OPERATION & MAINTENANCE MANUAL

DFI No. : D00245
Facility Type: Water Quality Biofiltration Swale

AUGUST, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00245**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 25V-061
Location:	District: 2B
	Highway No.: 002
	Mile Post: 14.47 / 14.72 (beg./end)
	Description: This facility is located south of the I-84 Eastbound on-ramp (Hwy 002). It is just east of Fairview Parkway. A railroad also lies just south of the facility. Access would be obtained from coming off of the on-ramp and pulling alongside the road.

2. Facility Contact Information

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

- Operational clarification
- Maintenance clarification
- Repair or restoration assistance

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 1 Tech. Center, Thomas D. Lulay, P.E./Mngr., (503) 731-8200
Facility construction:	1994
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. This type of facility is lined with grass. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

This water quality biofiltration swale is located south of the eastbound on-ramp to I-84 (Hwy 002) just east of Fairview Parkway (207th Ave.). A railroad also lies just south of the facility.

Impervious surface runoff is collected by catch-basins and an area storm drain system along Fairview Parkway (207th Ave.). This water flows toward a manhole, located at the intersection of the Parkway and the on-ramp, before being conveyed to the facility inlet by an 18-inch pipe; see Point A of the Operational Plan, Appendix A. Sheet flow runoff occurring along the sloping on-ramp, itself, flows northward toward a localized storm drain system and inlets along the north side of the ramp. This system is directed away from the swale, however, beneath I-84, to an outfall near where the swale also releases its treated stormwater (Point D).

A. Maintenance equipment access:
Access would be obtained from coming off of the on-ramp and pulling along side the road.

B. Heavy equipment access into facility:

☐ Allowed (no limitations)
☒ Allowed (with limitations); access is obtained at the end of the concrete median barrier, located between a portion of the on-ramp and swale.
☐ Not allowed

C. Special Features:

☐ Amended Soils
☐ Porous Pavers
☒ Liners; contaminant membrane
☐ Underdrains

Photo 1: Looking west toward the biofiltration swale and on-ramp. I-84 is located to the right.

Photo 2: Looking west toward the facility inlet and on-ramp. The ramp and I-84 are located to the right.

Photo 3: Looking east toward the swale and its outlet (Point B). I-84 is located to the left.

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the 18-inch-diameter outlet pipe located at the outlet of the water quality biofiltration swale. This pipe is noted as point B on the Operational Plan, Appendix A.

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, as noted below
There are no auxiliary features in this facility

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:

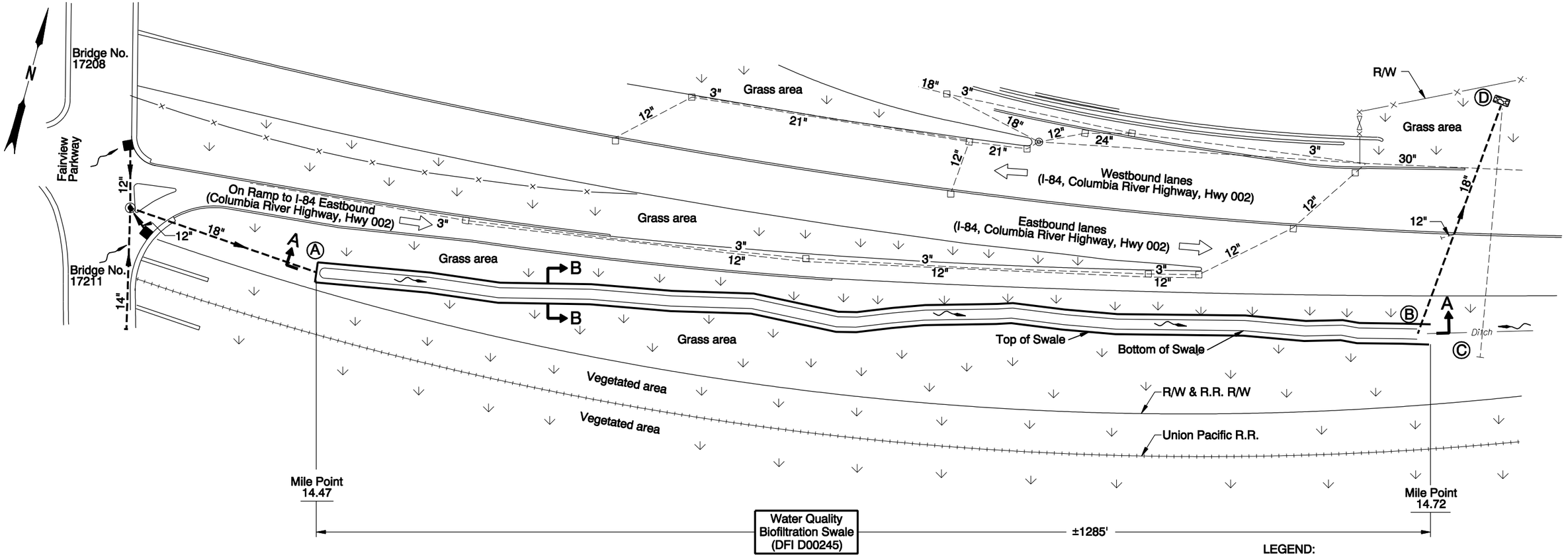
ODOT Clean Water Unit (503) 986-3008

ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 731-8290
ODEQ Northwest Region Office	(503) 229-5263

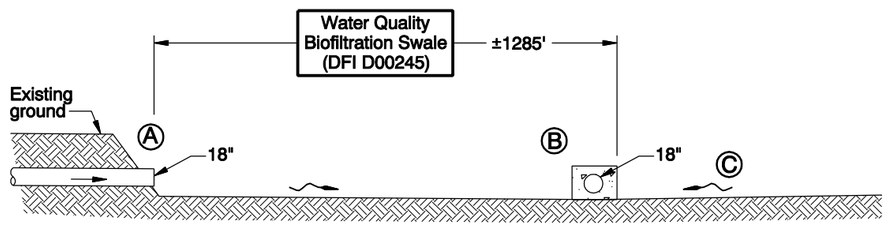
Appendix A

Content:

