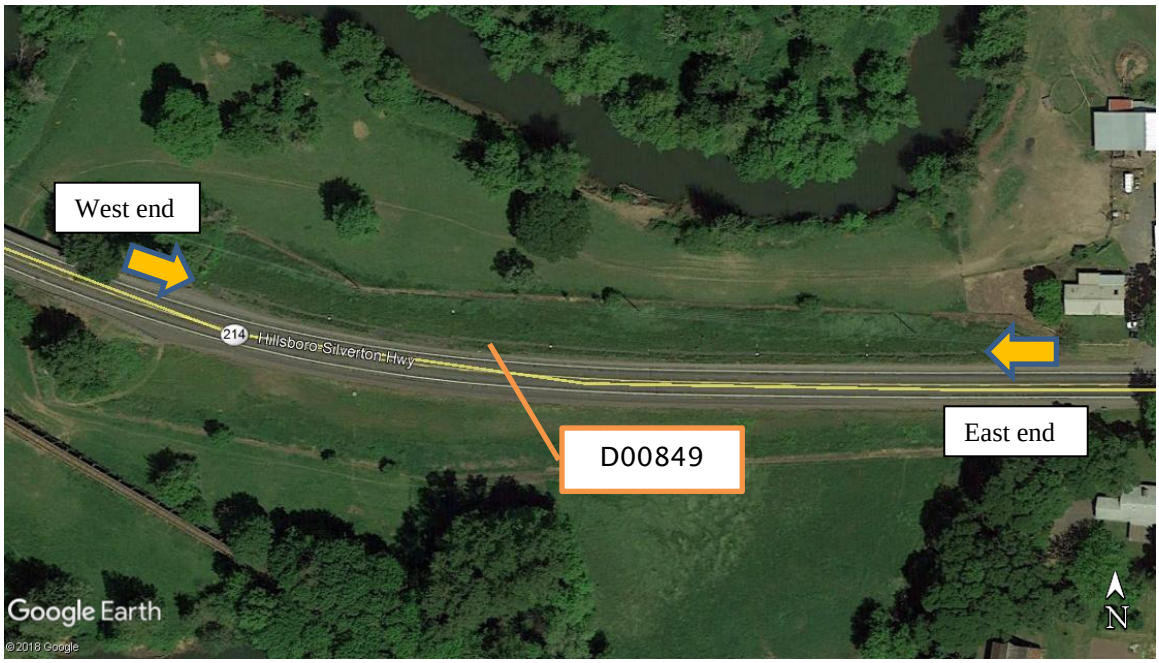
# OPERATION & MAINTENANCE MANUAL

## DFI No. : D00849
## Facility Type: Bio-Slope




**March 2018**

**INDEX**

## 1. Identification

| | |
|---|---|
| Drainage Facility ID (DFI): | **D00849** |
| Facility Type: | Water Quality Bio-Slope |
| Construction Drawings: | (V-File Number) 48V-60 |
| Location: | District: 3 |
| | Highway No.: 140 |
| | Mile Post: 40.86 to 41.01 |
| | Description: This facility is located east of Woodburn on the north side of the Hillsboro-Silverton Hwy near the Pudding River |

## 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: | Bruce Carmichael – Region 2 Tech. Center, Name, Phone no. (503) 986-2713 |
| Facility construction: | 2016 |
| Contractor: | ML Houck Construction Company |

## 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:

- **Vegetated 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.

- Facility Type: Bio-Slope
- Hwy 140 east of Woodburn
- Access: Hwy shoulder
- Contributing drainage basin and piping system, inlets and outlets (direction and flow path) – see appendix
- Discharges out hill side.

A. Maintenance equipment access:
Access facility via the highway shoulder.

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 Bio-Slope cannot be used to store a volume of liquid. If contaminated by a HazMat spill then the facility will need to be de-contaminated and re-built.

## 6. Auxiliary Outlet (High Flow Bypass)

Flows exceeding facility capacity will flow over the top of the facility and thence down hill to a flat pasture area.

## 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:

Mark as Required and always include Table 1:

- ☒ 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

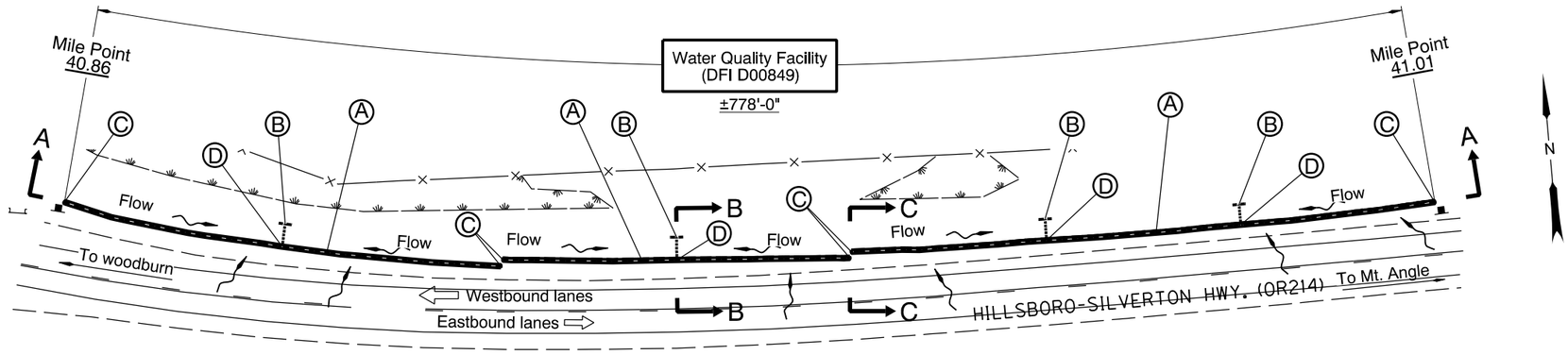
Contact any of the following for more detailed information about management of waste materials found on site:

| | |
|---|---|
| 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)**

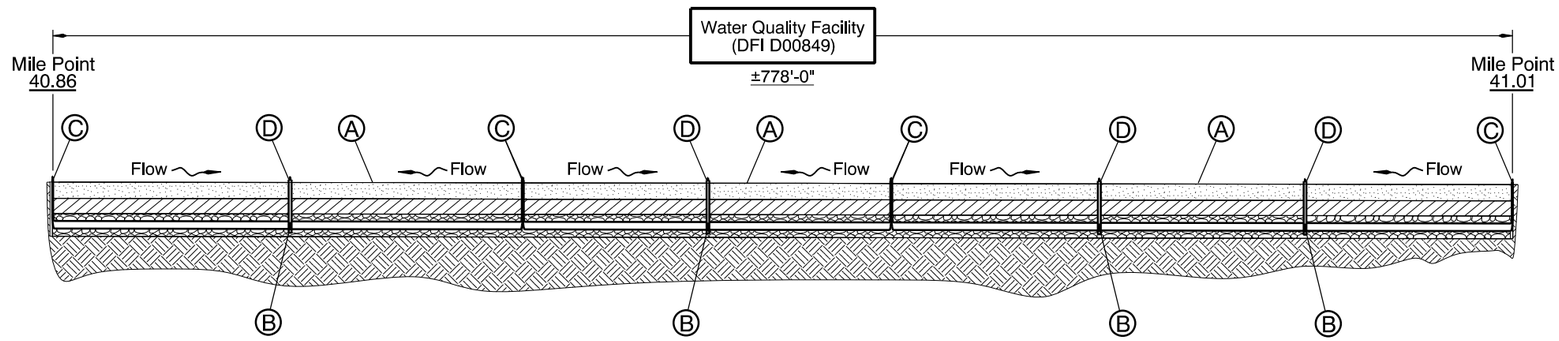



PLAN
N.T.S.

N

LEGEND:

- Photo Location / Direction
- (A) Water Quality Biospoe
- (B) Outlet
- (C) Cleanout
- (D) Stand Pipe
- Storm Pipe (Facility)
- Conveyance Direction
- Pavement / Facility Flow Path




SECTION A-A
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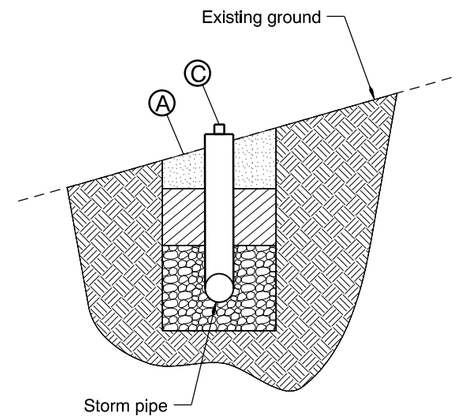


SECTION C-C
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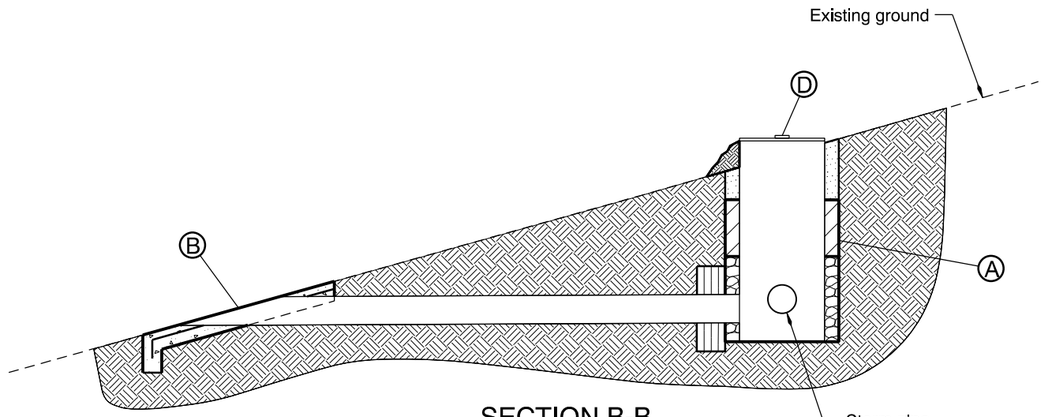



SECTION B-B
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: B. Carmichael

Drafted By: M. Skelton

**DFI D00849**
**MAINTENANCE DISTRICT 3 HWY 99E**
**WATER QUALITY BIOSLOPE**
PACIFIC HIGHWAY EAST MP 40.86
MARION

# Appendix B

**Content:**

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

48V-60

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

| No. | DATE | REVISIONS | BY |
|---|---|---|---|
| 3 | 05-28-15 | Edited and added name | C.G.B. |
| | | | |
| | | | |
| | | | |

