OPERATION & MAINTENANCE MANUAL

Other (Water Quality Facility)

Manual prepared: February 2019 (rev. June 2019)

DFI No. D00833

Figure 1: DFI No. D00833, looking northwest

Identification

Drainage Facility ID (DFI):	D00833
Facility Type:	Other (Water Quality Facility)
Construction Drawings:	(V-File Numbers) 46V-141
Location:	District: 2B
	Highway No.: 091
	Mile Post: 6.6 to 6.6, right

1. Manual Purpose

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

2. Facility Location

The location map below details the facility location. The highway, mile posts, side streets, access location, and stormwater flow directions are noted on the map. **NOTE: Mile posts are based off of the V-File, and may vary from TransGIS mile posts.**

Facility location type: **Roadway shoulder**

Flow direction: southwest

Figure 2: Facility location map, looking northeast

3. Facility Summary

This facility is of irregular shape. This is a modified infiltration facility with elements of both swale and bioslope functions, and is surrounded by curbing. The facility receives water from the small parking lot that drains into the curb opening inlets. The width is measured approximately perpendicular to the curb opening inlets. The length is measured parallel to the curb opening inlets.

The approximate length, width, and area of the facility are:

Component	Length (feet)	Width (feet)	Area (sq. ft.)
Facility	**18.5**	**3 (min) to 10**	**120**

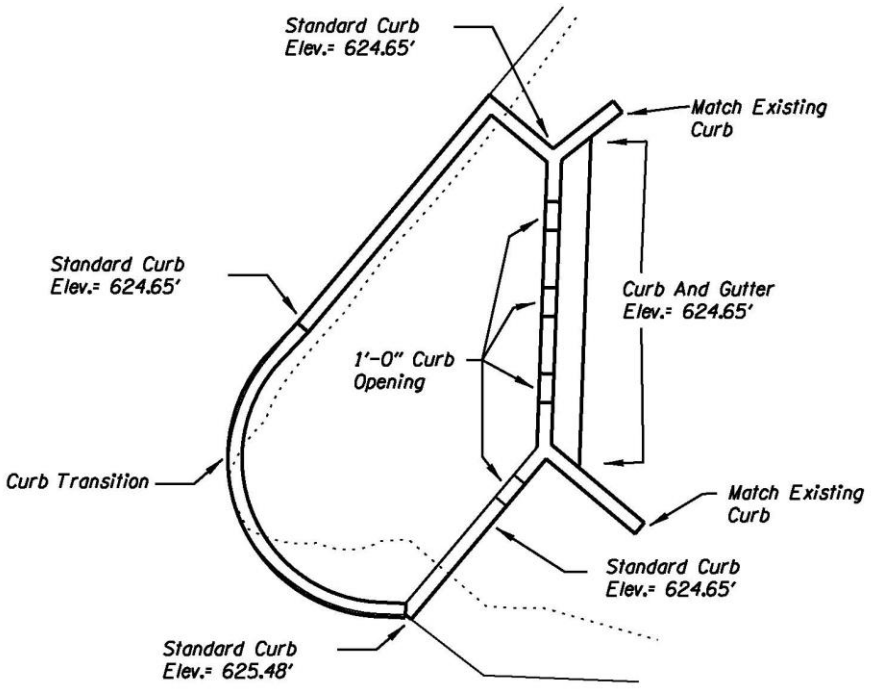


Figure 3: Other (Water Quality Facility) Plan View

The sides are essentially vertical. Typical is not provided, due to unique nature of the facility. The minimum depth of the infiltration layers within the curbs is:

Depth (feet)	3.25 min

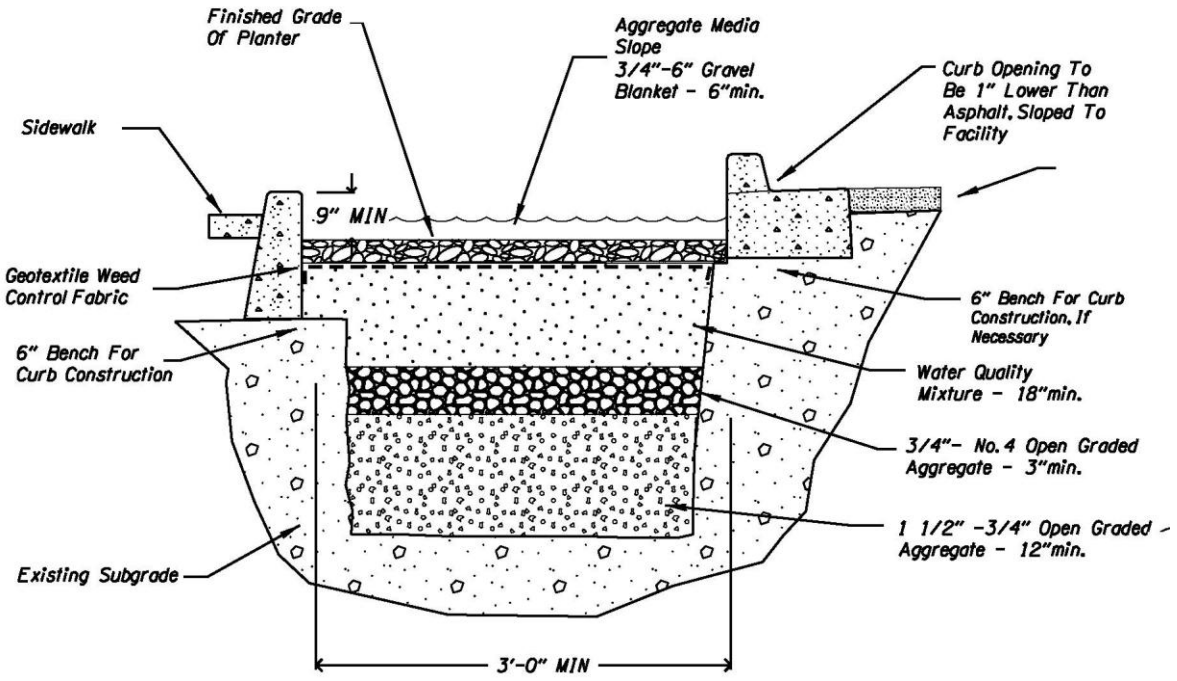


Figure 4: Other (Water Quality Facility) Section

Site Specific Information: This facility was created to compensate for impervious surface located elsewhere and impacted by the project. It collects water from the small parking area adjacent to the north. This facility may be considered a modified infiltration facility, and also has some characteristics of both a bioslope and a swale. Pavement flow from the parking area enters the facility via several curb openings (minimum slope of curb openings is about 4%). It then spreads across the aggregate media surface. Lower flows will infiltrate through the media. Higher flows may flow across the facility to the beehive grate over the manhole, as well as infiltrate. Outlet for flow can be by infiltration to surrounding soils, or through the 6" perforated pipe, or the beehive grate to the piped storm system. See Appendix A for additional details.

