OPERATION & MAINTENANCE MANUAL

DFI No.: D00389
Facility Type: Water Quality Biofiltration Swale

MARCH, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00389**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 40V-017
Location:	District: 7
	Highway No.: 234
	Mile Post: 12.27 / 12.29 (beg./end)
	Description: This facility is located on the western side of the old Hwy 99 (Hwy 234, Oakland - Shady Highway) between the southern approach to the Old Winchester Bridge and the NB I-5 Bridge over the North Umpqua River. Access can be obtained from Amacher Park.

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 Hydraulics Engineer (541) 957-3693

Or

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

3. Construction

Engineer of Record:	ODOT Designer – Region 3 Tech. Center, James Burford, 541-957-3573
Facility construction:	2006
Contractor:	Hamilton Construction Company.

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.

Stormwater is conveyed to the facility through a storm sewer system that collects water from the Old Winchester Bridge. The stormwater is collected at the south end of the bridge through a series of three inlets. The stormwater is then directed to a Type G-2 inlet where the flow exits due to head pressure generated by the system. Water conveyed into the swale then undergoes treatment as it flows through the length of the channel. The treated water flows out of the swale and discharges directly into the North Umpqua River.

A. Maintenance equipment access:

Maintenance crew can access the facility from the parking lot of Amacher Park.

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☐ Porous Pavers
☐ Liners
☐ Underdrains

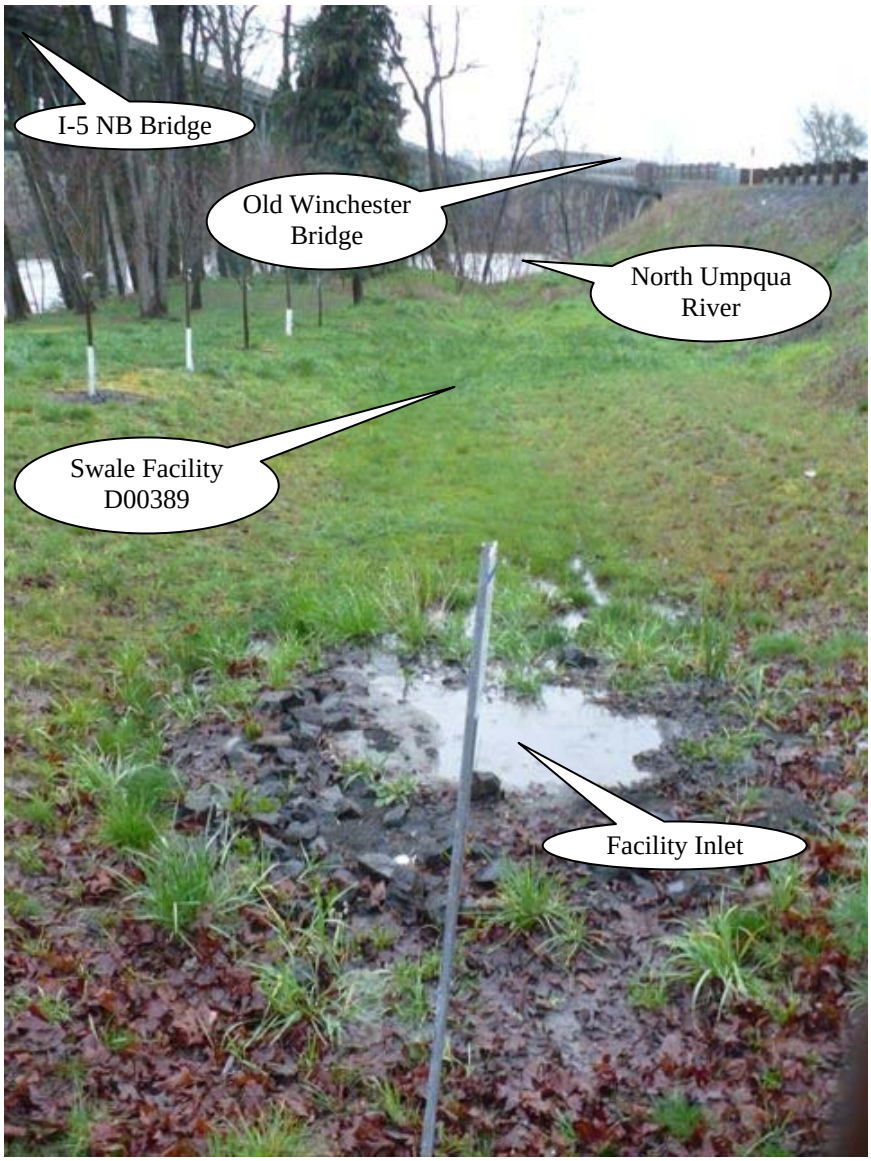


Photo 1: Looking north, flow into the swale is generated from the Old Winchester Bridge shown in the upper right portion of the picture. Water is flowing out of the Type G-2 inlet shown due to head pressure generated by the storm sewer system. The water is flowing towards the top of the picture and outfalls directly into the North Umpqua River.

