# OPERATION & MAINTENANCE MANUAL

## DFI No. : D00525
## Facility Type: Water Quality Biofiltration Swale

**October, 2017**

**INDEX**

## 1. Identification

| | |
|---|---|
| Drainage Facility ID (DFI): | **D00525** |
| Facility Type: | Water Quality Biofiltration Swale |
| Construction Drawings: | 44V-057 |
| Location: | District: 08 |
| | Highway No.: 272 |
| | Mile Post Beg./End: MP 4.10/MP 4.13 |
| | Description: This facility is located along the shoulder of OR 238 at the intersection of Jaynes Drive and OR 238. |

## 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: | Chris Zelmer – Region 3 Tech Center, White City, (541) 864-8812 |
| Facility construction: | 2016 |
| Contractor: | N/A |

## 4. Storm Drain System and Facility Overview

A water quality swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. This type of facility is lined with grass. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

This facility is located along the shoulder of northbound of OR 238 (No. 272). Access for this facility is available from the northbound shoulder of OR . Stormwater enters the facility via roadway runoff and a stormwater ditch located along the northbound OR 238. As the water flows through the swale it is treated as it slows and spreads out within the swale before outfalling into an existing stormwater culvert.

A. Maintenance equipment access:
   This facility can be accessed from the southbound shoulder of OR238 (Hwy 272).

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 swale can be used to store a volume of liquid by blocking the facility outlet through use of sandbags.

## 6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure can not safely pass the projected high flows. Broad-crested spillway weirs and over flow risers are the two most common auxiliary outlets used in stormwater treatment facility design. The auxiliary outlet feature is either a part of the facility or an additional storm drain feature/structure.

The auxiliary outlet feature for this facility is:

☐ Designed into facility

☒ Other
There are no auxiliary outlets built into this facility. In the event that flows exceed design flows the water will overtop the swale.

## 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:

Note: Special maintenance Requirements Require Concurrence from ODOT SR Hydraulics Engineer.

## 8. Waste Material Handling

Material removed from the facility is defined as waste by 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

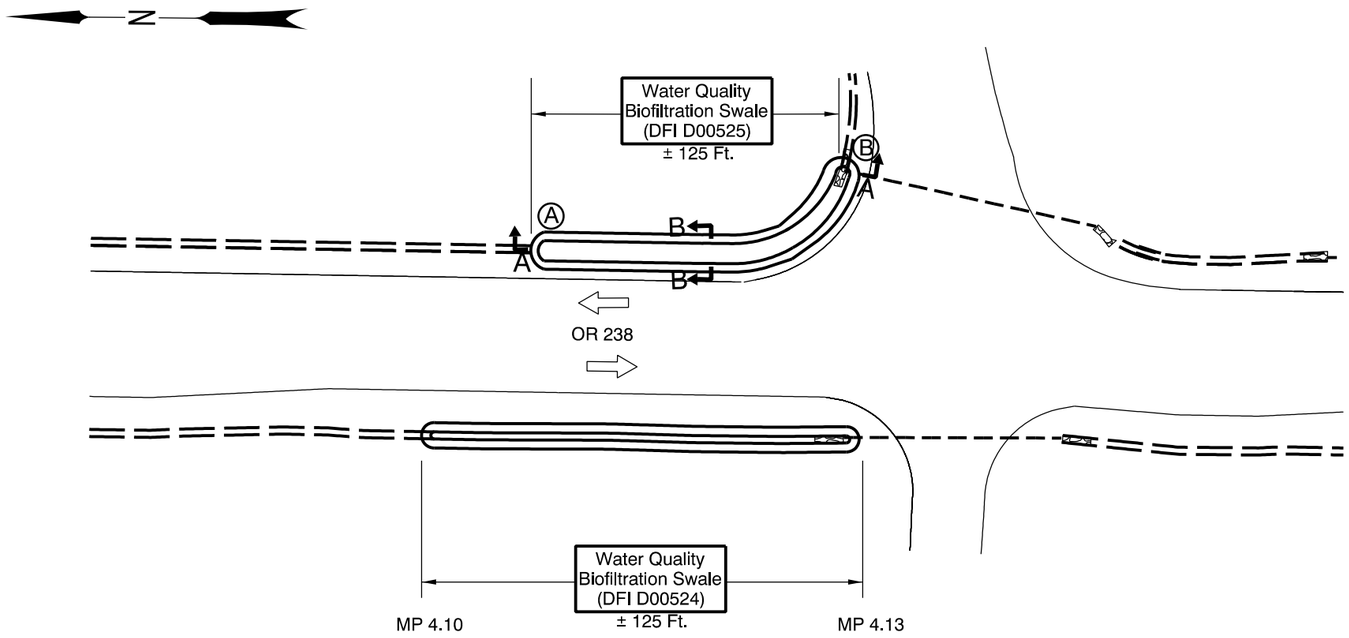
Contact any of the following for more detailed information about management of waste materials found on site:

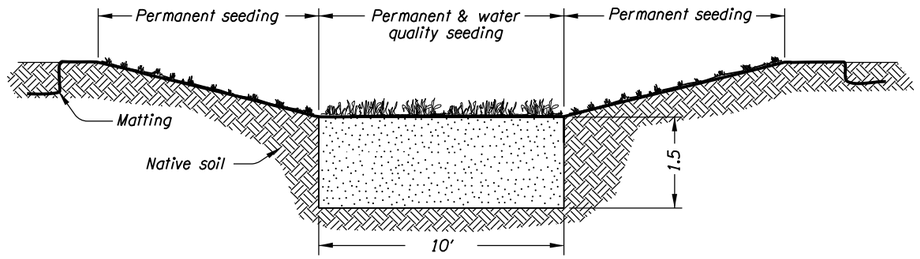
| | |
|---|---|
| ODOT Clean Water Unit | (503) 986-3008 |
| ODOT Statewide Hazmat Coordinator | (503) 667-7442 |
| ODOT Region 1 Hazmat Coordinator | (503) 731-8290 |
| ODOT Region 2 Hazmat Coordinator | (503) 986-2647 |
| ODOT Region 3 Hazmat Coordinator | (541) 957-3594 |
| ODOT Region 4 Hazmat Coordinator | (541) 388-6186 |
| ODOT Region 5 Hazmat Coordinator | (541) 963-1590 |
| ODEQ Northwest Region Office | (503) 229-5263 |

# Appendix A

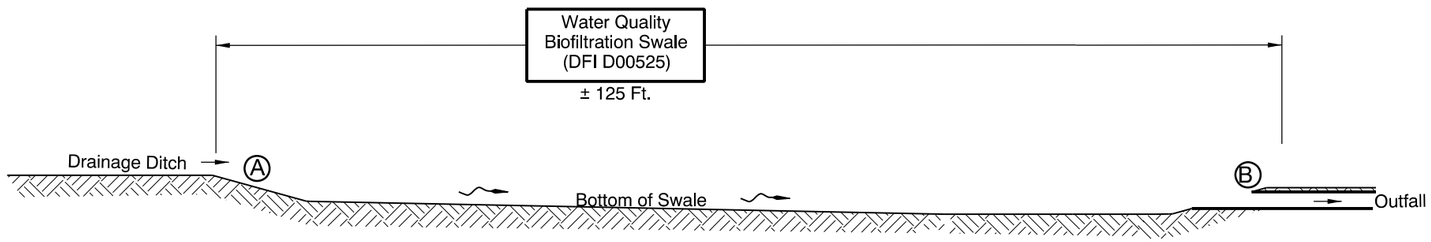
**Content:**

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




SECTION B-B
N.T.S.




