OPERATION & MAINTENANCE MANUAL

Water Quality Bioretention Pond

Manual prepared: September 2019

DFI No. D00928

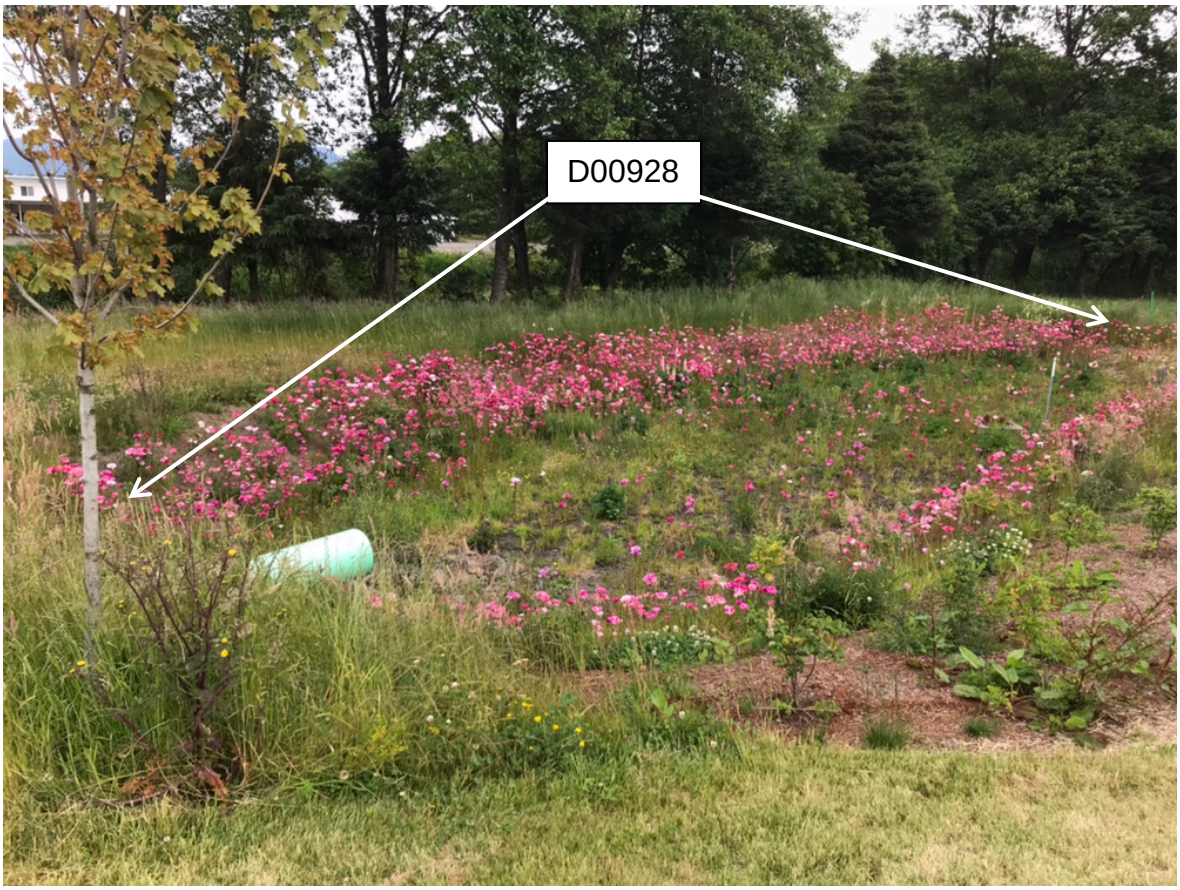


Figure 1: DFI No. D00928, looking East

1. Identification

Drainage Facility ID (DFI):	D00928
Facility Type:	Water Quality Bioretention Pond
Construction Drawings:	(V-File Numbers) 49V-060
Location:	District: 1
	Highway No.: 009
	Mile Post: 65.58, Left

2. Manual Purpose

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

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.

Facility location type: Roadway shoulder

Flow direction: South to North

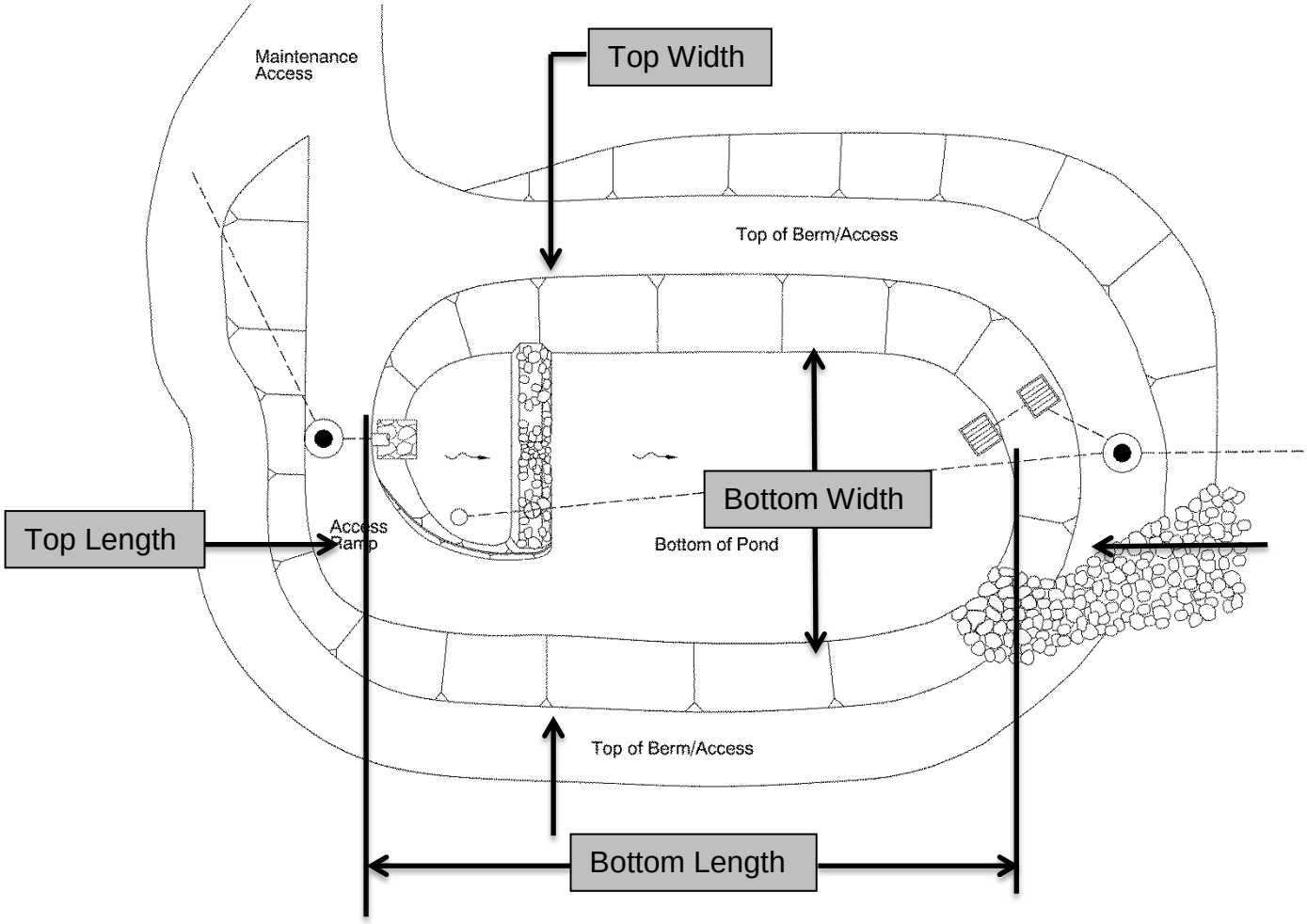
Figure 2: D00928 facility location map (Note: facilities were not constructed at the time the aerial photograph was taken. This Map will be updated)

4. Facility Summary

The pond size is based on storage volume, the bottom and top surface areas and the depth are used for this measurement.