Note: Water in the pipe shown passing through the beehive manhole from a surface inlet on the road is not treated at this facility.

Facility Access is at the road shoulder on SW Luradel St.

4. Facility Access

Maintenance access to the facility:

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

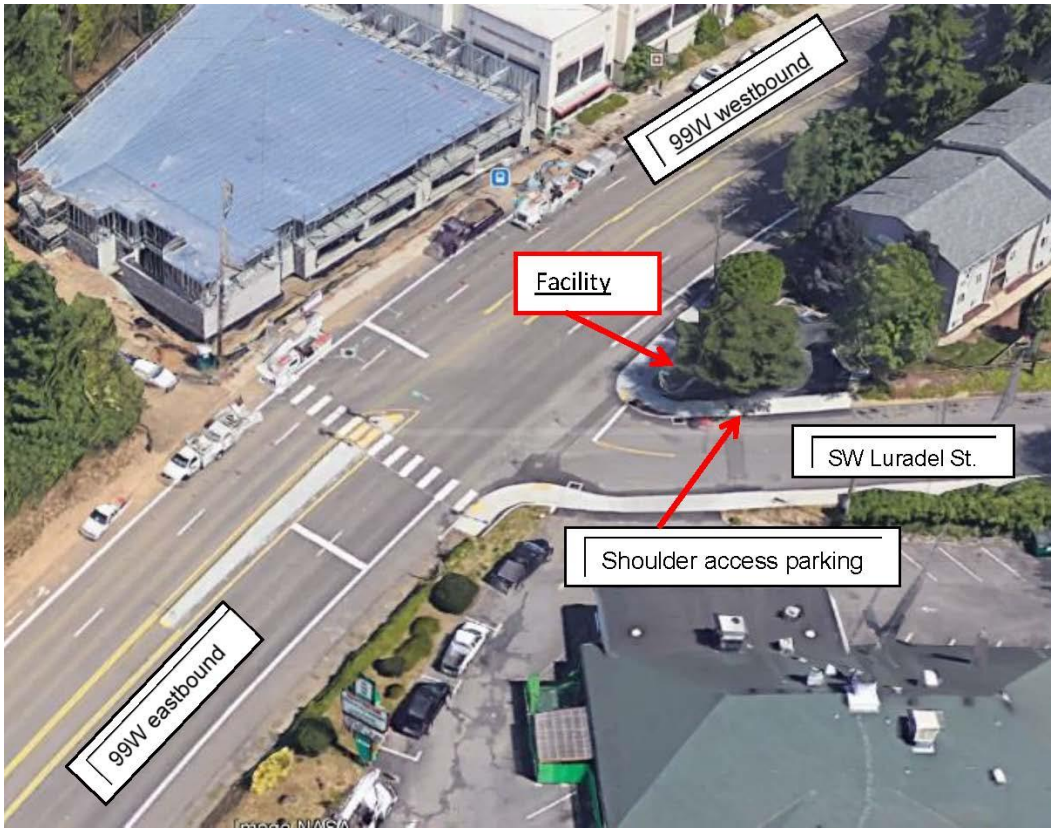


Figure 5: Facility Maintenance Access on shoulder of SW Luradel St.

5. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

☐ Filter Strip (Op Plan A)	☒ Other with bioslope and swale elements (Op Plan B)
A filter strip consists of a vegetated or media slope located parallel to the edge of pavement. It maintains sheet flow of stormwater runoff over the width of the strip.	This facility consists of curb open inlets from which water flows over and infiltrates a gravel blanket to layers of fill similar to a bioslope. It is a flow-through stormwater treatment facility located along roadside curb.
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B) are provided in the Standard Operation Manual.	

See Appendix A for the site specific operational plan

Operational Components

Swales and bioslopes have many components that assist with treatment, conveyance, and infiltration of stormwater runoff. The components in use can vary depending on the facility design. The facility components table (Table 1) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an “x” (e.g. ☒).

NOTE: This facility has elements similar to both a bioslope and a swale without vegetation. Therefore this table has some unusual components identified.

The Standard Operation Manual for Water Quality Filter Strips and Bioslopes 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/

Also review the Standard Operation Manual for Water Quality Biofiltration Swales (implemented March 2017) outlines facility operation, typical footprint configuration, and component definitions and details.

Maintenance Items

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

Table 1: Bioslope/Filter Strip Components		ID #
Facility Inlet		
Pavement Sheet Flow	☒	**B1**
Curb and gutter (with curb opening detail)	☒	**B2**
Ground Cover		
Vegetated Slope	☐	**B3**
Aggregate Media Slope 3/4”-#6 Gravel Blanket	☒	**B4**
Underground Components		
Water Quality Mix	☒	**B5**
Open Graded Aggregate (3/4” - #4)	☒	**B6**
Open graded aggregate (1 ½”-3/4”)	☒	**B7**
Geotextile Weed Control Fabric	☒	**B8**
Geocell Grid	☐	**B9**
Structures		
Standard Curb	☒	**B10**
Check Dam	☐	**B11**
Cleanout	☐	**B12**
Facility Outlet		
6” Perforated Drain Pipe	☒	**B13**
Manhole Outlet with Beehive Grate	☒	**B14**
Other: Infiltration to surrounding soils	☒	**B15**
Storm Drain Outlet Pipe	☒	**B16**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐ **O**	**B17**
Outfall Channel	☐	**B18**
Storm Drain System	☒	**B19**
Outfall Components		
Pervious Berm	☐	**B20**
Riprap Pad	☐	**B21**

6. Maintenance

Maintenance Frequency/Maintain Records

a. Inspect annually. Preferably prior to the rainy season.
b. Clean and maintain as necessary. Refer to Activity 125 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 and bioslopes:

- 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
- Table 5 (Water Quality Bioslopes)

The ODOT Maintenance Guide can be viewed at the following website:
http://www.oregon.gov/ODOT/HWY/OOM/pages/mguide.aspx

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

7. Limitations

This facility combines elements of swales and bioslopes. It is NOT designed to allow the use of heavy equipment. No access grid is installed. Vehicles entering the facility can create depressions (tire ruts), damage vegetation, and damage structural components (e.g. flow spreaders). These conditions may result in poor treatment and drainage performance.

