OPERATION & MAINTENANCE MANUAL

DFI No.: D00078
Facility Type: Water Quality Extended Detention Dry Pond

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00078**
Facility Type:	Water Quality Extended Detention Dry Pond
Construction Drawings:	(V-File Number) 25V-039
Location:	District: 2B (Old 2A)
	Highway No.: 001
	Mile Post: MP 69.3 to MP 69.3
	Description: This facility is located on the southeast quadrant of the US26 (Hwy 047) and OR217 (Hwy 144) Interchange. The facility lies south of OR217, nestled between two separate ramps, leading to and from the freeway.

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:	Thomas D. Lulay, Technical Services Managing Engineer, ODOT
Facility construction:	1997
Contractor:	Unknown

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.

Low flows are directed to this facility by a high-low split flow manhole (Point A, Operational Plan, Appendix A). The split-flow manhole is engineered to route the water quality flows to the extended detention dry pond and convey the larger flows in an 18-inch storm pipe where stormwater is discharged directly to a nearby detention pond (DFI D00085). After the split-flow manhole structure, the water quality flows are pretreated by a pollution control manhole (Point B) that is designed to capture debris and oils.

Stormwater treatment occurs in the extended dry pond. This pond drains at two locations (Point D and Point E). One outlet pipe drains into a water quality biofiltration swale (DFI D00129) and the other outlet pipe drains into a detention Pond (DFI D00085).

The extended dry pond consists of water quality and freeboard storage, an inlet pipe (Point C), an overflow riser (Point D), and two 8-inch perforated underdrains with cleanouts (Point F). Water that does not evaporate or soak away may infiltrate the bottom of the extended detention dry pond and be captured by the 8-inch drain lines where it is conveyed from the dry pond to the adjacent swale (DFI D00129) at Point E. The swale will provide additional water quality treatment by trapping sediments as water is routed through a vegetated channel. The treated water from the extended detention dry pond and the swale (DFI D00129) drain into the detention pond (DFI D00085) just west of the site. In the event the runoff exceeds the capacity of the extended detention dry pond, the water will overflow in the overflow riser (Point D) and be directed directly into the detention pond.

The drainage area for the facility includes drainage collected from both the eastbound and westbound portions of US26 for approximately 700 feet to the east. Additionally, offsite drainage from the north appears to be conveyed by the 18-inch storm pipe. Drainage is collected by a series of inlets that all tie into the 18-inch storm pipe. This pipe transverses the highway approximately 100 feet to the east of the facility.

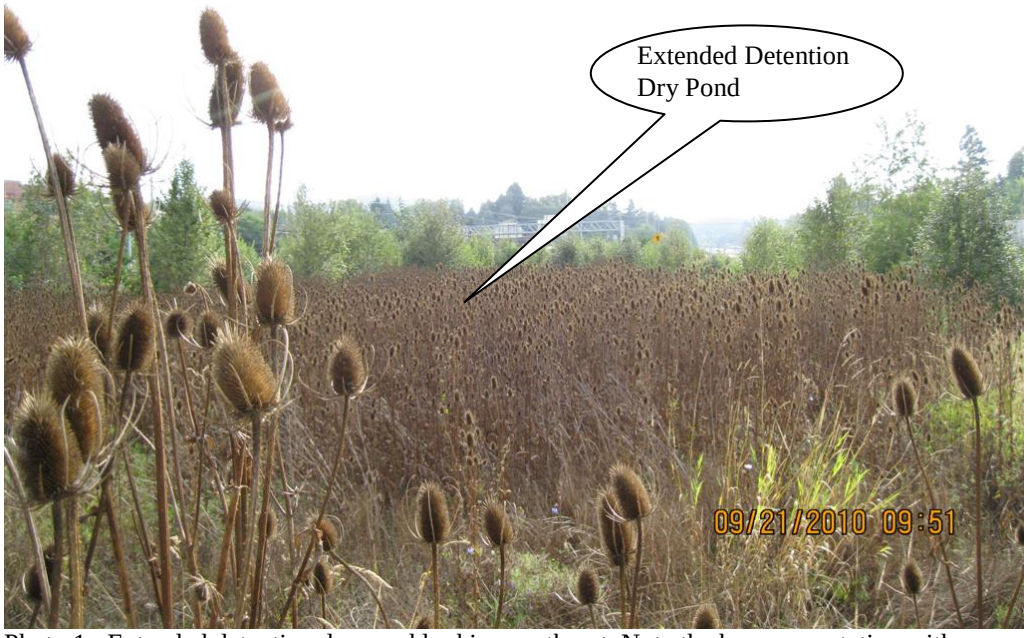


Photo 1: Extended detention dry pond looking northeast. Note the heavy vegetation with cattails.

Photo 2: Inlet pipe partially buried, (Point C, Operational Plan)

Photo 3: Overflow riser manhole for extended detention dry pond, (Point D, Operational Plan)

Photo 4: Overflow riser manhole from rim. Inlet at the top of the picture is intended for maintenance purposes and otherwise commonly pluged at all times, (Point D, Operational Plan)

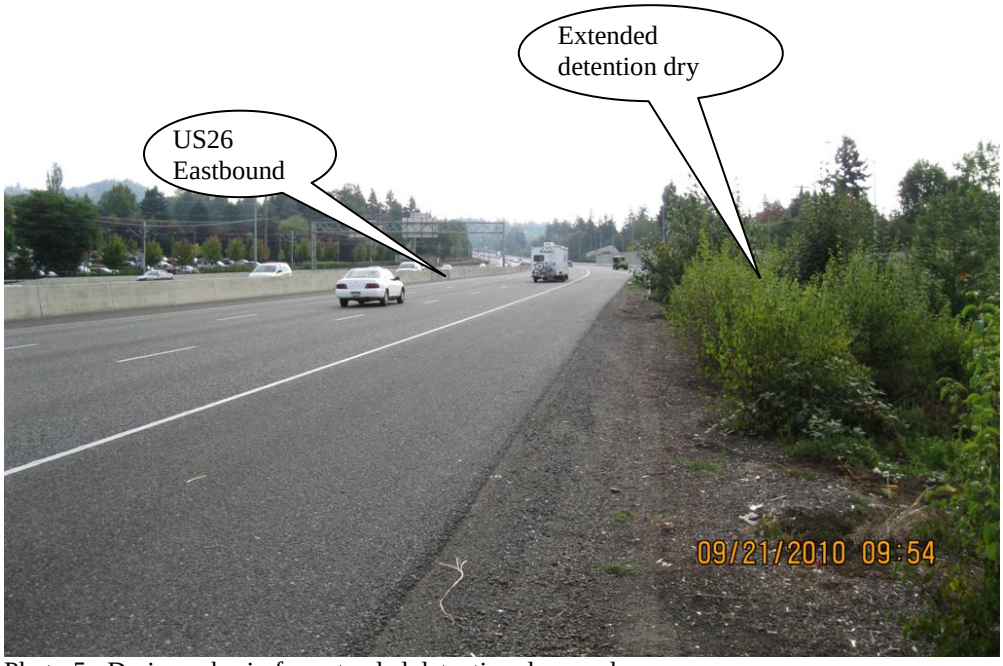


Photo 5: Drainage basin for extended detention dry pond.

Photo 6: Outlet from extended detention dry pond at modified inlet. The two 8-inch drain pipes discharge into this structure which serves as the inlet for the nearby WQ biofiltration swale (DFI D00129), (Point E, Operational Plan)

A. Maintenance equipment access:
The facility can be accessed for maintenance along US26 (Hwy 047) or Park Way onramp for maintenance access.

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☐ Porous Pavers
☐ Liners
☒ Underdrains – Two 8-inch underdrains direct flow to a water quality swale DFI D00129.

5. Facility Haz Mat Spill Feature(s)

The water quality extended detention dry pond facility can be used to store a volume of liquid by plugging the outlet structure at the overflow riser manhole (See Point D in the Operational Plan and Photo 3). Additional measures to plug the two 8-inch drain pipes at the modified inlet structure (Point E and Photo 6) may need be necessary.

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 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 – The facility has two structures which act as auxiliary outlets:

Auxiliary Outlet #1: The split flow manhole is designed to bypass high flows. See split flow manhole detail provided on the Operational plan. High flows drain out the 18-inch pipe draining to the west (Point A).

Auxiliary Outlet #2: An overflow riser manhole is designed to bypass high flows. This manhole is located in the west corner of the pond (Point D). Stormwater entering this structure drains into a detention pond (DFI D00085).

☐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 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:

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

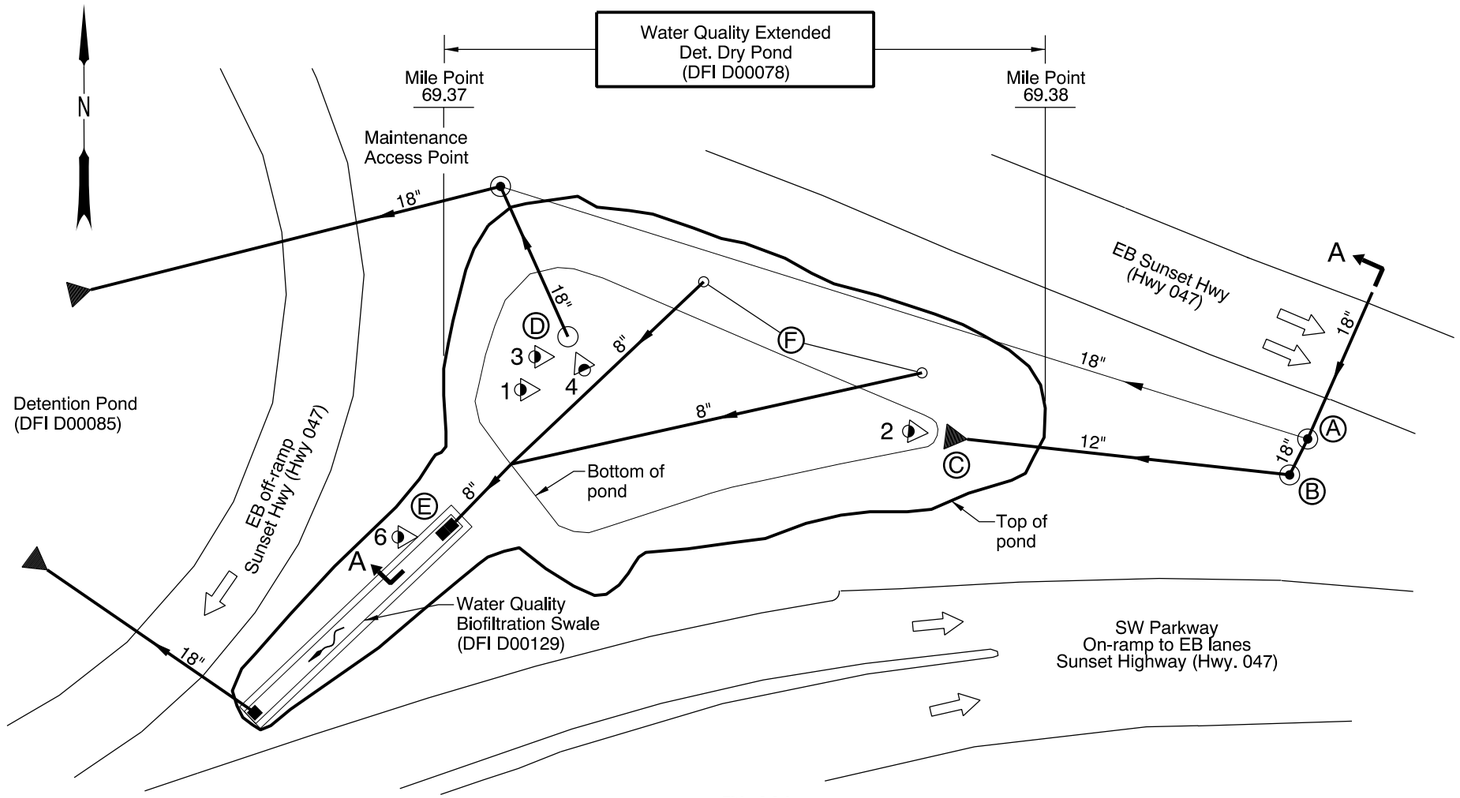
Contact any of the following for more detailed information about management of waste materials found on site:

