OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: July 2021

DFI No. D01332

Figure 1: DFI No. D01332, looking [note cardinal direction]

Identification

Drainage Facility ID (DFI):	D01332
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 54V-111
Location:	District: 1
	Highway No.: 009 (US101)
	Mile Post: 9.19 to 9.21, Lt.

1. Manual Purpose

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

2. Facility Location

The location map below details the facility location. The highway, mile posts, side streets, access location, and stormwater flow directions are noted on the map.

Facility location type: Roadway shoulder

Flow direction: West

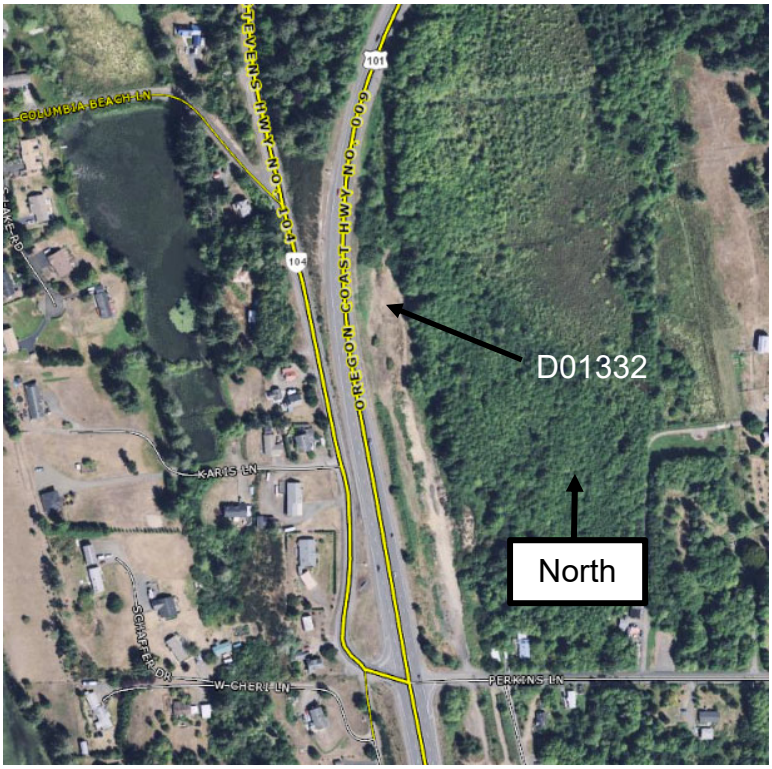


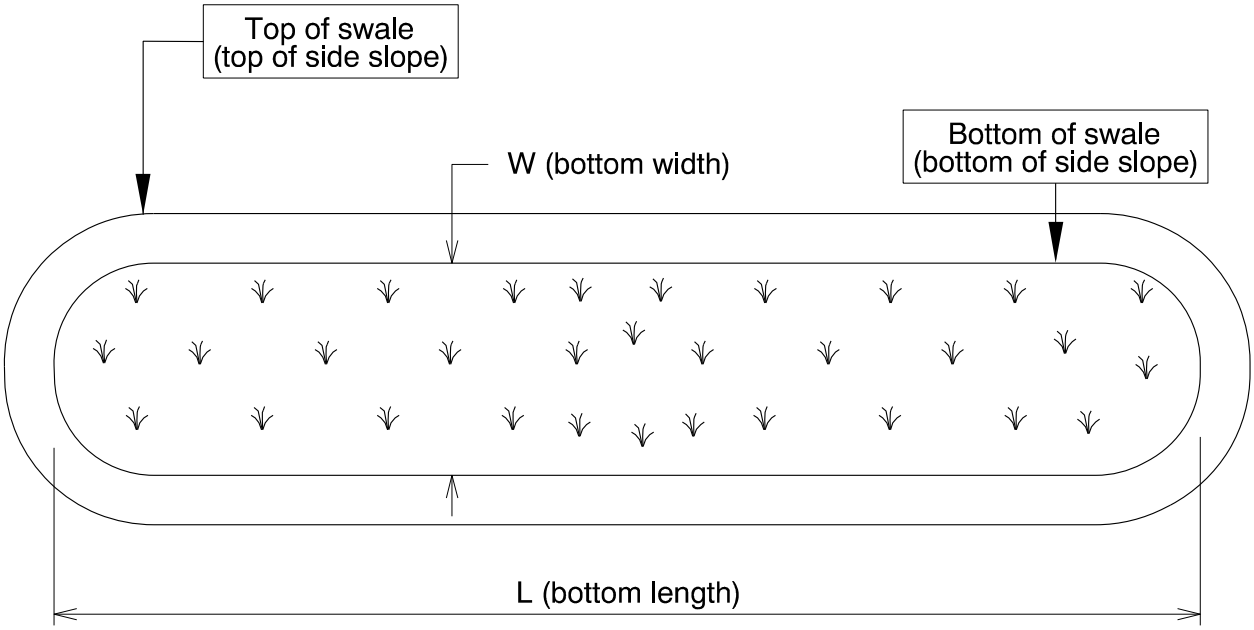
Figure 2: Facility location map

3. Facility Summary

The length and width of a swale is based on the bottom dimensions.

