OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: November 2018

DFI No. D00898 and D00899

Figure 1: DFI No. D00898, looking northeast

Figure 2: DFI No. D00899, looking northeast

Identification

Drainage Facility ID (DFI):	D00898
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 43V-097
Location:	District: 1
	Highway No.: 047
	Mile Post: 54.46-54.49 [left side]

Drainage Facility ID (DFI):	D00899
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 43V-097
Location:	District: 1
	Highway No.: 047
	Mile Post: 54.58-54.56 [left side]

1. Manual Purpose

The purpose of this manual is to outline inspection needs and summarize maintenance actions.

2. Facility Location

The location map below details the facility location. The highway, mile posts, side streets, access location, and stormwater flow directions are noted on the map.

Facility location type: Roadway shoulder

Flow direction: southeast for D00898, northwest for D00899

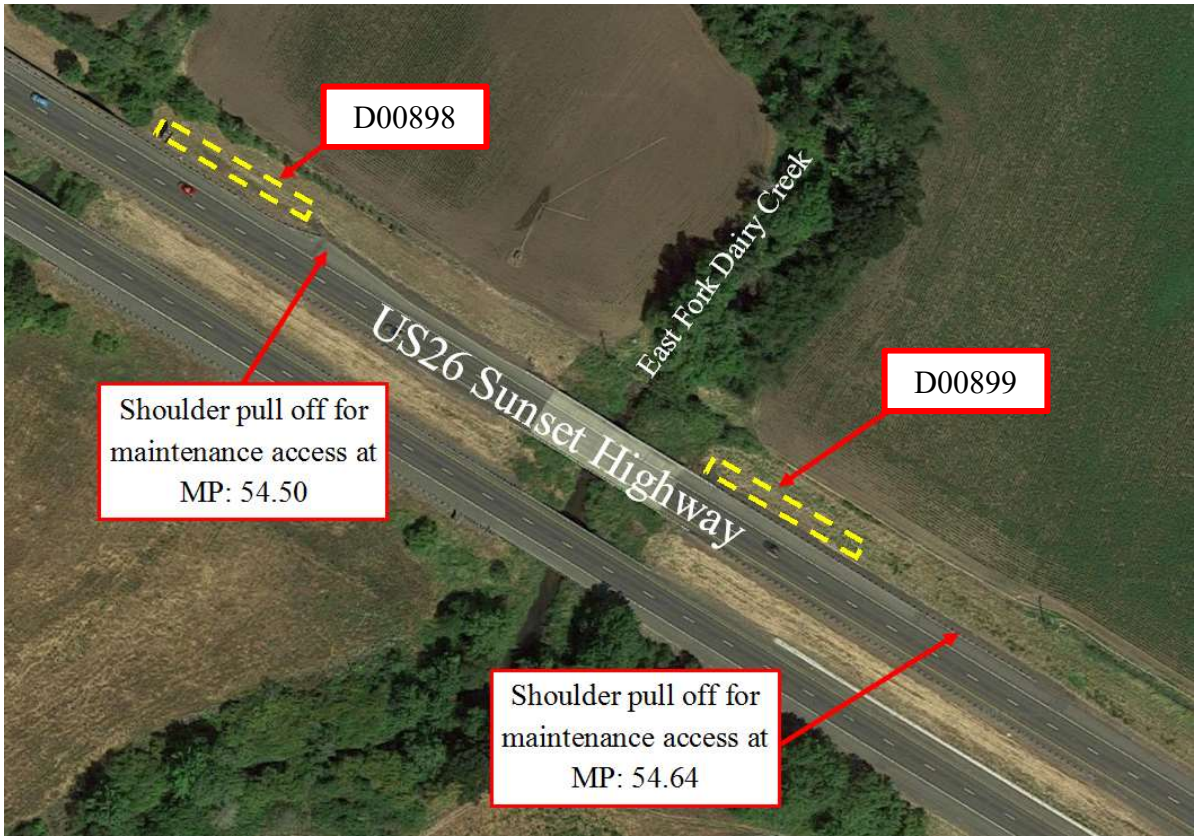


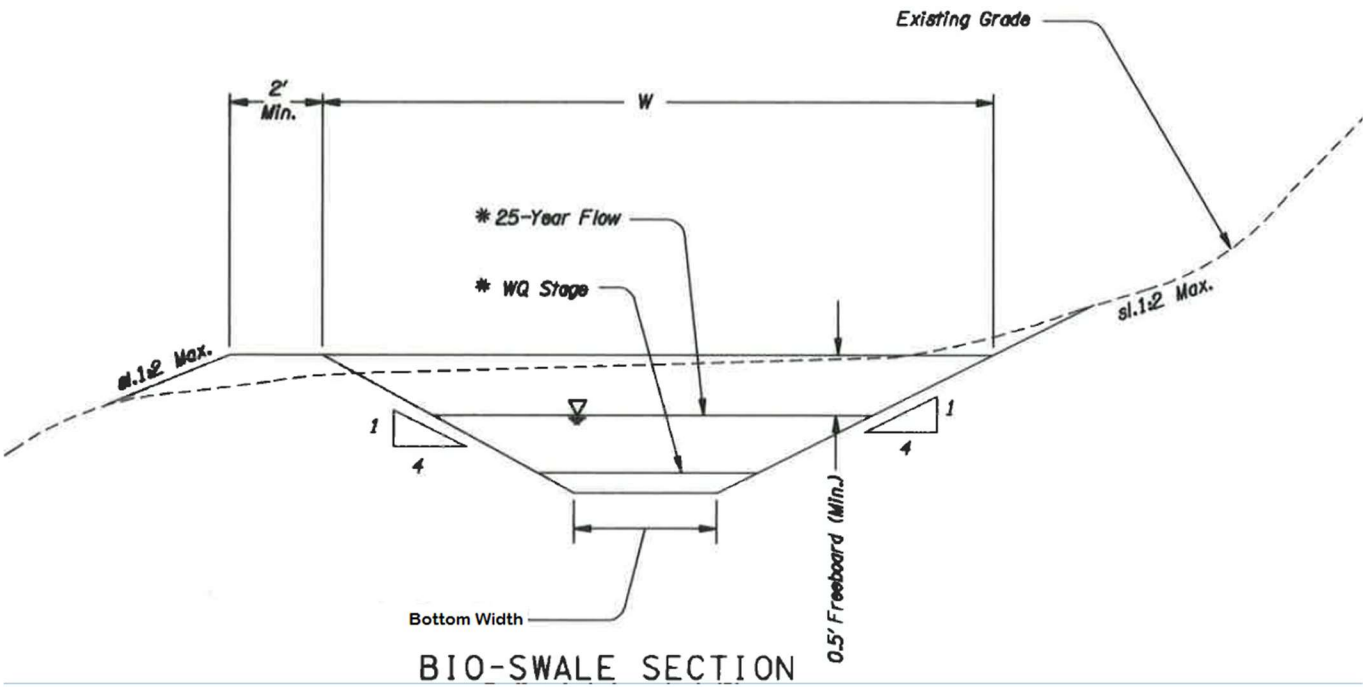
Figure 3: Facility location map for D00898 and D00899

3. Facility Summary

The length and width of a swale is based on the bottom dimensions.

The bottom length and bottom width of the swale is:

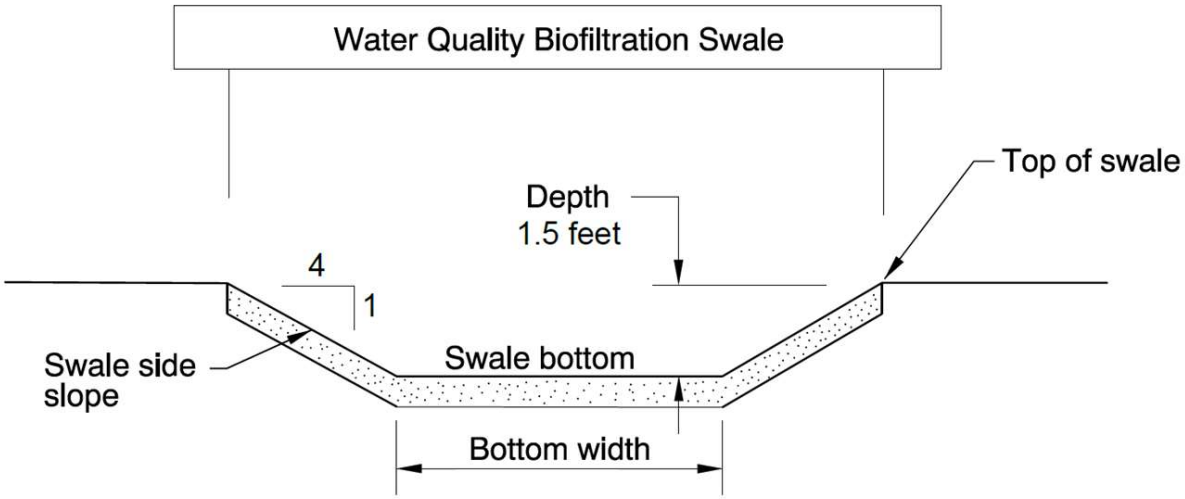
Facility ID	Bottom Length	Bottom Width	WQ Stage	25-Year Flood	W
D00898	131’	2’	0.19’	0.55’	10’
D00899	100’	9’	0.06’	0.21’	17’



The depth of the swale is the vertical distance measured from the bottom of the swale to the top. The slope of the swale sides is presented by a vertical distance (rise) followed by the horizontal distance (run).

