OPERATION & MAINTENANCE MANUAL

DFI No. : D00872

Facility Type: Modified Media Filter Drain (Bioslope)

[July, 2015]

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00872**
Facility Type:	Modified Media Filter Drain (Bioslope)
Construction Drawings:	(V-File Number) 48V-038
Location:	District: 2C
	Highway No.: 171
	Mile Post: 11.72; 11.79 (beg./end)
	Description:
	The facility is located on the north side of OR-224. The modified media filter drain (bioslope) is located east of SE 197th Ave intersection. The facility can be accessed via the shoulder of westbound OR-224.

2. Facility Contact Information

Contact the Engineer of Record (see section 3), Region Technical Center, or Geo-Environmental's Senior Hydraulics Engineer for:

- Operational clarification
- Maintenance clarification
- Repair or restoration assistance

Engineering Contacts:

Region Technical Center Geo-Environmental Unit Manager
(503) 731-8455.

Or

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

3. Construction

Engineer of Record:	ODOT Designer – Region 1 Tech. Center, David McDonald P.E., (503) 731-3160
Facility construction:	2015
Contractor:	Eagle Elsner

4. Storm Drain System and Facility Overview

Bioslopes are flow-through stormwater treatment facilities incorporated into roadside embankments and placed between pavement and a downstream conveyance system. These facilities utilize physical straining or filtration, sorption, carbonate precipitation, vegetative uptake and microbial degradation to provide stormwater treatment. Bioslopes are recommended for highway application because of their minimal right-of-way requirements and maintenance schedule. Other names for bioslopes that have been used include ecology embankment and media filter drain.

Bioslopes are designed to treat sheet flow from an adjacent impervious surface. A typical bioslope has the following facility features and components:

- Rock filter strip – It is provided upstream of the bioslope to evenly distribute flow into the treatment zone, reduce the runoff velocity, and provide pretreatment.

- Treatment Zone using Ecology mix – It is provided to remove pollutants as stormwater runoff drains through this zone. The ecology mix is a mixture of aggregate, dolomite, gypsum, and perlite.

- Sub surface drain – it is provided to allow positive outflow for runoff at the toe of the bioslope.

The bioslope is located on the north side of OR-224. The bioslope begins at milepoint 11.72 and extends east for approximately 400 ft.

The contributing drainage includes stormwater runoff from the forested area north of the facility and sheet flow from the highway.

Three PVC inlets exist along the length of this facility for maintenance to access/clean the subsurface drain pipe. The iron caps and concrete casing are visible from the highway within the ditch flow line. The bioslope ends at milepoint 11.79.

A. Maintenance equipment access:

   Maintenance crews and equipment can access the bioslope facility by parking on the shoulder of westbound OR-224 between mile posts 11.72 and 11.79.

B. Heavy equipment access into facility:

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

Access is allowed for light to mid weight equipment such as mowers and small excavators.

C. Special Features:

☒ Amended Soils
☐ Porous Pavers
☐ Liners
☒ Underdrains

Photo 1: Bioslope and facility ID, looking west from milepoint 11.79.

Photo 2: Looking west at the top of the iron cover and concrete casing of one of three PVC inlets along the bioslope.

Photo 3: Outfall drain into riprap basin, looking east towards bioslope.

5. Facility Haz Mat Spill Feature(s)

This facility has no Haz Mat spill features.

6. Auxiliary Outlet (High Flow Bypass)

There is no auxiliary flow 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:

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://www.oregon.gov/ODOT/Engineering/Pages/Manuals.aspx

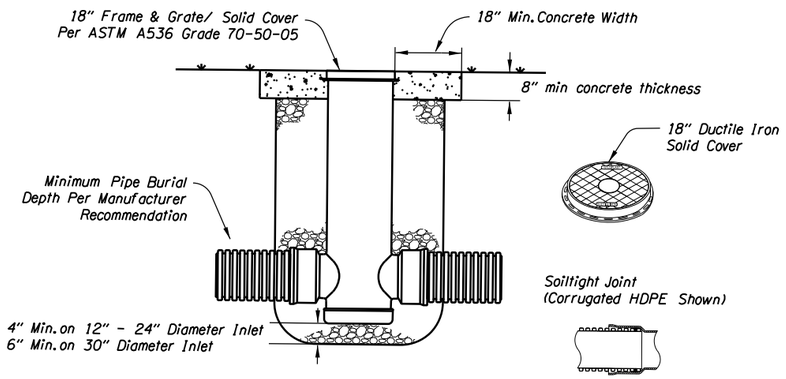
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region Hazmat Coordinator	(503) 731-8290
ODEQ Northwest Region Office	(503) 229-5263

