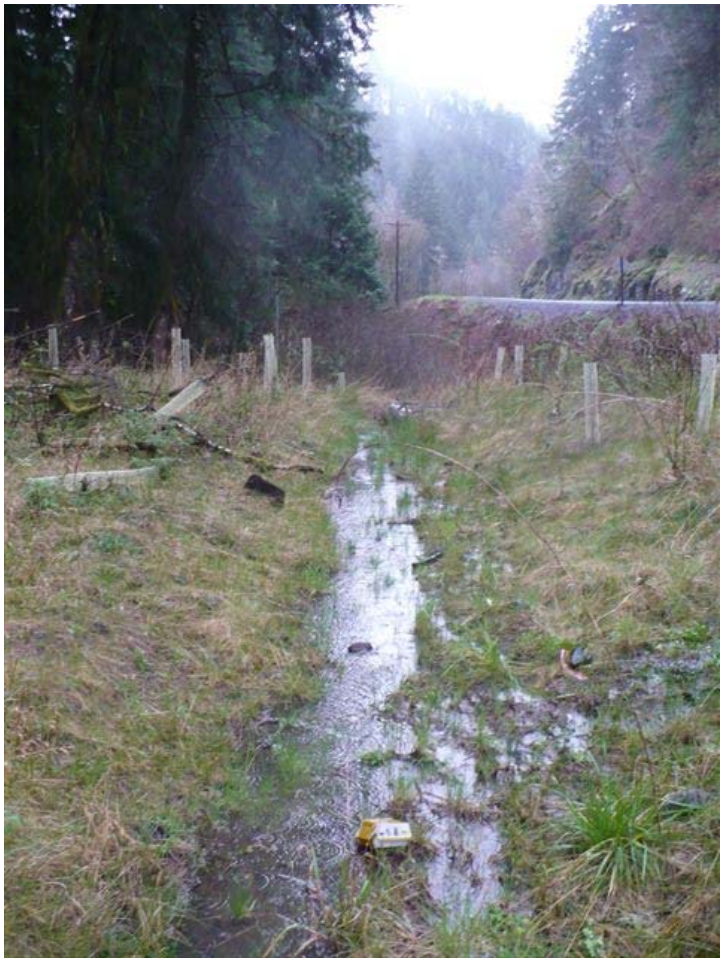
OPERATION & MAINTENANCE MANUAL

DFI No.: D00398
Facility Type: Water Quality Biofiltration Swale



MARCH, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00398**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 41V-055
Location:	District: 7
	Highway No.: 045
	Mile Post: 39.54 / 39.56 (beg./end)
	Description: This facility is located on the southern side of OR38 (Hwy 045, Umpqua Highway). Access can be obtained from the eastbound shoulder of OR38.

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 water from the Elk Creek Bridge. A 12-inch storm pipe delivers the stormwater to the beginning of the swale. Sheet flow from OR38 also contributes runoff directly to the swale. 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 into a ditch which discharges into Elk Creek.

A. Maintenance equipment access:

Maintenance crews can access the facility from the eastbound shoulder of OR38.

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 west, storm flow generated from OR38 on the right side of the picture contributes stormwater into the swale. Stormwater is flowing from the bottom of the picture towards top of the picture.

Photo 2: Looking west, storm flow generated from OR38 on the left side of the picture contributes stormwater into the swale. The 12-inch inlet pipe shown contributes storm flow from the Elk Creek Bridge.

Photo 3: Looking east, storm flow generated from OR38 on the left side of the picture contributes stormwater into the swale. Stormwater is flowing from the top of the picture towards the bottom of the picture.

5. Facility Haz Mat Spill Feature(s)

The swale can not be used to feasibly store liquid due to the flat cross section and close proximity to Elk Creek.

