

# OPERATION & MAINTENANCE MANUAL

## Water Quality Bioretention Pond

Manual prepared: **July 2022**

DFI No.     **D01388**

Drainage Berm/Retention Pond DFI No.     **D01388**

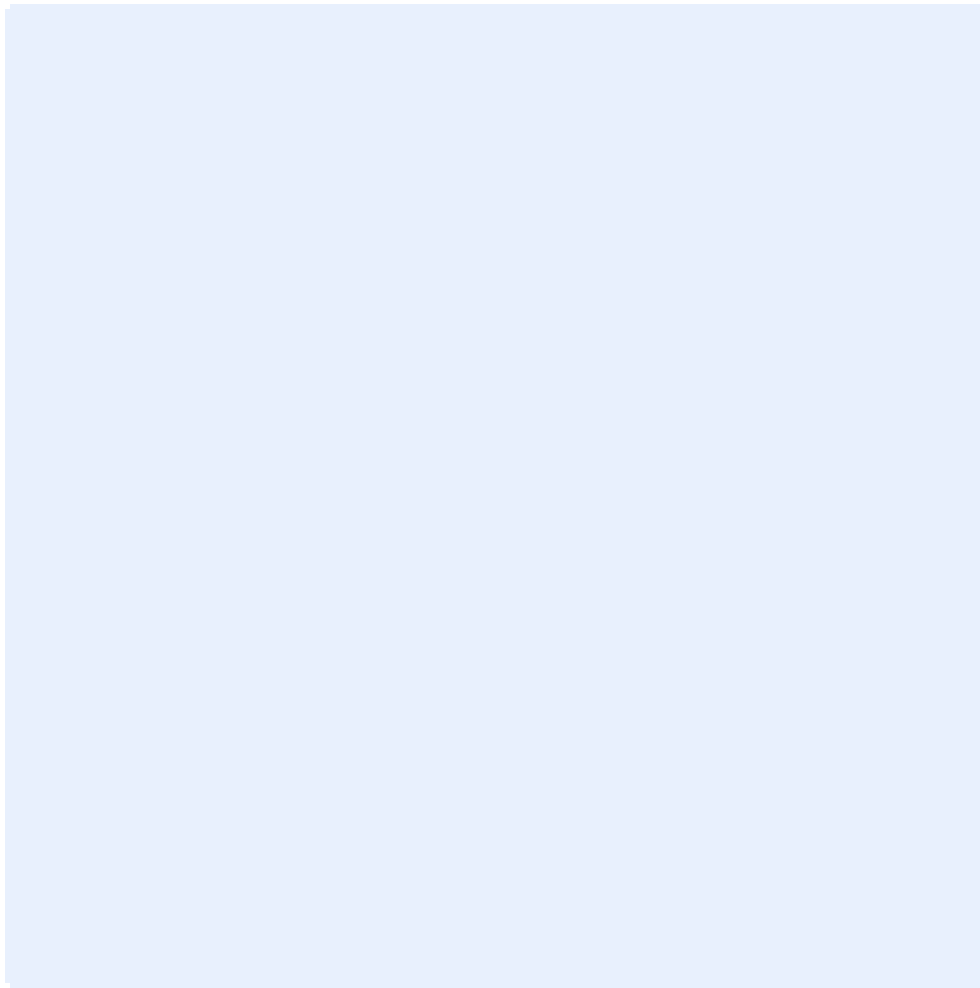


Figure 1: DFI No. D01388, looking **[note cardinal direction]**

## 1. Identification

Drainage Facility ID (DFI): D01388  
Facility Type: Retention Pond  
Construction Drawings: (V-File Numbers) 55V-086  
Location: District: 10  
Highway No.: 017  
Mile Post: 14.41 to 14.45, [LT]

## 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: [southeast]

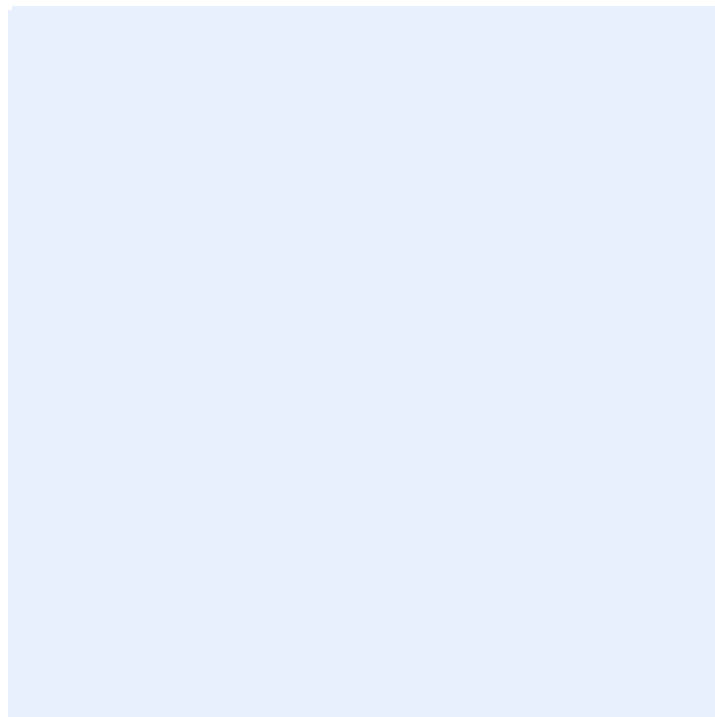


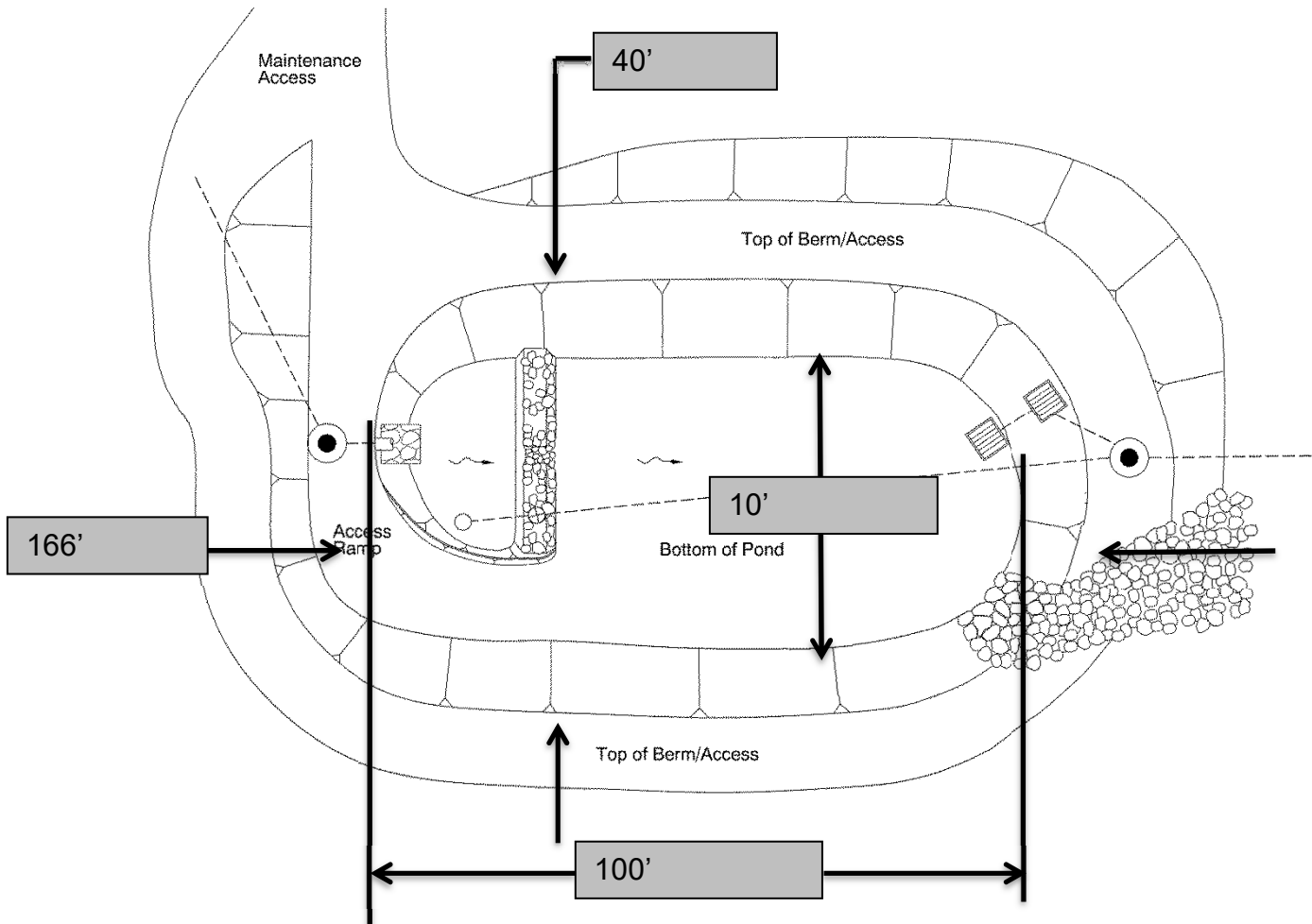
Figure 2: [ODOT Geo-Environmental to insert facility location map]