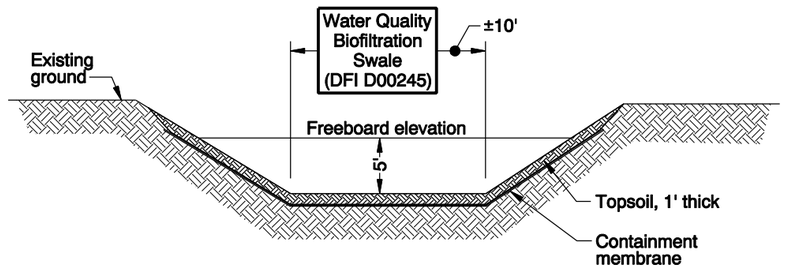
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Pipe outfall at swale inlet
- Ⓑ Swale outlet to culvert pipe with paved end slope
- Ⓒ Ditch draining to same culvert pipe as facility
- Ⓓ Culvert pipe outfall onto riprap
- and/or Manhole
- and/or Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Railroad
- Fence
- R/W Right of way
- Gate
- Barrier

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Wynee Hu

Drafted By: S. Wolfer

DFI D00245
MAINTENANCE DISTRICT 2B HWY 002
WATER QUALITY BIOFILTRATION SWALE
COLUMBIA RIVER HWY MP 14.47-14.72
MULTNOMAH 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 Thru 2A-3 Incl.	Typical Sections
2B Thru 2B-18 Incl.	Details
2C Thru 2C-24 Incl.	Traffic Control Plans
2D, 2D-2, 2D-3	Temporary Erosion Control
2E, 2E-2	Wetland Mitigation
2F Thru. 2F-5 Incl.	Pipe Data
2G Thru 2G-3 Incl.	Summary
3, 4, 5, 5A, 6, 6A, 6B, 7, 7A, 7A-2, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, 7J, 7K, 7L, 7M, 7N, 8, 8A, 8B, 9, 9A, 9B, 10, 10A, 10B, 10C, 11, 11A, 12	Plans & Profiles

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

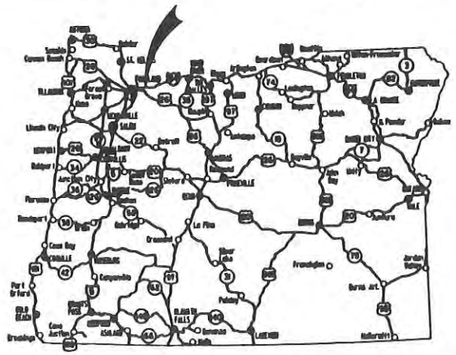
PLANS FOR PROPOSED PROJECT

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

N.E. 181ST AVE. - 223RD AVE. SEC.

COLUMBIA RIVER HIGHWAY

MULTNOMAH COUNTY
FEBRUARY, 1994



Length Of Project - 2.11 Miles
Overall Length Of Project - 51.32 Miles

CONTRACT NO. 11419

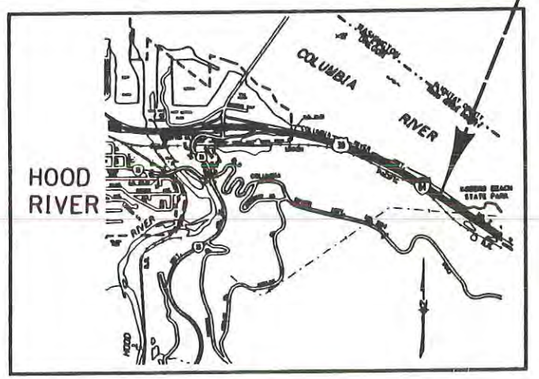
I-NH-S002(5)