SECTION A-A
N.T.S.

LEGEND:

- Ⓐ Swale Inlet w/Flow Spreader Inlet
- Ⓑ Swale Outlet
- Ⓒ Flow Board Spreader
- ◉ and or ◎ Manhole
- ■ and or □
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: T. BURRIER

Drafted By: T. BURRIER

**DFI D00525**
**MAINTENANCE DISTRICT 8 HWY 272**
**WQ BIOFILTRATION SWALE**
HIGHWAY MP 4.10 to MP 4.13
JOSEPHINE

# Appendix B

**Content:**

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

44V-057

| INDEX OF SHEETS | |
|---|---|
| SHEET NO. | DESCRIPTION |
| 1 | Title Sheet |
| 1A | Index Of Sheets Cont'd. & Std. Dwg. Nos. |

STATE OF OREGON

# DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

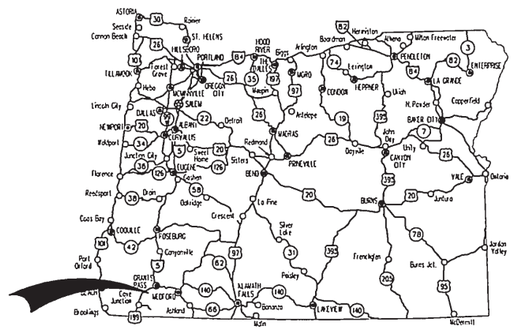
## PAVING, GRADING, DRAINAGE & SIGNS

# OR 238 @ JAYNES DRIVE

## JACKSONVILLE HIGHWAY

### JOSEPHINE COUNTY

### APRIL 2011



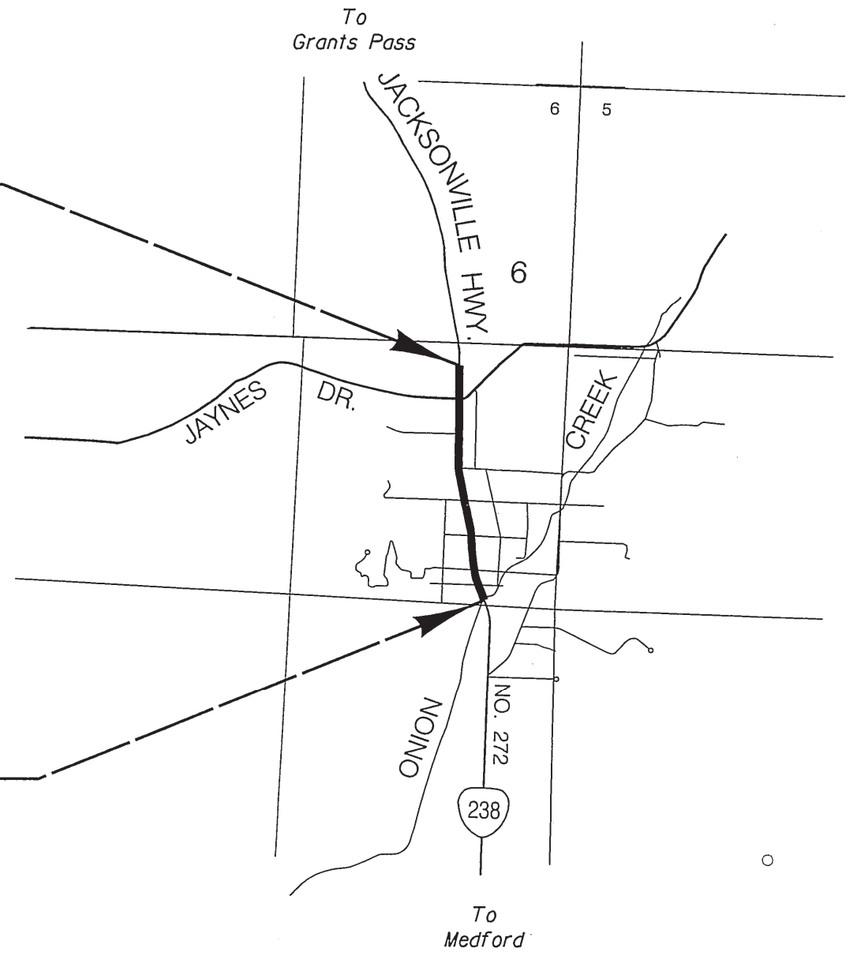
*Overall Length Of Project - 0.8 Miles*

**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**
**SO-NTSA-S272(029)**
**STA. "JH" 209+56.00 (M.P. 3.96)**

**END OF PROJECT**
**SO-NTSA-S272(029)**
**STA. "JH" 252+75.00 (M.P. 4.79)**




N

T. 37S., R. 5W., Sect. 07, W.M.

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 |

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: M. Thompson
Signature & date 2-28-2011

MARK THOMPSON, TECH CENTER MGR
Print name and title

Concurrence by ODOT Chief Engineer

**OR 238 @ JAYNES DRIVE**
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

| FEDERAL HIGHWAY ADMINISTRATION | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| OREGON DIVISION | SO-NTSA-S272(029) | 1 |

44V-057

| INDEX OF SHEETS, CONT'D. | |
|---|---|
| SHEET NO. | DESCRIPTION |
| 2 | Typical Sections |
| 2B Thru 2B-7 | Details |
| 2D | Pipe Data |
| 3 & 4 | General Construction |
| 5 Thru 8 | Drainage & Utilities |
| 9 & 10 | Profiles |
| GA-1 Thru GA-4 | Erosion Control |
| | |
| | |
| TRAFFIC PLANS | |
| ST1 & ST2 | Striping Plan |
| | |
| S-12625 Thru S-12629 | Sign Plan |
| | |
| 16026 | Signal Dwg., Flashing Beacon Plan |
| 16027 | Signal Dwg., Existing-Utilities |

Standard Dwg. Nos.

