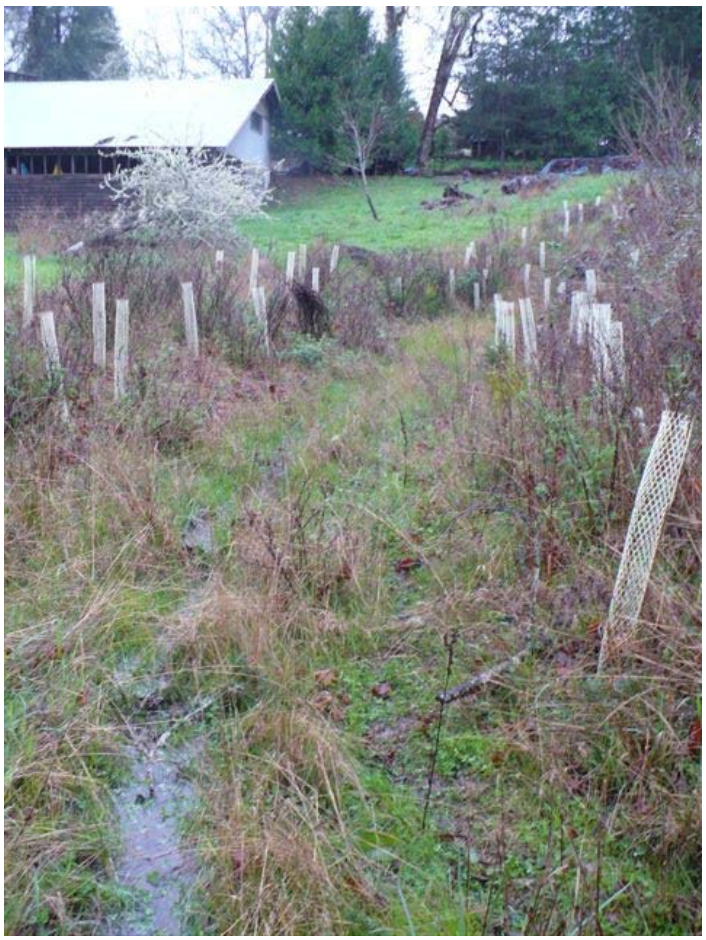
OPERATION & MAINTENANCE MANUAL

DFI No.: D00395
Facility Type: Water Quality Biofiltration Swale



MARCH, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00395**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 41V-055
Location:	District: 7
	Highway No.: 045
	Mile Post: 36.35 / 36.37 (beg./end)
	Description: This facility is located on the southern side of OR38 (Hwy 045, Umpqua Highway). Access can be obtained from Main Street in the City of Elkton.

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:	Consultant Designer – T.Y. Lin International., Kevin Ducharme, P.E., 503-385-4200.
Facility construction:	2008
Contractor:	Slayden Construction Group

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 from a storm sewer system that collects stormwater runoff from the Elk Creek Bridge. The storm sewer system terminates with 12-inch pipe at the swale facility inlet. Refer to the Operational Plan in Appendix A for further information. Water conveyed into the swale undergoes treatment as it flows through the length of the channel. The treated water flows out of the swale and directly into Elk Creek.

A. Maintenance equipment access:

Maintenance crews can access the facility from a point near the intersection of the OR38 and Main Street.

