OPERATION & MAINTENANCE MANUAL

DFI No. D00055
Facility Type: Water Quality Extended Detention Dry Pond

OCTOBER, 2010

INDEX

1. Identification

Drainage Facility ID (DFI):	**00055**
Facility Type:	Water Quality Extended Detention Dry Pond
Construction Drawings:	(V-File Number) 34V-053
Location:	District: 1
	Highway No.: 009
	Mile Post: 28.42 (beg./end)
	Description: This facility is located on the US 101 (Oregon Coast Hwy.) at the North Cannon Beach Interchange. Access may be obtained from southbound on-ramp to US 101.

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 Designers: Region 2 Tech. Center, Paul Wirfs, P.E., Phone no. 503-986-2990
Facility construction:	2003
Contractor:	Huffman-Wright Construction

4. Storm Drain System and Facility Overview

A water quality extended detention dry pond is a basin that is designed to detain stormwater for a sufficient time to allow particles and attached pollutants to settle. The outlet control structure limits the rate of runoff leaving the pond by using an orifice. These facilities are designed to completely drain over a 48 hour period. The size of these facilities depends on the location and the amount of contributing impervious area.

This facility is located on the US 101 (Oregon Coast Hwy.) at the North Cannon Beach Interchange. Access may be obtained from southbound on-ramp to US 101.

This facility collects stormwater along the Oregon coast highway north of the Cannon Beach interchange. The collected water passes through a split-flow diversion manhole and is directed into the facility's forebay through a 15-inch pipe; see Point B on the Operational Plan, Appendix A. Suspended solids and particulate matter in the stormwater settles to the bottom of the facility as flows continue towards the spillway at point A. The detention pond provides some additional treatment before the water is released at the outlet; Point C.

Water exits the detention pond through the open grates of a specialized outlet control structure indicated as point C on the Operational Plan before being conveyed through a 15-inch pipe to a series of manholes and released to a creek at Point E on the Plan.

A. Maintenance equipment access:
The facility is accessible via the right shoulder area of the southbound on-ramp to US 101.

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☐ Porous Pavers
☐ Liners
☐ Underdrains

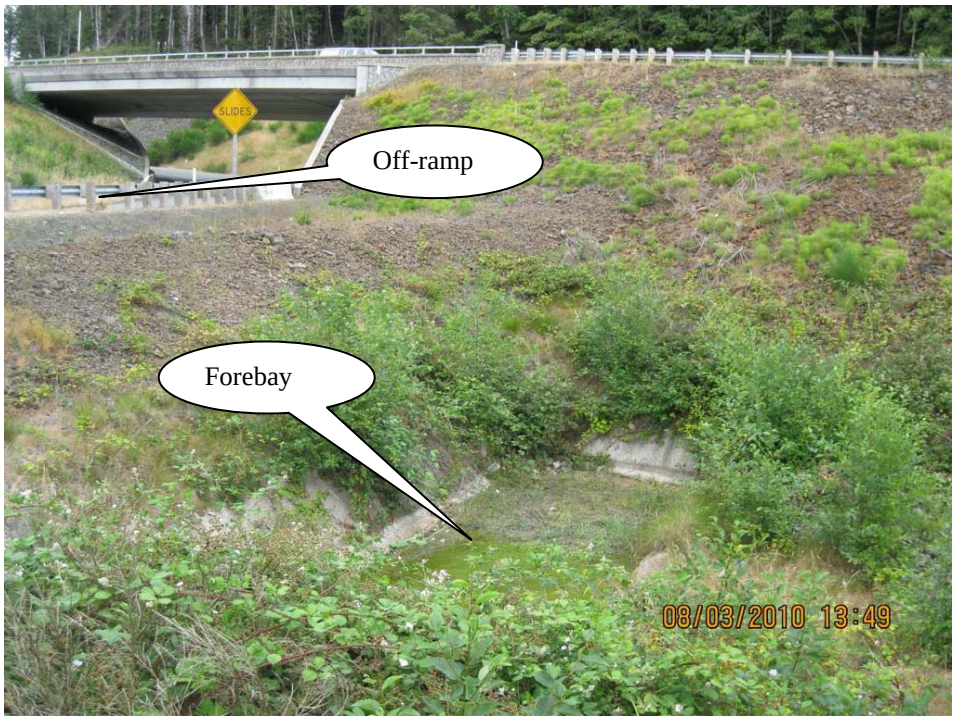


Photo 1: View of the forebay.

Photo 2: View of the detention pond facing north.

Photo 3: Outlet grate covered by vegetation

5. Facility Haz Mat Spill Feature(s)

The pond can be used to store a volume of liquid by blocking the metal grates of the outlet structure and the 15-inch diameter outlet pipe located at the outlet of the pond. The outlet and pipe are noted as Point C on the Operational Plan, Appendix A and shown in Photo 3.

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:
The detention pond is separated from the forebay by a rock berm which has an over flow channel that allows larger flows of stormwater to fill the pond.

A secondary auxiliary inlet/outlet grated catch basin has been designed as part of the facility's outlet control structure, and acts as an emergency overflow in the event the primary outlet control device is plugged.

Before flows ever reach the higher level of the secondary inlet/outlet device, however, they are typically released through a primary inlet/outlet grated catch basin located below the secondary device. If runoff should ever exceed the water quality event, where flows normally are directed to the lower primary outlet, the pond level will rise and flows will be released through the secondary auxiliary inlet/outlet device located just above the primary outlet.

☐ 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: N/A

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 road waste 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

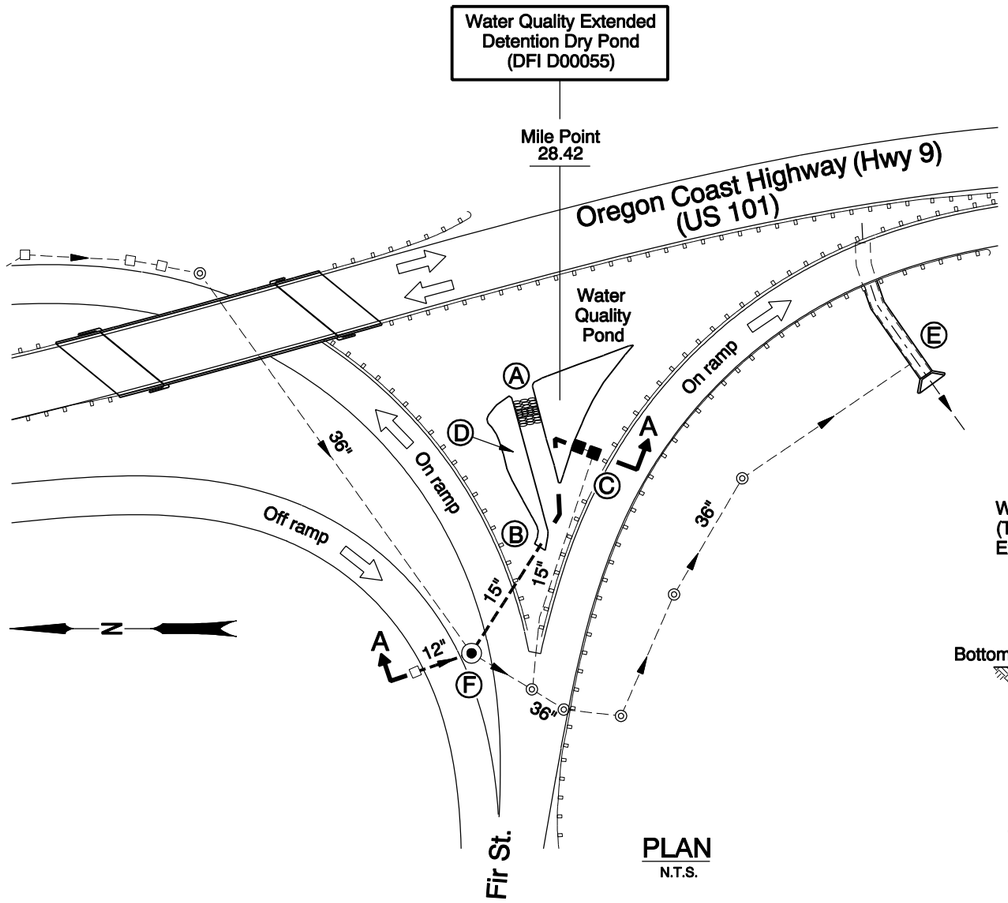
Contact any of the following for more detailed information about management of waste materials found on site:

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

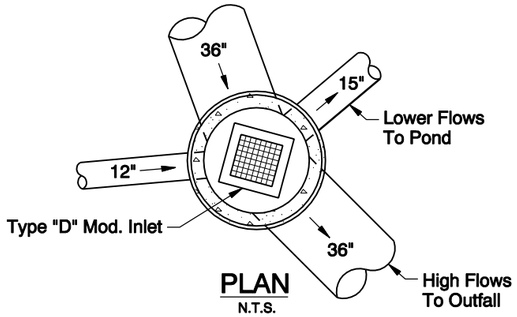
Appendix A

Content:

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



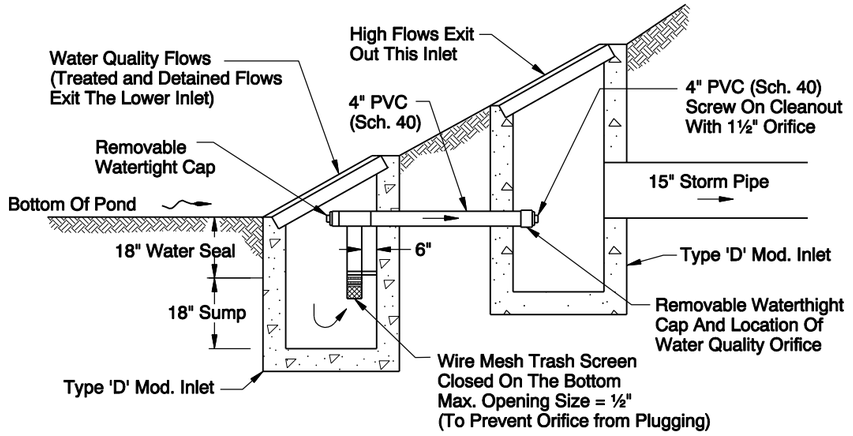
PLAN
N.T.S.



PLAN
N.T.S.

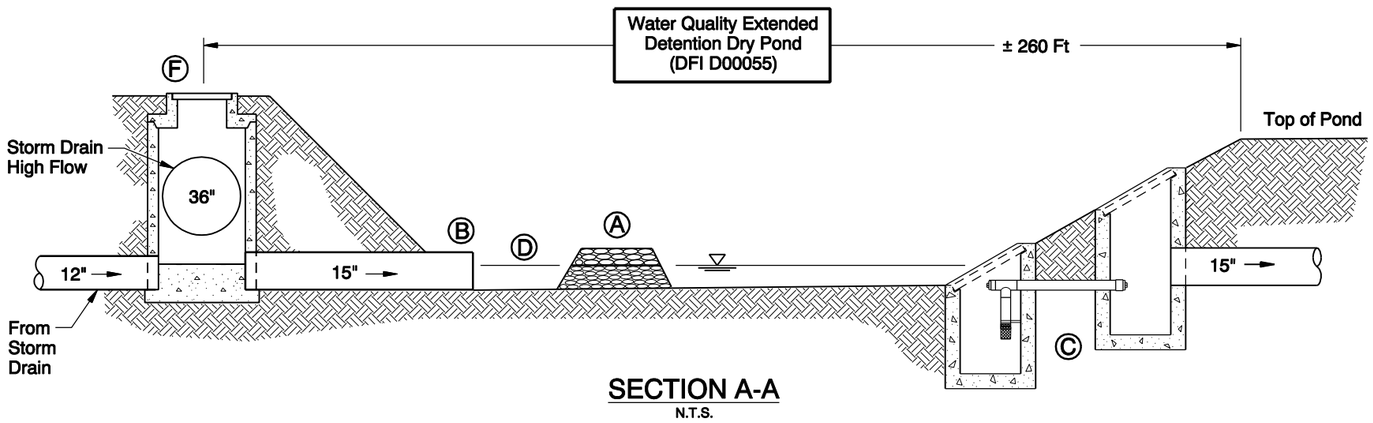
TYPE "D" MOD. INLET/SPLIT FLOW MANHOLE AT POINT Ⓕ

N.T.S.



WATER QUALITY CONTROL STRUCTURE AT POINT Ⓒ

N.T.S.



SECTION A-A

N.T.S.

LEGEND:

- Ⓐ Spillway
- Ⓑ Pond Inlet
- Ⓒ Outlet Control Structure
- Ⓓ Forebay
- Ⓔ Concrete Box Culvert
- Ⓕ Type "D" Mod. Inlet/Split Flow Manhole
- ◉ and/or ◎ Manhole
- ■ and/or □ Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Bob Knorr

Drafted By: Jim Holeman

DFI D00055
MAINTENANCE DISTRICT 1 HWY 9
WATER QUALITY EXT. DETENTION DRY POND
OREGON COAST HIGHWAY MP 28.42
CLATSOP COUNTY

Appendix B

Content:

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

34V-53

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Standard Drawing Nos.
2, 2A Thru 2A-7 Incl.	Typical Sections
2B	Stone Embankment Details
2B-2	Removal Of Surfacing Details
2B-3	Embankment Details
2B-4	Cul-De-Sac Details
2B-5	Ditch & Streambed Reconstruction Details
2B-6, 2B-7	Extraction Well Details
2B-8	Overflow Riser Cover Details
2B-9	Water Quality Details
2B-10	Manhole Details
2B-11	Slope Pipe Details
2B-12, 2B-13	Water Quality Basin Details
2B-14	Type "D" Mod. Inlet Details
2B-15	Ditch Energy Dissipater Details
2C Thru 2C-25 Incl.	Traffic Control Plans
2D Thru 2D-6 Incl.	Erosion Control Details
2D-7 Thru 2D-18 Incl.	Erosion Control Plans
2E	Pipe Data

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

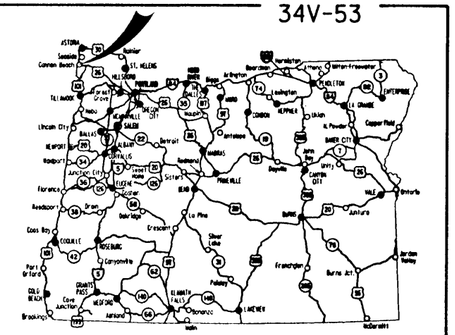
GRADING, STRUCTURE, PAVING, SIGNING, & ILLUMINATION

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.