Depth and side slopes for all facilities:

Depth (feet)	Rise (feet)	Run (feet)
1.5	**1**	**4**



Site Specific Information: Both of the water quality swales have no pipe inlets or storm pipe bypasses. They are open ditches that water flows into and through, emptying into a rip rap basin

4. Facility Access

Maintenance access to the facility:

☐Roadside pad	☒Roadside shoulder
☐Access road with Gate	☐Access road without Gate

Figure 4: Maintenance access for D00898 for westbound traffic

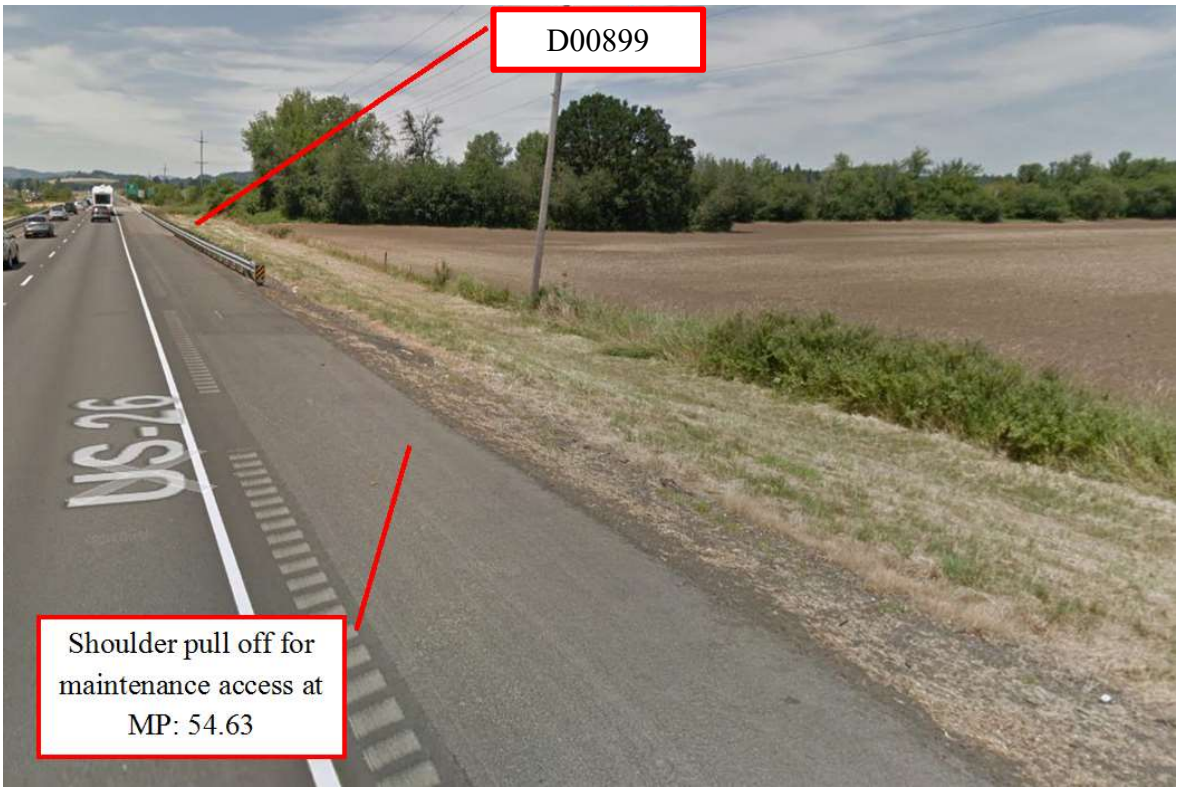


Figure 5: Maintenance access for D00899 for westbound traffic

5. Operational Components / Maintenance Items

Classification

☒ On-line Swale	☐ Off-line Swale
A swale that does not include a high flow bypass component; flow drains into and through the facility	**A swale that treats low/small flows and diverts high flows using a bypass component**

*Both facilities are on-line swales.

Bypass Component

☒ No	☐ Yes
There is no bypass component. High flows drains into and through the facility	There is a bypass component. Only low/small flows drain into the swale. High flows are diverted around the swale using a bypass component

Operational Components

A swale has many components that assist with treatment, conveyance, and reducing flow velocity to minimize erosion. The components in use can vary depending if the facility was designed to operate on-line or off-line. The facility components table (**Table 1**) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an "x" (e.g. ☒).

The Standard Operation Manual for Water Quality Biofiltration Swales (implemented March 2017) outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.
https://gis.odot.state.or.us/TransGIS/

Operational Plan

The applicable standard operational plan for both facilities is:

☒ Operational Plan A	☐ Operational Plan B	☐ Operational Plan C
An on-line swale with roadside ditches	An on-line swale with piped inlets and outlets	An off-line swale with a piped high flow bypass
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B, C) are provided in the Standard Operation Manual.		

See Appendix A for the site specific operational plan.

Maintenance Items

Operational components marked in **Table 1** should be inspected and maintained according to Section 7. Each facility component is defined and detailed in the Standard Operation Manual using the associated ID number indicated below.

Table 1: Swale Components		ID #
Manholes/Structures		
Pre-treatment manhole	☐	**S1**
Weir type flow splitter/flow splitter manhole	☐	**S2**
Orifice type flow splitter/flow splitter manhole	☐	**S3**
Standard manhole	☐	**S4**
Swale Inlet		
Pavement sheet flow	☐	**S5**
Inlet Pipe (s)	☐	**S6**
Open channel inlet	☒	**S7**
Riprap pad	☐	**S8**
Ground Cover		
Grass bottom	☒	**S9**
Grass side slopes	☒	**S10**
Granular drain rock	☐	**S11**
Plantings	☐	**S12**
Underground Components		
Geotextile fabric	☒	**S13**
Water quality mix	☐	**S14**
Perforated pipe	☐	**S15**
Porous pavers (access grid)	☐	**S16**
Flow Spreader		
Rock basin (used at inlet)	☐	**S17**
Anchored board (midpoint of swale or every 50 feet along swale bottom)	☐	**S18**
Other: describe type	☐	**S19**
Swale Outlet		
Catch basin with grate	☐	**S20**
Outlet Pipe (s)	☐	**S21**
Open channel outlet	☐	**S22**
Auxiliary Outlet: Riprap lined drainage	☒	**S23**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C**	**S24**
Ditch	☒	**S25**
Storm drain system	☐	**S26**
Outfall Components		
Riprap pad	☐	**S27**
Riprap bank protection	☐	**S28**

6. Maintenance

Maintenance Frequency/Maintain Records

a. Inspect annually. Preferably prior to the rainy season.
b. Clean and maintain as necessary. Refer to Activity 125 for conditions when maintenance is needed.
c. Keep a record of inspections, maintenance, and repairs.

Maintenance Guide/Maintenance Actions

The ODOT Routine Road Maintenance Water Quality and Habitat Guide (the *Blue Book*) outlines the standard maintenance actions for water quality facilities under Activity 125.

There are standard maintenance tables for standard ODOT designs. The maintenance tables describe the maintenance component, the defect or problem, the condition when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain ODOT swales:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 3 (Maintenance of Water Quality or Biofiltration Swales): Contains maintenance information for swales

The *Blue Book* can be viewed at the following website:
http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf

7. Limitations

Access grid installed:

☒ No	☐ Yes
There are no duty porous pavers installed in this swale	

Swales are designed to allow equipment access along the bottom. If an access grid is **NOT** installed, vehicles entering the swale can create depressions (tire ruts), damage vegetation, and damage structural components (e.g. flow spreaders). These conditions may result in poor treatment and drainage performance.

Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the swale bottom.

8. Waste Material Handling

Material removed from the facility is defined as waste by the Department of Environmental Quality (DEQ). Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

http://www.oregon.gov/ODOT/Maintenance/Documents/ems_manual.pdf

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) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186
ODOT Region 5 Hazmat Coordinator	(541) 963-1590
ODEQ Northwest Region Office	(503) 229-5263

A Appendix A – Site Specific Operational Plan

Contents:

Operational Plan: DFI D00898 and D00899

Water Quality Biofiltration Swale
(DFI D00898)

See Appendix B, Sheet No. 3C

Mile Point
54.46

Mile Point
54.49

N

East Fork Dairy Creek

S7

S23

S25

26

Northwestbound lanes

Sunset Highway (US 26)

