OPERATION & MAINTENANCE MANUAL

Manual prepared: July 2017

DFI No. D00355

Figure 1: DFI No. D00355, looking east

1. Identification

Drainage Facility ID (DFI):	D00355
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 36V-035
Location:	District: 2C
	Highway No.: 171
	Mile Post: 8.16 to 8.21, right side

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: west

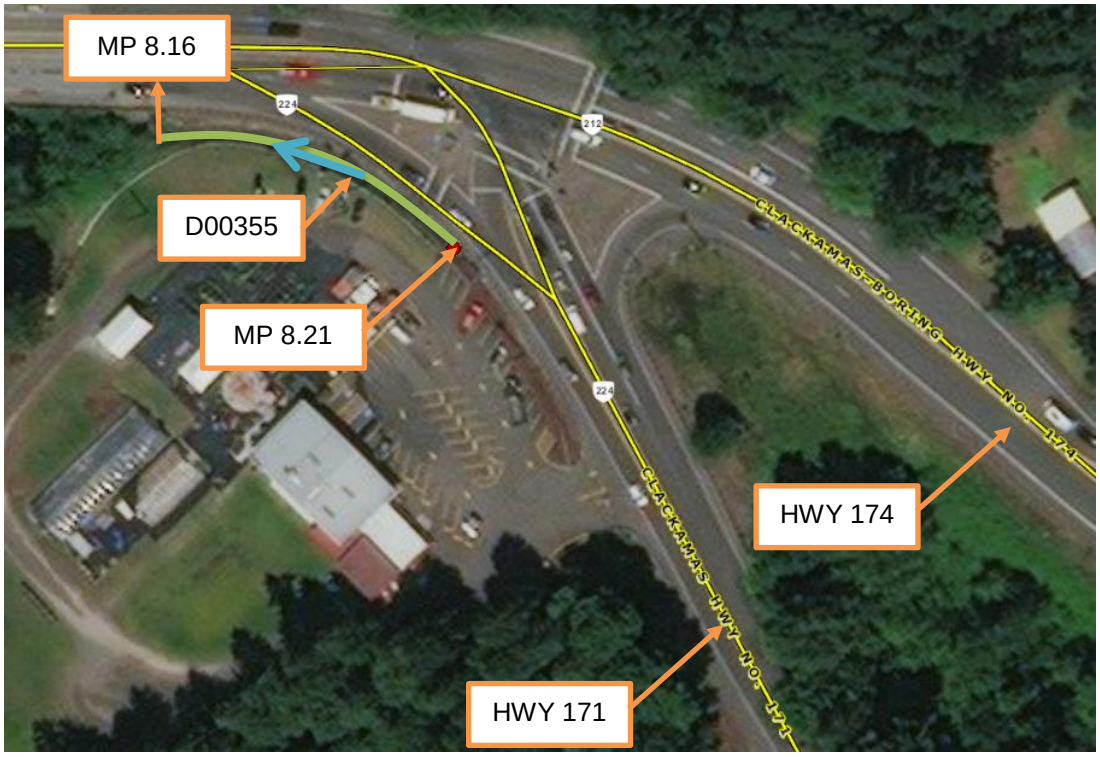


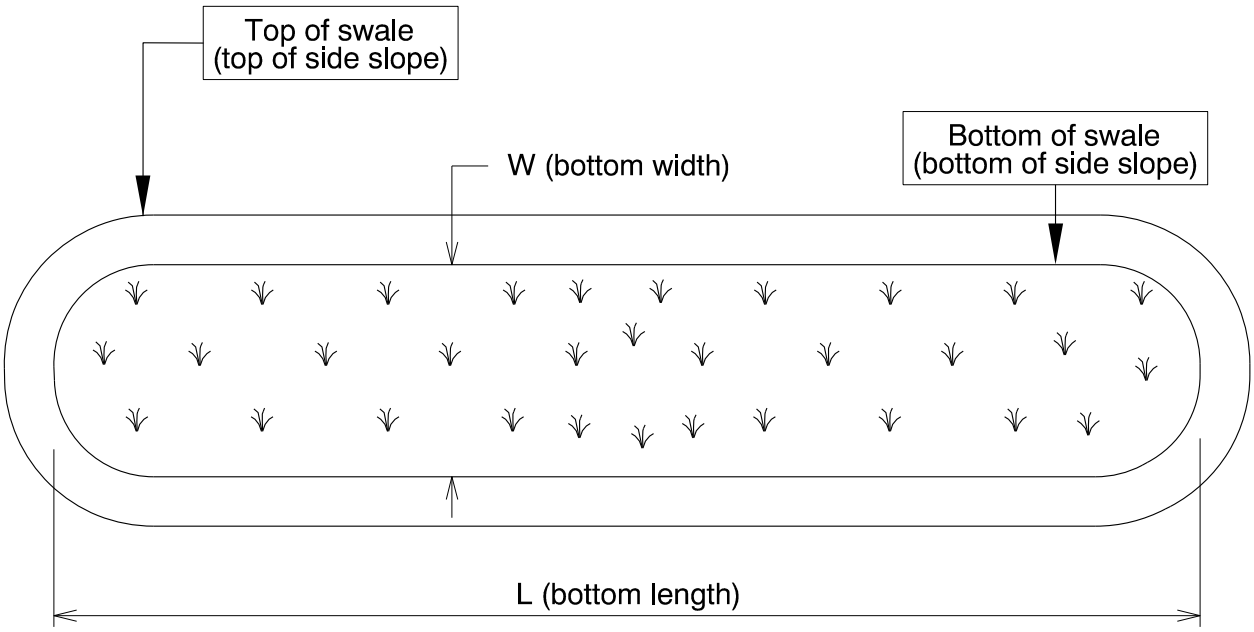
Figure 2: Facility location map

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:

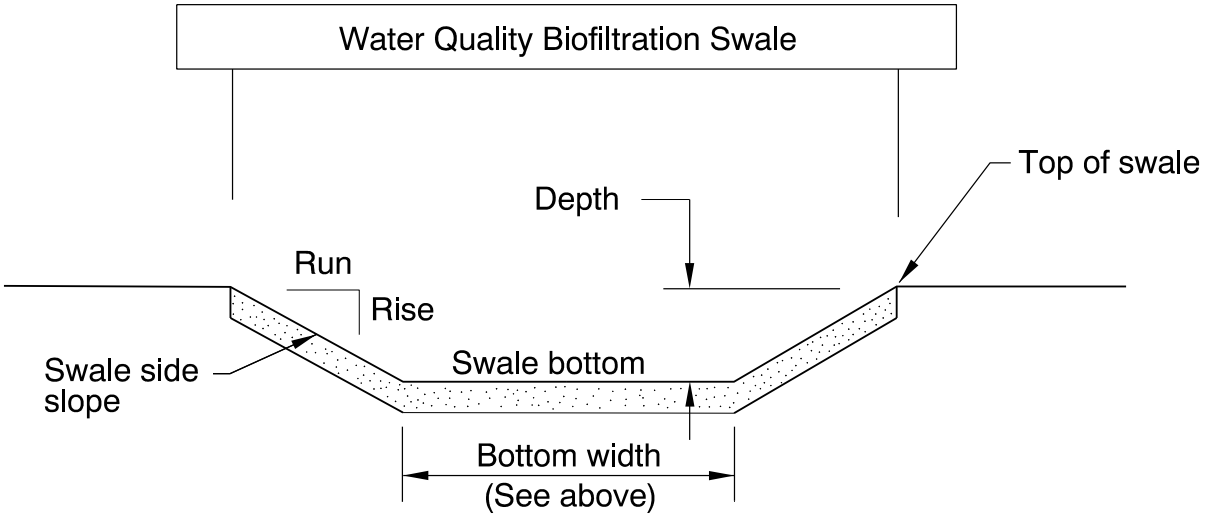
Bottom Length (feet)	Bottom Width (feet)
295	**15**



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)
6.5	**1**	**4**



Site Specific Information: Facility is located adjacent to a business parking lot.

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 adjacent parking lot

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 no porous pavers installed in this swale	

Swales are designed to allow equipment access along the bottom. 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

