OPERATION & MAINTENANCE MANUAL

Water Quality Bioslope

Manual prepared: December 2018

DFI No. D00785

Figure 1: DFI No. D00785, looking west

1. Identification

Drainage Facility ID (DFI):	D00785
Facility Type:	Water Quality Bioslope
Construction Drawings:	(V-File Numbers) 47V-003
Location:	District: 2B Highway No.: 002 Mile Post: 16.86 [Left side] (See N. Sundial Frontage Road at Marine Drive. MP 16.45)

2. Manual Purpose

The purpose of this manual is to outline inspection needs and summarize maintenance actions.

3. 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. **NOTE: Mile posts are based off of the V-File, and may vary from TransGIS mile posts.**

Facility location type: **Roadway shoulder**

Flow direction: South-Southeast

Figure 2: Facility Location Map

4. Facility Summary

This facility is a bioslope which uses infiltration as the treatment mechanism. The width is measured perpendicular to the edge of pavement and is equivalent to the flow length. The length is measured parallel to the edge of pavement and is equivalent to the length of the contributing impervious area.

The length and width of the applicable facility components are:

Component	Length (feet)	Width (feet)
Bioslope (Infiltration)	**108**	**13.3**

No typical diagram is provided due to the unique nature of this facility.

Figure 2: Bioslope (Infiltration Type) Section

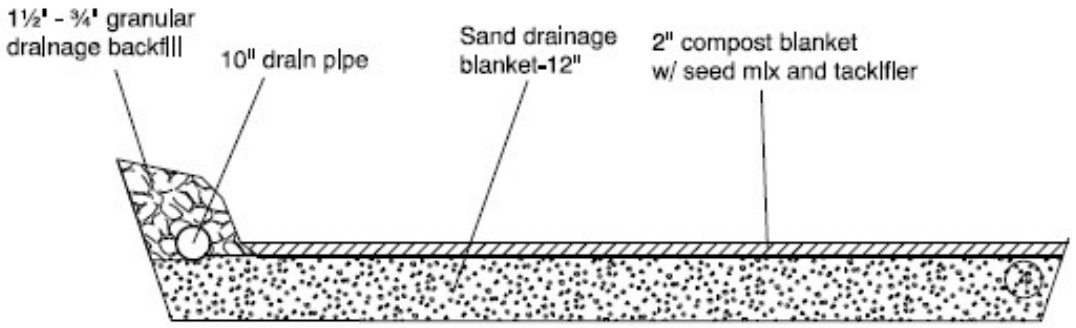


Figure 3: Facility Section

Site Specific Information: DFI # D00785

The N Sundial Frontage Rd. is a one way road, traveling east to west. This infiltration bioslope is similar to a bioslope; it is long and linearly constructed into the existing shoulder slope. The treatment is provided and pollutants are removed by infiltration processes. The water comes to the facility primarily through pipes to the PVC inlets and is stored in the voids in the trench gravels until it percolates through the sand drainage blanket to the surrounding soils. Water also comes to the facility over land at its ends and from rainfall, which percolates through the 2" compost seed blanket, to the sand drainage blanket and then seeps to the nearby storm ditch. The water generally is conveyed into the ground during routine storms. Seepage and larger storms will drain to the nearby storm ditch.

This bioslope has a high pressure gas pipeline located directly under the facility. The approximate location is shown in appendix A. Do not clean this facility with a backhoe or any other machinery that could damage the gas pipeline. Only use a Vactor truck hose to remove debris and only if necessary.

This facility treats stormwater from Marine Drive.

Figure 4: Fiber Optic and Gas conduit running directly under facility.
Digging in the facility is NOT ALLOWED.

Figure 5: Looking south at facility (Marine Dr. on the left)

5. Facility Access

Maintenance access to the facility:

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

Figure 6: Looking west, facility access via Marine Dr.

6. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

☐ Filter Strip (Op Plan A)	☒ Bioslope (Infiltration) (Op Plan B)
A filter strip consists of a vegetated or media slope located parallel to the edge of pavement. It maintains sheet flow of stormwater runoff over the width of the strip.	A bioslope consists of a filter strip and treatment zone. It is a flow-through and infiltration stormwater treatment facility located along roadside embankments.
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B) are provided in the Standard Operation Manual.	

See Appendix A for the site specific operational plan.

Operational Components

Filter strips and bioslopes have many components that assist with treatment, conveyance, and infiltration of stormwater runoff. The components in use can vary depending on the facility design. 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 Filter Strips and Bioslopes 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/

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: Facility Components		ID #
Facility Inlet		
Pavement Sheet Flow	☒	**B1**
Flow Spreader	☐	**B2**
Ground Cover		
Vegetated Slope	☒	**B3**
Aggregate Media Slope	☐	**B4**
Underground Components		
Water Quality Mix	☐	**B5**
Ecology Mix	☒	**B6**
Granular Drain Backfill Material	☒	**B7**
Geotextile Fabric	☒	**B8**
Geocell Grid	☐	**B9**
Structures		
Curb/Berm	☒	**B10**
Check Dam	☐	**B11**
Cleanout	☐	**B12**
Facility Outlet		
Perforated Drain Pipe	☒	**B13**
Open Slope Outlet	☐	**B14**
Open Channel Outlet	☐	**B15**
Storm Drain Outlet Pipe	☐	**B16**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐ **O**	**B17**
Outfall Channel	☒	**B18**
Storm Drain System	☐	**B19**
Outfall Components		
Pervious Berm	☐	**B20**
Riprap Pad	☐	**B21**

7. 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.

Do not clean this facility with a backhoe or any other machinery that could damage the gas pipeline or fiber optics cable.

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 filter strips and bioslopes:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 4 (Water Quality Filter Strips)
- Table 5 (Water Quality Bioslopes)

The ODOT Maintenance Guide can be viewed at the following website:
http://www.oregon.gov/ODOT/HWY/OOM/pages/mguide.aspx

The *Blue Book* can be viewed at the following website:
http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf

8. Limitations

Filter strips and bioslopes are NOT designed to allow the use of heavy equipment. Vehicles entering the facility 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.

