

Standard Detail & Specifications

Silt Fence

Section

Plan

Source: Adapted from MD Sds. & Specs. for ESC. Symbol: **SF**. Detail No. **DE-ESC-3.1.2.1** Sheet 1 of 2. Date: 6/05

Standard Detail & Specifications

Silt Fence

Construction Detail

Construction Notes:

- Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
- When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
- Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

- Stakes: Steel I-beam T or UJ or 2" x 2" hardwood
- Geosynthetic fabric: Type GD-1
- Reinforcing strip: Wooden lath, plastic strip or other approved equivalent
- Prefabricated Unit: Geofab, Envirofence, or approved equivalent

Source: Adapted from MD Sds. & Specs. for ESC. Symbol: **SF**. Detail No. **DE-ESC-3.1.2.1** Sheet 2 of 2. Date: 6/05

Standard Detail & Specifications

Reinforced Silt Fence

Section

Perspective

Cross-section

Source: Adapted from Tranco, Inc. Symbol: **RSF**. Detail No. **DE-ESC-3.1.2.2** Sheet 1 of 2. Date: 6/05

Standard Detail & Specifications

Reinforced Silt Fence

Construction Notes:

- Welded wire fabric to be fastened securely to the fence posts with wire ties or staples.
- Filter cloth to be fastened securely to woven wire fence with ties spaced every 24 inches at top and mid-section.
- When two sections of fabric adjoin each other, they shall be overlapped by six inches and folded.
- Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

- Posts: Steel either T or U or 2" x 2" hardwood
- Geotextile fabric: Type GD-1
- Prefabricated Unit: Geofab, Envirofence, or approved equivalent
- Backing: Woven welded wire, 14 Ga., 2" X 4" mesh opening

Source: Adapted from Tranco, Inc. Symbol: **RSF**. Detail No. **DE-ESC-3.1.2.2** Sheet 2 of 2. Date: 6/05

Standard Detail & Specifications

Topsailing

Construction Notes:

- Site Preparation** (Where Topsoil is to be added)
 - When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, waterways and sediment basins.
 - Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.
 - Liming - Where the topsoil is either highly acid or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet). Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
 - Tilling - After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or by scarifying to a depth of at least 3 inches to permit bonding of the topsoil to the subsoil. Park by passing a bulldozer up and down over the entire surface area of the slope to create horizontal erosion check slots to prevent topsoil from sliding down the slope.
- Topsoil Material and Application**
 - Note: Topsoil salvaged from the existing site may often be used but it should meet the same standards as set forth in these specifications. The depth of topsoil to be salvaged shall be no more than the depth described as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experimental Station.

Source: USDA - NRCS. Symbol: **SF**. Detail No. **DE-ESC-3.4.1** Sheet 1 of 2. Date: 05/15

Standard Detail & Specifications

Topsailing

Construction Notes (cont.)

- Materials** - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand or other soil as approved by an agronomist or soil scientist. It shall not have a mixture of contrasting textured subsoil and contain no more than 5 percent by volume of cinders, stones, slag, coarse fragment, gravel, sticks, roots, trash or other extraneous materials larger than 1 1/2 inches in diameter. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutgrass, poison ivy, thistles, or others as specified. All topsoil shall be tested by a reputable laboratory for organic matter content, pH and soluble salts. A pH of 6.0 to 7.5 and an organic content of not less than 1.5 percent by weight is required. If pH value is less than 6.0 lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoil containing soluble salts greater than 500 parts per million shall not be used.
- Note: No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.
- Grading** - The topsoil shall be uniformly distributed and compacted to a minimum of four (4) inches. Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

Note: Topsoil substitutes or amendments as approved by a qualified agronomist or soil scientist, may be used in lieu of natural topsoil. Compost material used to improve the percentage of organic matter shall be provided by a certified supplier.

Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of **Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.0 Soil Amendments.**

Source: USDA - NRCS. Symbol: **SF**. Detail No. **DE-ESC-3.4.1** Sheet 2 of 2. Date: 05/15

Standard Detail & Specifications

Stabilization Matting - Slope

Construction Notes:

- Prepare soil before installing matting, including application of lime, fertilizer, and seed.
- Begin at the top of the slope by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact trench after stapling.
- Roll the mats (A) down or (B) horizontally across the slope.
- The edges of parallel mats must be stapled with approx. 2" overlap.
- When mats must be stapled down the slope, place mats end over end and lashing style with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source: Adapted from North American Green, Inc. Symbol: **SM-S**. Detail No. **DE-ESC-3.4.6.1** Sheet 1 of 2. Date: 6/05

Standard Detail & Specifications

Stabilization Matting - Slope

Stapling Patterns

Source: Adapted from North American Green, Inc. Symbol: **SM-S**. Detail No. **DE-ESC-3.4.6.1** Sheet 2 of 2. Date: 6/05

Standard Detail & Specifications

Stabilization Matting - Channel

Construction Notes:

- Prepare soil before installing matting, including application of lime, fertilizer, and seed.
- Begin at the top of the channel by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact the trench after stapling.
- Roll center mat in direction of water flow on bottom of channel.
- Place mats end over end (lashing style) with a 6" overlap, use a double row of staggered staples 4" apart to secure mats.
- Full length edge of mats at top of side slopes must be anchored in 6" deep X 6" wide trench; backfill and compact the trench after stapling.
- Mats on side slopes must be overlapped 4" over the center mat and stapled.
- In high flow channel applications, a staple check slot is recommended at 30 to 40 foot intervals. Use a row of staples 4" apart over entire width of the channel. Place a second row 4" below the first row in a staggered pattern.
- The terminal end of the mats must be anchored in a 6" X 6" wide trench. Backfill and compact the trench after stapling.

