OPERATION & MAINTENANCE MANUAL

Water Quality Bioslope

Manual prepared: August 2023

DFI No. D01501

Figure 1: DFI No. D01501, looking [cardinal direction]

1. Identification

Drainage Facility ID (DFI):	D01501
Facility Type:	Water Quality Bioslope
Construction Drawings:	(V-File Numbers) 57V-010
Location:	District: 2C
	Highway No.: 281
	Mile Post: 2.31 to 2.36, Right

2. Manual Purpose

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

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. **NOTE: Mile posts are based off of the V-File, and may vary from TransGIS mile posts.**

Facility location type: **Roadway shoulder**

Flow direction: Water Quality Bioslope flows to a sag in the highway

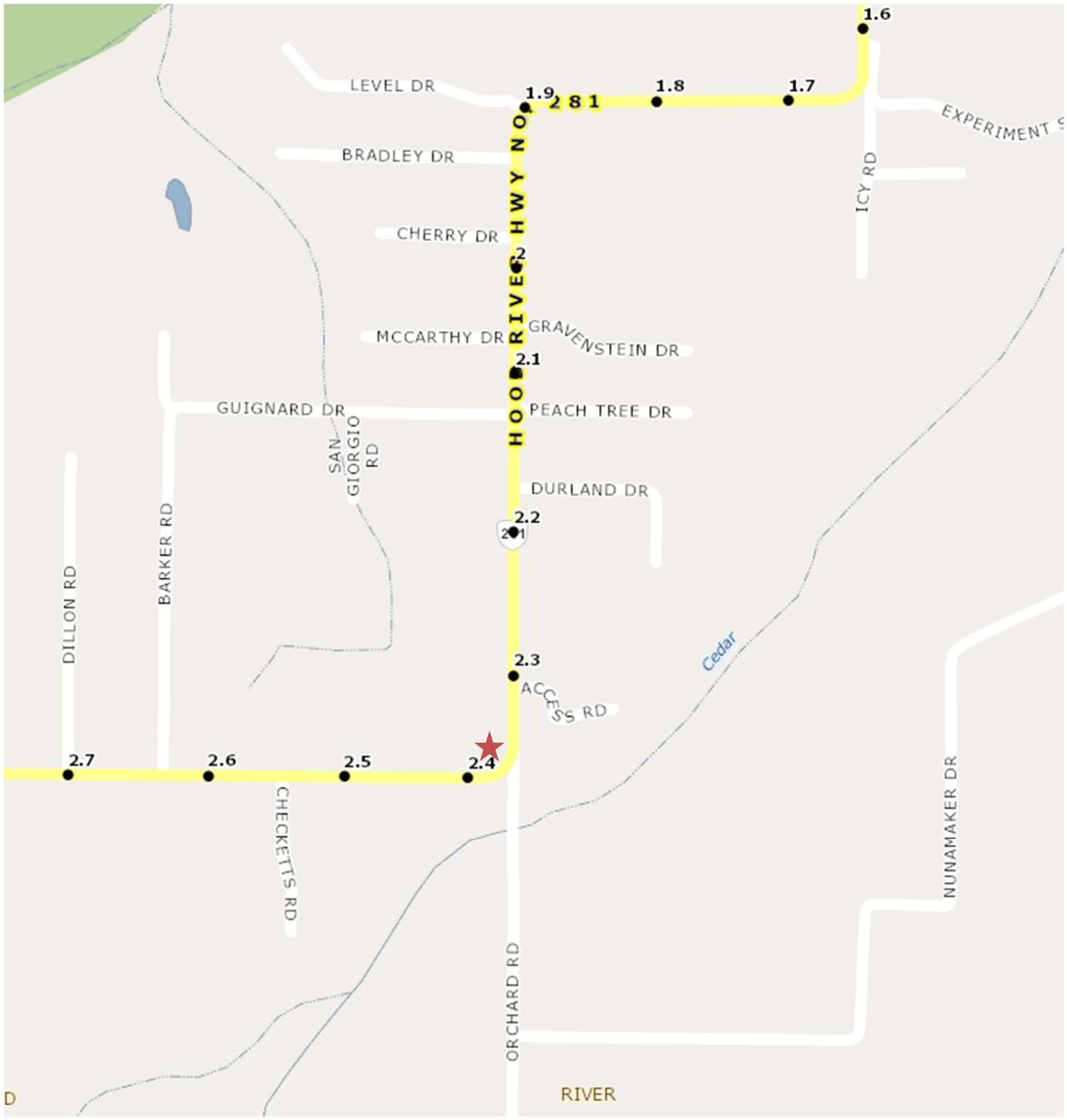


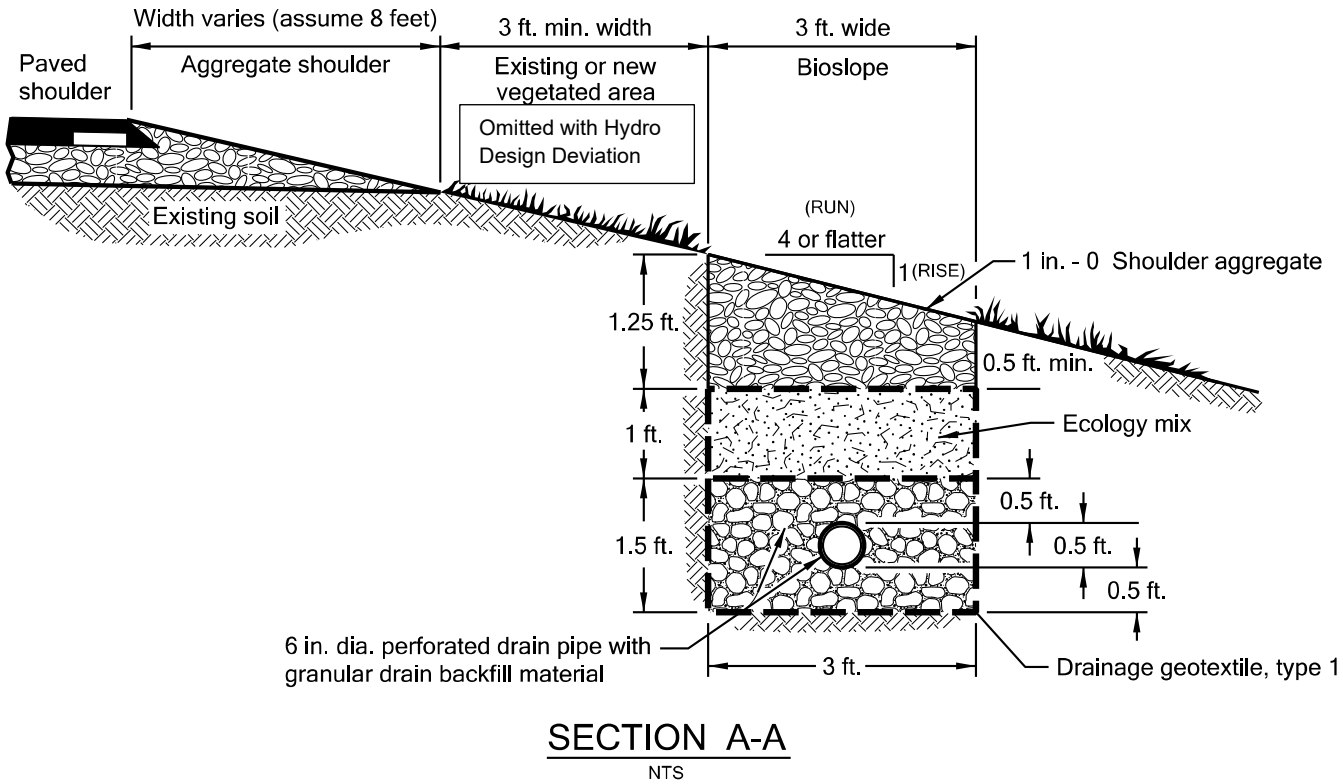
Figure 2: Location Map

4. Facility Summary

The width is measured perpendicular to the edge of pavement and is equivalent to the flow length. The length is measured parallel to the edge of pavement and is equivalent to the length of the contributing impervious area.

The length and width of the applicable facility components are:

Component	Length (feet)	Width (feet)
Filter Strip	**NA**	**NA**
Bioslope	**196**	**3**



SECTION A-A
NTS

Figure 3: BioSlope Section

Site Specific Information: The OR 281 bioslope is located on the inside of a horizontal curve on the roadside slope above a V ditch leading to the sag point. The width of the southbound shoulder is 6 ft. but the travel lane varies in width from a 15 to 31 ft. within the area of the bioslope. The bioslope is located between the two driveway entrances for the existing gas station. The vegetated filter strip was omitted due to project constraints. The perforated pipe within the bioslope outfalls to a Type D Modified inlet. The inlet is part of the culvert which flows southeast and is DFI # D029978.

5. Facility Access

Maintenance access to the facility:

☐Roadside pad	☒Roadside shoulder
☐Access road with Gate	☐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:

☐ Filter Strip (Op Plan A)	☒ Bioslope (Op Plan B)
A filter strip consists of a vegetated or media slope located parallel to the edge of pavement. It maintains sheet flow of stormwater runoff over the width of the strip.	A bioslope consists of a filter strip and treatment zone. It is a flow-through stormwater treatment facility located along roadside embankments.