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

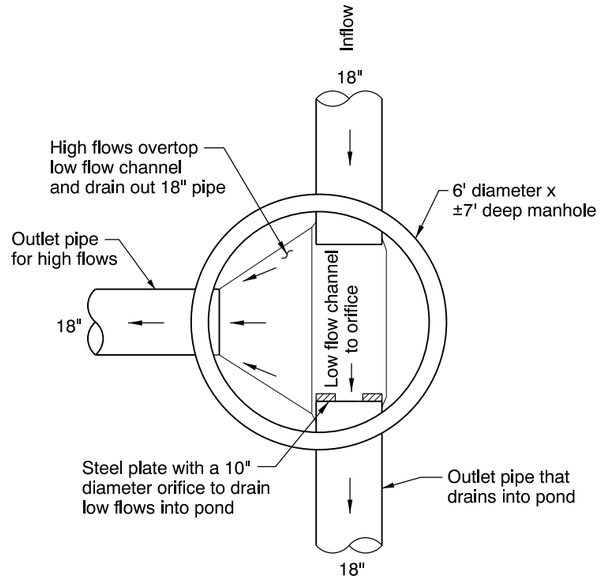
Appendix A

Content:

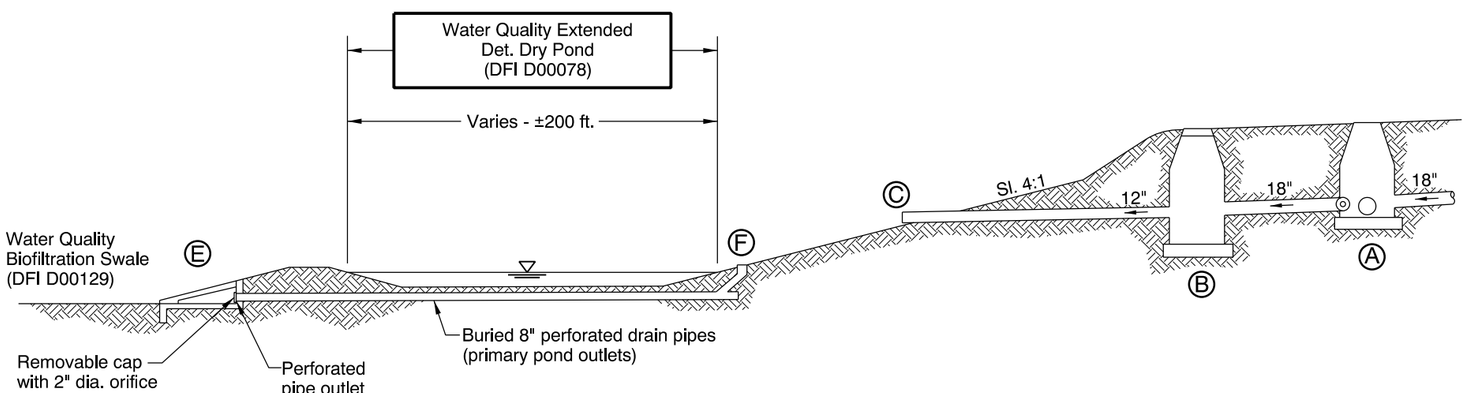
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SPLIT FLOW MANHOLE DETAIL AT POINT Ⓐ
N.T.S.



SECTION A-A
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Split Flow Manhole
- Ⓑ Pollution Control manhole
- Ⓒ Inlet to Pond
- Ⓓ Pond Overflow Riser
- Ⓔ Type "MO" Modified Inlet
- Ⓕ 8" Drain Cleanouts
- Manhole
- Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

Sht. 1 of 2

OREGON DEPARTMENT OF TRANSPORTATION

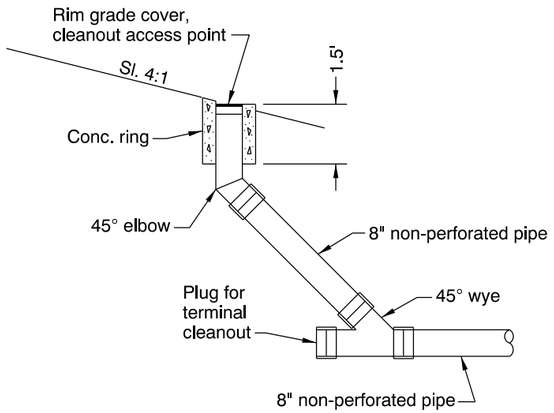
Prepared By: Bob Knorr

Drafted By: S. Wolfer

DFI D00078
MAINTENANCE DISTRICT 2B HWY 047
WATER QUALITY EXTENDED DET. DRY POND
SUNSET HIGHWAY MP 69.37 TO 69.38
WASHINGTON COUNTY

Z:\Hydraulics\Hydraulics OM\Completed_Facility_Files\Dist_2B\Hwy_047\2B_047_D00078\Operational Plan\DFI_D00078.dgn :: Sheet 1/15/2014 4:30:08 PM hwyr33e

DFI_D00078.2dgn



CLEANOUT DETAIL AT POINT Ⓕ
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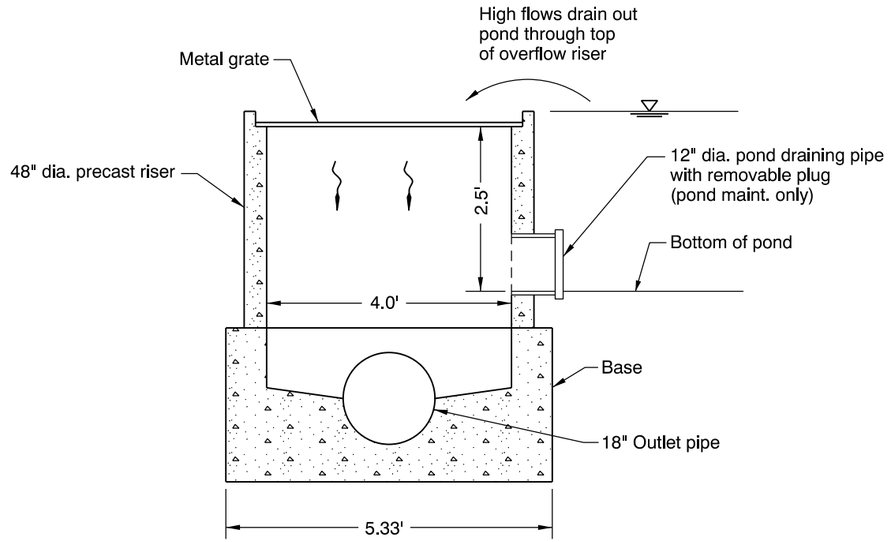
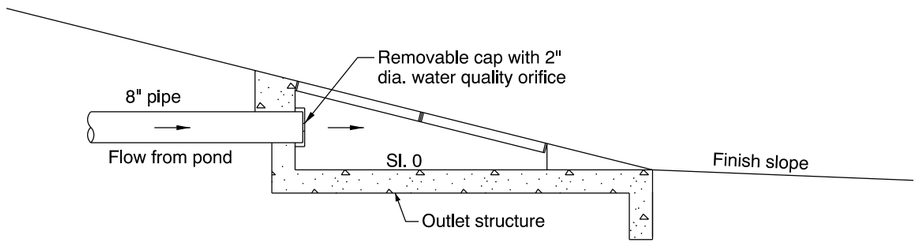


OVERFLOW RISER DETAIL AT POINT Ⓓ
N.T.S.



OUTLET STRUCTURE DETAIL AT POINT Ⓔ
N.T.S.

Sht. 2 of 2

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Bob Knorr

Drafted By: S. Wolfer

DFI D00078
MAINTENANCE DISTRICT 2B HWY 047
WATER QUALITY EXTENDED DET. DRY POND
SUNSET HIGHWAY MP 69.37 TO 69.38
WASHINGTON COUNTY

Appendix B

Content:

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

INDEX OF SHEETS		
SHEET NO.	DESCRIPTION	
1	Title Sheet	2
1A	Index Of Sheets Cont'd. & Standard Drawing Nos.	2
1B	Sheet Layout	
1C Thru 1C-4 Incl.	Alignment Data	
2 Thru 2A-22 Incl.	Typical Sections	2
2B Thru 2B-28 Incl.	Details	2 3
2C Thru 2C-20 Incl.	Traffic Control Plans	
2D Thru 2D-9 Incl.	Erosion Control Plans	
2E Thru 2E-6 Incl.	Pipe Data	2 3
2F Thru 2F-4 Incl.	Summary	
3 Thru 6 Incl. 6N, 6S, 7	Alignment	2 3
3A, 3A-2, 4A, 4A-2, 5A, 5A-2, 6A, 6A-2, 6NA, 6NA-2, 6SA, 6SA-2, 7A, 7A-2.	General Construction	2
3B, 3B-2, 4B, 4B-2, 5B, 5B-2, 6B, 6B-2, 6NB, 6NB-2, 6SB, 6SB-2, 7B, 7B-2.	Drainage & Utilities	2 3 2
6C, 6C-2 Thru 6C-5 Incl.	Intersection Detail, Interchange Grading, & Water Quality Pond Details	3
6D	Detour	

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

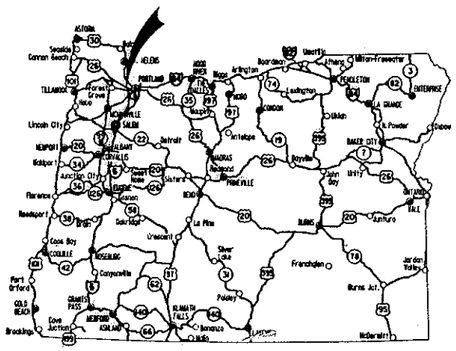
GRADING, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS, LANDSCAPING & TRANSIT FACILITIES

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.

SUNSET HIGHWAY

WASHINGTON COUNTY

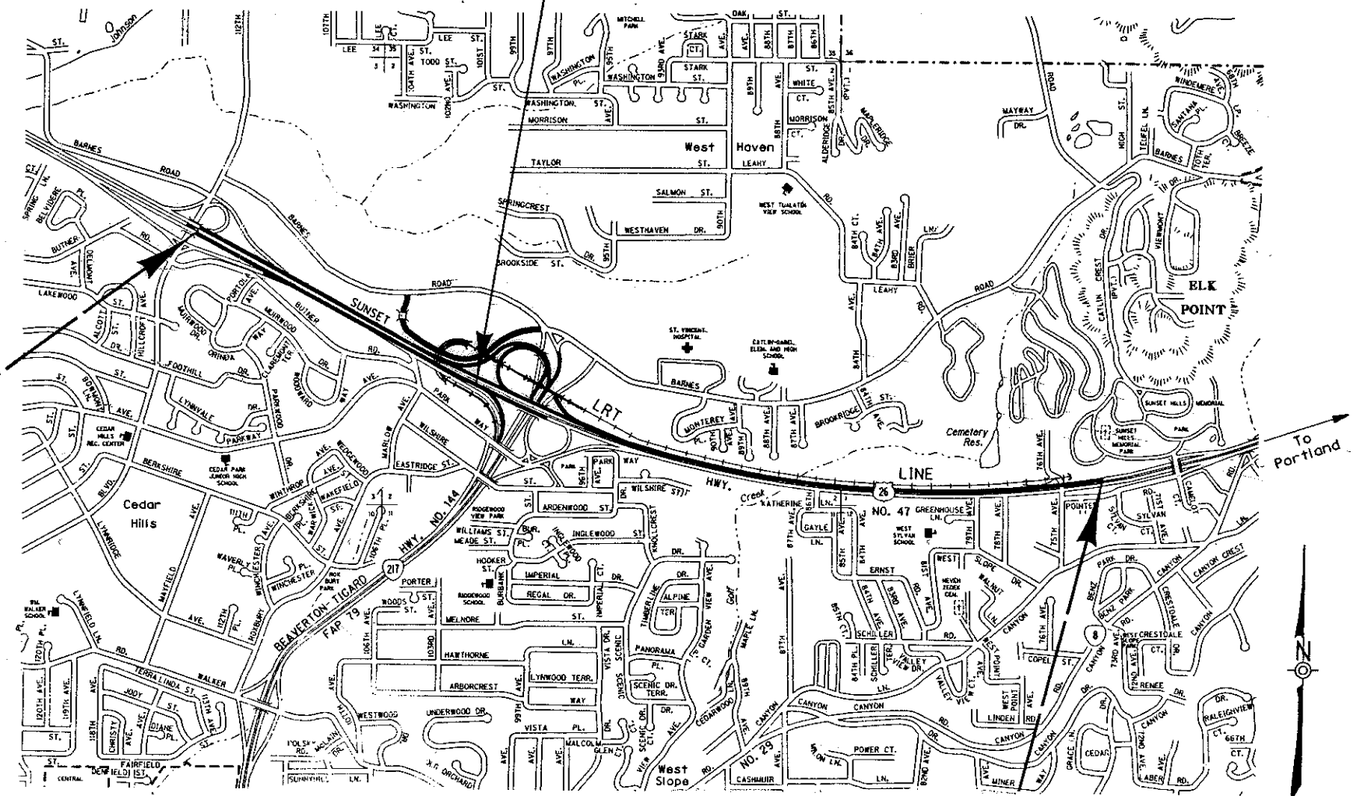
NOVEMBER, 1993



Overall Length Of Project - 2.08 Miles

STA. "LWF" 3186+33.15 P.O.T. Bk. (19' Lt.) &
STA. "LEF" 3186+33.87 P.O.T. Bk. (19' Lt.) =
STA. "L4F" 3185+97.05 P.C. Ah. EQUA.

