OPERATION & MAINTENANCE MANUAL

DFI No. : D00149
Facility Type: Water Quality Biofiltration Swale

MARCH, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00149**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 26V-105
Location:	District: 2B (Old 2A)
	Highway No.: 1
	Mile Post: 285.97; 286.01 (beg./end)
	Description: This facility is located in the southwest corner of the Elligsen Road and I-5 (Hwy 001) Interchange. Access to the facility can be obtained by the southbound on-ramp to I-5 (Hwy 001). An access gate is located immediately east of the facility.

2. Facility Contact Information

Contact the Engineer of Record, Region Technical Center, or Geo-Environmental's Senior Hydraulics Engineer for:

- Operational clarification
- Maintenance clarification
- Repair or restoration assistance

Engineering Contacts:

Region Technical Center Hydro Unit Manager

Or

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

3. Construction

Engineer of Record:	ODOT Designer – Region 2 Tech. Center, John Marks, P.E., 503-986-2990
Facility construction:	1996
Contractor:	N/A

4. Storm Drain System and Facility Overview

A water quality swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. Water quality treatment occurs when the influent slowly flows through the vegetation contained in the swale.

This swale (Photo 1) is approximately 200-feet long. The facility is located on the southwest quadrant of the I-5 (Hwy 001) and Elligsen Road Interchange. It lies just off of the southbound on-ramp between Commercial Circle and Peters Road.

The facility receives runoff from a portion of I-5's (Hwy 001) north and southbound off-ramps and the southbound on-ramp of the Elligsen Road and I-5 (Hwy 001) Interchange. Water from the inlets is conveyed through a series of pipes into a manhole. The manhole then conveys water to the swale through a 30-inch pipe. Treated water exits the swale through a large culvert, approximately 42 to 60 inches, (Photo 3) located at the west end of the swale.

A. Maintenance equipment access:
   This facility can be accessed from the southbound I-5 (Hwy 001) on-ramp by an access gate located immediately east of the swale (Photo 4).

B. Heavy equipment access into facility:

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

C. Special Features:

   ☐ Amended Soils
   ☐ Porous Pavers
   ☐ Liners
   ☐ Underdrains

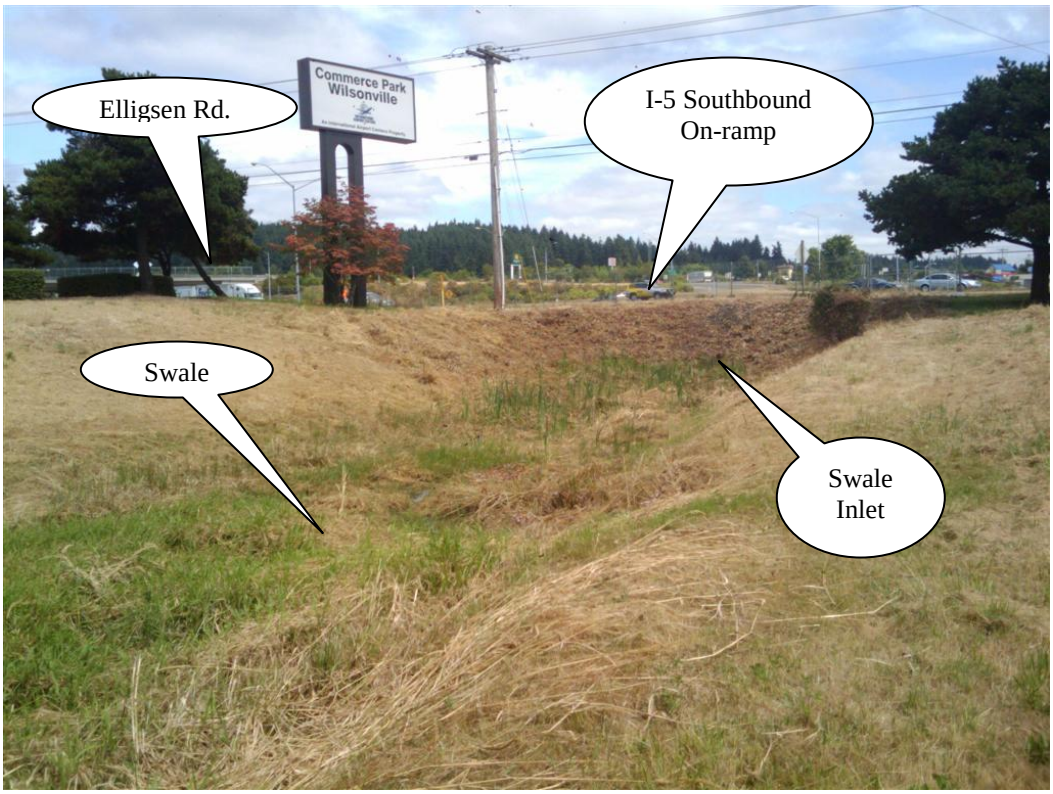


Photo 1: Swale (looking northeast)