Source: Adapted from North American Green, Inc. Symbol: **SM-C**. Detail No. **DE-ESC-3.4.6.2** Sheet 1 of 3. Date: 6/05

Standard Detail & Specifications

Stabilization Matting - Channel

Construction Notes:

- Prepare soil before installing matting, including application of lime, fertilizer, and seed.
- Begin at the top of the channel by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact the trench after stapling.
- Roll center mat in direction of water flow on bottom of channel.
- Place mats end over end (lashing style) with a 6" overlap, use a double row of staggered staples 4" apart to secure mats.
- Full length edge of mats at top of side slopes must be anchored in 6" deep X 6" wide trench; backfill and compact the trench after stapling.
- Mats on side slopes must be overlapped 4" over the center mat and stapled.
- In high flow channel applications, a staple check slot is recommended at 30 to 40 foot intervals. Use a row of staples 4" apart over entire width of the channel. Place a second row 4" below the first row in a staggered pattern.
- The terminal end of the mats must be anchored in a 6" X 6" wide trench. Backfill and compact the trench after stapling.

Source: Adapted from North American Green, Inc. Symbol: **SM-C**. Detail No. **DE-ESC-3.4.6.2** Sheet 2 of 3. Date: 6/05

Standard Detail & Specifications

Stabilization Matting - Channel

Stapling Patterns

Source: Adapted from North American Green, Inc. Symbol: **SM-C**. Detail No. **DE-ESC-3.4.6.2** Sheet 3 of 3. Date: 6/05

Standard Detail & Specifications

Inlet Protection - Type 1

Construction Notes:

- Excavate completely around inlet to a depth of 18" below grate elevation.
- Drive 2" x 4" post 1" into ground of four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2" x 4" frame using overlap joint shown. Top of frame (weil) must be 6" below edge of roadway adjacent to inlet.
- Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
- Stretch geotextile fabric tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet grate elevation. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
- Backfill around inlet in compacted 6" layers until at least 12" of geotextile fabric is buried.
- If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weil).
- This structure must be inspected frequently and the filter fabric replaced when clogged.

Materials:

- Wooden frame is to be constructed of 2" x 4" construction grade lumber.
- Wire mesh must be of sufficient strength to support filter fabric with water fully impounded against it.
- Geotextile fabric: Type GD-II

Source: Adapted from Erosion Draw Manual J. McCullough & Assoc. Symbol: **IP-1**. Detail No. **DE-ESC-3.1.5.1** Sheet 1 of 2. Date: 12/03

Standard Detail & Specifications

Inlet Protection - Type 1

Construction Notes:

- Excavate completely around inlet to a depth of 18" below grate elevation.
- Drive 2" x 4" post 1" into ground of four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2" x 4" frame using overlap joint shown. Top of frame (weil) must be 6" below edge of roadway adjacent to inlet.
- Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
- Stretch geotextile fabric tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet grate elevation. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
- Backfill around inlet in compacted 6" layers until at least 12" of geotextile fabric is buried.
- If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weil).
- This structure must be inspected frequently and the filter fabric replaced when clogged.

Materials:

- Wooden frame is to be constructed of 2" x 4" construction grade lumber.
- Wire mesh must be of sufficient strength to support filter fabric with water fully impounded against it.
- Geotextile fabric: Type GD-II

Source: Adapted from ACF Products, Inc. Symbol: **IP-2**. Detail No. **DE-ESC-3.1.5.2** Sheet 1 of 2. Date: 12/03

Standard Detail & Specifications

Inlet Protection - Type 2

Construction Notes:

- Excavate completely around inlet to a depth of 18" below grate elevation.
- Drive 2" x 4" post 1" into ground of four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2" x 4" frame using overlap joint shown. Top of frame (weil) must be 6" below edge of roadway adjacent to inlet.
- Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
- Stretch geotextile fabric tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet grate elevation. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
- Backfill around inlet in compacted 6" layers until at least 12" of geotextile fabric is buried.
- If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weil).
- This structure must be inspected frequently and the filter fabric replaced when clogged.

Materials:

- Wooden frame is to be constructed of 2" x 4" construction grade lumber.
- Wire mesh must be of sufficient strength to support filter fabric with water fully impounded against it.
- Geotextile fabric: Type GD-II

Source: Adapted from ACF Products, Inc. Symbol: **IP-2**. Detail No. **DE-ESC-3.1.5.2** Sheet 2 of 2. Date: 12/03

Standard Detail & Specifications

Inlet Protection - Type 2

Notes:

- This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
- It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
- For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbent pillow or shall be made completely from an oil-absorbent material with a woven pillow.