NH-S047(6)
BEGINNING OF PROJECT
STA. "LEF" 3149+00 (M.P. 68.37)



END PROJECT NH-S047(6)
STA. 3258+50 (M.P. 70.45)

3 Revised 2-17-94
2 Revised 12-1-93
1 Revised 10-20-93

OREGON TRANSPORTATION COMMISSION

Michael P. Hallern	CHAIRMAN
John Whitty	VICE CHAIRMAN
Susan Brody	COMMISSIONER
Cynthia J. Ford	COMMISSIONER
Roger L. Breezley	COMMISSIONER
Donald E. Forbes	DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER 8491 OREGON AUGUST 22, 1975 THOMAS D. LULAY Expires Dec. 31, 1994

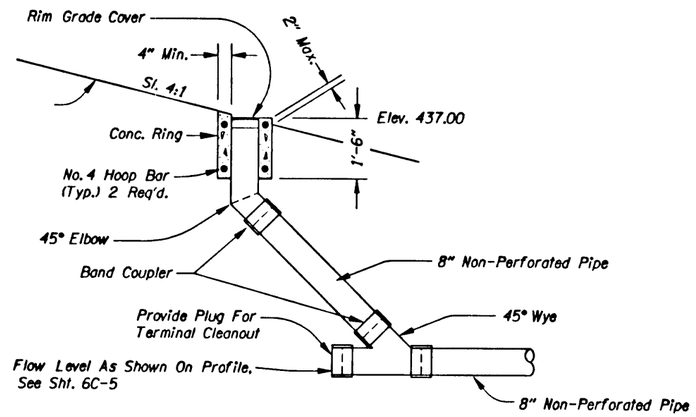
Thomas D. Lulay

TECHNICAL SERVICES MANAGING ENGINEER

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

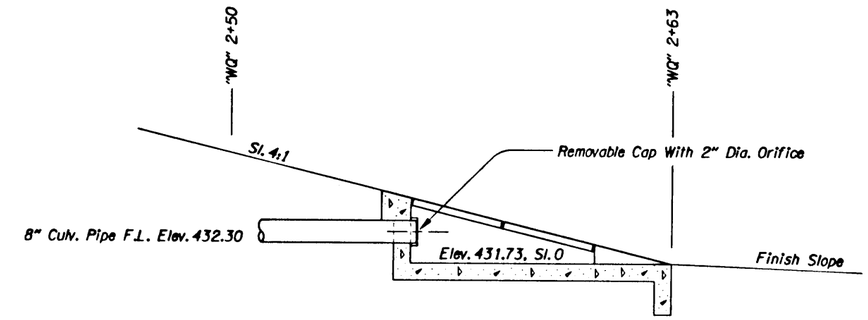
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
REGION 10 OREGON DIVISION	NH-S047(6)	1

D E T A I L S



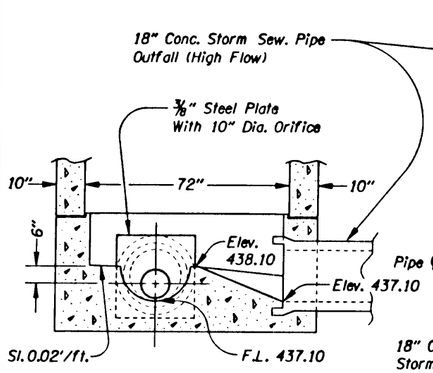
8-INCH DRAIN CLEANOUT

(For Locations, See Plans)

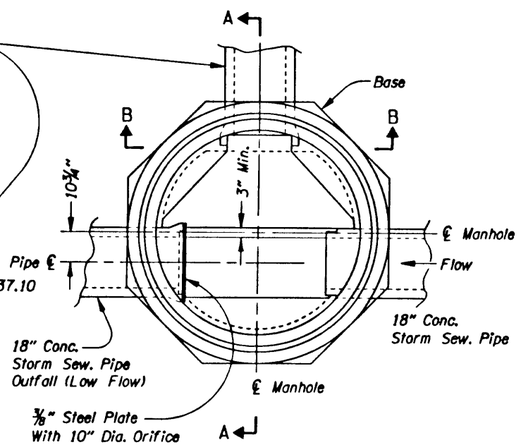


MODIFIED TYPE M-O INLET

(For Details Not Shown, See Drg. No. 2105A)
(For Location, See Sht. 6C-4)



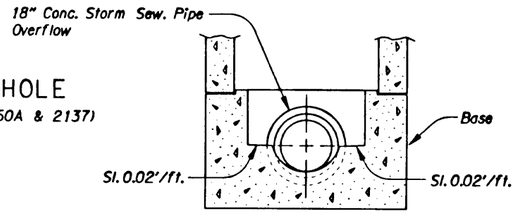
SECTION A-A



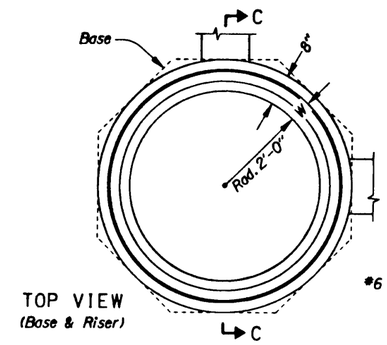
TOP VIEW

SPLIT FLOW MANHOLE

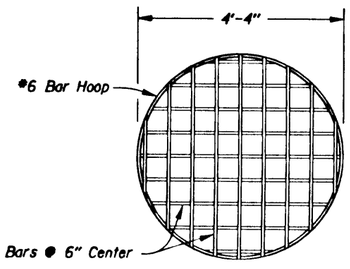
(For Details Not Shown, See Drg. No. 2050A & 2137)



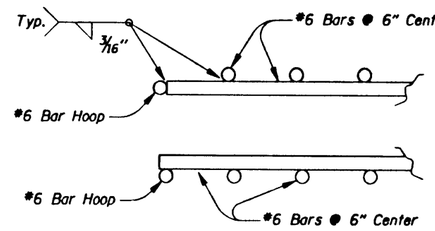
SECTION B-B



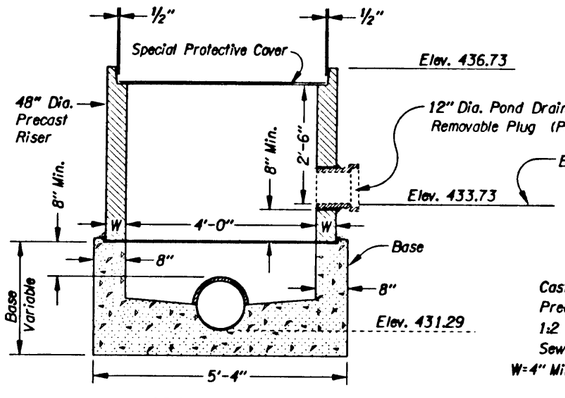
TOP VIEW
(Base & Riser)



Plan View
SPECIAL PROTECTIVE COVER



SPECIAL PROTECTIVE
COVER WELDING



SECTION C-C

NOTE: The Risers Shall Meet The Requirements Of The Current AASHTO Standard Specification M199

LEGEND

- Cast-In-Place Concrete
- Precast Concrete
- 1:2 Cement Mortar
- Sewer Pipe

W=4" Min. (For Tolerance, See AASHTO M199)

OVERFLOW RISER

(For Details Not Shown, See Drg. No. 2050A)

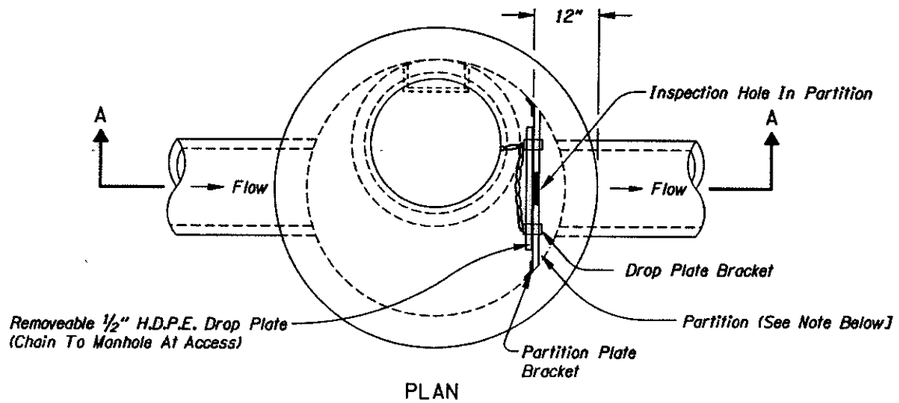
1 Revised 2-17-94

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

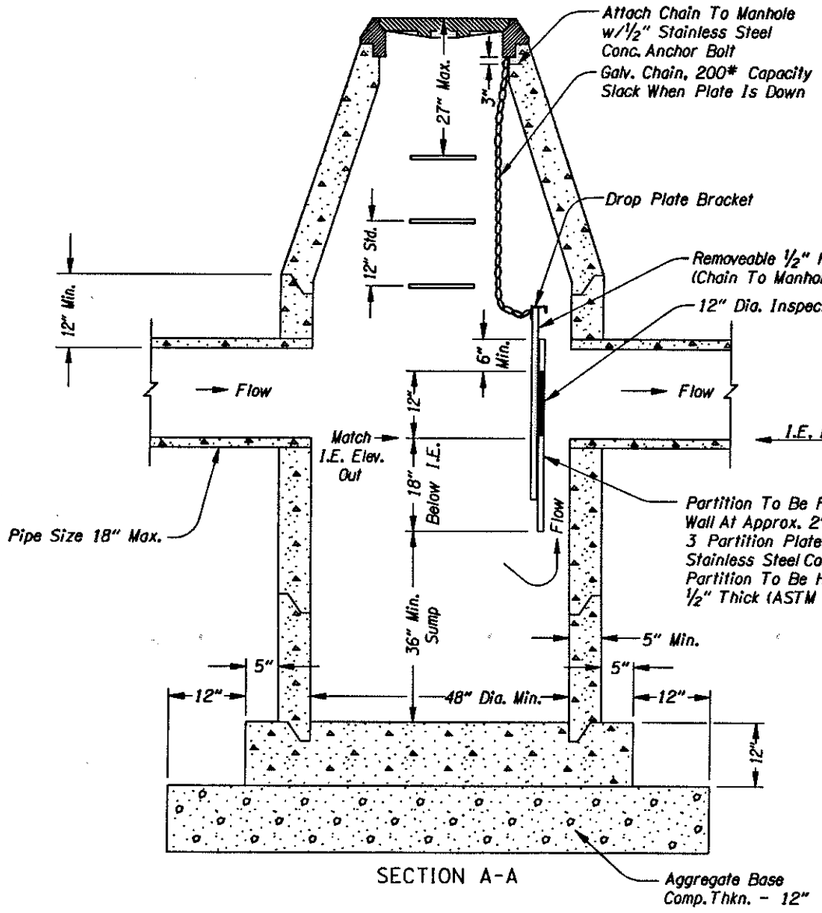
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		2B-27