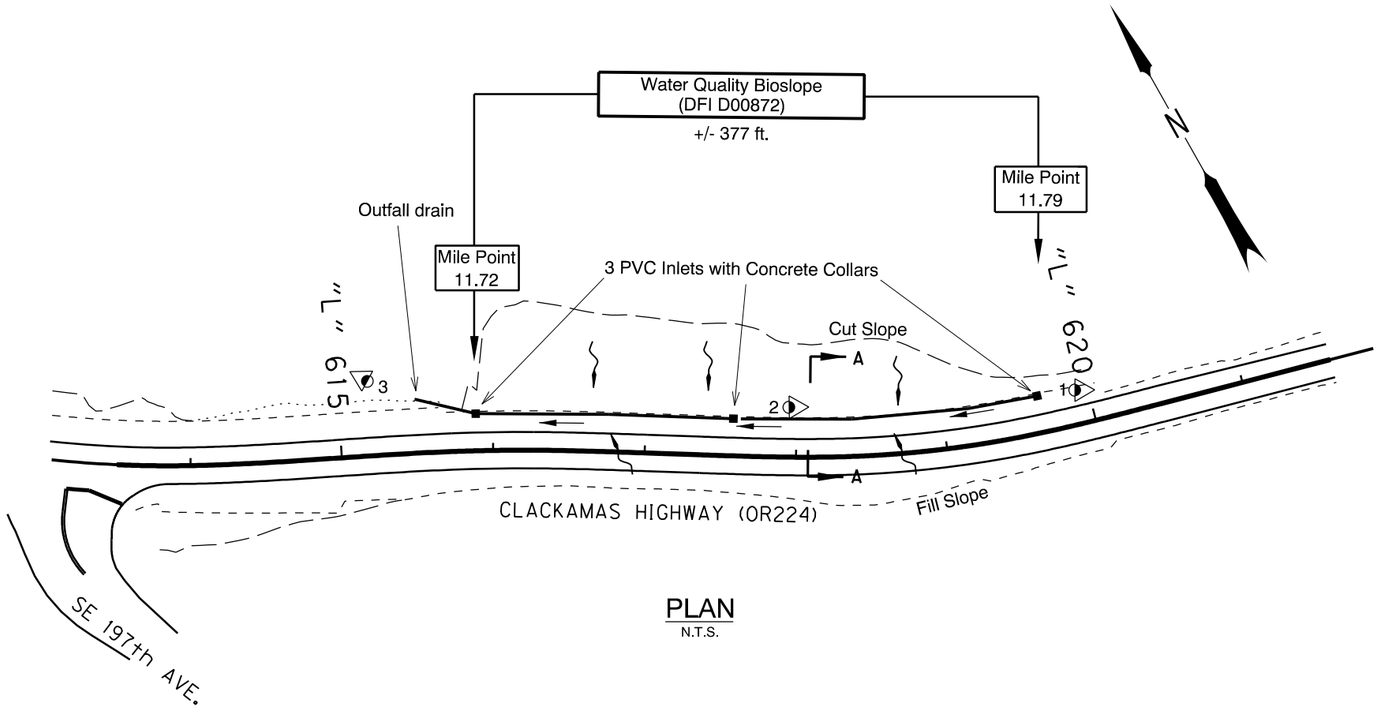
Appendix A

Content:

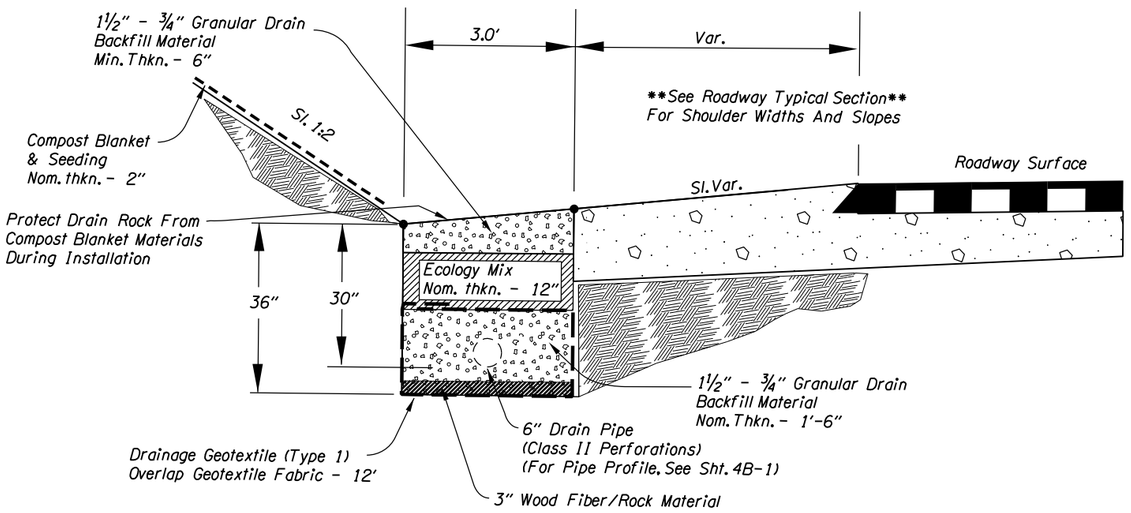
- **Operational Plan and Section Drawing(s)**