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B) are provided in the Standard Operation Manual.	

See Appendix A for the site specific operational plan.

Operational Components

Filter strips and bioslopes have many components that assist with treatment, conveyance, and infiltration of stormwater runoff. The components in use can vary depending on the facility design. The facility components table (Table 1) highlights 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 Filter Strips and Bioslopes (implemented October 2018) 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 below.

Table 1: Bioslope/Filter Strip Components		ID #
Facility Inlet		
Pavement Sheet Flow	☒	**B1**
Shoulder Aggregate	☒	**B2**
Ground Cover		
Vegetated Slope	☐	**B3**
Aggregate Media Slope	☐	**B4**
Underground Components		
Water Quality Mix	☐	**B5**
Ecology Mix	☒	**B6**
Granular Drain Backfill Material	☒	**B7**
Geotextile Fabric	☒	**B8**
Geocell Grid	☐	**B9**
Structures		
Curb/Berm	☐	**B10**
Check Dam	☐	**B11**
Cleanout	☒	**B12**
Facility Outlet		
Perforated Drain Pipe	☒	**B13**
Open Slope Outlet	☐	**B14**
Open Channel Outlet	☐	**B15**
Storm Drain Outlet Pipe	☒	**B16**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐ **O**	**B17**
Outfall Channel	☐	**B18**
Storm Drain System	☒	**B19**
Outfall Components		
Pervious Berm	☐	**B20**
Riprap Pad	☐	**B21**

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

Maintenance Guide/Maintenance Actions

The ODOT Maintenance Guide lists the standard maintenance actions for water quality facilities under Activity 125.

Standard maintenance tables describe the maintenance component, the potential defect or problem, the condition when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain ODOT filter strips and bioslopes:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 5 (Water Quality Bioslopes)

The *Maintenance Guide* can be viewed here:

http://transnet.odot.state.or.us/hwy/MaintOPs/Pages/Maintenance%20Guide.aspx

8. Limitations

Filter strips and bioslopes are NOT designed to allow the use of heavy equipment. Vehicles entering the facility 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.

9. Waste Disposal

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/Maintenance/Documents/ems_manual.pdf

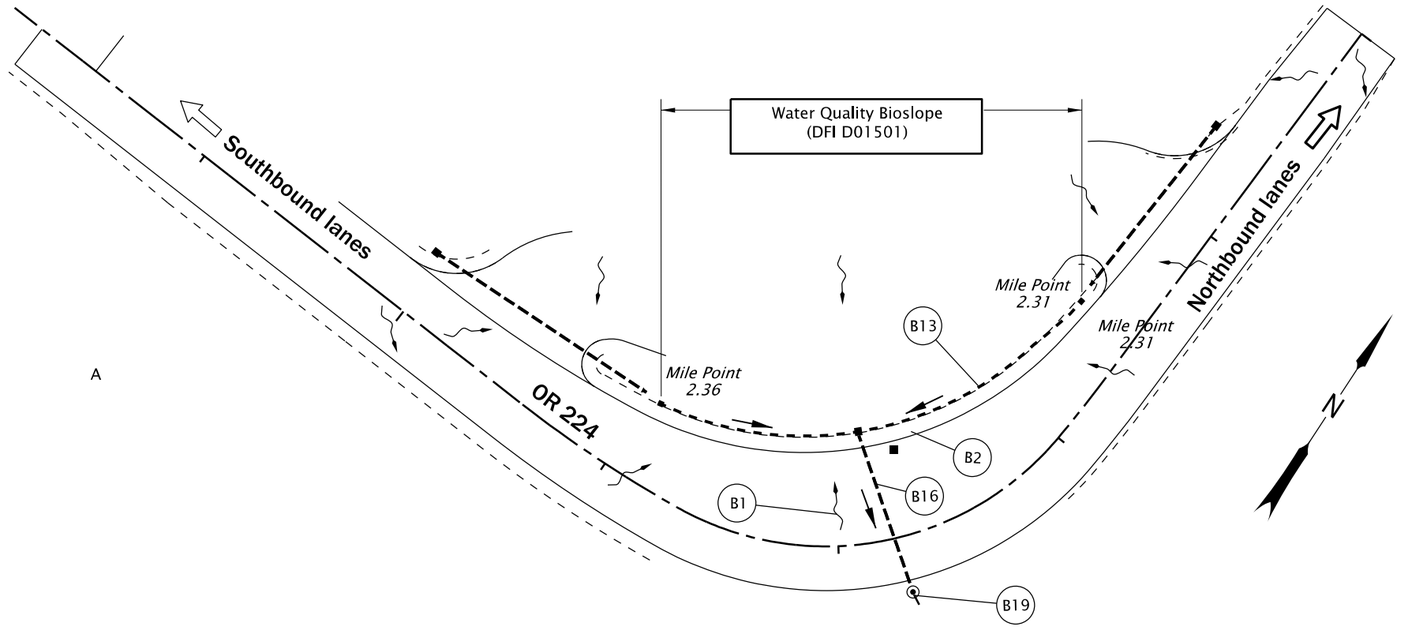
Contact any of the following for more detailed information about management of waste materials found on site:

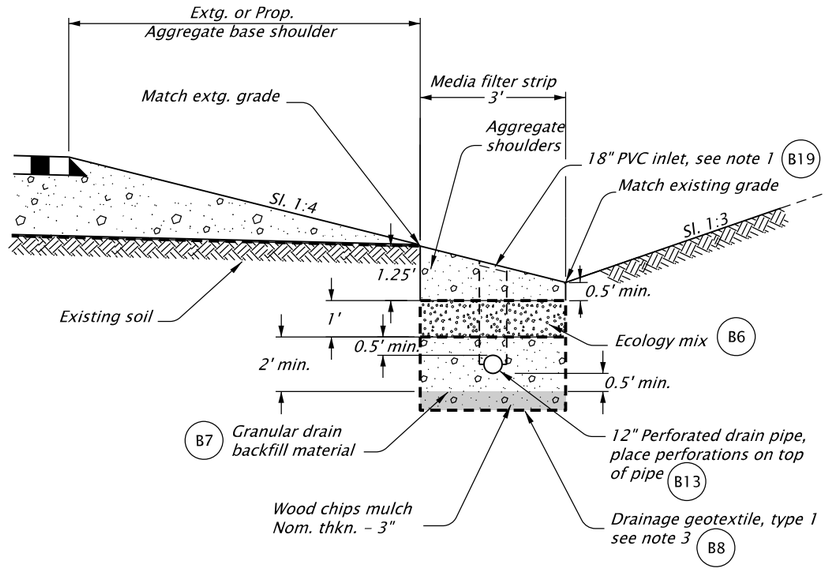
ODOT Materials Management Coordinator	(503) 731-8493
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186
ODOT Region 5 Hazmat Coordinator	(541) 963-1590
ODEQ Northwest Region Office	(503) 229-5263

A Appendix A – Site Specific Operational Plan

Contents:

Operational Plan: DFI D01501

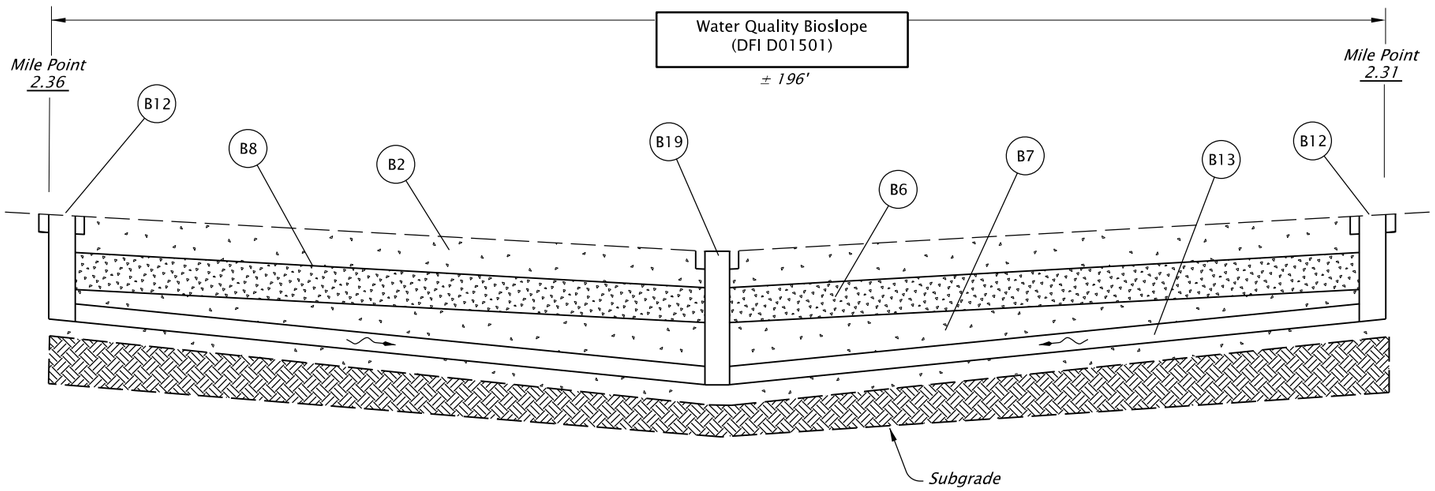




DFI No. D01501

WATER QUALITY BIOSLOPE SECTION (WITH DITCH)

(Not To Scale)



PROFILE
N.T.S.

LEGEND

- X# — *Facility component (see table 1 in O&M Manual)*
- ◉ and/or ◎ — *Manhole*
- ■ and/or □ — *Inlet*
- *Storm pipe*
- *Storm pipe existing*
- *Perforated pipe*
- *Conveyance direction*
- *Pavement / facility flow path*
- *Traffic flow direction*

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 1 of 1

Prepared By: Alan Babicky

Drafted By: Alan Babicky

DFI D01501
MAINTENANCE DISTRICT 2C HWY 281
FACILITY TYPE
HIGHWAY MP 2.31 - 2.36
HOOD RIVER COUNTY

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 57V-010

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
A01	*Title Sheet*
A02	*Index Of Sheets Cont. & Std. Dwg. Nos.*
AD01	*Survey Control Data*

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, PAVING & SIGNING

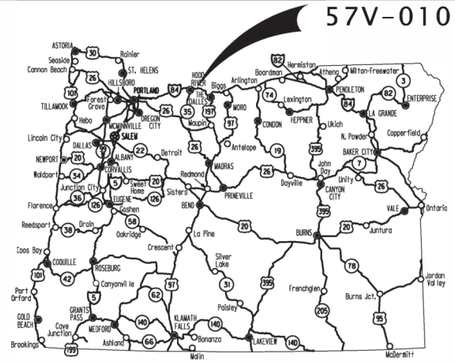
OR281 AT ORCHARD RD (HOOD RIVER) PROJECT