The bottom length and bottom width of the swale is:

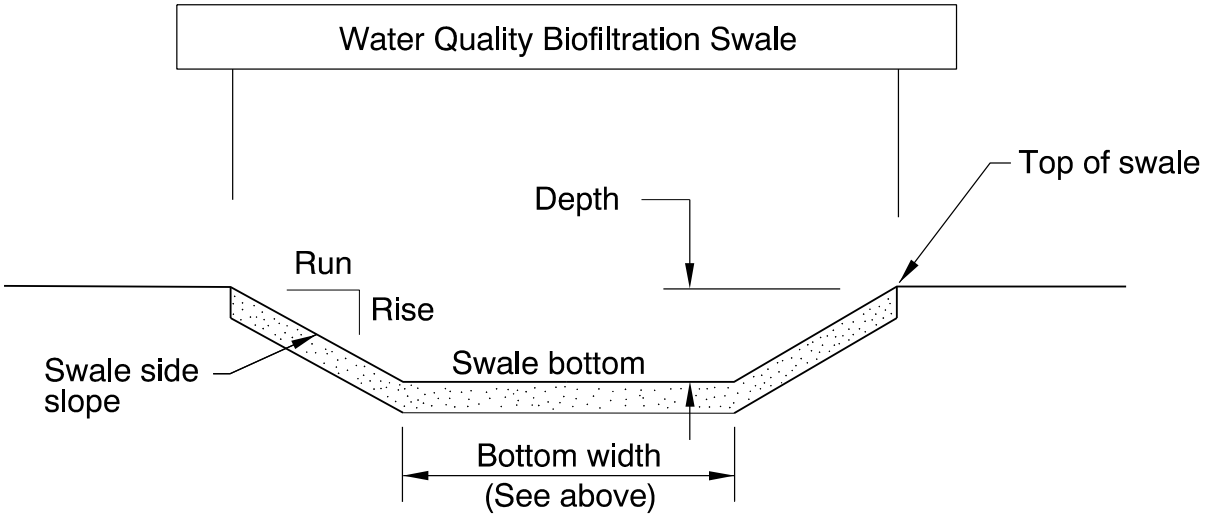
Bottom Length (feet)	Bottom Width (feet)
100	4



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)
Varies	**1**	**4**



Site Specific Information: The swale has a designed flat top 1' berms on each side then transitions at a 1:2 (Vertical: Horizontal) grade to match existing ground.

4. Facility Access

Maintenance access to the facility:

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

Figure 3: Access along the shoulder

5. Operational Components / Maintenance Items

Classification

This facility is classified as an:

☒ On-line Swale	☐ Off-line Swale
A swale that does not include a high flow bypass component; flow drains into and through the facility	A swale that treats low/small flows and diverts high flows using a bypass component

Bypass Component

This facility includes a high flow bypass component:

☒ No	☐ Yes
There is no bypass component. High flows drains into and through the facility	There is a bypass component. Only low/small flows drain into the swale. High flows are diverted around the swale using a bypass component

Operational Components

A swale has many components that assist with treatment, conveyance, and reducing flow velocity to minimize erosion. The components in use can vary depending if the facility was designed to operate on-line or off-line. The facility components table (**Table 1**) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an "x" (e.g. ☒).

The Standard Operation Manual for Water Quality Biofiltration Swales (implemented March 2017) outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.
https://gis.odot.state.or.us/TransGIS/

Operational Plan

The applicable standard operational plan for this facility is:

☒ Operational Plan A	☐ Operational Plan B	☐ Operational Plan C
An on-line swale with roadside ditches	An on-line swale with piped inlets and outlets	An off-line swale with a piped high flow bypass
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B, C) are provided in the Standard Operation Manual.		

See Appendix A for the site specific operational plan.

Maintenance Items

Operational components marked in **Table 1** should be inspected and maintained according to Section 7. Each facility component is defined and detailed in the Standard Operation Manual using the associated ID number indicated below.

Table 1: Swale Components		ID #
Manholes/Structures		
Pre-treatment manhole	☐	**S1**
Weir type flow splitter/flow splitter manhole	☐	**S2**
Orifice type flow splitter/flow splitter manhole	☐	**S3**
Standard manhole	☐	**S4**
Swale Inlet		
Pavement sheet flow	☒	**S5**
Inlet Pipe (s)	☐	**S6**
Open channel inlet	☒	**S7**
Riprap pad	☐	**S8**
Ground Cover		
Grass bottom	☒	**S9**
Grass side slopes	☒	**S10**
Granular drain rock	☐	**S11**
Plantings	☐	**S12**
Underground Components		
Geotextile fabric	☐	**S13**
Water quality mix	☒	**S14**
Perforated pipe	☐	**S15**
Porous pavers (access grid)	☐	**S16**
Flow Spreader		
Rock basin (used at inlet)	☐	**S17**
Anchored board (midpoint of swale or every 50 feet along swale bottom)	☐	**S18**
Other: Riprap flow spreader every 25’	☐	**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**

6. Maintenance

Maintenance Frequency/Maintain Records

a. Inspect annually. Preferably prior to the rainy season.
b. Clean and maintain as necessary. Refer to Activity 125 for conditions when maintenance is needed.
c. Keep a record of inspections, maintenance, and repairs.

Maintenance Guide/Maintenance Actions

The ODOT Routine Road Maintenance Water Quality and Habitat Guide (the *Blue Book*) outlines the standard maintenance actions for water quality facilities under Activity 125.

There are standard maintenance tables for standard ODOT designs. The maintenance tables describe the maintenance component, the defect or problem, the condition when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain ODOT swales:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 3 (Maintenance of Water Quality or Biofiltration Swales): Contains maintenance information for swales

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

7. Limitations

Access grid installed:

☒ No	☐ Yes
There are no porous pavers installed in this swale	

Swales are designed to allow equipment access along the bottom. If an access grid is **NOT** installed, vehicles entering the swale can create depressions (tire ruts), damage vegetation, and damage structural components (e.g. flow spreaders). These conditions may result in poor treatment and drainage performance.

Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the swale bottom.