8. Waste Material Handling

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

http://www.oregon.gov/ODOT/HWY/OOM/pages/ems.aspx

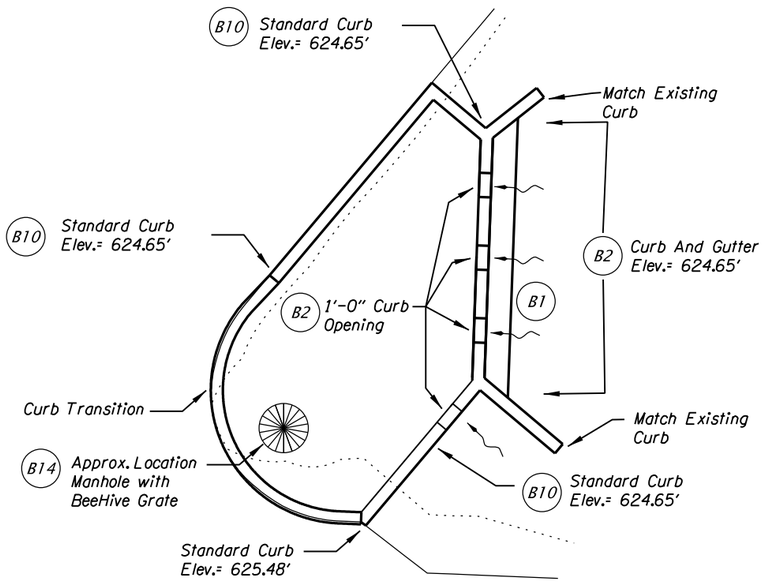
Contact any of the following for more detailed information about management of waste materials found on site:

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

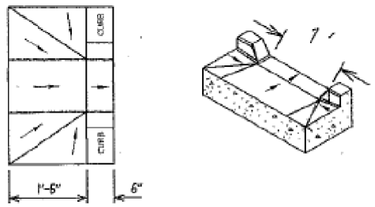
A Appendix A – Site Specific Operational Plan

Contents:

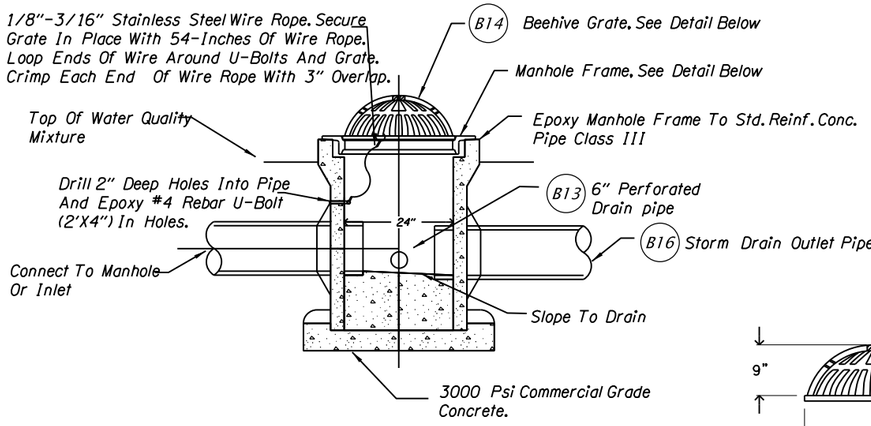
Operational Plan: DFI D00833



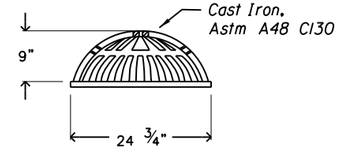
BIOSLOPE DETAIL



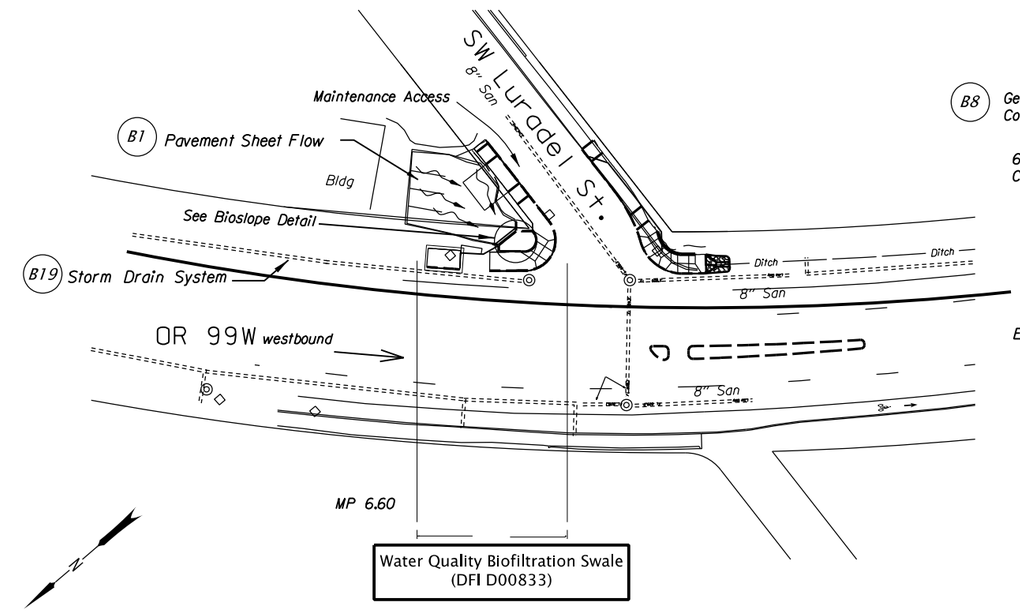
B2 CURB OPENING DETAIL

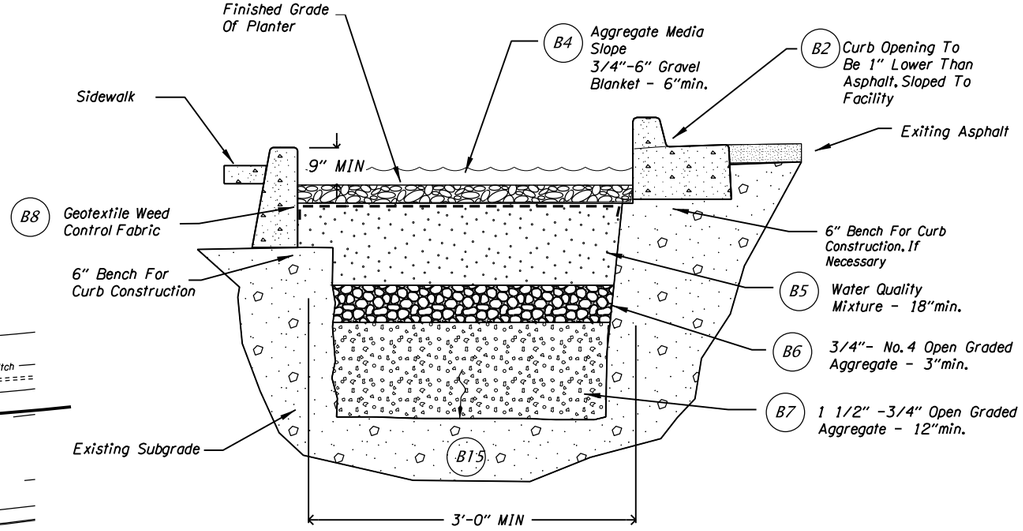


AREA DRAINAGE BASIN

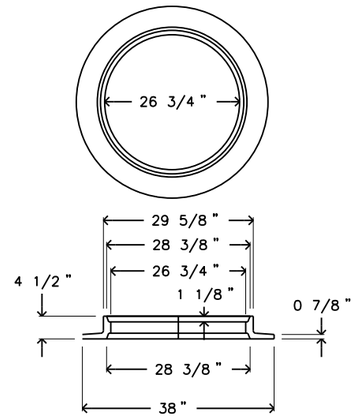


BEEHIVE GRATE





BIOSLOPE DETAIL



24"X4" REVERSIBLE MANHOLE FRAME

Sht. ## of ##

Prepared By: Laila Bush

Drafted By: McDonald/Kuehn

OREGON DEPARTMENT OF TRANSPORTATION

DFI D00833
MAINTENANCE DISTRICT 2B HWY 091
Water Quality Bioslope
Pacific Highway MP 6.60
Multnomah County

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 46V-141

Partial Plan Set

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

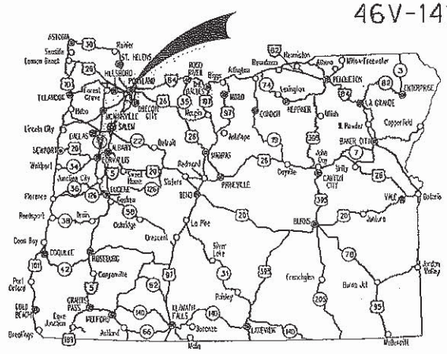
SIGNAL & SIDEWALK

OR99W: SW BARBUR BLVD. AT SW LURADEL ST. PEDESTRIAN CROSSING - SCP

PACIFIC HIGHWAY WEST

MULTNOMAH COUNTY
SEPTEMBER 2013

46V-141



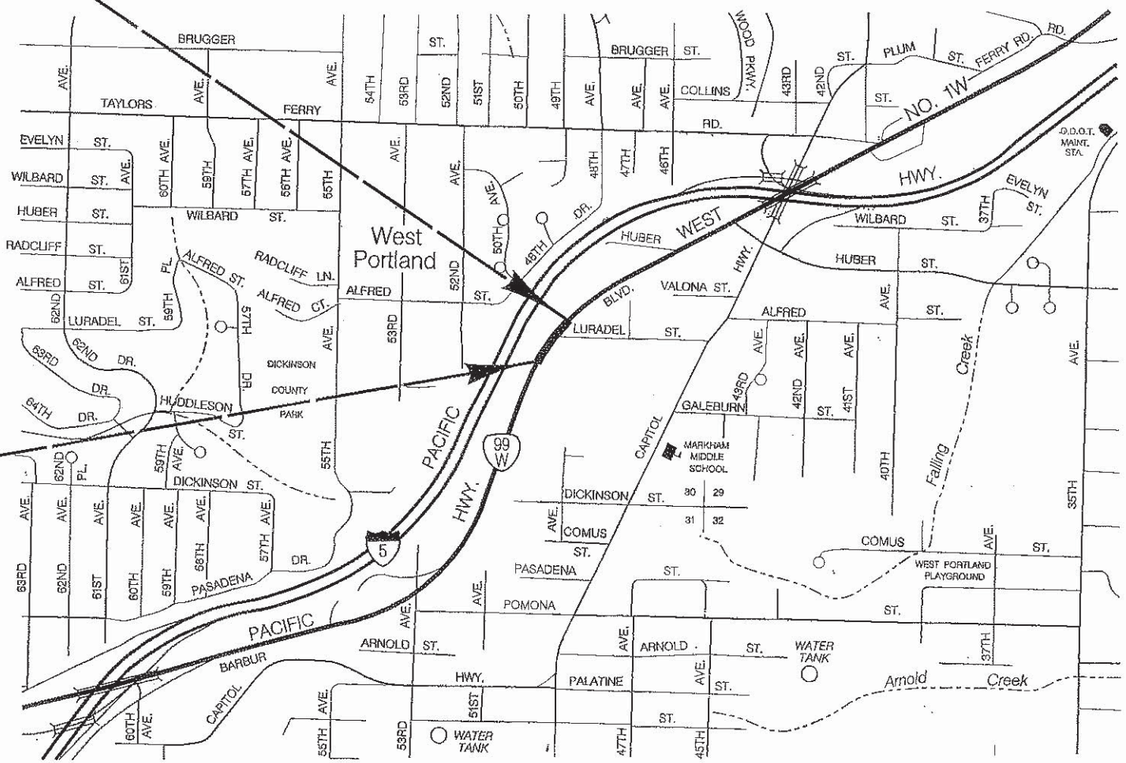
Overall Length Of Project – 0.10 Miles

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

BEGINNING OF PROJECT
STA. "C" 144+95 (M.P. 6.63)

END OF PROJECT
STA. "C" 146+42 (M.P. 6.53)



T. 1S., R. 1E., W.M.

"AS CONSTRUCTED"
Wayne A. Stalen
PROJECT MANAGER
17 FEB 2015
DATE

OR99W: SW BARBUR BLVD. AT SW LURADEL ST. PEDESTRIAN CROSSING - SCP PACIFIC HIGHWAY WEST MULTNOMAH COUNTY		
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STATE	1

C8261136-000

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INDEX OF SHEETS, CONT.	
SHEET NO.	DESCRIPTION
2B & 2B-2	Details
2C	Pipe Data Sheet
3	Alignment & General Construction
3A	Drainage & Utility Plan
3B	Drainage Profile
3C	Drainage Details
PERMANENT PAVEMENT MARKINGS	
ST	Striping Plan
PERMANENT SIGNING	
S-14094 Thru S-14096	Permanent Signing
TRAFFIC SIGNALS	
17362	Flashing Beacon Plan
17363	Flashing Beacon Details
17364	Rectangular Rapid Flashing Beacon

Standard Drg. Nos.

RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD302	- Street Cut
RD317	- Culvert Embankment Protection
RD335	- Standard Storm Sewer Manhole
RD336	- Standard Storm Sewer Manhole
RD342	- Shallow Manholes
RD344	- Standard Manhole Base Section
RD356	- Manhole Covers And Frames
RD364	- Concrete Inlets Type G-1, G-2, G-2M & G-2MA
RD374	- Area Drainage Basin Or Field Inlet
RD376	- Miscellaneous Drainage Structures Siphon Box, Inlet Cap & Inlet Adjustment
RD386	- Fill Height Tables For Circular Concrete Pipe
RD399	- Stormwater Treatment And Storage Facility Field Markers
RD700	- Curbs
RD701	- Drainage Curbs
RD705	- Islands
RD710	- Accessible Route Islands
RD715	- Approaches And Non-Sidewalk Driveways
RD720	- Sidewalks
RD750	- Curb Line Sidewalk Driveways Or Alleys (Options M & N) Local Jurisdictions
RD755	- Sidewalks Ramp Details
RD759	- Truncated Dome Detectable Warning Surface Details & Locations
TM200	- Sign Installation Details
TM201	- Miscellaneous Sign Placement Details
TM223	- Conventional Roads Directional Sign Layout Street Name Signs
TM457	- Vehicle, Pedestrian Signal And Push Button Mounting Option Details
TM458	- Pedestrian Ramp Placement Details
TM467	- Pedestrian Signal And Pedestrian Push Button Details
TM500, TM502 & TM503	- Pavement Marking Standard Detail Blocks
TM520	- Durable Pavement Markings Method "A" Profile
TM530	- Intersection Pavement Markings (Crosswalk, Stop Bar & Bike Lane Stencil)
TM560	- Alignment Layout: General
TM635	- Breakaway Sign & Luminaire Supports - Support Location Guidelines
TM670	- Wood Post Sign Supports
TM671	- 3 Second Gust Wind Speed Map
TM676	- Sign Attachments
TM677	- Sign Mounts
TM681	- Perforated Steel Square Tube (PSST) Sign Support Installation
TM687	- Perforated Steel Square Tube (PSST) Anchor Foundation
TM688	- Perforated Steel Square Tube (PSST) Slip Base Foundation
TM800	- Tables, Abrupt Edge And PCMS Details
TM820	- Temporary Barricades
TM821	- Temporary Sign Supports
TM841	- Intersection Work Zone Details
TM844	- Temporary Pedestrian Access Routing
TM851	- Non-Freeway Multi-Lane Sections

R/W Map No. 6B-11-2

"AS CONSTRUCTED"
Wayne A. Stalle
PROJECT MANAGER
17 FEB 2015
DATE

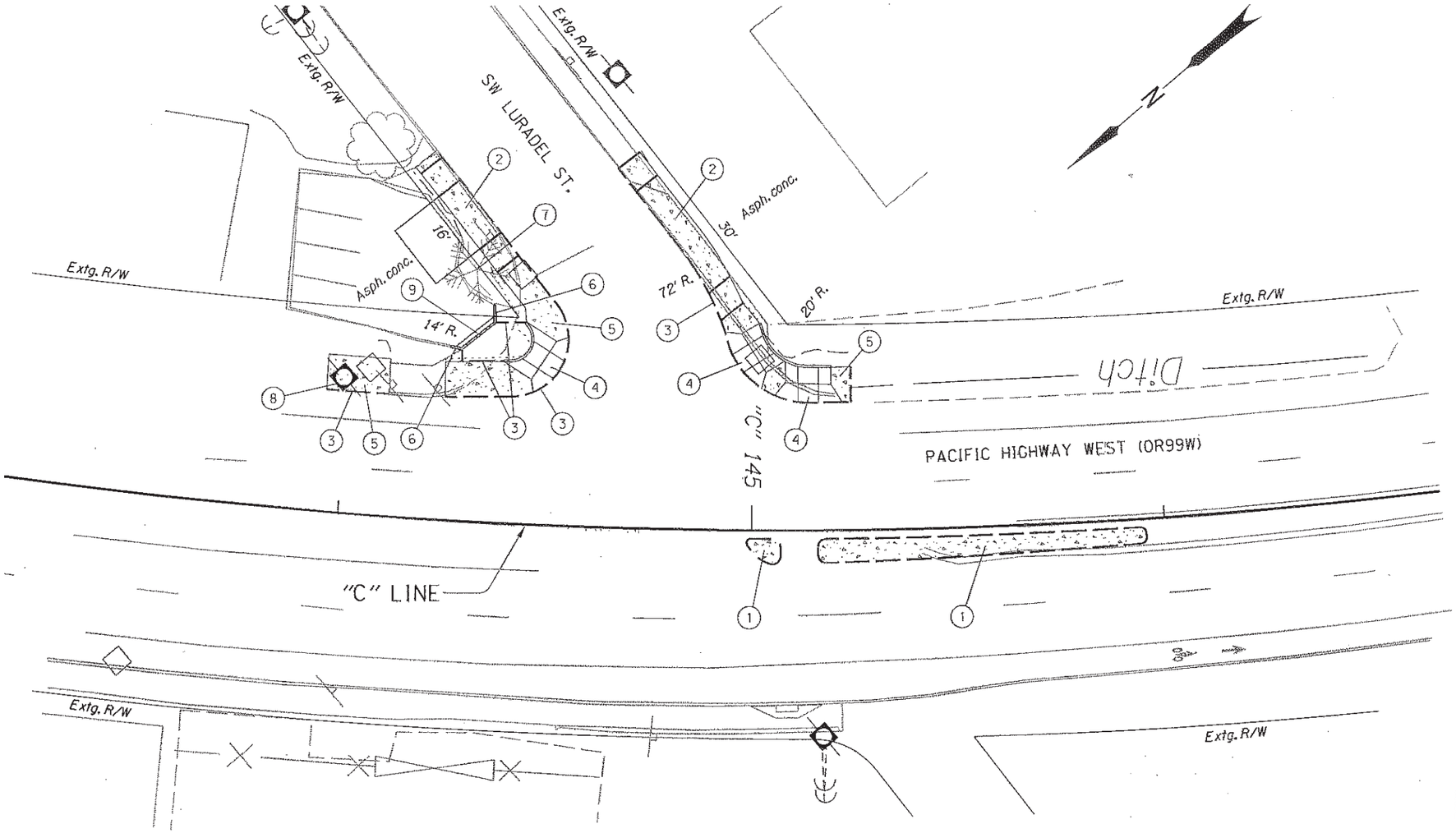
Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/pages/standard_drawings_home.aspx

OR99W: SW BARBUR BLVD AT SW LURADEL ST PEDESTRIAN CROSSING SCP
PACIFIC HIGHWAY WEST
MULTNOMAH COUNTY

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

Sec. 30, T. 1S., R. 1E., W.M.