#### 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.)
1,002	6,020

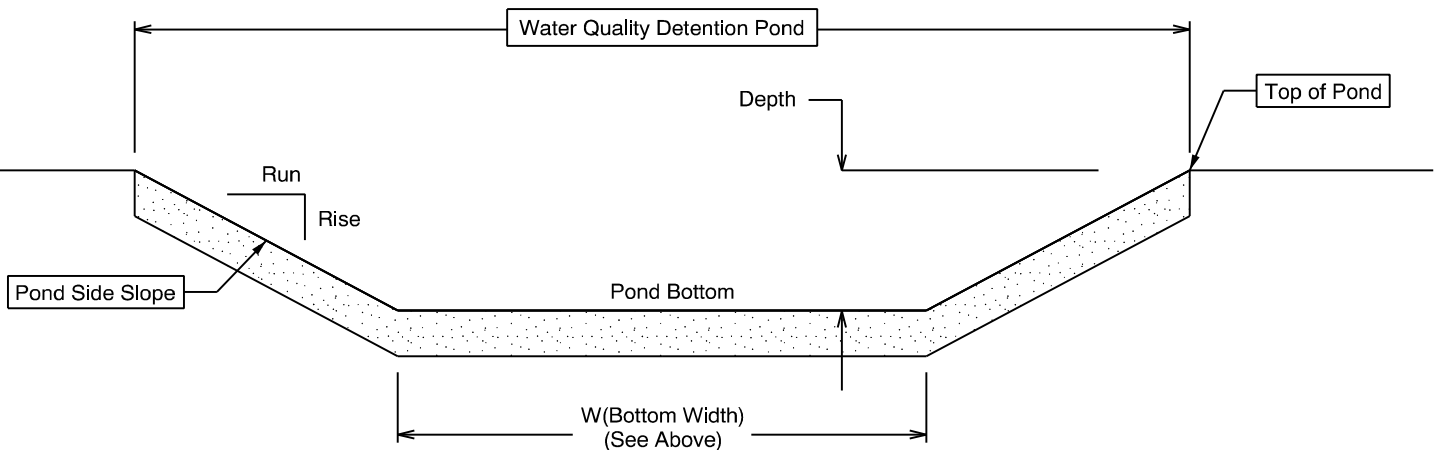


The depth of the pond is the vertical distance measured from the bottom of the pond to the top. The slope of the pond sides is presented by a vertical distance (rise) followed by the horizontal distance (run).

Depth and side slopes:

<b>Depth (feet)</b>
5

<b>Side Slope</b>	
<b>Rise (feet)</b>	1
<b>Run (feet)</b>	3



**Site Specific Information:** All manholes and inlets on west side of US20 near the pedestrian undercrossing should be maintained regularly to prevent clogged pipes beneath box culvert and wingwalls.

Path within 4<sup>th</sup> Street Right of Way crosses over a shallow irrigation pipe. Use caution.

Infiltration into the subsurface is the only outlet for this facility.

## 5. Facility Access

Maintenance access to the facility:

<input type="checkbox"/> Roadside pad	<input type="checkbox"/> Roadside shoulder
<input type="checkbox"/> Access road with Gate	<input checked="" type="checkbox"/> Access road without Gate

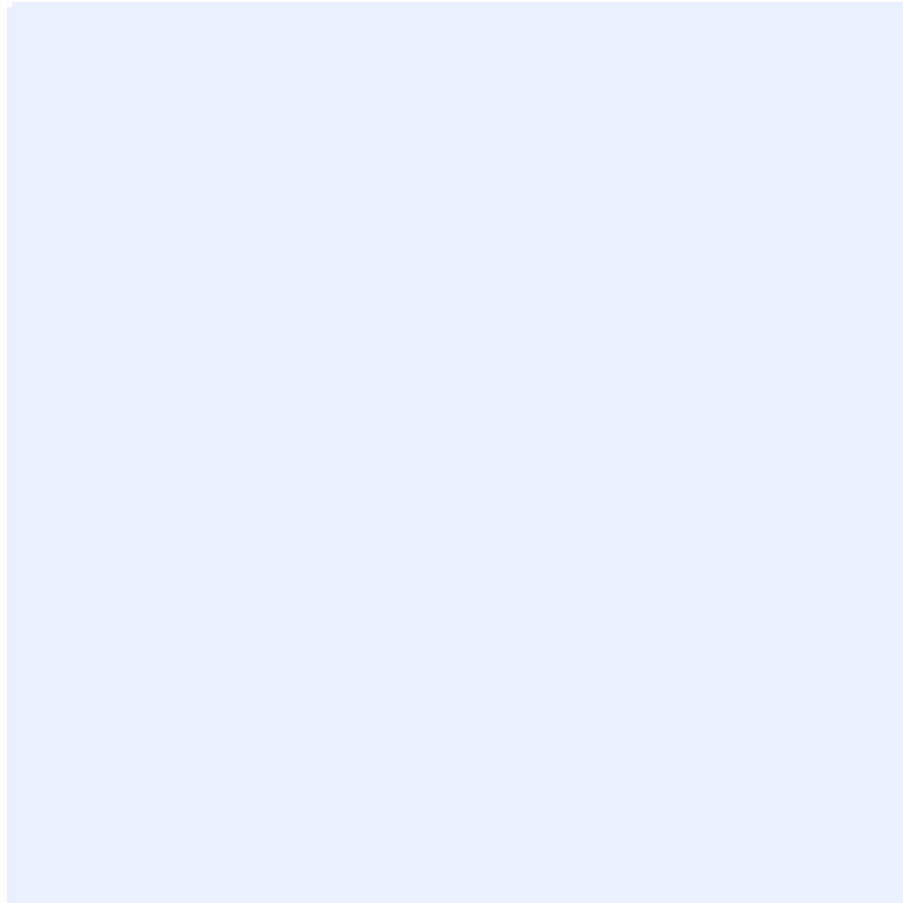


Figure 3: [insert post construction facility access photo and caption text]

## 6. Operational Components / Maintenance Items

### Classification and Standard Operational (Op) Plan:

This facility is classified as a:

<input type="checkbox"/> Detention Pond (Op Plan A)	<input checked="" type="checkbox"/> WQ Bioretention Pond (Op Plan B)	<input type="checkbox"/> WQ Extended Detention Dry Pond (Op Plan C)	<input type="checkbox"/> 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:

<input checked="" type="checkbox"/> Dry Pond	<input type="checkbox"/> 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**:

<input checked="" type="checkbox"/> No	<input type="checkbox"/> 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)**:

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
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: <b>describe</b>

## 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 **Month YYYY**) 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.

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

<b>Flow Spreader</b>		
Anchored Board (midpoint of pond or every 50 feet along pond bottom)	<input type="checkbox"/>	<b>P20</b>
Other:	<input type="checkbox"/>	<b>P21</b>
<b>Facility Outlet</b>		
Catch Basin with Grate	<input type="checkbox"/>	<b>P22</b>
Outlet Pipe(s)	<input type="checkbox"/>	<b>P23</b>
Outlet/Flow Control Structure	<input type="checkbox"/>	<b>P24</b>
Auxiliary Outlet	<input type="checkbox"/>	<b>P25</b>
Hazmat Control Valve:	<input type="checkbox"/>	<b>P26</b>
<b>Outfall Type</b>		
Waterbody (Creek/Lake/Ocean)	<input type="checkbox"/> C	<b>P27</b>
	<input type="checkbox"/> L	
	<input type="checkbox"/> O	
Ditch	<input type="checkbox"/>	<b>P28</b>
Storm Drain System	<input type="checkbox"/>	<b>P29</b>
<b>Outfall Components</b>		
Riprap Pad	<input type="checkbox"/>	<b>P30</b>
Riprap Bank Protection	<input type="checkbox"/>	<b>P31</b>

## 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](http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf)

## 8. Limitations

There are access limitations for this facility:

<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes
Access pond via multiuse path at 4 <sup>th</sup> Street east of US20. Access inlets and piping from Strickler Road and multiuse path west of US20. No access grid in pond bottom.	