RD100 - Mailbox Support
RD101 - Mailbox Installation

RD300 - Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD302 - Street Cut
RD304 - Arch Pipe Backfill/Compaction
RD316 - Sloped Ends For Metal Pipe
RD318 - Sloped Ends For Concrete Pipe
RD320 - Paved End Slope For Culverts 60" Maximum Pipe Size
RD322, RD324 - Safety End Section
RD326 - Coupling Bands For Corrugated Metal Pipe
RD336 - Standard Storm Sewer Manhole
RD346 - Large Precast Manhole
RD356 - Manhole Covers and Frames
RD380, RD382, RD384, RD386, RD388, RD390, RD391 - Pipe Fill Height Tables

RD610 - Asphalt Pavement Details

RD700 - Curbs
RD705 - Islands
RD710 - Accessible Route Islands
RD715 - Approaches And Non-Sidewalk Driveways

RD1005 - Check Dams
RD1055 - Matting

TM200 - Sign Installation Details
TM201 - Miscellaneous Sign Placement Details
TM206 - Sign Bracing Details
TM212 - Signing Details Oregon Route Signs
TM221 - Signing Details Milepost Markers
TM222 - Installation Details Milepost Marker Posts
TM223 - Conventional Roads Directional Sign Layout Street Name Signs
TM230, TM233 - Mounting Details For Removable Legend

TM500, TM501, TM502, TM503 - Pavement Marking Standard Details
TM515 - Raised Pavement Markers
TM523 - Durable Pavement Markings
TM539 - Median And Left Turn Channelization Details
TM560 - Alignment Layout
TM570 - Traffic Delineators
TM571 - Traffic Delineators Steel Post Details
TM576 - Traffic Delineator Installation For Non-Freeways

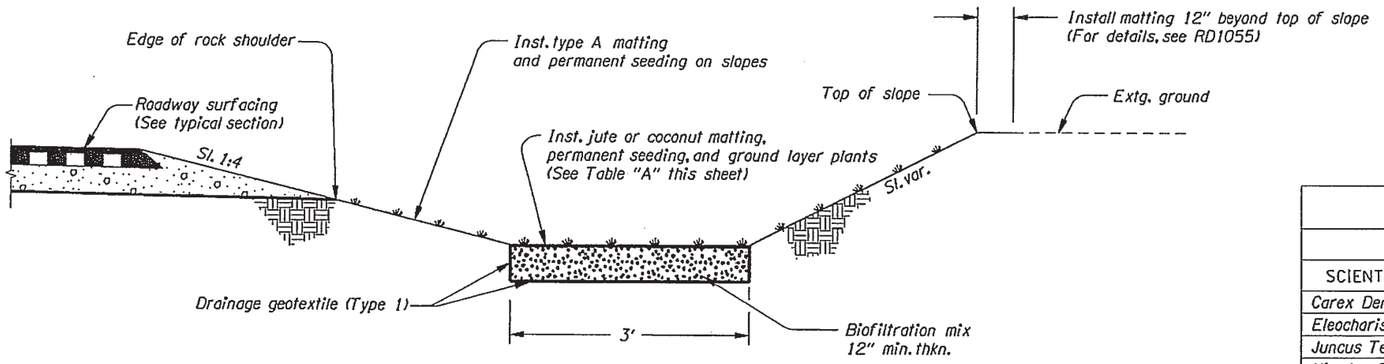
TM602 - Triangular Base Breakaway Sign Support
TM635 - Breakaway Sign and Luminaire Supports
TM670 - Wood Post Sign Supports
TM671 - 3 Second Gust Wind Speed Isotach
TM676 - Sign Attachments
TM681 - Perforated Steel Square Tube (PSST) Sign Support Installation
TM687 - Perforated Steel Square Tube (PSST) Anchor Foundation
TM688 - Perforated Steel Square Tube (PSST) Slip Base Foundation

TM800 - Tables, Abrupt Edge And PCMS Details
TM810 - Temporary Reflective Pavement Markers
TM821 - Temporary Sign Supports
TM850 - 2-Lane, 2-Way Roadways

**OR 238 @ JAYNES DRIVE**
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

| FEDERAL HIGHWAY ADMINISTRATION | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| OREGON DIVISION | SO-NTSA-S272(029) | 1A |

44V-057

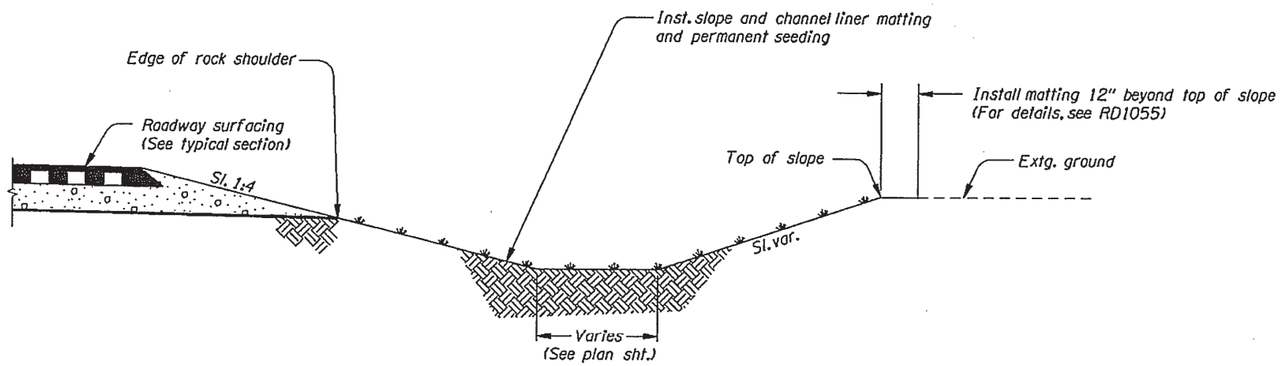



STA. "JH" 217+00.00 To STA. "JH" 218+27.00, Lt.
STA. "JH" 216+55.00 To STA. "JH" 217+80.00, Rt.

## BIOFILTRATION SWALE
*Not to scale*

| TABLE "A" | | | |
|---|---|---|---|
| ACCEPTABLE GROUNDLAYER PLANTS | | | |
| SCIENTIFIC NAME | COMMON NAME | TYPE | QTY |
| *Carex Densa* | *Dense Sedge* | *Plugs* | *378* |
| *Eleocharis Palustris* | *Common Spikebrush* | *Plugs* | *378* |
| *Juncus Tenuis* | *Proverty Rush* | *Plugs* | *378* |
| *Mimulus Guttatus* | *Seep Monkeyflower* | *Plugs* | *378* |
| | | TOTAL | 1512 |

*Note:*
1. *Inst. permanent seeding over swale (ditch) soil surface from edge of rock shoulder to top of slope. Inst. flexible channel liner over seeding - per manufactures installation instructions. See Erosion Control Plans for other seeding areas.*
2. *Plant a mix of all four groundlayer plant species in each bioswale at a total density of 2 plants per square foot.*
3. *For details not shown, see std. dwg. no. RD1055*




## TRAPEZOIDAL CHANNEL
*Not to scale*

*Note:*
*Inst. type A matting on slopes and channel from Sta. "JH" 209+56, Rt. to Sta. "JH" 216+55, Rt. and from Sta. "JH" 209+56, Lt. to 217+00, Lt.*

*Inst. type F flexible channel liner from Sta. "JH" 226+70, Rt. to Sta. "JH" 228+50, Rt.*

*Inst. type E flexible channel liner in all other locations.*

*For details not shown, see std. dwg. no. RD1055*

REGISTERED PROFESSIONAL ENGINEER
63243
OREGON
JULY 9, 2001
CHRIS R. ZELMER
EXPIRES: JUNE 30, 2012

**OREGON DEPARTMENT OF TRANSPORTATION**

**REGION 3 - TECHNICAL CENTER**

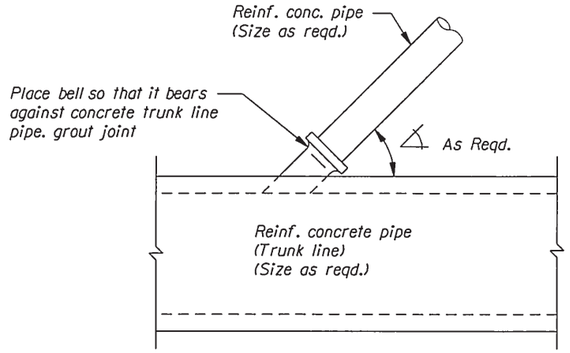
**OR 238 @ JAYNES DRIVE**
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Chris Zelmer
Drafted By - Judy Hardin

