OPERATION & MAINTENANCE MANUAL

Water Quality Bioslope

Manual prepared: January 2019

DFI No. D01056

Figure 1: DFI No. D01056, looking south

1. Identification

Drainage Facility ID (DFI):	D01056
Facility Type:	Water Quality Bioslope
Construction Drawings:	(V-File Numbers) 44V-034
Location:	District: 2B
	Highway No.: 081 SB
	Mile Post: 10.61 to 10.71, [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. **NOTE: Mile posts are based off of the V-File, and may vary from TransGIS mile posts.**

Facility location type: **Roadway shoulder**

Flow direction: Southeast

***The facility is located between the edge of pavement and the sidewalk.**

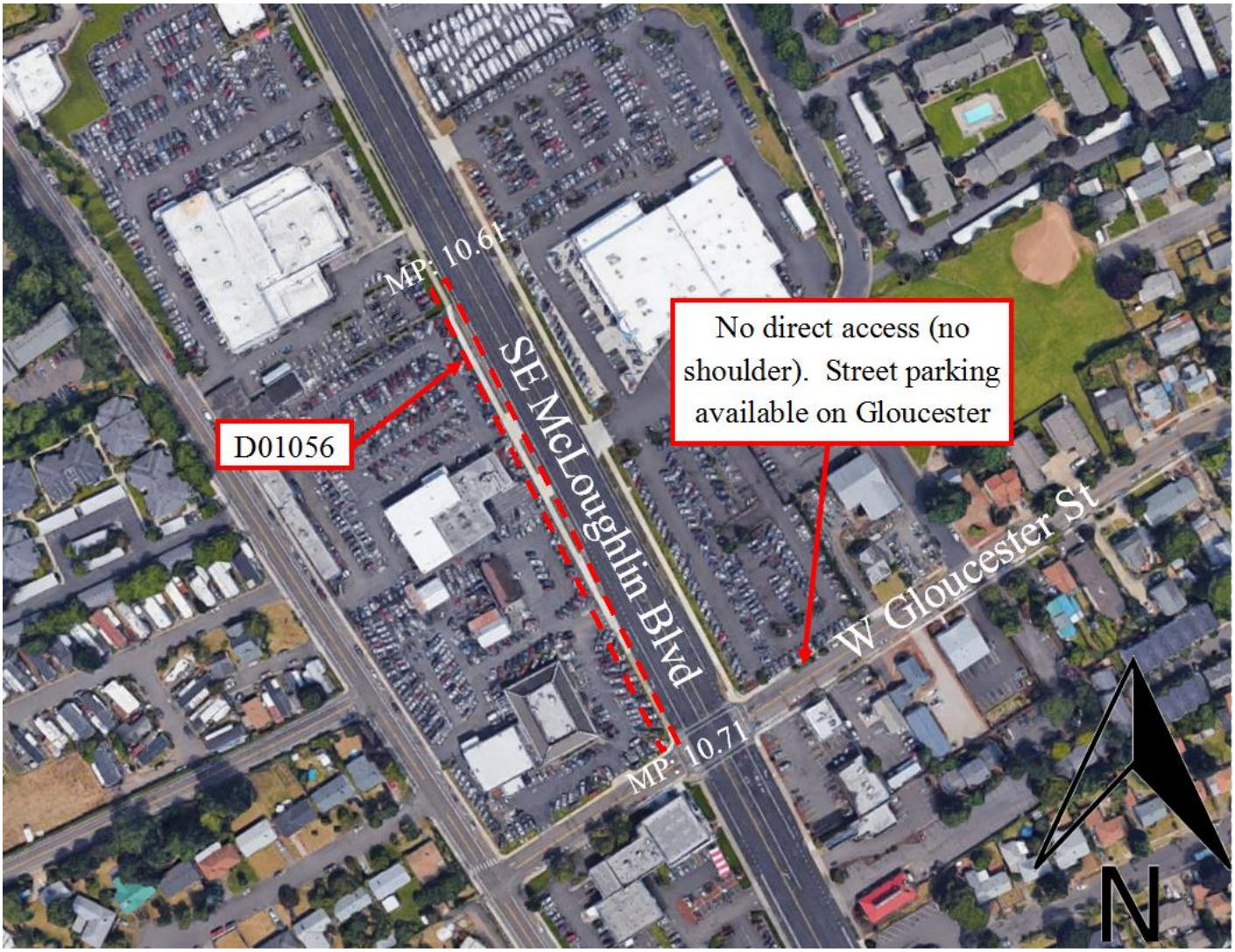


Figure 1: Facility location map

4. Facility Summary

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

The facility is one bioslope that is broken into three sections by private driveways. There are all part of the same facility, were installed at the same time, and have the same outfall. The lengths and widths of the applicable facility components are (from north to south):

Component	Length (feet)	Width (feet)
Section 1	**165**	**5**
Section 2	**54**	**5**
Section 3	**157**	**5**

The slope of the facility is presented by a vertical distance (rise) followed by the horizontal distance (run). However, bioslope section 1 (Figure 3) has no landscape strip between the sidewalk and the bioslope. Bioslope sections 2 and 3 (Figure 4) have a landscape strip between the sidewalk and the bioslope. There is no slope to the landscape strip for either bioslope. The sidewalks for all three bioslopes have a 2% max grade change.

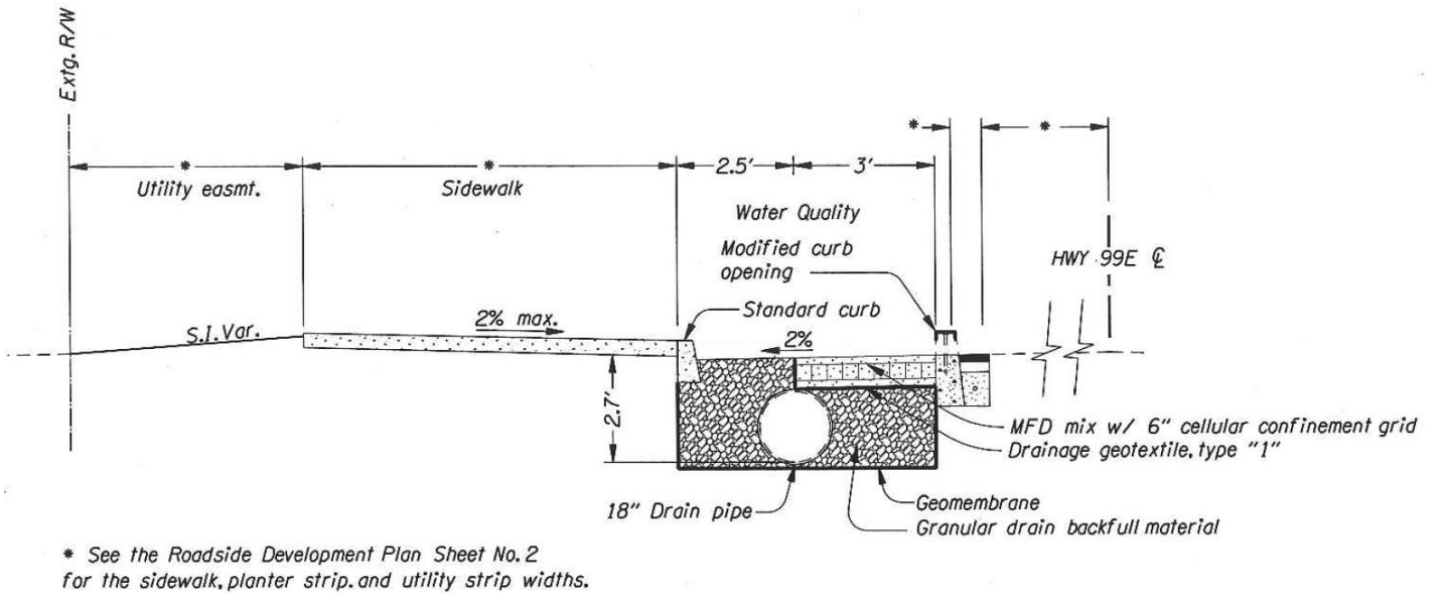


Figure 3: Profile view of Bioslope Section 1

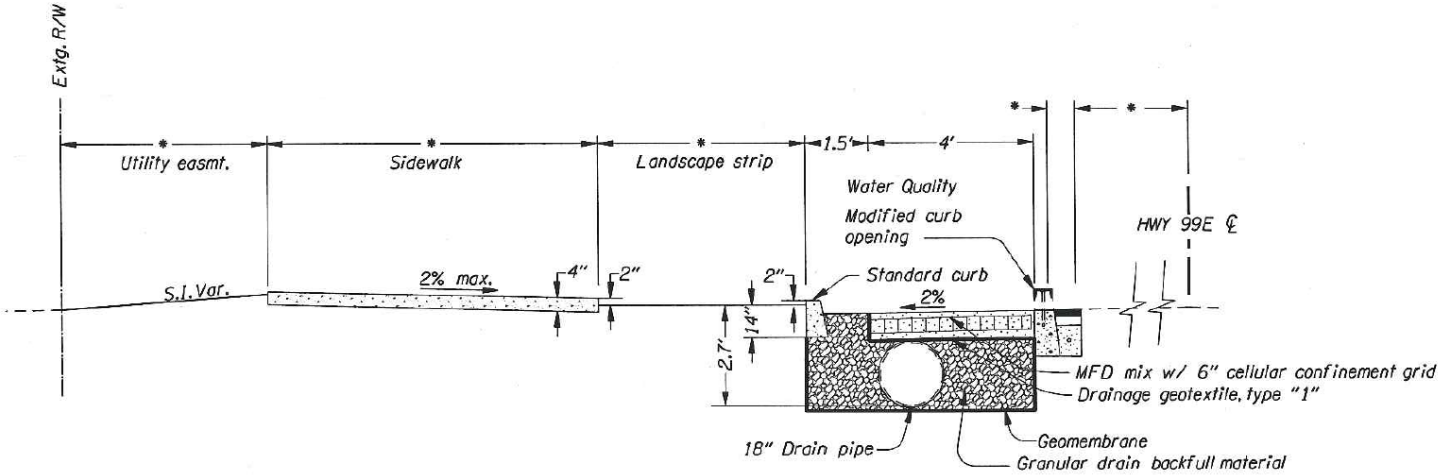


Figure 2: Profile view of Bioslope Sections 2 and 3

Site Specific Information: There are three consecutive sections of bioslope, divided by business entrances along OR 99E. The facility is flat, with the exception of a back slope of approximately 1:6 on the drain rock which separates the ecology mix and the concrete sidewalk.

The curb cuts have accumulated a layer of fine material that needs to be manually removed by a hand shovel. Remove trash from the bioslope and rake the ecology mix

so that it is even and below the elevation of the curb cut inlets. There is geocell cellular confinement grid material reinforcing the ecology mix one to four inches below the surface depending on the buildup of fines and depth of ecology mix. Take care when leveling out the ecology mix not to damage the geocell. Do not rake the ecology mix (or fines) into the drain rock, which begins approximately two feet from the sidewalk curb.