Materials:

The geotextile Inlet Insert shall meet or exceed the specifications of Type GD-II geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source: Adapted from ACF Products, Inc. Symbol: **IP-2**. Detail No. **DE-ESC-3.1.5.2** Sheet 2 of 2. Date: 12/03

REVISIONS: BY: _____ DATE: _____ DESCRIPTION: _____

WCCSP TRI-VALLEY TRAIL
SEDIMENT STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE DETAILS AND NOTES

SEAL: _____

CIVIL ENGINEER: _____

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. WCCSP-7A

DESIGNED BY: **ATF**

DRAWN BY: **ATF**

CHECKED BY: **AES**

DATE: **NOVEMBER 14, 2016**

SCALE: **NOT TO SCALE**

SHEET NO.: **SWM1.3**


CONTRACT NO.: **2016-WCCSP-100**

Standard Detail & Specifications

Mulching

1. Materials and Amounts

- Straw: Straw shall be untreated small grain straw applied at the rate of 1-1/2 to 2 tons per acre, or to 70 to 90 pounds straw bales per 1,000 square feet. Mulch materials shall be relatively free of weed seeds and shall be free of noxious weeds such as, thistles, johnsongrass, and quackgrass. Spread mulch uniformly by hand or mechanically. For uniform distribution of hand spread mulch, divide area into approximately 1,000 square foot sections and place 70-90 pounds three bales of mulch in each section.
- Wood chips: Apply at the rate of approximately 6 tons per acre or 275 pounds per 1,000 square feet when available and when feasible. These are particularly well suited for utility and road right-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre 200 pounds of 10-10-10 or 60 pounds of 30-0-0 per acre.
- Hydraulically applied mulch: The following conditions apply to hydraulically applied mulch:
 - Definitions:
 - Wood fiber mulch shall consist of specially prepared wood that has been processed to a uniform size, is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment, and consists of a minimum of 70% virgin or recycled wood fiber combined with 30% paper fiber and additives.
 - Wood fiber mulch shall consist of any hydraulic mulch that contains greater than 30% paper fiber. The paper component must consist of specially prepared paper that has been processed to a uniform fibrous state and packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment.
 - A banded fiber matrix (BFM) consists of long strand, specially prepared wood fibers that have been processed to a uniform state held together by a water resistant bonding agent. BFMs shall contain paper (excluding) mulch but may contain small percentages of synthetic fibers to enhance performance.
 - Refer to Figure 3.4.5a for conditions and limitations of use for each of the above categories of hydraulic mulch.
 - All components of the hydraulically applied mulches shall be pre-packaged by the manufacturer to assure material performance. Field mixing of the mulch components is acceptable, but must be done per manufacturer's recommendations to ensure the proper results.
 - Hydraulic mulches shall be applied with a visible seed and of a manufacturer's recommended rates. Increased rates may be necessary based on site conditions.
 - Hydraulically applied mulches and additives shall be mixed according to manufacturer's recommendations.
 - Materials within this category shall only be used when hydraulically applied mulch has been specified for use on the approved Sediment and Stormwater Plan, or supplemental approval from the plan approval agency has been obtained in writing for a specific area.


Source: Delaware ESC Handbook & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.4.5
 Sheet 1 of 3
 Date: 03/13

Standard Detail & Specifications

Mulching

2. Anchoring Mulch: Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon size of area, erosion hazard, and cost:


- Chaining - A chain is a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This product offers maximum erosion control but is limited to better slopes where equipment can operate safely. On sloping land, chaining should be done on the contour wherever possible.
- Tracking - Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on tracked tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with distinct marks running across the slope.
- Liquid mulch binders - Applications of liquid mulch binders should be heavier at edges, in valleys, and at crests of banks and other areas where the mulch will be moved by wind or water. All other areas should have uniform application of binder. The use of synthetic binders is the preferred method of mulch binding and should be applied at the rates recommended by the manufacturer.
- Paper fiber - The fiber binder shall be applied at a net dry weight of 750 lbs/ac. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons.
- Hardings - Synthetic or organic nettings may be used to secure straw mulch. Install and secure according to the manufacturer's recommendations.

Source: Delaware ESC Handbook & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.4.5
 Sheet 3 of 3
 Date: 03/13

Standard Detail & Specifications

Mulching


Crop	Seeding Rate	Optimum Seeding Dates											
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Barley	125	A	D	A	D	A	D	A	D	A	D	A	D
Wheat	125	A	D	A	D	A	D	A	D	A	D	A	D
Rye	125	A	D	A	D	A	D	A	D	A	D	A	D
Winter Wheat	125	A	D	A	D	A	D	A	D	A	D	A	D
Winter Rye	125	A	D	A	D	A	D	A	D	A	D	A	D
Winter Barley	125	A	D	A	D	A	D	A	D	A	D	A	D
Winter Oats	125	A	D	A	D	A	D	A	D	A	D	A	D
Winter Sorghum	125	A	D	A	D	A	D	A	D	A	D	A	D
Winter Millet	20 FLS	O											

Source: Delaware ESC Handbook & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.4.5
 Sheet 2 of 3
 Date: 03/13