46V-141



(1) Const. type "C" conc. island (non-mountable) - 860 sq.ft. (For details, see sht. 2B) (See drg. no. RD705)

(2) Const. P.C. conc. driveway Option "N" - 2 (490 sq.ft.) (See drg. no. RD750)

(3) Const. standard curb - 200' Curb exposure E=7" (See drg. no. RD700)

(4) Const. combination sidewalk ramp - 3 (See drg. no. RD755)

(5) Const. conc. sidewalk - 740 sq.ft. (See drg. no. RD720)

(6) Const. drainage conc. curb - 15' (See drg. no. RD701)

(7) Protect & preserve tree (As directed)

(8) Preserve and protect existing pole (As directed)

(9) Const. curb & gutter - 12' (For details, see 3C)

SCALE 1" = 30'

30 15 0 30

FEET

"AS CONSTRUCTED"
Wayne A. Statler
PROJECT MANAGER
17 FEB 2015
DATE

REGISTERED PROFESSIONAL ENGINEER
80879
OREGON
JUN. 11, 2008
JOHN P. WOLF

EXPIRES: 06-30-2014

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - ROADWAY ENGINEERING SECTION

OR99W: SW BARBUR BLVD. AT SW LURADEL ST. PEDESTRIAN CROSSING - SCP

PACIFIC HIGHWAY WEST

MULTNOMAH COUNTY

Design Team Leader - John Wolf
Designed By - Zdenek Vymazal
Drafted By - Jalal Heydarpour

ALIGNMENT & GENERAL CONSTRUCTION

SHEET NO. 3

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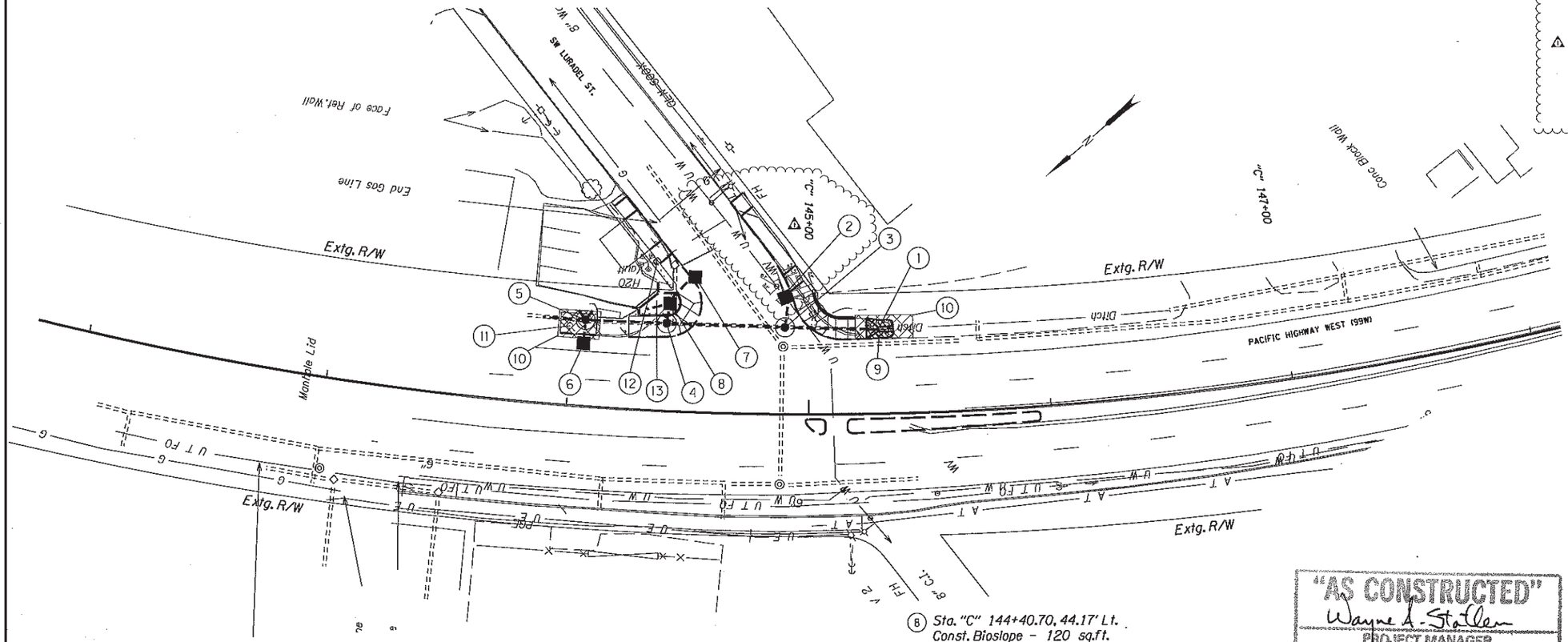
Sec. 30, T. 1S., R. 1E., W.M.

Erosion Control General Notes:

Provide an erosion and sediment control plan in compliance with Section 00280 of the Oregon Standard Specifications for Construction and Special Provisions. Implement this plan for all clearing and grading activities to prevent sediment-laden water from entering the roadway or drainage system, or violating applicable water standards.

At a minimum, install and maintain Type 3 inlet protection in all catch basins, install and maintain check dams in outflowing drainage channels, and Apply straw mulch to all exposed soils as needed or as directed to control erosion.

No.	DATE	REVISIONS	BY
1	10-03-2013	Moved Inlet & added water valves	ESC



(1) *Sta. "C" 145+24.06, 34.75' Lt.*
Remove Extg. 12" Conc. Pipe - 29'
Inst. 12" Storm Sewer Pipe - 38'
5' depth
Trench Resurf. - 3 Sq.Yd.
(See drg. nos. RD300, RD386, & RD302)

(2) *Sta. "C" 144+92.47, 49.18' Lt.*
Remove Extg. Inlet
Remove Extg. 12" Conc. Pipe - 6'
Const. Type "G-2" Inlet
Inst. 12" Storm Sewer Pipe - 22'
5' depth
Trench Resurf. - 7 Sq.Yd.
(See drg. no. RD364)

(3) *Sta. "C" 144+89.83, 35.74' Lt.*
Remove Extg. 12" Conc. Pipe - 49'
Const. 48" Shallow Manhole
Inst. 12" Storm Sewer Pipe - 49'
5' depth
Trench Resurf. - 13 Sq.Yd.
(See drg. nos. RD335, RD336, RD342, RD344, & RD356)

