OPERATION & MAINTENANCE MANUAL

DFI No.: D00035
Facility Type: Detention Tank/Pipe

MARCH, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00035**
Facility Type:	Detention Tank/Pipe
Construction Drawings:	(V-File Number) 38V-117
Location:	District: 3
	Highway No.: 001
	Mile Post: 252.24 / 252.27 (beg./end)
	Description: This facility is located along the shoulder of the northbound lanes of I-5 (Hwy 001) just north of bridge No. 20032, overcrossing Turner Road.

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

Or

Region Technical Center (Geo-Hydro)

Or

Geo-Environmental Senior Hydraulics Engineer (503) 986-3365.

3. Construction

Engineer of Record:
ODOT Designer – Region 2 Tech. Center
Chris Carman, 503-986-2691

Facility construction: 2005
Contractor: Hamilton 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 a 151 foot (46 m) long, 72-inches (1800 mm) in diameter pipe located along the shoulder of the northbound lanes of I-5, (Hwy 001) just north of the bridge (No. 20032) crossing overtop Turner Road.

Stormwater enters the detention system at a flow control manhole (Point C on the Operational Plan in Appendix C) via a 12-inch (300 mm) pipe (Photo 4), perpendicularly crossing I-5 from the west after leaving a manhole situated near the median. Water backs up into the detention pipe and is detained in the facility through the flow control manhole (Point C). After detention, the flow is released into a nearby water quality manhole structure (Point D, DFI D00032) located approximately 12 feet (3.5 m) further south. After treatment through the water quality manhole, the flow is discharged into a 12-inch pipe that directs the water into a siphon box before being released into a ditch near the right-of-way line.

For further information and details regarding the system refer to Appendix A for the Operational Plan and Profile Drawing.

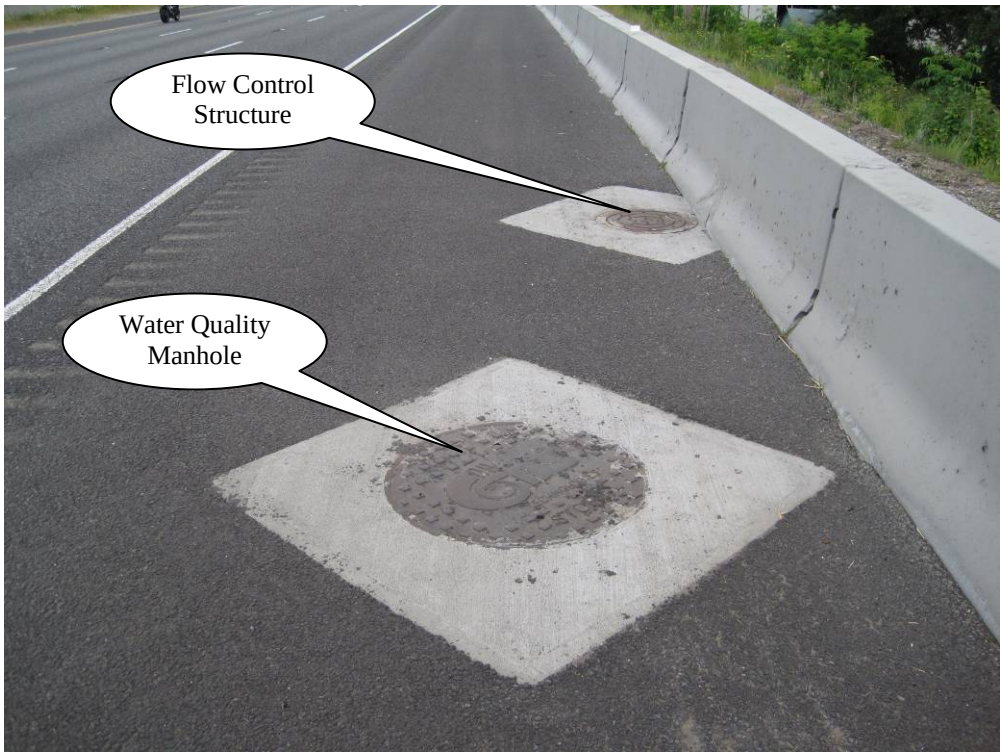


Photo 1: Detention pipe facility looking towards the north from the water quality manhole structure (DFI D00032) and the flow control structure.


Photo 2: Detention pipe facility looking towards the north. This photo includes more of a view of I-5 northbound.

Photo 3: Interior of flow control manhole. Detention pipe is to the left. The riser and orifice structure located to the right. The rod in the middle of the structure connects to a valve that drains the structure in event the orifices are plugged.

Photo 4: Interior of flow control manhole similar to Photo 3. This photo provides a view of the 12-inch storm inlet providing flow into the detention structure.

A. Maintenance equipment access:
This facility is located along a 12 foot shoulder of the northbound travel lanes of I-5 (Hwy 001). Sufficient room to utilize the shoulder area should allow adequate access to the system when performing maintenance activities. In the event the flow control orifices become plugged within the Control Structure (Point C), a draining mechanism with extension rod and handle are located near the manhole access to short cut the flow restriction and drain the structure.

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 detention facility does not does not have features to block liquids from draining from the pipe. However, the detention pipe itself can be used to store hazardous liquids entering the system until such time the pipe is full and begins flowing toward the water quality structure where additional storage of these liquids may be available in the manhole's sump. Another option may be possible by blocking the outfall pipe downstream from the manhole and capturing hazardous liquids there.