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:N/A

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:

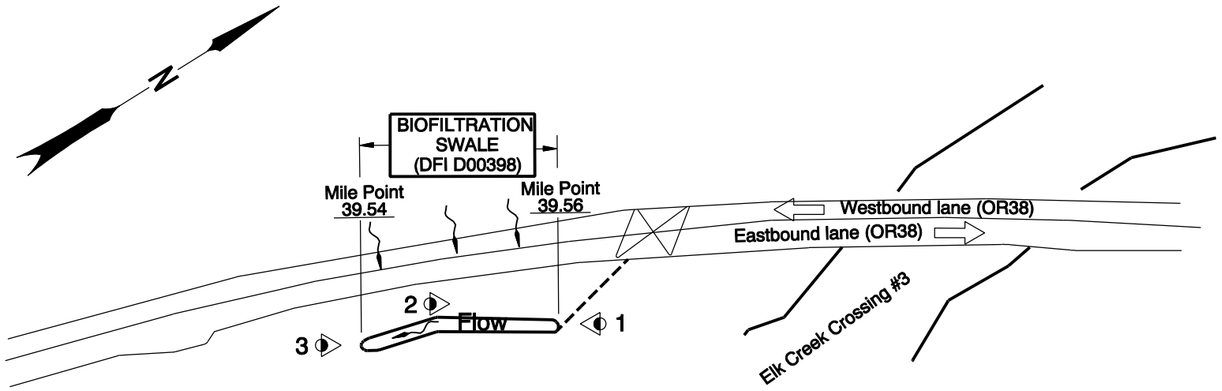
ODOT Clean Water Unit (503) 986-3008

ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(541) 957-3594
ODEQ Northwest Region Office	(503) 229-5263

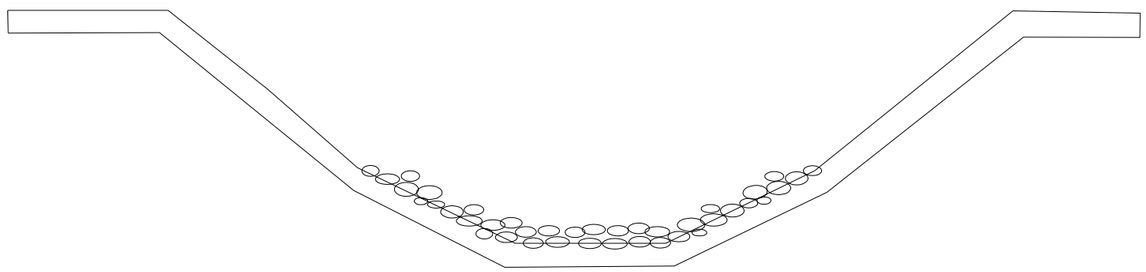
Appendix A

Content:

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



PLAN
N.T.S.



TYPICAL BIOSWALE CROSS-SECTION

LEGEND:

- Photograph location / direction
- Manhole and/or
- Inlet and/or
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: J. Carpenter

Drafted By: L. Coffel

DFI D00398
MAINTENANCE DISTRICT 7 HWY 45
BIOFILTRATION SWALE
UMPQUA HIGHWAY MP 39.54-39.56
DOUGLAS COUNTY

Appendix B

Content:

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

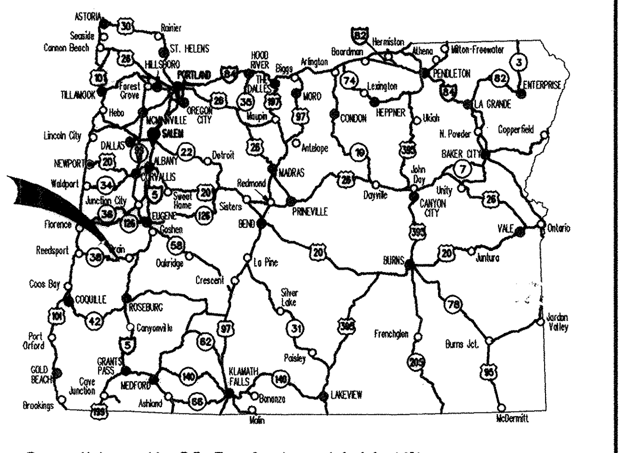
41V-55

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

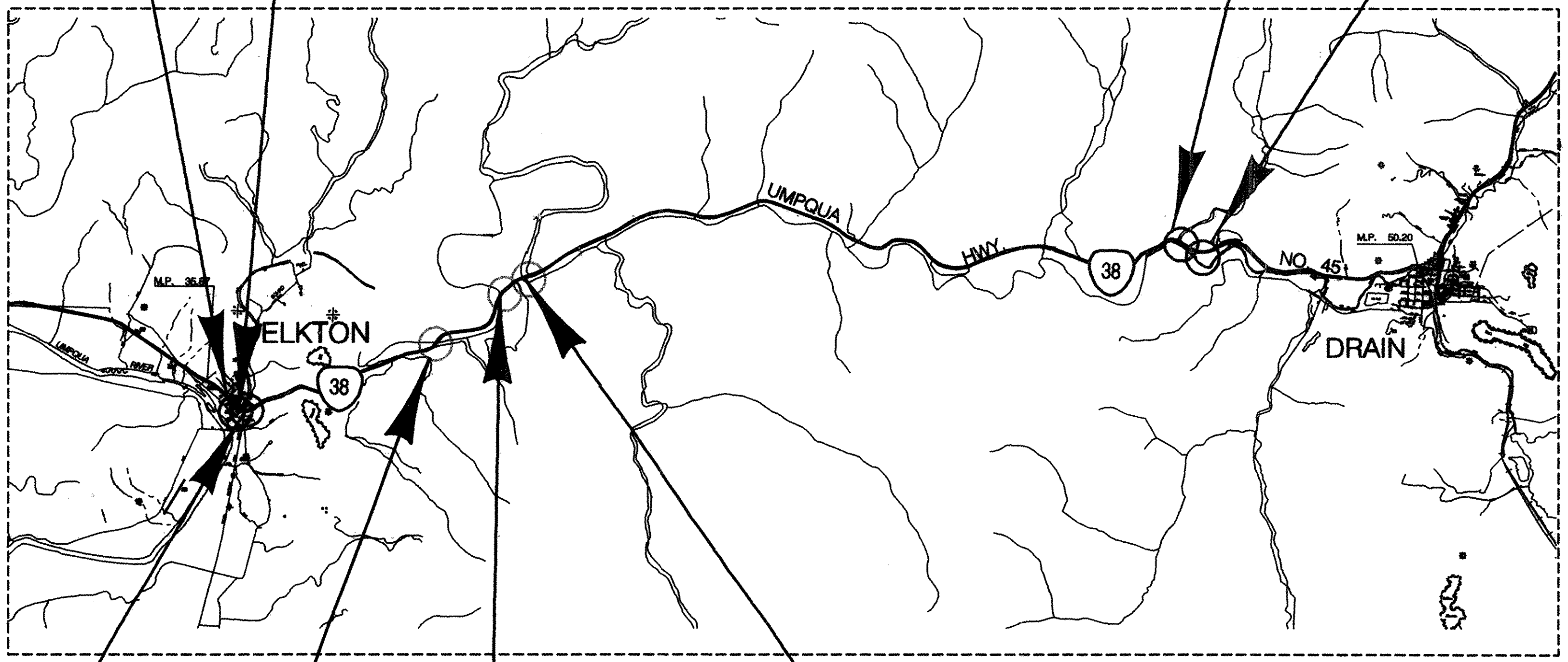
REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339
PROJ. MGR. John Ferguson P.E.

Elk Creek Crossing #1
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 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.