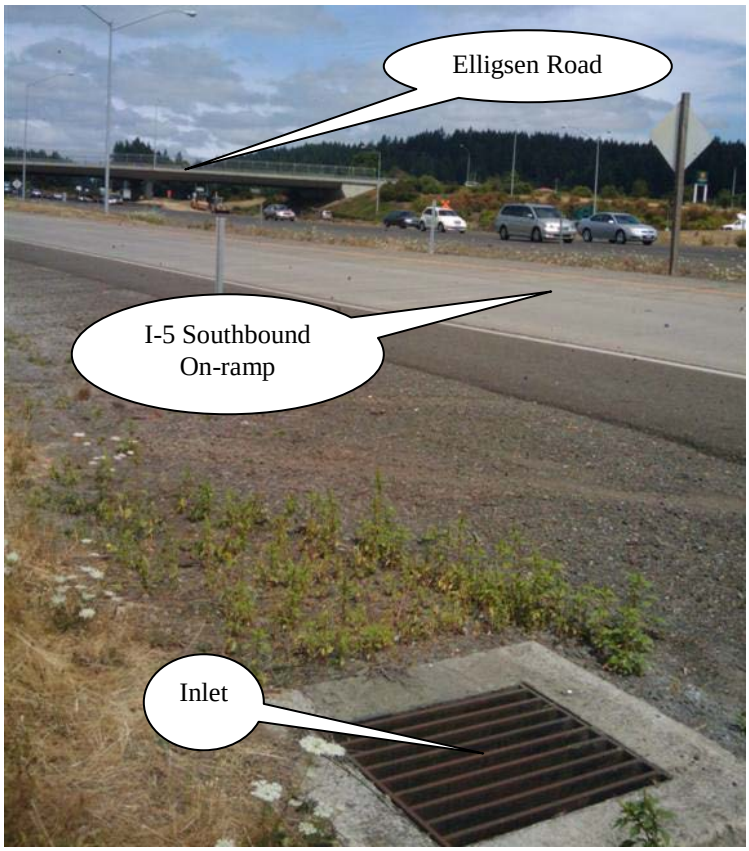


Photo 2: Inlet along the southbound on-ramp

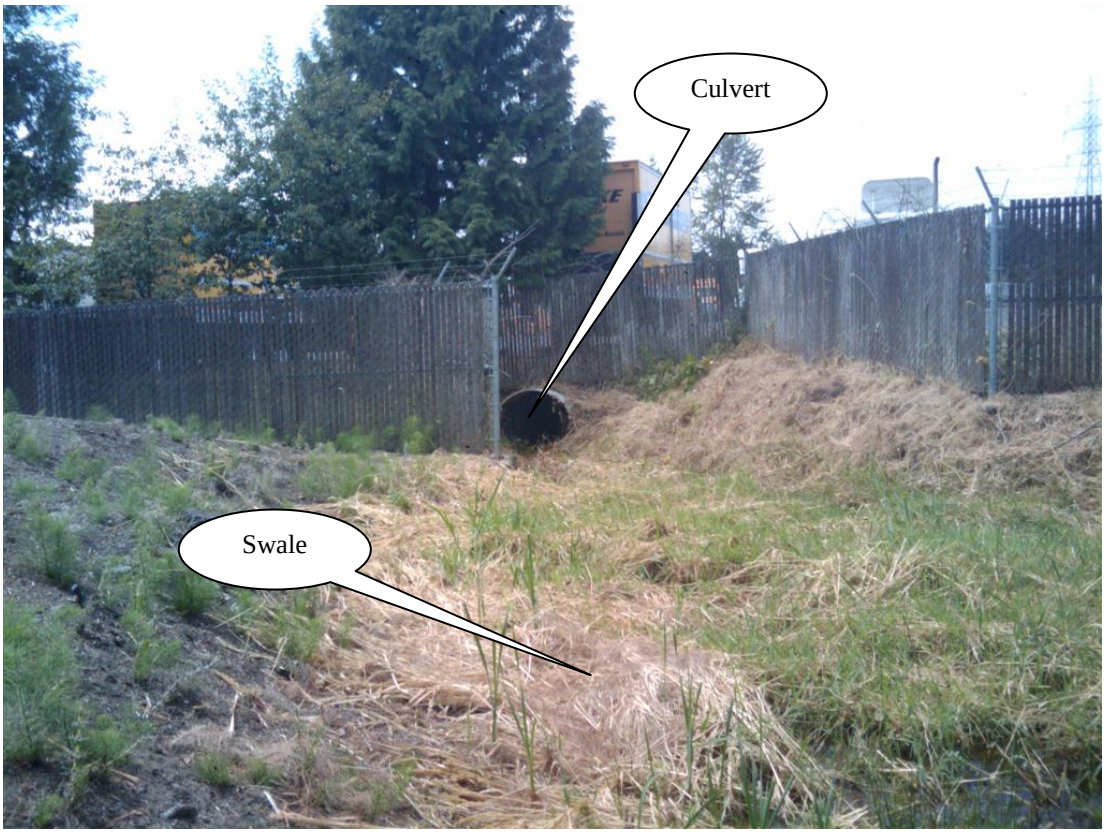


Photo 3: Swale outlet (looking west)

Photo 4: Swale access (looking north)

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the large-diameter culvert (unknown size) located at the outlet of the water quality biofiltration swale. This culvert is noted as Point B in the Operational Plan; Appendix A. Also see 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 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

☒ Other
There are no auxiliary outlets built into this facility. In the event that flows exceed design flows the water will overtop the swale.

7. Maintenance Requirements

Routine maintenance table for non-proprietary stormwater treatment and storage/detention facilities have been incorporated into ODOT's Maintenance Guide. These tables summarize the maintenance requirements for ponds, swales, filter strips, bioslopes, and detention tanks and vaults. Special maintenance requirements in addition to the routine requirements are noted below when applicable.

The ODOT Maintenance Guide can be viewed at the following website:

http://www.oregon.gov/ODOT/HWY/OOM/MGuide.shtml

Maintenance requirements for proprietary structures, such as underground water quality manholes and/or vaults with filter media are noted in Appendix C when applicable.

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual or follow the Maintenance requirements outlined in Appendix C when proprietary structure is selected below:

☒ Table 1 (general maintenance)
☐ Table 2 (stormwater ponds)
☒ Table 3 (water quality biofiltration swales)
☐ Table 4 (water quality filter strips)
☐ Table 5 (water quality bioslopes)
☐ Table 6 (detention tank)
☐ Table 7 (detention vault)
☐ Appendix C (proprietary structure)
☐ Special Maintenance requirements:

Note: Special maintenance Requirements Require Concurrence from ODOT SR Hydraulics Engineer.

8. Waste Material Handling

Material removed from the facility is defined as waste by DEQ. Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options: http://egov.oregon.gov/ODOT/HWY/OOM/EMS.shtml

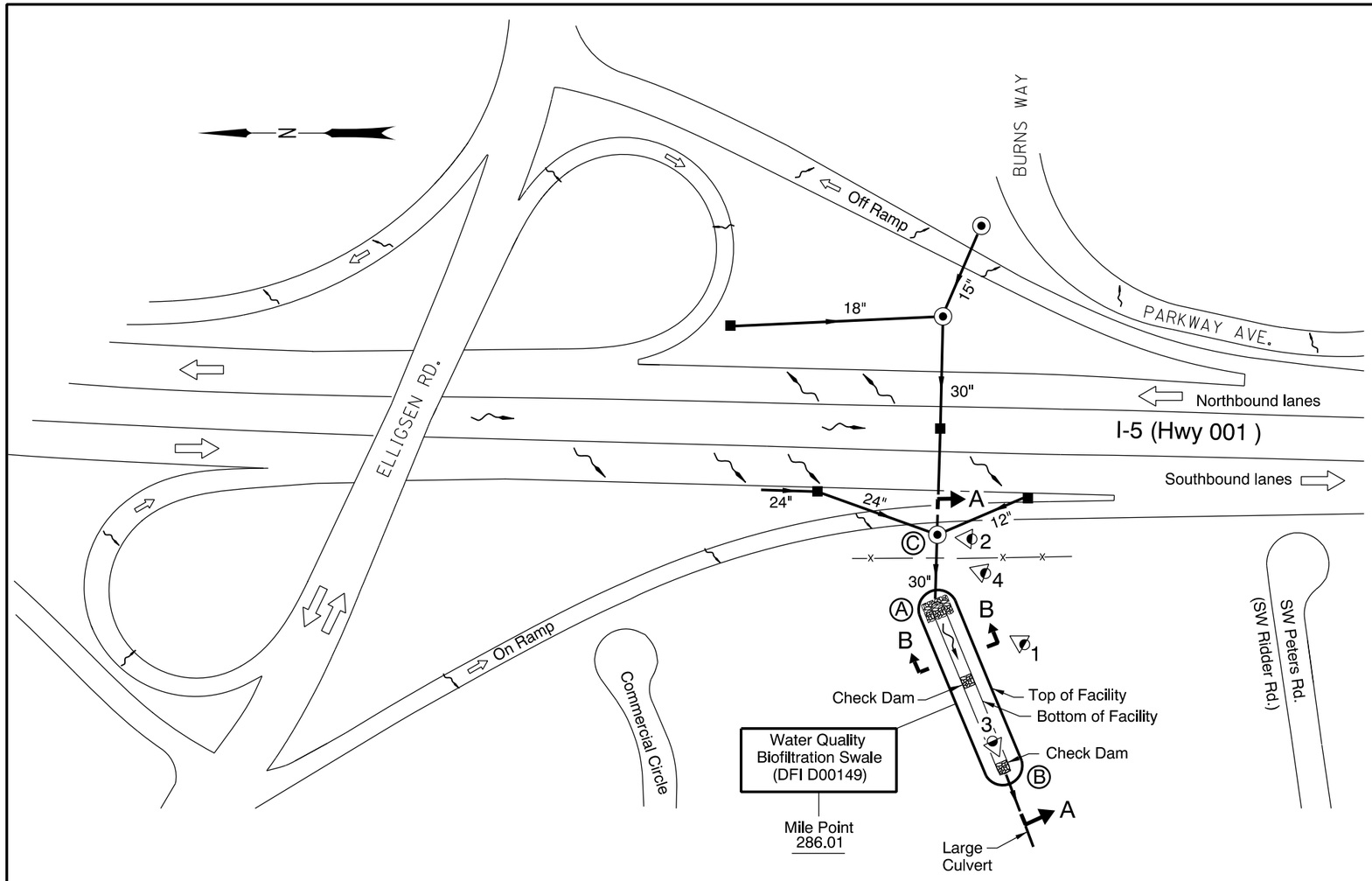
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 731-8304
ODEQ Northwest Region Office	(503) 229-5263