6. Auxiliary Outlet

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

This particular detention piping system includes a flow control structure with a high flow riser.

☐ 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

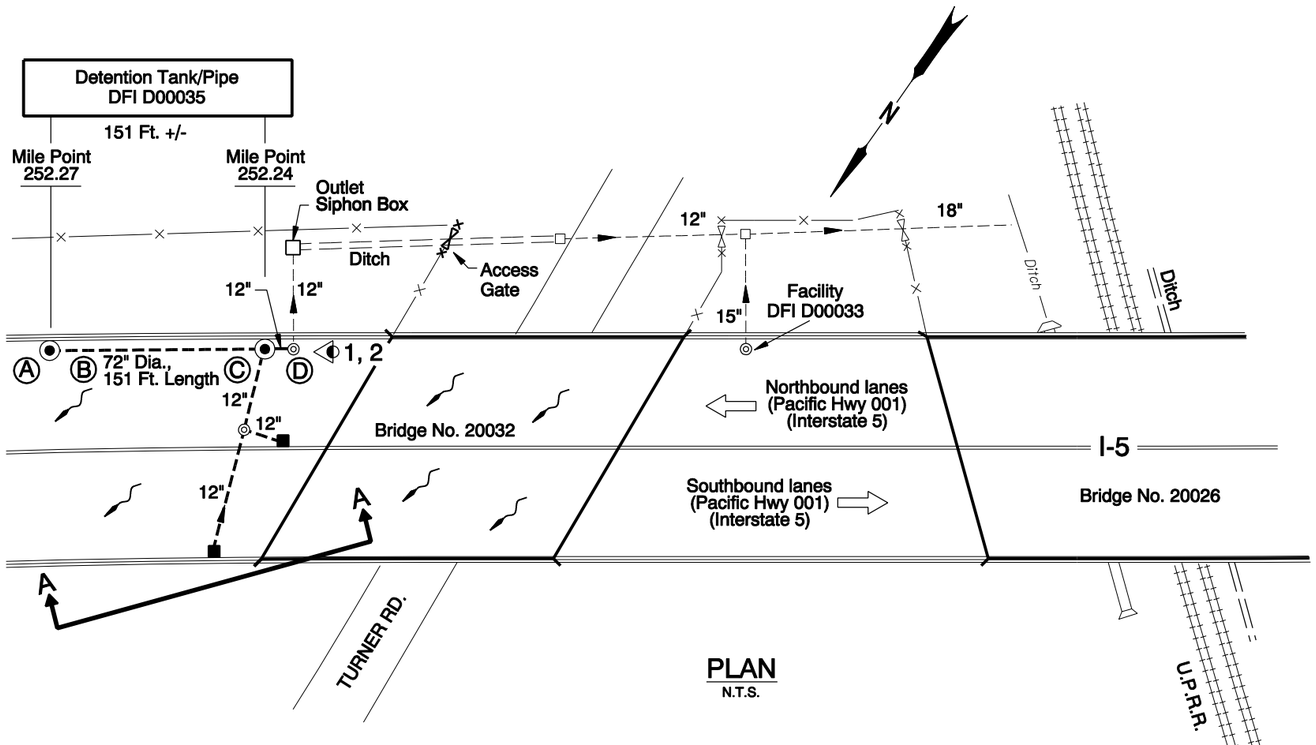
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 986-2647
ODEQ Northwest Region Office	(503) 229-5263

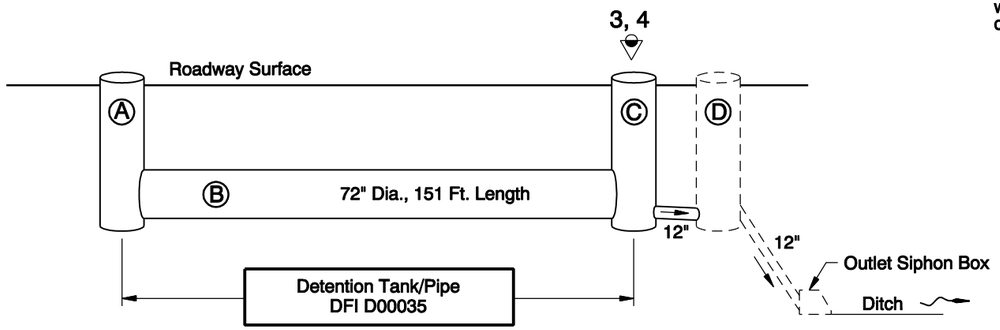
Appendix A

Content:

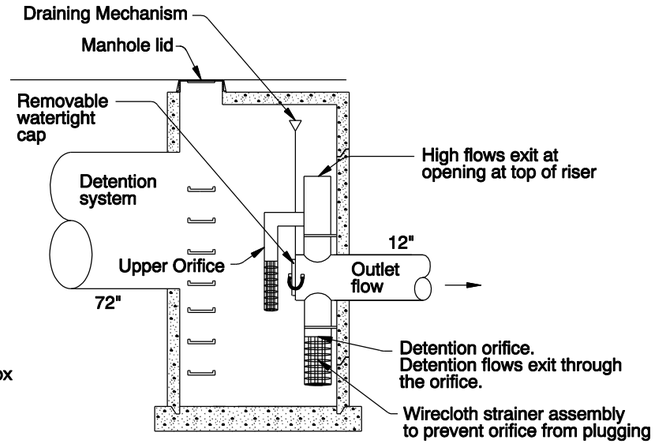
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SECTION A-A
N.T.S.