(4) *Sta. "C" 144+39.62, 36.02' Lt.*
Remove Extg. 12" Conc. Pipe - 33'
Const. 48" Shallow Manhole
Inst. 12" Storm Sewer Pipe - 33'
5' depth

(5) *Sta. "C" 144+05.43, 35.48' Lt.*
Remove Extg. Inlet
Const. 48" Storm Sewer Manhole
Connect Extg. 6" Drain Pipe - 2

(6) *Sta. "C" 144+05.18, 26.53' Lt.*
Const. Type "G-2" Inlet
Inst. 12" Storm Sewer Pipe - 8'
5' depth

(7) *Sta. "C" 144+50.92, 55.49' Lt.*
Remove Extg. Inlet
Remove Extg. 12" Conc. Pipe - 28'
Const. Type "G-2" Inlet
Inst. 12" Storm Sewer Pipe - 15'
5' depth

(8) *Sta. "C" 144+40.70, 44.17' Lt.*
Const. Bioslope - 120 sq.ft.
Const. Area Drainage Basin w/ Beehive Inlet Grate
(For Details See Sht. 3C & drg. no. RD374)
Inst. 6" Drain Pipe - 10'
5' depth
Inst. 12" Storm Sewer Pipe - 10'
5' depth

(9) *Sta. "C" 145+24.05, 34.75' Lt.*
Const. Riprap Basin- 5 Cu.Yd.
(See drg. RD 317)

(10) *Remove Exposed Topsoil 0-2' Feet*
Material Contains Petroleum Hydrocarbons
And Will Be Disposed Of At A Landfill
Per Special Provision 00294.
Removal Area Shown Thus:

(11) *Preserve And Protect Utility Pole*

(12) *Adjust Water Vault*

(13) *Sta. "C" 144+40.70, 44.17' Lt.*
Install Field Facility Marker- 4
(See drg. nos. RD399)

"AS CONSTRUCTED"
Wayne L. St. Clair
PROJECT MANAGER
17 FEB 2015
DATE

SCALE 1" = 50'
50 25 0 50
FEET

STORMWATER FIELD MARKER TABLE

FACILITY LOCATION		DFI #	TYPE S2 MARKER LOCATION		TYPE S1 MARKER	
STATION "E2"	MP		BEGIN	END	RED	GREEN
144+40.70	6.54	TBD	✓		✓	
144+40.80	6.55	TBD		✓		✓

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

REGISTERED PROFESSIONAL ENGINEER
19,156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

OR99W: SW BARBUR BLVD. AT SW LURADEL ST. PEDESTRIAN CROSSING - SCP
PACIFIC HIGHWAY WEST
MULTNOMAH COUNTY

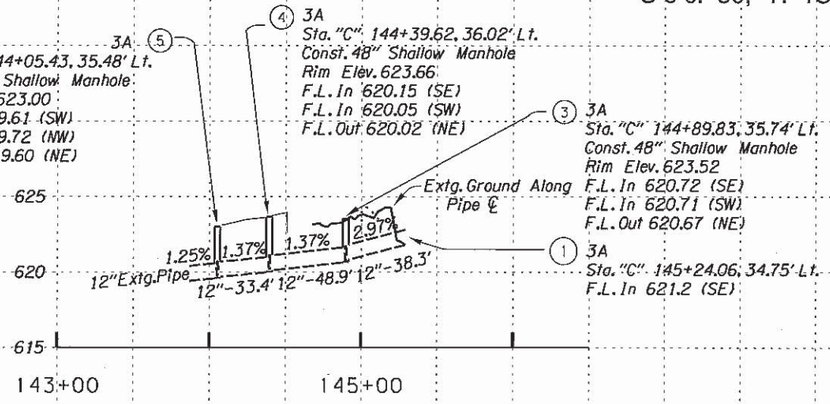
Reviewed By - Bruce Council
Designed By - David McDonald
Drafted By - David McDonald

DRAINAGE & UTILITIES

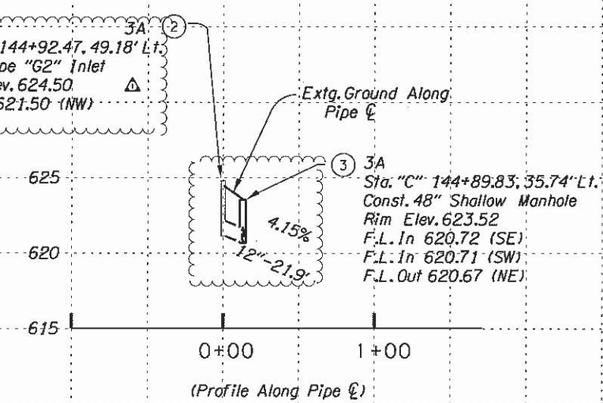
SHEET NO. 3A

Sec. 30, T. 1S., R. 1E., W.M.

46V-141



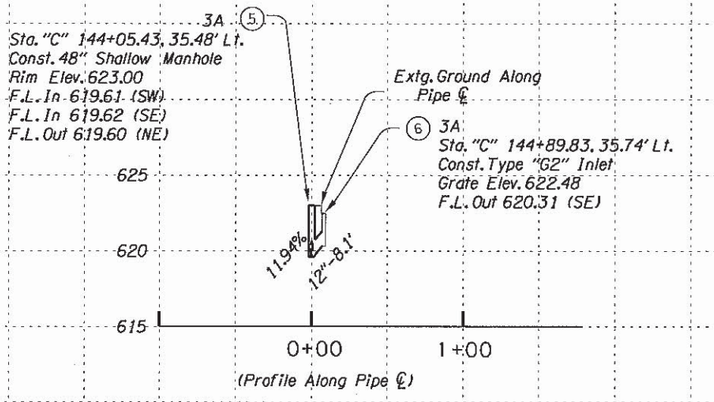
"C" Line
(Profile Along Pipe ℄)



(Profile Along Pipe ℄)

No.	DATE	REVISIONS	BY
⚠	10-03-2013	Moved Inlet & added water valves	BSC

(Profile Along Pipe ℄)



(Profile Along Pipe ℄)

"AS CONSTRUCTED"
Wayne A. Stahlin
PROJECT MANAGER
17 FEB 2015
DATE

REGISTERED PROFESSIONAL ENGINEER
19,156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