B. Heavy equipment access into facility:

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

C. Special Features:

☒ Amended Soils
☐ Porous Pavers
☐ Liners
☐ Underdrains

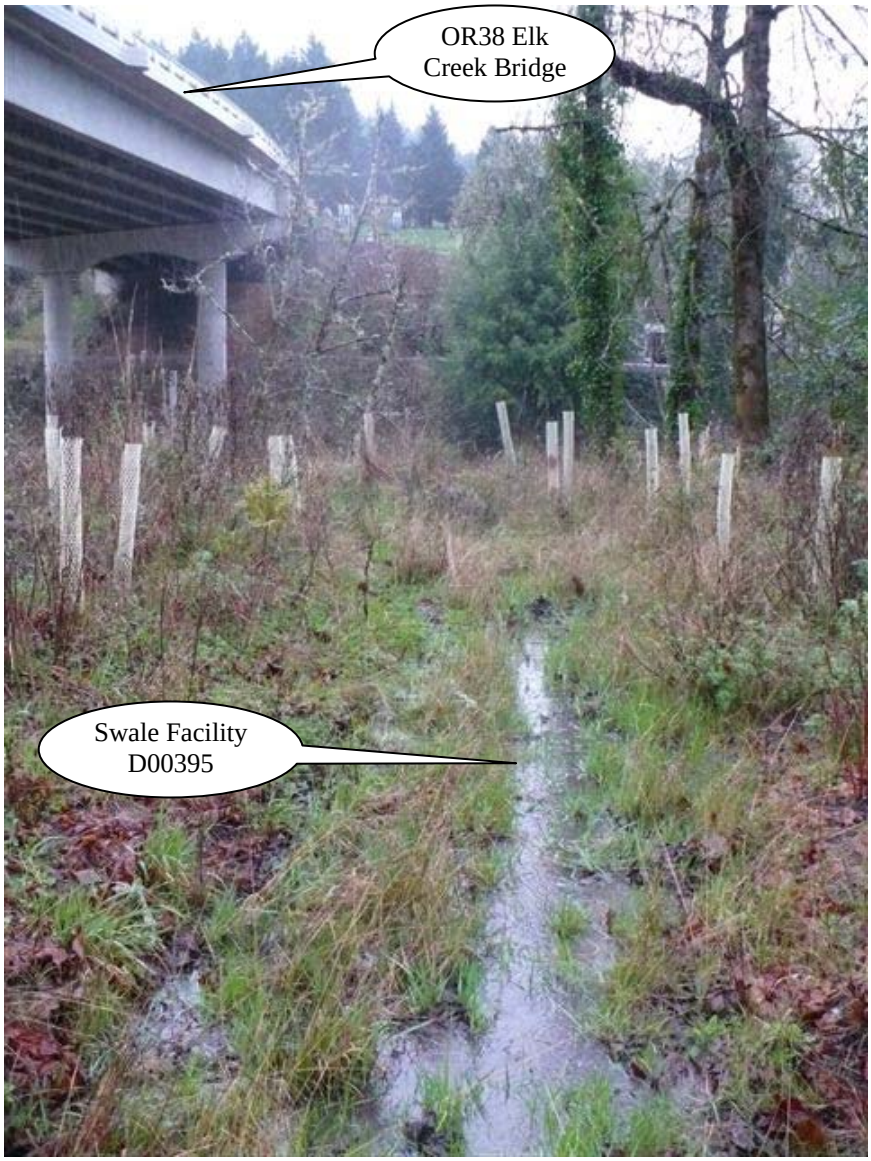


Photo 1: Looking east, storm flow generated from the Elk Creek Bridge on the left side of the picture contributes stormwater into the swale. Stormwater is flowing from the bottom of the picture towards Elk Creek at the top of the picture.

Photo 2: Looking east, stormwater is flowing from the bottom of the picture towards Elk Creek at the top of the picture.

Photo 3: Looking west, storm flow from the Elk Creek Bridge discharges on the riprap slope shown in the upper portion of the picture. The stormwater enters the swale at the base of the riprap slope and flows towards the bottom of the picture.

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 riprap basins may help facilitate this process; see Photo 2.

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

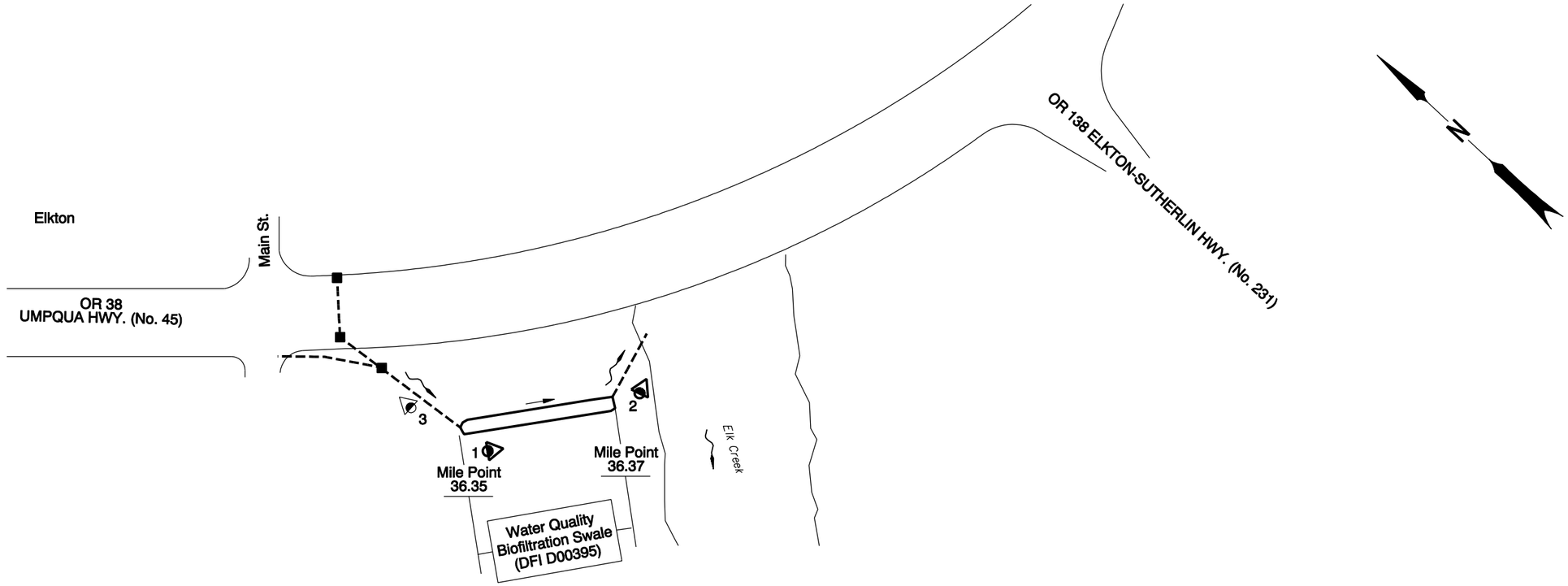
Contact any of the following for more detailed information about management of waste materials found on site:

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

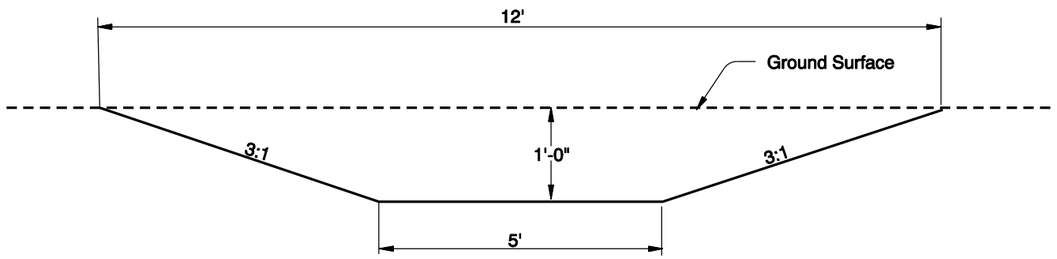
Appendix A

Content:

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



PLAN
N.T.S.



BIOSWALE SECTION
N.T.S.

LEGEND:

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

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: J. Carpenter

Drafted By: B. Shafer

DFI D00395
MAINTENANCE DISTRICT 7 HWY 045
WATER QUALITY BIOFILTRATION SWALE
UMPQUA HIGHWAY MP 36.35/36.37
DOUGLAS COUNTY

F:\ODOT_DATA\Projects\hydro\Jered\O&M Manual\DFI00395\DFI00395.dgn :: OM_Default 7/1/2011 12:05:31 PM hwye33h

DFI00395

Appendix B

Content:

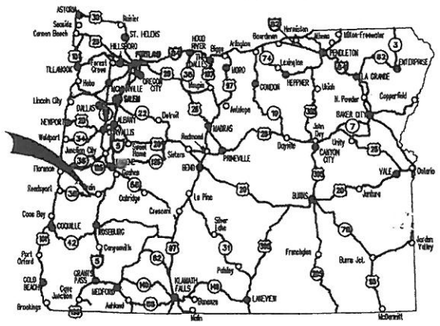
- **ODOT Project Plan Sheets**
  - ***Cover/Title Sheet***
  - ***Water Quality/Detention Plan Sheets***
  - ***Other Details***

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED PROJECT

STRUCTURES, SIGNING & PAVING

OR38: ELK CREEK TO HARDSCRABBLE CREEK DESIGN BUILD
BUNDLE 401

UMPQUA HIGHWAY (NO. 45)
DOUGLAS COUNTY
JANUARY 2008



Overall Length Of Project – 11.11 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.)

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

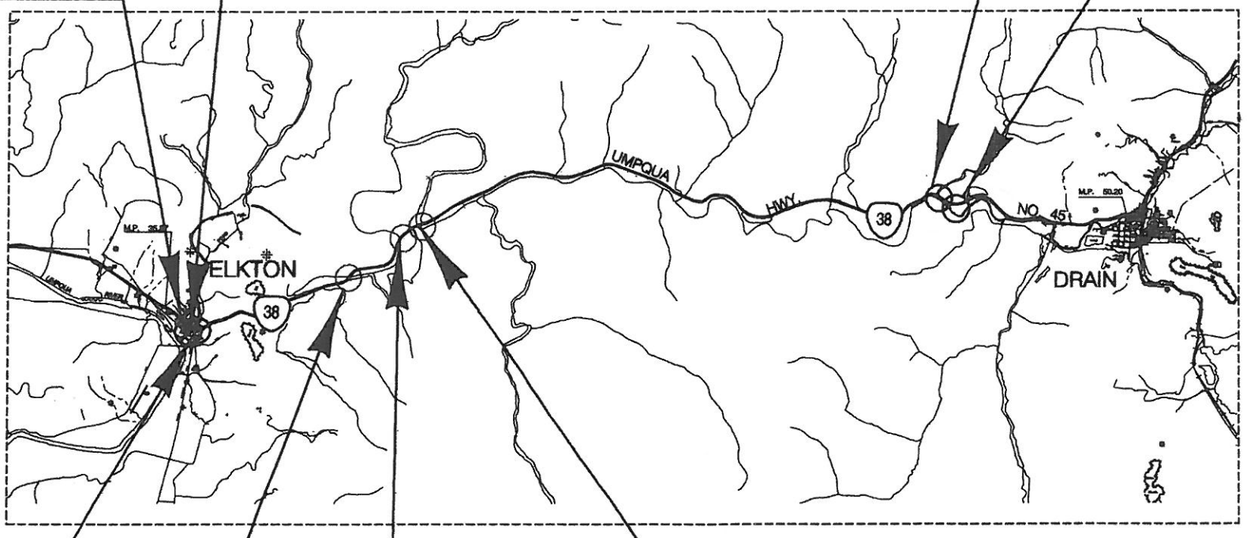
REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339
PROJ. MGR. John Ferguson P.E.