STATE OF OREGON

# DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

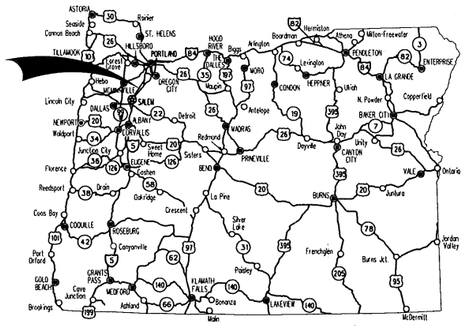
## GRADING, PAVING, SIGNING & SIGNAL

# OR99E: YOUNG STREET SAFETY & ADA RAMPS (WOODBURN) SEC.

## PACIFIC HIGHWAY EAST

## MARION COUNTY

3 JUNE 2015




*Overall Length Of Project - 20.76 Miles*

T. 4,5,6,7 S., R. 1,2 W., W.M.

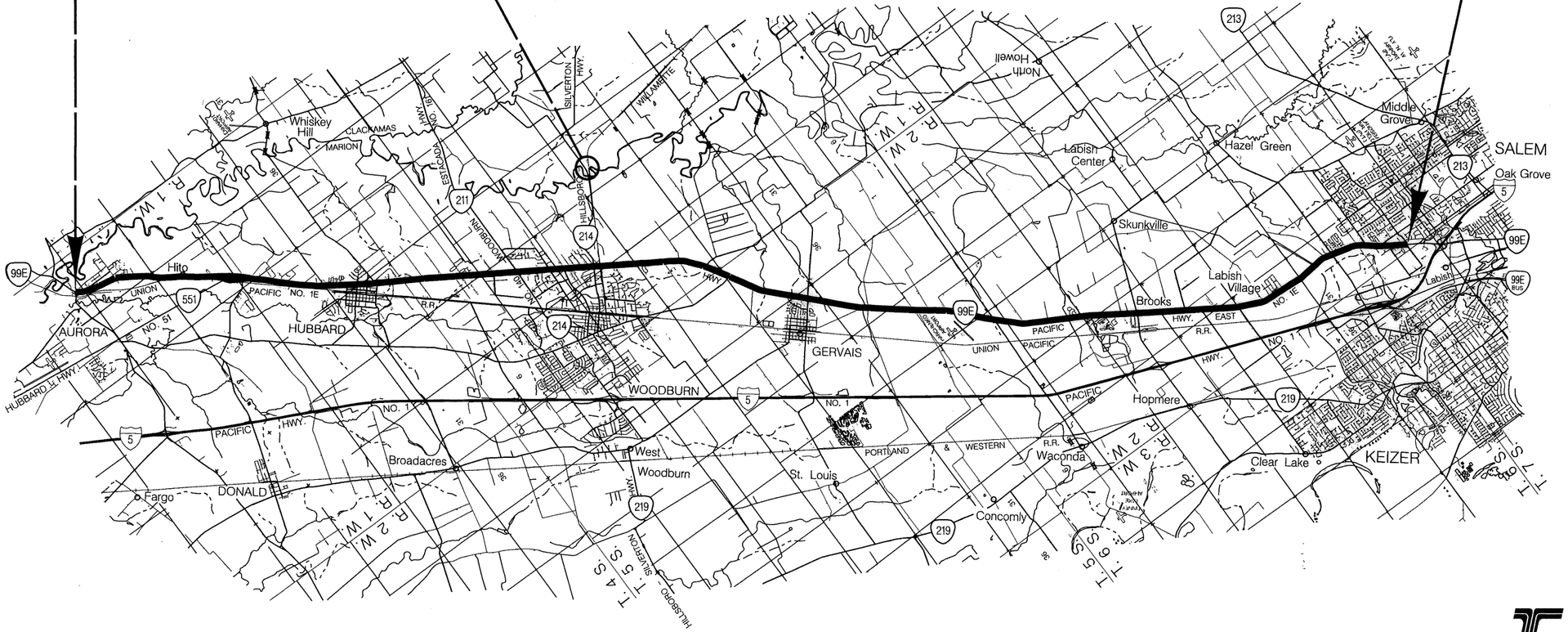
**ATTENTION:**
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0010 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center. (Note: The Telephone Number For The Oregon Utility Center Is (503) 232-1987.)

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

**BEGINNING OF PROJECT**
**HSIP-STP-S081(054)**
**M.P. 24.88**

**STORM WATER PLAN**
**HWY. 214 (M.P. 40.90)**

**END OF PROJECT**
**HSIP-STP-S081(054)**
**M.P. 45.64**




OREGON TRANSPORTATION COMMISSION

| | |
|---|---|
| Tammy Baney | CHAIR |
| David Lohman | COMMISSIONER |
| Susan Morgan | COMMISSIONER |
| Alando Simpson | COMMISSIONER |
| 3 Sean O'Hallaren | 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: _____ 5.28.15
Signature & date