5. Facility Access

Maintenance access to the facility:

Maintenance access to the facility: Curb and gutter (travel lane)

☒ Lane Closure Needed

☐Roadside pad	☐Roadside shoulder
☐Access road with Gate	☐Access road without Gate
☒None of the above	

Figure 5: Approaching southbound 99E, no shoulder or access road

There is no direct facility access for maintenance. There is no shoulder and the entrances off the street are to private businesses. Street parking is available on Gloucester Blvd. Lane closure will be required.

6. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

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

See Appendix A for the site specific operational plan.

Operational Components

Filter strips and bioslopes have many components that assist with treatment, conveyance, and infiltration of stormwater runoff. The components in use can vary depending on the facility design. The facility components table (Table 1) 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 Filter Strips and Bioslopes (implemented January 2019) outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.
https://gis.odot.state.or.us/TransGIS/

Maintenance Items

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

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

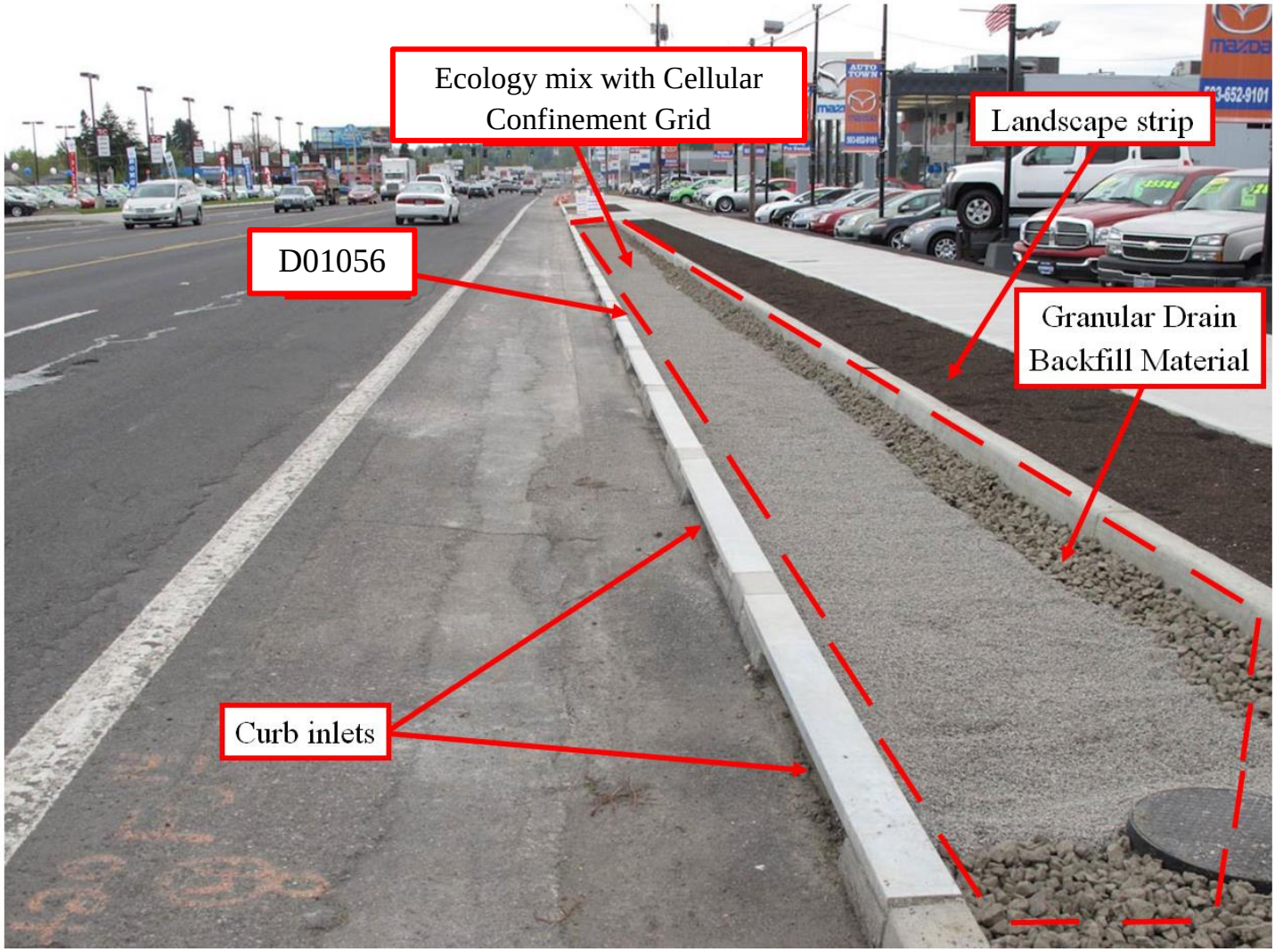


Figure 6: Components of D01056

Figure 7: Cellular Confinement Grid with ecology mix

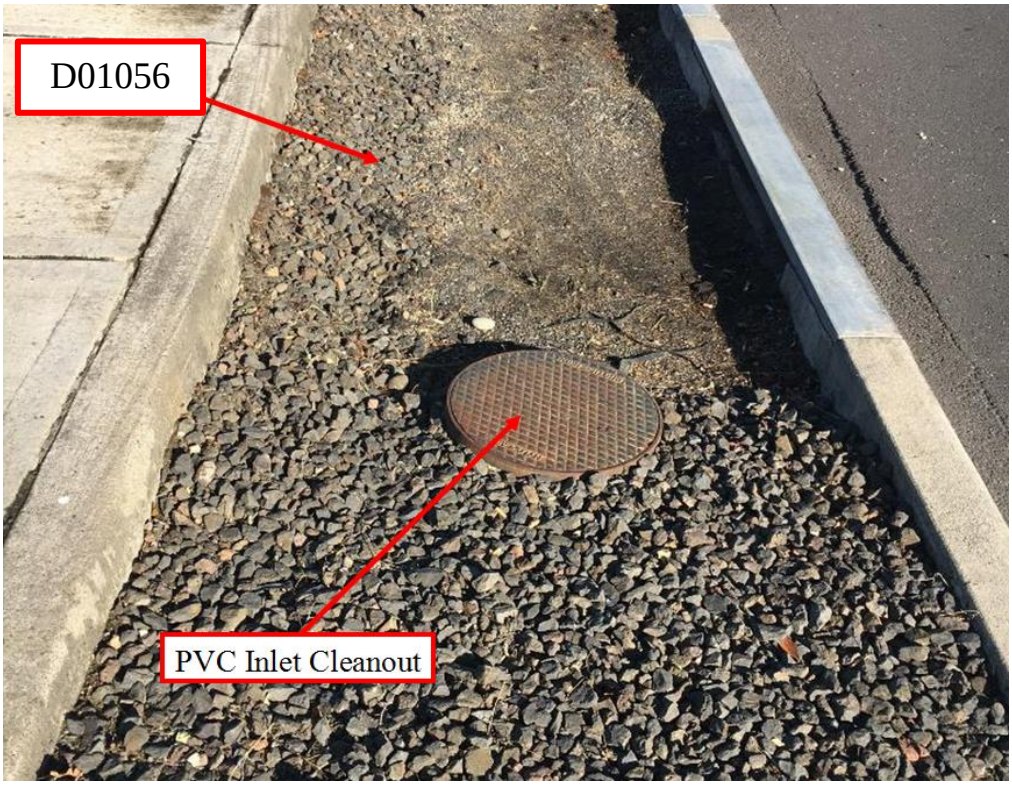


Figure 8: PVC Inlet

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 filter strips and bioslopes:

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

The 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

8. Limitations

Filter strips and bioslopes are NOT designed to allow the use of heavy equipment. Vehicles entering the facility can create depressions (tire ruts), damage vegetation, and damage structural components (e.g. flow spreaders). These conditions may result in poor treatment and drainage performance.

9. Waste 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

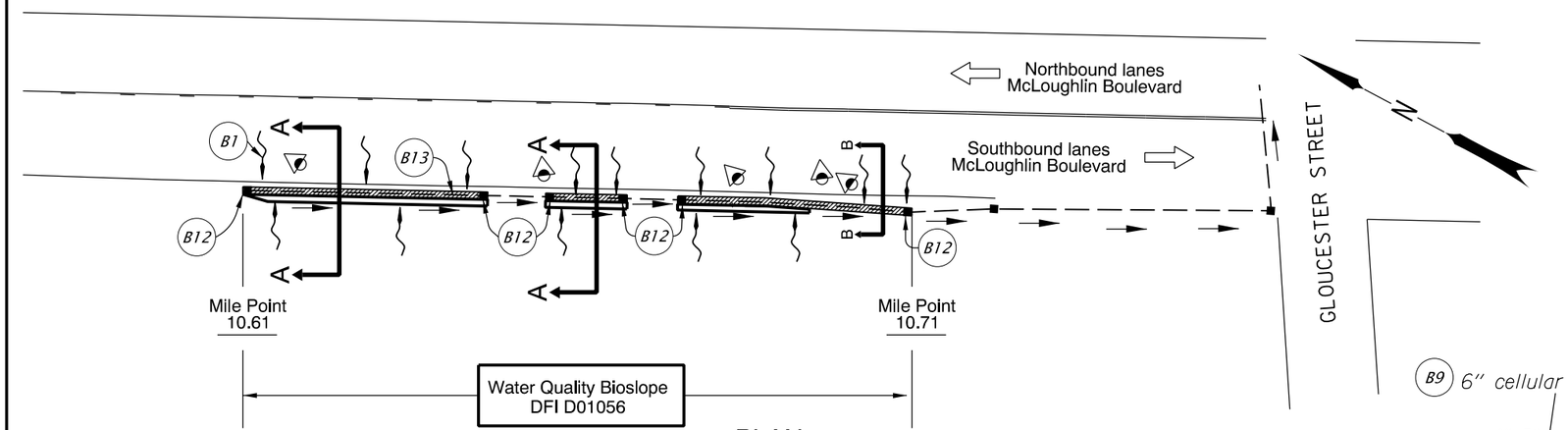
Contact any of the following for more detailed information about management of waste materials found on site:

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

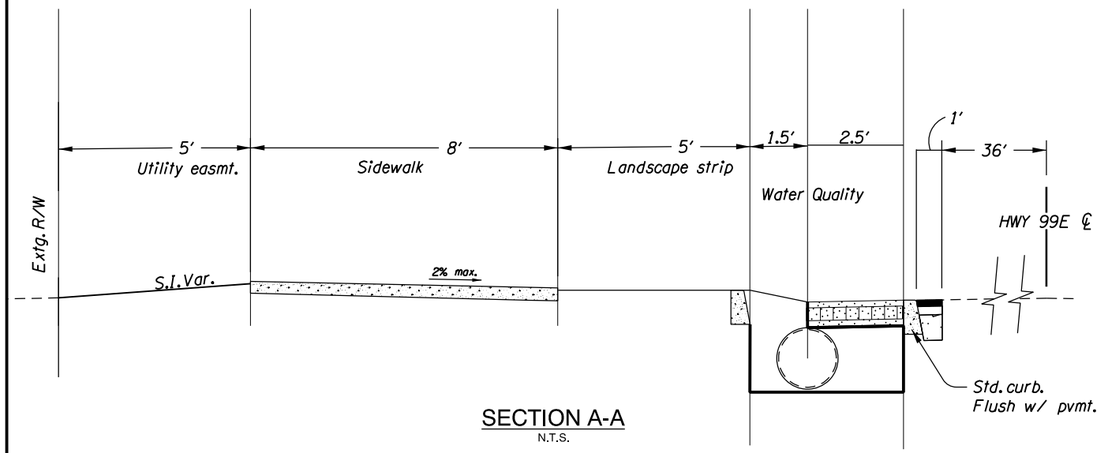
A Appendix A – Site Specific Operational Plan

Contents:

Operational Plan: DFI D01056



PLAN
N.T.S.



