# OPERATION & MAINTENANCE MANUAL

# Water Quality Biofiltration Swale

**Manual prepared: August 2019**

**DFI No. D00930**


**Figure 1: DFI No. D00930, looking North**

**Identification**

| | |
|---|---|
| Drainage Facility ID (DFI): | D00930 |
| Facility Type: | Water Quality Biofiltration Swale |
| Construction Drawings: | (V-File Numbers) 49V-060 |
| Location: | District: 1 |
| | Highway No.: 009 |
| | Mile Post: 65.64 to 65.67, Left |

## 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

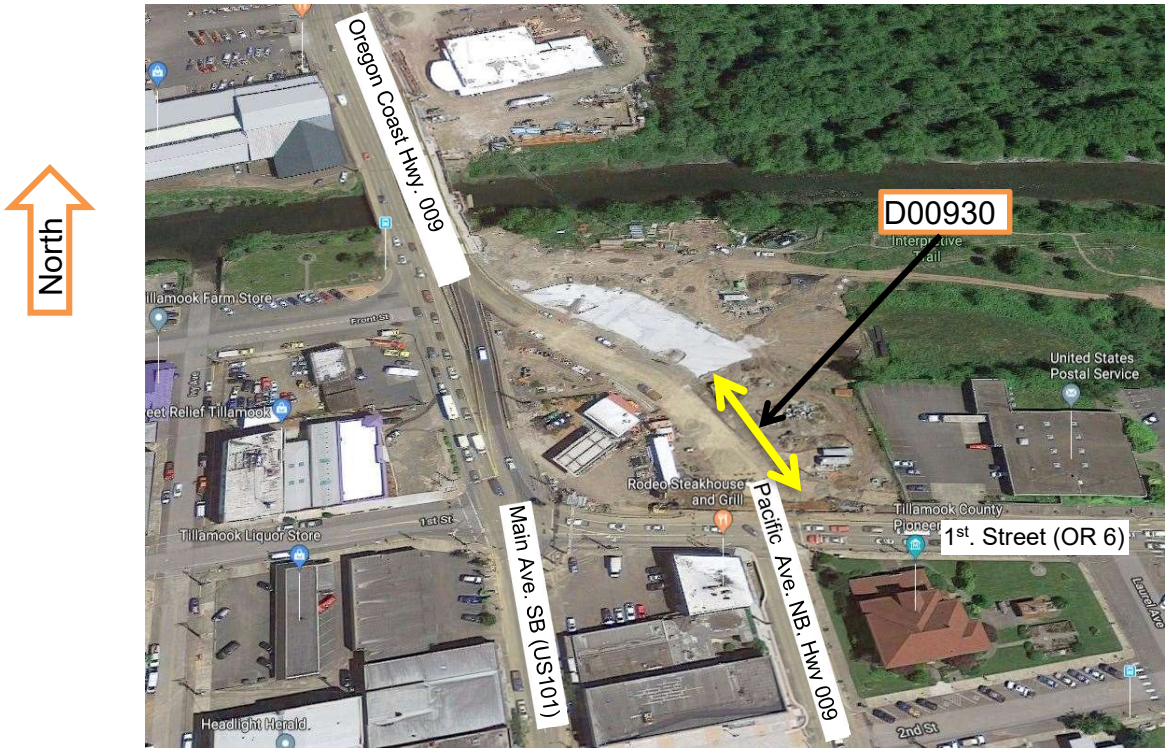


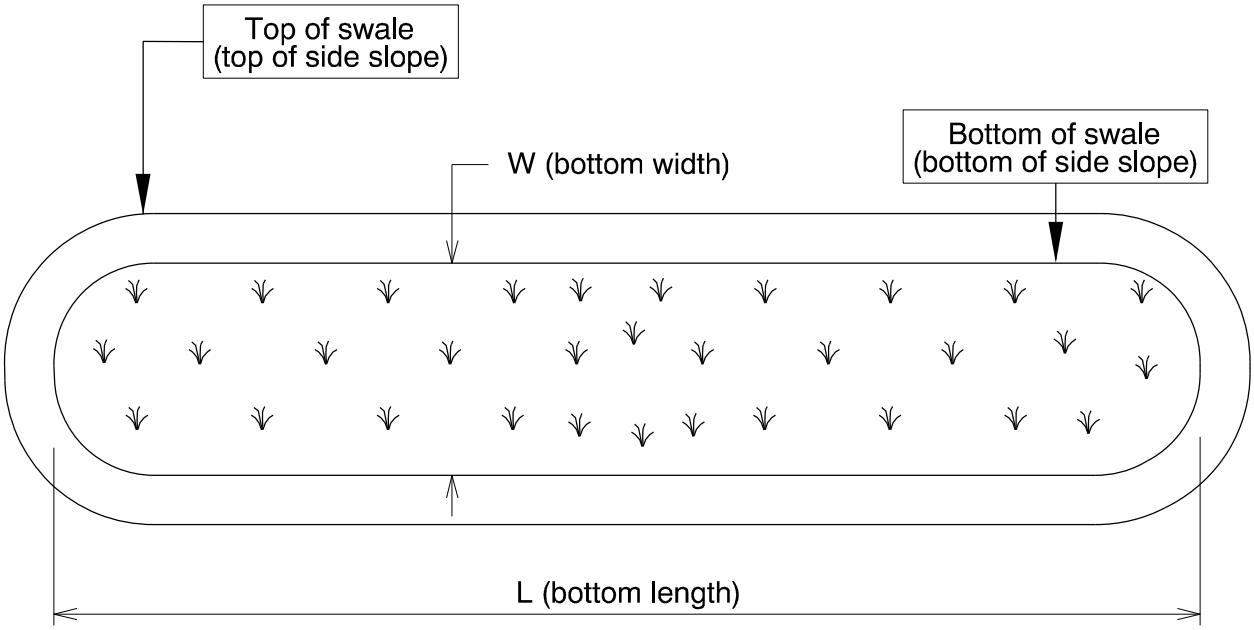

**Figure 2: Facility location map**

## 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:

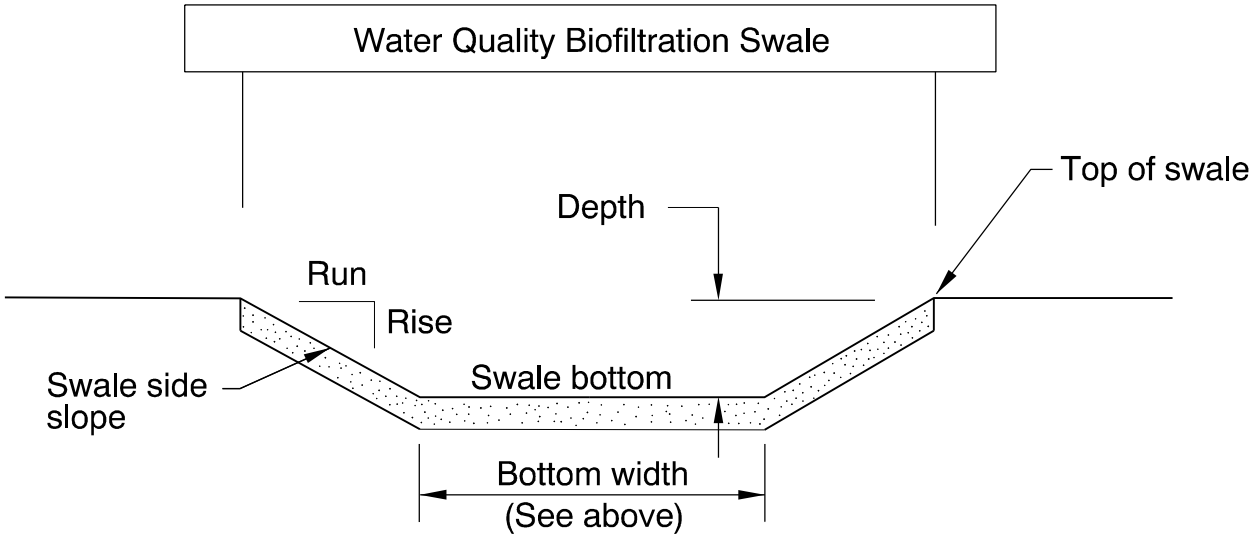
| Bottom Length (feet) | Bottom Width (feet) |
|---|---|
| 272 | 4 |



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) |
|---|---|---|
| 7 | 1 | 4 |




**Site Specific Information:**

The facility is operated as an on-line swale with piped inlets and outlets. The swale contains multiple 12-inch PVC pipes placed at the riprap pad locations to connect the existing inlets, flow spreader boards distributed along the facility and impermeable liner lines the bottom and walls of the planter box. Water enters the facility from the south and exits on the east end of the swale before entering the storm drain system again.