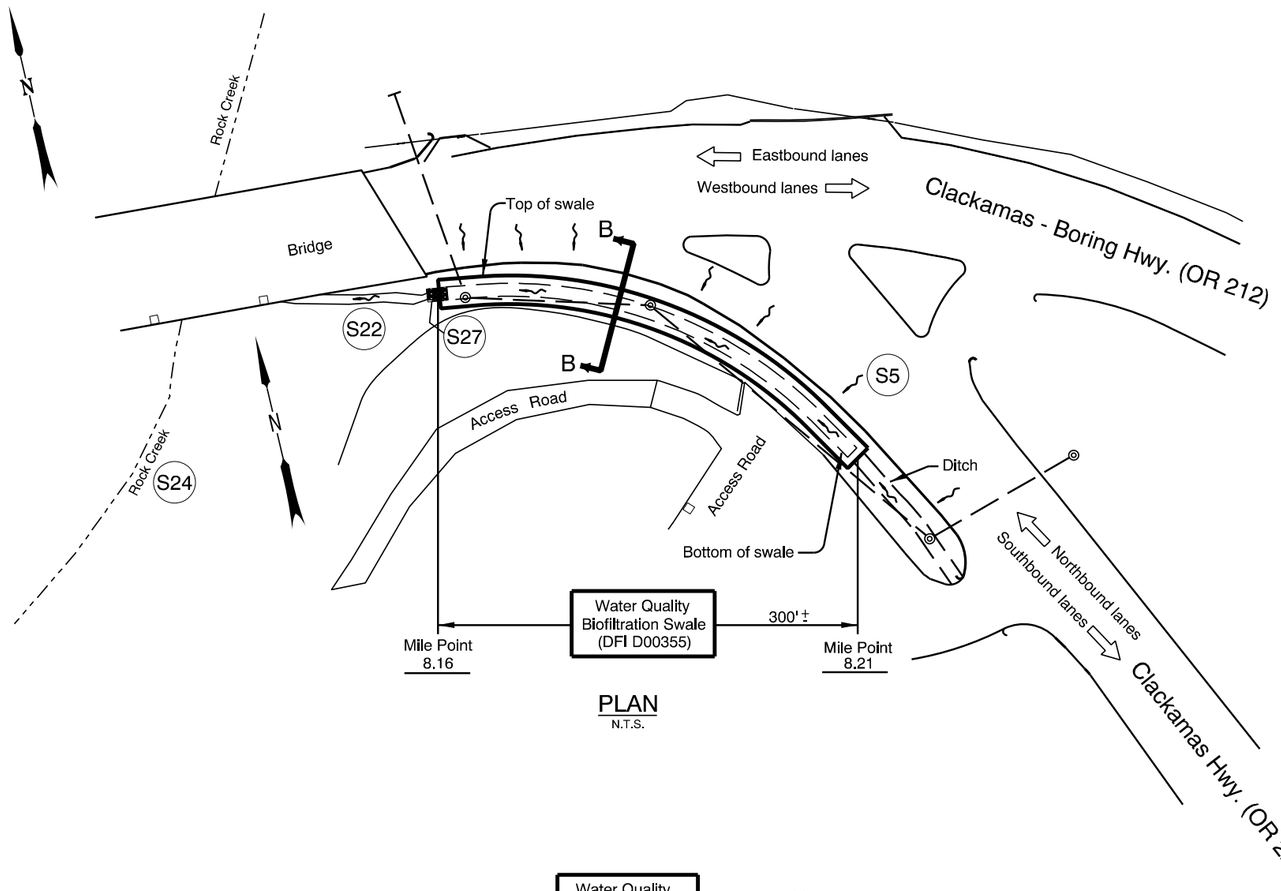
Contact any of the following for more detailed information about management of waste materials found on site:

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

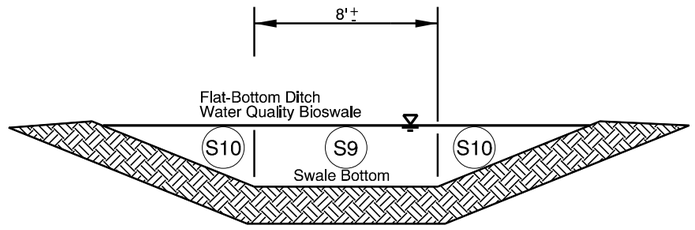
A Appendix A – Site Specific Operational Plan

Contents:

Operational Plan: DFI D00355



PLAN
N.T.S.



SECTION B-B
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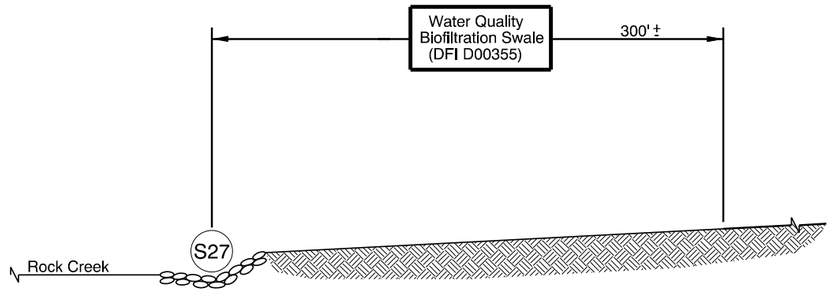


SECTION A-A
N.T.S.

LEGEND:

- (S#) Table 1: Facility Components
- ■ and/or □ Catch Basin
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

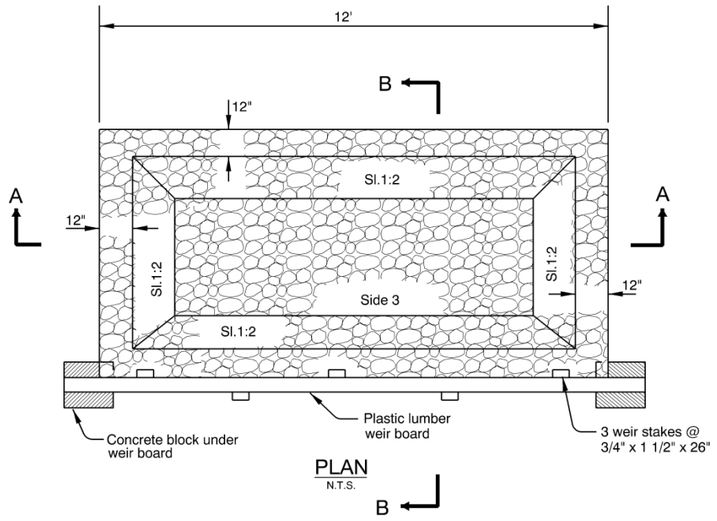
Sheet 1 of 2

Prepared By: Bob Knorr

Drafted By: Chris Wallen

OREGON DEPARTMENT OF TRANSPORTATION

DFI D00355
MAINTENANCE DISTRICT 2C HWY 174
WATER QUALITY BIOFILTRATION SWALE
CLACKAMAS-BORING HWT MP 8.19
CVLACKAMAS COUNTY



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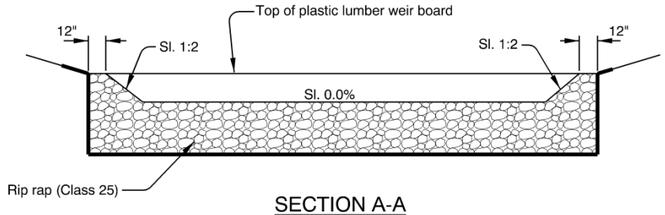
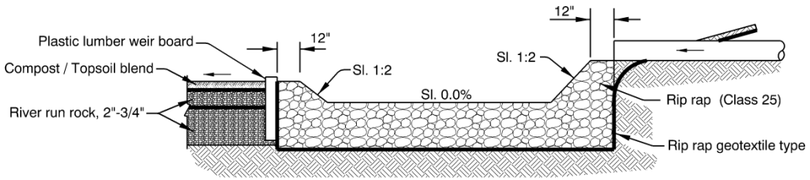
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

SWALE FLOW SPREADER DETAIL
N.T.S.

Sheet 2 of 2

Prepared By: Bob Knorr

Drafted By: Chris Wallen

OREGON DEPARTMENT OF TRANSPORTATION

DFI D00355
MAINTENANCE DISTRICT 2C HWY 174
WATER QUALITY BIOFILTRATION SWALE
CLACKAMAS-BORING HWT MP 8.19
CVLACKAMAS COUNTY

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

DFI_D00355.dgn

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 36V-035

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INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Standard Drawing Nos.
2, 2A Thru 2A-5 Incl.	Typical Sections
2B Thru 2B-9 Incl.	Details
2C Thru 2C-23 Incl.	Traffic Control Plans
2D Thru 2D-7 Incl.	Erosion Control Details
2D-8 Thru 2D-27 Incl.	Erosion Control Plans
2E Thru 2E-5 Incl.	Water Quality Details
2E-6 Thru 2E-8 Incl.	Water Quality Plans
2F, 2F-2	Pipe Data
3, 3A, 4 Thru 15 Incl.	Alignment & All Construction
16	Alignment & General Construction
16A	Drainage & Utilities
16B	Profile
17	Alignment & General Construction
17A	Drainage & Utilities
17B	Profile
18	Alignment & General Construction
18A	Drainage & Utilities
18B	Notes
18C	Profile
19	Alignment & General Construction
19A	Drainage & Utilities
19B	Profile
20	Alignment & General Construction
20A	Drainage & Utilities
20B	Profile
21	Alignment & General Construction
21A	Drainage & Utilities
21B	Profile
22	Alignment & General Construction
22A	Drainage & Utilities
22B	Profile
23	Alignment & General Construction
23A	Drainage & Utilities
24	Alignment & General Construction
24A	Drainage & Utilities
25	Alignment & General Construction
25A	Drainage & Utilities
25B	Profile
26, 27, 28	Alignment & All Construction
28A	Profile
29 Thru 38 Incl.	Alignment & All Construction
39	Alignment & General Construction

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

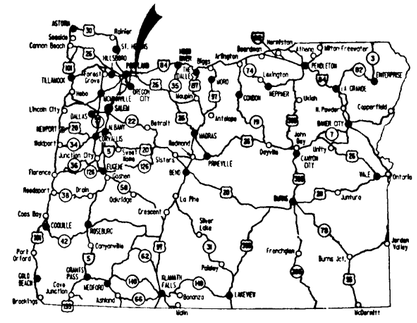
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, SIGNALS, & ROADSIDE DEVELOPMENT

ROCK CREEK BR. - RICHEY ROAD SEC.

CLACKAMAS & CLACKAMAS - BORING HWYS.