"PVC" INLET
N.T.S.



PLAN
N.T.S.



SECTION A-A
N.T.S.

MP 11.72 - MP 11.79 LT.

LEGEND:

- Photo 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: David McDonald

Drafted By: Zoe Keve

DFI D00872
MAINTENANCE DISTRICT 2C HWY 171
BIOSLOPE
HIGHWAY MP 11.72-11.79
CLACKAMAS COUNTY

D00872_OP.dgn :: Default 5/2/2018 3:50:26 PM Hwyr33e

Rotation: 0.5465° Scale: 1"=100'

Appendix B

Content:

- **ODOT Project Plan Sheets**
  - ***Cover/Title Sheet***
  - ***Drainage and Utility Sheets (4B)***
  - ***Pipe Data Sheet (2D)***
  - ***Drainage Profile Sheets (4B-2))***
  - ***Drainage Detail Sheets (GJ-2)***

48V-038

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

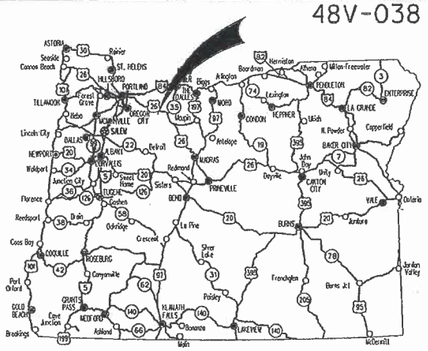
GRADING, DRAINAGE, PAVING, SIGNING

OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.

CLACKAMAS HIGHWAY

CLACKAMAS COUNTY
APRIL 2015

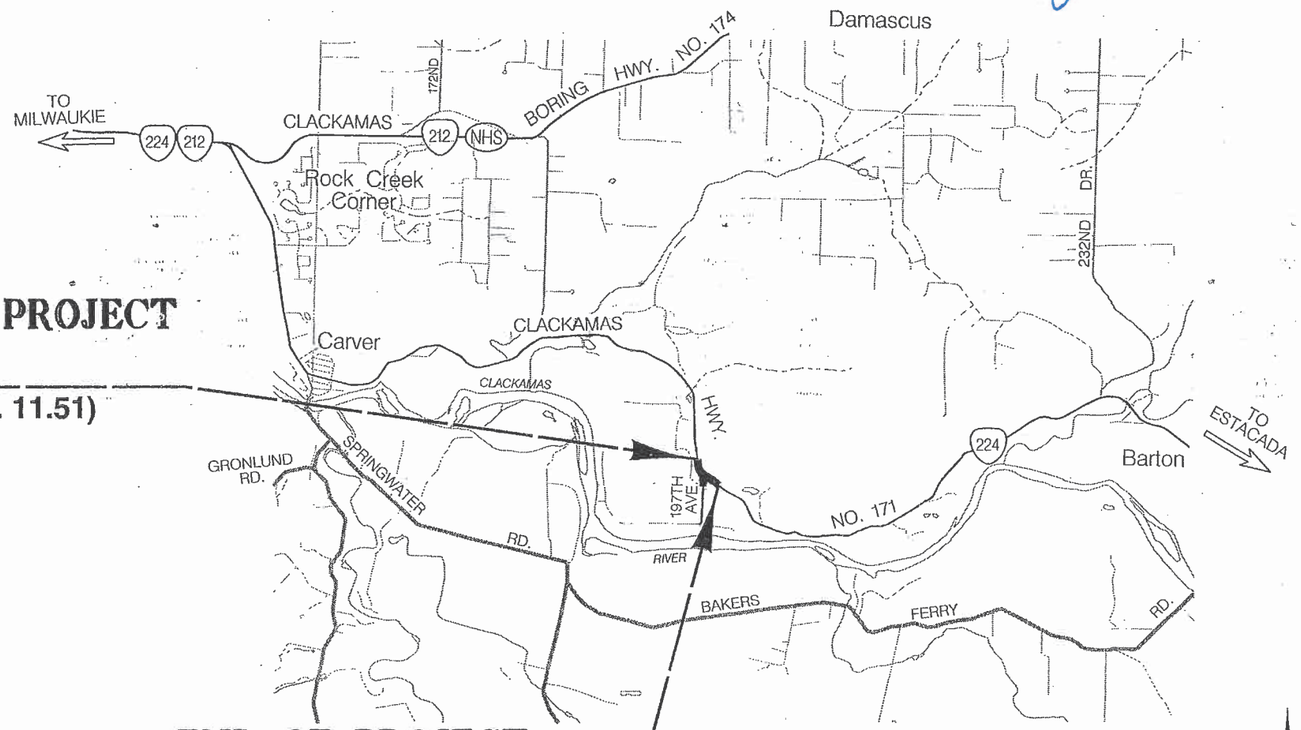
NOT REVISED AS CONSTRUCTED
30 SEP 2015 CONTRACT 14803
PROJ. MGR. MARJORIE WEST
Marjorie West 12/9/15