The stormwater then flows to the facility from the storm drain system through a manhole and then into a 12- inch diameter of a PVC storm drain pipe. After the water enters the swale, it flows into a riprap pad through a perforated pipe. The treated stormwater is collected through a catch basin and exits the swale through a storm drain pipe which directs the water into the existing stormwater conveyance system.

## 4. Facility Access

Maintenance access to the facility:

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


**Figure 3: D00930, Looking Southeast**

## 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: describe type | ☐ | **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**<br>☐ **L**<br>☐ **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 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

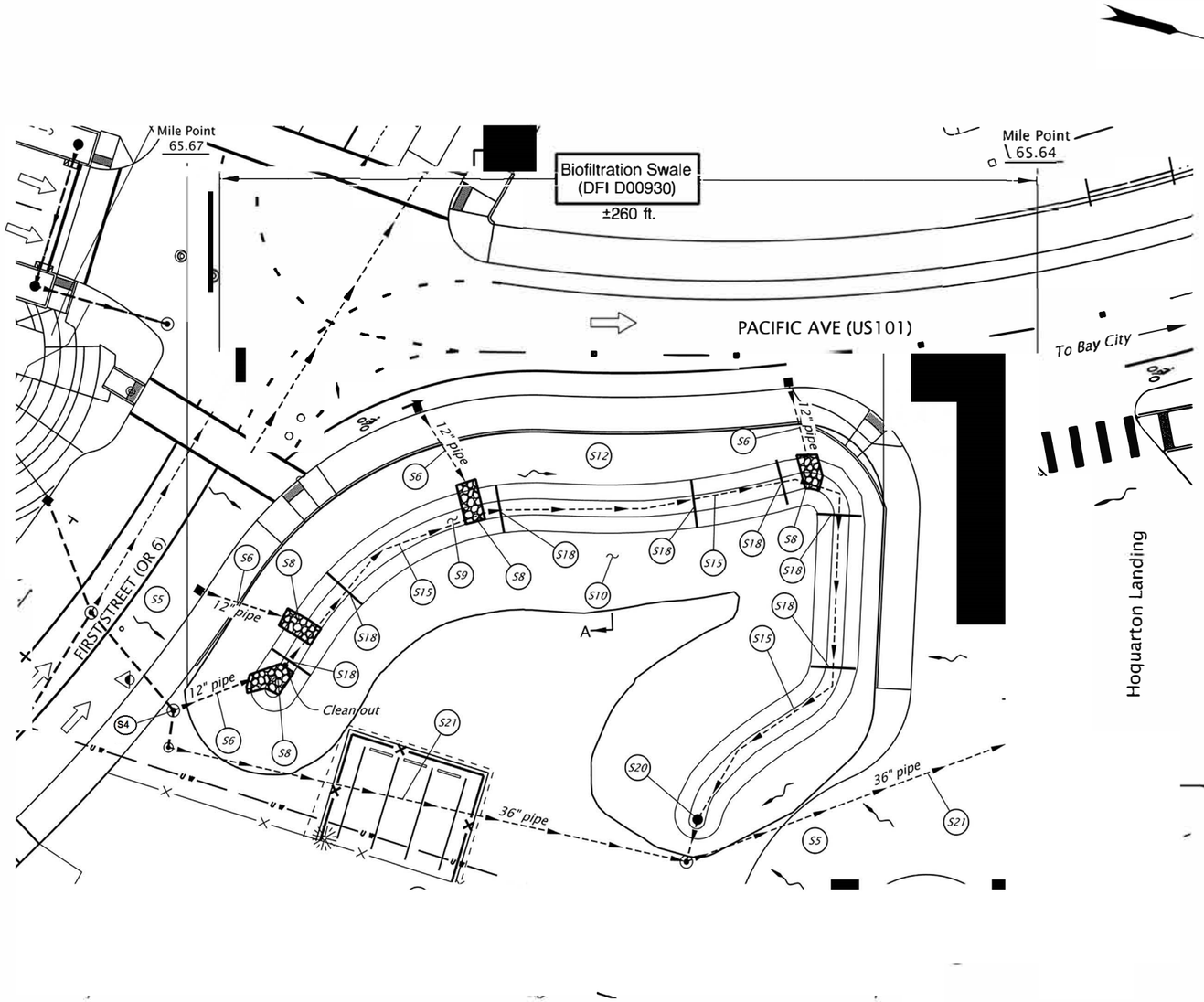
Contact any of the following for more detailed information about management of waste materials found on site:

| | |
|---|---|
| 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:

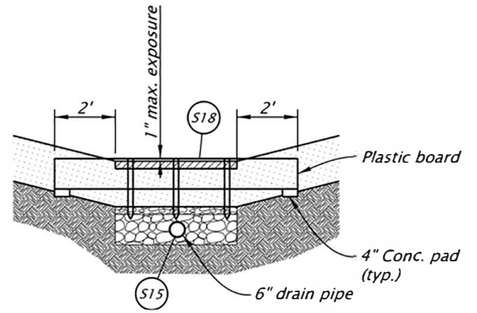
**Operational Plan: DFI D00930**



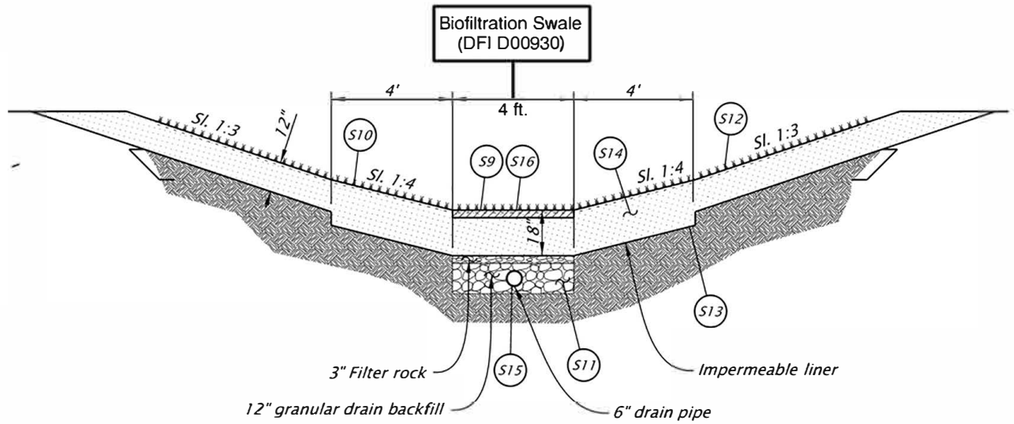

PLAN
N.T.S.

LEGEND:

- Photo Location / Direction
- S# Facility Component (see table 1 in O&M Manual)
- Manhole
- Bioretention Point Outlet
- Storm Pipe (Facility)
- Storm Pipe (Facility)
- Conveyance Direction
- Pavement/Facility Flow Path
- Traffic Flow Direction




FLOW SPREADER DETAIL
N.T.S.




SECTION A-A
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Chris Carman

Drafted By: Michael Skelton

**DFI D00930**
**MAINTENANCE DISTRICT 1 HWY 009**
**BIOFILTRATION SWALE**
OREGON COAST HWY MP 65.64 - 65.67
TILLAMOOK COUNTY

D00930_Swale.dgn :: D00930_SHEET 9/17/2019 1:07:50 PM hwye31g

Rotation: 104.8869° Scale: 1"=30'

# A Appendix A – Site Specific Operational Plan

## Contents:

**Operational Plan: DFI D00930**

49V-060

| INDEX OF SHEETS | |
|---|---|
| SHEET NO. | DESCRIPTION |
| 1 | Title Sheet |
| 1A, 1A-2 | Index Of Sheets Cont. |
| 1A-3 | Std. Drg. Nos. |
| 1A-5 | Index of Sheets Cont. |
| 1B | Plan Sheet Layout |

STATE OF OREGON

# DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

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

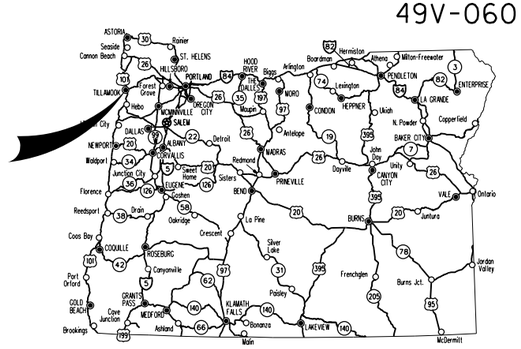
# US101 @ OR6 (TILLAMOOK) SEC.