HOOD RIVER HIGHWAY

HOOD RIVER COUNTY

DECEMBER 2023

57V-010



Overall Length Of Project – 0.14 Miles

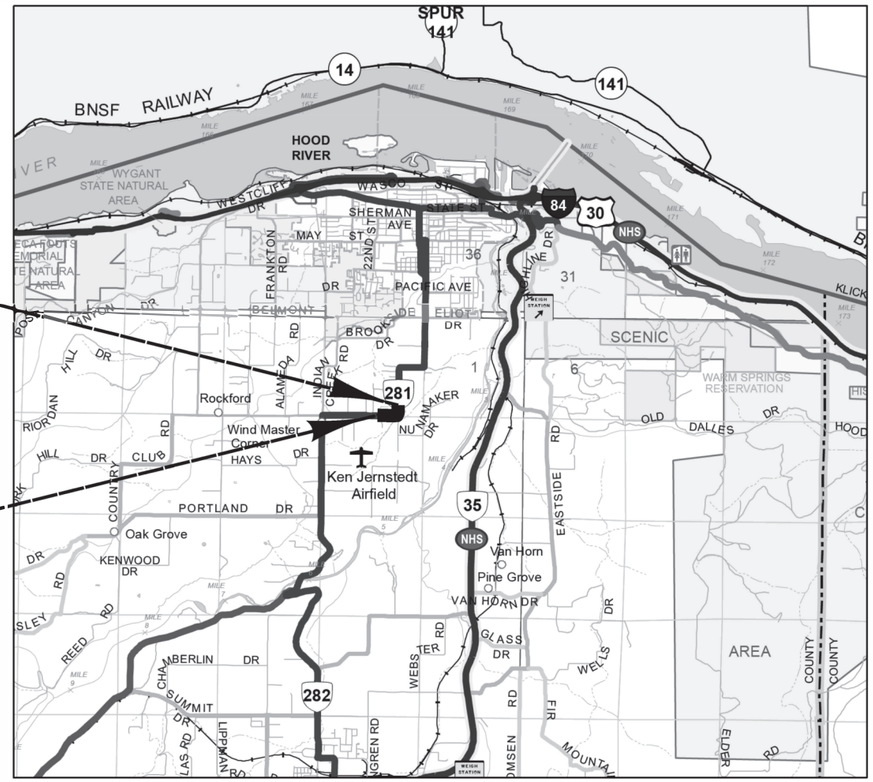
ATTENTION:
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0001 Through OAR 952-001-0100. You May Obtain Copies Of The Rules By Calling The Center (Note: The Telephone Number For The Oregon Utility Notification Center Is (503) 232-1987).

SAFETY FIRST

LET'S ALL
WORK TOGETHER
TO MAKE THIS
JOB SAFE

BEGINNING OF PROJECT
STA. "NBS" 200+25.0 (MP 2.29)

END OF PROJECT
STA. "NBS" 206+81.6 (MP 2.46)



N

T. 2 N., R. 10 E., W.M.

EA PE00316O 000

OREGON TRANSPORTATION COMMISSION

Julie Brown	CHAIR
Lee Beyer	VICE CHAIR
Sharon Smith	COMMISSIONER
Alicia Chapman	COMMISSIONER
Jeff Baker	COMMISSIONER
Kristopher W. Strickler	DIRECTOR OF TRANSPORTATION

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

Approving Authority: _____
Signature and date

Stephen Hay, R.G., C.E.G. OPMA
Interim Tech Center Manager, Region 1
Print name and title

_____
Concurrence by ODOT Chief Engineer

OR281 AT ORCHARD RD (HOOD RIVER) PROJECT

HOOD RIVER HIGHWAY

HOOD RIVER COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	S281(013)	A01

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

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PIPE 2008 - File Update: Dec. 2017

57V-010

PIPE

SHEET NUMBER	NOTE No. ON PLANS	DESIGN HEIGHT OF COVER (FEET) ①	CIRCULAR OR ELLIPTICAL, SIZE IN (Inches) 12 – LENGTH IN FEET	15	18	24	30	36	48			PIPE - ARCH: HELICAL Riveted Welded or Lock Seam, EQUIV. RND SIZE (Inches)	LENGTH (Feet)	CROSS-SECTIONAL DIMENSIONS ②: SPAN (Feet-Inches)	RISE (Feet-Inches)	CORNER RADII (Inches)
	1															
	2	0	100													
	3															
C01C	4	0	81													
	5															
	6	2.5			67											
	7	2.5	196													
	8															
	9															
	10															

USE / INSTALLATION CRITERIA and TERMINAL TREATMENT

NOTE No.	DRAIN (PERFORATED)	CULVERT (ROAD APPROACH)	CULVERT (CONDUIT)	CULVERT	IRRIGATION	SIPHON	STORM SEWER	SANITARY SEWER	OTHERS (SEE REMARKS)	WATERTIGHT JOINTS	SLOPE ANCHORS	IMPERFECT TRENCH	PH	RESISTIVITY (HUNDREDS)	LT./RT. SLOPED ENDS (Not For Conc. Pipe Over 60" Dia.)	SKEW NUMBER	PAVED END SLOPES No.
1		✓								✓			6.0	6.8			
2				✓						✓			6.0	6.8	RT	90	✓
3		✓								✓			6.0	6.8			
4				✓						✓			6.0	6.8	RT	90	✓
5		✓								✓			6.0	6.8			
6				✓						✓			6.0	6.8	RT	90	✓
7	✓									✓			6.0	6.8			
8																	
9																	
10																	

ALTERNATE MATERIALS – HELICAL CORRUGATED METAL

NOTE No.	ALUMINUM 1½" x ¼" PLATE THKN. (Inches)	CROSS SECTION ③	2⅔" x ½" PLATE THKN. (Inches)	CROSS SECTION ③	3" x 1" PLATE THKN. (Inches)	CROSS SECTION ③	COATING ⑤	LOCK SEAM SMOOTH WALL SPIRAL RIB ¾" x ¾" @ 7½" O.C. Or ¾" x 1" @ 11½" O.C. PLATE THKN. (Inches)	CROSS SECTION ③	COATING ⑤	ALUMINIZED OR GALVANIZED IRON AND STEEL 1½" x ¼" PLATE THKN. (Inches)	CROSS SECTION ③	2⅔" x ½" PLATE THKN. (Inches)	CROSS SECTION ③	3" x 1" PLATE THKN. (Inches)	CROSS SECTION ③	COATING GALVANIZED ⑤	ALUMINIZED ⑤	LOCK SEAM SMOOTH WALL SPIRAL RIB ¾" x ¾" @ 7½" O.C. Or ¾" x 1" @ 11½" O.C. PLATE THKN. (Inches)	CROSS SECTION ③	COATING GALVANIZED ⑤	ALUMINIZED ⑤
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

