OPERATION & MAINTENANCE MANUAL

Manual prepared: September 2017

DFI No. D00476

Figure 1: DFI No. D00476, looking East

1. Identification

Drainage Facility ID (DFI):	D00476
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 41V-028
Location:	District: 10
	Highway No.: 041
	Mile Post: 33.96 to 33.98, Left

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.

Flow direction: East

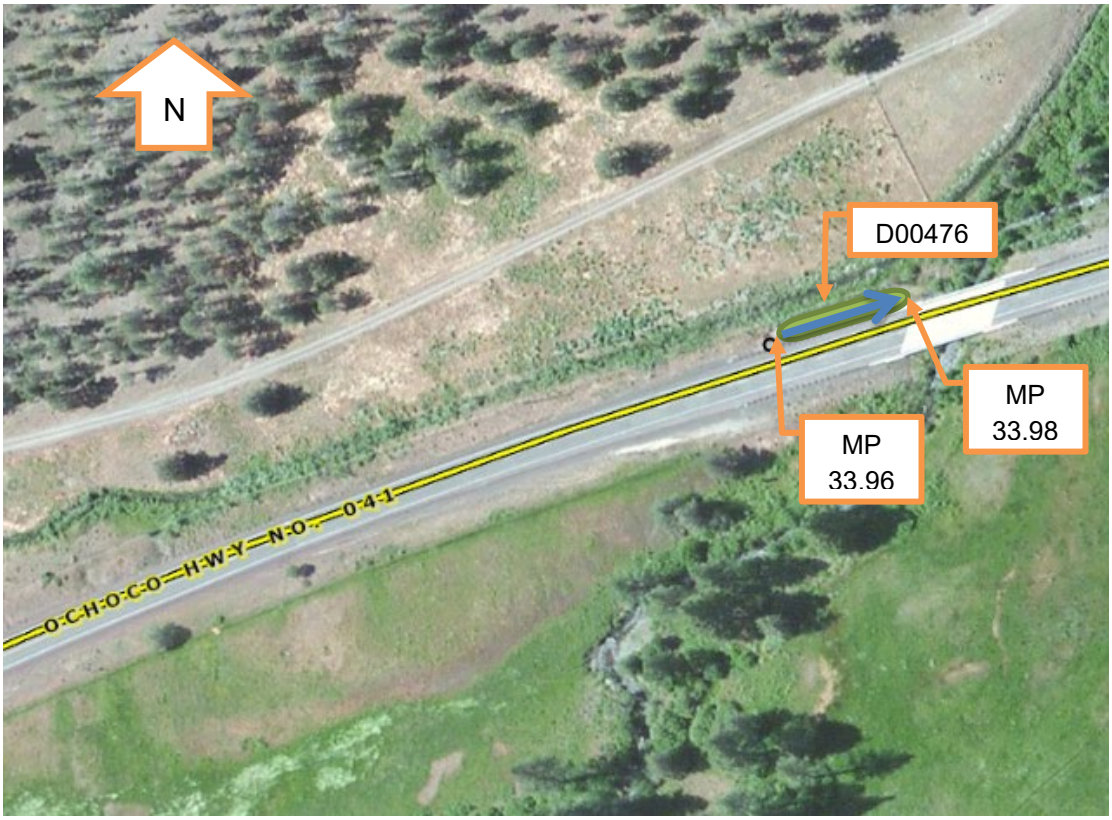


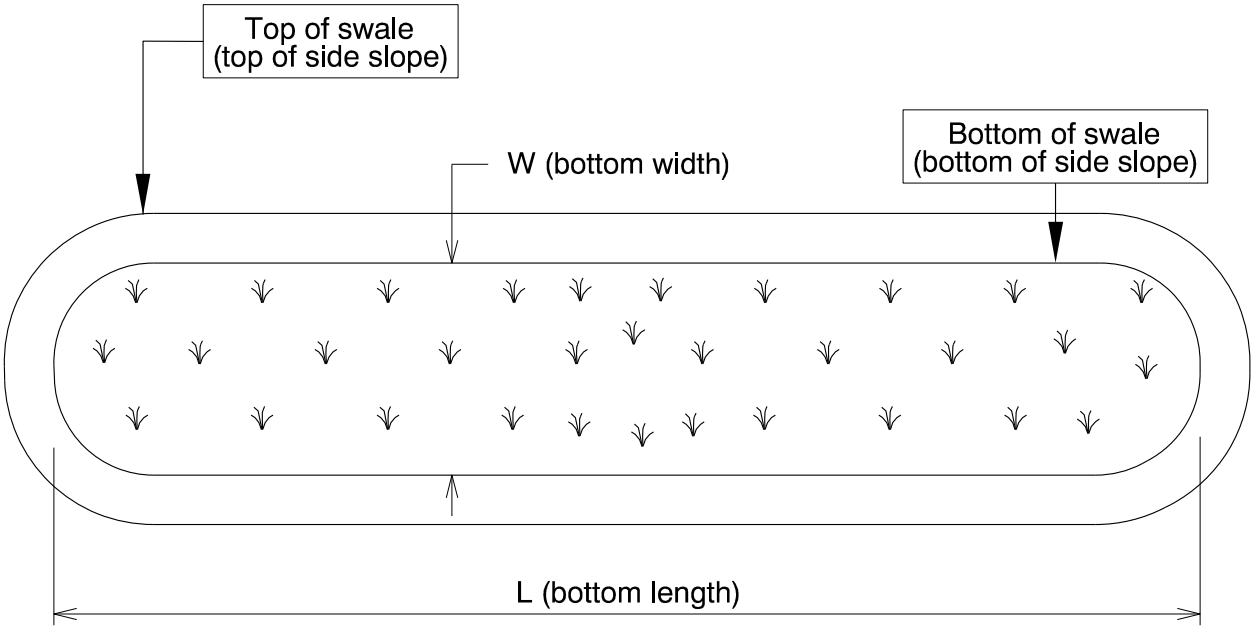
Figure 2: Facility location map

4. Facility Summary

The length and width of a swale is based on the bottom dimensions.