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

_____
Concurrence by ODOT Chief Engineer

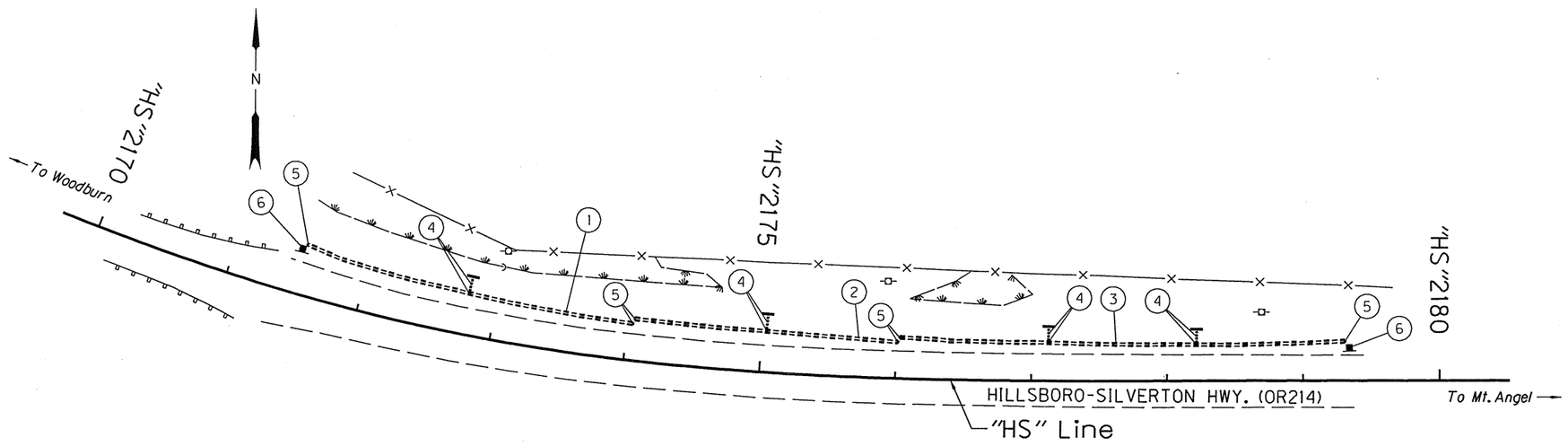
**OR99E: YOUNG STREET SAFETY & ADA RAMPS (WOODBURN) SEC.**
PACIFIC HIGHWAY EAST
MARION COUNTY

| FEDERAL HIGHWAY ADMINISTRATION | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| OREGON DIVISION | HSIP-STP-S081(054) | 1 |

PE00 1753 000

F:\ODOT_DATA\Projects\16008-YoungStWoodburn\Plans\16008r2.tsl :: Default 5/27/2015 9:43:34 AM tdb081

1200 - 001




(1) *Sta. "HS" 2171+52 to Sta. "HS" 2174+04, Lt.*
*Const. Water Quality Bioslope 1*
*Upper edge El. = 131.5*
*Inst. 6" perf. PVC pipe - 252'±*
*(For details, see shts. GJ-2 & GJ-3)*

(2) *Sta. "HS" 2174+05 to Sta. "HS" 2176+01.5, Lt.*
*Const. Water Quality Bioslope 2*
*Upper edge El. = 130.5*
*Inst. 6" perf. PVC pipe - 196.5'±*
*(For details, see shts. GJ-2 & GJ-3)*

(3) *Sta. "HS" 2176+02.5 to Sta. "HS" 2179+30.8, Lt.*
*Const. Water Quality Bioslope 3*
*Upper edge El. = 129.5*
*Inst. 6" perf. PVC pipe - 328.3'±*
*(For details, see shts. GJ-2 & GJ-3)*

(4) *Sta. "HS" 2172+78, Lt.*
*"HS" 2175+03, Lt.*
*"HS" 2177+12, Lt.*
*"HS" 2178+21, Lt.*
*Inst. 18" PVC stand pipe - Var.*
*Inst. 6" PVC pipe - Var.*
*(4 places)*
*(For details, see sht. GC-3)*

(5) *Inst. 6" PVC cleanout - Var.*
*(6 places)*

(6) *Inst. type S2 marker*
*DFI# D00849*
*(See dwg. RD399)*

*NOTE:*
*General Exc. - 187 cu. yd.*
*Shoulder Aggregate - 45 cu. yd.*
*Ecology Mix - 57 cu. yd.*
*Granular Drain Backfill - 80 cu. yd.*
*6" perf. PVC pipe - 780'±*
*6" PVC pipe - 40'*
*6" dia. PVC cleanouts - 18'*
*18" PVC stand pipe - 14'*
*Drainage Geotextile, Type 1 - 950 sq. yd.*
*Modified Paved End Slope - 21 sq. ft.*
*Wire reinforcement - 18 sq. ft.*

