OPERATION & MAINTENANCE MANUAL

DFI No.: D00032
Facility Type: Water Quality Manhole

MARCH, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00032**
Facility Type:	Water Quality Manhole
Construction Drawings:	(V-File Number) 38V-117
Location:	District: 3
	Highway No.: 001
	Mile Post: 252.24
	Description: This facility is located along the shoulder of the northbound lanes of I-5 (Hwy 001) just north of a bridge that crosses overtop Turner Road (Bridge No. 20032).

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

This water quality manhole is an underground facility designed to treat stormwater runoff. The system is a proprietary product manufactured by Contech Solutions. This system is a CDS Model PMSU20_15_4 (2) designed to remove sediments, oils, and debris from the stormwater. Stormwater enters the diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the runoff (**Photo 1**). This facility contains an Operational and Maintenance manual as prepared by the manufacturer and is provided in **Appendix C**.

This facility is just over 20 feet in depth, 48-inches in its inside diameter, and located along the shoulder of the northbound lanes of I-5 (Hwy 001), just north of the bridge (No. 20032) crossing overtop Turner Road (**Point A on the Operational Plan in Appendix A**). Vehicular and personnel access to the facility's water quality manhole may be obtained from the right shoulder on the northbound lanes of I-5 (Hwy 001) (**Photos 2 & 3**).

This facility receives stormwater from the northbound and southbound lanes of I-5 (Hwy 001) across from the facility (**Photo 3**). Stormwater enters a detention facility (DFI D00035) at a detaining flow control manhole (**Point B**) via a 12-inch (300 mm) diameter pipe, perpendicularly crossing I-5 (Hwy 001) from the west after leaving a manhole situated near the median. After detention, the water is treated through the water quality manhole (**Point A**) located approximately 11.5 feet south of the detaining manhole (**Photos 2 & 3**). The facility, the water quality manhole, is considered an online facility treating all stormwater with no bypass or flow diversion system. After treatment, the water is directed to the east through a 12-inch diameter pipe to an outlet siphon box. The water from the outlet siphon box is released to a drainage ditch near the right-of-way line (**Photo 4**). The ditch conveys water under an access gate and to a ditch inlet grate east of Turner Rd (**Point C; Photos 4 & 5**). From the ditch inlet grate, an underground 12-inch diameter pipe conveys the water across Turner Road and to an 18-inch diameter pipe, which outfalls at a ditch north of the U.P.R.R. railroad (**Point D; Photo 6**).

For further information and details regarding the system refer to **Appendix A** for the **Operational Plan**, **Appendix B** for **Construction Designs**, and **Appendix C** for the **Proprietary Structure Maintenance Requirements**.

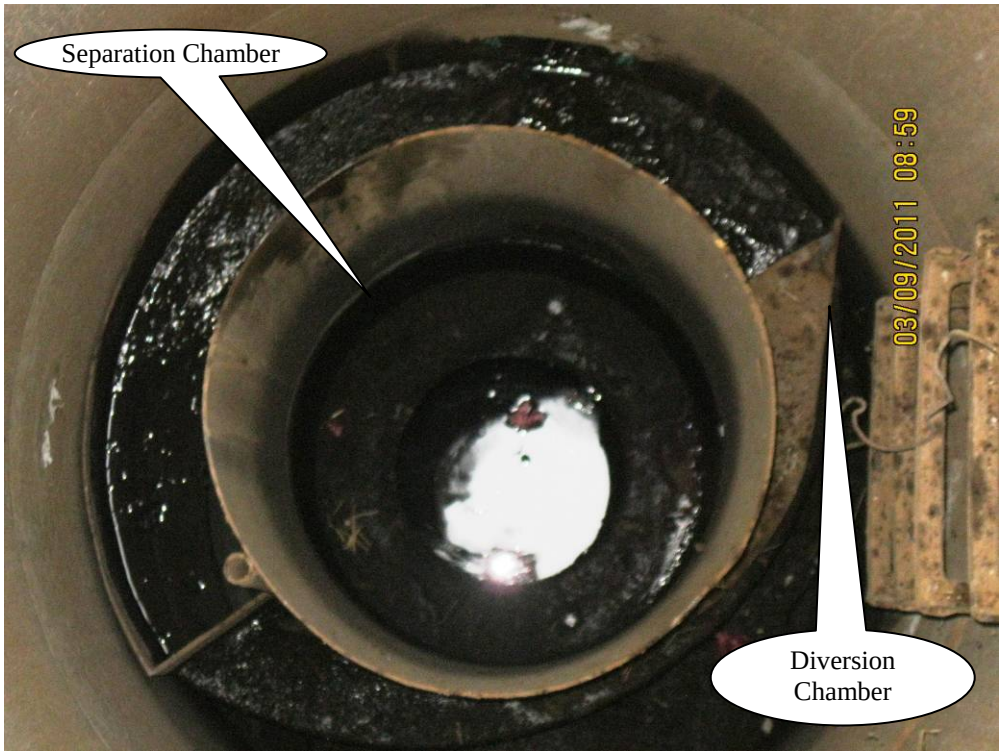


Photo 1: Interior of water quality manhole for this facility, DFI D00032.

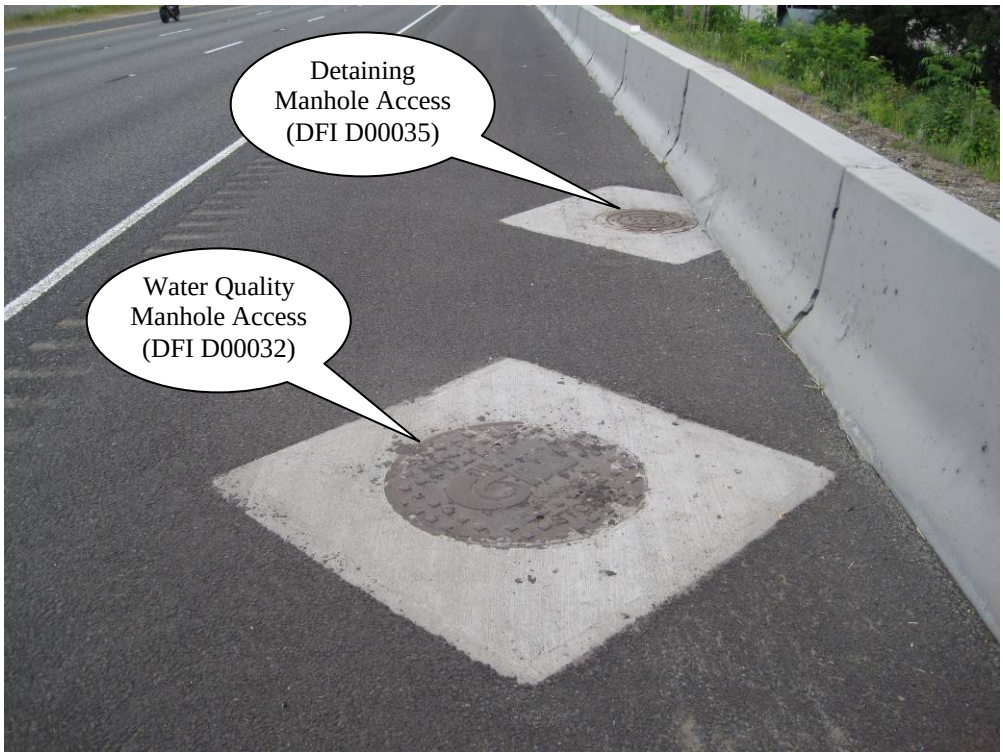


Photo 2: In the foreground, the water quality manhole for this facility (DFI D00032) (Point A on Operational Plan in Appendix A). Behind this facility is the detaining manhole for the detention facility (DFI D00035) (Point B). Wide shoulder allows for vehicular and personnel access.