The bottom length and bottom width of the swale is:

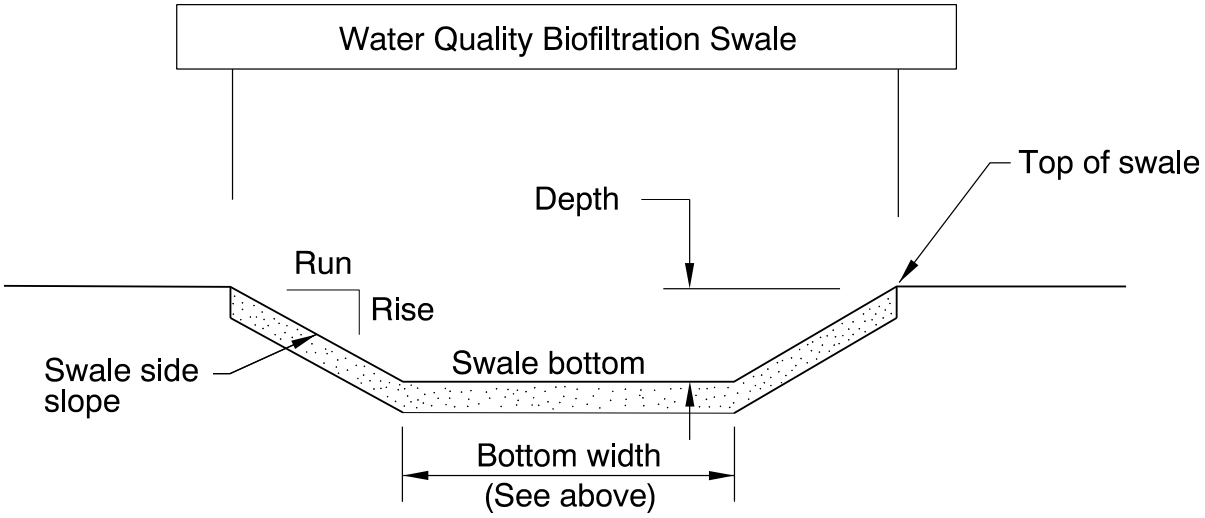
Bottom Length (feet)	Bottom Width (feet)
150	4



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

Depth and side slopes:

Depth (feet)	Rise (feet)	Run (feet)
1	1	4



Site Specific Information:

5. Facility Access

Maintenance access to the facility:

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

Figure 3: Facility access via roadside shoulder, looking East

6. Operational Components / Maintenance Items

Classification

This facility is classified as an:

☒ On-line Swale	☐ Off-line Swale
A swale that does not include a high flow bypass component; flow drains into and through the facility	**A swale that treats low/small flows and diverts high flows using a bypass component**

Bypass Component

This facility includes a high flow bypass component:

☒ No	☐ Yes
There is no bypass component. High flows drains into and through the facility	**There is a bypass component. Only low/small flows drain into the swale. High flows are diverted around the swale using a bypass component**

Operational Components

A swale has many components that assist with treatment, conveyance, and reducing flow velocity to minimize erosion. The components in use can vary depending if the facility was designed to operate on-line or off-line. The facility components table (**Table 1**) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an "x" (e.g. ☒).

The Standard Operation Manual for Water Quality Biofiltration Swales (implemented March 2017) outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.
https://gis.odot.state.or.us/TransGIS/

Operational Plan

The applicable standard operational plan for this facility is:

☒ Operational Plan A	☐ Operational Plan B	☐ Operational Plan C
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B, C) are provided in the Standard Operation Manual.		

See Appendix A for the site specific operational plan.

Maintenance Items

Operational components marked in **Table 1** should be inspected and maintained according to Section 7. Each facility component is defined and detailed in the Standard Operation Manual using the associated ID number indicated below.

Table 1: Swale Components		ID #
Manholes/Structures		
Pre-treatment manhole	☐	**S1**
Weir type flow splitter/flow splitter manhole	☐	**S2**
Orifice type flow splitter/flow splitter manhole	☐	**S3**
Standard manhole	☐	**S4**
Swale Inlet		
Pavement sheet flow	☐	**S5**
Inlet Pipe (s)	☒	**S6**
Open channel inlet	☐	**S7**
Riprap pad	☒	**S8**
Ground Cover		
Grass bottom	☒	**S9**
Grass side slopes	☐	**S10**
Granular drain rock	☐	**S11**
Plantings	☐	**S12**
Underground Components		
Geotextile fabric	☐	**S13**
Water quality mix	☒	**S14**
Perforated pipe	☐	**S15**
Porous pavers (access grid)	☐	**S16**
Flow Spreader		
Rock basin (used at inlet)	☐	**S17**
Anchored board (midpoint of swale or every 50 feet along swale bottom)	☐	**S18**
Other:	☐	**S19**
Swale Outlet		
Catch basin with grate	☐	**S20**
Outlet Pipe (s)	☐	**S21**
Open channel outlet	☒	**S22**
Auxiliary Outlet:	☐	**S23**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☒ **C** ☐ **L** ☐**O**	**S24**
Ditch	☐	**S25**
Storm drain system	☐	**S26**
Outfall Components		
Riprap pad	☒	**S27**
Riprap bank protection	☐	**S28**

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 Routine Road Maintenance Water Quality and Habitat Guide (the *Blue Book*) outlines the standard maintenance actions for water quality facilities under Activity 125.

There are standard maintenance tables for standard ODOT designs. The maintenance tables describe the maintenance component, the defect or problem, the condition when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain ODOT swales:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 3 (Maintenance of Water Quality or Biofiltration Swales): Contains maintenance information for swales

The *Blue Book* can be viewed at the following website:
http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf

8. Limitations

Access grid installed:

☒ No	☐ Yes
There are (Choose applicable weight: no, light, med., heavy) duty porous pavers installed in this swale	

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

Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the swale bottom.