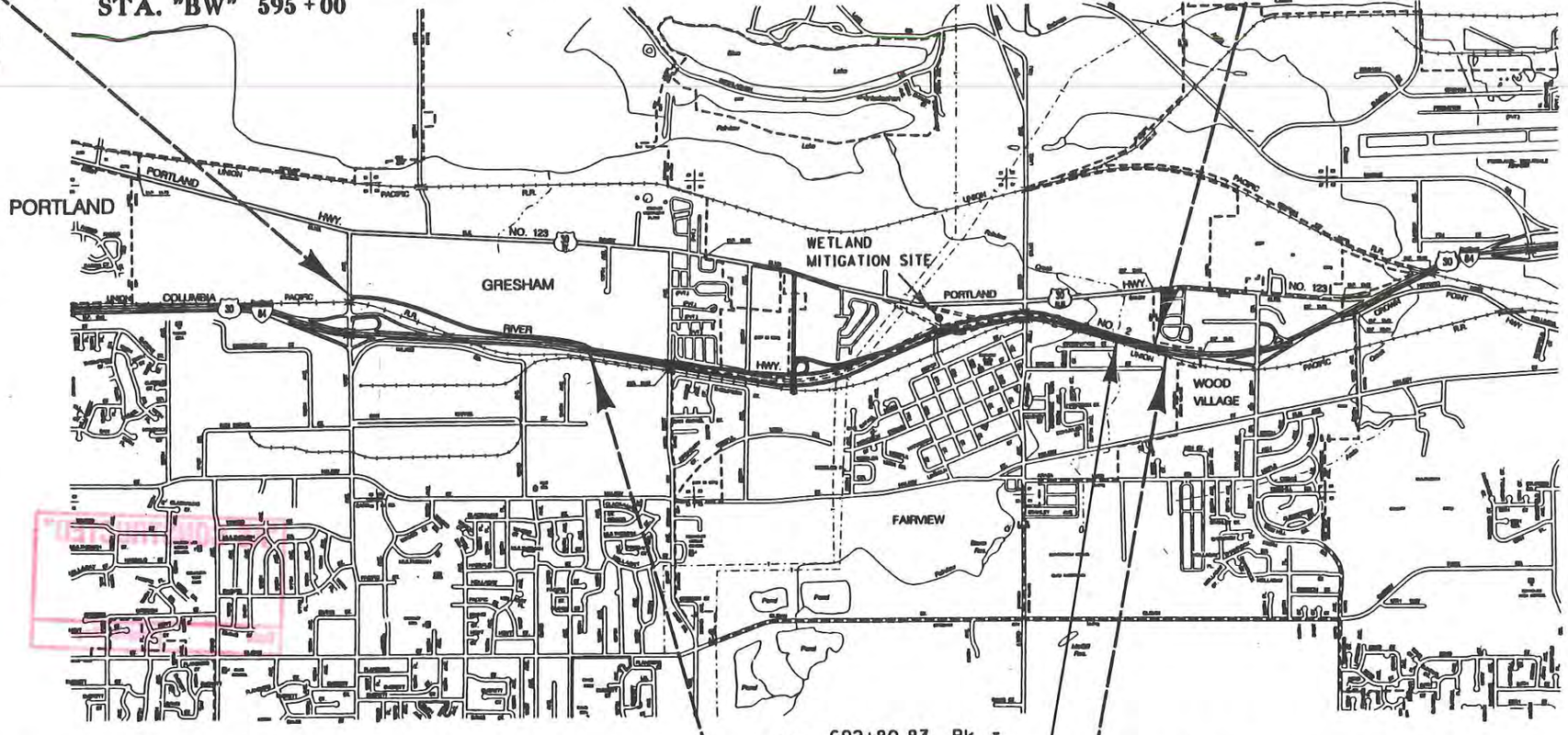
BEGINNING OF CONTRACT PROJECT
STA. "BW" 595 + 00

END OF PROJECT
STA. 701 + 10 (M.P. 15.65)

VARIABLE MESSAGE SIGN &
END OF CONTRACT PROJECT
M.P. 65.43

50 MILES





EQUA. 692+80.83 Bk. = 694+39.73 Ah.

BEGINNING OF PROJECT I-NH-S002(5)
STA. 606 + 19 (M.P. 14.04)

END OF WORK AREA
STA. "ECON" 708 + 00

T. 1 N., R. 3 E., W.M.

OREGON TRANSPORTATION COMMISSION

Michael P. Hollern	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 8418 OREGON AUGUST 22, 1978 THOMAS D. LULAY Expires Dec. 31, 19

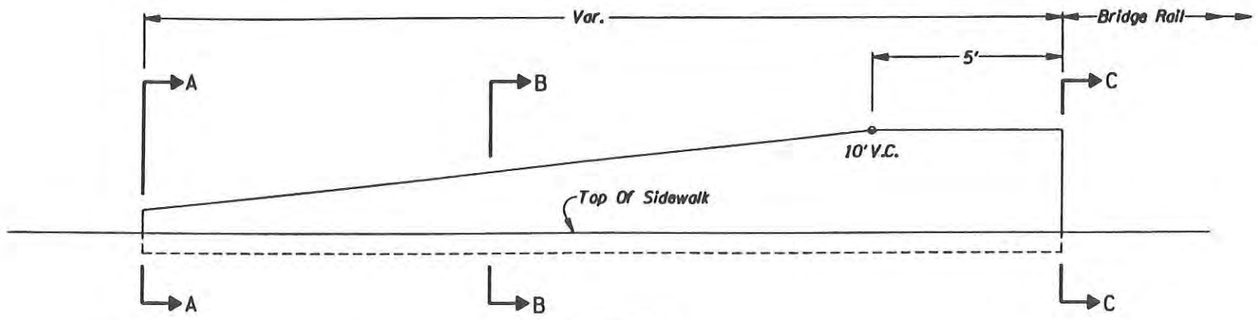
Thomas D. Lulay

TECHNICAL SERVICES MANAGING ENGINEER

N.E. 181ST AVE. - 223RD AVE. SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

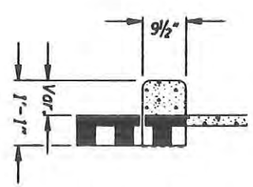
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION	I-NH-S002(5)	1

D E T A I L S

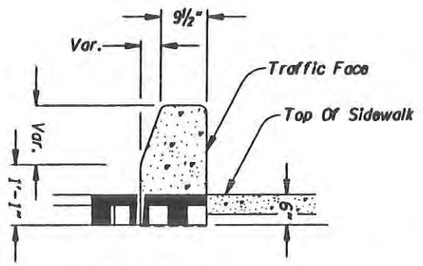


ELEVATION

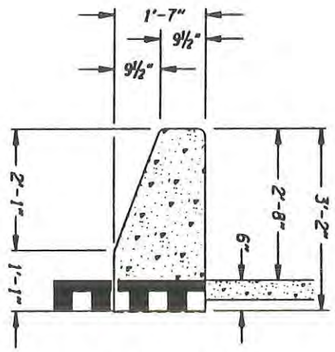
NOTE:
See Sht. 2B-5 For Typical Reinforcement Details