CLACKAMAS COUNTY

FEBRUARY 2003

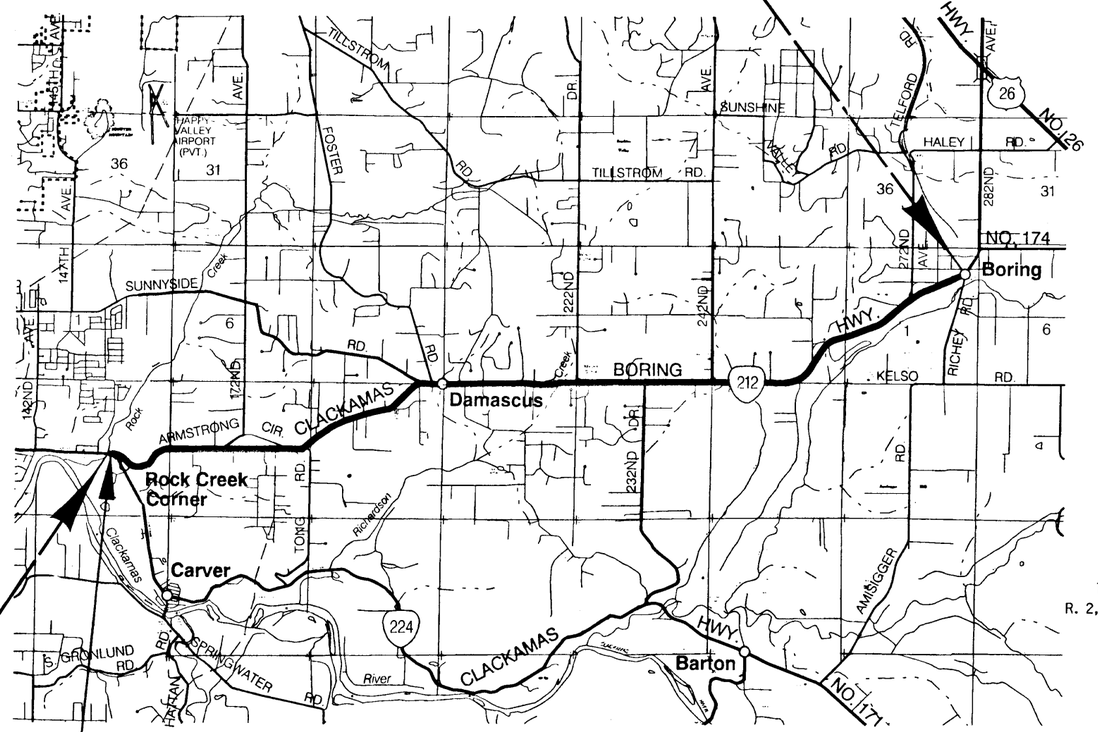


Overall Length Of Project - 11.19 km (6.96 Miles)

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 From The Center, Or Answers To Questions About The Rules By Calling (503) 232-1987.

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

X-HPP-S174(9)
END OF PROJECT
STA. 11+339 (M.P. 6.85)



T. 2 S., R. 2, 3 E., W.M.

X-HPP-S174(9)
BEGIN. OF PROJECT
STA. 6+145 (M.P. 8.07) Clackmas Hwy.

M.P. 8.19 Clackamas Hwy. Bk.= EQ.
M.P. 0.03 Clackamas - Boring Hwy. Ah.

⚠1 2-14-03 - Added Detail Sheet

OREGON TRANSPORTATION COMMISSION

Steven H. Corey	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Stuart Foster	COMMISSIONER
Randall Papé	COMMISSIONER
John Russell	COMMISSIONER
Bruce A. Warner	DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER 13,704
OREGON JULY 16, 1987 CATHERINE M. NELSON Expires Dec. 31, 2004

Catherine M. Nelson
TECHNICAL SERVICES MANAGING ENGINEER

ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS & CLACKAMAS - BORING HWYS.
CLACKAMAS COUNTY

METRIC

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION	X-HPP-S174(9)	1

VIEW A1 C103-1419-011

INDEX OF SHEETS CONTD.

SHEET NO.	DESCRIPTION
	ROADSIDE DEVELOPMENT
R-1	Planting Plan – Fish Habitat Mitigation Site #1
R-2	Planting Plan – Fish Habitat Mitigation Site #2
R-3	Plant Material Specifications – Fish Habitat Site #1 & #2
R-4	Planting Details
R-5	Bio Item Log/Plant List
	PERMANENT PAVEMENT MARKINGS
ST-1 Thru ST-20 Incl.	Striping Plans

DRAWING NO.	DESCRIPTION
	BRIDGE NOS. 01439, 0M505, 19249, 19250, & 19251
61872	General Layout & Index
	BRIDGE NO. 01439
61873	Plan
61874	Rail Transition Details
	Information Only
27155	Existing Rail Conditions
	BRIDGE NO. 0M505
61875	Plan & Elevation – Culvert Extension
61876	Culvert Extension Details
61877	Connection Details
61878	Wingwall Details
	BRIDGE NO. 19249
61879	Plan & Elevation
61880	Miscellaneous Details
	BRIDGE NO. 19250
61881	Plan & Elevation
61882	Typical Sections
	BRIDGE NO. 19251
61883	Plan & Elevation
61884 61885	Foundation Data
61886	Typical Sections
	PERMANENT SIGNING
S-6016 Thru S-6031 Incl.	Signing Plans
S-6032 Thru S-6035 Incl.	Sign Details
S-6036 Thru S-6043 Incl.	Sign & Post Data Tables

DRAWING NO.	DESCRIPTION
	TRAFFIC SIGNALS
12928	Traffic Signal Modification Legend
12929	Traffic Signal Modification Plan
12930, 12931, 12932	Loop Detector Replacement Plans
12933	Traffic Signal Modification Legend
12934	Traffic Signal Modification Plan
12935, 12936	Loop Detector Replacement Plans

Standard Drg. Nos.

RD120	– Concrete Stairway
RD200	– Roadway Cross Slopes & Superelevated Secs.
RD215, RD220	– Channelization & Intersection Details
RD225	– Slope Rounding
RD300	– Pipe Backfill/Compaction
RD309	– Sloped Ends, Metal Pipe
RD312	– Sloped ends, Concrete Pipe
RD324, RD327	– Manholes
RD330	– Large Precast Manholes
RD336	– Concrete Inlets
RD354	– Coupling Bands
RD357	– Pipe Fill Height Tables
RD400, RD405, RD410, RD415, RD417, RD420, RD440, RD445	– Guardrail
RD500	– Precast Conc. Barrier Pin & Loop Assembly
RD545	– Precast Tall Conc. Barrier
RD550	– Cast in Place Tall Conc. Barrier Transition To Bridge Rail
RD580	– Tall Conc. Barrier Curb Transition
RD610	– Asphalt Pavement Details
RD700	– Curbs
RD715	– Approaches & Non-Sidewalk Driveways
RD720	– Curb Line Sidewalk Driveways
RD725	– Sidewalk Ramps
RD900, RD901, RD905, RD910, RD930	– Traffic Control Plans
RD935	– Barricades

Standard Drg. Nos. Contd.

BR200	– Concrete Bridge Rail Type F
BR203	– Trnasition Conc. Bridge Rail To Guardrail
BR240, BR241	– Protective Fencing
BR705	– Retaining Walls Front Face Battered 12:1
BR720	– Gravity Retaining Wall
BR800	– Box Culvert Wingwalls
BR825	– Cast-In-Place Concrete Box Culverts
BR963, BR966	– Traffic Signal Supports
TM100	– Temp. Wood Post Sizing Charts
TM105	– Orange Flag Board Mounting Details
TM403	– Mast Arm Pole Details
TM405	– Pole Foundations & Grounding
TM406, TM407	– Vehicle Signal Details
TM409, TM410	– Pedestrian Signals
TM416	– Overhead Sign Details
TM417, TM418	– Junction Boxes
TM419	– Loop Details
TM421	– Color Code Charts
TM422	– Miscellaneous Details
TM423	– Controller Cabinet & Related Details
TM428	– Terminal Cabinets
TM500, TM501, TM502	– Pavement Markings
TM511	– Bike Lane Pavement Markings
TM522	– Durable Pavement Markings
TM525	– Pavement Marking Details
TM527	– Intersection Pavement Markings
TM530	– Urban Pavement Markings
TM531	– Urban Pavement Markers
TM535	– Crosswalk Markings
TM539, TM545	– Left Turn Pavement Markings
TM555	– No Passing Zone Pvmt. Markings
TM556	– Lane Reduction, Bus Pavement Markings
TM565	– Rural Raised Pavement Markers

ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS & CLACKAMAS - BORING HWYS.
CLACKAMAS COUNTY

