

## SECTION 01012 - STORMWATER CONTROL, WATER QUALITY BIOFILTRATION SWALE

*(Follow all instructions and make all edits with "Track Changes" turned on. This Section is not published in the Oregon Standard. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the Project, unless the item(s) that are included in the subsection, paragraph, sentence, or bullet are not required on the Project and then they should be deleted. In general do not re-number or re-letter subsections when item(s) are deleted. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)*

Section 01012 is not a Standard Specification and is included for this Project by Special Provision.

### Description

**01012.00 Scope** - This Work consists of furnishing and installing a water quality biofiltration swale as shown.

### Materials

*(Delete material items that do not apply and include other materials as necessary.)*

**01012.10 Materials** - Furnish Material meeting the following requirements:

Check Dam, Type 2.....	00280.15(a)
Concrete .....	00440
Drainage Geotextile, Type 1.....	02320
Facility Field Markers .....	00842.10
Granular Drain Backfill Material.....	00430.11
Manholes, Catch Basins, and Inlets .....	00470.11
Slope and Channel Liner Matting .....	00280.14(e)
Riprap .....	00390.11
Riprap Geotextile, Type 1 .....	02320
Storm Sewer Pipe .....	00445.11
Subsurface Drain Pipe .....	00430.10

*(Fill in the blank with one of the following types of pavers: heavy duty, medium duty, or light duty. Obtain the type to use from the Designer.)*

**01012.11 Porous Pavers** - Furnish \_\_\_\_\_ porous pavers from the QPL.

**01012.12 Water Quality Mixture** - Furnish medium compost meeting the requirements of Section 03020. Furnish soil meeting the following gradation requirements:

Sieve Size	Percent Passing (by Weight)
No. 4	100
No 10	95 - 100
No. 40	40 - 60
No. 100	10 - 25
No. 200	5 - 10

Sample soil according to AASHTO R 90. Determine sieve analysis according to AASHTO T 27 and AASHTO T 11.

Blend the medium compost and soil so that the mixture:

- Is composed of between 20 percent and 25 percent medium compost material and between 75 percent and 80 percent soil material.
- Has a pH between 5.5 and 8.0.
- Does not have clumps greater than 3 inches in any direction.

**01012.13 Plastic Board** - Furnish plastic board meeting the following requirements:

- Is HDPE or LDPE consisting of recycled plastic.
- Does not contain wood.
- Smooth and free of splinters.
- Includes an ultra-violet inhibitor.

**01012.14 Stone Embankment Material** - Furnish stone embankment material meeting the requirements of 00330.16 except:

- Furnish a maximum size between 9 inches and 3 inches.
- No large rock fragments are allowed.

**01012.15 Slope and Channel Liner Matting** - Furnish channel liner matting meeting the requirements of 00280.14(e) for resistance to shear stresses calculated for a 10-year storm event.

## Construction

**01012.40 General** - Construct water quality biofiltration swale facility as shown. Perform excavation, fine grading, and placement work only when the facility area is dry and only from the top of the swale area. Do not stockpile excavated material in the facility area. Perform work in sequence as follows:

*(Use one of the following two options as instructed below. Obtain the information from the Designer. Delete the option that does not apply.)*

*[ Option 1 - Use the following subsection .40 when a swale does not have a subsurface drain system. ]*

**(a) Scarify** - Scarify the subsoil area a minimum 12 inches deep.

**(b) Placement of Water Quality Mixture** - Place the water quality mixture in maximum 12-inch Lifts. Compact each Lift with a water filled landscape roller.

**(c) Pervious Pavers** - Install pervious pavers for full length of swale and full width of channel bottom. Fasten adjoining paver panels together.

**(d) Seeding** - Seed according to 01030.13.

**(e) Slope and Channel Liner Matting** - After seeding install slope and channel liner matting as shown or directed.

*(Select permanent or temporary for type of check dam. Delete the language in purple parentheses that does not apply and delete all purple parentheses.)*

**(f) Check Dams** - Install (permanent/temporary) check dams spaced as shown or directed.

**(g) Stone Embankment** - Key and embed permanent check dams and rock basin flow Spreaders constructed with stone embankment horizontally into side slopes of swale to a depth not less than 12 inches. Where rock basin flow spreaders embed into side slopes, extend stone embankment 6 inches higher on side slope.

**(h) Plastic Boards** - Install plastic boards plumb, level and perpendicular to swale flow line. Key and embed plastic boards horizontally into side slopes of swale to a depth not less than 12 inches. Where plastic board embeds into side slope, extend stone embankment 6 inches higher than plastic boards on both sides of boards on side slope.