The bottom area and top area of the pond is:

Bottom Area (sq. ft.)	Top Area (sq. ft.)
1,360	4,260

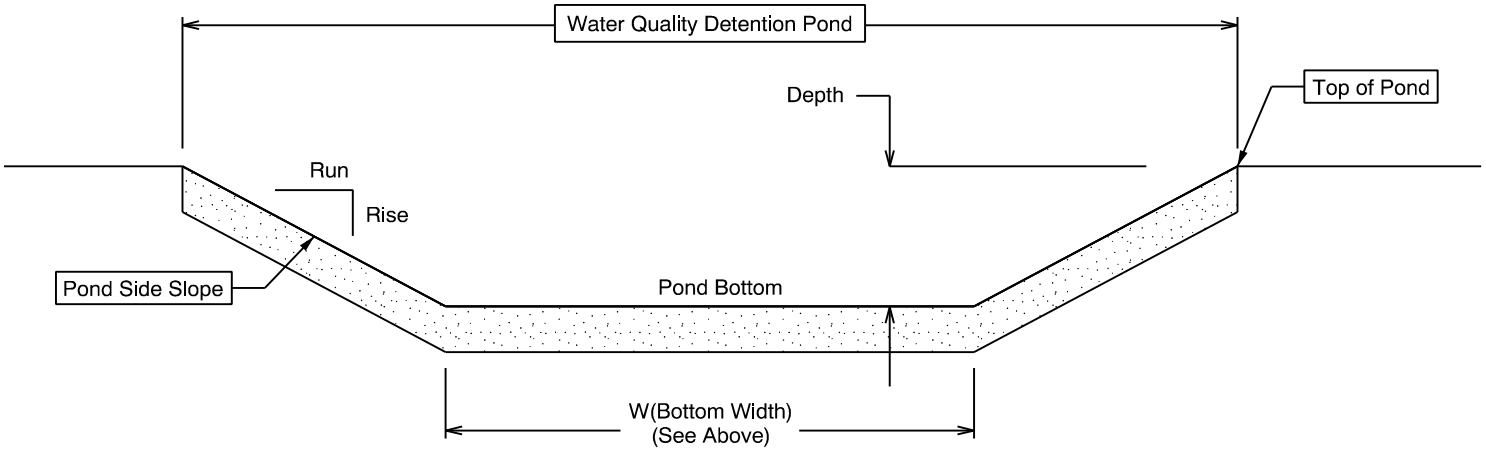


The depth of the pond is the vertical distance measured from the bottom of the pond to the top. The slope of the pond sides is presented by a vertical distance (rise) followed by the horizontal distance (run).

Depth and side slopes:

Depth (feet)
3

Side Slope	
Rise (feet)	**1**
Run (feet)	**4**



Site Specific Information:

Water flows from the gutter and enters the pond from a storm drain pipe and falls onto riprap before making contact with the plants and water quality soil mix. Below the 24" of water quality soil mix 3" of filter rock and 12" of granular drain rock exist. An impermeable liner lines the bottom and walls of the planter box. Finally, water exits the system through a 6" perf pipe and into the storm drain system. A clean out for the 6" pipe is shown in the photo below.

5. Facility Access

Maintenance access to the facility:

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

Figure 3: Looking Northeast

6. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

☐ Detention Pond (Op Plan A)	☒ WQ Bioretention Pond (Op Plan B)	☐ WQ Extended Detention Dry Pond (Op Plan C)	☐ WQ Detention Pond/Biofiltration Swale Combo (Op Plan D)
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A,B,C,D) are provided in the Standard Operation Manual.			

See Appendix A for the site specific operational plan.

Key Features/Items:

This facility is classified as a:

☒ Dry Pond	☐ Wet Pond
The pond is wet during storm events and dries during periods of no precipitation.	**The pond has constant presence of water year round. A portion of the pond dries during periods of no precipitation.**

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 pond. High flows are diverted around the pond using a bypass component**

This facility includes a **proprietary structure(s)**:

☒ No	☐ Yes (DXXXXX)
There are no proprietary structures associated with this facility.	**A proprietary structure is used in the operation of this facility. The proprietary structure is a/an:** describe

Operational Components

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 Ponds (implemented May 2019) 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 in the table below.

Table 1: Stormwater Pond Components		ID #
Upstream Manholes/Structures		
Pre-treatment Manhole Type: describe	☐	**P1**
Water Quality Manhole Type: describe	☒	**P2**
Flow Splitter Manhole (Weir/Orifice)	☐	**P3**
Standard Manhole	☐	**P4**
Sediment Basin/Forebay	☐	**P5**
Forebay Dewatering Riser Pipe (outlet)	☐	**P6**
Facility Inlet		
Pavement Sheet Flow	☒	**P7**
Inlet Pipe(s)	☐	**P8**
Open Channel Inlet	☐	**P9**
Riprap Pad (Energy Dissipater)	☒	**P10**
Ground Cover		
Grass Bottom	☒	**P11**
Grass Side Slopes	☒	**P12**
Granular Drain Rock	☒	**P13**
Plantings	☒	**P14**
Underground Components		
Geotextile Fabric: Specify Type	☐	**P15**
Impermeable Liner	☒	**P16**
Water Quality Mix	☒	**P17**
Perforated Pipe	☒	**P18**
Bottom Marker (ex. Porous Pavers)	☒	**P19**

Flow Spreader		
Anchored Board (midpoint of pond or every 50 feet along pond bottom)	☐	**P20**
Other: describe	☐	**P21**
Facility Outlet		
Catch Basin with Grate	☒	**P22**
Outlet Pipe(s)	☒	**P23**
Outlet/Flow Control Structure	☐	**P24**
Auxiliary Outlet	☐	**P25**
Hazmat Control Valve: Specify make/model	☐	**P26**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☒ **C** ☐ **L** ☐ **O**	**P27**
Ditch	☐	**P28**
Storm Drain System	☐	**P29**
Outfall Components		
Riprap Pad	☐	**P30**
Riprap Bank Protection	☐	**P31**

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 in the Maintenance Guide for conditions when maintenance is needed.
c. Keep a record of inspections, maintenance, and repairs.

Maintenance Guide/Maintenance Actions

The Maintenance Guide 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 Ponds:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 2 (Maintenance of Stormwater Ponds): Contains maintenance information for ponds

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

There are access limitations for this facility:

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

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

If no access grid then: Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the pond bottom.