Ditch

Ditch

Ditch

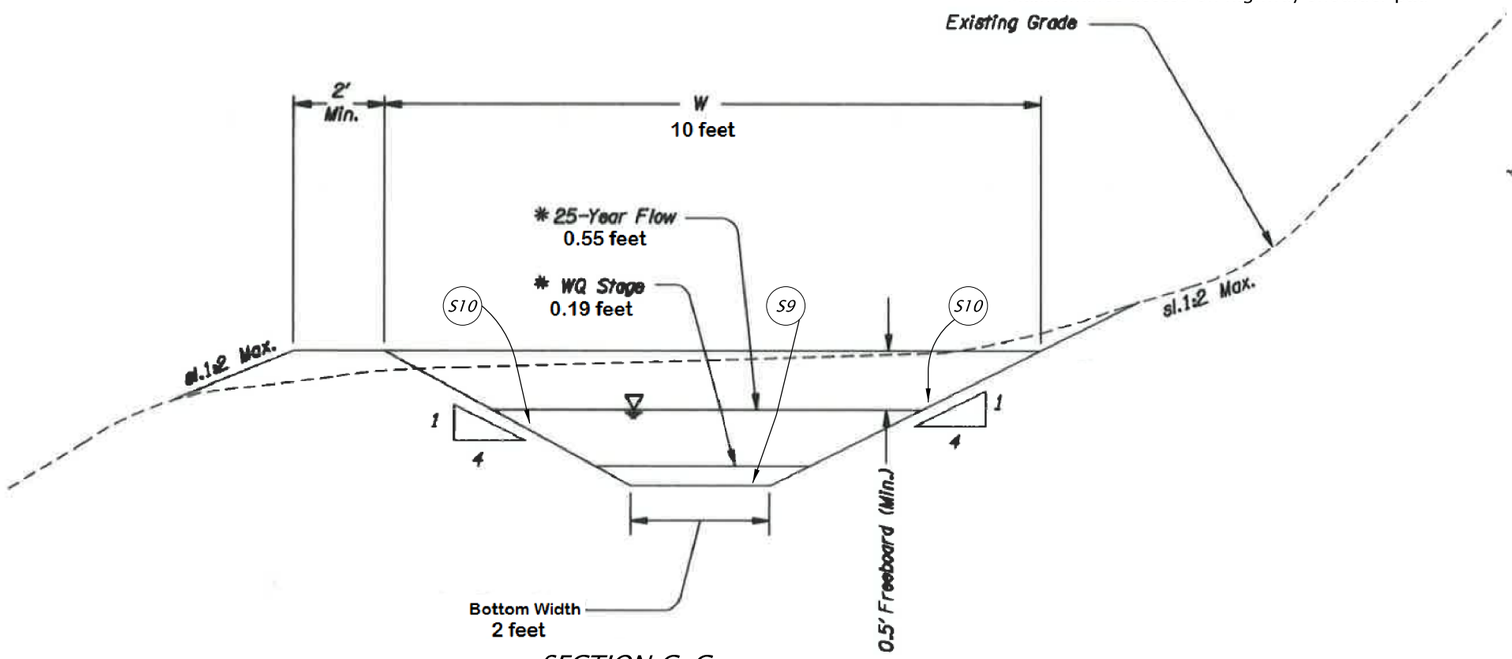
Ditch

Southeastbound lanes

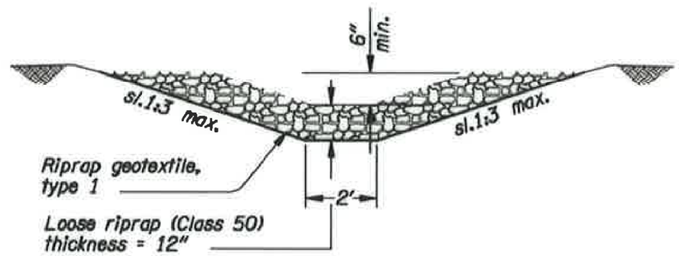
Maintenance access on highway shoulder pad

Legend

- Water Flow Direction
- Traffic Flow Direction
- Picture Location/Direction



SECTION C-C
N.T.S.



RIPRAP LINED DRAINAGE DITCH

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 01 of 04

Prepared By:
Katrina Sepulveda

Drafted By:
Katrina Sepulveda

DFI D00898
MAINTENANCE DISTRICT 1 HWY 047
Water Quality Biofiltration Swale
Sunset Highway MP 54.46-54.49
Washington County

1.dgn :: Default 11/6/2018 5:04:28 PM hwyr65q

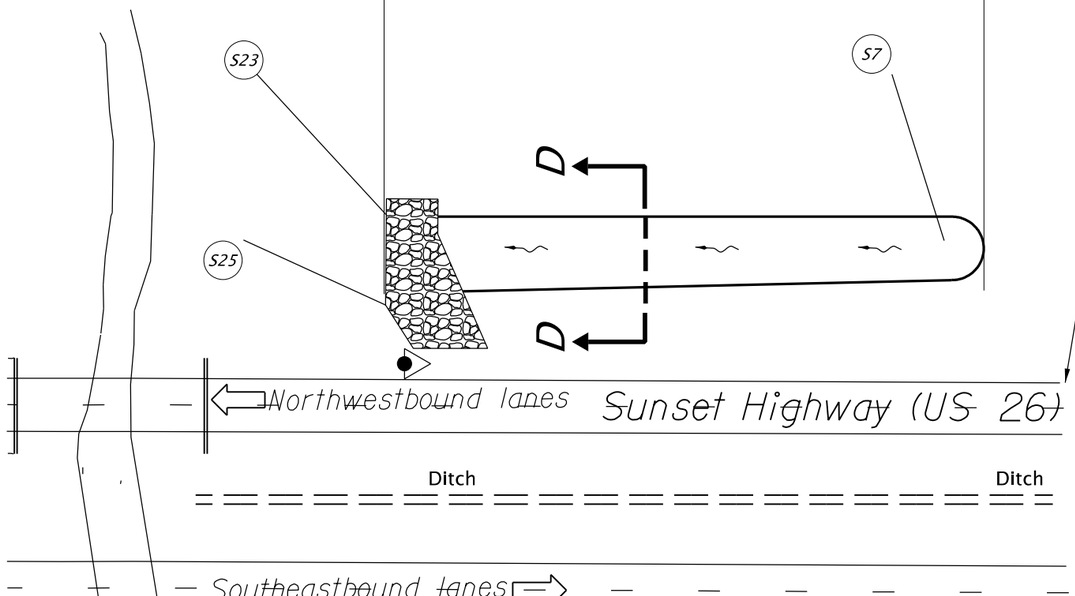
DFI_D00000.dgn

Water Quality Biofiltration Swale
(DFI D00899)

See Appendix B, Sheet No. 3C

Mile Point
54.56

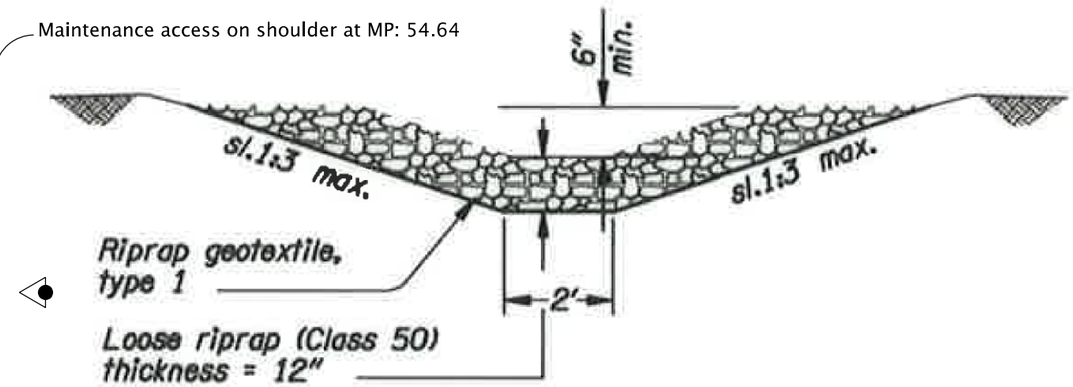
Mile Point
54.58



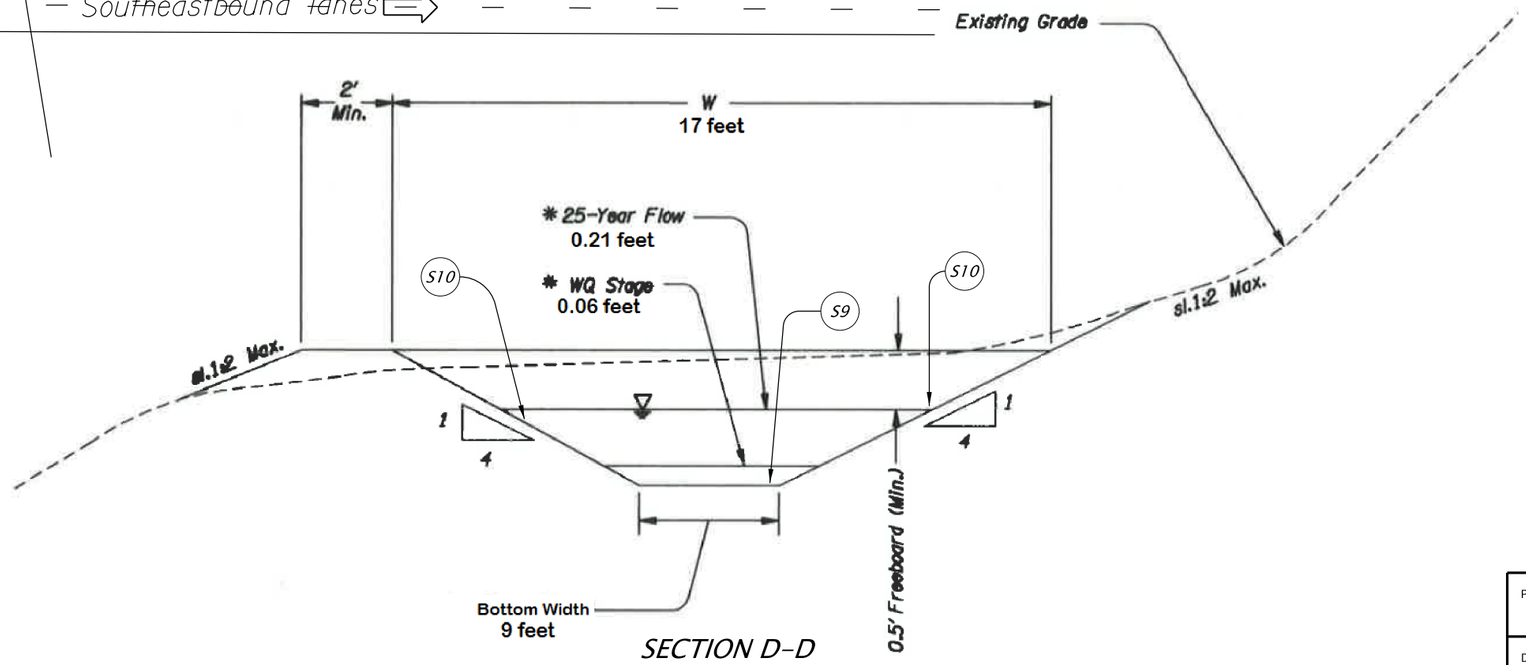
Legend

- Water Flow Direction
- Traffic Flow Direction
- Picture Location/Direction

Maintenance access on shoulder at MP: 54.64



RIPRAP LINED DRAINAGE DITCH



SECTION D-D
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 02 of 04

Prepared By:
Katrina Sepulveda

Drafted By:
Katrina Sepulveda

DFI D00899
MAINTENANCE DISTRICT 1 HWY 047
Water Quality Biofiltration Swale
Sunset Highway MP 54.56-54.58
Washington County

B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 43V-097

43V-097

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index of Sheets and Standard Drg. Nos.

