OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: October, 2020

DFI No. D01120

Figure 1: DFI No. D01120, looking South

Identification

Drainage Facility ID (DFI):	D01120
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 51V-076
Location:	District: 2B
	Highway No.: 91
	Mile Post: 11.07 to 11.10, [in median]

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 median
Flow direction: South

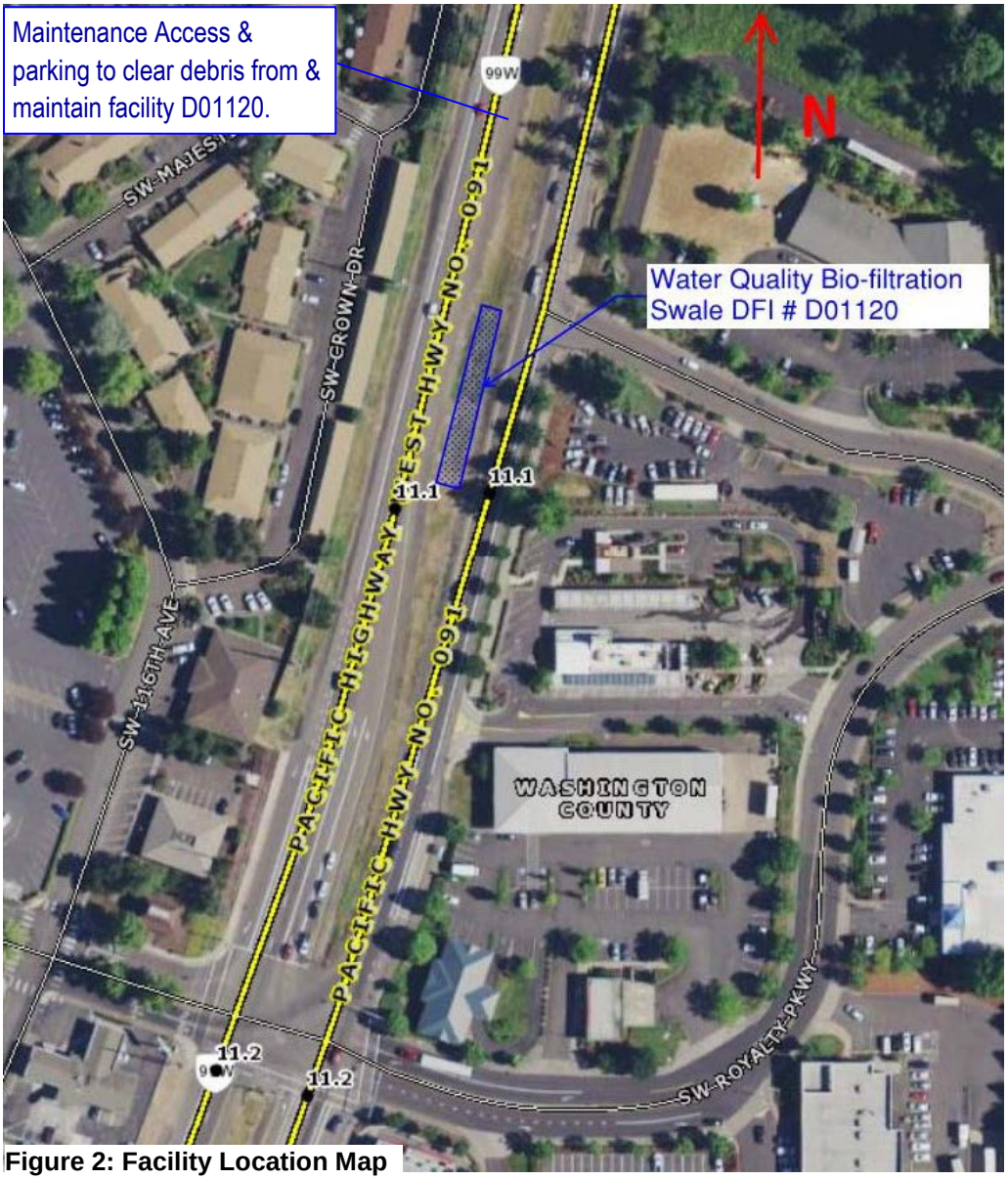


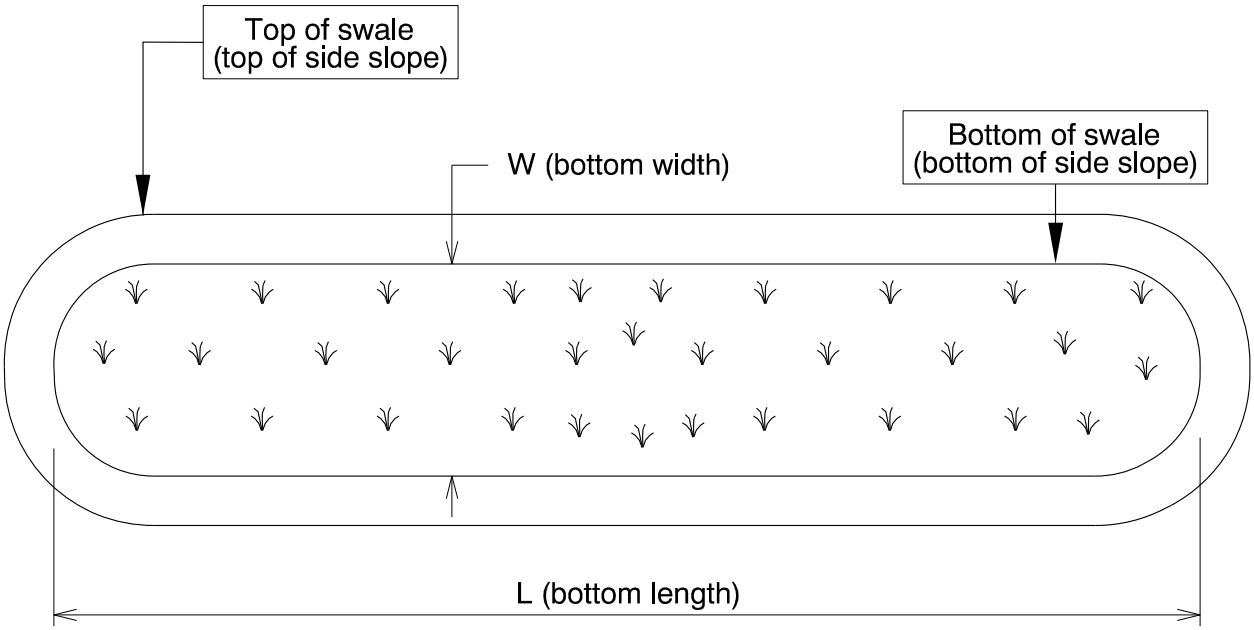
Figure 2: Facility Location Map

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:

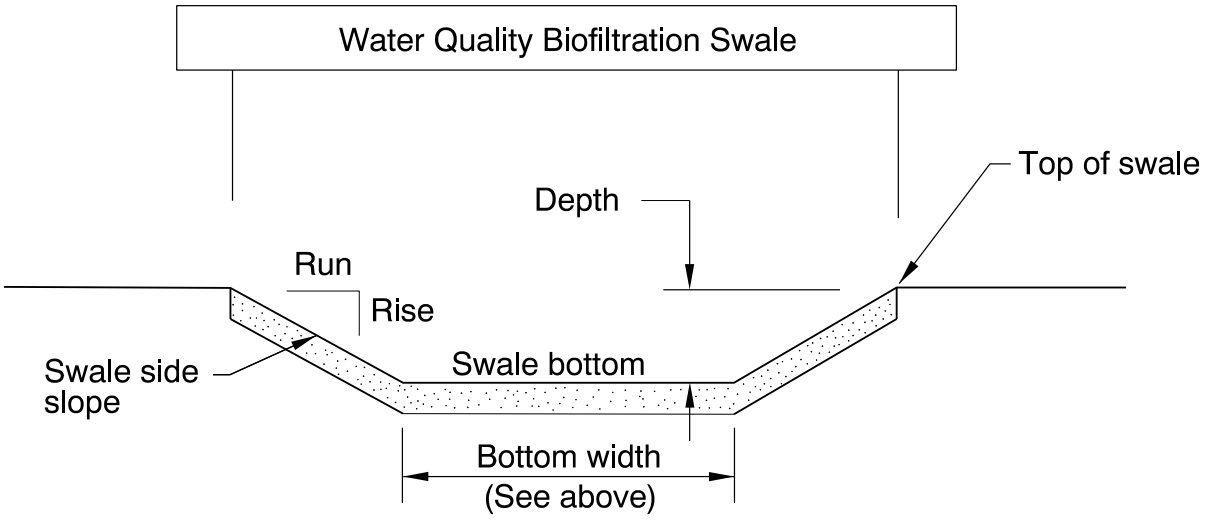
Bottom Length (feet)	Bottom Width (feet)
156	4



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)
1.7	1	4



Site Specific Information:

- Water Quality Biofiltration Swale
- The swale is located in the median between NB and SB OR99W.
- Access to the swale will by the roadside inside shoulder. If using a trailer, it may be necessary to close the "A" lane, or if preferable, close the inner turn lane.
- The swale will treat roadway drainage basin from north of facility by ditch conveyance or overland flow. New storm sewer system will convey runoff along east side of highway from SW Beef Bend Rd to SW Naeve St.
- The swale will discharge into existing drainage ditch below swale.