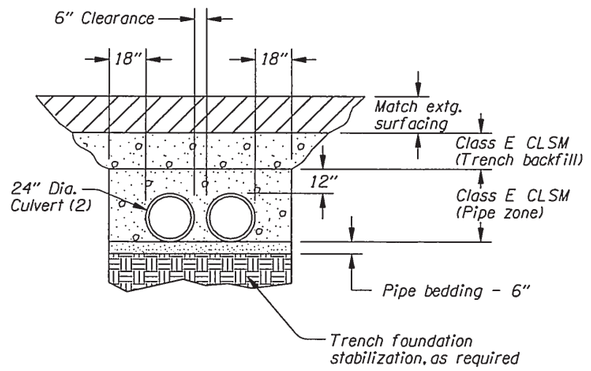
**DETAILS**

SHEET NO. 2B-3

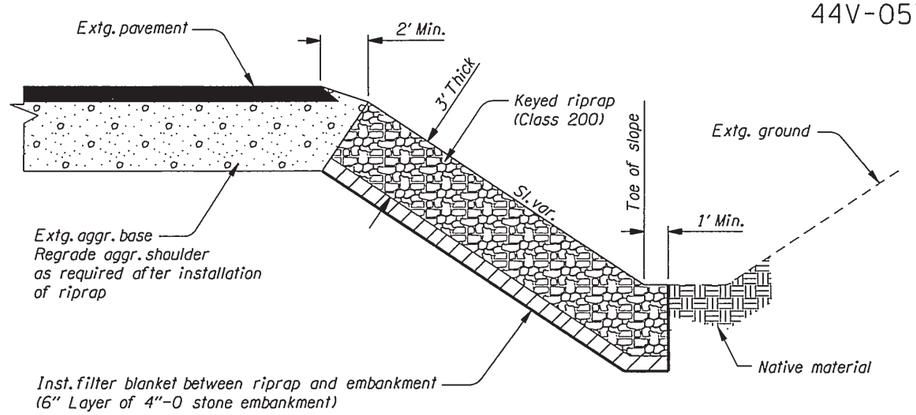
44V-057



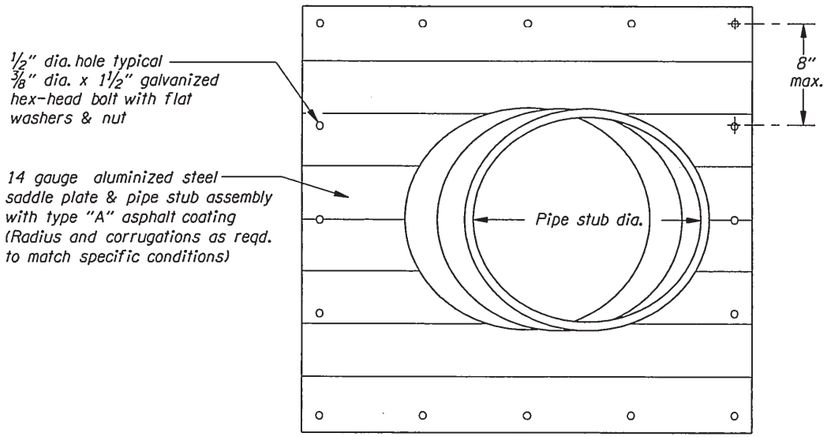

BLIND CONNECTION
CONCRETE PIPE TO CONCRETE PIPE



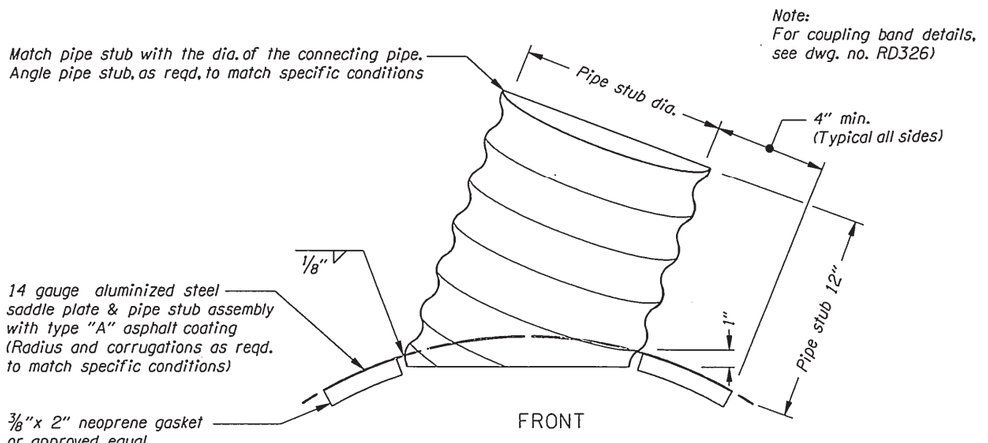

DOUBLE CULVERT INSTALLATION




KEYED RIPRAP DETAIL

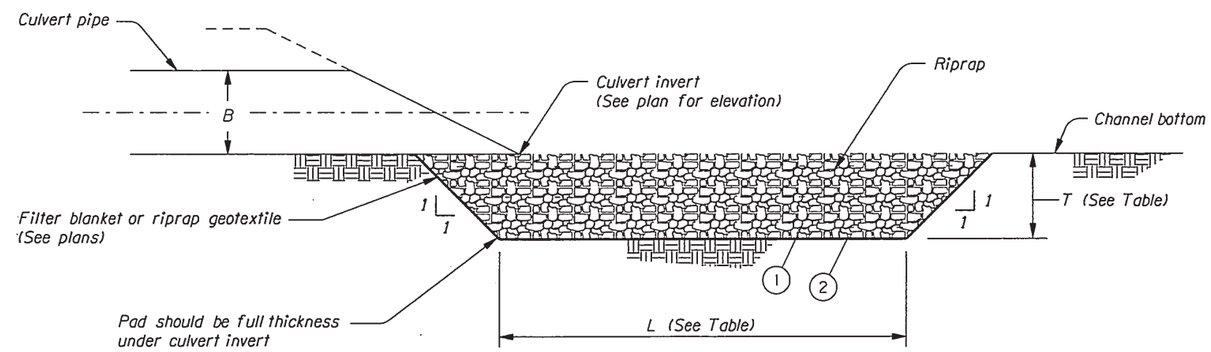



SIDE




FRONT

CORRUGATED METAL PIPE SADDLE - T CONNECTION
TO EXISTING CORRUGATED METAL PIPE




LOOSE RIPRAP PAD DETAIL

Notes:

(1) Do not excavate non-erodible rock in order to place riprap.

(2) Use filter blanket beneath Class 200 loose riprap.

(3) Top width of the riprap pad to match width of swale bottom.