ALTERNATE MATERIALS – RIGID, PLASTIC & IRON

NOTE No.	PRE-CAST CONCRETE PLAIN ④ 1	2	3	REINF. III	IV	V	CORRUGATED HDPE	SOLID WALL HDPE	REINFORCED HDPE	PVC - PSI STIFFNESS	POLYPROPYLENE, DOUBLE WALL	POLYPROPYLENE, TRIPLE WALL	DUCTILE IRON - PIPE CLASS
1													
2													52
3													
4													52
5													
6				✓									
7							✓						
8													
9													
10													

APPURTENANCES, EXTENSION, REMARKS

NOTE No.	MANHOLES: DEPTH, TOP OF COVER TO INVERT (Feet)	DIAMETER OF LARGEST PIPE IN BASE (In.)	CONC. PRECAST	CONC. CAST-IN-PLACE	DROP MANHOLE	SPECIAL	INLETS TYPE (Number Required): G-2	D	D (mod)	18" PVC	EXTENSION LEFT (Feet)	RIGHT (Feet)	EXTG. PIPE MATERIAL ⑥	REMARKS
1									✓					w/ 1.5' sump
2														
3									✓					w/ 1.5' sump
4														
5									✓					w/ 1.5' sump
6	8.8	18	✓	✓										Connect to extg. pipe
7														
8										✓				
9										✓				
10														

GENERAL NOTES:

1. A check (✓) indicates column heading applies.
2. A new pipe culvert installation shall be of like material throughout.
3. Extension of existing metal culverts may be of unlike metal or corrugations. For connecting details, see Std Drg. No. RD326.
4. Dimensions shown are nominal.
5. All pipes shall conform to the AASHTO specification applicable for the type of material and the diameter of the pipe involved.

FOOTNOTES:

① Design height of cover is the critical design height used to select pipe materials. The height of cover for any given run of pipe may vary. Design height of cover shall be measured to subgrade.

② Cross-sectional dimensions may vary with different materials. When galvanized iron or steel and aluminum are acceptable alternates use a separate line for each type of material.

③ Cross-sectional shape of pipe normal to longitudinal axis, prior to loading
- A = Pipe - Arch
- R = Round
- E = Elliptical (5% nominal elongation)

④ Minimum allowable diameter for Class 1 nonreinforced concrete pipe is 15".

⑤ Abbreviations for protective coatings for metal pipe
- PM = Polymeric, 10 Mil. thkn. coated both sides
- PO = Polyethylene inside lining, polymeric outside
- U = Uncoated
- CIM = Chevron industrial membrane
- Ep = Epoxy coated

⑥ Abbreviations for existing pipe materials
- AB = Asbestos cement
- Al = Corrugated aluminum
- Co = Concrete
- Pl = Plastic
- St = Corrugated steel
- X = Other material, see remarks column

STANDARD DRAWINGS

- ■ RD300 Trench Backfill, Bedding, Pipe Zone And Multiple Installations
- ■ RD302 Street Cut
- □ RD304 Arch Pipe Backfill/Compaction
- □ RD306 Concrete Encasement, Cradle, and Cap Details
- □ RD308 Bore Casing Detail
- □ RD310 Shallow/Deep Trench Service Connection, Blocking and Markers
- □ RD312 Subsurface Drain
- □ RD316 Sloped Ends For Metal Pipe
- ■ RD317 Culvert Embankment Protection And Riprap Pads
- ■ RD318 Sloped Ends For Concrete Pipe
- ■ RD319 Miscellaneous Culvert Details
- ■ RD320 Paved End Slope For Culverts 60" Maximum Pipe Size
- □ RD321 Paved End Slope With Removable Safety Bar(s)
- □ RD322 Safety End Section For Metal Pipe
- □ RD324 Safety End Section For Concrete, PVC, HDPE & Polypropylene Pipe
- □ RD325 Coupling Bands For Corrugated Metal Pipe
- □ RD326 Coupling Bands For Corrugated Metal Pipe
- □ RD327 Coupling Bands For Corrugated Metal Pipe
- □ RD328 Slotted C.M.P. Drain Details
- □ RD330 Pipe Slope Anchors - Metal
- □ RD332 Pipe Slope Anchors - Concrete
- □ RD334 Locator Post
- ■ RD335 Standard Storm Sewer Manhole
- ■ RD336 Standard Manhole Details
- □ RD338 Standard Sanitary Sewer Manhole
- ■ RD339 Pipe To Structure Connections
- □ RD340 Storm Sewer Pollution Control Manhole
- □ RD342 Shallow Manholes
- □ RD343 24" Manholes
- ■ RD344 Standard Manhole Base Section
- ■ RD345 Pipe To Manhole Connections
- □ RD346 Large Precast Manhole
- □ RD348 Manhole With Inlet
- □ RD350 Sanitary Sewer Piped Inside Drop Connection for Manholes
- □ RD352 Outside Drop Manholes
- □ RD354 Carry Through Manhole - Storm
- ■ RD356 Manhole Covers And Frames
- □ RD358 Manhole Slope Protectors
- □ RD360 Manhole Frame Adjustment
- □ RD362 Sanitary Cleanout
- □ RD363 Gutter Transition At Inlet
- □ RD364 Concrete Inlets Type G-1, G-2, G-2M, & G-2MA
- ■ RD365 Frames & Grates For Concrete Inlets
- □ RD366 Concrete Inlets Type CG-1, CG-2
- □ RD367 Curb Inlet Channel
- □ RD368 Concrete Inlets Type M-E, M-O, B And B-SL
- ■ RD370 Ditch Inlet Type D
- □ RD371 Concrete Inlet Base Type CG-3
- □ RD372 Concrete Inlet Top, Option 1 Type CG-3
- □ RD373 Concrete Inlet Top, Option 2 Type CG-3
- □ RD374 Area Drainage Basin Or Field Inlet
- □ RD376 Miscellaneous Drainage Structures Siphon Box, Inlet Cap & Inlet Adjustment
- □ RD378 Type "3" Catch Basin, Frame and Grate
- □ RD380 Fill Height Tables For Aluminum & Steel Corrugated Pipe
- □ RD382 Fill Height Tables For Aluminum & Steel Arch Pipe
- □ RD384 Fill Height Tables For Aluminum & Steel Spiral Rib Pipe
- ■ RD386 Fill Height Table For Circular Concrete Pipe
- ■ RD388 Fill Height Tables For PVC Pipe
- ■ RD390 Fill Height Table For Corrugated HDPE Pipe
- □ RD391 Fill Height Table For Steel Reinforced HDPE Pipe
- ■ RD393 Fill Height Tables For Polypropylene Pipe
- ■ RD398 Culvert ID Marker
- ■ RD399 Stormwater Treatment and Storage Facility Field Markers