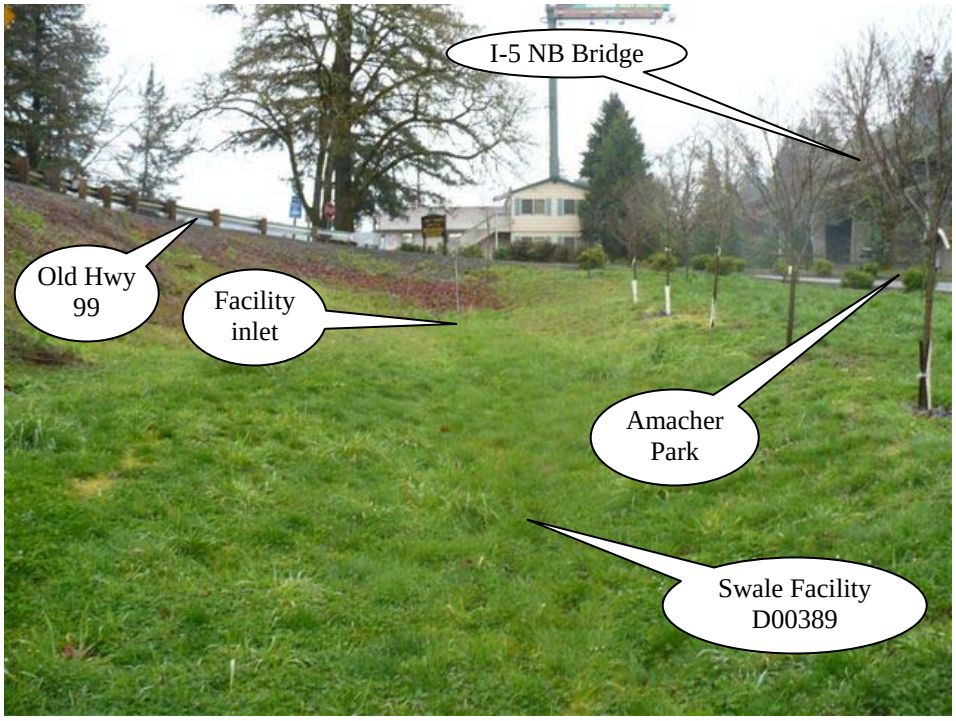


Photo 2: Looking south, the Type G-2 facility inlet is shown towards the upper portion of the picture. Water flows towards the bottom of the picture.

Photo 3: Looking north, the riprap pad shown is located at the outlet of the swale as an erosion control measure.

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the flow path and outlet channel of the water quality biofiltration swale. Constructing a sandbag dam upstream from the facility outlet/riprap pad may help facilitate this process; see Photo 3. Otherwise, the storm sewer system that contributes flow to the swale can be used to store a limited volume of liquid (less than 2,000 Gallons) by blocking the Type G-2 inlet. This method of liquid storage would generate static pressures approximately equal to 10 psi at the facility inlet; therefore a method to resist this pressure would be required in order to successfully store liquid in the storm system itself.

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 is no auxiliary outlet for 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

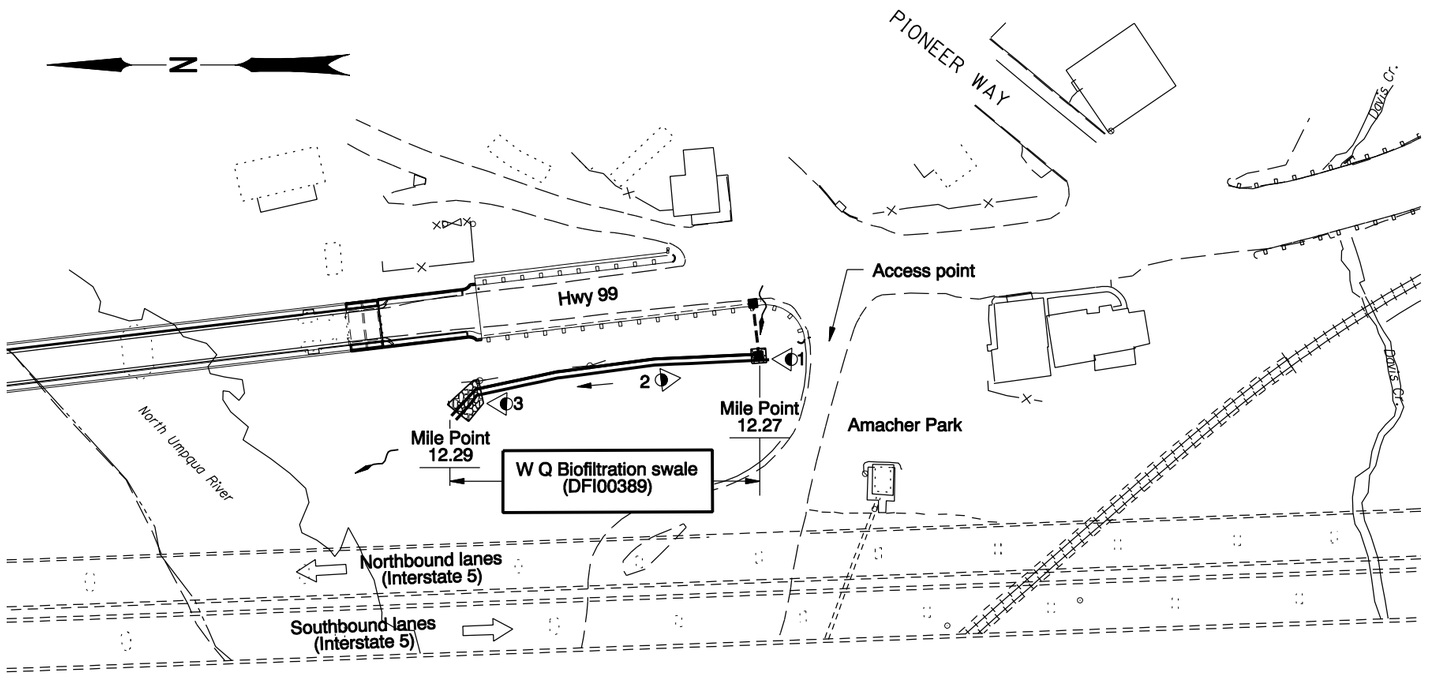
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(541) 957-3594
ODEQ Northwest Region Office	(503) 229-5263