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

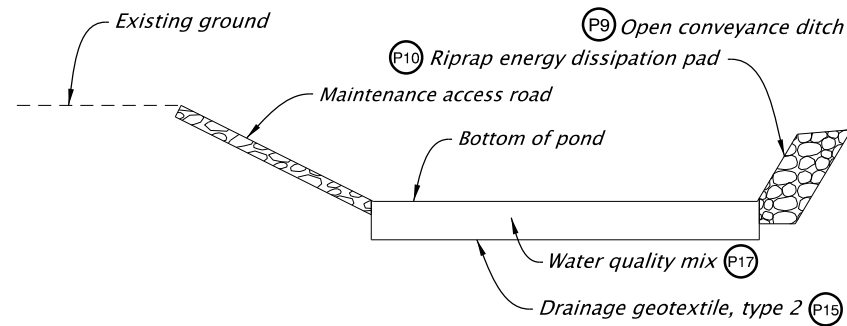
ODEQ Northwest Region Office

(503) 229-5263

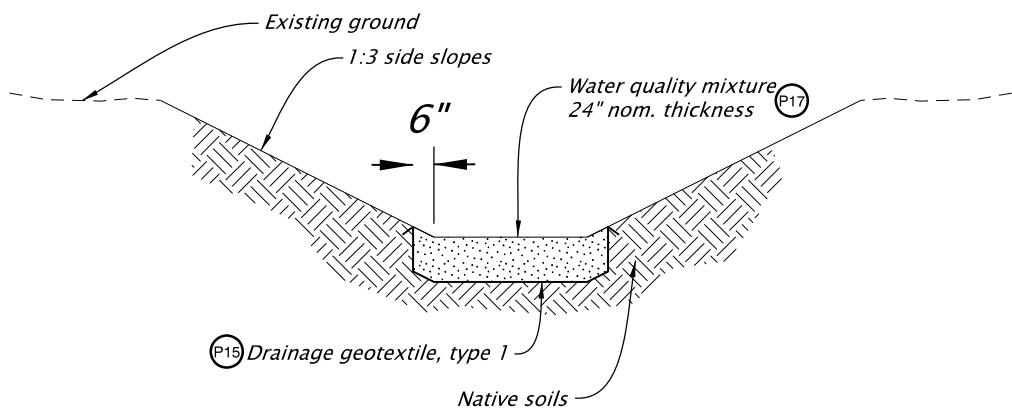
## **A Appendix A – Site Specific Operational Plan**

### **Contents:**

**Operational Plan: DFI D01388**

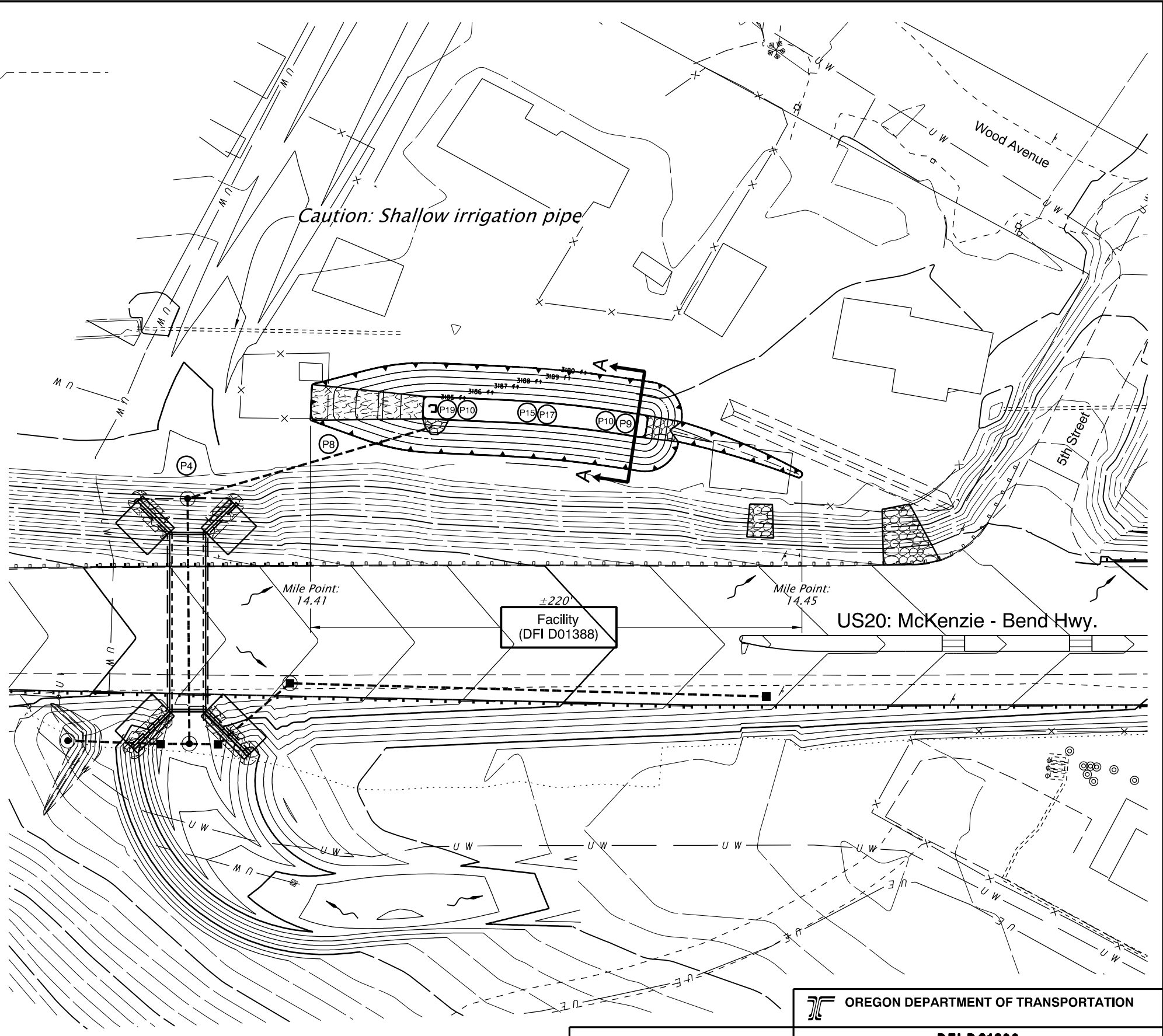
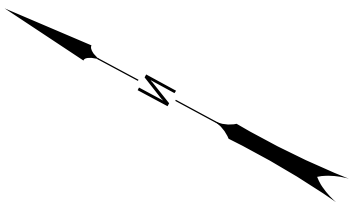


**PROFILE**  
N.T.S.



**SECTION A-A**  
N.T.S.

- LEGEND:**
- Photo Location / Direction
  - Facility component (see table 1 in O&M Manual)
  - Manhole
  - Inlet
  - Manhole with Inlet Top
  - Storm Pipe (Facility)
  - Storm Pipe
  - Conveyance Direction
  - Pavement / Facility Flow Path



