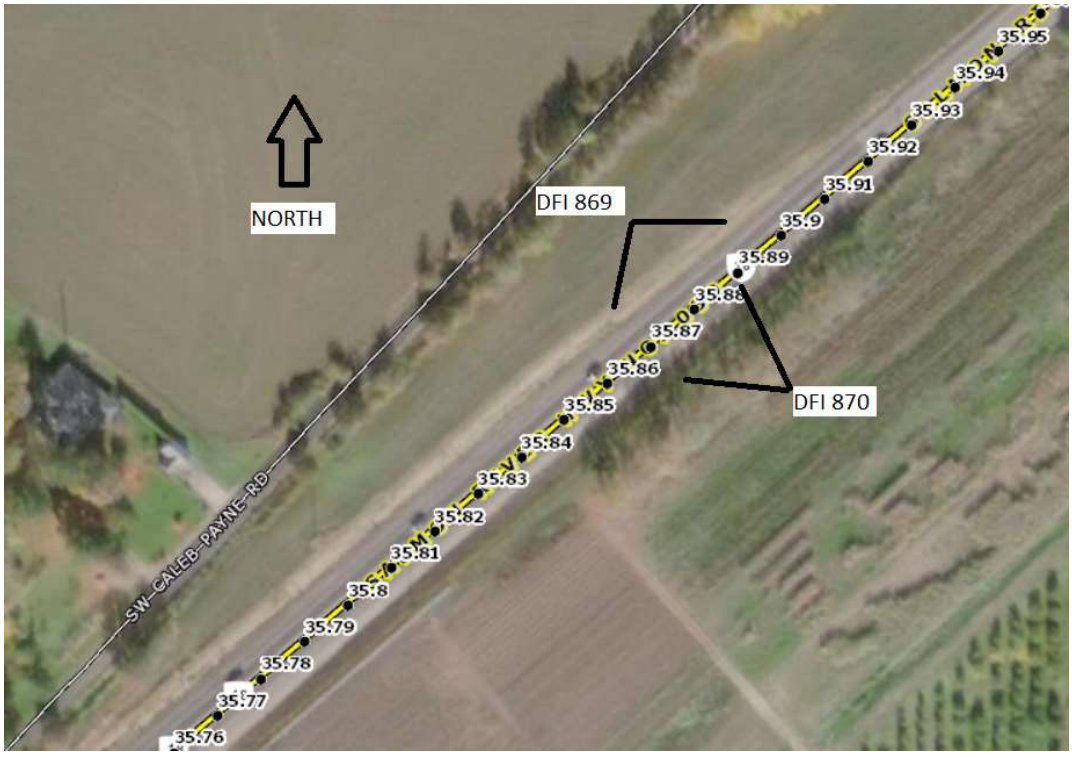
OPERATION & MAINTENANCE MANUAL

DFI No.: D00869, D00870

Facility Type: Water Quality Biofiltration Swale



June 2019

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00869,**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 49V-029
Location:	District: 3
	Highway No.: 039
	Mile Post: 35.870 Lt to 35.895 Lt
	Description: located on OR 18 - 1,400 feet east of Christensen Road.

Drainage Facility ID (DFI):	**D00870**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 49V-029
Location:	District: 3
	Highway No.: 039
	35.870 Rt to 35.889 Rt
	Description: located on OR 18 - 1,400 feet east of Christensen 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 2 Tech. Center, Bruce Carmichael,PE, Phone no. 503.986.2713

Facility construction: 2016
Contractor: Roy Houck Construction, LLC

4. Storm Drain System and Facility Overview

A water quality biofiltration swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. This type of facility is lined with grass and has a cell containing water quality mix under the bottom of the swale which stormwater can be filtered through. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

- Water Quality Biofiltration Swale
- OR 18 – 1,400 feet east of Christensen Road
- Access as would normally access a highway drainage ditch
- Contributing drainage basin (see Operational Plan Sheet and Drainage Area Plats in Appendix)
- Swales discharge to highway ditch line and ultimately to Deer Creek (see Design Sheets and Drainage Area Plats in Appendix)

A. Maintenance equipment access:
There is no special access. Access as would normally access a highway drainage ditch.

B. Heavy equipment access into facility:

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

C. Special Features:

☒ Amended Soils
☐ Porous Pavers
☐ Liners
☐ Underdrains

5. Facility Haz Mat Spill Feature(s)

The Water Quality Biofiltration Swales can be used to store a volume of liquid by damming the end of the swales such that liquids cannot exit the swale.

6. Auxiliary Outlet (High Flow Bypass)

There is no auxiliary outlet for the swales.