Overall Length Of Project - 0.29 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



BEGINNING OF PROJECT
HSIP-S171(033)
STA. "L" 606+70 (M.P. 11.51)

END OF PROJECT
HSIP-S171(033)
STA. "L" 621+60 (M.P. 11.80)

N

T. 2 S., R. 3 E., W.M.

OREGON TRANSPORTATION COMMISSION

Tammy Baney	CHAIR
David Lohman	COMMISSIONER
Susan Morgan	COMMISSIONER
Alando Simpson	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.

Approving Authority: Tamira Clark
Tamira J. Clark
Technical Center Manager, Region 1

Concurrence by ODOT Chief Engineer

OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HSIP-S171(033)	1

PE002130 000

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NOT REVISED AS CONSTRUCTED
CONTRACT 14803
PROJ. MGR MARJORIE WEST
Marjorie West 12/4/15

48V-038

INDEX OF SHEETS, CONT.	
SHEET NO.	DESCRIPTION
2, 2A thru 2A-4	Typical Sections
2B, 2B-2 & 2B-3	Details
2C & 2C-2	Traffic Control Plans
2D	Pipe Data Sheet
3	General Construction
3A & 3A-2	Profile
3B	Drainage & Utilities
4	General Construction
4A	Profile
4B	Drainage & Utilities
4B-2	Drainage Profile
GEO/HYDRO	
GA & GA-2	Erosion Control Plans
GA-3	Erosion Control Details
GB & GB-2 thru GB-5	Geotechnical Data
GJ & GJ-2	Water Quality Details
GM	Contaminated Soil Designated Fill Site
PERMANENT PAVEMENT MARKINGS	
ST	Striping Plan
PERMANENT SIGNING	
S-15400 & S-15402	Permanent Signing

Standard Drg. Nos.

RD140 - Roadway Cross Slopes Superelevated Sections
RD150 - Slope Rounding

RD300 - Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD302 - Street Cut
RD312 - Subsurface Drain
RD317 - Culvert Embankment Protection
RD388 - Fill Height Tables For PVC Pipe
RD390 - Fill Height Tables For Corrugated HDPE Pipe
RD399 - Stormwater Treatment And Storage Facility Field Markers

RD610 - Asphalt Pavement Details

RD715 - Approaches And Non-Sidewalk Driveways

RD815 - Chain Link Fence

RD1000 - Construction Entrances
RD1005 - Check Dams
RD1030 - Sediment Barrier (Type 2 & 4) Biofilter Or Sandbags
RD1040 - Sediment Fence, Supported Sediment Fence, Unsupported
RD1055 - Matting

TM200 - Sign Installation Details
TM201 - Miscellaneous Sign Placement Details
TM211 - Sign Details US & Interstate Route Shields
TM223 - Conventional Roads Directional Sign Layout Street Name Signs
TM224 - Freeway/Expressway Directional Sign Layout
TM230 - Mounting Details For Removable Legend 4" Through 8" Letters & Numbers
TM231 - Mounting Details For Removable Legend 10" Through 12" Letters & Numbers
TM232 - Mounting Details For Removable Legend 13½" Through 16" Letters & Numbers
TM233 - Mounting Details For Removable Legend Various Arrow Sizes