Standard Detail & Specifications

Vegetative Stabilization


Mix #	Species	Seeding Rate	Optimum Seeding Dates											
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	Grass	100	A	D	A	D	A	D	A	D	A	D	A	D
2	Grass	100	A	D	A	D	A	D	A	D	A	D	A	D
3	Grass	100	A	D	A	D	A	D	A	D	A	D	A	D
4	Grass	100	A	D	A	D	A	D	A	D	A	D	A	D
5	Grass	100	A	D	A	D	A	D	A	D	A	D	A	D
6	Grass	100	A	D	A	D	A	D	A	D	A	D	A	D

Source: Delaware ESC Handbook
 Symbol: 
 Detail No. DE-ESC-3.4.3
 Sheet 2 of 3
 Date: 12/03

Standard Detail & Specifications

Vegetative Stabilization


Seeding Mixtures	Seeding Rate	Optimum Seeding Dates											
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	100	A	D	A	D	A	D	A	D	A	D	A	D
2	100	A	D	A	D	A	D	A	D	A	D	A	D
3	100	A	D	A	D	A	D	A	D	A	D	A	D
4	100	A	D	A	D	A	D	A	D	A	D	A	D
5	100	A	D	A	D	A	D	A	D	A	D	A	D
6	100	A	D	A	D	A	D	A	D	A	D	A	D

Source: Delaware ESC Handbook
 Symbol: 
 Detail No. DE-ESC-3.4.3
 Sheet 2 of 4
 Date: 12/03

Standard Detail & Specifications

Vegetative Stabilization

Seeding Mixtures	Seeding Rate	Optimum Seeding Dates											
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	100	A	D	A	D	A	D	A	D	A	D	A	D
2	100	A	D	A	D	A	D	A	D	A	D	A	D
3	100	A	D	A	D	A	D	A	D	A	D	A	D
4	100	A	D	A	D	A	D	A	D	A	D	A	D
5	100	A	D	A	D	A	D	A	D	A	D	A	D
6	100	A	D	A	D	A	D	A	D	A	D	A	D

Source: Delaware ESC Handbook
 Symbol: 
 Detail No. DE-ESC-3.4.3
 Sheet 3 of 4
 Date: 12/03

Standard Detail & Specifications

Vegetative Stabilization


Construction Notes:

- Site Preparation
 - Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
 - Final grading and shaping is not necessary for temporary seedings.
- Seeded Preparation

It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.

 - Liming - Apply liming materials based on the requirements of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
 - Fertilizer - Apply fertilizer based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 of the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soil.
- Seeding
 - For temporary stabilization, select a mixture from Sheet 1. For permanent stabilization, select a mixture from Sheet 2 or Sheet 3 depending on the conditions.
 - Apply seed uniformly with a broadcast seeder, drill, cultipacker or hydroseeder. All seed will be applied at the recommended rate and planting depth.
 - Seed that has been broadcast should be covered by rolling or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
- Mulching

All mulching shall be done in accordance with detail DE-ESC-3.4.5.

Source: Delaware ESC Handbook
 Symbol: 
 Detail No. DE-ESC-3.4.3
 Sheet 4 of 4
 Date: 12/03


Standard Detail & Specifications

Dust Control

Temporary Methods:

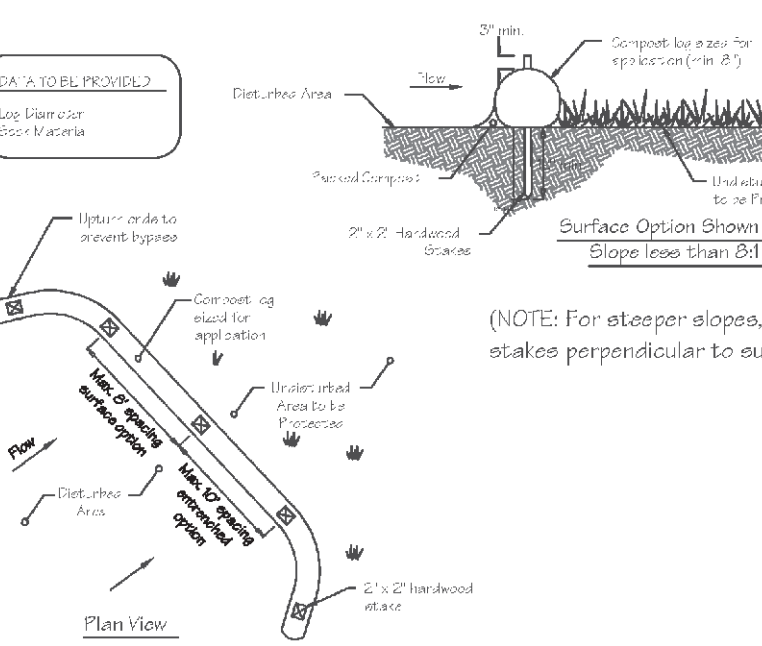
- Mulches - See DE-ESC-3.4.5, Standard Detail and Specifications for Mulching.
- Vegetative cover - See DE-ESC-3.4.3, Std. Detail and Specifications for Vegetative Stabilization.
- Adhesives - Use on mineral soils only not effective on muck soils. Keep traffic off these areas. The following table may be used for general guidance.