Flow Control Structure for
Detention Tank/Pipe (DFI D00035)

LEGEND:

- Photo Location / Direction
- (A) 9' Diameter Manhole
- (B) Detention Pipe - 6' Dia.
- (C) Flow Control Manhole - 8' Dia.
- (D) Water Quality Manhole D00032
- Siphon Box
- Manhole (and/or)
- Inlet (and/or)
- Access Gate
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: M. Wittenbrink

Drafted By: Jim Holeman

DFI D00035
MAINTENANCE DISTRICT 3 HWY 1
DETENTION TANK/PIPE
PACIFIC HIGHWAY MP 252.24-252.27
MARION COUNTY

G:\03_001_D00035\Operational Plan\DFI_D00035.dgn :: Default 9/28/2011 9:31:51 AM hwye94w

Appendix B

Content:

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

38V-117

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd.
1A-2	Index Of Sheets Cont'd.
1A-3	Index Of Sheets Cont'd.
1A-4	Standard Drawing Nos.
1B	Layout Sheet

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

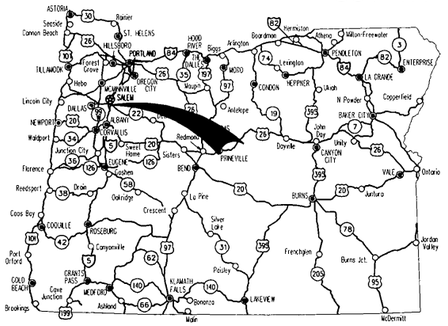
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

I-5: N. SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.

PACIFIC HIGHWAY

MARION COUNTY

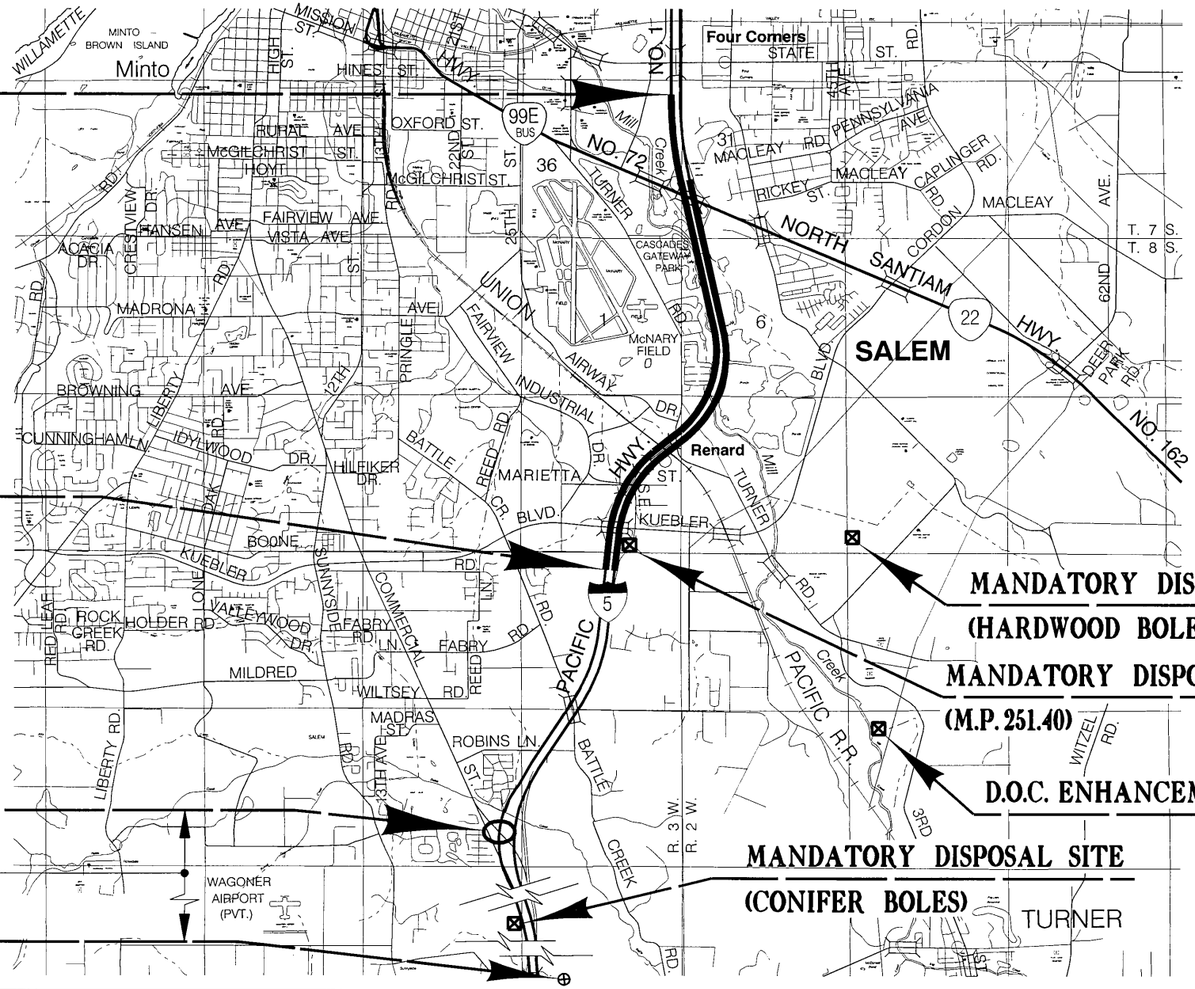
OCTOBER 2005



Overall Length Of Project - 4.02 km (2.49 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-NH-IM-S001(196)
BEGINNING OF PROJECT
STA. "L" 10+280 (M.P. 254.58)