A. Heavy equipment access:

- Heavy equipment will be allowed on upper and lower parts of the swale but NOT on swale bottom. Care should be taken to not disturb or destroy plantings.

4. The swale bottom has amended soils that would be compacted by heavy equipment

5. Facility Access

Maintenance access to the facility:

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

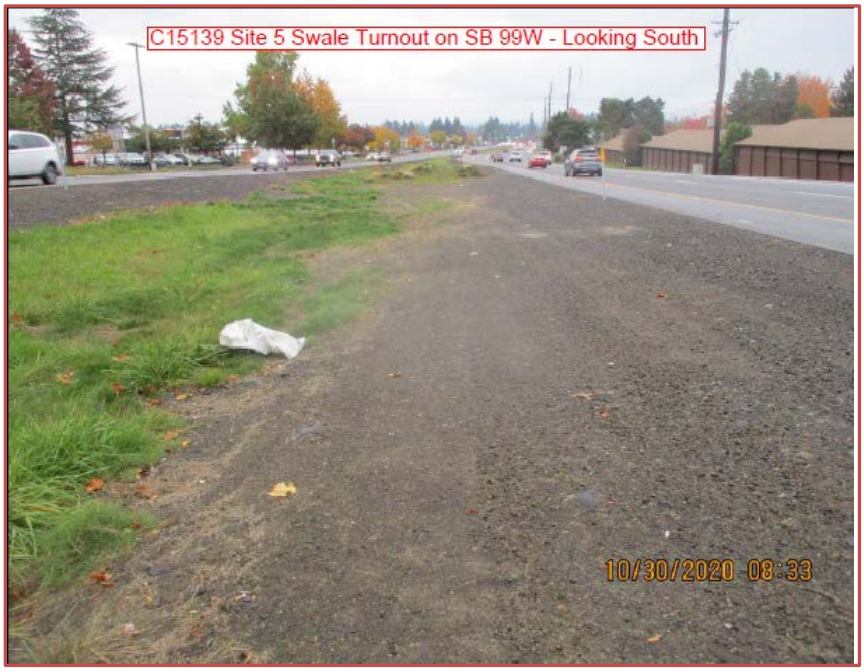


Figure 3: Facility access from the OR99W SB "A" lane to the inside shoulder, slightly to the north of the actual facility

6. 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/ Inlet	☒	**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: River Rock Check Dam	☒	**S19**
Swale Outlet		
Catch basin with grate	☒	**S20**
Outlet Pipe (s)	☐	**S21**
Open channel outlet	☒	**S22**
Auxiliary Outlet: describe type	☐	**S23**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐**O**	**S24**
Ditch	☒	**S25**
Storm drain system	☐	**S26**
Outfall Components		
Riprap pad	☐	**S27**
Riprap bank protection	☐	**S28**

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.

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

8. Limitations

Access grid installed:

☒ No	☐ Yes
There are (no, light, med., heavy) 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.

9. 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

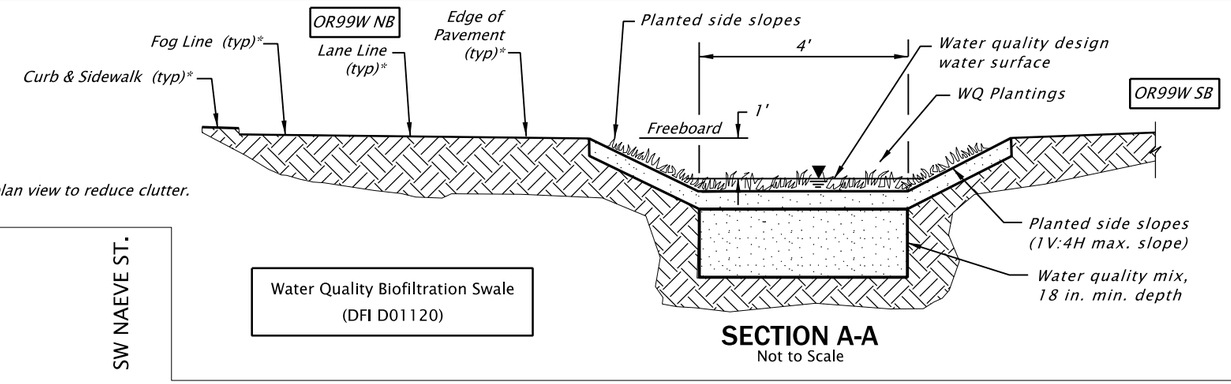
Contact any of the following for more detailed information about management of waste materials found on site:

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

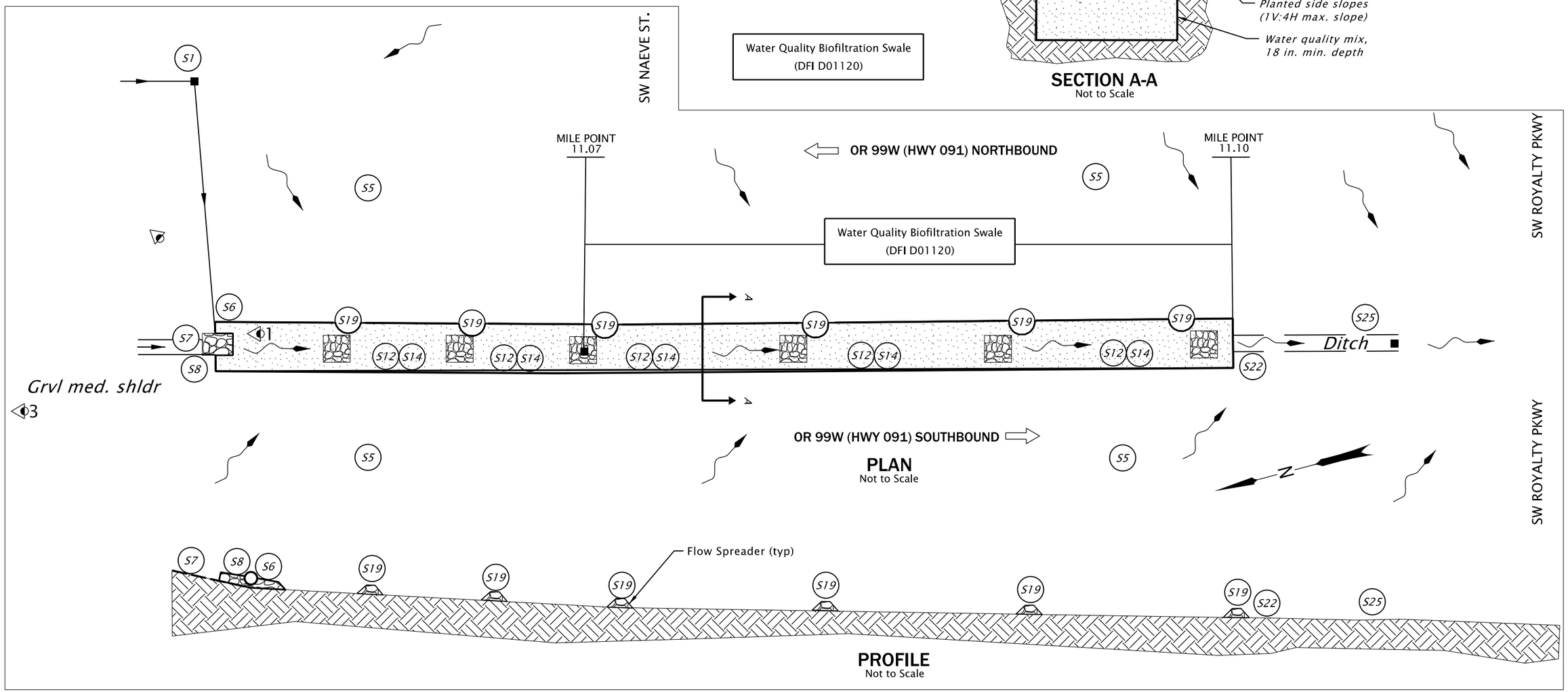
Contents:

Operational Plan: DFI D01120



*These features are left off the plan view to reduce clutter.

SECTION A-A
Not to Scale



PLAN
Not to Scale

PROFILE
Not to Scale

LEGEND:

- X# — *Facility component (see table 1 in O&M Manual)*
- *Inlet (18" Sump)*
- *Storm pipe*
- *Conveyance direction*
- *Pavement / facility flow path*
- *Traffic flow direction*
- X# — *Photo Location (#)*
- *River Rock Flow Spreaders*
- Ditch — *Existing Median Ditch*

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 1 of 1

Prepared By: Bruce Councill, PE

Drafted By: Bruce Councill, PE

DFI D01120
MAINTENANCE DISTRICT 2B HWY 091
WATER QUALITY BIOFILTRATION SWALE
HIGHWAY MP 11.07
WASHINGTON COUNTY

D01120

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 51V-076

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
A01	Title Sheet
A02	Index Of Sheets Cont'd. & Std. Drg. Nos.