REGISTERED PROFESSIONAL ENGINEER
65305
OREGON
JANUARY 23, 2001
BRUCE A. CARMICHAEL
EXPIRES: 12/31/2015

**OREGON DEPARTMENT OF TRANSPORTATION**

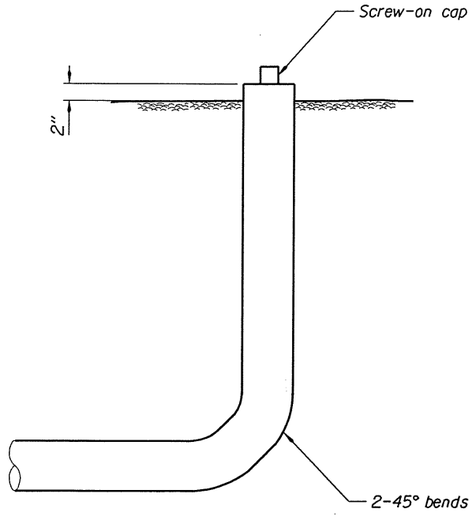
**REGION 2 TECH CENTER**

**OR99E: YOUNG STREET SAFETY & ADA RAMPS (WOODBURN) SEC.**
PACIFIC HIGHWAY EAST
MARION COUNTY

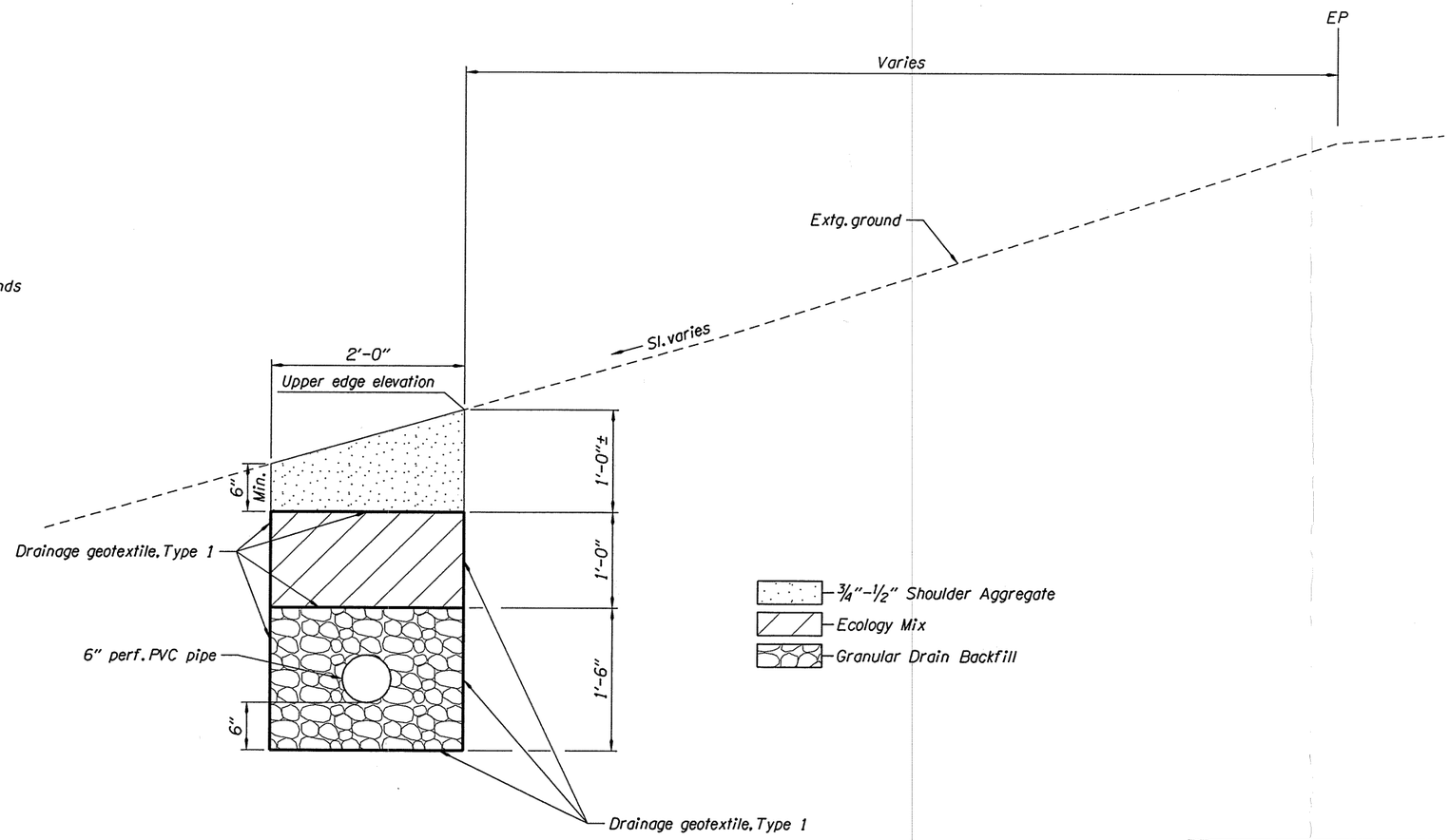
Reviewed By - Bo Miller
Designed By - Bruce Carmichael
Drafted By - Sandra Gish

**STORMWATER PLAN**

SHEET NO. GJ




6" DIA. PVC CLEANOUT (TYPICAL)




OREGON DEPARTMENT OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
65305
OREGON
JANUARY 23, 2001
BRUCE A. CARMICHAEL
EXPIRES: 12/31/2015

