# OPERATION & MAINTENANCE MANUAL

# Water Quality Biofiltration Swale

**Manual prepared: November 2022**

**DFI No. D01412**



**Figure 1: DFI No. D01412, looking [note cardinal direction]**

**Identification**

| | |
|---|---|
| Drainage Facility ID (DFI): | D01412 |
| Facility Type: | Water Quality Biofiltration Swale |
| Construction Drawings: | (V-File Numbers) 56V-030 |
| Location: | District: 04 |
| | Highway No.: 034 |
| | Mile Post: 0.30 to 0.32, right |

## 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: West

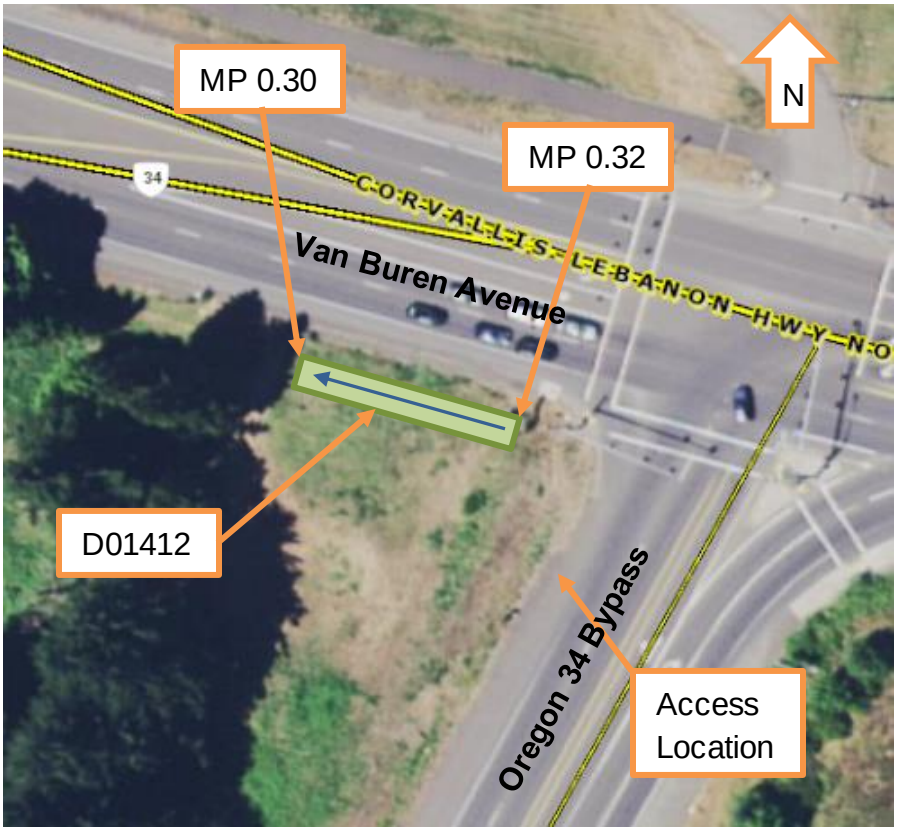


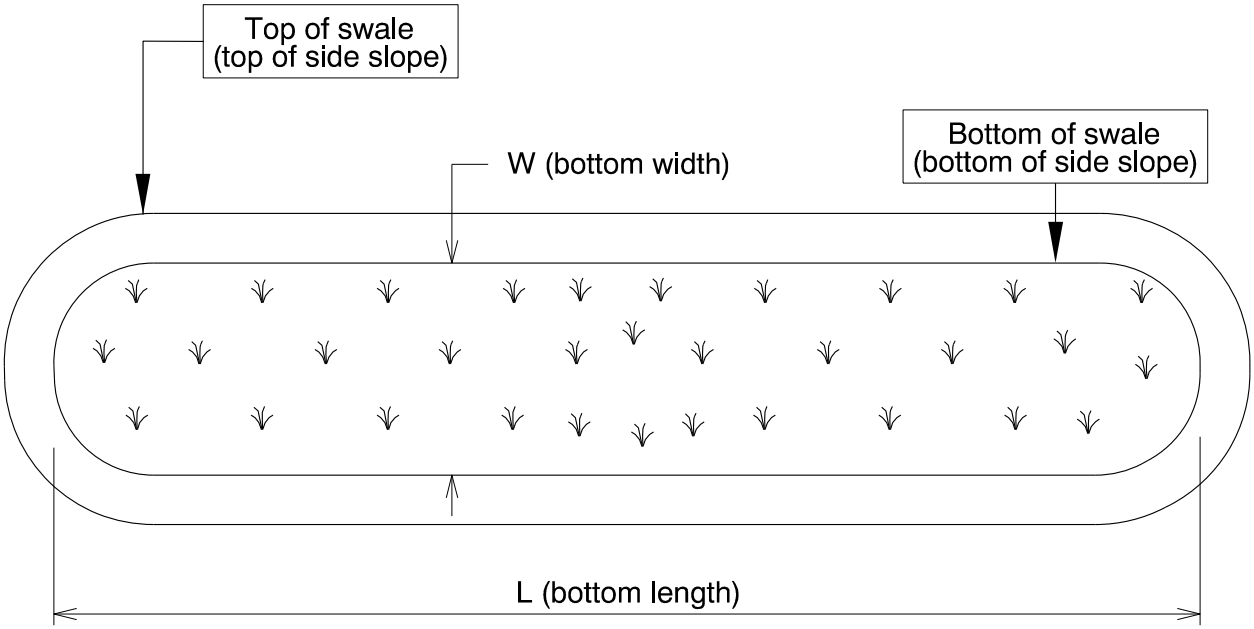

**Figure 2: Facility location map**

## 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:

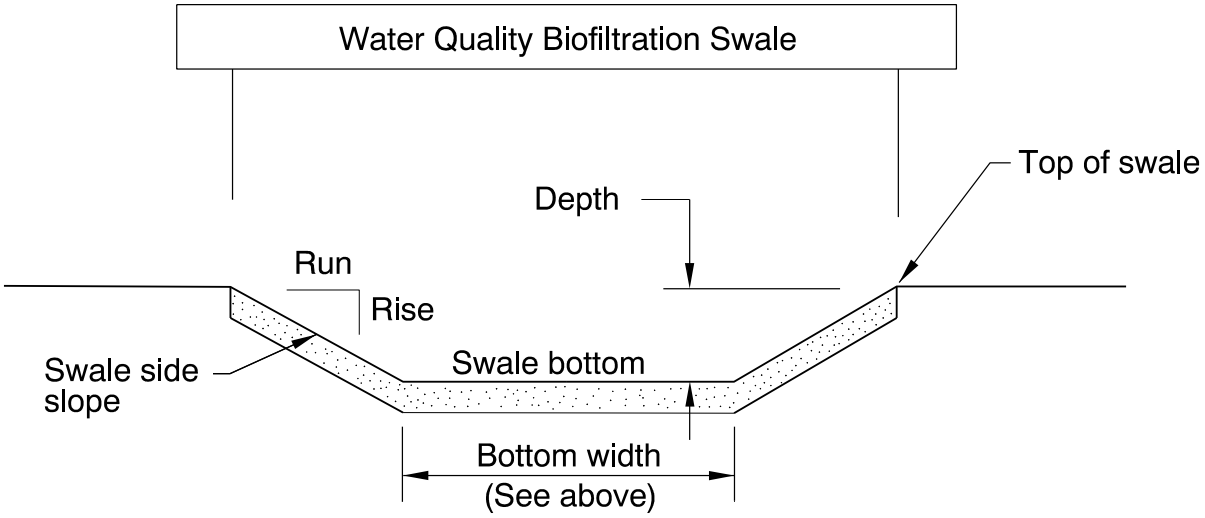
| Bottom Length (feet) | Bottom Width (feet) |
|---|---|
| 105 | 6 |



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:

| Depth (feet) | Rise (feet) | Run (feet) |
|---|---|---|
| 2-3 | 1 | 4 |




**Site Specific Information:** Swale is constructed south of Van Buren Avenue and west of the Oregon 34 Bypass. Access will be from the southbound shoulder of Oregon 34 Bypass. Park in the shoulder and perform routine maintenance from there. Medium duty porous pavers installed on swale bottom.