T. 7, 8 S.,
R. 2, 3 W., W.M.

END OF WORK AREA
STA. "L" 15+682.3 (M.P. 251.22)

NO WORK AREA

OTIA-NH-IM-S001(196)
END OF PROJECT
STA. "LS" 18+664.61 (M.P. 249.38)

Approx. 28 Mi. South

PROSPECTIVE MATERIAL SOURCE
(M.P. 221.13)

MANDATORY DISPOSAL SITE
(HARDWOOD BOLES)

MANDATORY DISPOSAL SITE
(M.P. 251.40)

D.O.C. ENHANCEMENT SITE

MANDATORY DISPOSAL SITE
(CONIFER BOLES)

OREGON TRANSPORTATION INVESTMENT ACT

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Papé	COMMISSIONER
Janice J. Wilson	COMMISSIONER
Bruce A. Warner	DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
13,704
OREGON
JULY 16, 1987
CATHERINE M. NELSON
Expires Dec. 31, 2006

Catherine M. Nelson
TECHNICAL SERVICES MANAGING ENGINEER

I-5: N. SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.
PACIFIC HIGHWAY
MARION COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	OTIA-NH-IM-S001(196)	1

METRIC

PE000950

F:\ODOT_DATA\Projects\13284Kuebler\13284r2.tsl 8/2/2005 12:26:38 PM hwye07x

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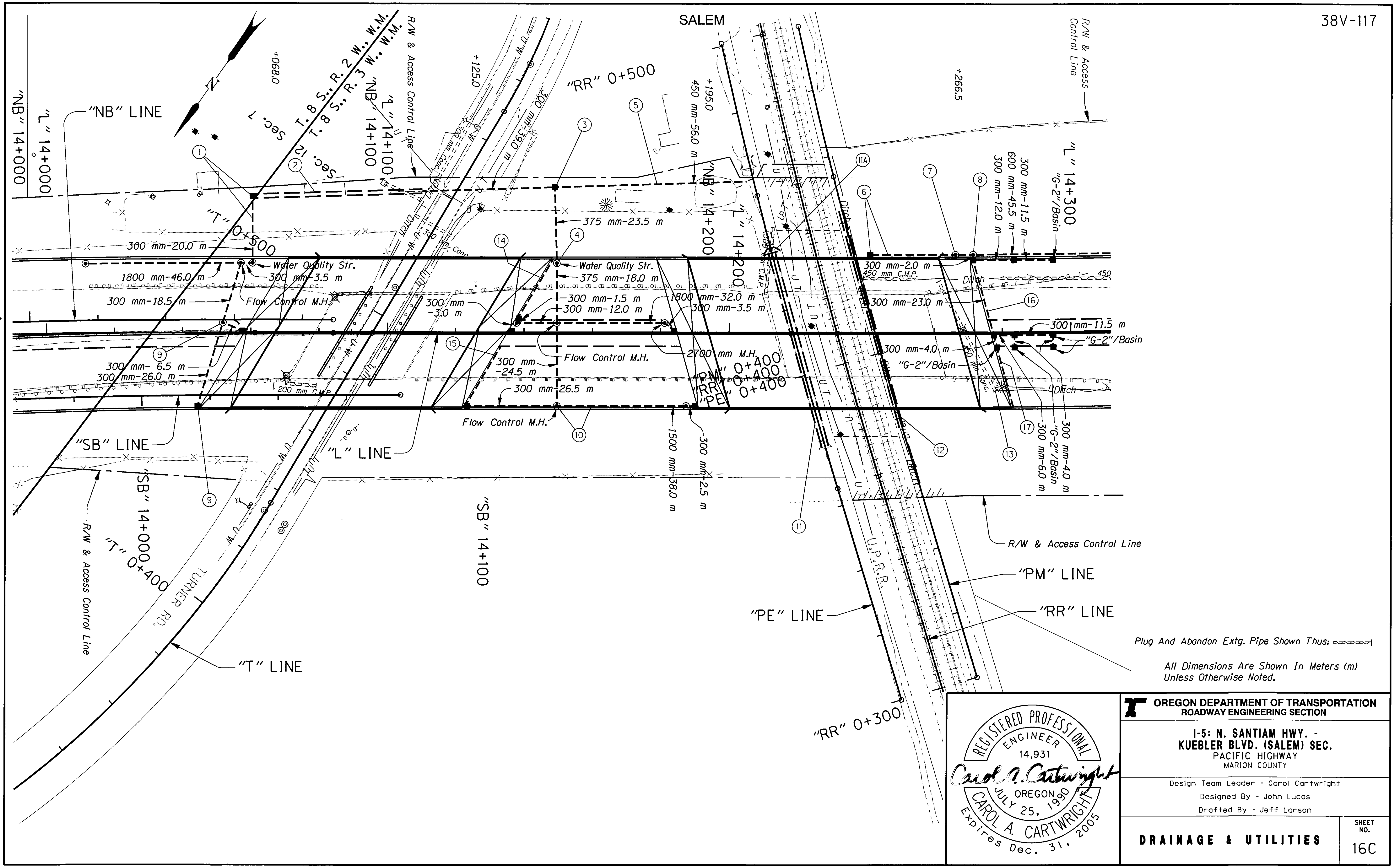