Elk Creek Crossing #1 x2
01614 - Replacement (M.P. 36.39)

BEGINNING OF PROJECT
Sta.1063+00 (M.P. 36.39)

Hardscrabble Creek Crossing
01424 - Replacement (M.P. 47.50)

END OF PROJECT
Sta.1663+00 (M.P. 47.55)



OR38 - OR138
Intersection Upgrade

Elk Creek Crossing #2
01601 - Replacement (M.P. 38.76)

Elk Creek Crossing #3
01465 - Replacement (M.P. 39.64)

Elk Creek Crossing #4
01406 - Replacement (M.P. 39.97)

OREGON TRANSPORTATION INVESTMENT ACT

REGISTERED PROFESSIONAL ENGINEER 17262PE OREGON JULY 19, 1994 SCOTT M. NETTLETON
EXP. 12-31-10

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Pape	COMMISSIONER
John Russell	COMMISSIONER
Matthew Garrett	DIRECTOR OF TRANSPORTATION

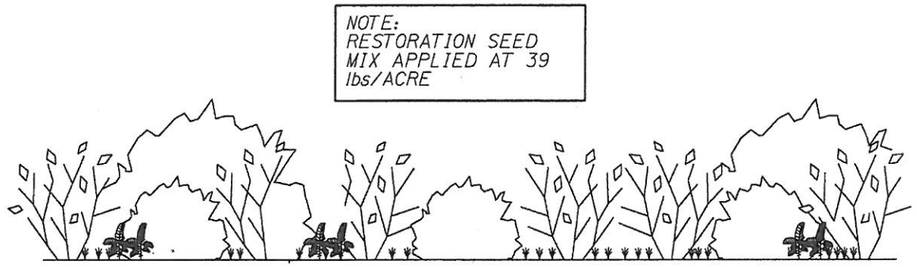
Oregon Department of Transportation

Slayden Construction Group, Inc.

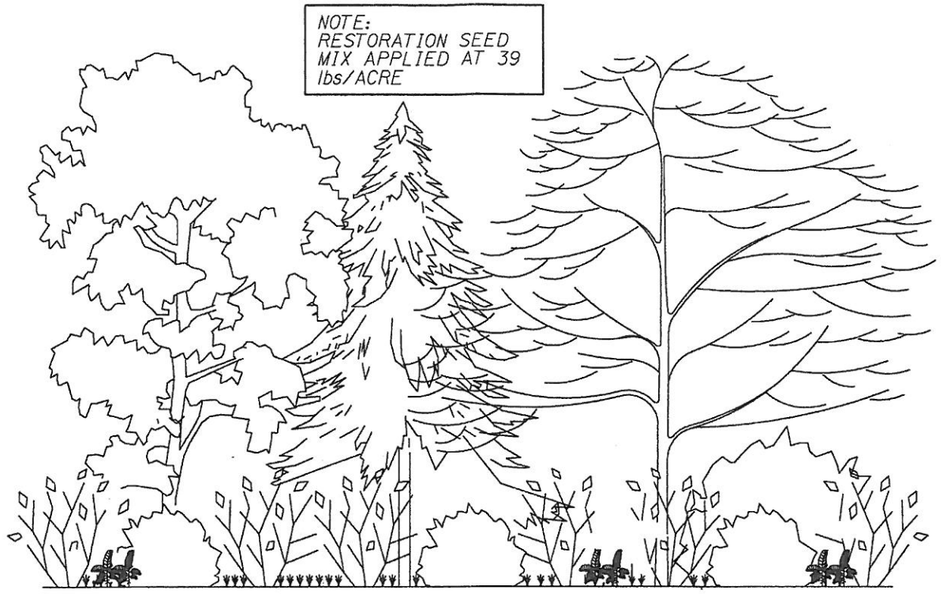
T-Y LIN INTERNATIONAL

ELK CREEK TO HARDSCRABBLE DESIGN BUILD
UMPQUA HIGHWAY (NO. 45)
DOUGLAS COUNTY

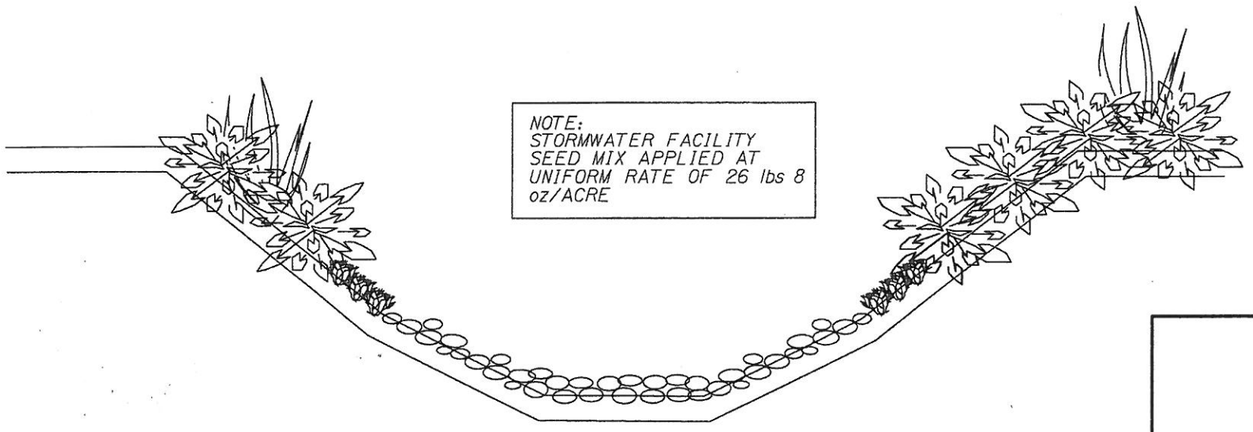
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	BSR-OTIA-S045(030)	1



