OPERATION & MAINTENANCE MANUAL

Water Quality Filter Strip

Manual prepared: February 2020

DFI No. D01211

Figure 1: DFI No. D01211, looking West [Placeholder for Future Photo]

1. Identification

Drainage Facility ID (DFI):	D01211
Facility Type:	Water Quality Filter Strip
Construction Drawings:	(V-File Numbers) 52V-27
Location:	District: 05 Highway No.: 069 AN1 Mile Post: 9.98 to 9.89, Right Side within Loop Ramp

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: East

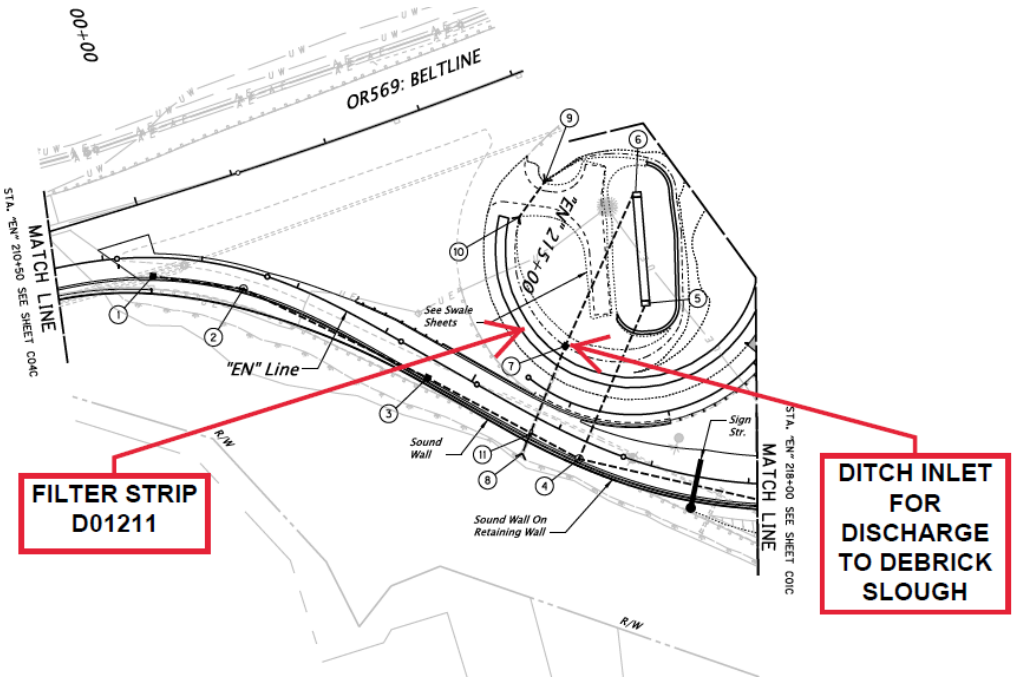


Figure 2: Filter Strip D01211 Location

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 length and width of the applicable facility components are:

Component	Length (feet)	Width (feet)
Filter Strip	627	10

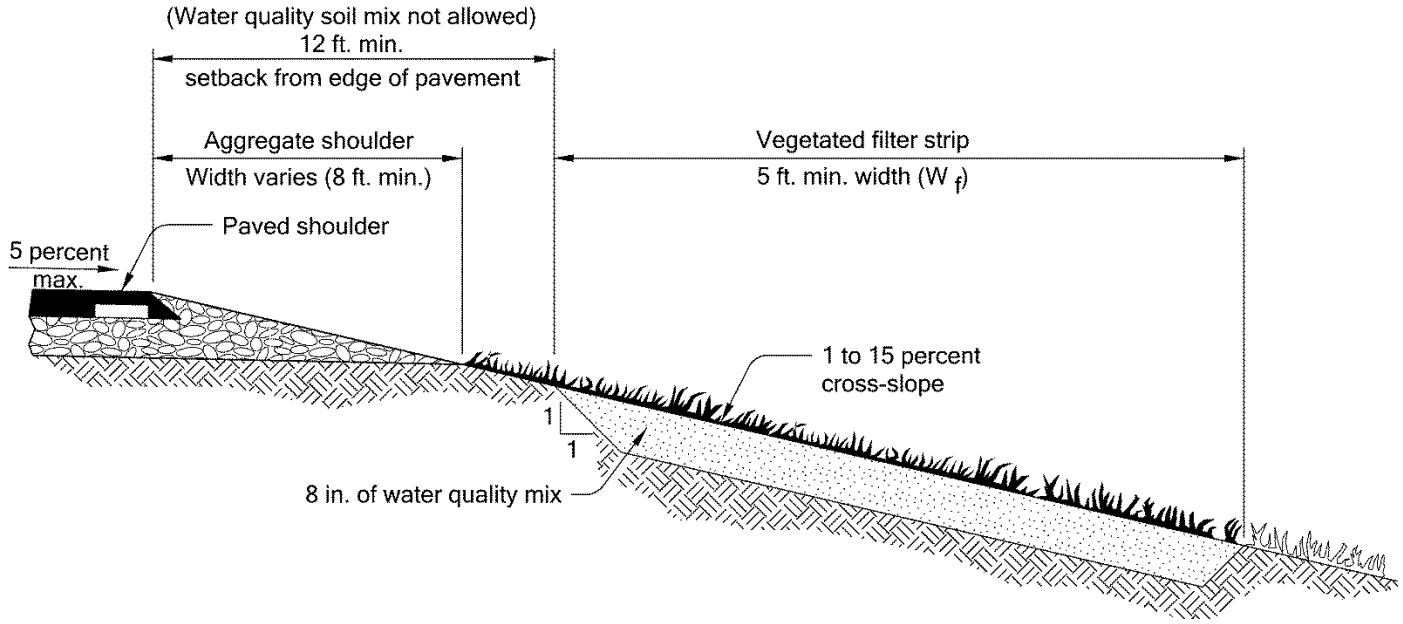


Figure 3: Filter Strip Section

The slope of the facility is presented by a vertical distance (rise) followed by the horizontal distance (run).

Side Slope	Rise (feet)	Run (feet)
Filter Strip	**0.50**	**10**

Site Specific Information:

Maintenance vehicles can park next to the filter strip along the Delta Highway shoulder. Heavy equipment should be kept off the filter strip

5. Facility Access

Maintenance access to the facility:

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

Figure 4: [Placeholder pending facility construction]

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 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: Bioslope/Filter Strip 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**
Geocell 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**

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 4 (Water Quality Filter Strips)

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

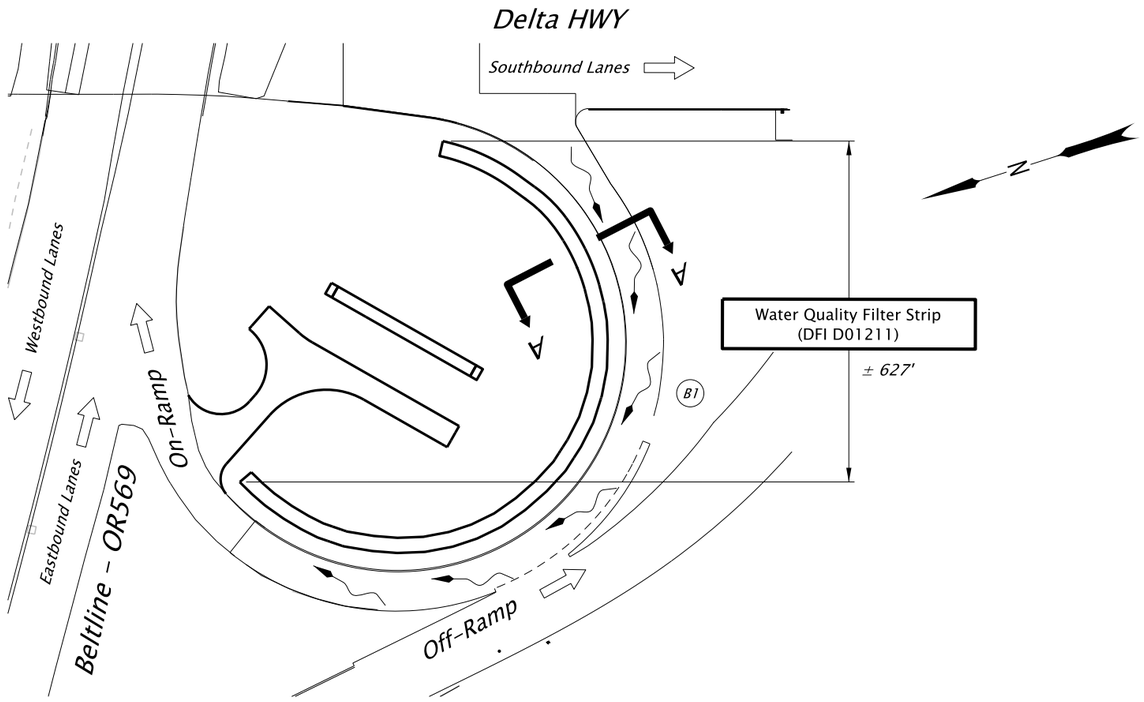
Contact any of the following for more detailed information about management of waste materials found on site:

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

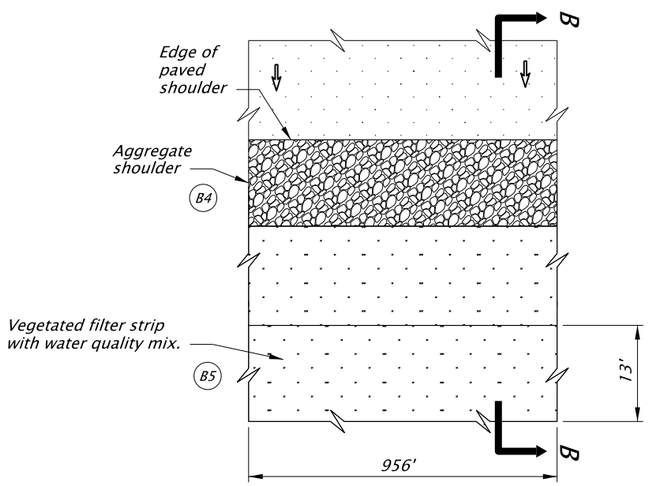
A Appendix A – Site Specific Operational Plan