## 4. Facility Access

Maintenance access to the facility:

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



**Figure 3: [insert post construction facility access photo and caption text]**

## 5. Operational Components / Maintenance Items

### Classification

This facility is classified as an:

| ☒ 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** |

### Bypass Component

This facility includes a high flow 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 this facility 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: | ☐ | **S19** |
| **Swale Outlet** | | |
| Catch basin with grate | ☐ | **S20** |
| Outlet Pipe (s) | ☒ | **S21** |
| Open channel outlet | ☐ | **S22** |
| Auxiliary Outlet: | ☐ | **S23** |
| **Outfall Type** | | |
| Waterbody (**C**reek/**L**ake/**O**cean) | ☐ **C**<br>☐ **L**<br>☐ **O** | **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 medium 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

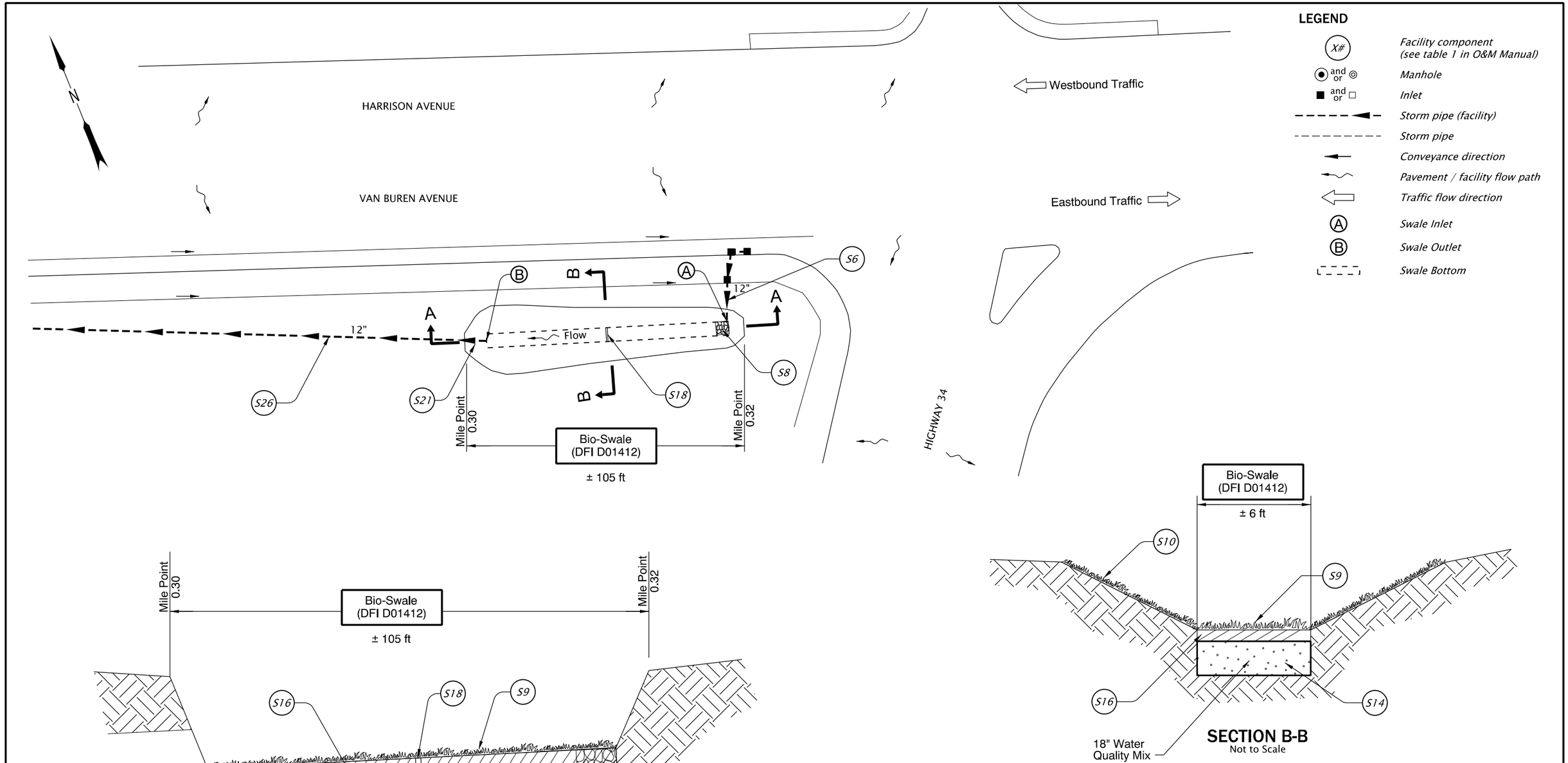
Contact any of the following for more detailed information about management of waste materials found on site:

| | |
|---|---|
| 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 D01412**




OREGON DEPARTMENT OF TRANSPORTATION

Sht. 1 of 1

Prepared By: Scott Taylor

Drafted By: Scott Taylor

**DFI D01412**
**MAINTENANCE DISTRICT 4 HWY 34**
**FILTERRA**
HIGHWAY MP 0.30 to 0.32
LINN COUNTY

DFI_D01412.dgn

# B Appendix B – Project Contract Plans

## Contents:

**Site Specific Subset of Project Contract Plan 56V-030**

56V-030

| INDEX OF SHEETS | |
|---|---|
| SHEET NO. | DESCRIPTION |
| A01 | Title Sheet |
| A02, A03 | Index Of Sheets Cont. |
| A04 | Std. Dwg. Nos. |
| A05, A06 | Survey Control Data |

STATE OF OREGON

# DEPARTMENT OF TRANSPORTATION

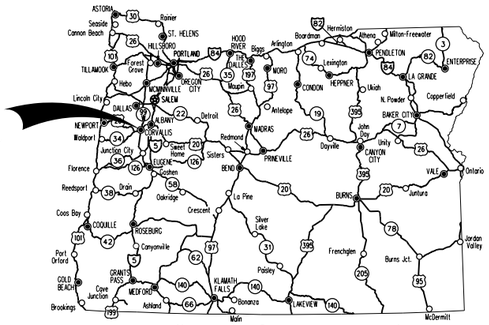
PLANS FOR PROPOSED PROJECT

**GRADING, DRAINAGE, STRUCTURES, PAVING, CURB RAMPS, SIGNING, ILLUMINATION, SIGNALS, INTELLIGENT TRANSPORTATION SYSTEM & ROADSIDE DEVELOPMENT**

# OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT

## CORVALLIS-LEBANON HWY.

**BENTON AND LINN COUNTIES**
**FEBRUARY 2023**



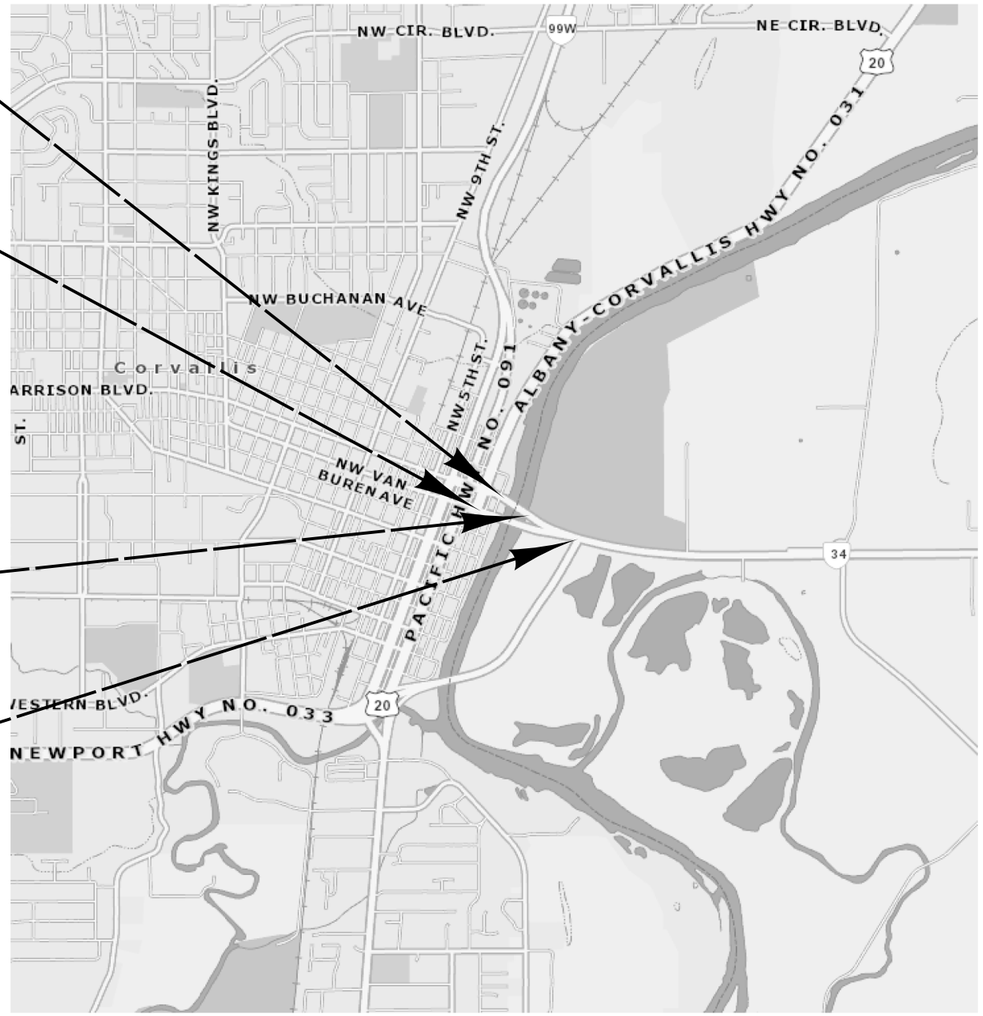
*Overall Length Of Project – 0.35 Miles*

BEGINNING OF WORK
**STA. "L3w" 12+93.98**

BEGINNING OF PROJECT
**STA. "L" 9+76.48 (M.P. -0.01)**

END OF WORK
**STA. "L3w" 23+10.00**

END OF PROJECT
**STA. "L" 28+70.98 (M.P. 0.34)**




SEC. 35, T. 11 S., R. 5 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 952-001-0001 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center (Note: The Telephone Number For The Oregon Utility Notification Center Is (503) 232-1987).

PLANS PREPARED FOR
OREGON DEPARTMENT OF TRANSPORTATION

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OREGON TRANSPORTATION COMMISSION

| | |
|---|---|
| Robert Van Brocklin | CHAIR |
| Julie Brown | COMMISSIONER |
| Sharon Smith | COMMISSIONER |
| Marcilynn Burke | COMMISSIONER |
| Kristopher W. Strickler | 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: _____
Signature & date

_____
Print name and title

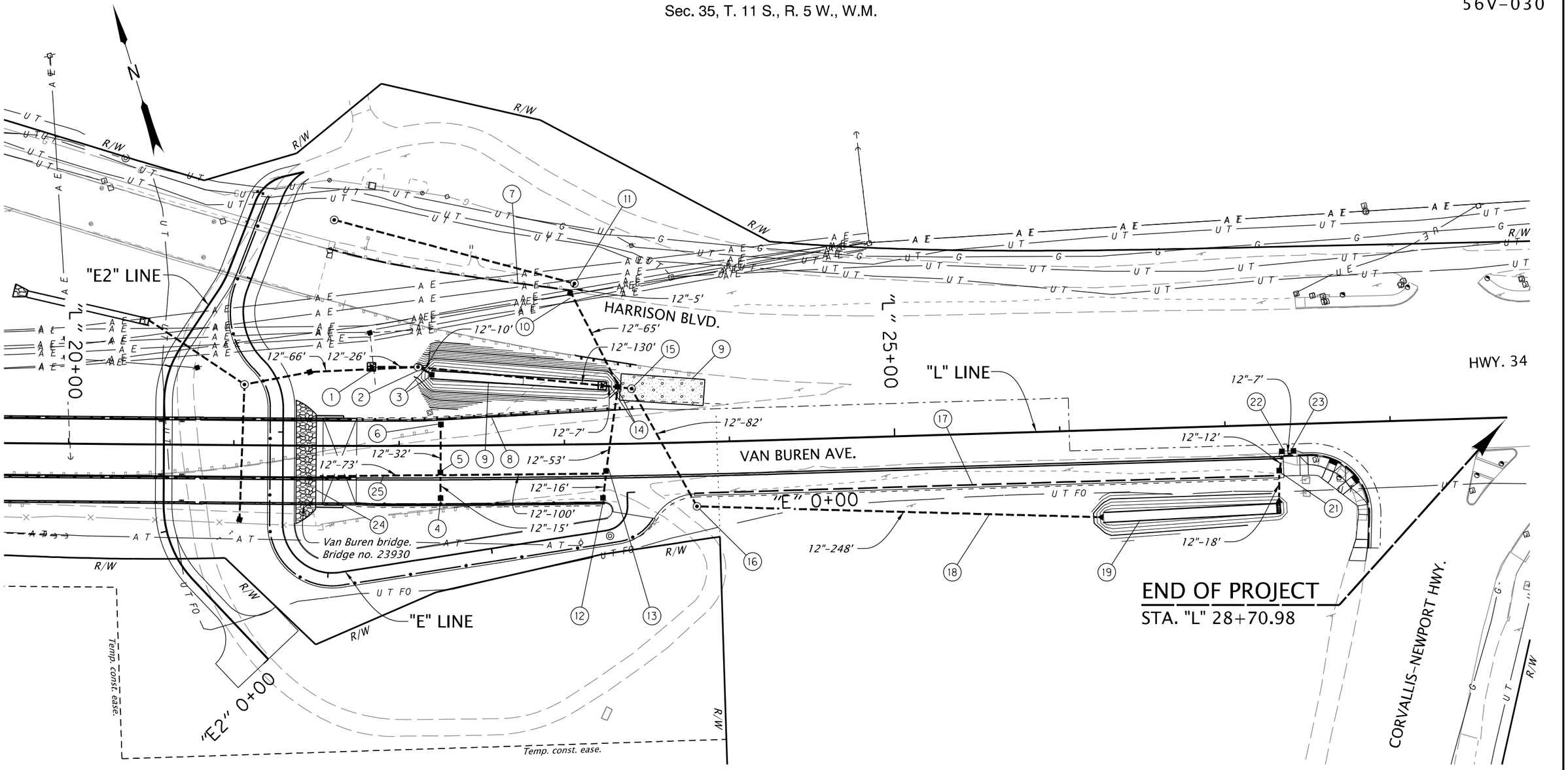
_____
Concurrence by ODOT Chief Engineer

**OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT**
CORVALLIS-LEBANON HWY.
BENTON AND LINN COUNTIES

| FEDERAL HIGHWAY ADMINISTRATION | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| OREGON DIVISION | S210(022) | A01 |

Sec. 35, T. 11 S., R. 5 W., W.M.

56V-030




REGISTERED PROFESSIONAL ENGINEER
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OREGON
JUNE 14, 2007
BENJAMIN P. WEWERKA
EXPIRES: 06/30/24

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**OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT**
CORVALLIS-LEBANON HWY.
BENTON AND LINN COUNTIES

Designer: Scott Taylor
Drafter: Serban Dinca/Andrew Hill
Reviewer: Ben Wewerka, PE
Checker: Colton Fisher, PE

**DRAINAGE & UTILITIES**

SHEET NO.
C03C

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

R_K20688_pl_06.dgn :: Default 11/17/2022 8:08:22 AM SDinca

Rotation: 342.9896° Scale: 1"=60'

1. *Sta. "L" 21+85.71, 47.91' Lt.*
   *Inst. 12" storm sew. pipe - 26'*
   *5' depth*
   *Const. sloped end*
   *Const. paved end slope, Lt.*
   *Const. loose riprap (Class 50) - 1 cu. yd.*
   *Riprap geotextile, type "1" - 3 sq. yd.*
   *(For details, see sht. HA05)*
   *(See dwg. no. RD320)*

2. *Sta. "L" 22+11.5, 47.8' Lt.*
   *Const. storm manhole 48" dia., outside drop*
   *Inst. 12" storm sew. pipe - 66'*
   *20' depth*
   *(See dwg. no. RD352)*

3. *Sta. "L" 22+20.86, 43.20' Lt.*
   *Const. type "D" inlet*
   *Inst. 12" storm sew. pipe - 10'*
   *5' depth*

4. *Sta. "L" 22+25.0, 33.4' Rt.*
   *Const. type "G-2" inlet*
   *Inst. 12" storm sew. pipe - 15'*
   *5' depth*

5. *Sta. "L" 22+25.0, 17.8' Rt.*
   *Const. type "G-2" inlet*
   *Inst. 12" storm sew. pipe - 100'*
   *5' depth*
   *Class E backfill*

6. *Sta. "L" 22+25.0, 14.6' Lt.*
   *Const. type "G-2" inlet*
   *Inst. 12" storm sew. pipe - 32'*
   *5' depth*

7. *Sta. "L" 21+56.56 to Sta. "L" 23+03.3*
   *Const. drainage curb - 147'*

8. *Sta. "L" 21+83.92 to Sta. "L" 22+68.06*
   *Const. drainage curb - 84'*

9. *Const. water quality swale #1 (DFI D01411)*
   *Inst. facility field markers, type "S1" - 2*
   *Inst. facility field markers, type "S2"*
   *(See detail sht. HA01)*

10. *Sta. "L" 23+04.9, 92.8' Lt.*
    *Const. type "G-2" inlet*
    *Inst. 12" storm sew. pipe - 65'*
    *5' depth*
    *Class E backfill*

11. *Sta. "L" 23+07.3, 97.3' Lt.*
    *Const. storm sew. manhole 48" dia., shallow*
    *Inst. 12" storm sew. pipe - 5'*
    *5' depth*

12. *Sta. "L" 23+23.0, 34.1' Rt.*
    *Const. type "G-2" inlet*
    *Inst. 12" storm sew. pipe - 16'*
    *5' depth*

13. *Sta. "L" 23+25.0, 17.9' Rt.*
    *Const. type "G-2" inlet*
    *Inst. 12" storm sew. pipe - 53'*
    *5' depth*
    *Class E backfill*

14. *Sta. "L" 23+33.03, 34.58' Lt.*
    *Const. type "G-2M" inlet*
    *Inst. 12" storm sew. pipe - 7'*
    *5' depth*
    *Const. sloped end*
    *Const. paved end slope, Lt.*

15. *Sta. "L" 23+41.0, 33.3' Lt.*
    *Const. storm sew. manhole 48" dia.*
    *Inst. 12" storm sew. pipe - 130'*
    *20' depth*

16. *Sta. "L" 23+79.7, 38.7' Rt.*
    *Const. storm sew. manhole 48" dia.*
    *Inst. 12" storm sew. pipe - 82'*
    *20' depth*

17. *Sta. "L" 23+78 to Sta. "L" 27+31*
    *Const. drainage curb - 353'*

18. *Sta. "L" 26+27, 52.94' Rt.*
    *Inst. 12" storm sew. pipe - 248'*
    *5' depth*
    *Const. sloped end*
    *Const. paved end slope, Rt.*

19. *Const. water quality swale #2 (DFI D01412)*
    *Inst. facility field markers, type "S1" - 2*
    *Inst. facility field markers, type "S2"*
    *(For details, see sht. HA02)*

20. *Note not used*

21. *Sta. "L" 27+32.0, 29.3' Rt.*
    *Const. type "G-2" inlet*
    *Inst. 12" storm sew. pipe - 18'*
    *5' depth*
    *Const. sloped end*
    *Const. paved end slope, Rt.*

22. *Sta. "L" 27+34.0, 17.7' Rt.*
    *Const. type "G-2" inlet*
    *Inst. 12" storm sew. pipe - 12'*
    *5' depth*

23. *Sta. "L" 27+41.0, 17.8' Rt.*
    *Const. type "G-2" inlet*
    *Inst. 12" storm sew. pipe - 7'*
    *5' depth*
    *Class E backfill*

24. *Sta. "E" 2+45 to Sta. "E" 3+18.90, Lt.*
    *Const. grouted riprap (Class 50) - 29.9 cu. yd.*
    *Filter blanket - 89.7 sq. yd.*
    *(For details, see sht. HG03)*

25. *Sta. "L" 21+52.23, 18.42' Rt.*
    *Inst. 12" storm sew. pipe - 73'*
    *5' depth*
    *Connect to 10" bridge deck drainage pipe*

REGISTERED PROFESSIONAL ENGINEER
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EXPIRES: 06/30/24

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OREGON DEPARTMENT OF TRANSPORTATION

**OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT**
CORVALLIS-LEBANON HWY.
BENTON AND LINN COUNTIES

Designer: Scott Taylor
Reviewer: Ben Wewerka, PE
Drafter: Serban Dinca/Andrew Hill
Checker: Colton Fisher, PE

**DRAINAGE & UTILITIES NOTES**

SHEET NO.
C03D

# "L" LINE

Water quality swale #1
(DFI D01411)
Slope = 0.50%
Elev. in 225.75
Elev. out 225.23

"L" 22+25.0, 14.6' Lt.
Type "G-2" inlet
Rim elev. 233.12
F.L. out 229.12 (S)

"L" 22+25.0, 17.8' Rt.
Type "G-2" inlet
Rim elev. 233.01
F.L. in 228.82 (N)
F.L. in 228.68 (S)
F.L. out 228.58 (E)

"L" 22+25.0, 33.4' Rt.
Type "G-2" inlet
Rim elev. 232.78
F.L. out 228.78 (N)

"L" 23+04.9, 92.8' Lt.
Type "G-2" inlet
Rim elev. 228.00
F.L. in 226.12 (NE)
F.L. out 226.12 (S)

"L" 23+07.3, 97.3' Lt.
Storm sew. manhole
Rim elev. 227.80
F.L. in 226.15 (W)
F.L. out 226.15 (S)

"L" 23+23.0, 34.1' Rt.
Type "G-2" inlet
Rim elev. 228.92
F.L. out 226.20

"L" 23+25.0, 17.9' Rt.
Type "G-2" inlet
Rim elev. 229.08
F.L. in 226.10 (W)
F.L. in 226.10 (S)
F.L. out 226.00 (N)

"L" 27+32.0, 29.3' Rt.
Type "G-2" inlet
Rim elev. 219.64
F.L. in 216.70 (NE)
F.L. out 216.60 (S)

"L" 27+34.0, 17.7' Rt.
Type "G-2" inlet
Rim elev. 219.81
F.L. in 216.90 (E)
F.L. out 216.80 (SW)

"L" 27+41.0, 17.8' Rt.
Type "G-2" inlet
Rim elev. 219.70
F.L. out 217.00 (W)

END OF PAVING
STA. "L" 27+85.11

"L" 23+33.03, 34.58' Lt.
Type "G-2M" inlet
Rim elev. 227.28
F.L. in 225.78 (N)
F.L. in 225.78 (S)
F.L. out 225.78 (W)

Profile grade @ ℄

12"-32' @ 0.93%
12"-15' @ 0.65%
12"-100' @ 2.47%
12"-26' @ 0.65%
12"-10'@ 1.00%
12"-5' @ 0.60%
12"-65' @ 0.52%
12"-53' @ 0.60%
12"-16' @ 0.61%
12"-7' @ 0.44%
12"-82' @ 0.43%
12"-130' @ 0.46%
12"-248' @ 0.50%
12"-12' @ 0.77%
12"-7' @ 1.43%
12"-18' @ 3.31%

"L" 22+11.5, 47.8' Lt.
Storm sew. manhole,
outside drop
Rim elev. 227.73
F.L. in 213.10 (SE)
F.L. in 223.60 (SE)
F.L. out 223.60 (W)
F.L. out 213.00 (NW)

"L" 22+20.86, 43' Lt.
Type "D" inlet
Rim elev. 225.23
F.L. out 223.70

"L" 23+41.0, 33.3' Lt.
Storm sew. manhole
Rim elev. 227.50
F.L. in 213.80 (SE)
F.L. out 213.70 (NW)

"L" 23+79.7, 38.7' Lt.
Storm sew. manhole
Rim elev. 225.35
F.L. in 214.25 (E)
F.L. out 214.15 (NW)

Const. loose riprap basin
Class 50 riprap - 1.0 cu. yd.
Riprap geotextile - 3.0 sq. yd.

Pipe elev. 215.48

Water quality swale #2
(DFI D01412)
Slope = 0.50%
Elev. in 216.00
Elev. out 215.48

Riprap basin flow spreader
(For details, see sht. HA03)

25+00

265 260 255 250 245 240 235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155

REGISTERED PROFESSIONAL ENGINEER
79131
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OREGON
JUNE 14, 2007
BENJAMIN P. WEWERKA
EXPIRES: 06/30/24

FINAL ELECTRONIC DOCUMENT
AVAILABLE UPON REQUEST

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OREGON DEPARTMENT OF TRANSPORTATION

**OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT**
CORVALLIS-LEBANON HWY.
BENTON AND LINN COUNTIES

Designer: Scott Taylor
Drafter: Serban Dinca/Andrew Hill
Reviewer: Ben Wewerka, PE
Checker: Nick Reid, PE

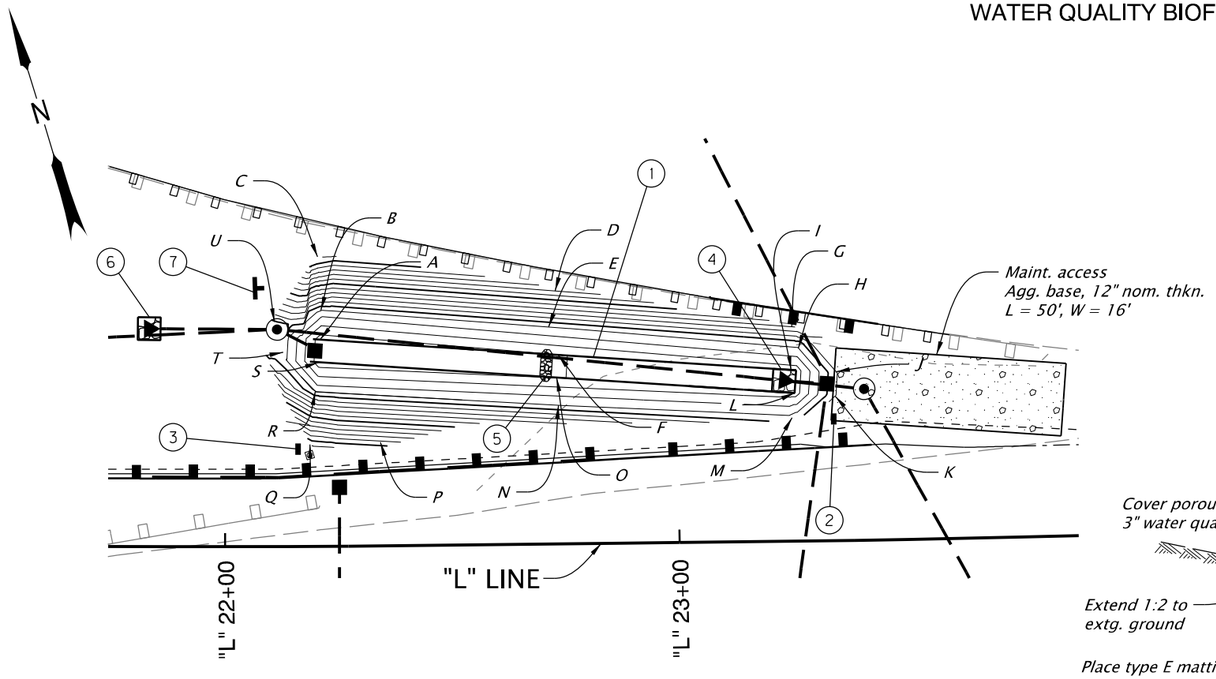
**DRAINAGE & UTILITIES PROFILE**

SHEET NO.
C03F

R_K20688_pf_08.dgn :: Default 11/17/2022 8:39:10 AM SDinca

Rotation: 0° Scale: 1"=60'