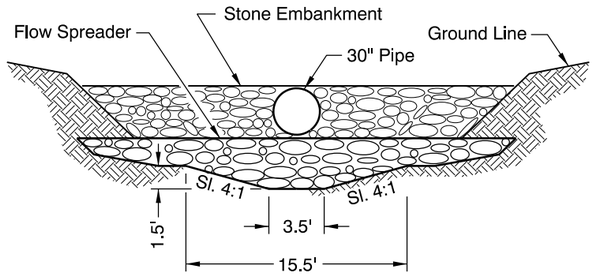
Appendix A

Content:

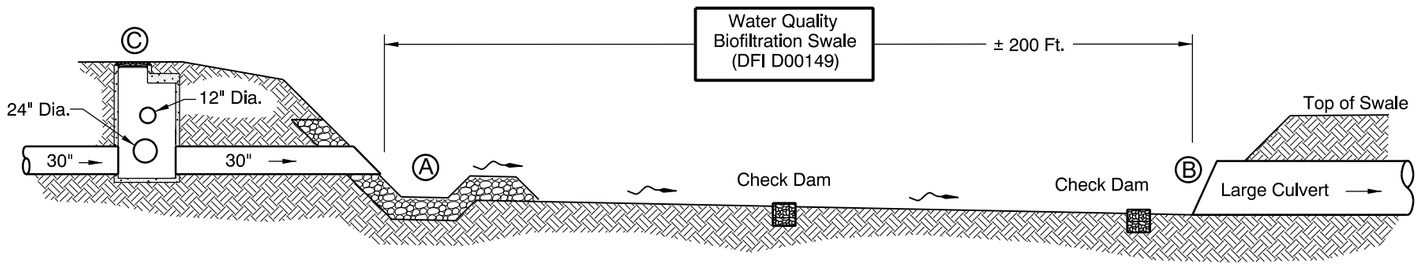
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SECTION B-B
N.T.S.



SECTION A-A
N.T.S.

LEGEND:
- Photo Location/ Direction
- Swale Inlet w/Flow Spreader
- Swale Outlet
- Manhole with Inlet
- Manhole
- Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Access Gate

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Bob Knorr

Drafted By: Jim Holeman

DFI D00149
MAINTENANCE DISTRICT 2B HWY 1
WATER QUALITY BIOFILTRATION SWALE
PACIFIC HIGHWAY MP 286.01
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
1A	Index Of Sheets Cont'd. & Standard Drawing Nos.
2, 2A Thru 2A-8 Incl.	Typical Sections
2B Thru 2B-14 Incl.	Details
2C Thru 2C-25 Incl.	Traffic Control Plans
2D Thru 2D-13 Incl.	Erosion Control Plans
2E Thru 2E-3 Incl.	Pipe Data
2F Thru 2F-2 Incl.	Summary
3	Plan
3A	Drainage
3B, 3C	Profiles
4	Plan
4A	Drainage
4B, 4C	Profiles
5	Plan
5A	Drainage
6	Plan
6A	Drainage
6B	Profile
7, 7A	Plans
7B, 7C	Drainage
7D	Plan
7E	Drainage
7F	Plan
7G, 7H	Drainage
7J, 7K, 7L, 7M, 7N, 7P	Profiles
8	Plan
8A, 8B	Drainage
8C, 8D	Profiles
9	Plan
9A	Drainage
10, 11, 12, 13, 14, 14A, 14B, 14C, 15, 16, 16A, 16B, 16C, 17, 17A, 18, 18A, 18B	Landscaping Plans

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

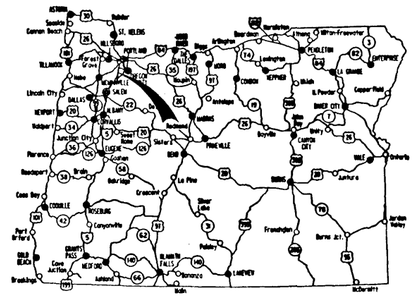
GRADING, STRUCTURE, PAVING, SIGNING, ILLUMINATION, & SIGNALS

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.

PACIFIC HIGHWAY

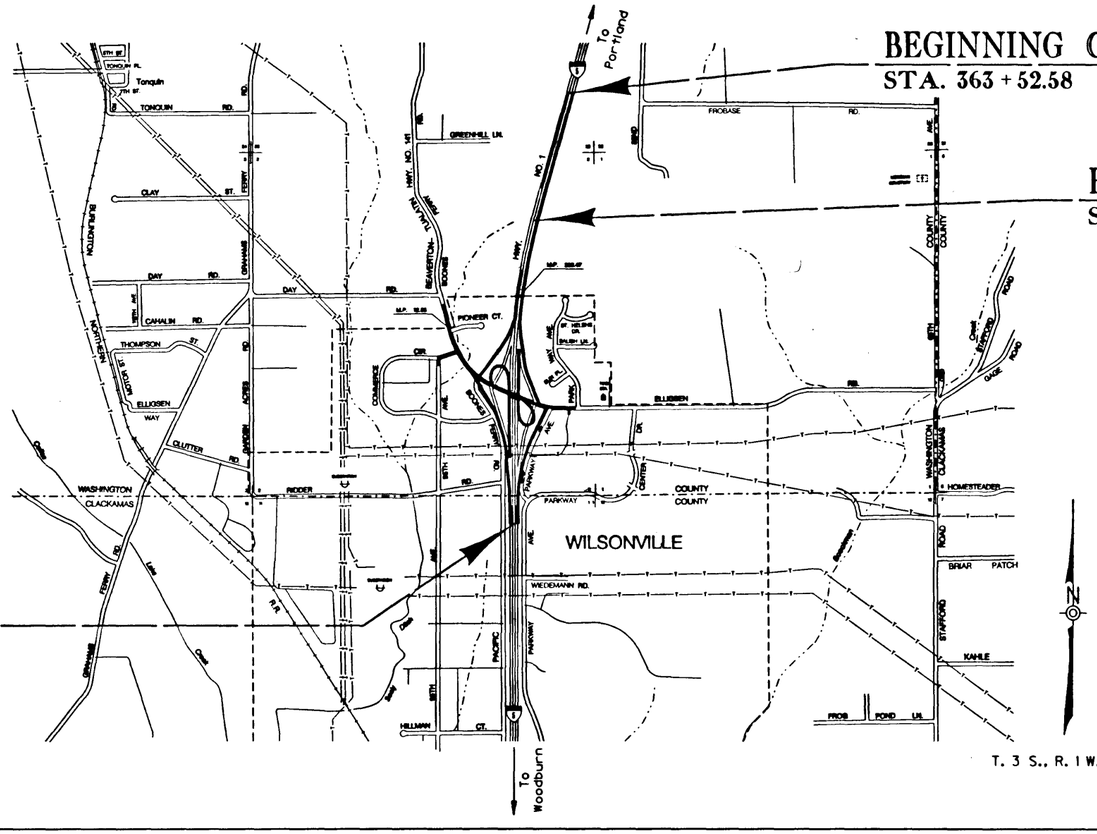
WASHINGTON & CLACKAMAS COUNTIES

JANUARY 1996



Overall Length Of Project - 1.33 Miles

THE TRAFFIC CONTROL YOU PROVIDE PROTECTS YOU AS WELL AS THE PUBLIC. LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE.