SALEM
N
T. 8 S., R. 2 W., W.M.
T. 8 S., R. 3 W., W.M.
Sec. 7
Sec. 12
"NB" LINE
"NB" 14+000
"L" 14+000
"NB" 14+100
"L" 14+100
"NB" 14+200
"L" 14+200
"L" 14+300
"RR" 0+500
"RR" 0+400
"PM" 0+400
"PE" 0+400
"RR" 0+300
"T" 0+500
"T" 0+400
"SB" LINE
"SB" 14+000
"SB" 14+100
"L" LINE
"T" LINE
"PM" LINE
"RR" LINE
"PE" LINE
TURNER RD.
U.P.R.R.
R/W & Access Control Line
+068.0
+125.0
+195.0
+266.5
300 mm-39.0 m
450 mm-56.0 m
375 mm-23.5 m
300 mm-20.0 m
1800 mm-46.0 m
Water Quality Str.
300 mm-3.5 m
375 mm-18.0 m
300 mm-18.5 m
Flow Control M.H.
300 mm-1.5 m
300 mm-12.0 m
1800 mm-32.0 m
300 mm-3.0 m
2700 mm M.H.
300 mm-24.5 m
300 mm-6.5 m
300 mm-26.0 m
200 mm C.M.P.
300 mm-26.5 m
1500 mm-38.0 m
300 mm-2.5 m
300 mm-2.0 m
450 mm C.M.P.
Ditch
300 mm-23.0 m
300 mm-4.0 m
"G-2"/Basin
300 mm-11.5 m
300 mm-12.0 m
600 mm-45.5 m
300 mm-6.0 m
1
2
3
4
5
6
7
8
9
10
11
11A
12
13
14
15
16
17
Plug And Abandon Extg. Pipe Shown Thus:
All Dimensions Are Shown In Meters (m) Unless Otherwise Noted.
REGISTERED PROFESSIONAL ENGINEER
14,931
Carol A. Cartwright
OREGON
JULY 25, 1990
CAROL A. CARTWRIGHT
Expires Dec. 31, 2005
STRUCTURAL DETAILS CHECKED

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

I-5: N. SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.
PACIFIC HIGHWAY
MARION COUNTY

Design Team Leader - Carol Cartwright
Designed By - John Lucas
Drafted By - Jeff Larson

DRAINAGE & UTILITIES

SHEET NO. 16C

STRUCTURAL DETAILS CHECKED _____

(1) *Sta."L"14+051.1 To Sta."NB"14+065.4*
Const. Manhole 2700 mm Dia.
Const. Water Quality Structure
Const. Flow Control Manhole 2400 mm Dia.
Const. Siphon Box
Inst. 300 mm Sew. Pipe - 18.5 m
3.0 m Depth
Inst. 300 mm Sew. Pipe - 23.5 m
6.0 m Depth
Inst. 1800 mm Sew. Pipe - 46.0 m
6.0 m Depth
(For Details, See Sht. GJ-4)
(See Drg. No. RD376)

(2) *Const. Ditch*
"V" Bottom, 1:3 Slopes
Dt. Exc. - 48 m³

(3) *Sta."L"14+110.1 To Sta."L"14+148.9*
Const. Type "G-2MA" Inlet
Shape Bottom
Inst. 300 mm Sew. Pipe - 39.0 m
1.5 m Depth
Inst. 375 mm Sew. Pipe - 23.5 m
6.0 m Depth
Inst. Slope Anchors
(See Drg. Nos. RD330 & RD364)

(4) *Sta."L"14+136.4 To Sta."L"14+183.9*
Const. Water Quality Structure
Const. Flow Control Manhole 2700 mm Dia.
Const. Large Manhole 2700 mm Dia.
Const. Manhole
Const. Type "G-2" Open Grade HMAC Inlet
With Basin - 2
0.45 m Deep
Const. Type "G-2" Open Grade HMAC Inlet
Shape Bottom
Adjust Inlet For Wearing Course - 2
Inst. 300 mm Sew. Pipe - 20.0 m
1.5 m Depth
Inst. 300 mm Sew. Pipe - 24.5 m
3.0 m Depth
Inst. 375 mm Sew. Pipe - 18.0 m
6.0 m Depth
Inst. 1800 mm Sew. Pipe - 32.0 m
6.0 m Depth
(For Details, See Sht. GJ-4)

(5) *Sta."L"14+148.9 To Sta."L"14+205.0*
Inst. 450 mm Sew. Pipe - 56.0 m
1.5 m Depth

(6) *Sta."L"14+241.4 To Sta."L"14+266.3*
Const. Type "D MOD" Inlet
Inst. 300 mm Sew. Pipe - 26.5 m
1.5 m Depth
Inst. Slope Anchors
(For Details, See Sht. GJ-9)
(See Drg. No. RD370)

(7) *Sta."L"14+266.3 To Sta."L"14+271.5*
Const. Water Quality Structure
Inst. 600 mm Sew. Pipe - 5.5 m
1.5 m Depth

