OPERATION & MAINTENANCE MANUAL

Water Quality Bioretention Pond

Manual prepared: May/2019

DFI No. D01234

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Figure 1: DFI No. D01234, looking South (Placeholder for future photo)

1. Identification

Drainage Facility ID (DFI):	D01234
Facility Type:	Water Quality Bioretention Pond
Construction Drawings:	(V-File Numbers) 52V-062
Location:	District: 11
	Highway No.: 050
	Mile Post: 0.330 to 0.370, Rt.

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

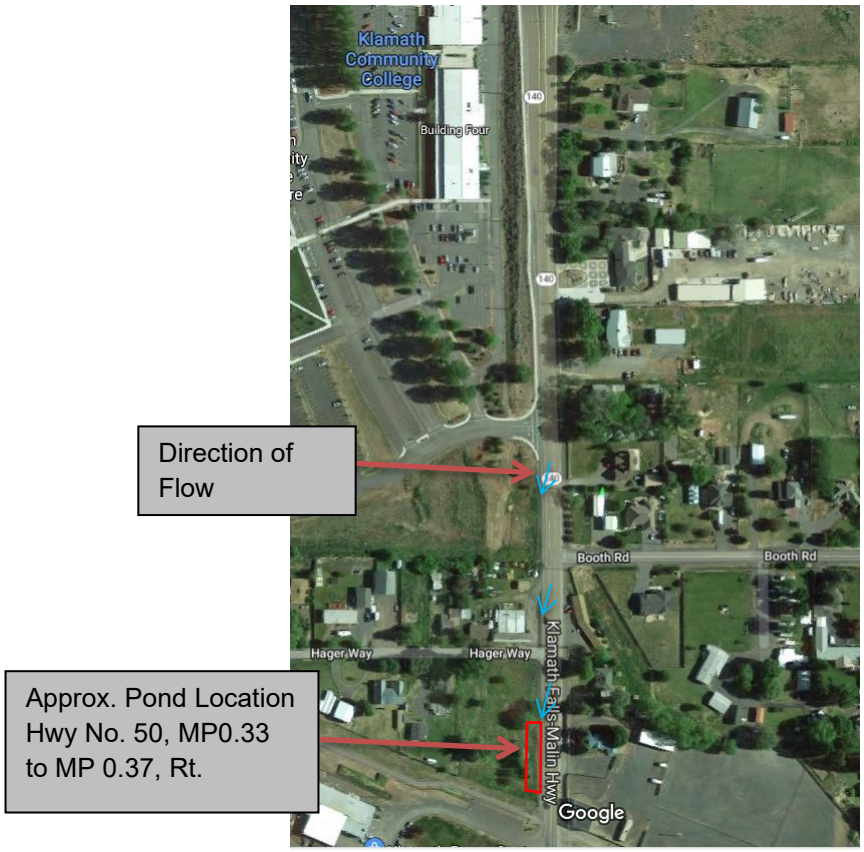


Figure 2: Facility location map (placeholder)

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:

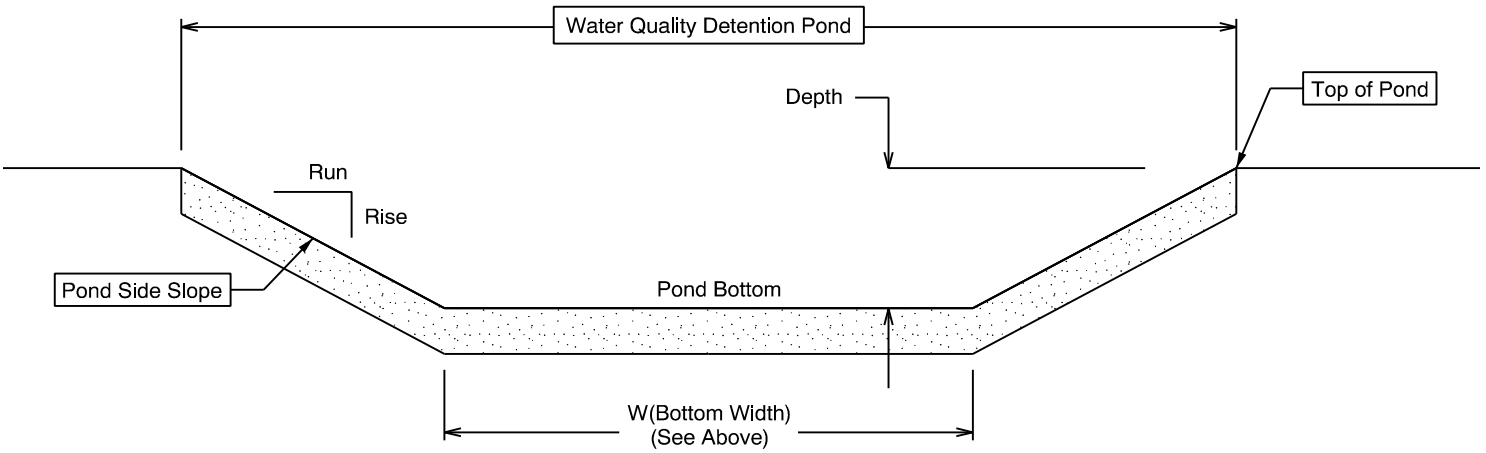
Bottom Area (sq. ft.)	Top Area (sq. ft.)
1,060	3,940

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 3 (feet)
3.0

Side Slope 1 (Rt.) : 2 (Lt.)	
Rise (feet)	3 : 3
Run (feet)	9 : 12



Site Specific Information: The pond has a varying ditch bottom from 0 to 11 feet. Generally it is close to 10 feet. The side slope adjacent to the highway is 1:4, with the side slope adjacent to the walk at 1:3. Visual inspections to the pond should be made from the roadside shoulder. Mowing and other maintenance activities can be accessed through the multi-use path on the south end of the pond. Stormwater from the pond will back up in the roadside ditch back to Hager Way. The water quality mixture is only in the portion identified in the Operation Plan. Ground water is approximately 4 feet below the pond bottom during the high groundwater season (spring), otherwise it was monitored as low as 7 feet below the pond bottom.

Facility Access

Maintenance access to the facility:

☐Roadside pad	☒Roadside shoulder
☐Access road with Gate	☒Access road without Gate (multi-used path on S. end)

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

5. 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 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.

Table 1: Stormwater Pond Components		ID #
Upstream Manholes/Structures		
Pre-treatment Manhole Type: A type G-2 Inlet with a 3 foot sump	☒	**P1**
Water Quality Manhole Type:	☐	**P2**
Flow Splitter Manhole	☐	**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: Drainage geotextile	☒	**P15**
Impermeable Liner	☐	**P16**
Water Quality Mix	☒	**P17**
Perforated Pipe	☐	**P18**
Bottom Marker – Concrete square	☒	**P19**

Flow Spreader		
Anchored Board (midpoint of pond or every 50 feet along pond bottom)	☐	**P20**
Other:	☐	**P21**
Facility Outlet		
Catch Basin with Grate	☐	**P22**
Outlet Pipe(s)	☐	**P23**
Outlet/Flow Control Structure	☐	**P24**
Auxiliary Outlet – Flow over walk	☒	**P25**
Hazmat Control Valve:	☐	**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**

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 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

7. 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.