**PLAN**  
N.T.S.

Prepared By: Tyler Van Meter  
 Drafted By: Tyler Van Meter

**OREGON DEPARTMENT OF TRANSPORTATION**

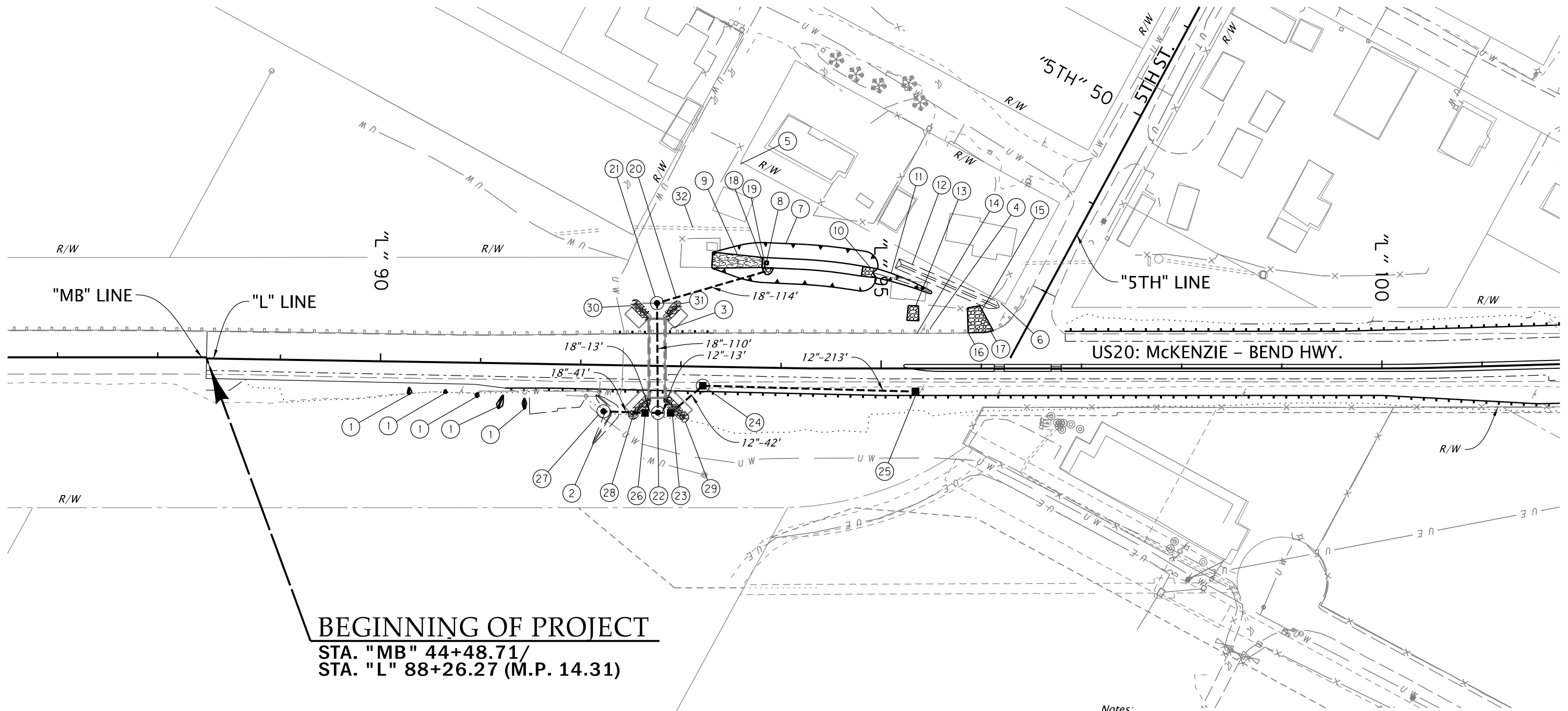
**DFI D01388**  
**MAINTENANCE DISTRICT 10 HWY 17**  
**BIORETENTION POND**  
 14.40  
 DESCHUTES COUNTY

## **B Appendix B – Project Contract Plans**

### **Contents:**

**Drainage Plan Sheet**

**Stormwater Details**



**BEGINNING OF PROJECT**  
 STA. "MB" 44+48.71/  
 STA. "L" 88+26.27 (M.P. 14.31)

Notes:  
 1. Station/Offset call-outs for Type "G-2" and "CG-3" inlets are to the face of curb.  
 Station/Offset call-outs for manholes are to the center of structure.

REGISTERED PROFESSIONAL  
 ENGINEER  
 14,972  
 OREGON  
 JULY 25, 1990  
 BARRY C. JOHNSON  
 EXPIRES: 06/30/2023

**Parametrix**  
 ENGINEERING · PLANNING · ENVIRONMENTAL SCIENCES  
 700 NE MULTNOMAH, SUITE 1000 | PORTLAND, OR 97232  
 P 503.233.2400  
 WWW.PARAMETRIX.COM

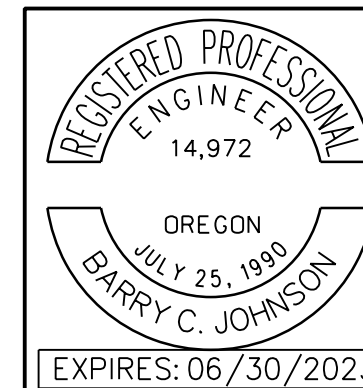
**US20: TUMALO - COOLEY RD. (BEND) SEC.**  
 MCKENZIE-BEND HIGHWAY  
 DESCHUTES COUNTY

Designer: Tyler Van Meter      Reviewer: Barry Johnson  
 Drafter: Tyler Van Meter      Checker: Shawn Ellis

**DRAINAGE**      SHEET NO. C01B

- ① Const. check dam  
Typical of 5  
(For detail, see sht. HA01)
- ② Const. drainage berm at culvert wingwall  
Height varies, 0 to 3'  
(For detail, see sht. HA04)
- ③ Inst. stormwater field marker, type S1, green  
DFI D01388  
MP 14.40  
(See std dwg. RD399)
- ④ Inst. stormwater field marker, type S1, red  
DFI D01388  
MP 14.45
- ⑤ Inst. stormwater field marker, type S2  
DFI D01388  
MP 14.41
- ⑥ Inst. stormwater field marker, type S2  
DFI D01388  
MP 14.44
- ⑦ Const. bioretention pond D01388  
(For details, see shts. HA01, HA02 and HA04)
- ⑧ Inst. porous paver bottom marker - 9 sq. ft.
- ⑨ Const. access road  
(For details, see sht. HA02)
- ⑩ Const. riprap slope protection (Class 50) - 10 cu. yd.  
(For detail, see sht. HA02)
- ⑪ Const. pond v-ditch - 58'  
0.1% longitudinal slope  
(For detail, see sht HA02)
- ⑫ Const. drainage berm at top of pond - 111'  
12" height  
(For detail, see sht. HA01)
- ⑬ Const. riprap slope protection (Class 50) - 14 sq. yd.  
Verify storm drain outfall location in field  
(For detail, see sht. HA02)
- ⑭ Protect existing inlet in place.
- ⑮ Const. riprap slope protection (Class 50) - 42 cu. yd.  
(For detail, see sht. HA02)
- ⑯ Sawcut and remove existing drainage curb.  
Protect existing pavement below curb.  
Sta. "L" 95+71.50 to 96 +01.50 Lt  
For detail, see sht. HA01.
- ⑰ Const. concrete collars around existing  
guardrail posts.  
For detail see sht. HA01
- ⑱ Const. sloped end
- ⑲ Const. riprap pad  
(For details, see sht. HA02)
- ⑳ Inst. 18" storm sew. pipe - 114'  
5' depth  
F.L. out = 3186.20  
(See dwg. no RD348)
- ㉑ Sta. "L" 92+76.70, 73.65' Lt.  
Const. manhole 60" dia.  
Rim = 3191.70  
Connect fdn. drain pipe  
Inst. 18" storm sew. pipe - 110'  
5' depth  
F.L. in = 3187.30  
F.L. out = 3187.20
- ㉒ Sta. "L" 92+77.76, 46.87' Rt.  
Const. manhole 60" dia.  
Rim = 3196.60  
F.L. out = 3189.00  
Inst. 18" storm sew. pipe - 13'  
5' depth  
F.L. in = 3189.10  
Inst. 12" storm sew. pipe - 13'  
5' depth  
F.L. in = 3189.65
- ㉓ Sta. "L" 92+84.50, 46.90' Rt.  
Const. type D inlet  
Const. 24" sump  
Rim = 3195.05  
F.L. out = 3189.70  
Inst. 12" storm sew. pipe - 42'  
15' depth  
F.L. in = 3189.80
- ㉔ Sta. "L" 93+22.22, 24.80' Rt.  
Const. manhole 48" with inlet, type G-2  
Const. 24" sump  
Const. gutter transition  
Rim = 3207.80  
F.L. out = 3190.00  
Inst. 12" storm sew. pipe - 213'  
10' depth  
F.L. in = 3197.50
- ㉕ Sta. "L" 95+34.21, 27.00' Rt.  
Const. type G-2 inlet  
Const. 24" sump  
Const. gutter transition  
Rim = 3203.10  
F.L. out = 3198.55
- ㉖ Sta. "L" 92+69.50, 47.15' Rt.  
Const. type D inlet  
Const. 24" sump  
Rim = 3195.55  
F.L. out = 3189.20  
Inst. 18" storm sew. pipe - 41'  
15' depth  
F.L. in = 3189.30
- ㉗ Sta. "L" 92+23.48, 46.36' Rt.  
Const. manhole 48" with inlet, beehive dome  
Const. 24" sump  
For detail, see sht. HA04  
15' depth  
Rim = 3207.10  
F.L. out = 3189.50
- ㉘ Const. slope protection (2 1/2"-0 aggregate base) - 4 cu. yd.  
For detail, see sht. HA01
- ㉙ Const. slope protection (2 1/2"-0 aggregate base) - 5 cu. yd.  
For detail, see sht. HA01
- ㉚ Const. slope protection (2 1/2"-0 aggregate base) - 4 cu. yd.  
For detail, see sht. HA01
- ㉛ Const. slope protection (2 1/2"-0 aggregate base) - 3 cu. yd.  
For detail, see sht. HA01
- ㉜ Protect existing shallow irrigation pipe.