9. Waste Material Handling

Material removed from the facility is defined as waste by the Department of Environmental Quality (DEQ). Refer to the road waste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

http://www.oregon.gov/ODOT/HWY/OOM/pages/ems.aspx

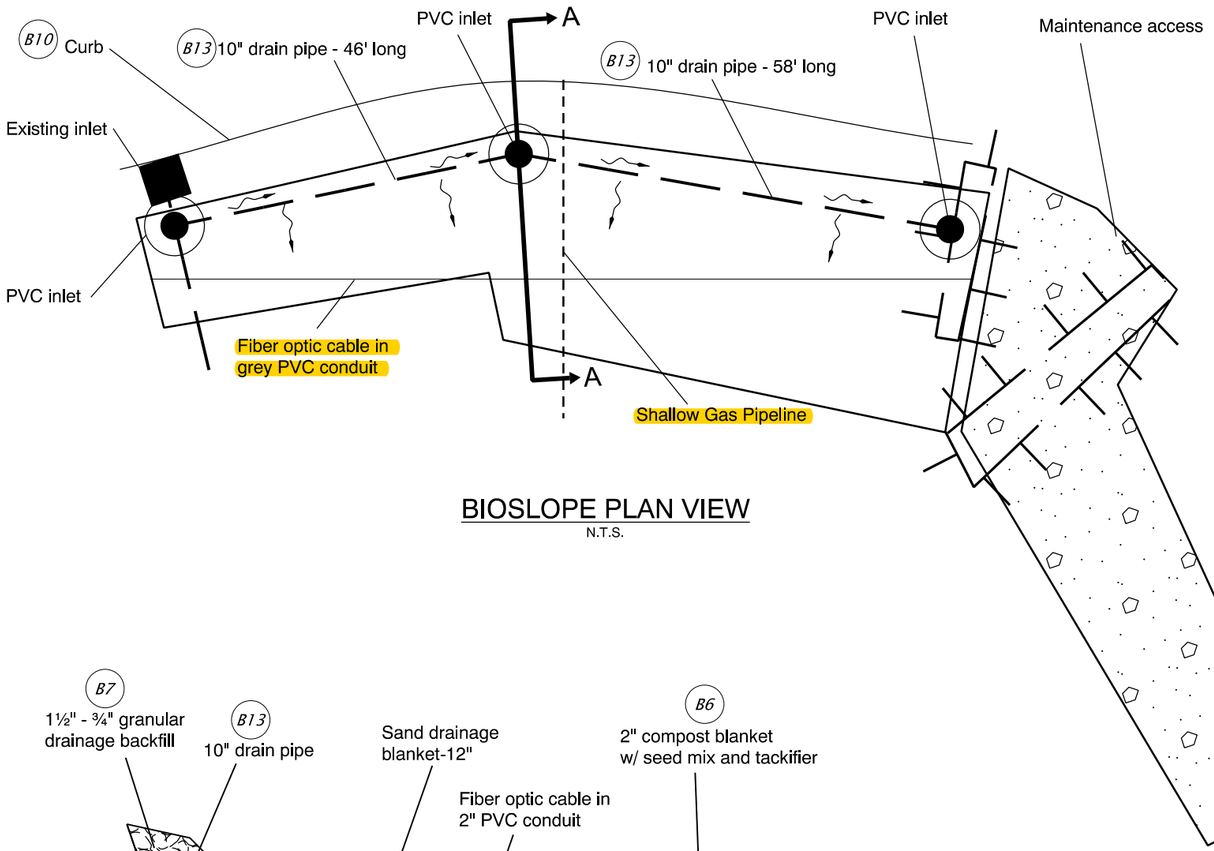
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 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

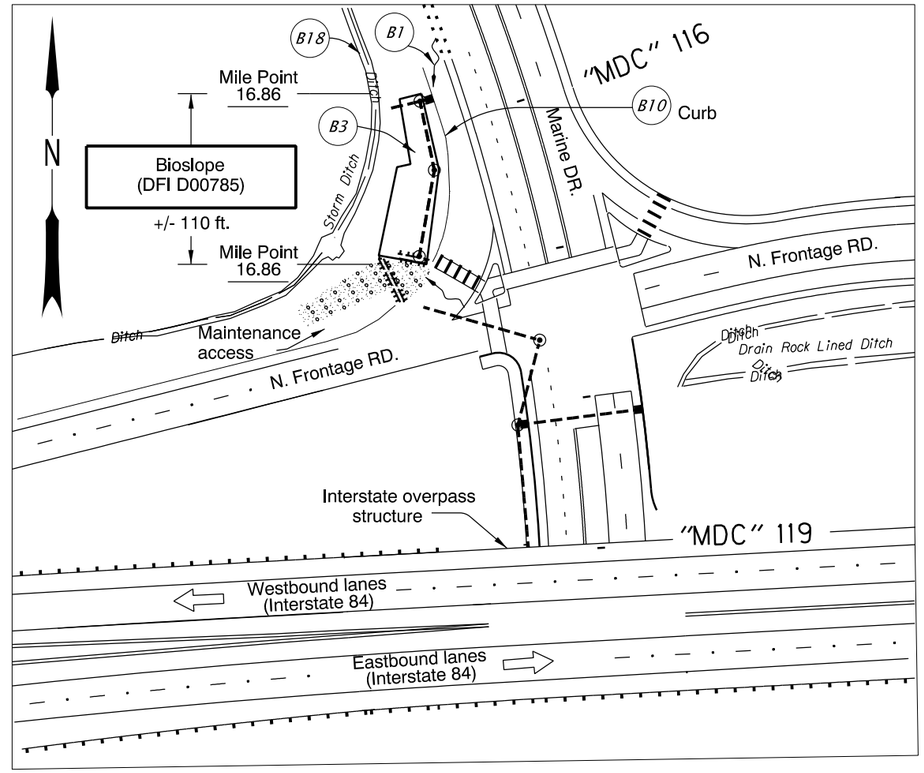
A Appendix A – Site Specific Operational Plan

Contents:

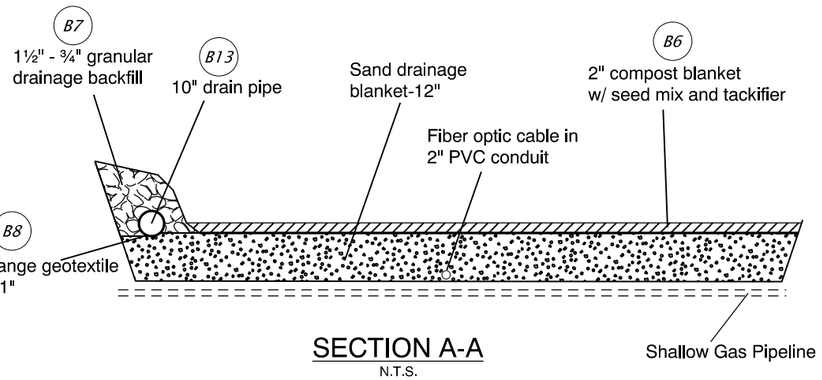
Operational Plan: DFI D00785



BIOSLOPE PLAN VIEW
N.T.S.