TYPICAL RESTORATION PLANTING AREA TYPE 1 CROSS-SECTION
SEE SHEET GN-4



TYPICAL RESTORATION PLANTING AREA TYPE 2 CROSS-SECTION
SEE SHEET GN-5



TYPICAL BIOSWALE CROSS-SECTION

REVISED AS CONSTRUCTED
18-Feb-2010 CONTRACT C13319

PBS Engineering + Environmental

REGISTERED
525
Frank A. Groznik
02/28/2011
OREGON
LANDSCAPE ARCHITECT

OREGON DEPARTMENT OF TRANSPORTATION
REGION 3 TECHNICAL SERVICES

ELK CREEK TO HARDSCRABBLE DESIGN BUILD
BUNDLE 401
HIGHWAY 45
DOUGLAS COUNTY

Design Team Leader - Frank Groznik
Designed By - Morgan Holen and Elisabeth Bowers
Drafted By - Don James and Fouad El-Gharabli

PLANTING DETAILS

SHEET NO. GN-6

THIS IS THE FILENAME LOCATION 14221GN-6.DGN 5/24/2010 11:56:18 AM

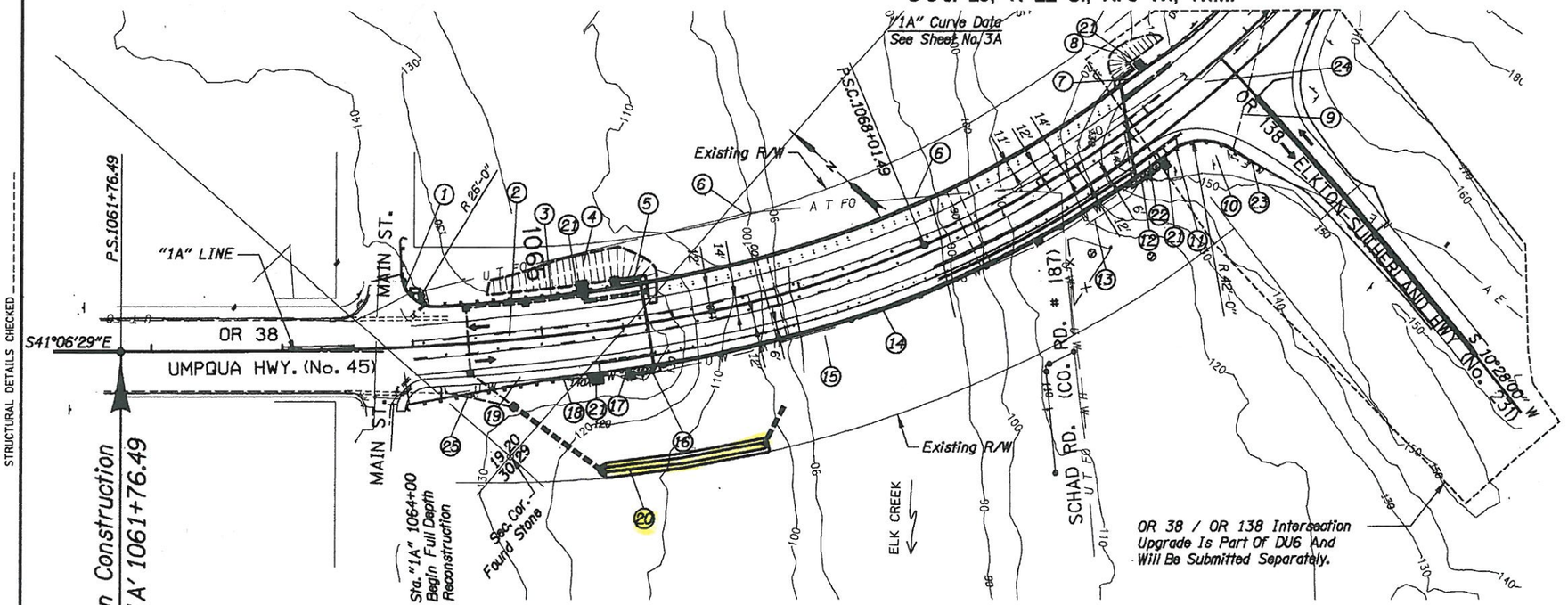
Crossing # 1

41V-55

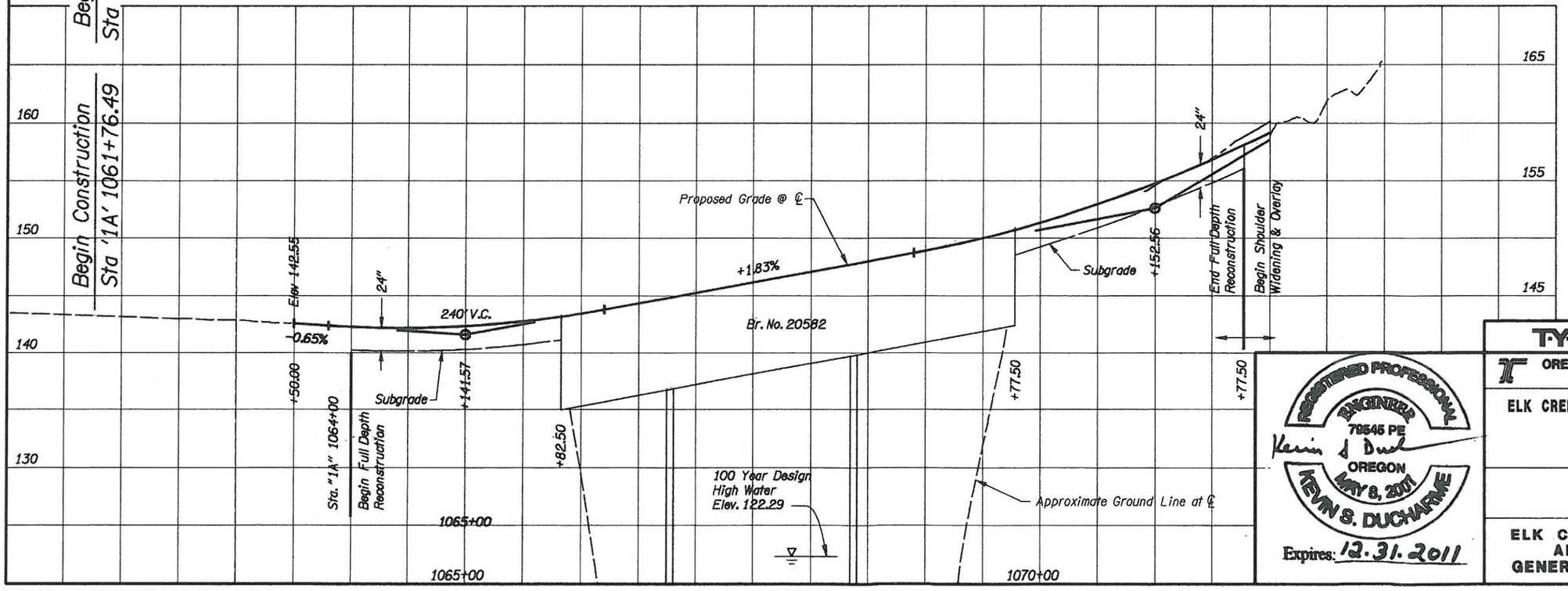
REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339

STRUCTURAL DETAILS CHECKED

Sec. 29, T. 22 S., R. 8 W., W.M.



CONSTRUCTION NOTES
SEE SHEET NO. 5A-4



LEGEND

- Toe of Slope
- Top of Cut
- New Guardrail
- New Reinforced Soil Slope
- U W — Buried Water Line
- A T FO - Aerial Fiber Line
- A E — Aerial Electrical Line
- U T FO - Buried Fiber Optic Line

REGISTERED PROFESSIONAL ENGINEER
70545 PE
OREGON
MAY 8, 2007
KEVIN S. DUCHARME
Kevin S Duch
Expires: 12.31.2011

T.Y. LIN INTERNATIONAL

OREGON DEPARTMENT OF TRANSPORTATION
REGION 3 TECHNICAL SERVICES

ELK CREEK TO HARDSCRABBLE DESIGN BUILD BUNDLE 401 SECTION
HIGHWAY 45
DOUGLAS COUNTY

Design Team Leader - KSD
Designed By - DWB
Drafted By - JG

ELK CREEK CROSSING #1 ALIGNMENT AND GENERAL CONSTRUCTION

SHEET NO. 5A-3

REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339

CONSTRUCTION NOTES

1. Construct Energy Absorbing Terminal, TL-2, Non Flared
(For Details See Dwg. RD420)
2. Remove Existing Guardrail
3. Sta. "1A" 1063+93.5 To Sta. "1A" 1065+61.5, Lt.
Construct Guardrail -41.0' Type 2A Curved (R=26.0')
-Type 1 Modified Anchor
-106.25' Type 2A (Flare Rate=0, W=0, E=2')
-12.5' Type 3
(For Details See Dwg. RD400, RD405, RD415, RD450 & DET235)
4. Construct Reinforced Soil Slope