SECTION A-A
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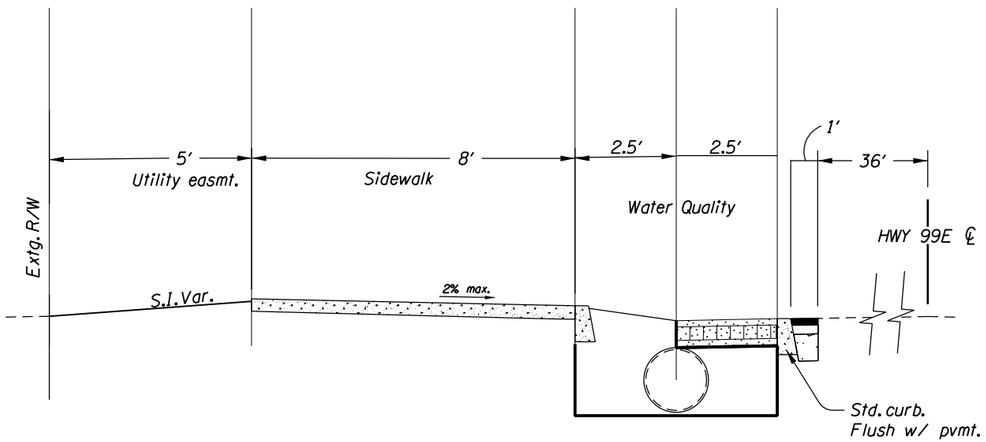

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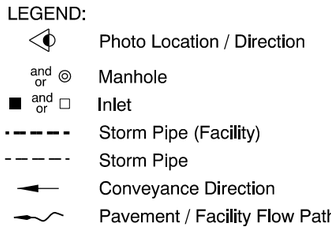
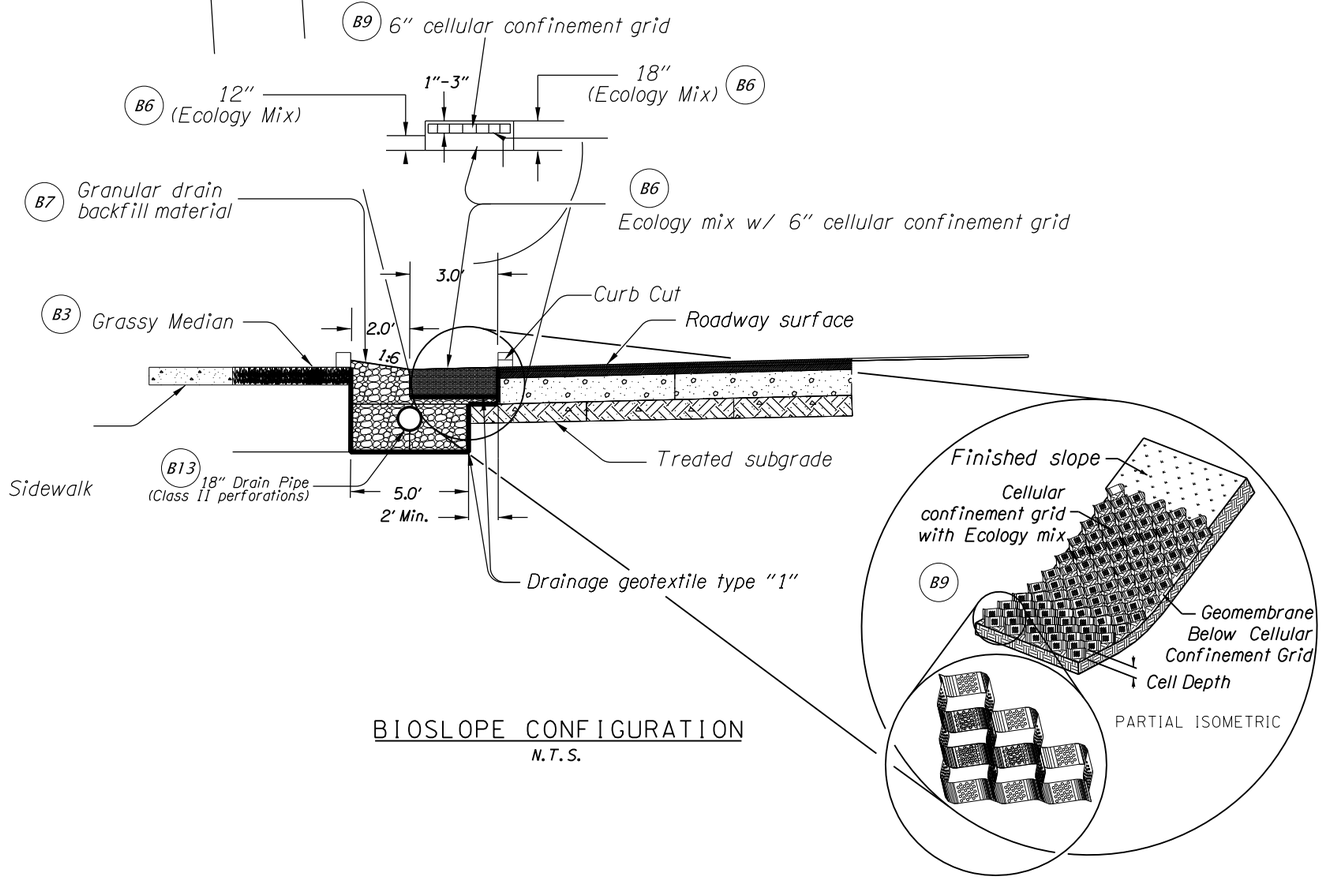




BIOSLOPE CONFIGURATION
N.T.S.

Sht. 01 of 01

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Dan Gunther

Drafted By: Zoe Keve

DFI D01056
MAINTENANCE DISTRICT 2B HWY 081
Water Quality Bioslope
Highway MP 10.61 to 10.71
Clackamas County

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 44V-034

These plans are not available at ODOT Map Center but this is the correct set.

44V-034

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

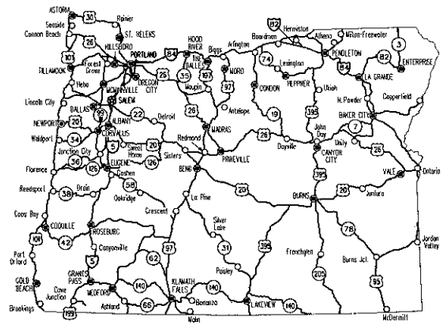
SCOPE OF WORK

OR99E: MP 10.61-MP 10.71 SEC. 19405-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1)

PACIFIC HIGHWAY EAST

CLACKAMAS COUNTY

JANUARY 2011



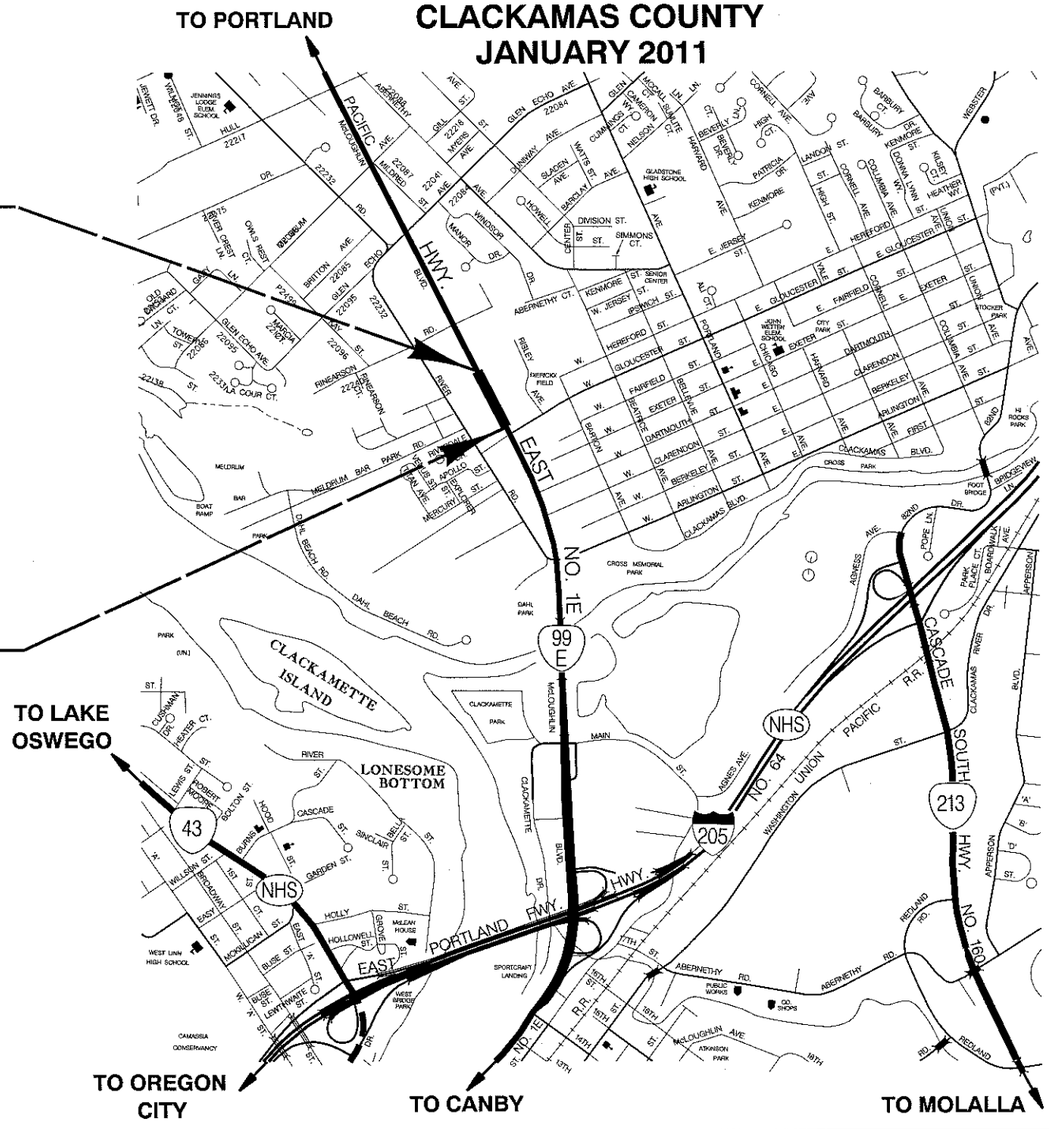
Overall Length Of Project - 0.10 Miles

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.)