BEGINNING OF CONTRACT PROJECT

STA. 363 + 52.58

IM-S001(28)
BEGINNING OF PROJECT

STA. 371 + 00 (M.P. 287.19)

IM-S001(28)
END OF PROJECT

STA. 441 + 42 (M.P. 285.86)

T. 3 S., R. 1 W., W.M.

OREGON TRANSPORTATION COMMISSION

Henry H. Hewitt	CHAIRMAN
Susan Brody	VICE CHAIRMAN
Cynthia J. Ford	COMMISSIONER
Steven H. Corey	COMMISSIONER
Stuart Foster	COMMISSIONER
Kenneth E. Husby	INTERIM DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER 8491 OREGON AUGUST 22, 1975 THOMAS D. LULAY Expires Dec. 31, 1996

Thomas D. Lulay

TECHNICAL SERVICES MANAGING ENGINEER

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.
PACIFIC HIGHWAY
WASHINGTON & CLACKAMAS COUNTIES

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION	IM-S001(28)	1

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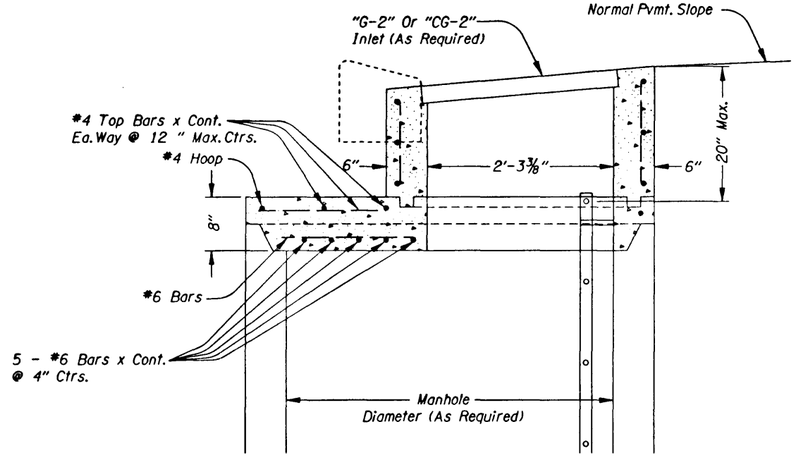
/usr/fd/0823 2fd.tsl

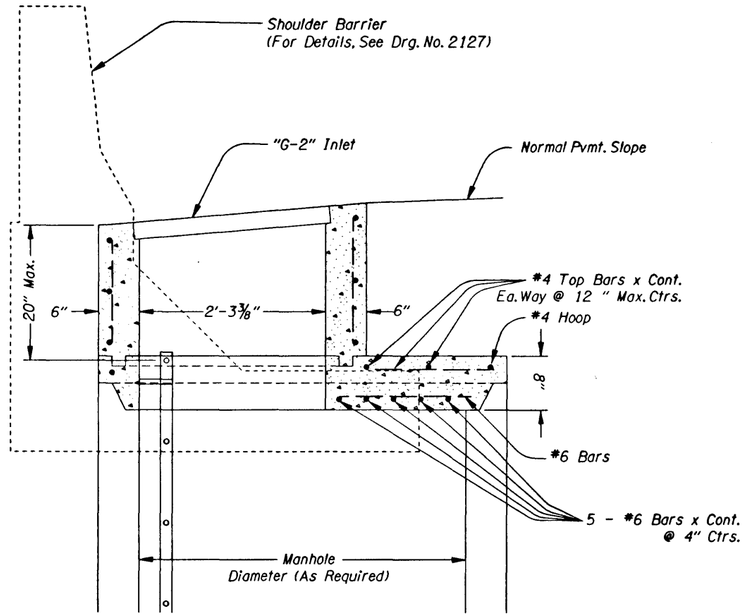
VIEW A1 C634-1964/C634-1461

D E T A I L S

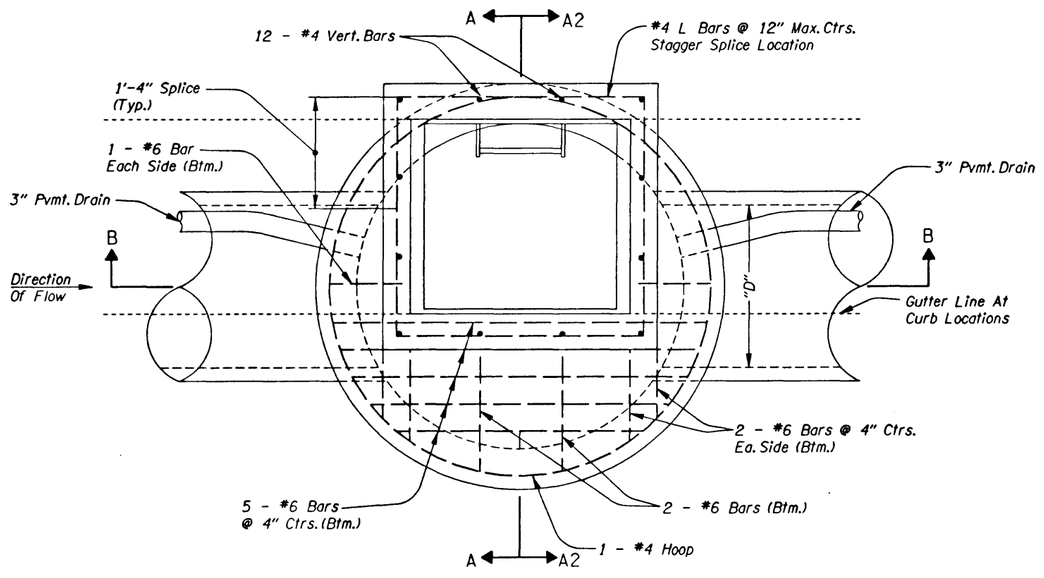


SECTION A-A
(AT CURB LOCATIONS)

NOTE:
All Reinforcing Bars Shall Be Placed 2" Clear Of The Nearest Face Of Concrete Unless Shown Otherwise.

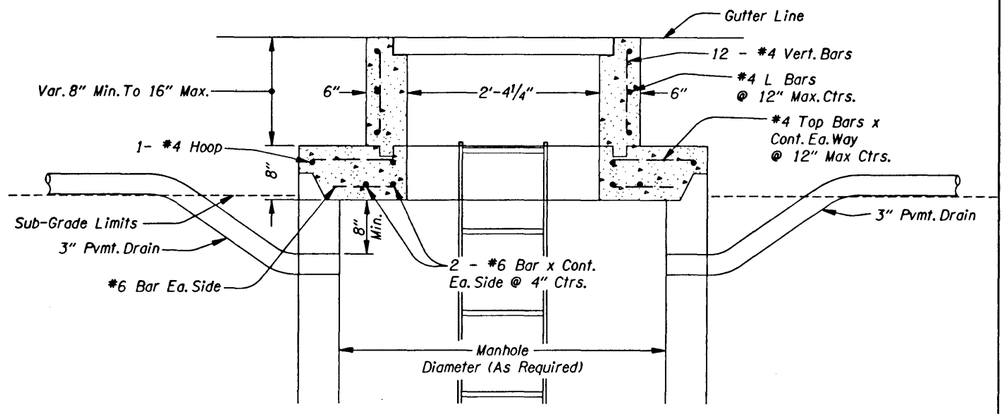


SECTION A2-A2
(AT BARRIER LOCATIONS)



"D" = Pipe Dia.

