OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: September 2017

DFI No. D00472

Figure 1: DFI No. D00472, looking east

1. Identification

Drainage Facility ID (DFI):	D00472
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 40V-24
Location:	District: 10
	Highway No.: 041
	Mile Post: 65.67 to 65.71, SB [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.

Facility location type: Roadway shoulder

Flow direction: Northwest

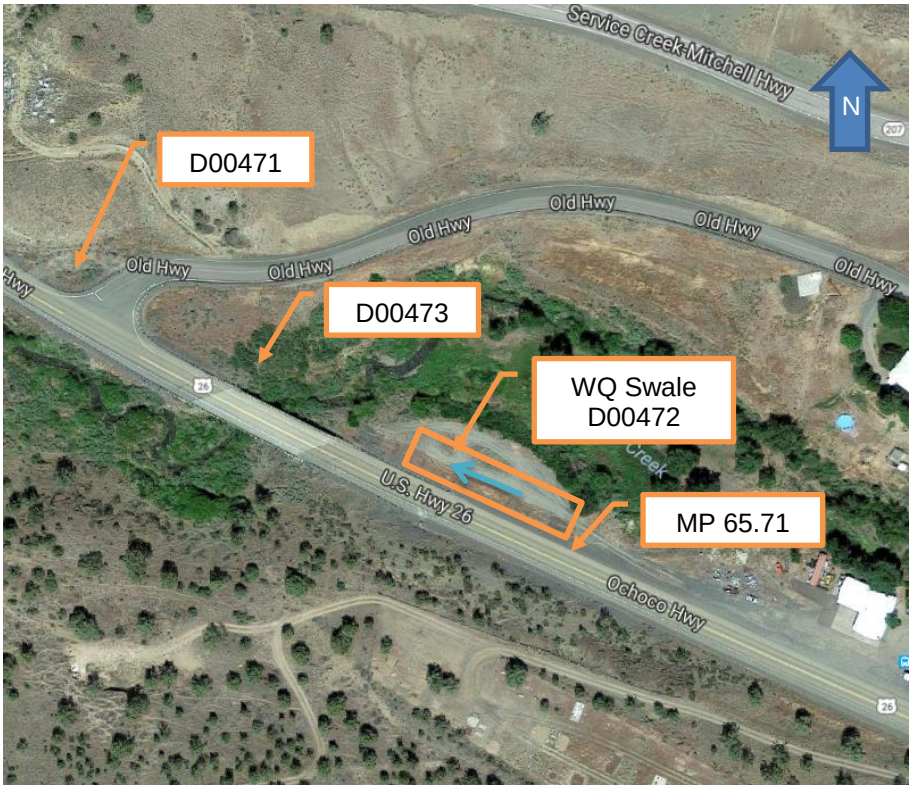


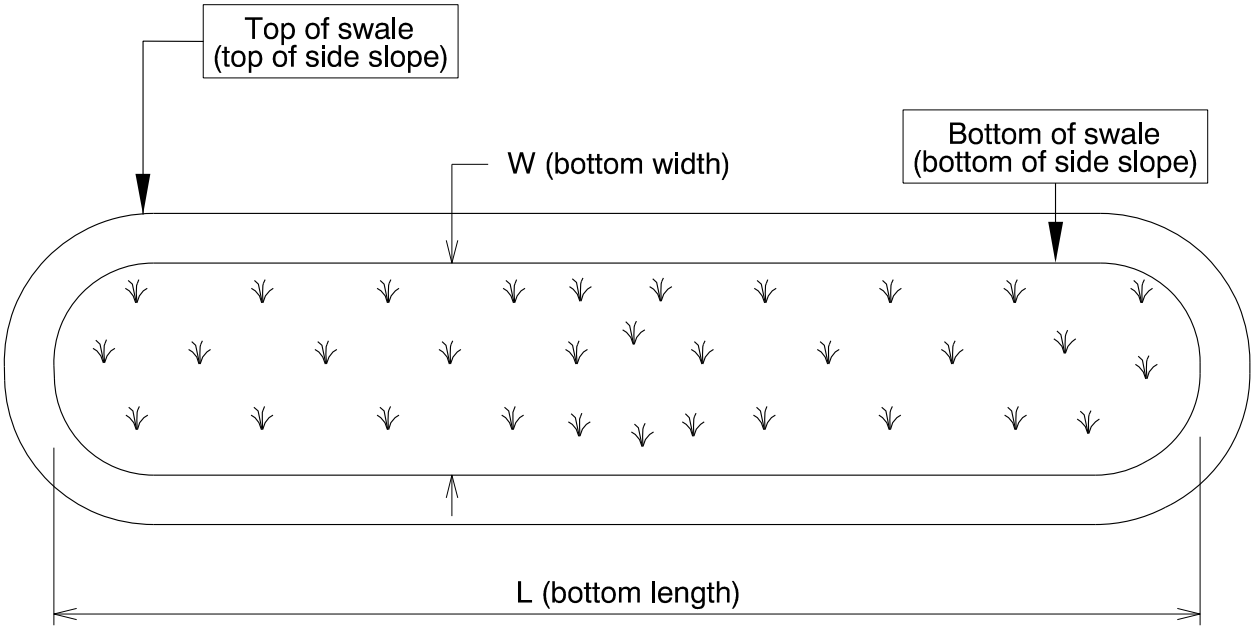
Figure 2: Facility location map

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:

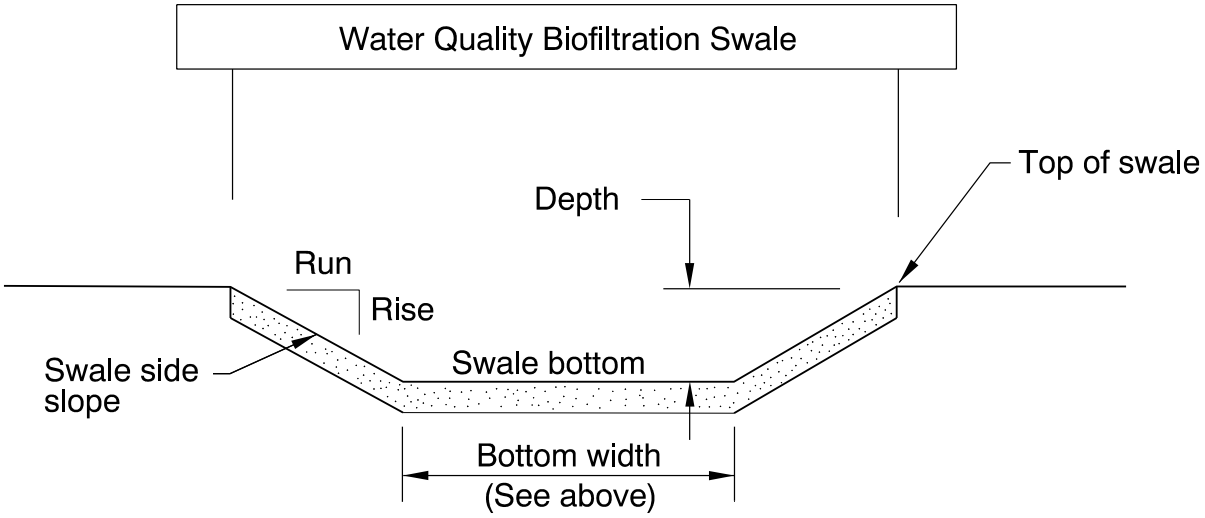
Bottom Length (feet)	Bottom Width (feet)
± 230	± 4



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)
Varies ±1.0	**4**	**1**



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: Roadside shoulder on Ochoco Hwy looking west

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 in table 1.

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 (Topsoil)	☒	**S14**
Perforated pipe	☐	**S15**
Porous pavers (access grid)	☐	**S16**
Flow Spreader		
Rock basin (used at outlet)	☐	**S17**
Anchored board (midpoint of swale or every 50 feet along swale bottom)	☐	**S18**
Other: Type 1 Check dams, approx. every 20 ft.	☒	**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 no 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

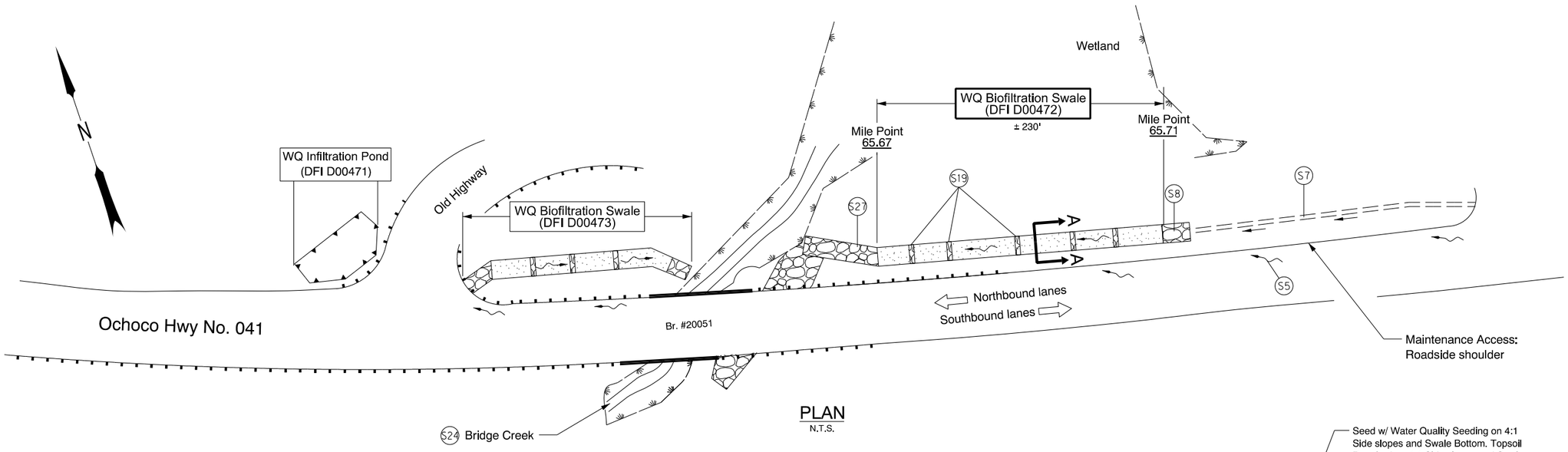
Contact any of the following for more detailed information about management of waste materials found on site:

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

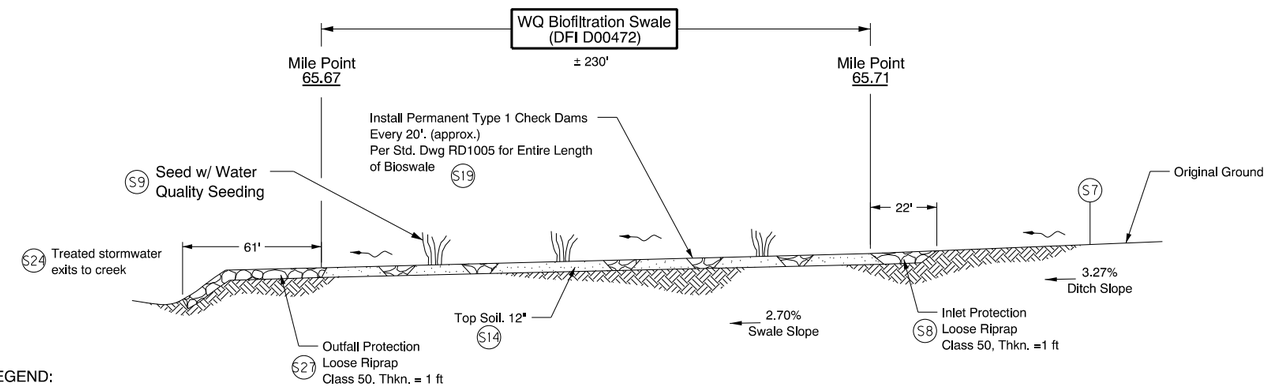
A Appendix A – Site Specific Operational Plan

Contents:

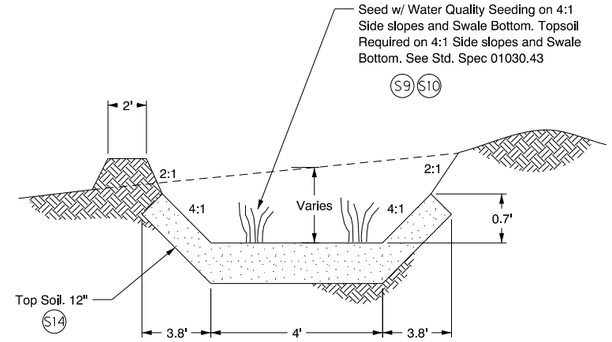
Operational Plan: DFI D00472



PLAN
N.T.S.