8. 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

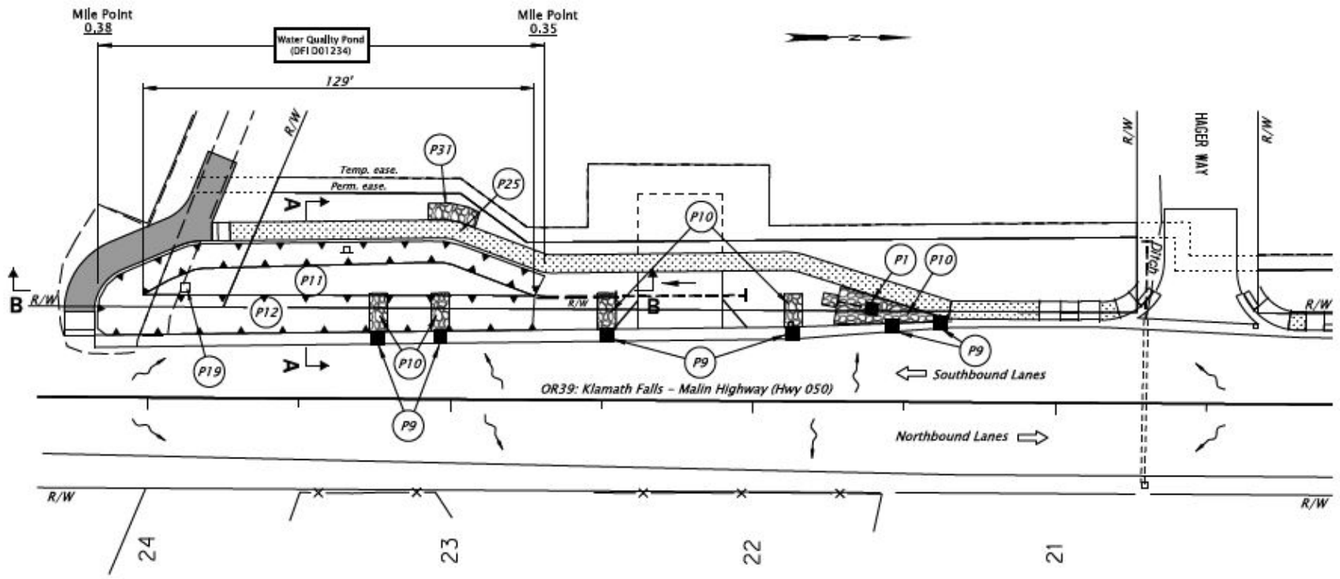
Contact any of the following for more detailed information about management of waste materials found on site:

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

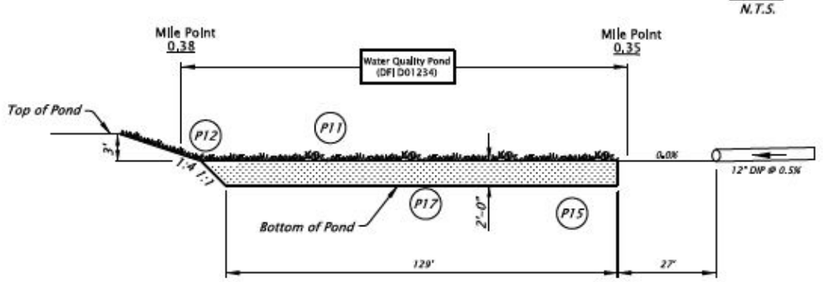
A Appendix A – Site Specific Operational Plan

Contents:

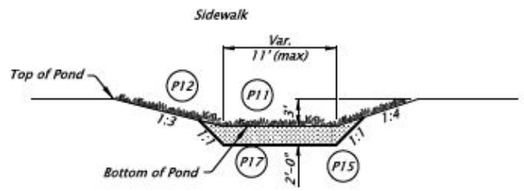
Operational Plan: DFI D01234



PLAN
N.T.S.



SECTION B-B
N.T.S.



SECTION A-A
N.T.S.

LEGEND

- X# — Facility Component (see table 1 in O&M manual)
- ■ or □ — Inlet
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Traffic Flow Direction