OREGON COAST HIGHWAY

CLATSOP COUNTY

NOVEMBER 2001



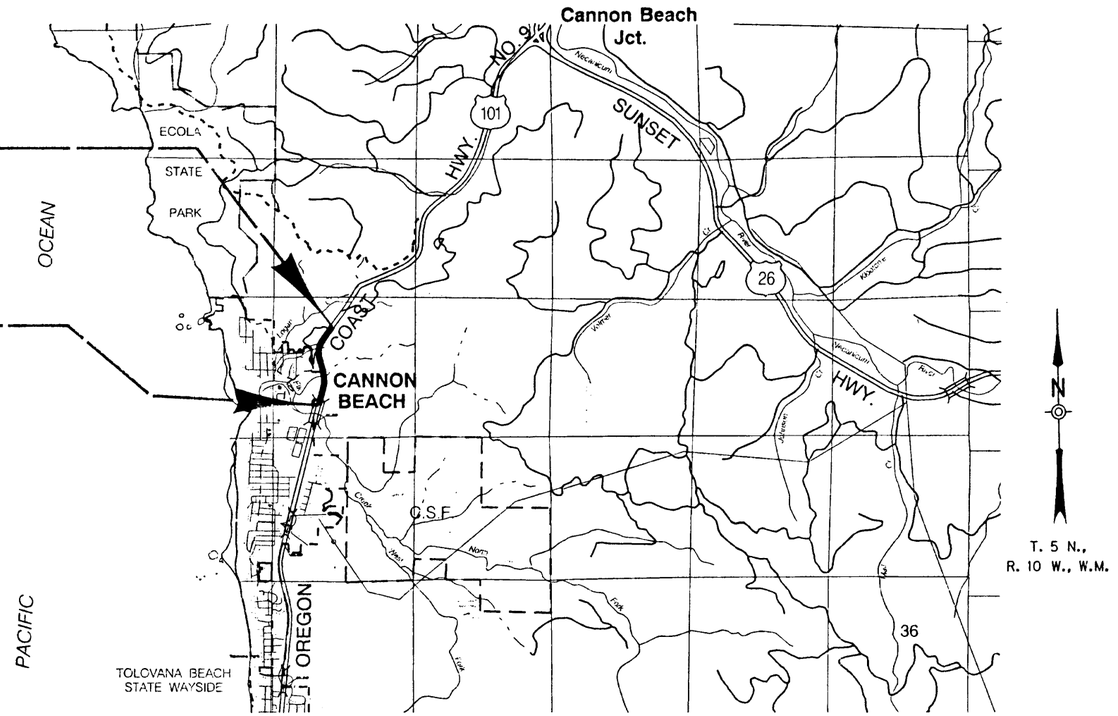
Overall Length Of Project - 1.159 km (0.72 Mile)

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 From The Center, Or Answers To Questions About The Rules By Calling (503) 232-1987.

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

NH-S009(122)
BEGINNING OF PROJECT
STA. 45 + 002.590 (M.P. 27.96)

NH-S009(122)
END OF PROJECT
STA. 46 + 167.000 (M.P. 28.68)



3	Alignment
3A, 3B	General Construction
3C, 3D	Drainage & Utilities
3E, 3F, 3G	Construction Profiles
3H, 3J, 3K	Drainage Profiles
4	Alignment
4A, 4B	General Construction
4C, 4D	Drainage & Utilities
4E, 4F, 4G	Construction Profiles
4H	Drainage Profile
5, 5A	Alignment
5B, 5C, 5D	General Construction
5E, 5F, 5G	Drainage & Utilities
5H, 5J, 5K, 5L	Construction Profiles
5M, 5N, 5P	Drainage Profiles
6	Alignment
6A, 6B	General Construction
6C, 6D	Drainage & Utilities
6E	Construction Profile
6F	Drainage Profile

OREGON TRANSPORTATION COMMISSION

Steven H. Corey	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Stuart Foster	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, 2002

Catherine M. Nelson

ACTING TECHNICAL SERVICES MANAGING ENGINEER

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION	NH-S009(122)	1

METRIC

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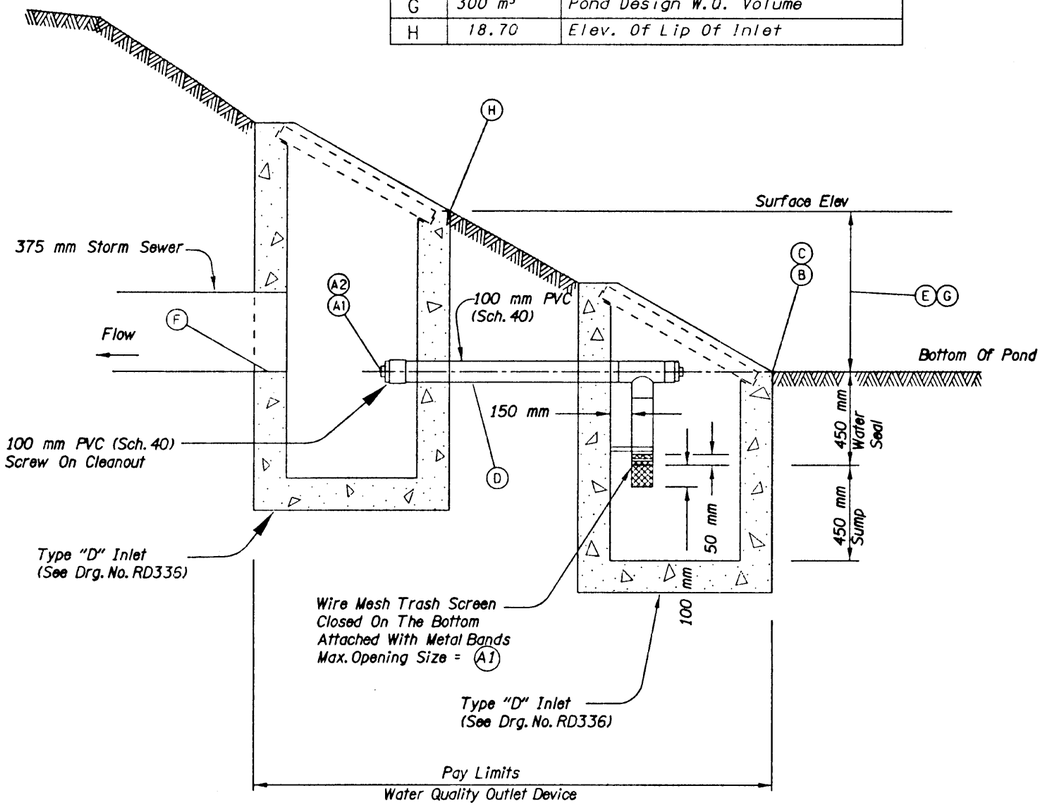
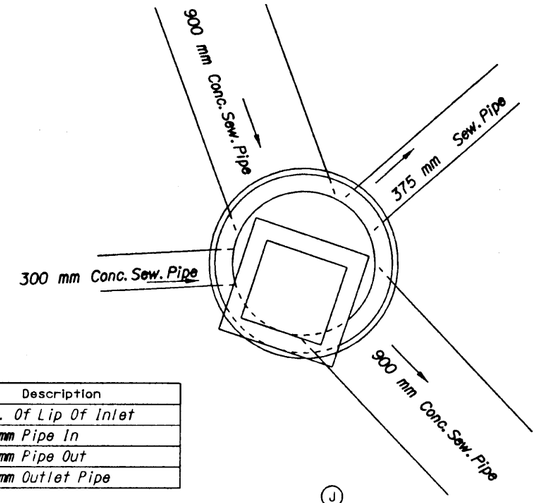
VIEW A: C004-1414