(8) *Sta."L"14+271.5 To Sta."L"14+317.4*
Const. Manhole
Const. Type "G-2" Open Grade HMAC Inlet
With Basin - 5
0.45 m Deep
Const. Type "G-2" Open Grade HMAC Inlet - 4
Shape Bottom
Adjust Inlet For Wearing Course - 6
Inst. 300 mm Sew. Pipe - 78.0 m
1.5 m Depth
Inst. 600 mm Sew. Pipe - 45.5 m
1.5 m Depth

(9) *Sta."SB"14+016.3 To Sta."L"14+051.1*
Const. Manhole
Const. Type "G-2" Open Grade HMAC Inlet
With Basin - 2
0.45 m Deep
Adjust Inlet For Wearing Course - 2
Inst. 300 mm Sew. Pipe - 6.5 m
1.5 m Depth
Inst. 300 mm Sew. Pipe - 26.0 m
3.0 m Depth

(10) *Sta."L"14+123.4 To Sta."L"14+190.1*
Const. Large Manhole 2100 mm Dia.
Const. Flow Control Manhole 2100 mm Dia.
Const. Type "G-2" Open Grade HMAC Inlet
With Basin - 2
0.45 m Deep
Adjust Inlet For Wearing Course - 2
Inst. 300 mm Sew. Pipe - 2.5 m
1.5 m Depth
Inst. 300 mm Sew. Pipe - 26.5 m
3.0 m Depth
Inst. 1500 mm Sew. Pipe - 38.0 m
6.0 m Depth
(For Details, See Sht. GJ-4)

(11) *Remove Extg. 2.1 m x 1.2 m R.C.B.C.*
Const. Channel Change
(11A) *Const. Outlet*
(For Details, See Shts. GE-1, GE-2, GE-3 & GF-1)

(12) *Const. Channel Change*
(For Details, See Sht. GF-2)

(13) *Remove Pipe*

(14) *Sta."L"14+135.6*
Const. Open Grade Wearing Surface Drain
Outlet To Inlet

(15) *Sta."L"14+135.6*
Const. Open Grade Wearing Surface Drain
Outlet To Inlet

(16) *Sta."L"14+272.0*
Const. Open Grade Wearing Surface Drain
Outlet To Inlet

(17) *Sta."L"14+278.5*
Const. Open Grade Wearing Surface Drain
Outlet To Inlet

REGISTERED PROFESSIONAL ENGINEER
14,931
Carol A. Cartwright
OREGON
JULY 25, 1990
CAROL A. CARTWRIGHT
Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

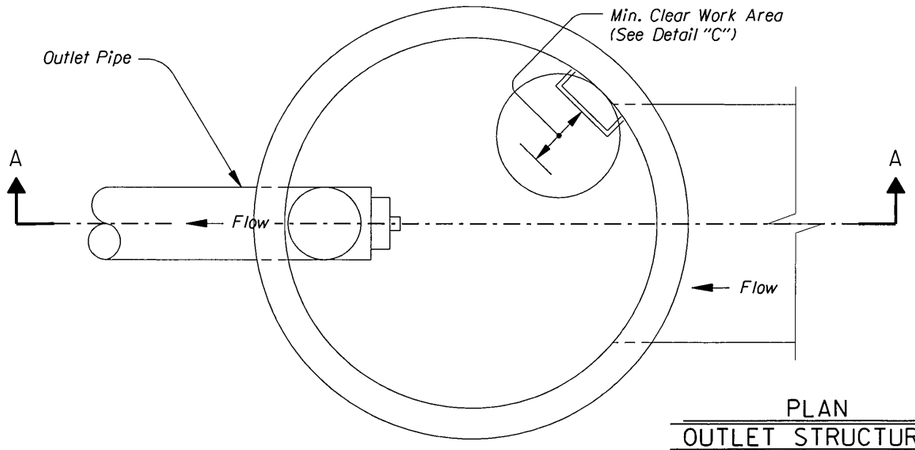
I-5: N. SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.
PACIFIC HIGHWAY
MARION COUNTY

Design Team Leader - Carol Cartwright
Designed By - John Lucas
Drafted By - Jeff Larson