(For Details See Sht. GN-12, 13, 14 & 17)
5. Sta. "1A" 1065+61.5 To Sta. "1A" 1065+83.0. Lt.
Construct Bridge Transition Rail
(For Details See Dwg. 76680 & Std Dwgs. BR270 RD410, RD440, D405)
6. Relocate Existing Utility (by Others)
(For Details See Utility Master Plans)
7. Sta. "1A" 1069+92.8 To Sta. "1A" 1070+14.6 Lt.
Construct Bridge Transition Rail
(For Details See Dwg. 76680 & Std Dwgs. BR270 RD410, RD440, D405)
8. Construct Reinforced Soil Slope
(See Sht. GN-12, 13, 14 & 17)
9. Remove Existing Traffic Beacon
(For Details See Plans for OR38 / OR138 Intersection)
10. Remove Existing Guardrail
11. Sta. "1A" 1069+82.3 To Sta "1A" 1070+32.3 Rt.
Construct Guardrail -12.5' Type 2A (Flare Rate=0, W=0, E=6.6')
-Type 1 Modified Anchor
-50.0' Type 2A Curved (R=42.0')
(For Details See Dwg. RD400, RD405, RD415, RD450 & DET235)
12. Sta. "1A" 1069+62.1 To Sta. "1A" 1069+82.3: Rt.
Construct Bridge Transition Rail
(For Details See Dwg. 76680 & Std Dwgs. BR270 RD410, RD440, D405)
13. Disconnect Existing Water Line (by Others)
(For Details See Utility Master Plans)
14. Construct Bridge No. 20582
15. Portion of Existing Water Line Attached
to Bridge will be removed by contractor
16. Sta. "1A" 1065+61.5 To Sta. "1A" 1065+83.0 Lt.
Construct Bridge Transition Rail
(For Details See Dwg. 76680 & Std Dwgs. BR270 RD410, RD440, D405)
17. Remove Existing Guardrail
18. Sta. 1064+18.8 to Sta. 1065+50.0 Rt.
Construct Guardrail -131.25' Type 2A (Flare Rate=12.5: 1, W=8.5', E=6.6')
-25' Type 2A (Flare Rate=0, W=0, E=6.6')
-12.5' Type 3
(For Details See Dwg. RD400, RD405, RD415 & RD450)
19. Construct Sidewalk
(For Details See Typical Sections & Dwgs. RD720, RD755 & RD760)
20. Construct Bio-Swale Water Quality Facility
(For Details See GN Shts.)
21. Construct Pylon Footing (Field Locate)
(For Details See Dwg. 76656)
22. Construct Sidewalk
(For Details See Typical Sections & Dwgs. RD720, RD755 & RD760)
23. Construct Energy Absorbing Terminal, TL-2, Non Flared
24. Remove Existing Guardrail
25. Add Elbow And Extend Existing 12" Concrete Pipe