8. Waste Material Handling

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

http://www.oregon.gov/ODOT/Maintenance/Documents/ems_manual.pdf

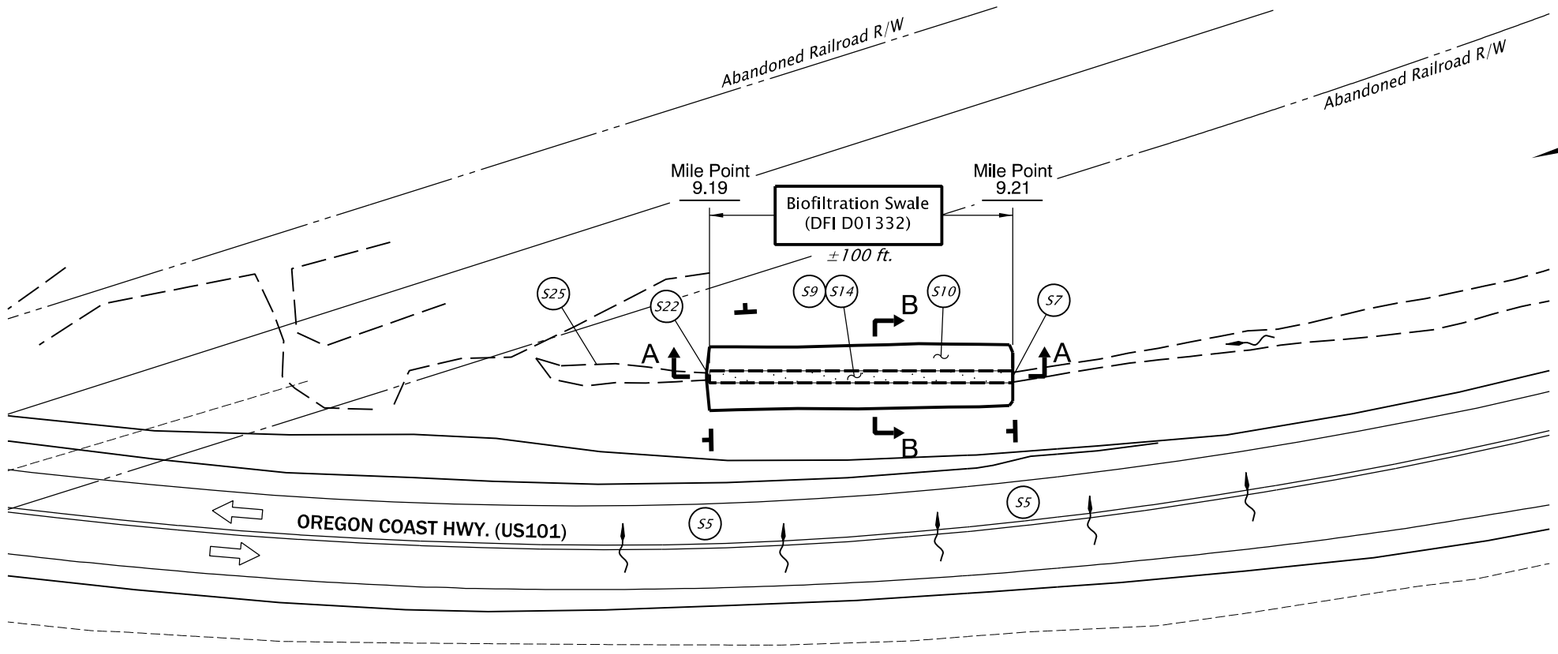
Contact any of the following for more detailed information about management of waste materials found on site:

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

A Appendix A – Site Specific Operational Plan

Contents:

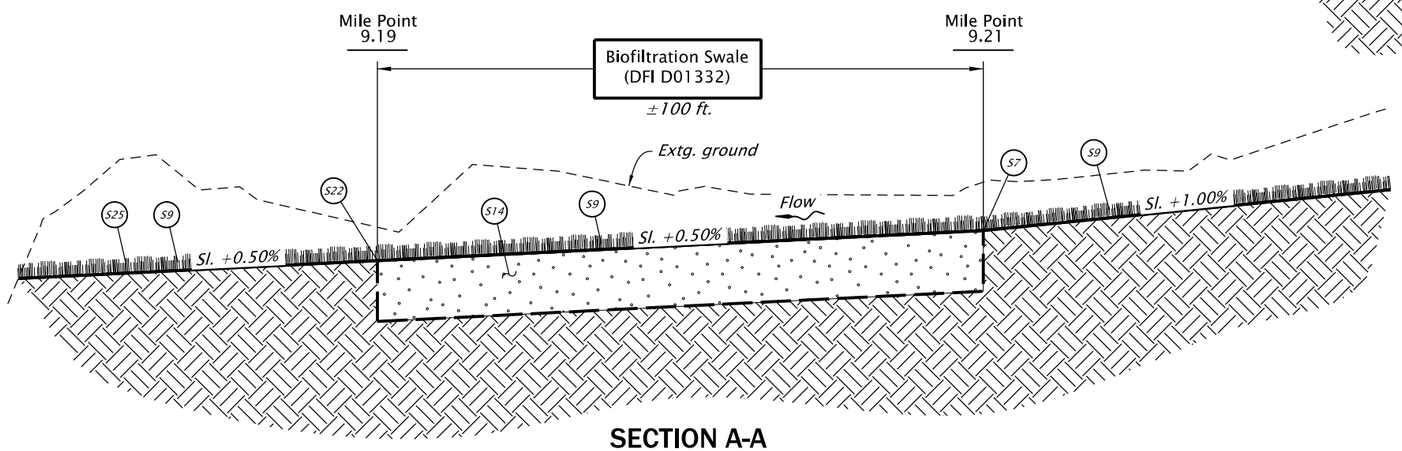
Operational Plan: DFI D01332



PLAN
Not to Scale

LEGEND:

- Photo Location / Direction
- S# — Facility component (see table 1 in O&M Manual)
- Storm facility boundry
- Storm facility bottom
- Pavement / facility flow path
- Traffic flow direction



SECTION A-A
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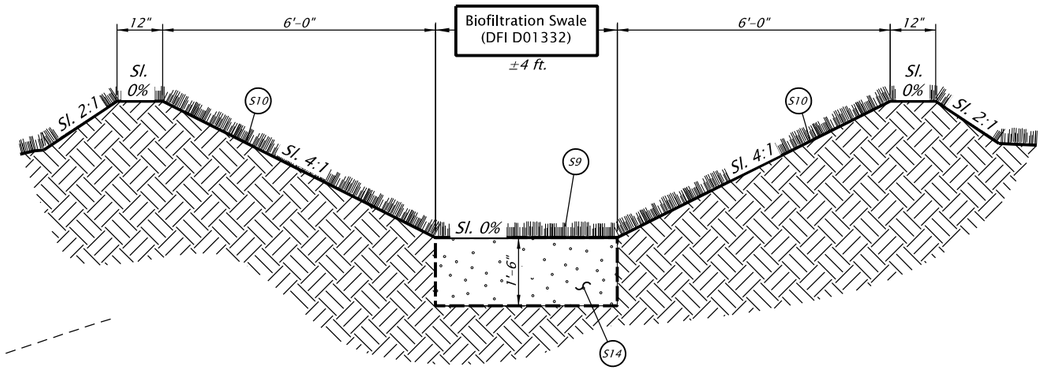


SECTION B-B
Not to Scale

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Ramiro Perez

Drafted By: Michael Skelton

DFI D01332
MAINTENANCE DISTRICT 1 HWY 9
WATER QUALITY BIOFILTRATION SWALE
OREGON COAST HWY MP 9.19
CLATSOP COUNTY

H_K20203_SwOMP_01 :: D01332 7/23/2021 1:06:28 PM hwye93l

Rotation: 254.2578° Scale: 1"=40'

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 54V-111

54V-111

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
A01	*Title Sheet*
A02	*Index Of Sheets Cont. & Std. Dwg. Nos.*