Notes:  
1. Station/Offset call-outs for Type "G-2" and "CG-3" inlets are to the face of curb.  
Station/Offset call-outs for manholes are to the center of structure.



**Parametrix**  
ENGINEERING · PLANNING · ENVIRONMENTAL SCIENCES  
700 NE MULTNOMAH, SUITE 1000 | PORTLAND, OR 97232  
P 503.233.2400  
WWW.PARAMETRIX.COM

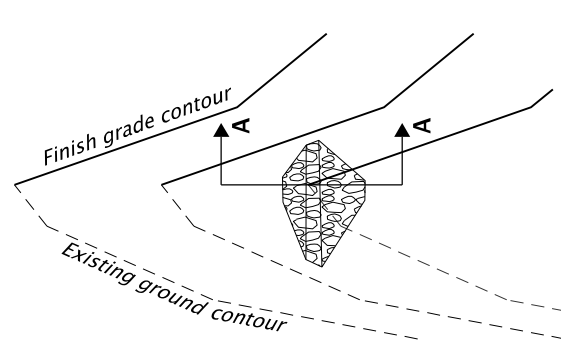


**US20: TUMALO - COOLEY RD. (BEND) SEC.**  
MCKENZIE-BEND HIGHWAY  
DESCHUTES COUNTY

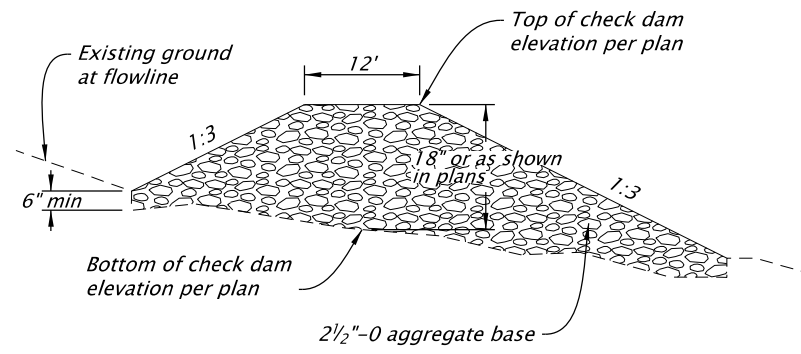
Designer: Tyler Van Meter      Reviewer: Barry Johnson  
Drafter: Tyler Van Meter      Checker: Shawn Ellis

**DRAINAGE NOTES**

SHEET NO.  
C01C



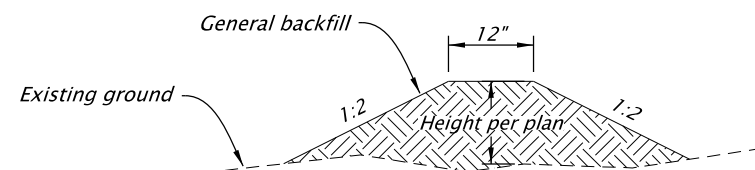
PLAN



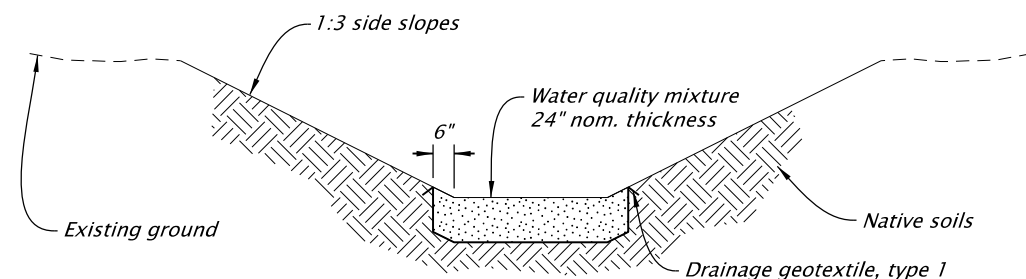
SECTION A-A

CHECK DAM LOCATION TABLE				
Location		Elevation		Quantity (cu. yd.)
Station	Offset	Top	Flowline	
"L" 90+29.1	29' Rt	3215.5	3215.0	1.0
"L" 90+65.2	29' Rt	3214.5	3214.0	1.0
"L" 90+96.8	32' Rt	3213.5	3213.0	1.0
"L" 91+20.3	38' Rt	3212.5	3211.0	3.0
"L" 91+44.4	40' Rt	3211.5	3210.5	1.5

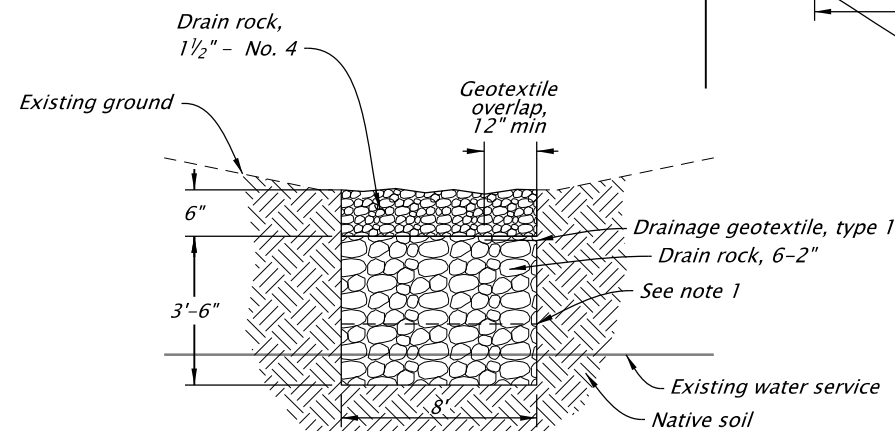
CHECK DAMS



DRAINAGE BERM AT TOP OF POND



BIORETENTION POND TYPICAL SECTION

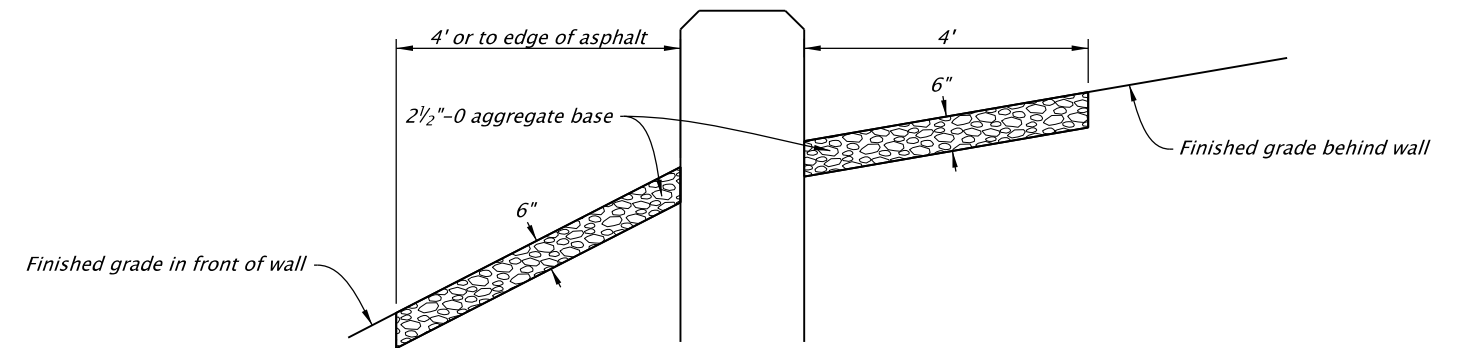


Note:

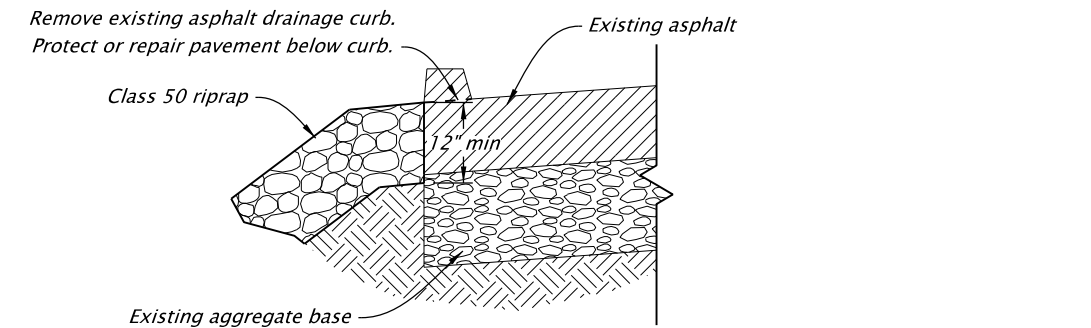
Adjust bottom of trench to maintain 2' clear horizontally and 6" clear vertically from water service pipe. Pothole to verify water pipe location.

