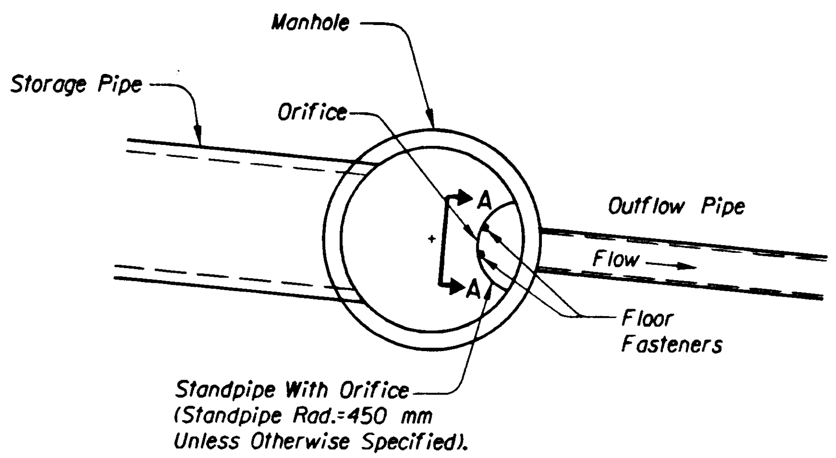
US26: CORNELL RD. -
OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