PROFILE
N.T.S.



SECTION A-A
N.T.S.

DFI D00472 (Bioswale #2) Minimum Depth = 1.0 ft

LEGEND:

- Manhole
- Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Swale Component (Table 1)

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Chabeli Arreola

Drafted By: Chabeli Arreola

DFI D00472
MAINTENANCE DISTRICT 10 HWY 041
WATER QUALITY BIOFILTRATION SWALE
HIGHWAY MP 65.67-65.71
CROOK AND WHEELER COUNTIES

THIS IS THE FILENAME LOCATION ********** DD-MMM-YYYY HH:MM USERNAME DFI_D00472.dgn

[BLANK]

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 40V-24

[BLANK]

Revised Plan
Sheets Incorporated

Revised Plan
Sheets Incorporated

40V-24

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

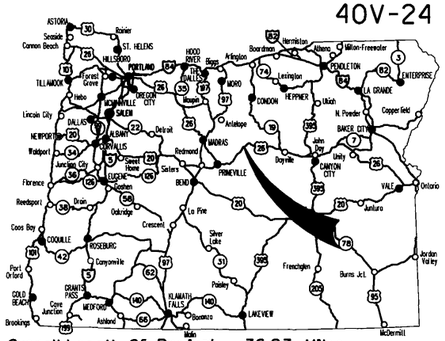
PAVING AND STRUCTURES

US26: RUSH CREEK-ANTONE-BUNDLE A51

OCHOCO HIGHWAY

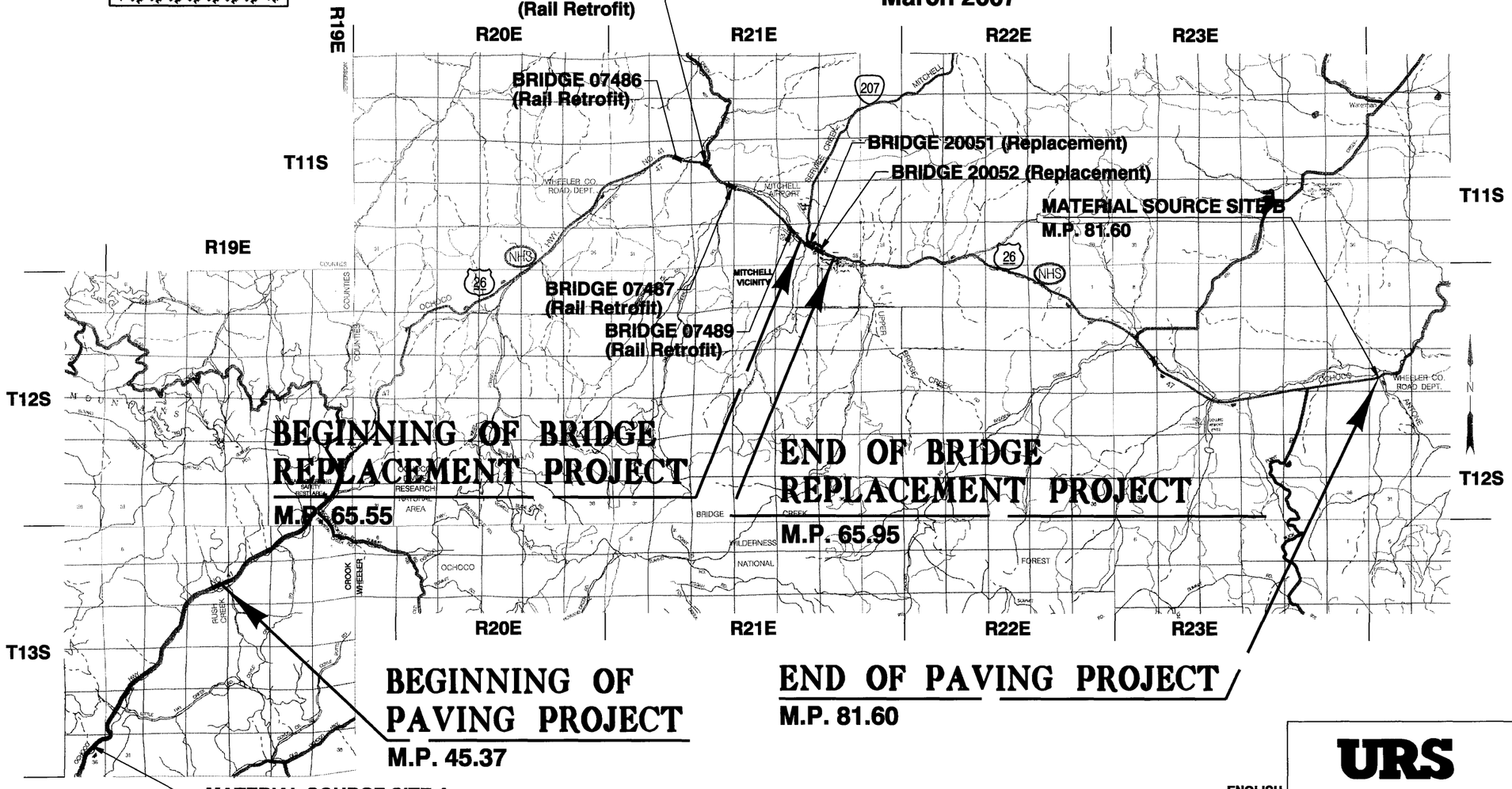
CROOK AND WHEELER COUNTIES

March 2007



Overall Length Of Project - 36.23 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.)



T. 13 S., R. 19 E. Thru T. 11 S., R. 21 E., TO T. 12 S., R. 23 E.

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Pape	COMMISSIONER
Janice Wilson	COMMISSIONER
Matt Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
OREGON DEPT. OF TRANSPORTATION
BY:
URS

OREGON DEPARTMENT OF TRANSPORTATION
CONCURRENCE

Technical Services Managing Engineer — 2-07 DATE

ENGLISH

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

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-OTIA-S041 (021)	1

INDEX OF SHEETS CONT'D.

SHEET NO.	DESCRIPTION
2A Thru 2A-5	Typical Sections
⚠1 2B Thru 2B-13	Details
2C Thru 2C-13	Traffic Control Plans
2D	Pipe Data Sheet
3, 3A, 3B - 4, 4A, 4B	Detour R/W Alignment, Const. & Profile
5, 5A - 6, 6A	Mainline Const. & Profile

PERMANENT PAVEMENT MARKINGS	
ST Thru ST-2	Striping Plan

GEO/HYDRO	
GA Thru GA-2	Erosion Control Plans
GM Thru GM-5	Prospective Material Source and Cross Sections

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 20051
75135	Plan & Elevation
75136	General Notes
75137	Foundation Data
75138	Foundation Plan
75139	End Bent 1 Plan and Elevation
75140	End Bent 2 Plan and Elevation
75141	End Bent Detail and Bearing Details
75142	Wingwall Details
75143	Standard Bulb-T Beam Details
75144	Bulb-T beam Schedule and Misc. Details
75145	Deck Section and Details
75146	Deck Elevations

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 20052
75147	Plan & Elevation
75148	General Notes
75149	Foundation Data
75150	Foundation Plan
75151	End Bent 1 Plan and Elevation
75152	End Bent 2 Plan and Elevation
75153	End Bent Detail and Bearing Details
75154	Wingwall Details
75155	Girder Details 1
75156	Girder Details 2
75157	Standard Precast Prestressed Box Schedule
75158	Deck Section and Details
75159	Deck Elevations

DRAWING NO.	DESCRIPTION
	STRUCTURE NO. 20492
75160	Retaining Wall Design

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 07486
75161	Plan

INDEX OF SHEETS CONT'D.

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 07372
75162	Plan

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 07487
75163	Plan

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 07489
75164	Plan

DRAWING NO.	DESCRIPTION
PERMANENT SIGNING	
S-09261 Thru S-09271	Signing Plan

Standard Drg. Nos.

RD100, RD101	- Mailbox Installation	TM570, TM575	- Delineators
RD200	- Superelevated Sections		
RD230	- Slope Rounding	TM600, TM601, TM602, TM603, TM604	- Breakaway Sign Supports
RD300, RD304	- Pipe Backfill and Compaction		
RD316, RD318	- Slope End Section	TM670	- Permanent Signing Wood Post Sizing Chart
RD326	- Coupling Bands		
RD364	- Concrete Inlets		
RD380, RD382, RD384, RD386	- Fill Height Tables		
RD400, RD405	- Guardrail Parts		
RD410	- Thriebeam		
RD415	- Guardrail		
RD420	- Terminals		
RD440	- Guardrail at Bridge Ends		
RD450	- Guardrail Anchors		
RD610	- Asphalt Pavement		
RD700	- Curbs		
RD715	- Approaches		
RD810, RD820	- Fences		
RD900, RD905, RD908, RD910, RD911, RD935, RD945, RD950	- Traffic Control		
RD1000, RD1005, RD1010, RD1030, RD1040, RD1055	- Erosion Control		
BR140	- Expansion Joint w/ Compression Seal or Poured Sealant		
BR165	- Bridge End Panel		
BR200	- Type "F" Rail		
BR203	- Bridge Rail/Guardrail Transition		
BR233	- Thrie Beam Rail		
BR273	- Thrie Beam Rail Retrofit		
BR350	- Temporary Diaphragms		
⚠2 ⚠3 BR445	- Prestressed Boxes & Slabs		
TM100, TM105	- Temporary Wood Posts		
TM200, TM201, TM205, TM206, TM207, TM211, TM212, TM217, TM221, TM222, TM223, TM235, TM239, TM240	- Permanent Signing		
TM500, TM501, TM502, TM525, TM545	- Pavement Markings Details		

REVISIONS	
⚠1	Revised 03-12-2007 Revised Sheet Number
⚠2	Revised 03-12-2007 Added Std. Drg. BR445
⚠3	Revised 03-12-2007 Deleted Std. Drg. BR800