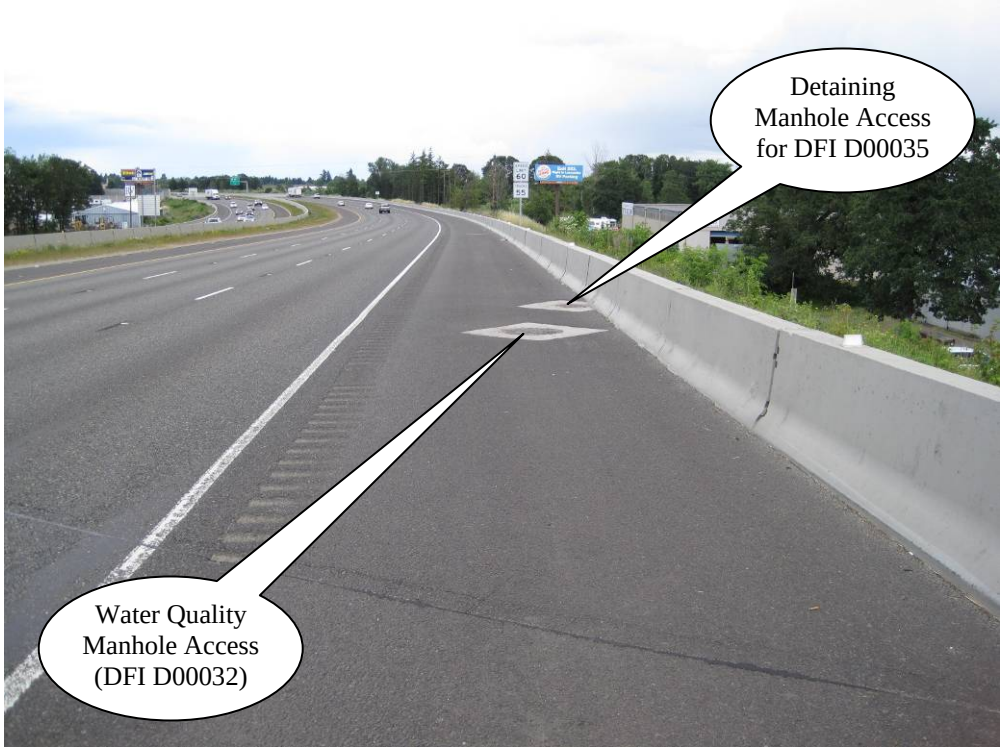


Photo 3: Water quality manhole facility, looking towards the north. This photo includes more of a view of the northbound lanes of I-5 (Hwy 001). Wide shoulder allows for vehicular and personnel access.

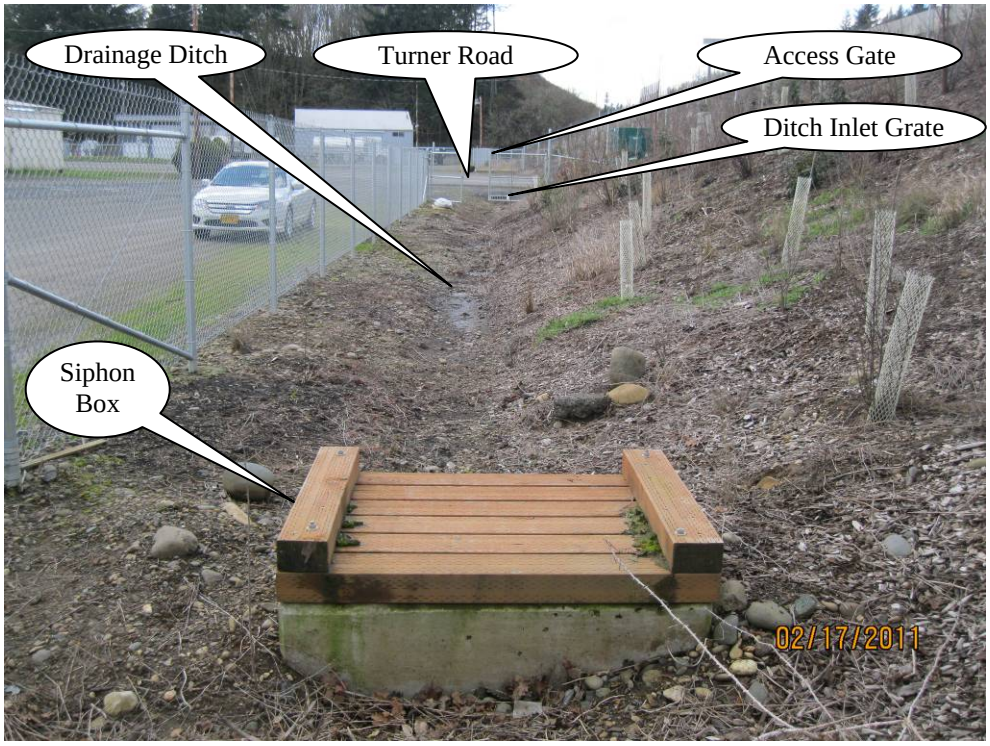


Photo 4: Siphon box connection downstream of the facility. Siphon box drains into ditch towards access gate.

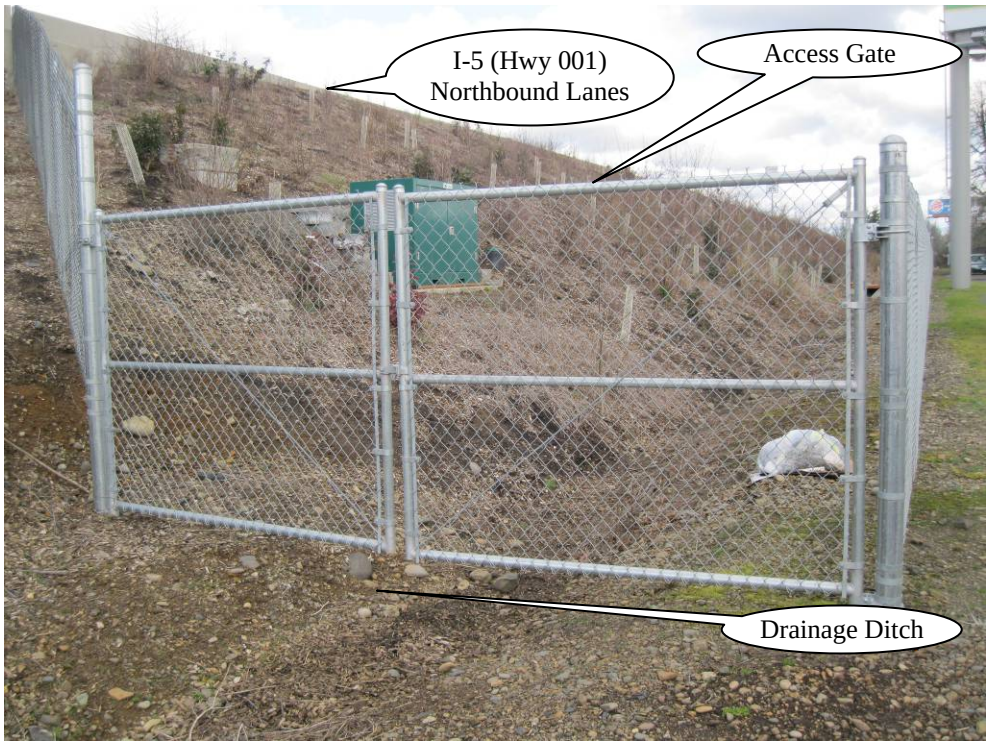


Photo 5: Access gate located on lower end of embankment downhill from treatment facility.

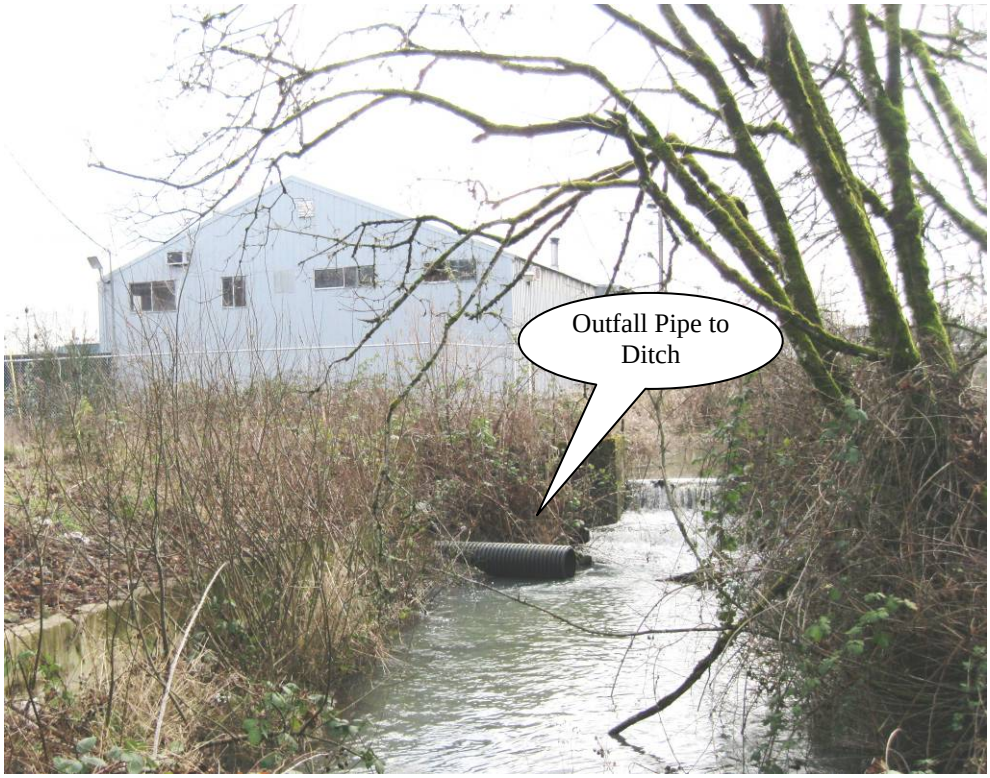


Photo 6: Outfall pipe to ditch (Point D on Operational Plan in Appendix A.) Photograph taken facing southeast. (U.P.R.R. to right (south) not pictured.)