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:

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

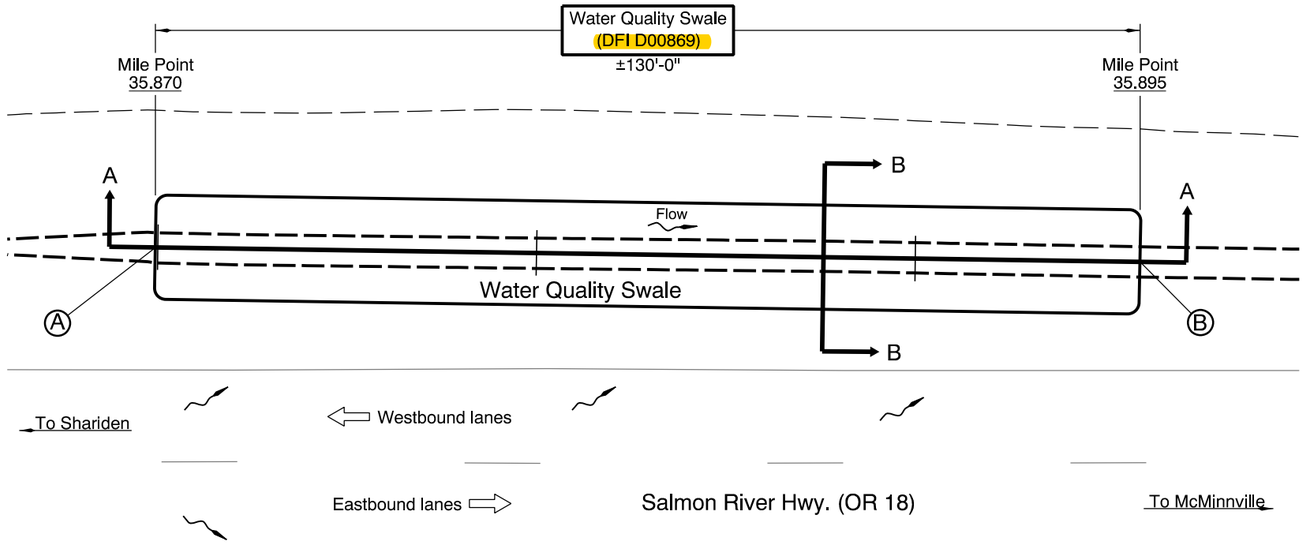
Contact any of the following for more detailed information about management of waste materials found on site:

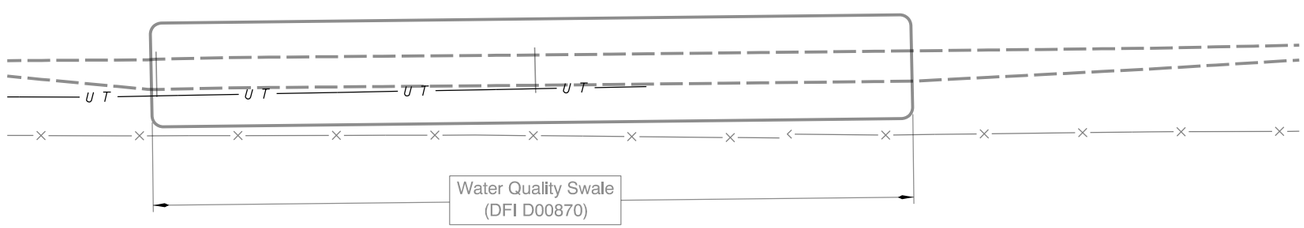
ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 986-2647
ODEQ Northwest Region Office	(503) 229-5263

Appendix A

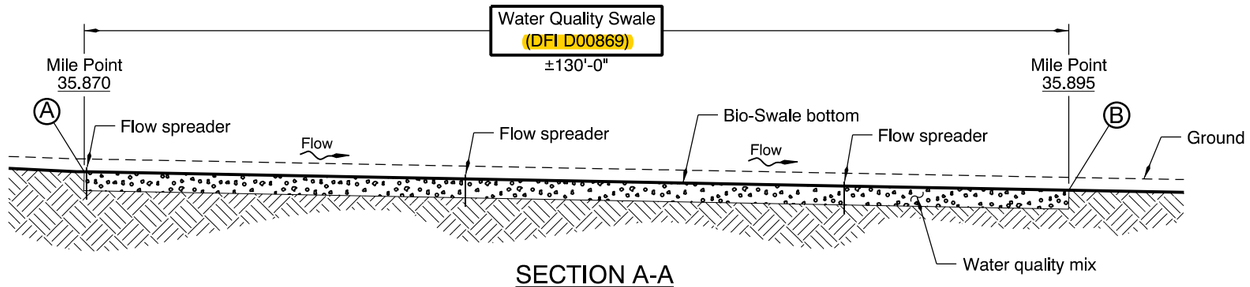
Content:

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





PLAN
N.T.S.



SECTION A-A
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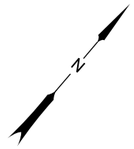
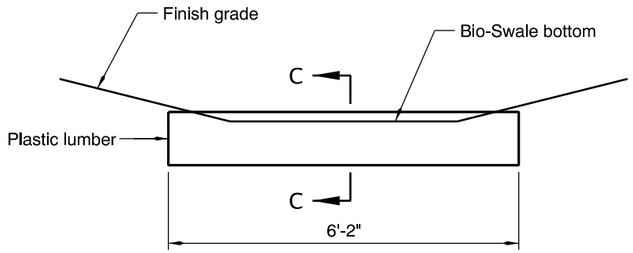


LEGEND:
- Ⓐ Swale Inlet
- Ⓑ Swale Outlet
- Pavement / Facility Flow Path
- Ditch Line
- Swale Boundery
- Traffic Direction



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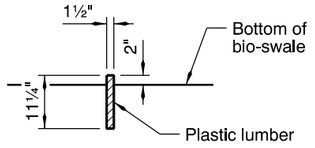