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

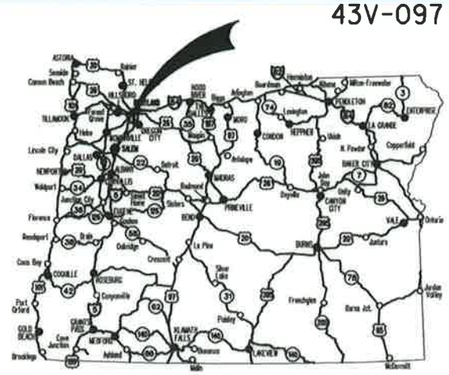
PLANS FOR PROPOSED PROJECT

STRUCTURES,GRADING, DRAINAGE, PAVING, SIGNING AND ROADSIDE DEVELOPMENT

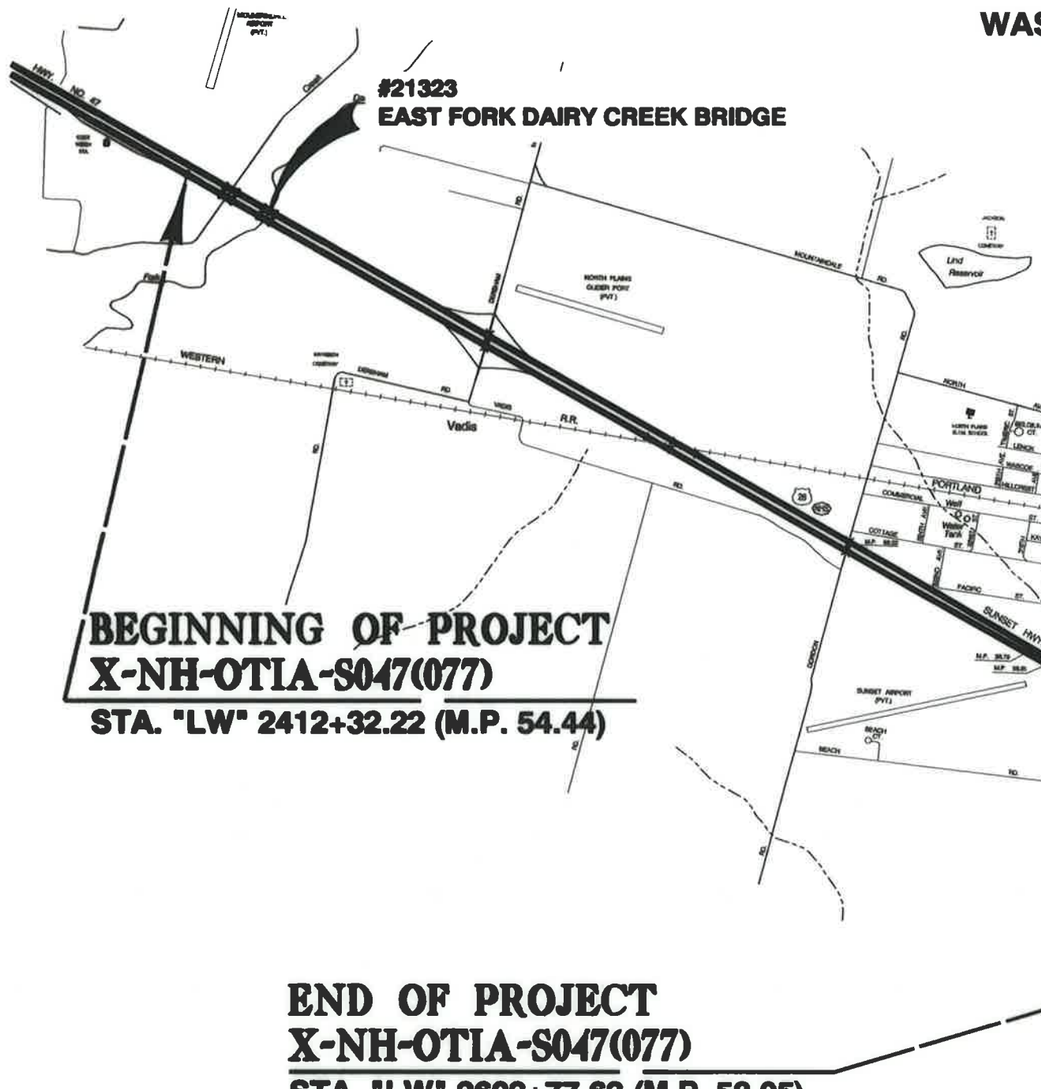
US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511

SUNSET HIGHWAY

WASHINGTON COUNTY
APRIL 2010



Overall Length Of Project - 3.61 Miles



REVISED AS CONSTRUCTED
9/27/11 CONTRACT C14249
PROJ. MGR. TOM MARZOLF

Sec. 34, T. 2 N, R. 3 W, W.M
Sec. 7, T. 1 N, R. 2 W, W.M.

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

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.)

OREGON TRANSPORTATION COMMISSION

Gail Achterman	CHAIR
Michael Nelson	VICE-CHAIR
Mary F. Olson	COMMISSIONER
Alan Brown	COMMISSIONER
David Lohman	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
ODOT
BY:

exeltech
Lacey, WA Seattle, WA Portland, OR

These plans were developed using ODOT design standards. Exceptions to these standards, if any, have been submitted and approved by the ODOT Chief Engineer or their delegated authority.

Approving Authority: _____
Signature & date

_____
Print name and title

_____
Concurrence by ODOT Chief Engineer

OTIA
OREGON TRANSPORTATION INVESTMENT ACT

US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511
SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	X-NH-OTIA-S047(077)	1

INDEX OF SHEETS CONT'D.

SHEET NO.	DESCRIPTION
2	TYPICAL SECTIONS
2A	TYPICAL SECTIONS
2B	RIPRAP PLAN
2B-2	RIPRAP PLAN
2B-3	RIPRAP DETAILS
2B-4	DETAILS
2B-5	DETAILS
2B-6	DRAINAGE DETAILS
2C	TRAFFIC CONTROL PLAN
2C-2	TRAFFIC CONTROL PLAN
2C-3	DETOUR STRIPING PLAN
2C-4	DETOUR STRIPING PLAN
2C-5	TRAFFIC CONTROL PLAN
2C-6	TRAFFIC CONTROL PLAN
2C-7	DETOUR STRIPING PLAN
2C-8	DETOUR STRIPING PLAN
2D	PIPE DATA SHEET
3	ALIGNMENT AND GENERAL CONSTRUCTION
3A	PROFILE
3B	DETOUR ALIGNMENT AND GENERAL CONSTRUCTION
3B-2	DETOUR ALIGNMENT AND GENERAL CONSTRUCTION
3B-3	DETOUR PROFILE
3C	DRAINAGE AND RUNOFF TREATMENT PLAN
4	ALIGNMENT AND GENERAL CONSTRUCTION
4A	PROFILE
4B	DETOUR ALIGNMENT AND GENERAL CONSTRUCTION
4B-2	DETOUR ALIGNMENT AND GENERAL CONSTRUCTION
4B-3	DETOUR PROFILE
4C	DRAINAGE AND RUNOFF TREATMENT PLAN
6A	EROSION CONTROL PLAN
6A-2	EROSION CONTROL PLAN
6A-3	SITE STABILIZATION PLAN
6A-4	STREAMBANK STABILIZATION PLAN
6A-5	SITE STABILIZATION PLAN
6A-6	STREAMBANK STABILIZATION PLAN
6N	CONTOUR GRADING PLAN
6N2	CONTOUR GRADING PLAN

PERMANENT SIGNING & PAVEMENT MARKINGS

SHEET NO.	DESCRIPTION
ST	STRIPING PLAN
ST-2	STRIPING PLAN
ST-3	STRIPING PLAN
ST-4	STRIPING PLAN
ST-5	STRIPING DETAILS
S-12013	SIGNING PLAN
S-12014	SIGNING PLAN
S-12015	SIGNING PLAN

INDEX OF SHEETS
Bridge No. 21322

DRAWING NO.	DESCRIPTION
83254	PLAN AND ELEVATION
83255	GENERAL NOTES
83256	FOUNDATION DATA
83257	FOUNDATION PLAN & DETAILS
83258	END BENT PLAN AND ELEVATION
83259	END BENT DETAILS
83260	WING WALL DETAILS
83261	BENTS 2 & 3 PLAN & ELEVATION
83262	BENTS 2 & 3 DETAILS
83263	DECK PLAN
83264	TYPICAL DECK SECTIONS & DETAILS
83265	SLAB SCHEDULE & DETAILS

INDEX OF SHEETS
Bridge No. 21323

Bridge Sheets

DRAWING NO.	DESCRIPTION
83266	PLAN AND ELEVATION
83267	GENERAL NOTES
83268	FOUNDATION DATA
83269	FOUNDATION PLAN & DETAILS
83270	END BENT PLAN AND ELEVATION
83271	END BENT DETAILS
83272	WING WALL DETAILS
83273	BENTS 2 & 3 PLAN & ELEVATION
83274	BENTS 2 & 3 DETAILS
83275	DECK PLAN
83276	TYPICAL DECK SECTIONS & DETAILS
83277	SLAB SCHEDULE & DETAILS

Standard Drg. Nos.