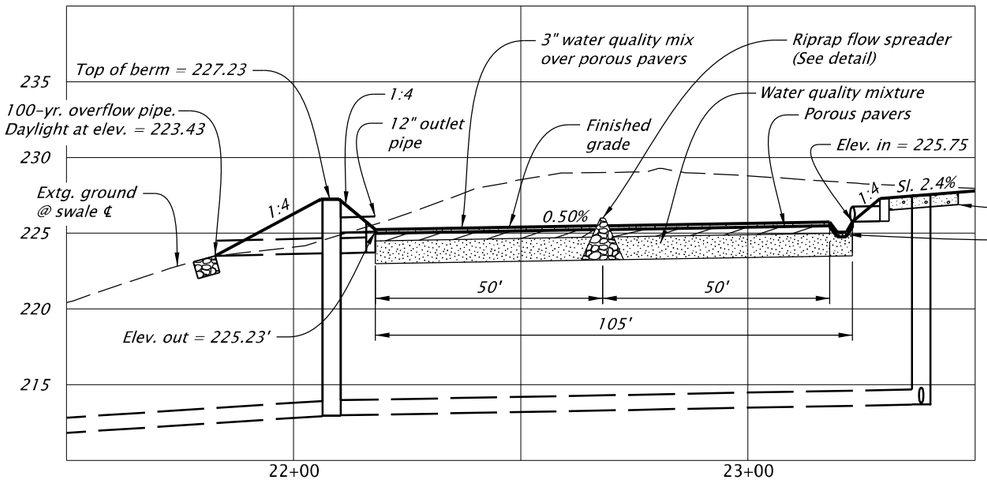
# WATER QUALITY BIOFILTRATION SWALE



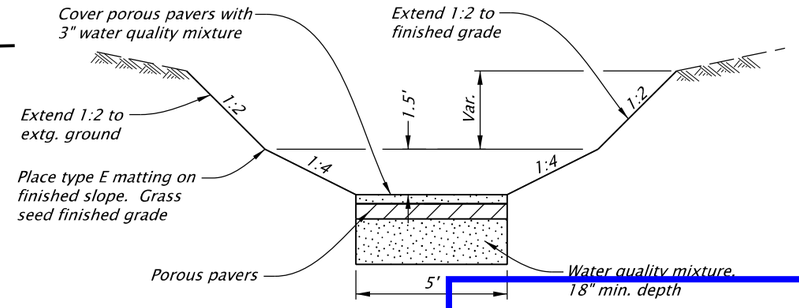

WATER QUALITY SWALE #1 (DFI D01411) PLAN
*NTS*

1. *Sta. "L" 22+20.8 to Sta. "L" 23+25.8*
   *Const. water quality biofiltration swale*
   *DFI no. 01411*
2. *Sta. "L" 23+35.22, 25.66' Lt.*
   *Inst. type "S1" marker - green*
   *(For details, see sht. HA05)*
3. *Sta. "L" 22+13.67, 20.92' Lt.*
   *Inst. type "S1" marker - red*
   *(For details, see sht. HA05)*
4. *Rock basin flow spreader*
5. *Riprap flow spreader*
6. *Const. riprap pad*
   *Loose riprap (Class 50) - 1 cu. yd.*
   *Riprap geotextile, type "I" - 3 sq. yd.*
   *(For details, see sht. HA05)*
7. *Sta. "L" 22+07.58, 59.02' Lt.*
   *Inst. type "S2" marker*
   *(For details, see sht. HA05)*

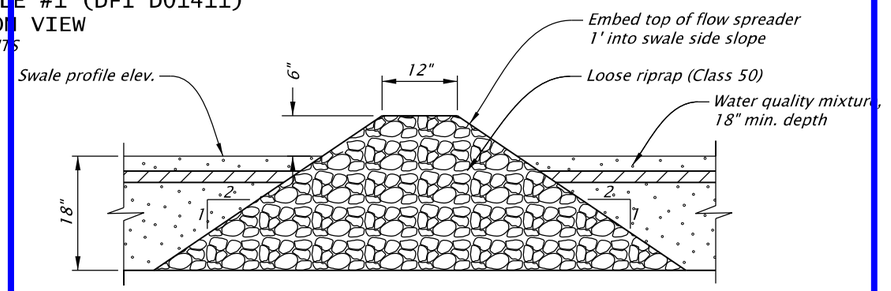
| WATER QUALITY SWALE GRADING TABLE | | | |
|---|---|---|---|
| POINT | STATION | OFFSET | ELEVATION (FT) |
| *A* | *"L" 22+21.04* | *45.49' Lt.* | *225.24* |
| *B* | *"L" 22+21.35* | *51.92' Lt.* | *226.80* |
| *C* | *"L" 22+20.54* | *63.51' Lt.* | *233.00* |
| *D* | *"L" 22+77.16* | *55.69' Lt.* | *231.10* |
| *E* | *"L" 22+76.68* | *47.75' Lt.* | *227.10* |
| *F* | *"L" 22+75.77* | *41.63' Lt.* | *225.50* |
| *G* | *"L" 23+26.22* | *47.16' Lt.* | *229.00* |
| *H* | *"L" 23+26.86* | *43.49' Lt.* | *227.20* |
| *I* | *"L" 23+26.35* | *37.62' Lt.* | *225.75* |
| *J* | *"L" 23+35.46* | *36.89' Lt.* | *228.00* |
| *K* | *"L" 23+35.43* | *31.89' Lt.* | *228.10* |
| *L* | *"L" 23+25.89* | *32.71' Lt.* | *225.75* |
| *M* | *"L" 23+26.13* | *27.15' Lt.* | *227.30* |
| *N* | *"L" 22+74.52* | *30.63' Lt.* | *227.00* |
| *O* | *"L" 22+75.38* | *36.62' Lt.* | *225.50* |
| *P* | *"L" 22+35.86* | *21.99' Lt.* | *232.50* |
| *Q* | *"L" 22+19.33* | *21.94' Lt.* | *223.10* |
| *R* | *"L" 22+20.28* | *34.34' Lt.* | *226.80* |
| *S* | *"L" 22+20.71* | *40.53' Lt.* | *225.23* |
| *T* | *"L" 22+12.53* | *42.56' Lt.* | *227.20* |
| *U* | *"L" 22+12.94* | *48.44' Lt.* | *227.20* |




WATER QUALITY SWALE #1 (DFI D01411) PROFILE
*NTS*




WATER QUALITY SWALE #1 (DFI D01411)
SECTION VIEW
*NTS*




RIPRAP FLOW SPREADER DETAIL
*NTS*

REGISTERED PROFESSIONAL ENGINEER
79131
Digitally Signed 2022.11.17 15:10:26-08'00'
OREGON
JUNE 14, 2007
BENJAMIN P. WEWERKA
EXPIRES: 06/30/24

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OREGON DEPARTMENT OF TRANSPORTATION