Appendix A

Content:

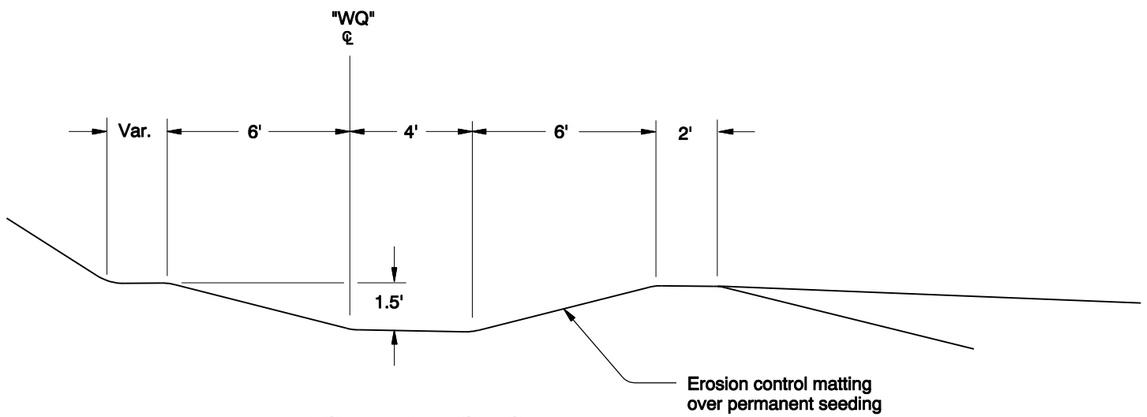
- **Operational Plan and Profile Drawing(s)**



LEGEND:

- Photo Location / Direction
- Manhole (and / or)
- Inlet (and / or)
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

PLAN
N.T.S.



BIOFILTRATION SWALE
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: J. Carpenter

Drafted By: B. Shafer

DFI D00389
MAINTENANCE DISTRICT 7 HWY 234
WATER QUALITY BIOFILTRATION SWALE
OAKLAND - SHADY HIGHWAY MP 12.27/12.29
DOUGLAS COUNTY

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DFI00389

Appendix B

Content:

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

Revised Plan
Sheets Incorporated

40V-17

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Std. Dwg. Nos.