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

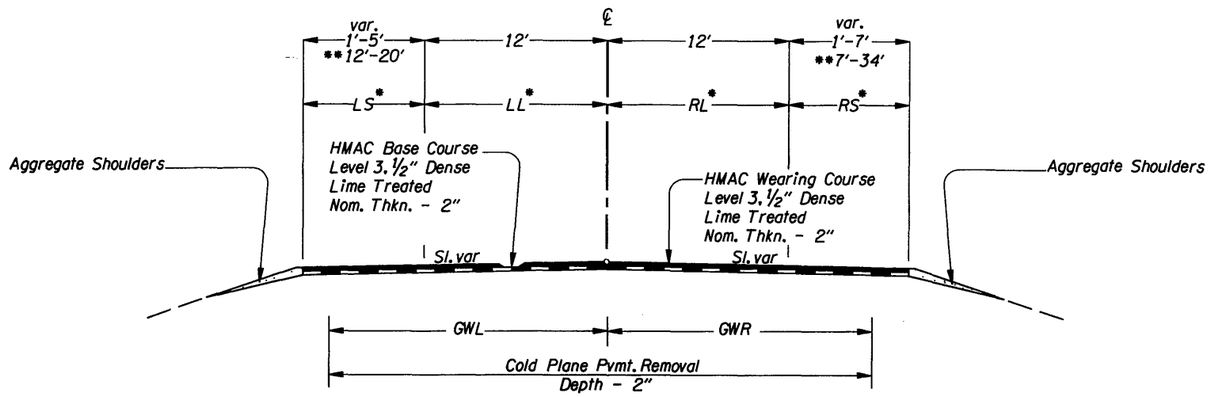
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-OTIA-S041 (021)	1A

MP	GWL	LS	LL	RL	RS	GWR
45.370	14	3	11	11	2	13
45.490	13	3	12	11	3	14
45.785	14	2	12	11	4	13
45.951	13	2	11	12	3	13
46.188	14	3	11	11	3	14
46.366	14	3	11	11	4	13
46.549	14	2	12	10	3	13
46.879	13	2	11	11	3	14
47.023	13	2	11	11	2	13
47.279	12	2	10	11	3	14
47.500	14	2	12	10	3	13
47.663	13	2	11	11	3	14
48.074	13	2	11	11	3	14
48.177	12	2	10	11	4	13
48.342	14	3	11	11	3	14
48.718	14	3	11	10	3	13
49.137	14	3	11	11	3	14
49.489	14	3	11	11	2	13
49.564	13	3	12	11	2	13
49.668	13	3	12	11	3	14
49.881	13	4	11	11	9	13
49.909	13	15	11	11	16	13
49.926	13	15	11	11	16	13
49.947	13	21	11	11	35	13
49.974	13	21	11	11	35	13
49.990	13	20	11	12	10	13
50.027	13	12	12	11	7	13
50.100	14	15	11	12	2	14
50.1 - 60.3	NO WORK AREA					
60.300	13	2.5	12.5	12	4	13
60.500	13	3	12	12	2	14
60.736	14	3	11	12	3	13
61.012	13	3	12	12	3	13
61.243	13	3	12	12	2	14
61.377	13	3	12	11	2	13
61.588	13	3	12	12	2	14
61.802	13	3	12	11	2	13
62.000	14	2	12	12	3	13
62.190	13	2	13	11	3	14
62.290	13	3	12	11	2	13
62.532	13	2	11	12	3	13
62.619	13	3	12	12	3	13
62.925	13	3	12	12	3	13
63.192	13	3	12	12	4	13
63.460	13	3	12	12	2	14
63.652	13	3	12	12	3	13
63.909	14	3	11	12	2	14
64.080	14	2	12	12	3	13
64.449	13	3	13	11	3	14
64.651	13	3	12	12	3	13
65.022	13	3	12	11	3	14
65.260	13	3	12	12	3	13
65.368	13	3	12	11	2	13
65.55	SEE TYPICAL SHEET 2A-2, 2A-3					
65.95	SEE TYPICAL SHEET 2A-2, 2A-3					
66.057	13	3	12	12	3	13
66.175	14	2	12	12	3	13
66.225	13	3	12	11	3	14
66.378	13	3	12	12	2	14
66.461	14	3	11	11	3	14
66.569	13	3	12	12	3	13
66.785	13	6	12	12	4	13
67.1 - 72.3	13	4-5	12	12	4-5	13

LEGEND:

MP	Milepoint
GWL	Grinding Width Left
LS	Left Shoulder
LL	Left Lane
RL	Right Lane
RS	Right Shoulder
GWR	Grinding Width Right

* Existing Widths Shown in Table
*** See Detail Sheet 2B-4 for Structure Surfacing Details



M.P. 45.37 To M.P. 49.90
**49.90 To 50.10
50.10 To 60.30 NO WORK AREA
60.30 To 65.55 (STA. 695+00)
65.95 (STA. 708+75) To 72.33
***61.70 To 61.72 STRUCTURE NO. 07486
***62.53 To 62.55 STRUCTURE NO. 07372
***63.21 To 63.23 STRUCTURE NO. 07487
***65.02 To 65.04 STRUCTURE NO. 07489

REGISTERED PROFESSIONAL ENGINEER
60239PE
Robert L. Townsend
OREGON
JANUARY 13, 2004
ROBERT L. TOWNSEND
EXPIRES JUNE 30, 2008

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

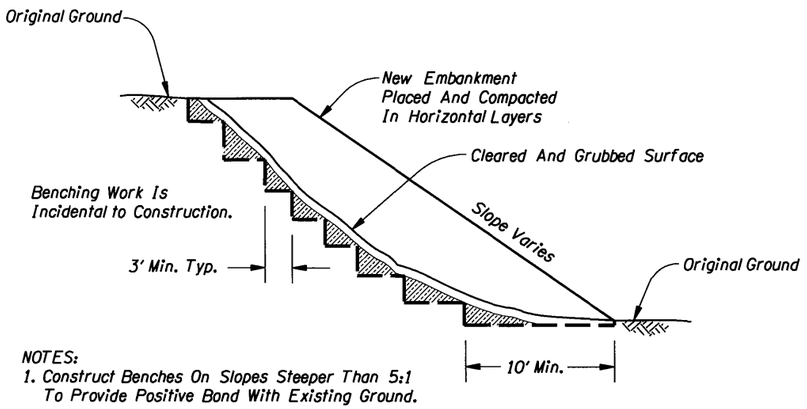
US26: RUSH CREEK-ANTONE-BUNDLE A51

OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Designed By - Robert Townsend
Drafted By - Greg Saurbier

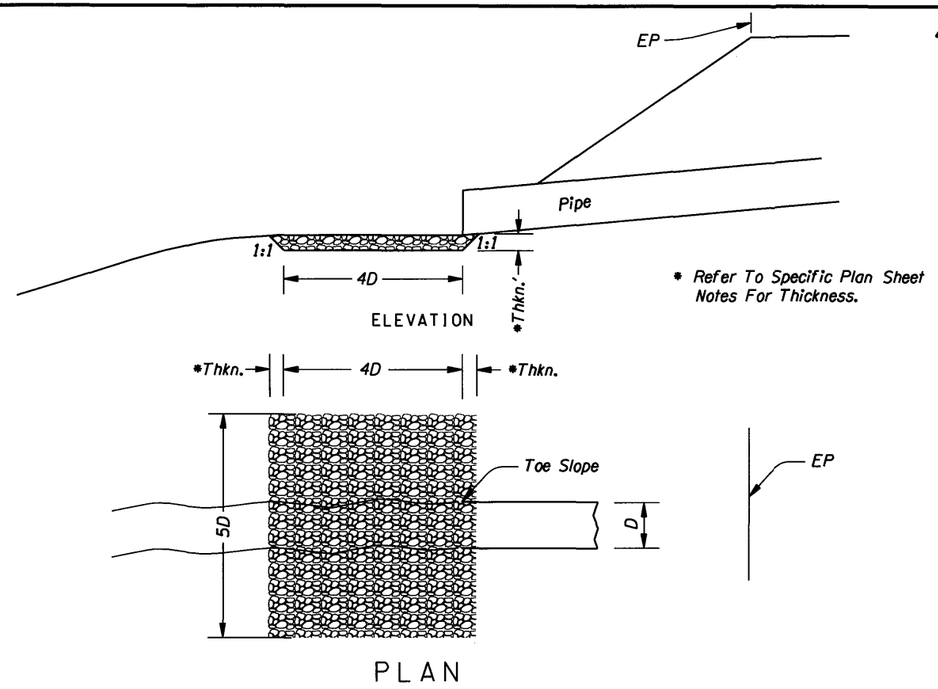
TYPICAL SECTION

SHEET NO. 2A

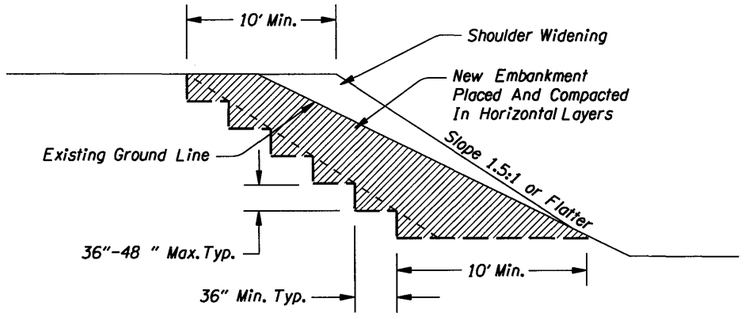


NOTES:
1. Construct Benches On Slopes Steeper Than 5:1 To Provide Positive Bond With Existing Ground.

STANDARD EMBANKMENT CONSTRUCTION



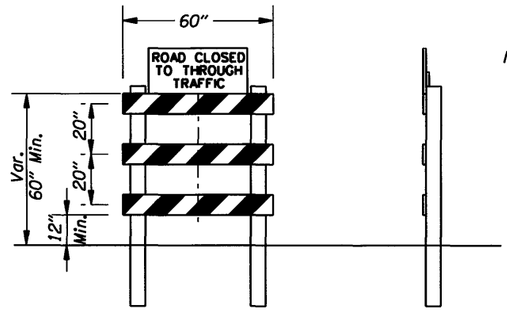
RIPRAP CONSTRUCTION AT PIPE OUTFALLS



SLIVER FILL BENCHING DETAIL

NOTES:
1. Detail Is For All Fill Widenings Which Toe Out On The Existing Embankment Slope Or Within 5' Of The Existing Embankment Toe. Use Standard Embankment Construction Detail For Widenings Toeing Out 5' Or More Beyond The Existing Embankment Toe.

2. This Detail May Require Removal Of Part Of Existing Paved Roadway.



NOTE:
For Details Not Shown, See Std. Drg. RD950.

TYPE III BARRICADE AND SIGN

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

OREGON DEPARTMENT OF TRANSPORTATION

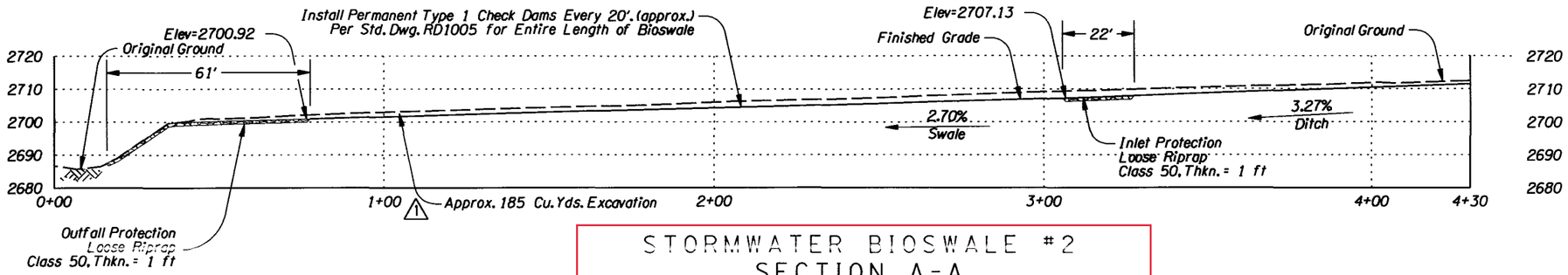
URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