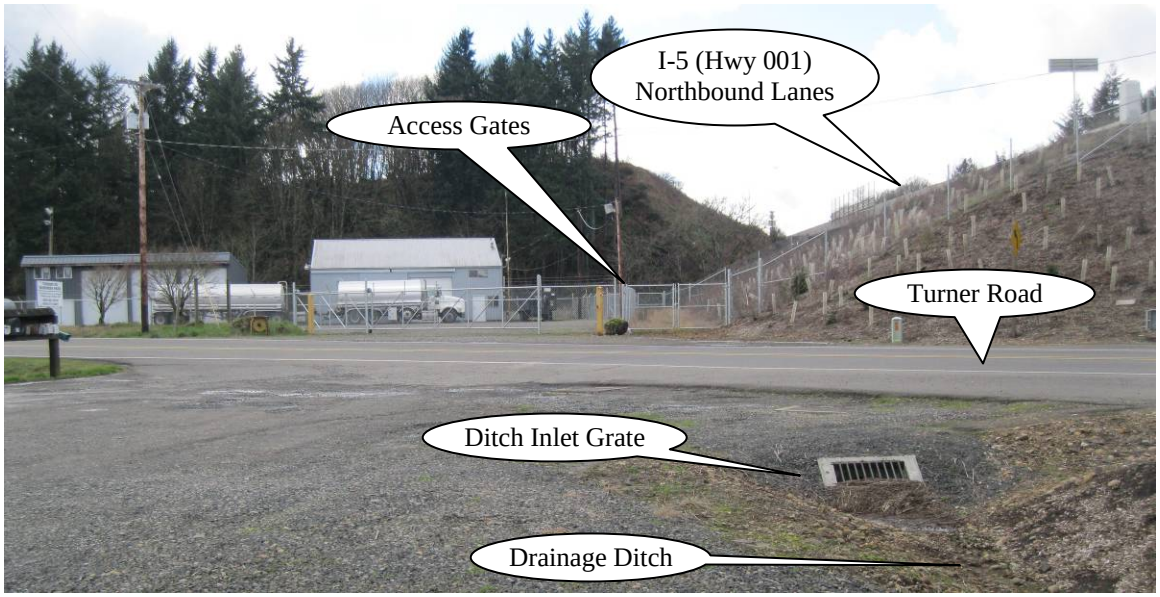


Photo 7: Access to outfall pipe to ditch. Photograph taken facing southwest. Refer to the Operational Plan in Appendix A for the location.

A. Maintenance equipment access:
This facility is located along a 12-foot wide shoulder of the northbound lanes of I-5 (Hwy 001). Sufficient room to utilize the shoulder area should allow adequate vehicular access to the system when performing maintenance activities (**Photo 3**).

Downstream access to the siphon box can be obtained at an access gate off Turner Road on the southeast side of the interstate crossing (Bridge No. 20032) (**Photos 4 & 5**).

Access to the outfall can be obtained at access gates off Turner Road, southwest of the interstate crossing (Bridge No. 20032) (**Operational Plan in Appendix A; Photo 7**).

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 manhole facility does not have features to block liquid from draining from the manhole. However, the manhole's sump may provide some storage capacity of hazardous liquids. 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
High flows bypass the treatment features and exit the manhole by draining into an interior high flow bypass weir. **See Appendix C**.

☐ 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: See Appendix C and the Proprietary Structure Maintenance Requirements for an O&M Manual specifically written for the water quality structure.

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

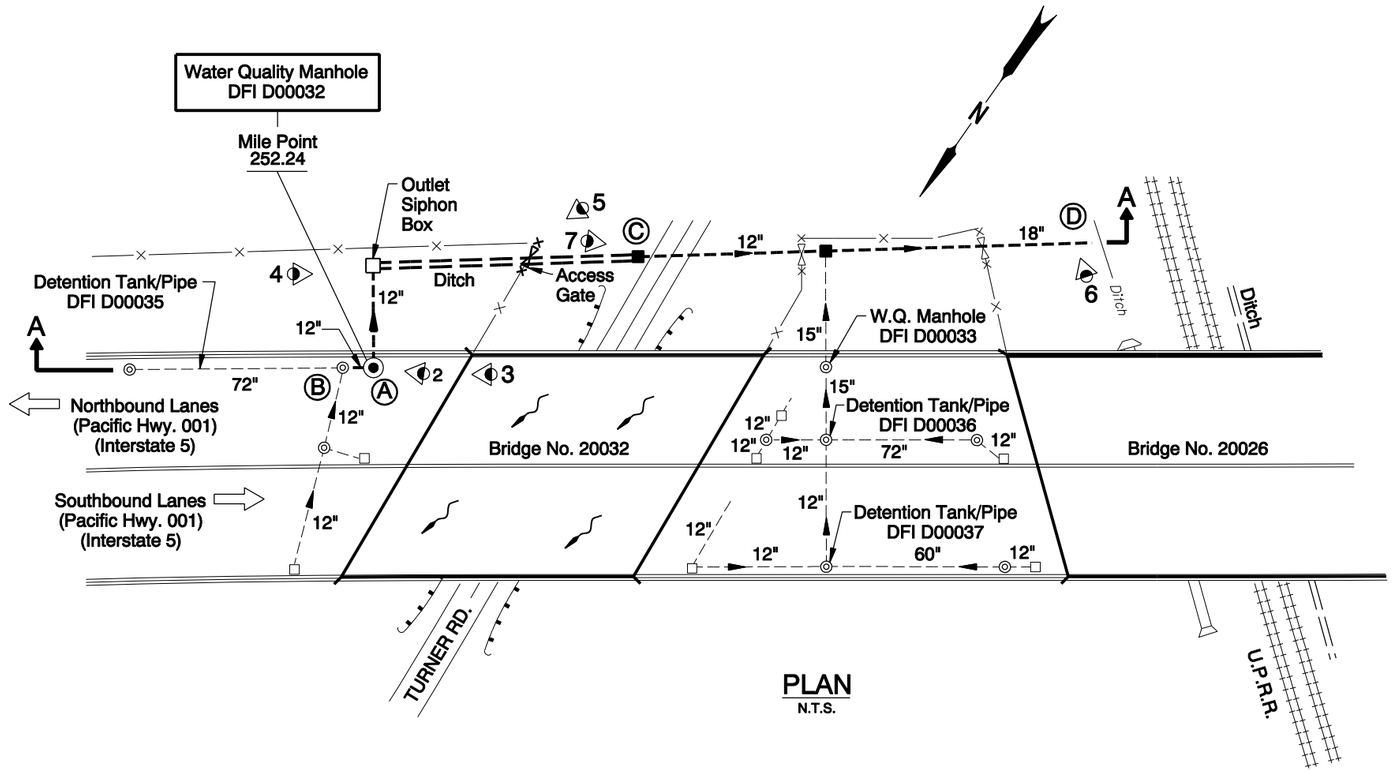
Contact any of the following for more detailed information about management of waste materials found on site:

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

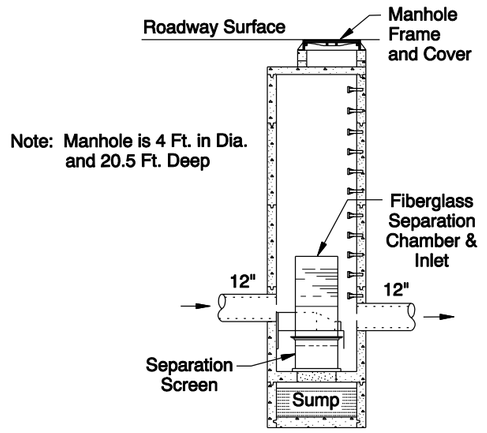
Appendix A

Content:

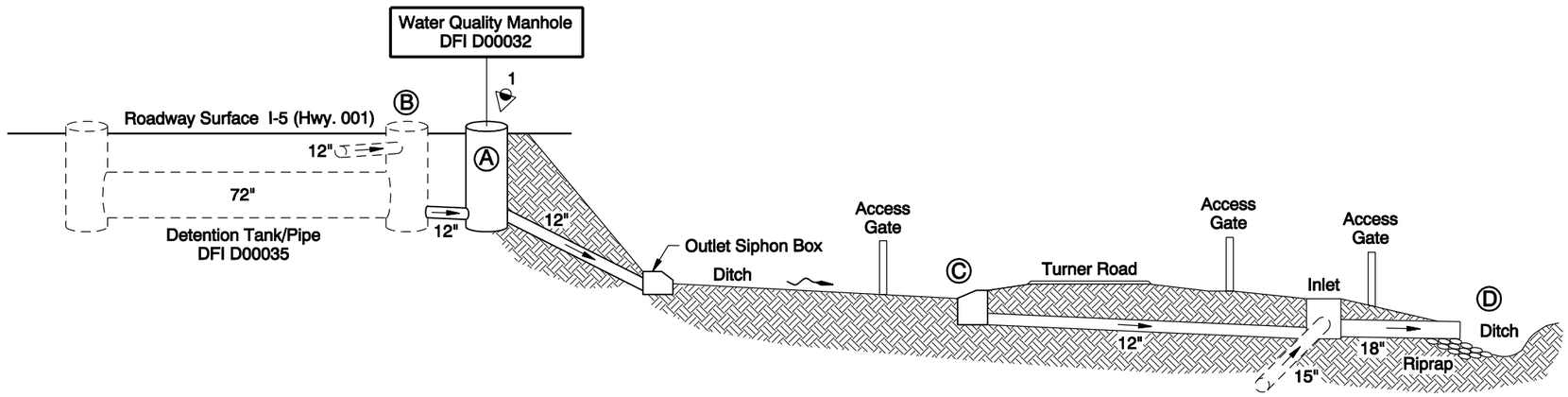
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



WATER QUALITY MANHOLE - CDS UNIT
N.T.S.



SECTION A-A
N.T.S.

LEGEND:

- Photo Location/Direction
- Water Quality Manhole
- 8' Dia. Flow Control Manhole
- Ditch Inlet Grate
- Outfall
- Manhole
- Inlet
- Access Gate
- 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: Jim Holeman

DFI D00032
MAINTENANCE DISTRICT 3 HWY 001
WATER QUALITY MANHOLE
PACIFIC HIGHWAY MP 252.24
MARION COUNTY

G:\03_001_D00032\Operational Plan\DFI_D00032.dgn :: Default 9/28/2011 8:52:37 AM hwye94w

DFI_D00032.dgn

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

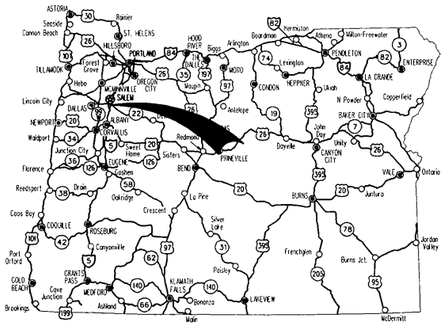
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

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

PACIFIC HIGHWAY

MARION COUNTY

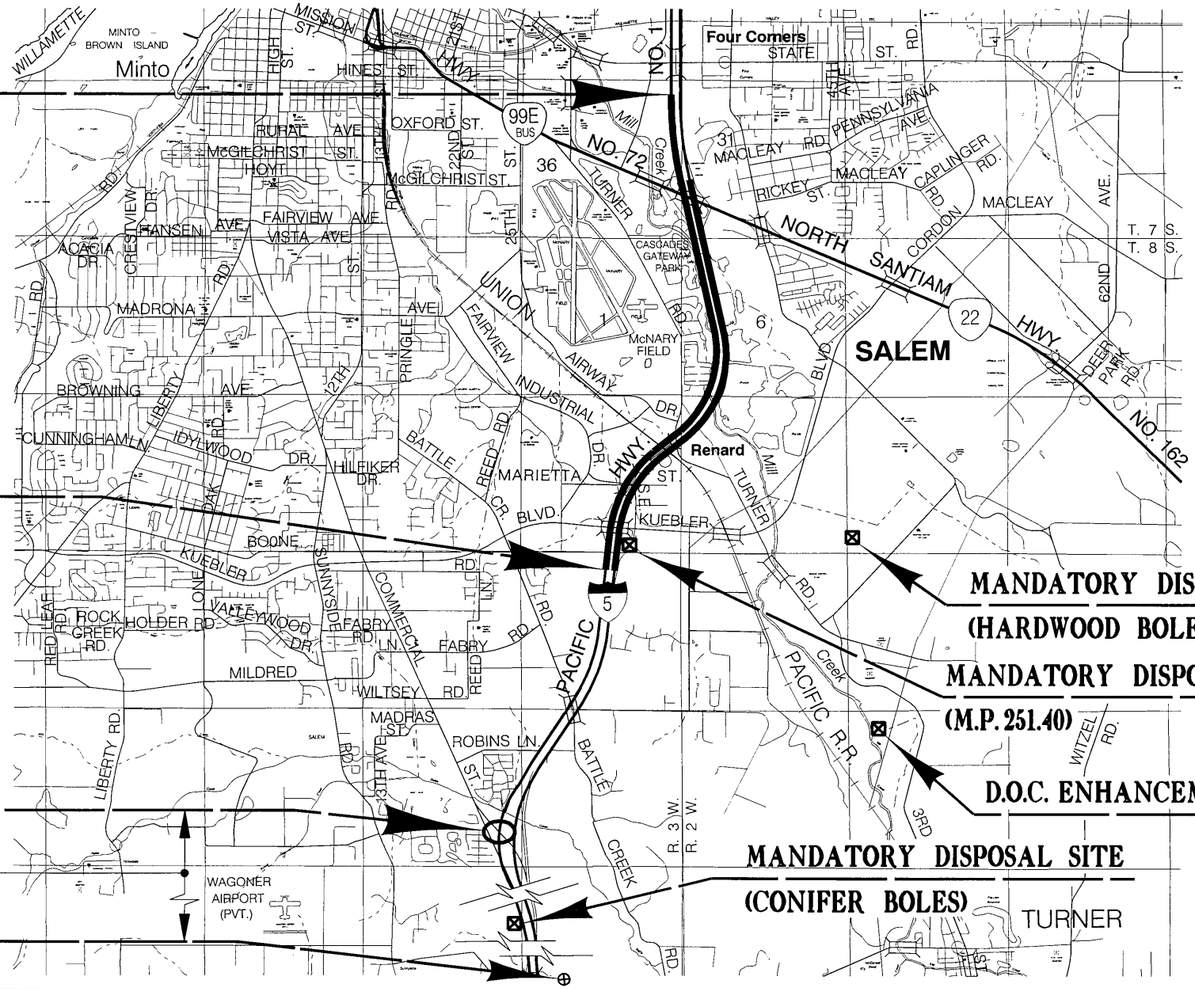
OCTOBER 2005



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

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1:1000 - 1

SALEM

"NB" LINE

"L" 14+000

"NB" 14+000

"L" 14+100

"NB" 14+100

"L" 14+200

"NB" 14+200

"L" 14+300

"G-2" Basin

"RR" 0+500

"T" 0+500

"PM" 0+400

"RR" 0+400

"PE" 0+400

"RR" 0+300

"SB" LINE

"SB" 14+000

"SB" 14+100

"T" 0+400

"L" LINE

"T" LINE

"PE" LINE

"PM" LINE

"RR" LINE

R/W & Access Control Line

Sec. 12 T. 8 S., R. 2 W., W.M.

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

+0680

+1125.0

+195.0

+266.5

200 mm-39.0 m

450 mm-56.0 m

375 mm-23.5 m

300 mm-20.0 m

1800 mm-46.0 m

300 mm-3.5 m

300 mm-18.5 m

Water Quality Str.

Flow Control M.H.

375 mm-18.0 m

300 mm-1.5 m

300 mm-12.0 m

1800 mm-32.0 m

300 mm-3.5 m

2700 mm M.H.

300 mm-23.0 m

300 mm-2.0 m

450 mm C.M.P.

300 mm-11.5 m

600 mm-45.5 m

300 mm-12.0 m

300 mm-4.0 m

300 mm- 6.5 m

300 mm-26.0 m

200 mm C.M.P.