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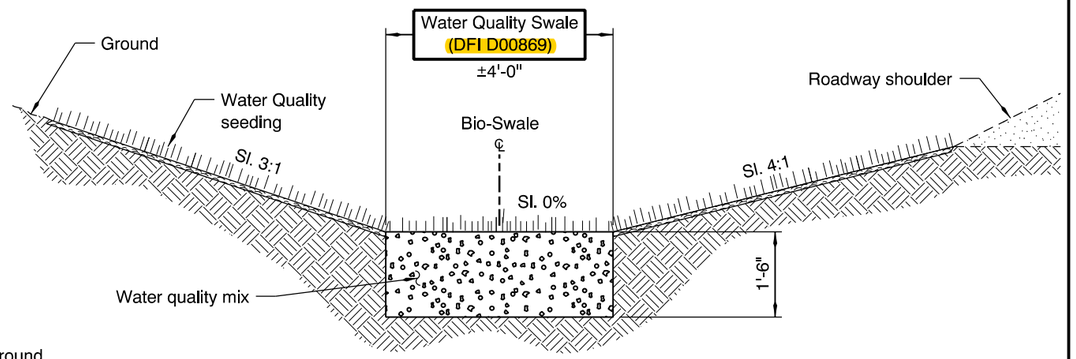


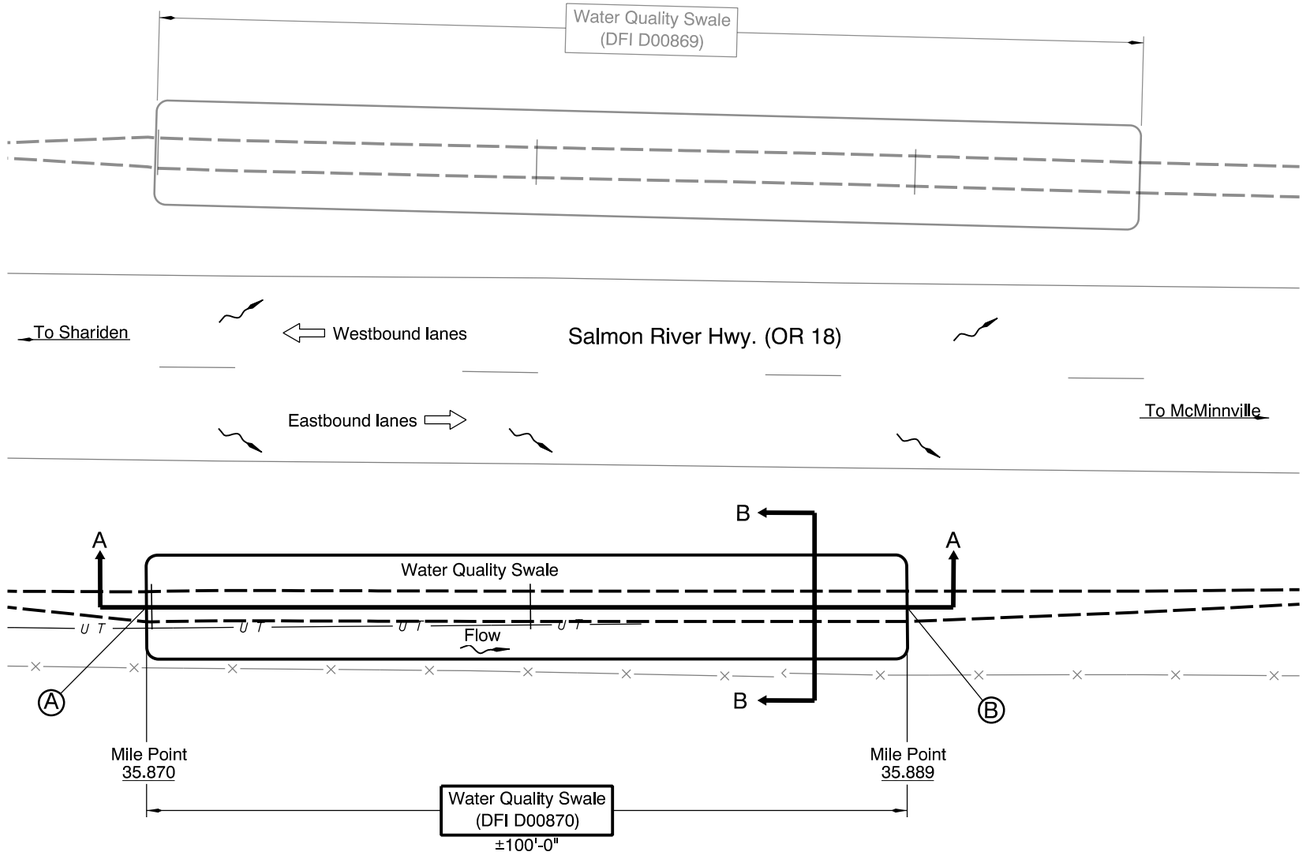
SECTION B-B
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: B. Carmichael