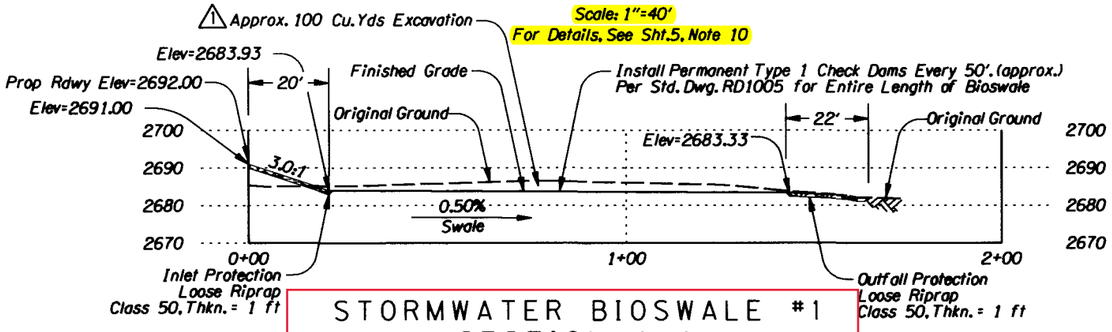
Project Leader - Brian Willman
Designed By - Dale Cerney
Drafted By - Serge Valverde

DETAILS

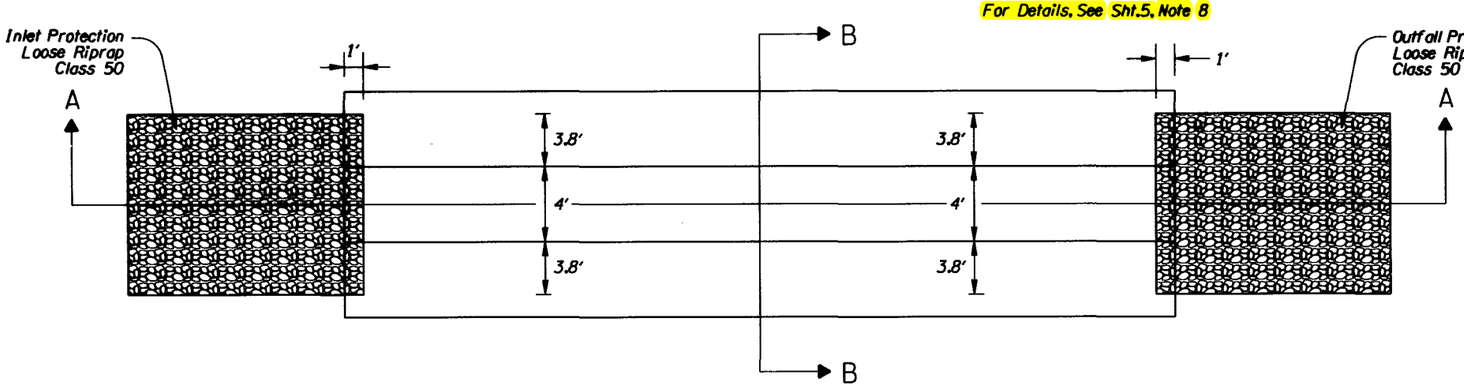
SHEET NO. 2B-7



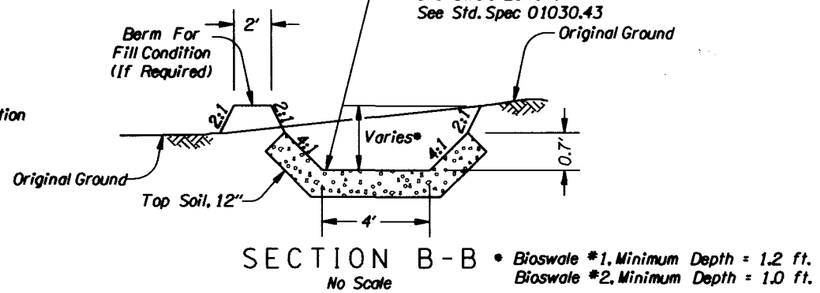
STORMWATER BIOSWALE #2
SECTION A-A
Sta. 701+55 To Sta. 703+85
LENGTH - 230.0 ft



STORMWATER BIOSWALE #1
SECTION A-A
Sta. 698+49 To Sta. 699+71
LENGTH - 120.0 ft
Scale: 1"=40'
For Details, See Sht.5, Note 8



STORMWATER BIOSWALES #1 AND #2
PLAN VIEW, TYPICAL
No Scale



SECTION B-B
No Scale

* Bioswale #1, Minimum Depth = 1.2 ft.
Bioswale #2, Minimum Depth = 1.0 ft.

REVISIONS	
⚠	Revised 03-29-2007 Added Note

REGISTERED PROFESSIONAL ENGINEER
60,015
OREGON
JULY 13, 1999
RODRICK P. LUNDBERG
RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

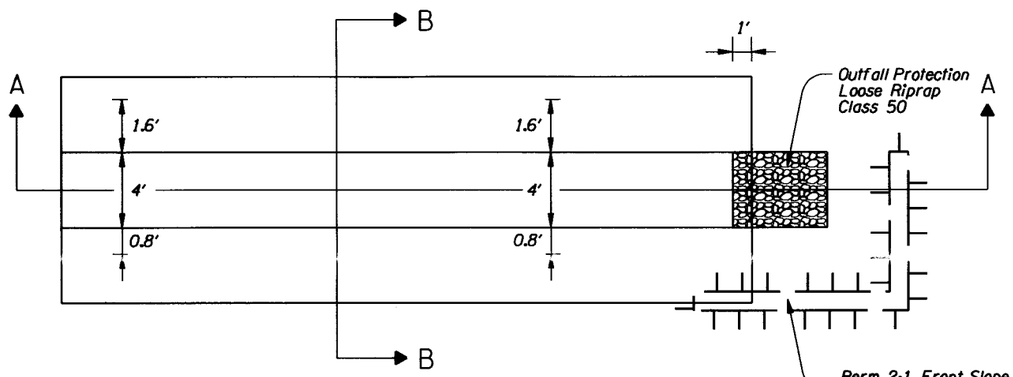
URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

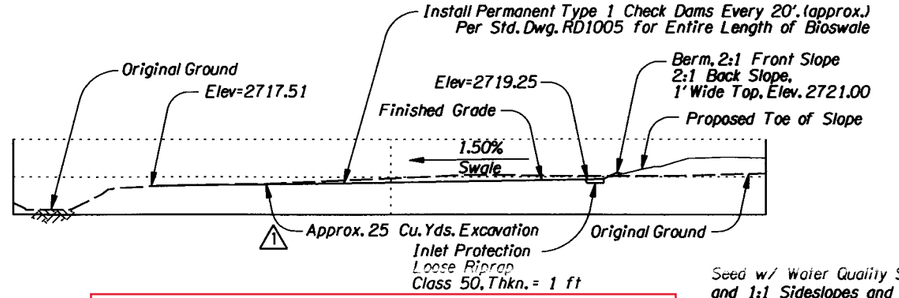
Project Leader - Brian Willmon
Designed By - Dale Cerney
Drafted By - Serge Valverde

DETAILS

SHEET NO. 2B-8

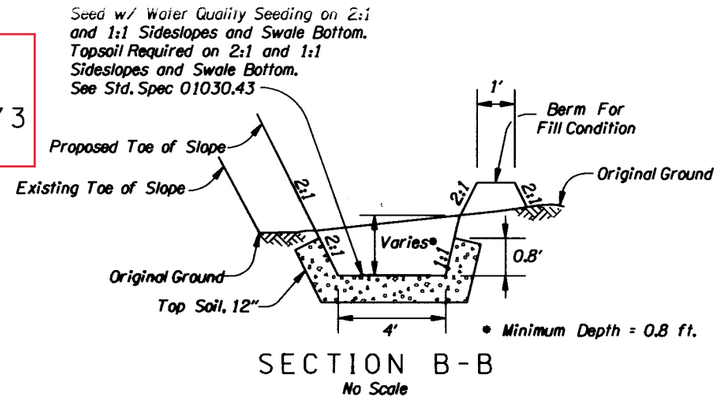


STORMWATER BIOSWALE #3
PLAN VIEW
No Scale

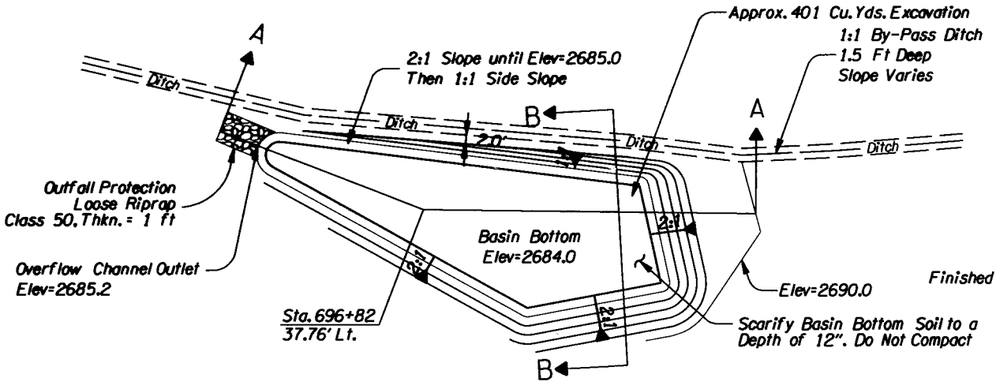


STORMWATER BIOSWALE #3
SECTION A-A
Sta. 704+57 To Sta. 705+73
LENGTH - 116.0 ft

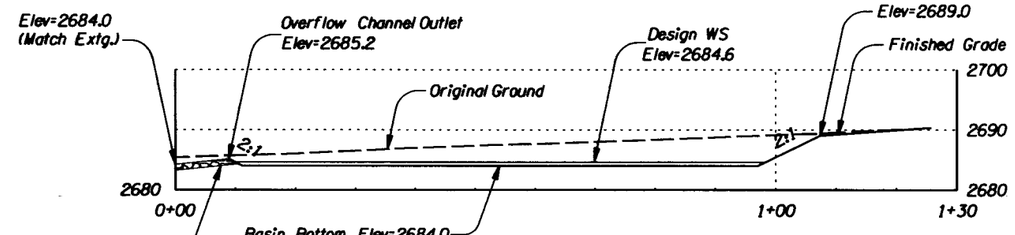
Scale: 1"=40'
For Details, See Sht.6, Note 15



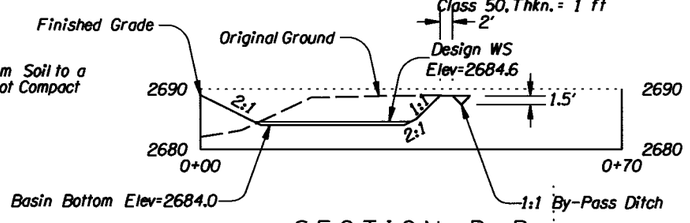
SECTION B-B
No Scale



RETENTION BASIN GRADING DETAIL
Sta. 696+34 Lt. TO 697+47 Lt.
Scale 1"=30'
For Details, See Sht 5, Note15



SECTION A-A
No Scale



SECTION B-B
No Scale

REVISIONS	
⚠	Revised 03-29-2007 Added Note

REGISTERED PROFESSIONAL ENGINEER
60,015
OREGON
JULY 13, 1999
RODRICK P. LUNDBERG
RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

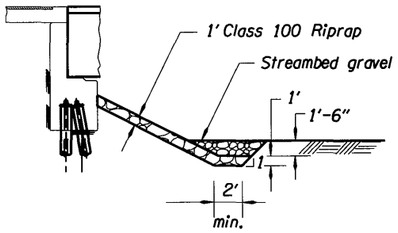
URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willmon
Designed By - Dale Cerney
Drafted By - Serge Valverde