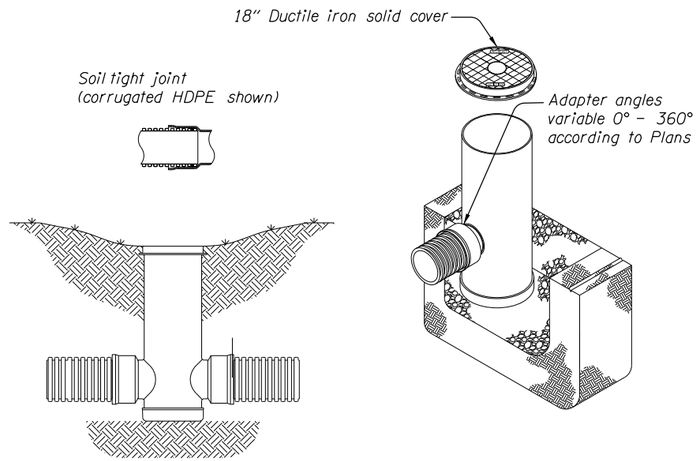


PLAN
N.T.S.



SECTION A-A
N.T.S.

Length and shape of section varies across bioslope



"PVC" INLET
N.T.S.

LEGEND:

- Photo Location / Direction
- Manhole and/or
- Inlet and/or
- Gas Pipeline
- Fiber Optic Cable
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Dan Gunther

Drafted By: Zoe Keve

DFI D00785
MAINTENANCE DISTRICT 2B HWY 002
BIOSLOPE
HIGHWAY MP 16.86
MULTNOMAH COUNTY

D00785_FilterStrip.dgn :: Default 6/18/2019 12:21:21 PM hwym18g

DFI_D00000.dgn

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 47V-003

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Std. Drg. Nos.
1A-2 & 1A-3	Std. Drg. Nos. Cont'd
1B	Sheet Layout

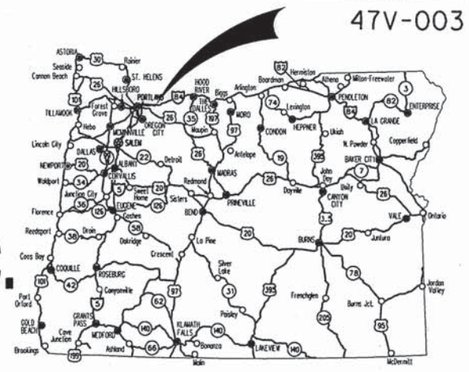
STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION & SIGNALS

47V-003



FFO - I-84: TROUTDALE INTERCHANGE (MARINE DRIVE) SEC.

COLUMBIA RIVER HIGHWAY

MULTNOMAH COUNTY
DECEMBER 2013

Overall Length Of Project - 0.85 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.)

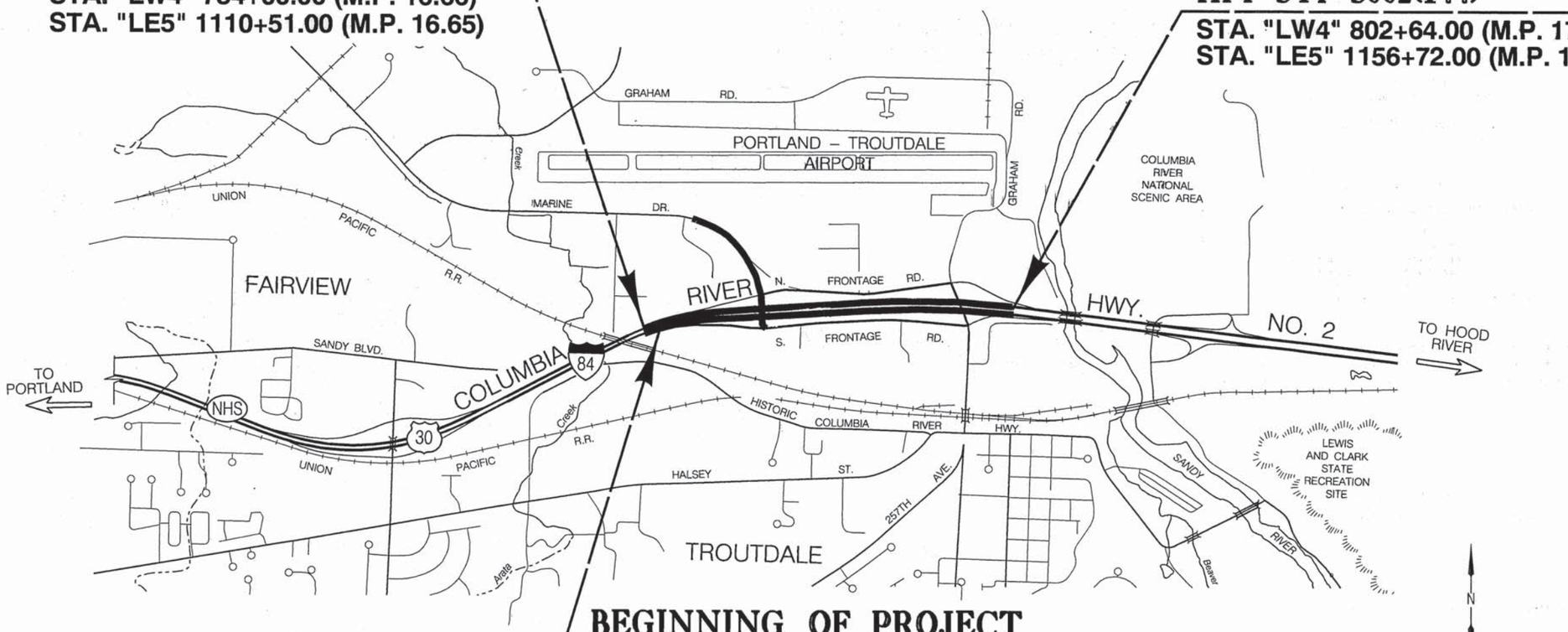
LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

CONTRACT LIMITS

STA. "LW4" 754+00.00 (M.P. 16.66)
STA. "LE5" 1110+51.00 (M.P. 16.65)

END OF PROJECT

HPP-STP-S002(144)
STA. "LW4" 802+64.00 (M.P. 17.35)
STA. "LE5" 1156+72.00 (M.P. 17.48)



BEGINNING OF PROJECT

HPP-STP-S002(144)
STA. "LW4" 756+51.95
STA. "LE5" 1112+66.90

N

T. 1 N., R. 3 E., W.M.

OREGON TRANSPORTATION COMMISSION

Pat Egan	CHAIR
David Lohman	COMMISSIONER
Mary F. Olson	COMMISSIONER
Mark Frohnmayer	COMMISSIONER
Tammy Baney	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: Naveen G. Chandra, P.E.
Project Delivery Manager, Region 1

Concurrence by ODOT Chief Engineer

FFO - I-84: TROUTDALE INTERCHANGE (MARINE DRIVE) SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HPP-STP-S002(144)	1