SECTION A-A

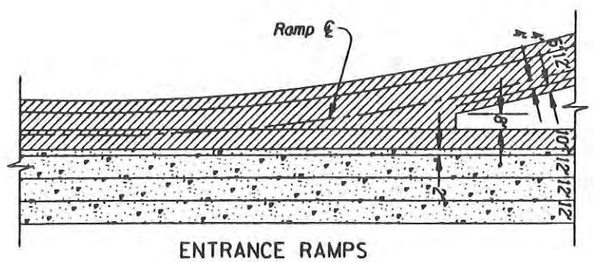


SECTION B-B

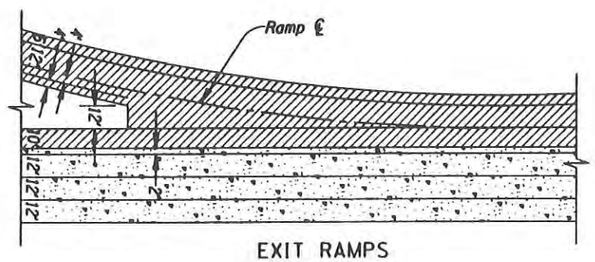


SECTION C-C

B R I D G E R A I L T R A N S T I O N



ENTRANCE RAMPS



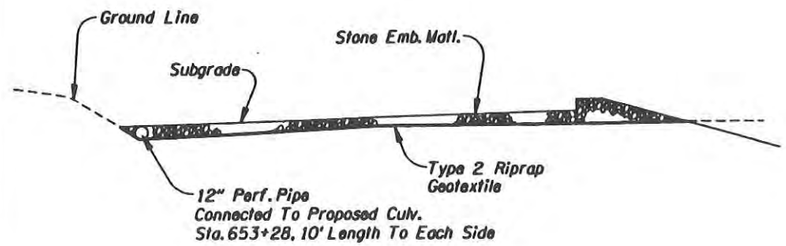
EXIT RAMPS

Continuously Reinforced Conc. Pvmt.

Plain Undowelled Conc. Pvmt.

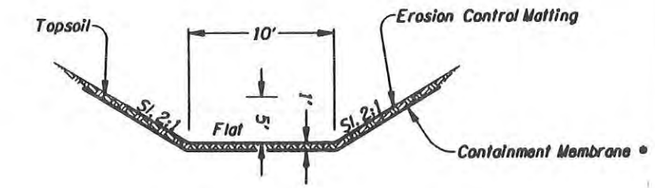
GORE PAVING

(For Locations, See Plans)



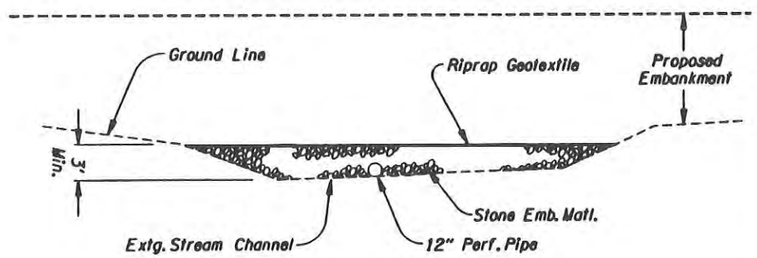
SPECIAL EMBANKMENT CONSTRUCTION

STA. 652+75 To STA. 656+00



DITCH WITH EROSION CONTROL MATTING

STA. 640+15 To STA. 653+00
* 640+15 643+15



SPECIAL DRAINAGE

(For Location, See Sht. 7B, Note 27)

"AS CONSTRUCTED"
Mark Keem
Date 10-24-00 Project Mngr

N.E. 181ST AVE. - 223RD AVE. SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		2B-12

17-DEC-1993 08:15
/usr/fd/cosentino/0078Tfd2.dt3
VIEW A1

DRAINAGE & EXISTING UTILITIES

Sec. 28, T. 1N., R. 3E., W.M.

AS CONSTRUCTED

10-24-00 CONTRACT 11419

PROJ. MGR. Mark Bean

1 REVISED 7-27-94
REMOVE BIKEPATHS, SIDEWALK RAMP & FENCE

2 REVISED 8-5-94
REVISE "BP" ALIGNMENT

SEE SHT. 7D MATCH LINE A-A

Fairview City Limits

Gate

No Inlet. MH only

outfall moved about 15' SW from fence corner

Gate Added??

"BC" LINE (For Profile, See Sht. 7K)

"BPA" LINE (For Profile, See Sht. 7N

"207TH" LINE (For Profile, See Sht. 7H)

"BP" LINE (For Profile, See Sht. 7M)

"C" LINE (For Profile, See Sht. 7K)

"B" LINE (For Profile, See Sht. 7K)

"A" LINE (For Profile, See Sht. 7J)

"D" LINE (For Profile, See Sht. 7L)

"XRR" LINE

UNION PACIFIC R.R.

205TH AVE.

Fairview City Limits

G-2 INLET

INSTALLED G-2 INLET

mowed inlet

An extra inlet was installed here

Perf. pipes

Subgrade

Spring

Taper 10:1

Note: Manhole added

Inlet & Pipe not installed

12"-24" Future Conduit

12"-24" FUTURE CONDUIT

Plug And Abandon Extg. Pipes, Shown Thus :

N.E. 181ST AVE. - 223RD AVE. SEC. COLUMBIA RIVER HIGHWAY MULTNOMAH COUNTY			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7B

C:\usr\Projects\Bias_built_search\SALEM\00787\00787rd2.pli 26-SEP-2000 13:37

VIEW B1

(1) See Sht. 6, Note 10

(2) Sta. "A" 631+20
Const. Manhole
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 372'
Tr. Exc. - 82 C.Y.
(See Drg. Nos. 2050 & 2050A)

(3) Sta. 631+20
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 90'
Tr. Exc. - 38 C.Y.

(4) Sta. 632+00
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 104'
Inst. 15" Sew. Pipe - ~~398'~~ 397'
Tr. Exc. - 178 C.Y.