Contents:

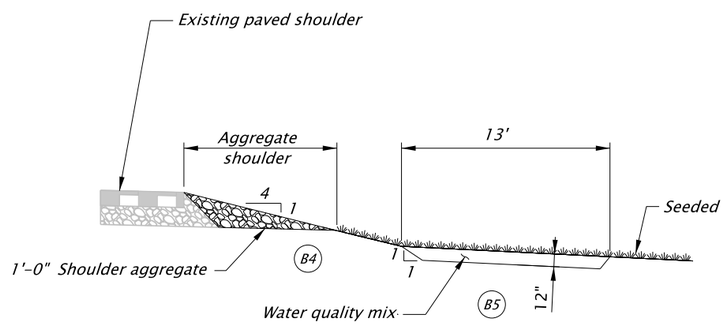
Operational Plan: DFI D01211



PLAN
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:

- B# — Swale Component (See Table 1 in O&M Manual)
- Manhole
- Inlet
- Storm Pipe (Facility)
- Conveyance Direction
- Pavement / Facility Flow Path
- Highway Lane Direction

WATER QUALITY FILTER STRIP
N.T.S.

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: R. Attenasio

Drafted By: M. Wainscott

DFI D01211
MAINTENANCE DISTRICT 05 HWY OR569
WATER QUALITY BIOFILTRATION SWALE
BELTLINE HIGHWAY
LANE COUNTY

DFI_D00006.dgn

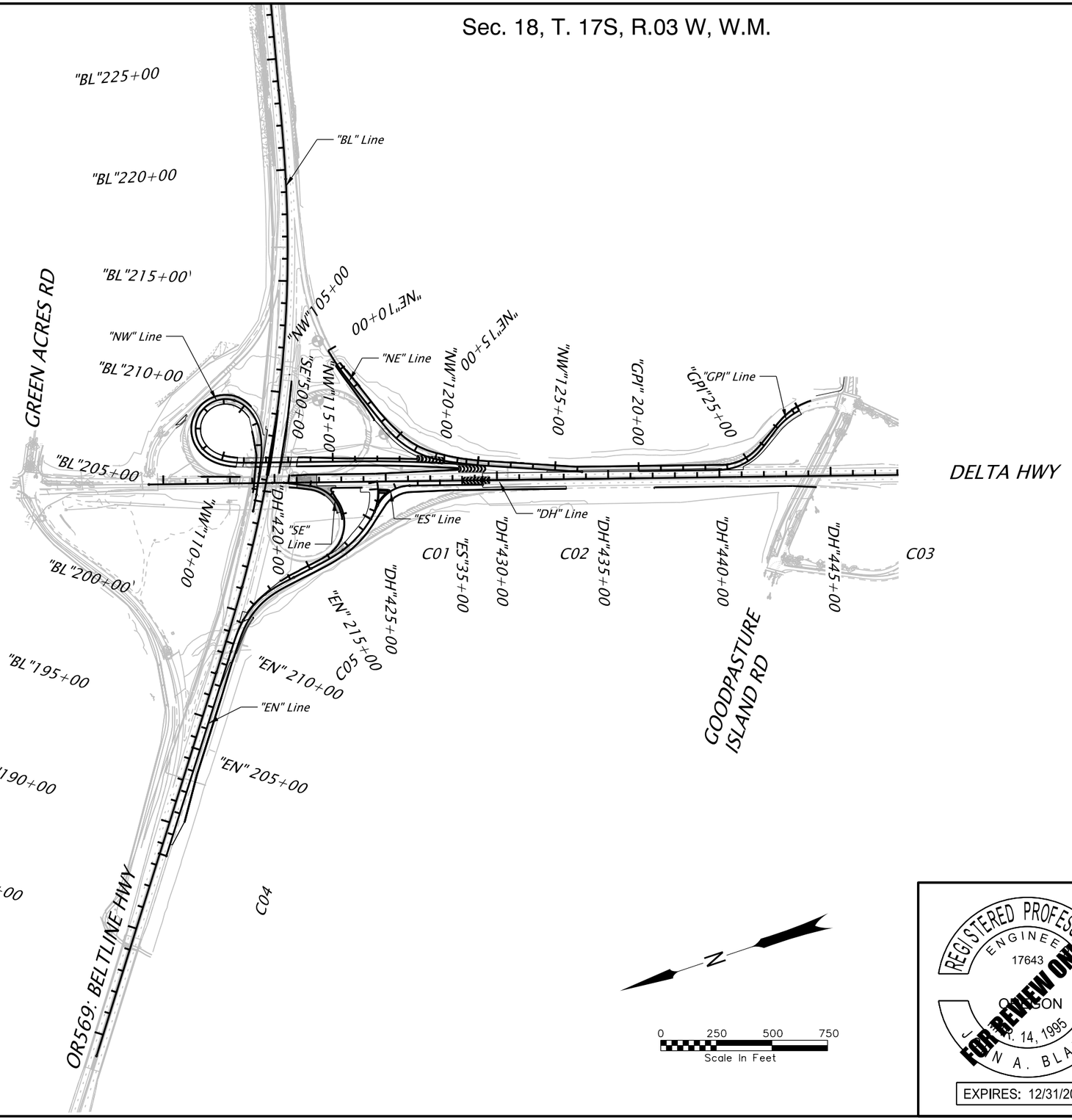
B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 52V-27