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

WATER QUALITY DETAILS

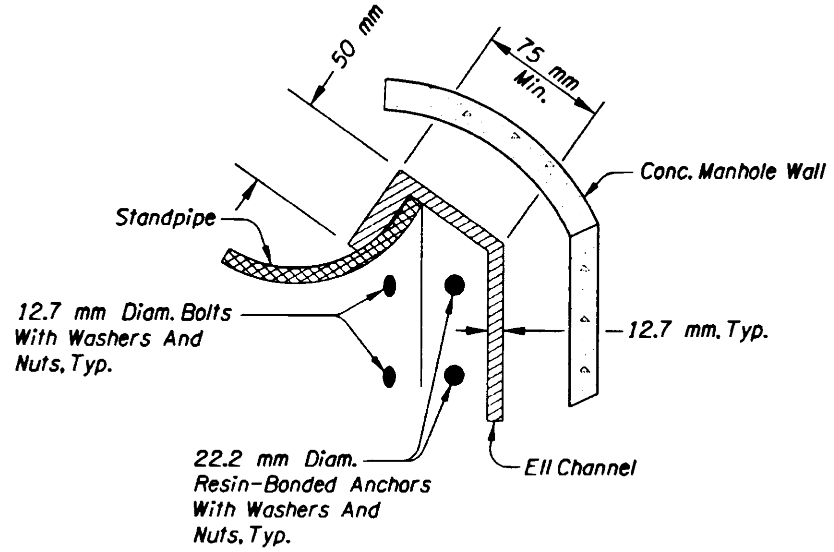
SHEET NO. GHJ-10

DETENTION MANHOLE GENERAL DETAILS

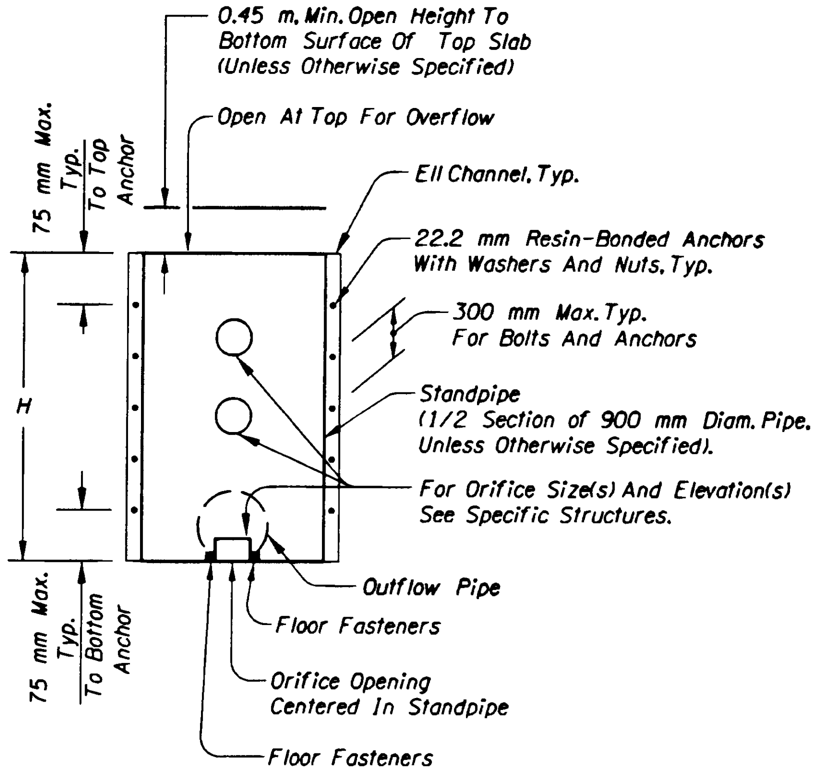


PLAN

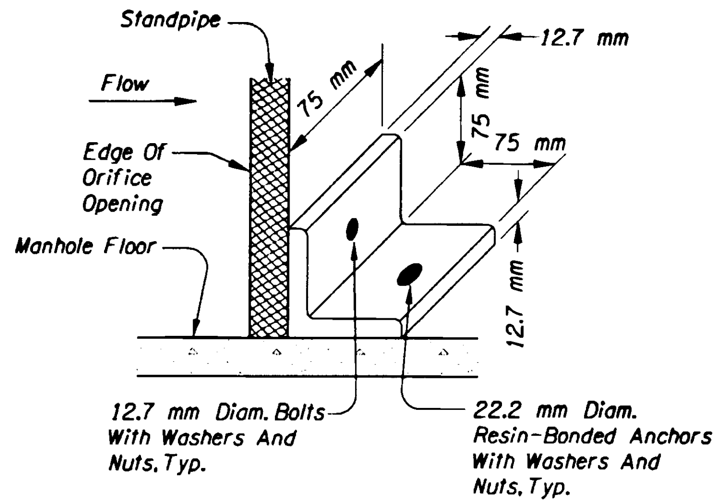
DETENTION MANHOLE



STANDPIPE CONNECTION TO MANHOLE WALL



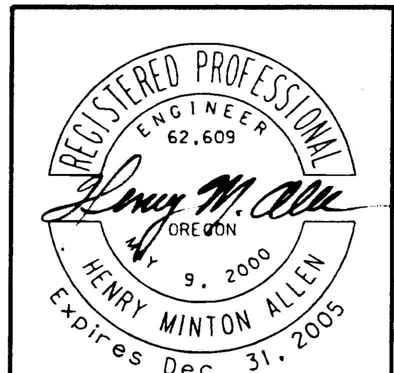
SECTION A-A



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.