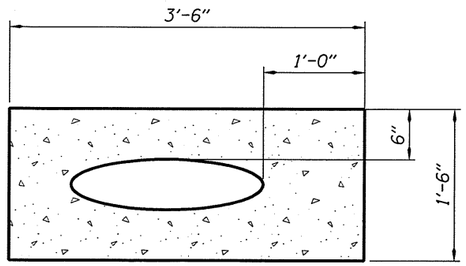
**REGION 2 TECH CENTER**

**OR99E: YOUNG STREET SAFETY & ADA RAMPS (WOODBURN) SEC.**
PACIFIC HIGHWAY EAST
MARION COUNTY

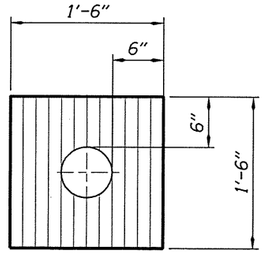
Reviewed By - Bo Miller
Designed By - Bruce Carmichael
Drafted By - Sandra Gish

**STORMWATER DETAILS**

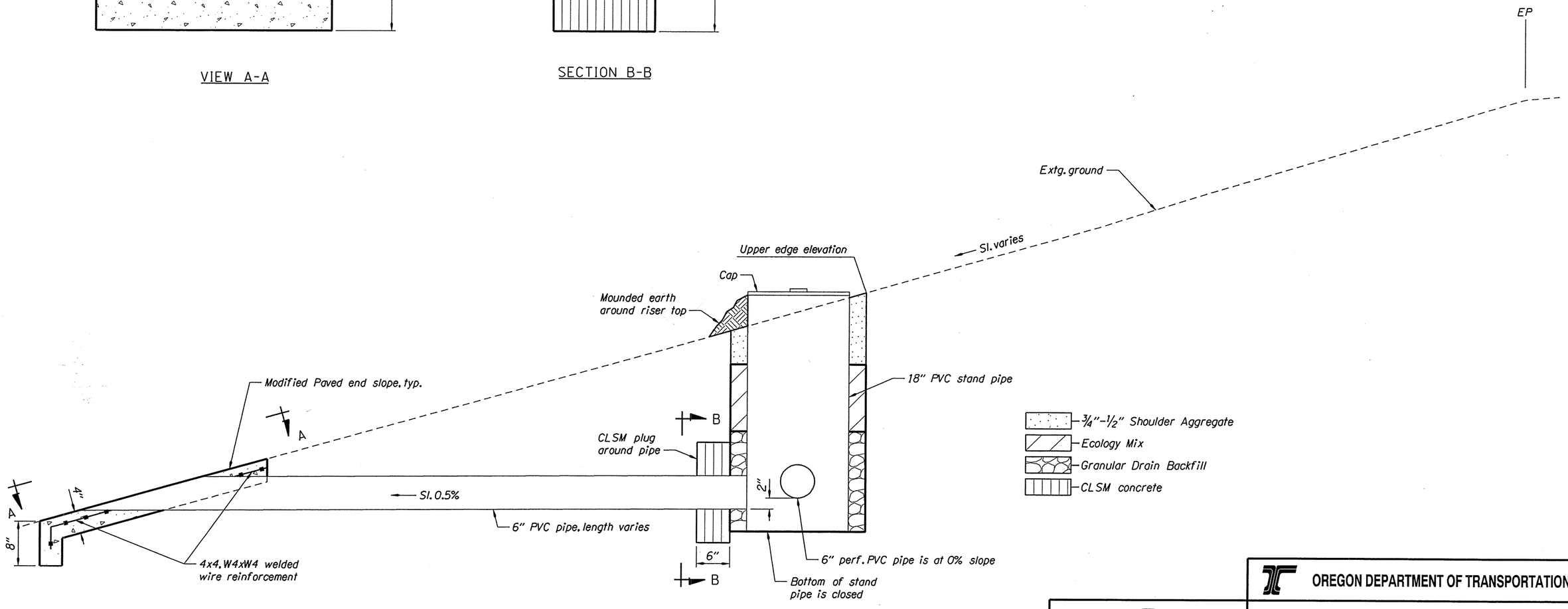
SHEET NO. GJ-2




VIEW A-A




SECTION B-B




WATER QUALITY BIOSLOPE
TYPICAL SECTION AT OUTLET PIPE

REGISTERED PROFESSIONAL ENGINEER
65305
OREGON
JANUARY 23, 2001
BRUCE A. CARMICHAEL
EXPIRES: 12/31/2015

**OREGON DEPARTMENT OF TRANSPORTATION**

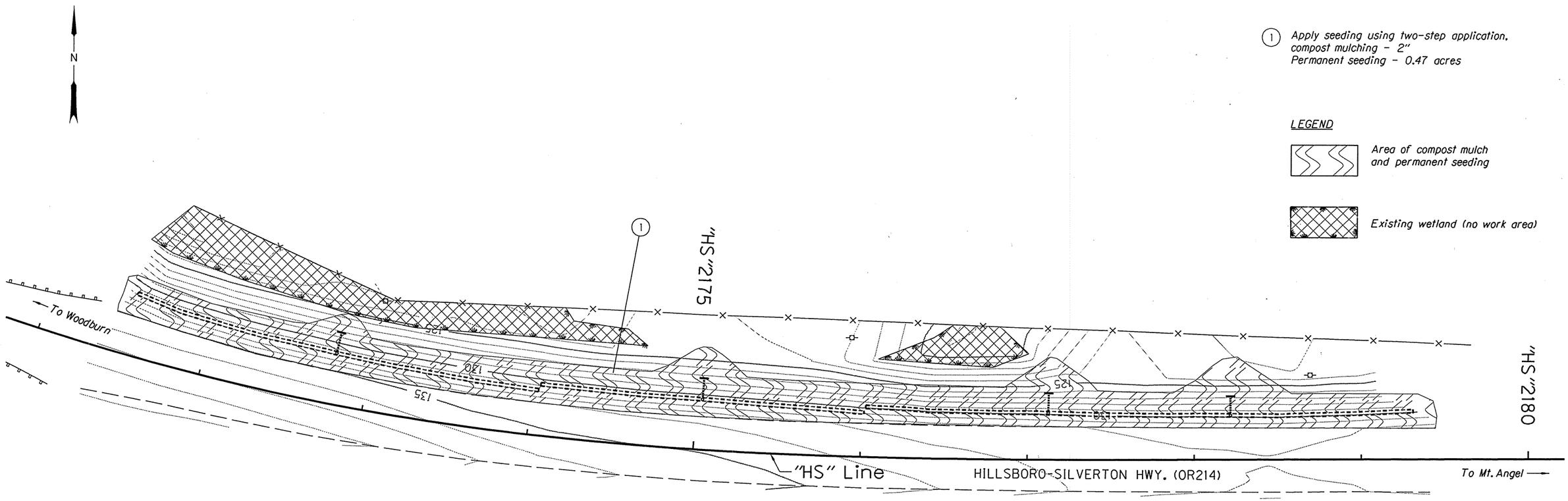
**REGION 2 TECH CENTER**

**OR99E: YOUNG STREET SAFETY & ADA RAMPS (WOODBURN) SEC.**
PACIFIC HIGHWAY EAST
MARION COUNTY

Reviewed By - Bo Miller
Designed By - Bruce Carmichael
Drafted By - Sandra Gish

**STORMWATER DETAILS**

SHEET NO. GJ-3