	Dimemsion	Description
A1	31 mm	Orifice Diameter
A2	18.00	Elev. Of Center Of Orifice
B	18.00	Elev. Of Pond Bottom
C	18.00	Elev. Of Lip Of Inlet
D	17.95	F.L. Elev.Of 100 mm P.V.C.
E	0.7 m	Pond Design Depth
F	18.00	F.L. Elev. Of Outlet Pipe
G	300 m³	Pond Design W.Q. Volume
H	18.70	Elev. Of Lip Of Inlet

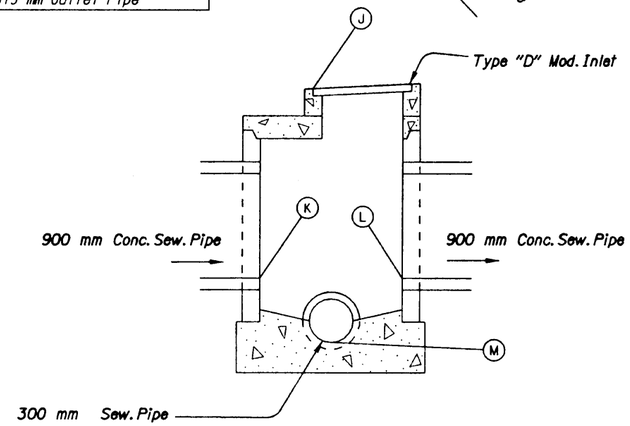


WATER QUALITY OUTLET DEVICE

(For Location See Sht. 5F, Note 14)



	Elevation	Description
J	20.813	Elev. Of Lip Of Inlet
K	19.181	900 mm Pipe In
L	19.181	900 mm Pipe Out
M	18.630	375 mm Outlet Pipe



SPECIAL MANHOLE (SPLITTER)

(For Location See Sht. 5F, Note 8)

(For Details, Not Shown, See Drg. No. RD327, RD333)

REGISTERED PROFESSIONAL ENGINEER
45556PE
Dani C. Nelson
OREGON
JULY 9, 2001
DANI C. NELSON
EXPIRES: December 31, 2002

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

Review By - Earnie Crom
Designed By - Dani Nelson
Drafted By - Bob Erpelding

WATER QUALITY DETAILS

SHEET NO. 2B-9

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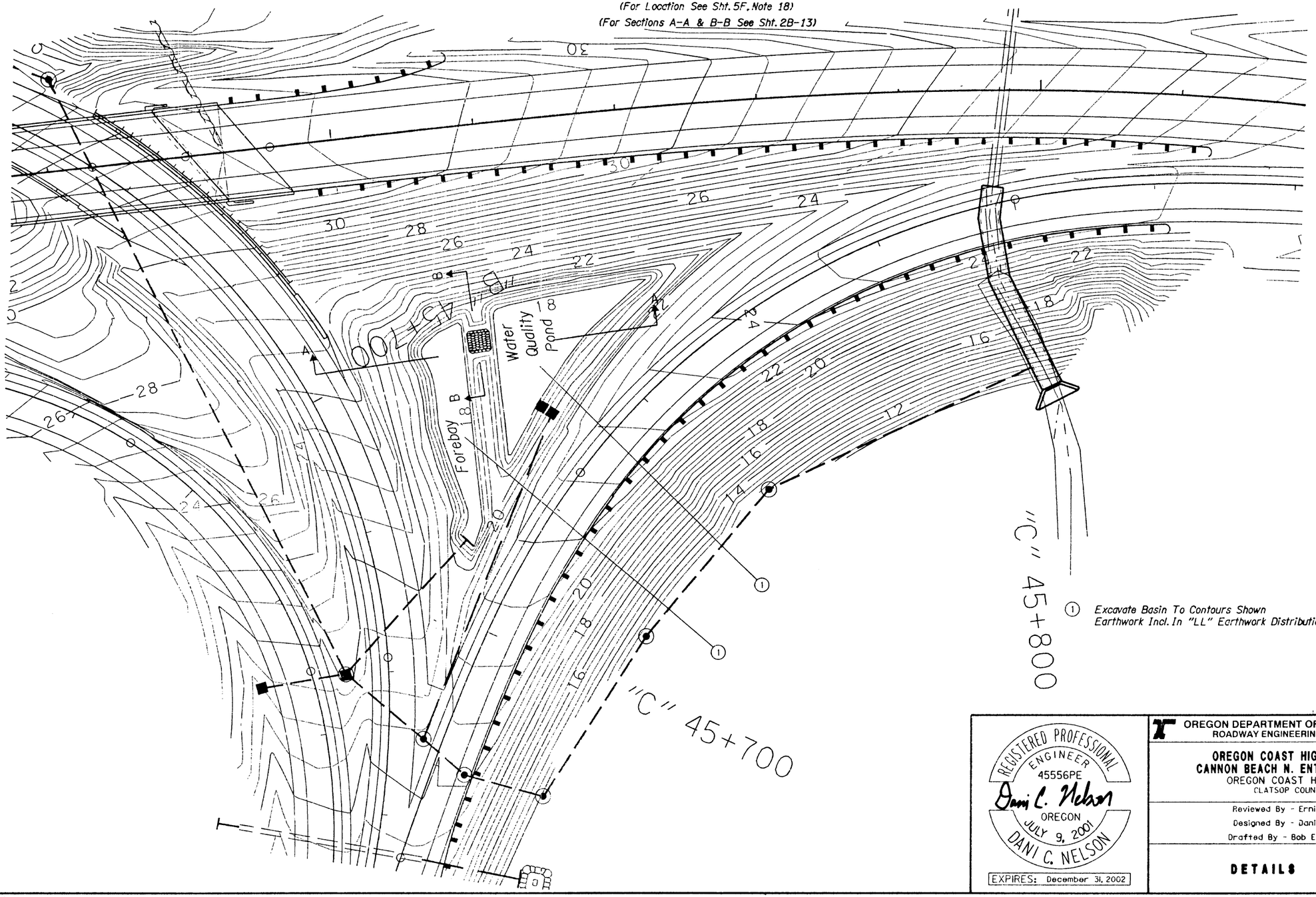
VIEW 3

VIEW 3

WATER QUALITY BASIN

(For Location See Sht. 5F, Note 18)

(For Sections A-A & B-B See Sht. 2B-13)



① *Excavate Basin To Contours Shown*
Earthwork Incl. In "LL" Earthwork Distribution

REGISTERED PROFESSIONAL ENGINEER
45556PE
Dani C. Nelson
OREGON
JULY 9, 2001
DANI C. NELSON

EXPIRES: December 31, 2002

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OREGON COAST HIGHWAY AT
CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