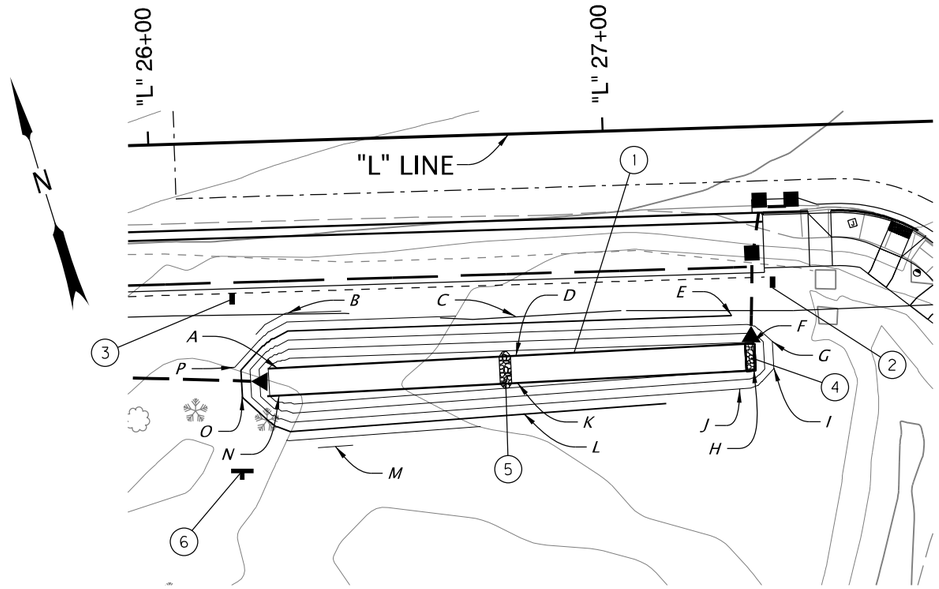
**OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT**
CORVALLIS-LEBANON HWY.
BENTON - LINN COUNTIES

Designer: Scott Taylor
Drafter: Serban Dinca
Reviewer: Ben Wewerka, PE
Checker: Colton Fisher, PE

**STORMWATER SWALE DETAILS**

SHEET NO.
HA01

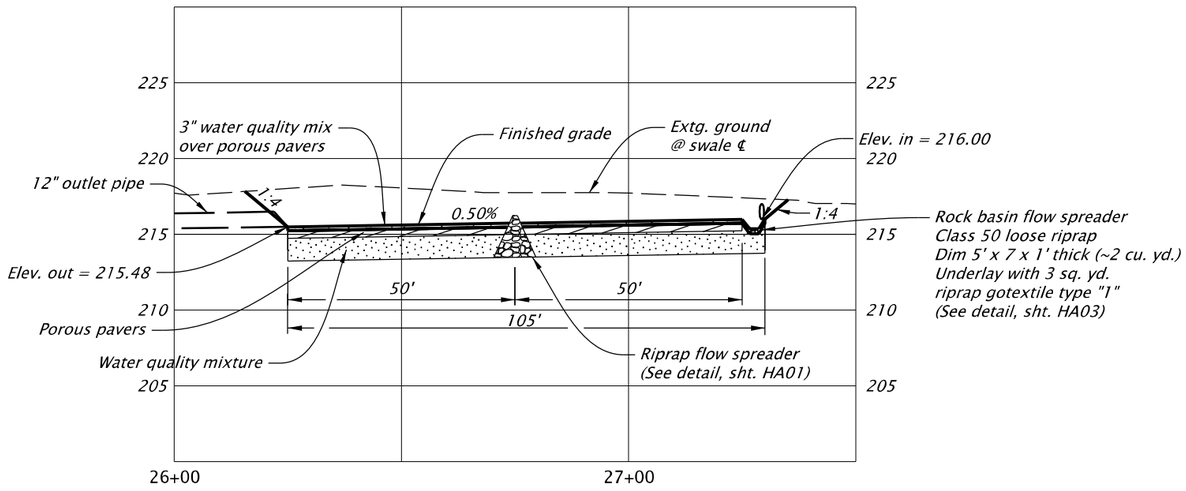
# WATER QUALITY BIOFILTRATION SWALE



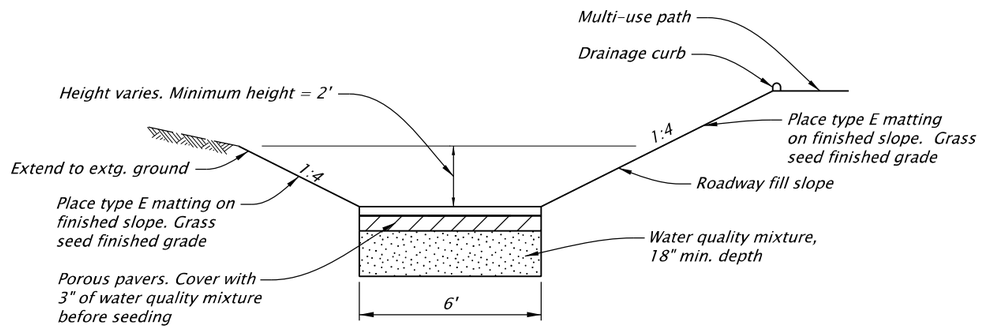

WATER QUALITY SWALE #2 (DFI D01412) PLAN
*NTS*

1. *Sta. "L" 26+27.0 to Sta. "L" 27+32.0*
   *Const. water quality biofiltration swale*
   *DFI no. 01412*
2. *Sta. "L" 27+35.46, 33.21' Rt.*
   *Inst. type "S1" marker - green*
   *(For details, see sht. HA05)*
3. *Sta. "L" 26+17.28, 33.14' Rt.*
   *Inst. type "S1" marker - red*
   *(For details, see sht. HA05)*
4. *Rock basin flow spreader*
5. *Riprap flow spreader*
6. *Sta. "L" 26+17.32, 69.76' Rt.*
   *Inst. type "S2" marker*
   *(For details, see sht. HA05)*

| WATER QUALITY SWALE GRADING TABLE | | | |
|---|---|---|---|
| POINT | STATION | OFFSET | ELEVATION (FT) |
| *A* | *"L" 26+26.95* | *49.97' Rt.* | *215.54* |
| *B* | *"L" 26+29.23* | *37.43' Rt.* | *218.60* |
| *C* | *"L" 26+81.98* | *40.05' Rt.* | *217.90* |
| *D* | *"L" 26+81.80* | *48.91' Rt.* | *215.75* |
| *E* | *"L" 27+27.19* | *41.62' Rt.* | *217.50* |
| *F* | *"L" 27+31.95* | *47.68' Rt.* | *216.00* |
| *G* | *"L" 27+37.01* | *47.23' Rt.* | *217.30* |
| *H* | *"L" 27+31.66* | *53.46' Rt.* | *216.00* |
| *I* | *"L" 27+36.91* | *53.38' Rt.* | *217.20* |
| *J* | *"L" 27+28.56* | *58.86' Rt.* | *217.30* |
| *K* | *"L" 26+81.83* | *54.70' Rt.* | *215.75* |
| *L* | *"L" 26+82.39* | *62.85' Rt.* | *217.80* |
| *M* | *"L" 26+38.80* | *67.57' Rt.* | *218.50* |
| *N* | *"L" 26+27.13* | *55.93' Rt.* | *215.53* |
| *O* | *"L" 26+17.77* | *56.20' Rt.* | *217.82* |
| *P* | *"L" 26+17.51* | *49.54' Rt.* | *218.00* |