METRIC

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		1A

20-DEC-2002 12:51

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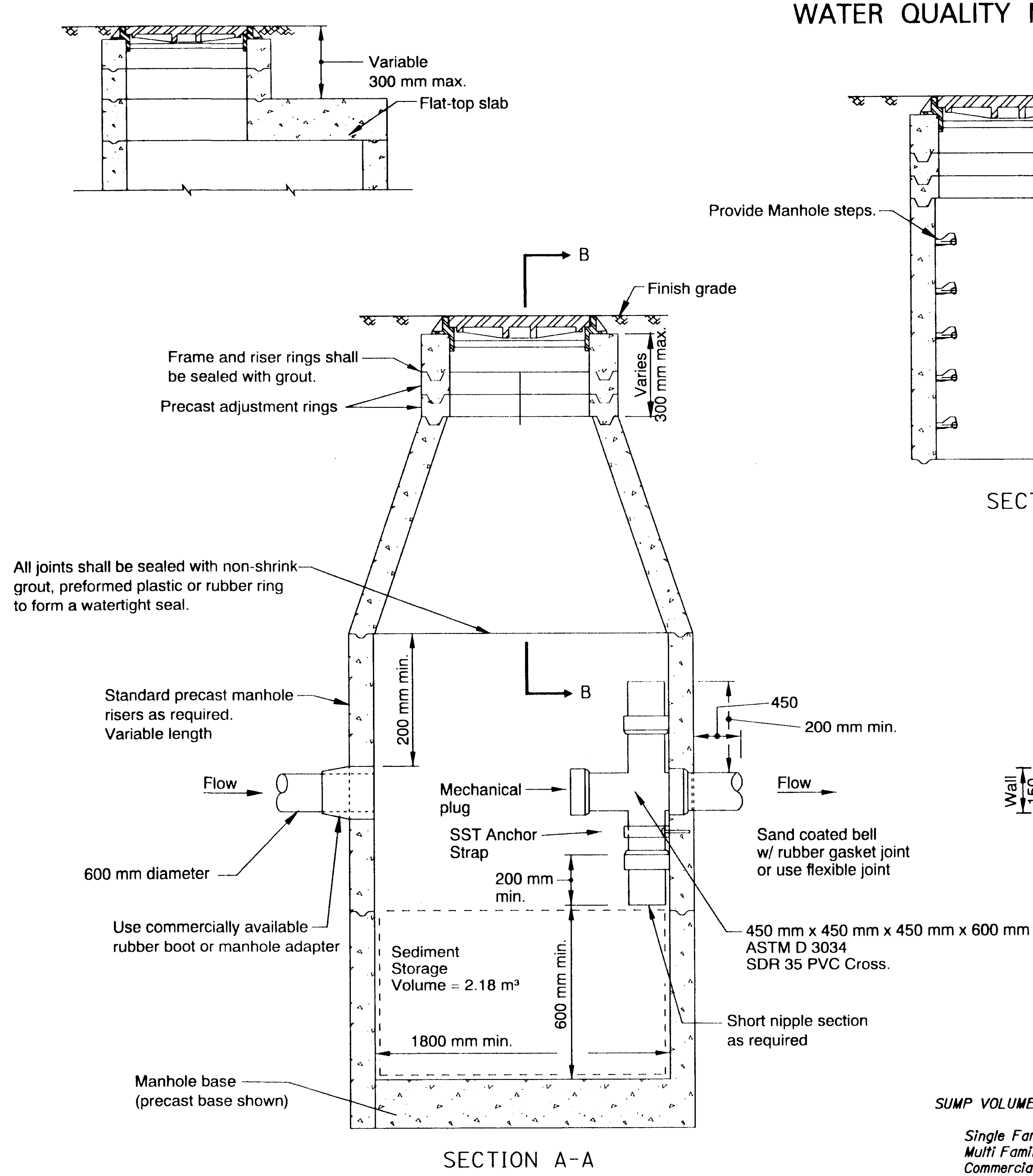
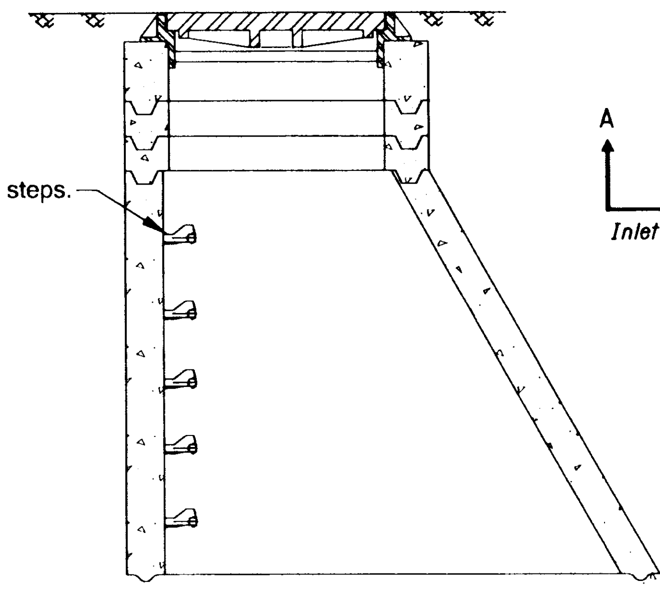
VIEW A3 C103-1419-011

WATER QUALITY MANHOLE



SECTION A-A



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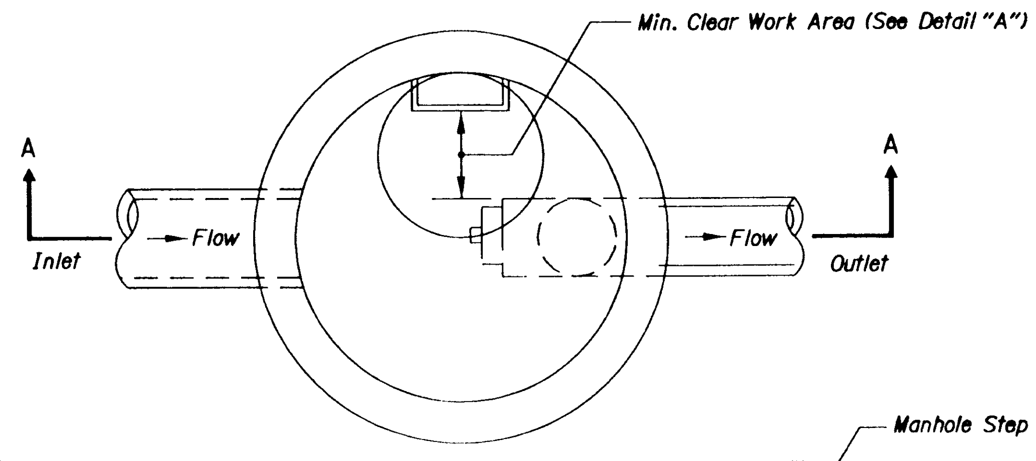
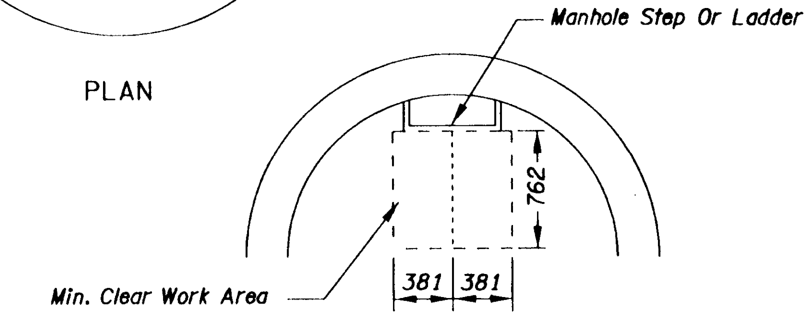


PLAN

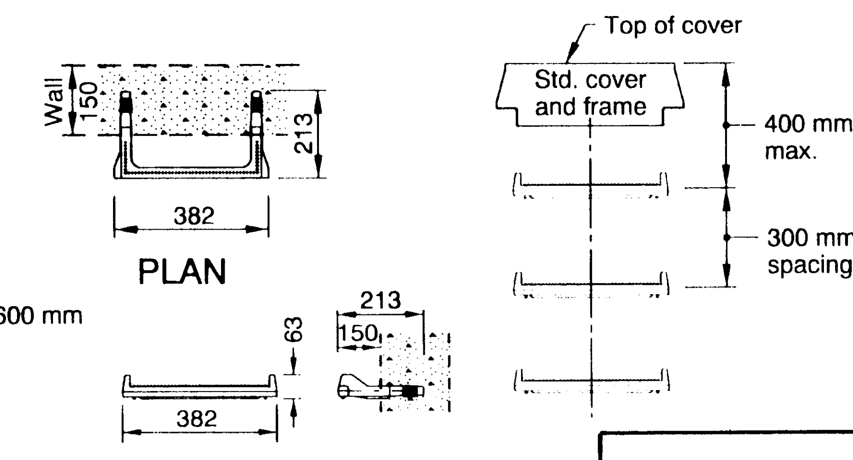


DETAIL "A"

Locate Pipes, Etc. So That No Portion Of Them Are Within Min. Clear Work Area

STEPS

See Current Qualified Products List (QPL) For Acceptable Alternate Manhole Steps



NOTES:

1. *Hardware, Fasteners And Anchors To Be Stainless Steel.*
2. *See Pipe Data Sheet And Plan Sheets For Pipe Size(s).*
3. *Manhole And Base Per Manhole Standard Drawings.*
4. *Hardware, Fasteners, Anchors, Fittings, Appurtenances, Labor And Equipment Is Incidental To Water Quality Manhole Item.*

- All dimensions are in mm unless otherwise noted.