Sec. 18, T. 17S, R.03 W, W.M.

52V-27



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OR569: BELTLINE @ DELTA HIGHWAY - INTERCHANGE SEC.

BELTLINE HIGHWAY
LANE COUNTY

Designer: B. Niameogo
Drafter: M. Wainscott
Reviewer: S. Litchfield
Checker: J. Bland

PLAN SHEET LAYOUT

SHEET NO.
A04

(1) *Sta. "EN" 211+50.97, 18.68' Rt.*
Const. type "G-2" conc. inlet with sump
Grate Elev. = 396.54
I.E. (OUT) = 392.33 (SE)

(2) *Sta. "EN" 212+48.02, 18.68' Rt.*
Inst. 12" DI storm sew. pipe - 91' (NW)
5' depth
Const. storm manhole 48" dia. with inlet grate
Rim Elev. = 397.24
I.E. (IN) = 391.89 (NW)
I.E. (OUT) = 391.89 (S)

(3) *Sta. "EN" 214+59.31, 18.73' Rt.*
Inst. 18" storm sew. pipe - 206' (N)
5' depth
Const. type "G-2" Conc. inlet with sump
Grate Elev. = 396.39
I.E. (IN) = 391.35 (N)
I.E. (OUT) = 391.15 (S)

(4) *Sta. "EN" 216+20.00, 18.73' Rt.*
Inst. 18" storm sew. pipe - 174' (N)
10' depth
Inst. 18" storm sew. pipe - 201' (SE)
10' depth
Const. storm manhole 48" dia. with inlet grate
Grate Elev. = 398.05
I.E. (IN) = 390.70 (N)
I.E. (IN) = 390.70 (SE)
I.E. (OUT) = 390.50 (E)

(5) *Sta. "EN" 216+29.25, 149.57' Rt.*
Inst. 18" storm sew. pipe with sloped end section - 169' (W)
10' depth
I.E. (OUT) = 389.78 (W)