morris
01-MAR-1994 10:49
/usr/fd/projects/06597/06597wq.dt6
VIEW A2

POLLUTION CONTROL MANHOLE DETAILS

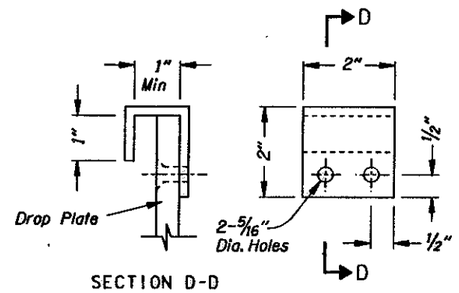


PLAN



SECTION A-A

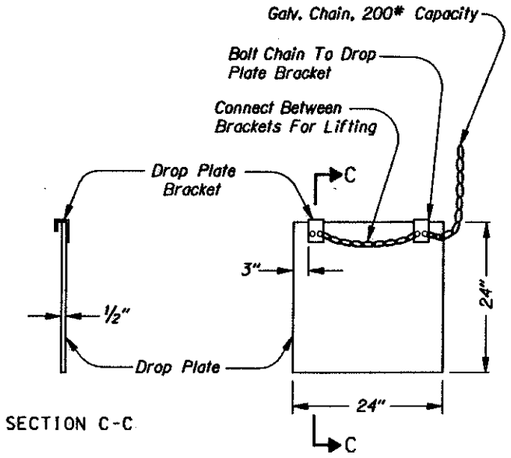
MANHOLE



SECTION D-D

(14 Ga. Stainless Steel)

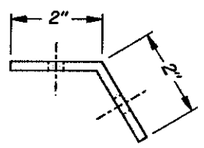
DROP PLATE BRACKET



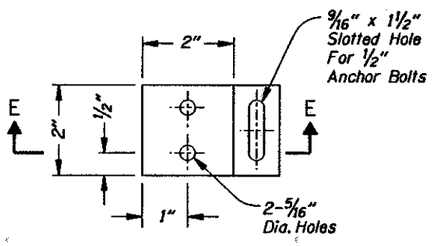
SECTION C-C

Connect Drop Plate Brackets & Chain To Drop Plate With ¼" x 1¼" Stainless Steel Bolts W/Lock Washers

DROP PLATE

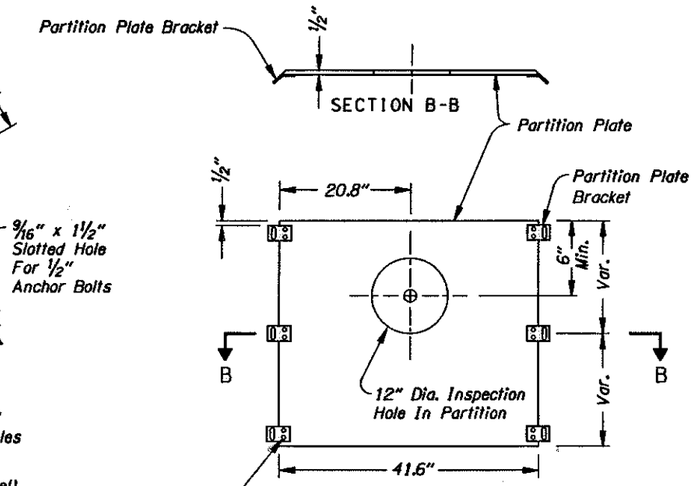


SECTION E-E



(12 Ga. Stainless Steel)

PARTITION PLATE BRACKET



PARTITION PLATE

NOTES:

1. Hardware, Fasteners & Anchors To Chain May Be Galv. Steel Or Stainless Steel.
2. Removeable Drop Plate & Partition To Be Constructed Of High Density Polyethylene (H.D.P.E.) ½" Thick ASTM D1248-78 & Inst. Prior To Manhole Cone Or Top.
3. Manhole Base May Be Pre-Cast Or Cast-In-Place. Pre-Cast Base Must Be Submitted For Approval Before Using. (For Manhole Details Not Shown, See Drg. Nos. 2050, 2050A & 2137)

1 Revised 2-17-94

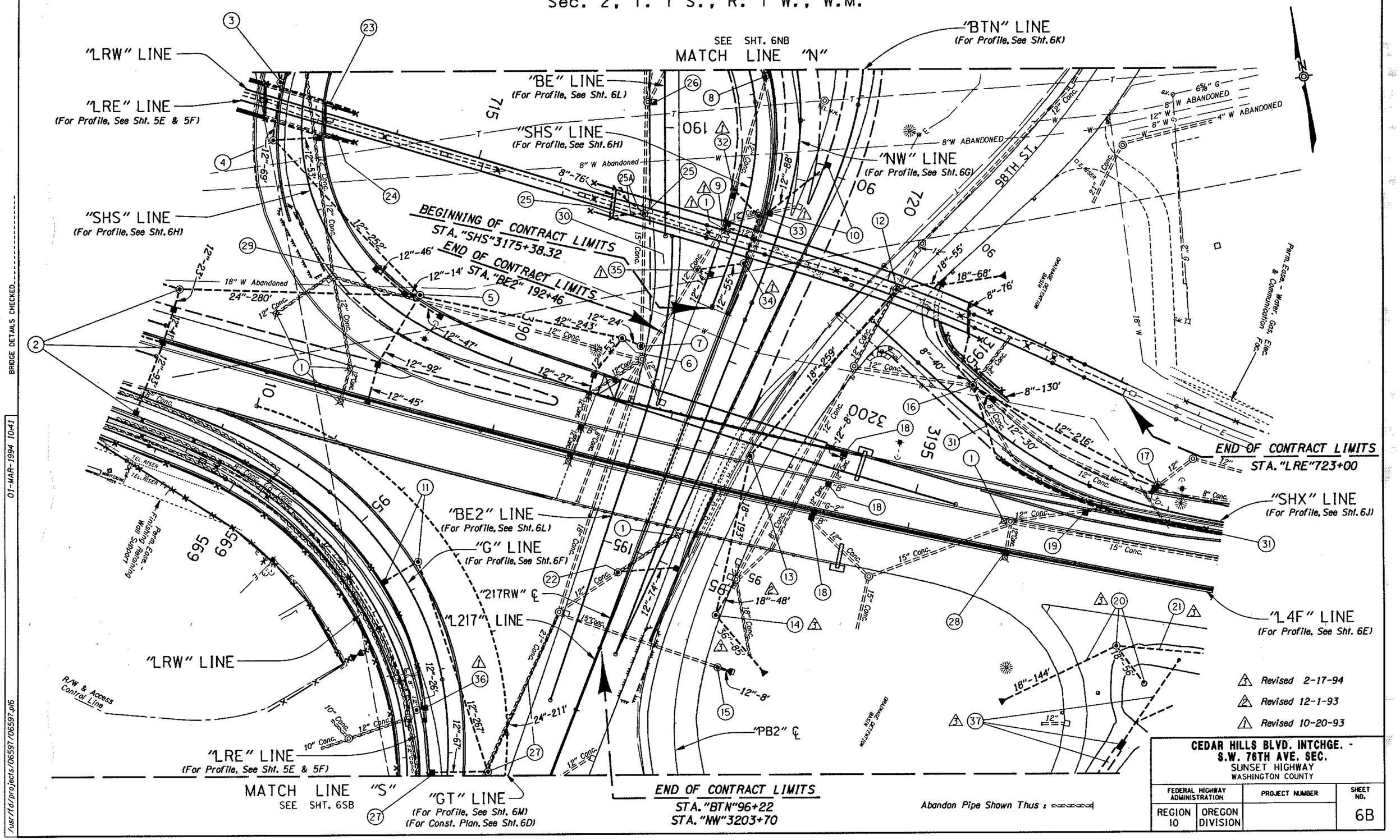
CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC. SUNSET HIGHWAY WASHINGTON COUNTY			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		2B-28

01-MAR-1994 10:49

/usr/td/projects/06597/06597wq.dfb

VIEW A3

DRAINAGE & UTILITIES
Sec. 2, T. 1 S., R. 1 W., W.M.



CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		6B

BRIDGE DETAILS CHECKED

01-MAR-1994 10:41

/usr/td/projects/06597/065971.plt6

VIEW B2

DRAINAGE & UTILITIES NOTES

△1
(1) Remove Inlet - 6

(2) See Sht. 5B-2, Note 11

(3) See Sht. 6NB-2, Note 2
Sta. "SHS" 3185+50
Const. Manhole

(4) Sta. "SHS" 3186+00
Const. Manhole
Const. Type "G-2" Mod. Inlet
Inst. 12" Sew. Pipe - 122'
Tr. Exc. - 99 C.Y.
(For Details, See Sht. 2B-2)

(5) Sta. "SHS" 3188+68
Const. Large Drop Manhole
Const. Type "G-2" Mod. Inlet - 5
Inst. Safety Ladder
Inst. 12" Sew. Pipe - 496'
Inst. 24" Sew. Pipe - 280'
Under Pvmt. - 37'
Tr. Exc. - 1,134 C.Y.
(For Details, See Shts. 2B-2 & 2B-4)

(6) Sta. "SHS" 3191+16
Remove Inlet - 3
Remove 12" Sew. Pipe - 6'
Const. Large Manhole
Const. Type "B" Inlet
Const. Type "G-2" Mod. Inlet - 2
Inst. 12" Sew. Pipe - 80'
Inst. 9" Orifice Plate
Inst. 42" Sew. Pipe - 243'
Tr. Exc. - 1,245 C.Y.
(For Details, See Shts. 2B-2 & 2B-3)
(See Drg. No. 2105A)

(7) Sta. "SHS" 3191+40
Const. Drop Manhole
Inst. 12" Sew. Pipe - 24'
Tr. Exc. - 18 C.Y.

(8) See Sht. 6NB-2, Note 4
Sta. "SHS" 3178+18
Remove Inlet
Const. Manhole

△1
(9) Remove Manhole

(10) Sta. "NW" 3198+17 To Sta. "BTN" 89+90
Const. Type "G-2" Mod. Inlet - 2
Inst. 12" Sew. Pipe - 88'
Tr. Exc. - 84 C.Y.
(For Details, See Sht. 2B-2)

(11) Sta. "G" 95+75
Const. Manhole
Const. Type "G-2" Mod. Inlet
Inst. 12" Sew. Pipe - 45'
Tr. Exc. - 13 C.Y.
(For Details, See Sht. 2B-2)
(See Drg. No. 49599)

(12) Sta. "PB2" 91+10
Const. Manhole
Const. Type "G-2" Mod. Inlet
Inst. 18" Sew. Pipe - 123'
Const. Paved End Slope
Under Pvmt. - 48'
Tr. Exc. - 89 C.Y.
(For Details, See Sht. 2B-2)
(For Pipe Profile, See Sht. 6J)

(13) Sta. "PB2" 93+67
Const. Manhole
Inst. 18" Sew. Pipe - 259'
Under Pvmt. - 259'
Tr. Exc. - 179 C.Y.
(For Pipe Profile, See Sht. 6J)

△3△2 (14) Sta. "PB2" 95+62
Const. Manhole
Inst. 18" Sew. Pipe - 241'
Inst. 36" Sew. Pipe - 85'
Const. Paved End Slope
Under Pvmt. - 199'
Tr. Exc. - 207 C.Y.
(For Pipe Profile, See Sht. 6J)

(15) Sta. "PB2" 96+24
Const. Manhole
Inst. 12" Sew. Pipe - 8'
Const. Paved End Slope
Inst. 15" Gate Valve
Tr. Exc. - 6 C.Y.
(For Details, See Sht. 2B-7)

(16) Sta. "SHX" 3195+18
Adjust Manhole
Inst. 8" Drain Pipe - 246'
Drainage Geotextile - 161 Sq.Yds.
Granular Drain Backfill - 26 C.Y.
Tr. Exc. - 19 C.Y.
(For Details, See Sht. 2B-3 & 2B-5)
(See Drg. Nos. 2091A, 49621, 49657 & Assoc. Bridge Drgs.)