SUMP VOLUME REQUIREMENTS

Single Family Residential	*.245 m³/hectare*
Multi Family Residential	*1.539 m³/hectare*
Commercial/Industrial	*6.577 m³/hectare*

(For Details Not Shown, See Manhole Standard Drawings, RD324, & RD327)

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2003

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS-BORING HIGHWAY
CLACKAMAS COUNTY

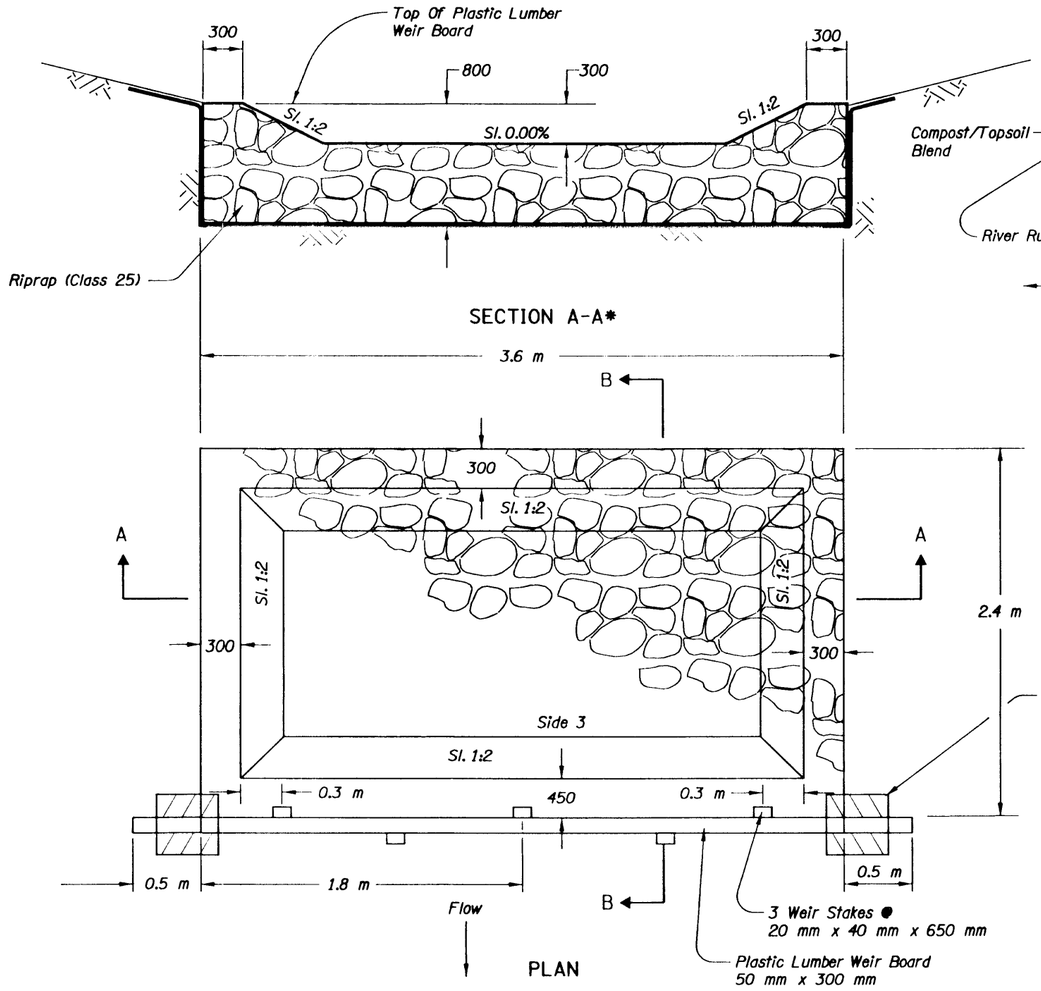
Reviewed By - Henry M. Allen
Designed By - Bruce S. Council
Drafted By - Martin G. Casillas

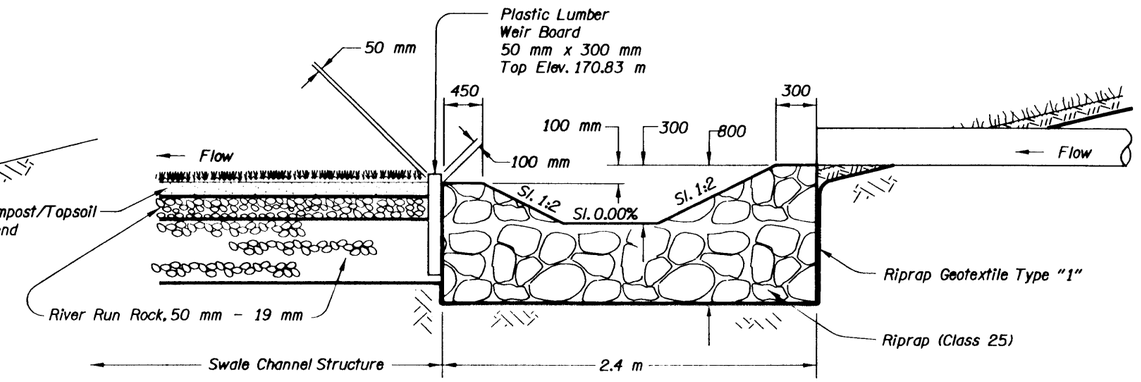
WATER QUALITY DETAILS — SHEET NO. 2E

23-JAN-2003 09:27

C:\usr\Projects\0665Rotcr\Wq\0665fwqdtl

SWALE FLOW SPREADER





*Note:
Length/Width Of The Swale Flow Spreader, Use In Conjunction With Sheet 2E-6, Note 2. Shall Be 2.4 m. Only The Riprap Geotextile Type "1", And Riprap (Class 25) Portions Of This Detail Is Applicable.

All Dimensions Are In Millimeters (mm) Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2003

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS-BORING HIGHWAY
CLACKAMAS COUNTY

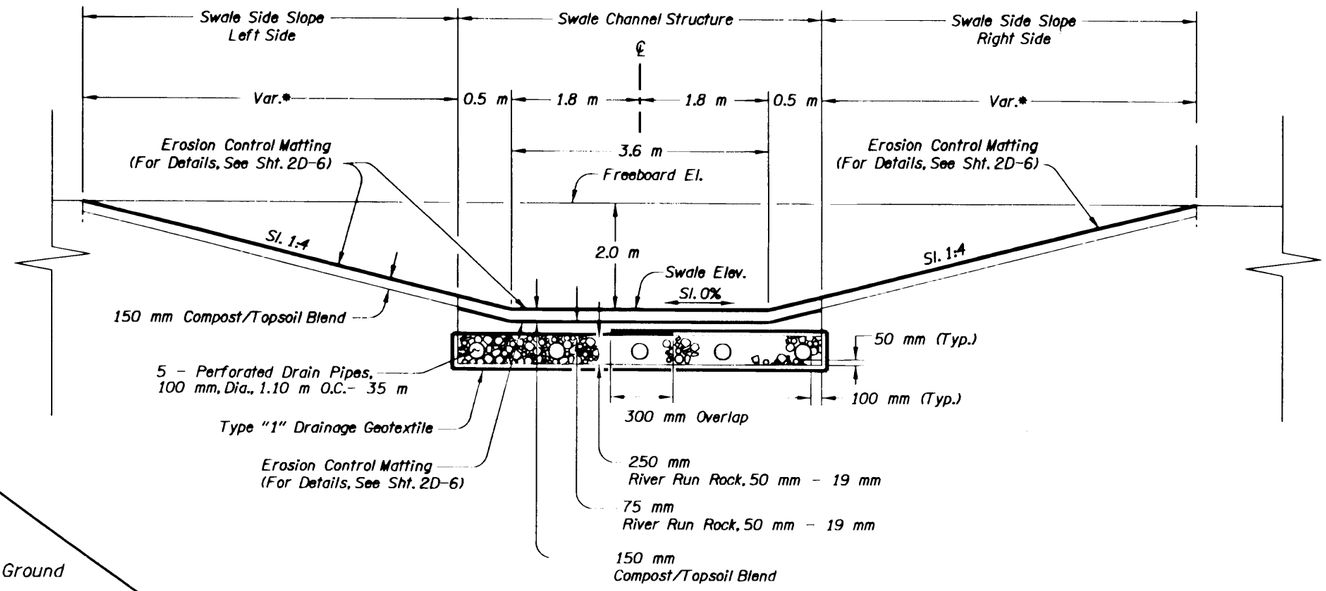
Reviewed By - Henry M. Allen
Designed By - Bruce S. Council
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. 2E-2

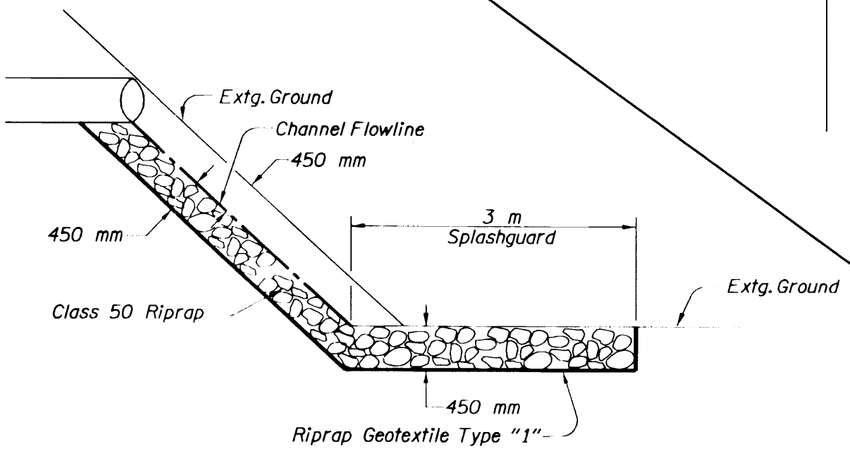
23-JAN-2003 13:39
C:\usr\Projects\0665Rotar\Wq\0665fwqdtl