(6) *Sta. "EN" 215+28.92, 170.07' Rt.*
See sheet HA07
I.E. (IN) = 389.00

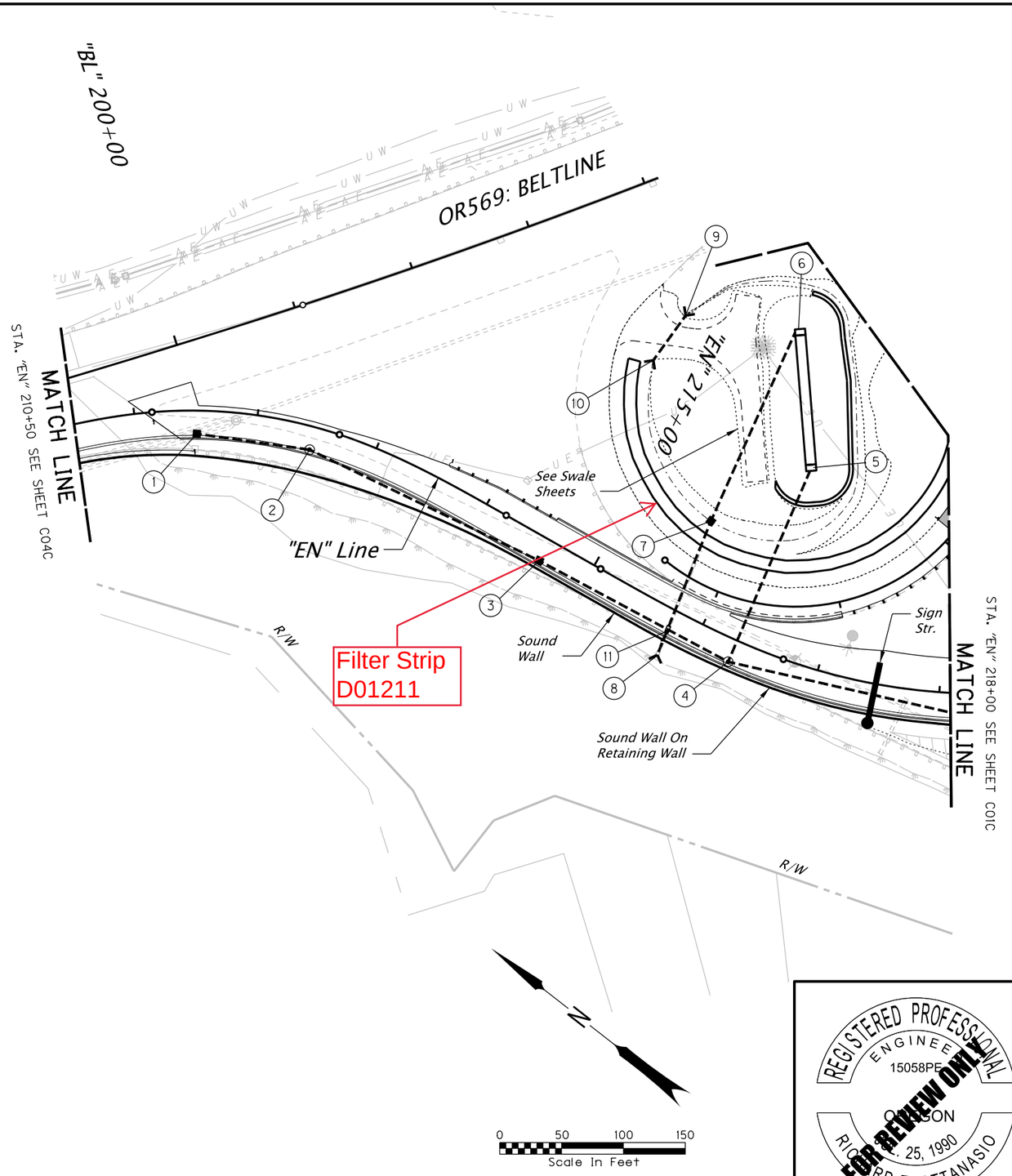
(7) *Sta. "EN" 215+55.66, 74.85' Lt.*
Inst. 18" storm sew. pipe with sloped end section - 167 '
5' depth
Const. ditch inlet Type D
Grate Elev. = 392.69
I.E. (IN) = 388.00 (E)
I.E. (OUT) = 387.80 (W)

(8) *Sta. "EN" 215+65.84, 38.08' Rt.*
Inst. 18" storm sew. pipe with sloped end section - 113' (E)
10' depth
I.E. (OUT) = 387.42
Riprap Outlet (Cl. 50)(18" depth)

(9) *Sta. "EN" 214+70.02, 220.03' Lt.*
Const. sloped end
I.E. (IN) = 394.63

(10) *Sta. "EN" 214+57.22, 174.88' Lt.*
Inst. 18" culv. pipe - 47' (E)
5' depth
I.E. (OUT) = 394.20
Const. sloped end

(11) *Sta. "EN" 215+77.00, 25.74' Rt.*
Install 6' steel casing under soundwall
Min. dia. 34" smooth steel casing
0.313" thickness per ASTM A 53 grade B
or ASTM A 252 grade 2