Adjust horizontal layout of trench to maintain 1' clear from existing water meter vault and existing irrigation pipe.

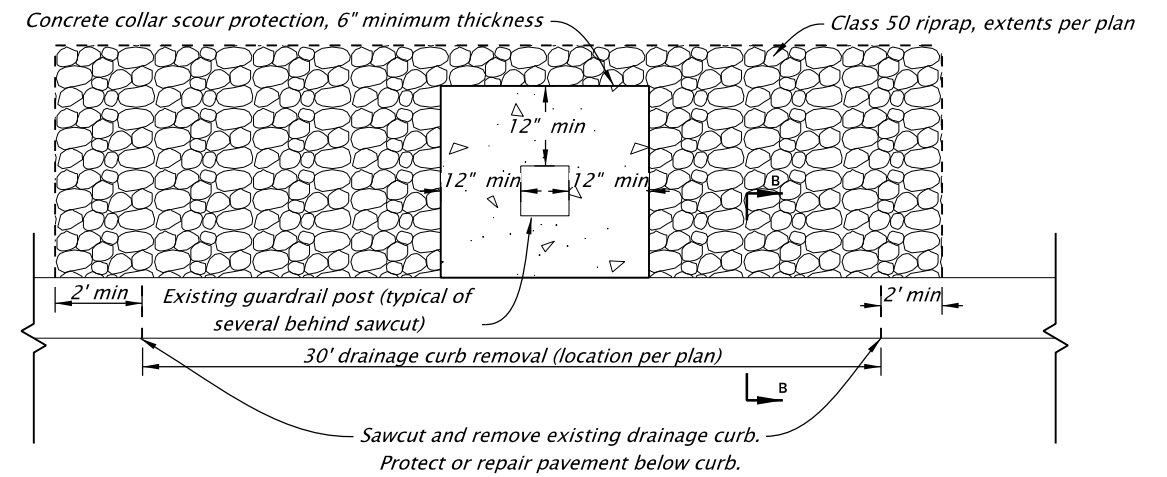
INFILTRATION TRENCH



SLOPE PROTECTION AT CULVERT WINGWALLS

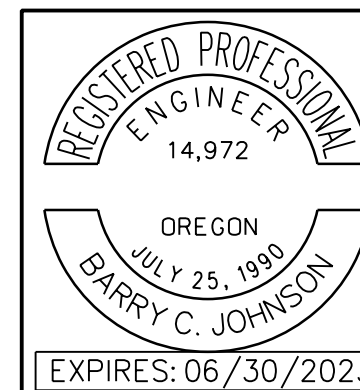


SECTION B-B



PLAN

CURB CUT AT HWY US20 / 5TH ST



**Parametrix**  
ENGINEERING · PLANNING · ENVIRONMENTAL SCIENCES  
700 NE MULTNOMAH, SUITE 1000 | PORTLAND, OR 97232  
P 503.233.2400  
WWW.PARAMETRIX.COM



**US20: TUMALO - COOLEY RD. (BEND) SEC.**  
MCKENZIE-BEND HIGHWAY  
DESCHUTES COUNTY

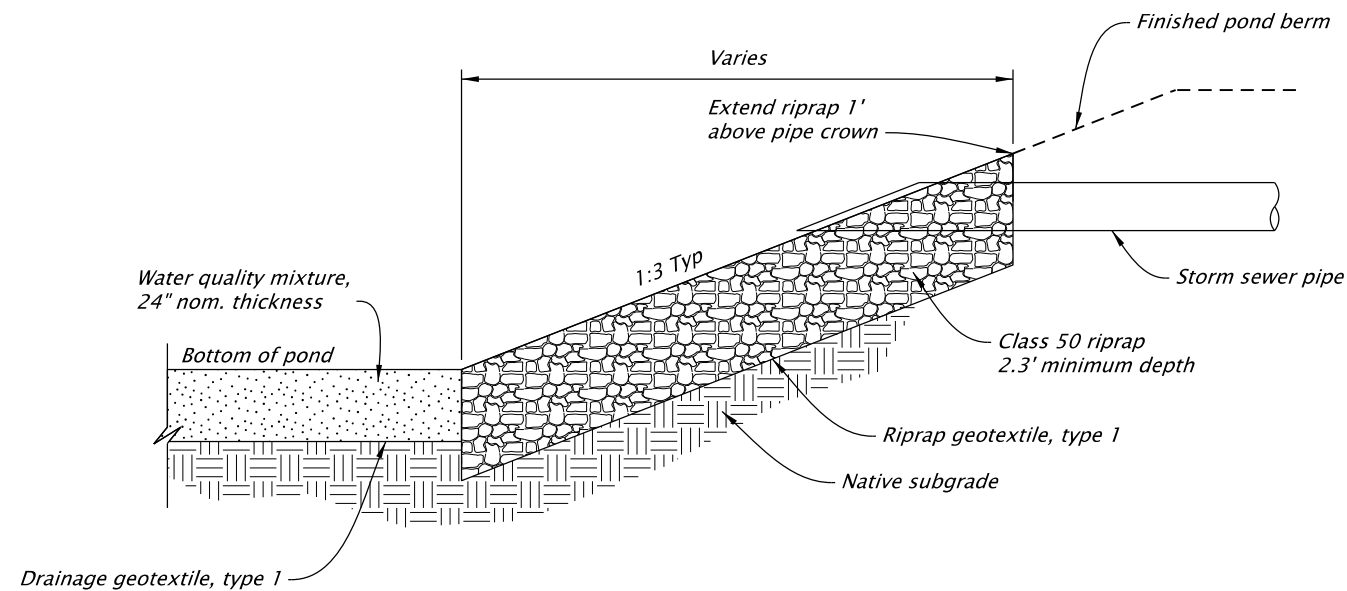
Designer: Tyler Van Meter  
Drafter: Tyler Van Meter

Reviewer: Barry Johnson  
Checker: Shawn Ellis

**STORMWATER DETAILS**

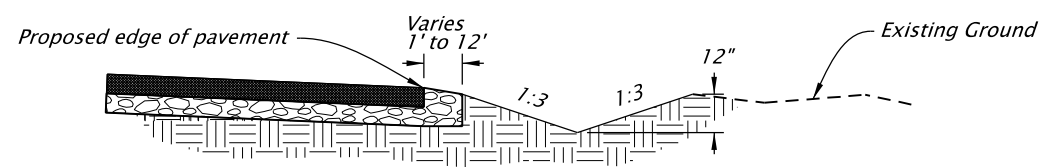
SHEET NO.  
HA01



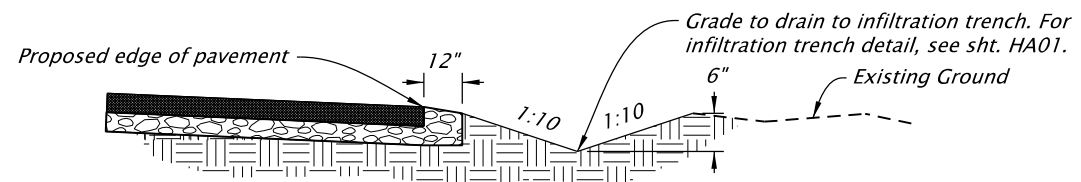


- Notes:
1. Riprap pad to be centered on pipe outfall
  2. See ODOT std. dwg. RD317