Type of Emulsion	Water Dilution	Type of Nozzle	Apply Gal./Ac.
Latex emulsion	12.5:1	Fine spray	235
Resin-in-water emulsion	4:1	Fine spray	300
Acrylic emulsion (non-traffic)	7:1	Coarse spray	450
Acrylic emulsion (traffic)	3.5:1	Coarse spray	350

Source: Adapted from VA ESC Handbook
 Symbol: 
 Detail No. DE-ESC-3.4.8
 Sheet 1 of 1
 Date: 12/03

Standard Detail & Specifications

Compost Filter Log




Source: Adapted from MD Sds & Specs for ESC & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.1.7
 Sheet 1 of 2
 Date: 03/13

Standard Detail & Specifications

Compost Filter Log

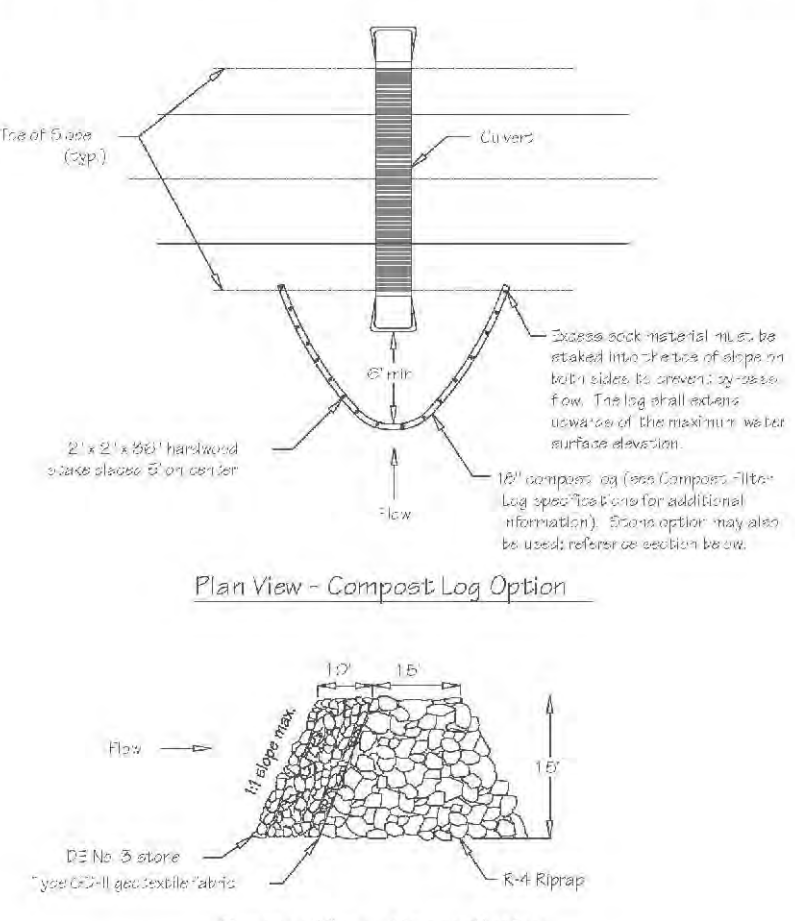
Construction Notes:


- Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
- Fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
- For trenced applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
- Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, up to a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
- For untrenced applications, blow or hand pack soil, mulch, or compost on the upslope side of the log. Fill the bottom void area.
- Stake the filled log every 10 feet maximum through the center of the sock for trenced applications, or every 5 feet for untrenced. The stakes shall be 2" x 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 3:1, the stake shall be angled downwards at a 45 degree angle to prevent the force of the water from dislodging to log.
- When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
- Remove accumulated sediment when it has reached half of the effective height of the log.
- Inspect weekly and after rain event. If sock is degrading or the sock is falling, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "bluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source: Adapted from MD Sds & Specs for ESC & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.1.7
 Sheet 2 of 2
 Date: 03/13

Standard Detail & Specifications

Culvert Inlet Protection



Source: Adapted from VA ESC Handbook & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.1.6
 Sheet 1 of 2
 Date: 03/13

Standard Detail & Specifications


Culvert Inlet Protection

Construction Notes

- Compost logs shall be designed and installed in accordance with the Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- If compost logs can not be installed properly or flow conditions exceed the design capabilities of the compost log, the stone option shall be employed. Additional filtration may be provided by using a Type GD-4 geotextile incorporated into the design as an option.
- Placement of the compost log or stone barrier should be in a "horseshoe" shape and provide a minimum of 6 feet of clearance from the culvert inlet.