PE002002 000

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47V-003

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2C-2 thru 2C-6, Incl.	Detour
2C-7 thru 2C-31, Incl.	Traffic Control Plan
2D	Pipe Data Sheet
3	Alignment
3A	General Construction
3C, 3C-2 thru 3C-4	Profile
3D & 3D-2	Drainage and Utilities
4	Alignment
4A & 4A-2	General Construction
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4D, 4D-2 thru 4D-5	Drainage and Utilities
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5C & 5C-2	Profile
5D	Drainage and Utilities
6	Alignment
6A	General Construction
6C	Profile
6D	Drainage and Utilities
7	Alignment
7A	General Construction
7D	Drainage and Utilities
8	Alignment
8A	General Construction
8C	Profile
8D	Drainage and Utilities
GEO/HYDRO	
GA	Erosion and Sediment Control Plan
GA-2 & GA-3	Erosion Control Details
GA-4 thru GA-9	Stage I Phase 1 & 2 Erosion Control Plan
GA-10 thru GA-15	Stage III Phase 1 Erosion Control Plan
GB	Geotechnical Data Plan
GB-2	Geotechnical Data - South Intersection
GB-3	Geotechnical Data - North Intersection
GB-4	Geotechnical Data - "EB" Sign Bridge
GB-5	Geotechnical Data - "TB2" Sign Bridge
GC	Retaining Wall Plan & Profile
GC-2	Retaining Wall Details
GJ thru GJ-3	Water Quality Details
GL & GL-2	Contaminated Soil
GR	Ground Improvement Plan
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92109	Plan and Elevation
92110	General Notes
92111	Construction Notes and Sequence
92112	Stage Construction Section
92113	Stage 1 Plan at Bent 1
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INDEX OF SHEETS, CONT'D.

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92122	Deck Section & Closure Pour
92123	Bar Splice & Misc. Details
92124	Longitudinal Beam Elevation
92125	Bent 1
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92130	Wingwall 'A' Details - Bent 1
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92132	Architectural Treatment Details
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17482	Temporary Signal Plan
17483	Signal Modification Plan
17484	Detector Plan
17485	Existing Utilities
17486	Temporary Signal Plan
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I-02185	Illumination Legend
I-02186 & I-02187	Illumination Plan
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Standard Drg. Nos.	
BR115	- Slope Paving
BR133	- Trapezoidal Box Reinforcement
BR135, BR136	- Access And Ventilation Harware For Conc. Box Girders
BR145	- Single Strip Seal Expansion Joint
BR165	- Bridge End Panel
BR195	- Bridge ID Marker
BR200	- Concrete Bridge Rail Type "F"
BR203	- Transition Concrete Bridge Rail To Guardrail
BR236	- Trailing End Bridge Connection Conc. Bridge Rail To Guardrail
BR263	- Concrete Med. Barrier At Bridge Expansion Joints (Type "F")
BR290	- 3'-6" Type "F" Rail
BR291	- Transition 3'-6" Concrete Bridge Rail To Guardrail
BR970	- Luminaire Base on Structures With Mounting Details
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RD150	- Slope Rounding
RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
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RD318	- Sloped Ends For Concrete Pipe
RD320	- Paved End Slope For Culverts 60" Maximum Pipe Size
RD326	- Coupling Bands For Corrugated Metal Pipe
RD336, RD342, RD344, RD346	- Manholes
RD348	- Manhole With Inlet
RD356	- Manhole Cover & Frames
RD358	- Manhole Slope Protectors
RD364, RD370	- Concrete Inlets
RD372	- Concrete Inlet Top, Option 1, Type CG-3
RD376	- Miscellaneous Drainage Structures Siphon Box, Inlet Cap & Inlet Adjustment
RD378	- Type "3" Catch Basin, Frame and Grate
RD380	- Fill Height Tables For Aluminum & Steel Corrugated Pipe
RD384	- Fill Height Tables For Aluminum & Steel Spiral Rib Pipe
RD386	- Fill Height Tables For Circular Concrete Pipe
RD388	- Fill Height Tables For PVC Pipe
RD390	- Fill Height Tables For Corrugated HDPE Pipe
RD391	- Fill Height Tables For Steel Reinforced HDPE Pipe
RD393	- Fill Height Tables For Polypropylene Pipe
RD400, RD405, RD410, RD415, RD420, RD425, RD450	- Guardrail

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

FFO - I-84: TROUTDALE INTERCHANGE (MARINE DRIVE) SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HPP-STP-S002(144)	1A

Standard Drg. Nos. (Cont'd.)

RD500	- Precast Concrete Barrier Pin And Loop Assembly
RD505	- Concrete Barrier Cast-In-Place
RD510	- Concrete Barrier Terminal
RD516	- Securing Concrete Barrier To Roadway
RD526	- Standard Concrete Barrier Buried In Backslope
RD530	- Transition 3'-6" Concrete Bridge Rail To Guardrail
RD545	- Precast Tall (42") Concrete Barrier
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RD756	- Sidewalk Ramp Placement Options Curb Radii $\leq$ 15'
RD759	- Truncated Dome Detectable Warning Surface Details & Locations
RD1000	- Construction Entrances
RD1005	- Check Dams
RD1010, RD1015	- Inlet Protection
RD1040	- Sediment Fence
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TM212	- Signing Details Oregon Route Signs
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TM222	- Installation Details Milepost Markers Posts
TM223	- Conventional Roads Directional Sign Layout Street Name Signs
TM224	- Freeway/Expressway Directional Sign Layout
TM225	- Exit Number & Gore Signing Details
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TM302	- Pad-Mount Illumination Control Cabinet
TM450	- Mast Arm Pole Details
TM452	- Strain Pole Details
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TM457	- Vehicle, Pedestrian Signal And Push Button Mounting Option Details
TM458	- Pedestrian Ramp Placement Details
TM460	- Vehicle Signal Details
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TM463	- Spanwire Mounting Details
TM465	- Overhead Sign, Fire Preemption And Photoelectronic Control Details
TM467	- Pedestrian Signal And Pedestrian Push Button Details
TM470	- Color Code Charts
TM472	- Traffic Signal Junction Boxes/Hand Holes
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TM482	- Controller Cabinet And Foundation Details
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TM490	- Crosswalk Closure Detail
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TM515	- Raised Pavement Markers
TM517	- Recessed Pavement Markers
TM521	- Durable Pavement Markings Method "B" Extruded & Method "F" Spray
TM530	- Intersection Pavement Markings (Crosswalk, Stop Bar & Bike Lane Stencil)
TM531	- Turn Arrow Marking Details
TM547	- Freeway Entrance Ramp Pavement Markings
TM551	- Freeway Exit Ramp Pavement Markings
TM560	- Alignment Layout: General
TM561	- Alignment Layout: Left Turn Lane, Centerline & Medians
TM570	- Traffic Delineators
TM571	- Traffic Delineators Steel Post Details
TM575	- Traffic Delineator Installation For Freeways
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TM601	- Multi-Post Breakaway Sign Supports Details
TM602	- Triangular Base Breakaway Multi-Directional Slip Base Design
TM614	- Standard Truss Type Sign Bridge 50' To 167' Span Range Typical Plan And Elevation
TM615	- Standard Truss Type Sign Bridge 50' To 167' Span Range Notes
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TM618	- Standard Truss Type Sign Bridge 50' To 167' Span Range Sign And Luminaire Mounting Details
TM619	- Standard Truss Type Sign Bridge 50' To 167' Span Range Std. Spread Ftg. Foundation Details
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TM625	- Std. Monotube Cantilever Sign Support Sign And Luminaire Mounting Details
TM629	- Slip Base And Fixed Base Luminaire Supports General Details And Design Criteria
TM630	- Slip Base And Fixed Base Luminaire Supports Base Plate & Footing Details
TM635	- Breakaway Sign & Luminaire Supports - Support Location Guidelines
TM650	- Traffic Signal Supports General Details & Design Criteria
TM651	- Traffic Signal Supports Notes And Reactions
TM652	- Traffic Signal Supports Steel Details
TM653	- Traffic Signal Supports Foundation Requirements
TM670	- Wood Post Sign Supports
TM671	- 3 Second Gust Wind Speed Map
TM675	- Extruded Aluminum Panels
TM676	- Sign Attachments
TM677	- Sign Mounts
TM678	- Secondary Sign Mounting Details
TM679	- Signal Mast Arm Street Name Sign Mounts
TM680	- Signal Pole Mounts
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TM687	- Perforated Steel Square Tube (PSST) Anchor Foundation
TM688	- Perforated Steel Square Tube (PSST) Slip Base Foundation