300 mm -3.0 m

300 mm -24.5 m

300 mm-26.5 m

1500 mm-38.0 m

300 mm-2.5 m

300 mm-6.0 m

Ditch

U Ditch

Plug And Abandon Extg. Pipe Shown Thus:

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

STRUCTURAL DETAILS CHECKED

REGISTERED PROFESSIONAL ENGINEER
14,931
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

DRAINAGE & UTILITIES

SHEET NO. 16C

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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

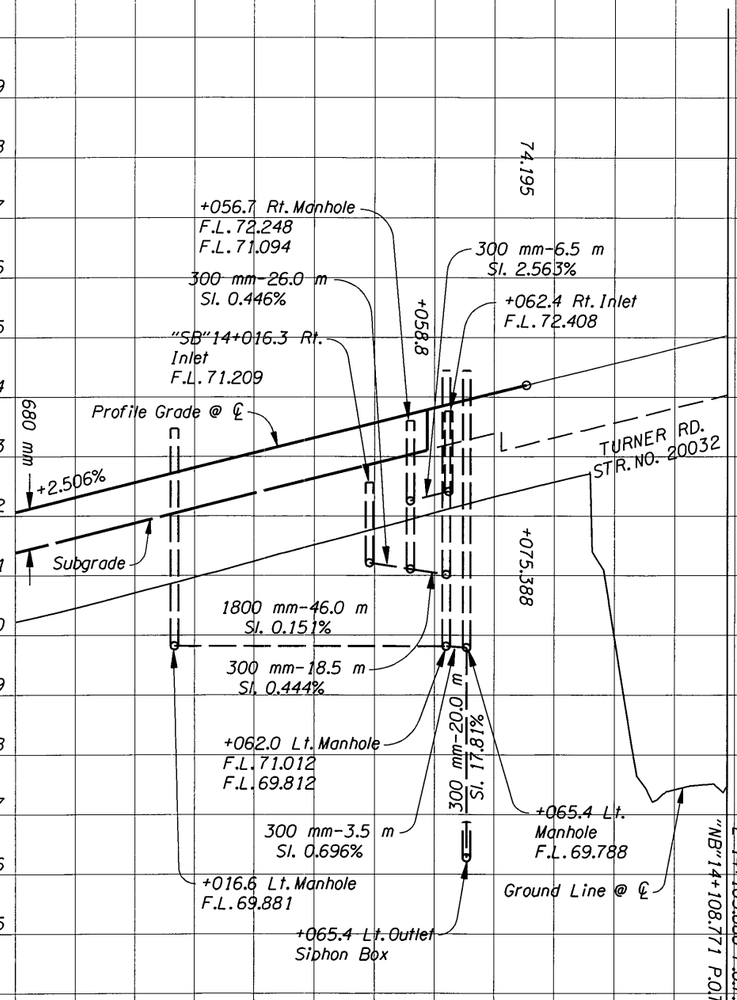
I-5: N. SANTIAM HWY. - KUEBLER BLVD. (SALEM) SEC.
PACIFIC HIGHWAY
MARION COUNTY

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

NOTES

SHEET NO. 16D

"NB" LINE



STRUCTURAL DETAILS CHECKED

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 P.E.
Designed By - John Lucas
Drafted By - Steve Donaldson

PROFILE

SHEET NO. 16J

Appendix C

Content:

- **Proprietary Structure Operation & Maintenance Manual Maintenance Requirements**

Operation & Maintenance Manual

For D00032

I-5: N. Santiam Highway
Kuebler Blvd
Salem, Oregon

6 RECEIVED
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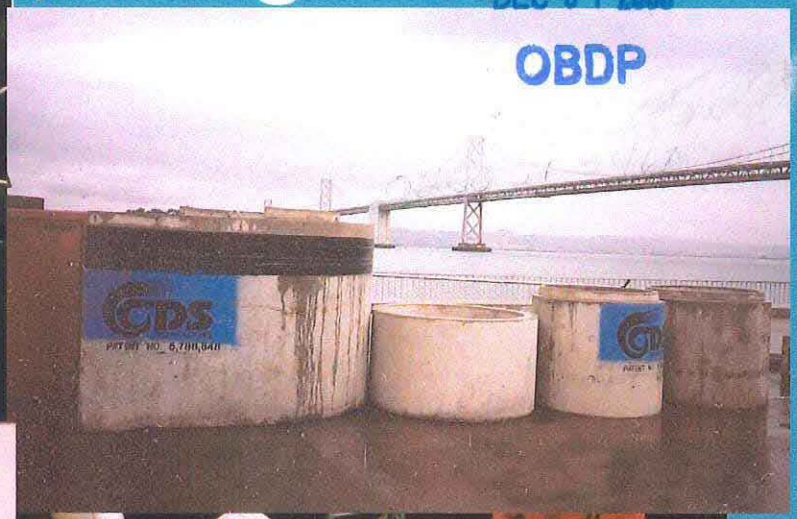
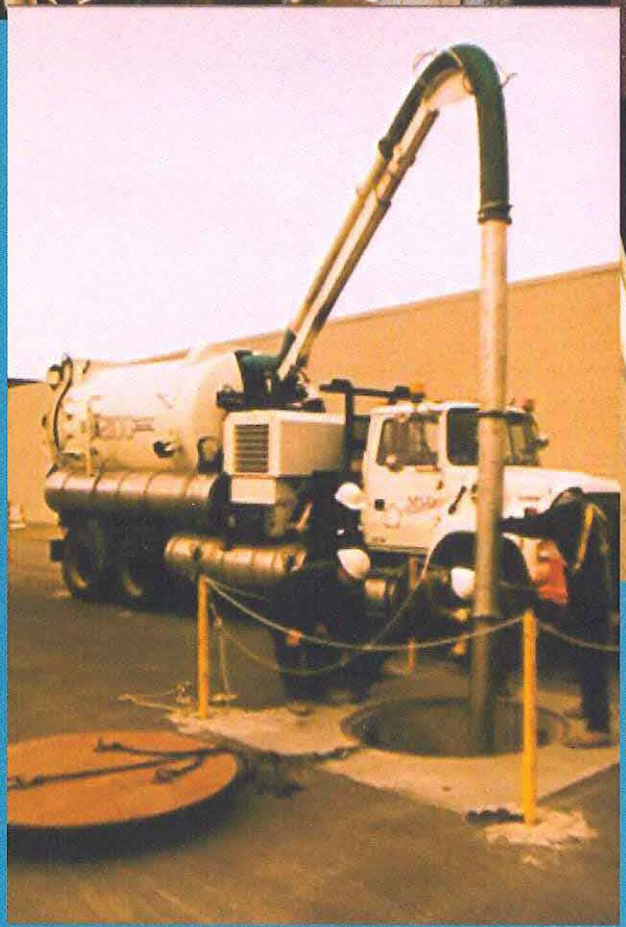
OBDP





CDS Technologies
PMB #438, 4110 SE Hawthorne Blvd.
Portland, OR 97214-5246
503-872-8593
503-872-8597 fax

CDS TECHNOLOGIES

OPERATIONS AND MAINTENANCE GUIDELINES
For the CDS Technologies Models PMSU, PSW & PSWC
CONTINUOUS DEFLECTIVE SEPARATION UNIT
Located at

I-5: N. Santiam Highway Kuebler Blvd
Salem, OR

INTRODUCTION

The CDS unit is an important and effective component of your storm water management program and proper operation and maintenance of the unit are essential to demonstrate your compliance with local, state and federal water pollution control requirements.

The CDS technology features a patented non-blocking, indirect screening technique developed in Australia to treat water runoff. The unit is highly effective in the capture of suspended solids, fine sands and larger particles. Because of its non-blocking screening capacity, the CDS unit is un-matched in its ability to capture and retain gross pollutants such as trash and debris. In short, CDS units capture a very wide range of organic and in-organic solids and pollutants that typically result in tons of captured solids each year: total suspended solids (TSS), sediments, oil and greases and captured trash and debris (including floatables, neutrally buoyant, and negatively buoyant debris) under very high flow rate conditions.

CDS units are equipped with conventional oil baffles to capture and retain oil and grease. Laboratory evaluations show that the CDS units are capable of capturing up to 70% of the free oil and grease from storm water. CDS units can also accommodate the addition of oil sorbents within their separation chambers. The addition of the oil sorbents can ensure the permanent removal of 80% to 90% of the free oil and grease from the storm water runoff.

OPERATIONS

The CDS unit is a non-mechanical self-operating system and will function any time there is flow in the storm drainage system. The unit will continue to effectively capture pollutants in flows up to the design capacity even during extreme rainfall events when the design capacity may be exceeded. Pollutants captured in the CDS unit's separation chamber and sump will be retained even when the units design capacity is exceeded.

CDS UNIT CLEANOUT

The frequency of cleaning the CDS unit will depend upon the generation of trash and debris and sediments in your application. Cleanout and preventive maintenance schedules will be determined based on operating experience unless precise pollutant loadings have been determined. The unit should be periodically inspected to determine the amount of accumulated pollutants and to ensure that the cleanout frequency is adequate to handle the predicted pollutant load being processed by the CDS unit. The recommended cleanout of solids within the CDS unit's sump should occur at 75% of the sump capacity. However, the sump may be completely full with no impact to the CDS unit's performance.