REGISTERED PROFESSIONAL ENGINEER
70545 PE
OREGON
MAY 8, 2001
KEVIN S. DUCHARME
Expires: 12.31.2011

T.Y. LIN INTERNATIONAL

OREGON DEPARTMENT OF TRANSPORTATION

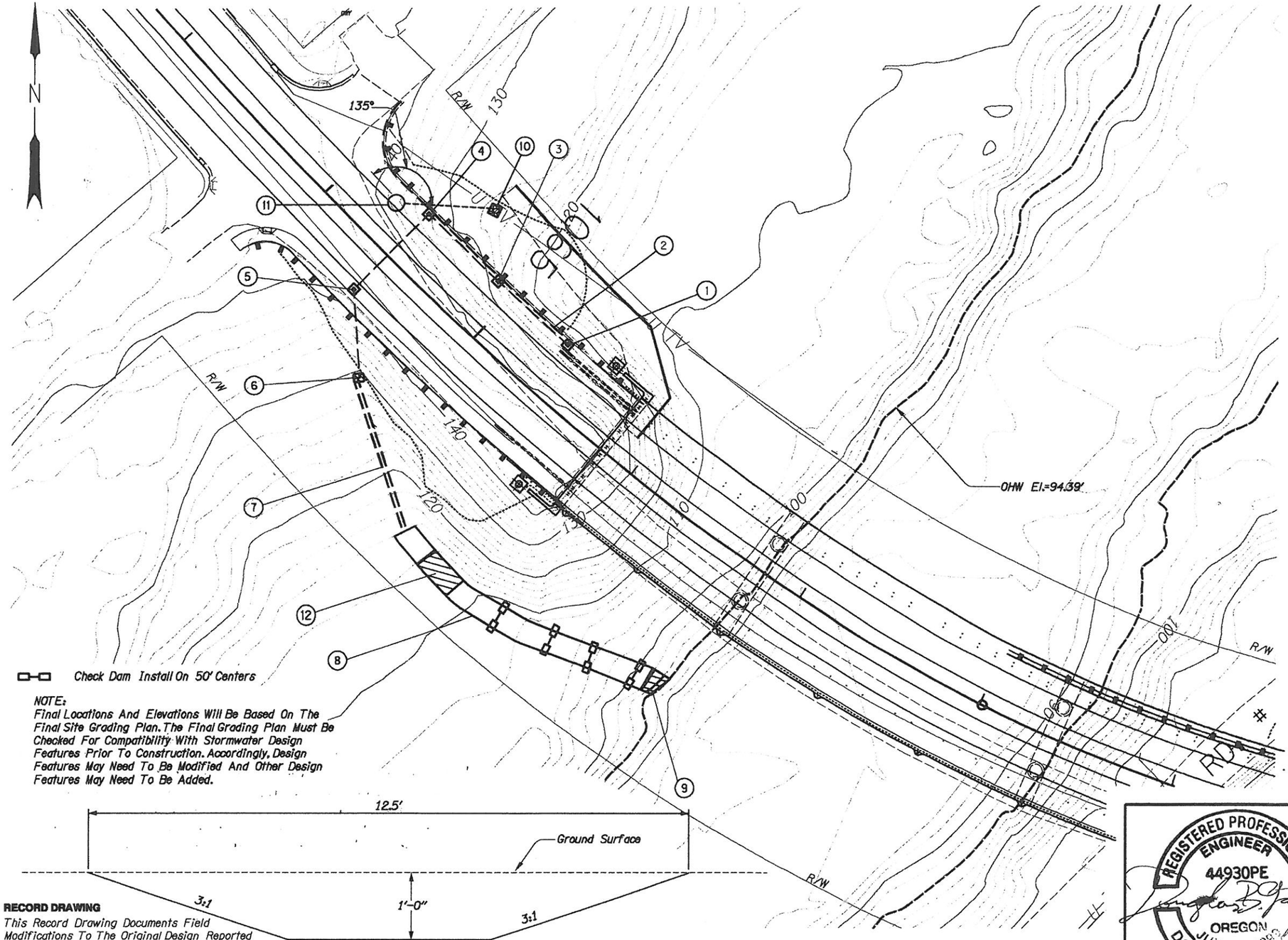
ELK CREEK TO HARDSCRABBLE DESIGN BUILD
BUNDLE 401 SECTION
HIGHWAY 45
DOUGLAS COUNTY