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

FFO - I-84: TROUTDALE INTERCHANGE (MARINE DRIVE) SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HPP-STP-S002(144)	1A-2

Standard Drg. Nos. (Cont'd.)

TM800	- Tables, Abrupt Edge And PCMS Details
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TM830	- Temporary Concrete Barrier And Rumble Strip Details
TM840	- Closure Details
TM841	- Intersection Work Zone Details
TM842	- Signalized Intersection Details
TM843	- Multi-Lane Signalized Intersection Details
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TM851	- Non-Freeway Multi-Lane Sections
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TM862	- Freeway Sections

R/W Map Nos. 6B-15-13,
1A-22-7,
1R-3-1477 and
1R-3-1477

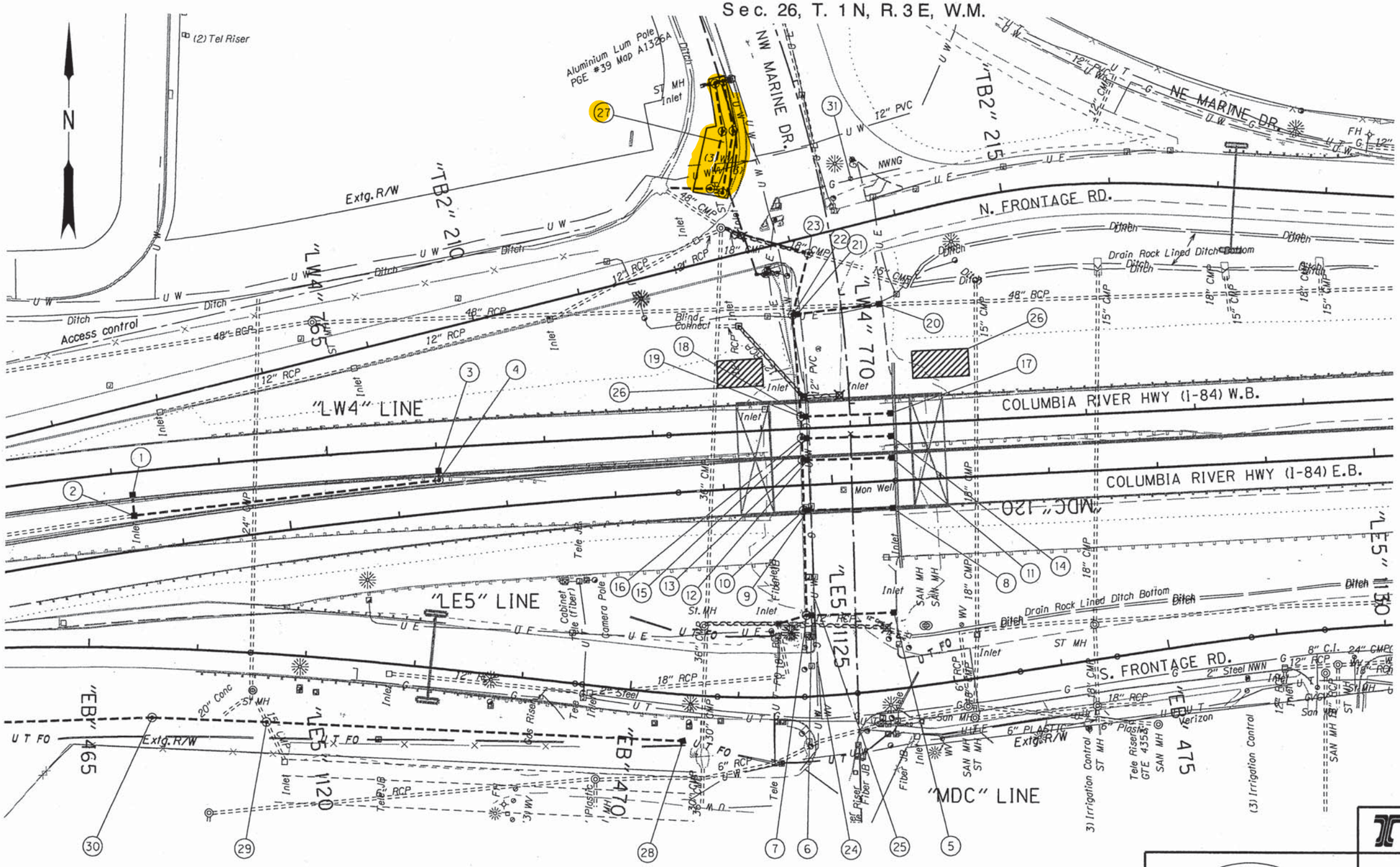
Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/Pages/standard_drawings_home.aspx

FFO - I-84: TROUTDALE INTERCHANGE (MARINE DRIVE) SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	**HPP-STP-S002(144)**	1A-3

47V-003

Sec. 26, T. 1N, R. 3E, W.M.