Drafted By: M. Skelton

DFI D00869
MAINTENANCE DISTRICT 3 HWY 39
BIO-SWALE
SALMON RIVER HWY. MP 35.87
YAMHILL COUNTY



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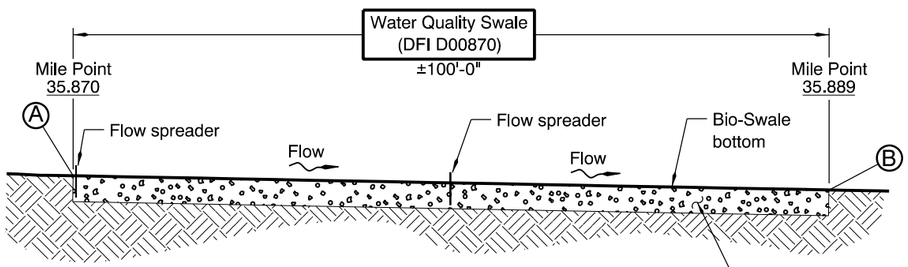

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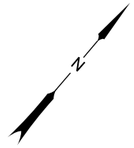
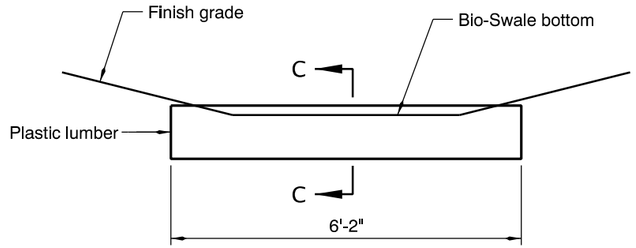
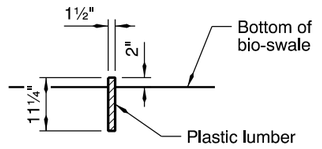


LEGEND:
- Ⓐ Swale Inlet
- Ⓑ Swale Outlet
- Pavement / Facility Flow Path
- Ditch Line
- Swale Boundery
- Traffic Direction



FLOW SPREADER DETAIL
N.T.S.



SECTION C-C
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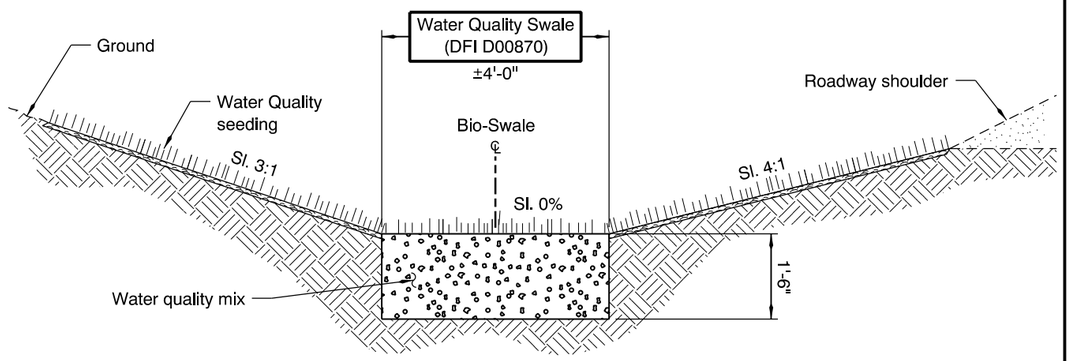


SECTION B-B
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: B. Carmichael

Drafted By: M. Skelton

DFI D00870
MAINTENANCE DISTRICT 3 HWY 39
BIO-SWALE
SALMON RIVER HWY. MP 35.87
YAMHILL COUNTY

Appendix B

Content:

- **ODOT Project Plan Sheets**
  - ***Water Quality***
  - ***Other Details***

49V-029

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Contd. & Std. Drg. Nos.

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

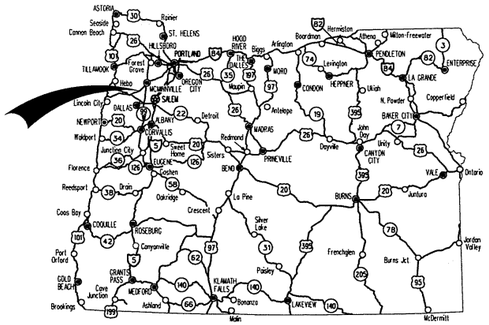
DRAINAGE, PAVING & ROADSIDE DEVELOPMENT

OR18 AT CHRISTENSEN ROAD SEC.