Reviewed By - Ernie Crom
Designed By - Dani Nelson
Drafted By - Bob Erpelding

DETAILS

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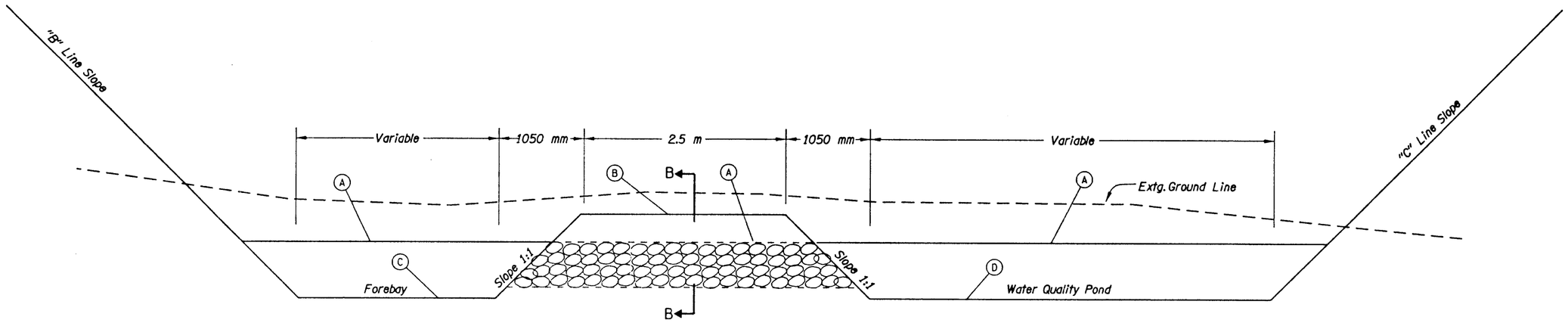
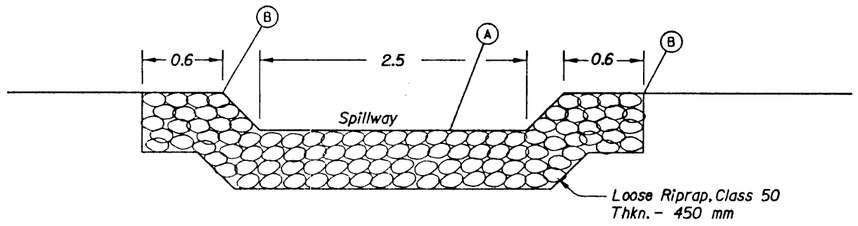
VIEW 4



SECTION A-A



SECTION B-B

ELEVATION TABLE

POINT	ELEVATION	DESCRIPTION
A	18.70 m	Design W.S. And Spillway
B	19.05 m	Top Of Berm
C	18.00 m	Bottom Of Forbay
D	18.00 m	Bottom Of Water Quality Pond

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

REGISTERED PROFESSIONAL ENGINEER
45556PE
Dani C. Nelson
OREGON
JULY 9, 2001
DANI C. NELSON
EXPIRES: December 31, 2002

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

Reviewed By - Ernie Crom
Designed By - Dani Nelson
Drafted By - Bob Erpelding

DETAILS

SHEET NO. 2B-13

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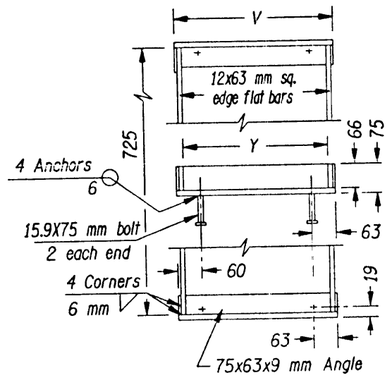
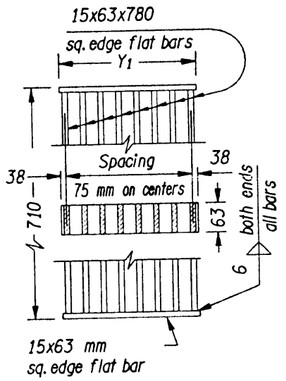
VIEW 5

VIEW 5



FRAME



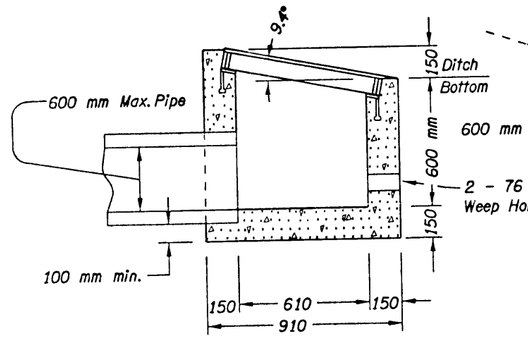
GRATE-TYPE 1

NOTE:
9 mm Cross Bars Shall Be Flush With The Grate Surface And May Be Fillet Welded, Resistance Welded or Electroforged To Bearing Bars.

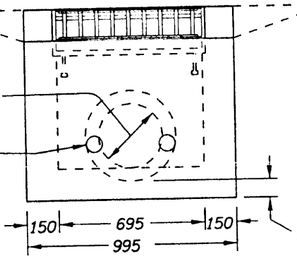
INLET TYPE	FRAME V	FRAME Y	GRATE Y_1	GRATE NO. OF BARS	GRATE TYPE	REMARKS
D, D-Modified	730	695	685	9	1	

INLET

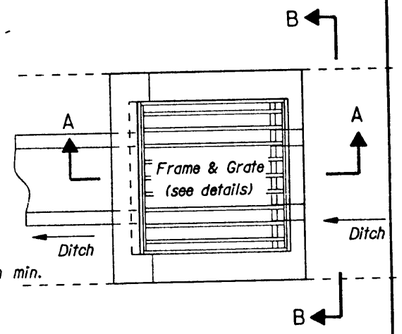
TYPE D - MODIFIED (150mm Rise)



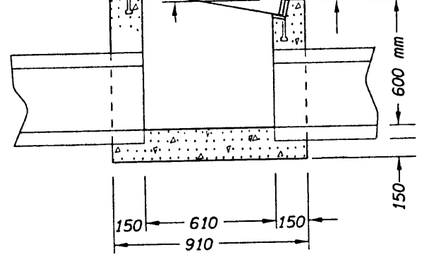
SECTION A-A



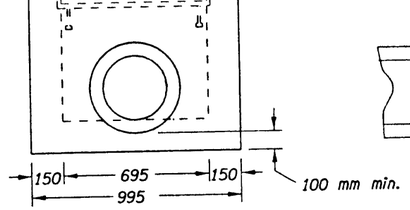
ELEVATION B-B



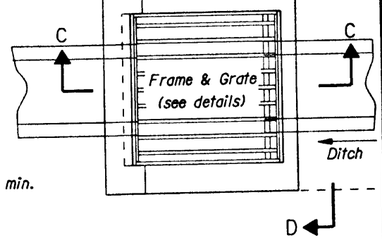
PLAN



SECTION C-C



ELEVATION D-D



PLAN

OREGON DEPARTMENT OF TRANSPORTATION

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

Design Team Leader - Mike Harris
Designed By - Ernie Crom
Drafted By - Bob Erpelding