9. Waste Material Handling

Material removed from the facility is defined as waste by the Department of Environmental Quality (DEQ). Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

http://www.oregon.gov/ODOT/Maintenance/Documents/ems_manual.pdf

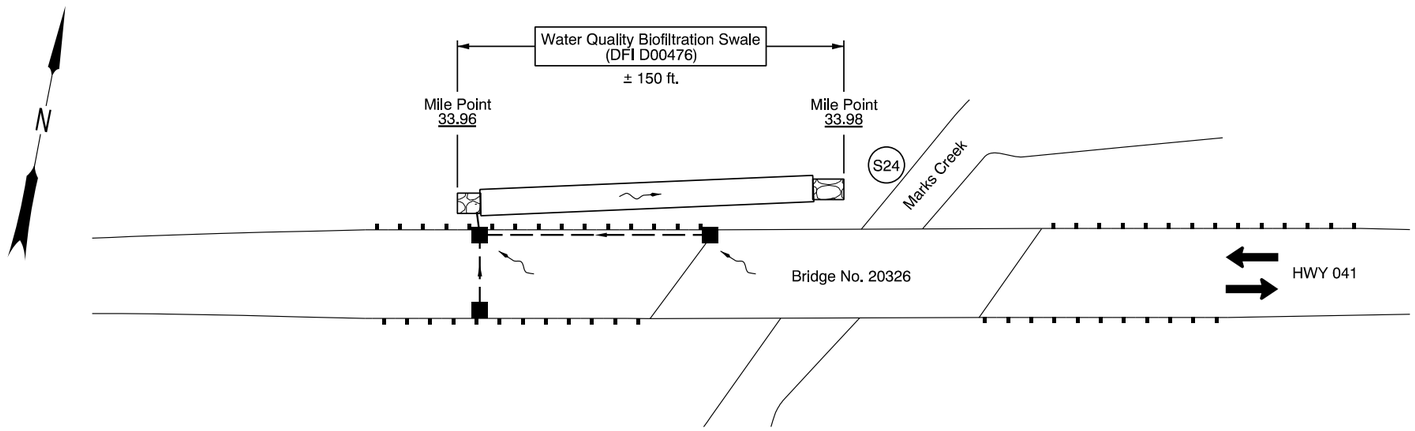
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186
ODOT Region 5 Hazmat Coordinator	(541) 963-1590
ODEQ Northwest Region Office	(503) 229-5263

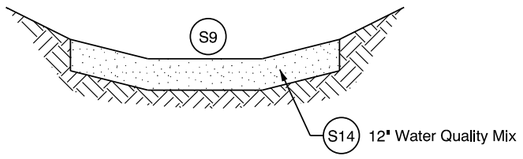
A Appendix A – Site Specific Operational Plan

Contents:

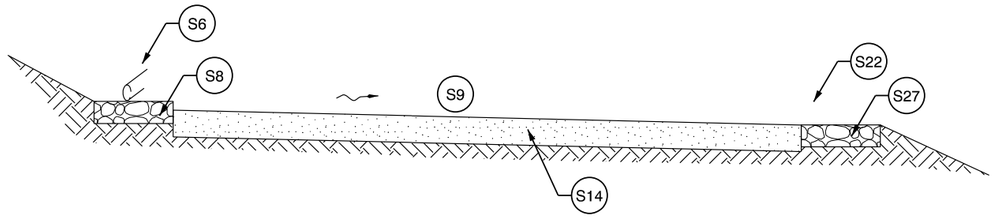
Operational Plan: DFI D00476



PLAN
N.T.S.



SECTION A-A
N.T.S.



PROFILE
N.T.S.

LEGEND

- Catch Basin
- Traffic Flow Direction
- Stormwater Flow Path
- Storm Pipe
- Drainage Ditch
- Guardrail
- (S#) Table 1 Facility Components

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Brooklyn Scholz

Drafted By: Brooklyn Scholz

DFI D00476
MAINTENANCE DISTRICT 10 HWY 041
WATER QUALITY BIOFILTRATION SWALE
HIGHWAY MP 33.96, 33.98
CROOK

DFI_D00476.dgn

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B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 41V-028

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INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd., Index Of Std. Drg. Nos.

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

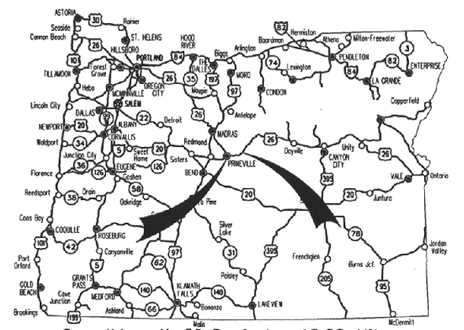
STRUCTURES, EARTHWORK AND DRAINAGE

US26: OCHOCO CREEK-BRIDGE CREEK- BUNDLE A05

OCHOCO HIGHWAY

CROOK COUNTY

FEBRUARY 2008



Overall Length Of Project - 18.29 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.)

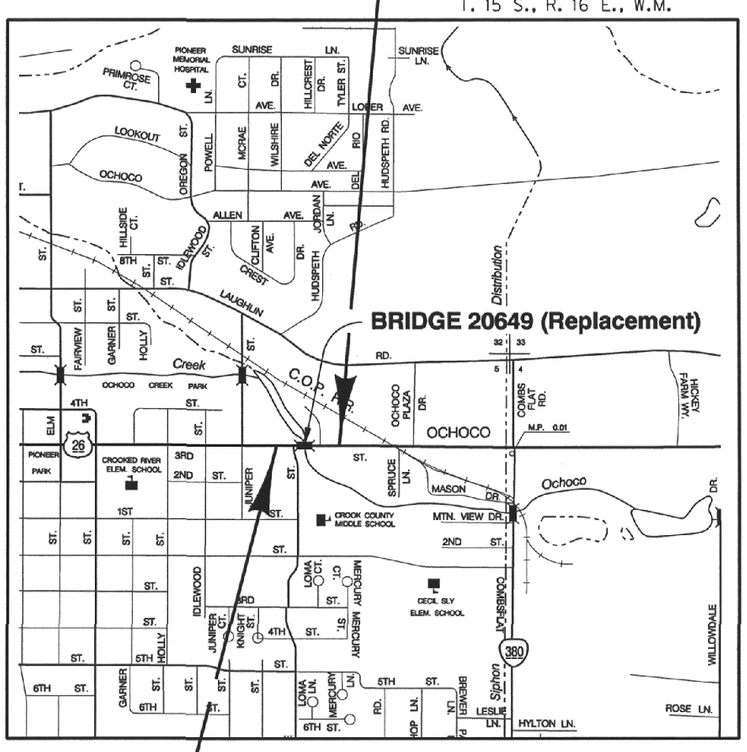
LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