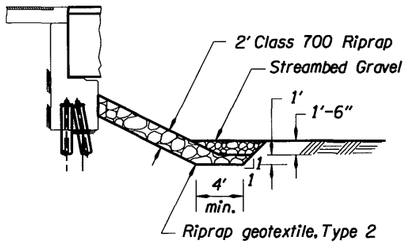
DETAILS

SHEET NO. 2B-9



RIPRAP DETAIL: Br. 20051

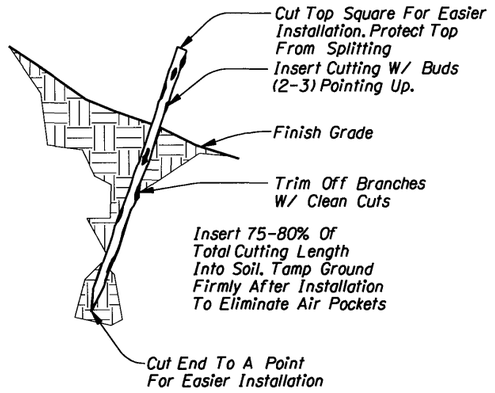
No Scale
For Details, See Sht 5, Notes 16 and 17



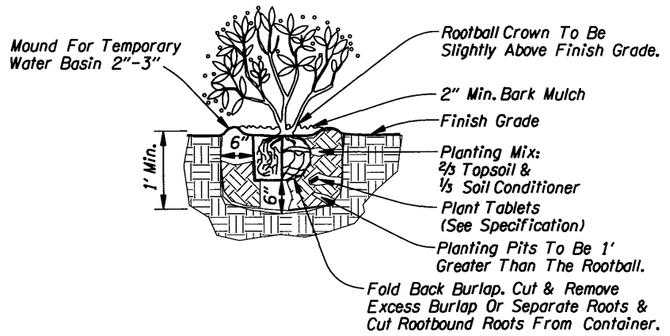
RIPRAP DETAIL: Br. 20052

No Scale
For Details See Sht 6, Notes 18 and 19

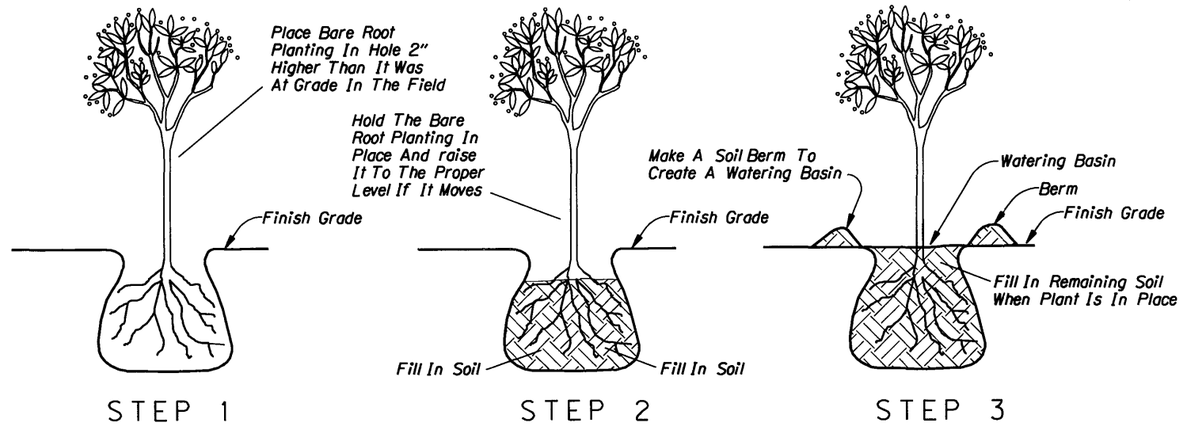
Note:
Live Cuttings Must Be Cut In 1½'-3' Lengths, From ¾"-2" Dia. Stock Within 20 mi Of Site. Cutting And Installation Must Be Performed Within 24 Hours and Cuttings Must Be Kept Cool And Moist Prior To Installation.



PLANT CUTTING INSTALLATION



1 GAL POTTED PLANTING



STEP 1 STEP 2 STEP 3

BARE ROOT PLANTING

BARE ROOT PLANTING NOTES:

1. *Gently Unwrap The Packaging Around The Plant Roots. Being Careful Not To Damage The Roots. Consult With The Nursery On How To Care For The Roots. Soak roots Overnight In Water, Or Use A Hose To Moisten Them.*

2. *Spread Roots Out And Place In The Planting Hole. Refill The Hole With Soil, Burying Roots Just To The Crown. A Crown Refers To The Point At Which A Plant's Roots And Top Structure Join. (Usually At Or Near The Soil Line)*

3. *Fill In The Hole With Soil Nearly To The Top, Flirming It With Your Fingers As You Fill. And Then Gently Water. After The Plant Is Placed Correctly, Fill In Any Remaining Soil. Make A Berm (Narrow Pile) Of Soil Around The Hole To Form A Watering Basin.*

REGISTERED PROFESSIONAL ENGINEER
10186
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

OREGON DEPARTMENT OF TRANSPORTATION

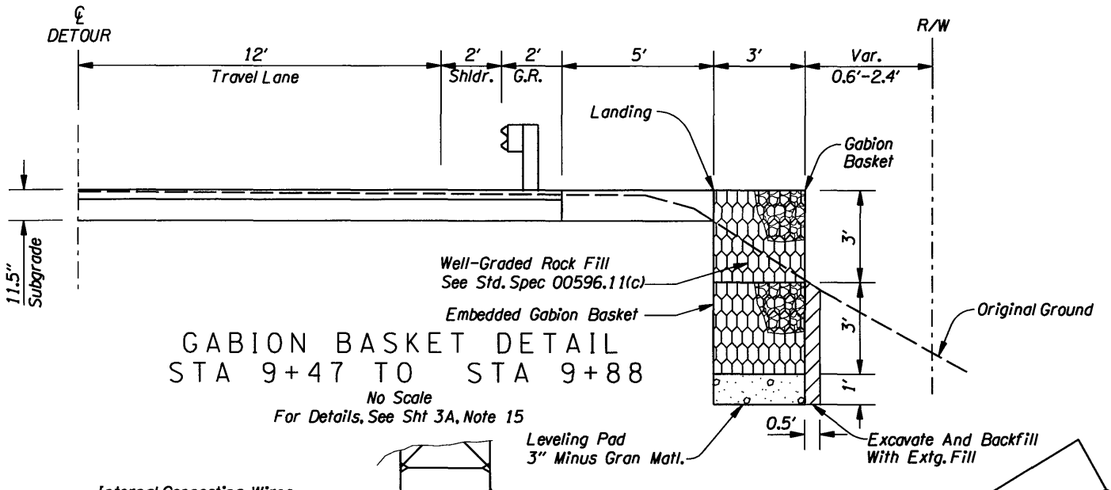
URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - Dale Cerney
Drafted By - Serge Valverde

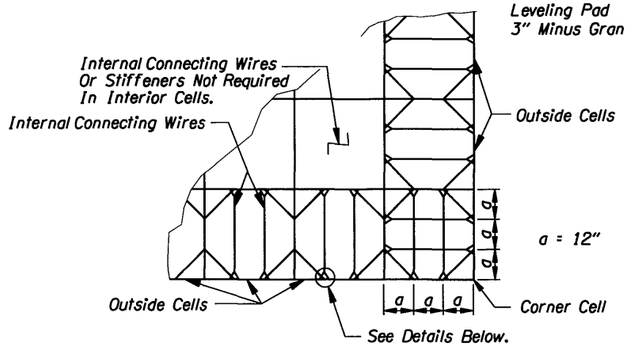
DETAILS

SHEET NO. 2B-10

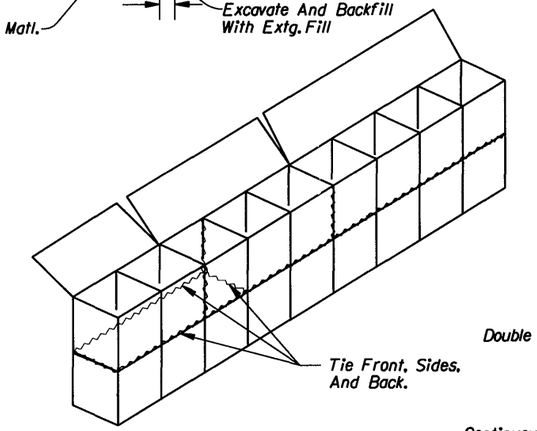


GABION BASKET DETAIL
STA 9+47 TO STA 9+88

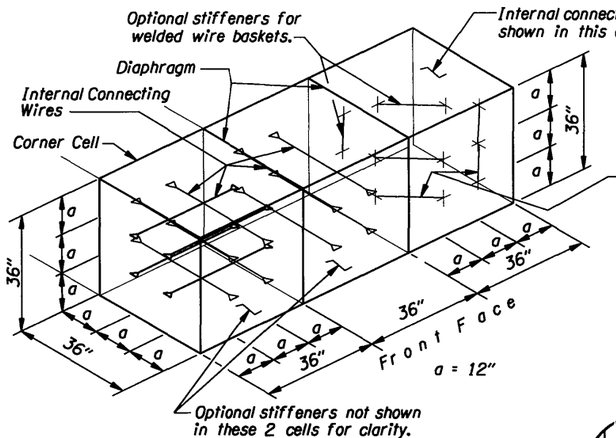
No Scale
For Details, See Sht 3A, Note 15



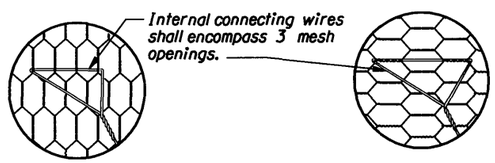
TYPICAL PLAN FOR INTERNAL CONNECTING WIRES



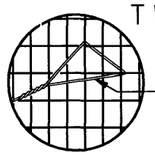
GABION BASKET TYING DETAIL



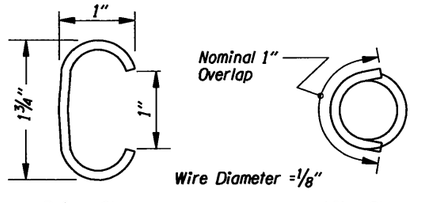
INTERNAL CONNECTING WIRES

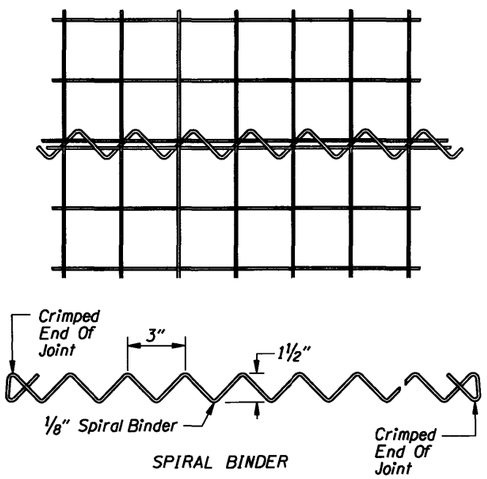


TWISTED WIRE BASKETS

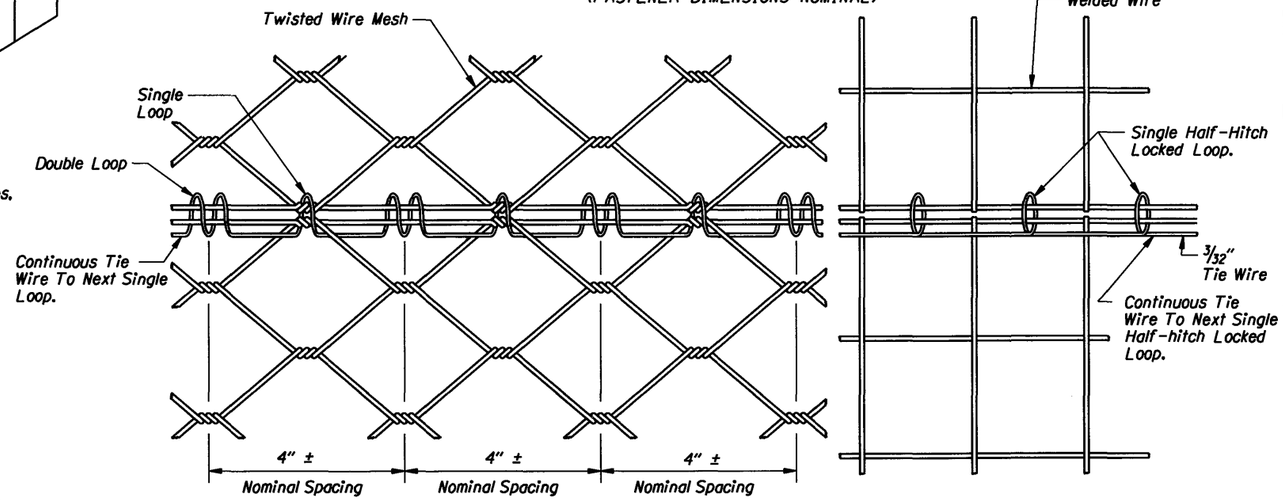


WELDED WIRE BASKETS

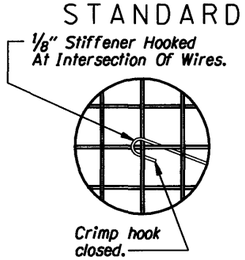




ALTERNATE GABION JOINT FASTENERS
(FASTENER DIMENSIONS NOMINAL)