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

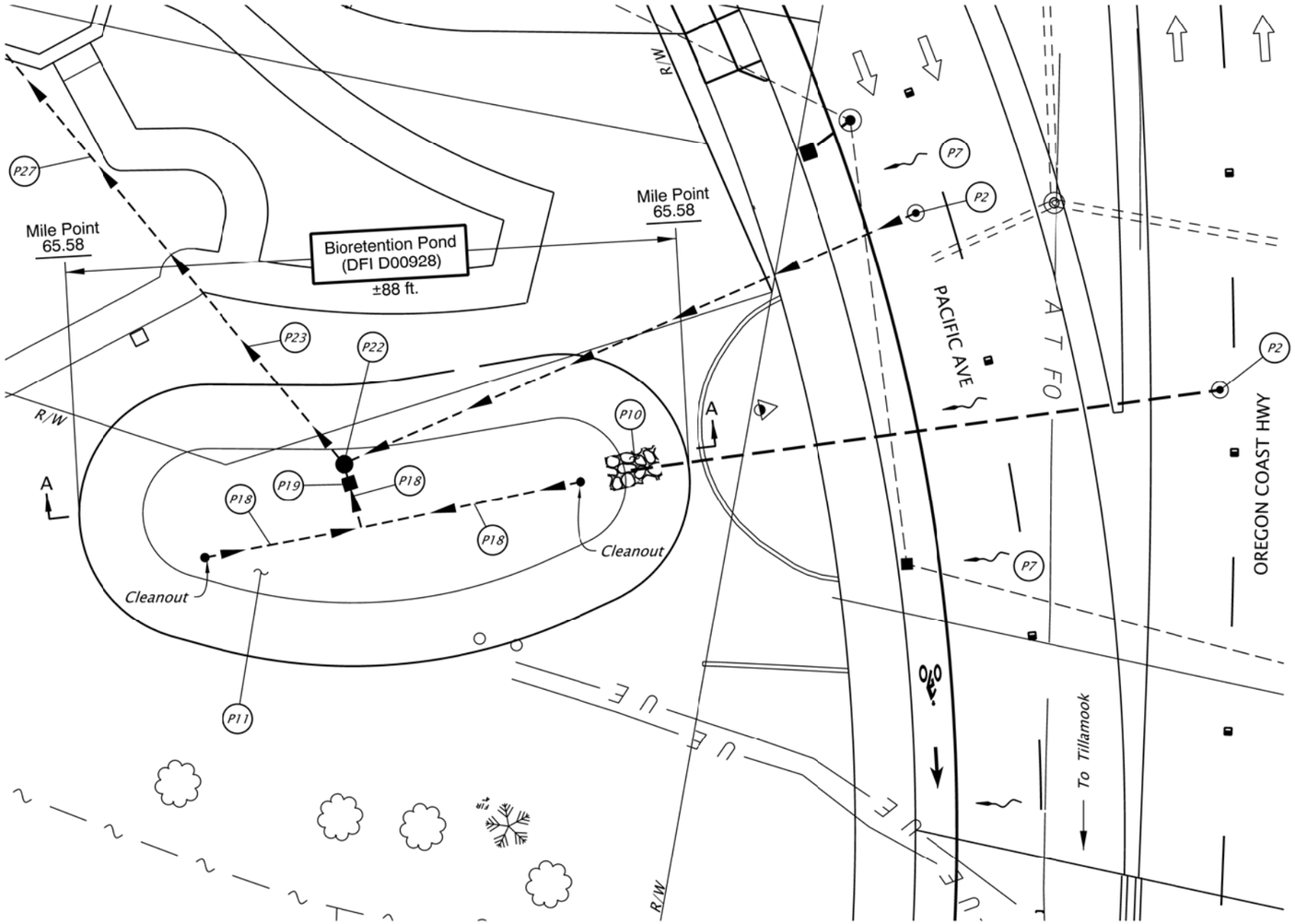
Contact any of the following for more detailed information about management of waste materials found on site:

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

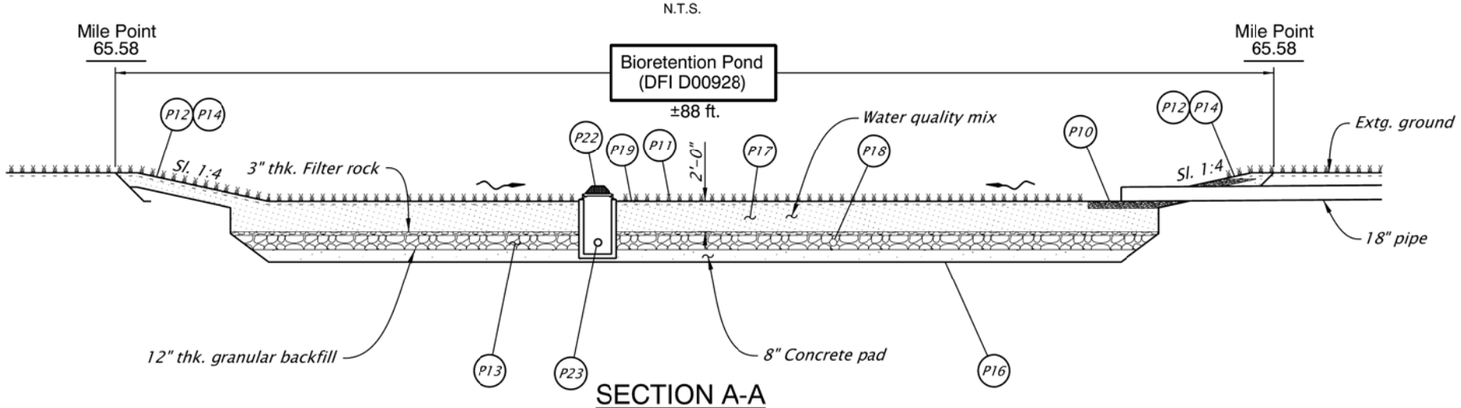
A Appendix A – Site Specific Operational Plan

Contents:

Operational Plan: DFI D00928



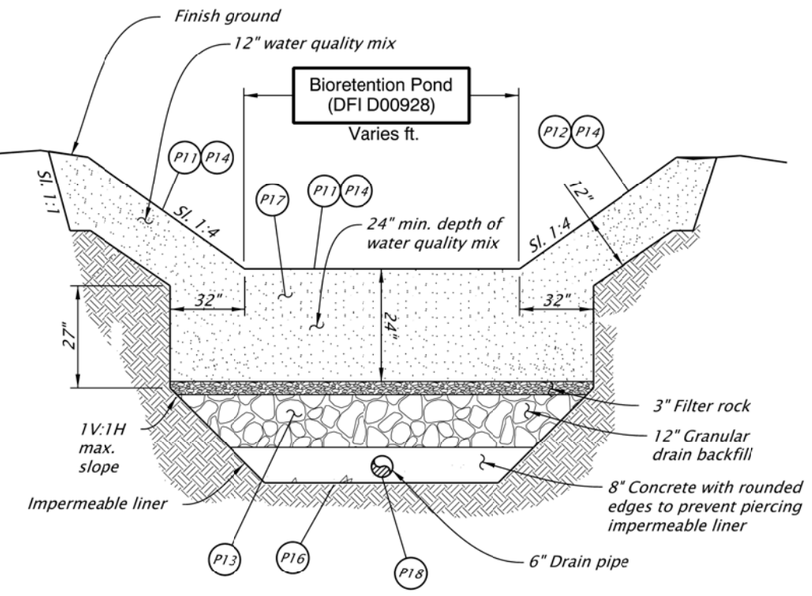
PLAN
N.T.S.



SECTION A-A
N.T.S.

LEGEND:

- Photo Location / Direction
- P# — 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



TYPICAL SECTION
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Chris Carman

Drafted By: Michael Skelton

DFI D00928
MAINTENANCE DISTRICT 1 HWY 009
BIORETENTION POND
OREGON COAST HWY MP 65.58
TILLAMOOK COUNTY

D00928_Pond.dgn :: D00928_SHEET 9/17/2019 11:54:58 AM hwye31g

Rotation: 187.6931° Scale: 1"=20'

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 49V-060

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

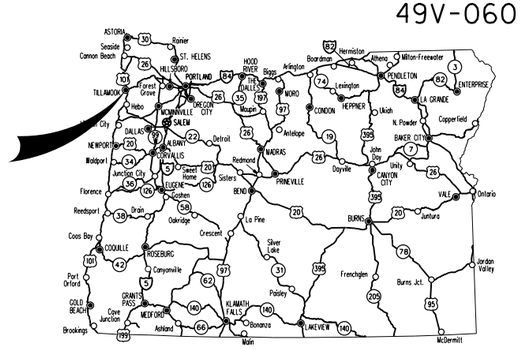
US101 @ OR6 (TILLAMOOK) SEC.