PLAN



SECTION B-B

(For Details Not Shown, See Drg. Nos. 2050, 2050A & 2105)

MANHOLE WITH INLET

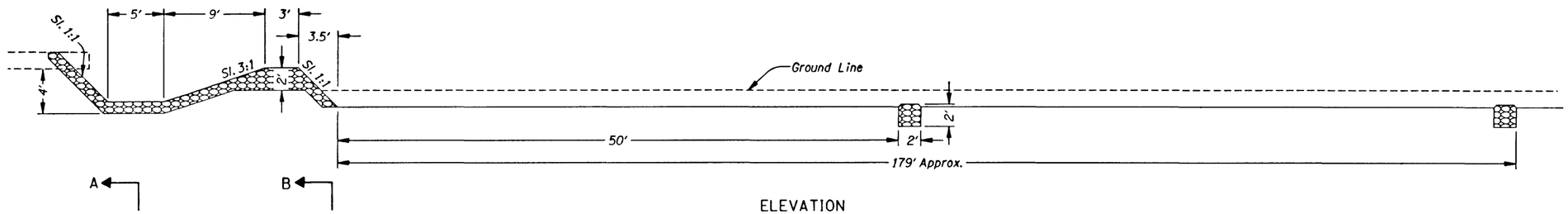
STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC. PACIFIC HIGHWAY WASHINGTON & CLACKAMAS COUNTIES			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		2B-13

BRIDGE DETAILS CHECKED 9-DEC-1995 08:46 jenkins 032711.dn3

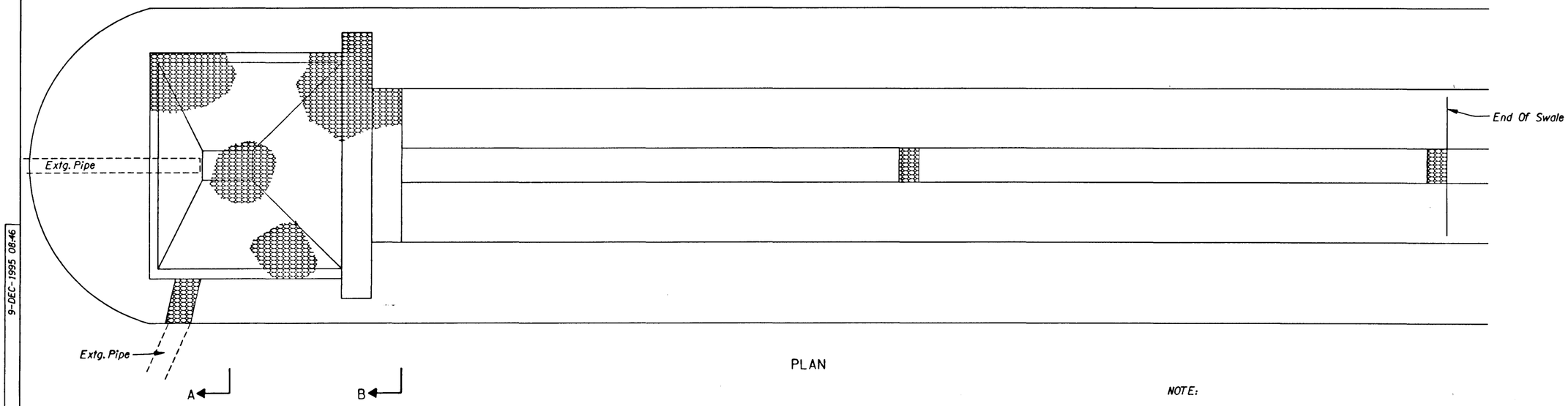
VIEW A1

STORMWATER DETAILS

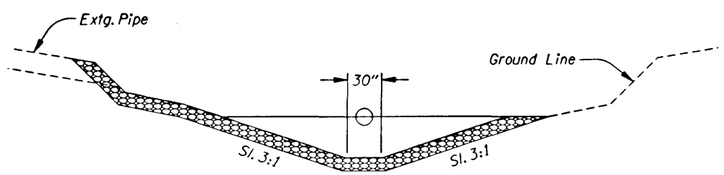
26V-105



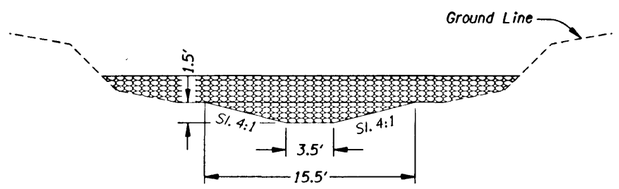
ELEVATION



PLAN



SECTION A-A



SECTION B-B

NOTE:

Construct Water Quality Swale On A Uniform 2% Slope, With 3.5' Bottom Width, 4:1 Side Slopes, And 1.5' Minimum Deep.

Clear And Seed The Area Outside The Swale Using Seed Mix No. 1

Seed The Swale Area With Seed Mix No. 2

Use 3" To 6" Stone Embankment Material In The Forebay And Checkdams..

WATER QUALITY SWALE

STA. "L5" 424+07, Rt.

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.
PACIFIC HIGHWAY
WASHINGTON & CLACKAMAS COUNTIES

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

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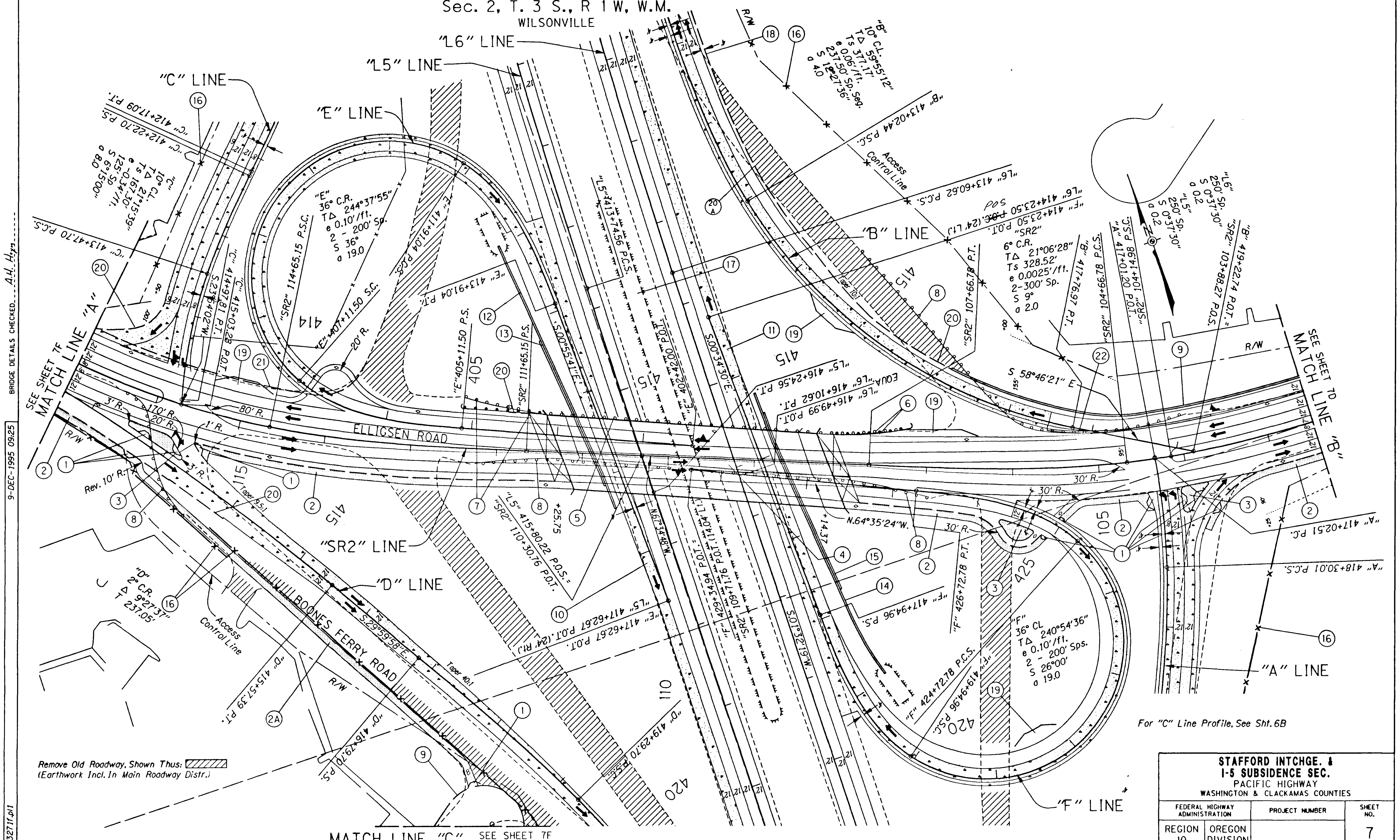
VIEW B1