OR99W: SW BARBUR BLVD. AT SW LURADEL ST. PEDESTRIAN CROSSING - SCP

PACIFIC HIGHWAY WEST

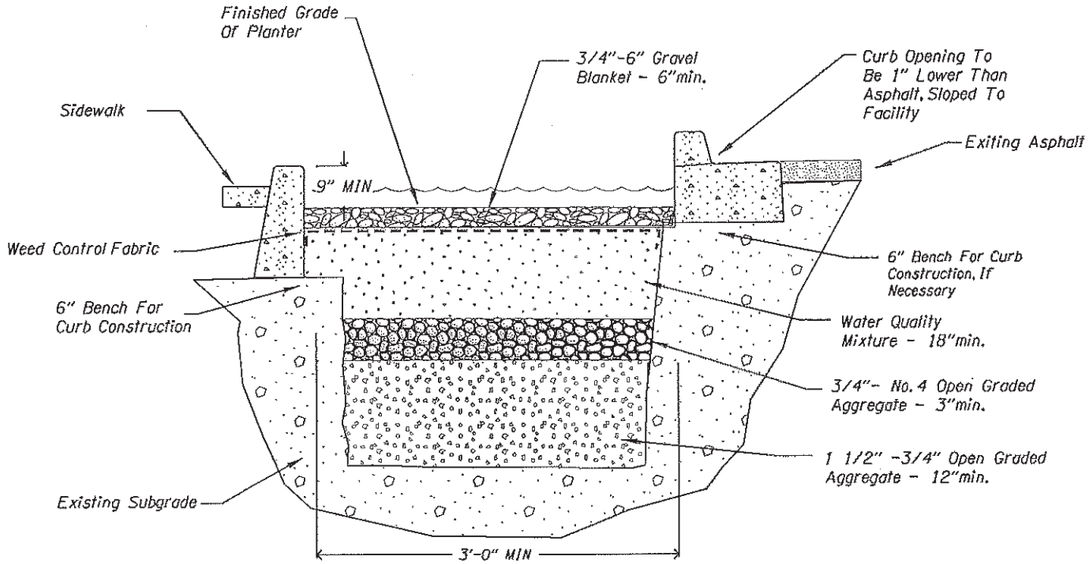
MULTNOMAH COUNTY

Reviewed By - Bruce Council
Designed By - David McDonald
Drafted By - David McDonald

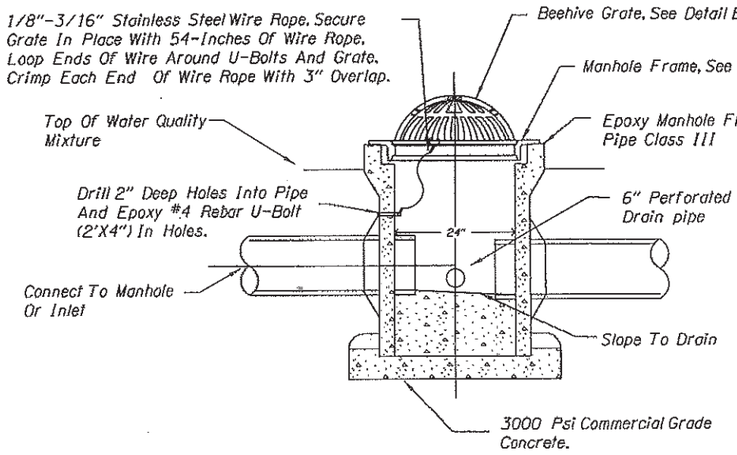
PROFILE

SHEET NO. 3B

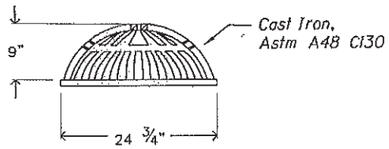
\\scregl\crewl630\geoonly\PROJECT_FILES\99W_at_Luradel\CADD\37309_Luradel_dr.PL1 :: Default 10/4/2013 9:37:18 AM hwye66k



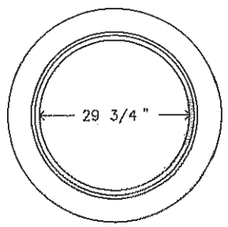
BIOSLOPE DETAIL

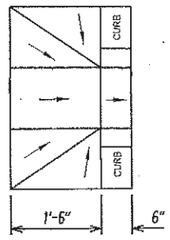


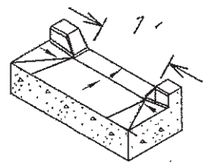
AREA DRAINAGE BASIN



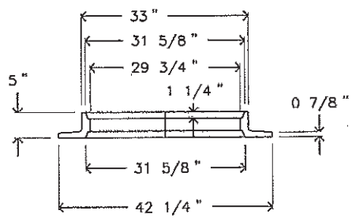
BEEHIVE GRATE



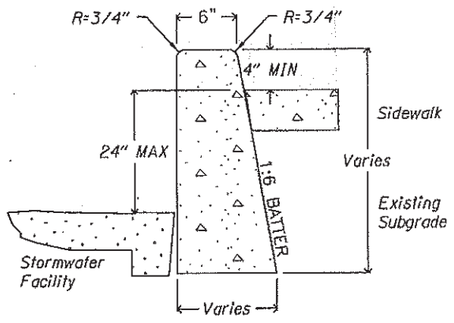




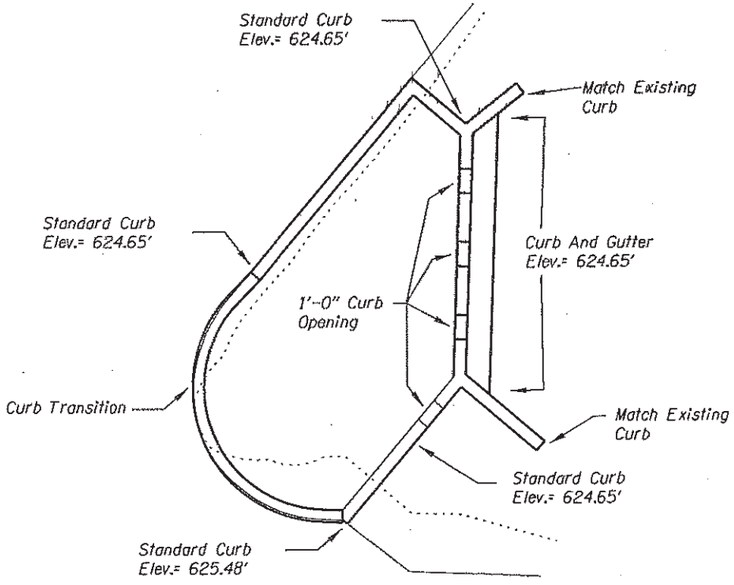
CURB OPENING DETAIL



24"X4" REVERSIBLE MANHOLE FRAME



Standard Curb Detail



BIOSLOPE DETAIL

"AS CONSTRUCTED"
Wayne A. Statler
PROJECT MANAGER
17 FEB 2015
DATE

Details Not to Scale

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DRAINAGE & UTILITIES

SHEET NO. 3C