Remove manhole shown thus:
Adjust inlet shown thus:
Remove inlet shown thus:
Plug and abandon pipe shown thus:

REGISTERED PROFESSIONAL ENGINEER
17,573
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JAN 19, 1995
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RENEWS: 06-30-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

FFO - I-84: TROUTDALE INTERCHANGE (MARINE DRIVE) SEC.
COLUMBIA RIVER HIGHWAY
MULTNOMAH COUNTY

Reviewed by - Bruce Council
Designed by - Daniel Gunther
Drafted by - Daniel Gunther

DRAINAGE & UTILITIES

SHEET NO. 4D

F:\ODOT_DATA\Projects\K17541_I84_MarineDr\06_CADD\Design\17541_dr.PL1 :: D_U_Shts 8/26/2013 2:58:10 PM hwye66d

Rotation: 0° Scale: 1"=100'

Sec. 26, T. 1 N, R. 3 E, W.M.

(1) Sta. "LW4" 763+17.56
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 18'
F.L. Out 42.68
5' depth

(2) Sta. "LW4" 763+17.04, 40.17' Rt.
Remove extg. inlet
Const. manhole 48" with inlet over extg. (12" RCP) storm sew. pipe
(See drg. no. RD348)

(3) Sta. "LW4" 766+00.92, Rt.
Const. type "G-2" inlet w/ 2/0' sump
Inst. 12" storm sew. pipe - 9'
F.L. Out 43.52
5' depth

(4) Sta. "LW4" 766+00.82, 30.0' Rt.
Const. shallow manhole 48" dia.
Inst. 12" storm sew. pipe - 283'
5' depth
(See drg. nos. RD342)

(5) Sta. "MDC" 120+93.20
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 76'
5' depth

(6) Sta. "MDC" 120+93.20
Const. type "CG-3" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 6'
5' depth
(See drg. nos. RD372)

(7) Sta. "MDC" 120+93.20, 45.0' Rt.
Const. shallow manhole 60" dia.
Inst. 30" storm sew. pipe - 96'
Inst 12" storm sew. pipe - 12'
connect to extg. inlet
5' depth

(8) Sta. "MDC" 119+97.20
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe -78'
5' depth

(9) Sta. "MDC" 119+97.20
Const. type "CG-3" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 6'
5' depth

(10) Sta. "MDC" 119+97.20, 45.0' Rt.
Const. shallow manhole 60" dia.
Inst. 30" storm sew. pipe - 46'
5' depth

(11) Sta. "MDC" 119+50.00
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe -78'
5' depth

(12) Sta. "MDC" 119+50.00
Const. type "CG-3" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 6'
5' depth

(13) Sta. "MDC" 119+50.00, 45.0' Rt.
Const. shallow manhole 60" dia.
Inst. 30" storm sew. pipe - 20'
5' depth

(14) Sta. "MDC" 119+30.00
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe -78'
5' depth

(15) Sta. "MDC" 119+30.00
Const. type "CG-3" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 6'
5' depth

(16) Sta. "MDC" 119+30.00, 45.0' Rt.
Const. shallow manhole 60" dia.
Inst. 30" storm sew. pipe - 20'
5' depth

(17) Sta. "MDC" 119+10.00
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 78'
5' depth

(18) Sta. "MDC" 119+10.00
Const. type "CG-3" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 6'
5' depth

(19) Sta. "MDC" 119+10.00, 45.0' Rt.
Const. shallow manhole 60" dia.
Inst. 30" storm sew. pipe - 94'
5' depth

(20) Sta. "MDC" 118+12.71
Const. type "G-2" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 76'
5' depth

(21) Sta. "MDC" 118+12.71
Const. type "CG-3" inlet w/ 2.0' sump
Inst. 12" storm sew. pipe - 6'
5' depth

(22) Sta. "MDC" 118+12.71, 45.0' Rt.
Const. shallow manhole 60" dia.
Inst. 30" storm sew. pipe - 58'
5' depth

(23) Sta. "MDC" 117+57.99, 22.40' Rt.
Remove inlet
Remove pipe
Const. 72" manhole over exgt. 18" CMP pipe
Inst. 36" storm sew. pipe - 84'
(2) Protect extg. 8" water pipe
10' depth

(24) Relocate gas line
(By others)

(25) Relocate waterline
(By others)

(26) Limits of stone column placement zone
(See sht. GR)

(27) Sta. "MDC" 115+80.12 to
Sta. "MDC" 116+92.27
Const. Bioslope
Const. Maintenance access road
(For Details, see detail sht. GJ & GJ-2)

(28) Sta. "EB" 470+51.65, 42.52 Rt.
Const. type "D" inlet
Inst. 30" drain pipe - 384'
10' depth
(For Details, see detail sht. GJ-4)

(29) Sta. "EB" 466+67.75, 62.48 Rt.
Const. 48" manhole over extg. 15" CMP
Inst. 30" drain pipe - 106'
10' depth
(For Details, see detail sht. GJ-4)

(30) Sta. "EB" 465+59.79, 63.37 Rt.
Const. 48" manhole
Inst. 30" drain pipe - 271'
10' depth
(For Details, see detail sht. GJ-4)

(31) Adjust valve

No.	DATE	REVISIONS	BY
(2)	25-Nov-13	Add caution RE 8" water pipe	D.C.G.