## OREGON COAST HWY. & WILSON RIVER HWY.

### TILLAMOOK COUNTY

### MAY 2016

REVISED AS CONSTRUCTED
4/19/19 CONTRACT C14902
PROJ. MGR. Ian Machan




Overall Length Of Project - 0.4 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

**STA. "L" 412+03.00 (M.P. 65.41)**

**END OF PROJECT**
**JTA-S009(473)**
**STA. "WR" 17+62.63 (M.P. 9.07)**

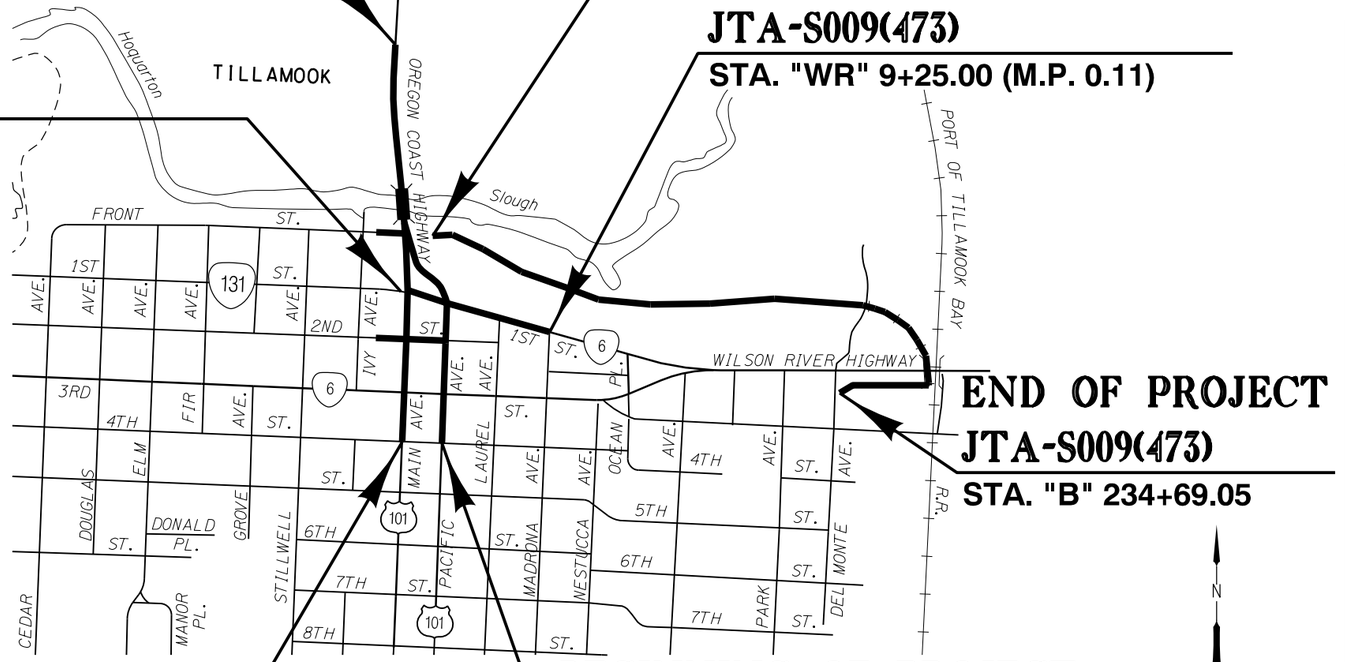
**BEGINNING OF PROJECT**
**JTA-S009(473)**
**STA. "M" 191+93.00 (M.P. 65.78)**

**BEGINNING OF PROJECT**
**JTA-S009(473)**
**STA. "B" 200+00.00**

**BEGINNING OF PROJECT**
**JTA-S009(473)**
**STA. "WR" 9+25.00 (M.P. 0.11)**

**END OF PROJECT**
**JTA-S009(473)**
**STA. "B" 234+69.05**

**BEGINNING OF PROJECT**
**JTA-S009(473)**
**STA. "P" 192+68.00 (M.P. 65.81)**




T. 1 S., R. 9 W., W.M.

OREGON TRANSPORTATION COMMISSION

| | |
|---|---|
| Tammy Baney | CHAIR |
| David Lohman | COMMISSIONER |
| Susan Morgan | COMMISSIONER |
| Alando Simpson | COMMISSIONER |
| Sean O'Hollaren | COMMISSIONER |
| Matthew L. Garrett | DIRECTOR OF TRANSPORTATION |

PLANS PREPAIRED FOR
OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

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: _____
Signature & date

Jeff W. Olson, Principal
Print name and title

_____
Concurrence by ODOT Chief Engineer

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

| FEDERAL HIGHWAY ADMINISTRATION | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| OREGON DIVISION | JTA-S009(473) | 1 |

Sec. 30, T. 1 S., R. 9 W., W.M.
TILLAMOOK

REVISED AS CONSTRUCTED
4/19/19 CONTRACT C14902

49V-060

"P" 199+00
"WR" LINE
(For profile, see sht. 10G)
SEE SHEET 5 MATCH LINE
"L1" 401+00
"L1" LINE
(For profile, see sht. 10F)
"L1" 400+00
"L1" 398+61.15 P.C.
1ST ST. (OR6)
N. 74°41'57" W.
R/W
Permanent Easement
"L1" 16°00'00" C.L.
Δ 48°39'45"
L 304.14'
T 161.92'
e 2.00%
"L1" 400+43.79 P.O.C. = "H" 10+00.00 P.O.B.
"H" 10+00
N. 58°45'14" E.
PACIFIC AVE.
SEE SHEET 5 MATCH LINE
"L1" 401+71.29 P.R.C.
S. 83°28'14" W.
"H1" LINE
"H1" 11+00
N. 38°26'54" W.
"H1" 10+00
"H1" 12+00
"H1" 12+02.02 P.T.
Perm. Easement
"H1" 133°14'46" C.L.
(R = 43')
Δ 58°04'52"
L 43.59'
T 23.88'
"B" 200+00
N. 53°48'17" E.
"B" 99°59'33" C.L.
(R = 57.3')
Δ 64°06'36"
L 64.12'
T 35.88'
e 1.5%
"B" 200+00.00 P.O.B.
"B" 200+01.68 P.C.
"B" 200+65.80 P.T.
S. 62°05'07" E.
"B" 200+78.91 P.C.
"B" 201+00
"B" 8°00'00" C.L.
Δ 8°47'22"
L 109.87'
T 55.04'
e 1.5%
"B" LINE
(For profile, see sht. 10G)
"P" LINE
(For profile, see shts. 9D & 9E)
"WR" 15+00
N. 2°25'31" W.
N. 2°29'37" W.
"L1" 398+78.61 P.O.C. = "WR" 14+73.65 P.O.T.
"P" 200+10.33 P.O.E. = "WR" 14+60.03 P.O.T.
"WR" 14+16.09 P.T.
"WR" 14+00
MATCH LINE SEE SHEET 11
"H" 10+40.11 P.C.
"H" 28°38'52" C.R.
Δ 25°11'58"
L 87.96'
T 44.70'
"H" 11+00
"H" 11+28.08 P.T.
HOQUARTON LANDING
"H" 10+85.88 P.C. = "H1" 10+00.00 P.O.B.
"H" LINE
N. 83°57'12" E.
"H" 12+00
S. 70°52'29" E.
MATCH LINE SEE SHEET 12

OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
May 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2018

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Design Team Leader - Russell W. Norton
Designed By - Russell W. Norton
Drafted By - Patrick Kenney