SALMON RIVER HIGHWAY

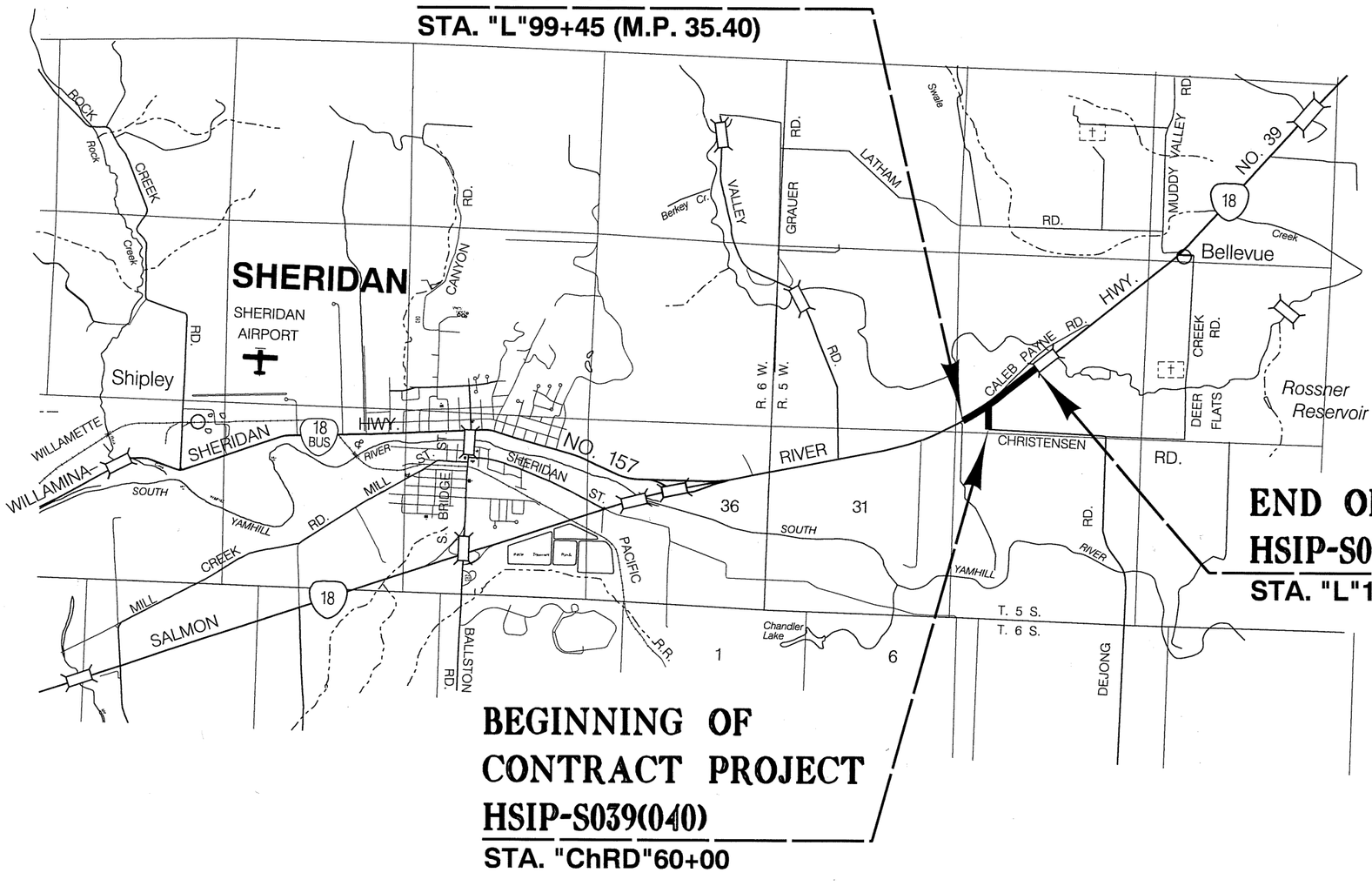
YAMHILL COUNTY

MARCH 2016



Overall Length Of Project - 0.56 Miles

BEGINNING OF PROJECT
HSIP-S039(040)
STA. "L"99+45 (M.P. 35.40)



END OF PROJECT
HSIP-S039(040)
STA. "L"128+00 (M.P. 35.96)

BEGINNING OF CONTRACT PROJECT
HSIP-S039(040)
STA. "ChRD"60+00

T. 5 S., R. 5 W., W.M.

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

OREGON TRANSPORTATION COMMISSION

Tammy Baney	CHAIR
David Lohman	COMMISSIONER
Susan Morgan	COMMISSIONER
Alando Simpson	COMMISSIONER
Sean O'Hollaren	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

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.

By: 1-21-16
Signature & date

James E. West - R2 Tech Center Manager
Print name and title

Concurrence by ODOT Chief Engineer

OR18 AT CHRISTENSEN ROAD SEC.
SALMON RIVER HIGHWAY
YAMHILL COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HSIP-S039(040)	1

PE001905 000

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INDEX OF SHEETS, CONTD.

SHEET NO.	DESCRIPTION
2, 2A Thru 2A-5 Incl.	Typical Sections
2B	Details
2C Thru 2C-13 Incl.	Traffic Control Plans
2D	Pipe Data Sheet
3	Alignment
3A	General Construction
3B	"L" Profile
3C	"A1" & "A2" Profile
4	Alignment
4A	General Construction
4B	Construction Notes
4C	"L" Profile
4D	"ChRD", "CuDs" & "CpDR" Profile
4E	"A3", "A4" & "A5" Profile
5	General Construction
5A	"L" Line Profile
	GEO/HYDRO
GA Thru GA-3 Incl.	Erosion And Sediment Control Plan
GB	Geotechnical Data
GJ	Stormwater Plan
GJ-2	Stormwater Details
	PERMANENT PAVEMENT MARKERS
ST & ST-2	Striping Details
ST-3 Thru ST-5 Incl.	Striping Plans
	PERMANENT SIGNING
S-15768 Thru S-15770 Incl.	Signing Plans
S-15771	Signing Details
S-15772	Sign & Post Data Tables

Standard Drg. Nos.