(5) Sta. "B" 636+00
Const. Type "G-2" Inlet - ~~2~~ 3
Inst. 12" Sew. Pipe - ~~100'~~ 107'
Inst. 18" Sew. Pipe - 396'
Tr. Exc. - 248 C.Y.
400' of Perf. Pipe added

(6) Sta. 640+00
Const. Type "G-2" Inlet - 2
Inst. 12" Sew. Pipe - ~~116'~~ 117'
Inst. 21" Sew. Pipe - 396'
Tr. Exc. - 294 C.Y.

(7) Sta. 640+00 To Sta. 644+00
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 102'
Inst. 21" Sew. Pipe - ~~398'~~ 397'
Tr. Exc. - 294 C.Y.
Added: Const. Type "D" Inlet
Inst. 12" Sew. Pipe - 45'

(8) Sta. "207TH" 102+38
Const. Manhole
Const. Type "CG-2" Inlet - ~~3~~ 2
Inst. 12" Sew. Pipe - ~~174'~~ 118'
Inst 14" Ductile Iron Pipe - 162'
Inst. 18" Sew. Pipe - 230'
(8A) Plug 14" Ductile Iron Pipe
Tr. Exc. - 244 C.Y.

(9) Sta. "D" 641+50
Const. Type "G-2" Inlet
Inst. 12" Sew Pipe - 396'
Tr. Exc - 66 C.Y.

(10) Sta. "207TH" ~~97+15~~ 66+69
Const. Type "CG-2" Inlet - ~~2'~~ 1
Inst. 12" Sew. Pipe - ~~166'~~ 175'
Tr. Exc. - 28 C.Y.
G-2 Inlet - 1

(11) Sta. "207TH" 96+00
Const. Type ~~"CG-2" Inlet~~ G-2 Inlet
Inst. 12" Sew. Pipe - ~~120'~~ 100'
Tr. Exc. - 20 C.Y.

(12) Sta. "BC" 646+66
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - ~~50'~~ 66'
Tr. Exc. - 8 C.Y.

(13) Sta. "C" 636+30 Const. Manhole
~~Const. Type "CG-2" Inlet~~
Inst. 12" Sew. Pipe - ~~68'~~ 69'
Tr. Exc. - 12 C.Y.

(14) Sta. "B" 644+50
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - ~~182'~~ 185'
Tr. Exc. - 34 C.Y.

(15) Sta. "B" 643+26
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 110'
Tr. Exc. - 22 C.Y.

(16) Sta. "B" 643+00
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - ~~26'~~ 24'
Tr. Exc. - 5 C.Y.

(17) Sta. "B" 642+74
Const. Type "G-2" Inlet - 3
Inst. 12" Sew. Pipe - ~~244'~~ 248'
Tr. Exc. - 52 C.Y.

(18) Sta. "C" 640+80
Const. Type "G-2" Inlet - 2
Inst. 12" Sew. Pipe - 176'
Inst. 18" Sew. Pipe - 100'
Tr. Exc. - 62 C.Y.

(19) Sta. "C" 640+80 To Sta. "C" 645+64
Inst. 18" Sew. Pipe - ~~396'~~ 476'
Tr. Exc. - 144 C.Y.

(20) Sta. 633+05 Const. Manhole
Inst. 48" Culv. Pipe - ~~346'~~ 333'
Const. Ditch
4' Bottom, 2:1 Side Slopes
Tr. Exc. - 442 C.Y.
Dt. Exc. - 18 C.Y.

(21) Sta. "207" 95+00
Inst. 48" Culv. Pipe - ~~320'~~ 312'
Const. Paved End Slope - Lt. & Rt.
Tr. Exc. - 596 C.Y.
(For Details, See Sht. 2B-2)
(See Drg. Nos., 2123, 2112 & 2121)

(22) Sta. "B" 645+50
Inst. 24" Culv. Pipe - 286'
Const. Paved End Slope Lt. & Rt.
Const. Loose Riprap (Class 100) - 25 C.Y.
Tr. Exc. - 170 C.Y.
(For Details, See Sht. 2B-2)

(23) Sta. "BP" 639+92
Inst. 12" Culv. Pipe - 182'
Const. Paved End Slope Lt. & Rt.
Tr. Exc. - 62 C.Y.

(24) See Sht. 6, Note 11

(25) Sta. 640+15 To Sta. 653+00
Const. Grassy Swale
10' Bottom, 2:1 Side Slopes
Inst. Erosion Control Matting - 4,850 Sq. Yds.
Inst. Containment Membrance - 1,350 Sq. Yds.
Topsoil - 450 C.Y.
(For Details, See Sht. 2B-12)
(Earthwork Incl. In Main Rdwy. Dist.)

(26) Plug And Abandon - Manhole
- Inlet
Granular Backfill - 5 C.Y.