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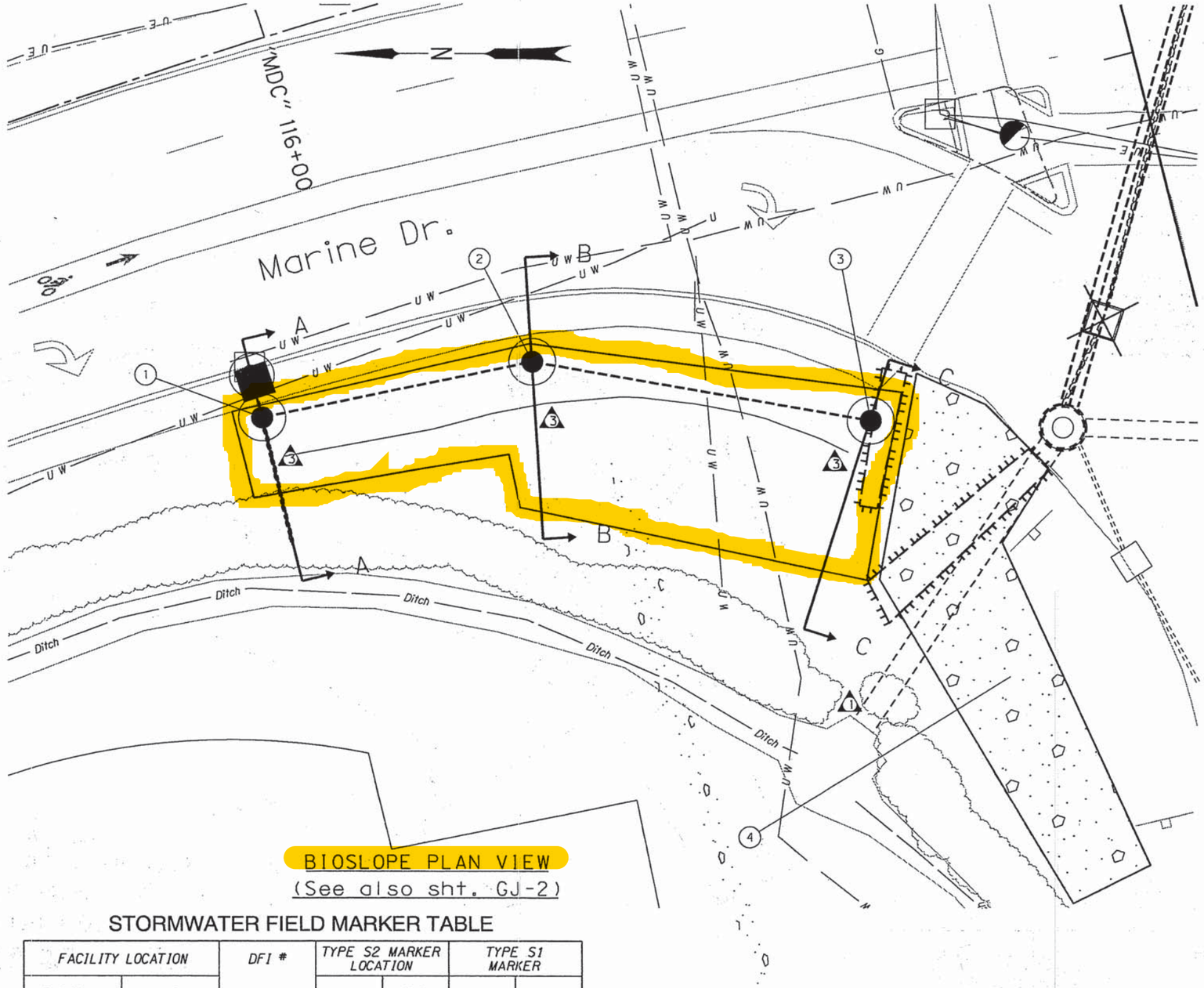
DRAINAGE & UTILITIES

SHEET NO. 4D-2



BIOSLOPE PLAN VIEW
(See also sht. GJ-2)

(1) Sta. "EB" 115+79.50, 60.90 Rt.
Remove 21' of extg. CMP pipe
Const. "PVC" inlet over end of CMP pipe
Inst. 10" drain pipe - 46'
(For details see sht. GJ-3 "PVC" Inlet)

(2) Sta. "EB" 116+28.29, 65.24 Rt.
Const. "PVC" inlet
Inst. 10" drain pipe - 58'

(3) Sta. "EB" 116+84.47, 89.26 Rt.
Const. "PVC" inlet at end of pipe

(3) (4) Sta. "EB" 117+16.00, 119' to 199' Rt.
Const. maintenance access entrance
15' wide x 80' long, 6" aggregate base
Const. 6" high berms using
aggregate base, to direct roadway
runoff to the infiltration facility as shown

STORMWATER FIELD MARKER TABLE

	FACILITY LOCATION		DFI #	TYPE S2 MARKER LOCATION		TYPE S1 MARKER	
	BMP Type	MP		BEGIN	END	RED	GREEN
	Bioinfiltration Swale	16.85	D 00784	✓		✓	
	Bioinfiltration Swale	16.85	D 00784		✓		✓
(3)	Infiltration Facility	16.86	D 00785	✓		✓	
(3)	Infiltration Facility	16.86	D 00785		✓		✓
	Infiltration Facility	16.91	D 00786	✓		✓	
	Infiltration Facility	17.56	D 00786		✓		✓

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

No.	DATE	REVISIONS	BY
(3)	03-30-15	Revisions	D.C.G.

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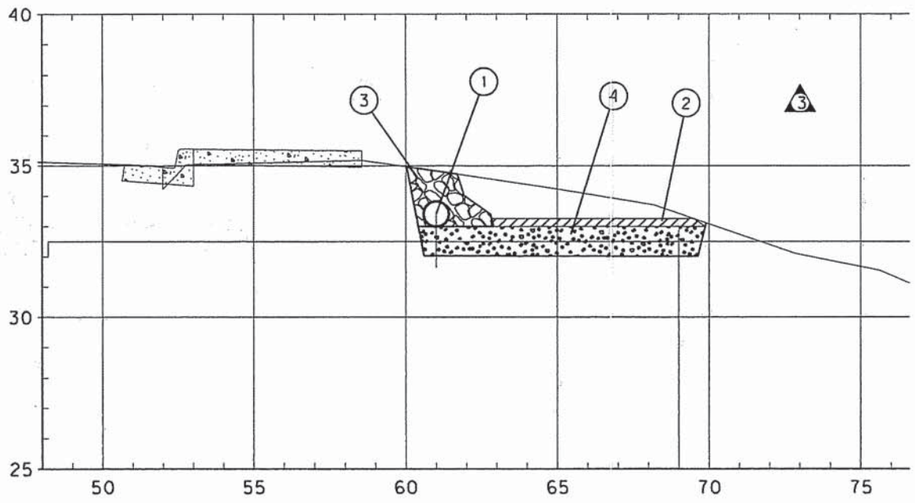
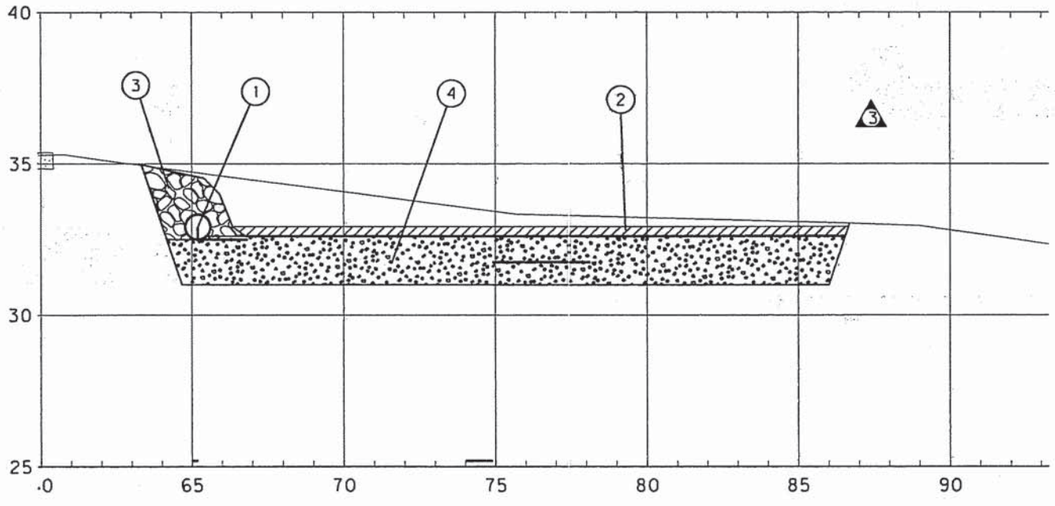
WATER QUALITY DETAILS