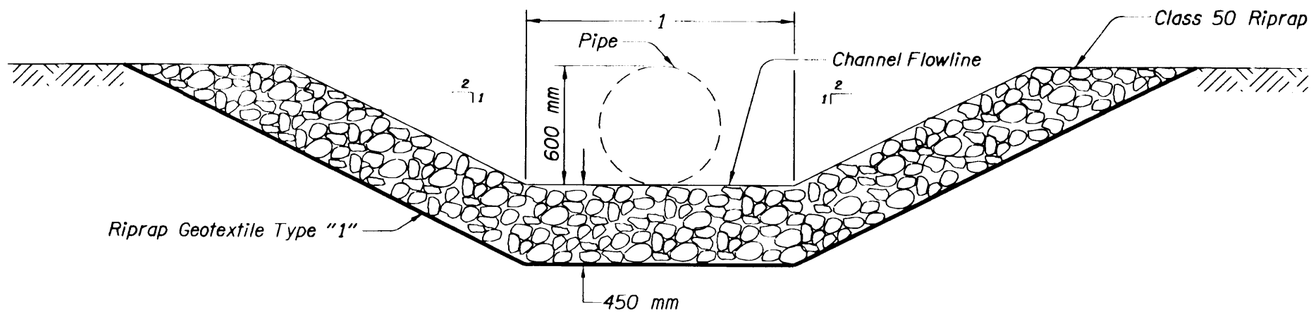
SWALE TYPICAL SECTION



* See Sht.2E-8 For Specific X-section Dimensions Not Shown Here

RIPRAP OUTFALL PROTECTION





Swale Notes:
1) See Shts. R1 For Applicable Bioswale Seeding And Plantting Instructions.
2) River Run Rock Shall Be Well Graded And Shall Consist Of Well Rounded Stones With Diameters Ranging From 19 To 50 mm.

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OREGON
JULY 15, 1997
BRUCE S. COUNCILL
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OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS-BORING HIGHWAY
CLACKAMAS COUNTY

Reviewed By - Henry M. Allen
Designed By - Bruce S. Councll
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. 2E-3

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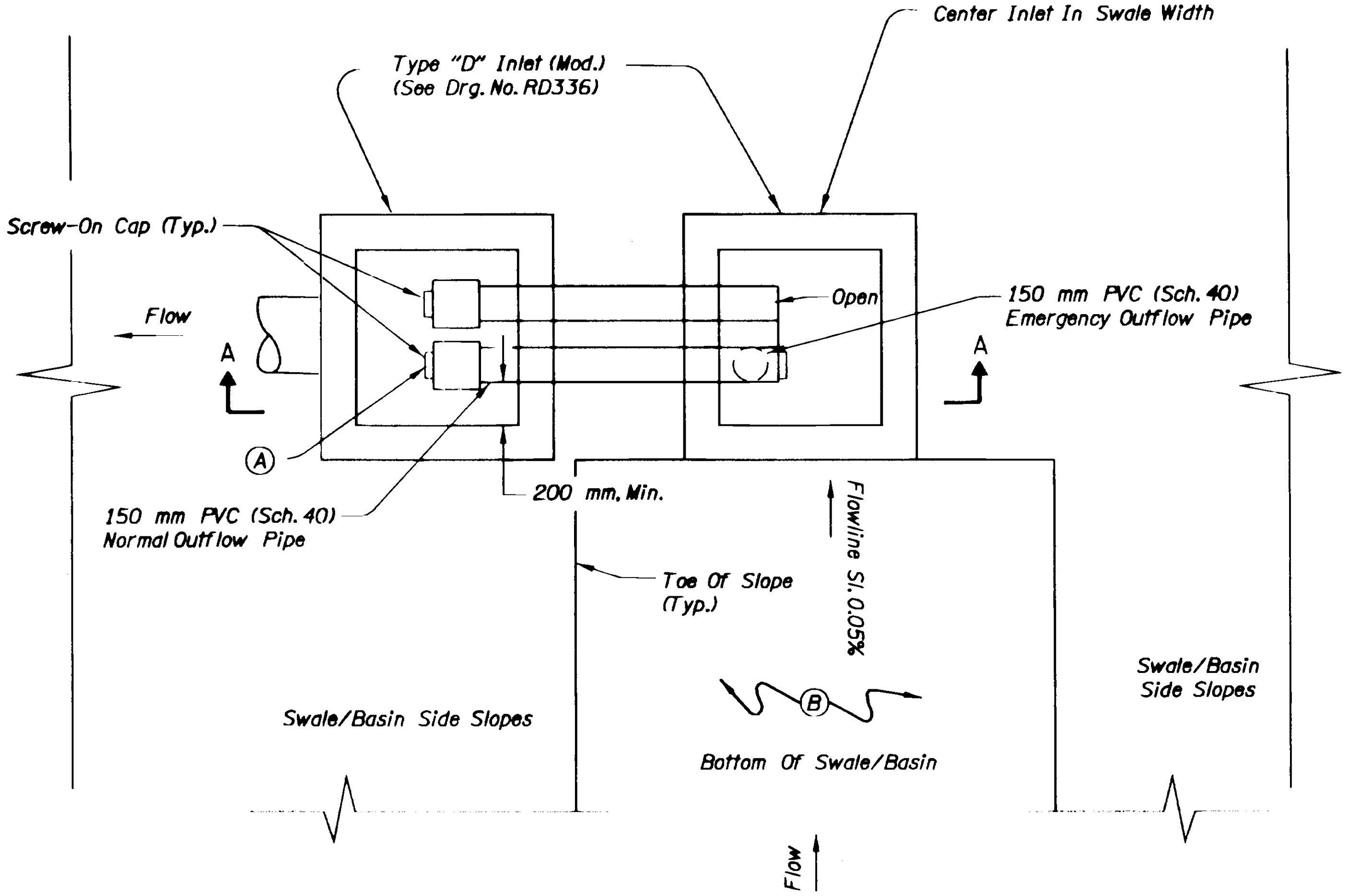
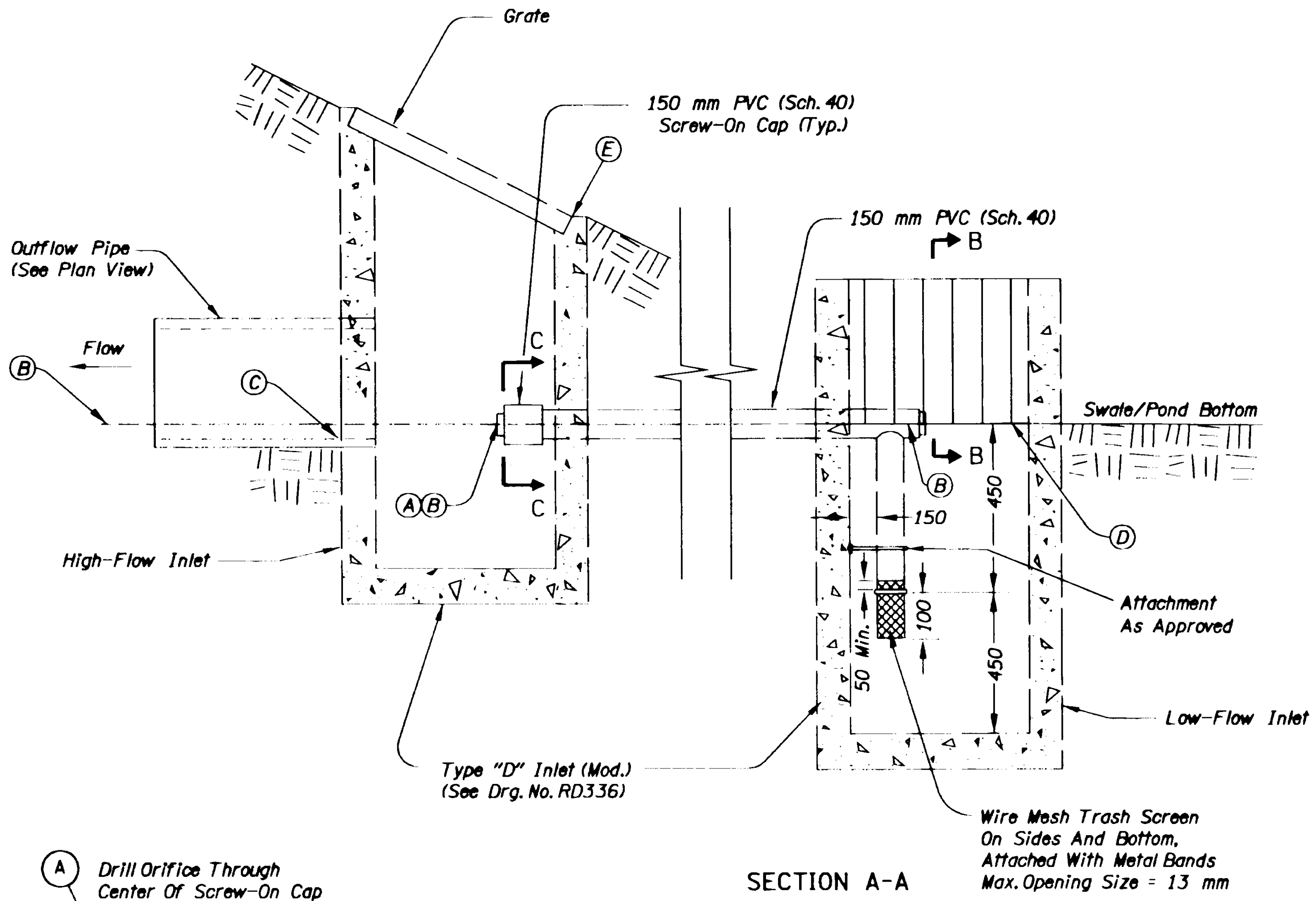
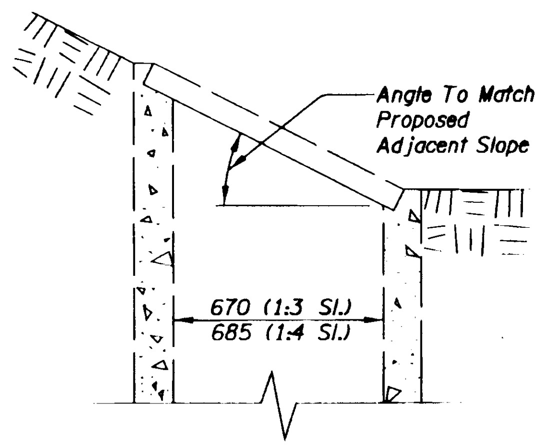
WATER QUALITY OUTLET STRUCTURE
FOR WATER QUALITY SWALE "S1"