STANDARD 3/32" TIE WIRE DETAIL



OPTIONAL STIFFENER CONNECTION FOR WELDED WIRE GABION BASKET

REGISTERED PROFESSIONAL ENGINEER
60468PE
OREGON
MAY 17, 1999
BRIAN M WILLMAN
EXPIRES: 06/30/08

OREGON DEPARTMENT OF TRANSPORTATION

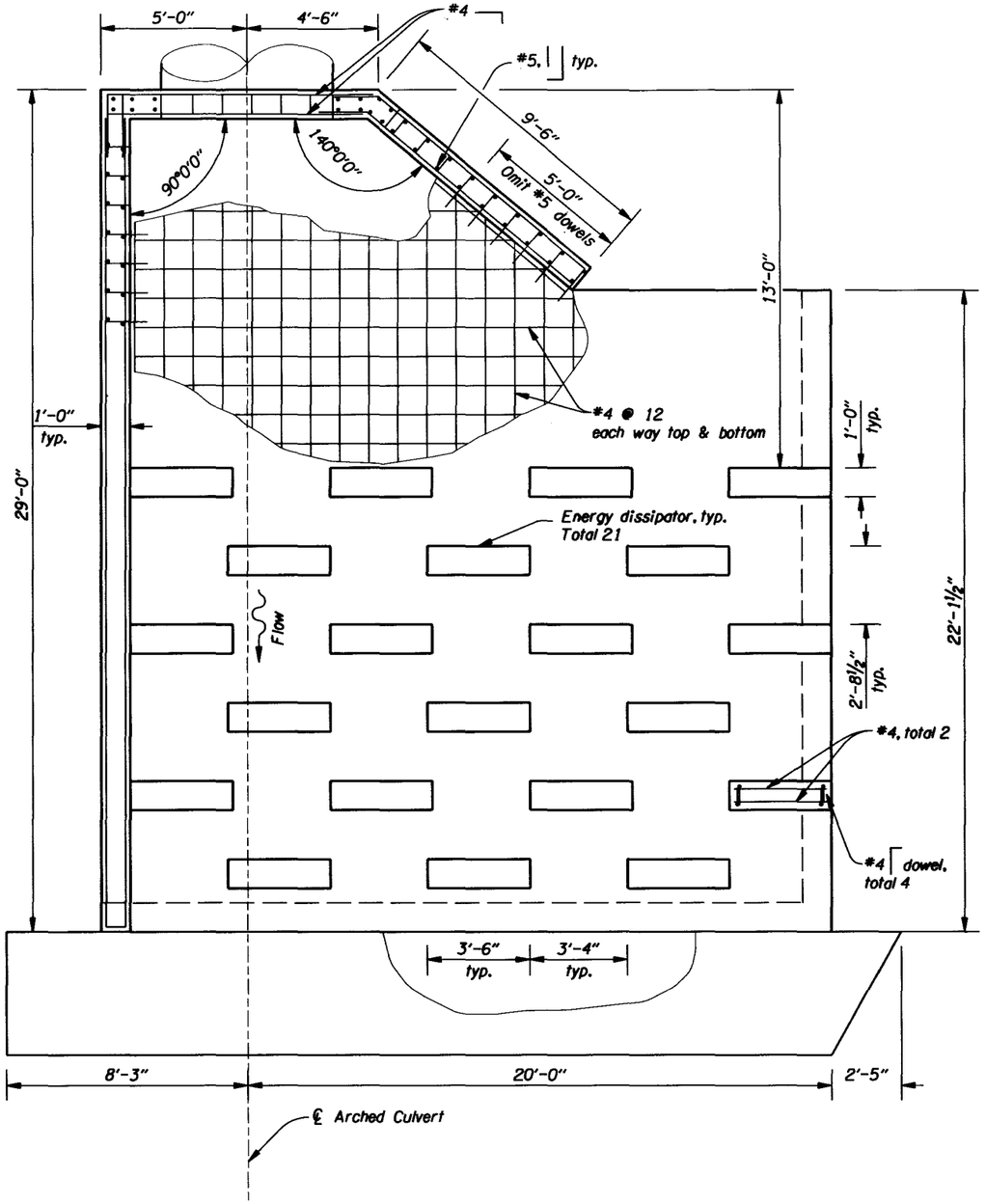
URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - Dale Cerney
Drafted By - Serge Valverde

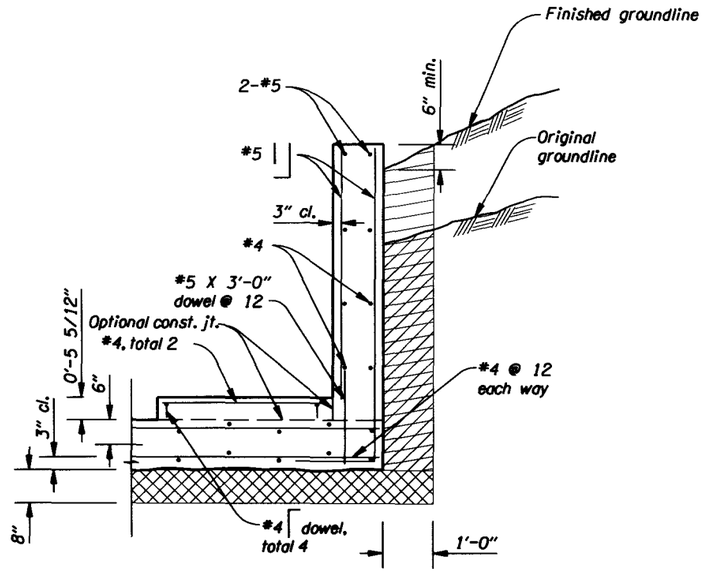
DETAILS

SHEET NO. 2B-11



PLAN
Scale: 1"=50'-0"

Note:
For details not shown, See Sht. 2B-13

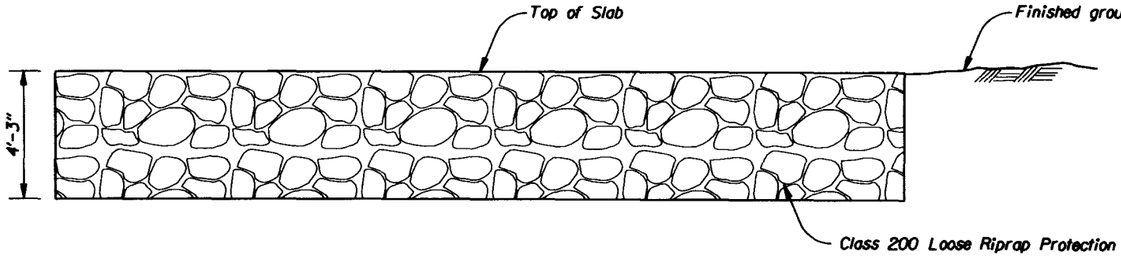


PART WALL SECTION
Scale: 1"=30'-0"

Limit of structure excavation

Limits of granular backfill

Limits of granular wall backfill



RIPRAP ELEVATION
Scale: 1"=50'-0"

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

REGISTERED PROFESSIONAL ENGINEER
19,186
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

US26: RUSH CREEK-ANTONE-BUNDLE A51

OCHOCO HIGHWAY

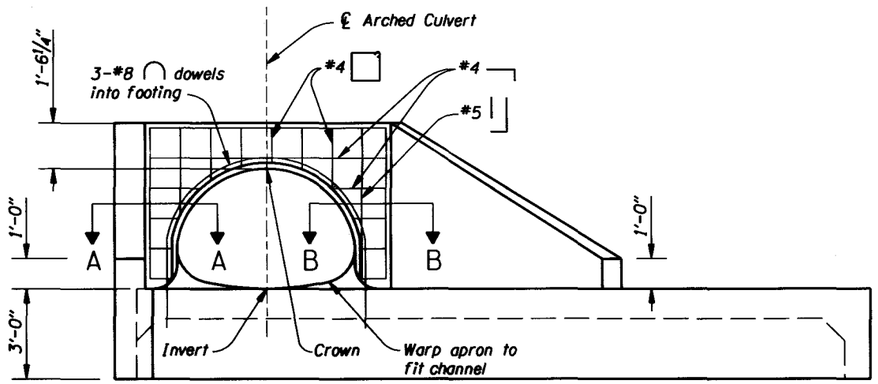
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - John England
Drafted By - Serge Valverde

⚠ **DETAILS**

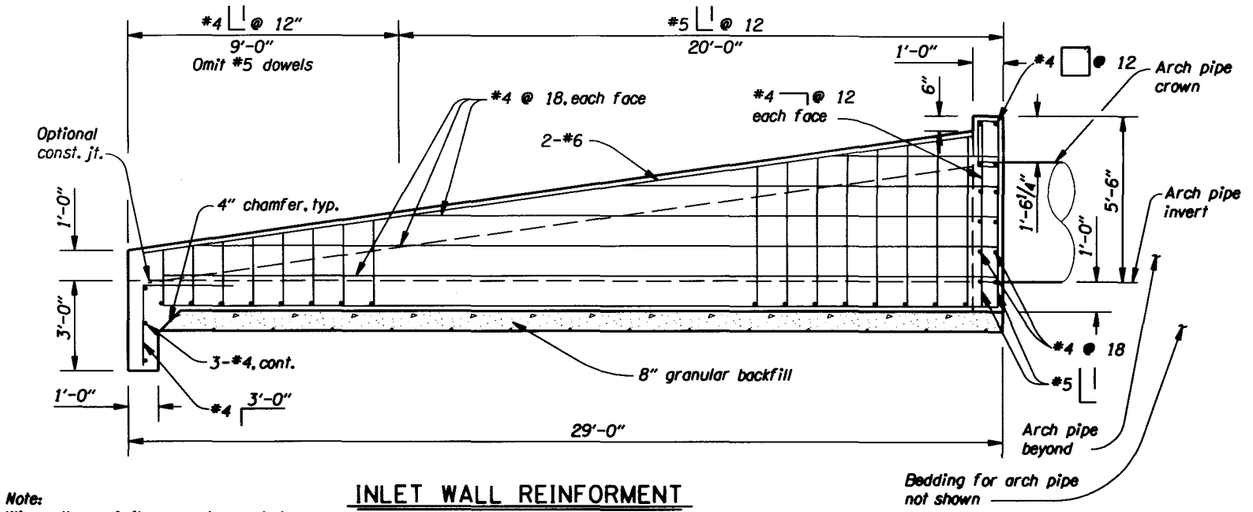
SHEET NO. 2B-12

REVISIONS	
⚠	Revised 03-12-2007 New Sheet Created



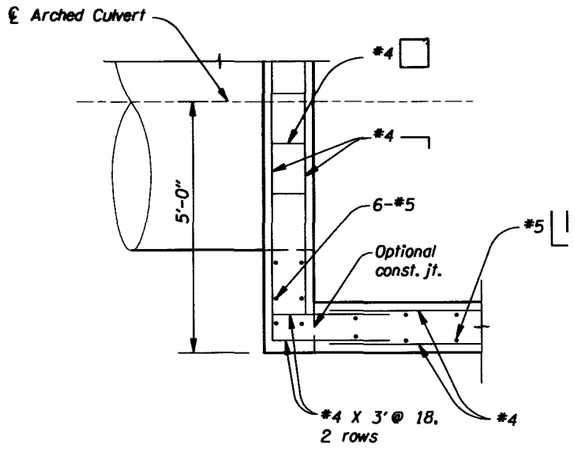
END ELEVATION
Scale: 1"=50'-0"