B = Diameter or span of conduit, ft.
L = Length of bottom of riprap pad, ft.
T = Thickness of riprap pad, ft.
W = Width of top of riprap pad, ft.

| TABLE | | |
|---|---|---|
| Riprap Class | L* (ft) | T (ft) |
| 50 | 4B or 1.3 | 2.3 |
| 100 | 4B or 1.6 | 3.3 |
| 200 | 4B or 2.0 | 4.3 |

* L is the greater of 4B or the listed dimension

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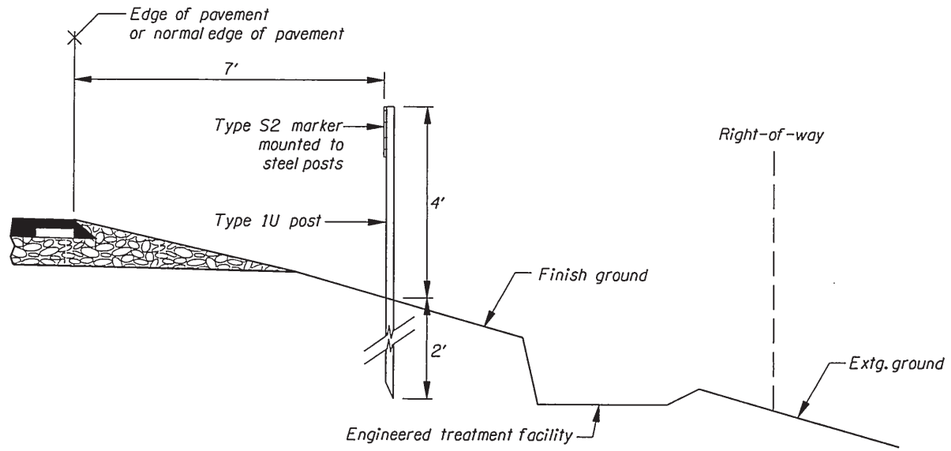
REGION 3 - TECHNICAL CENTER

OR 238 @ JAYNES DRIVE
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

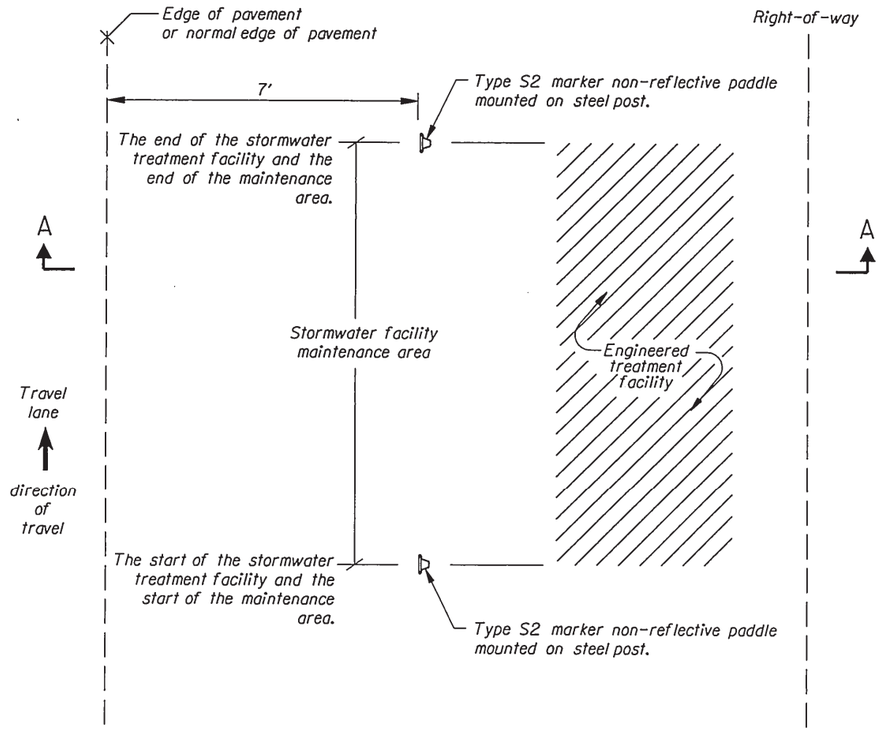
Design Team Leader - Chris Zelmer
Designed By - Chris Zelmer
Drafted By - Judy Hardin

DETAILS

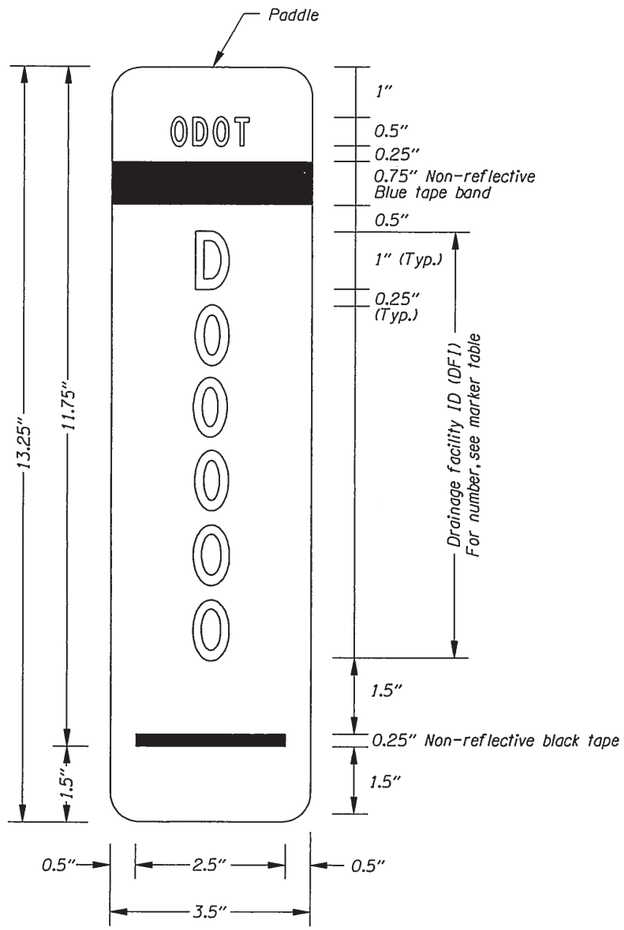
SHEET NO. 2B-4




SECTION A-A




INSTALLATION DETAIL




TYPE S2 MARKER

*(State supplied item)*

MARKER TABLE

| FACILITY LOCATION | DFI # | TYPE S2 MARKER | |
|---|---|---|---|
| STATION | | BEGIN | END |
| 216+55, Rt. | D00524 | ✓ | |
| 217+80, Rt. | D00524 | | ✓ |
| 217+00, Lt. | D00525 | ✓ | |
| 218+27, Lt. | D00525 | | ✓ |

*Notes:*

1. *Paddle:*
   - *Aluminum sheet, nominal thickness 0.050"*
   - *White non-reflective background*
   - *Mount paddle to one (1) type 1U steel post using 3/16" diameter aluminum blind rivets and washers.*
   - *Text and numbers are type C font in non-reflectorized black*
   - *Band is non-reflective blue tape*
   - *Do not mount paddle to other highway signing posts*
   - *Install paddle parallel to travel lane*
   - *Prepare paddle for each "DFI" noted in the marker table*
2. *Steel Posts:*
   - *See standard drawing TM571 for type 1U steel post dimensions*
3. *Place 7 feet from edge of pavement or normal edge of pavement.*
4. *See marker table for installation locations.*