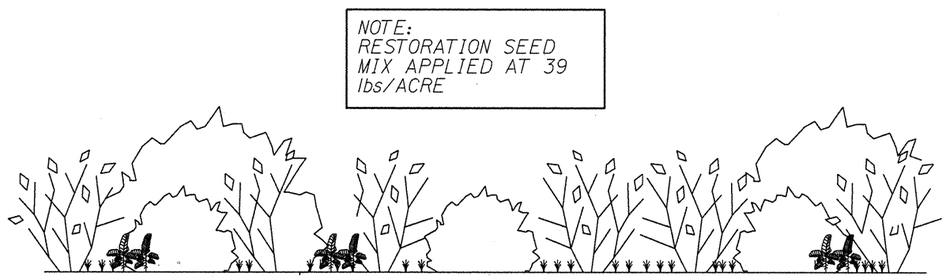
T·Y·LIN INTERNATIONAL

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

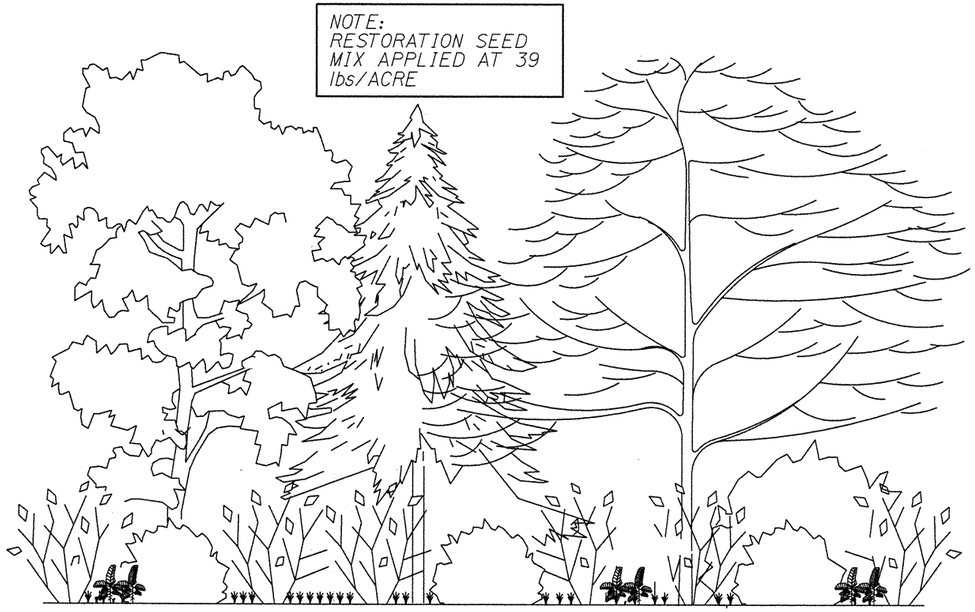
OTIA
OREGON TRANSPORTATION INVESTMENT ACT

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

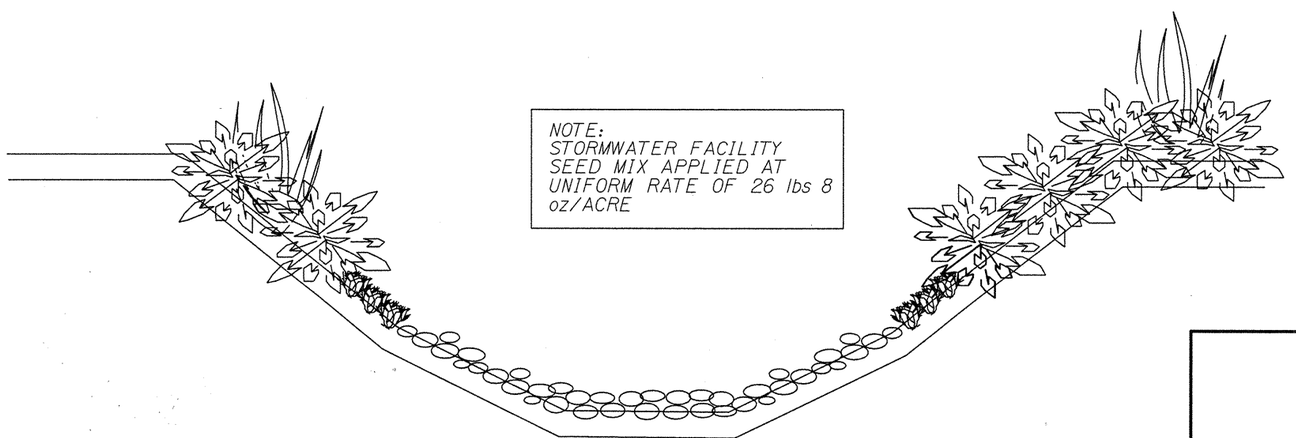
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	BSR-OTIA-S045(030)	1