Note:
Energy dissipators not shown

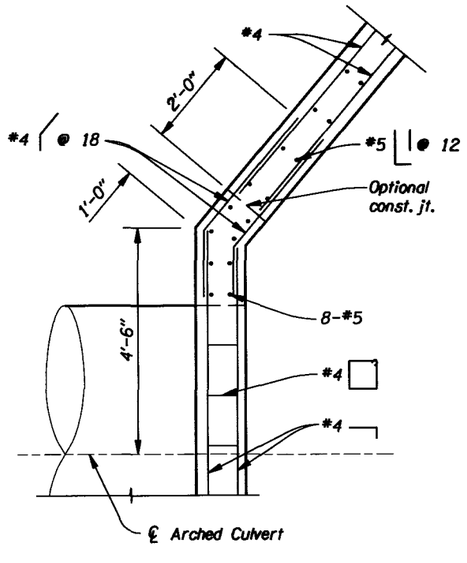


Note:
Wingwall are similar except as noted
Energy dissipaters not shown

INLET WALL REINFORMENT
Scale: 1"=50'-0"



SECTION A-A
Scale: 1"=30'-0"



SECTION B-B
Scale: 1"=30'-0"

GENERAL NOTES:
Provide all material and perform all work according to the 2002 Standard Specification For Highway Construction of the Oregon Department of Transportation.

Bar Size		#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18
Splice Length	Uncoated	1'-0"	1'-4"	1'-8"	2'-0"	2'-8"	3'-6"	4'-4"	5'-7"	6'-9"	Not Permitted	
	Epoxy Coated	1'-5"	1'-10"	2'-4"	2'-10"	3'-9"	4'-11"	6'-1"	7'-10"	9'-6"	Not Permitted	

Earth Load = 135 lb/cu.ft.
Equivalent fluid pressure = 58 lb/cu.ft.
Use epoxy coated reinforcing steel, all locations.
Concrete should be class 3600 - 1 1/2, 1 or 3/4.
Concrete members designed by load factor design methods.

NOTES TO CONTRACTOR:
1. All corners to have 1" chamfer.
2. Concrete forms may be removed at 75% f'c or 28 days.
3. For details not show see Sht. No. 3A.
4. Field verify height and alignment of wingwalls before ordering or fabricating any material.
5. All reinforcing steel shall be 2" clear unless otherwise shown.

REVISIONS	
⚠	Revised 03-12-2007 New Sheet Created

REGISTERED PROFESSIONAL ENGINEER
19,186
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - John England
Drafted By - Serge Valverde

⚠ **DETAILS**

SHEET NO. 2B-13

(1) Const. Bridge (Str # 20051) (For Bridge Details, See Index of Sheets)
Remove Extg. Bridge (Str#07490)

(2) Sta. 695+80 To Sta. 698+96 Rt.
Remove Extg. G.R. - 81'
Const. G.R. - 250' (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 Std. Drg. BR203, RD410 & RD440)

(3) Sta. 698+62 To Sta. 699+34 Lt.
Remove Temporary G.R. Terminal
Remove Extg. G.R. - 56'
Const. G.R. - 37.5' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Connect To Extg. G.R.

(4) Sta. 700+90 To Sta. 702+05 Rt.
Remove Extg. G.R. - 56'
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'

(5) Sta. 701+31 To Sta. 702+47 Lt.
Remove Extg. G.R. - 81'
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'

(6) Sta. 698+35 To Sta. 699+32 Lt.
Const. Asph. Drainage Curb - 97 Ft

(7) Sta. 698+31 Lt.
Const. Loose Riprap (Class 50) - 9.0 C.Y.

(8) Sta. 698+49, 41' Lt. To Sta. 699+71, 38' Lt.
Const. Stormwater Detention Bioswale #1
4:1 Side Slope, 4' Wide, 120' Long
(For Details, See Sheet 2B-8)

(9) Sta. 699+71 Lt.
Const. Loose Riprap (Class 50) - 9.5 C.Y.

(10) Sta. 701+55, 40' Lt. To Sta. 703+85 40' Lt.
Const. Stormwater Detention Bioswale #2
4:1 Side Slope, 4' Wide, 230' Long
(For Details, See Sheet 2B-8)

(11) Sta. 701+55 Lt.
Const. Loose Riprap (Class 50) - 26.6 C.Y.

(12) Sta. 696+00 To Sta. 697+10 Lt.
Remove Temporary G.R. Terminal
Connect To Exst. G.R.
Const. G.R. 75' (Type 2A)
Const. G.R. Terminal (Level 3), Non-Flared
Flare Rate = 0', W=1', E=2'

(13) Sta. 695+03 To Sta. 699+21
Const. Retaining Wall - 4275 SF
(For Details, See Sht 75160)

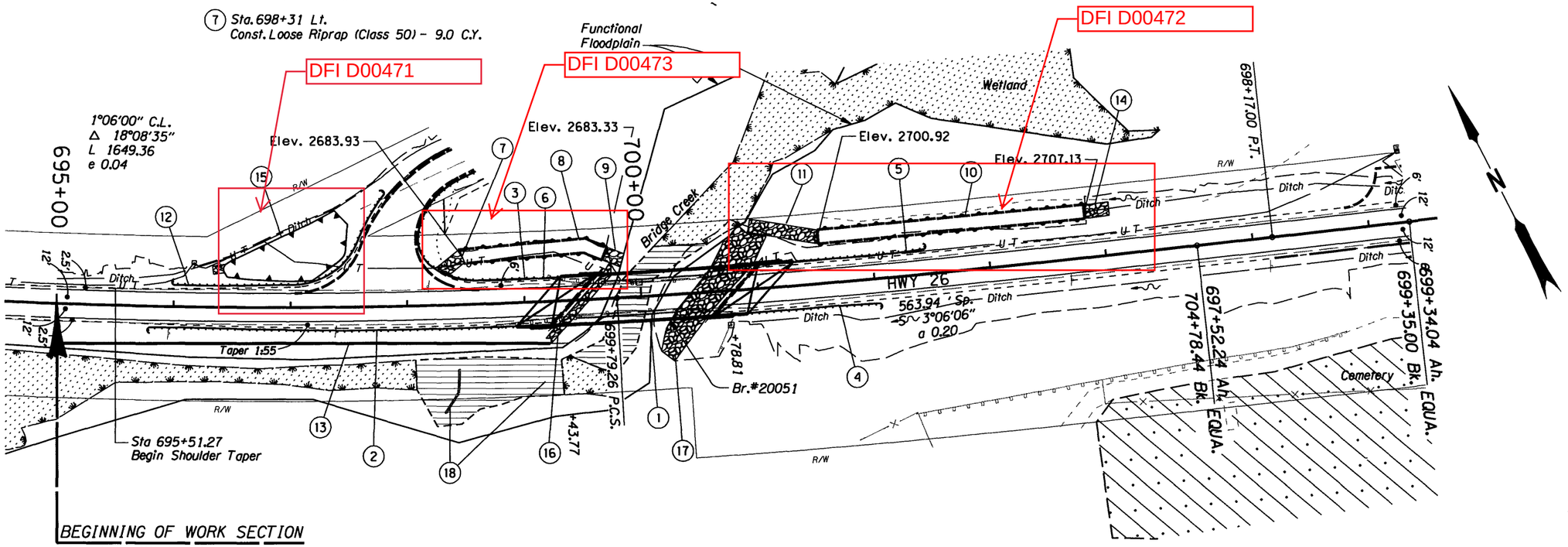
(14) Sta. 704+06 Lt.
Const. Loose Riprap (Class 50) - 9.5 C.Y.

(15) Construct Retention Basin
Const. Loose Riprap (Class 50) - 9.0 C.Y.
(For Details, See Sht 2B-9)

(16) Sta. 699+22, 35.5' Rt. To Sta. 699+74, 29.7' Lt.
Const. Loose Riprap (Class 100) - 13.0 C.Y.
(For Details, See Sht 2B-10)

(17) Sta. 700+14, 47.3' Rt. To Sta. 701+10, 43.7' Lt.
Const. Loose Riprap (Class 100) - 114.6 C.Y.
(For Details, See Sht 2B-10)

(18) Remove Extg. Concrete and Corrugated Metal (Location is Approximate)



Regulated In-Water Work Area shown Thus:
Period of July 15 - August 31.

No Work Area, Off-Limits To Contractor

No Work Area, Cemetery

REGISTERED PROFESSIONAL ENGINEER
19,186
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - Dale Cerney
Drafted By - Serge Valverde

GENERAL CONSTRUCTION

SHEET NO. 5

(1) Const. Bridge (Str # 20052) (For Bridge Details, See Index of Sheets)
Remove Extg. Bridge (Str#07491)

⚠1 (2) Sta. 702+32 To Sta. 703+89 Lt.
Remove Extg. G.R. - 57'
Const. G.R. - 43.75' (Type 2A) 28' Rad.
- 31.25' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type C)
E=2'

⚠1 (3) Sta. 702+66 To Sta. 703+32 Rt.
Remove Extg. G.R. - 82'
Const. G.R. - 25' (Type 2A)
- 37.5' (Type 2A) 28' Rad.
- 12.5' (Type 3)
Const. G.R. Transition
Const. Anchor (Type 1 Mod)
Inst. End Piece (Type C)
E=2'

⚠1 (4) Sta. 704+72 To Sta. 706+57 Lt.
Remove Extg. G.R. - 82'
Const. G.R. - 167.75' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Connect To Extg. G.R.
E=2'

⚠1 (5) Sta. 704+95 To Sta. 706+11 Rt.
Remove Extg. G.R. - 56'
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'

⚠1 (6) Sta. 702+58 Rt.
Const. Approach Type "A1"

(7) Sta. 702+05 Lt.
Const. Appr. Type "A1"

(8) Sta. 699+35 Lt.
Const. Appr. Type "A1"

(9) Sta. 702+99 To Sta. 703+40 Rt.
Const. Asph. Drainage Curb - 46 Ft.

(10) Sta. 703+01 To Sta. 703+16 Lt.
Const. Asph. Drainage Curb - 15 Ft.

(11) Sta. 704+87 To Sta. 708+75 Rt.
Const. Asph. Drainage Curb - 387 Ft.