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 1 of 1

Prepared By: Wade J. Cootney

Drafted By: Michael L. Graves

DFI D01234
MAINTENANCE DISTRICT #11 HWY 050
WATER QUALITY POND
KLAMATH FALLS - MALIN HIGHWAY MP 0.35
KLAMATH COUNTY

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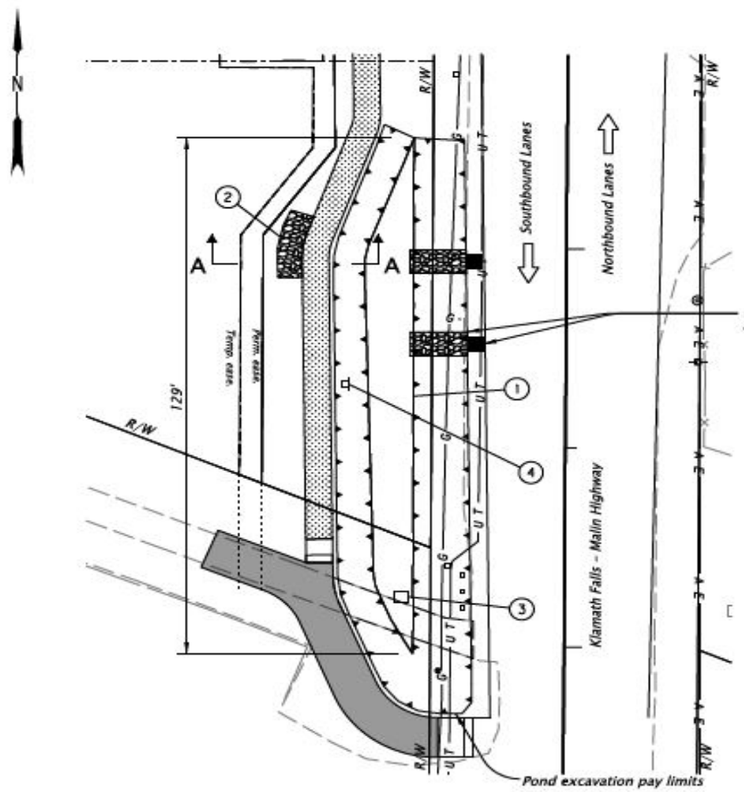
B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 52V-062

52V-062



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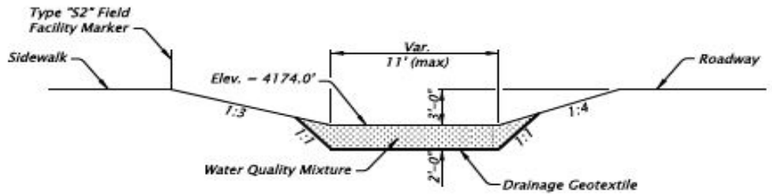
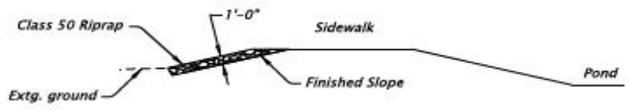


TYPICAL SECTION
NTS



SECTION A-A
NTS

RIP RAP SLOPE PROTECTION
NTS

1. Const. bioretention pond DFI no. D01234
   Exc. - 280 cu. yd.
   Water Quality Mixture - 110 cu. yd.
   Drainage Geotextile - 250 sq. yd.
2. Const. rip rap slope protection - 5 cu. yd.
   (For details, see this sheet)
3. Const. conc. bottom marker
   3' x 3' - 6" thick
   Elev. - 4174.0'
4. Inst. Type "S2" field facility marker
   DFI D01234
   (See dwg. no. RD398)

General Notes:

1. Riprap will be paid for under appropriate bid items, seperate from pond.
2. Pond excavation will be paid for seperate from general excavation. See pay limits, this sheet.
3. For modified curb inlets and riprap splash pad details and locations see sheet 8B06.

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
87978PE
DIGITALLY SIGNED May 24 2019 12:15 PM
OREGON
MARCH 12, 2013
WADE JOSH COATNEY
RENEWS: 12-31-2019
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

OR39; KLAMATH FALLS/LAKEVIEW JCT -MATNEY RD SEC.
KLAMATH FALLS-MALIN HIGHWAY
KLAMATH COUNTY

Designed: Wade J. Coatney | Reviewed: Chad M. Howard
Drafted: Michael L. Graves | Checked: N/A