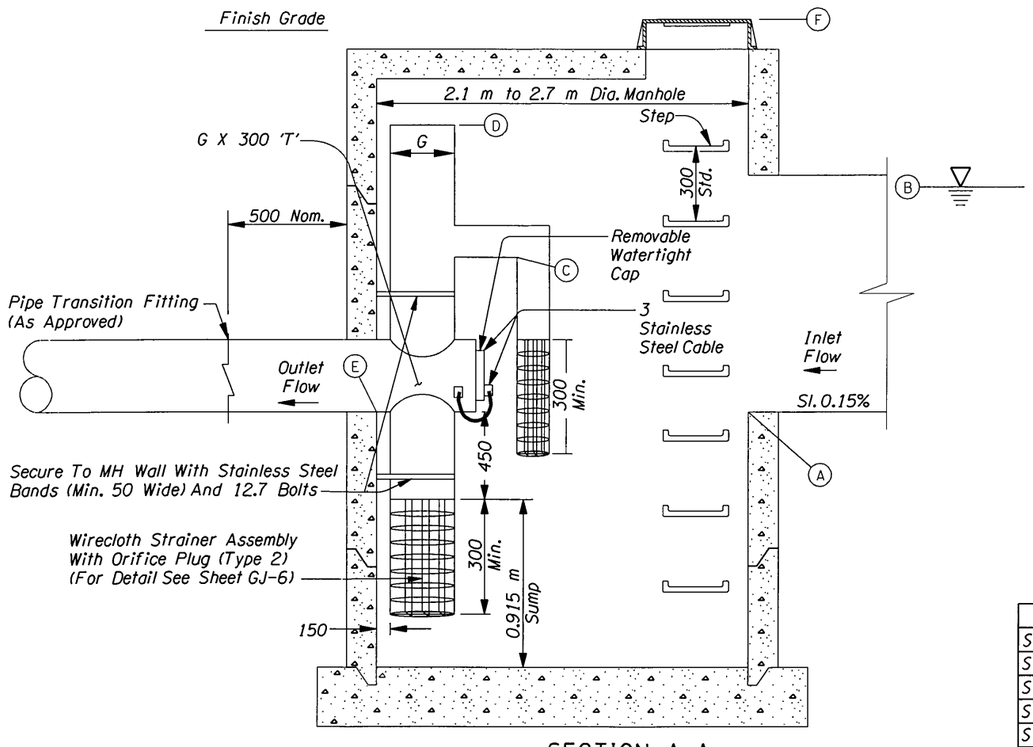
NOTES

SHEET NO. 16D

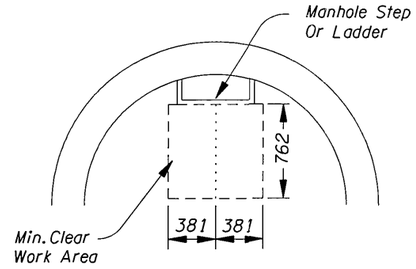
NOTES:
1. Hardware, Fasteners And Anchors To Be Stainless Steel; Use 3 mm Stainless Steel Cable.
2. For Manhole Details Not Shown, See RD346
3. Hardware, Fasteners, Anchors, Fittings, Appurtenances, Labor, And Equipment Are Incidental.



PLAN
OUTLET STRUCTURES
(For Location, See Sht. 16C and 17)
Not To Scale



SECTION A-A
FLOW CONTROL MANHOLE
Not To Scale



Locate Pipes, Etc. So That No Portion Of Them Are Within Min. Clear Work Area

DETAIL "C"
MIN. CLEAR WORK AREA
Not To Scale

Sta "L" 14+149.633 21.510 Rt.		
	ELEVATION (m)	DESCRIPTION
A	73.251	Detention Pipe Inlet
B	74.733	Elev. Of Detention Water Surface 50 Year Storm
C	74.247	Fl. Elev. Of Elbow
D	75.033	Rim Of Overflow Riser
E	73.247	Fl. Elev. Of Outlet Pipe
F	75.796	Top Of Manhole

Sta "L" 14+149.601 0.720 Lt.		
	ELEVATION (m)	DESCRIPTION
A	72.466	Detention Pipe Inlet
B	74.131	Elev. Of Detention Water Surface 50 Year Storm
C	73.058	Fl. Elev. Of Elbow
D	74.431	Rim Of Overflow Riser
E	72.458	Fl. Elev. Of Outlet Pipe
F	76.124	Top Of Manhole

Sta "L" 14+362.421 25.372 Lt.		
	ELEVATION (m)	DESCRIPTION
A	77.376	Detention Pipe Inlet
B	78.839	Elev. Of Detention Water Surface 50 Year Storm
C	78.071	Fl. Elev. Of Elbow
D	79.139	Rim Of Overflow Riser
E	77.371	Fl. Elev. Of Outlet Pipe
F	80.618	Top Of Manhole

Sta "L" 14+061.972 16.794 Lt.		
	ELEVATION (m)	DESCRIPTION
A	69.814	Detention Pipe Inlet
B	71.408	Elev. Of Detention Water Surface 50 Year Storm
C	70.353	Fl. Elev. Of Elbow
D	71.708	Rim Of Overflow Riser
E	69.803	Fl. Elev. Of Outlet Pipe
F	74.439	Top Of Manhole

Sta "L" 14+360.118 2.547 Rt.		
	ELEVATION (m)	DESCRIPTION
A	78.348	Detention Pipe Inlet
B	79.723	Elev. Of Detention Water Surface 50 Year Storm
C	79.043	Fl. Elev. Of Elbow
D	80.023	Rim Of Overflow Riser
E	78.343	Fl. Elev. Of Outlet Pipe
F	81.590	Top Of Manhole

Location	G(mm)
Sta. "L" 14+149.633 21.510 Rt.	250
Sta. "L" 14+149.601 0.720 Lt.	250
Sta. "L" 14+061.972 16.494 Lt.	250
Sta. "L" 14+362.421 25.372 Lt.	300
Sta. "L" 14+360.118 2.547 Rt.	450