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)

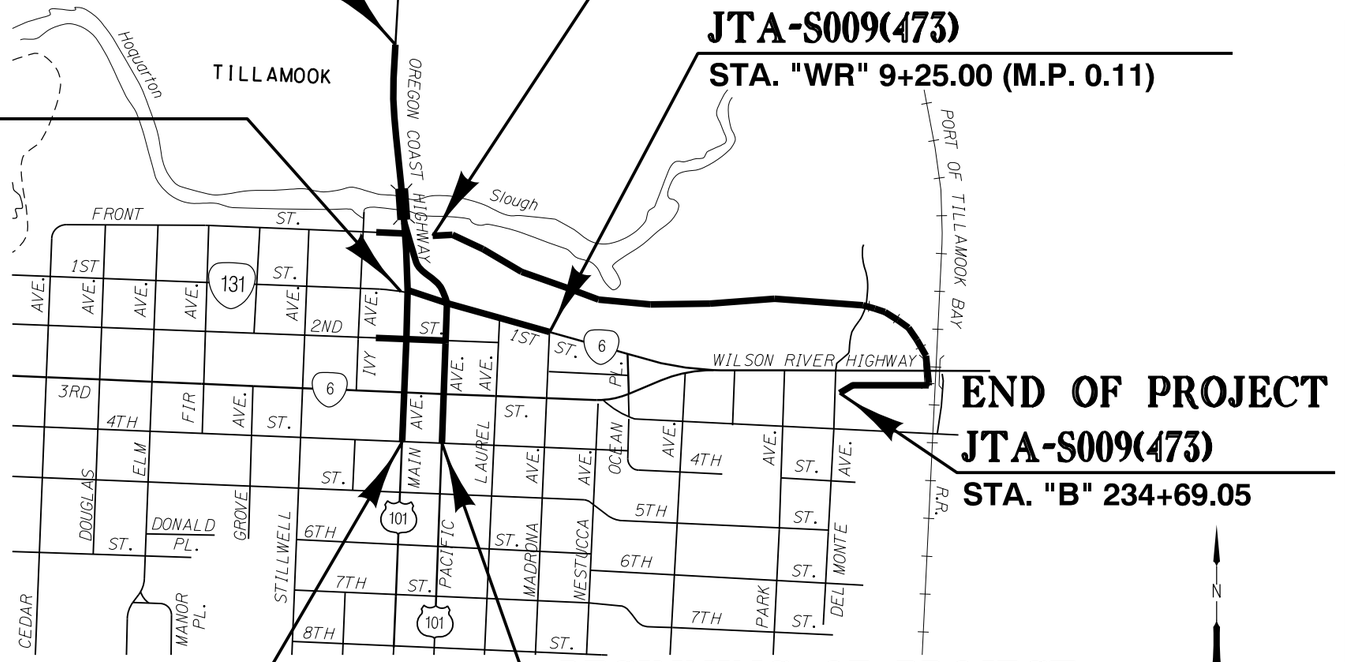
BEGINNING OF PROJECT
JTA-S009(473)
STA. "M" 191+93.00 (M.P. 65.78)

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

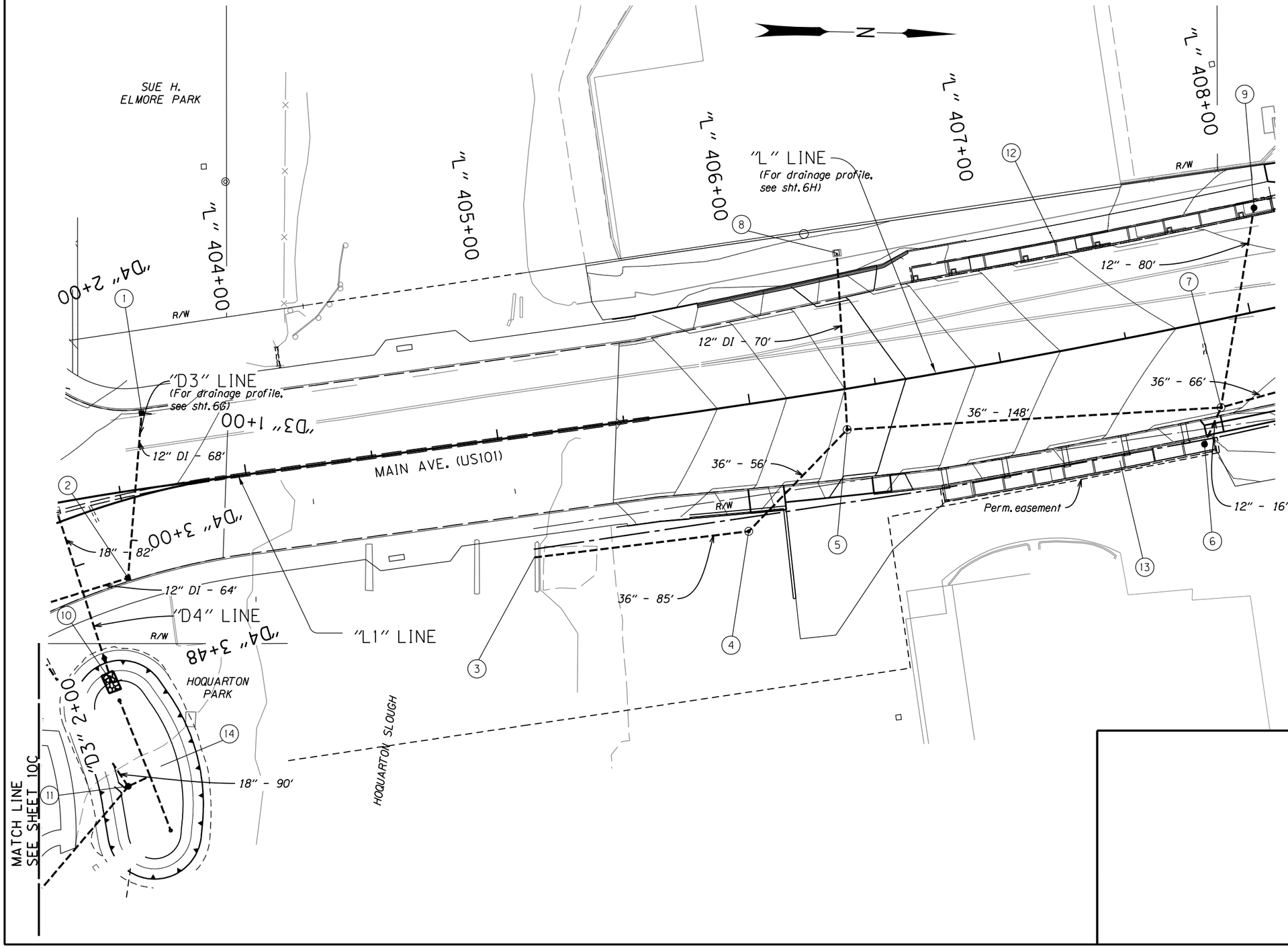
US101 @ OR6 (TILLAMOOK) SEC.
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