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

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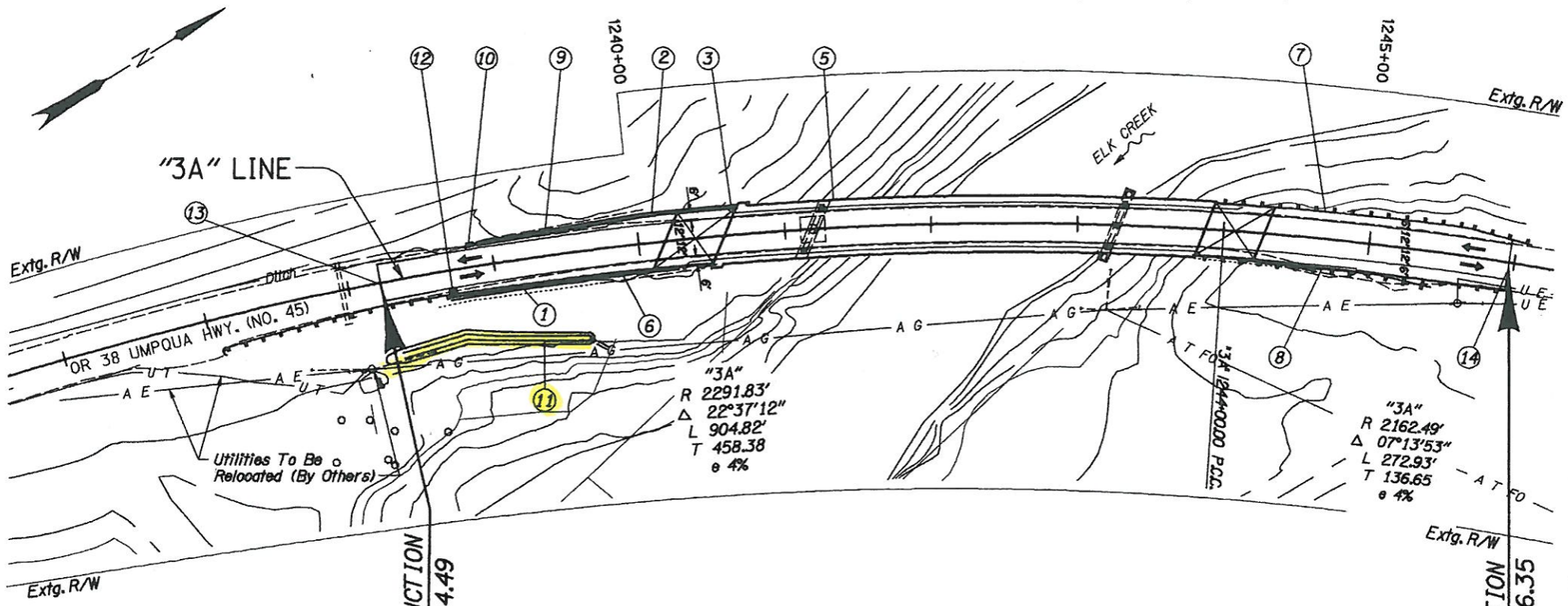
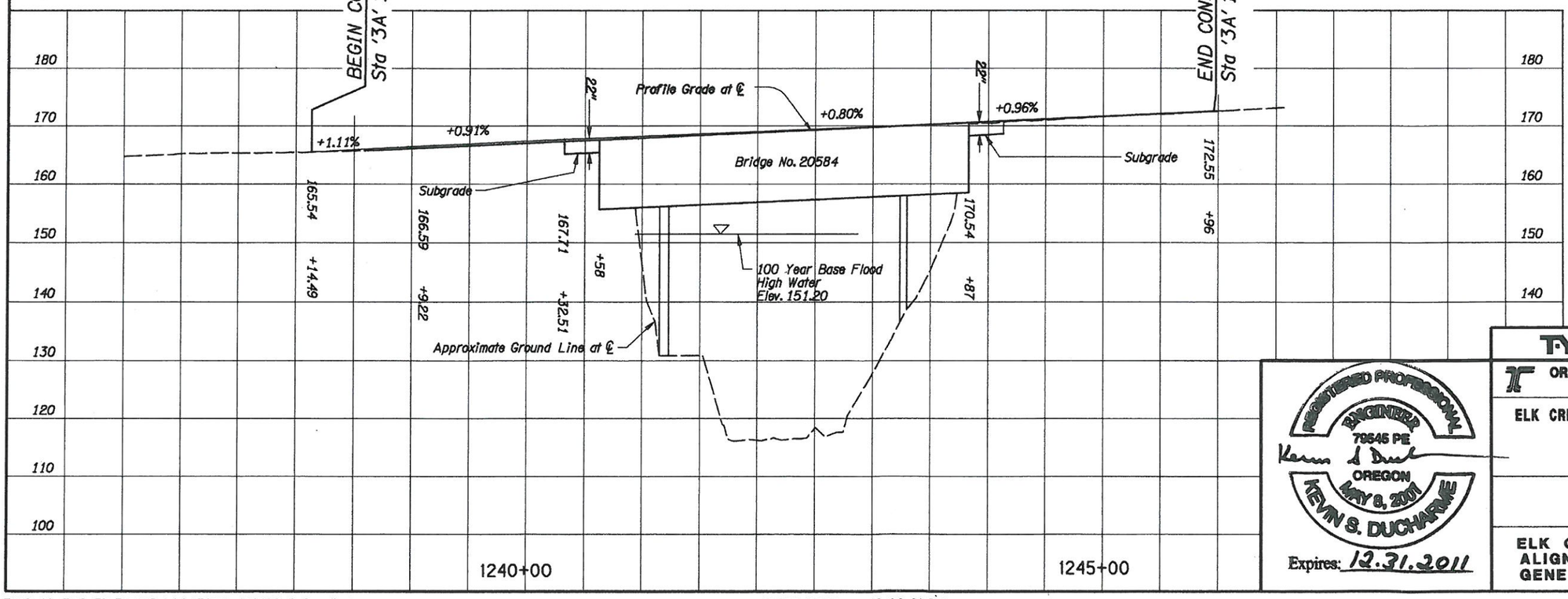
Crossing #3