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

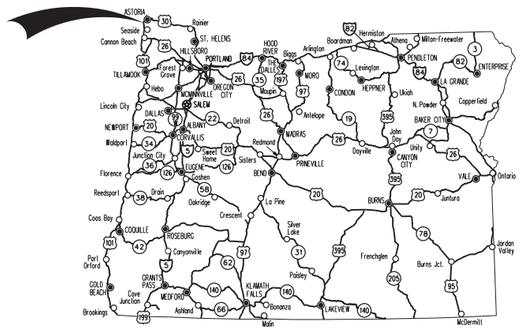
GRADING, DRAINAGE, PAVING, SIGNING & ILLUMINATION

US101 @ PERKINS LANE INTERSECTION IMPROVEMENTS PROJECT

OREGON COAST HIGHWAY

CLATSOP COUNTY

OCTOBER 2021

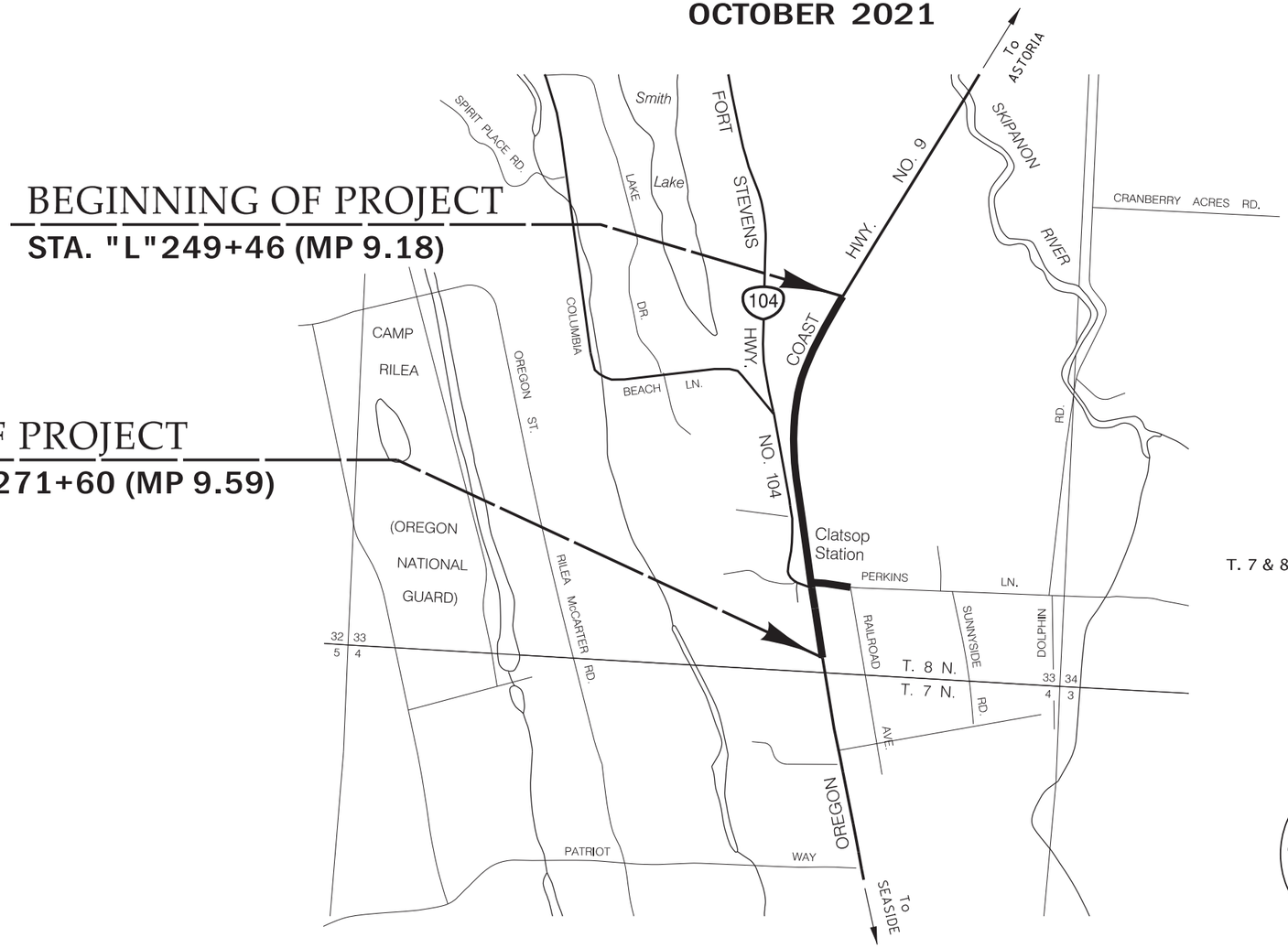


Overall Length Of Project - 0.41 Miles

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.)

BEGINNING OF PROJECT
STA. "L"249+46 (MP 9.18)

END OF PROJECT
STA. "L"271+60 (MP 9.59)



N

T. 7 & 8 N., R. 10 W., W.M.

OREGON TRANSPORTATION COMMISSION

Robert Van Brocklin	CHAIR
Alando Simpson	COMMISSIONER
Julie Brown	COMMISSIONER
Sharon Smith	COMMISSIONER
Vacant	COMMISSIONER
Kristopher W. Strickler	DIRECTOR OF TRANSPORTATION

These plans were developed using ODOT design standards. Exceptions to these standards, if any, have been submitted and approved by the ODOT Chief Engineer or their delegated authority.

Approving Authority: CAROL A. CARTWRIGHT Aug 23 2021 7:36 AM
Signature & date

Carol A. Cartwright-R2 Tech Center Manager
Print name and title

Steven B Cooley Aug 26 2021 8:38 AM
Concurrence by ODOT Chief Engineer

US101 @ PERKINS LANE INTERSECTION IMPROVEMENTS PROJECT
OREGON COAST HIGHWAY
CLATSOP COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	S009(504)	A01

PE002961 000

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FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

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54V-111

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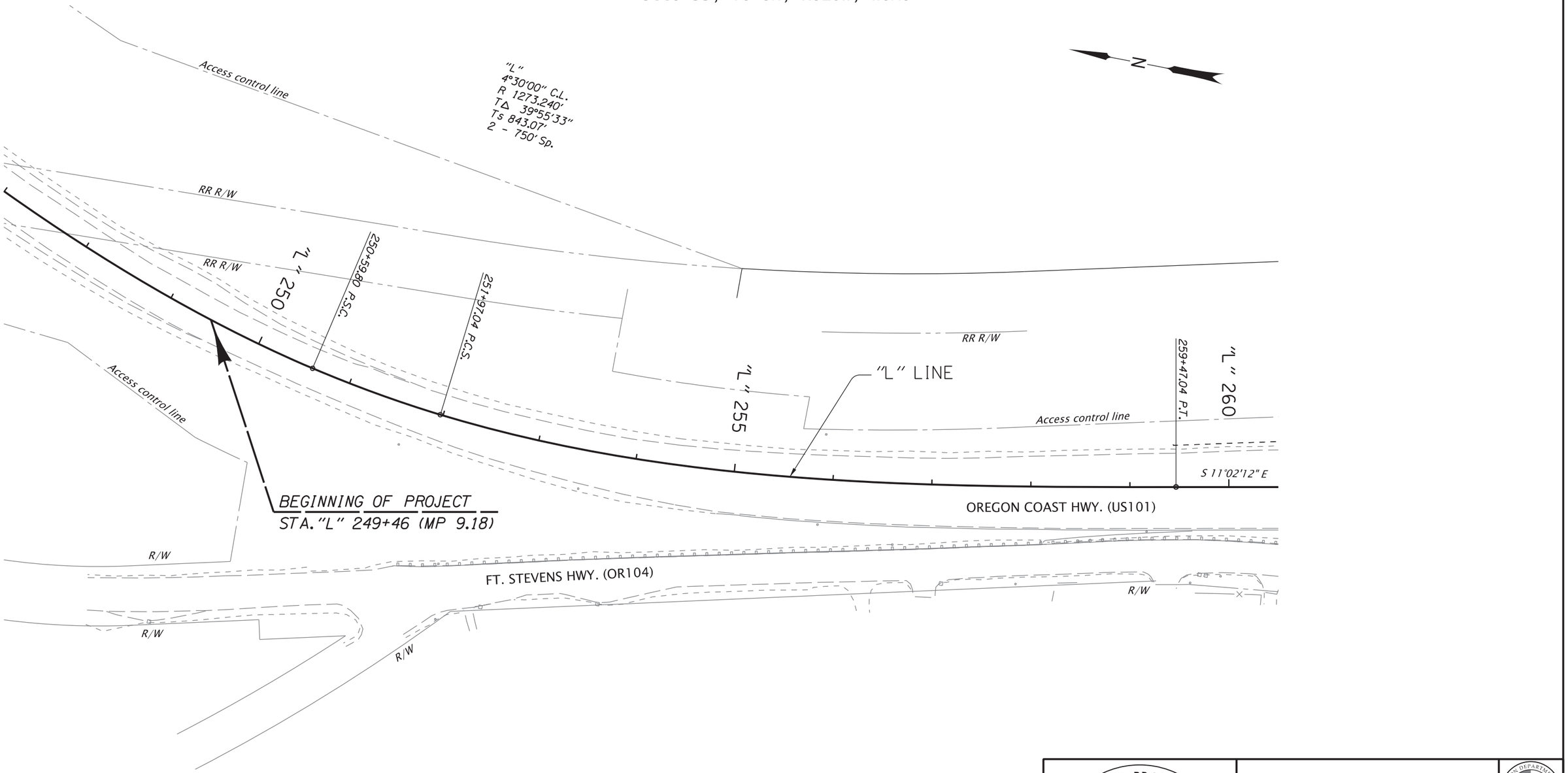