REGISTERED PROFESSIONAL ENGINEER
93,567
OREGON
MAY 8, 2018
WILLIAM A. BABICKY
RENEWS: 12-31-2023

FINAL ELECTRONIC DOCUMENT
AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

OR281 AT ORCHARD RD (HOOD RIVER) PROJECT

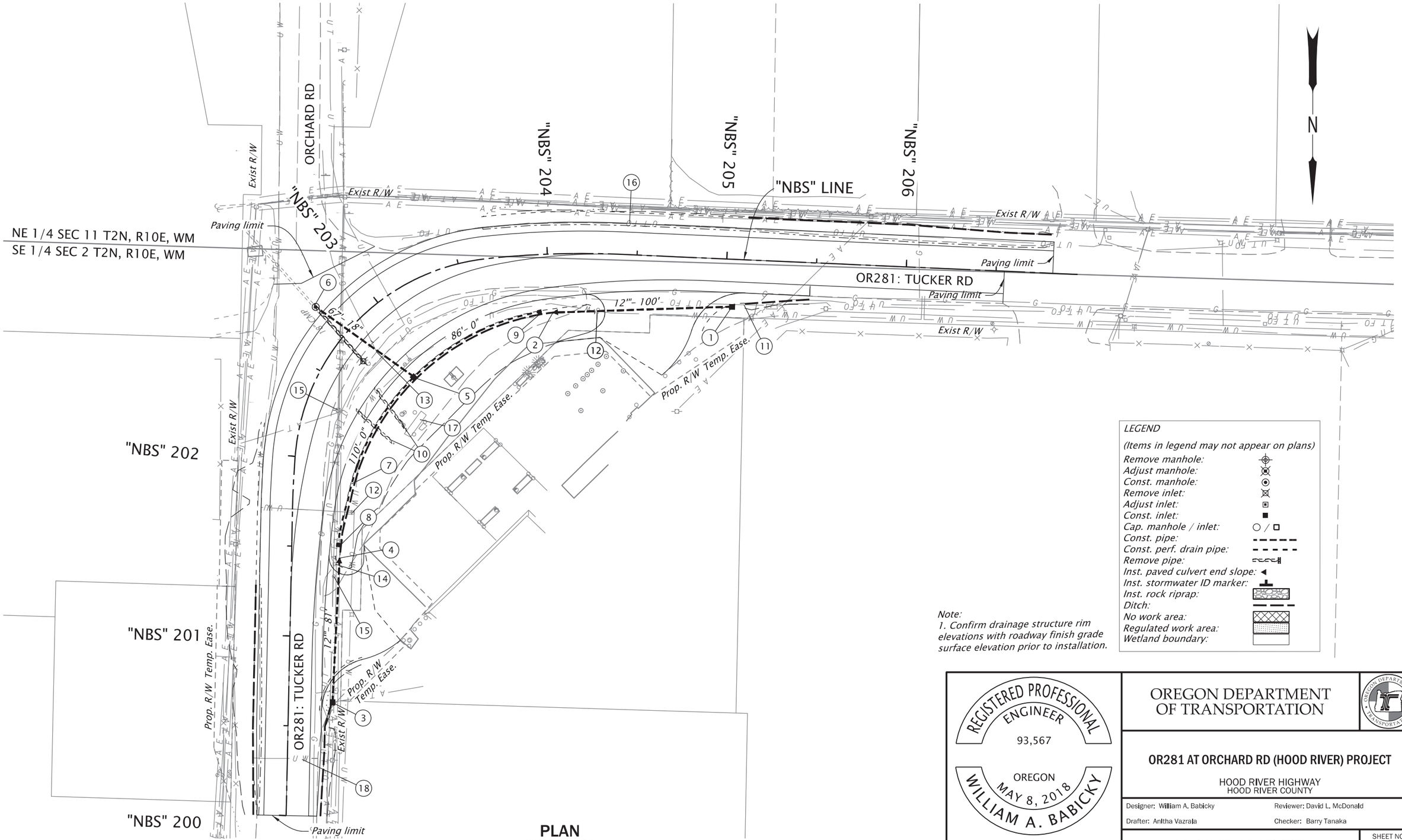
HOOD RIVER HIGHWAY
HOOD RIVER COUNTY

Designer: William A. Babicky | Reviewer: David L. McDonald
Drafter: Anitha R. Vazrala | Checker: Barry Tanaka

PIPE DATA

SHEET NO. BD01

Sec. 2, T.2N, R.10E, W.M.
Sec.11, T.2N, R.10E, W.M.



PLAN
SCALE: 1" = 50'

LEGEND

(Items in legend may not appear on plans)

- *Remove manhole:*
- *Adjust manhole:*
- *Const. manhole:*
- *Remove inlet:*
- *Adjust inlet:*
- *Const. inlet:*
- *Cap. manhole / inlet:* ○ / □
- *Const. pipe:*
- *Const. perf. drain pipe:*
- *Remove pipe:*
- *Inst. paved culvert end slope:*
- *Inst. stormwater ID marker:*
- *Inst. rock riprap:*
- *Ditch:*
- *No work area:*
- *Regulated work area:*
- *Wetland boundary:*

Note:
1. Confirm drainage structure rim elevations with roadway finish grade surface elevation prior to installation.

REGISTERED PROFESSIONAL ENGINEER
93,567
OREGON
MAY 8, 2018
WILLIAM A. BABICKY
RENEWS: 12-31-2023

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OREGON DEPARTMENT OF TRANSPORTATION

OR281 AT ORCHARD RD (HOOD RIVER) PROJECT

HOOD RIVER HIGHWAY
HOOD RIVER COUNTY

Designer: William A. Babicky | Reviewer: David L. McDonald
Drafter: Anitha Vazrala | Checker: Barry Tanaka

DRAINAGE AND UTILITIES

SHEET NO. C01B

CONSTRUCTION NOTES

1. *Sta. "NBS" 205+04.1, 26.6 ft. Rt.*
   Const. type D mod. Inlet w/ 1.5' sump
   (For details, see sht. HA01)
   (See dwg. nos. RD339, RD365, and RD370)

2. *Sta. "NBS" 204+01.8, 32.5 ft. Rt.*
   Inst. 12" ductile iron pipe - 100'
   5' depth
   Const. sloped end 12"
   Const. paved end slope - 26 sq. ft.
   (fine grade at outlet)
   Const. riprap pad (class 50) - 3 tons
   (See dwg. nos. RD300, RD317, RD318, RD319, RD320 & RD386)

3. *Sta. "NBS" 200+63.5, 24.5 ft. Rt.*
   Const. type D mod. Inlet w/ 1.5' sump

4. *Sta. "NBS" 201+44.0, 26.9 ft. Rt.*
   Inst. 12" ductile iron pipe - 81'
   5' depth
   Const. sloped end 12"
   Const. paved end slope - 26 sq. ft.
   (fine grade at outlet)
   Const. riprap pad (class 50) - 3 tons