STORMWATER

DIVISION NO. D01234
SHEET NO. HA01

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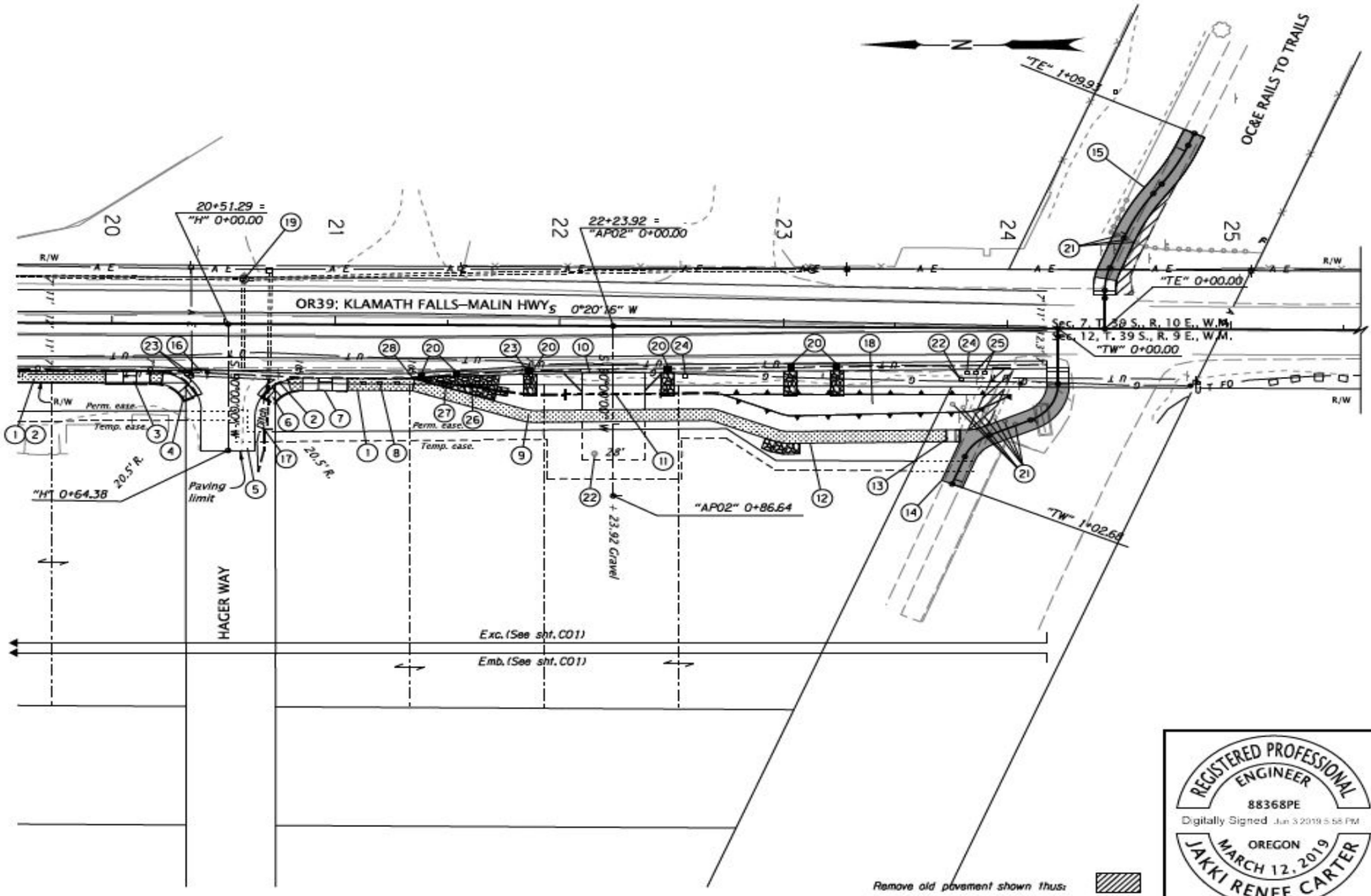
N
"TE" 1+09.91
OC&E RAILS TO TRAILS
20
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20+51.29 = "H" 0+00.00
22+23.92 = "AP02" 0+00.00
OR39: KLAMATH FALLS–MALIN HWY
S 0°20'16" W
R/W
A E
L O
Perm. ease.
Temp. ease.
"TE" 0+00.00
Sec. 7, T. 38 S., R. 10 E., W.M.
Sec. 12, T. 39 S., R. 9 E., W.M.
"TW" 0+00.00
"H" 0+64.38
20.5' R.
Paving limit
"AP02" 0+86.64
"TW" 1+02.64
+ 23.92 Gravel
HAGER WAY
Exc. (See sht. C01)
Emb. (See sht. C01)
Remove old pavement shown thus:
Realign asphalt walks shown thus:
REGISTERED PROFESSIONAL ENGINEER
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OREGON
MARCH 12, 2019
JAKKI RENEE CARTER
RENEWS: 12–31–2021
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST
OREGON DEPARTMENT OF TRANSPORTATION
OR39; KLAMATH FALLS/LAKEVIEW JCT -MATNEY RD SEC,
KLAMATH FALLS-MALIN HIGHWAY
KLAMATH COUNTY
Designer: Jakki R. Carter
Reviewer: Brian D. Pasley
Drafter: Joseph J. Rodriguez
Checker: Brian Wood
GENERAL CONSTRUCTION
SHEET NO. C02
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52V–062