(17) Sta. "SHX" 3197+80
Adjust Manhole
Const. Type "G-2" Mod. Inlet - 2
Remove 12" Sew. Pipe - 11'
Inst. 12" Sew. Pipe - 246'
Tr. Exc. - 185 C.Y.
(For Details, See Sht. 2B-2)

(18) Sta. "L4F" 3193+89
Remove Inlet - 3
Remove 12" Sew. Pipe - 3'
Const. Type "B" Inlet - 2
Const. Type "G-2" Inlet
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
Extend - 8' Lt.
Under Pvmt. - 3'
Tr. Exc. - 5 C.Y.
(For Details, See Sht. 2B-2)
(See Drg. No. 2105)

(19) Sta. "L4F" 3192+01
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
Remove - 20'
Tr. Exc. - 3 C.Y.
(For Details, See Sht. 2B-2)

△3 (20) Sta. "L4F" 3197+50
Const. Manhole
Const. Pond Overflow Riser
Inst. 18" Sew. Pipe - 200'
Const. Paved End Slope
Under Pvmt. - 27'
Tr. Exc. - 167 C.Y.
(For Details, See Sht. 2B-27)

(21) See Sht. 7B-2, Note 2

(22) Sta. "BTN" 95+36
Const. Manhole
Const. Type "G-2" Mod. Inlet
Inst. 12" Sew. Pipe - 74'
Under Pvmt. - 63'
Tr. Exc. - 42 C.Y.
(For Details, See Sht. 2B-2)

(23) See Sht. 5B-2, Note 8

(24) See Sht. 5B-2, Note 9

(25) Sta. "LRE" 717+03
Const. Manhole
Inst. 8" Drain Pipe - 76'
(25A) Inst. Bridge Drainage System
Drainage Geotextile - 56 Sq.Yds.
Granular Drain Backfill - 8 C.Y.
Tr. Exc. - 5 C.Y.
(See Drg. Nos. 49617, 49625 & Assoc. Bridge Drgs.)

(26) Sta. "BE" 189+70
Reconst. "CG-2" Inlet
(For Details, See Sht. 2B-3)

(27) Sta. "G" 98+25
Const. Drop Manhole
Const. Type "G-2" Mod. Inlet
Inst. 12" Sew. Pipe - 334'
Inst. 24" Sew. Pipe - 211'
Tr. Exc. - 704 C.Y.
(For Details, See Shts. 2B-2 & 2B-4)

(28) Sta. "L4F" 3196+20
Remove Inlet
Remove 12" Sew. Pipe - 5'
Const. Type "G-2" Inlet
Under Pvmt. - 5'
Tr. Exc. - 3 C.Y.

(29) Sta. "SHS" 3187+95
Inst. 12" Culv. Pipe - 62' (Conduit)
Tr. Exc. - 19 C.Y.

(30) Sta. "BE2" 191+63
Inst. 12" Culv. Pipe - 42' (Conduit)
Under Pvmt. - 38'
Tr. Exc. - 19 C.Y.

(31) Sta. "SHX" 3195+18 To Sta. "SHX" 3200+00
Inst. 8" Drain Pipe (Wall #37 Drain) - 500'
Drainage Geotextile - 318 Sq.Yds.
Granular Drain Backfill - 56 C.Y.
Tr. Exc. - 18 C.Y.
(For Details, See Sht. 2B-3)
(See Drg. Nos. 2091A, 49654 & Assoc. Bridge Drgs.)

△2△1 (32) Sta. "SHS" 3176+82
Const. Manhole
Const. Type "G-2" Mod. Inlet
Inst. 12" Sewer Pipe - 7'
Tr. Exc. - 3 C.Y.
(For Details, See Sht. 2B-2)

△2△1 (33) Sta. "SHS" 3176+58
Const. Manhole
Inst. 12" Sewer Pipe - 42'
Under Pvmt. - 38'
Tr. Exc. - 35 C.Y.

△2△1 (34) Sta. "SHS" 3176+00
Const. Manhole
Inst. 12" Sewer Pipe - 59'
Under Pvmt. - 59'
Tr. Exc. - 54 C.Y.

△2△1 (35) Sta. "SHS" 3175+75
Const. Manhole
Const. Type "G-2" Mod. Inlet
Inst. 12" Sewer Pipe - 69'
Under Pvmt. - 40'
Tr. Exc. - 58 C.Y.
(For Details, See Sht. 2B-2)

△1 (36) Sta. "LRE" 691+70
Const. Manhole
Const. Special Inlet
Inst. 12" Sew. Pipe - 26'
Conc. Encasement - 3 C.Y.
Tr. Exc. - 1 C.Y.
Connect To Track Drainage System
(For Details, See Shts. 2B-26, LR-2, LR-49, LR-50 & LR-55)

△3△2 (37) Const. Water Quality Treatment Facility
(For Details, See Shts. 2B-27, 2B-28, 6C-4 & 6C-5)

△3△2 (38) Note Removed From Plan

△3 Revised 2-17-94
△2 Revised 12-1-93
△1 Revised 10-20-93

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		6B-2

BRIDGE DETAILS CHECKED
01-MAR-1994 10:41
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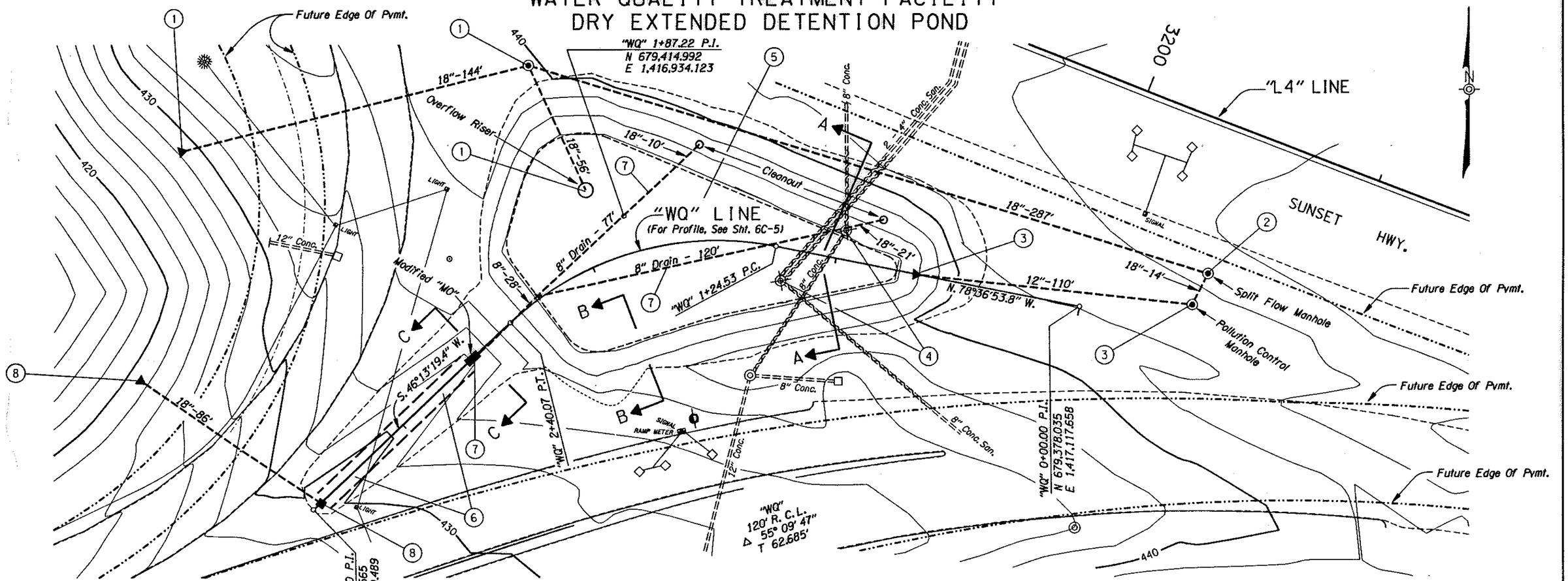
VIEW A2

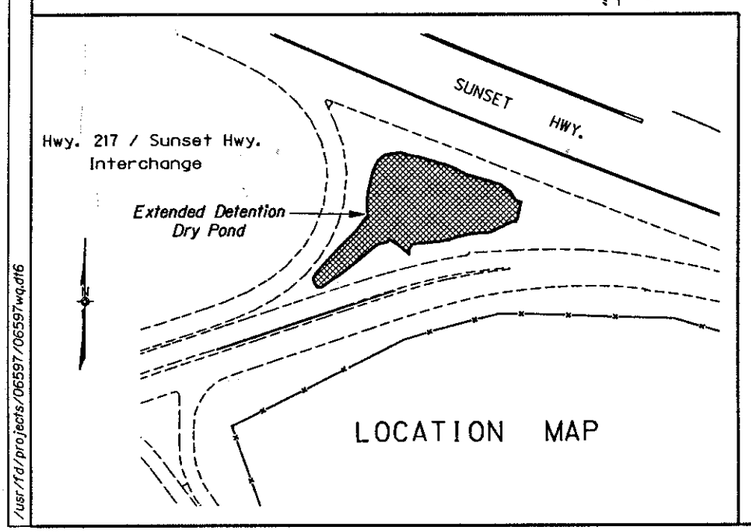
WATER QUALITY TREATMENT FACILITY
DRY EXTENDED DETENTION POND



For Sections A-A, B-B & C-C, See Sht. 2B-28

Top Cut Slope ----------

Toe Fill Slope ----------



(1) See Sht. 6B-2, Note 20

(2) See Sht. 7B-2, Note 2

(3) See Sht. 7B-2, Note 17

(4) See Sht. 7B-2, Note 18

(5) Sta. "WQ" 0+44 To Sta. "WQ" 2+63
Const. Water Quality Treatment Facility
(For Details, See Shts. 2B-27, 2B-28 & 6C-5)

(6) Sta. "WQ" 2+63 To Sta. "WQ" 3+46
Const. 4' Bottom Outlet Ditch
Dt. Exc. - 172 C.Y.
Field Verify Location Of Buried Powerline Prior To Const.
(See Sht. 6C-5, Section C-C)

(7) Sta. "WQ" 2+63
Const. Type "MO" Mod. Inlet
Inst. 8" Sew. Pipe - 62'
Inst. 8" Cap With 2" Dia. Orifice
Inst. 8" Drain Pipe - 197'
Inst. 8" Drain Cleanout - 2
Drainage Geotextile - 173 Sq.Yds.
Granular Drain Backfill - 19 C.Y.
Tr. Exc. - 41 C.Y.
(For Details, See Shts. 2B-27 & 6C-5)

(8) Sta. "WQ" 3+46
Const. Type "G-2" Inlet
Inst. 18" Sew. Pipe - 86'
Under Pvmt. - 27'
Const. Paved End Slope
Tr. Exc. - 50 C.Y.