END OF WORK SECTION
STA. 39+25 (M.P. 19.49)

BEGINNING OF WORK SECTION
STA. 727+30 (M.P. 37.36)

END OF PROJECT
STA. 734+35 (M.P. 37.49)

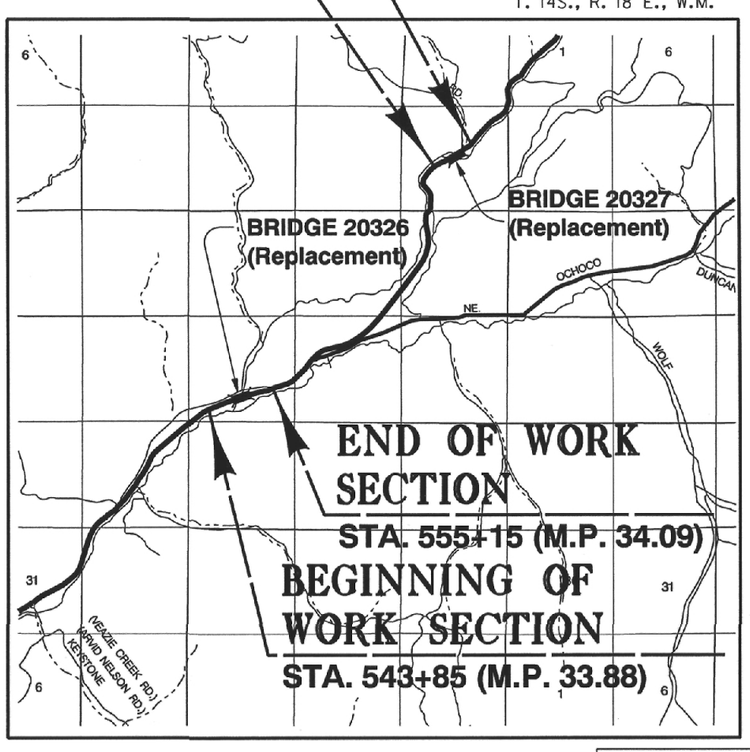
T. 15 S., R. 16 E., W.M.



BEGINNING OF PROJECT
STA. 29+25 (M.P. 19.30)

N

T. 14S., R. 18 E., W.M.



END OF WORK SECTION
STA. 555+15 (M.P. 34.09)

BEGINNING OF WORK SECTION
STA. 543+85 (M.P. 33.88)

REVISED AS CONSTRUCTED
03/15/10 CONTRACT C13438
PROJ. MGR. PATRICK CIMMIYOTTI

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Papé	COMMISSIONER
Janice J. Wilson	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
ODOT
BY:
URS CORPORATION

REGISTERED PROFESSIONAL ENGINEER
79487PE
OREGON
MARCH 13, 2007
DALE CERNEY

RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION
CONCURRENCE

CHIEF ENGINEER — DATE

URS
111 S.W. Columbia, Suite 1500
Portland , Oregon 97201
(tel) 503-222-7200
(fax) 503-222-4292

US26: OCHOCO CREEK-BRIDGE CREEK- BUNDLE A05
OCHOCO HIGHWAY
CROOK COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-OTIA-S041 (022)	1

NOT REVISED AS CONSTRUCTED
03/15/10 CONTRACT C13438

INDEX OF SHEETS CON'D

SHEET NO.	DESCRIPTION
2A - 2A-4	Typical Sections Br. 20649
2A-5 - 2A-6	Typical Sections Br. 20326
2A-7 - 2A-8	Typical Sections Br. 20327
2 2B thru 2B-15	Details
2C thru 2C-6	Traffic Control Br. 20649
2C-7 thru 2C-9	Traffic Control Br. 20326
2 2C-10 thru 2C-18	Traffic Control Br. 20327
2D	Pipe Data Sheet
3-3B	Construction Br. 20649
3C	Profile Br. 20649
4-4B	Construction Staging Br. 20649
5, 5A	Construction, Profile Br. 20326
6	Detour Plan & Profile Br. 20326
7, 7A	Construction, Profile Br. 20327
8	Detour Plan & Profile Br. 20327

SHEET NO.	DESCRIPTION
GEO/HYDRO	
GA-GA3	Erosion Control Plan Br. 20649
GA-4	Erosion Control Plan Br. 20326
GA-5	Erosion Control Plan Br. 20327

DRAWING NO.	DESCRIPTION
20649 BRIDGE	
77853	Plan & Elevation
77854	General Notes and Quantities
77855	Construction Staging
77856	Staging Plan
77857	Footing Plan
77858	Foundation Data
77859	End Bent 1
77860	End Bent 2
77861	End Bent Details 1
77862	End Bent Details 2
77863	End Bent Details 3
77864	Wingwall Details 1
77865	Wingwall Details 2
77866	Typical Deck Section
77867	Deck Plan
77868	Girder Details
77869	Girder Schedule
77870	Rail Details

DRAWING NO.	DESCRIPTION
20757 MSE Wall	
78049	Plan & Elevation
78050	General Notes

DRAWING NO.	DESCRIPTION
20326 BRIDGE	
77885	Plan & Elevation
77886	General Notes
77887	Footing Plan
77888	Foundation Data
77889	End Bent 1 Plan & Elevation
77890	End Bent 2 Plan & Elevation
77891	End Bent Detail and Bearing Details
77892	Wingwall Details
77893	Typical Deck Section
77894	Deck Plan
77895	Deck Elevations