"NOT REVISED AS CONSTRUCTED"
PROJECT MANAGER
10.14.20
DATE

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED PROJECT

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

OR99W: SW LANE ST (PORTLAND)- SW NAEVE ST (TIGARD) PROJECT

PACIFIC HIGHWAY WEST

MULTNOMAH/WASHINGTON COUNTIES
APRIL 2019

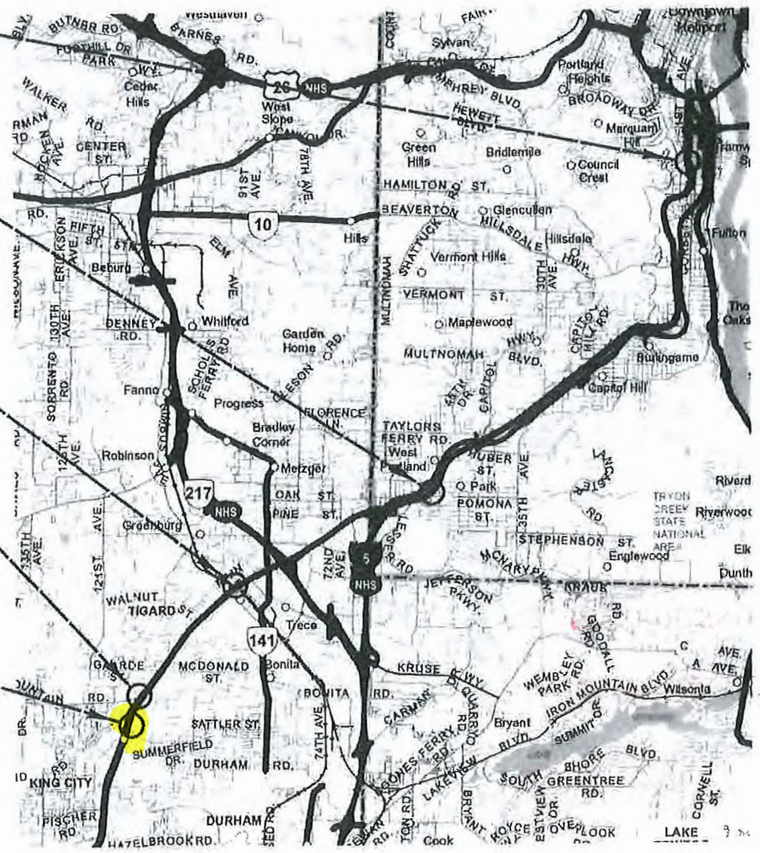
SITE 1
STA. "B" 34+13.80 (M.P. 1.97) BEGIN
STA. "B" 37+24.70 (M.P. 2.03) END

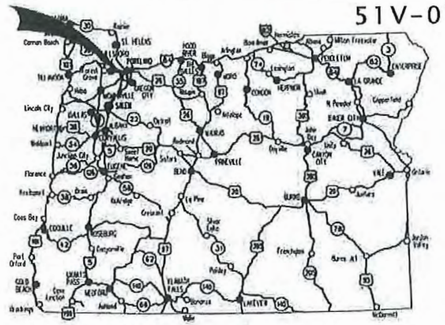
SITE 2
STA. "B" 163+81.40 (M.P. 6.93) BEGIN
STA. "B" 166+03.64 (M.P. 6.97) END

SITE 3
STA. "C" 20+68.19 (M.P. 9.20) BEGIN
STA. "C" 28+44.99 (M.P. 9.20) END

SITE 4
STA. "H" 161+96.48 (M.P. 10.67) BEGIN
STA. "H" 164+09.46 (M.P. 10.71) END

SITE 5
STA. "H" 177+86.77 (M.P. 10.95) BEGIN
STA. "H" 186+68.78 (M.P. 11.13) END





Overall Length Of Project - 9.31 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

PLANS PREPARED FOR
OREGON DEPARTMENT OF TRANSPORTATION

HHPR Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS

OREGON TRANSPORTATION COMMISSION

Tammy Baney	CHAIR
Bob Van Brocklin	COMMISSIONER
Alando Simpson	COMMISSIONER
Julie Brown	COMMISSIONER
Martin Callery	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: Jessica Clark
Signature & date 1-28-2019
ODOT Region 1 Technical Center Manager
Print name and title

Concurrence by ODOT Chief Engineer

N

T. 1 S., R. 1 E., W.M.
T. 2 S., R. 1 W., W.M.

OREGON DEPARTMENT OF TRANSPORTATION

OR99W: SW LANE ST (PORTLAND)- SW NAEVE ST (TIGARD) PROJECT
PACIFIC HIGHWAY WEST
MULTNOMAH/WASHINGTON COUNTIES

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	0000(239)	A01

INDEX OF SHEETS, CONT.

SHEET NO.	DESCRIPTION
A03	Plan Sheet Layout
A04 THRU A08	Survey Control Data
BA01 THRU BA06	Typical Sections
BB01 THRU ~~BB05~~ BB06	Details
BC01 THRU BC08	Curb Ramp Details
BC09	Grading Details
BC010 THRU BC14	Curb Ramp Details
BC15 THRU BC19	Sidewalk, Driveway, and Bike Path Details
BD01	Pipe Data
C01	Alignment and Right of Way Plan
C01A	General Construction
C01B	Drainage and Utilities
C02	Alignment and Right of Way Plan
C02A	General Construction
C02B	Profile
C02C	Drainage and Utilities
C03	Alignment and Right of Way Plan
C03A	General Construction
C03B	Drainage and Utilities
C04	Alignment and Right of Way Plan
C04A	General Construction
C04B	Drainage and Utilities
C05	Alignment and Right of Way Plan
C05A	General Construction
C05B	Drainage and Utilities
C06	Alignment and Right of Way Plan
C06A	General Construction
C06B	Profile
C06C	Drainage and Utilities
C07	Alignment and Right of Way Plan
C07A	General Construction
C07B	Drainage and Utilities
D01	Paving Plan
D02	Paving Plan
D03	Paving Plan
D04	Paving Plan
D05	Paving Plan
D06	Paving Plan
D07	Paving Plan
EC01 THRU EC06	Traffic Control Plan
ED01	Traffic Control Plan
EE01	Traffic Control Detour Plan
EF01	Traffic Control Plan
EG01	Traffic Control Detour Plan
EH01	Temporary Sidewalk Ramp Details

INDEX OF SHEETS, CONT.

SHEET NO.	DESCRIPTION
FA01 THRU FA03	Roadside Development Details
FA04 THRU FA12	Roadside Development
FB01 THRU FB07	Erosion and Sediment Control Plan
GB100	Retaining Wall Plan & Elevation
GB101	Geotechnical Data
GB102	Retaining Wall Details
GB200	Retaining Wall Plan & Elevation
GB201	Geotechnical Data
GB202	Retaining Wall Details
GB300	Soil Nail Wall Plan & Elevation
GB301	Geotechnical Data
GB302	Soil Nail Wall Details
GB303	Soil Nail Wall Details
GB304	Soil Nail Wall Details
GB305	Soil Nail Wall Details
GB306	Soil Nail Wall Details
GB307	Soil Nail Wall Details
GG01 THRU GG07	Hazardous Materials
HA01	Stormwater Details
HA02	Stormwater Plan & Profile
LA01 THRU LA05	Sign Installation Plan
LB01	Sign Details
LC01 THRU LC04	Sign & Post Data Table
MA01	Legend
MB01	Flashing Beacon Plan
MB02	Existing Utilities Plan
MB03	Flashing Beacon & Signal Details
MC01	Signal/Detection Modification Plan
MC02	Existing Utilities Plan
MD01	Signal Modification Plan
MD02	Existing Utilities Plan
PA01	Illumination Legend
PA02	Illumination Plan
QA01	Pavement Marking Legend
QB01 THRU QB05	Pavement Marking Plan

"REVISED AS CONSTRUCTED"

PROJECT MANAGER

10.14.20

DATE

Standard Drg. Nos.