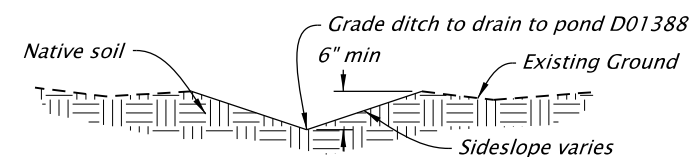
POND ENERGY DISSIPATOR



BAILEY RD

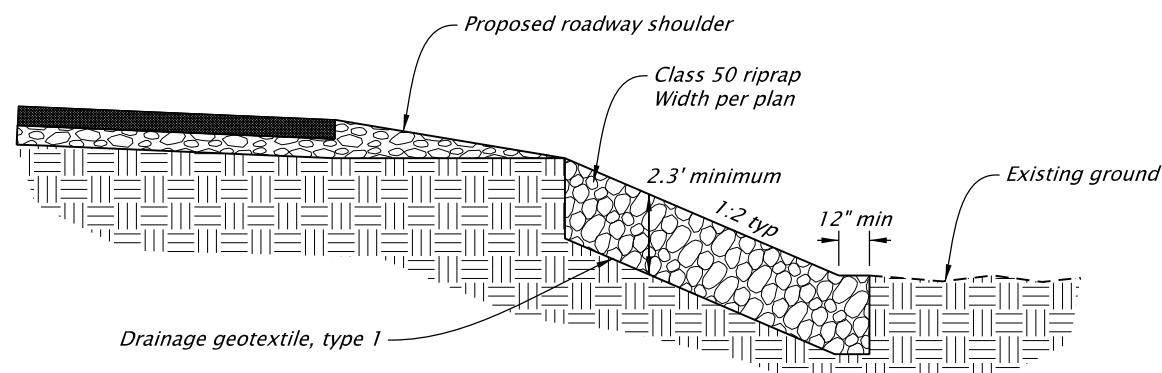


WOOD AVE



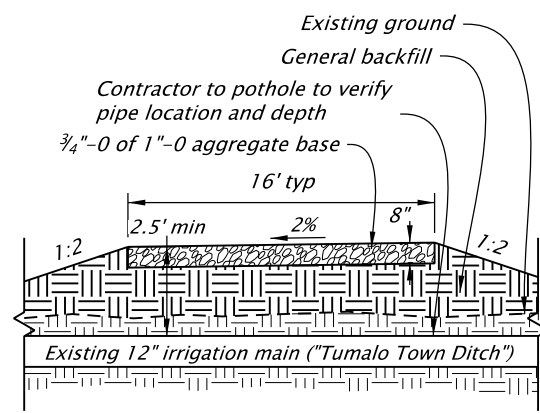
NORTH POND

V-DITCH

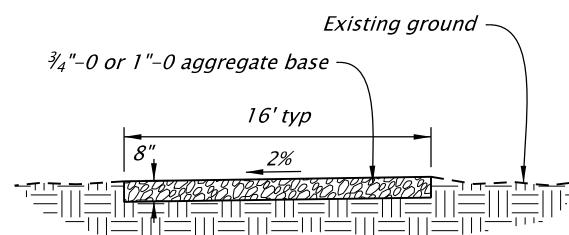


LOOSE RIPRAP SLOPE PROTECTION

FACILITY ID MARKER TABLE						
Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	MP		Begin	End	Red	Green
"L" 95+49 Rt.	14.45	D01388	✓		✓	
"L" 92+90 Rt.	14.40	D01388		✓		✓
"L" 95+05 Rt.	14.44	D01388	✓			
"L" 93+57 Rt.	14.41	D01388		✓		
"C" 53+51 Lt.	14.68	D01389	✓		✓	
"C" 54+35 Lt.	14.66	D01389		✓		✓
"C" 53+50 Lt.	14.67	D01389	✓			
"C" 54+37 Lt.	14.68	D01389		✓		
"OB" 48+42 Lt.	14.70	D01390	✓		✓	
"OB" 45+97 Lt.	14.71	D01390		✓		✓
"OB" 47+78 Lt.	14.69	D01390	✓			
"L" 112+21 Rt.	14.76	D01392	✓		✓	
"L" 115+86 Rt.	14.83	D01392		✓		✓
"L" 112+44 Rt.	14.77	D01392	✓			
"L" 115+74 Rt.	14.83	D01392		✓		

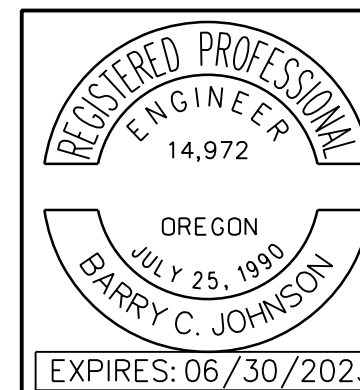


TUMALO TOWN DITCH OVERCROSSING



TYPICAL ACCESS ROAD

POND MAINTENANCE ACCESS ROAD



**Parametrix**  
 ENGINEERING · PLANNING · ENVIRONMENTAL SCIENCES  
 700 NE MULTNOMAH, SUITE 1000 | PORTLAND, OR 97232  
 P 503.233.2400  
 WWW.PARAMETRIX.COM

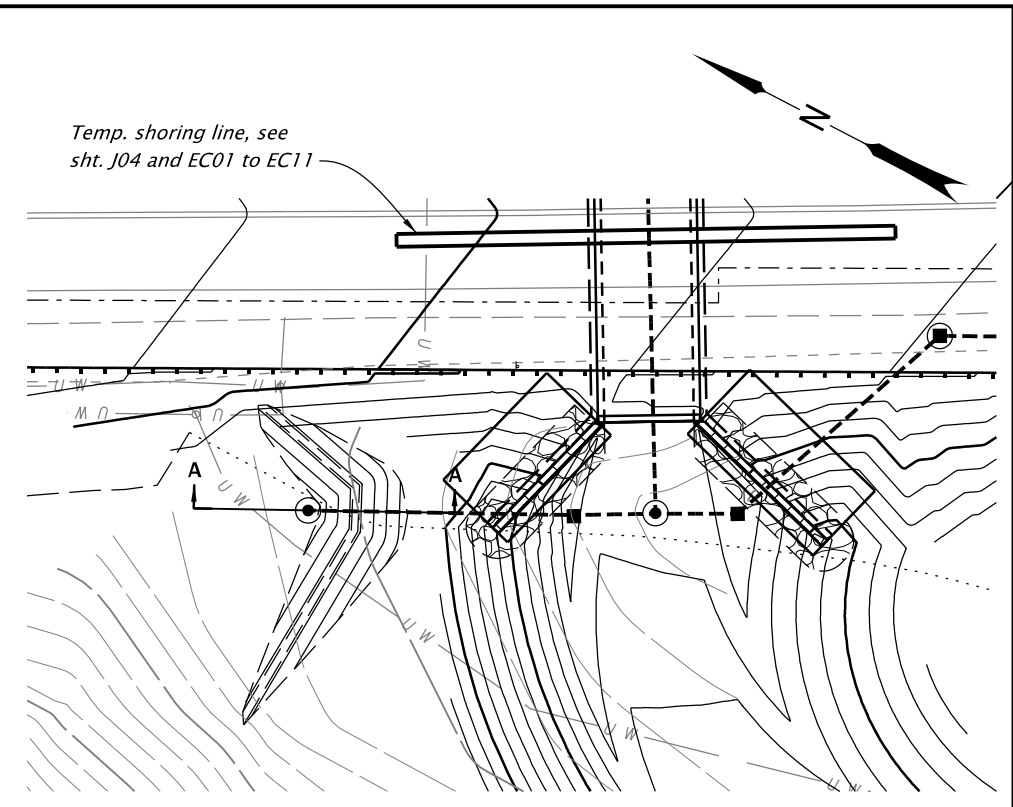
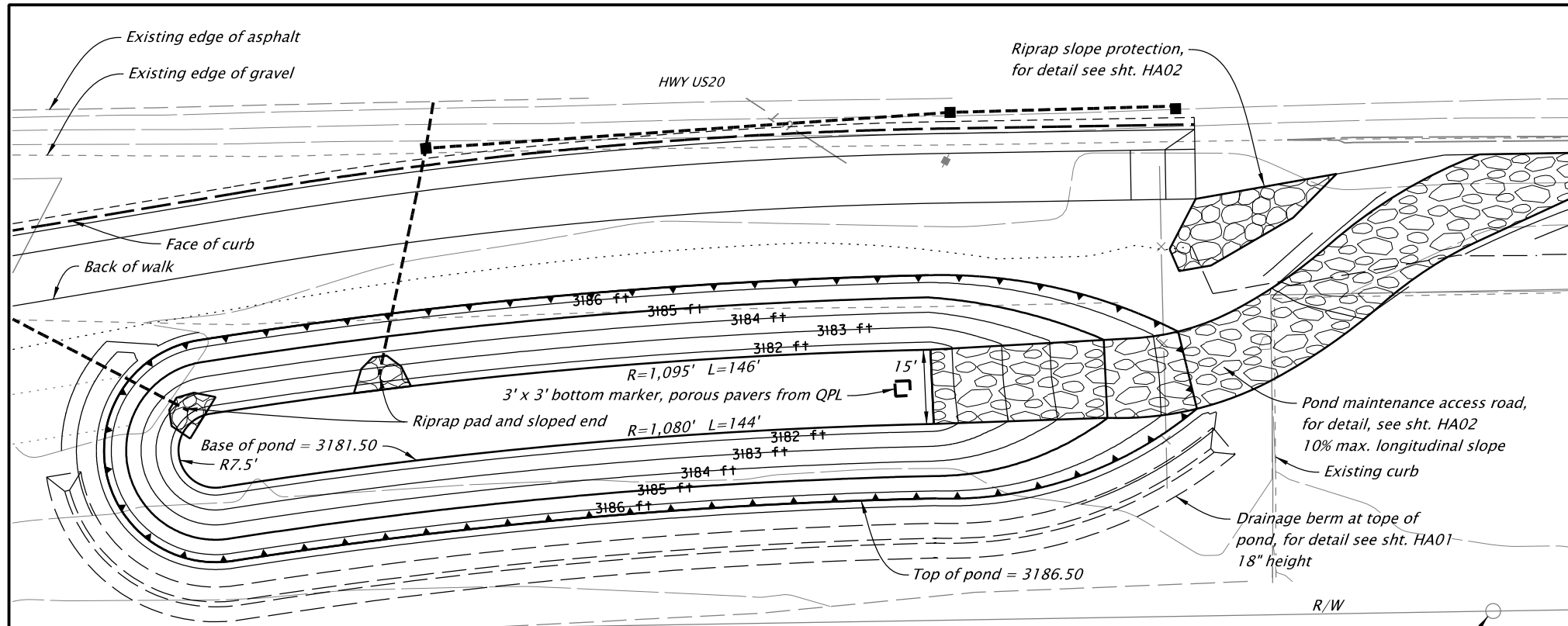