DRAWING NO.	DESCRIPTION
20326 BRIDGE (Con'd)	
77896	Bulb-T Beam Schedule and Misc. Details
77897	Standard Bulb-T Beam Details
77898	Miscellaneous Details

DRAWING NO.	DESCRIPTION
20327 BRIDGE	
77871	Plan & Elevation
77872	General Notes
77873	Footing Plan
77874	Foundation Data
77875	End Bent 1 Plan & Elevation
77876	End Bent 2 Plan & Elevation
77877	End Bent Detail and Bearing Details
77878	Wingwall Details
77879	Typical Deck Section
77880	Deck Plan
77881	Deck Elevations
77882	Bulb-T Beam Schedule and Misc. Details
77883	Standard Bulb-T Beam Details
77884	Miscellaneous Details

SHEET NO.	DESCRIPTION
PERMANENT SIGNING	
S-10015 Thru S-10020	Signing Plan

SHEET NO.	DESCRIPTION
TRAFFIC SIGNALS	
2 14825 Thru 14827	Temporary Traffic Signal

Standard Drg. Nos.

RD115		- Monument Box
RD200		- Rdwy. Cross Slopes Superelevated Sections
RD230		- Slope Rounding
RD300		- Trench Backfill, Bedding, Pipe Zone and Multiple Installations
RD302		- Street Cut
RD326		- Coupling Bands
RD362	3 1	- Sanitary Cleanout
RD364, RD366		- Inlets
RD380, RD386		- Pipe Fill Height Tables
RD400, RD405		- Guardrail Parts
RD410		- Thriebeam
RD415		- Guardrail
RD420		- Terminals
RD440		- Guardrail at Bridge Ends
RD450		- Guardrail Anchors
RD500		- Precast Conc. Bar. Pin & Loop Assembly
RD505		- Concrete Barrier Cast-In-Place
RD516		- Securing Conc. Barrier to Roadway
RD520		- Cast-In-Place Concrete Barrier Transition To Bridge Rail
RD610		- Asphalt Pavement

Standard Drg. Nos.

RD700		- Curbs
RD715		- Approaches & Non-Sidewalk Dwys
RD720		- Sidewalks
RD735		- Curb Line Sidewalk Dwys. Or Alleys
RD740		- Separated Sidewalk Dwys. - Local Jurisdictions
RD755		- Sidewalk Ramp Details
RD760		- Sidewalk Ramp Placement
RD1000		- Construction Entrances
RD1005		- Check Dams
RD1025		- Sediment Barrier
RD1040		- Sediment Fence
BR140, BR141, BR145, BR150		- Expansion Joints
BR165		- Bridge End Panel Details
BR200		- Conc. Bridge Rail Type F
BR203		- Transition Conc. Br. Rail To Guardrail
BR250 (Modified)		- Pedestrian Rail On Sidewalk Mounted Concreted Parapet
BR270		- Flex Beam Rail To Curb & Parapet Rail
BR310		- Bulb-T Beams Details
BR350		- Temp. Diaphragms Beam For Prestressed Conc. Beams
BR440		- 48" Precast Prestressed Box
BR445		- General Details for Prestressed Boxes & Slabs
BR450		- Precast Prestressed Conc. Slab Design Sheet
BR460		- Precast Prestressed Conc. Box Design Sheet
TM200		- Sign Installation Details
TM201		- Miscellaneous Sign Placement Details
TM204		- Flag Board Mounting Detail
TM221		- Signing Details Milepost Marker
TM222		- Installation Details Milepost Marker Posts
TM230		- Mounting Details For Removable Legend (203 & 152 UC & LC Letters/Numbers)
TM457		- Vehicle, Pedestrian Signal And Push Button Mounting Option Details
TM485	3 1	- Service Cabinet And Service Cabinet Wiring Details
TM488		- Terminal Cabinet Detail
TM500, TM501, TM502		- Pavement Markings
TM515		- Raise Pavement Marking Details
TM525		- Pavement Marking Details
TM570		- Traffic Delineators
TM670		- Permanent Signing Wood Post Supports Sizing Charts
TM700		- Tables, Abrupt Edge, and PCMS Details
TM710		- 2 Lane, 2 way Roadways
TM717		- Non-Freeway Multilane Section
TM735		- Bridge Construction
TM745		- Temporary Concrete Barrier Details
TM747		- Temporary Reflective Pavement Markers
TM750		- Traffic Control Plans - Temporary Barricades
TM755, TM760		- Temporary Impact Attenuators
TM775		- Temporary Sign Supports
TM780		- Closure Details