SHEET NO. GJ

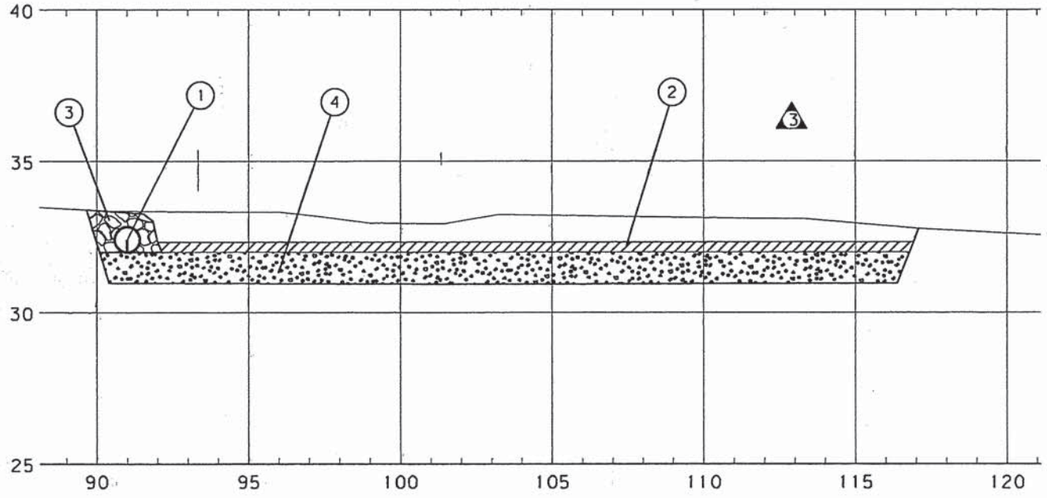


Section A-A 115+80.00



116+30.00

Section B-B



Section C-C

(1) 10" drain pipe (typ.)
(Discharge pipe)

(3) (2) 2" compost blanket with permanent seed mix and tackifier incorporated.
(See sht. GA-3, note 3)

(3) (3) 1½" - ¾" Granular drain backfill material

(3) (4) 00360.10 Sand drainage blanket or approved equal - 12" min. thickness

No.	DATE	REVISIONS	BY
3	03-30-15	Revisions	D.C.G.

INFILTRATION FACILITY SECTION VIEWS
(See sht. GJ)

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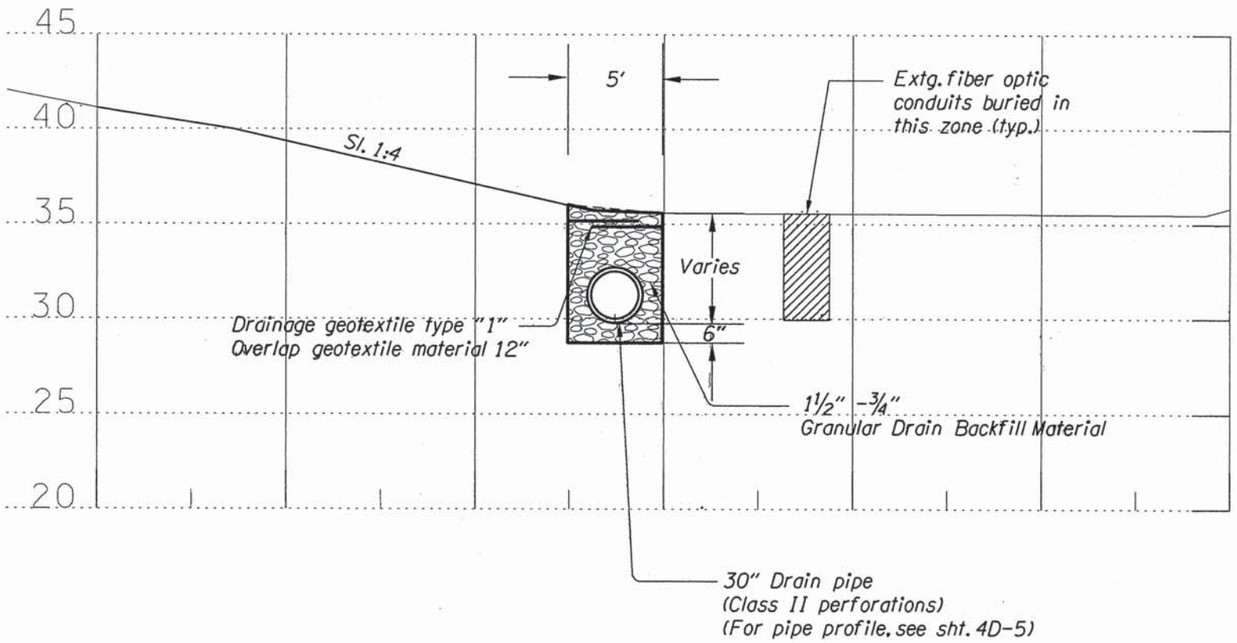
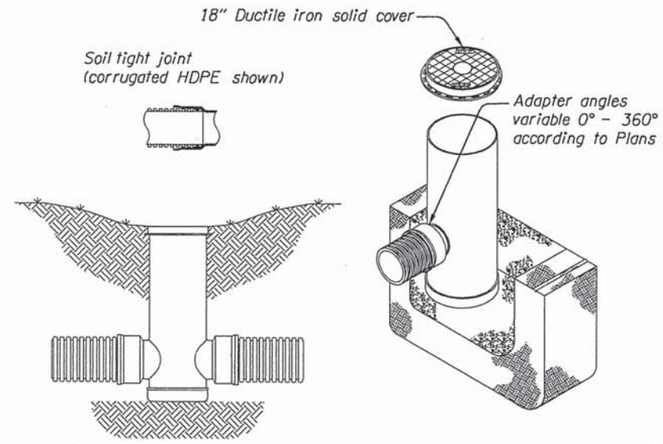
WATER QUALITY DETAILS

SHEET NO. GJ-2

47V-003



FLOODWAY FRENCH DRAIN
N.T.S.



"PVC" INLET
N.T.S.

** Drawing Not to Scale **

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WATER QUALITY DETAILS

SHEET NO. GJ-3

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Rotation: 0° Scale: 1/8"=1'-0"