TM500 - Pavement Marking Standard Detail Blocks
TM502 - Pavement Marking Standard Detail Blocks
TM503 - Pavement Marking Standard Detail Blocks
TM515 - Pavement Markers
TM517 - Recessed Pavement Markers
TM521 - Durable Pavement Markings Method "A" & Method "B" Surface & Groove Installed Non-Profiled
TM530 - Intersection Pavement Markings (Crosswalk, Stop Bar & Bike Lane Stencil)
TM560 - Alignment Layout General
TM561 - Alignment Layout Left Turn Lane, Centerline & Medians
TM570 - Traffic Delineators
TM571 - Traffic Delineators Steel Post Details
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
TM677 - Sign Mounts
TM679 - Signal Mast Arm Street Name Sign Mounts
TM680 - Signal Pole Mounts
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
TM841 - Intersection Work Zone Details
TM850 - 2-Lane, 2-Way Roadways

R/W Map No. 6B-34-12

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

OR224 (CLACKAMAS HWY): SE 187TH AVE. SEC.		
CLACKAMAS HIGHWAY, CLACKAMAS COUNTY		
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HSIP-S171(033)	1A

48V-038

FINAL REVIEW PLANS

PIPE

CIRCULAR OR ELLIPTICAL

PIPE - ARCH

USE / INSTALLATION CRITERIA

TERMINAL TREATMENT

ALTERNATE MATERIALS

HELICAL CORRUGATED METAL

ALUMINUM

ALUMINIZED OR GALVANIZED IRON AND STEEL

SIZE OF CORRUGATIONS

RIGID

PLASTIC & IRON

APPURTENANCES

MANHOLES

INLETS

EXTENSIONS

REMARKS

NCT REVISED AS CONSTRUCTED
3) SEP 2015 CONTRACT 14803
FROJ. MGR. MARJORIE WEST
[illegible] - 12/9/15

GENERAL NOTES:

FOOTNOTES:

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - GEO-ENVIRONMENTAL UNIT

OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

REGISTERED PROFESSIONAL ENGINEER
OREGON
MAY 21, 2014
DAVID L. MCDONALD
RENEWS: 12-31-2016

PIPE DATA SHEET

SHEET NO. 2D

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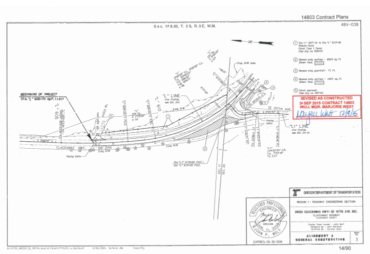
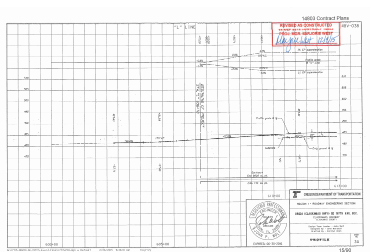
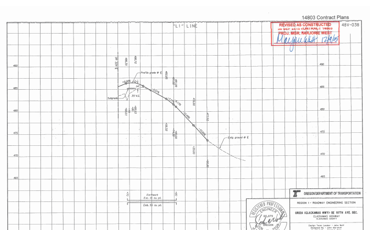
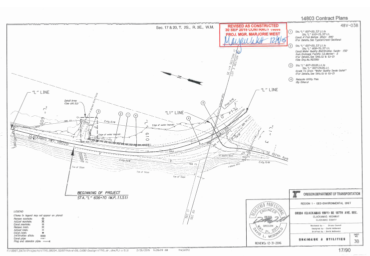

Sec. 17 & 20, T. 2 S, R. 3 E, W.M.
48V-038
BEGINNING OF PROJECT
STA. "L" 606+70 (M.P. 11.91)
"L" LINE
(For Profile, see Sht. 3A)
"L1" LINE
(For Profile, see Sht. 3A-2)
SE 197th AVE.
CLACKAMAS HWY. (OR 224)
Exist. R/W
Prop. R/W esmt.
Paving limits
SEC. 17
SEC. 20
① Sta. "L" 607+10 to Sta. "L" 613+40 Remove fence Const. Type 1 fence (See drg. no. RD815)
② Remove exist. surface - 6824 sq. ft. Shown thus ▨
③ Remove exist. guardrail - 71 ft.
④ Remove exist. surface - 1853 sq. ft. Shown thus ▨
⑤ Const. approach (See drg. no. RD715)
REVISED AS CONSTRUCTED
3 SEP 2015 CONTRACT 14803
PROJ. MGR. MARJORIE WEST
Marjorie West 12/9/15
OREGON DEPARTMENT OF TRANSPORTATION
REGION 1 - ROADWAY ENGINEERING SECTION
OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY
Design Team Leader - John Wolf
Designed By - John Marshall
Drafted By - Carolyn Allen
ALIGNMENT & GENERAL CONSTRUCTION
SHEET NO. 3
REGISTERED PROFESSIONAL ENGINEER
OREGON
JUN. 11, 2008
JOHN P. WOLF
EXPIRES: 06-30-2016