RD100 - Mailbox Support
RD101 - Mailbox Installation
RD140 - Roadway Cross Slopes Superelevated Sections
RD150 - Slope Rounding

RD300 - Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD302 - Street Cut
RD318 - Sloped Ends For Concrete Pipe
RD319 - Miscellaneous Culvert Details
RD320 - Paved End Slope For Culverts 60" Maximum Pipe Size
RD386 - Fill Height Tables For Circular Concrete Pipe
RD398 - Culvert ID Marker
RD399 - Stormwater Treatment And Storage Facility Field Markers

RD610 - Asphalt Pavement Details

RD715 - Approaches And Non-Sidewalk Driveways

RD1006 - Check Dams Type 2 and 6
RD1040 - Sediment Fence

TM200 - Sign Installation Details
TM201 - Miscellaneous Sign Placement Details
TM212 - Signing Details Oregon Route Signs
TM223 - Conventional Roads Directional Sign Layout Street Name Signs

TM500 - Pavement Marking Standard Detail Blocks
TM501 - Pavement Marking Standard Detail Blocks
TM503 - Pavement Marking Standard Detail Blocks
TM521 - Durable Pavement Markings Method "A" & Method "B" Surface & Groove Installed Non-Profiled
TM530 - Intersection Pavement Markings (Crosswalk, Stop Bar & Bike Lane Stencil)
TM531 - Turn Arrow Marking Details
TM539 - Median and Left Turn Channelization Details
TM560 - Alignment Layout: General
TM561 - Alignment Layout: Left Turn Lane, Centerline & Medians
TM570 - Traffic Delineators
TM576 - Traffic Delineator Installation For Non-Freeways

TM670 - Wood Post Sign Supports
TM671 - 3 Second Gust Wind Speed Map
TM675 - Extruded Aluminum Panels
TM676 - Sign Attachments
TM681 - Perforated Steel Square Tube (PSST) Sign Support Installation
TM687 - Perforated Steel Square Tube (PSST) Anchor Foundation
TM688 - Perforated Steel Square Tube (PSST) Slip Base Foundation

TM800 - Tables, Abrupt Edge And PCMS Details
TM810 - Temporary Pavement Markings
TM820 - Temporary Barricades
TM821 - Temporary Sign Supports
TM840 - Closure Details
TM841 - Intersection Work Zone Details
TM850 - 2-Lane, 2-Way Roadways

R/W Map No. 11-B-7-34

Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/pages/standard drawings home.aspx

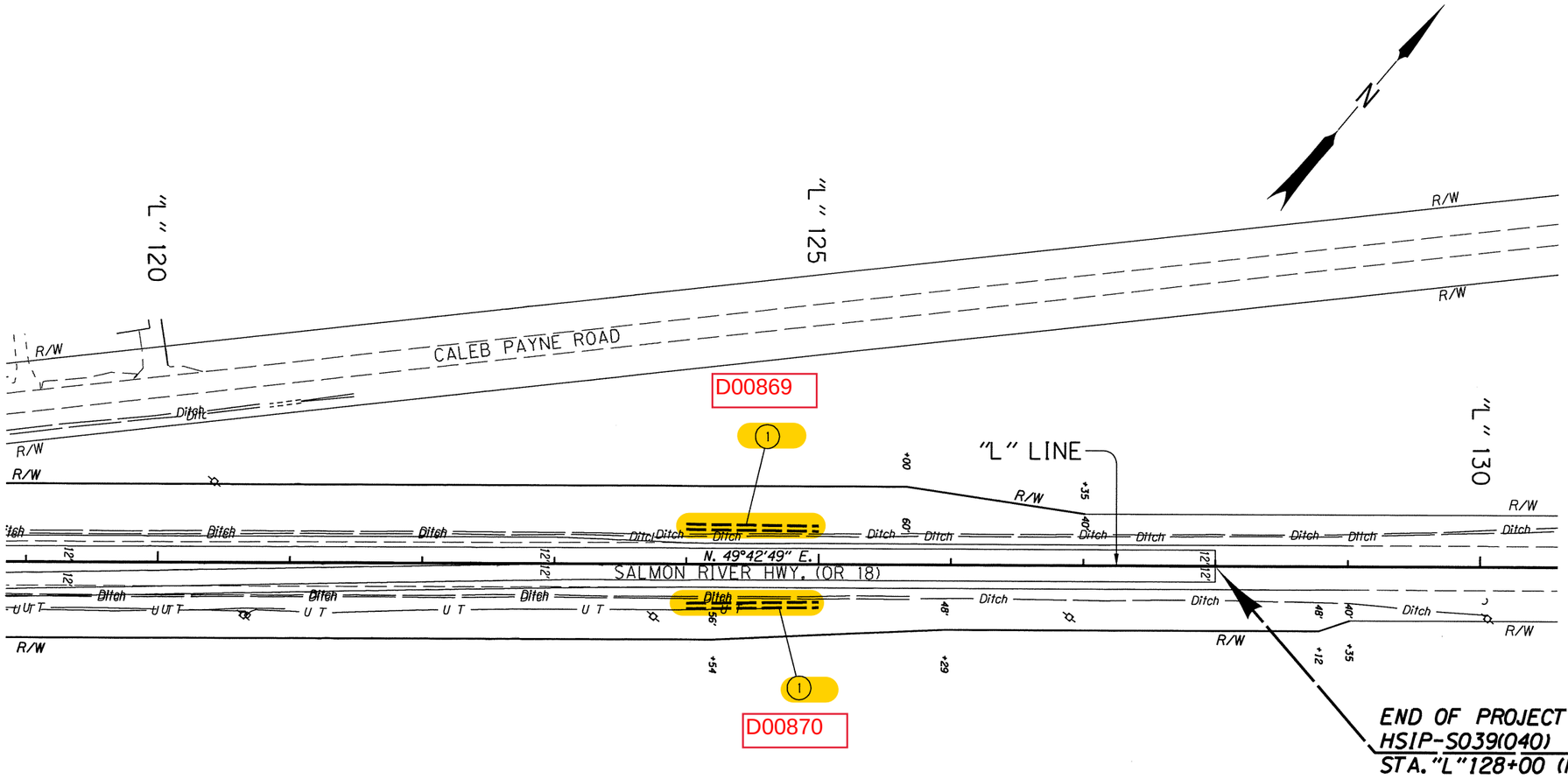
OR18 AT CHRISTENSEN ROAD SEC.
SALMON RIVER HIGHWAY
YAMHILL COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	SEE SHT. 1	1A