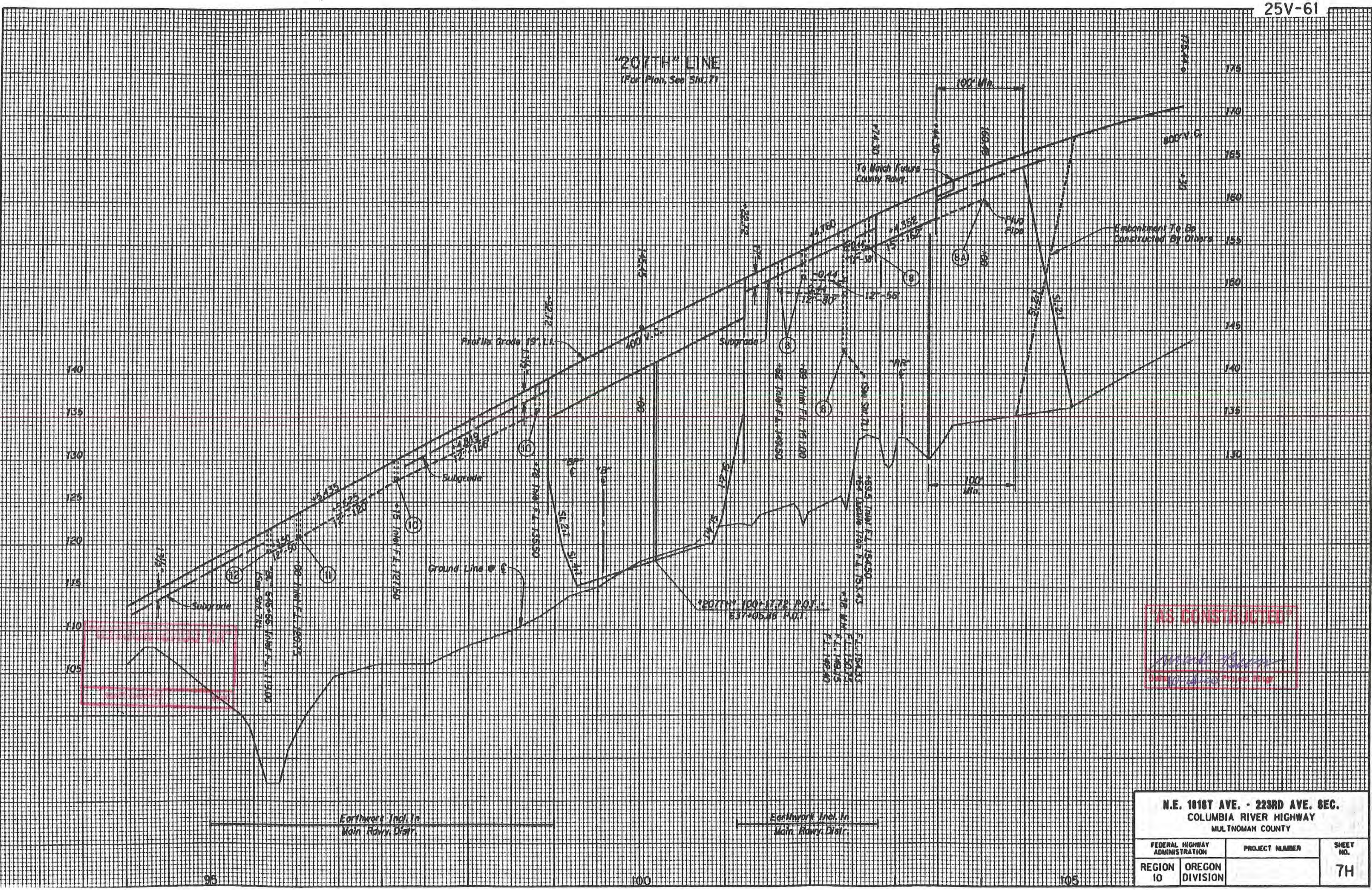
(27) Inst. 12" Drain Pipe - 570'
Const. Stone Embankment - 2,600 C.Y.
Inst. Type 2 Riprap Geotextile - 2,600 Sq. Yds.
(For Details, See Sht. 2B-12)

(28) Plant Hardstem Bulrush (Scirpus Acutus)
18" O.C. As Dir. By The Engineer
Total Hardstem Bulrush - 4,222

(29) Plant Hardstem Bulrush (Scirpus Acutus)
18" O.C. As Dir. By The Engineer
Total Hardstem Bulrush - 1,222

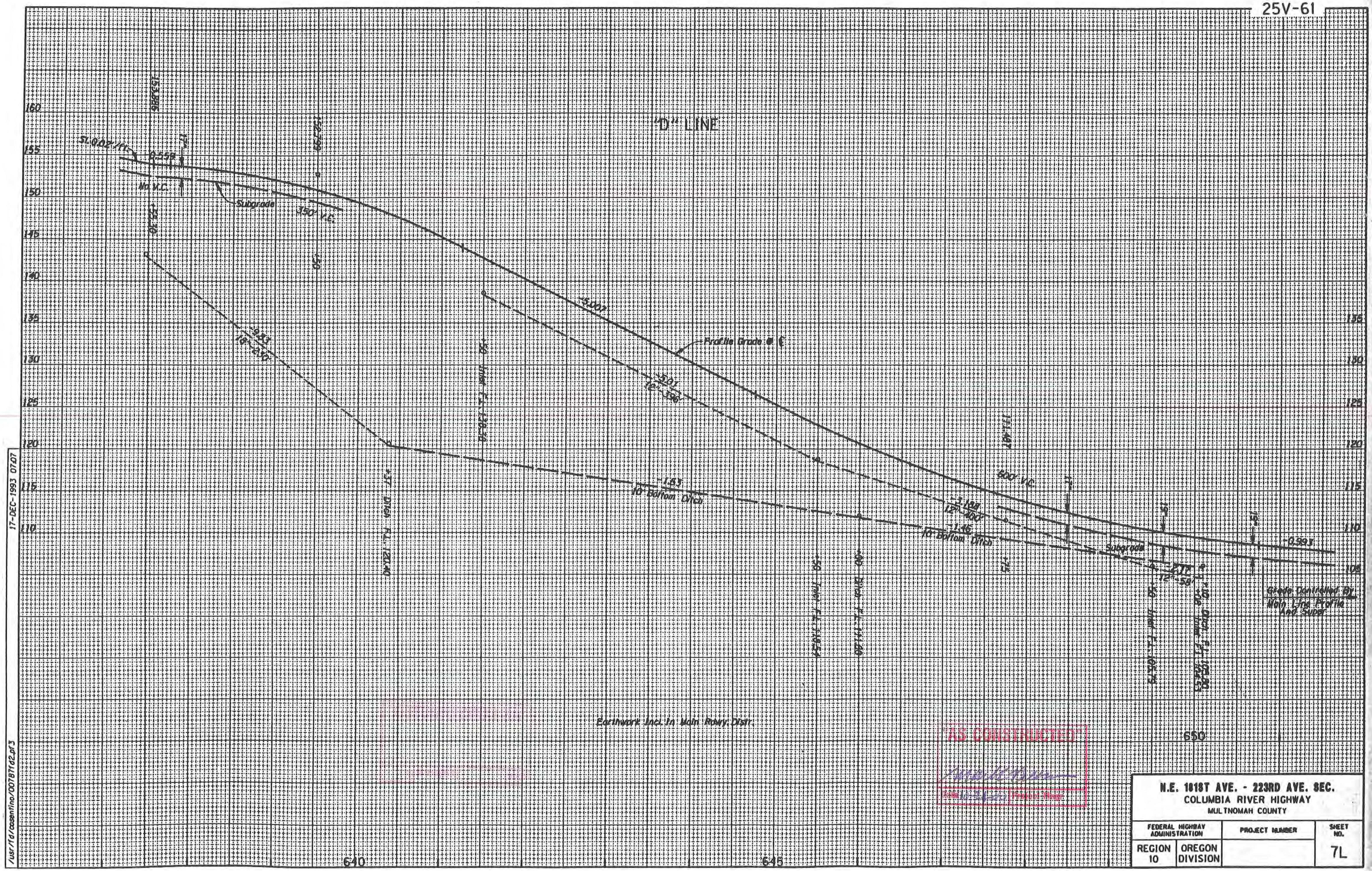
AS CONSTRUCTED
CONTRACT 11419
DATE: 10-24-00
PROJ. MGR. [signature]