DETAILS

SHEET NO. 2B-14

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VIEW 6
VIEW 6

BRIDGE DETAILS CHECKED

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N

"B" LINE
(For Drainage Profile, See Sht. 5N)

"LL" 45+600

"B" 45+600

"LL" 45+700

"LL" 45+800

"LL" 45+900

"LL" LINE
(For Profile, See Sht. 5H)

Ditch

450mm Conc

DRIVEWAY GRAVEL

ACCESS NORTH

CANNON BEACH

"A" LINE
(For Drainage Profile, See Sht. 5M)

"B" 45+700

"C" 45+700

"C" LINE
(For Drainage Profile, See Sht. 5P)

No Work Area

CITY LIMITS CANNON BEACH

"C" 45+800

"C" 45+900

Water Quality Pond

Forebay

MATCH LINE
SEE SHEET 5G

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

REGISTERED PROFESSIONAL ENGINEER
15441
Paul R. Wirfs
OREGON
MAY 30, 1991
PAUL R. WIRFS
Expires June 30, 2002

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

Reviewed By - Ernie Crom
Designed By - Paul Wirfs
Drafted By - Bob Erpelding

DRAINAGE & UTILITIES

SHEET NO. 5E

VIEW 3

VIEW 3

BRIDGE DETAILS CHECKED

13-SEP-2001 09:23

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(1) Sta. "LL"45+600
Sta. "LL"45+685
Plug And Abandon Extg. Pipe (STAGE III)

(2) Sta. "C"45+796.68
Bridge No. 18892
Remove Extg. Wingwalls & Apron
Remove Extg. 600 mm C.M.P.
1.2 x1.2 R.C.B.C. - 57.72 m (In Pl.)
Inst. Offset Fishway Baffle - 37
Extend RCBC With 2.4 x2.4
Cast-In-place RCBC - 26.72 m
(For Drg. Nos., See Sht. 1A)

(3) Sta. "A"45+646 To Sta. "A"45+740, Lt.
Sta. "B"45+665 To Sta. "B"45+740, Rt.
Const. Ditch
Const. Loose Riprap (Class 50) - 145.0 m^3
Inst. Riprap Geotextile - 665.0 m^2
Ditch Exc. - 160.0 m^3
(For Details, See Sht. 2B-5)

(4) Sta. "B"45+590, (4.4 m Rt.) To
Sta. "B"45+610, (7.5 m Lt.)
Const. Type "D" Mod. Inlet
Inst. 450 mm Sew. Pipe - 23.5 m
Tr. Exc. - 30.0 m^3
(For Details, See Sht. 2B-14)

(5) See Sht. 4D, Note 4
(5A) Const. Type "M-0" Inlet

(6) Sta. "B"45+643 Lt. To Sta. "B"45+740, Rt.
Const. Manhole
Inst. 900 mm Sew. Pipe - 95.0 m
Tr. Exc. - 230.0 m^3
(See Drg. No. RD330)

(7) Sta. "A"45+740, Rt. To Sta. "B"45+740, Rt.
Const. Type "D" Mod. Inlet
Inst. 300 mm Sew. Pipe - 12.0 m
Tr. Exc. - 9 m^3
(For Details, See Sht. 2B-14)

(8) Sta. "B"45+740, Rt. To Sta. "B"45+749, Lt.
Const. Manhole (Splitter) With Type "D" Mod. Inlet
Inst. 900 mm Sew. Pipe - 14.0 m
Tr. Exc. - 37 m^3
(For Details, See Shts. 2B-9, 2B-14)
(See Drg. No. RD333)

(9) Sta. "C"45+680 To Sta. "C"45+681, Rt.
Const. Outside Drop Manhole
Inst. 900 mm Sew. Pipe - 17.0 m
Tr. Exc. - 105.0 m^3
(For Details, See Sht. 2B-10)

(10) Sta. "C"45+681 To Sta. "C"45+710, Rt.
Const. Manhole
Inst. 900 mm Sew. Pipe - 26.7 m
Tr. Exc. - 147 m^3

(11) Sta. "C"45+710 To Sta. "C"45+743, Rt.
Const. Manhole
Inst. 900 mm Sew. Pipe - 27.1 m
Tr. Exc. - 126 m^3

(12) Sta. "C"45+743 To Sta. "C"45+797, Rt.
Const. Manhole
Const. Connection To RCBC
Inst. 900 mm Sew. Pipe - 40.8 m
Tr. Exc. - 83 m^3
(For Drg. Nos., See Sht. 1A)

(13) Sta. "B"45+730, Lt. To Sta. "C"45+710, Lt.
Inst. 375 mm Sew. Pipe - 25.3 m
Tr. Exc. - 34 m^3

(14) Sta. "C"45+730, Lt.
Const. Water Quality Outlet Device
(For Details, See Sht. 2B-9)

(15) Sta. "B"45+765
450 mm Conc. Pipe 26.0 m (In Place)
(Elev. To Be Determined In The Field)
Extend - 3.0 m Rt.
- 14.0 m Lt.
Const. Riprap Basin (Class 50) - 10 m^3
Tr. Exc. - 17.0 m^3
(For Details, See Sht. 2B-11)

(16) Sta. "B"45+630 To Sta. "B"45+635, Lt.
Const. Type "D" Mod. Inlet
Inst. 600 mm Sew. Pipe - 5.0 m
Tr. Exc. - 5.0 m^3
(For Details, See Sht. 2B-14)

(17) Sta. "LL"45+675 To Sta. "LL"45+720, Lt.
Const. Ditch "V" Bottom
Const. In Stage I
Const. Loose Riprap (Class 50) - 40.0 m^3
Inst. Riprap Geotextile - 60.0 m^2
Ditch Exc. - 155.0 m^3
(For Details, See Sht. 2B-5)

(18) Sta. "LL"45+710 To Sta. "LL"45+750, Lt.
Const. Water Quality Basin
Gen. Exc. - 350.0 m^3
(For Details, See Shts.. 2B-12 & 2B-13)

(19) Relocate Extg. Power Pole
Gas Line
Telephone Line
By Others

(20) See Sht. 4D, Note 11

(21) See Sht. 4D, Note 8

(22) Sta. "LL"45+720 To Sta. "LL"45+910, Lt.
Sta. "C"45+840 To Sta. "C"45+920, Rt.
Const. Ditch
Const. Loose Riprap (Class 25) - 220.0 m^3
Inst. Riprap Geotextile - 355.0 m^2
Ditch Exc. - 250.0 m^3
(For Details, See Sht. 2B-5)

(23) Sta. "B"45+635 To Sta. "B"45+643, Lt.
Const. Type "D" Mod. Inlet
Inst. 600 mm Sew. Pipe - 8.0 m
Tr. Exc. - 8.0 m^3
(For Details, See Sht. 2B-14)

(24) Sta. "B"45+749, Lt. To Sta. "C"45+680, Rt.
Const. Outside Drop Manhole
Inst. 900 mm Sew. Pipe - 7.6 m
Tr. Exc. - 37 m^3
(For Details, See Sht. 2B-10)

(25) Sta. "C"45+683, Lt. To Sta. "C"45+730, Lt.
Inst. 375 mm Sew. Pipe - 49.6 m
Tr. Exc. - 75 m^3

(26) New Location Of Power Pole - 3
(By Others)