T. 5 S., R. 5 W., W.M.

49V-029

(1) Const. water quality bio-swale
(For details, see sht. GJ)



OREGON DEPARTMENT OF TRANSPORTATION

REGION 2 TECH CENTER

OR18 AT CHRISTENSEN ROAD SEC.
SALMON RIVER HIGHWAY
YAMHILL COUNTY

REGISTERED PROFESSIONAL ENGINEER
56,134
OREGON
JUNE 14, 2007
ELISEO LEMUS MAGAÑA
RENEWS: 12-31-2016

Design Team Leader - Ed Cantrell
Designed By - Cesar Lopez
Drafted By - Charlotte Gerken

GENERAL CONSTRUCTION

SHEET NO. 5

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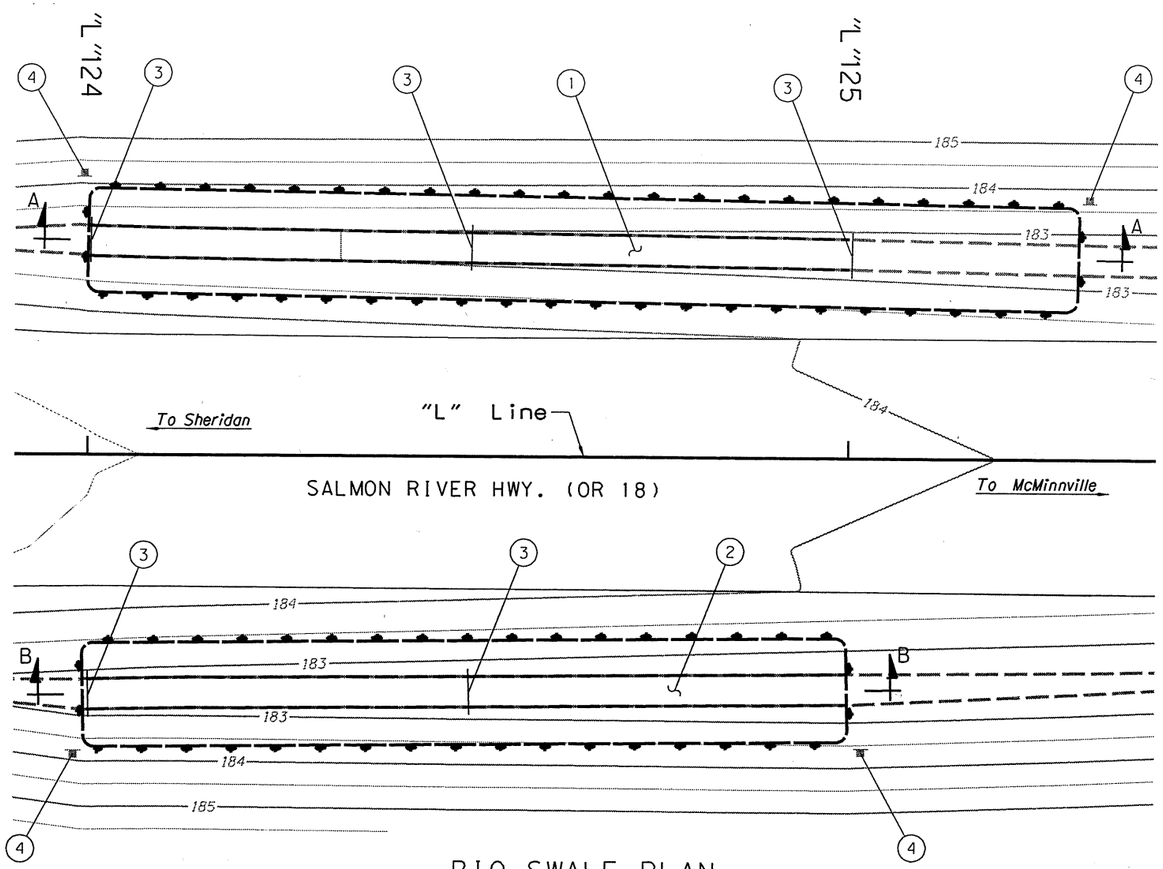
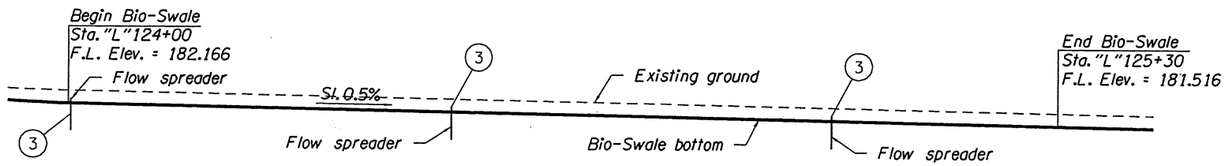
49V-029