(12) Sta. 704+90 20' Rt.
Const. Type "G-1" Inlet
Grate E1=2730.03, F.L. E1=2722.71
(See Std. Drg. RD364)

(13) Sta. 700+30 To Sta. 702+30
Const. 3' Flat Bottom Ditch

(14) Sta. 704+90 To Sta. 705+72 Rt.
Install 12" Storm Pipe - 86'

(15) Sta. 704+57 To Sta. 705+73 Rt.
Const. Stormwater Detention Bioswale #3
2:1 Sideslope, 4' Wide, 1:1 Sideslope, 116' Long
(For Details, See Sht 2B-9)

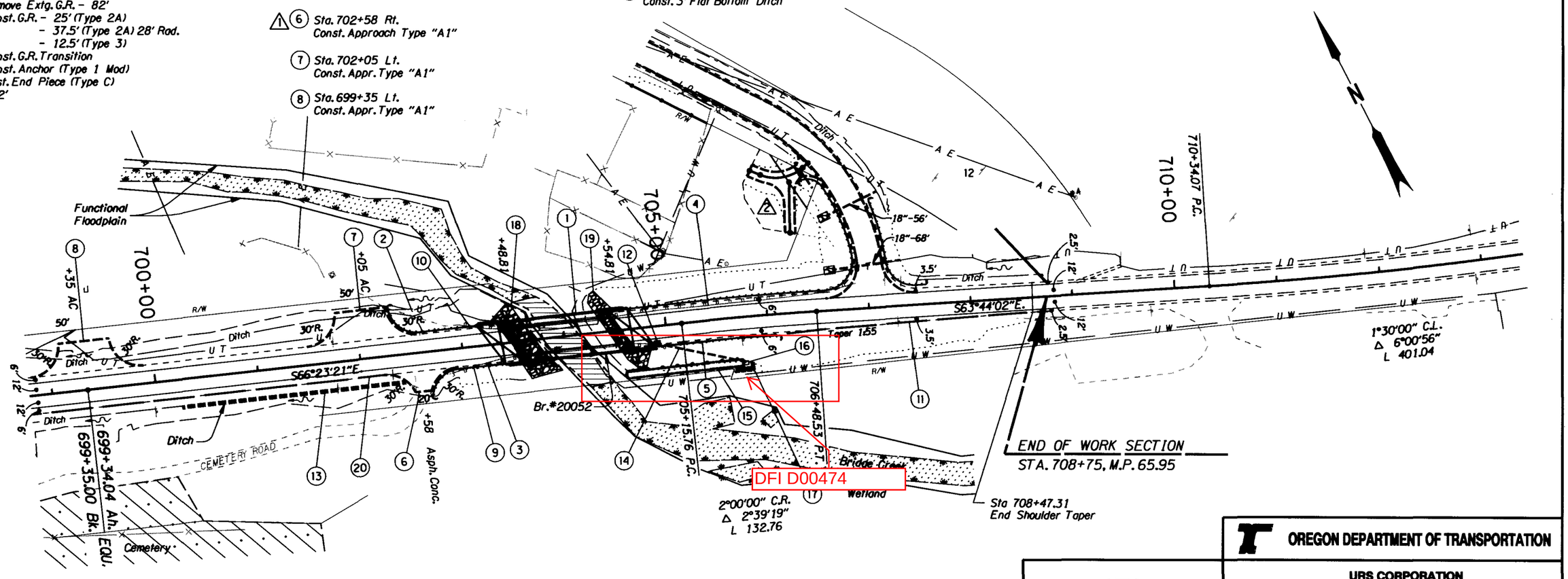
(16) Sta. 705+78
Const. Loose Riprap (Class 50) - 4.0 C.Y.

(17) Sta. 705+65 To Sta. 705+82
Const. 2:1 Slope, 1' Wide Berm - 20'
(For Details, See Sht 2B-9)

(18) Sta. 703+30, 22.3' Lt. To Sta. 703+95, 32.7' Rt.
Const. Loose Riprap (Class 700) - 59.7 C.Y.
(For Details, See Sht 2B-10)

(19) Sta. 704+26, 36.1' Lt. To Sta. 704+83, 22.3' Rt.
Const. Loose Riprap (Class 700) - 37.1 C.Y.
(For Details, See Sht 2B-10)

⚠1 (20) Sta. 698+17 To Sta. 702+21 Rt.
Const. Asph. Drainage Curb - 405 Ft.



Regulated In-Water Work Area shown Thus:
Period of July 15 - August 31.

No Work Area, Off-Limits To Contractor

No Work Area, Cemetery

REVISIONS	
⚠1	Revised 03-12-2007 Revised Note
⚠2	Revised 03-12-2007 Redisplayed Dwy.

REGISTERED PROFESSIONAL ENGINEER
19,186
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - Dale Carney
Drafted By - Serge Valverde

GENERAL CONSTRUCTION

SHEET NO. 6

(1) Const. Bridge (Str # 20052) (For Bridge Details, See Index of Sheets)
Remove Extg. Bridge (Str#07491)

⚠1 (2) Sta. 702+32 To Sta. 703+89 Lt.
Remove Extg. G.R. - 57'
Const. G.R. - 43.75' (Type 2A) 28' Rad.
- 31.25' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type C)
E=2'

⚠1 (3) Sta. 702+66 To Sta. 703+32 Rt.
Remove Extg. G.R. - 82'
Const. G.R. - 25' (Type 2A)
- 37.5' (Type 2A) 28' Rad.
- 12.5' (Type 3)
Const. G.R. Transition
Const. Anchor (Type 1 Mod)
Inst. End Piece (Type C)
E=2'

⚠1 (4) Sta. 704+72 To Sta. 706+57 Lt.
Remove Extg. G.R. - 82'
Const. G.R. - 167.75' (Type 2A)
- 12.5' (Type 3)
Const. G.R. Transition
Connect To Extg. G.R.
E=2'

⚠1 (5) Sta. 704+95 To Sta. 706+11 Rt.
Remove Extg. G.R. - 56'
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'

⚠1 (6) Sta. 702+58 Rt.
Const. Approach Type "A1"

(7) Sta. 702+05 Lt.
Const. Appr. Type "A1"

(8) Sta. 699+35 Lt.
Const. Appr. Type "A1"

(9) Sta. 702+99 To Sta. 703+40 Rt.
Const. Asph. Drainage Curb - 46 Ft.

(10) Sta. 703+01 To Sta. 703+16 Lt.
Const. Asph. Drainage Curb - 15 Ft.

(11) Sta. 704+87 To Sta. 708+75 Rt.
Const. Asph. Drainage Curb - 387 Ft.

(12) Sta. 704+90 20' Rt.
Const. Type "G-1" Inlet
Grate E1=2730.03, F.L. E1=2722.71
(See Std. Drg. RD364)

(13) Sta. 700+30 To Sta. 702+30
Const. 3' Flat Bottom Ditch

(14) Sta. 704+90 To Sta. 705+72 Rt.
Install 12" Storm Pipe - 86'

(15) Sta. 704+57 To Sta. 705+73 Rt.
Const. Stormwater Detention Bioswale #3
2:1 Sideslope, 4' Wide, 1:1 Sideslope, 116' Long
(For Details, See Sht 2B-9)

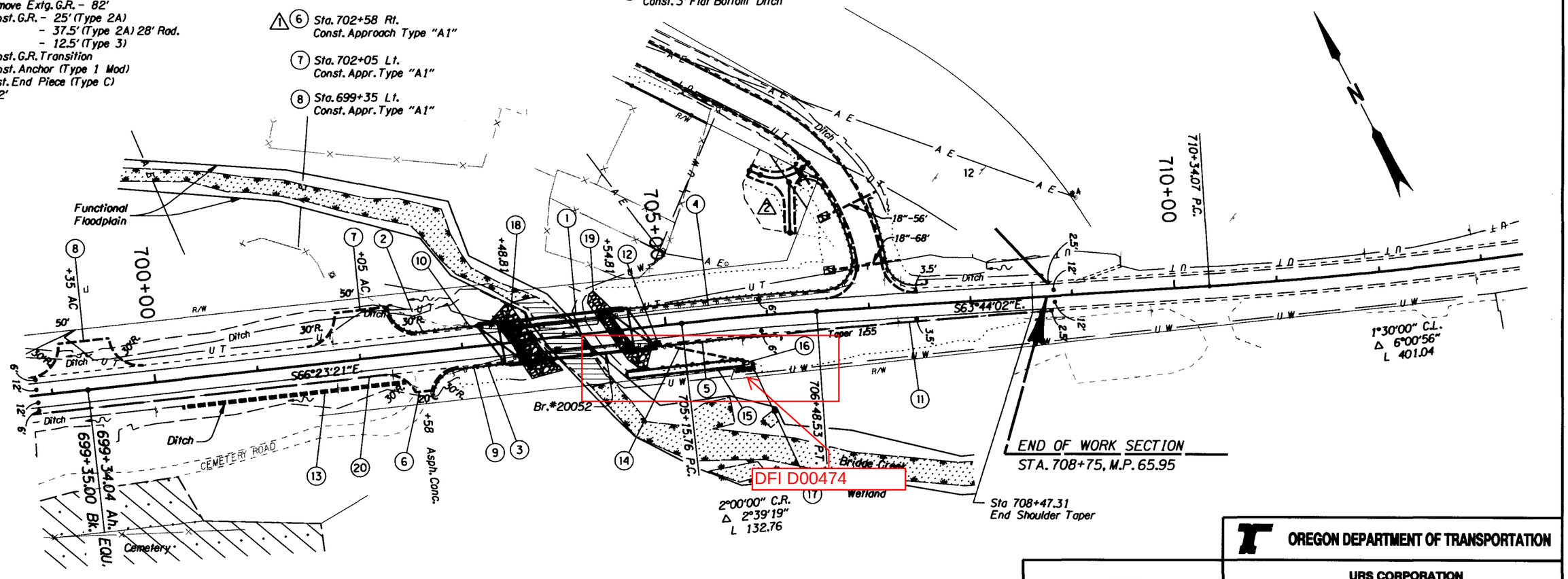
(16) Sta. 705+78
Const. Loose Riprap (Class 50) - 4.0 C.Y.

(17) Sta. 705+65 To Sta. 705+82
Const. 2:1 Slope, 1' Wide Berm - 20'
(For Details, See Sht 2B-9)

(18) Sta. 703+30, 22.3' Lt. To Sta. 703+95, 32.7' Rt.
Const. Loose Riprap (Class 700) - 59.7 C.Y.
(For Details, See Sht 2B-10)

(19) Sta. 704+26, 36.1' Lt. To Sta. 704+83, 22.3' Rt.
Const. Loose Riprap (Class 700) - 37.1 C.Y.
(For Details, See Sht 2B-10)

⚠1 (20) Sta. 698+17 To Sta. 702+21 Rt.
Const. Asph. Drainage Curb - 405 Ft.



Regulated In-Water Work Area shown Thus:
Period of July 15 - August 31.

No Work Area, Off-Limits To Contractor

No Work Area, Cemetery

REVISIONS	
⚠1	Revised 03-12-2007 Revised Note
⚠2	Revised 03-12-2007 Redisplayed Dwy.

REGISTERED PROFESSIONAL ENGINEER
19,186
OREGON
JULY 15, 1997
JAMES H. HALLORAN
Expires June 30, 2007

OREGON DEPARTMENT OF TRANSPORTATION

URS CORPORATION
HIGHWAYS AND BRIDGES SECTION

US26: RUSH CREEK-ANTONE-BUNDLE A51
OCHOCO HIGHWAY
CROOK AND WHEELER COUNTIES

Project Leader - Brian Willman
Designed By - Dale Carney
Drafted By - Serge Valverde

GENERAL CONSTRUCTION

SHEET NO. 6