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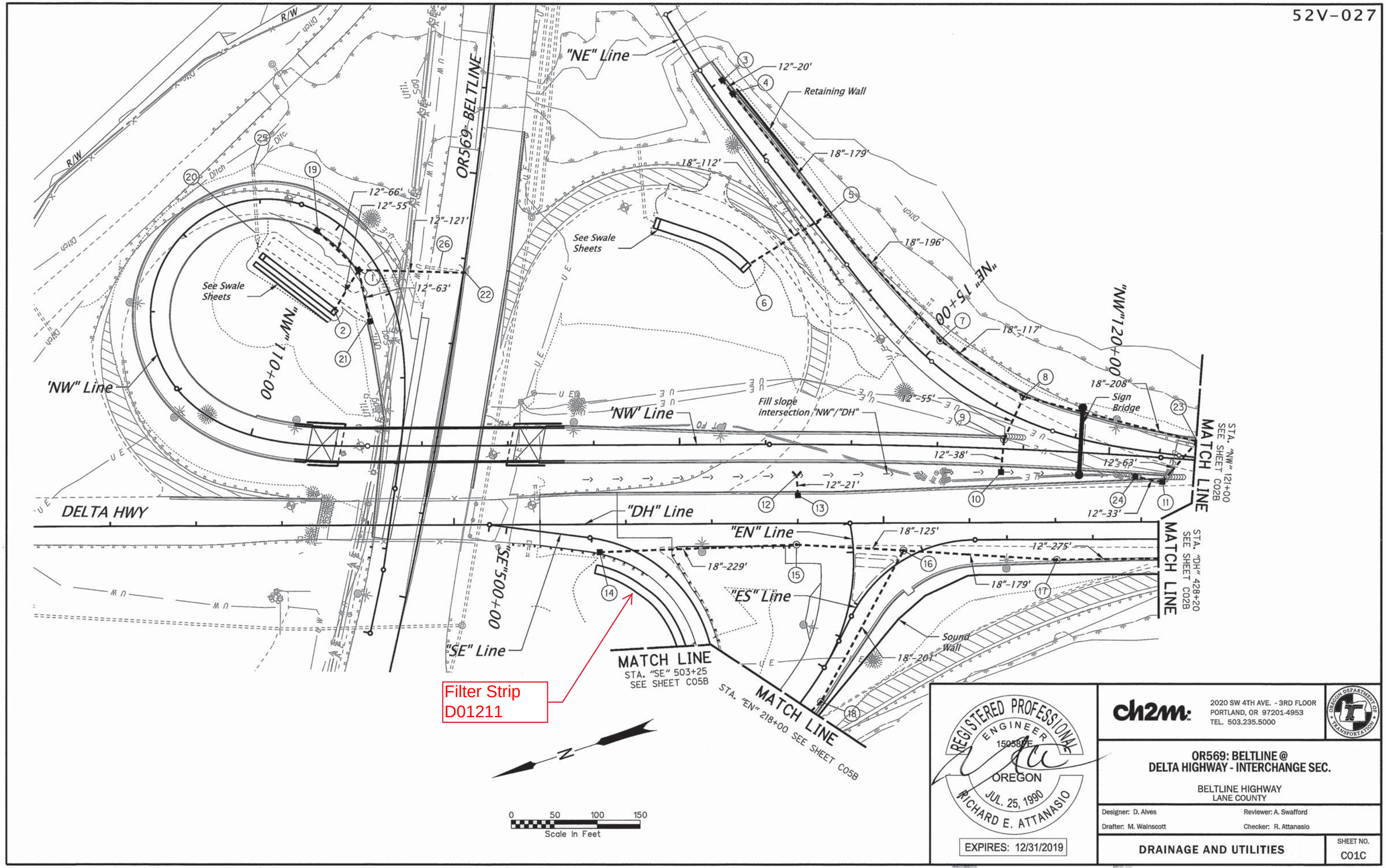
Drafter: M. Wainscott
Reviewer: S. Litchfield
Checker: R. Attanasio

DRAINAGE AND UTILITIES

SHEET NO.
C05B

52V-027



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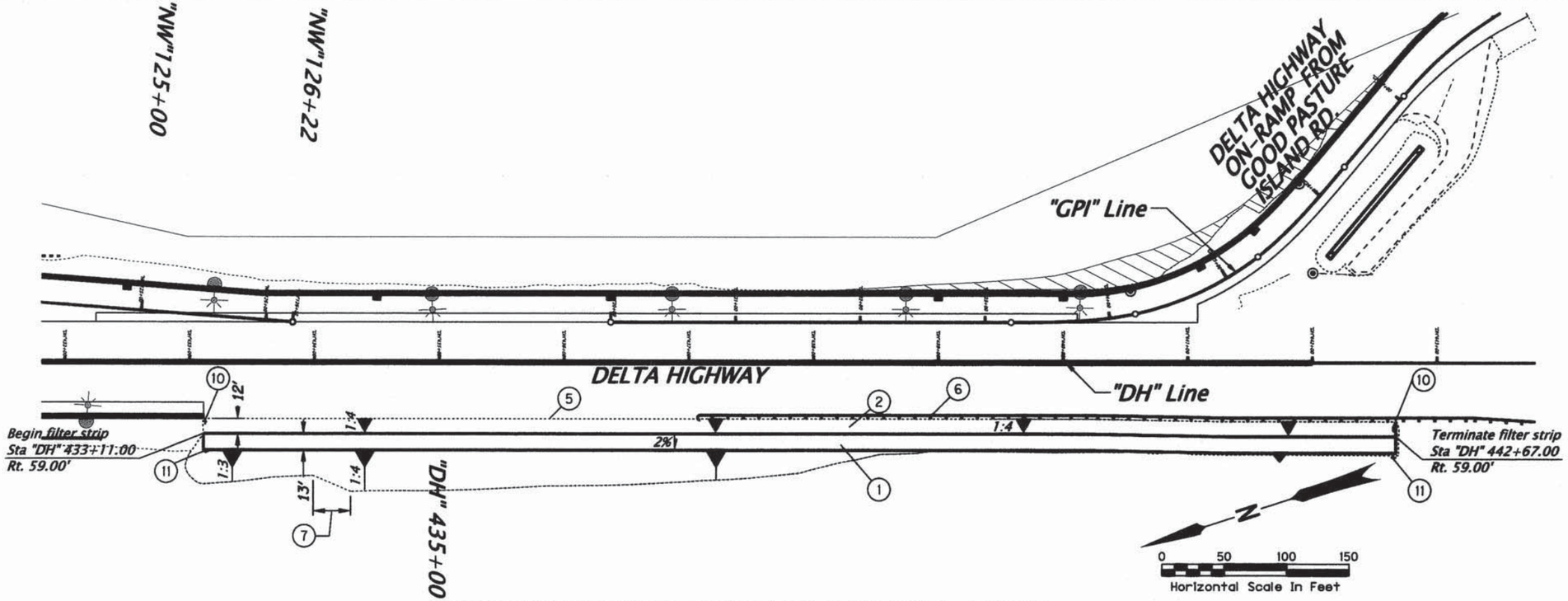
DRAINAGE AND UTILITIES