BIO-SWALE PLAN



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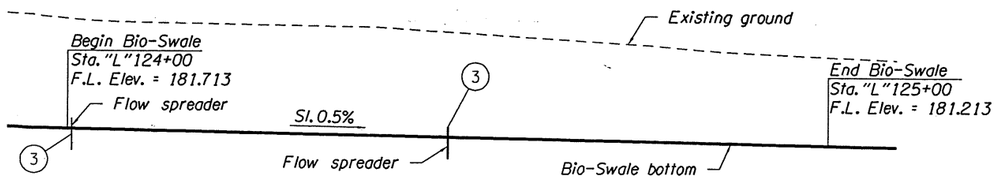


SECTION BB

(1) Sta. "L" 124+00 Lt. to "L" 125+30, Lt.
Const. Bio-Swale to contours shown. (DFI no. D00869)
Water Quality Mix - 33.7 cu. yd.
(For details see sht. GJ-2)

(2) Sta. "L" 124+00 Rt. to "L" 125+00, Rt.
Const. Bio-Swale to contours shown. (DFI no. D00870)
Water Quality Mix - 25.5 cu. yd.
(For details see sht. GJ-2)

(3) Install flow spreaders, plastic lumber
(50' spacing) - 31 ft.
(For details see sht. GJ-2)

(4) Install Type S2 markers
(For details see sht. RD399)

REGISTERED PROFESSIONAL ENGINEER
65305
OREGON
JANUARY 23, 2001
BRUCE A. CARMICHAEL
EXPIRES: 12/31/2017

OREGON DEPARTMENT OF TRANSPORTATION

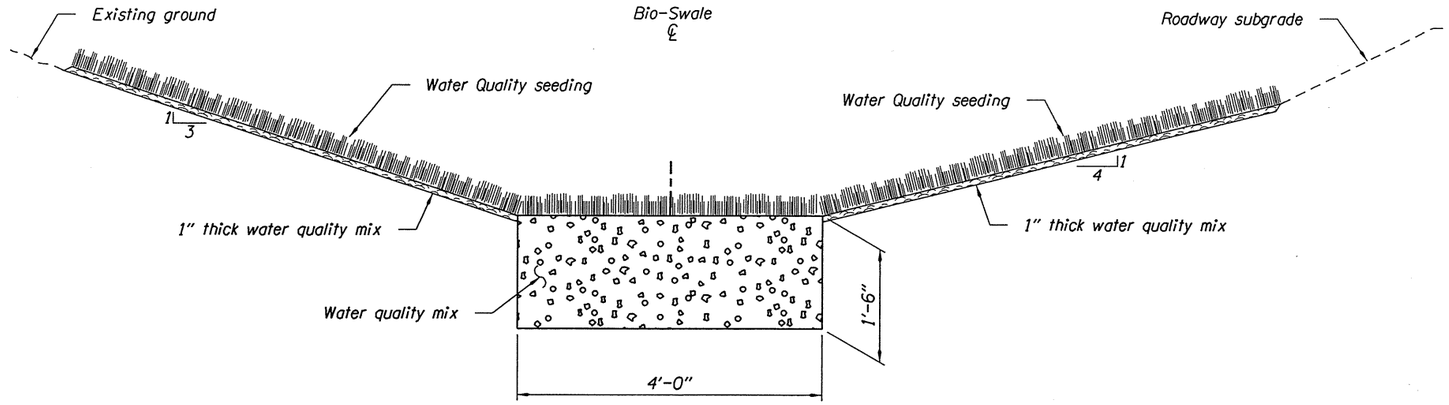
REGION 2 TECH CENTER

OR18 AT CHRISTENSEN ROAD SEC.
SALMON RIVER HIGHWAY
YAMHILL COUNTY

Reviewed By - Bo Miller
Designed By - Bruce Carmichael
Drafted By - Michael Skelton

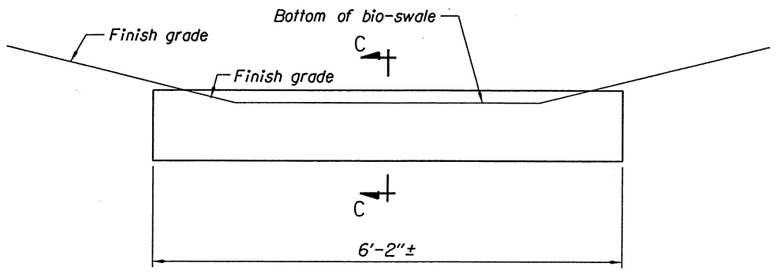
STORMWATER PLAN

SHEET NO. GJ



TYPICAL SECTION

SECTION C-C



FLOW SPREADER DETAIL

REGISTERED PROFESSIONAL ENGINEER
65305
OREGON
JANUARY 23, 2001
BRUCE A. CARMICHAEL
EXPIRES: 12/31/2017

OREGON DEPARTMENT OF TRANSPORTATION

REGION 2 TECH CENTER

OR18 AT CHRISTENSEN ROAD SEC.
SALMON RIVER HIGHWAY
YAMHILL COUNTY

Reviewed By - Bo Miller
Designed By - Bruce Carmichael
Drafted By - Michael Skelton

STORMWATER DETAILS

SHEET NO. GJ-2