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OREGON
JULY 9, 2001
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EXPIRES: JUNE 30, 2012

**OREGON DEPARTMENT OF TRANSPORTATION**

**REGION 3 - TECHNICAL CENTER**

**OR 238 @ JAYNES DRIVE**
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Chris Zelmer
Drafted By - Judy Hardin

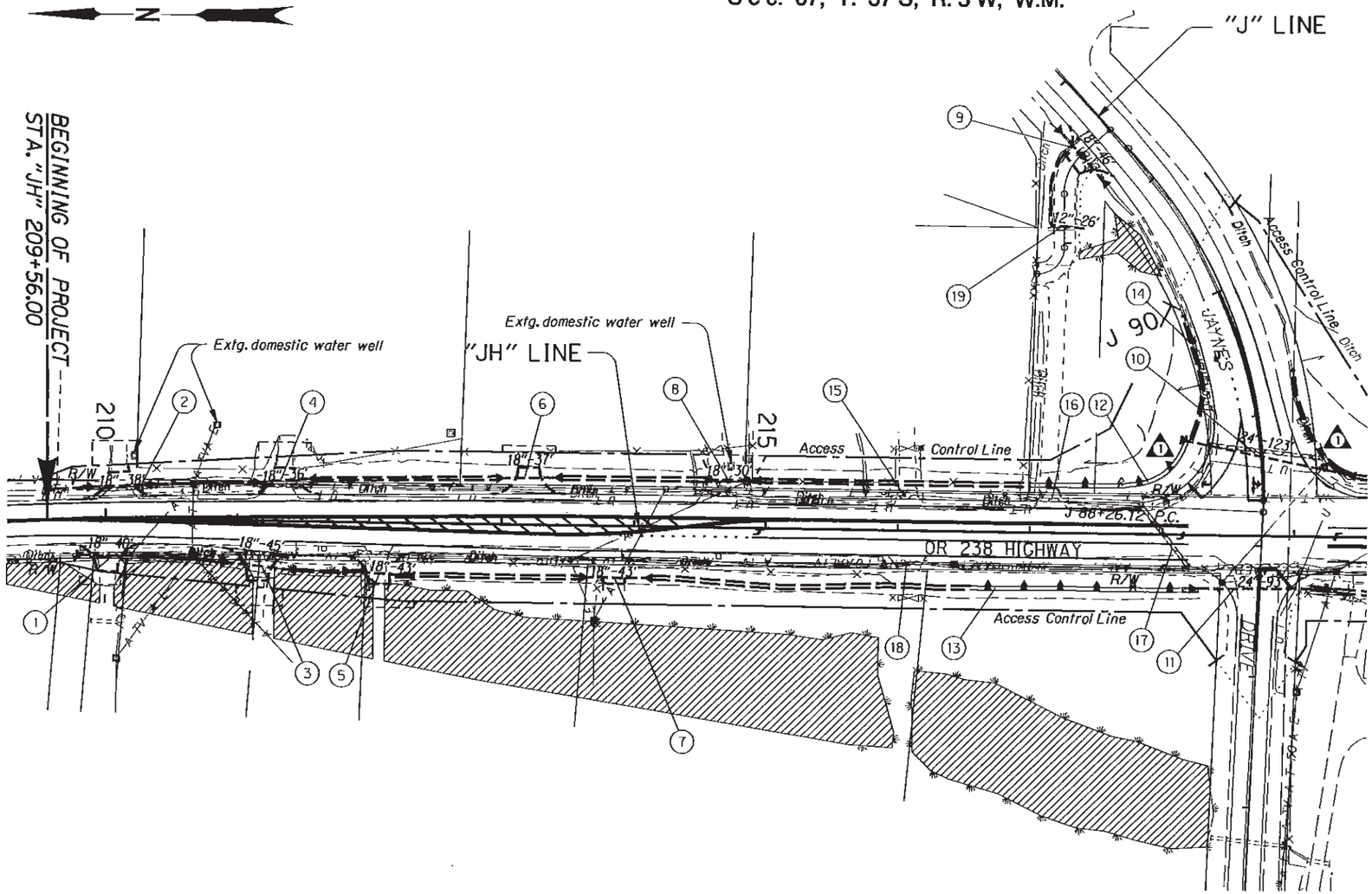
**DETAILS**

SHEET NO. 2B-6

44V-057

Sec. 07, T. 37 S, R. 5 W, W.M.

For notes, see sht. 5A




*Notes:*

1. *Existing pipe removal is incidental to Section 00310 - Removal of Structures and Obstructions. No separate or additional payment will be made for pipe removal.*
2. *Safety end sections shall be 1:4 slope unless otherwise noted on plans.*

*No work zone shown thus:*

*Roadside ditch shown thus:* *(Incidental to general excavation)*

*Remove pipe or abandon in place shown thus:*

| No. | DATE | REVISIONS | BY |
|---|---|---|---|
| 1 | 04-13-11 | 123' was 109', clarified swale | J.H. |
| | | | |

REGISTERED PROFESSIONAL ENGINEER
63243
OREGON
JULY 9, 2001
CHRIS R. ZELMER

EXPIRES: JUNE 30, 2012

**OREGON DEPARTMENT OF TRANSPORTATION**

**REGION 3 - TECHNICAL CENTER**

**OR 238 @ JAYNES DRIVE**
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Chris Zelmer
Drafted By - Judy Hardin

**DRAINAGE & UTILITIES**

SHEET NO. 5

\\s-whitecity-1\userseng\hwye33g\ODOT_DATA\Projects\ARCHIVED_Mylars_2011\14991_OR238_@_Jaynes_Drive\01_Working\14991_rev_1.drl :: Default 4/13/2011 2:31:20 PM hwye33g 1:200_BL - 05

(1) Sta. "JH" 209+85.50, 27.5' Rt. to
Sta. "JH" 210+25.40, 28' Rt.
Remove extg. culv. pipe - 30'
Inst. 18"' culv. pipe - 40'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0303'/ft.
I.E. (Rt.) = 1274.46
I.E. (Lt.) = 1273.25
(See dwg. nos. RD300, RD316, RD318 & RD320)

(2) Sta. "JH" 209+92.00, 22.5' Lt. to
Sta. "JH" 210+30.00, 26.5' Lt.
Remove extg. culv. pipe - 33'
Inst. 18" culv. pipe - 38'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0295'/ft.
I.E. (Lt.) = 1276.37
I.E. (Rt.) = 1275.25

(3) Sta. "JH" 210+94.3, 33' Rt. to
Sta. "JH" 211+39.30, 37.1' Rt.
Remove extg. culv. pipe -21'
Inst. 18" culv. pipe - 45'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0296'/ft.
I.E. (Rt.) = 1270.58
I.E. (Lt.) = 1269.25

(4) Sta. "JH" 211+17.90, 29.6' Lt. to
Sta. "JH" 211+54.00, 32.5' Lt.
Remove extg. culv. pipe - 36'
Inst. 18" culv. pipe - 36'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0417'/ft.
I.E. (Lt.) = 1272.60
I.E. (Rt.) = 1271.10