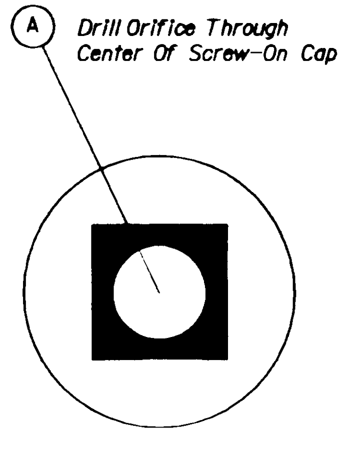


SECTION A-A

A	Orifice Diameter	50 mm
B	Elev. Of Swale/Pond Bottom, Center Of Orifice, And Center-line Of 150 mm PVC (Normal And Emergency Outflow) Pipes.	170.76 m
C	FL Elev. Of Outfall Pipe	170.68 m
	Wall Location For Outfall Pipe	Back
D	Elev. Of Lip Of Low-Flow Inlet	170.76 m
E	Elev. Of Lip Of High-Flow Inlet	172.00 m
	Outfall Pipe Diameter	300 mm



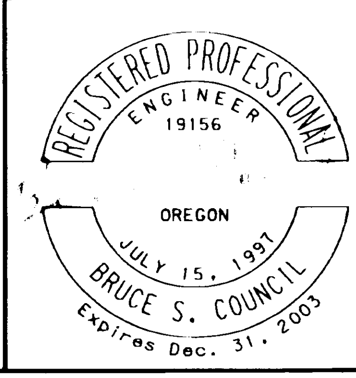
SECTION B-B



SECTION C-C

Notes:
1) Locate Center Of Low Type "D" Inlet At Center Of Swale Width.
2) For Plan View Of Extended Detention Basin Outlet, See Sht. 2E-2.
3) All Fasteners, Bands, And Wire Mesh Screens Shall Be Stainless Steel Or Shall Have A Protective Coating To Prevent Corrosion.
4) The Screw-On Cap For The Emergency Outflow Pipe Is Solid With No Orifice Opening.
5) The Orifice Opening Is In The Normal Outflow Pipe Cap.

Note: If Perf. Drain Pipe Is Required, The Flow Line Of The Outfall Pipe Should Be Set To An Elevation That Allows Perf. Pipe To Drain.



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CLACKAMAS-BORING HIGHWAY
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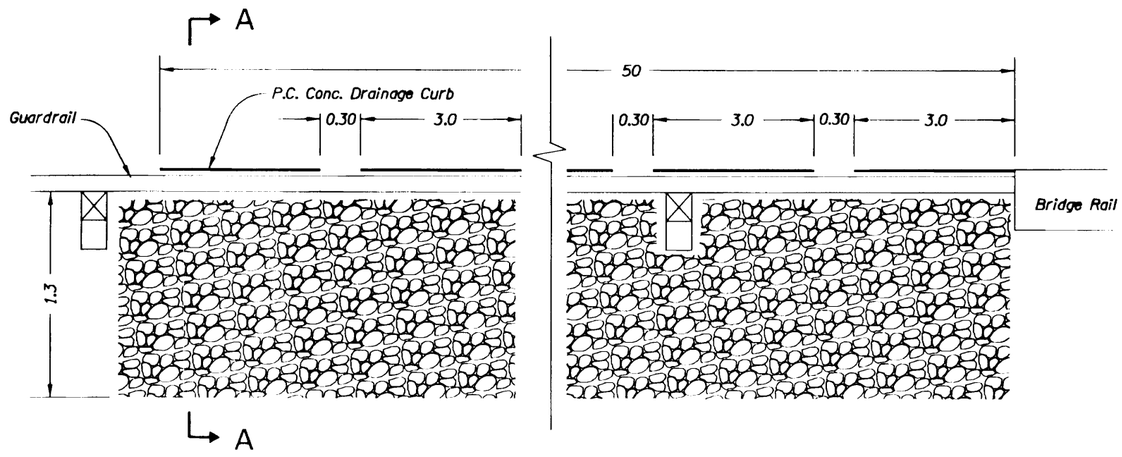
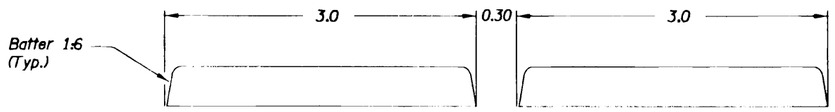
WATER QUALITY DETAILS

SHEET NO. 2E-4

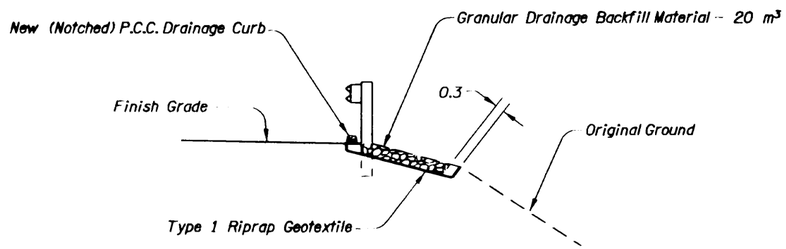


DRAINAGE CURB & AGGREGATE FLOW SPREADER LAYOUT

(For Location, See Sht. 2E-6, Note 3)
(For Details Not Shown, See Drg. No. RD700)
(Ditch Exc. - 20 m^3)



DRAINAGE CURB



SECTION A - A

All Dimensions Are Shown In Meters (m)
Unless Otherwise Noted.

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WATER QUALITY DETAILS

SHEET NO. 2E-5

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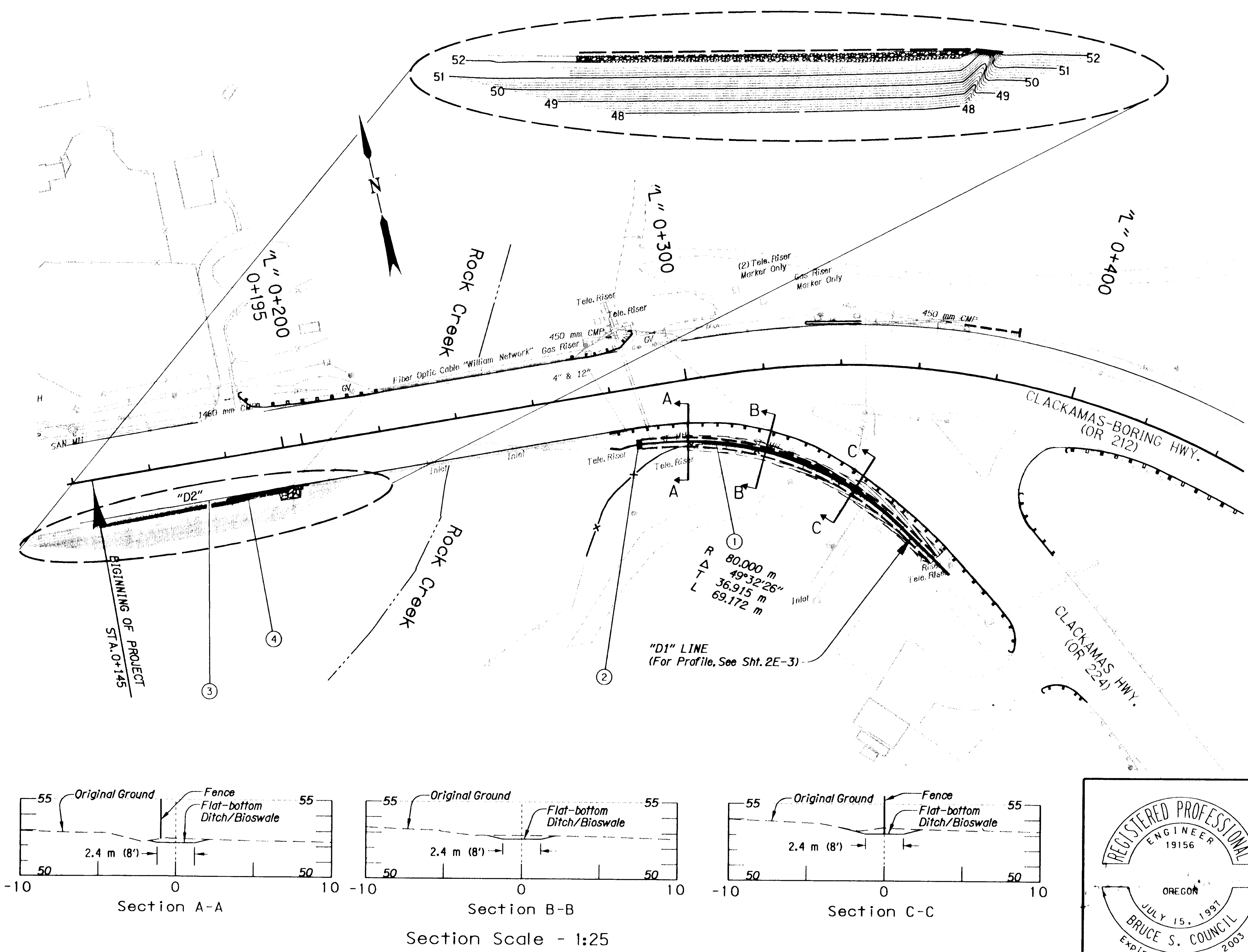