REVISIONS

1	Revised 01-06-2008 Deleted Std. Drgs.	2	Revised 01-06-2008 Adjusted Sheets	3	Revised 01-06-2008 Added Std. Drgs.

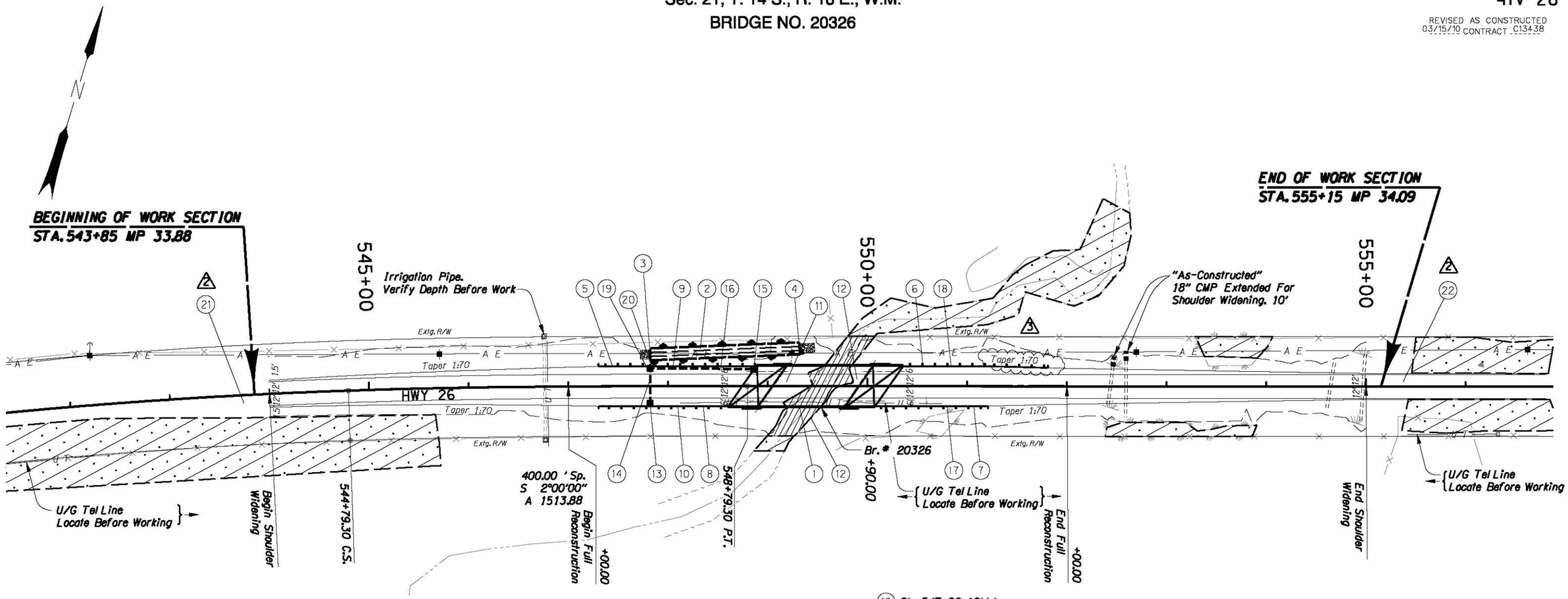
US26: OCHOCO CREEK-BRIDGE CREEK- BUNDLE A05
OCHOCO HIGHWAY
CROOK COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-0TIA-S041 (022)	1A

Sec. 21, T. 14 S., R. 18 E., W.M.
BRIDGE NO. 20326

41V-28

REVISED AS CONSTRUCTED
03/15/10 CONTRACT C134.38



(1) Const. Bridge (Str. #20326)
(For Bridge Details, See Index of Sheets)

(2) Sta. 547+82, 32" Lt. To
Sta. 549+32, 38' Lt.
Const. Stormwater Detention Bioswale #1
4:1 Side Slope, 4' Wide, 150' Long
(For Details, See Sht. 2B-4)

(3) Sta. 547+82 Lt.
Const. Loose Riprap (Class 50) - 3 C.Y.
(For Details, See Sht. 2B)

(4) Sta. 549+32 Lt.
Const. Loose Riprap (Class 50) - 3 C.Y.
(For Details, See Sht. 2B)

(5) Sta. 547+31 Lt. To 548+89 Lt.
Const. G.R. - 93.75' (Type 2A)
-12.5' (Type 3)
Const. G.R. Transition
Const. G.R. Terminal (Level 3) Non-Flared
Flare Rate=0', W=1', E=2'
(See Drg. Nos. BR203, RD400, RD405,
RD410, RD415, RD420, RD440)

(6) Sta. 550+37 Lt. To 551+80 Lt.
Const. G.R. - 62.5' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Const. G.R. Terminal (Level 3) Non-Flared
Flare Rate=0', W=1', E=2'

(7) Sta. 550+07 Rt. To 551+20 Rt.
Const. G.R. - 50' (Type 2A)
-12.5' (Type 3)
Const. G.R. Transition
Const. G.R. Terminal (Level 3) Non-Flared
Flare Rate=0', W=1', E=2'

(8) Sta. 547+31 Rt. To 548+59 Rt.
Const. G.R. - 62.5' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Const. G.R. Terminal (Level 3) Non-Flared
Flare Rate=0', W=1', E=2'

(9) Sta. 548+69 Lt. To Sta. 548+89 Lt.
Const. Asph. Drainage Curb - 20'
(See Drg. No. RD700)

(10) Sta. 547+31 Rt. To Sta. 548+59 Rt.
Const. Asph. Drainage Curb - 82'

(11) Const. Loose Riprap (Class 100) - 90 C.Y.
(For Details, See Sht. 2B-6) ⚠1

(12) Const. Loose Riprap (Class 100) - 90 C.Y.
(For Details, See Sht. 2B-6) ⚠1

(13) Sta. 547+82, 18' Rt.
Const. Type G-2M Inlet
Grate Elev. 3362.67, F.L. Elev. 3359.50
(See Drg. No. RD364)

(14) Sta. 547+82 Rt. To Sta. 547+82 Lt.
Inst. 12" Storm Pipe - 35'

(15) Sta. 548+87, 18' Lt.
Const. Type G-2M Inlet
Grate Elev. 3364.05, F.L. Elev. 3359.82

(16) Sta. 547+82 Rt. To Sta. 548+86 Lt.
Inst. 12" Storm Pipe - 104'

(17) Sta. 550+08 Rt. To Sta. 551+21 Rt.
Const. Asph. Drainage Curb - 113'

(18) Sta. 550+35 Lt. To Sta. 551+21 Lt.
Const. Asph. Drainage Curb - 86'

(19) Sta. 547+82, 18' Lt.
Const. Type G-2M Inlet
Grate Elev. 3362.33, F.L. 3359.32

(20) Sta. 547+82 Lt. To Sta. 547+82 Lt.
Inst. 12" Storm Pipe - 14'

⚠2 (21) Sta. 542+85 To Sta. 543+85
Cold Plane Pvmt. Removal (0" To 2") - 267 S.Y.
(For Details See Sht. 2B-8)