ALIGNMENT AND GENERAL CONSTRUCTION

Sec. 2, T. 3 S., R 1 W, W.M.
WILSONVILLE



For "C" Line Profile, See Sht. 6B

Remove Old Roadway, Shown Thus: (hatched)
(Earthwork Incl. In Main Roadway Distr.)

BRIDGE DETAILS CHECKED A.H. Hays

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VIEW B2

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC. PACIFIC HIGHWAY WASHINGTON & CLACKAMAS COUNTIES			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7

(1) Const. Sidewalk Ramp - 11
(See Drg. No. 2077C)

(2) Const. Monolithic Curb & Sidewalk
(2A) Const. P.C. Conc. Walk
(See Drg. No. 2077)

(3) Const. Type "C" Non-Mountable Island - 227 Sq.Yd.
(For Details, See Sht. 2B-4)
(See Drg. No. 2077A)

(4) Bridge No. 75794
Const. Structure Widening - 28'-8"
Rdwy. Width 76.67' With 8' Walk
And Reinf. Panels At Bridge Ends
(For Drg. Nos., See Sht. 1)

(5) Remove Extg. Bridge Rail, Rt.
Const. Bridge Rail
(For Drg. No., See Sht. 1)

(6) Sta. "SR2" 107+13.5 To Sta. "SR2" 108+08
Remove Extg. Guard Rail - 100'
Const. Guard Rail - 25' (Type 2A)
- 12.5' (Type 3)
Const. Guard Rail Transition
Flare Rate=15:1, W=8.1', E=2'
Inst. SRT-100 End Terminal

(7) Sta. "SR2" 111+64 To Sta. "SR2" 112+08.5
Remove Extg. Guard Rail - 100'
Const. Guard Rail - 12.5' (Type 2A)
- 12.5' (Type 3)
Const. Guard Rail Transition
Flare Rate=0, W=0, E=2'
Const. Drainage Curb - 45'
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)

(8) Remove Extg. Guard Rail - 250'

(9) Sta. "SR2" 101+65 To Sta. "B" 416+18
Const. Conc. Barrier - 500'
Grout Barrier
Flare Rate=0, W=0, E=0
Const. Conc. Barrier To Curb Transition - 2
(For Details, See Shts. 2B-7 & 2B-9)

(10) Const. Entrance Ramp
Accelaration Lane Length - 1,710'

(11) See Sht. 6, Note 5

(12) Sta. "E" 413+00 To Sta. "L5" 416+50
Const. Conc. Barrier - 175'
Const. Conc. Narrow Shldr. Barrier - 175'
Grout Barrier
With Mound Terminal
Flare Rate=20:1, W=15', E=0
Const. Earth Mound
Topsoil - 10 C.Y.
(EarthWork Incl. In Main Rdwy. Distr.)
(For Details, See Sht. 2B-6 & 2B-7)
(See Drg. No. 2135)

(13) Sta. "E" 414+25 To Sta. "L5" 416+00
Bridge No. 17489
Const. Conc. Retaining Wall
(For Details, See Sht. 2B-5
(For Drg. Nos., See Sht. 1)

(14) Sta. "F" 415+25 To Sta. "F" 418+87.50
Const. Conc. Barrier - 137.5'
Const. Conc. Narrow Shldr. Barrier - 225'
Grout Barrier
With Mound Terminal
Flare Rate=20:1, W=15', E=0
Const. Earth Mound
Topsoil - 10 C.Y.
(EarthWork Incl. In Main Rdwy. Distr.)
(For Details, See Sht. 2B-6 & 2B-7)

(15) Sta. "F" 415+50 To Sta. "F" 417+75
Bridge No. 17489
Const. Conc. Retaining Wall
(For Details, See Sht. 2B-5)
(For Drg. Nos., See Sht. 1)

(16) Const. Type "CL-6" Fence

(17) Sta. "L5" 412+80 To Sta. "L5" 419+35, Lt.
Const. Earth Mound
Topsoil - 360 C.Y.
Emb. In Place - 1,500 C.Y.
(For Details, See Sht. 2B-8)

(18) Const. Type "B" Curb

(19) Const. Maintance Pad - 4
(For Details, See Sht. 2B-5)
(See Drg. No. 2077B)

(20) Const. Type "C" Curb
(20A) Const. Curb Transition
(For Details, See Sht. 2B-5)

(21) Const. Temp. Type "C" Curb
Remove Temp. Curb

(22) Sta. "B" 417+50 To Sta. "SR2" 103+60
Const. Traffic Separator
(See Drg. No. 2077A)

(23) Remove Extg. Fence

BRIDGE DETAILS CHECKED... A.H. Hsyn.....
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VIEW A1

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC. PACIFIC HIGHWAY WASHINGTON & CLACKAMAS COUNTIES			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7A

DRAINAGE AND EXTG. UTILITIES

Sec. 2, T. 3 S., R 1 W, W.M.

Plug Or Remove Extg. Inlet, Shown Thus: ☒

Plug And Abandon Extg. Pipe, Shown Thus:

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.
PACIFIC HIGHWAY
WASHINGTON & CLACKAMAS COUNTIES

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

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VIEW B2

(1) Const. Manhole With "G-2MA" Inlet
Const. Type "G-2MA" Inlet - 2
Inst. 18" Sewer Pipe - 390'
Tr. Exc. - 305 C.Y.
(For Details, See Sht. 2B-13)

(2) Inst. 4" Sewer Pipe - 86'
Connect To Bridge Drainage
Tr. Exc. - 30 C.Y.

(3) Sta. "L5" 411+80
Const. Type "G-2MA" Inlet
Inst. 18" Sewer Pipe - 198'
Tr. Exc. - 133 C.Y.

(4) Sta. "SR2" 111+90
Const. Manhole With "G-2" Inlet
Const. Type "CG-2" Inlet
Inst. 12" Sewer Pipe - 152'
Tr. Exc. - 102 C.Y.
(For Details, See Sht. 2B-12 & 2B-13)

(5) Sta. "D" 418+90, Rt.
Const. Type "CG-2" Inlet
Inst. 12" Culvert Pipe - 36'
Const. Paved End Slope
Tr. Exc. - 19 C.Y.