Revised Plan
Sheets Incorporated

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION

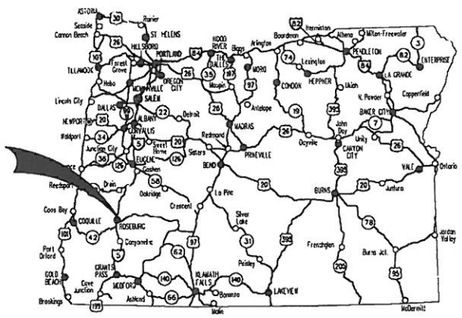
PLANS FOR PROPOSED PROJECT

GRADING, PAVING & STRUCTURES

OR99: N UMPQUA RIVER
(OLD WINCHESTER) BRIDGE REHAB

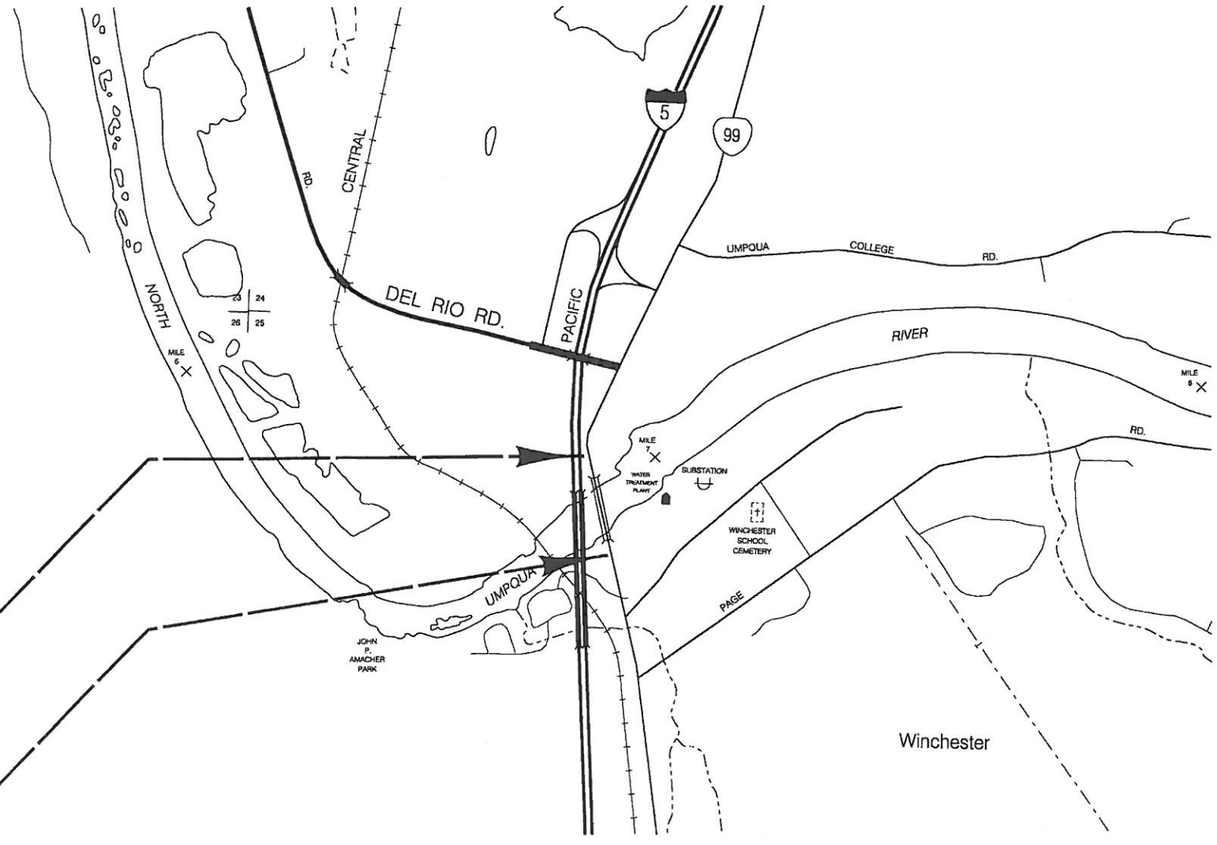
OAKLAND - SHADY HIGHWAY

DOUGLAS COUNTY
NOVEMBER, 2006



Overall Length Of Project - 0.27 Miles

ATTENTION:
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0010 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center. (Note: The Telephone Number For The Oregon Utility Center Is (503) 232-1987.)



BEGINNING OF PROJECT
SO-S234(008)
STA. "C" 2270+14.00 (M.P. 12.12)

END OF PROJECT
SO-S234(008)
STA. "C" 2285+98.00 (M.P.12.29)

N

T.26 S.,
R.6 W.,W.M.

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Pape	COMMISSIONER
Janice J. Wilson	COMMISSIONER
Mathew L. Garrett	DIRECTOR OF TRANSPORTATION

RENEWAL DATE: 12-31-2006
Catherine M. Nelson
TECHNICAL SERVICES MANAGING ENGINEER

OR99: N. UMPQUA RIVER
(OLD WINCHESTER) BRIDGE REHAB
OAKLAND - SHADY HIGHWAY
DOUGLAS COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	SO-S234(008)	1

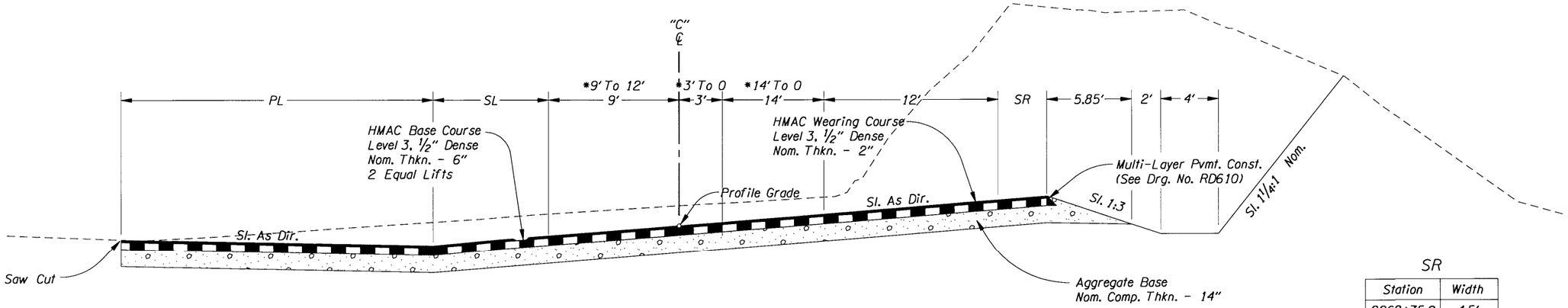
F:\ODOT_DATA\Projects\OLD WINCHESTER BR\11851R3R.pl1 9/12/2006 11:27:03 AM hwye32v