SAFETY FIRST
LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

END OF PROJECT
STA. "L" 74+40.54 (M.P. 10.61)

BEGINNING OF PROJECT
STA. "L" 69+00.66 (M.P. 10.71)



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

OR99E: MP 10.61-MP 10.71 SEC. 19405-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1) PACIFIC HIGHWAY EAST CLACKAMAS COUNTY		
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STATE	1

INDEX OF SHEETS, CONT'D.	
SHEET NO.	DESCRIPTION
2	Typical Sections
2B	Details
3	Removal Plan
3A	General Construction Plan
3B	Drainage & Utilities
	GEO/HYDRO
GJ & GJ-2	Water Quality Details
	TRAFFIC SIGNALS
15742	Legend/Details
15743	Removal Plan
15744	Detector Plan
15745	Existing Utilities Plan

Standard Drg. Nos.

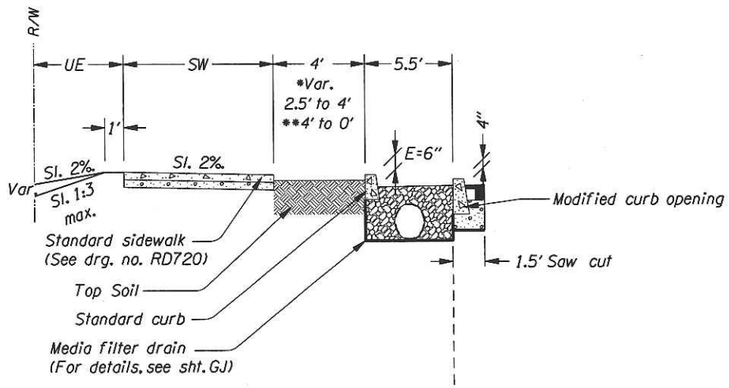
RD258	- Valve Box And Operator Extension Assembly
RD366	- Concrete Inlets
RD700	- Curbs
RD715	- Approaches And Non-Sidewalk Driveways
RD720	- Sidewalks
RD725	- Separated Sidewalk Driveways or Alleys
RD740	- Separated Sidewalk Driveways - Local Jurisdictions
TM472	- Traffic Signal Junction Boxes
TM475	- Loop Details
TM480	- Loop Entrance Details
TM677	- Sign Mounts
TM681, TM687, TM688	- Square Tube Sign Supports
TM800	- Tables, Abrupt Edge And PCMS Details
TM820	- Temporary Barricades
TM821	- Temporary Sign Supports
TM840	- Closure Details
TM843	- Intersection Details

R/W Map No.

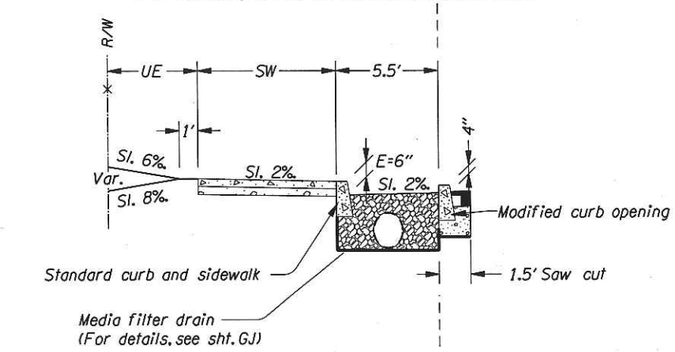
Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/standard drawings home.shtml

OR99E: MP 10.61-MP 10.71 SEC.
19405-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1)
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

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



STA. "L" 70+48.73 To STA. "L" 74+30.60
* "L" 70+48.73 To STA. "L" 70+78.96
** "L" 74+13.14 To STA. "L" 74+30.60
(For surfacing details not shown, see section below)



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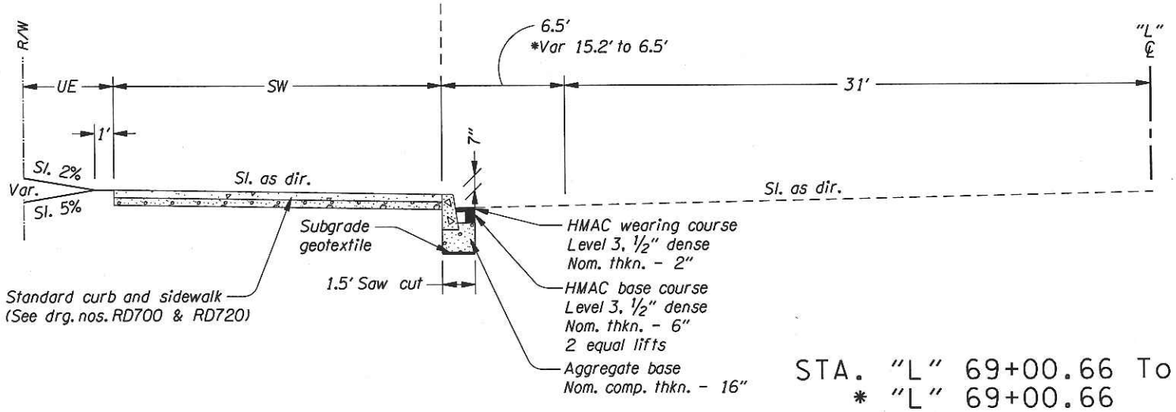


STA. "L" 69+00.66 To STA. "L" 74+40.54
* "L" 69+00.66 "L" 70+78.96

STA.	To	STA.	UE
69+00.66		69+16.61	6.1' to 6.9'
69+16.61		69+33.93	6.9' to 5'
69+33.93		74+28.38	5'
74+28.38		74+34.71	5' to 10.3'
74+34.71		74+40.54	10.3'

STA.	To	STA.	SW
69+00.66		69+16.61	7.5'
69+16.61		69+33.93	7.5' to 10.3'
69+33.93		69+79.93	10.3' to 12.6'
69+79.93		70+48.73	7.1' to 10.5'
70+48.73		71+37.54	8'
71+37.54		71+71.54	17.5'
71+71.54		72+26.42	8'
72+26.42		72+65.42	17.5'
72+65.42		74+40.54	8'

NOTE:

1. Sections are not to scale unless otherwise noted.
3. See GJ sheets for modified curb opening details.
2. 4" aggregate base shall be provided for all proposed sidewalk.

REGISTERED PROFESSIONAL ENGINEER
14468
Lawrence A Krettler
OREGON
JULY 26, 1989
LAWERENCE A. KRETTLER

RENEWAL DATE: 6-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

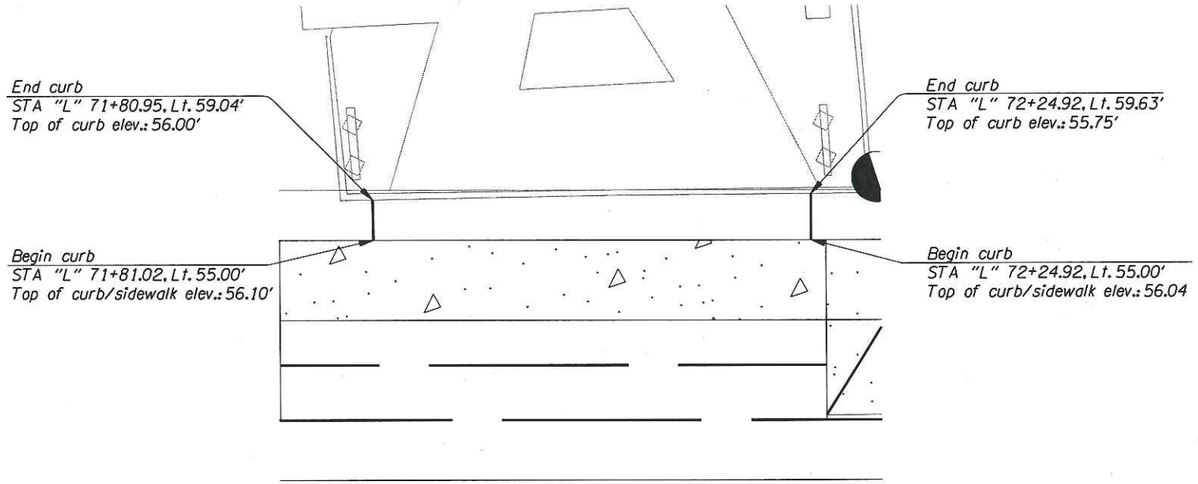
REGION 1 - ROADWAY ENGINEERING SECTION

OR99E: MP 10.61-MP 10.71 SEC.
19405-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1)
PACIFIC HWY. EAST
CLACKAMAS COUNTY

Design Team Leader - Lawerence A. Krettler
Designed By - Marco Singer
Drafted By - Marco Singer

TYPICAL SECTIONS

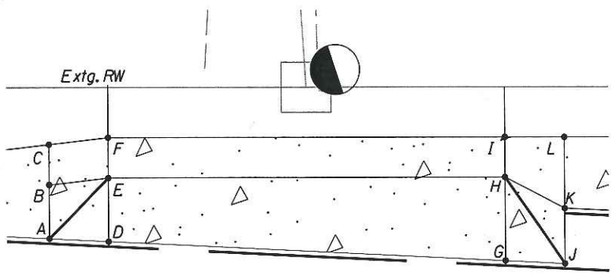
SHEET NO. 2



NOTE:

1) Top of proposed curb to be flush with proposed sidewalk and existing curb.