(27) New Location Of Gas Line And Telephone Line
By Others

(28) New Location Of Telephone Line
By Others

(29) Sta. "B"45+610 To Sta. "B"45+630, Lt.
Const. Type "D" Mod. Inlet
Inst. 450 mm Sew. Pipe - 23.7 m
Tr. Exc. - 30.0 m
(For Details, See Sht. 2B-14)

(30) Inst. Fish Rocks - 45
Const. Selected Native Streambed Material - 50 m^3
(For Details, See Sht. 2B-5)

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

REGISTERED PROFESSIONAL ENGINEER
15441
Paul R Wirfs
OREGON
MAY 30, 1991
PAUL R. WIRFS
Expires June 30, 2002

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OREGON COAST HIGHWAY AT CANNON BEACH N. ENTRANCE SEC.
OREGON COAST HIGHWAY
CLATSOP COUNTY

Reviewed By - Ernie Crom
Designed By - Paul Wirfs
Drafted By - Bob Erpelding

DRAINAGE & UTILITIES

SHEET NO. 5F

VIEW 3

VIEW 3

OCT 2001

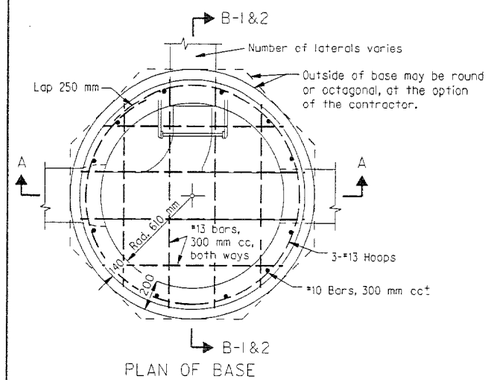
PRECAST MANHOLE
TYPE A-P

NOTES:
For Cast-in-Place Manhole see Drg. No. RD324.

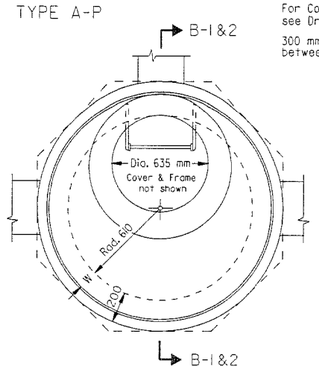
For Cover and Frame details see Drg. No. RD324.

300 mm min. wall is required between pipes in manhole.

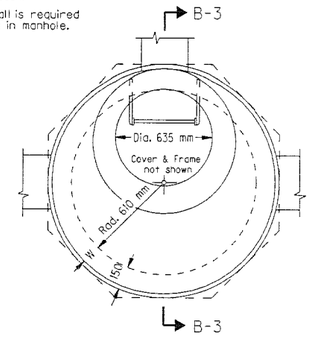
- All dimensions are in mm unless otherwise noted.



PLAN OF BASE
(Base, Risers & Cone)

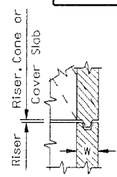


TOP VIEW
(Base, Risers & Cone)



TOP VIEW
(Base & Cone)

NOTE: Shape bottom of manhole as shown on "Plan of Base" and Section A-A for "Base, Risers & Cone"



ALTERNATE JOINT

MINIMUM DEPTH OF MANHOLE TYPE A-P

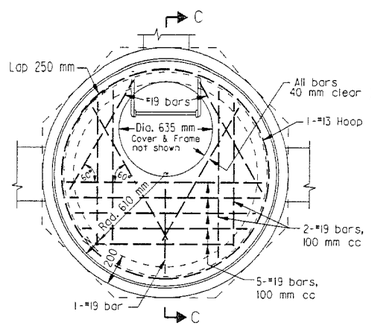
⌀D(mm)	H(mm)
200	1675
250	1750
300	1825
375	1900
450	1975
525	2050
600	2125

⌀D is inside diameter of the largest pipe entering or leaving base.

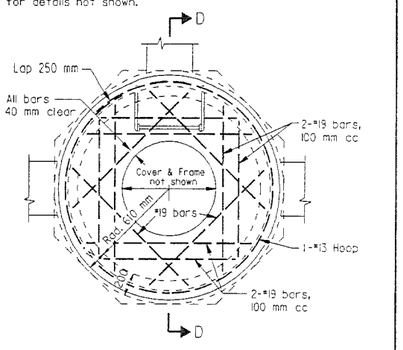
NOTE: When depth is less than minimum for manhole type A-P, use shallow manhole type B or type B-P.

SHALLOW PRECAST MANHOLE
TYPE B-P

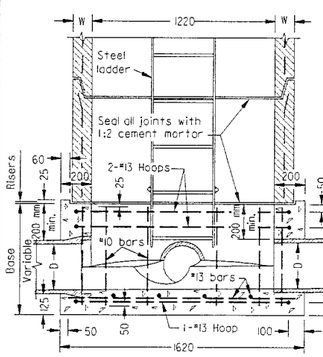
NOTE: See Manhole type A-P for details not shown.



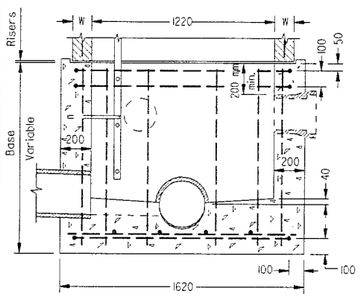
TOP VIEW
(Base, Riser & Cover Slab)



TOP VIEW
(Base & Cover Slab)

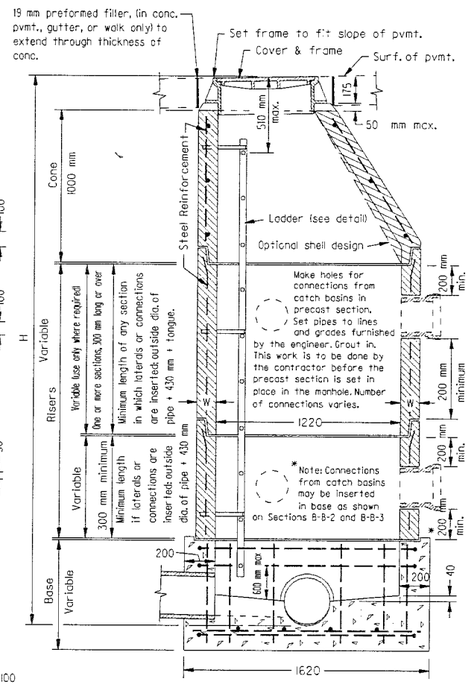


PARTIAL SECTION A-A
(Base, Risers & Cone)



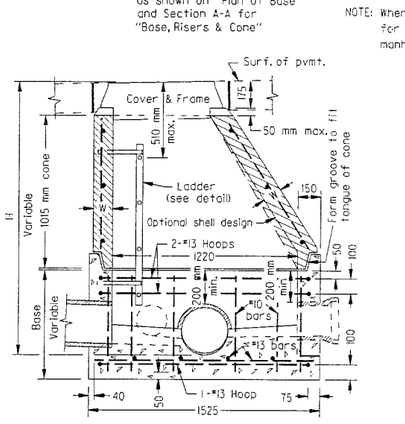
SECTION B-B-2
(Base for Manholes)

NOTE: Set pipes for catch basin connections in base to grade as directed by the engineer.