**US20: TUMALO - COOLEY RD. (BEND) SEC.**  
 MCKENZIE-BEND HIGHWAY  
 DESCHUTES COUNTY

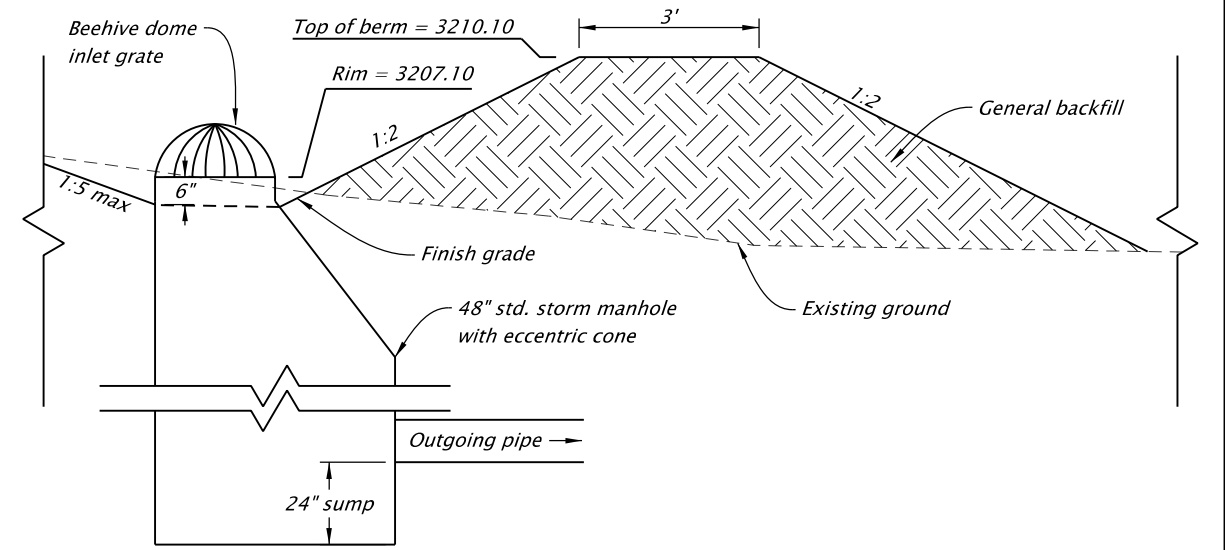
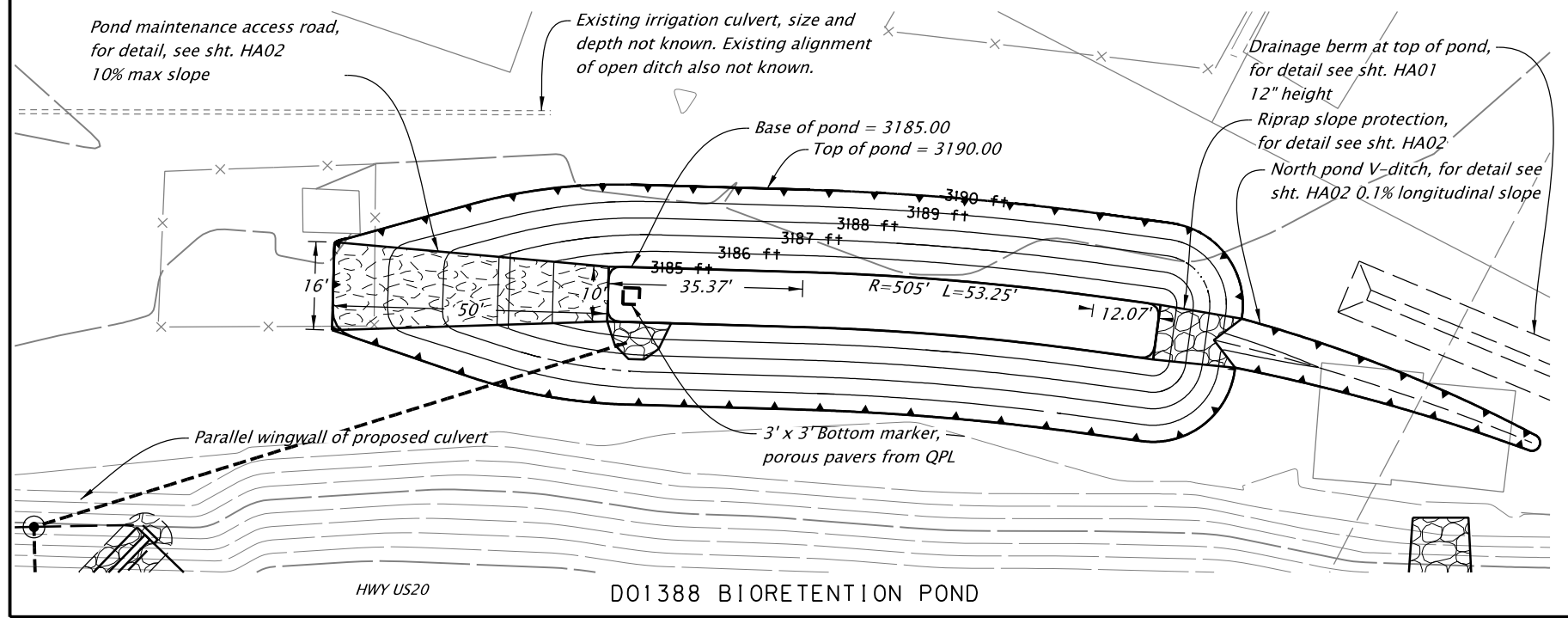
Designer: Tyler Van Meter      Reviewer: Barry Johnson  
 Drafter: Tyler Van Meter      Checker: Shawn Ellis

**STORMWATER DETAILS**

SHEET NO.  
**HA02**



D01392		D01392 BIORETENTION POND	
Bottom of pond	Area: 251 sq yd	Elevation: 3181.50	
Top of storage (100-yr event)	Area: 858 sq yd	Elevation: 3185.50	
Top of pond	Area: 1,021 sq yd	Elevation: 3186.50	
D01388			
Bottom of pond	Area: 111 sq yd	Elevation: 3185.00	
Top of storage (100-yr event)	Area: 594 sq yd	Elevation: 3189.40	
Top of pond	Area: 669 sq yd	Elevation: 3190.00	



SECTION A-A  
DRAINAGE BERM AT CULVERT WINGWALL

REGISTERED PROFESSIONAL  
ENGINEER  
14,972  
OREGON  
JULY 25, 1990  
BARRY C. JOHNSON  
EXPIRES: 06/30/2023

**Parametrix**  
ENGINEERING · PLANNING · ENVIRONMENTAL SCIENCES  
700 NE MULTNOMAH, SUITE 1000 | PORTLAND, OR 97232  
P 503.233.2400  
WWW.PARAMETRIX.COM

**US20: TUMALO - COOLEY RD. (BEND) SEC.**  
MCKENZIE-BEND HIGHWAY  
DESCHUTES COUNTY

Designer: Tyler Van Meter      Reviewer: Barry Johnson  
Drafter: Tyler Van Meter      Checker: Shawn Ellis

STORMWATER DETAILS      SHEET NO. HA04