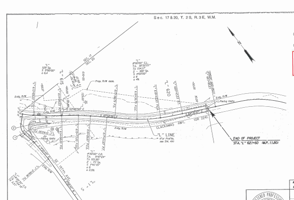

"L" LINE
48V-038
REVISED AS CONSTRUCTED
PROJ. MGR. MARJORIE WEST
12/9/15
Rt. EP superelevation
Profile grade @ "L" Line
Lt. EP superelevation
BEGINNING OF PROJECT
STA. "L" 605+70
Profile grade @ ℄
Subgrade
Exist. ground @ ℄
Earthwork
Exc. 9828 cu. yd.
Emb. 743 cu. yd.
600+00
605+00
610+00
613+00
REGISTERED PROFESSIONAL ENGINEER
OREGON
JUN. 11, 2008
JOHN P. WOLF
EXPIRES: 06-30-2016
OREGON DEPARTMENT OF TRANSPORTATION
REGION 1 - ROADWAY ENGINEERING SECTION
OR224 (CLACKAMAS HWY): SE 107TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY
PROFILE
3A


"L1" LINE
REVISED AS CONSTRUCTED
PROJ. MGR. MARJORIE WEST
12/9/15
48V-038
490
485
480
475
470
465
Profile grade @ ℄
Subgrade
35' V.C.
Extg. ground @ ℄
Earthwork
Exc. 76 cu. yd.
Emb. 55 cu. yd.
0+00
1+00
2+00
3+00
OREGON DEPARTMENT OF TRANSPORTATION
REGION 1 - ROADWAY ENGINEERING SECTION
OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY
PROFILE
3A-2
REGISTERED PROFESSIONAL ENGINEER
OREGON
JUN. 11, 2008
JOHN P. WOLF
EXPIRES: 06-30-2016


48V-038
Sec. 17 & 20, T. 2S., R. 3E., W.M.
REVISED AS CONSTRUCTED
PROJ. MGR. MARJORIE WEST
① Sta. "L" 607+20, 33' Lt. to Sta. "L" 610+15, 33' Lt.
Const. 4' Flat Bottom Ditch - 295'
(For Details, See Typical Cross-Sections)
② Sta. "L" 607+20, 33' Lt. to Sta. "L" 608+70, 33' Lt.
Const. Water Quality Biofiltration Swale - 150'
Inst. Drainage Facility I.D. Marker - 2
(For Details, See Shts. GJ & GJ-2)
③ Sta. "L" 607+20.00, Lt. to Sta. "L" 607+24.00, Lt.
Grade To Drain "Water Quality Swale Outlet"
(For Details, See Shts. GJ & GJ-2)
④ Relocate Utility Pole (By Others)
"L" LINE
"L1" LINE
SE 197th Ave
Toe of Slope
SEC 17
SEC 20
BEGINNING OF PROJECT
STA. "L" 606+70 (M.P. 11.51)
LEGEND
OREGON DEPARTMENT OF TRANSPORTATION
REGION 1 - GEO-ENVIRONMENTAL UNIT
OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY
REGISTERED PROFESSIONAL ENGINEER
OREGON
MAY 21, 2014
DAVID L. MCDONALD
RENEWS: 12-31-2016
DRAINAGE & UTILITIES
38

48V-038

Sec. 17 & 20, T. 2S, R.3E, W.M.