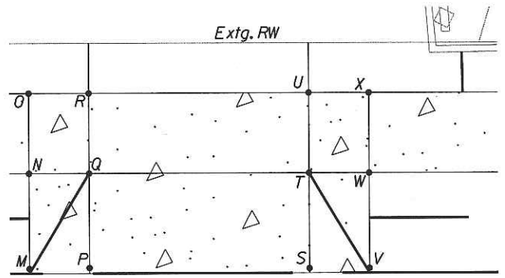
CURB LAYOUT DETAIL #1
NOT TO SCALE



DRIVEWAY #1 LAYOUT DETAIL
NOT TO SCALE

DRIVEWAY #1

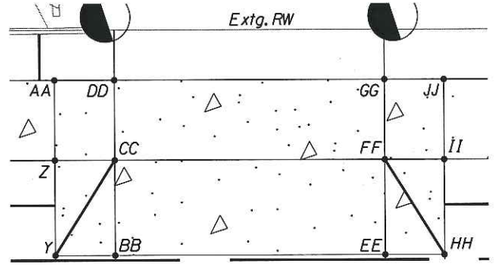
POINT	STATION	OFFSET (ft.)	FINISH GRADE ELEVATION (ft.)
A	69+27.93	44.94	54.89
B		50.30	54.99
C		54.32	55.07
D	69+33.93	44.65	54.32
E		50.97	54.91
F		55.00	54.99
G	69+73.93	42.67	54.54
H		51.00	55.12
I		55.00	55.20
J	69+79.93	42.38	55.16
K		47.88	55.20
L		55.00	55.26



DRIVEWAY #2 LAYOUT DETAIL
NOT TO SCALE

DRIVEWAY #2

POINT	STATION	OFFSET (ft.)	FINISH GRADE ELEVATION (ft.)
M	71+37.54	37.50	55.73
N		47.00	55.91
O		55.00	56.07
P	71+43.54	37.50	55.44
Q		47.00	55.54
R		55.00	55.62
S	71+65.54	37.50	55.50
T		47.00	55.60
U		55.00	55.68
V	71+71.54	37.50	55.82
W		47.00	55.74
X		55.00	55.82



DRIVEWAY #3 LAYOUT DETAIL
NOT TO SCALE

DRIVEWAY #3

POINT	STATION	OFFSET (ft.)	FINISH GRADE ELEVATION (ft.)
Y	72+26.42	37.50	55.71
Z		47.00	55.80
AA		55.00	55.88
BB	72+32.42	37.50	55.39
CC		47.00	55.48
DD		55.00	55.56
EE	72+59.42	37.50	55.40
FF		47.00	55.50
GG		55.00	55.58
HH	72+65.42	37.50	56.75
II		47.00	55.66
JJ		55.00	55.82

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RENEWAL DATE: 6-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - ROADWAY ENGINEERING SECTION

OR99E: MP 10.61-MP 10.71 SEC.
19405-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1)
PACIFIC HWY. EAST
CLACKAMAS COUNTY

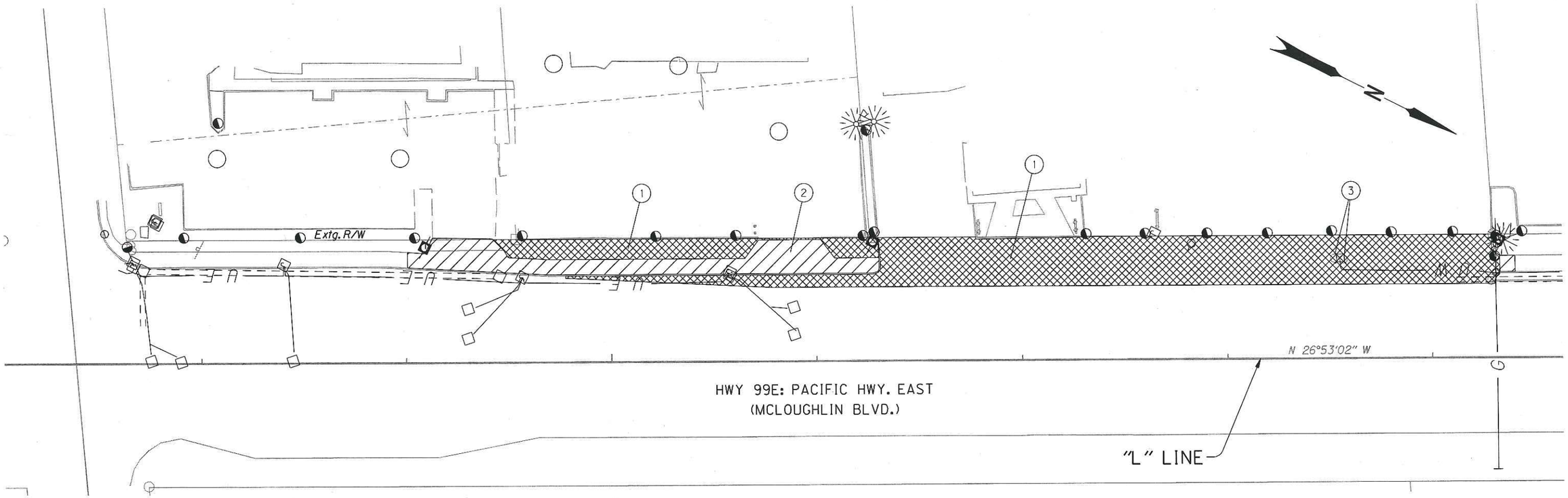
Design Team Leader - Lawerence A. Krettler
Designed By - Marco Singer
Drafted By - Marco Singer

DETAILS

SHEET NO. 2B

Sec. 19, T. 2S, R. 2E, W.M.

44V-034



(1) *Remove pvmt., shown thus:* ⊠

(2) *Remove curb & sidewalk, shown thus:* ▨

(3) *Remove bollard - 2*

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14468
OREGON
JULY 26, 1989
LAWERENCE A. KRETTLER

RENEWAL DATE: 6-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - ROADWAY ENGINEERING SECTION

19405-65 McLOUGHLIN BLVD.
PACIFIC HWY. EAST
CLACKAMAS COUNTY

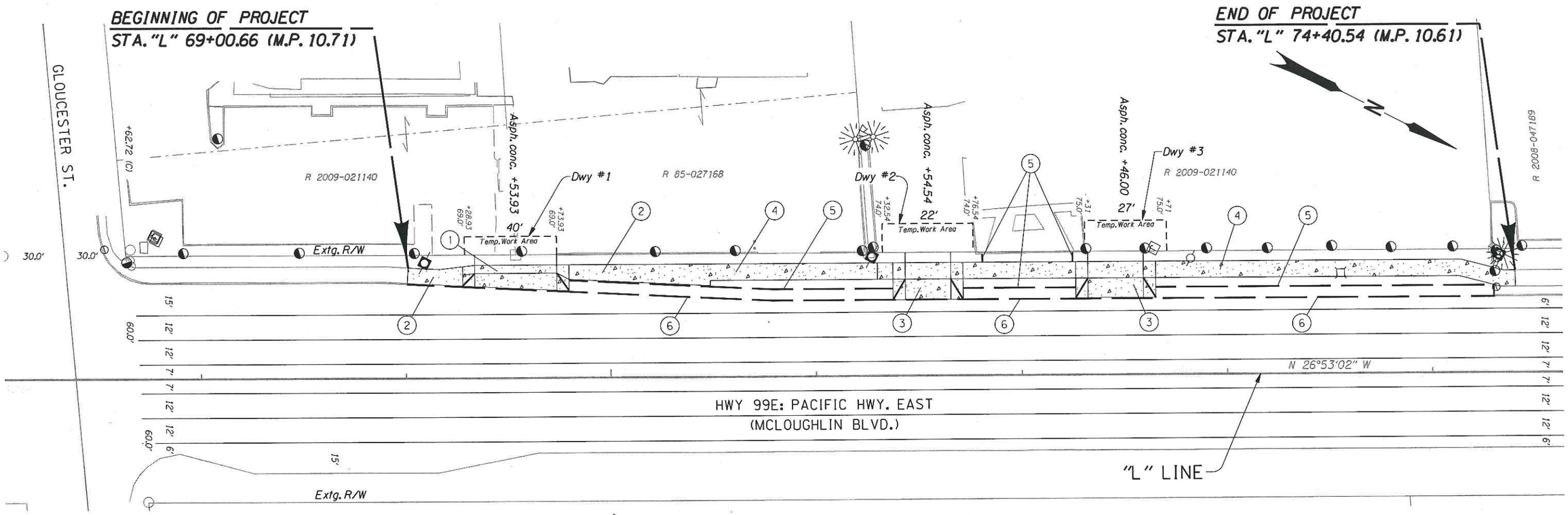
Design Team Leader - Lawerence A. Krettler
Designed By - Marco Singer
Drafted By - Marco Singer

REMOVAL PLAN

SHEET NO. 3

Sec. 19, T. 2S, R. 2E, W.M.

44V-034



(1) Const. P.C. conc. dwy., option H
Const. asph. conc. connection
(For details, see sht. 2B)
(See drg. nos. RD715, RD740)

(2) Const. curb and sidewalk
(See drg. no. RD720)

(3) Const. P.C. conc. dwy., option J - 2
Const. asph. conc. connection
(For details, see sht. 2B)
(See drg. no. RD740)

(4) Const. P.C. conc. sidewalk
(See drg. no. RD720)

(5) Const. standard curb
(For details, see sht. 2B)
(See drg. no. RD700)

(6) Const. modified curb opening
(For details, see shts. GJ & GJ-2)

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RENEWAL DATE: 6-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - ROADWAY ENGINEERING SECTION

19405-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1) SEC.
PACIFIC HWY. EAST
CLACKAMAS COUNTY

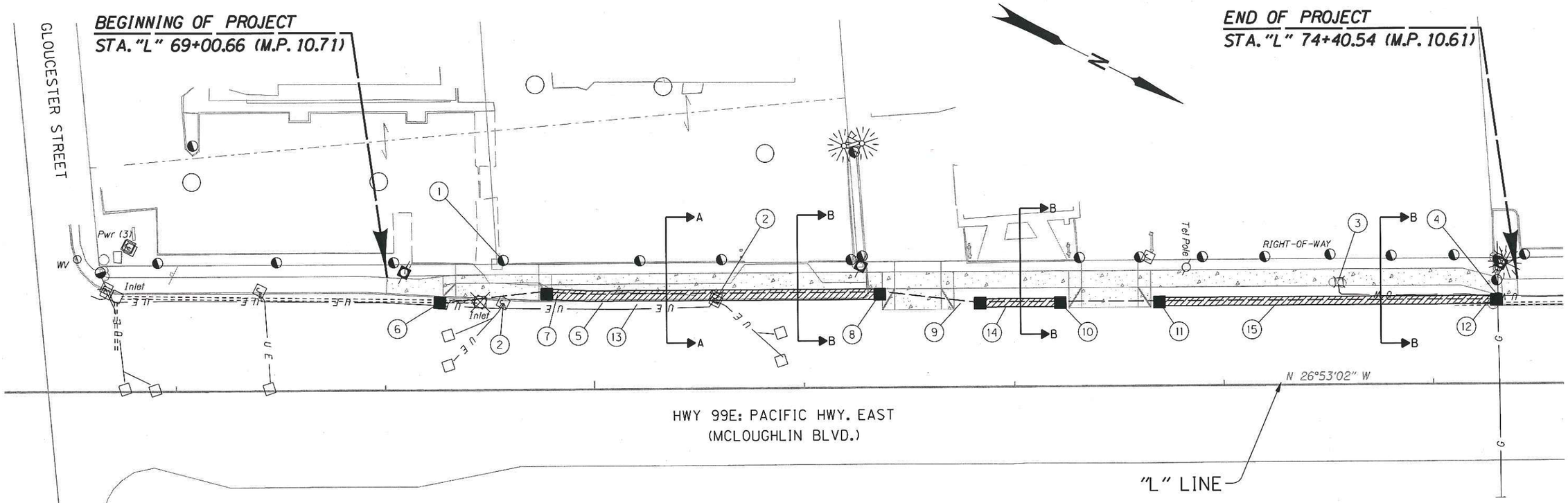
Design Team Leader - Lawerence A. Krettler
Designed By - Marco Singer
Drafted By - Marco Singer

GENERAL CONSTRUCTION

SHEET NO. 3A

Sec. 19, T. 2S, R. 2E, W.M.