① Sta. "L" 0+282.619., Rt. To "L" 0+373.514, Rt.
Const. Vegetated Flat Bottom Ditch, "D1"
Ditch Exc. - 75.0 m^3

② Sta. "L" 0+285.237, Rt.
Const. Swale Flow Spreader
(For Details, See Sht. 2E-2)

③ Sta. "L" 0+195.30, Rt.
Const. PCC Drainage Curb - 50.0 m
(With Notches)
(For Details, See Sht. 2E-5)
(See Drg. No. RD700)

④ Sta. "L" 0+195.30, Rt.
Const. Aggregate Flow Spreader, "D2"
(For Details, See Sht. 2E-5)

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ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS-BORING HIGHWAY
CLACKAMAS COUNTY

Reviewed By - Henry Allen
Designed By - Bruce Council
Drafted By - Bruce Council

WATER QUALITY PLAN

SHEET NO. 2E-6

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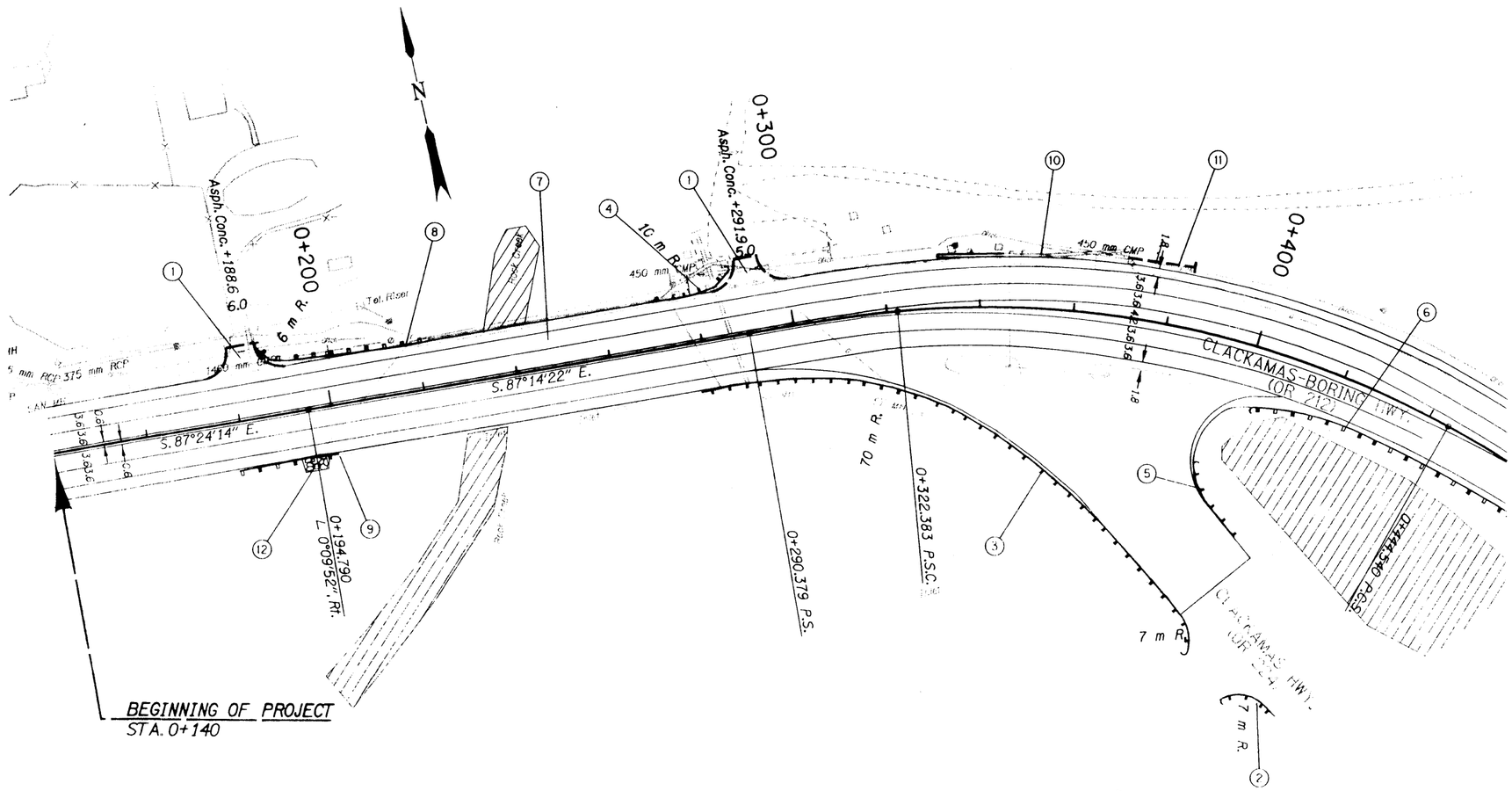

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OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

ROCK CREEK BR. - RICHEY ROAD SEC.
CLACKAMAS & CLACKAMAS - BORING HWYS.
CLACKAMAS COUNTY

Design Team Leader - Carol Cartwright
Designed By - Richard Crossler-Laird
Drafted By - Sandra Gish

ALIGN. & ALL CONSTRUCTION

SHEET NO. 3

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VIEW 1

① *Const. Approach – 2*

② *Sta. "R" 0+426.5 To Sta. "R" 0+445.6, Rt.*
Remove Extg. Guardrail – 19.05 m
Const. Guardrail – 7.62 m (Type 2A)
– 11.43 m (Type 2A) (7 m Radius)
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)
(See Drg. Nos. RD400, RD405, RD410, RD415, RD440 & RD445)

③ *Sta. "R" 0+281.8 To Sta. "R" 0+415.0, Rt.*
Remove Extg. Guardrail – 133.35 m
Remove Extg. Bridge Conn.
Const. Guardrail – 60.96 m (Type 2A)
– 60.96 m (Type 2A) (70 m Radius)
– 11.43 m (Type 2A) (7 m Radius)
– 3.81 m (Type 3)
Const. Guardrail Transition
Flare Rate=0, W=0, E=0.6 m
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)

④ *Sta. 0+270.00 To Sta. 279.05, Lt.*
Remove Extg. Guardrail – 19.05 m
Remove Extg. Bridge Conn.
Const. Guardrail – 11.43 m (Type 2A) (10 m Radius)
– 3.81 m (Type 3)
Const. Guardrail Transition
Flare Rate=0, W=0, E=0.6 m
Const. Anchor (Type 1 Mod.) – 2
Inst. End Piece (Type B)
(For Details, See Sht. 2B-5)

⑤ *Sta. "R" 0+382.00 To Sta. "R" 0+397.24, Lt.*
Remove Extg. Guardrail – 15.24 m
Const. Guardrail – 3.81 m (Type 2A)
– 11.43 m (Type 2A) (12 m Radius)
Flare Rate=0, W=0, E=0
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)

⑥ *Sta. 0+400 To Sta. 0+560, Rt.*
Adjust Guardrail – 160 m (As Directed)

⑦ *Rock Creek Structure (No. 1439B)*
Remove Extg. Asph. Conc. Surface
– 1475 m² (As Directed)
Plug Extg. Inlets – 2 (As Directed)
(For Details, See Bridge Drg. No. 61873)

⑧ *Sta. 0+186.0 And Sta. 0+224.1, Lt.*
Remove Extg. Bridge Conn.
Remove Extg. Guardrail – 38.10 m
Const. Guardrail – 19.05 m (Type 2A)
– 11.43 m (Type 2A) (6 m Radius)
– 3.81 m (Type 3)
Const. Guardrail Transition
Flare Rate=0, W=0, E=0.6 m
Const. Anchor (Type 1 Mod.) – 2
Inst. End Piece (Type B)
(For Details, See Sht. 2B-5)

⑨ *Sta. 0+197.8, Rt.*
Remove Extg. Bridge Conn.
Remove Extg. Guardrail – 19.05 m
Const. Guardrail – 7.62 m (Type 2A)
– 3.81 (Type 3)
Const. Guardrail Transition
Match Extg. Guardrail (In Place)

⑩ *Sta. 0+345.0 To Sta. 0+383.1*
Remove Extg. Conc. Barrier – 26.67 m
Const. Conc. Barrier – 41.91 m
(See Drg. No. RD500)

⑪ *Sta. 0+370 To Sta. 0+395*
Remove Extg. Culv. Pipe – 20 m
Inst. 450 mm Culv. Pipe – 35 m
(See Drg. Nos. RD300, RD309, RD312 & RD357

⑫ *Sta. 0+191.8 To Sta. 197.8, Rt.*
Remove Extg. Drainage Curb – 6 m
Inst. Notched Drainage Curb – 6 m
Const. Drainage Flow Spreader
(For Details, See Sht. 2E-5)

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CONSTRUCTION NOTES

SHEET NO. 3A

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VIEW 1

VIEW 1