STRUCTURAL DETAILS CHECKED

Sec. 15, T. 22 S., R. 7 W., W.M.





(1) Sta. "3A" 1237+09 to 1240+49.50
Remove Extg. Guardrail
Const. Guardrail Transition – 18.5'

Const. Guardrail (Type 3) – 12.5'
Const. Guardrail (Type 2A) – 272'

Const. Non-Flared Energy Absorbing Terminal (TL-3) – 37.5'

(2) Sta. "3A" 1240+04.5 to 1240+54.5
Remove Extg. Guardrail
Const. Reflectorized Conc. Shldr. Barrier – 50' Lt.
Pin And Grout Barrier
Flare Rate=0, W=0, E=0
(See Drg. No. RD505)

(3) Sta. "3A" 1240+54.5 to 1240+67
Const. Cast-In-Place Bridge Rail Transition – 12.5'
(For Detail, See Sht. 2B)
(See Drg. No. RD550)

(5) Bridge No. 20584
Const. Structure – 329'±
Roadway Width – 36'
And Precast Reinforced Panel At Bridge Ends
(For Drg. Nos. See Sheet 1A)

(6) Sta. "3A" 1238+60.00 to 1240+43.50
Structure No. 76558
Const. Structure – 182.0'
Gravity Retaining Wall
(For Drg. Nos., See Sheet 1A)

(7) Sta. "3A" 1243+93 to 1246+12
Remove Extg. Guardrail
Const. Guardrail Transition – 18.5'
Const. Guardrail (Type 3) – 12.5'
Const. Guardrail (Type 2A) – 69'±
Const. Guardrail (Type 3) – 12.5'
Const. Guardrail Transition (Type 4) – 18.5'

Connect to Existing as Directed

(8) Sta. "3A" 1243+71.75 to 1245+45.00
Remove Extg. Guardrail
Const. Guardrail Transition – 18.5'
Const. Guardrail (Type 3) – 12.5'
Const. Transition Parabola – 25'
Const. Guardrail (Type 2A) – 105.5' Rt.
Construct Energy Absorb. Terminal – 37.5'
Flare Rate=0, W= 4', E=2' (See Drg. No. RD440)

(9) Sta. "3A" 1239+04.5 to 1240+04.5
Rock Cut Embankment Taper = 26:1 min.
Const. Reflectorized Conc Shldr Barrier – 100' Lt. Pin And Grout Barrier (See Drg. No. RD505)

(10) Sta. "3A" 1238+92 to 1239+04.5
Rock Cut Embankment Taper = 26:1 Min.
Const. Conc. Shldr Barrier End Panel
Match Edge Of Existing Ditch
(For Detail, See Sht. 2B)

(11) Sta. "3A" 1238+16, 52' Rt.
Const. 120'x 10' Water Quality Swale
(For Details, See Sht. GJ-1)

(12) Sta. "3A" 1238+69, 15' Rt.
Const. Inlet Type G-1
Inst. 12" Storm Sew. Pipe – 61'
(See Drg. No. RD364)
(For Details, See Sht. GJ-1)

(13) Sta. "3A" 1238+14.49
Grind and Match Pavement
(See Drg. No. RD610)

(14) Sta. "3A" 1245+96.35
Grind and Match Pavement
(See Drg. No. RD610)

REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339

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

REGISTERED PROFESSIONAL ENGINEER
79545 PE
OREGON
MAY 8, 2001
KEVIN S. DUCHARME
Expires: 12.31.2011

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

ELK CREEK CROSSING #3 ALIGNMENT, PROFILE & GENERAL CONSTRUCTION

SHEET NO. 3

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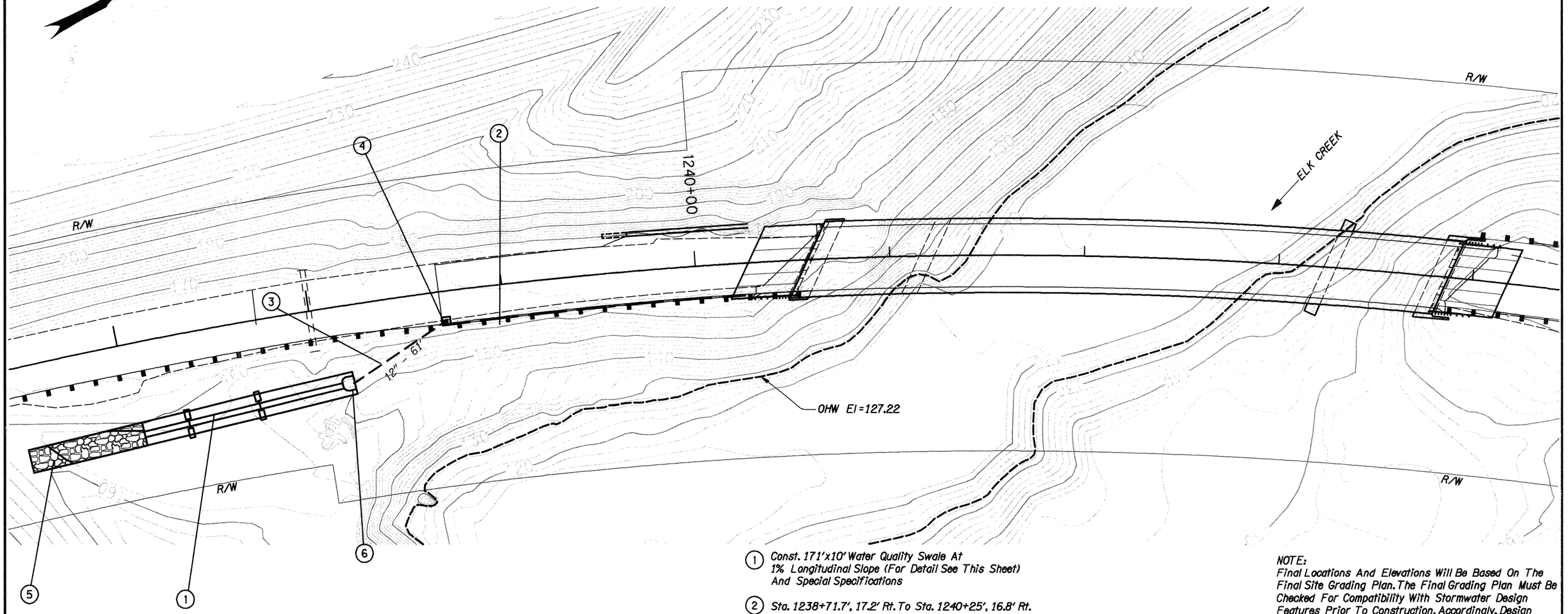
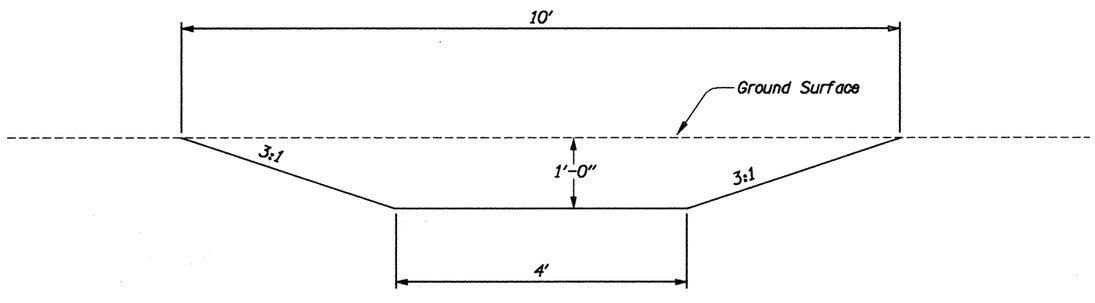
Sec. 15, T. 22 S., R. 7 W., W.M.

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.

REVISED AS CONSTRUCTED
10-APR-2009 CONTRACT #13339





1. *Const. 171'x10' Water Quality Swale At 1% Longitudinal Slope (For Detail See This Sheet) And Special Specifications*
2. *Sta. 1238+71.7', 17.2' Rt. To Sta. 1240+25', 16.8' Rt. Const. 6" Drainage Curb From Bridge Deck To Inlet. - 152' (See Drg. No. RD700)*
3. *Sta. 1238+22', 51' Rt. Inst. 12" Dia. Storm Sew. Pipe - 61'*
4. *Sta. 1238+69.3', 15.1' Rt. Const. Storm Water Inlet Type G-1 (See Drg. No. RD364)*
5. *Inst. Trapazoidal Rock-Lined Ditch. 0.5' deep 2:1 Side Slopes. 5' Base, Transition From Swale, Class 100 Rip Rap.*
6. *Const. Energy Dissipator Splash Pad. 5' Wide x 4' Long x 2-3' Deep, Using Class 50 Rip Rap*

Check Dam

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.

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. 3) STORM WATER MANAGEMENT

SHEET NO. GJ