- RD100 - Mailbox Support
- RD101 - Mailbox Installation
- RD300 - Trench Backfill, Bedding, Pipe Zone and Multiple Installations
- RD302 - Street Cut
- RD335 - Standard Storm Sewer Manhole
- RD336 - Standard Manhole Details
- RD339 - Pipe to Structure Connections
- RD342 - Shallow Manholes
- RD344 - Standard Manhole Base Section
- RD345 - Pipe to Manhole Connections
- RD346 - Large Precast Manhole
- RD352 - Outside Drop Manholes
- RD354 - Carry Through Manhole-Storm
- RD356 - Manhole Covers And Frames
- RD360 - Manhole Frame Adjustment
- RD364 - Concrete Inlets Type G-1, G-2, G-2M, & G-2MA
- RD365 - Frames And Grates For Concrete Inlets
- RD366 - Concrete Inlets Type CG-1, CG-2
- RD370 - Ditch Inlet Type D
- RD371 - Concrete Inlet Base Type CG-3
- RD372 - Concrete Inlet Top, Option 1 Type CG-3
- RD376 - Miscellaneous Drainage Structures Siphon Box, Inlet Cap & Inlet Adjustment
- RD386 - Fill Height Table For Circular Concrete Pipe
- RD388 - Fill Height Table For PVC Pipe
- RD390 - Fill Height Table For Corrugated HDPE Pipe
- RD393 - Fill Height Tables For Polypropylene Pipe
- RD700 - Curbs
- RD705 - Islands
- RD710 - Accessible Route Islands
- RD715 - Approaches & Non-Sidewalk Dwys.
- RD720 - Sidewalks
- RD735 - Curb Line Sidewalk Dwys. Or Alleys (Options F and G) ODOT Highways
- RD750 - Curb Line Sidewalk Dwys. Or Alleys (Options M and N) Local Jurisdictions
- RD754 - Curb Ramp and Turning Space (For Ends of Sidewalks)
- RD755 - Curb Ramp Details
- RD757 - Curb Ramp Placement Options Large Radii
- RD759 - Detectable Warning Surface Details & Placement Locations
- RD770 - Pedestrian Handrail
- RD771 - Pedestrian Handrail Details
- RD815 - Chain Link Fence
- RD1000 - Construction Entrances
- RD1006 - Check Dams Type 2 and 6
- RD1010 - Inlet Protection Type 2, 3, 6, 7, 10 and 11
- RD1032 - Sediment Barrier Type 8
- RD1033 - Sediment Barrier Type 9
- BR241 - Protective Fencing Details-1
- BR705 - Standard Retaining Wall Cast-In-Place Semi-Gravity Front Face Batter
- BR709 - Standard Retaining Wall Cast-In-Place Semi-Gravity Joints And Details
- TM200 - Sign Installation Details
- TM201 - Miscellaneous Sign Placement Details
- TM220 - Multi-Post Installations with Auxiliary Signs
- TM221 - Signing Details Milepost Markers
- TM222 - Installation Details Milepost Marker Posts
- TM223 - Conventional Roads Directional Sign Layout Street Name Signs
- TM240 - Crosswalk Closure Details
- TM457 - Vehicle, Pedestrian Signal and Push Button Mounting Option Details
- TM465 - Overhead Sign, Fire Preemption And Photoelectric Control Details
- TM467 - Pedestrian Signal Mount And Pedestrian Pushbutton Details
- TM470 - Wire & Cable Installation And Color Code Charts
- TM472 - Traffic Signal Junction Boxes/Hand Holes
- TM475 - Loop Details
- TM485 - Service Cabinet Wiring Details
- TM500 - Pavement Marking Standard Detail Blocks
- TM501 - Pavement Marking Standard Detail Blocks
- TM502 - Pavement Marking Standard Detail Blocks
- TM503 - Pavement Marking Standard Detail Blocks
- TM515 - Pavement Markers
- TM520 - Durable Pavement Markings Method "A" & Method "D" Surface Installed Profiled
- TM521 - Durable & High Performance Pavement Markings Surface & Groove Installed Non-Profiled
- TM530 - Intersection Pavement Markings (Crosswalk, Stop Bar, & Bike Lane Stencil)
- TM531 - Turn Arrow Marking Details
- TM560 - Alignment Layout: General
- TM561 - Alignment Layout: Left Turn Lane, Centerline, & Medians
- 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
- TM671 - 3 Second Gust Wind Speed Map
- TM676 - Sign Attachments
- TM677 - Sign Mounts
- TM681 - Perforated Steel Square Tube (PSST) Sign Support Installation
- TM687 - Perforated Steel Square Tube (PSST) Anchor Foundation
- TM688 - Perforated Steel Square Tube (PSST) Slip Base Foundation
- TM800 - Tables, Abrupt Edge and PCMS Details
- TM810 - Temporary Pavement Markings
- TM820 - Temporary Barricades
- TM821 - Temporary Sign Supports
- TM822 - Temporary Sign Supports
- TM840 - Closure Details
- TM841 - Intersection Work Zone Details
- TM842 - Signalized Intersection Details
- TM843 - Multi-Lane Signalized Intersection Details
- TM844 - Temporary Pedestrian Access Routing
- TM850 - 2-Lane, 2-way Roadways
- TM851 - Non-Freeway Multi-Lane Sections
- TM852 - Non-Freeway Multi-Lane Sections
- TM853 - Non-Freeway Multi-Lane Sections

R/W Map No. 1R-4-1278

Harper Houf Peterson Righellis Inc.

ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS

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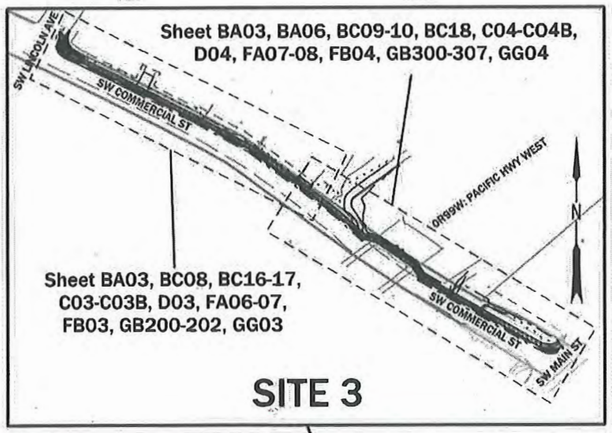
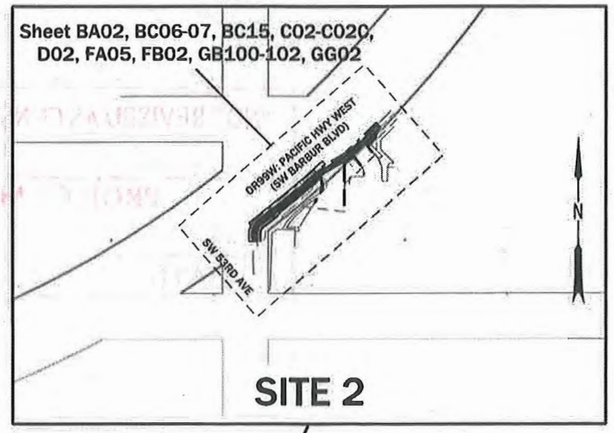
phone: 503.221.1131 www.hhpr.com fax: 503.221.1171

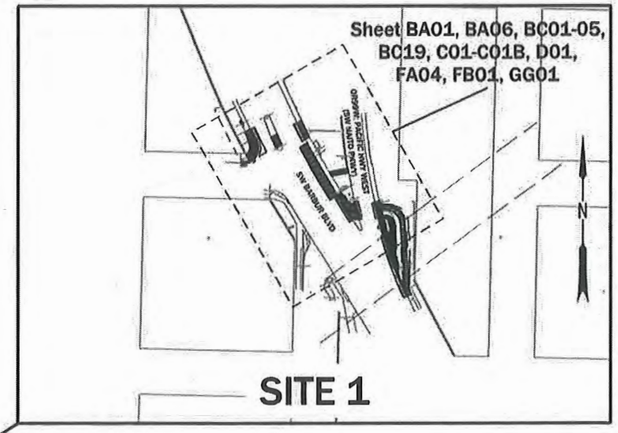
OREGON DEPARTMENT OF TRANSPORTATION

OR99W: SW LANE ST (PORTLAND)-SW NAEVE ST (TIGARD) PROJECT
PACIFIC HIGHWAY WEST
MULTNOMAH/WASHINGTON COUNTIES

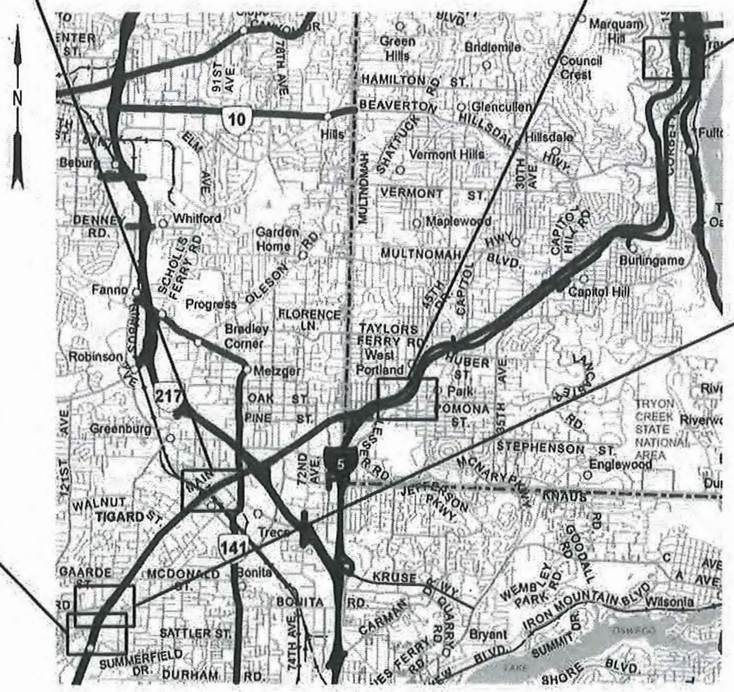
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	0000(239)	A02