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

REGISTERED PROFESSIONAL ENGINEER
17807
OREGON
JULY 25, 1995
CHRIS CARMAN
EXPIRES: December 31, 2005

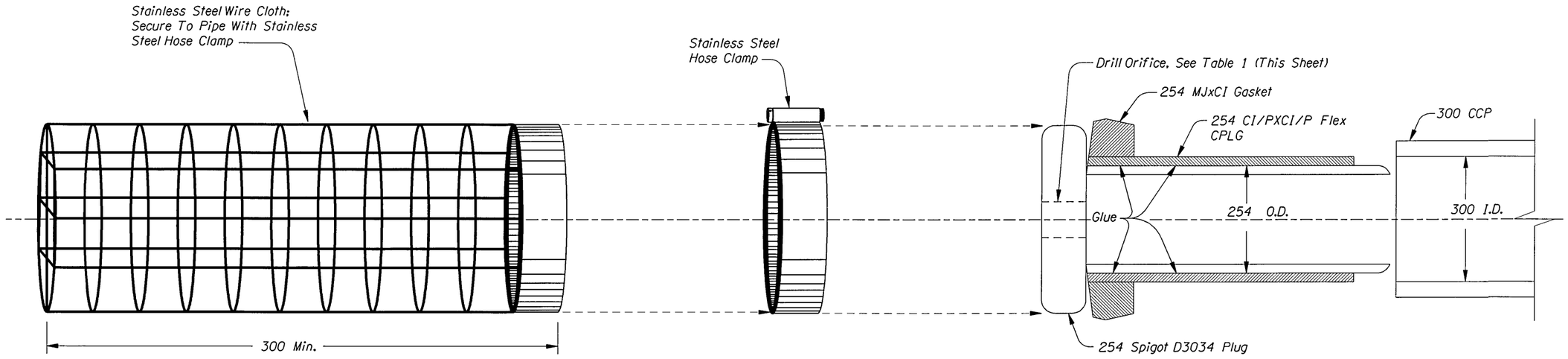
OREGON DEPARTMENT OF TRANSPORTATION
REGION 2 TECH CENTER

I-5: NORTH SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.
PACIFIC HIGHWAY
MARION COUNTY

Reviewed By - Alvin Shoblom
Designed By - Chris Carman
Drafted By - Chris Shearer

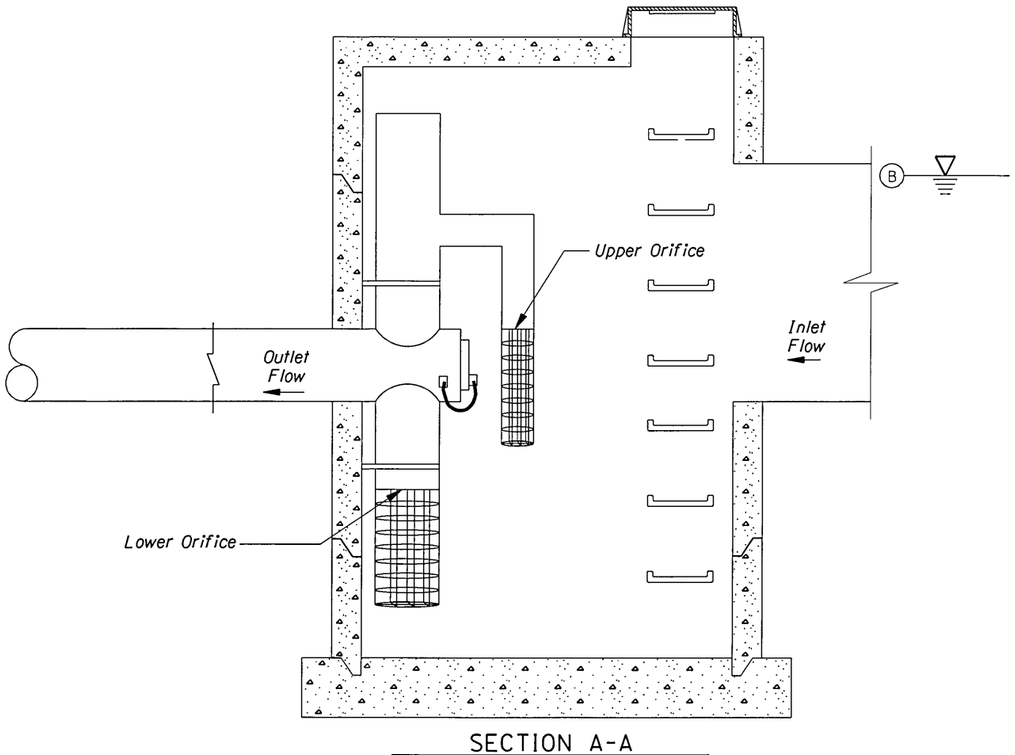
DETAILS

SHEET NO. GJ-4



FLOW CONTROL MANHOLE
WIRE CLOTH STRAINER ASSEMBLY
Not To Scale

ORIFICE PLUG (TYPE 2)
Not To Scale



SECTION A-A
FLOW CONTROL MANHOLE
Not To Scale

Table 1

Location	Lower Orifice Dia.(mm)	Upper Orifice Dia.(mm)
North Santiam Interchange	63.5	N/A
Sta."L" 14+360.118 2.547 Rt.	50	250
Sta."L" 14+362.421 25.372 Lt.	25	175
Sta."L" 14+149.633 21.50 Rt.	25	75
Sta."L" 14+149.601 0.720 Lt.	50	115
Sta."L" 14+061.976 16.794 Lt.	25	75
Kuebler Blvd. Interchange	25	400

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

REGISTERED PROFESSIONAL ENGINEER
17807
OREGON
JULY 25, 1995
CHRIS CARMAN
EXPIRES: December 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
REGION 2 TECH CENTER

I-5: NORTH SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.
PACIFIC HIGHWAY
MARION COUNTY

Reviewed By - Alvin Shoblom
Designed By - Chris Carman
Drafted By - Chris Shearer

DETAILS

SHEET NO. GJ-6