5. *Sta. "NBS" 202+84.5, 44.4 ft. Rt.*
   Const. type D mod. Inlet w/ 1.5' sump

6. *Sta. "NBS" 202+75.6, 22.3 ft. Lt.*
   Remove pipe - 40'
   Remove inlet
   Remove structures and obstructions
   (extg. pcc below pavement, depth varies)
   Const. storm manhole
   Extra for manhole over extg.
   Inst. 18" culvert pipe - 67'
   10' depth
   Inst. culvert ID markers - 2
   DFI. no. D29978, M.P. 2.35
   (See dwg. nos. RD302, RD335, RD336, RD344, RD345, RD356 & RD398)

7. *Sta."NBS" 201+50.0, 25.8 ft. Rt. to "NBS" 203+95.3, 31.7 ft. Rt.*
   Const. water quality bio-slope
   DFI no. D01501
   (For details, see sht. HA01)

8. *Sta. "NBS" 201+50.0, 25.8 ft. Rt.*
   Const. 18" pvc inlet
   Inst. DFI marker, type S1 - 2 ea.
   Inst. DFI marker, type S2 - 2 ea.
   (For details, see sht. HA01)
   (See dwg. no. RD399)

9. *Sta. "NBS" 203+95.3, 31.7 ft. Rt.*
   Const. 18" pvc inlet
   (For details, see sht. HA01)

10. *Sta. "NBS" 202+43.0, Rt.*
    Remove pipes - 60'
    (cut drain pipes flush w/ slope)

11. *Relocated fiber optic (by others)*
12. *Relocate water line (by others)*
13. *Relocate gas line (by others)*
14. *Relocate comm. cabinet (by others)*
15. *Relocate utility pole (by others)*
16. *Preserve & protect irrigation pipe*
17. *Propane tanks removed (by others)*
18. *Remove & abandon (by others)*
    (extg. wood creosote pipe)

REGISTERED PROFESSIONAL ENGINEER
93,567
OREGON
MAY 8, 2018
WILLIAM A. BABICKY
RENEWS: 12-31-2023

FINAL ELECTRONIC DOCUMENT
AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

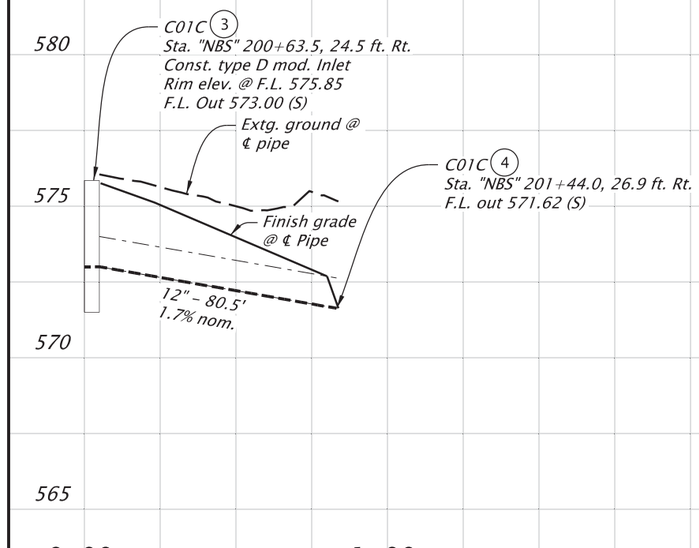
OR281 AT ORCHARD RD (HOOD RIVER) PROJECT

HOOD RIVER HIGHWAY
HOOD RIVER COUNTY

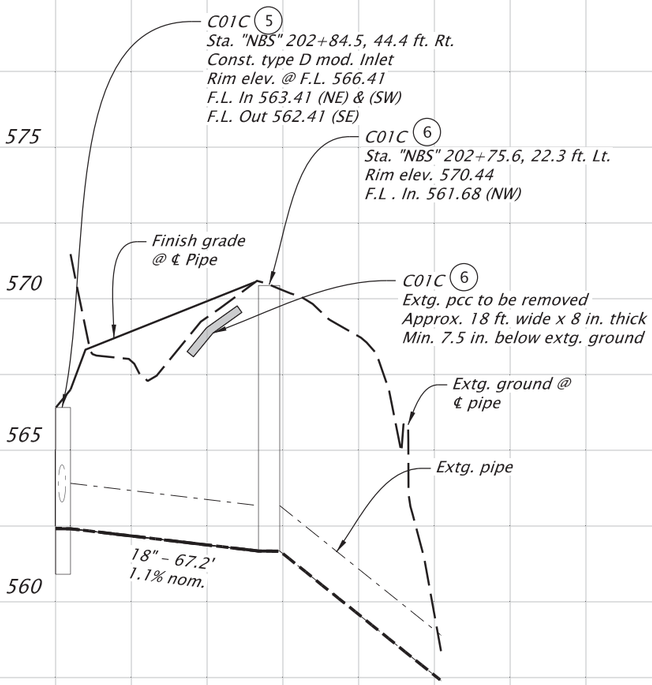
Designer: William A. Babicky | Reviewer: David L. McDonald
Drafter: Anitha R. Vazrala | Checker: Barry Tanaka