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 14902

49V-060



1. Sta. "L" 403+62.74, 29.50' Lt.
   Const. type G-2 inlet with sump
   Rim = 17.20
   I.E. Out= 14.20 (12" E)

2. Sta. "L1" 403+43.12, 29.67' Rt.
   Const. type G-2 inlet with sump
   Rim = 16.90
   I.E. In= 13.90 (12" W)
   I.E. Out= 13.90 (12" S)
   Inst. 12" DI storm sew. pipe - 68'
   5' depth

3. Sta. "L" 405+07.85, 47.89' Rt.
   Const. storm outfall class 100 riprap, with tide gate
   (For details, see sht. GJ-14)
   I.E. Out= 3.53 (36" N)
   Inst. 36" storm sew. pipe - 85'
   20' depth

4. Sta. "L" 405+92.33, 49.41' Rt.
   Const. manhole, 72" dia.
   Rim = 13.68
   I.E. In= 3.74 (36" NW)
   I.E. Out= 3.64 (36" S)
   Inst. 36" storm sew. pipe - 56'
   20' depth

5. Sta. "L" 406+36.21, 15.87' Rt.
   Const. manhole, 72" dia.
   Rim = 15.75
   I.E. In= 7.07 (12" W)
   I.E. In= 3.82 (36" N)
   I.E. Out= 3.82 (36" SE)
   Inst. 12" DI storm sew. pipe - 70'
   10' depth
   Inst. 36" storm sew. pipe - 148'
   20' depth

6. Sta. "L" 407+72.07, 46.83' Rt.
   Const. Beehive inlet
   Rim = 10.47
   I.E. Out= 6.61 (12" NW)
   (For details, see sht. GJ-12)

NOTE:
1. Field verify elevation call-outs noted with "±".
2. Utilities in conflict to be relocated by others prior to construction, unless otherwise noted.
3. Construction notes continued on sht. 6D.

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 Cantlon
Drafted By - A Cobb/M McCandless

DRAINAGE PLAN

SHEET NO. 6C

(7) *Sta. "L" 407+81.26, 34.00' Rt.*
Const. shallow manhole, 84" dia.
Rim = 11.20
I.E. In= 6.54 (12" SE)
I.E. In= 4.14 (36" N)
I.E. In= 5.63 (12" W)
I.E. Out= 4.04 (36" S)
Inst. 12" storm sew. pipe - 80'
10' depth
Inst. 12" storm sew. pipe - 16'
5' depth
Inst. 36" storm sew. pipe - 66'
10' depth

(8) *Sta. "L" 406+43.36, 53.30' Lt.*
Connect to extg. storm sew. pipe
Rim = 13.42
I.E. In= Field verifiy (3" SE)
I.E. In= Field verifiy (4" N)
I.E. In= Field verifiy (4" W)
I.E. Out= 10.20 (12" E)

(9) *Sta. "L" 408+10.03, 40.08' Lt.*
Const. Beehive inlet
Rim = 10.59
I.E. Out= 5.95 (12" E)
(For details, see sht. GJ-12)

(10) *Sta. "L 1" 403+19.65, 66.43' Rt.*
Const. Storm Outfall Class 50 riprap
(For details, see sht. GJ-14)
I.E. Out= 10.82 (18" W)
Inst. 18" storm sew. pipe - 82'
10' depth

(11) *Sta. "L 1" 403+05.73, 106.23' Rt.*
Const. Beehive Inlet
Rim = 10.38
I.E. In= 6.51 (18" SW)
I.E. Out= 6.51 (18" SE)
Inst. 18" sew. pipe - 90'
10' depth
(For details, see sht. GJ-12)

(12) *Sta. "L" 406+71.5 to Sta. "L" 408+16.8, Lt.*
Const. Bioretention Pond D00925 - 881 Sq. Ft
(For details, see shts. GJ thru GJ-15)

(13) *Sta. "L" 406+69.5 to Sta. "L" 407+75.5, Rt.*
Const. Bioretention Pond D00926 - 724 Sq. Ft.
(For details, see shts. GJ thru GJ-15)

(14) *Sta. "L 1" 403+09.33 to Sta. "L 1" 403+69.12, Rt.*
Const. Bioretention Pond D00928 - 4,000 Sq. Ft.
(For details, see sht. GJ-7)

OREGON DEPARTMENT OF TRANSPORTATION

otak Otak Inc.
Hanmi Global Partner
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US101 @ OR6 (TILLAMOOK) SEC.
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

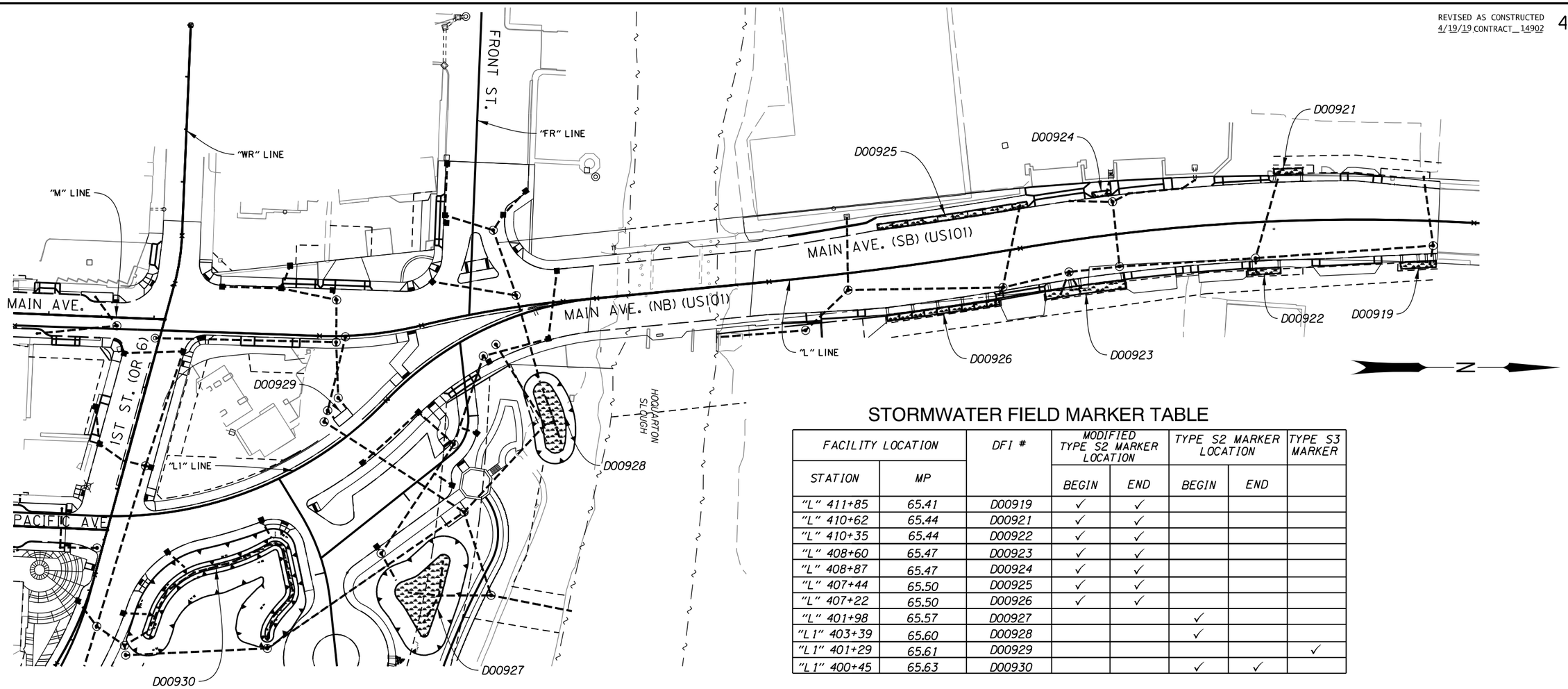
Reviewed By - T Kraft
Designed By - A Cantion
Drafted By - A Cobb/M McCandless