⚠2 (22) Sta. 555+15 To Sta. 556+15
Cold Plane Pvmt. Removal (0" To 2") - 267 S.Y.
(For Details See Sht. 2B-8)

No Work Area
Off Limits To Contractor

Regulated In Water Work Area
July 1 - October 31

REVISIONS	
⚠1	Revised 01-06-2008 Adjusted Note
⚠2	Revised 01-13-2008 Added Note
⚠3	Revised 05-29-2008 Adjusted GR Length

REGISTERED PROFESSIONAL ENGINEER
79487PE
OREGON
MARCH 13, 2001
DALE CERNEY
RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: OCHOCO CREEK-BRIDGE CREEK- BUNDLE A05
OCHOCO HIGHWAY
CROOK COUNTY

Design Team Leader - Lee Jordan
Designed By Jim Halloran
Drafted By Serge Valverde

GENERAL CONSTRUCTION

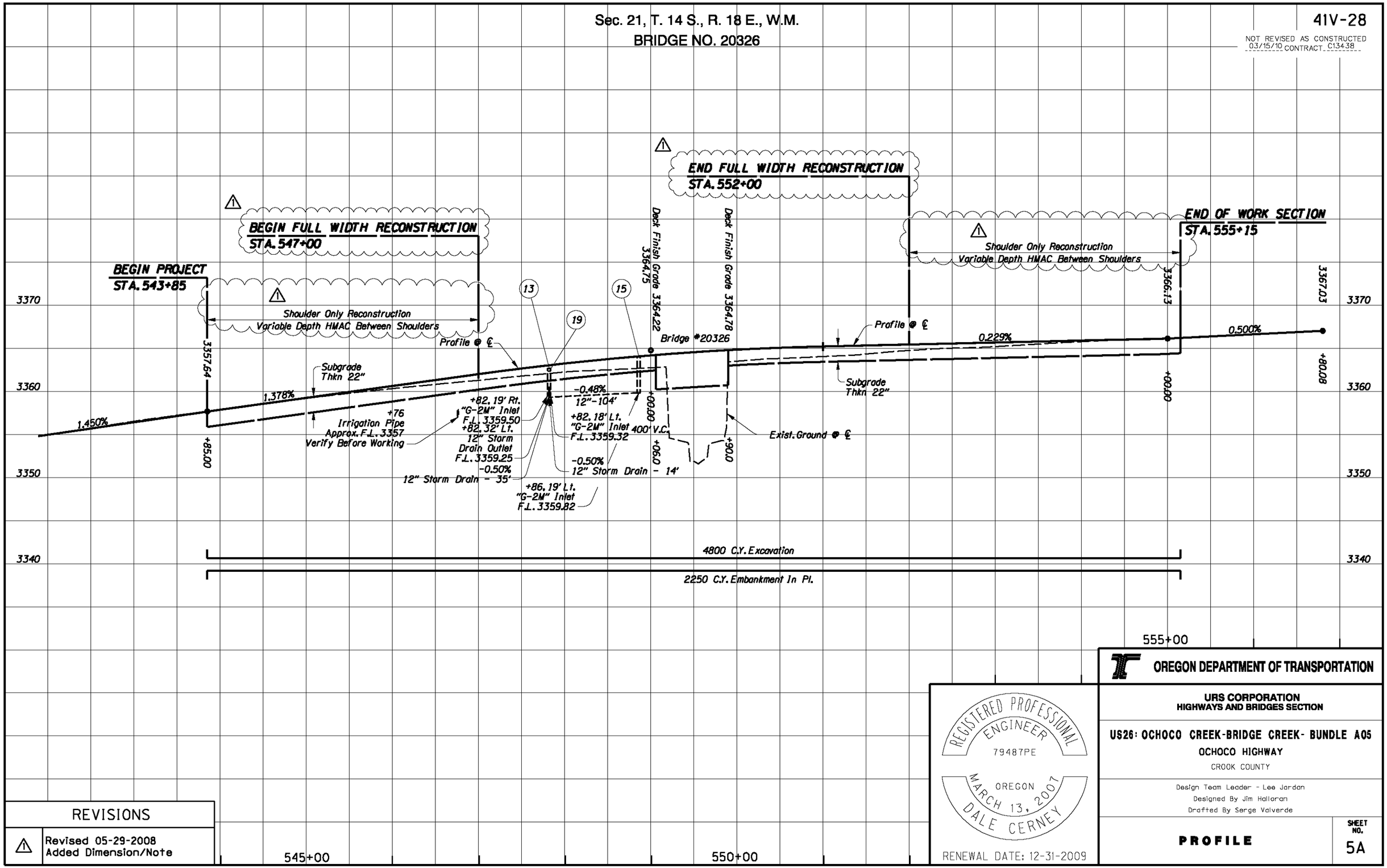
SHEET NO. 5

I:\25696023\As Constructed\13540f-20326.pl1 :: Default 4/15/2010 4:36:01 PM Serge_Valverde

Sec. 21, T. 14 S., R. 18 E., W.M.
BRIDGE NO. 20326

41V-28

NOT REVISED AS CONSTRUCTED
03/15/10 CONTRACT C134.38



REVISIONS	
⚠	Revised 05-29-2008 Added Dimension/Note

REGISTERED PROFESSIONAL ENGINEER
79487PE
OREGON
MARCH 13, 2007
DALE CERNEY
RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: OCHOCO CREEK-BRIDGE CREEK- BUNDLE A05
OCHOCO HIGHWAY
CROOK COUNTY

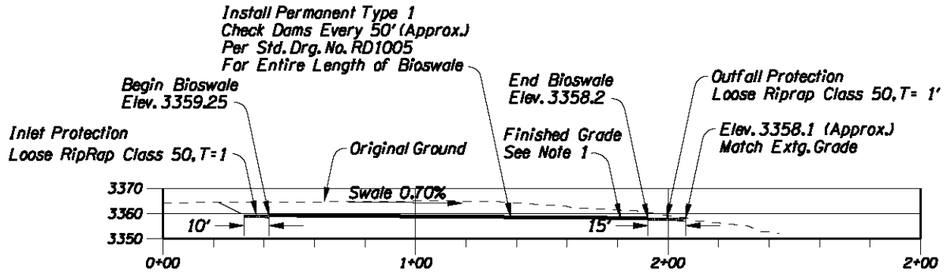
Design Team Leader - Lee Jordan
Designed By Jim Halloran
Drafted By Serge Valverde