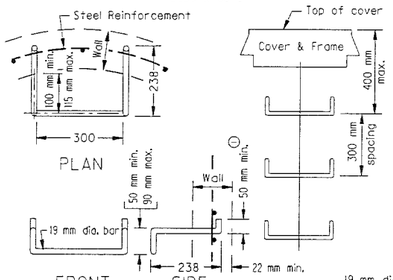


SECTION B-B-1
(Base, Risers & Cone)

NOTE: Use Section B-B-3 when length of risers become less than minimum shown.



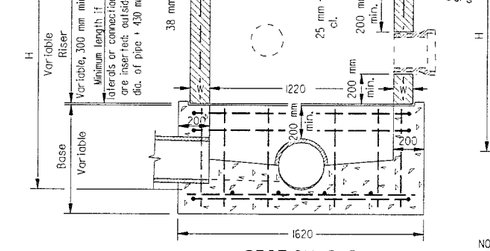
SECTION B-B-3
(Base & Cone)



STEPS
(Steps may be substituted for ladder)

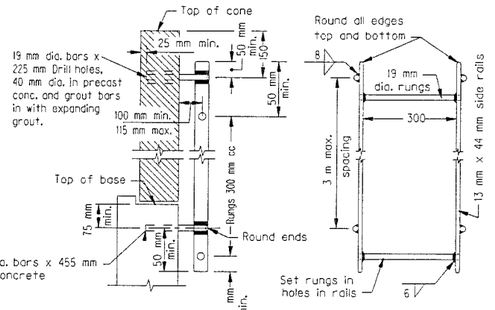
See Current Qualified Products List (QPL) For Acceptable Alternate Manhole Steps

① Hook may be eliminated, provided steps will withstand a "pull" force of 1800 N without loosening.



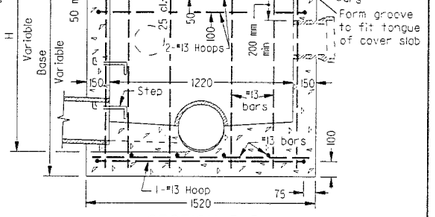
SECTION C-C
(Base, Riser & Cover Slab)

NOTE: Use Section D-D when length of riser becomes less than minimum shown.



* DETAIL OF STEEL LADDER
* See Steps

NOTE: When H=1525 mm or less make hole for frame in center of cover slab. When H=1065 mm or less omit steps.



SECTION D-D
(Base & Cover Slab)

NOTE:
The risers, cones and cover slabs shall meet the requirements of the current AASHTO Standard Specification M199M

LEGEND

- Cast-in-Place concrete
- Precast concrete
- 1:2 cement mortar
- Sewer pipe

W 100 mm min. (For tolerance see AASHTO M199M)

NOTE: All material and workmanship shall be in accordance with the current State of Oregon Standard Specifications for Highway Construction.

OREGON
DEPARTMENT OF TRANSPORTATION
STANDARD

MANHOLES

JANUARY 1996

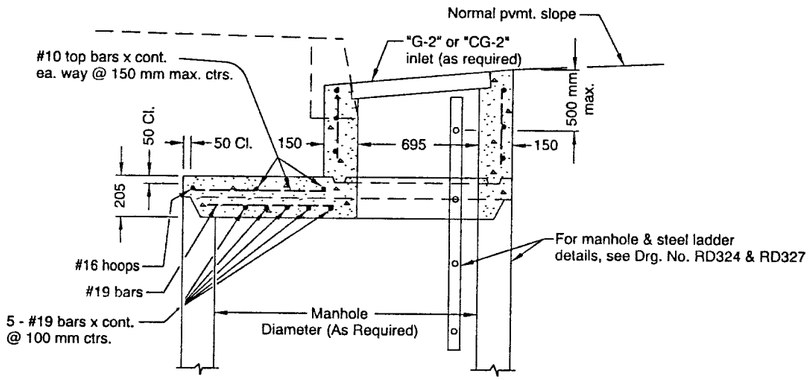
REVISIONS		APPROVED
DATE	DESCRIPTION	
8-96	REVISED REINFORCEMENT	
4-97	REVISED STEPS DETAIL	STANDARDS ENGINEER
2-99	REVISED NOTE (SEC. B-B-2)	
8-01	REVISED NOTE ①	DRG. NO. RD327

8-27-01

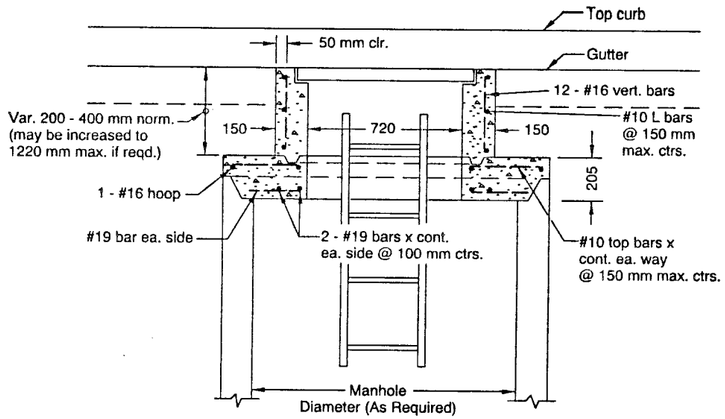
ne7360db/usr/metric/rd327.dgn

RD327

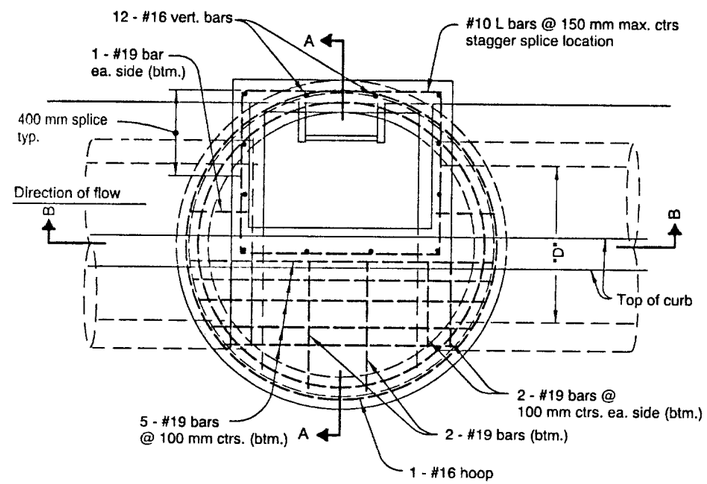
METRIC



SECTION A-A



SECTION B-B



PLAN

"D" = Pipe Dia.

GENERAL NOTES:

1. All reinforcing steel to be placed a minimum of 50 mm clear of nearest face of concrete unless otherwise shown or noted.

- All dimensions are in mm unless otherwise noted.

NOTE: All material and workmanship shall be in accordance with the current State of Oregon Standard Specifications for Highway Construction.

OREGON
DEPARTMENT OF TRANSPORTATION
STANDARD

MANHOLE WITH INLET

JANUARY 1996

REVISIONS	
DATE	DESCRIPTION
8-96	REVISED REINFORCEMENT

APPROVED
Sam Johnston
STANDARDS ENGINEER

DRG. NO. RD333

m7360a/rd333.met 8-5-96

RD333