SL

Station	Width
2268+75.0	4.0'
2272+15.0	4.0'
2272+49.5	10'
2273+00.0	10'
2274+21.5	4.0'

PL

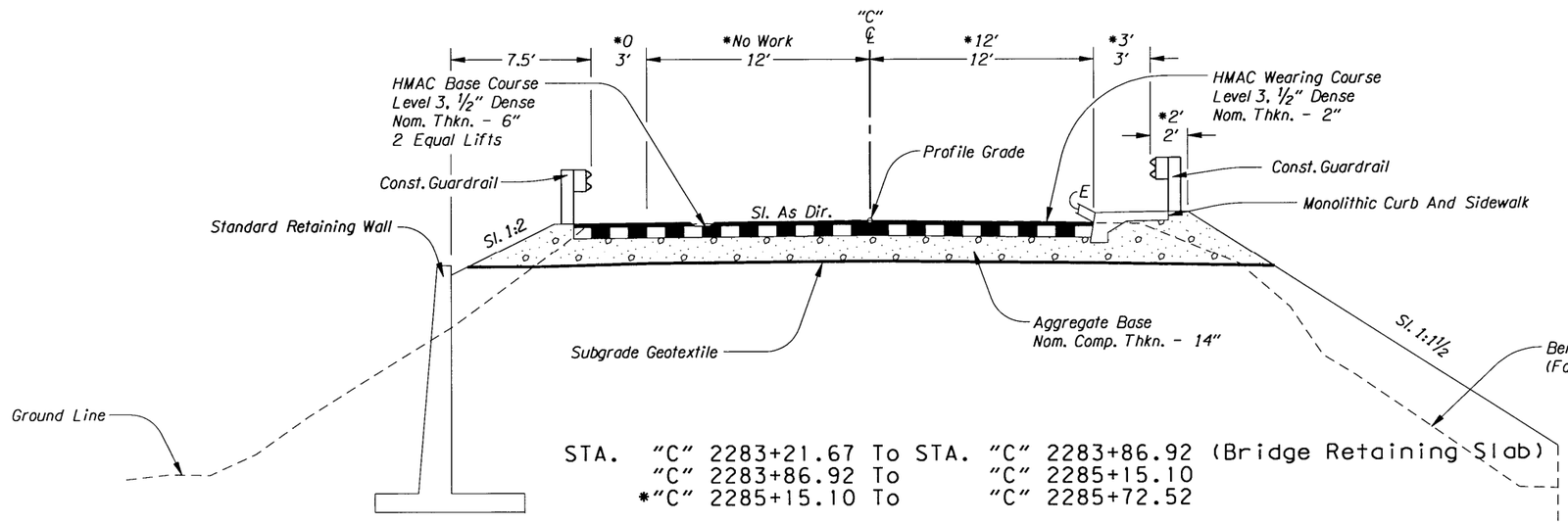
Station	Width
2272+49.5	38.3'
2273+00.0	30.37
2274+21.5	3.9'



SR

Station	Width
2268+75.0	4.5'
2273+06.0	4.5'
2274+21.5	3.5'

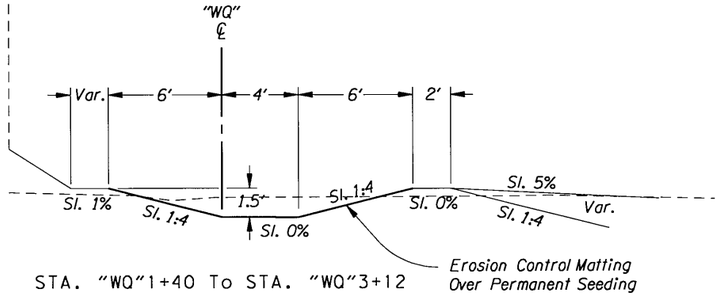
STA. "C"2268+75.00 To STA. "C"2273+06.00
*"C"2273+06.00 To "C"2274+10.52
"C"2274+10.52 To "C"2274+21.50 (Approach Slab)
"C"2274+21.50 To "C"2283+21.67 (Old Winchester Bridge)



CURB HEIGHT TABLE

Station	E
2283+86.92	10.25"
2284+72.00	6"
2285+72.52	6"

STA. "C" 2283+21.67 To STA. "C" 2283+86.92 (Bridge Retaining Slab)
"C" 2283+86.92 To "C" 2285+15.10
*"C" 2285+15.10 To "C" 2285+72.52