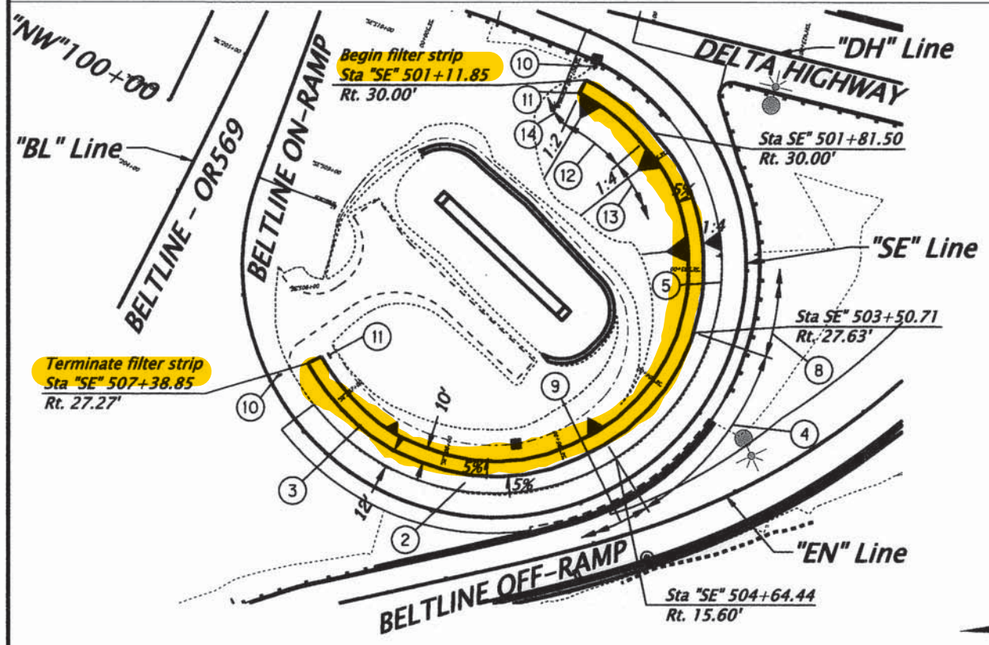
SHEET NO. C01C

52V-027



1. Const. 13' water quality filter strip, (For details, see sht. HA10)
2. Setback from edge of pavement (For details, see sht. HA10)
3. Const. 10' water quality filter strip (For details, see sht. HA10)
4. Transition cross-slope for setback from 1:4 to 1:20
5. Existing edge of pavement
6. Guardrail (For details, see sht. C03A)
7. 30' transition from 1:3 to 1:4 for fill slope below filter strip
8. 1:4 setback cross-slope
9. 1:20 setback cross-slope
10. Inst. stormwater Facility Field Marker Type S1-4, (see drg. no. RD399)
11. Inst. stormwater Facility Field Marker Type S2-4, (see drg. no. RD399)
12. Transition from 1:2 to 1:4 for fill slope below filter strip
13. 1:4 fill slope below filter strip
14. 1:2 fill slope below filter strip

WATER QUALITY FILTER STRIP 5 (FS5) PLAN DFI #: D01210



WATER QUALITY FILTER STRIP 6 (FS6) PLAN DFI #: D01211

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LANE COUNTY

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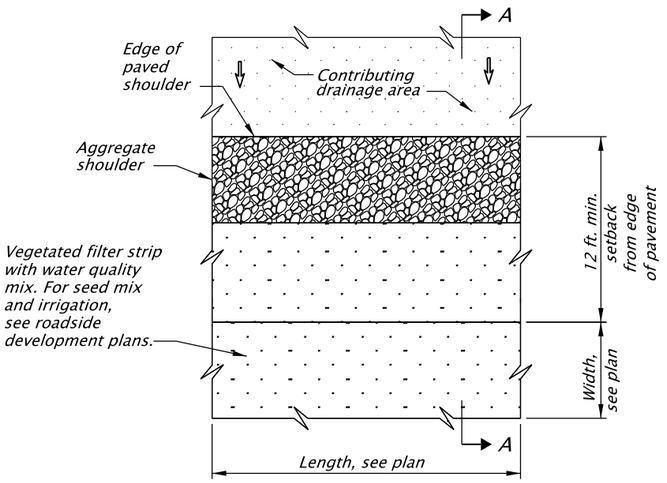
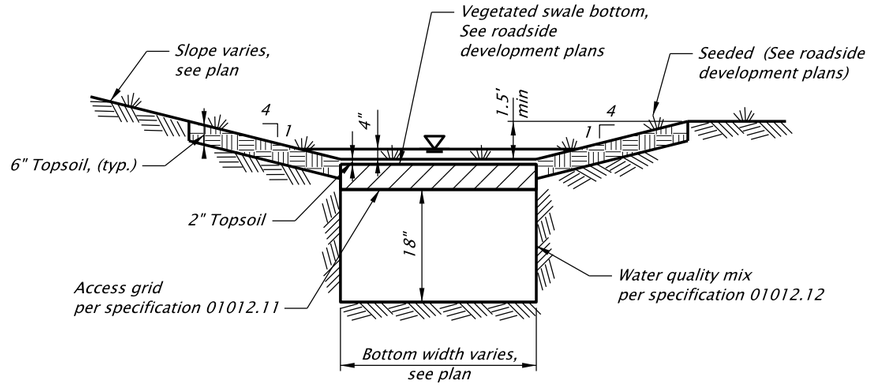
Drafter: J. Pfeifer | Checker: R. Attanasio