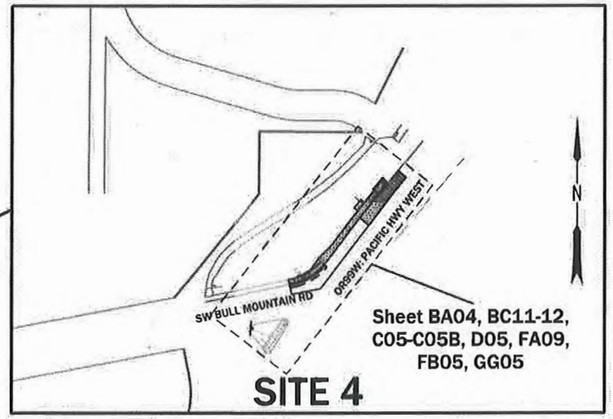


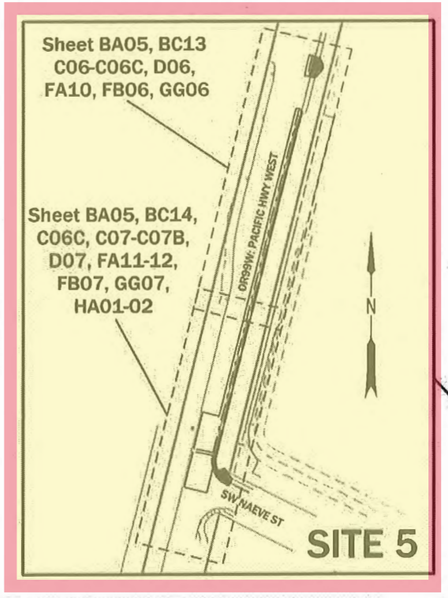




"NOT REVISED AS CONSTRUCTED"
PROJECT MANAGER
10.14.20
DATE







REGISTERED PROFESSIONAL ENGINEER
69245
OREGON
JUL. 09, 2002
AARON J. ISENHART
EXPIRES: 06/30/19

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS
205 SE Spokane Street, Suite 200 Portland, OR 97202 PHONE: 503.221.1131 www.hhpr.com FAX: 503.221.1171

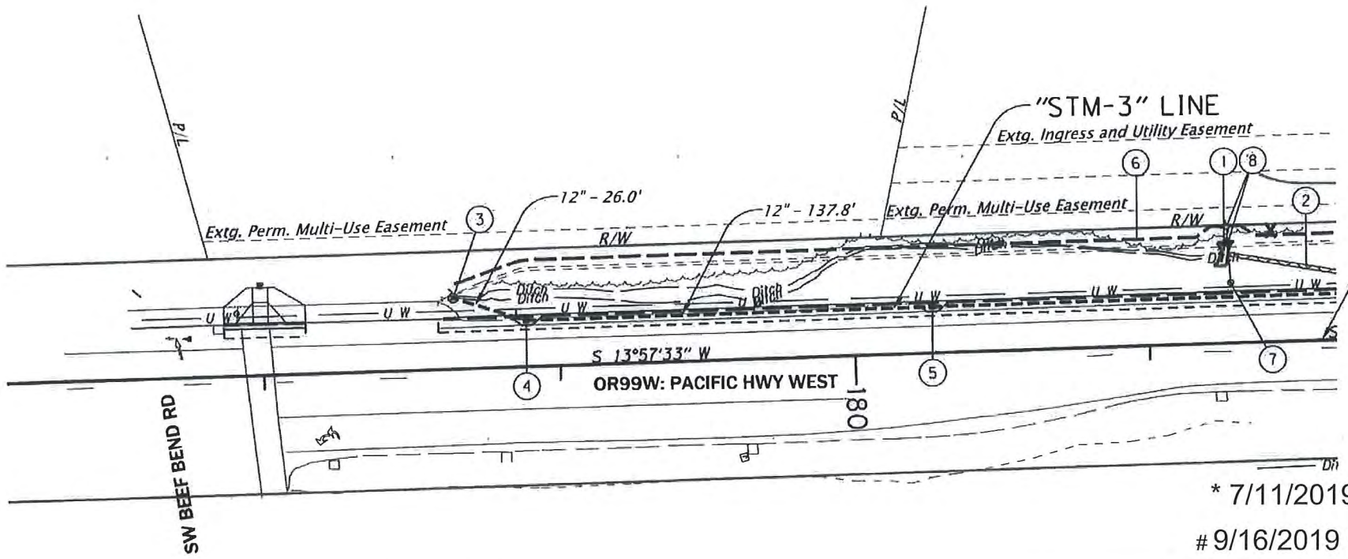
OREGON DEPARTMENT OF TRANSPORTATION

OR99W: SW LANE ST (PORTLAND)-SW NAEVE ST (TIGARD) PROJECT
PACIFIC HIGHWAY WEST
MULTNOMAH/WASHINGTON COUNTIES

Designer: Daniel E. Cicerchi | Review: Aaron J. Isenhart
Drafter: HHPR | Checker: Peter G. Coffman

PLAN SHEET LAYOUT | SHEET NO. A03

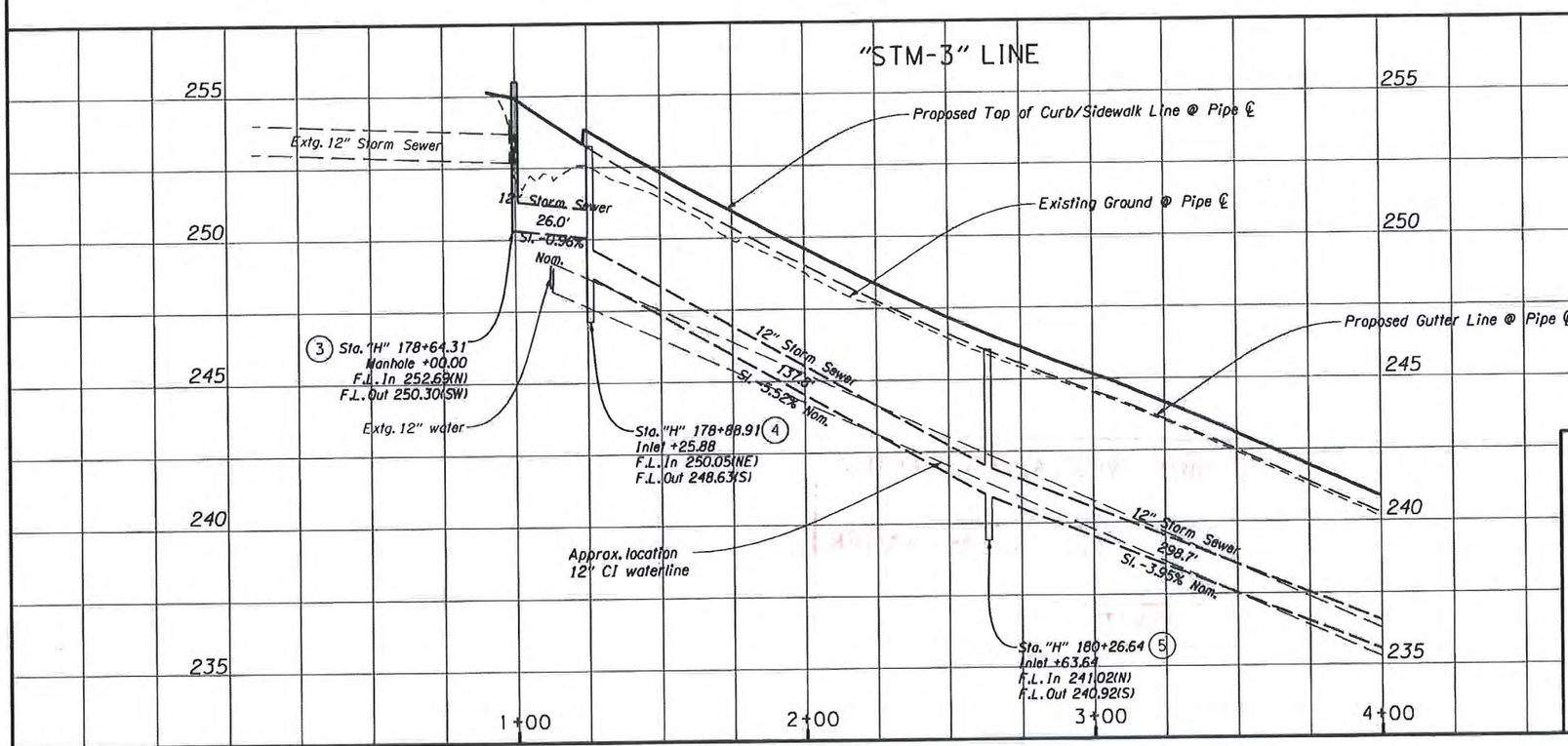
Sec. 10, T. 2S, R. 1W, W.M.
SITE 5



1. Remove Inlet and Headwall
2. Remove or abandon extg. storm sew.
3. "H" STA 178+64.31, 24.19' Lt.
   = "STM-3" STA 1+00.00
   Const. storm manhole
   w/ flat top lid
   Connect to extg. storm sew.
   (See drg. no. RD335)
   * ~~(See drg. no. RD352)~~
4. "H" STA 178+88.91, 15.75' Lt.
   = "STM-3" STA 1+25.88
   Const. conc. inlet, type CG-2 with 18" sump
   Install 12" storm sew. pipe - 26.0'
   5' depth
   (See drg. no. RD366)
   (For profile, see sht. HA03)
5. "H" STA 180+26.64, 15.75' Lt.
   = "STM-3" STA 2+63.64
   Const. conc. inlet, type CG-2 with 18" sump
   Install 12" storm sew. pipe - 137.8'
   5' depth
6. "H" STA #178+59.03, 28.84' Lt.
   to "H" STA #182+16.91, 37.60' Lt.
   Const. V bottom ditch - #354.5'
   1:2 foreslope/ Var. slope backslope
7. Adjust water valve box
8. Relocate fire hydrant (by City of Tigard)

* 7/11/2019- POR Removed reference for RD352

9/16/2019 POR revised stationing and ditch length



"REVISED AS CONSTRUCTED"
PROJECT MANAGER
10.14.20
DATE

N

General Notes:
1) Sta/Offsets for inlets are to the center of the structure.
2) Rim elevations for CG-2 inlets are at gutter line grade.