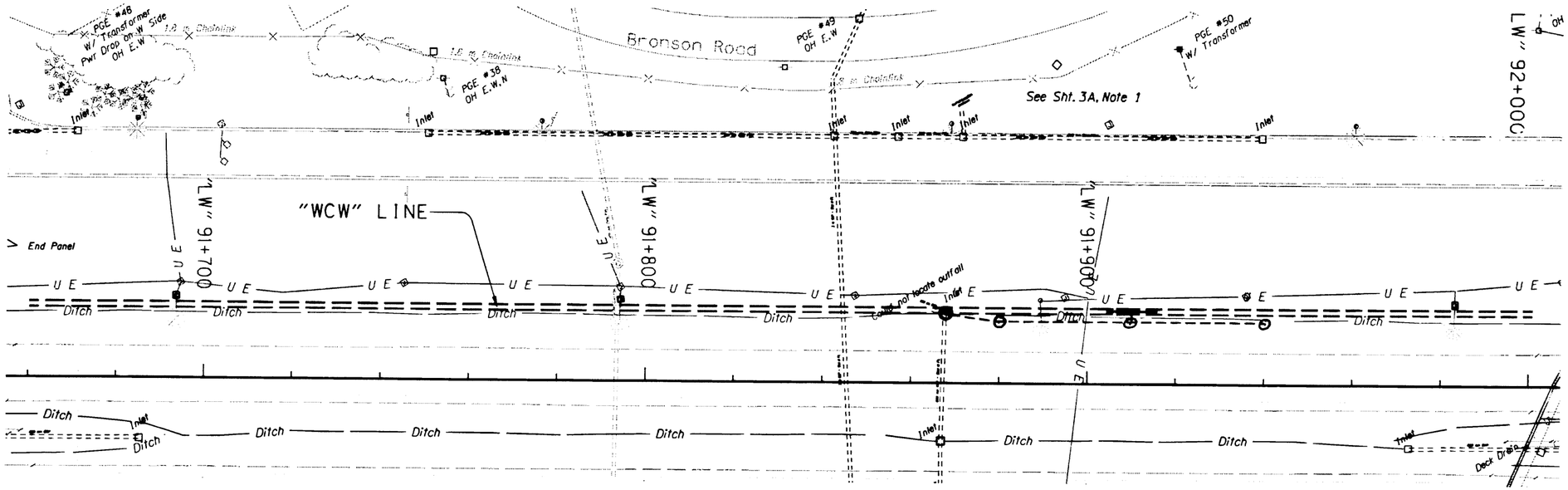
OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

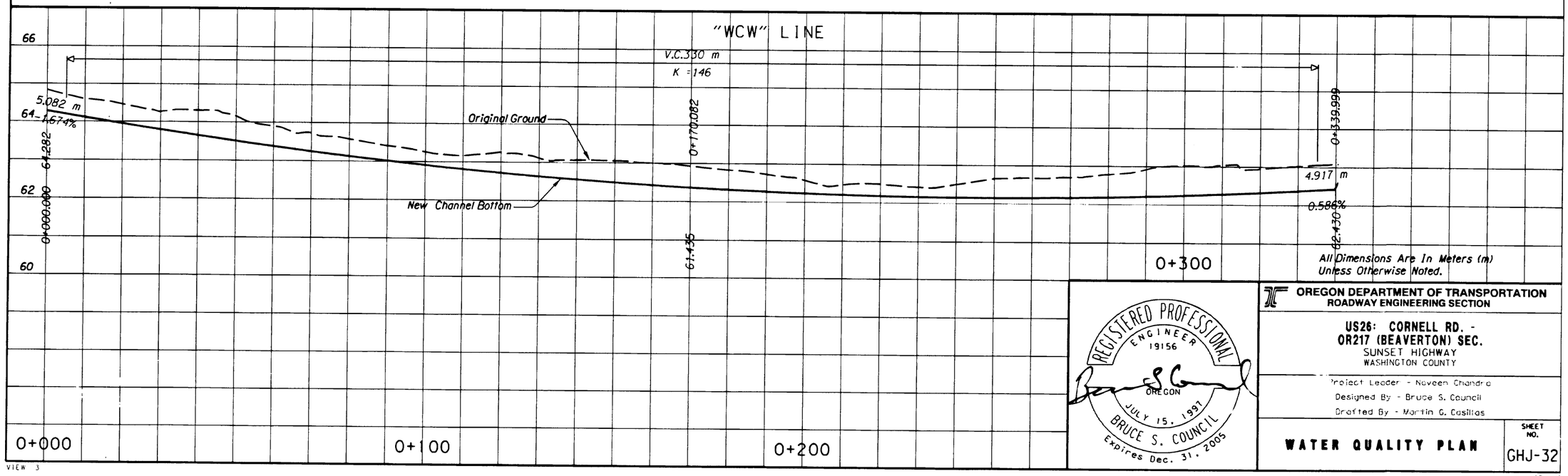
US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

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

WATER QUALITY DETAILS

SHEET NO. GHJ-13





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
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WATER QUALITY PLAN

SHEET NO. GHJ-32

VIEW 3