N.E. 181ST AVE. - 223RD AVE. SEC. COLUMBIA RIVER HIGHWAY MULTNOMAH COUNTY			
FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		7C



N.E. 181ST AVE. - 223RD AVE. SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

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

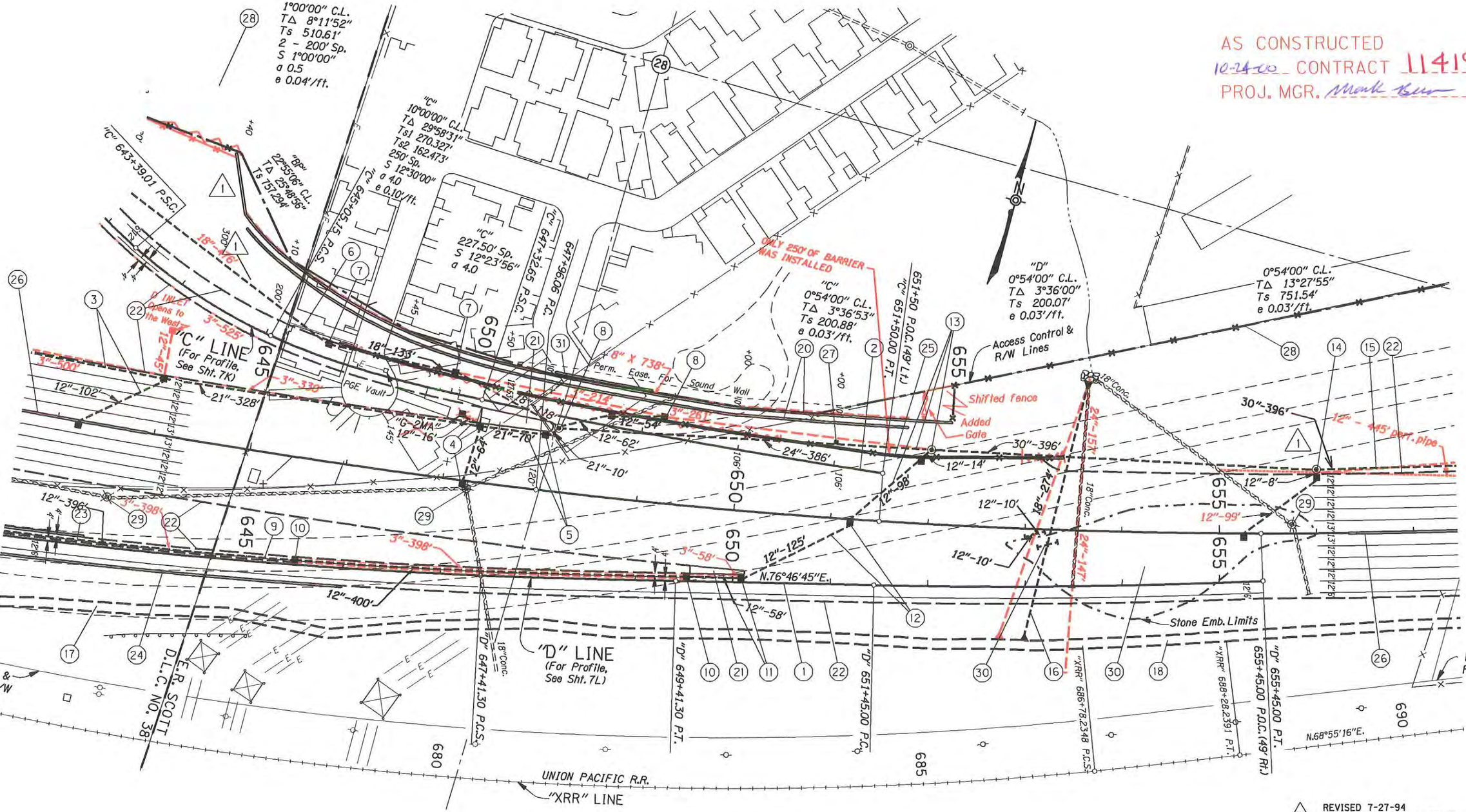

"D" LINE
160
155
150
145
140
135
130
125
120
115
110
SL.002'/Ft.
0.55%
No V.C.
Subgrade
350' V.C.
-5.00%
Profile Grade @ ℄
-5.01
12" 350'
-9.33
18" 250'
-1.63
10' Bottom Ditch
+37 Ditch F.L. 120.40
-50 Inlet F.L. 138.56
600' V.C.
-3.19%
12" 400'
-1.46
10' Bottom Ditch
Subgrade
-0.99%
12" 58'
Grade Controlled By Main Line Profile And Super
Earthwork Incl. in Main Rdwy. Distr.
AS CONSTRUCTED
640
645
650
17-DEC-1993 07:07
/usr1/d/cosentino/00787102.pf3

N.E. 181ST AVE. - 223RD AVE. SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

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

Sec. 28, T. 1N., R. 3E., W.M.