REGISTERED PROFESSIONAL ENGINEER
88867
OREGON
MAY. 21, 2014
PETER G. COFFMAN
EXPIRES: 12/31/19

Harper Houf Peterson Righellis Inc.
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OREGON DEPARTMENT OF TRANSPORTATION

OR99W: SW LANE ST (PORTLAND)-
SW NAEVE ST (TIGARD) PROJECT
PACIFIC HIGHWAY WEST
MULTNOMAH/WASHINGTON COUNTIES

Designer: Daniel E. Cicerchi | Review: Aaron J. Isenhart
Drafter: HHPR | Checker: Peter G. Coffman

DRAINAGE AND UTILITIES

SHEET NO. C06C

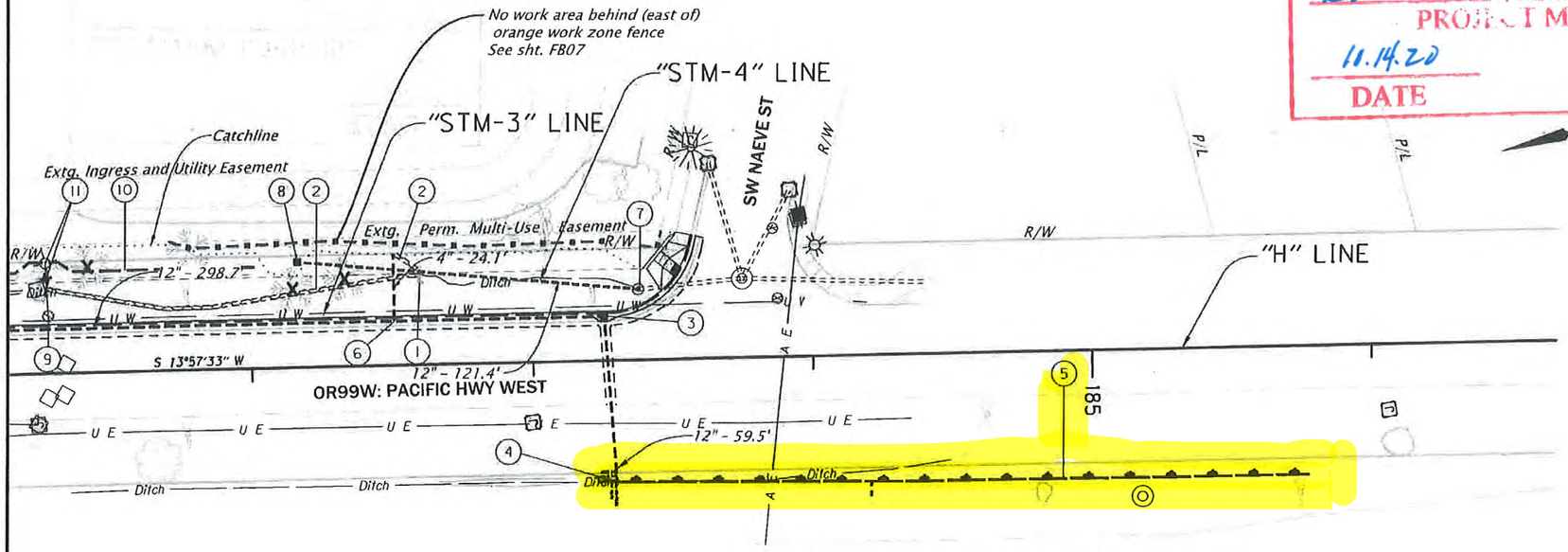
Rotation: 254.7372° Scale: 1"=50'

18838_C05.dgn :: C06C - DRAINAGE 1/23/2019 10:11:18 AM danielcicerchi

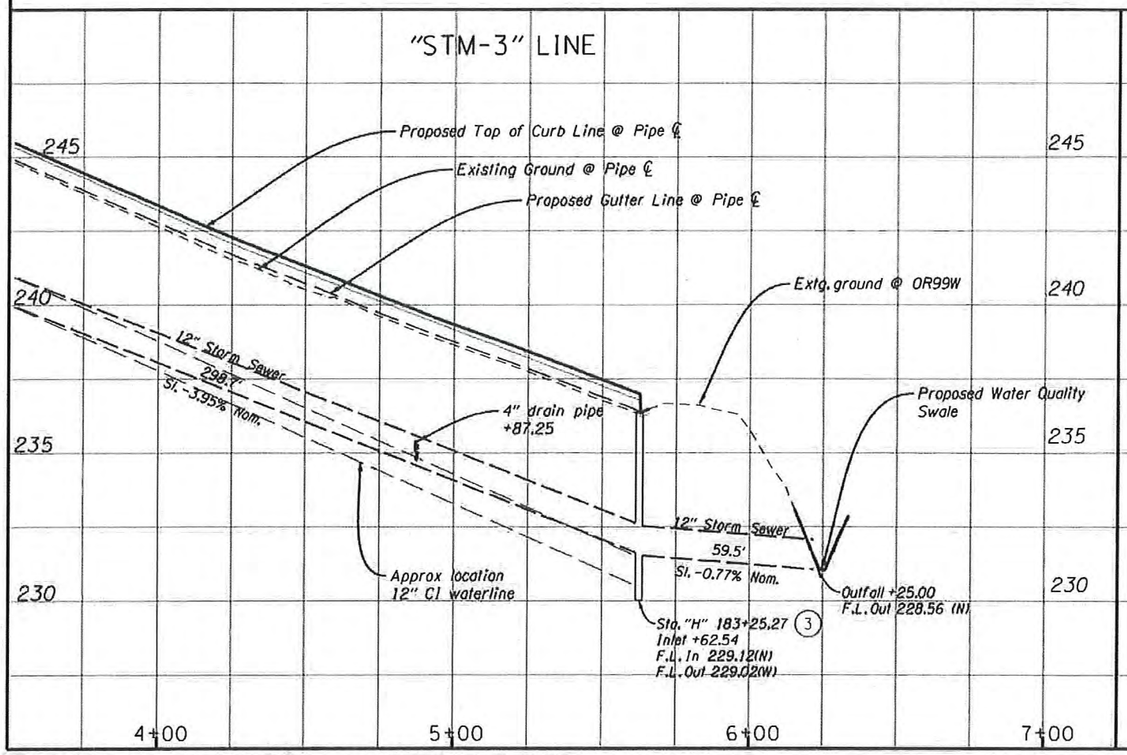
Sec. 10, T. 2S, R. 1W, W.M.
SITE 5

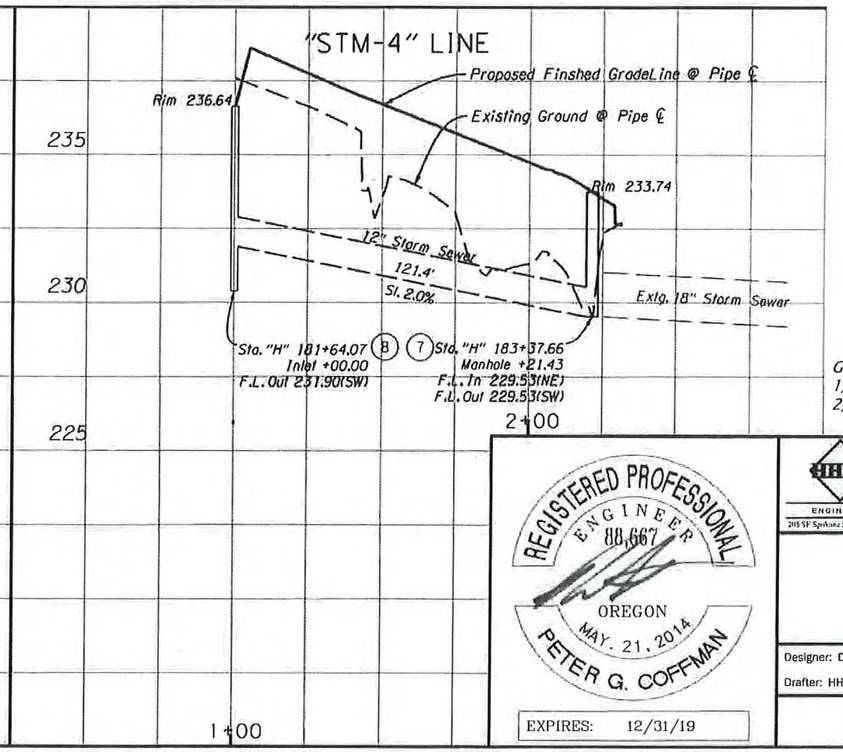
51V-076

"REVISED AS CONSTRUCTED"
PROJECT MANAGER
11.14.20
DATE



* 08/09/2019 POR revised Stationing for note 8





(1) *Remove Inlet and Headwall*

(2) *Remove or abandon extg storm sew. pipe*

(3) *"H" STA 183+25.27, 15.70' Lt*
= "STM-3" STA 5+61.93
Const. conc. inlet, type CG-2
w/ 18" sump
Install 12" storm sew. pipe - 298.7'
5' depth