**ALIGNMENT**

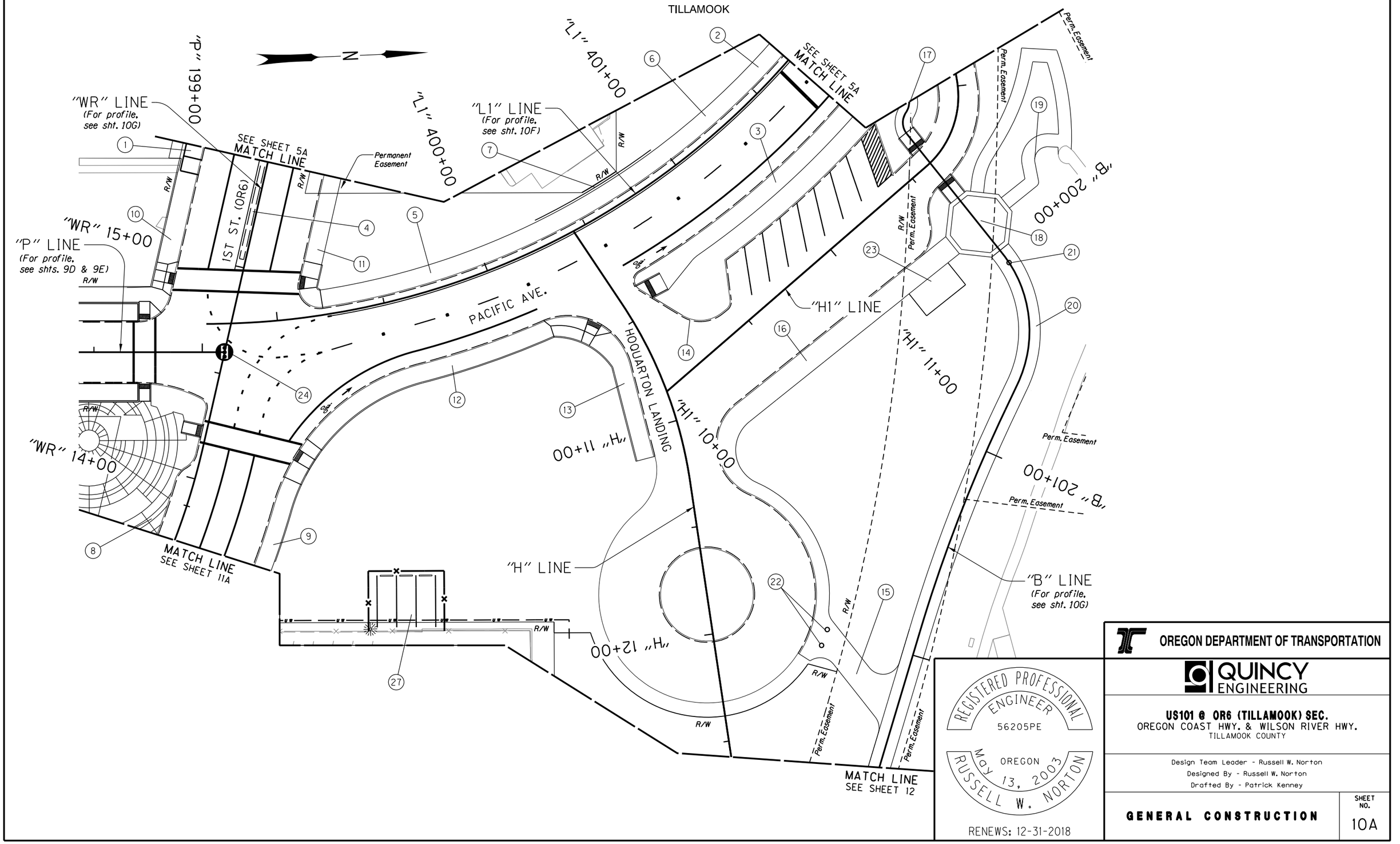
SHEET NO. 10

Sec. 30, T. 1 S., R. 9 W., W.M.

TILLAMOOK

REVISED AS CONSTRUCTED
4/19/19 CONTRACT C14902

49V-060




OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
May 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2018

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Design Team Leader - Russell W. Norton
Designed By - Russell W. Norton
Drafted By - Patrick Kenney

**GENERAL CONSTRUCTION**

SHEET NO. 10A

(1) See sht. 5B, note 4
Const. 24" curb and gutter
Const. P.C. conc. dwy., reinf., option (G)

(2) See sht. 5B, note 16
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", square score pattern

(3) See sht. 5B, note 17
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", square score pattern
Const. sidewalk ramp, parallel
Const. sidewalk ramp, perpendicular

(4) See sht. 5B, note 30
Const. type "C" traffic separator, 16"

(5) Sta. "L1" 399+21.63 to Sta. "L1" 401+00.00, Lt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", square score pattern
1,442 sq. ft.

(6) Sta. "L1" 401+00 to Sta. "L1" 401+50.00, Lt.
Const. 24" mountable curb and gutter
Const. P.C. conc. walk, 4", square score pattern
391 sq. ft.

(7) Structure no. 22462
Sta. "L1" 400+30 to Sta. "L1" 400+95, Lt.
Const. retaining wall A

(8) Sta. "WR" 13+03.87 to Sta. "WR" 14+39.31, Lt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", radial score pattern
3,207 sq. ft.
(For details, see GN shts.)
Const. sidewalk ramp, perpendicular (Option A) - 2

(9) Sta. "WR" 13+24.38 to Sta. "WR" 14+29.36, Rt.
Const. std. curb, modified
Const. 24" curb and gutter
Const. P.C. conc. walk, 4" - 918 sq. ft.
Const. sidewalk ramp, combination (Option I)

(10) Sta. "WR" 14+64.93 to Sta. "WR" 15+37.16, Lt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", square score pattern
669 sq. ft.
Const. sidewalk ramp, combination (Option I)
Const. sidewalk ramp, perp. (Single flare)

(11) Sta. "WR" 14+89.83 to Sta. "WR" 15+52.68, Rt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", square score pattern
512 sq. ft.
Const. sidewalk ramp, diagonal parallel (Option K)

(12) Sta. "L1" 399+07.22 to Sta. "L1" 400+37.50, Rt.
Const. std. curb, modified
Const. 24" curb and gutter
Const. P.C. conc. walk, 4", square score pattern
1,202 sq. ft.
Const. sidewalk ramp, combination (Option I)

(13) Sta. "H" 10+47.89 to Sta. "H" 11+14.00, Rt.
Const. std. curb, modified
Const. P.C. conc. walk, 4" - 485 sq. ft.

(14) Sta. "H1" 10+23.10 to Sta. "H1" 11+56.71, Lt.
Const. 24" curb and gutter

(15) Sta. "H" 12+00.00 to Sta. "H" 12+14.58, Lt.
Const. 24" curb and gutter
Const. 24" mountable curb and gutter - 25'
Const. P.C. conc. walk, 6" - 1,523 sq. ft.

(16) Sta. "H" 12+00.00 to Sta. "H1" 11+55.91, Rt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4" - 1,241 sq. ft.

(17) Sta. "H1" 11+56.71 to Sta. "H1" 12+21.91, Lt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4" - 309 sq. ft.
Const. sidewalk ramp, perpendicular

(18) Sta. "H1" 11+43.68 to Sta. "H1" 11+67.97, Rt.
Const. 24" curb and gutter
Const. P.C. conc. walk, 4" - 77 sq. ft.
Const. sidewalk ramp, perpendicular
Const. 4" conc. surfacing - 763 sq. ft.
(For details, see GN shts.)

(19) Sta. "H1" 11+63.70 to Sta. "H1" 12+12.70, Rt.
Const. P.C. conc. walk, 4" - 919 sq. ft.
Const. conc. stairs - 2.3 cu. yd.
(See drg. no. RD120)

(20) Sta. "B" 200+00.00 to Sta. "B" 234+65.69
Const. shared-use path - 10' width
(For details, see sht. 2A-15)

(21) Sta. "B" 200+07.00
Inst. removable bollard no. 1
(For details, see GN shts.)

(22) Sta. "H" 12+05.80 to Sta. "H" 12+12.64, Lt.
Inst. removable bollard no. 1 - 2
(For details, see GN shts.)