(1) *Const. P.C. sidewalk*
Setback – 0

(2) *Const. curb and gutter*

(3) *Const. parallel curb ramp*
(For details, see sht. BC05)

(4) *Const. end of walk curb ramp*
(See dwg. No. RD754)
(For details, see sht. BC05)

(5) *Const. A.C. appr*
(See dwg. No. RD715)

(6) *Const. end of walk ramp*
(For details, see sht. BC06)

(7) *Const. parallel curb ramp*
(For details, see sht. BC06)

(8) *Const. mailbox service turnout – 1*
Inst. multiple mailbox support – 3
Const. conc. collar – 3
(See dwg. nos. RD100 & RD101)

(9) *Const. P.C. sidewalk*
Setback – 20.75'

(10) *Const. P.C. conc. dwy., option G*

(11) *Inst. 12" ductile iron pipe – 44'*
I.E. (in) – 4174.40'
I.E. (out) – 4174.24'
5' depth
S – 0.005 ft/ft
Const. sloped end – 2

(12) *Const. P.C. sidewalk*
Setback – 32.75'

(13) *Const. end of walk curb ramp*
(For details, see sht. BC07)

(14) *Asphalt conc. trail realignment*
(For details, see sht. BC07 & BC08)

(15) *Asphalt conc. trail realignment*
(For details, see sht. BC09)

(16) *Const. valley gutter*
(For details, see sht. BB11)

(17) *Sta. 20+69.9, 53.5', Rt. to*
Sta. 20+70.2, 27.5', Rt.
Extend 18" CMP culvert pipe – 26' Rt.
Match ext. slope
5' depth
Const. sloped end Rt.
(See dwg. nos. RD316, RD325, RD326, RD380 & RD398)

(18) *Const. water quality pond – D01234*
(For details, see sht. HA01)

(19) *Minor adjust manhole*

(20) *Const. CG–3 modified curb opening – 6*
(For details, see sht. BB06)

(21) *Remove extg. bollards*

(22) *Utility to be adjusted by others*

(23) *Utility to be relocated by others*

(24) *Remove & reinst. single mailbox support*

(25) *Remove & reinst. multiple mailbox support – 2*

(26) *Sta. 21+60.9, 30.7' Rt.*
Const. type "G–2" inlet with 3' sump
Rim elev – 4776.4'
Inst. 12" storm sew. pipe – 12'
I.E. (out) – 4174.5
Depth – 5'
S – 0.005 '/ft
Const. sloped end
(See dwg. nos. RD318, RD336, RD339, RD364, RD365, & RD386)

(27) *Const. riprap lined ditch – 10 cu. yd.*
(For details, see sht. BB04)

(28) *Const. curb and gutter, modified*

REGISTERED PROFESSIONAL ENGINEER
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OREGON
MARCH 12, 2019
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RENEWS: 12–31–2021
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KLAMATH FALLS–MALIN HIGHWAY
KLAMATH COUNTY

Designer: Jakki R. Carter | Reviewer: Brian D. Pasley
Drafter: Joseph J. Rodriguez | Checker: Brian Wood

GENERAL CONSTRUCTION NOTES | SHEET NO. C02A

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