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Access to the CDS unit is typically achieved through two manhole access covers – one allows inspection and cleanout of the separation chamber (screen/cylinder) & sump and another allows inspection and cleanout of sediment captured and retained behind the screen. The PSW & PSWC off-line models have an additional access cover over the weir of the diversion vault. For units possessing a sizable depth below grade (depth to pipe), a single manhole access point would allow both sump cleanout and access behind the screen.

CDS Technologies Recommends The Following:

NEW INSTALLATIONS – Check the condition of the unit after every runoff event for the first 30 days. The visual inspection should ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen), measuring the amount of solid materials that have accumulated in the sump, the amount of fine sediment accumulated behind the screen, and determining the amount floating trash and debris in the separation chamber. This can be done with a calibrated "dip stick" so that the depth of deposition can be tracked. Refer to **Appendix A – Annual Record of Maintenance & Cleanout Elevation View** for allowable deposition depths and critical distances. Schedules for inspections and cleanout should be based on storm events and pollutant accumulation.

ONGOING OPERATION – During the rainfall season, the unit should be inspected at least once every 30 days. The floatables should be removed and the sump cleaned when the sump is 75-85% full. If floatables accumulate more rapidly than the settleable solids, the floatables should be removed using a vactor truck or dip net before the layer thickness exceeds one to two feet.

Cleanout of the CDS unit at the end of a rainfall season is recommended because of the nature of pollutants collected and the potential for odor generation from the decomposition of material collected and retained. This end of season cleanout will assist in preventing the discharge of pore water from the CDS® unit during summer months.

USE OF SORBENTS – It needs to be emphasized that the addition of sorbents is not a requirement for CDS units to effectively control oil and grease from storm water. The conventional oil baffle within a unit assures satisfactory oil and grease removal. However, the addition of sorbents is a unique enhancement capability special to CDS units, enabling increased oil and grease capture efficiencies beyond that obtainable by conventional oil baffle systems.

Under normal operations, CDS units will provide effluent concentrations of oil and grease that are less than 15 parts per million (ppm) for all dry weather spills where the volume is less than or equal to the spill capture volume of the CDS unit. During wet weather flows, the oil baffle system can be expected to remove between 40 and 70% of the free oil and grease from the storm water runoff.

CDS Technologies only recommends the addition of sorbents to the separation chamber if there are specific land use activities in the catchment watershed that could produce exceptionally large concentrations of oil and grease in the runoff,

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concentration levels well above typical amounts. If site evaluations merit an increased control of free oil and grease then oil sorbents can be added to the CDS unit to thoroughly address these particular pollutants of concern.

Recommended Oil Sorbents

Rubberizer® Particulate 8-4 mesh or OARS™ Particulate for Filtration, HPT4100 or equal. Rubberizer® is supplied by Haz-Mat Response Technologies, Inc. 4626 Santa Fe Street, San Diego, CA 92109 (800) 542-3036. OARS™ is supplied by AbTech Industries, 4110 N. Scottsdale Road, Suite 235, Scottsdale, AZ 85251 (800) 545-8999.

The amount of sorbent to be added to the CDS separation chamber can be determined if sufficient information is known about the concentration of oil and grease in the runoff. Frequently the actual concentrations of oil and grease are too variable and the amount to be added and frequency of cleaning will be determined by periodic observation of the sorbent. As an initial application, CDS recommends that approximately 4 to 8 pounds of sorbent material be added to the separation chamber of the CDS units per acre of parking lot or road surface per year. Typically this amount of sorbent results in a ½ inch to one (1") inch depth of sorbent material on the liquid surface of the separation chamber. The oil and grease loading of the sorbent material should be observed after major storm events. Oil Sorbent material may also be furnished in pillow or boom configurations.

The sorbent material should be replaced when it is fully discolored by skimming the sorbent from the surface. The sorbent may require disposal as a special or hazardous waste, but will depend on local and state regulatory requirements.

CLEANOUT AND DISPOSAL

A vactor truck is recommended for cleanout of the CDS unit and can be easily accomplished in less than 30-40 minutes for most installations. Standard vactor operations should be employed in the cleanout of the CDS unit. Disposal of material from the CDS unit should be in accordance with the local municipality's requirements. Disposal of the decant material to a POTW is recommended. Field decanting to the storm drainage system is not recommended. Solids can be disposed of in a similar fashion as those materials collected from street sweeping operations and catch-basin cleanouts.

MAINTENANCE

The CDS unit should be pumped down at least once a year and a thorough inspection of the separation chamber (inlet/cylinder and separation screen) and oil baffle performed. The unit's internal components should not show any signs of damage or any loosening of the bolts used to fasten the various components to the manhole structure and to each other. Ideally, the screen should be power washed for the

inspection. If any of the internal components is damaged or if any fasteners appear to be damaged or missing, please contact CDS Technologies to make arrangements to have the damaged items repaired or replaced:

CDS Technologies, Inc.
16360 Monterey Road, Suite 250
Morgan Hill, CA 95037-5406

Phone, Toll Free: (888) 535-7559
Fax: (408) 782-0721

The screen assembly is fabricated from Type 316 stainless steel and fastened with Type 316 stainless steel fasteners that are easily removed and/or replaced with conventional hand tools. The damaged screen assembly should be replaced with the new screen assembly placed in the same orientation as the one that was removed.

CONFINED SPACE

The CDS unit is a confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the unit to perform maintenance or inspection procedures. Inspections of the internal components can, in most cases, be accomplished through observations from the ground surface.

RECORDS OF OPERATION AND MAINTENANCE

CDS Technologies recommends that the owner maintain annual records of the operation and maintenance of the CDS unit to document the effective maintenance of this important component of your storm water management program. The attached **Annual Record of Operations and Maintenance** form (see **Appendix A**) is suggested and should be retained for a minimum period of three years.

Date: **11/20/2006**

Project: **I-5: N. Santiam Highway Kuebler Blvd**

Subject: **Maintenance Pump Volume – Replacement Oil Sorbent Quantity**

Location: **Salem, OR**

CDS Model Number: **PMSU20_15_4 (2)**

The CDS PMSU20_15_14, 0.7 unit installed at the I-5: N. Santiam Highway Kuebler Blvd project in Salem, OR is designed with 1.39 cubic yards (38 cubic feet) (282 gallons) of storage volume. This volume includes the pounds of sediments that will settle inside of the sump, fine sediment on the separation slab, trash and debris along with the water. Once the unit is maintained the above listed volume of water should be added to the cleaned unit to prepare for treatment of the next storm event.

If oil sorbent material is to be used in this unit, 8 sorbent booms are recommended to be installed inside the fiberglass cylinder on the water surface. This material will provide 80% removal of floatable oil and grease in storm water at an average concentration of 15 ppm. It is recommended that booms are replaced more frequently if higher oil and grease loadings occur.

Please contact CDS Technologies to coordinate ordering new oil sorbent material or see page 3 of this manual for manufacturers of the sorbent material if you wish to order it direct.

APPENDIX A

ANNUAL RECORD OF

OPERATIONS AND MAINTENANCE

&

CLEANOUT ELEVATION VIEW
(PROJECT SPECIFIC)

CDS TECHNOLOGIES
ANNUAL RECORD
OF
OPERATION AND MAINTENANCE

OWNER _____

ADDRESS _____

OWNER REPRESENTATIVE _____ **PHONE** _____

CDS INSTALLATION:

MODEL DESIGNATION _____ DATE _____

SITE LOCATION _____

DEPTH FROM COVER TO BOTTOM OF SUMP _____

VOLUME OF SUMP _____ CUYD VOLUME/INCH DEPTH _____ CUYD

INSPECTIONS:

DATE/INSPECTOR	SCREEN INTEGRITY	FLOATABLES DEPTH	SEDIMENT VOLUME	SORBENT DISCOLORATION

OBSERVATIONS OF FUNCTION: _____

_____

_____

_____

CLEANOUT:

DATE	VOLUME FLOATABLES	VOLUME SEDIMENTS	METHOD OF DISPOSAL OF FLOATABLES, SEDIMENTS, DECANT AND SORBENTS

OBSERVATIONS:

_____

_____

_____

_____

_____

_____

SCREEN MAINTENANCE:

DATE OF POWER WASHING, INSPECTION AND OBSERVATIONS: _____

_____

_____

CERTIFICATION: _____ **TITLE:** _____

DATE: _____

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APPENDIX B

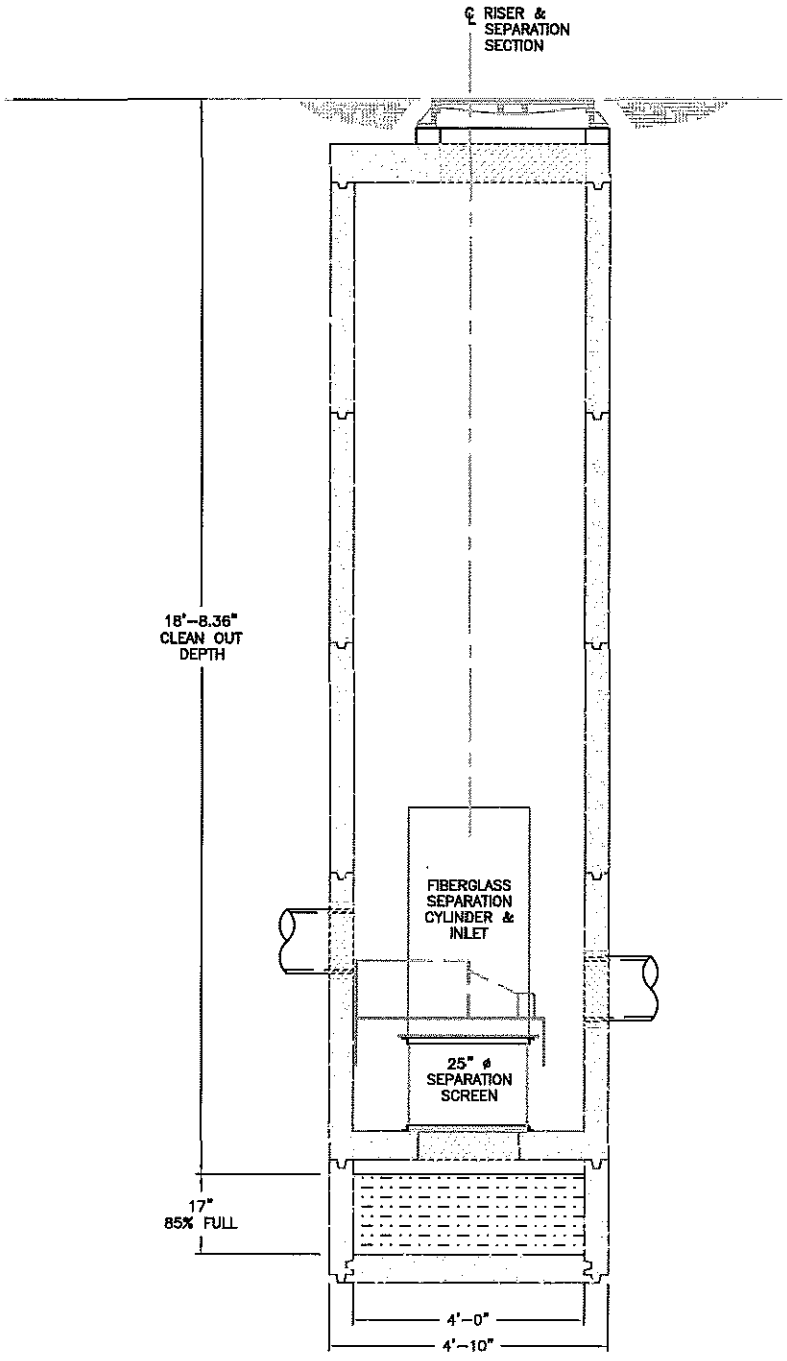
SITE LOCATION PLANS

(PROJECT SPECIFIC)

CLEAN OUT VIEW

CDS MODEL PMSU20_15_4, 0.7 CFS CAPACITY

CDS 1 Sta 14+065.4 LT 16.7



CDS TECHNOLOGIES PATENTED	I-5 N Santiam Hwy Kuebler Blvd Salem Oregon	DATE 01/10/06 DRAWN D.J. APPROV.	SCALE 1"=4' SHEET C1

APPENDIX B

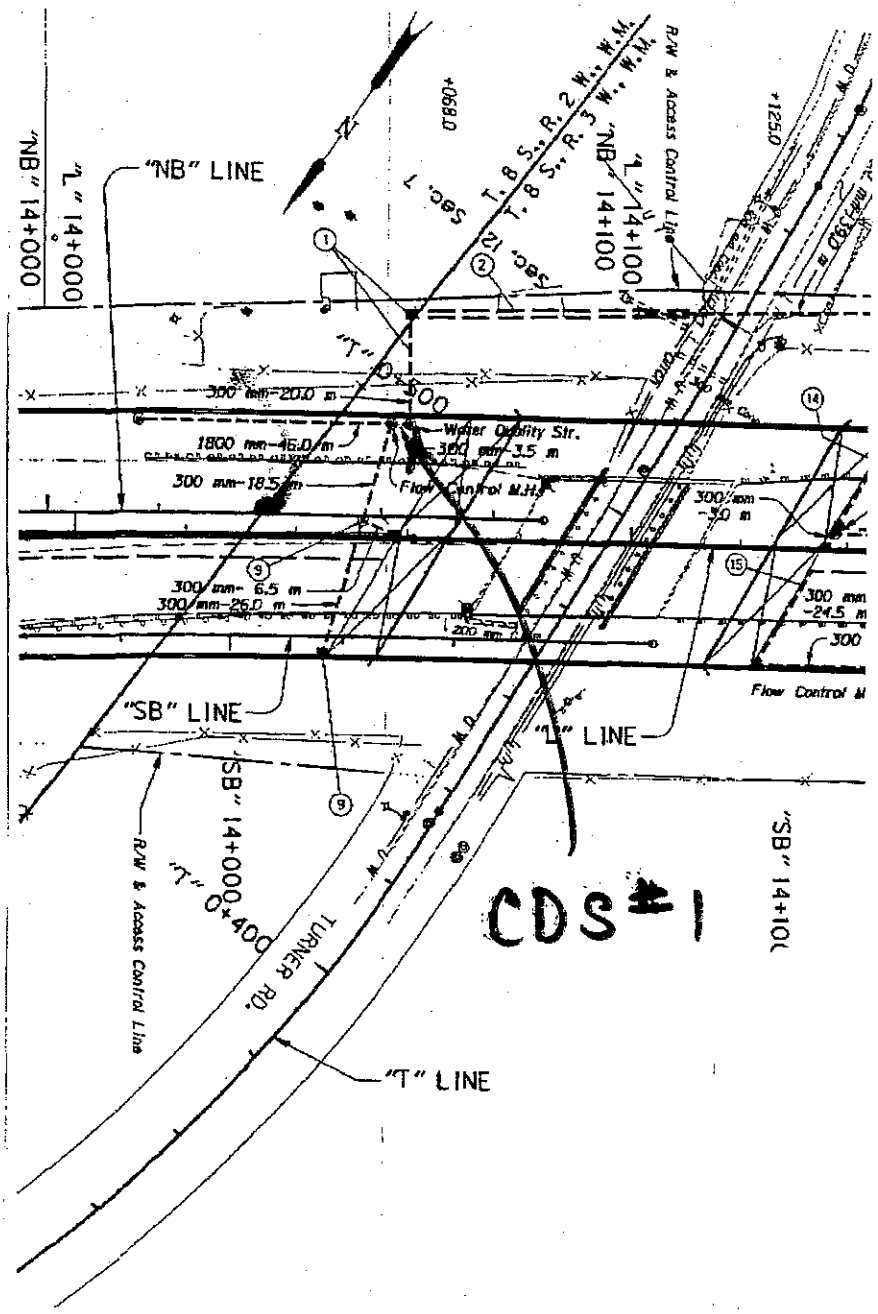
SITE LOCATION PLANS

(PROJECT SPECIFIC)

SITE PLAN VIEW

CDS MODEL PMSU20_15_4, 0.7 CFS CAPACITY

CDS 1 Sta 14+065.4 LT 16.7



CDS TECHNOLOGIES PATENTED	I-5 N Santiam Hwy Kuebler Blvd Salem Oregon	DATE 01/10/06	SCALE 1"=4'
		DRAWN D.J.	SHEET S1
		APPROV.	