TM200 -Sign Installation Details
TM201 -Miscellaneous Sign Placement Details
TM500 -Pavement Marking Standard Detail Blocks
1 *TM502 -Pavement Marking Standard Detail Blocks*
TM515 -Raised Pavement Markers
TM517 -Recessed Pavement Markers
TM520 -Durable Pavement Markings Method "A" Profiled
TM601 -Multi-Post Breakaway Sign Supports (Details)
TM602 -Triangular Base Breakaway Sign Support (Multi-Directional Slip Base Design)
TM635 -Breakaway Sign and Luminaire Supports (Location Guidelines)
TM800 -Tables, Abrupt Edge, And PCMS Details
TM810 -Temporary Reflective Pavement Markers
TM820 -Temporary Barricades
TM821 -Temporary Sign Supports
TM830 -Temporary Concrete Barrier And Rumble Strip Details
TM831 -Temporary Impact Attenuators
TM860 -Freeway Sections
RD140 -Roadway Cross Slopes Superelevated Sections
RD300 -Trench Backfill, Bedding, Pipe Zone and Multiple Installations.
RD317 -Culvert Embankment Protection
RD326 -Coupling Bands for Corrugated Metal Pipe
RD364 -Concrete Inlets Type G-1, G-2, G-2M, & G-2MA
RD390 -Fill Height Table for HDPE Pipe
RD400 -Guardrail And Metal Median Barrier
RD405 -Guardrail And Metal Median Barrier Parts
RD410 -Guardrail Parts (Thrie Beam)
RD415 -Guardrail And Metal Median Barrier Parts
RD420 -Energy Absorbing Terminal
RD440 -Guardrail Installation At Bridge Ends
RD450 -Guardrail Anchors (Steel)
RD500 -Precast Concrete Barrier Pin and Loop Assembly
RD610 -Asphalt Pavement Details
RD700 -Curbs
RD701 -Drainage Curbs
RD1000 -Construction Entrances
RD1005 -Check Dams
RD1010 -Inlet Protection (Type 1, 2 and 3)
RD1015 -Inlet Protection (Type 4) Biofilter Bags
RD1035 -Sediment Barrier (Type 3)
RD1040 -Sediment Fence, Supported Sediment Fence, Unsupported
RD1055 -Matting
BR165 -Bridge End Panel
BR200 -Concrete Bridge Rail Type "F"
BR203 -Transition Concrete Bridge Rail To Guardrail
BR236 -Trailing End Bridge Connection Concrete Bridge Rail To Guardrail
BR420 -26" Precast Prestressed Slab
BR445 -Precast Prestressed Boxes And Slabs Details

No R/W Map No.

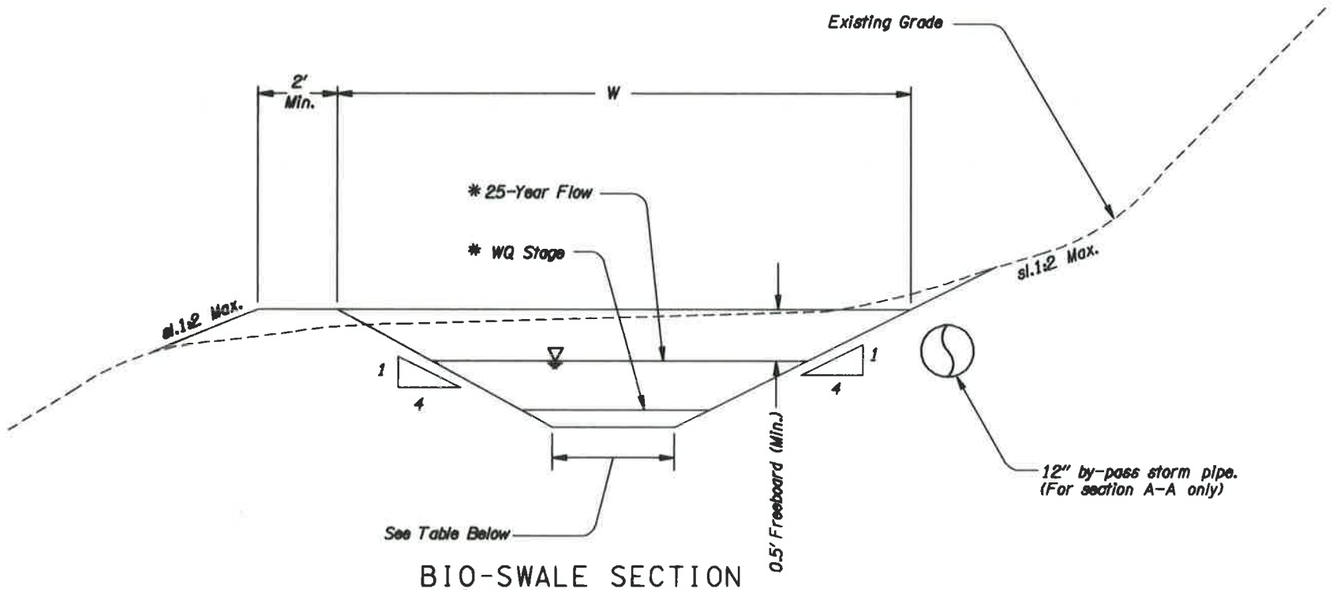
REVISED AS CONSTRUCTED
9/27/11 CONTRACT C14249

No.	DATE	REVISIONS	BY
1	04-15-10	Added standard drawings.	HJP

US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511

SUNSET HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	X-HB-0TIA-0047(077)	1A



BIO-SWALE SECTION

Section A-A (see sheet, 4C)

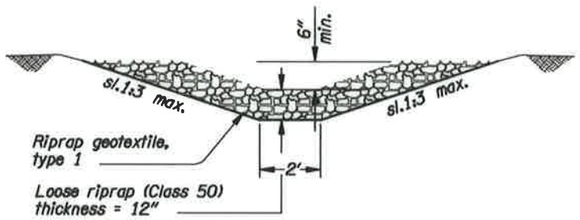
Section B-B (see sheet, 4C)

Section C-C (see sheet, 3C)

Section D-D (see sheet, 3C)

* BIO-SWALE'S DESIGN DATA:

LOCATION	LENGTH	BOTTOM WIDTH	WQ STAGE	25-YR FL. STAGE	W
(BRIDGE-21322)					
SECTION A-A	134'	2'	0.2'	0.57'	10'
SECTION B-B	100'	4'	0.1'	0.33'	12'
(BRIDGE-21323)					
SECTION C-C	131'	2'	0.19'	0.55'	10'
SECTION D-D	100'	9'	0.06'	0.21'	17'



RIPRAP LINED DRAINAGE DITCH

Bio-swale specifications

1. Site stabilization - install surface runoff control measures. See site stabilization plans.
2. Seedbed preparation may include the following:
   a. If infertile or coarse texture subsoil will be exposed during grading, stockpile topsoil and respread it over the finished slope and roll it to provide a firm seedbed.
   b. If construction fills have left soil exposed with a loose, rough, or irregular surface, break with a chisel plow or other implement.
   c. Topsoil to be installed as indicated on the site stabilization plans.
3. Do not apply fertilizers to areas within 50 feet of U.S. waters.