(4) *"H" STA 183+29.21, 43.76' Rt*
Const. storm sew. outfall
Install 12" storm sew. pipe - 59.5'
5' depth
Trench resurf. - 11.2 sq. yd.
(For details, see sht. HA01)

(5) *"H" STA 183+26.21, 43.76' Rt*
to "H" 185+77.27, 46.29' Rt
Const. 4' wide water quality swale - 339.7'
(For details, see sht. HA01 & HA02)

(6) *"H" STA 182+50.79, 18.28' Lt*
Install 4" storm sew. pipe - 24.1'
5' depth
Install 45° bend
Connect to extg. 4" storm sew. pipe
Connect to 12" storm sew. pipe

(7) *"H" STA 183+37.66, 25.27' Lt.*
Const. storm manhole
with flat top lid
Install 12" storm sew. pipe - 121.4'
5' depth
Connect to extg. 18" storm sew.

(8) *"H" STA ~~181+64.07~~ *182+16.92 37.60' ~~Rt~~ *Lt.*
Const. conc. inlet, type D
w/ 18" sump
Rim elev 236.64

(9) *See sht. C06C, note 7*
Adjust water valve box

(10) *See sht. C06C, note 6*
Const. V bottom ditch
1:2 foreslope/ var. slope backslope

(11) *See sht. C06B, note 8*
Relocate fire hydrant (by City of Tigard)

General Notes:
1) Sta/Offsets for inlets are to the center of the structure.
2) Rim elevations for CG-2 inlets are at gutter line grade.

REGISTERED PROFESSIONAL ENGINEER
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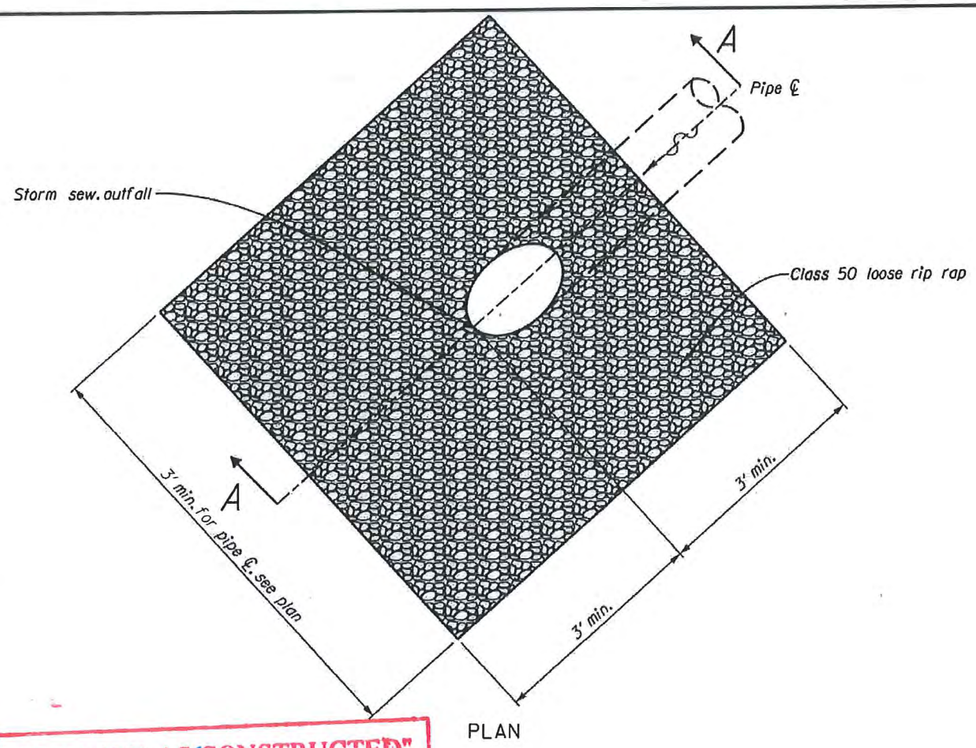
OR99W: SW LANE ST (PORTLAND)-
SW NAEVE ST (TIGARD) PROJECT
PACIFIC HIGHWAY WEST
MULTNOMAH/WASHINGTON COUNTIES

Designer: Daniel E. Clcerchi | Review: Aaron J. Isenhart
Drafter: HHPR | Checker: Peter G. Coffman

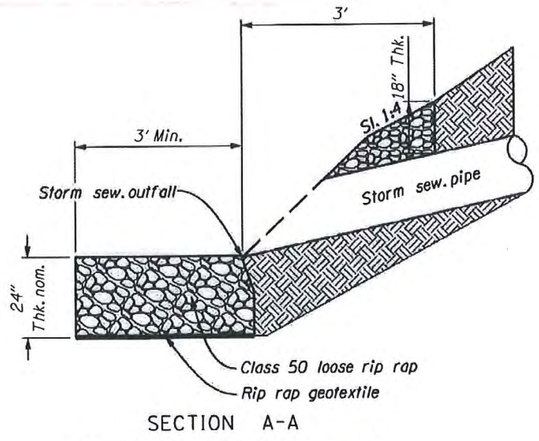
DRAINAGE AND UTILITIES

SHEET NO. C07B



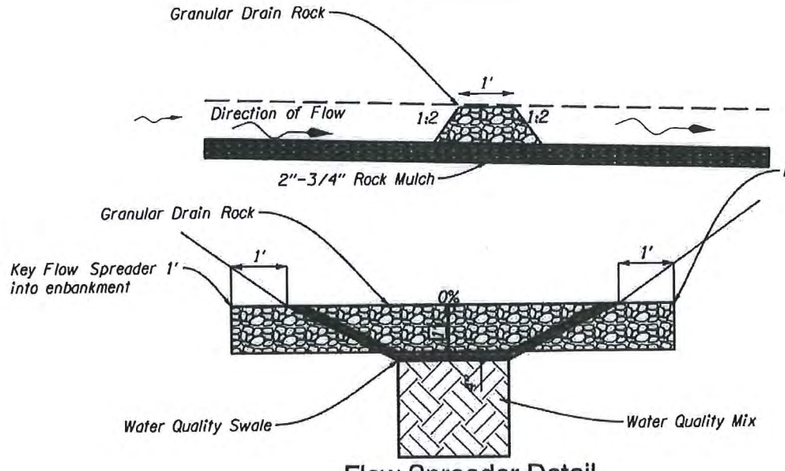
PLAN

"REVISED AS CONSTRUCTED"
PROJECT MANAGER
10.14.20
DATE



SECTION A-A

OUTFALL PROTECTION

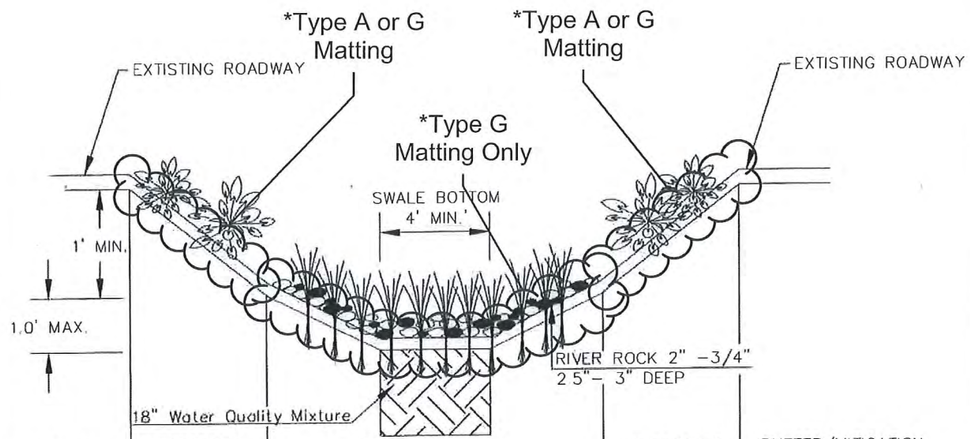


Flow Spreader Detail

WATER QUALITY SWALE

DRAWING NO. 700

REVISED 12-06



SWALE AREA	FREEBOARD AREA	TREATMENT AREA 8' MINIMUM WIDTH			FREEBOARD AREA	BUFFER/MITIGATION AREA
EC MATTING	ECONOJUTE*	COCONUT FIBER OR GEOJUTE PLUS*			ECONOJUTE*	ECONOJUTE* (S> 20%)
SEED MIX	LOW GROW MIX SEE NOTE #5	NONE			LOW GROW MIX SEE NOTE #5	AS APPROVED BY DISTRICT OR CITY
MAX. SLOPE	2.5:1	4:1	FLAT BOTTOM	4:1	2.5:1	NA

* OR AS APPROVED

NOTES:
1. REFER TO APPENDIX A, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS APPROVED BY CWS
3. JUTE MATTING- GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILIAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
4. 12-INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY TRACT
5. ~~FREEBOARD AREA SEED MIX, DWARF TALL FESCUE 40%, DWARF PERENIAL RYE 30%, CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.~~

* See Sheet FA01 for Seeding Mix requirements.