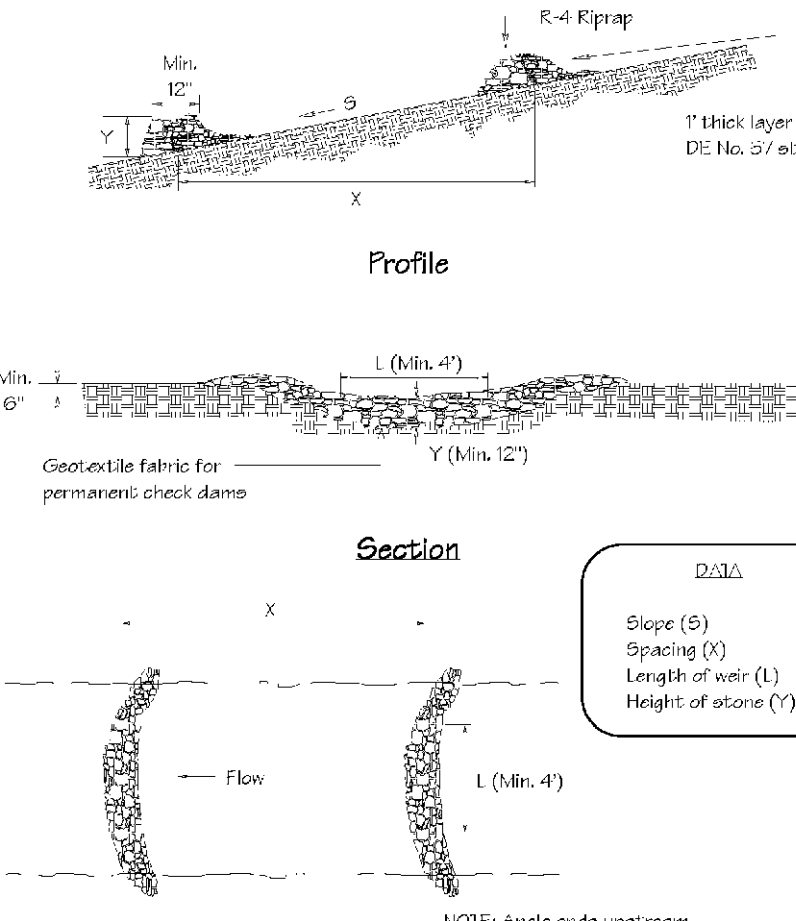
Materials


- Stakes: 2" x 2" x 36" hardwood.
- Compost media: See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- Filter sock: See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- Geotextile: Type GD-4 for stone/riprap option.
- Stone: DE No. 3 for stone/riprap option.
- Riprap: R-6 for stone/riprap option.

Source: Adapted from VA ESC Handbook & Filtrac[®] International
 Symbol: 
 Detail No. DE-ESC-3.1.6
 Sheet 2 of 2
 Date: 03/13

Standard Detail & Specifications

Stone Check Dam




Source: Adapted from MD Sds & Specs for ESC
 Symbol: 
 Detail No. DE-ESC-3.3.6
 Sheet 1 of 2

Standard Detail & Specifications

Stone Check Dam

Construction Notes:


- Swales and channels shall be prepared in accordance with the construction specifications described in the Standards and Specifications for Temporary Berm, Temporary Swale, Vegetated Channel, or Diversions.
- The check dam shall be constructed of 4" to 8" riprap. The riprap shall be placed so that it completely covers the width of the channel.
- The top of the check dam shall be constructed so that the center is approximately 6" lower than the outer edges, forming a weir that the water can flow across. The minimum length of weir shall be 4'.
- The maximum height of the check dam at the center of the weir must not exceed two (2) feet.
- Maximum spacing between dams should be the distance in the channel where the toe of the upstream dam is at the same elevation as the top of the downstream dam. (See Standard & Specifications for Check Dams for design chart.)

Source: Adapted from MD Sds & Specs for ESC
 Symbol: 
 Detail No. DE-ESC-3.3.6
 Sheet 2 of 2

REVISIONS:
 DATE: _____
 DESCRIPTION: _____

WCCSP TRI-VALLEY TRAIL
 SEDIMENT STORMWATER MANAGEMENT PLANS
 CONSTRUCTION SITE DETAILS AND NOTES

SEAL:

CIVIL ENGINEER:

 CENTURY ENGINEERING
 CONSULTING ENGINEERS, SURVEYORS
 4134 N. DUPONT HWY.
 DOVER, DELAWARE 19901

CEI CONTRACT NO. WCCSP-7A

DESIGNED BY:
 ATF

DRAWN BY:
 ATF

CHECKED BY:
 AES

DATE:
 NOVEMBER 14, 2016

SCALE:
 NOT TO SCALE

SHEET NO.:

SWM1.4

CONTRACT NO.:

2016-WCCSP-100

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

DATA TO BE PROVIDED:
Volume of material to be spilled
Area of containment
Volume of spill area

Source: Delaware ESC Handbook
Symbol: **ESC**
Detail No: **DE-ESC-3.6.1**
Sheet 1 of 5
Date: 03/15

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Pollution Prevention - Spill Prevention

- Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
- Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
- Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-off and runoff.
- Use barriers such as berms to prevent storm water run-off and runoff, and to contain spills.
- Place a "Fueling Area" sign next to each fueling area.
- Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
- Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
- Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
- If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
- Properly dispose of used oil, fluids, lubricants and spill clean-up materials.

CLEAN UP SPILLS

- If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
- Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
- Do not bury spills or wash them down with water.