DRAINAGE & UTILITIES NOTES

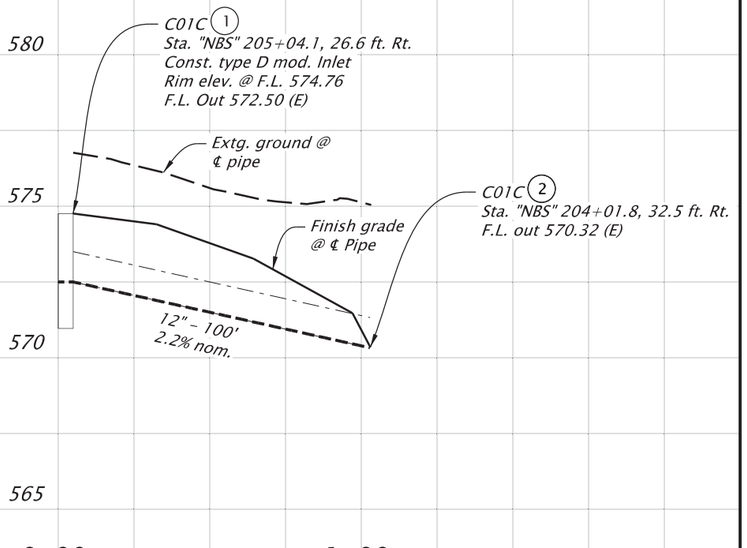
SHEET NO. C01C



Profile Along Pipe ℄
Sta. "L" 200+63.5 to Sta. "L" 201+44



Profile Along Pipe ℄
Sta. "L" 202+84.5 to Sta. "L" 202+75.6



Profile Along Pipe ℄
Sta. "L" 205+04.1 to Sta. "L" 204+01.8

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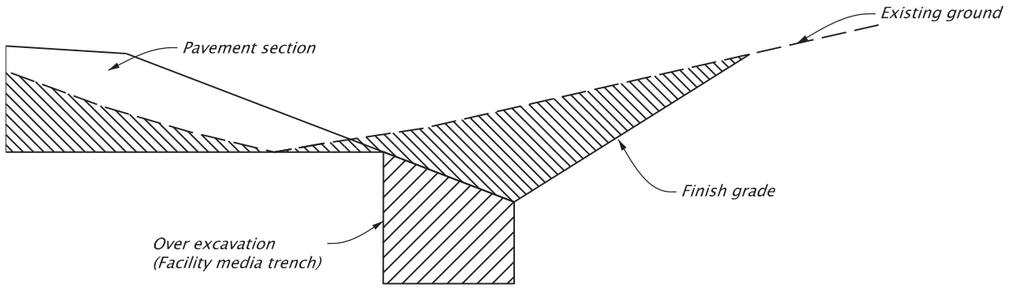
PROFILE

SHEET NO.
C01E

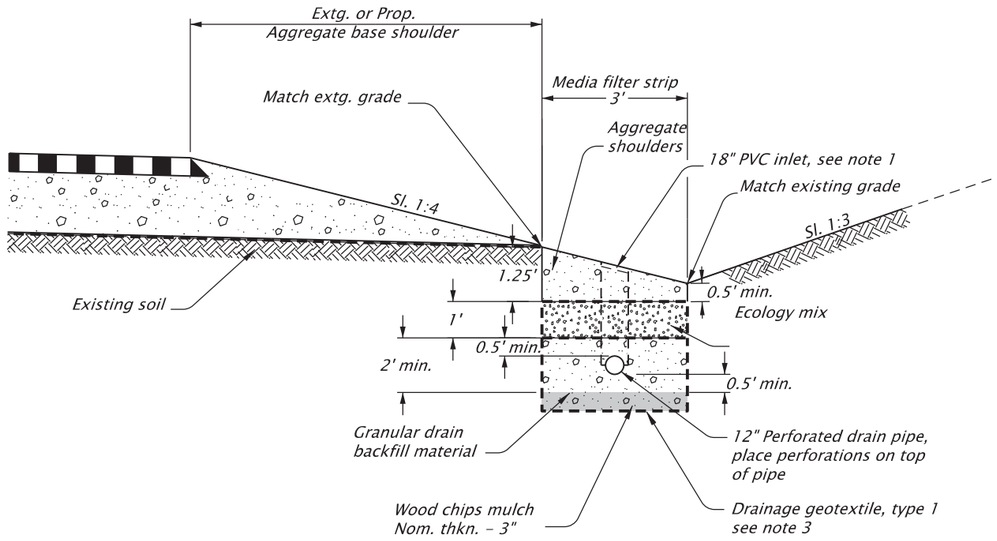


Excavation paid under bioslope lump sum items

General excavation

BIOSLOPE EXCAVATION PAY LIMITS

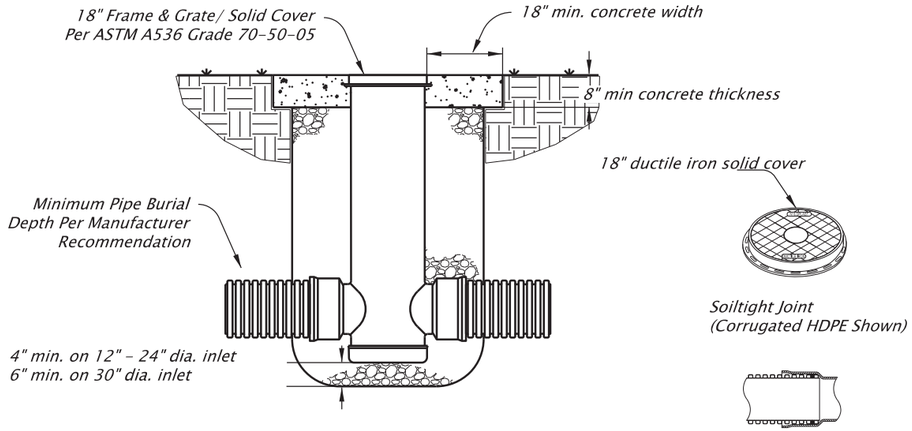
(Not To Scale)



DFI No. D01501

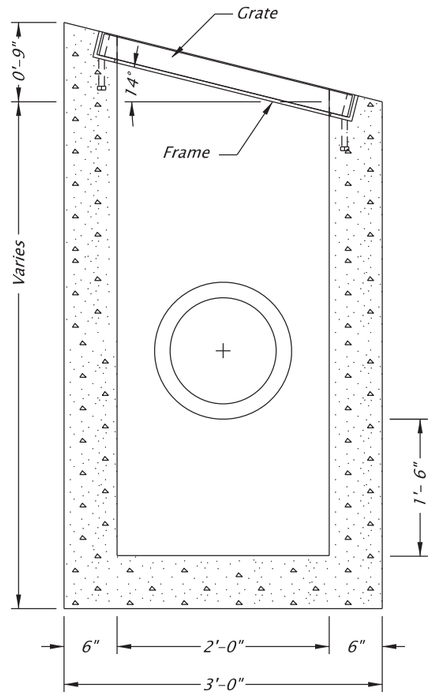
WATER QUALITY BIOSLOPE SECTION (WITH DITCH)

(Not To Scale)



"PVC" INLET

(Not To Scale)



DITCH INLET TYPE D MODIFIED

(For details note shown see dwg. no. RD370)

STORMWATER FIELD MARKER TABLE

Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	MP		Begin	End	Red	Green
"NBS" 201+50.0 Rt.	2.31	D01501	✓		✓	
"NBS" 203+95.3 Rt.	2.36	D01501		✓		✓

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

GENERAL NOTES:

1. Grates/solid cover shall be ductile iron per ASTM A536 grade 70-50-05.
2. Frames shall be ductile iron per ASTM A536 grade 70-50-05.
3. Drain basin to be manufactured according to plan details and manufacturers recommendations.
4. Drainage connection stub joint tightness shall conform to ASTM D3212 for corrugated HDPE (ADS n-12/hancor dual wall), n-12 hp, & PVC sewer.
5. Adapters can be mounted on any angle 0° to 360°. Follow manufacturers recommendations to determine minimum angle between adapters.

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STORMWATER DETAILS

SHEET NO. HA01