PROFILE

SHEET NO. 5A

I:\25696023\As Constructed\13540f-20326.pf1 :: Default 4/15/2010 4:35:03 PM Serge_Valverde

NOT REVISED AS CONSTRUCTED
03/15/10 CONTRACT C13438

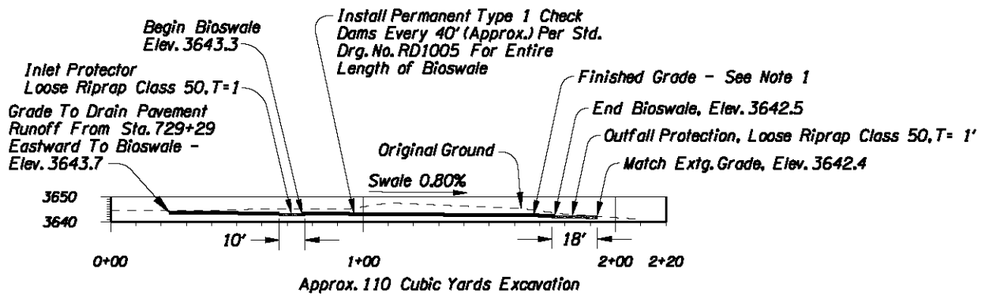


Approx. 64.78 Cubic Yards Excavation

BRIDGE 20326 - STORMWATER BIOSWALE #1
SECTION A-A, Sta. 547+82 Lt To Sta. 549+32 Lt
LENGTH - 150.0 ft

Scale: 1"=60'

For Details, See Sht.5, Note 2

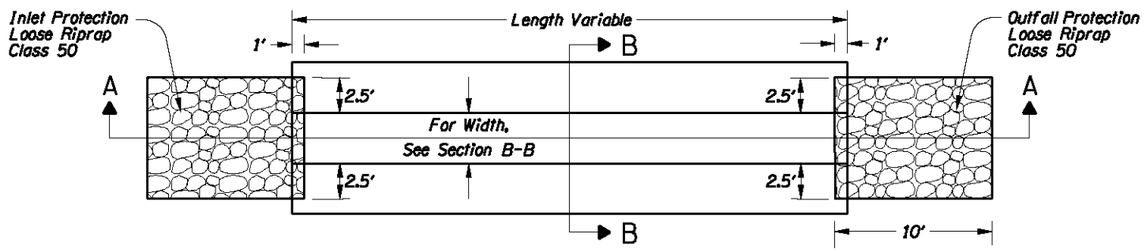


Approx. 110 Cubic Yards Excavation

BRIDGE 20327 - STORMWATER BIOSWALE #2
SECTION A-A, Sta. 729+81.2 Rt To Sta. 730+81.8 Rt
LENGTH - 100.0 ft

Scale: 1"=60'

For Details, See Sht.5, Note 6 ⚠1



STORMWATER BIOSWALES #1 AND #2, PLAN VIEW, TYPICAL

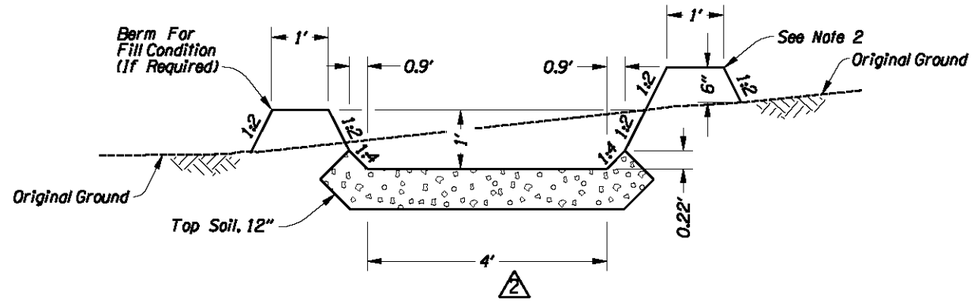
Scale: 1"=10'

NOTES

1. Bioswales To Be Constructed Within Footprint Of Detour Route After Detour Is Removed. Contractor May Elect To Shape Bioswale To The Required Grades Using In-Place Detour Route Subgrade, Or The Contractor May Remove The Subgrade Material To Restore Surface To Original Grades, Then Construct The Bioswale. Bioswale Subgrade Soils Must Be Loosened To A Minimum Depth Of 3 Feet Below Topsoil Finished Grade To Allow For Percolation And Vegetation Growth. Bioswale Berms To Be Recompacted To 85% Maximum Dry Density.

2. Bioswale #2 Berm As Needed To Divert Upgradient Runoff Around Bioswale And Drain To Creek. Alternatively, Or In Combination, Leave Bench Created By Construction Of Detour Route And Grade Bench To Divert Upgradient Runoff Around Bioswale And Drain To Creek.

Seed w/ Water Quality Seeding Mix on 1:4 Sideslopes and Swale Bottom. Topsoil Required on 1:4 Sideslopes and Swale Bottom. See Std. Spec 01030.43



SECTION B-B

No Scale

	REVISIONS
⚠1	Revised 09-24-2008 Relocated And Adjusted Bioswale
⚠2	Revised 09-24-2008 Adjusted Dimension

REGISTERED PROFESSIONAL ENGINEER
60,015
OREGON
JULY 13, 1999
RODRICK P. LUNDBERG

RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: OCHOCO CREEK-BRIDGE CREEK- BUNDLE A05
OCHOCO HIGHWAY
CROOK COUNTY

Design Team Leader - Lee Jordan
Designed By Rod Lundberg
Drafted By Serge Valverde

DETAILS

SHEET NO. 2B-4