REGISTERED PROFESSIONAL ENGINEER
85185PE
Digitally Signed Aug 12 2021 4:51 PM
OREGON
NOV. 13, 2018
NICOLAS DAVID THRASHER
RENEWS: 06-30-2022

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

US101 @ PERKINS LANE INTERSECTION IMPROVEMENTS PROJECT
OREGON COAST HIGHWAY
CLATSOP COUNTY

Designer: Nicolas Thrasher
Reviewer: Calvin Larwood
Drafter: Greg Malin
Checker: N/A

ALIGNMENT

SHEET NO. C01

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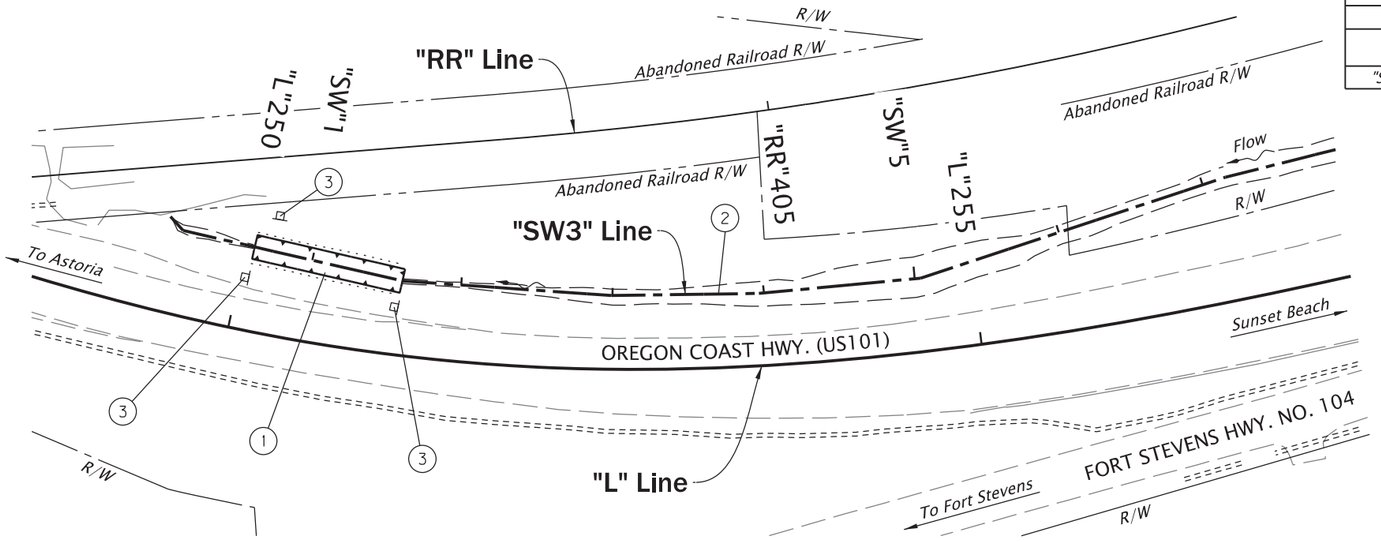
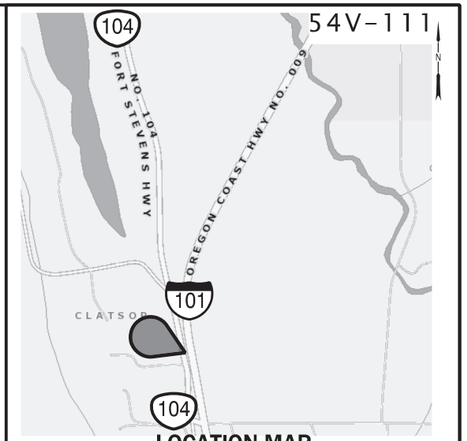


PLAN

FACILITY ID MARKER TABLE						
Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	MP		Begin	End	Red	Green
"SW3" 00+61.00	9.19	D01332	✓	✓	✓	

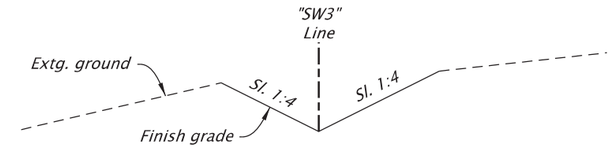
✓ Check where appropriate
Red = Beginning of facility
Green = End of facility