DRAINAGE NOTES

SHEET NO. 6D

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

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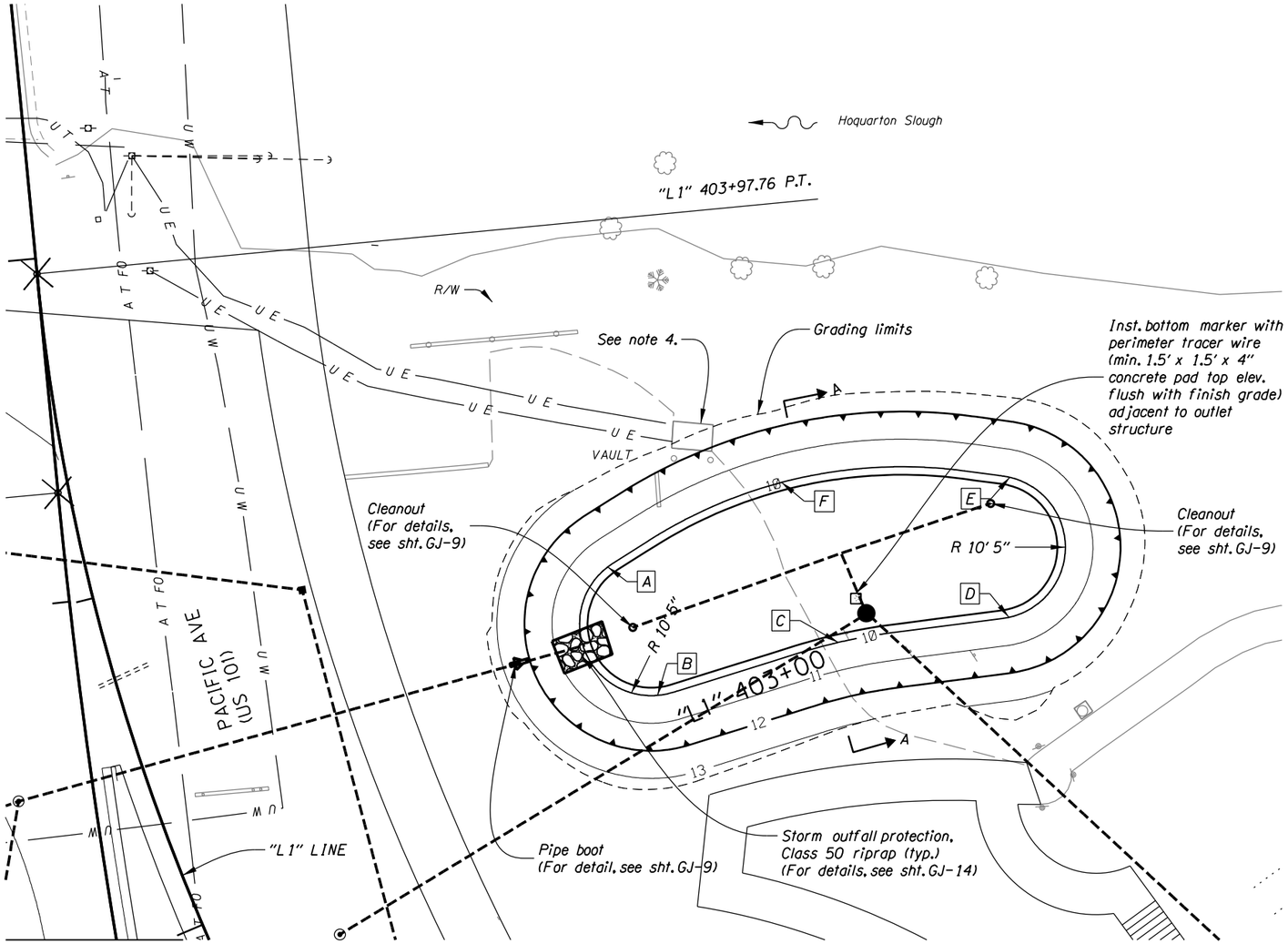
Phone: 360.373.9613 Fax: 360.737.9651

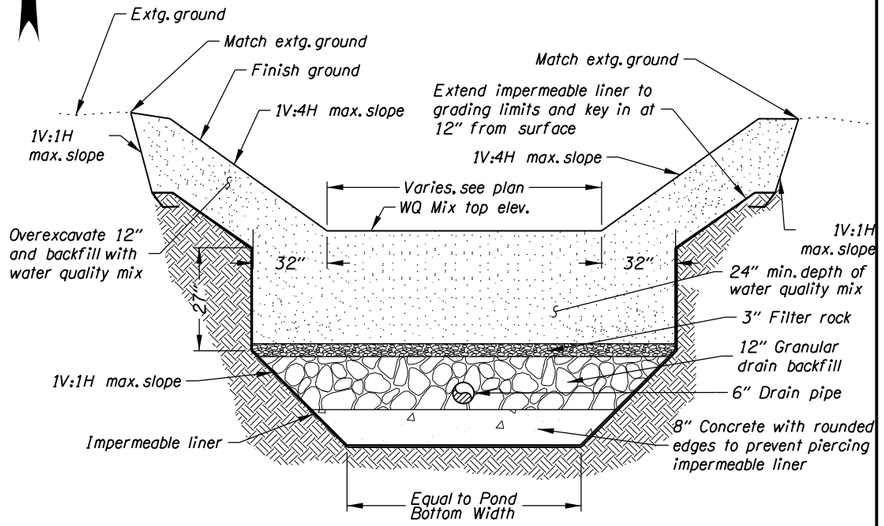
US101 @ OR6 (TILLAMOOK) SEC.
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

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

WATER QUALITY PLAN

SHEET NO.
GJ-2





BIORETENTION POND D00928
SECTION A-A
No Scale

NOTES:

1. See GN shts. for planting plan.
2. See shts. 6C and 6D for inlet and outlet data.
3. Heavy equipment shall not be allowed in bioretention pond.
4. Electric vault to be relocated by others prior to construction.

FACILITY ID	WQ MIX TOP ELEV.
D00928	9.71

2

D00928 STAKING TABLE	
POINT	STA., OFFSET
A	"L1" 403+32.1, 73.2' RT.
B	"L1" 403+06.2, 73.2' RT.
C	"L1" 403+02.2, 100.8' RT.
D	"L1" 402+92.0, 125.0' RT.
E	"L1" 403+23.7, 132.6' RT.
F	"L1" 403+38.2, 100.8' RT.