LEAKS AND DRIPS

- Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
- Do not allow oil, grease, fuel or chemicals to drip onto the ground.
- Have spill kits and clean up material on-site.
- Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
- Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
- Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source: Delaware Handbook
Symbol: **ESC**
Detail No: **DE-ESC-3.6.1**
Sheet 3 of 5
Date: 03/15

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes:
The Construction Site Pollution Prevention Plan should include the following elements:

- Material inventory**
Document the storage and use of the following materials:
a. Concrete
b. Detergents
c. Paints (liquid and latex)
d. Cleaning solvents
e. Pesticides
f. Wood scraps
g. Fertilizers
h. Petroleum based products
- Good housekeeping practices**
a. Store only enough product required to do the job.
b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
c. Substances shall not be mixed.
d. When possible, all of a product shall be used up prior to disposal of the container.
e. Manufacturers' instructions for disposal shall be strictly adhered to.
f. The site foreman shall designate someone to inspect oil BMPs daily.
- Waste management practices**
a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
b. Waste materials shall be salvaged and/or recycled whenever possible.
c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source: Adapted from USEPA Pub. 840-B-92-002
Symbol: **ESC**
Detail No: **DE-ESC-3.6.1**
Sheet 3 of 5
Date: 03/15

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

- Trash shall be disposed of in accordance with all applicable Delaware laws.
- Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
- Flammable bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.
- Equipment maintenance practices**
a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
c. Drip pans shall be used for all equipment maintenance.
d. Equipment shall be inspected for leaks on a daily basis.
e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
f. Fuel nozzles shall be equipped with automatic shut-off valves.
g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.
- Spill prevention practices**
a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
b. Warning signs shall be posted in hazardous material storage areas.
c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
d. Low or non-toxic substances shall be prioritized for use.

Source: Adapted from USEPA Pub. 840-B-92-002
Symbol: **ESC**
Detail No: **DE-ESC-3.6.1**
Sheet 5 of 5
Date: 03/15

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

- Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.
- Education**
a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
b. Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

CONTACT INFORMATION

DNREC 24-Hour Toll Free Number: 800-662-8802
DNREC Solid & Hazardous Waste Branch: 302-739-9403

Source: Adapted from USEPA Pub. 840-B-92-002
Symbol: **ESC**
Detail No: **DE-ESC-3.6.1**
Sheet 5 of 5
Date: 03/15

Standard Detail & Specifications

Sensitive Area Protection

Location of Sensitive Area Protection

20' min. setback applies to all sensitive areas covered by this specification.

Methods of Sensitive Area Protection

Source: Adapted from VA ESC Handbook
Symbol: **SAP**
Detail No: **DE-ESC-3.7.2**
Sheet 1 of 3
Date: 03/15

Standard Detail & Specifications

Sensitive Area Protection

Construction Notes:

Fencing shall be installed at the extents of all sensitive areas. For trees, the fencing shall be installed outside the drip line (canopy) and at no time within 5 feet of the trunk. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained. If all fence is to be used for demarcation purposes, appropriate signage shall be provided a minimum of every 20 feet denoting the area as a sensitive area protection zone.

Materials:

- Snow Fence - Standard 40-inch high snow fence shall be placed at the limits of clearing or construction on standard steel posts set 6 feet apart.
- Board Fence - Board fencing consisting of 4-inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. For tree protection, if it is not practical to erect a fence at the drip line, construct a triangular fence nearer the trunk. The limits of clearing will still be located at the drip line, since the root zone within the drip line will still require protection.
- Plastic Fencing - 40-inch high "International orange" plastic (polyethylene) web fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:
 - Tensile yield: Average 2,000 lbs. per 4-foot width (ASTM D638)
 - Ultimate tensile yield: Average 2,900 lbs. per 4-foot width (ASTM D638)
 - Elongation at break (%): Greater than 1000% (ASTM D638)
 - Chemical resistance: Inert to most chemicals and acids

Source: Adapted from VA ESC Handbook
Symbol: **SAP**
Detail No: **DE-ESC-3.7.2**
Sheet 3 of 3
Date: 03/15

Standard Detail & Specifications

Sensitive Area Protection

- Cord Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of cord 1/4-inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the string at intervals no greater than 3 feet.
- Earth Berms - Temporary earth berms shall be constructed according to specifications for a Temporary Earth Dike with the base of the berm on the sensitive area side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.
- Trunk Armoring (Tree Protection Only) - As a last resort, a tree trunk can be armored with burlap wrapping and 2-inch studs wired vertically no more than 2 inches apart to a height of 5 feet encircling the trunk. If this alternative is used, the root zone within the drip line will still require protection. Nothing should ever be nailed to a tree.

Maintenance:

Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

Source: Adapted from VA ESC Handbook
Symbol: **SAP**
Detail No: **DE-ESC-3.7.2**
Sheet 3 of 3
Date: 03/15

Standard Detail & Specifications

Stabilized Construct. Entrance

Plan

Profile

Section A-A (Std.)

Source: Adapted from VA ESC Handbook
Symbol: **SCE**
Detail No: **DE-ESC-3.4.7**
Sheet 1 of 2
Date: 12/05

Standard Detail & Specifications

Stabilized Construct. Entrance

Section A-A (Opt.)