(23) Sta. "H1" 11+14.00 to Sta. "H1" 11+37.00, Rt.
Const. conc. bus shelter pad
(For details, see sht. 2B-22)

(24) Inst. traffic signal
(For drg. nos. see sht. 1-A)

(27) Const. ACP parking pad - approx. 1,073 sq. ft.
Inst. parking bumpers - 3
Inst. CL-8 chain-link fence
w/ 3 strands barbed wire - 93'±
(See sht. 2B-27 for details)

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
May 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2018

OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Design Team Leader - Russell W. Norton
Designed By - Russell W. Norton
Drafted By - Patrick Kenney

**CONSTRUCTION NOTES**

SHEET NO. 10B

Sec. 30, T. 1 S., R. 9 W., W.M.

REVISED AS CONSTRUCTED
4/19/19 CONTRACT 14902

49V-060

TILLAMOOK

"OUTFALL" LINE
(For drainage profile, see sht. 10K)

"L1" LINE
(For profile, see sht. 10F)

"WR" LINE
(For drainage profile, see sht. 10J)

"P" LINE

"H1" LINE

"D3" LINE
(For drainage profile, see sht. 6G)

"D2" LINE
(For drainage profile, see sht. 10L)

"B" LINE
(For profile, see sht. 10G)

"H" LINE

"OUTFALL" LINE

"P" 199+00

"WR" 15+00

"WR" 14+00

"L1" 2+00

"D2" 5+00

"D2" 4+00

"D2" 3+00

"D2" 2+00

"D2" 6+00

"D3" 3+00

"D3" 4+72

"OUTFALL" 3+00

"OUTFALL" 4+00

"OUTFALL" 5+00

SEE SHEET 5C MATCH LINE

SEE SHEET 6C MATCH LINE

MATCH LINE SEE SHEET 11C

MATCH LINE SEE SHEET 12

1ST ST. (OR6)

PACIFIC AVE.

HOQUARTON LANDING

HOQUARTON PARK

HOQUARTON SLOUGH

R/W

12" DI - 36'
8" DI - 50'
12" DI - 6'
12" DI - 72'
12" DI - 46'
12" DI - 88'
12" DI - 18'
36" - 160'
12" - 22'
18" - 125'
18" - 112'
36" - 84'
12" - 8'
18" - 30'
18" - 228'
36" - 78'
18" - 50'
12" - 14'
30" - 12'
12" - 10'
12" - 36'
12" - 160'
12" - 24'
12" - 20'
8" DI - 30'
12" - 24'
12" - 25'
12" - 136'
12" - 10'

NOTE:
1. Field verify elevation call-outs noted with "±".
2. Utilities in conflict to be relocated by others prior to construction, unless otherwise noted.

**OREGON DEPARTMENT OF TRANSPORTATION**

Otak Inc.
HanmiGlobal Partner
700 Washington St, Ste. 401
Vancouver, WA 98660
Phone: 360.373.9613 Fax: 360.737.9651

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Reviewed By - T Kraft
Designed By - A Conlon
Drafted By - A Cobb/M McCandless

**DRAINAGE PLAN**

SHEET NO. 10C

(1) *Sta. "WR" 14+41.12, 4.51' Rt.*
*Const. shallow manhole*
*Rim 27.39*
*I.E. In= 21.08 (18" E) extg.*
*I.E. In= 21.61 (12" S)*
*I.E. Out= 21.08 (18" W) extg.*
*Connect to extg. storm sew. pipe*
*Inst. 12" storm sew. pipe - 36'*
*10' depth*

(2) *Sta. "WR" 13+86.98, 7.84' Lt.*
*Const. type G-2 inlet with sump*
*Rim 27.60*
*I.E. Out= 24.27 (8" NE)*

(3) *Sta. "WR" 13+90.56, 36.55' Lt.*
*Const. type G-2 inlet with sump*
*Rim 27.00*
*I.E. Out= 23.00 (12" N)*

(4) *Sta. "L 1" 399+27.64, 37.16' Rt.*
*Const. type G-2 inlet with sump*
*Rim 25.86*
*I.E. Out= 21.12 (12" NE)*

(5) *Sta. "L 1" 400+13.98, 29.53' Rt.*
*Const. type G-2 inlet with sump*
*Rim 23.60*
*I.E. Out= 19.60 (12" NE)*

(6) *Sta. "WR" 15+28.45, 24.46' Lt.*
*Const. type G-2 inlet with sump*
*Rim 27.02*
*I.E. Out= 23.90 (12" S)*

(7) *Sta. "WR" 15+28.42, 19.01' Lt.*
*Const. shallow manhole*
*Rim 27.13*
*I.E. In= 23.56 (12" N)*
*I.E. In= 23.32 (12" W)*
*I.E. In= 23.89 (8" S)*
*I.E. Out= 23.22 (12" E)*
*Connect to extg. storm sew. pipe*
*Inst. 12" DI storm sew. pipe - 120'*
*5' depth*
*Inst. 8" DI storm sew. pipe - 50'*
*5' depth*

(8) *Sta. "WR" 15+37.00, 28.59' Rt.*
*Const. type G-2 inlet with sump*
*Rim 26.85*
*I.E. In= 24.27 (12" W)*
*I.E. Out= 24.27 (8" N)*
*Inst. 12" DI storm sew. pipe - 36'*
*5' depth*

(9) *Sta. "L 1" 401+16.50, 29.32' Rt.*
*Const. type G-2 inlet with sump*
*Rim 19.20*
*I.E. Out= 15.20 (12" NW)*

(10) *Sta. "L 1" 401+89.32, 74.81' Rt.*
*Const. shallow manhole*
*Rim 16.41*
*I.E. In= 12.85 (12" SW)*
*I.E. In= 12.85 (12" W)*
*I.E. Out= 12.77 (18" SE)*
*Inst. 12" DI storm sew. pipe - 134'*
*5' depth*

(11) *Sta. "L 1" 402+20.24, 80.71' Rt.*
*Const. type G-2 inlet with sump*
*Rim 15.65*
*I.E. Out= 13.50 (12" SW)*

(12) *Sta. "L 1" 401+59.17, 101.25' Rt.*
*Const. type G-2 inlet with sump*
*Rim 16.40*
*I.E. Out= 13.15 (12" SE)*

(13) *Sta. "L 1" 400+87.07, 102.29' Rt.*
*Const. type G-2 inlet with sump*
*Rim 18.88*
*I.E. Out= 13.52 (12" NE)*

(14) *Sta. "L 1" 400+87.14, 109.31' Rt.*
*Const. storm sew. pollution control manhole*
*Rim 19.41*
*I.E. In= 11.13 (18" NW)*
*I.E. In= 13.49 (12" SW)*
*I.E. Out= 11.03 (18" NE)*
*Inst. 12" storm sew. pipe - 8'*
*10' depth*
*Inst. 18" storm sew. pipe - 125'*
*10' depth*

(15) *Sta. "L 1" 399+86.75, 146.95' Rt.*
*Const. std. manhole*
*Rim 18.00*
*I.E. In= 12.22 (12" S)*
*I.E. In= 12.22 (12" W)*
*I.E. Out= 8.22 (18" NW)*
*Inst. 12" storm sew. pipe - 146'*
*10' depth*

(16) *Sta. "L 1" 399+88.88, 136.56' Rt.*
*Const. ditch inlet*
*Rim 15.47*
*I.E. In= 12.97 (6" W)*
*I.E. Out= 12.77 (12" E)*

(17) *Sta. "L 1" 401+52.07, 127.48' Rt.*
*Const. manhole, 72" dia.*
*Rim 17.11*
*I.E. In= 7.00 (18" SE)*
*I.E. In= 6.02 (36" SW)*
*I.E. In= 6.02 (18" NW)*
*I.E. Out= 5.92 (36" E)*
*Inst. 18" storm sew. pipe - 228'*
*10' depth*
*Inst. 18" storm sew. pipe - 112'*
*20' depth*
*Inst. 36" storm sew. pipe - 160'*
*20' depth*

(18) *Sta. "L 1" 400+85.68, 139.17' Rt.*
*Const. storm outfall class 50 riprap*
*I.E. Out= 10.88 (18" W)*
*(For details, see sht. GJ-14)*
*Inst. 18" storm sew. pipe - 30'*
*10' depth*

(19) *Sta. "L 1" 401+29.51, 203.86' Rt.*
*Const. shallow manhole, 72" dia.*
*Rim 13.00*
*I.E. In= 5.84 (36" W)*
*I.E. In= 7.43 (18" S)*
*I.E. Out= 5.74 (36" N)*
*Inst. 18" storm sew. pipe - 50'*
*10' depth*
*Inst. 36" storm sew. pipe - 84'*
*20' depth*