REVISED AS CONSTRUCTED
9/27/11 CONTRACT C14249

REGISTERED PROFESSIONAL ENGINEER
83339PE
OREGON
September 8, 2009
HAROLD JOHN PETERFESO
EXPIRES: 12-31-2010

OREGON DEPARTMENT OF TRANSPORTATION

exeltech
Lacey, WA Seattle, WA Portland, OR

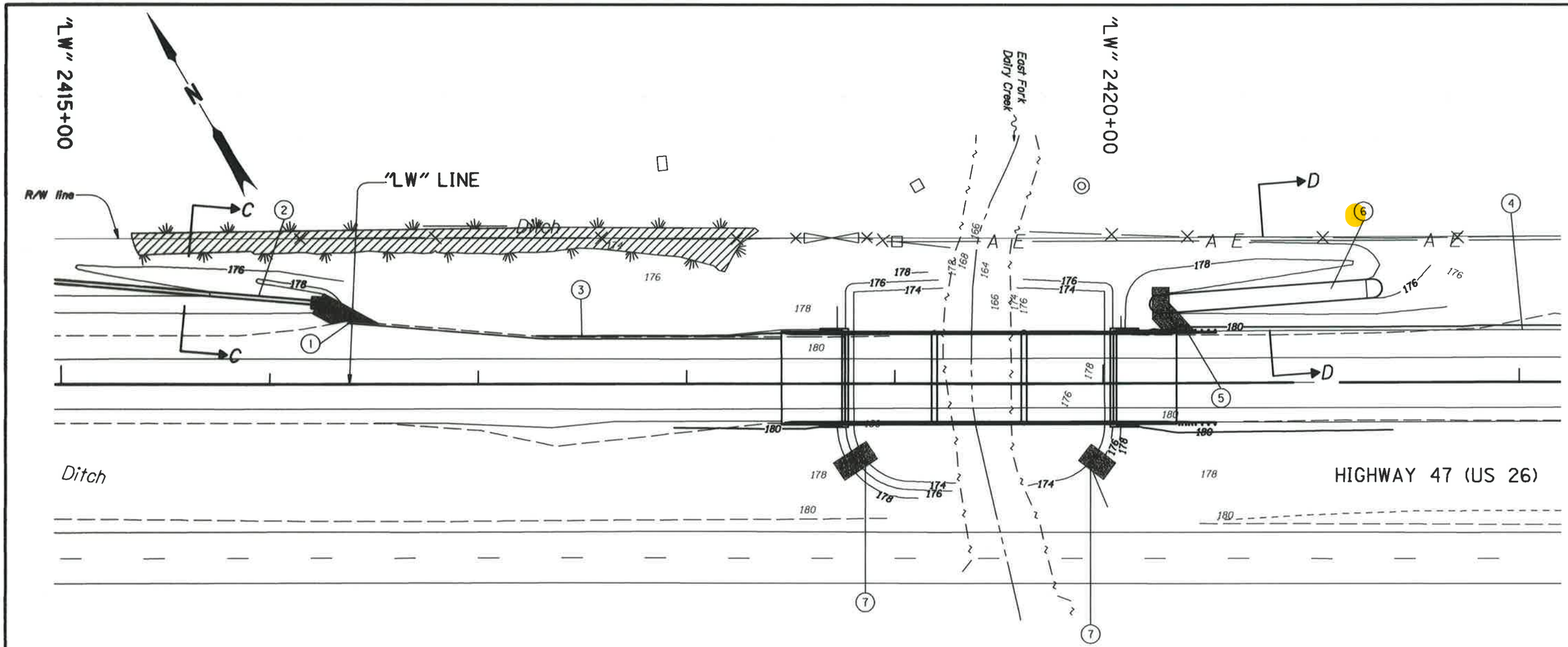
US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511
SUNSET HIGHWAY
WASHINGTON COUNTY

Design Team Leader - Karl Kirker
Designed By - Harold Peterfeso
Drafted By - Nell Henry

DRAINAGE DETAILS

SHEET NO. 2B-6

43V-097



(1) Install riprap lined drainage ditch-7.3 c.y. riprap, class 50
(See detail, sheet 2B-6)
Ditch exc.-8.7 c.y.
Riprap geotextile, type 1-21.8 s.y.
Sta. "LW" 2416+40.19, 30' Lt. to
Sta. "LW" 2416+24.40, 38' Lt.

(2) Construct swale
2' bottom width, 131 l.f.
S=0.0200'/Ft.
Ditch exc.-14.0 c.y.
Emb.-85.0 c.y.
(See bio-swale section sheet 2B-6)
Sta. "LW" 2416+24.70, 39' Lt. (beg. bio-swale)
Sta. "LW" 2414+95.10, 50' Lt. (end bio-swale)
Beg. El.= 177.05
End El.= 174.43
Const. 6'Wx5'Lx12"D class 50 riprap pad at beginning-1.0 c.y.
Ditch exc.-1.0 c.y.
Riprap geotextile, type 1-3.3 s.y.

(3) See sht. 3, note 6.

(4) See sht. 3, note 7

(5) Install riprap lined drainage ditch-4.2 c.y. riprap, class 50
(See detail, sheet 2B-6)
Ditch exc.-5.0 c.y.
Riprap geotextile, type 1-12.7 s.y.
Sta. "LW" 2420+35.81, 24' Lt. to
Sta. "LW" 2420+30.50, 32' Lt.

(6) Construct swale
9' bottom width, 100 l.f.
S=0.0200'/Ft.
Ditch exc.-36.0 c.y.
Emb.-116.0 c.y.
(See bio-swale section sheet 2B-6)
Sta. "LW" 2420+27.04, 38' Lt. (beg. bio-swale)
Sta. "LW" 2421+29.82, 45' Lt. (end bio-swale)
Beg. El.= 178.00
End El.= 176.00
Const. 15'Wx8'Lx12"D class 50 riprap pad at beginning-4.5 c.y.
Ditch exc.-4.5 c.y.
Riprap geotextile, type 1-13.3 s.y.

(7) Construct riprap ditch-12.6 c.y. riprap, class 50
Ditch exc.-24.4 c.y.
Riprap geotextile, type 1-37.7 s.y.
Sta. "LW" 2418+73, 42' Rt. to Sta. "LW" 2418+89, 32' Rt.
Sta. "LW" 2419+91, 33' Rt. to Sta. "LW" 2420+03, 42' Rt.
(See detail, sheet 2B-5).

Note:
For sections C-C & D-D see sheet 2B-6.

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9/27/11 CONTRACT C14249

REGISTERED PROFESSIONAL ENGINEER
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OREGON
September 8, 2009
HAROLD JOHN PETERFESO
EXPIRES: 12-31-2010

OREGON DEPARTMENT OF TRANSPORTATION

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Lacey, WA Seattle, WA Portland, OR

US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511
SUNSET HIGHWAY
WASHINGTON COUNTY

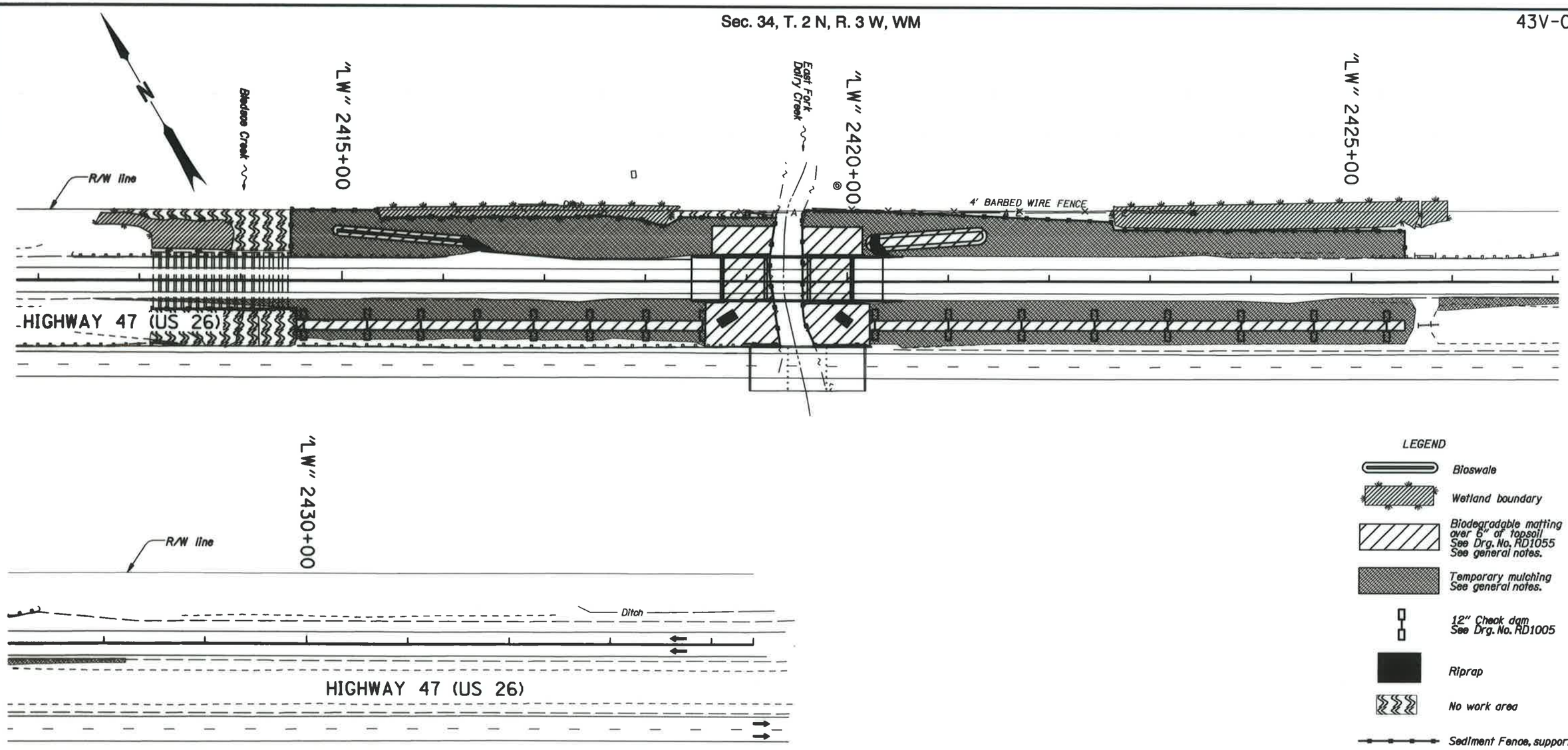
Design Team Leader - Karl Kirker
Designed By - Harold Peterfeso
Drafted By - Neil Henry

DRAINAGE AND RUNOFF TREATMENT PLAN

SHEET NO. 3C

Sec. 34, T. 2 N, R. 3 W, WM

43V-097



LEGEND

- Bioswale
- Wetland boundary
- Biodegradable matting over 6" of topsoil See Drg. No. RD1055 See general notes.
- Temporary mulching See general notes.
- 12" Check dam See Drg. No. RD1005
- Riprap
- No work area
- Sediment Fence, supported