(5) Sta. "JH" 211+86.60, 37.3' Rt. to
Sta. "JH" 212+29.30, 39.3' Rt.
Remove extg. culv. pipe - 31'
Inst. 18" culv. pipe - 43'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0209'/ft.
I.E. (Rt.) = 1267.50
I.E. (Lt.) = 1266.60

(6) Sta. "JH" 213+02.00, 35.4' Lt. to
Sta. "JH" 213+39.00, 36.2' Lt.
Inst. 18" culv. pipe - 37'
5' depth
Const. sloped end section - 2
Const. poved end slope, Lt. & Rt.
S = 0.0189'/ft.
I.E. (Lt.) = 1265.67
I.E. (Rt.) = 1264.97

(7) Sta. "JH" 213+66.00, 39.4' Rt. to
Sta. "JH" 214+08.50, 39.4' Rt.
Inst. 18" culv. pipe - 43'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0256'/ft.
I.E. (Rt.) = 1263.00
I.E. (Lt.) = 1261.90
(See dwg. nos. RD316 & RD326)

(8) Sta. "JH" 214+60.00, 36.3' Lt. to
Sta. "JH" 214+90.00, 36.3' Lt.
Remove extg. culv. pipe - 31'
Inst. 18" culv. pipe - 30'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0220'/ft.
I.E. (Lt.) = 1261.68
I.E. (Rt.) = 1261.02

(9) Sta. "J" 91+25.43, 30.5' Lt. to
Sta. "J" 91+71.75, 29.0' Lt.
Inst. 18" culv. pipe - 46'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0543'/ft.
I.E. (Rt.) = 1261.90
I.E. (Lt.) = 1259.40
(See dwg. no. RD390)

1 (10) Sta. "JH" 218+18.82, 71.6' Lt. to
Sta. "JH" 219+40.40, 48.2' Lt.
Remove extg. culv. pipe - 87'
Inst. 24" culv. pipe - 123'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 7 cu. yd.
Riprap geotextile - 6 sq. yd.
Trench resurfacing - 78 sq. yd.
Class E backfill
S = 0.0049'/ft.
I.E. (Lt.) = 1250.60
I.E. (Rt.) = 1250.00
(For details, see sht. 2B-4)

(11) Sta. "JH" 218+27.00, 42.5' Rt. to
Sta. "JH" 219+20.00, 39.5' Rt.
Remove extg. culv. pipe - 60'
Inst. 24" culv. pipe - 93'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 7 cu. yd.
Riprap geotextile - 6 sq. yd.
Trench resurfacing - 75 sq. yd.
Class E backfill
S = 0.0151'/ft.
I.E. (Rt.) = 1252.90
I.E. (Lt.) = 1251.50
(For details, see sht. 2B-4)

(12) Sta. "JH" 217+00.00 to
Sta. "JH" 218+27.00, Lt.
Const. biofiltration swale - 140'
Install level spreader - 3
(For details, see shts. 2B-2 & 2B-3)

(13) Sta. "JH" 216+55.00 to
Sta. "JH" 217+80.00, Rt.
Const. biofiltration swale - 125'
Install level spreader - 3
(For details, see shts. 2B-2 & 2B-3)

1 (14) Sta. "J" 89+29.00 to
Sta. "J" 89+94.00, Lt.
Ditch excavation - 60 cu. yd.

(15) Sta. "JH" 215+94.6, Lt. to
Sta. "JH" 216+18.7, Lt.
Remove extg. culv. pipe - 24'

(16) Sta. "JH" 217+04.0, Lt. to
Sta. "JH" 217+28.5, Lt.
Remove extg. culv. pipe - 24'

(17) Sta. "JH" 217+84.0, 29' Lt. to
Sta. "JH" 218+19.25, 24' Rt.
Remove extg. culv. pipe - 58'
Trench resurfacing - 30 sq. yd.
Class E backfill

(18) Sta. "JH" 215+91.37, Rt. to
Sta. "JH" 216+22.05, Rt.
Remove extg. culv. pipe - 31'

(19) Sta. "F" 20+86.00, 10.3' Rt. to
Sta. "F" 20+89.30, 15.4' Lt.
Inst. 12" culv. pipe - 26'
5' depth
S = 0.0462'/ft.
I.E. (Rt.) = 1260.40
I.E. (Lt.) = 1259.20

| No. | DATE | REVISIONS | BY |
|---|---|---|---|
| 1 | 04-13-11 | Revised notes 10 and 14. | J.H. |
| | | | |

REGISTERED PROFESSIONAL ENGINEER
63243
OREGON
JULY 9, 2001
CHRIS R. ZELMER
EXPIRES: JUNE 30, 2012

**OREGON DEPARTMENT OF TRANSPORTATION**

**REGION 3 - TECHNICAL CENTER**

**OR 238 @ JAYNES DRIVE**
JACKSONVILLE HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Chris Zelmer
Drafted By - Judy Hardin

**DRAINAGE & UTILITIES**

SHEET NO. 5A

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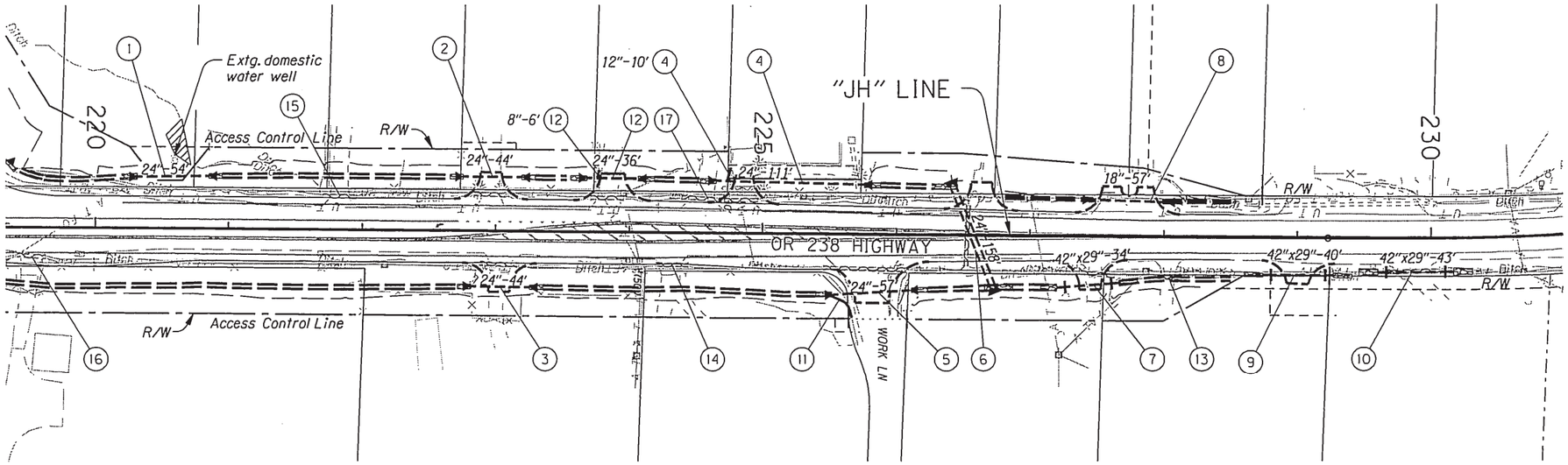
Sec. 07, T. 37 S, R. 5 W, W.M.