AS CONSTRUCTED
10-24-00 CONTRACT 11419
PROJ. MGR. Mark Kuss



Remove Surfacing, Shown Thus : ▭

Plug And Abandon Extg. Pipes, Shown Thus : ⊢═══⊣

1 REVISED 7-27-94
REMOVE BIKEPATH & FENCE

N.E. 181ST AVE. - 223RD AVE. SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

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

BRIDGE DETAILS CHECKED 21-SEP-2000 08:54
c:\usr\projects\Bios_built_search\salem\00787\00787rd2.pl2
VIEW A1

(1) Const. Entrance Ramp

(2) Const. Exit Ramp

(3) See Sht. 7B, Note 7

(4) Sta. 644+00 & Sta. 647+30
Const. Type "G-2" Inlet - 3
~~Const. Type "G-2MA" Inlet~~
Inst. 12" Sew. Pipe - ~~80'~~ 64'
Inst. 21" Sew. Pipe - 328'
Tr. Exc. - 170 C.Y.

(5) Sta. 648+00
Const. Type "G-2" Inlet
Inst. 21" Sew. Pipe - 70'
Tr. Exc. - 34 C.Y.

(6) See Sht. 7B, Note 19

(7) Sta. "C" 645+64 & Sta. "C" 647+00
Const. Type "G-2" Inlet - 2
Inst. 18" Sew. Pipe - 134'
Tr. Exc. - 62 C.Y.

(8) Sta. 648+10
Const. Manhole
Const. Type "G-2" Inlet - 2
Inst. 12" Sew. Pipe - ~~114'~~ 116'
Inst. 18" Sew. Pipe - 118'
Inst. 21" Sew. Pipe - ~~12'~~ 10'
Tr. Exc. - 80 C.Y.

(9) See Sht. 7B, Note 9

(10) Sta. "D" 645+50 & Sta. "D" 649+50
Const. Type "G-2" Inlet - 2
Inst. 12" Sew. Pipe - 400'
Tr. Exc. - 68 C.Y.

(11) Sta. "D" 650+08
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 58'
Tr. Exc. - 12 C.Y.

(12) Sta. 651+20
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 126'
Tr. Exc. - 24 C.Y.

(13) Sta. 652+00
Const. Manhole
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 112'
Inst 24" Sew. Pipe - 386'
Tr. Exc. - 336 C.Y.

(14) Sta. 656+00
Const. Manhole
Const Type "G-2" Inlet - 2
Inst 12" Sew. Pipe - 106'
Inst. 30" Sew. Pipe - 396'
Tr. Exc. - 310 C.Y.

(15) Sta. 656+00 To Sta. 660+00
Inst. 30" Sew. Pipe - 400'
Tr. Exc. - 328 C.Y.

(16) Sta. 653+28
Inst. 18" Culv. Pipe - 274'
Const. Paved End Slope, Lt. & Rt.
Const. Loose Riprap (Class 100) - 10 C.Y.
Tr. Exc. - 158 C.Y.

(17) See Sht. 7B, Note 25
4:1 Side Slope In
2:1 Side Slope Out

(18) Sta. 653+00 To Sta. 664+33
Const. Ditch
10' Bottom, Var. 4:1 Side Slope In
2:1 Side Slope Out
(Earthwork Incl. In Main Rdwy. Dist.)

(19) Note Removed From Plan

(20) Sta. "BP" 646+46 To Sta. "BP" 654+95
Bridge No. 17207
Const. Conc. Retaining Wall
Const. Precast Soundwall
(See Drg. Nos. 49841, 49842 & 49857)

(21) Const. P. C. Conc. Surfacing - 130 Sq. Yds.
Thkn. - 4"
(For Details, See Sht. 2B-2)

(22) Const. Type "B" Curb

(23) See Sht. 7, Note 13
Const. Conc. Shldr. Barrier
Const. Conc. Barrier Transition
(For Details, See Sht. 2B-11)

(24) See Sht. 7, Note 14
Const. Conc. Shldr. Barrier
Const. Conc. Barrier Transition
(For Details, See Sht. 2B-11)

(25) ~~Sta. "C" 645+75 To Sta. 653+37~~ Approx. "C" 650+40 To 652+90
Const. Conc. Shldr. Barrier ~~762.5'~~ Approx. 250'
Const Type CL-2 Fence - ~~762.5'~~ Approx. 250'
Flare Rate=20:1, W=13', E=0
Bury End
(For Details, See Sht. 2B-4)

(26) See Sht. 7, Note 22
Sta. 639+47.50 To Sta. 701+10
Const. Conc. Median Barrier

(27) Sta. 651+00
Const. Cantilever Sign Support
(See Drg. No. 49850)

(28) Const. Type CL-6 Fence

(29) Plug And Abandon Manhole - 3
Granular Backfill - 10 C.Y.

(30) Sta. 652+75 To Sta. 656+00
Inst. 12" Drain Pipe - 20'
Inst. Type 2 Riprap Geotextile - 1,620 Sq. Yds.
Const. Stone Embankment - 500 C.Y.
(For Details, See Sht. 2B-12)

(31) Const. Conc. Shldr. Barrier - 50'
Const. Conc. Shldr. Barrier Transition - 50'

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To Face Sht. 8