GENERAL NOTES:

1. *See sheet 2B-6 for seedbed preparation to be applied at areas with matting and temporary mulching.*

REVISED AS CONSTRUCTED
9/27/11 CONTRACT C14249

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US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511
SUNSET HIGHWAY
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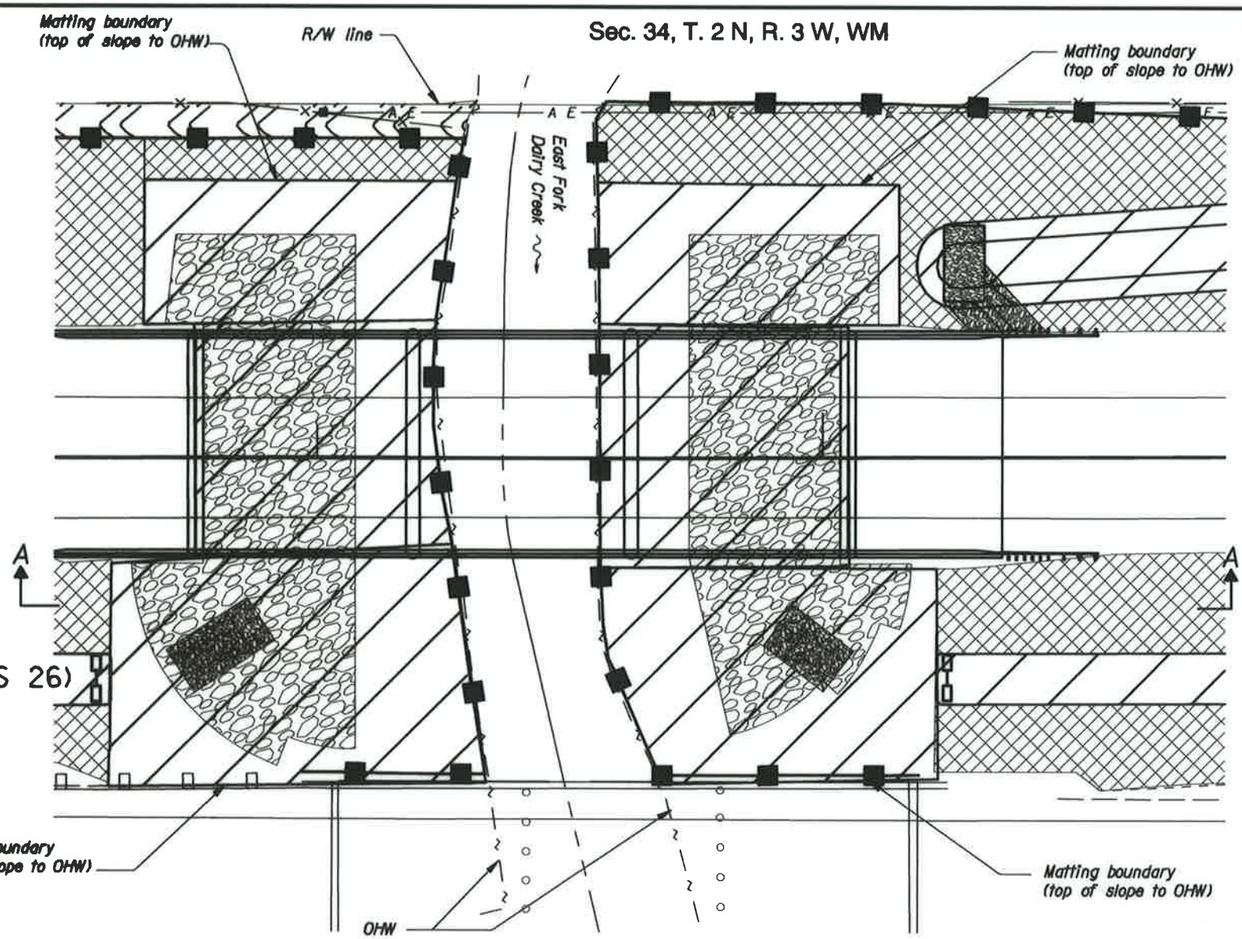
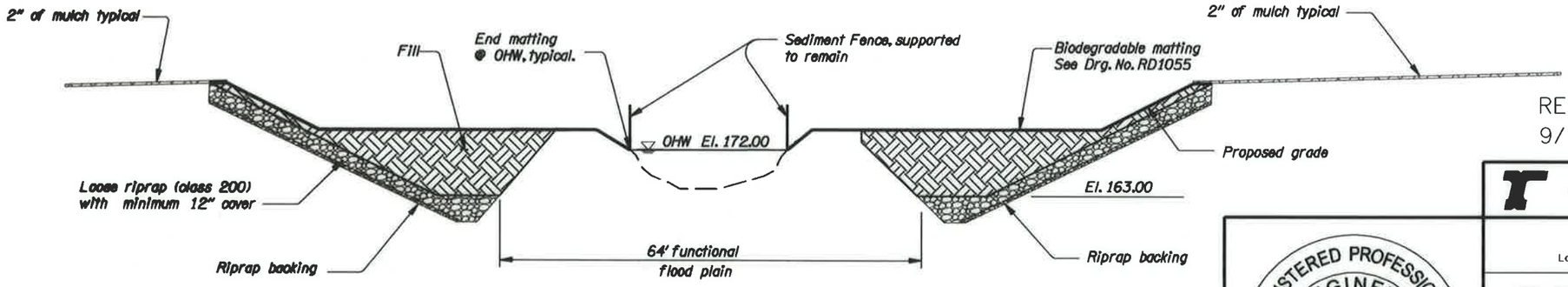
SITE STABILIZATION PLAN

SHEET NO. GA-3

Sec. 34, T. 2 N, R. 3 W, WM





SECTION A-A

LEGEND

- Biodegradable matting See Drg. No. RD1055 Slope application
- Proposed riprap
- Temporay Mulching
- No work area
- Riprap
- Check dam See Drg. No. RD1005.
- Sediment Fence, supported

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9/27/11 CONTRACT C14249

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US26: EAST FORK DAIRY CR - MCKAY CR - BUNDLE 511
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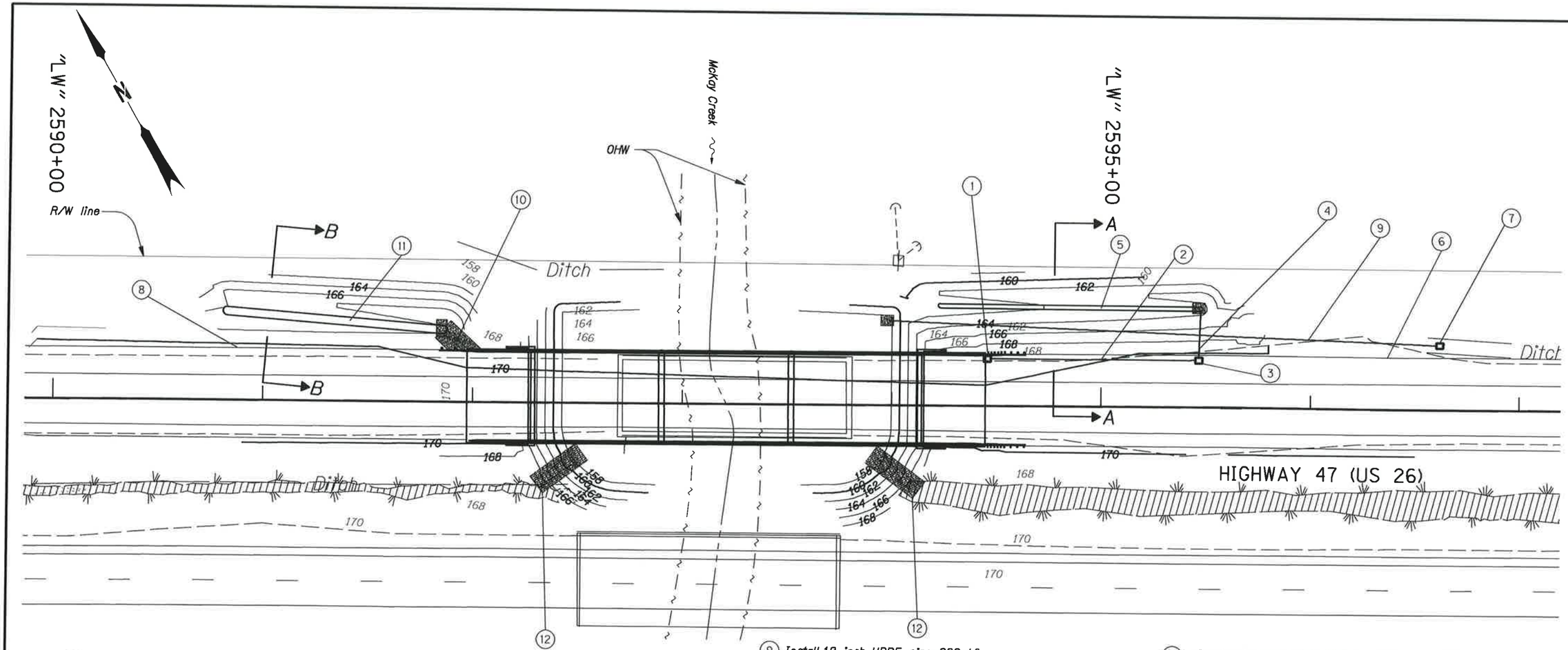
STREAMBANK STABILIZATION PLAN

SHEET NO.
GA-4



(1) *Sta. "LW" 2594+46.50, 22.63' Lt.*
Install type G-1 inlet
Rim El.=169.72
Inv. El.=166.72
(See Drg. No. RD364)

(2) *Install 12 inch HDPE pipe-100 l.f.*
S=0.0100'/Ft.
3' deep.
(See Drg. No. RD300, RD390)

(3) *Sta. "LW" 2595+46.00, 22.23' Lt.*
Install type G-1 inlet
Rim El.=170.20
Inv. El.=165.72

(4) *Sta. "LW" 2593+45.42, 46' Lt.*
Install 12 inch HDPE pipe-22 l.f.
S=0.1009'/Ft.
3' deep and daylight to bio-swale end
(See Drg. No. RD300, RD390)

(5) *Construct swale*
2' bottom width, 134 l.f.
S=0.0200'/Ft.
Ditch exc.-25.0 c.y.
Emb.-422.0 c.y.
(See bio-swale section, sheet 2B-6)
Sta. "LW" 2595+45.38, 47' Lt. (beg. bio-swale)
Sta. "LW" 2594+18.07, 47' Lt. (end bio swale)
Beg. El.=163.50
End El.=160.88
Const. 10'Wx5'Lx12"D Class 50 riprap pad at beginning-1.9 c.y.
Ditch exc.-1.9 c.y.
Riprap geotextile, type 1-5.6 s.y.