1 *Apply seeding using two-step application.*
*compost mulching - 2"*
*Permanent seeding - 0.47 acres*

*LEGEND*

*Area of compost mulch and permanent seeding*

*Existing wetland (no work area)*

*General Notes:*

1. *See Specification 01030 for permanent seeding.*
2. *Provide/restore smooth finish grade prior to installation of compost and seeding.*
3. *Seed/mulch areas shown on plan are approximate. seed and mulch all disturbed areas.*

REGISTERED
316
SARA GEDDES
OREGON
4/14/94
LANDSCAPE ARCHITECT
RENEWS: 04/30/2015

OREGON DEPARTMENT OF TRANSPORTATION

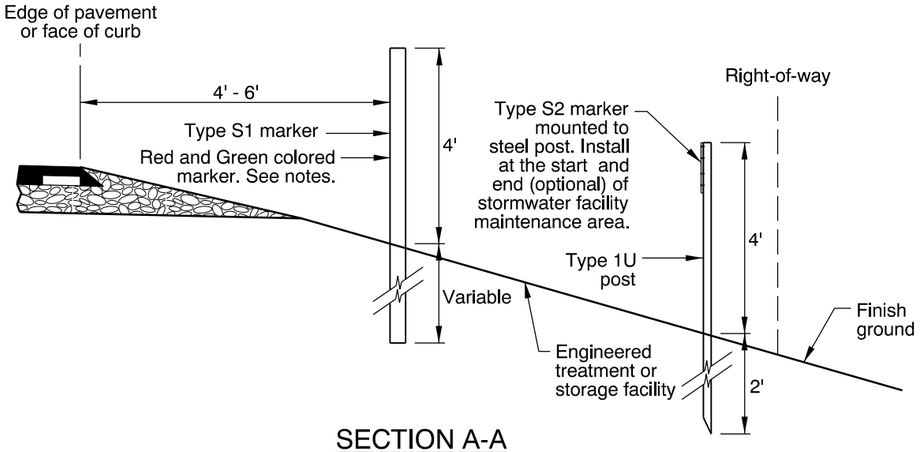
**REGION 2 TECH CENTER**

**OR99E: YOUNG STREET SAFETY & ADA RAMPS (WOODBURN) SEC.**
PACIFIC HIGHWAY EAST
MARION COUNTY

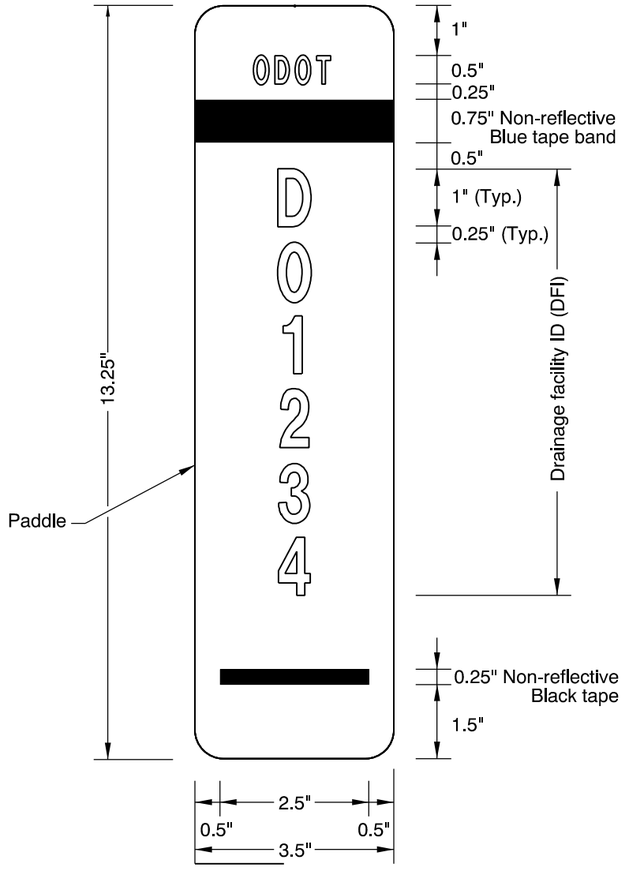
Reviewed By - Bruce Carmichael
Designed By - Sara Geddes
Drafted By - Julie Rentz