Construction Notes:

- Stone size - Use DE #3 stone.
- Length - As required, but not less than 50 feet except on a single residence lot where a 30-foot minimum length would apply.
- Thickness - Not less than size #3 inches.
- Width - Ten (10) foot minimum, but not less than the full width of points where ingress or egress occurs.
- Geotextile - Type GS-1 placed over the entire area prior to placing of stone.
- Surface Water - All surface water flowing or directed toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
- Maintenance - The entrance shall be maintained in a condition which will prevent tracking or blowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or removal of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
- Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

Source: Adapted from VA ESC Handbook
Symbol: **SCE**
Detail No: **DE-ESC-3.4.7**
Sheet 2 of 2
Date: 12/05

Standard Detail & Specifications

Soil Stockpile

DATA TO BE PROVIDED:
Max. height

Plan View

Section A-A

Source: Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3
Symbol: **SP**
Detail No: **DE-ESC-3.7.3**
Sheet 1 of 2

Standard Detail & Specifications

Soil Stockpile

Construction Notes:

- Locate stockpiles so that they are 50 feet from any storm drain inlet, open channel, wetland or waterbody. Redirect any concentrated flow around the stockpile using an approved erosion and sediment control measure.
- Secure the perimeter of the stockpile with an approved erosion and sediment control perimeter device.
- If stockpile is to remain inactive for more than 14 calendar days, the stockpile must be vegetated. Follow the temporary vegetation specifications. The vegetation chosen shall last the duration of the stockpile. The stockpile shall be restabilized if the temporary vegetation dies or erosion results.

Source: Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3
Symbol: **SP**
Detail No: **DE-ESC-3.7.3**
Sheet 2 of 2

Standard Detail & Specifications

Riprap Outlet Protection - 1

Plan

Section A-A

DATA:
Pipe diameter (D_p)
Apron length (L_a)
Apron width (D_w)
Riprap size (R₁₅)
Riprap thickness (T)

NOTE: Degree cantilever of apron slightly to prevent edge-curtling

NOTE: Key into exist. grad

Source: Adapted from MD Sds. & Specs. for ESC
Symbol: **ROP-1**
Detail No: **DE-ESC-3.3.10.1**
Sheet 1 of 2

Standard Detail & Specifications

Riprap Outlet Protection - 1

Construction Notes:

- The subgrade for the riprap shall be prepared to the required lines and grades as shown on the plan. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
- The riprap shall conform to the grading limits as shown on the plan.
- Filter cloth shall be protected from punching, cutting or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.
- Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the filter cloth. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.

Source: Adapted from MD Sds. & Specs. for ESC
Symbol: **ROP-1**
Detail No: **DE-ESC-3.3.10.1**
Sheet 2 of 2

VEGETATED FILTER STRIP SEED MIX

Seeding Rate: 20-40 lb per acre

Species List:

- 63.6% Sheep Fescue, Variety Not Stated (*Festuca ovina*, Variety Not Stated)
- 17% Annual Ryegrass (*Lolium multiflorum* (L. perenne var. italicum))
- 8% Perennial Blue Flax (*Linum perenne* ssp. lewisii)
- 2% Blackeyed Susan, Coastal Plain NC Ecotype (*Rutbeckia hirta*, Coastal Plain NC Ecotype)
- 2% Lanceleaf Coreopsis, Coastal Plain NC Ecotype (*Coreopsis lanceolata*, Coastal Plain NC Ecotype)
- 2% Oxyeye Daisy (*Chrysanthemum leucanthemum*)
- 1% Shasta Daisy (*Chrysanthemum maximum*)
- 1% Partridge Pea, PA Ecotype (*Chamaecrista fasciculata* (Cassia f.), PA Ecotype)
- 1% Corn Poppy/Shirley Mix (*Papaver rhoeas*, Shirley Mix)
- 0.5% Common Yarrow (*Achillea millefolium*)
- 0.5% Aromatic Aster, PA Ecotype (*Aster oblongifolius* (*Symphotrichum oblongifolium*), PA Ecotype)
- 0.5% Mattflower, VA Ecotype (*Eupatorium coelestinum* (*Conoclinium* c.), VA Ecotype)
- 0.5% Spotted Beebalm, Coastal Plain SC Ecotype (*Monarda punctata*, Coastal Plain SC Ecotype)
- 0.3% Butterfly Milkweed (*Asclepias tuberosa*)
- 0.1% Slender Mountainmint (*Pycnanthemum tenuifolium*)

Total: 100%

REVISIONS:

NO.	DATE	DESCRIPTION	BY
1	10/14/16	ADDED VEGETATED FILTER STRIP SEED MIX	WH

**WCCSP TRI-VALLEY TRAIL
SEDIMENT STORMWATER MANAGEMENT PLANS**

CONSTRUCTION SITE DETAILS AND NOTES

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. WCCSP-7A

DESIGNED BY:
ATF

DRAWN BY:
ATF

CHECKED BY:
AES

DATE:
NOVEMBER 14, 2016

SCALE:
NOT TO SCALE

SHEET NO.:
SWM1.5

CONTRACT NO.:
2016-WCCSP-100