WATER QUALITY SWALE #2 (DFI D01412) PROFILE
*NTS*




WATER QUALITY SWALE #2 (DFI D01412)
SECTION VIEW
*NTS*

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79131
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OREGON
JUNE 14, 2007
BENJAMIN P. WEWERKA
EXPIRES: 06/30/24

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**OR34: VAN BUREN BRIDGE (CORVALLIS) PROJECT**
CORVALLIS-LEBANON HWY.
BENTON - LINN COUNTIES

Designer: Scott Taylor | Reviewer: Ben Wewerka, PE
Drafter: Serban Dinca | Checker: Colton Fisher, PE

**STORMWATER SWALE DETAILS**

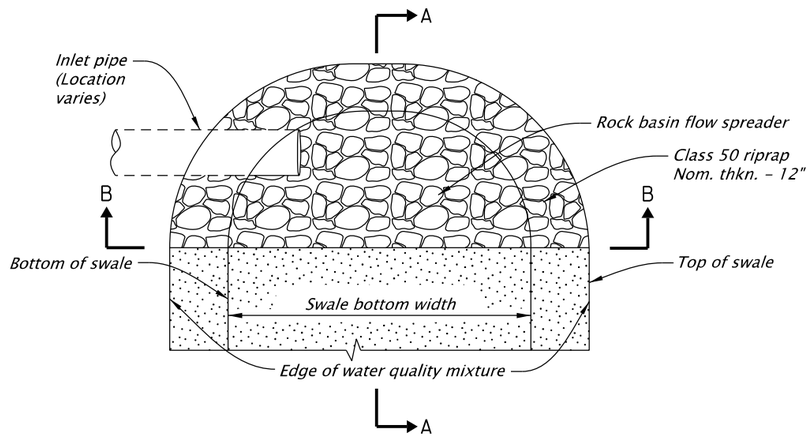
SHEET NO. HA02



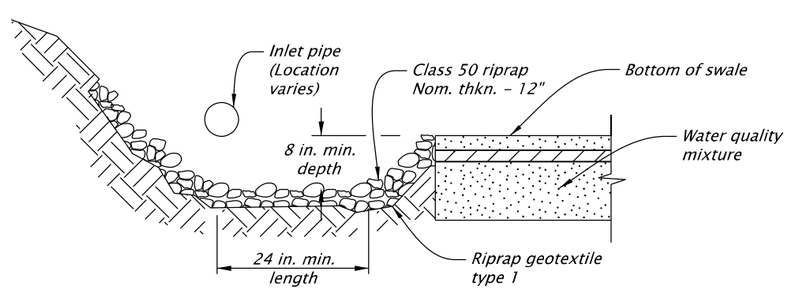


Rotation: 342.9896° Scale: N/A

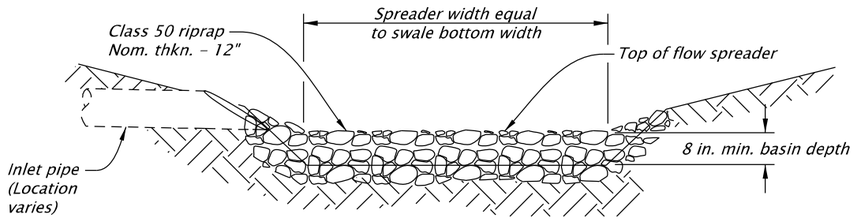
## ROCK BASIN FLOW SPREADER



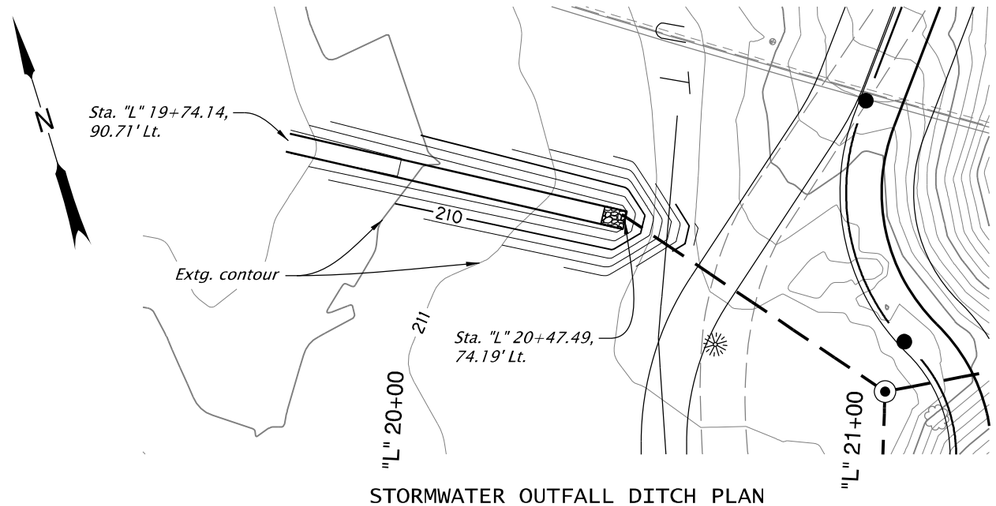

PLAN VIEW
*NTS*



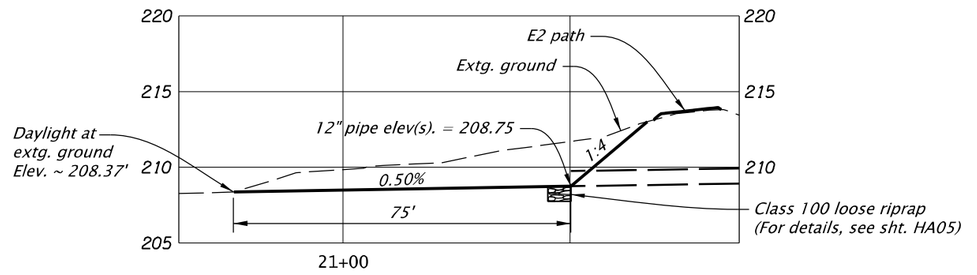

SECTION A-A
*NTS*



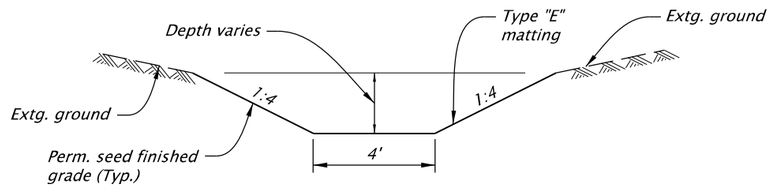

SECTION B-B
*NTS*




STORMWATER OUTFALL DITCH PLAN
*NTS*




STORMWATER OUTFALL DITCH PROFILE
*NTS*




STORMWATER OUTFALL DITCH SECTION
*NTS*

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JUNE 14, 2007
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CORVALLIS-LEBANON HWY.
BENTON - LINN COUNTIES

Designer: Scott Taylor
Drafter: Serban Dinca
Reviewer: Ben Wewerka, PE
Checker: Colton Fisher, PE

**STORMWATER DITCH DETAILS**

SHEET NO.
HA03