① See sht. 3, note 3

② See sht. 3, note 4

REVISED AS CONSTRUCTED
3? SEP 2015 CONTRACT 14803
PROJ. MGR. MARJORIE WEST
Marjorie West 12/9/15

REGISTERED PROFESSIONAL ENGINEER
60,878
OREGON
JUN. 11, 2008
JOHN P. WOLF
EXPIRES: 06-30-2016

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - ROADWAY ENGINEERING SECTION

OR224 (CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

Design Team Leader - John Wolf
Designed By - John Marshall
Drafted By - Condon Allen

ALIGNMENT & GENERAL CONSTRUCTION

SHEET NO. 4

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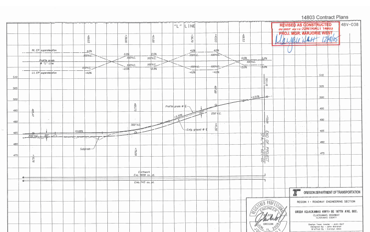
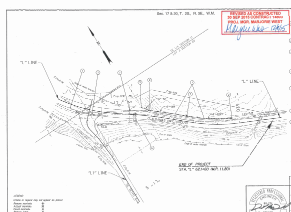

"L" LINE
48V-038
REVISED AS CONSTRUCTED
PROJ. MGR. MARJORIE WEST
Rt. EP superelevation
Profile grade @ "L" Line
Lt. EP superelevation
Profile grade @ ℄
Exfg. ground @ ℄
Subgrade
300' V.C.
250' V.C.
+1.51%
END OF PROJECT
Earthwork
Exc. 743 cu. yd.
615+00
620+00
OREGON DEPARTMENT OF TRANSPORTATION
REGION 1 - ROADWAY ENGINEERING SECTION
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY
REGISTERED PROFESSIONAL ENGINEER
OREGON
JUN. 11, 2008
JOHN P. WOLF
EXPIRES: 06-30-2016
PROFILE
4A

Sec. 17 & 20, T. 2S., R. 3E., W.M.

48V-038

REVISED AS CONSTRUCTED
30 SEP 2015 CONTRACT 14803
PROJ. MGR. MARJORIE WEST
Marjorie West 12/4/15



1. Sta. "L" 615+89.07, Lt. to Sta. "L" 619+65.41, Lt. Const. Bioslope - 377' Inst. Drainage Facility I.D. Marker - 2 (For Details, See Shts. GJ & GJ-2)
2. Sta. "L" 619+65.41, 24.5' Lt. Const. Type "PVC" Inlet w/ Concrete Collar (For Details See Shts. GJ & GJ-2)
3. Sta. "L" 617+57.90, 24.5' Lt. Const. Type "PVC" Inlet w/ Concrete Collar Inst. 6" Drain Pipe - 208' 5' Depth (See drg. nos. RD300, RD388, & RD390) (For Details, See Shts. GJ & GJ-2)
4. Sta. "L" 615+89.07, 24.5' Lt. Const. Type "PVC" Inlet w/ Concrete Collar Inst. 6" Drain Pipe - 169' 5' Depth (For Details, See Shts. GJ & GJ-2)
5. Sta. "L" 615+49.92, 35.61' Lt. Inst. 6" Drain Pipe - 40' 5' Depth Const. Subsurface Drain - 40' Const. Riprap Basin (Class 50) - 5 Tons (For Details, See Shts. GJ & GJ-2) (See drg. no. RD312)
6. Sta. "L" 615+30, Rt. Remove (Abandon) 10" Concrete Culvert - 35' Remove (Abandon) 18" Concrete Culvert - 10'
7. Relocate Utility Pole (By Others)

LEGEND
(Items in legend may not appear on plans)

Remove manhole	
Adjust manhole	
Const. manhole	
Remove inlet	
Adjust inlet	
Const. inlet	
Infiltration ditch	
Const. pipe	
Plug and abandon pipe	

REGISTERED PROFESSIONAL ENGINEER
88,201
OREGON
MAY 21, 2014
DAVID L. MCDONALD
RENEWS: 12-31-2016

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - GEO-ENVIRONMENTAL UNIT

OR224 (CLACKAMAS HWY): SE 107TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

Reviewed by - Bruce Council
Designed by - David McDonald
Drafted by - David McDonald

DRAINAGE & UTILITIES

SHEET NO. 4B

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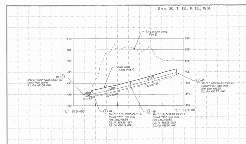
48V-038

REVISED AS CONSTRUCTED
30 SEP 2015 CONTRACT 14803
PROJ. MGR. MARJORIE WEST
Marjorie West 12/9/15

Sec. 30, T. 1S., R. 1E., W.M.



General Note:
1. Ditch excavation associated with the water quality bioswale is included in the roadway excavation estimate.