(6) Sta. "L5" 417+60
Remove Extg. Inlet
Const. Type "G-2" Inlet - 3
Const. Type "G-2MA" Inlet
Inst. 18" Sewer Pipe - 398'
Tr. Exc. - 250 C.Y.
(For Details, See Sht. 2B-12)

(7) Const. Type "CG-2" Inlet - 4
Inst. 12" Sewer Pipe - 196'
Inst 18" Sewer Pipe - 70'
Const. Paved End Slope, Rt.
Tr. Exc. - 130 C.Y.
(For Details, See Sht. 2B-12)

(8) Sta. "F" 418+80
Const. Type "G-2" Inlet
Const. Type "G-2MA" Inlet - 2
Inst. 18" Sewer Pipe - 504'
Tr. Exc. - 280 C.Y.
(For Details, See Sht. 2B-12)

(9) Sta. "F" 424+50
Const. Precast Manhole 60"
Const. Type "CG-2" Inlet
Inst. 12" Sewer Pipe - 70'
Inst. 30" Sewer Pipe - 244'
Const. Paved End Slope, Lt.
Tr. Exc. - 350 C.Y.
(For Details, See Sht. 2B-12)
(See Drg. No. 2137)

(10) Sta. "SR2" 105+40
30" Culv. Pipe (In Pl.)
Extend - 24', Rt.
Const. Paved End Slope, Lt.
Tr. Exc. - 24 C.Y.

(11) Sta. "SR2" 104+05
Const. Type "G-2" Inlet
Inst. 12" Culvert Pipe - 62'
Inst. 3 Piece 30° Elbow - 2
Inst. Slope Anchors - 6
Const. Loose Riprap (Class 100) - 10 C.Y.
Tr. Exc. - 23 C.Y.
(For Details, See Sht. 2B-12)
(See Drg. No. 2091)

(12) Sta. "F" 417+20, Lt.
Const. Type "G-2" Inlet
Const. Type "G-2MA" Inlet
Inst. 12" Sewer Pipe - 196'
Inst. 18" Sewer Pipe - 10'
Tr. Exc. - 190 C.Y.
(For Details, See Sht. 2B-12)

(13) Adjust Valve - 4

(14) Const. Surfacing Drain Pipe - 14
(For Details, See Sht. 2B-11)

(15) See Sht. 6A, Note 4

(16) Inst. 6" Culvert Pipe - 400' (Conduit)
Tr. Exc. - 200 C.Y.

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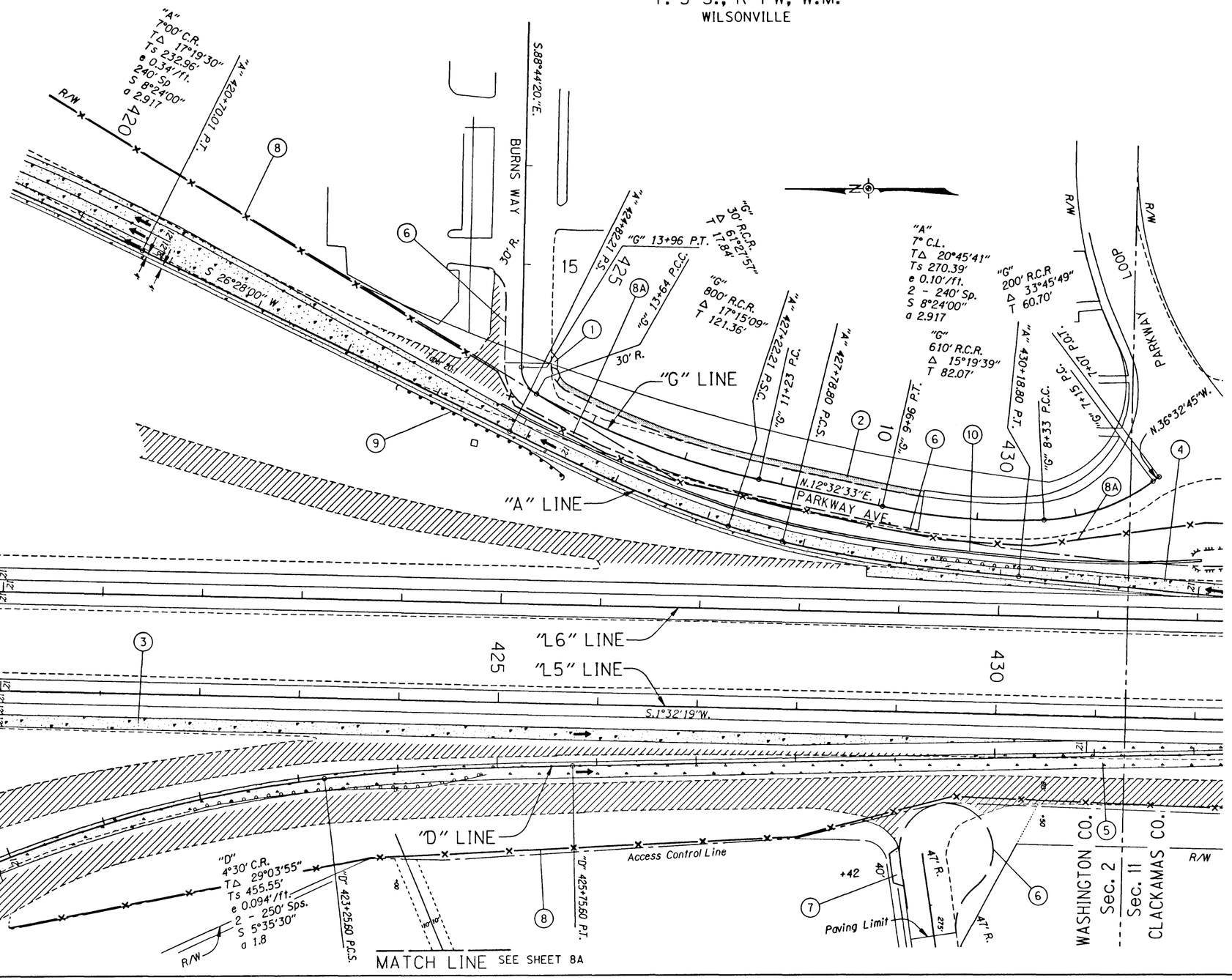
VIEW A2

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.
PACIFIC HIGHWAY
WASHINGTON & CLACKAMAS COUNTIES

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

ALIGNMENT AND GENERAL CONSTRUCTION

T. 3 S., R 1W, W.M.
WILSONVILLE



(1) Const. Asph. Conc. Sidewalk Ramp

(2) Const. Monolithic Curb & Sidewalk

(3) See Sht. 7, Note 10

(4) Const. Exit Ramp

(5) Const. Entrance Ramp
Accelaration Lane Length - 1,150'

(6) Const. Type "C" Curb

(7) Const. P.C. Reinf. Conc. Dwy.
(For Details, See Sht. 2B-3)

(8) Const. Type "CL-6" Fence
(8A) Inst. Screening Pickets - 700'
(For Details, See Sht. 2B-5)

(9) Sta. "A" 423+62.50 To Sta. "A" 425+50, Rt.
Const. Guard Rail - 150' (Type 2A)
Flare Rate=15:1, W=8.1', E=0
Inst. SRT-100 End Terminal
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)

(10) Sta. "A" 424+62.50 To Sta. "A" 432+00, Lt.
Const. Conc. Barrier - 737.5'
Grout Barrier
Flare Rate=20:1, W=15', E=0
Const. Earth Mound
Topsoil - 10 C.Y.
(Earthwork Incl. In Main Rdwy. Distr.)
(For Details, See Sht. 2B-7)

Remove Old Roadway, Shown Thus: ▨
(Earthwork Incl. In Main Roadway Distr.)