1 Revised 2-17-94

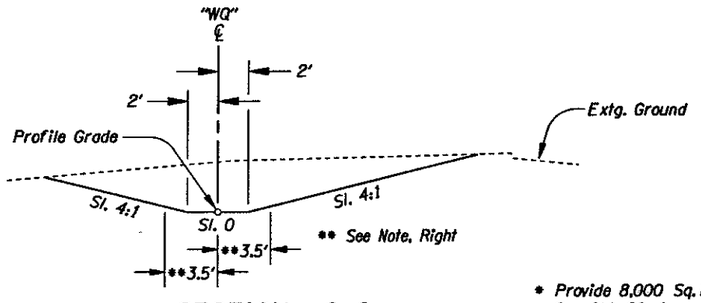
CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		6C-4

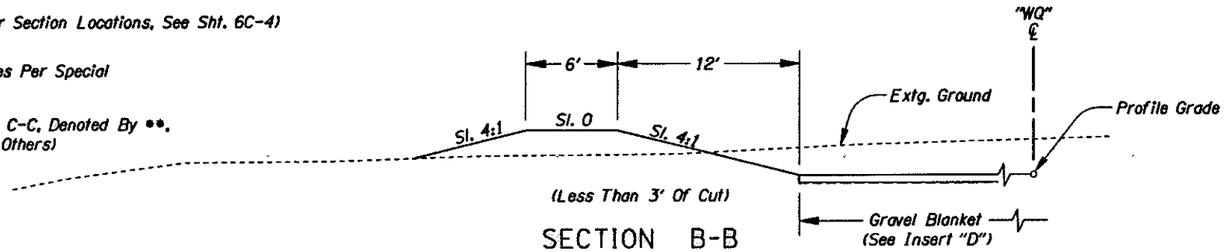
WATER QUALITY TREATMENT FACILITY
DRY EXTENDED DETENTION POND

(For Section Locations, See Sht. 6C-4)

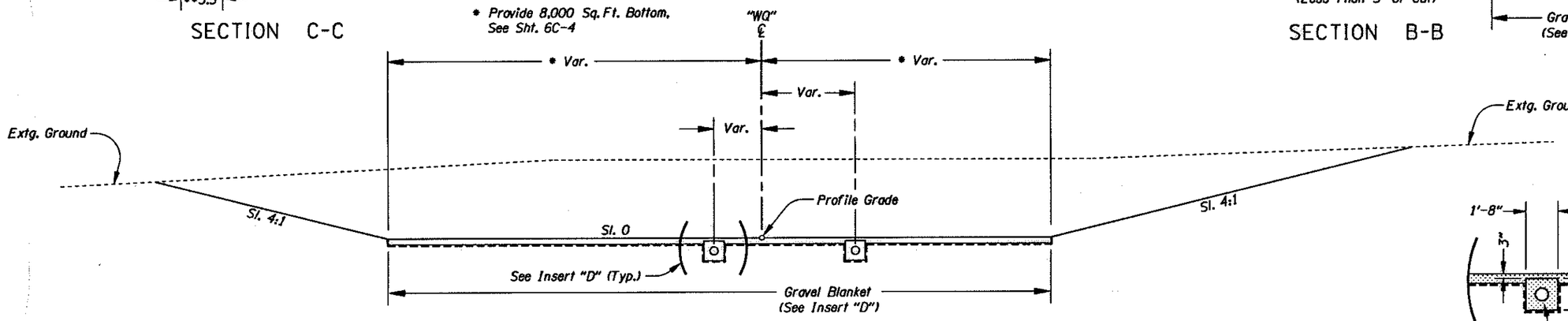
NOTES:
- Seed & Mulch All New Earth Surfaces Per Special Provision Section 01020.
- Maintain Grass Height Within Section C-C, Denoted By **, Between 4 Inches & 12 Inches. (By Others)



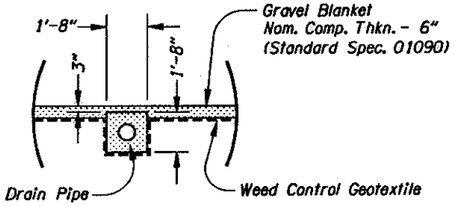
SECTION C-C



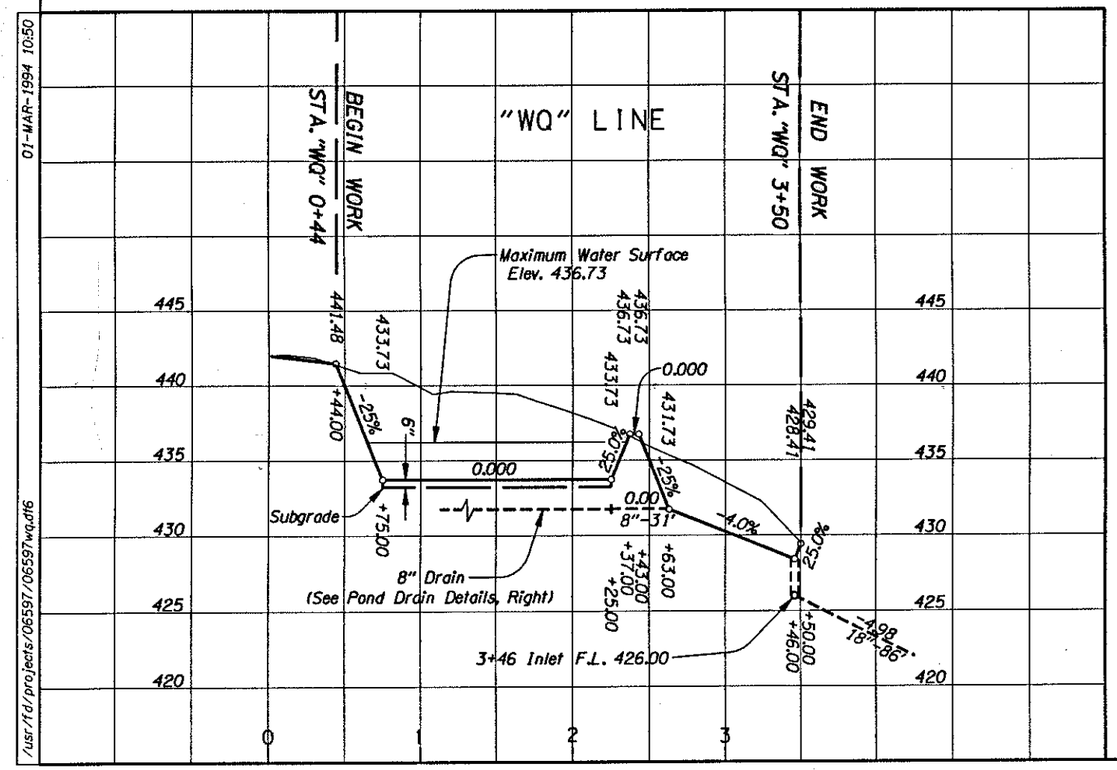
SECTION B-B

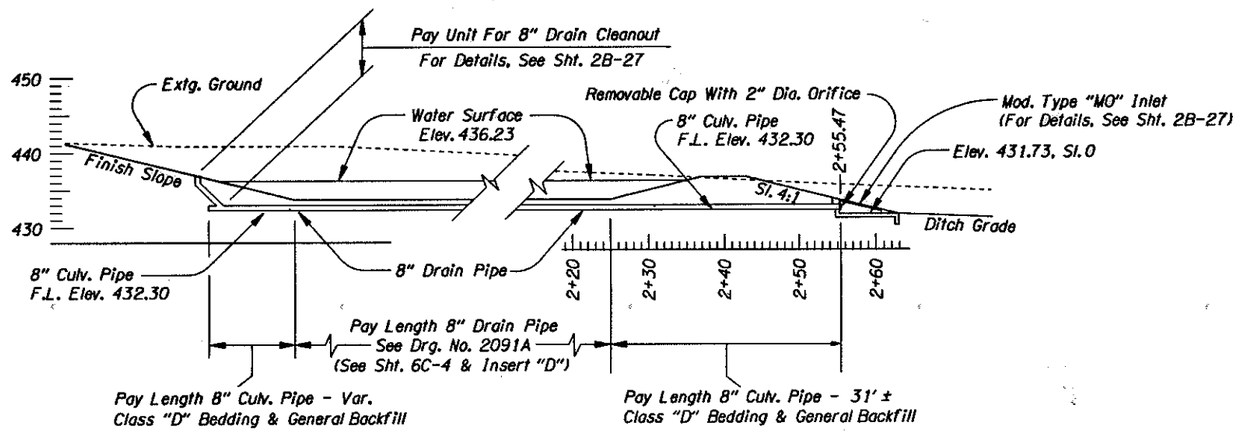


SECTION A-A



INSERT "D"





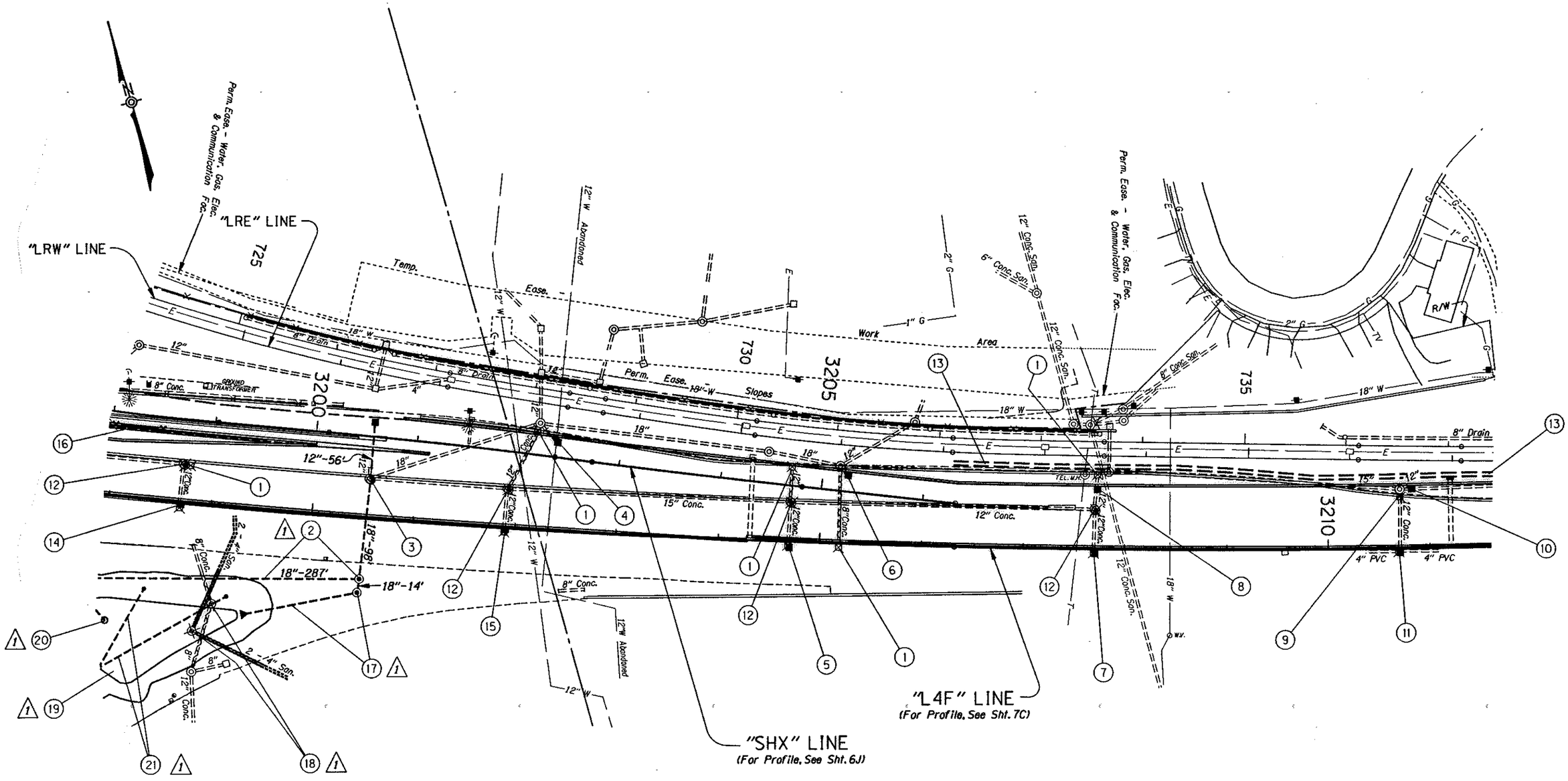
POND DRAIN DETAILS

/1 Revised 2-17-94

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		6C-5

DRAINAGE & UTILITIES
Sec. 2, T. 1S., R. 1W., W.M.



Revised 2-17-94

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7B

DRAINAGE & UTILITIES NOTES

(1) Remove Inlet - 5

⚠1 (2) Sta. "L4F" 3200+50 Rt.
Const. Split Flow Manhole
Inst. 18" Sew. Pipe - 301'
Tr. Exc. - 330 C.Y.
(For Details, See Sht. 2B-27)

(3) Sta. "L4F" 3200+54
Reconstruct Manhole
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
Remove Plug
Extend - 56' Lt.
Inst. 18" Sew. Pipe - 98'
Under Pvmt. - 84'
Tr. Exc. - 150 C.Y.
(For Details, See Sht. 2B-2)

(4) Sta. "SHX" 3202+30
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
Remove Plug
Extend - 13' Rt.
Tr. Exc. - 9 C.Y.
(For Details, See Sht. 2B-2)

(5) Sta. "L4F" 3204+69
Remove Inlet
Const. Type "G-2" Inlet
12" Sew. Pipe (In Pl.)
Remove 12" Pipe - 2'
Under Pvmt. - 5'
Tr. Exc. - 1 C.Y.