(20) *Sta. "L 1" 400+03.58, 173.81' Rt.*
*Const. beehive inlet*
*Rim 11.55*
*I.E. Out= 7.68 (18" N)*
*(For details, see sht. GJ-12)*

(21) *Sta. "H" 11+93.10, 48.16' Lt.*
*Inst. concrete channel inlet without conc. splash pad*
*from gutter to back of walk*
*I.E. = 12.56*
*(For details, see sht. GJ-13)*

(22) *Sta. "H" 11+94.91, 56.02' Lt.*
*Const. storm outfall protection alt. from back*
*of walk to bottom of pond*
*(For details, see sht. GJ-14)*

(23) *Sta. "L 1" 401+58.02, 266.40' Rt.*
*Const. storm outfall Class 100 riprap, with tidegate*
*I.E. Out= 5.66 (36" S)*
*(For details, see sht. GJ-14)*
*Inst. 36" storm sew. pipe - 78'*
*10' depth*

(24) *Sta. "WR" 13+77.53, 57.30' Lt.*
*Const. storm outfall class 50 riprap*
*I.E. Out= 19.75 (12" S)*
*(For details, see sht. GJ-14)*
*Inst. 12" storm sew. pipe - 22'*
*5' depth*

(25) *Sta. "WR" 13+94.57, 51.69' Lt.*
*Const. storm outfall class 50 riprap*
*I.E. Out= 22.0 (12" SE)*
*(For details, see sht. GJ-14)*
*Inst. 12" storm sew. pipe - 24'*
*5' depth*

(26) *Sta. "L 1" 399+37.41, 50.07' Rt.*
*Const. storm outfall class 50 riprap*
*I.E. Out= 21.0 (12" SE)*
*(For details, see sht. GJ-14)*
*Inst. 12" storm sew. pipe - 24'*
*5' depth*

(27) *Sta. "L 1" 400+16.05, 43.08' Rt.*
*Const. storm outfall class 50 riprap*
*I.E. Out= 19.0 (12" W)*
*(For details, see sht. GJ-14)*
*Inst. 12" storm sew. pipe - 20'*
*5' depth*

(28) *Sta. "L 1" 399+57.24 to Sta. "L 1" 401+33.00, Rt.*
*Const. Water Quality Swale D00930- 258'*
*(For details, see sht. GJ-5)*

(29) *Sta. "L 1" 401+67.40 to Sta. "L 1" 402+27.95, Rt.*
*Const. Bioretention Pond D00927- 6,600 Sq. Ft.*
*(For details, see sht. GJ-8)*

(30) *Sta. "L 1" 401+28.70, 16.19' Lt.*
*Const. water quality structure D00929*
*Rim 21.49*
*I.E. In= 14.67 (12" SW)*
*I.E. Out= 11.62 (12" SW)*
*Inst. 12" storm sew. pipe - 14'*
*10' depth*
*(For details, see sht. GJ-6)*

(31) *Sta. "L 1" 401+10.82, 23.93' Lt.*
*Const. large precast manhole, 72" dia.*
*Rim 21.40*
*I.E. In= 7.08 (30" N)*
*I.E. Out= 6.25 (36" NE)*
*Inst. 30" storm sew. pipe - 12'*
*20' depth*

(32) *Sta. "L 1" 401+20.72, 30.44' Lt.*
*Const. large precast manhole, 60" dia.*
*Rim 21.08*
*I.E. In = 11.52 (12" E)*
*I.E. In = 7.34 (30" NW)*
*I.E. Out= 7.14 (30" SE)*
*Inst. 12" storm sew. pipe - 10'*
*10' depth*
*Inst. 30" storm sew. pipe - 72'*
*20' depth*

(33) *Sta. "H" 11+86.22, 49.37' Lt.*
*Inst. concrete channel inlet without conc. splash pad*
*from gutter to back of walk*
*I.E. = 13.02*
*(For details, see sht. GJ-13)*

(34) *Sta. "H" 11+87.14, 57.28' Lt.*
*Const. class 50 riprap from back of walk*
*to storm outfall class 50 riprap at Sta. "H" 11+94.91*
*(For details, see sht. GJ-14)*

(35) *Sta. "L 1" 401+55.71, 81.48' Rt.*
*Inst. pipe tees, 12"*
*Inst. 12" storm sew. pipe - 22'*
*10' depth*

(36) *Sta. "L 1" 402+08.07, 66.30' Rt.*
*Inst. pipe tees, 12"*
*Inst. 12" DI storm sew. pipe - 18'*
*5' depth*

(37) *Sta. "WR" 15+27.70, 3.51' Lt.*
*Inst. 22° elbow*

**OREGON DEPARTMENT OF TRANSPORTATION**

Otak Inc.
HanmiGlobal Partner
700 Washington St, Ste. 401
Vancouver, WA 98660
Phone: 360.373.9613 Fax: 360.737.9651

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Reviewed By - T Kraft
Designed By - A Cantion
Drafted By - A Cobb/M McCandless