OREGON DEPARTMENT OF TRANSPORTATION
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700 Washington Street, Suite 401
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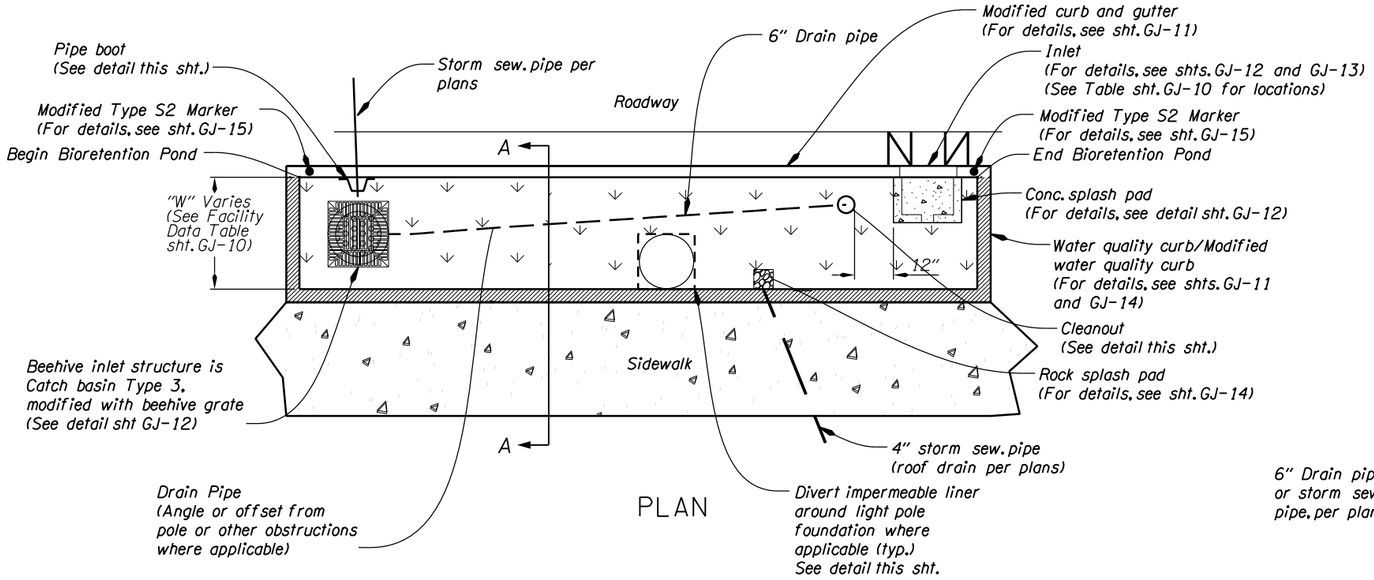
US101 @ OR6 (TILLAMOOK) SEC.
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

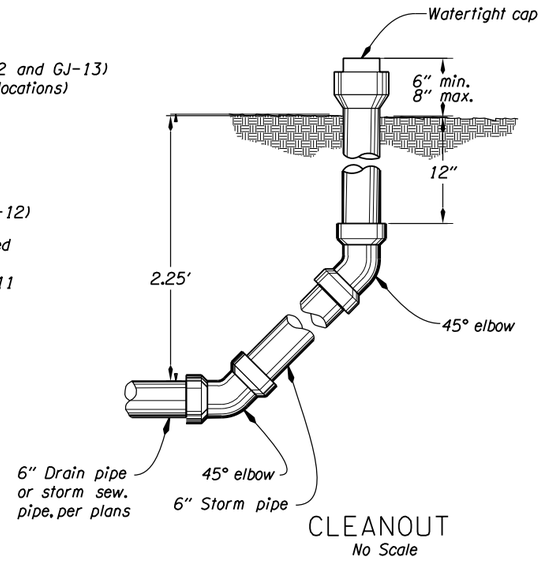
Reviewed By - T Kraft
Designed By - A Cantlon
Drafted By - S Reiter

WATER QUALITY DETAILS

SHEET NO. GJ-7



PLAN



CLEANOUT
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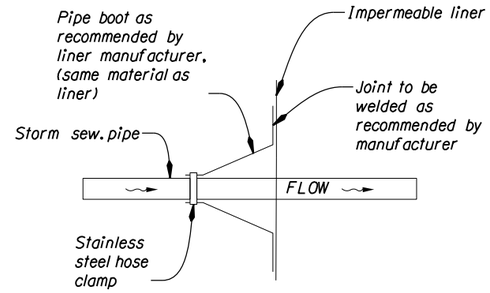
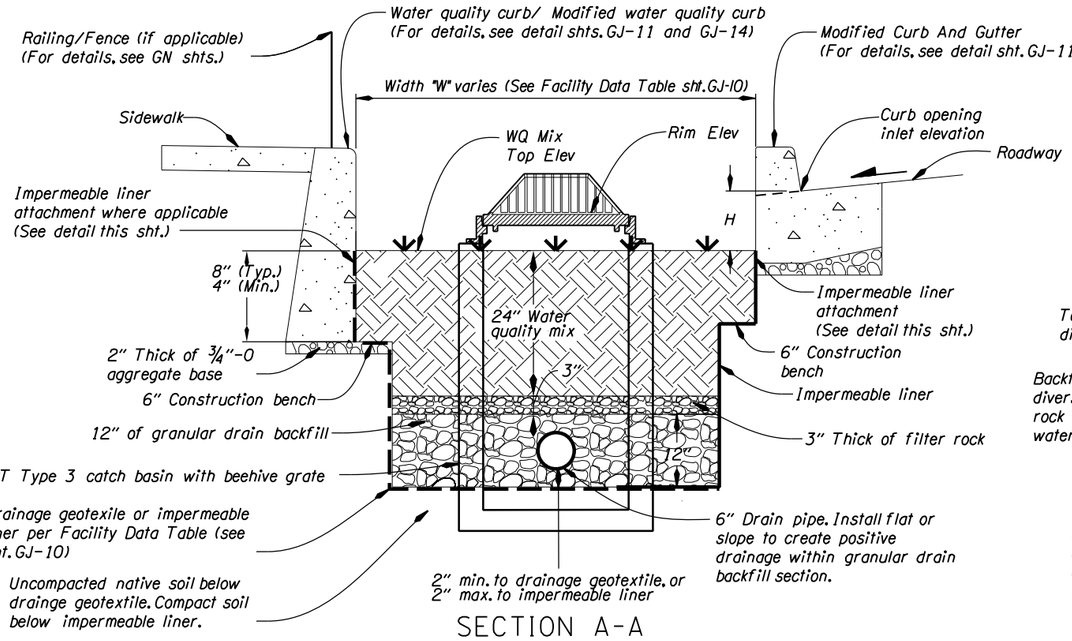


PIPE BOOT
No Scale

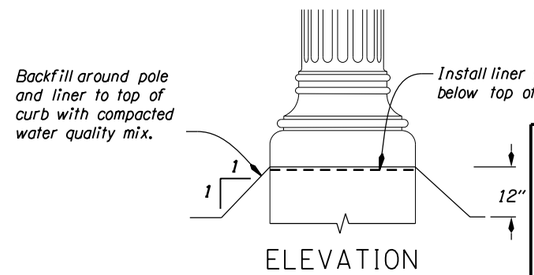
NOTE: Pipe boot required for all pipes entering and exiting facility through impermeable liner.



SECTION A-A

TYPICAL BIORETENTION POND
No Scale

PLAN



ELEVATION

IMPERMEABLE LINER AROUND LIGHT POLE FOUNDATION
No Scale

NOTES:
1. Liner to extend from 3 in. below top of top soil to the bottom of excavation.
2. 3 in. of concrete is required on all sides of attachment.

IMPERMEABLE LINER ATTACHMENT
No Scale

GENERAL NOTES FOR ALL DETAILS:

1. Slope Drain Rock and Filter Rock layers to match bottom slope.
2. Slope drain pipe towards outlet.
3. Install Drain Rock splash pad downstream of check dam, see details sht. GJ-11.
4. Where catch basin structure protrudes through impermeable liner, cut liner in "X" shape to create rectangular hole to match size and shape of structure. Upon installation of catch basin, fold resulting triangular shaped fabric up sides of structure, and secure to structure with adhesive caulk. Backfill holes in liner with compacted topsoil.