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.
PACIFIC HIGHWAY
WASHINGTON & CLACKAMAS COUNTIES

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		8

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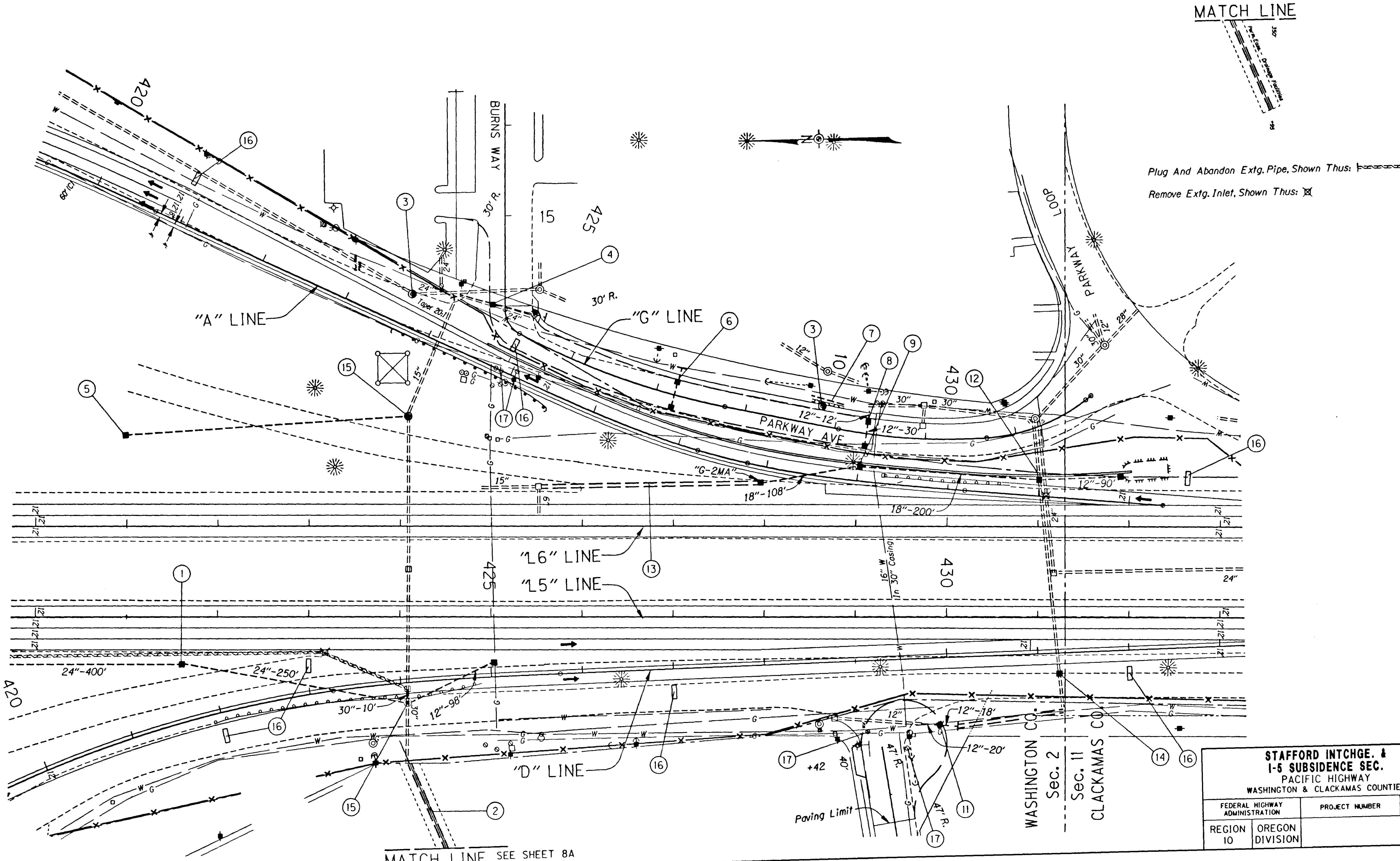
VIEW B3

DRAINAGE AND EXTG. UTILITIES
T. 3 S., R 1 W, W.M.



STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC. PACIFIC HIGHWAY WASHINGTON & CLACKAMAS COUNTIES			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		8A

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VIEW B3

(1) Sta. "L5" 424+07, Rt.
Const. Type "G-2MA" Inlet
Inst. 24" Sewer Pipe - 650'
Connect To Extg. Inlet
Tr. Exc. - 493 C.Y.

(2) Sta. "L5" 424+07, Rt.
Const. Water Quality Swale
6' Bottom, 4:1 Slopes
Const. Stone Embankment - 9 C.Y.
Dt. Exc. - 110 C.Y.
(For Details, See Sht. 2D-2)

(3) Reconst. Manhole - 2

(4) Sta. "G" 14+02
Const. Type "CG-2" Inlet
Inst. 24" Sewer Pipe - 98'
Tr. Exc. - 75 C.Y.

(5) See Sht. 7C, Note 8

(6) Sta. "G" 11+80
Const. "CG-2" Inlet - 2
Inst. 12" Sewer Pipe - 42'
Tr. Exc. - 22 C.Y.

(7) Sta. "G" 10+00
Inst. 24" Culvert Pipe - 36'
Tr. Exc. - 31 C.Y.

(8) Sta. "G" 9+62
Const. Type "CG-2" Inlet - 2
Inst. 12" Sewer Pipe - 42'
Tr. Exc. - 22 C.Y.

(9) Sta. "A" 429+00
Const. Type "G-2" Inlet
Const. Type "G-2MA" Inlet
Inst. 18" Sewer Pipe - 108'
Tr. Exc. - 72 C.Y.
(For Details, See Sht. 2B-12)

(10) Note Removed From Plans

(11) Sta. "D" 429+40
Const. Type "CG-2" Inlet
Extg. 12" Sewer Pipe (In Pl.)
Extend - 20', Rt.
Inst. 18" Sewer Pipe - 18'
Const. Ditch
"V" Bottom, 2:1 Slopes
Dt. Exc. - 10 C.Y.
Tr. Exc. - 23 C.Y.

(12) Sta. "A" 431+00, Lt.
Const. Type "G-2" Inlet - 2
Inst. 12" Sewer Pipe - 90'
Inst. 18" Sewer Pipe - 200'
Connect Inlet To Extg. Pipe
Tr. Exc. - 170 C.Y.

(13) Sta. "L6" 427+00, Lt.
Cons. Ditch
"V" Bottom, 4:1 Slopes
Dt. Exc. - 10 C.Y.

(14) Sta. "L5" 431+15, Rt.
Const. "G-2MA" Inlet
Connect To Extg. Pipe

(15) Sta. "L5" 424+10, Lt.
Const. Manhole With "G-2MA" Inlet - 2
Inst. 12" Sewer Pipe - 98'
Inst. 30" Sewer Pipe - 10'
Connect To Extg. Pipe
Tr. Exc. - 11 C.Y.
(For Details, See Sht. 2B-13)

(16) Const. Surfacing Drain - 7
(For Details, See Sht. 2B-11)

(17) Adjust Valve - 4

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VIEW B1

STAFFORD INTCHGE. & I-5 SUBSIDENCE SEC.
PACIFIC HIGHWAY
WASHINGTON & CLACKAMAS COUNTIES

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		8B