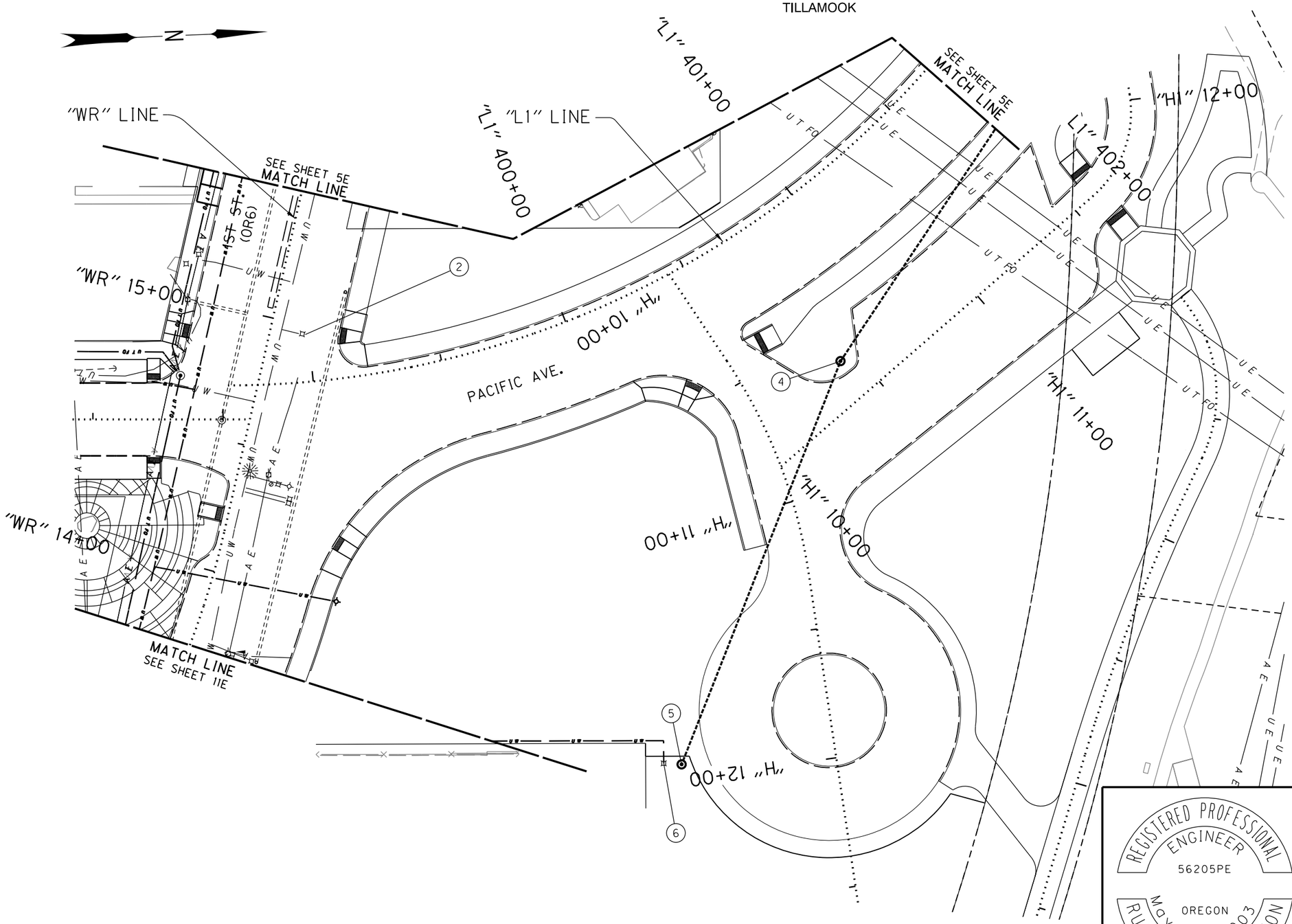
**DRAINAGE NOTES**

SHEET NO. 10D

Sec. 30, T. 1 S., R. 9 W., W.M.
TILLAMOOK

REVISED AS CONSTRUCTED
4/19/19 CONTRACT C14902

49V-060




(2) *Relocate water meter assembly (See Drg. No. RD274)*

(4) *Sta. "H" 10+60, Lt.*
*Const. san. sewer manhole, 48" dia.*
*Rim elev. 20.58*
*Connect to 8" san. sewer pipe*
*10' depth*
*Const. conc. pipe protection block*
*(For details, see sheet 2B-27)*
*Inst. 8" san. sewer pipe - 166'*
*10' depth*
*I.E. out= 10.00 (8" NW)*
*I.E. in= 10.02 (8" SE)*
*(See drg. no. RD335)*

(5) *Sta. "H" 11+90, 60' Rt.*
*Const. san. sewer cleanout*
*Rim elev. 13.70*
*Connect to 8" san. sewer pipe*
*10' depth*
*I.E. out= 10.44 (8" NW)*
*(See drg. no. RD362)*

(6) *Sta. "H" 11+92, 66' Rt.*
*Relocate 1" water meter assembly*
*Inst. 1" water service connection piping*
*(See drg. nos. RD258 & RD274)*

*NOTE:*
1. *Protect all existing utilities shown in place unless otherwise noted.*
2. *Notify the Engineer immediately if additional underground utilities are encountered.*
3. *See Drainage Plans and Signal Plans for more details.*

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
May 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2018

OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Design Team Leader - Russell W. Norton
Designed By - Russell W. Norton
Drafted By - Patrick Kenney

**UTILITY PLAN**

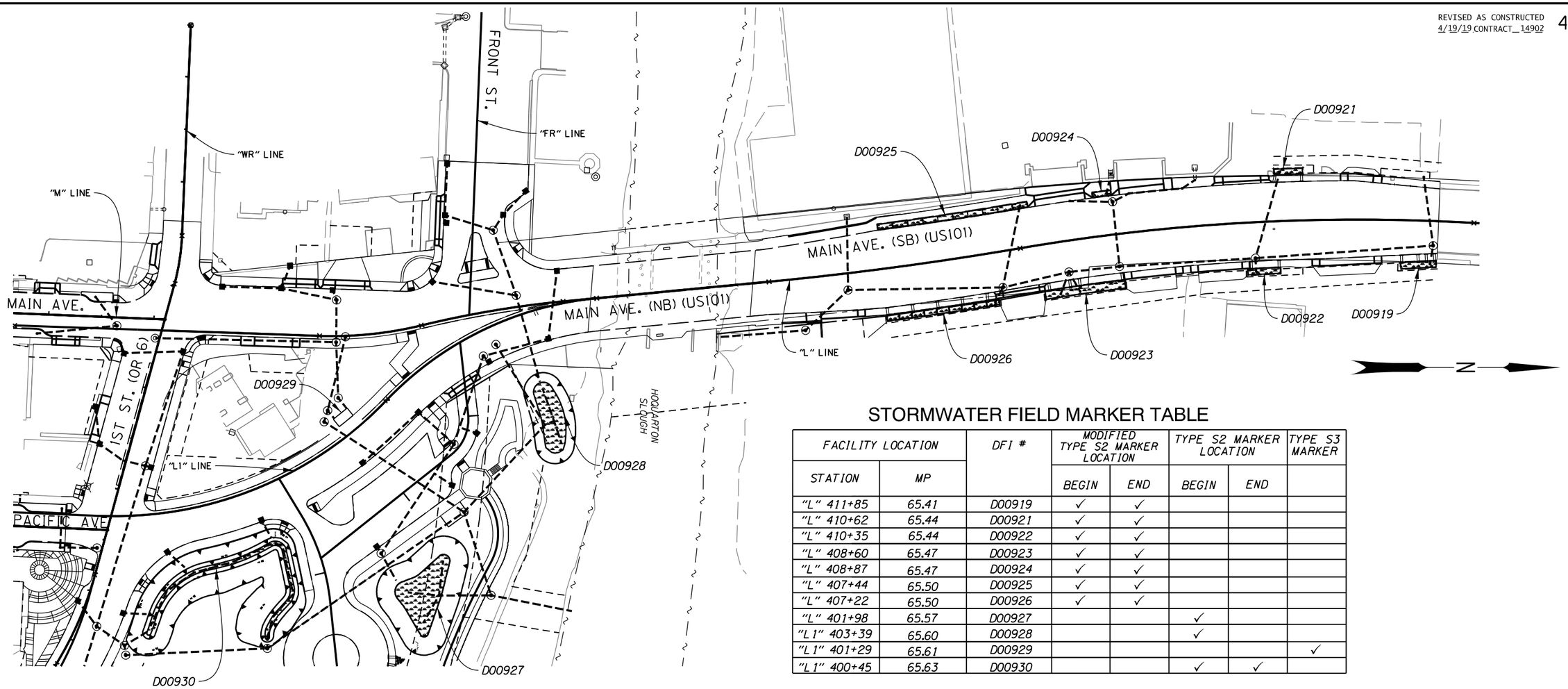
SHEET NO. 10E

14313_10E_rUT.dgn :: Default 5/9/2019 12:32:03 PM russn

Rotation: 0° Scale: 1"=40'

REVISED AS CONSTRUCTED
4/19/19 CONTRACT_14902

49V-060




PLAN
No Scale

## STORMWATER FIELD MARKER TABLE

| FACILITY LOCATION | | DFI # | MODIFIED TYPE S2 MARKER LOCATION | | TYPE S2 MARKER LOCATION | | TYPE S3 MARKER |
|---|---|---|---|---|---|---|---|
| STATION | MP | | BEGIN | END | BEGIN | END | |
| "L" 411+85 | 65.41 | D00919 | ✓ | ✓ | | | |
| "L" 410+62 | 65.44 | D00921 | ✓ | ✓ | | | |
| "L" 410+35 | 65.44 | D00922 | ✓ | ✓ | | | |
| "L" 408+60 | 65.47 | D00923 | ✓ | ✓ | | | |
| "L" 408+87 | 65.47 | D00924 | ✓ | ✓ | | | |
| "L" 407+44 | 65.50 | D00925 | ✓ | ✓ | | | |
| "L" 407+22 | 65.50 | D00926 | ✓ | ✓ | | | |
| "L" 401+98 | 65.57 | D00927 | | | ✓ | | |
| "L1" 403+39 | 65.60 | D00928 | | | ✓ | | |
| "L1" 401+29 | 65.61 | D00929 | | | | | ✓ |
| "L1" 400+45 | 65.63 | D00930 | | | ✓ | ✓ | |

See Drg. No. RD399 for facility marker details.