*[End Option 1]*

*[ Option 2 - Use the following subsection .40 when a swale does have a subsurface drain system. ]*

**(a) Scarify** - After excavation scarify the subsoil area a minimum 12 inches deep.

**(b) Laying Pipe** - Lay the pipe according to Section 00445. Place pipe with perforations down.

**(c) Joining Pipe** - Fasten pipes together with coupling fittings or bands as specified for the type of pipe used. Cap the upstream end of the pipe.

**(d) Inspection and Repair** - Place the water quality mix only after all the pipe is laid, joined, and inspected. Remove and reinstall or replace all pipe that is out of alignment, has settled, or is damaged at no additional cost to the Agency.

**(e) Placement of Water Quality Mixture** - Place the water quality mixture in maximum 12-inch Lifts. Compact each Lift with a water filled landscape roller or approved equal.

**(f) Pervious Pavers** - Install pervious pavers for full length of swale and full width of channel bottom. Fasten adjoining paver panels together. Infill pervious pavers with water quality mixture to depth as shown or directed.

**(g) Seeding** - Apply seed according to 01030.13.

**(h) Slope and Channel Liner Matting and Seeding** - After seeding install slope and channel liner matting as shown or directed.

*(Select permanent or temporary for type of check dam. Delete the language in purple parentheses that does not apply and delete all purple parentheses.)*

**(i) Check Dams** - Install (permanent/temporary) check dams spaced at intervals as shown or directed.

**(j) Stone Embankment** - Key and embed permanent check dams and rock basin flow spreaders constructed with Stone Embankment horizontally into side slopes of swale to a depth not less than 12 inches. Where rock basin flow spreaders embed into side slopes, extend stone embankment 6 inches higher on side slope.

**(k) Plastic Boards** - Install plastic boards plumb, level and perpendicular to swale flow line. Key and embed plastic boards horizontally into side slopes of swale to a depth not less than 12 inches. Where plastic board embeds into side slope, extend stone embankment 6 inches higher than plastic boards on both sides of boards on side slope. Seal bottom of plastic boards to prevent water from flowing under boards.

*[End Option 2]*

**01012.41 Facility Field Markers** - Install field markers as shown and according to Section 00842.

### **Maintenance**

**01012.70 Cleaning** - If a stormwater control facility is used for erosion and sediment control, remove all accumulated sediment and debris before completing the facility.

**01012.71 Removal** - Remove temporary erosion and sediment control features according to 00280.70 only after water quality vegetation has met the establishment requirements of 01030.60.

### **Measurement**

**01012.80 Measurement** - No measurement of quantities will be made for Work performed under this Section. The estimated quantities of Materials are:

*(Identify swales by the Drainage Facility Identification Number (DFI). List each DFI separately. Obtain the DFI, the items, and the quantities from the Designer. Fill in all the required blanks. Delete items that do not apply. Copy and paste for multiple facilities. Include excavation quantity only when the swale excavation is not part of the Roadway typical section.)*

**Water Quality Swale \_\_ (DFI) \_\_ Quantities:**

Item	Quantity
Excavation .....	_____ Cu. Yd.
Drainage Geotextile, Type 1 .....	_____ Sq. Yd.
Riprap Geotextile, Type 1 .....	_____ Sq. Yd.
Loose Riprap, Class _____ .....	_____ Cu. Yd.
Granular Drain Backfill.....	_____ Cu. Yd.
Water Quality Mixture .....	_____ Cu. Yd.
Ditch Inlet, Type D .....	_____ Each
Concrete Storm Sewer Manhole (Flow Splitter) .....	_____ Each
_____ Inch Storm Sewer Pipe .....	_____ Foot
_____ Inch Subsurface Drain Pipe .....	_____ Foot
Plastic Board Flow Spreader .....	_____ Foot
Matting, Type _____ .....	_____ Sq. Yd.
Check Dam, Type 2.....	_____ Each
Concrete Basin Flow Spreader.....	_____ Each
Rock Basin Flow Spreader with Stone Embankment... _____	_____ Cu. Yd.
Rock Basin Flow Spreader with Riprap .....	_____ Cu. Yd.
Riprap Flow Spreader.....	_____ Each
Porous Pavers .....	_____ Sq. Ft.

Field facility markers will be measured according to 00842.80.

**Payment**

**01012.90 Payment** - The accepted quantities of Work performed under this Section will be paid for at the Contract lump sum amount for the item "Water Quality Swale, \_\_\_\_\_".

The drainage facility identification number is inserted in the blank.

*(Use the following paragraph when the swale excavation is included in the Roadway excavation quantity.)*

Excavation will be paid according to 00330.90.

Field facility markers will be paid for according to 00842.90.

Payment will be payment in full for furnishing and placing all Materials, and for providing all Equipment, labor, and Incidentals necessary to complete the Work as specified.