WATER QUALITY

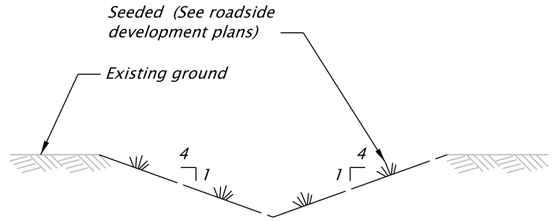
SHEET NO. HA09



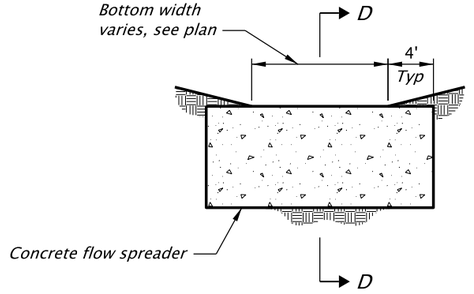
PLAN VIEW

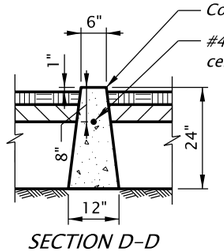


BIOSWALE
NTS



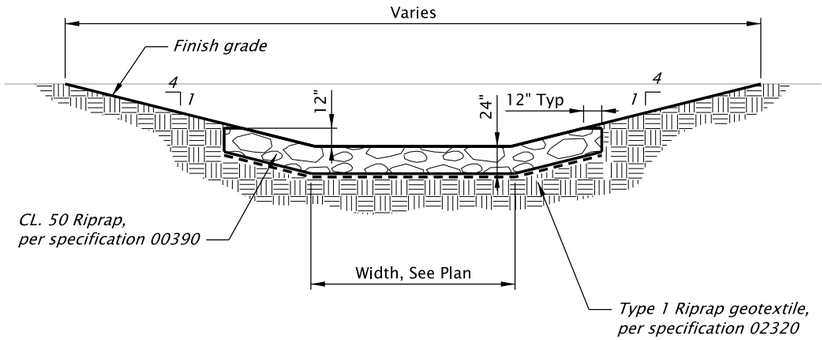
V - DITCH
NTS



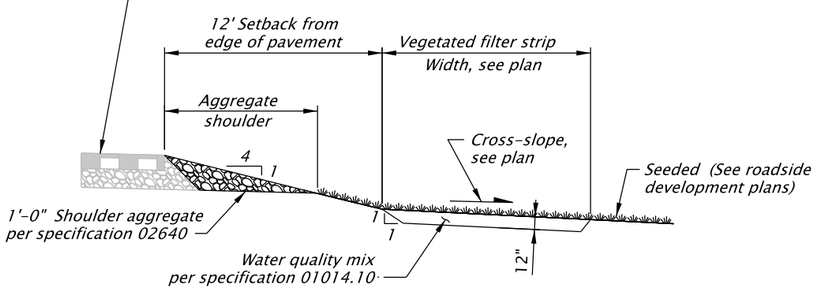


SECTION D-D

FLOW SPREADER
NTS

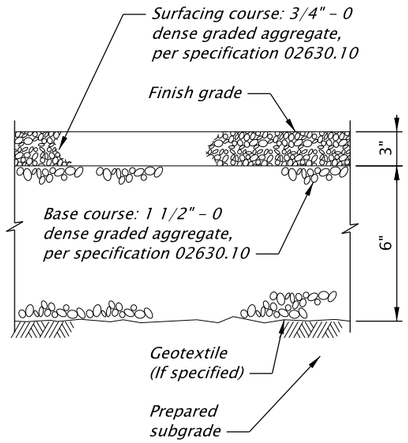


RIPRAP BASIN
NTS



SECTION A-A

FILTER STRIP
NTS



GRAVEL ACCESS ROAD SECTION
NTS

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WATER QUALITY

SHEET NO.
HA10