OREGON DEPARTMENT OF TRANSPORTATION


Otak Inc.
Hanmi Global Partner
700 Washington St, Ste. 401
Vancouver, WA 98660
Phone: 360.373.9613 Fax: 360.737.9651


**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

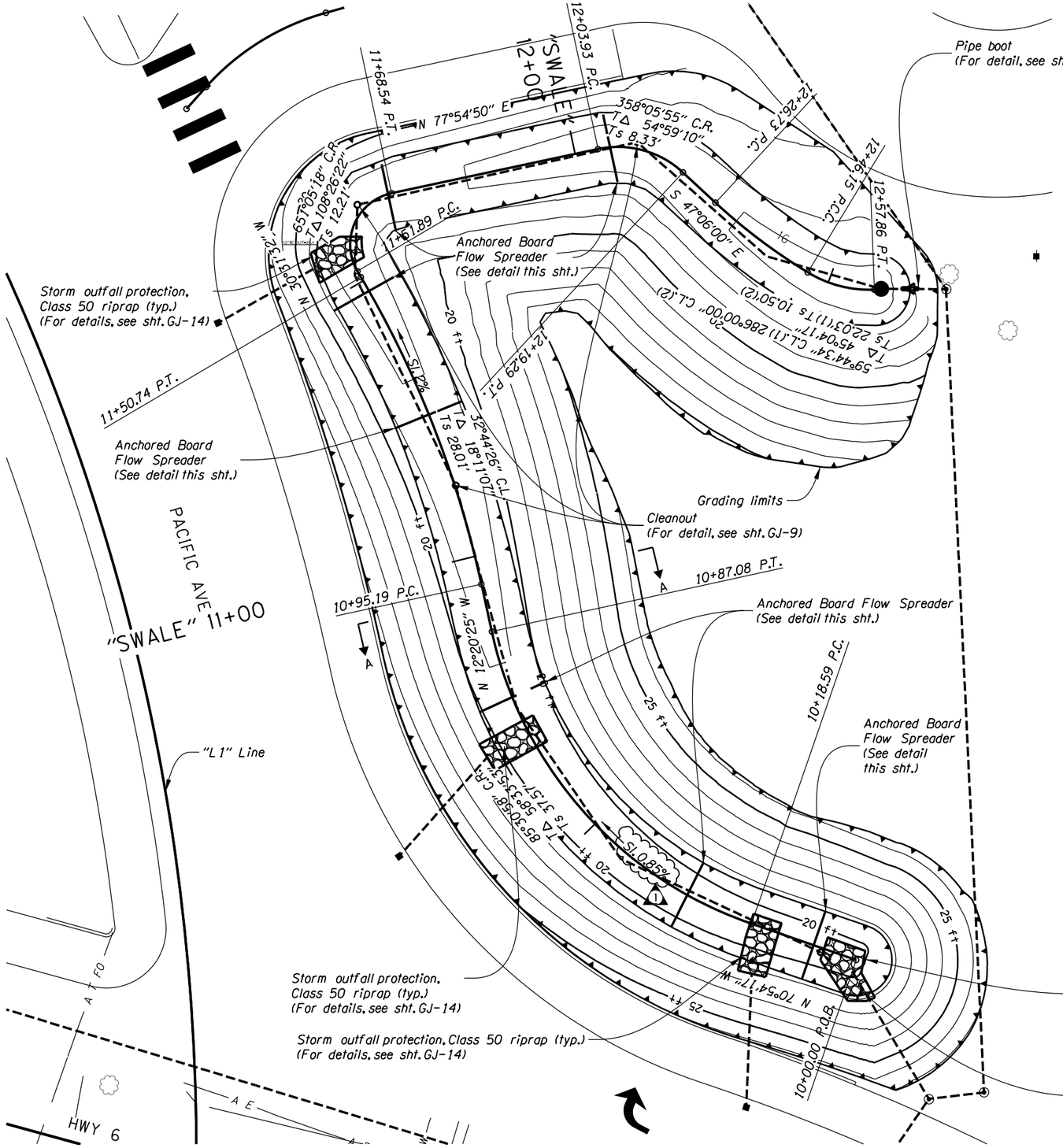
Reviewed By - T Kraft
Designed By - A Cantlon
Drafted By - A Cobb

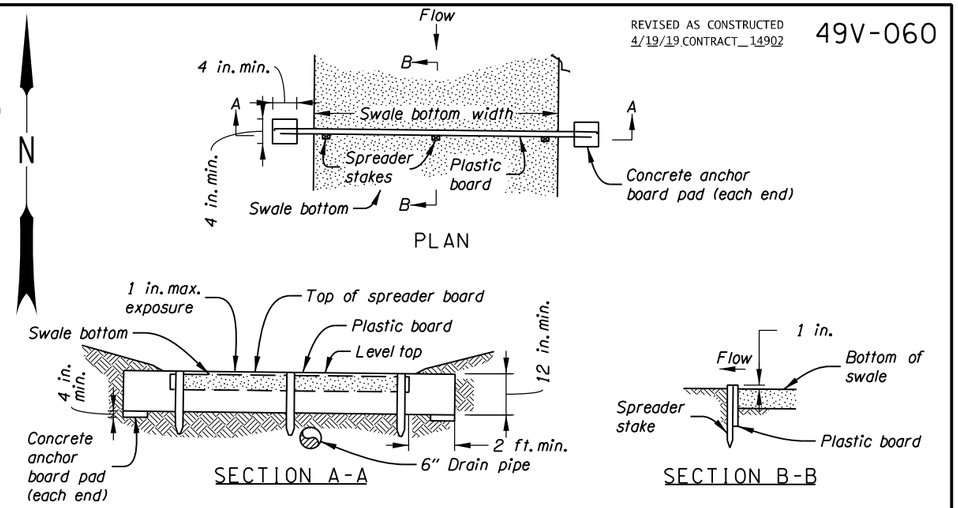
**WATER QUALITY PLAN**

SHEET NO.
GJ-2

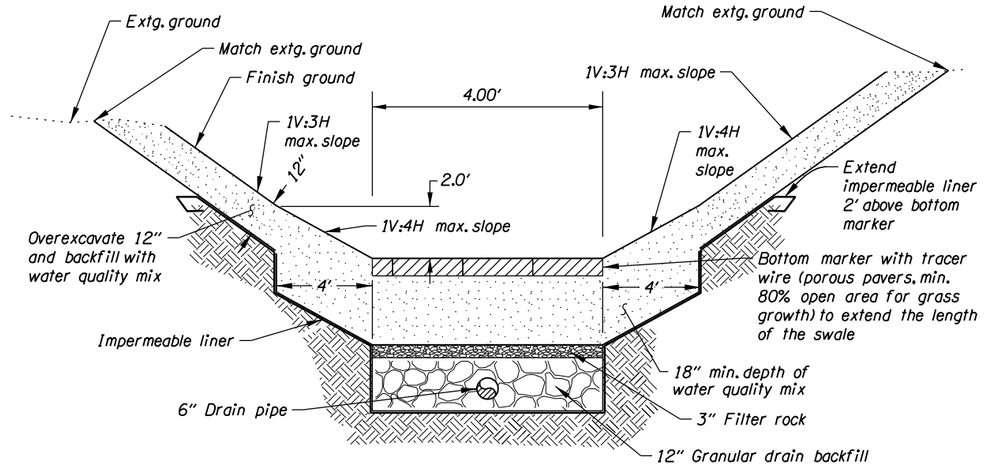
REVISED AS CONSTRUCTED
4/19/19 CONTRACT_14902

49V-060




ANCHORED BOARD FLOW SPREADER




WATER QUALITY SWALE D00930
SECTION A-A
No Scale

NOTES:

1. See GN shts. for planting plan.
2. See shts. 10C and 10D for inlet and outlet data.
3. Heavy equipment shall not be allowed in swale.

**OREGON DEPARTMENT OF TRANSPORTATION**


Otak Inc.
700 Washington Street, Suite 401
Vancouver, WA 98660
Phone: (360)737-9613 Fax: (360)737-9651


**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Reviewed By - T Kraft
Designed By - A Cantlon
Drafted By - S Reiter

**WATER QUALITY DETAILS**

SHEET NO. GJ-5

MATCHLINE SHEET GN-20

HOQUARTON LANDING

"H" 12+00

"H" 11+00

"H" 10+00

PACIFIC AVE (US 101)

"L1" LINE

LIMIT OF LANDSCAPE WORK

D00930

Tree

Area

MATCHLINE SHEET GN-22

N

REVISED AS CONSTRUCTED
4/19/19 CONTRACT 14902

49V-060

(1) *Install 12' length root barrier along curb centered on tree trunk.*

(2) *Install plant bed edger per detail sheet GN-2.*

*NOTE:*
1. *See sheet GN-8 for planting legend.*
2. *See sheet GN for planting notes and details.*

**OREGON DEPARTMENT OF TRANSPORTATION**

Otak Inc.
Hanmi Global Partner
700 Washington St, Ste. 401
Vancouver, WA 98660
Phone: 360.373.9613 Fax: 360.737.9651

**US101 @ OR6 (TILLAMOOK) SEC.**
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

Reviewed By - Ken Ackerman
Designed By - David Haynes
Drafted by - S. Reiter/M. Daly

**PLANTING PLAN**

SHEET NO.
GN-21