LOCATION MAP
SEC. 28, T08N, R10W, WM
LAT. 46.1301, LONG. -123.9284

N

1. Sta. "SW3"00+61.00 to Sta. "SW3"1+61.00
   Const. Water Quality Biofiltration Swale
   DFI no. 01332
   General excavation – 30 cu. yd.
   Water Quality Soil Mix – 30 cu. yd.
2. Sta. "SW3" 0+01.75 to Sta. "SW3" 0+61.00
   Sta. "SW3" 1+61.00 to Sta. "SW3" 14+48.84
   Const. Ditch
   Ditch Excavation – 1900 cu. yd.
3. Inst. stormwater facility markers
   (See dwg. RD399)



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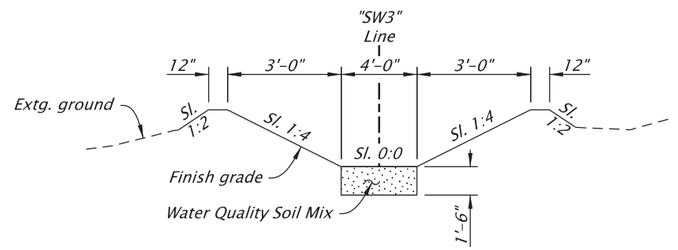
STA. "SW3" 1+61.00 to STA. "SW3" 14+48.84



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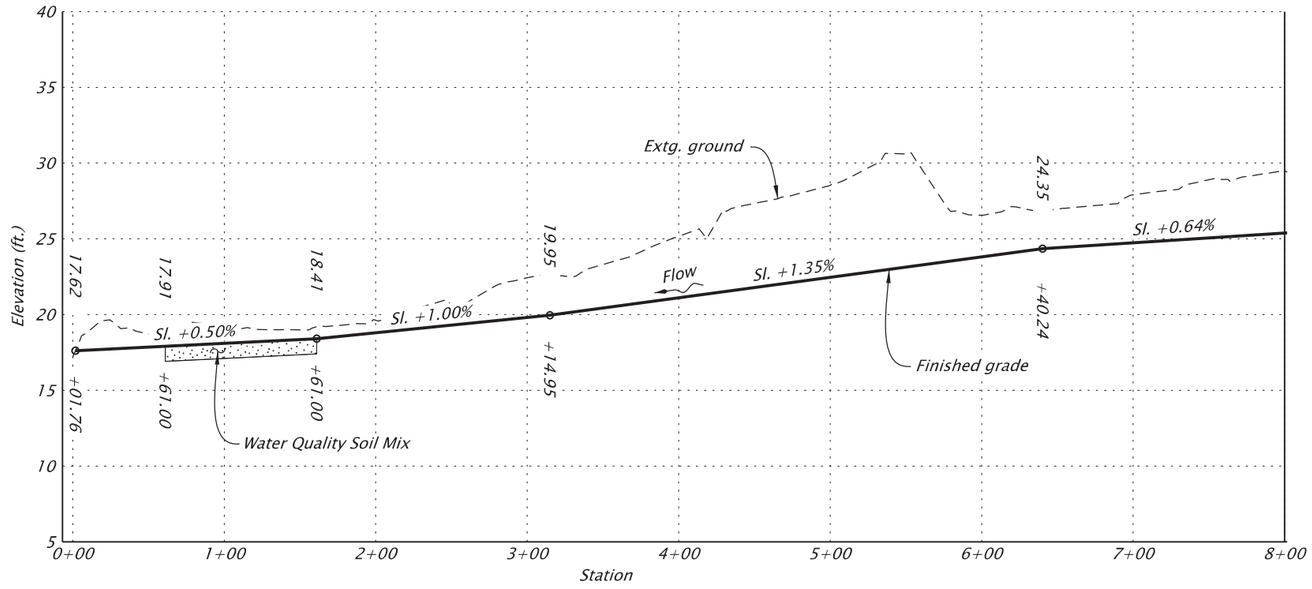


PROFILE ALONG "SW3" LINE
Scale Horz.: 1"=100'
Scale Vert.: 1"=10'

NOTE:
Elevations shown are based on
North American Vertical Datum 1988 (NAVD88).

Note:
Slopes are shown as Vertical to Horizontal.