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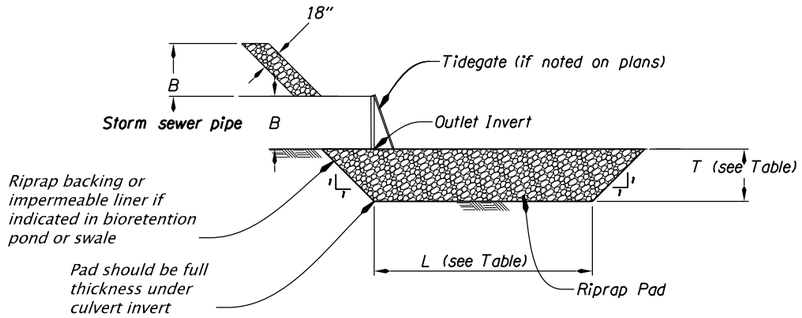
OREGON COAST HWY. & WILSON RIVER HWY.
TILLAMOOK COUNTY

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

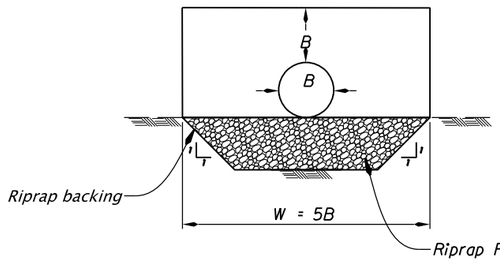
WATER QUALITY DETAILS

SHEET NO.
GJ-9



ELEVATION

B = Diameter of storm sew. pipe, ft
L = Length of bottom of riprap pad, ft
T = Thickness of riprad pad, ft
W = Width of top of riprap pad, ft



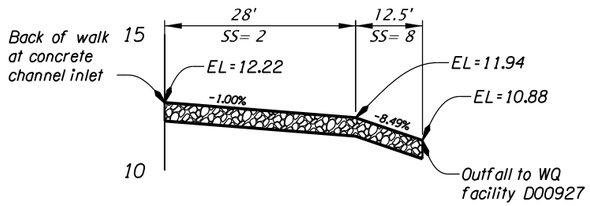
END VIEW

TABLE		
Riprap Class	L* (ft)	T (ft)
50	4B or 1.3	2.3
100	4B or 1.6	3.3

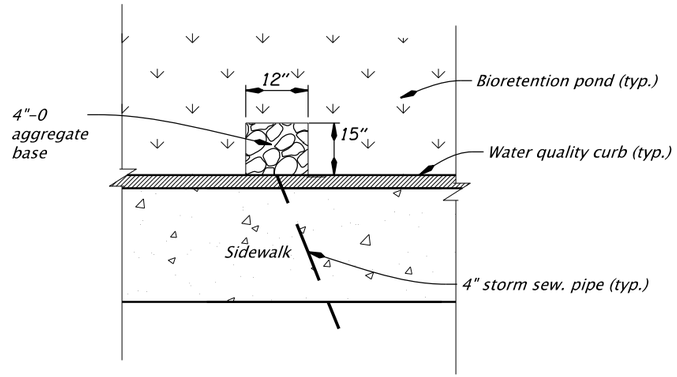
* L is the greater of 4B or the listed dimension.

NOTES:
1. Do not excavate non-erodible rock in order to place riprap.
2. Riprap backing under class 50 riprap shall be riprap geotextile, Type 1.

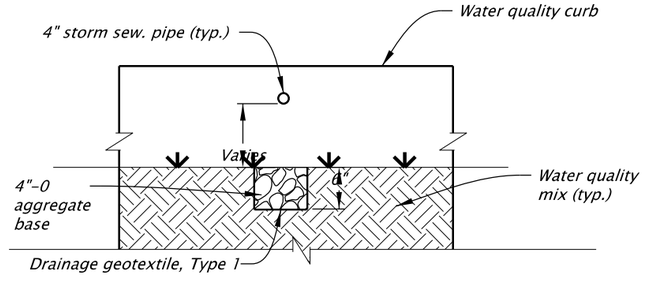
STORM OUTFALL PROTECTION
No Scale



PROFILE

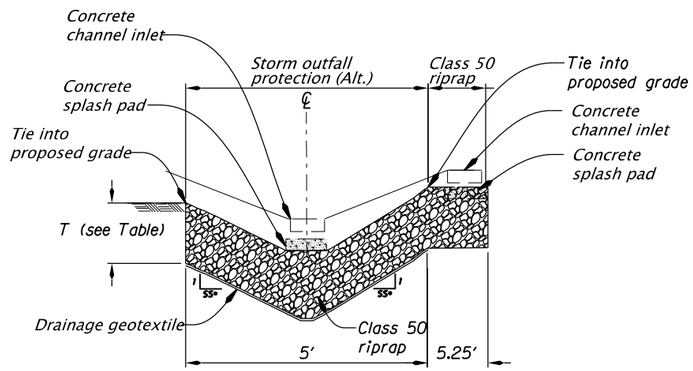


PLAN VIEW



SECTION VIEW

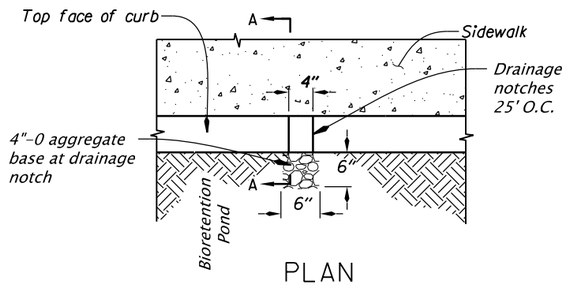
ROCK SPLASH PAD
No Scale



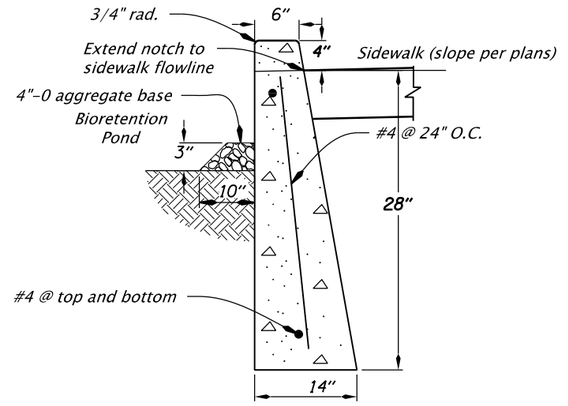
*SS= Side slope (per profile)

SECTION X-X

STORM OUTFALL PROTECTION ALTERNATIVE
No Scale



PLAN



SECTION A-A

NOTES:
1. Provide a 3/4" reveal (dummy joint) on sides and top at 10' O.C. and provide a 1/2" expansion joint at 50' O.C.

MODIFIED WATER QUALITY CURB
No Scale

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Designed By - A Cantlon
Drafted By - S Reiter

WATER QUALITY DETAILS

SHEET NO. GJ-14

REVISED AS CONSTRUCTED
4/19/19 CONTRACT 14902

49V-060

LIMIT OF WORK

MATCHLINE SEE BELOW

MATCHLINE SEE SHEET GN-20

"B" LINE

N

D00928

Entry Sculpture

"L1" 403+00

PACIFIC AVE (US 101)

"L1" LINE

"H1" LINE

"L1" 402+00

"H1" 11+00

Bus shelter

D00927

"B" LINE

MATCHLINE SEE ABOVE

MATCHLINE SHEET GN-23

MATCHLINE SHEET GN-20

MATCHLINE SHEET GN-20

1. *Install Dairylands Unit Paver (gray). See detail sheet GN-4.*
2. *Install 12' length root barrier along curb centered on tree trunk.*
3. *Install unit pavers per detail sheet GN-5.*
4. *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.*

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

PLANTING PLAN

SHEET NO.
GN-19