44V-034



(1) *Relocate utility pole (By others)*

(2) *Relocate junction box - 2 (for details, see sheet XX.XX)*

(3) *Adjust water meter*

(4) *Adjust water valve (See drg. no. RD258)*

(5) *Sta. "L" 69+79.93 to 74+30.62 Construct modified curb opening, option 1-30 Place on 8' centers (except driveways) (For details, see sht. GJ-2)*

(6) *Sta. "L" 69+24.76, 41.73 Rt. Const. CG-2 inlet around extg. SD pipe (See drg. no. RD366)*

(7) *Sta. "L" 69+81.93, 45.15 Rt. Const. type "PVC" inlet (For details, see sht. GJ) Inst. 18" sew. pipe - 58.1' I.E. (out) 51.76*

(8) *Sta. "L" 71+35.54, 40.08 Rt. Const. type "PVC" inlet (For details, see sht. GJ)*

(9) *Sta. "L" 71+73.54, 39.88 Rt. Const. type "PVC" inlet Inst. 18" sew. pipe - 40.2' I.E. (out) 52.73*

(10) *Sta. "L" 72+24.42, 39.87 Rt. Const. type "PVC" inlet (For details, see sht. GJ)*

(11) *Sta. "L" 72+67.42, 39.89 Rt. Const. type "PVC" inlet Inst. 18" sew. pipe - 72.8' I.E. (out) 52.68*

(12) *Sta. "L" 74+28.61, 39.81 Rt. Const. type "PVC" inlet (For details, see sht. GJ)*

(13) *Sta. "L" 69+79.93 to 71+37.54 Const. MFD - 157.6' (For details, see sht. GJ)*

(14) *Sta. "L" 71+71.54 to 72+26.42 Const. MFD - 54.9' (For details, see sht. GJ)*

(15) *Sta. "L" 72+65.42 to 74+30.61 Const. MFD - 165.2' (For details, see sht. GJ)*

Remove inlet shown thus: ⊠

Plug and abandon pipe shown thus: ⊟

▨ = *Media Filter Drain (MFD)*

REGISTERED PROFESSIONAL ENGINEER
17,573
OREGON
JAN 19, 1995
DANIEL C. GUNTHER

RENEWS: 06-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

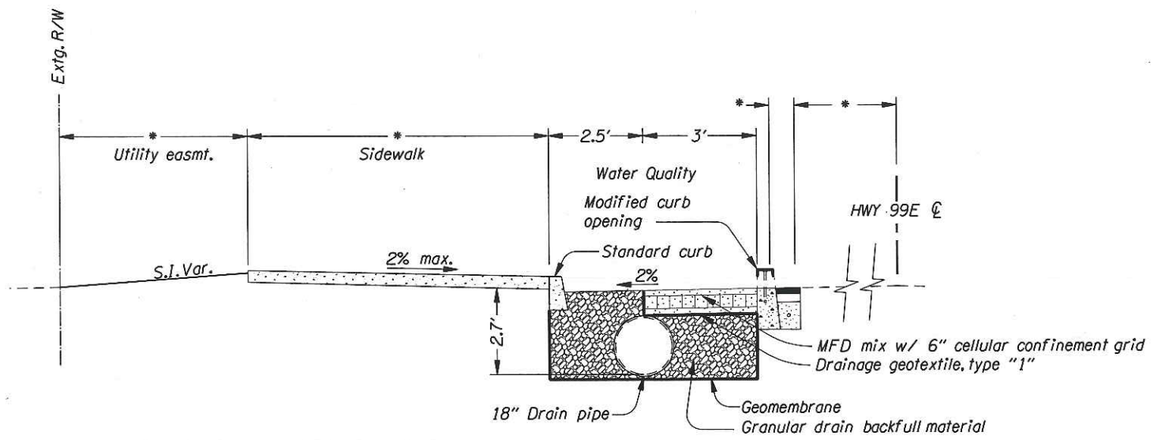
99E: MP 10.61-MP 10.71 SEC.
19405-65 McLOUGHLIN BLVD (AMF-0911-500K-R1.1)
PACIFIC HWY. EAST
CLACKAMAS COUNTY

Reviewed by - Ed Foltyn
Designed by - Daniel Gunther
Drafted by - Daniel Gunther

DRAINAGE & UTILITIES

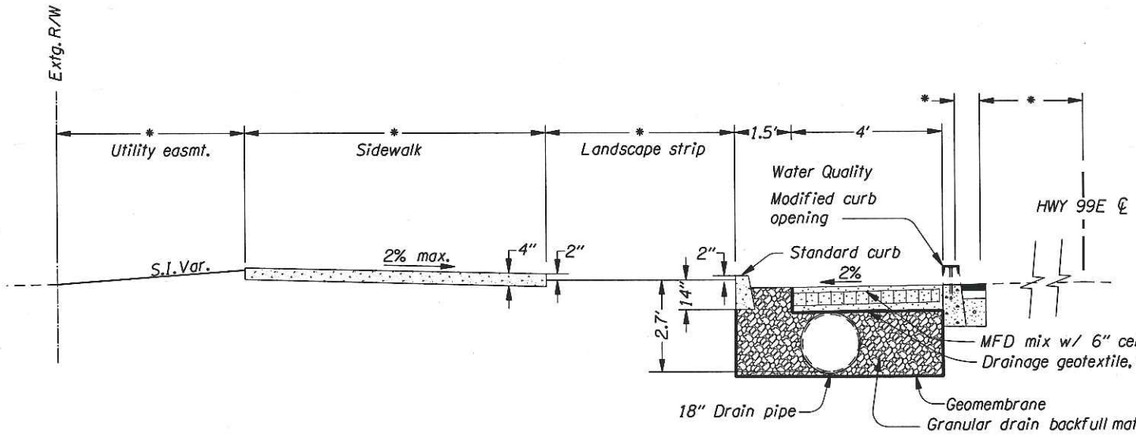
SHEET NO. 3B

Media Filter Drain (MFD) Detail

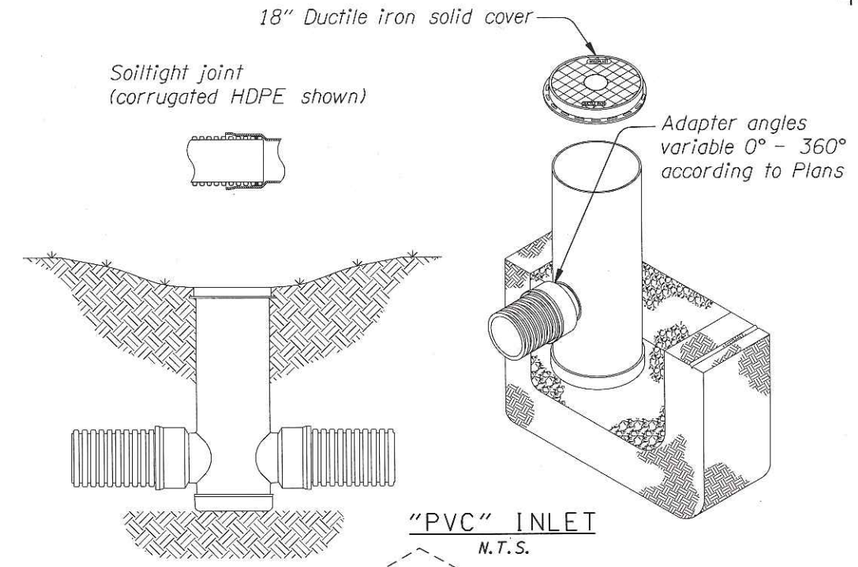


* See the Roadside Development Plan Sheet No. 2 for the sidewalk, planter strip, and utility strip widths.

SECTION A-A

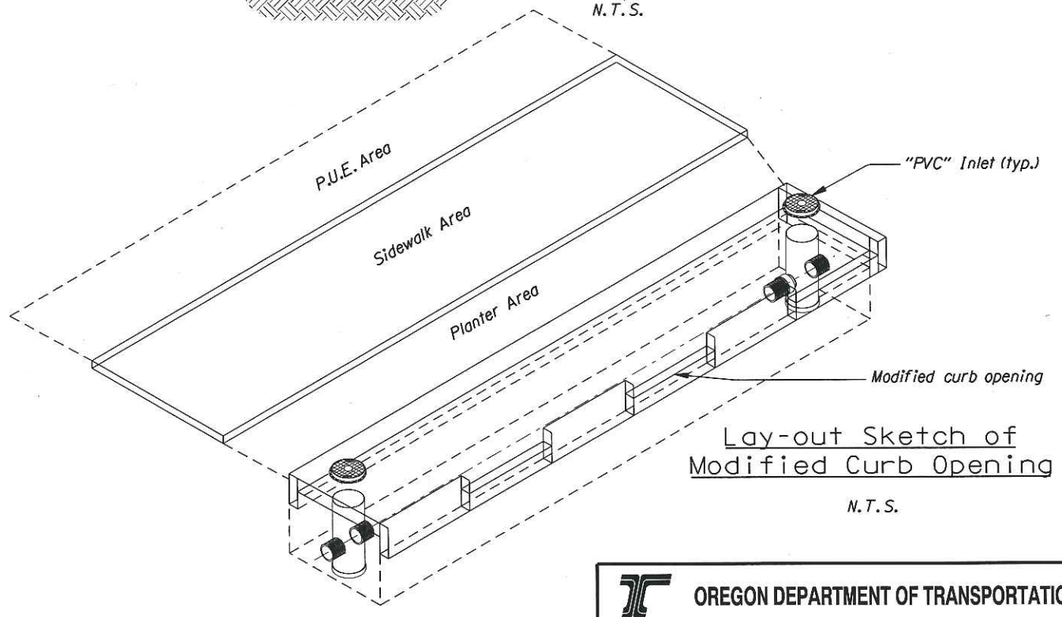


SECTION B-B



"PVC" INLET

N.T.S.