Design Team Leader - JDF
Designed By - DJS
Drafted By - DJS

GENERAL CONSTRUCTION

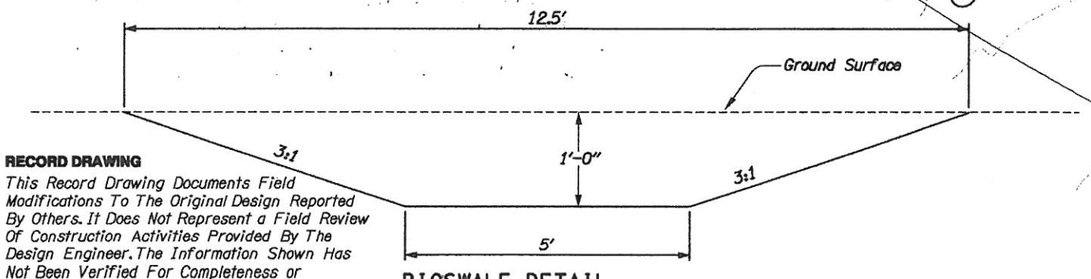
SHEET NO. 5A-4

Sec. 29, T. 22 S., R. 8 W., W.M.



Check Dam Install On 50' Centers

NOTE:
Final Locations And Elevations Will Be Based On The Final Site Grading Plan. The Final Grading Plan Must Be Checked For Compatibility With Stormwater Design Features Prior To Construction. Accordingly, Design Features May Need To Be Modified And Other Design Features May Need To Be Added.



BIOSWALE DETAIL

RECORD DRAWING
This Record Drawing Documents Field Modifications To The Original Design Reported By Others. It Does Not Represent a Field Review Of Construction Activities Provided By The Design Engineer. The Information Shown Has Not Been Verified For Completeness or Accuracy.

1. Sta. 1065+35.6', 27.45' Lt.
Const. Type G-1 Inlet
Rim El = 141.42'
IE. = 137.92'
Inst. 12" Storm Sew. Pipe = 45.5'

REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339

2. Sta. 1063+93' To Sta. 1065+36.7' Lt.
Inst. Drainage 6" Curb In Front Of Guardrails At Edge Of Paving To Bridge Barrier (See Drg. No. RD700)

3. Sta. 1064+90.1', 28.8' Lt.
Const. Type G-1 Inlet
Rim El = 140.99'
IE. = 136.74'
Inst. 12" Storm Sew. Pipe = 46'

4. Sta. 1064+42.90', 28.43' Lt.
Const. Type G-2 Inlet
Rim El = 140.83'
IE. = 137.33'
Sumped = 2'
Inst. 12" Storm Sew. Pipe = 51.3' Lt

5. Sta. 1064+42.90', 22.74 Rt.
Const. Type G-1 Inlet
Rim El = 141.88'
IE. = 137.92'
Inst. 12" Storm Sew. Pipe = 42.5'

6. Inst. Energy Dissipator Splash Pad,
5' Wide x 4' Long x 2.3' Deep,
Transition Into Ditch, Class 100 Rip Rap

7. Inst. Trapazoidal Rock-Lined Ditch, 0.75' Deep
2:1 Side Slopes, 2.5' Base, Transition Into Swale, Class 100 Rip Rap

8. Const. 130'x12.5' Water Quality Swale, S=0.75%
(For Detail See This Sheet) And Special Specifications

9. Inst. Trapazoidal Rock-Lined Ditch, 0.5' Deep
2:1 Side Slopes, 5' Base, Transition From Swale, Class 100 Rip Rap

10. Inst. Energy Dissipator Splash Pad,
5' Wide x 5' Long x 2.3' Deep, Class 100 Rip Rap

11. Sta 1064+28.5 Lt.
Over 12" Existing Storm Sewer
Const. 48" Manhole
Rim El= 141.03'
IE. In (12" NW) = 137.25'
IE. Out (18" E) = 136.95'
Inst. 41 Lf 18" Storm Sew. Pipe
From Manhole To Toe Of Fill Slope.
Sta. 1064+47 Lt.
IE. Outfall = 134.60'

12. Install Rocklined step 20'x12.5' Calss 100 Rip Rap

REGISTERED PROFESSIONAL ENGINEER
44930PE
OREGON
JULY 13, 1999
DOUGLAS B. GATES

EXPIRATION DATE: 6/30/11

Parametrix

OREGON DEPARTMENT OF TRANSPORTATION

ELK CREEK TO HARDSCRABBLE DESIGN BUILD BUNDLE 401 SECTION
HIGHWAY 45
DOUGLAS COUNTY

Design Team Leader - Randy Reeve
Designed By - Douglas Gates
Drafted By - Paula Morgan

ELK CREEK BRIDGE (CROSSING NO.1) STORM WATER MANAGEMENT

SHEET NO. GJ-3