(6) Sta. "L4F" 3205+25 Lt.
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
Remove Plug
(For Details, See Sht. 2B-2)

(7) Sta. "L4F" 3207+69
Remove Inlet
Const. Type "G-2" Inlet
12" Sew. Pipe (In Pl.)
Remove 12" Pipe - 3'
Under Pvmt. - 3'
Tr. Exc. - 2 C.Y.

(8) Sta. "L4F" 3207+72
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
(For Details, See Sht. 2B-2)

(9) Sta. "L4F" 3210+71
Remove Inlet
12" Sew. Pipe (In Pl.)
Extend - 4' Lt.
Tr. Exc. - 2 C.Y.

(10) Sta. "L4F" 3210+78
Const. Type "G-2" Mod. Inlet
12" Sew. Pipe (In Pl.)
Remove Plug
(For Details, See Sht. 2B-2)

(11) Sta. "L4F" 3210+78
Remove Inlet
Const. Type "G-2" Inlet
12" Sew. Pipe (In Pl.)
Remove 12" Pipe - 3'
Under Pvmt. - 3'
Tr. Exc. - 2 C.Y.

(12) Adjust Manhole - 4
(For Details, See Sht. 2B-5)

(13) Sta. "L4F" 3206+30 To Sta. "L4F" 3213+00
Const. Trackbed Ditch
(Quantities Incl. In Main Roadbed Dist.)
(See Profiles, Shts. 7C & 8B)
(See Typical Sections, Shts. 2A-8 & 2A-9)

(14) Sta. "L4F" 3198+61
Remove Inlet
12" Sew. Pipe (In Pl.)
Remove 12" Sew. Pipe - 6'
Const. Type "G-2" Inlet
Under Pvmt. - 6'
Tr. Exc. - 5 C.Y.

(15) Sta. "L4F" 3201+90
Remove Inlet
12" Sew. Pipe (In Pl.)
Remove 12" Sew. Pipe - 6'
Const. Type "G-2" Inlet
Under Pvmt. - 6'
Tr. Exc. - 5 C.Y.

(16) See Sht. 6B-2, Note 31

⚠1 (17) Sta. "L4F" 3199+43.50
Const. Pollution Control Manhole
Inst. 12" Sew. Pipe - 110'
Const. Paved End Slope
Tr. Exc. - 73 C.Y.
(For Details, See Sht. 2B-28)

⚠1 (18) Remove Manhole - 2

⚠1 (19) See Sht. 6B-2, Note 37

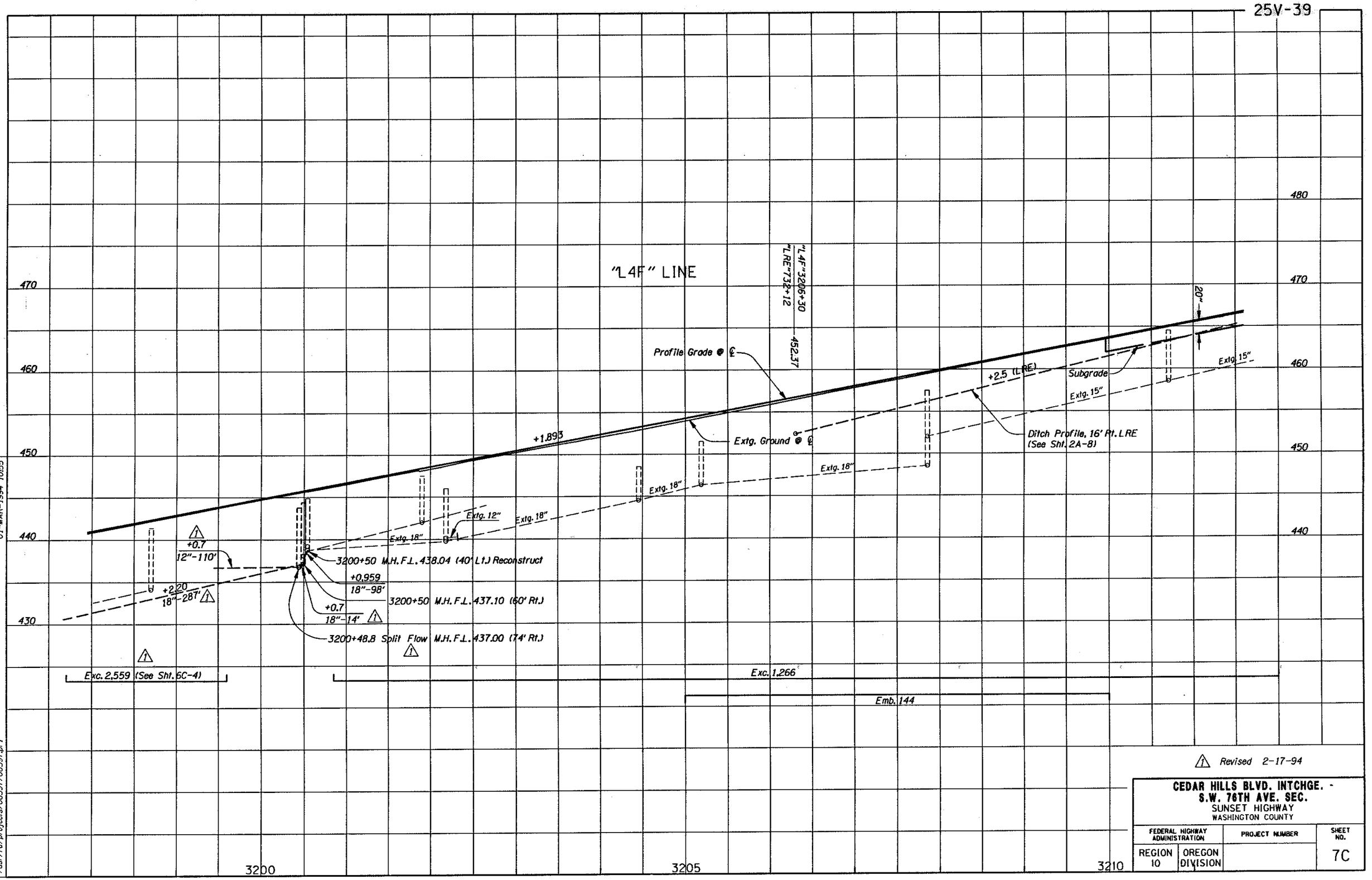
⚠1 (20) See Sht. 6B-2, Note 20

⚠1 (21) See Sht. 6C-4, Note 7

⚠1 Revised 2-17-94

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7B-2



Revised 2-17-94

CEDAR HILLS BLVD. INTCHGE. - S.W. 76TH AVE. SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7C

01-MAR-1994 10:55
morris
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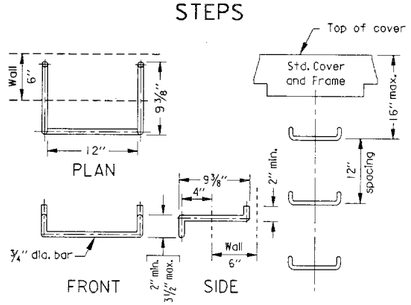
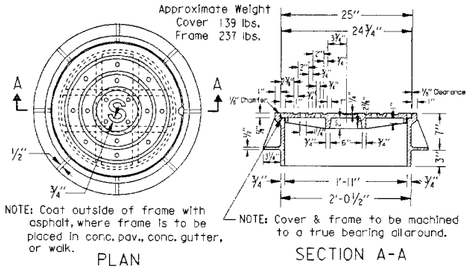
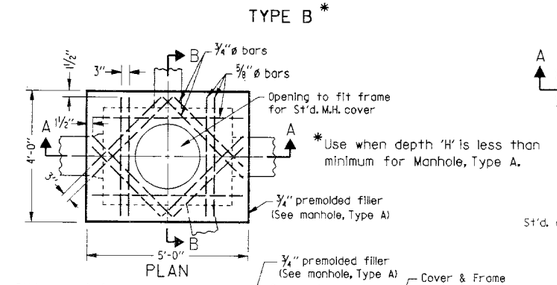
STEPS



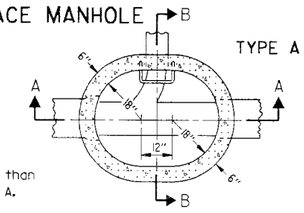
STANDARD MANHOLE COVER & FRAME



CAST-IN-PLACE MANHOLE



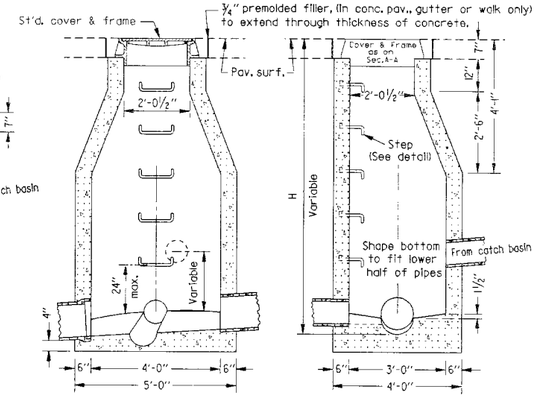
TYPE A



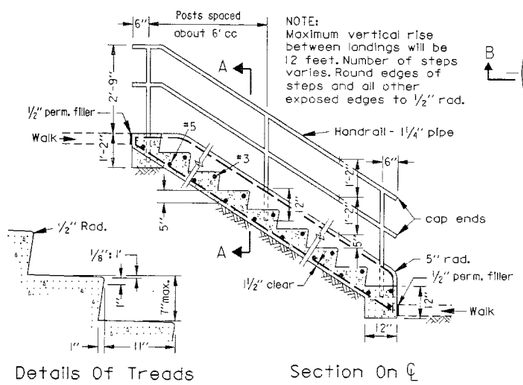
MINIMUM DEPTH 'H' FOR MANHOLE TYPE A

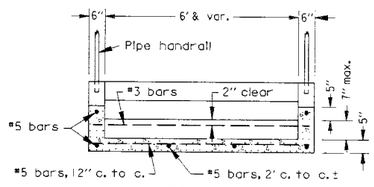
D ⊗	H
8"	5'-0"
10"	5'-3"
12"	5'-6"
15"	5'-9"
18"	6'-0"
21"	6'-3"
24"	6'-6"
30"	7'-2"
36"	7'-8"

⊗ D is inside dia. of largest pipe entering or leaving at bottom of manhole.



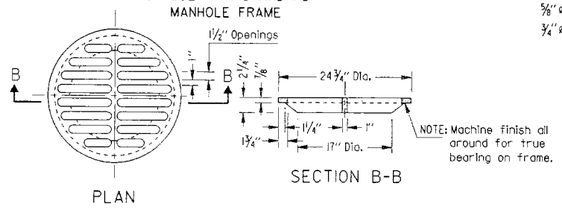
CONCRETE STAIRWAY



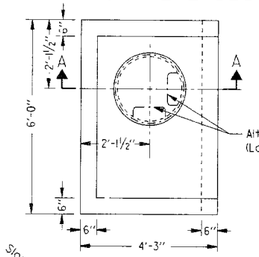


MANHOLE GRATE

FOR USE WITH STANDARD MANHOLE FRAME



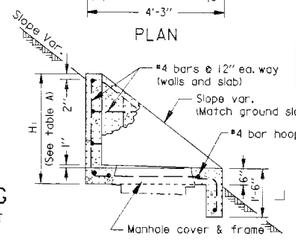
CONCRETE SLOPE PROTECTOR



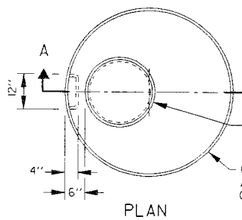
NOTE:
1. All reinforcing steel shall be placed 2" clear of nearest face of conc. unless shown or noted otherwise.
2. All bar splices to be 20 dia.