STA. "WQ"1+40 To STA. "WQ"3+12

REGISTERED PROFESSIONAL ENGINEER
64309PE
OREGON
MAY 9, 2000
JAMES PATRIC BURFORD
Expires Dec. 31, 2007

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

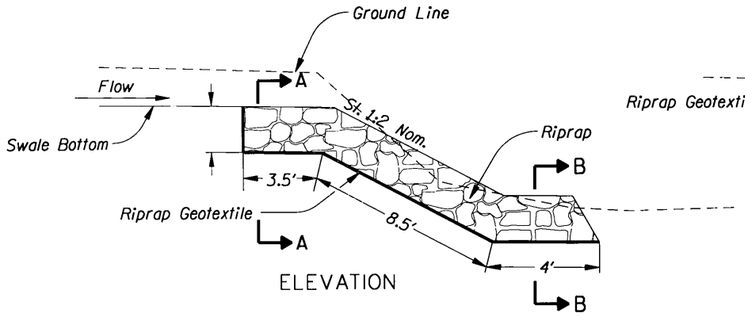
OR99: N. UMPQUA RIVER (OLD WINCHESTER) BRIDGE REHAB.

OAKLAND - SHADY HIGHWAY
DOUGLAS COUNTY

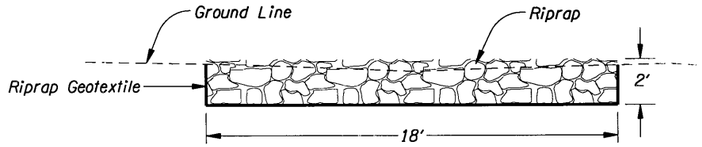
Design Team Leader - James Burford
Designed By - Richard D. Coffel
Drafted By - Linda Coffel

TYPICAL SECTIONS

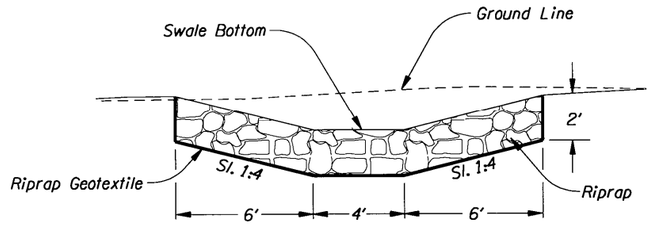
SHEET NO. 2



ELEVATION



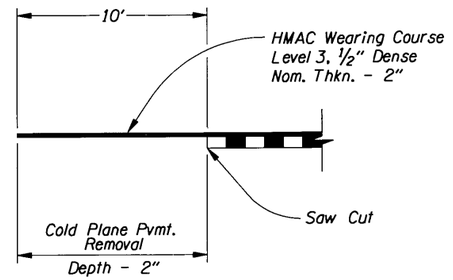
SECTION B-B



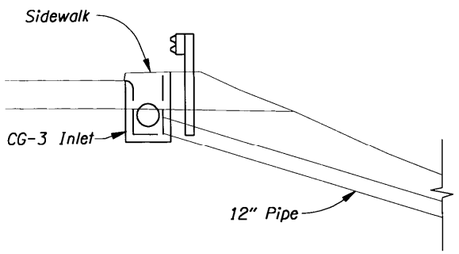
SECTION A-A

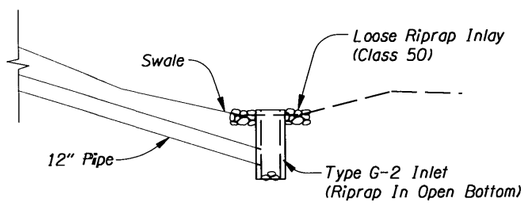
LOOSE RIPRAP INLAY

(For Location, See Sht. 4, Note 2)



PAVEMENT MATCH @ PROJECT ENDS



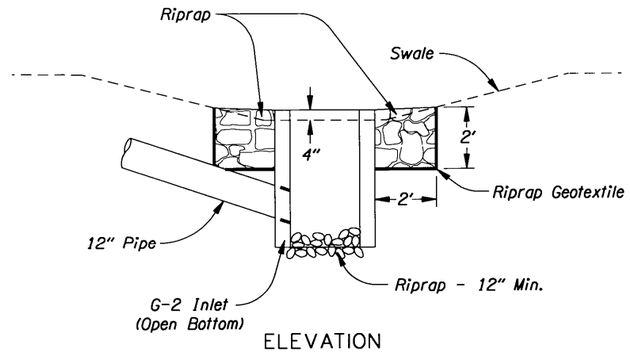


ELEVATION

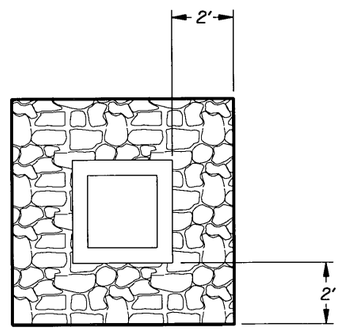
ENERGY DISSIPATER

(For Location, See Sht. 4A, Note 3)