HWY: 009
M.P.: 9.19-9.48
UNIT FILE CODE
N/A
DFI/TSSU NO.
01332

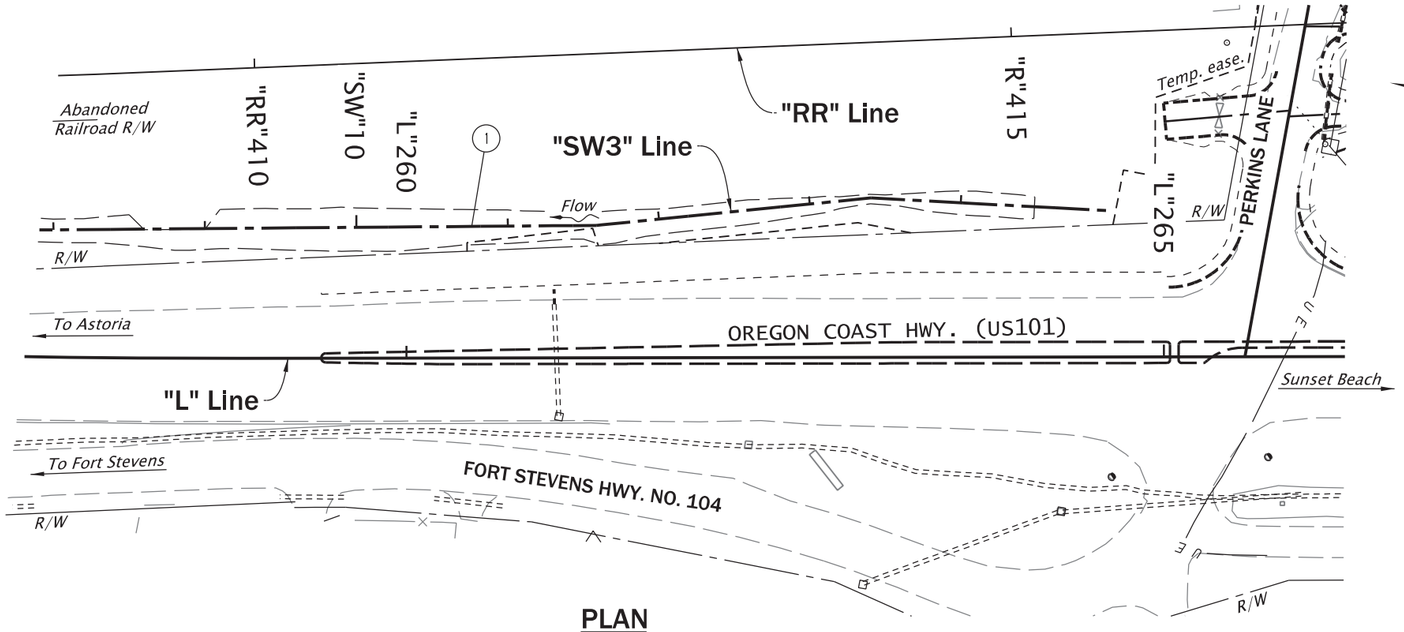
REGISTERED PROFESSIONAL ENGINEER
94,880
Digitally Signed Aug 19 2021 10:46 AM
OREGON
MAY 14, 2019
RAMIRO PEREZ
RENEWS: 12-31-2022
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

US101 @ PERKINS LANE INTERSECTION IMPROVEMENTS PROJECT
OREGON COAST HIGHWAY
CLATSOP COUNTY

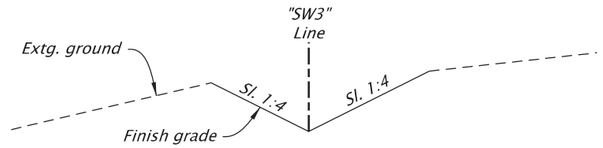
Designer: Ramiro Perez
Reviewer: Chris Carman
Drafter: Michael Skelton
Checker: N/A

STORMWATER PLAN
SHEET NO. HA01



PLAN

① Sta. "SW3" 0+01.75 to Sta. "SW3" 0+61.00
Sta. "SW3" 1+61.00 to Sta. "SW3" 14+48.84
Const. Ditch
Ditch Excavation - 1900 cu. yd.



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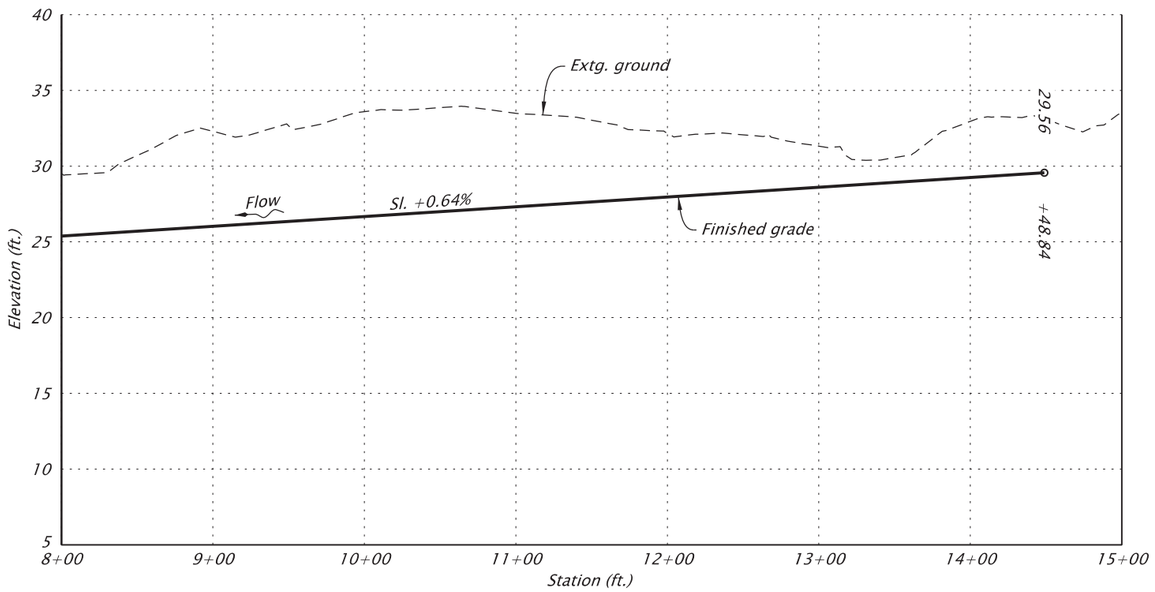
STA. "SW3" 1+61.00 to STA."SW3" 14+48.84



PROFILE ALONG "SW3" LINE
HORIZ. SCALE: 1":100'
VERT. SCALE: 1":10'

NOTE:
Elevations shown are based on
North American Vertical Datum 1988 (NAVD88).

Note:
Slopes are shown as Vertical to Horizontal.

REGISTERED PROFESSIONAL ENGINEER
94,880
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OREGON
MAY 14, 2019
RAMIRO PEREZ
RENEWS: 12-31-2022

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OREGON COAST HIGHWAY
CLATSOP COUNTY

Designer: Ramiro Perez | Reviewer: Chris Carman
Drafter: Michael Skelton | Checker: N/A

STORMWATER PLAN | SHEET NO. HA02