TABLE A

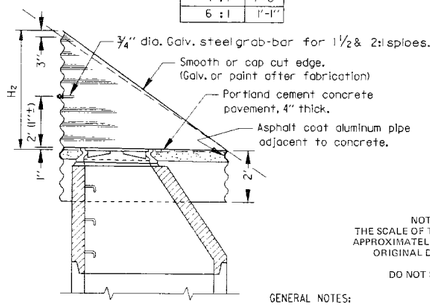
SLOPE	H₁	CONC. cu. yd.	STEEL lb.
1½:1	3'-0"	1.00	88
2 : 1	2'-4½"	0.89	75
3 : 1	1'-9"	0.78	70
4 : 1	1'-5¼"	0.72	63
6 : 1	1'-1½"	0.66	60



METAL PIPE SLOPE PROTECTOR



SLOPE	H₂
1½:1	3'-8"
2 :1	2'-9"
3 :1	2'-0"
4 :1	1'-6"
6 :1	1'-1"



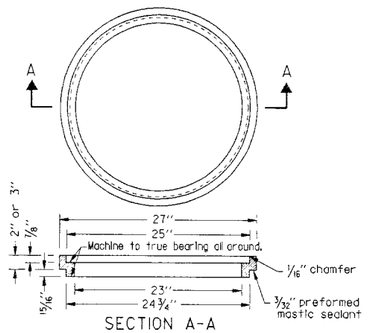
NOTE
THE SCALE OF THIS PRINT IS APPROXIMATELY 45% OF THE ORIGINAL DRAWING.

DO NOT SCALE

GENERAL NOTES:
1. For Precast Manhole see Drg. No. 2050A.

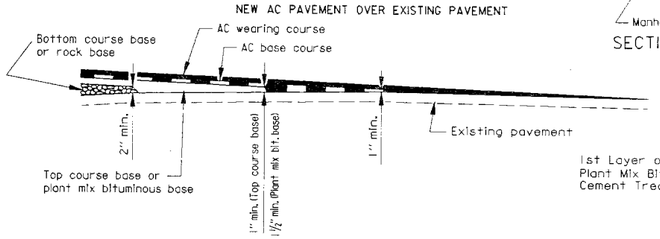
MANHOLE ADJUSTMENT RINGS

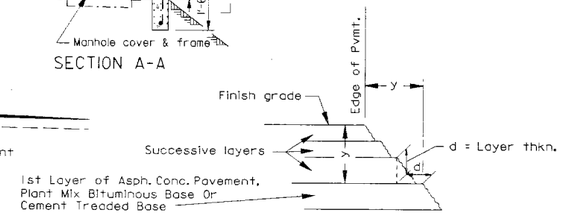
(2 INCH OR 3 INCH INCREMENTS)



METHOD OF FEATHERING

NEW AC PAVEMENT OVER EXISTING PAVEMENT





WIDENING FOR MULTI-LAYER PAVEMENT CONSTRUCTION

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

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY DIVISION
STANDARD

MISCELLANEOUS STRUCTURES
FOR URBAN PROJECTS

APRIL 1966

DATE	REVISIONS DESCRIPTION
NOV.,'72	Added A.C. pvmt. const. detail
MAY,'75	Added metal pipe slope protector and manhole adjustment rings
SEPT.,'88	PIPE ENDS FLUSH WITH WALL

APPROVED
Wayne F. Cabine
ROADWAY DESIGN ENGINEER

DRG. NO. 2050

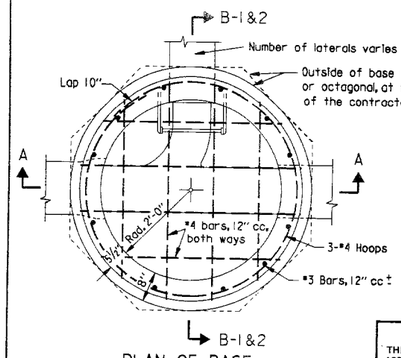
10-2-86

ZG1:t 100,104 12050.DGN:1

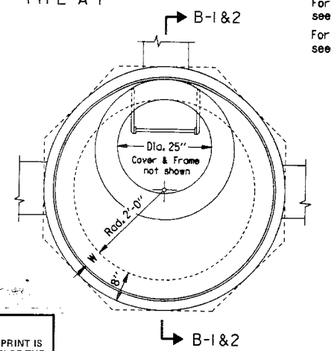
2-21

1st Used 12/93

PRECAST MANHOLE
TYPE A-P



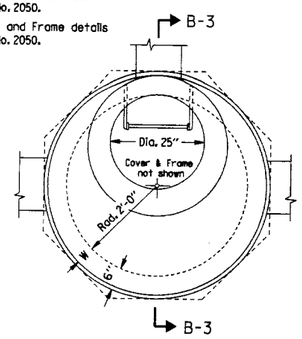
PLAN OF BASE
(Base, Risers & Cone)



TOP VIEW
(Base, Risers & Cone)

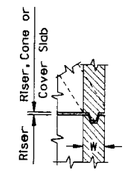
NOTE
THE SCALE OF THIS PRINT IS APPROXIMATELY 45% OF THE ORIGINAL DRAWING.
DO NOT SCALE

NOTES:
For Cast-In-Place Manhole see Drg. No. 2050.
For Cover and Frame details see Drg. No. 2050.



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

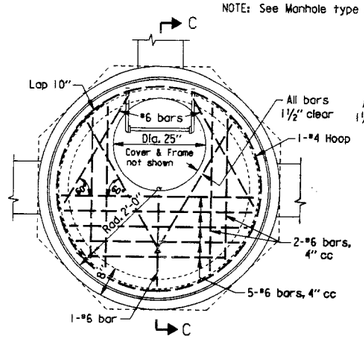
⌀D	H
8"	5'-6"
10"	5'-9"
12"	6'-0"
15"	6'-3"
18"	6'-6"
21"	6'-9"
24"	7'-0"

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

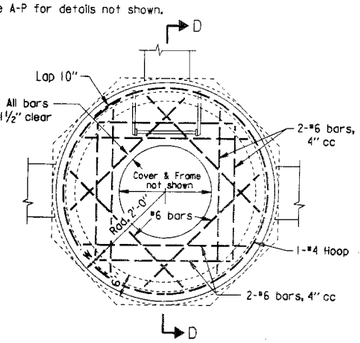
NOTE: When depth is less than minimum for manhole type A-P, use shallow manhole type B or type B-P.

SHALLOW PRECAST MANHOLE
TYPE B-P

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

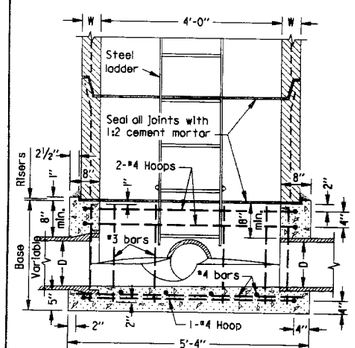


TOP VIEW
(Base, Riser & Cover Slab)

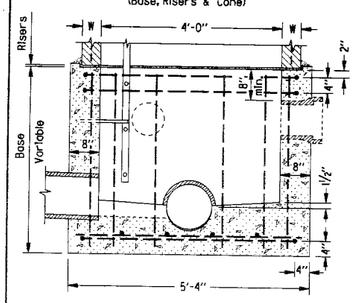


TOP VIEW
(Base & Cover Slab)

NOTE: When H=5'-0" or less make hole for frme in center of cover slab, When H=3'-6" or less omit steps.

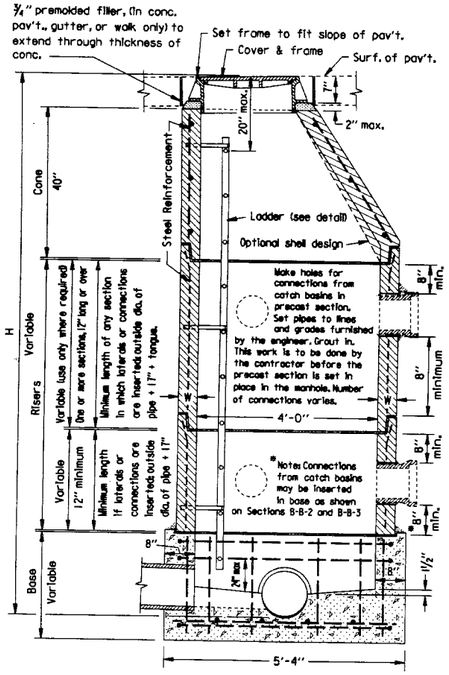


PARTIAL SECTION A-A
(Base, Risers & Cone)



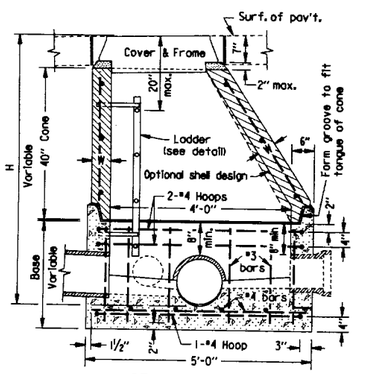
SECTION B-B-2
(Base for Manholes)

NOTE: Set pipes for catch basin connections in base, to grade and directions furnished by the engineer.

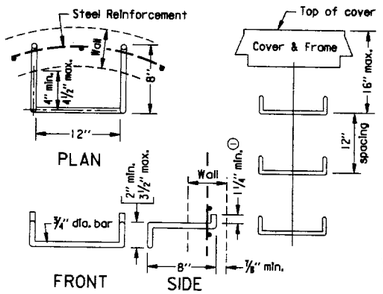


SECTION B-B-1
(Base, Risers & Cone)

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

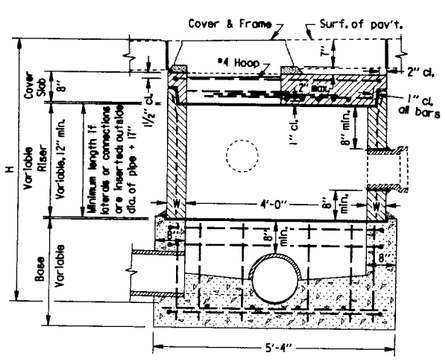


SECTION B-B-3
(Base & Cone)



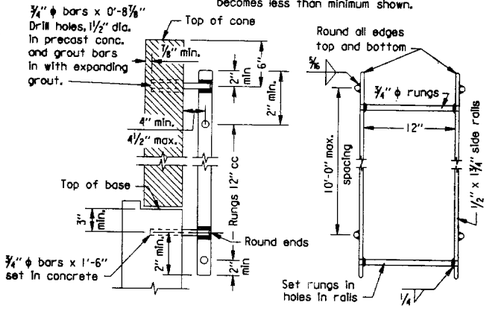
STEPS
(Steps may be substituted for ladder)

① Eliminate hook, provided steps will withstand a "pull" force of 1,000 lbs. without loosening.



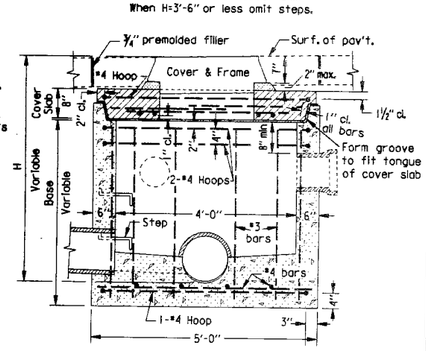
SECTION C-C
(Base, Riser & Cover Slab)

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



* DETAIL OF STEEL LADDER

* See Steps



SECTION D-D
(Base & Cover Slab)

NOTE:
The risers, cones and cover slabs shall meet the requirements of the current AASHTO Standard Specification M199

LEGEND

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

W-4" min. (For tolerance see AASHTO M199)

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

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY DIVISION
STANDARD

MISCELLANEOUS STRUCTURES
FOR URBAN PROJECTS

JUNE 1970

REVISIONS	
DATE	DESCRIPTION
6-20-86	UPDATE SIGNATURE
9-18-88	PIPE ENDS FLUSH WITH WALL
10-27-93	DELETE 30" PIPE

APPROVED
SPECIFICATIONS ENGINEER

DRG. NO. 2050A

2-2.2

/usr/std/std/2050A.dgn:1 7-8-88

VIEW-01