Lay-out Sketch of Modified Curb Opening

N.T.S.

REGISTERED PROFESSIONAL ENGINEER
17,573
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RENEWS: 06-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

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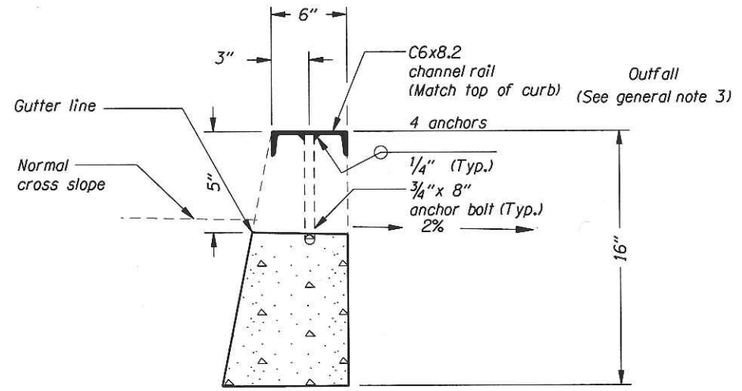
PACIFIC HWY. EAST
CLACKAMAS COUNTY

Reviewed by - Ed Foltyn
Designed by - Daniel Gunther
Drafted by - Daniel Gunther

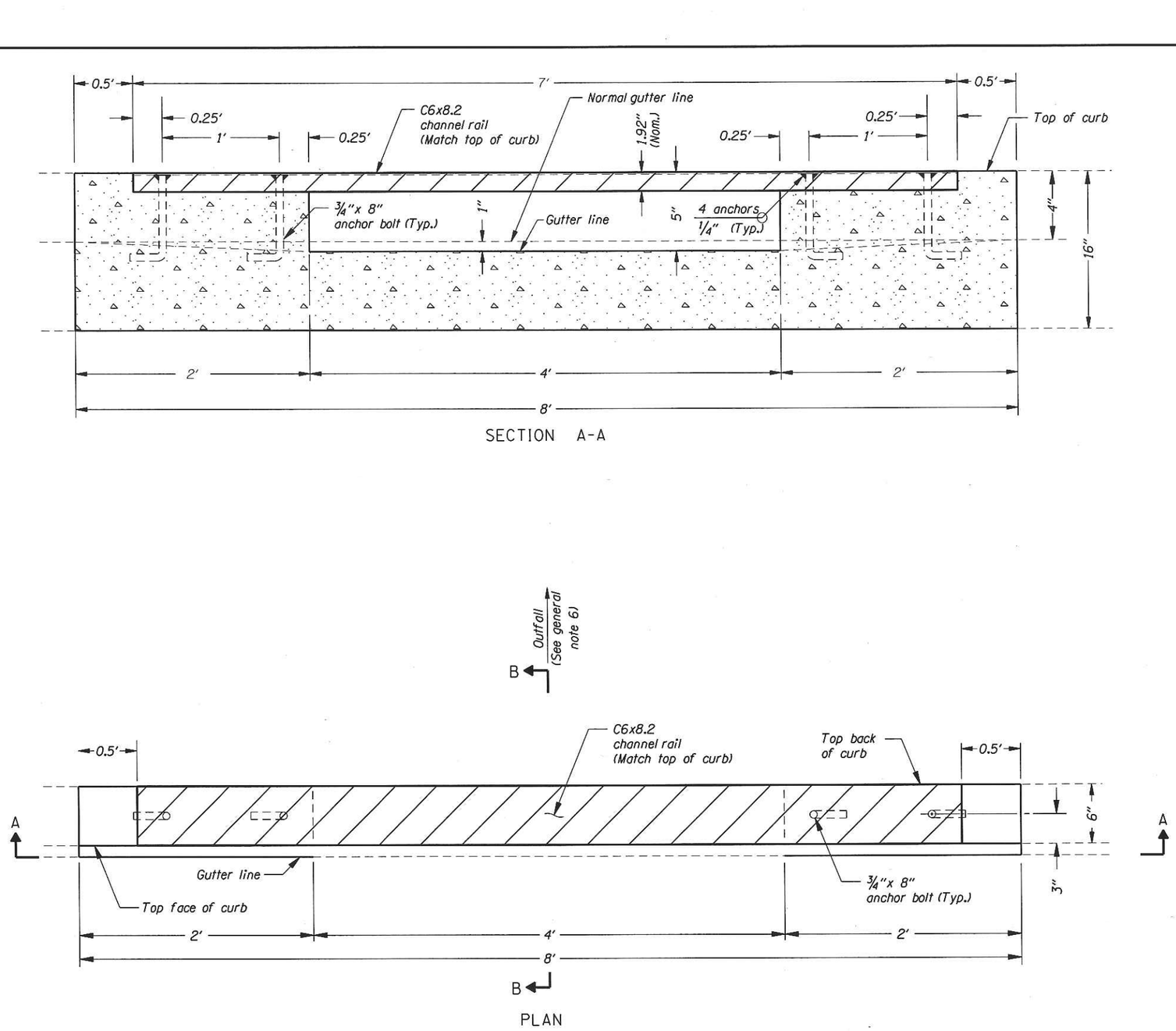
WATER QUALITY DETAILS

SHEET NO. GJ

SECTION A-A



SECTION B-B



PLAN

GENERAL NOTES FOR ALL DETAILS:

1. This structure shall be monolithic Commercial Grade Concrete.
2. Hot-dip galvanize C6x8.2 channel and anchor bolts after fabrication.
3. For outfall to water quality, see sht. GJ.

Modified Curb Opening, Option 1

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17,573
OREGON
JAN 19, 1995
DANIEL C. GUNTHER

RENEWS: 06-30-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

US30: SWEDETOWN ROAD - JCT OR-47 SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Reviewed by - Ed Foltyn
Designed by - Daniel Gunther
Drafted by - Daniel Gunther

WATER QUALITY DETAILS

SHEET NO. GJ-2

LEGEND/DETAILS
PACIFIC HWY. EAST AT GLOUCESTER ST
OR99E. M.P. 10.75
(GLADSTONE)

L E G E N D

C O N T R O L L E R S

(EX C) Retain and protect existing controller and cabinet

J U N C T I O N B O X E S

(EX J1) Retain and protect existing 17"x10"x12" precast concrete junction box

(RX JB) Remove existing junction box

(JB 1) Install 17"x10"x12" (min. dimension) precast concrete junction box

(SP S) Install 6" max. sand pocket block-out with (S=size) inch conduit to junction box

(N LW) Install (N=number) pair of loop wires

L O O P S / C A M E R A S

(AX LPh) Abandon existing phase (Ph = phase) vehicle detector loop

(LD Ph) Install phase (Ph=phase) 6' round or 4' diamond vehicle detector loop

(LF X-Ph) Install (X=number of cables) phase (Ph=phase) loop feeder cables

(RX FPh) Remove existing phase (Ph=phase) loop feeder cable

(EX LPh) Retain and protect existing phase (Ph=phase) vehicle detector loop

(EX FPh) Retain and protect existing phase (Ph=phase) loop feeder cable

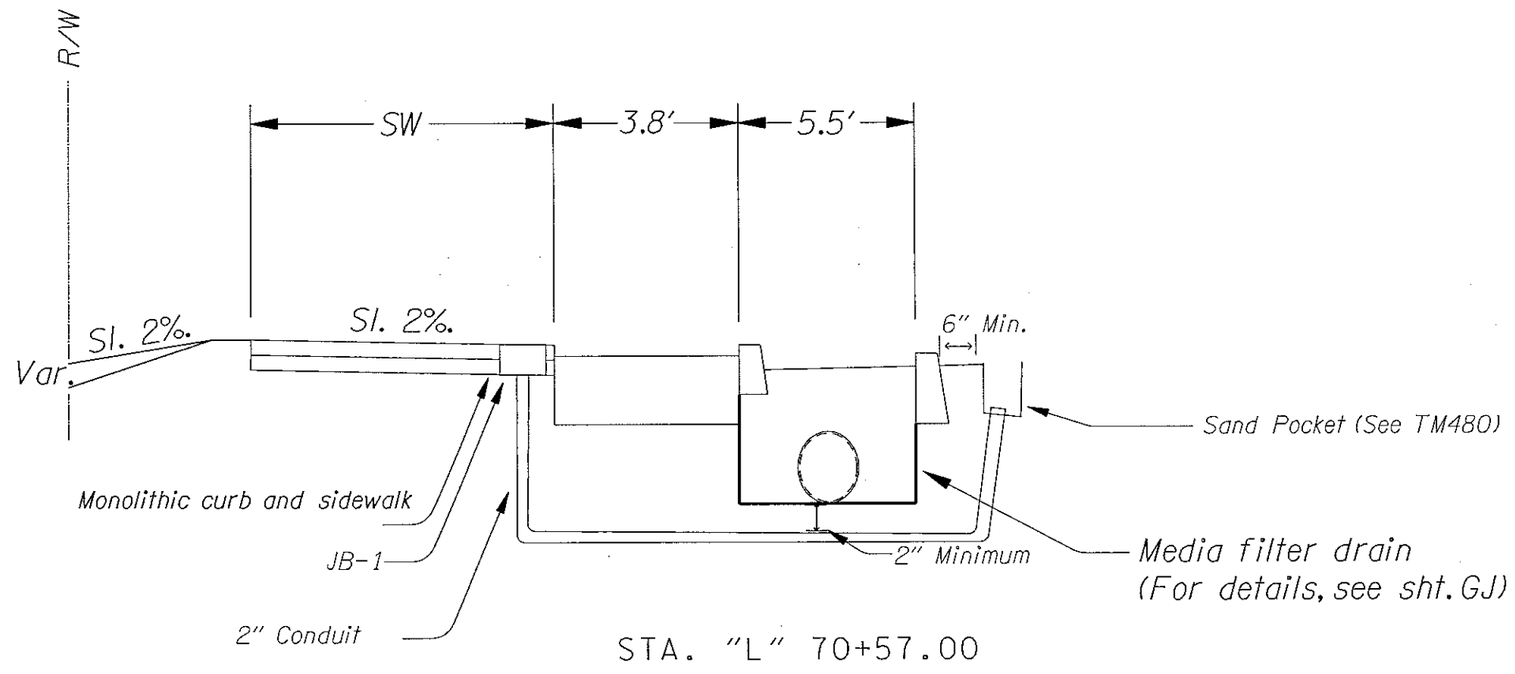
C O N D U I T S

(EX DC S) Retain and protect existing (s=size) detector conduit

(AX C) Abandon existing conduit

(S) Install (S=size) inch electrical conduit

(CJ) Splice new electrical conduit to existing electrical conduit



STA. "L" 70+57.00

NOTE:
See T.R.S. Dwg. 15743 Thru 15745 for Signal and Detector Plans

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER 48,097 JULY 21, 1998 OREGON JORDON R. ORSER Expires Dec. 31, 2010