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - GEO-ENVIRONMENTAL UNIT

OR224 (CLACKAMAS HWY): SE 167TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

Reviewed by - Bruce Council
Designed by - David McDonald
Drafted by - David McDonald

DRAINAGE PROFILE

SHEET NO. 4B-2

REGISTERED PROFESSIONAL ENGINEER
68,701
OREGON
MAY 21, 2014
DAVID L. MCDONALD
RENEWS: 12-31-2016

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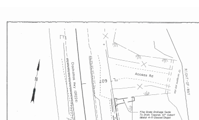
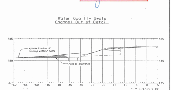
REVISED AS CONSTRUCTED
30 SEP 2015 CONTRACT 14803
PROJ. MGR. MARJORIE WEST
Marjorie West 12/9/15

48V-038



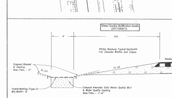
Water Quality Swale
Channel Outlet Detail



GENERAL NOTE:

1. Ditch excavation associated with the water quality swale channel outlet is included in the water quality lump sum estimate.

** Drawing Not to Scale **



Water Quality Swale
N.T.S.

STA. "L" 607+20 To STA. "L" 608+70

GENERAL NOTES:

1. Ditch excavation for the water quality mix is not included in the roadway excavation estimate. All excavation associated with the Water quality swale has been included in the water quality lump sum pay item.

2. Create a suitable water quality mix by amending existing soils or installing an engineer approved water quality soil mixture. (See ODOT Hydraulics Manual 14-E-1)

3. Amend existing soil by placing 6" of compost material and mechanically combine into 12" of soil. (total 18" of amended soil) or 3" of compost material and mechanically combine into 5" of soil. (total 8" of amended soil).

4. See stds. GA & GA-2 for seeding and matting information not shown on this sheet.

REGISTERED PROFESSIONAL ENGINEER
88701
OREGON
MAY 21, 2014
DAVID L. MCDONALD
RENEWS: 12-31-2016

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - GEO-ENVIRONMENTAL UNIT

OR224(CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

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Designed by - David McDonald
Drafted by - David McDonald

WATER QUALITY DETAILS

SHEET NO. GJ

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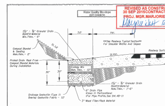
48V-038

REVISED AS CONSTRUCTED
30 SEP 2015CONTRACT 14803
PROJ. MGR.MARJORIE WEST
Marjorie West 12/9/15

Water Quality Bio-slope
(DFI D00872)

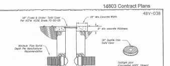


Water Quality Bioslope
N.T.S.

STA. "L" 615+89 To STA. "L" 619+65

GENERAL NOTE:

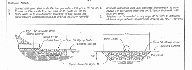
1. Ditch excavation associated with the water quality bioslope is included in the roadway excavation estimate.



"PVC" INLET
N.T.S.

GENERAL NOTES:

1. Grates/solid cover shall be ductile iron per astm a536 grade 70-50-05.
2. Frames shall be ductile iron per astm a536 grade 70-50-05
3. Drain basin to be manufactured according to plan details and manufacturers recommendations. See drawing no. 7001-110-065
4. Drainage connection stub joint tightness shall conform to astm d3212 for corrugated hdpe (ads n-12/hancor dual wall), n-12 hp, & pvc sewer.
5. Adapters can be mounted on any angle 0° to 360°. to determine minimum angle between adapters. See drawing no. 7001-110-012.



TYPICAL ENERGY DISSIPATOR PAD
N.T.S.

STORMWATER FIELD MARKER TABLE

FACILITY LOCATION		DFI #	TYPE S2 MARKER LOCATION		TYPE S1 MARKER	
STATION	MP		BEGIN	END	RED	GREEN
"L" 607+00.Lt.	11.51	D00871		✓		
"L" 608+30.Lt.	11.52	D00871	✓			
"L" 615+89.Lt.	11.77	D00872		✓		
"L" 619+65.Lt.	11.79	D00872	✓			

✓ Check where appropriate
Red = Beginning of Facility
Green = End of Facility

** Drawing Not to Scale **

REGISTERED PROFESSIONAL ENGINEER
88701
OREGON
MAY 21, 2014
DAVID L. MCDONALD
RENEWS: 12-31-2016

OREGON DEPARTMENT OF TRANSPORTATION

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OR224(CLACKAMAS HWY): SE 197TH AVE. SEC.
CLACKAMAS HIGHWAY
CLACKAMAS COUNTY

Reviewed by - Bruce Council
Designed by - David McDonald
Drafted by - David McDonald

WATER QUALITY DETAILS

SHEET NO. GJ-2