Clean Water Services
Our commitment is clear.

* 10/21/2019 POR Added detail for Clarity

REGISTERED PROFESSIONAL ENGINEER
88667
OREGON
MAY. 21, 2014
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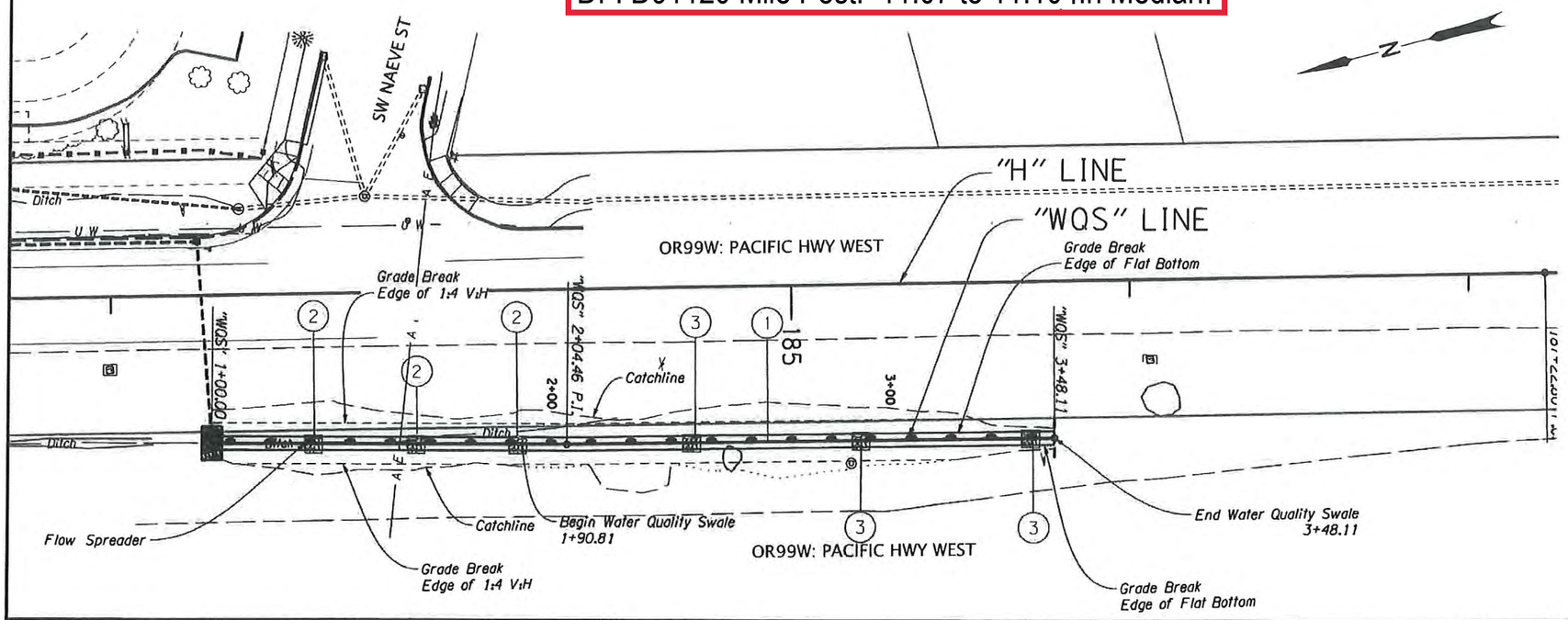
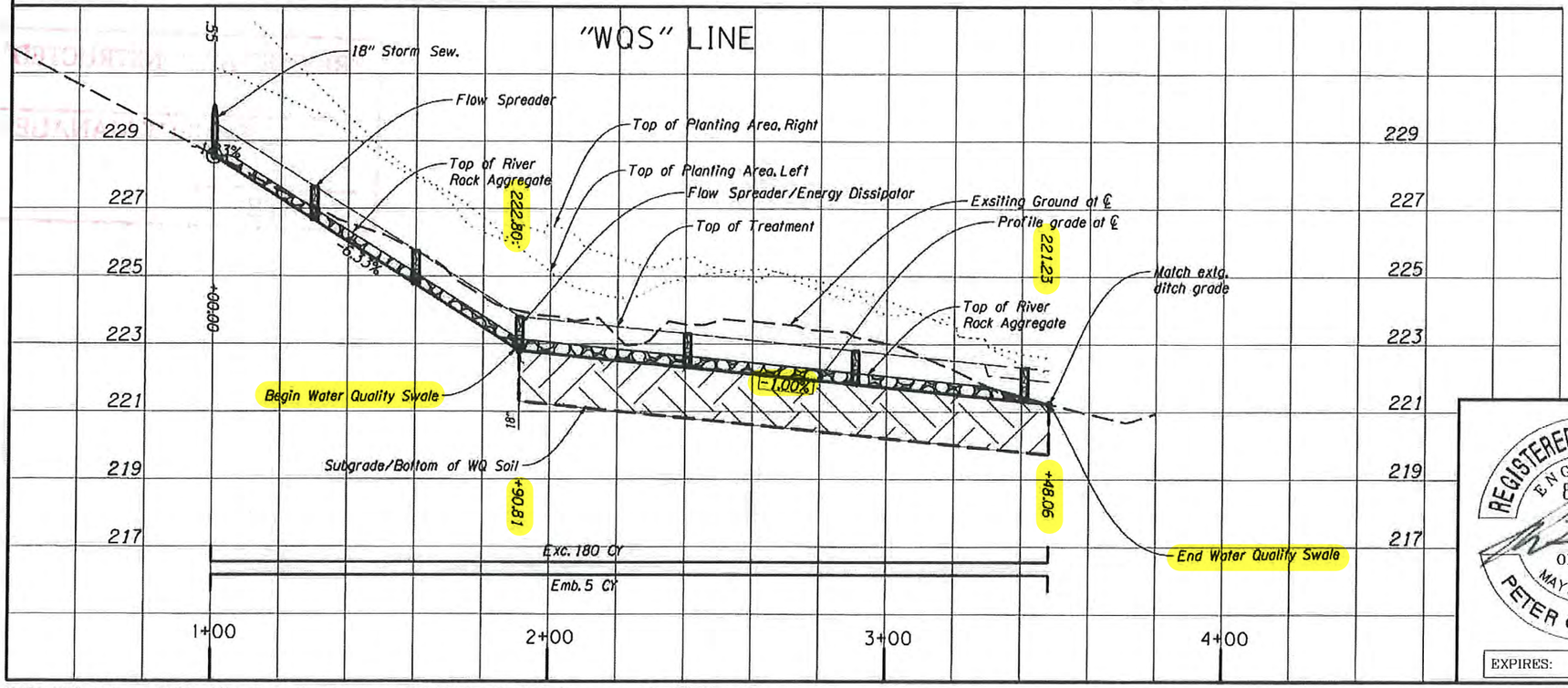
STORMWATER DETAILS

SHEET NO. HA01

51V-076

DFI D91120 Mile Post: 11.07 to 11.10 [In Median]





1) "WQS" STA 1+90.74 to 4+39.74
Install 4" 2" - 3/4" river rock
Install 18" Water Quality Mix
(For planting details, see Sht FA12)

2) Install flow spreader, +/-30' spacing - 3
(For details, see HA01)

3) Install flow spreader, +/-50' spacing - 3
(For details, see HA01)

"NOT REVISED AS CONSTRUCTED"
PROJECT MANAGER
10.14.20
DATE

LEGNED

Flow Spreader-Plan

Flow Spreader-Profile

General Notes:

1) All items shown are incidental to Water Quality Biofiltration Swale Bid Item.

2) Coordinate with Engineer for grading at begining and end of swale and around existing utilities.

3) All imported fill will be clean and free of debris.

REGISTERED PROFESSIONAL ENGINEER
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MAY. 21, 2014
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STORMWATER PLAN & PROFILE

SHEET NO. HA02