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 1 TRAFFIC UNIT

OR99E: MP 10.61 - 10.71 SEC.
19495-65 McLOUGHLIN BLVD. (AMF-0911-500K-R1.1)
Pacific Highway East
Clackamas County

DESIGNED BY: Jeffrey Hayes
REVIEWED BY: Jordon Orser
DRAWN BY: Jeffrey Hayes
FC: 081 MP:10.75

ACCOMPANIED BY DWGS. TM472, TM475, TM480, and T.R.S. Dwgs 15743 - 15745

LEGEND/DETAILS

ISSU NO. 2B022 T.R.S. DWG. NO. 15742

REMOVAL PLAN
PACIFIC HWY. EAST AT GLOUCESTER ST
OR99E, M.P. 10.75
(GLADSTONE)

GLOUCESTER STREET

PACIFIC HIGHWAY EAST

R/W

64 66 67 69 71

NOTE:
See T.R.S. Dwg. 15742 for Legend

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER
48,097
JORDON R. ORSER
OREGON
JULY 21, 1998
Expires Dec. 31, 2010

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Pacific Highway East
Clackamas County

DESIGNED BY: Jeffrey Hayes
REVIEWED BY: Jordon Orser
DRAWN BY: Jeffrey Hayes
FC: 081 MP: 10.75

REMOVAL PLAN

TSSU NO. 2B022 T.R.S. DWG. NO. 15743

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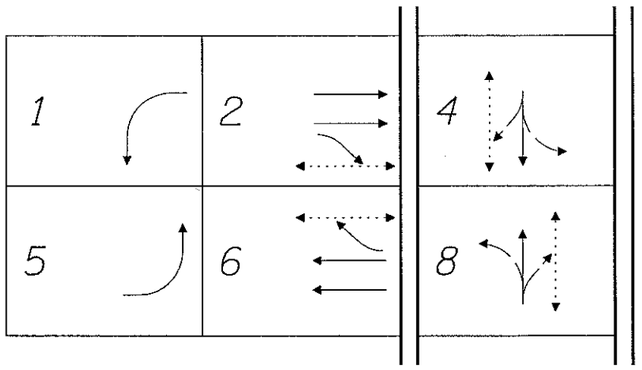
DETECTOR PLAN
PACIFIC HWY. EAST AT GLOUCESTER ST
OR99E, M.P. 10.75
(GLADSTONE)



NORMAL PHASE ROTATION

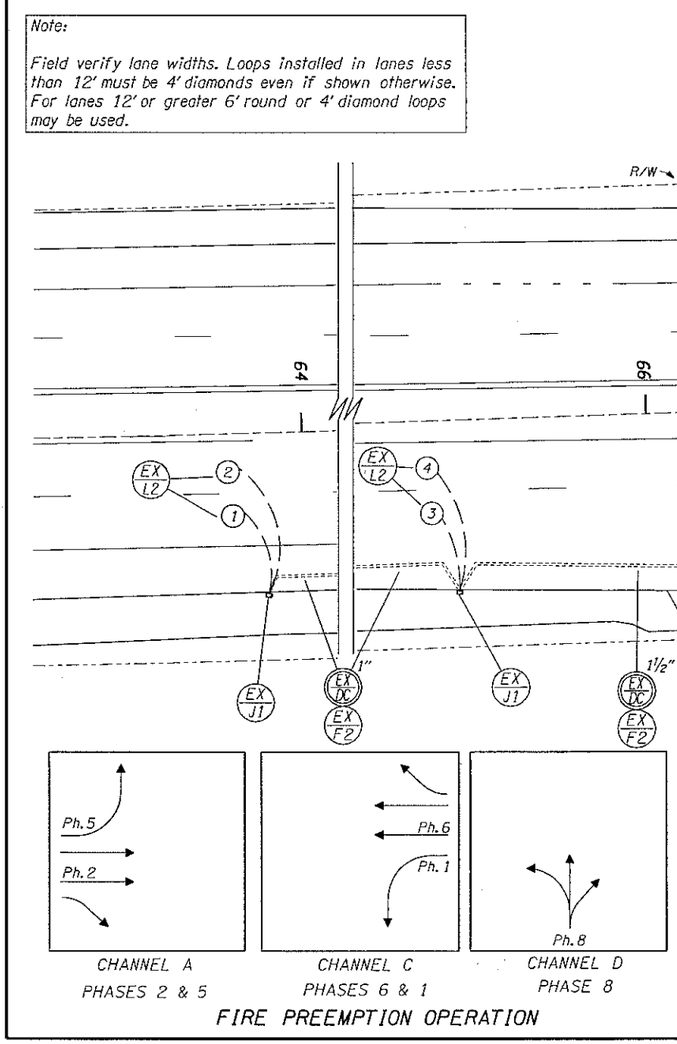
Loop Number	Distance Feet	Phase	Slot	
1	320	2	I2U	
2	320	2	I2L	
3	160	2	I3U	
4	160			No Work
5	75	5	J1U	
6	15	5	J9U	
7	5			No Work
8	75	4	I6U	
9	15	4	I6L	
10	5			No Work
11	320	6	J2U	
12	320	6	J2L	
13	160	6	J3U	
14	160	6	J4U	Controller Cabinet
15	75	1	I1U	
16	15	1	I9U	
17	5			No Work
18	75	4	J6L	
19	15	4	J6U	
20	5			No Work

LOOP DETECTOR WIRING DIAGRAM

"Distance" is from Stop Line to center of loop in feet

Note:

Field verify lane widths. Loops installed in lanes less than 12' must be 4' diamonds even if shown otherwise. For lanes 12' or greater 6' round or 4' diamond loops may be used.



CHANNEL A PHASES 2 & 5 | CHANNEL C PHASES 6 & 1 | CHANNEL D PHASE 8

FIRE PREEMPTION OPERATION

NOTE:
See T.R.S. Dwg. 15742 for Legend

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER 48,097 OREGON JULY 21, 1998 JORDON R. ORSER Expires Dec. 31, 2010

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 1 TRAFFIC UNIT

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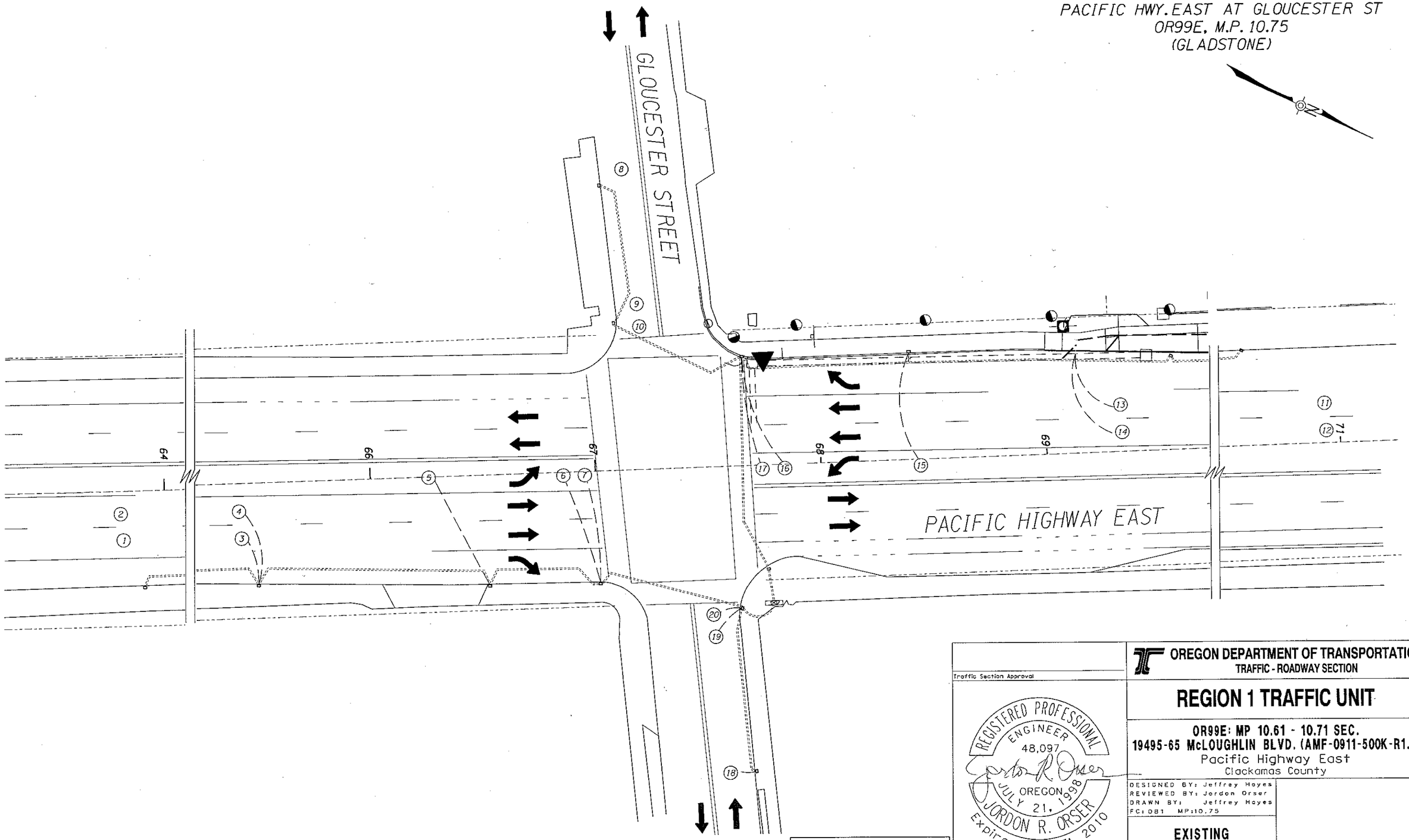
Pacific Highway East
Clackamas County

DESIGNED BY: Jeffrey Hayes
REVIEWED BY: Jordon Orser
DRAWN BY: Jeffrey Hayes
FC: 081 MP:10.75

DETECTOR PLAN

TSSU NO. 2B022 T.R.S. DWG. NO. 15744

EXISTING UTILITY PLAN
PACIFIC HWY. EAST AT GLOUCESTER ST
OR99E, M.P. 10.75
(GLADSTONE)



NOTE:
See T.R.S. Dwg. 15742 for Legend

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER
48,097
OREGON
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Pacific Highway East
Clackamas County

DESIGNED BY: Jeffrey Hayes
REVIEWED BY: Jordon Orser
DRAWN BY: Jeffrey Hayes
FC: OB1 MP:10.75

EXISTING UTILITIES PLAN

TSSU NO. 2B022 T.R.S. DWG. NO. 15745

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