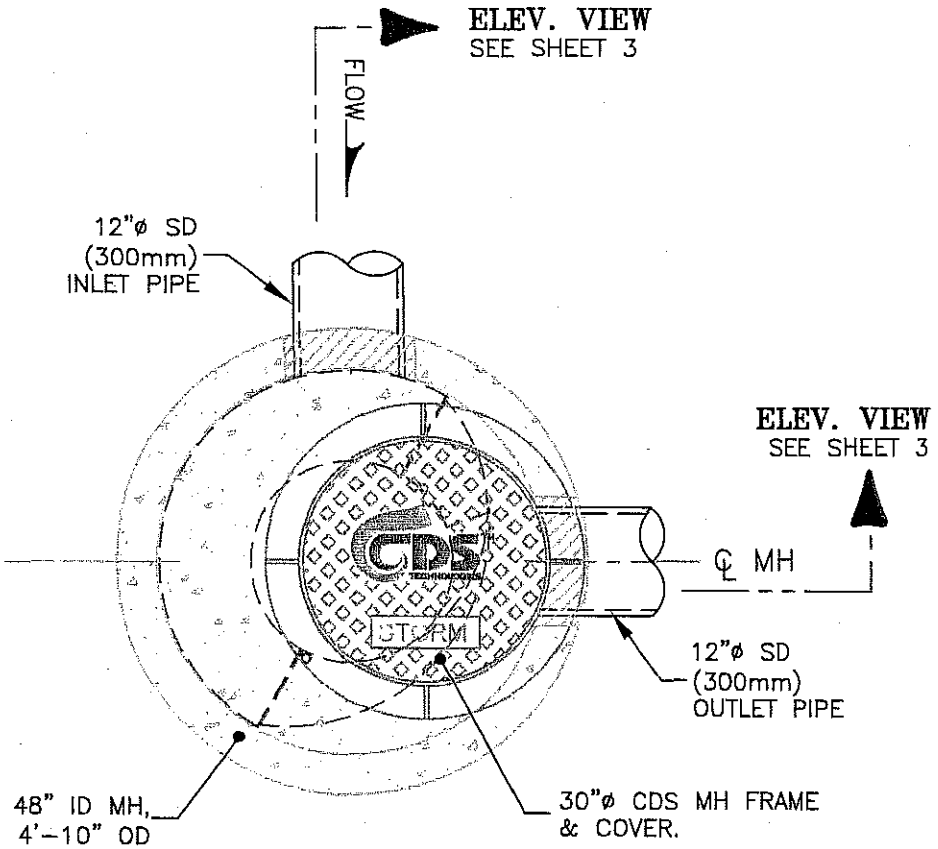
APPENDIX C

PLAN & PROFILE DRAWINGS

(PROJECT SPECIFIC)

PLAN VIEW

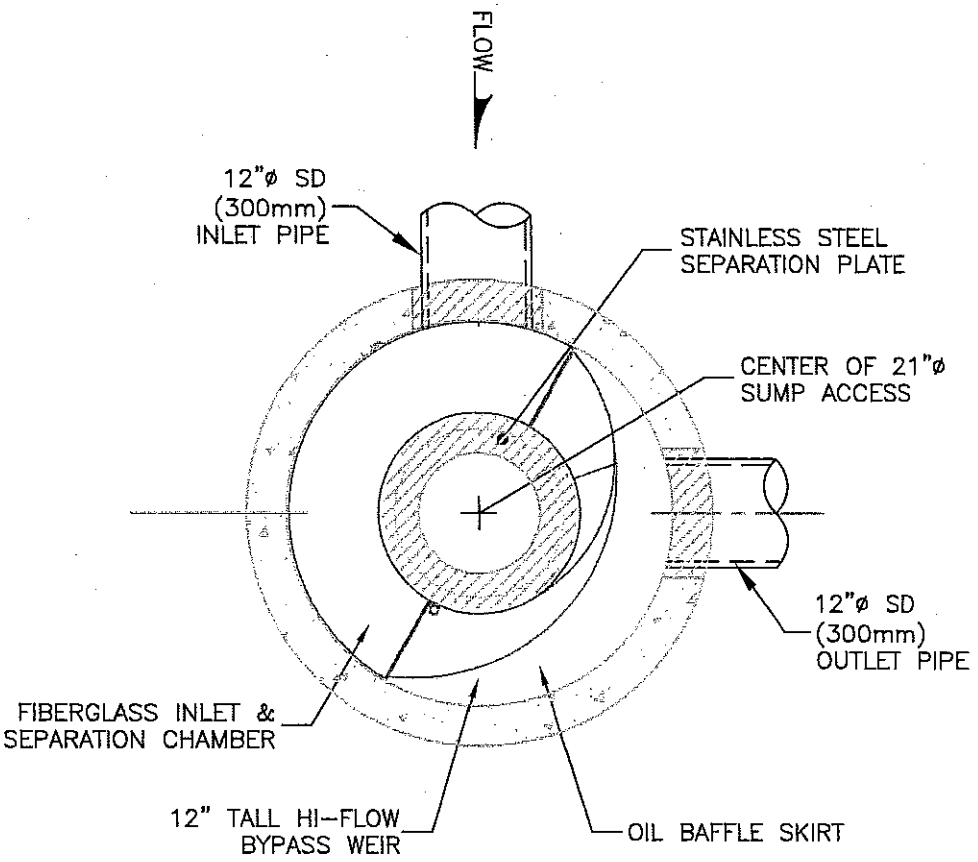
CDS MODEL PMSU20_15_4, 0.7 CFS CAPACITY
CDS 1 Sta 14+065.4 LT 16.7



CDS TECHNOLOGIES PATENTED	I-5 N Santiam Hwy Kuebler Blvd Salem Oregon	DATE 01/10/06 DRAWN D.J. APPROV.	SCALE 1"=2' SHEET 1

SECTION CUT

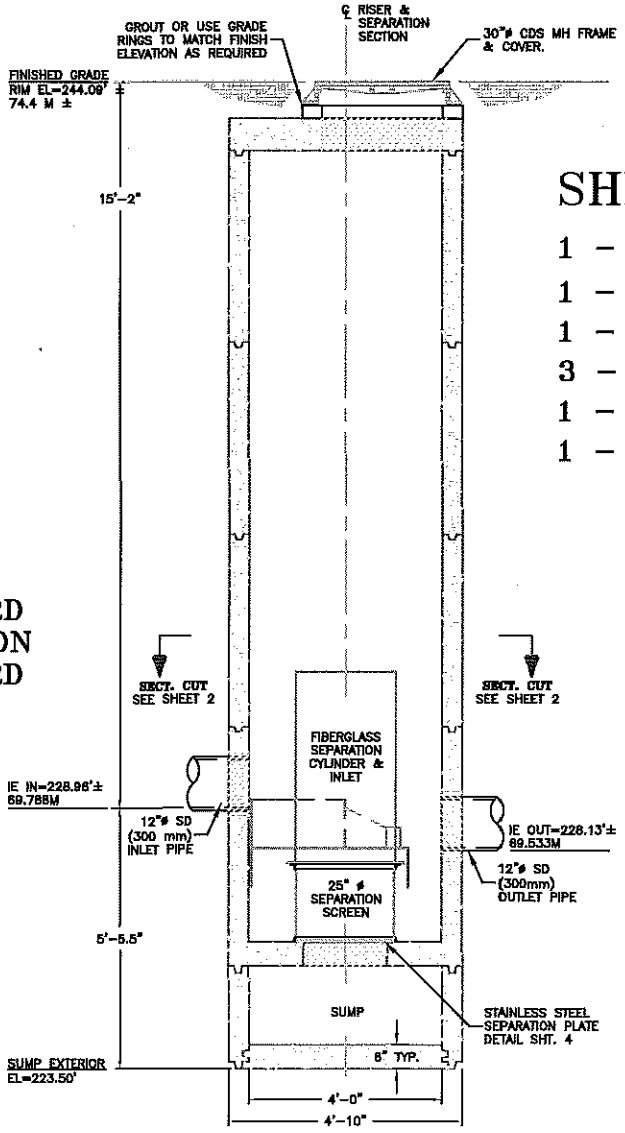
CDS MODEL PMSU20_15_4, 0.7 CFS CAPACITY
CDS 1 Sta 14+065.4 LT 16.7



CDS TECHNOLOGIES PATENTED	I-5 N Santiam Hwy Kuebler Blvd Salem Oregon	DATE 01/10/06 DRAWN D.J. APPROV.	SCALE 1"=2' SHEET 2

ELEVATION VIEW

CDS MODEL PMSU20_15_4, 0.7 CFS CAPACITY
CDS 1 Sta 14+065.4 LT 16.7



SHIPPING MATERIAL:

1 – 30"ø CDS FRAME AND COVER
1 – 30" X 4" GRADE RING
1 – 48"ø FLAT CAP
3 – 48"ø X 48" RISER SECTION
1 – 48"ø X 60" SEPERATION SECTION
1 – 48"ø X 24" SUMP BASE

NOTE:
NON–STANDARD INLET LOCATION
NON–STANDARD WIER HEIGHT

CDS™ TECHNOLOGIES PATENTED	I–5 N Santiam Hwy Kuebler Blvd Salem Oregon	DATE 07/21/06 DRAWN D.J. APPROV.	SCALE 1"=4' SHEET 3