SLOPE PIPES AND DETAILS



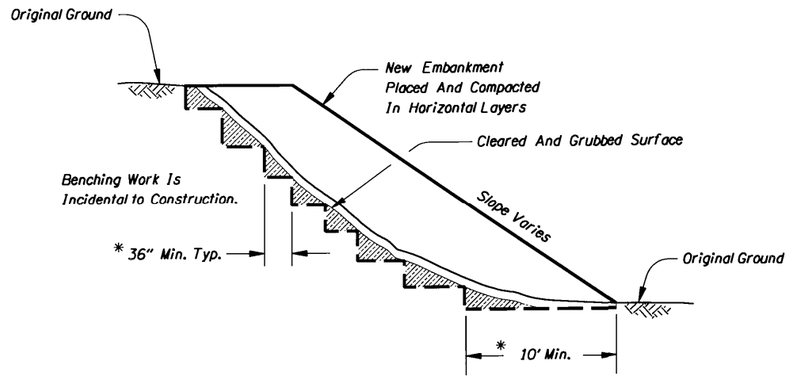
ELEVATION



PLAN

LOOSE RIPRAP INLAY

(For Location, See Sht. 4A, Note 3)



STANDARD EMBANKMENT CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
64309PE
OREGON
MAY 9, 2000
JAMES PATRIC BURFORD
Expires Dec. 31, 2007

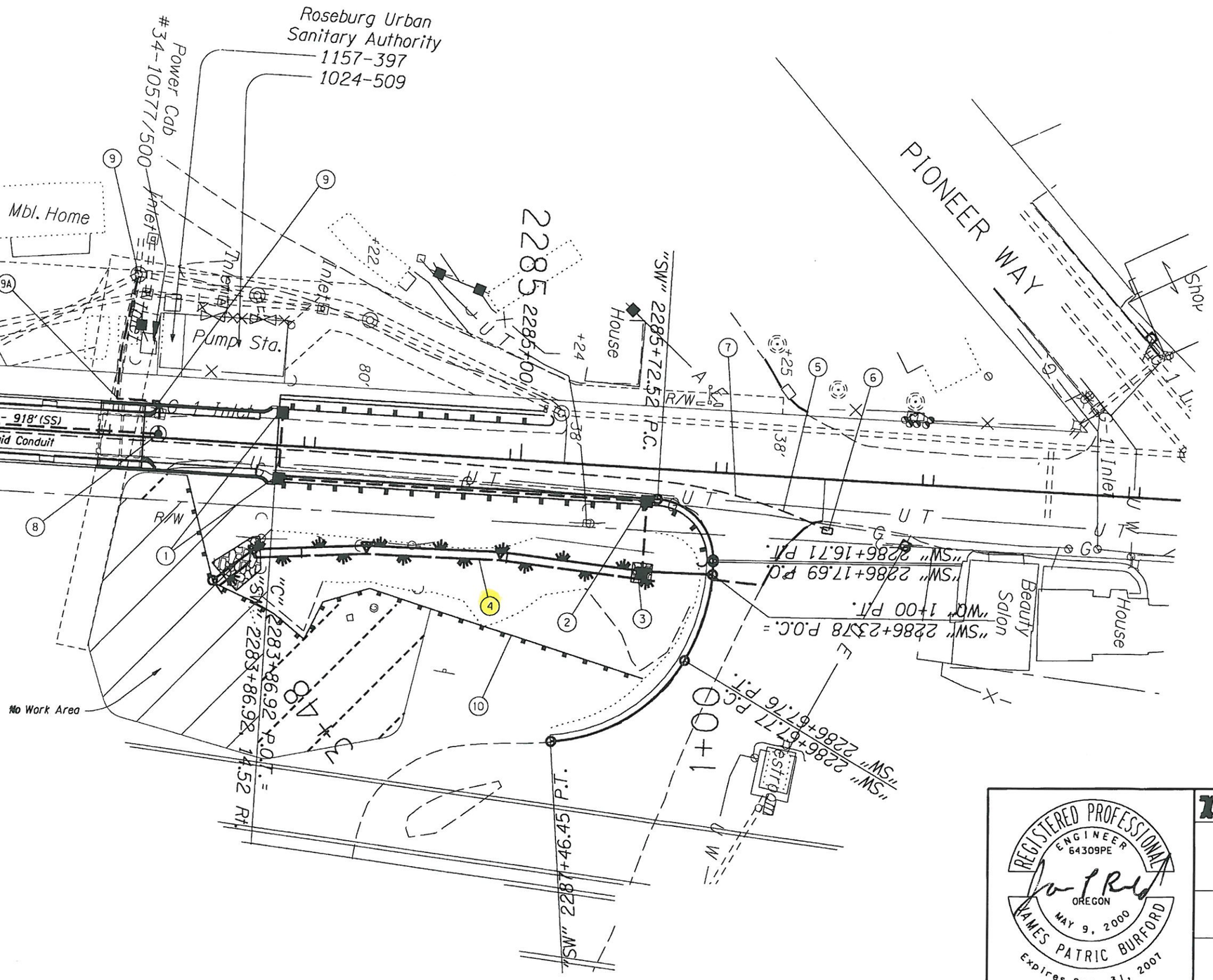
OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OR99: N. UMPQUA RIVER (OLD WINCHESTER) BRIDGE REHAB.
OAKLAND - SHADY HIGHWAY
DOUGLAS COUNTY