44V-057

N

For notes, see sht. 6A




*No work zone shown thus:*

*Roadside ditch shown thus:* ═══: *(Incidental to general excavation)*

*Remove extg. culvert shown thus:*

*Notes:*

1. *Existing pipe removal is incidental to Section 00310 - Removal of Structures and Obstructions. No separate or additional payment will be made for pipe removal.*
2. *Safety end sections shall be 1:4 slope unless otherwise noted on plans.*

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**DRAINAGE & UTILITIES**

SHEET NO. 6

△1 (1) Sta. "JH" 220+32.0, 40.3' Lt. to
Sta. "JH" 220+86.0, 41.1' Lt.
Inst. 24'" culv. pipe - 54'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 6 cu. yd.
Riprap geotextile - 6 sq. yd.
S = 0.0352'/ft.
I.E. (Lt.) = 1248.25
I.E. (Rt.) = 1246.35
(For details, see sht. 2B-4)

(2) Sta. "JH" 222+75.5, 40' Lt. to
Sta. "JH" 223+19.5, 40' Lt.
Remove extg. culv. pipe - 24'
Inst. 24" culv. pipe - 44'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 6 cu. yd.
Riprap geotextile - 6 sq. yd.
S = 0.0170'/ft.
I.E. (Lt.) = 1240.00
I.E. (Rt.) = 1239.25
(For details, see sht. 2B-4)

(3) Sta. "JH" 222+81.75, 41.8' Rt. to
Sta. "JH" 223+25.86, 42' Rt.
Remove extg. culv. pipe - 27'
Inst. 24" culv. pipe - 44'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 6 cu. yd.
Riprap geotextile - 6 sq. yd.
S = 0.0191'/ft.
I.E. (Rt.) = 1239.08
I.E. (Lt.) = 1238.24
(For details, see sht. 2B-4)

(4) Sta. "JH" 224+64.70, 39.8' Lt. to
Sta. "JH" 225+76.00, Lt.
Remove extg. culv. pipe - 25'
Inst. 12" culv. pipe - 10'
5' depth
Connect extg. storm sew. pipe
Inst. 24" culv. pipe - 111'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Inst. 12" WYE Fitting
Const. loose riprap (Closs 100) - 6 cu. yd.
Riprap geotextile - 6 sq. yd
S = 0.0234'/ft.
I.E. (24" Lt.) = 1236.00
I.E. (24" Rt.) = 1233.40
I.E. (12" In) = 1237.75
(For details, see sht. 2B-4)

(5) Sta. "JH" 225+53.0, 41.7' Rt. to
Sta. "JH" 226+10.0, 40.8' Rt.
Remove extg. culv. pipe - 60'
Inst. 24" culv. pipe - 57'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 6 cu. yd.
Riprap geotextile - 6 sq. yd
Class E backfill
S = 0.0307'/ft.
I.E. (Rt.) = 1232.60
I.E. (Lt.) = 1230.85
(For details, see sht. 2B-4)

(6) Sta. "JH" 226+39.5, 37.5' Lt. to
Sta. "JH" 226+70.0, 39' Rt.
Remove extg. culv. pipe - 46'
Inst. 24" culv. pipe - 158'
5' depth (Double barrel)
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Const. loose riprap (Class 100) - 15 cu. yd.
Riprap geotextile - 14 sq. yd.
Trench resurfacing - 32 sq. yd.
Class E backfill
S = 0.0266'/ft.
△1 I.E. (Lt.) = 1231.40
I.E. (Rt.) = 1229.30
(For details, see sht. 2B-4)
(See dwg. no. RD320)

(7) Sta. "JH" 227+20.0, 38.5' Rt. to
Sta. "JH" 227+67.5, 34.5' Rt.
Remove extg. culv. pipe - 25'
Inst. 42"x29" arch culv. pipe - 34'
5' depth
Inst. safety end section - 2
Const. loose riprap (Class 200) - 15 cu. yd.
Filter blanket - 11 sq. yd.
S = 0.0337'/ft.
I.E. (Rt.) = 1227.70
I.E. (Lt.) = 1226.20
(For details, see sht. 2B-4)
(See dwg. nos. RD304 & RD322)

(8) Sto. "JH" 227+46.0, 28' Lt. to
Sta. "JH" 228+02.0, 26' Lt.
Inst. 18" culv. pipe - 57'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
S = 0.0263'/ft.
I.E. (Lt.) = 1229.10
I.E. (Rt.) = 1227.60

(9) Sta. "JH" 228+74.0, 28.0' Rt. to
Sta. "JH" 229+27.3, 28.0' Rt.
Inst. 42"x29" arch culv. pipe - 40'
5' depth
Inst. safety end section - 2
Const. loose riprap (Class 200) - 15 cu. yd.
Filter blanket - 11 sq. yd.
S = 0.0093'/ft.
I.E. (Rt.) = 1223.70
I.E. (Lt.) = 1223.33
(For details, see sht. 2B-4)

(10) Sta. "JH" 229+64.4, 25' Rt. to
Sta. "JH" 230+12.2, 25' Rt.
Remove extg. culv. pipe - 40'
Inst. 42"x29" arch culv. pipe - 43'
5' depth
Inst. safety end section - 2
Const. loose riprap (Class 200) - 15 cu. yd.
Filter blanket - 11 sq. yd.
Trench resurfacing - 27 sq. yd.
S = 0.0600'/ft.
I.E. (Rt.) = 1221.56
I.E. (Lt.) = 1218.98
(For details, see sht. 2B-4)

(11) Regrade extg. ditch.
Grade to drain as directed by engineer

(12) Sta. "JH" 223+68.00, 40' Lt. to
Sta. "JH" 224+04.00, 40.5' Lt.
Remove extg. culv. pipe - 24'
Inst. 8" culv. pipe - 6'
5' depth
Inst. 24" culv. pipe - 36'
5' depth
Const. sloped end section - 2
Const. paved end slope, Lt. & Rt.
Canst. loose riprap (Class 100) - 6 cu. yd.
Riprap geotextile - 6 sq. yd.
Inst. 8" WYE Fitting
S = 0.0222'/ft.
I.E. (24" Lt.) = 1238.20
I.E. (24" Rt.) = 1237.40
I.E. (8" In) = 1239.30
(For details, see sht. 2B-4)

(13) Sta. "JH" 227+95.6, Rt. to
Sta. "JH" 228+11.6, Rt.
Remove extg. culv. pipe - 16'

(14) Sta. "JH" 224+20.0, Rt. to
Sto. "JH" 224+44.0, Rt.
Remove extg. culv. pipe - 24'

(15) Sta. "JH" 221+70.5, Lt. to
Sta. "JH" 221+95.7, Lt.
Remove extg. culv. pipe - 25'

(16) Sta. "JH" 219+41.6, Rt. to
Sta. "JH" 219+62.8, Rt.
Remove extg. culv. pipe - 21'

(17) Sta. "JH" 224+38.79, Lt. to
Sta. "JH" 224+68.75, Lt.
Remove extg. culv. pipe - 30'

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SHEET NO. 6A