**ROADSIDE DEVELOPMENT PLAN**

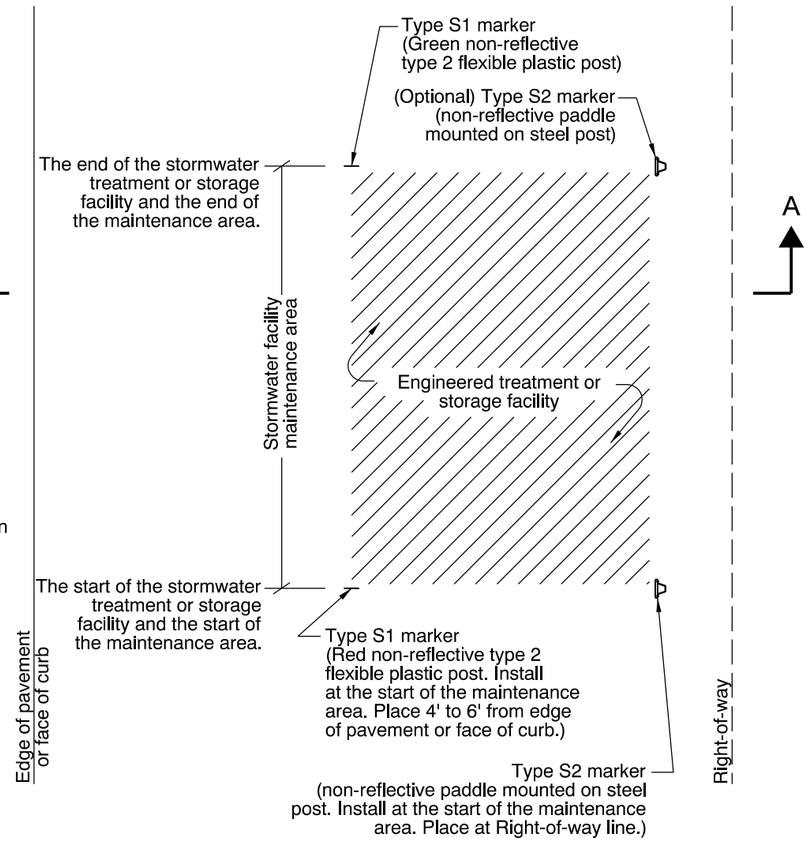
SHEET NO. GN



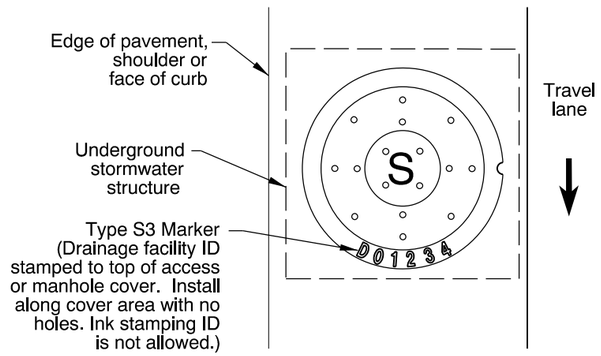

SECTION A-A




TYPE S2 MARKER




TYPE S1 & S2 MARKERS INSTALLATION DETAIL




TYPE S3 MARKER INSTALLATION DETAIL

Notes:

Stormwater Facility Field Marker Type S1:
1. See Standard Drawing TM570 for Type 2 flexible plastic post dimensions. Do not mount reflective sheeting to flexible plastic post.
2. A red Type S1 marker is used to mark the start of a stormwater facility maintenance area. A green Type S1 marker is used to mark the end of a stormwater facility maintenance area.
3. Place 4 to 6 feet from edge of pavement or face of curb.
4. See marker table for installation locations.

Stormwater Facility Field Marker Type S2:
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. See Standard Drawing TM570 detail labeled "Steel Posts" for mounting a traffic target. Install paddle onto Type 1U steel post using the same hole pattern.
   - 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

Stormwater Facility Field Marker Type S3:
1. The top of access or manhole cover shall be stamped with the drainage facility ID. Ink stamping ID is not allowed.

| | |
|---|---|
| CALC. BOOK NO. N/A | BASELINE REPORT DATE 01-JAN-2013 |
| | NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications |

*The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.*

OREGON STANDARD DRAWINGS

STORMWATER TREATMENT
AND
STORAGE FACILITY
FIELD MARKERS
2015

| DATE | REVISION DESCRIPTION |
|---|---|
| | |
| | |
| | |
| | |
| | |

rd399.dgn 01-30-2012

RD399