Design Team Leader - James Burford
Designed By - Richard D. Coffel
Drafted By - Linda Coffel

DETAILS

SHEET NO. 2A



(1) *Sta. "C" 2283+74.40, Lt. & Rt.*
Const. Type "CG-3" Inlet
Const. Type "G-2" Inlet
Inst. 18" Sew. Pipe - 31.7'
5' Depth
Connect To Bridge Drainage System
(See Dwg. Nos. RD300, RD326, RD372 & RD380)
(For Bridge Dwgs., See Sht. 1A)

(2) *Sta. "C" 2283+88.66 To Sta. "C" 2285+67.40, Rt.*
Const. Type "CG-3" Inlet
Inst. 18" Sew. Pipe - 178.7'
5' Depth

(3) *Sta. "C" 2285+67.40, Rt.*
Const. Type "G-2" (Mod.) Inlet (No Bottom)
Inst. 12" Sew. Pipe - 37'
5' Depth
Const. Loose Riprap (Class 50) Inlay - 2.5 Cu. Yd.
(See Dwg. No. RD364)
(For Details, See Sht. 2A)

(4) *Const. Water Quality Swale*
(For Details, See Shts. 2, 2A & 4B-2)

(5) *Sta. "C" 2283+92.00 To Sta. "C" 2286+56.00 Rt.*
Const. 4" Sch. 40 PVC Utility Conduit - 268'
5' Depth
Connect to Conduit Under Bridge

(6) *Sta. "C" 2286+56.00, 24.70' Rt.*
Const. Intercept Vault (By Others)

(7) *Sta. "C" 2285+72.52 To Sta. "C" 2286+53.00 Rt.*
Const. Trench Resurfacing - 60 Sq. Yd.

(8) *Sta. "C" 2274+11.3 1.24' Lt. To Sta. "C" 2283+29.02, 1.83' Lt.*
Const. Sanitary Sewer Manhole
Const. 10" Sanitary Sewer Pipe - 918'
(Class 50 Ductile Iron, Cement Lined)
(For Bridge Connection Details See Sht. 1A)

(9) *Sta. "C" 2283+29.02 1.83' Lt. To Sta. "C" 2283+14.28, 78.37' Lt.*
Const. 10" Sanitary Sewer Pipe - 100'
(Class 50 Ductile Iron, Cement Lined)
Connect To Extg. Manhole

(9A) *Const. "MJ" Joint W/ Retainer Gland*

(10) *Const. Sediment Fence, Unsupported*

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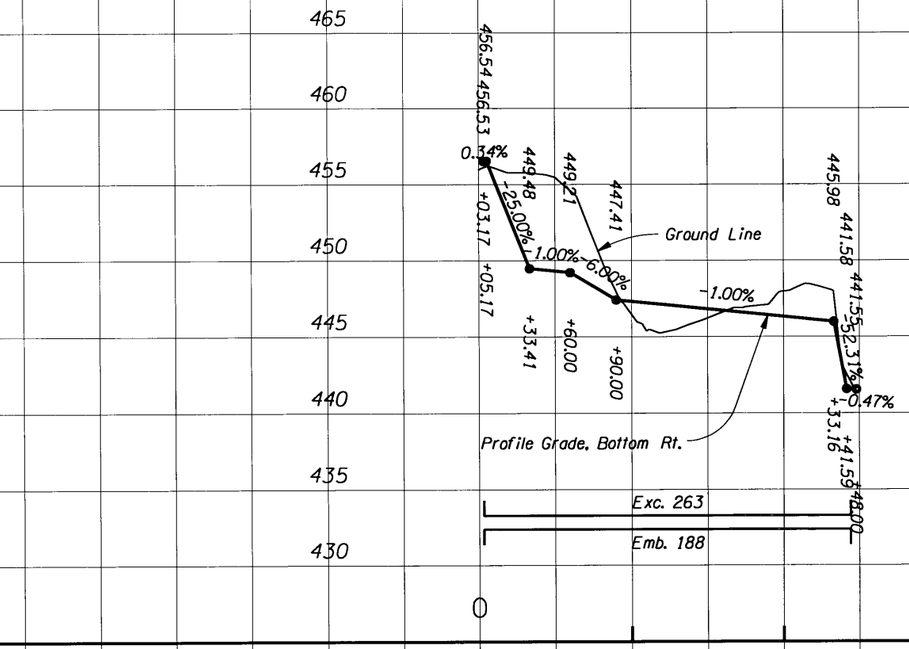
OAKLAND - SHADY HIGHWAY
DOUGLAS COUNTY

Design Team Leader - James Burford
Designed By - Richard D. Coffel
Drafted By - Linda Coffel

DRAINAGE AND UTILITIES

SHEET NO. 4A

"WQ" LINE



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PROFILE

SHEET NO. 4B-2