(6) *See sht 4, note 9.*

(7) *Sta. "LW" 2596+61.85, 29' Lt.*
Install type G-2MA inlet
Rim El.=168.90±
Inv. El.=165.40.
Location and elevation to be field verified, if relocation is necessary submit to engineer for approval.
(See Drg. No. RD364)

(8) *See sht. 4, note 8.*

(9) *Install 12 inch HDPE pipe-262 l.f.*
S=0.0282'/Ft.
3.5' deep and daylight to grade
End Sta. "LW" 2594+00.19, 40' Lt.
Const. 6'Wx5'Lx12"D class 50 riprap pad at outlet-1.0 c.y.
(See Drg. No. RD300, RD317, RD390)
Ditch exc.-1.0 c.y.
Riprap geotextile, type 1-3.3 s.y.

(10) *Install riprap lined drainage ditch-5.2 c.y. riprap, class 50*
(See detail, sheet 2B-6)
Ditch exc.-6.3 c.y.
Riprap geotextile, type 1-15.6 s.y.
Sta. "LW" 2591+97.19, 24' Lt. to
Sta. "LW" 2591+87.30, 33' Lt.

(11) *Construct swale*
4' Bottom Width, 100 l.f.
S=0.0200'/Ft.
Ditch exc.-14.0 c.y.
Emb.-151.0 c.y.
(See bio-swale section, sheet 2B-6)
Sta. "LW" 2591+85.61, 35' Lt. (beg. bio-swale)
Sta. "LW" 2590+82.85, 43' Lt. (end bio swale)
Beg. El.=168.00
End El.=166.00
Const. 8'Wx5'Lx12"D class 50 riprap pad at beginning-1.5 c.y.
Ditch exc.-1.5 c.y.
Riprap geotextile, type 1-4.4 s.y.

(12) *Construct riprap ditch-20.5 c.y. riprap, class 50*
Ditch exc.-40.7 c.y.
Riprap geotextile, type 1-61.3 s.y.
Sta. "LW" 2592+30.39' Rt. to Sta. "LW" 2592+52, 23' Rt.
Sta. "LW" 2593+90, 23' Rt. to Sta. "LW" 2594+12, 41' Rt.
(See detail, sheet 2B-5)

Note:
For sections A-A & B-B see sheet 2B-6.

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9/27/11 CONTRACT C14249

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September 8, 2009
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SUNSET HIGHWAY
WASHINGTON COUNTY

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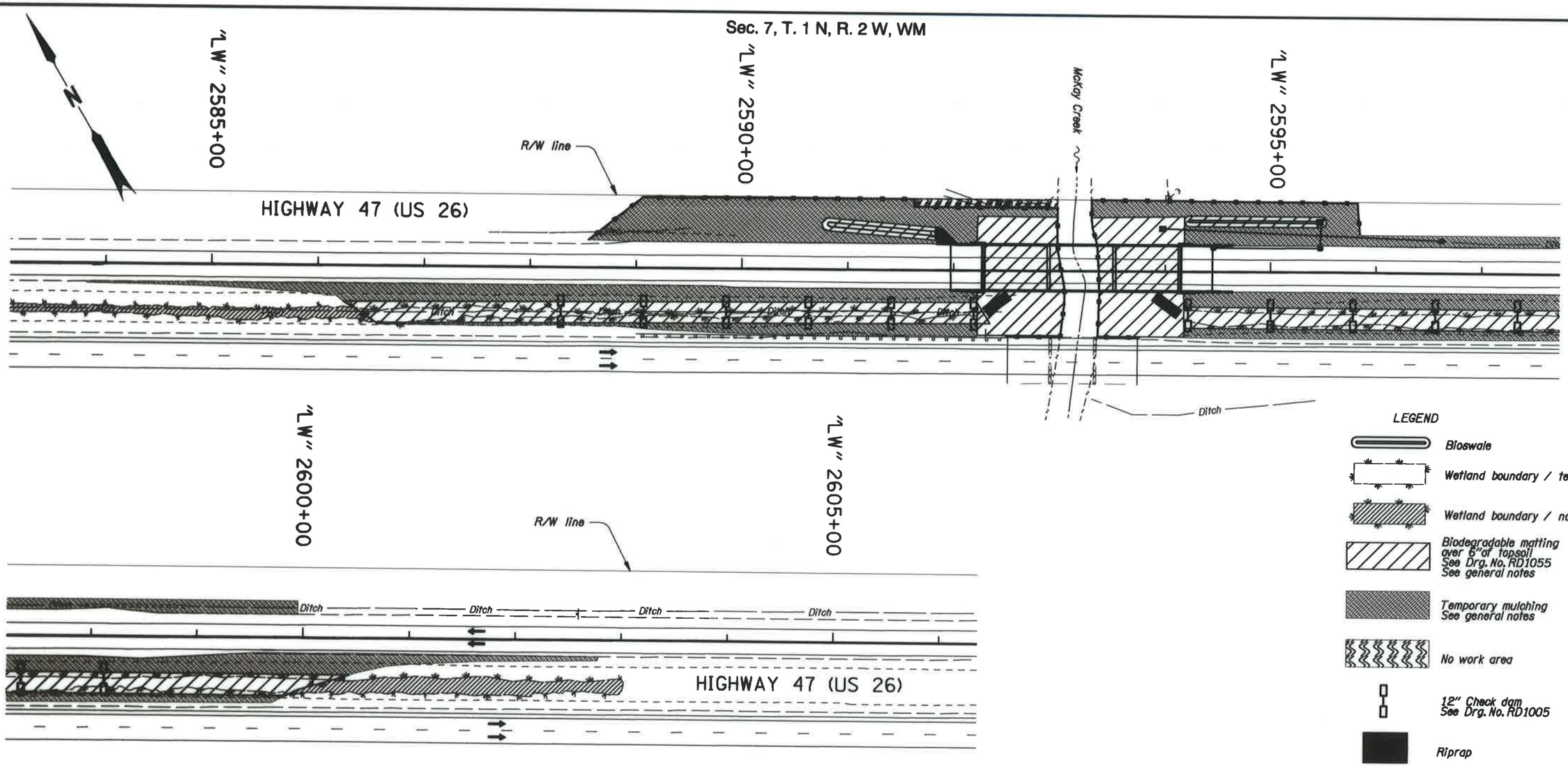
DRAINAGE AND RUNOFF TREATMENT PLAN

SHEET NO. 4C

Sec. 7, T. 1 N, R. 2 W, WM

43V-097



LEGEND

- Bioswale
- Wetland boundary / temporary impact
- Wetland boundary / no impact
- Biodegradable matting over 6"of topsoil See Drg. No. RD1055 See general notes
- Temporary mulching See general notes
- No work area
- 12" Check dam See Drg. No. RD1005
- Riprap
- Sediment Fence, supported

GENERAL NOTES:

1. See sheet 2B-6 for seedbed preparation to be applied at areas with matting and temporary mulching.

REVISED AS CONSTRUCTED
9/27/11 CONTRACT C14249

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SUNSET HIGHWAY
WASHINGTON COUNTY

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SITE STABILIZATION PLAN

SHEET NO. GA-5

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Sec. 7, T. 1 N, R. 2 W, WM

Matting boundary (Top of slope to OHW)

McKay Creek

Matting boundary (Top of slope to OHW)

HIGHWAY 47 (US 26)

A

A

Matting boundary (Top of slope to OHW)

OHW

Matting boundary (Top of slope to OHW)

LEGEND

- Biodegradable matting See Drg. No. RD1055 Slope application
- Proposed riprap
- Temporary mulching
- No work area
- Wetland boundary / temporary impact
- Check dam See Drg. No. RD1005.
- Riprap
- Sediment Fence, supported

2" of mulch typical

Fill

End matting @ OHW, typical.

Sediment Fence, supported to remain

Biodegradable matting See Drg. No. RD1055

2" of mulch typical

OHW El. 153.00

El. 147.00

Loose riprap (Class 200) with minimum 12" cover

Original ground

Riprap backing

99' Functional flood plain

Riprap backing

SECTION A-A

REVISED AS CONSTRUCTED
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STREAMBANK STABILIZATION PLAN

SHEET NO. GA-6

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