



EROSION AND SEDIMENT CONTROL PLAN FOR OIL AND GAS OPERATIONS

I. GENERAL INFORMATION							
A. Administrative							
Project Name: _____		Municipality: _____		County: _____			
Latitude: ____ degrees ____ minutes ____ seconds				Longitude: ____ degrees ____ minutes ____ seconds			
B. Responsible Parties							
Operator/Owner/Applicant: _____		Phone Number: _____					
Address: _____		City: _____		State: _____		Zip Code: _____	
Person(s) responsible for construction and maintenance of erosion and sediment (E&S) control best management practices (BMP) during earth disturbance activities.							
Operator: _____		Phone Number: _____					
Address: _____		City: _____		State: _____		Zip Code: _____	
Erosion and Sediment Control Plan (E&S Plan) prepared by:							
Name: _____		Phone Number: _____					
Address: _____		City: _____		State: _____		Zip Code: _____	
C. Project Description							
The project includes all the project types checked below: (Check all that apply)							
<input type="checkbox"/> Oil/Gas Well		<input type="checkbox"/> Transmission Facility		<input type="checkbox"/> Gathering Facility		<input type="checkbox"/> Processing Facility	
<input type="checkbox"/> Centralized Fresh Water Impoundment		<input type="checkbox"/> Centralized Wastewater Impoundment		<input type="checkbox"/> Treatment Facility			
<input type="checkbox"/> Ground/Surface Water Withdrawal Site		<input type="checkbox"/> Other: _____		<input type="checkbox"/> Water Pipeline			
Project Starting Date: _____				Anticipated Project Completion Date: _____			
A narrative description of the proposed project is presented below: (Add additional sheets as necessary)							
Disturbed Acreage Calculation							
	Total Length (ft.)		Average Width (ft.)		Area (sq. ft.)		
Access Roads		x		=			
Pipelines/Compressors		x		=			
Drill Pads		x		=			
Impoundments		x		=			
Other (Describe)		x		=			
			Total Area (sq. ft.)	=		÷ 43,560 Sq. ft./A	= A
Total Project Area (Acres): _____				Total Disturbed Area (Acres): _____			

II. E&S CONTROL PLAN NARRATIVE REPORT

Erosion and Sediment Control Planning and Implementation shall be undertaken in accordance with the following:

1. **Minimize the extent and duration of the earth disturbance.**
2. **Maximize the protection of existing drainage features and vegetation.**
3. **Minimize soil compaction.**
4. **Utilize controls that prevent or minimize the generation of increased runoff.**
5. **Preserve the integrity of stream channels and maintain and protect the physical, biological, and chemical qualities of the receiving streams.**

A. Soil Characteristics:

A.1. Soil types found in the project area and their limitations pertaining to earth disturbance activities are listed below:

Limiting Soil Characteristics									
Map Symbol	Soil Name	Erodible	Cut Banks Cave	Corrosive to Concrete or Steel	High Water Table	Low Strength	Piping	Poor Topsoil	Potentially Hydric

A.2. A description of the types, depth, slope, and limitations of the soils and the methods used to address the identified soil limitations are presented below and on the construction drawings:

A.3. A description of geologic formations on site that may cause pollution when disturbed during construction is presented below:

A.4. A description of bedrock and/or soil conditions that have the potential for significant slope failure is presented below:

<p>A.4.1. Is the earth disturbance likely to cause pollution from naturally occurring geologic formations or soil conditions?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, identify and provide a description of geologic formations that may be disturbed during construction that contain minerals (e.g. pyrite) in sufficient quantities that could result in discharges that do not meet water quality standards for the receiving surface water(s).</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>A.5. Is coal or other acid-producing rock (APR), including previously surface mined areas, likely to be intercepted during construction? This will be determined by drill holes/core holes drilled to the maximum excavation depth when due diligence dictates the need. <input type="checkbox"/> Yes (proceed to A.5.1) <input type="checkbox"/> No (proceed to B)</p> <ul style="list-style-type: none">• Reference material such as coal resource publications for further explanation. (see notes A & B, in Instructions for additional detail)
<p>A.5.1. Is the APR excavated likely to be greater than 250 tons?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>A.5.2. Will all of the APR be removed from the site to an approved landfill?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>A.5.3. If the answer to question A.5.2 is 'No,' prepare and submit an APR handling plan. Refer to the Pennsylvania Department of Environmental Resources (PADEP) Fact Sheet, "How to Avoid and Handle Acid-Producing Rock Formations Encountered During Well Site Development," referenced in the instructions. An APR handling plan is attached. <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>A.5.4. Does the proposed excavation area lie within a groundwater discharge zone (such as defined by the presence of springs or wetlands) or within areas with high groundwater tables? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, the APR handling plan must be designed to avoid contact with these areas.</p>
<p>A.5.5. Does the proposed excavation lie within 500 ft. horizontally from an abandoned or active deep mine?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, consult the appropriate DEP Underground Mine Office permitting section for additional information.</p>

B. Earth Disturbance Activity
B.1. Past land use is presented below:
B.2. Current land use is presented below:

C. Off Site Discharge Analysis

Will the project include a non-surface water discharge? Yes No

If yes, please provide an off-site discharge analysis, including calculations showing downstream impacts of project runoff

D. Surface Water Classification

Stream name and watershed with the stream designated **and** existing uses are listed below. Streams that are siltation impaired are identified with a check in the check box.

The DEPs eMapPA (located at www.depgis.state.pa.us/emappa/) is used to identify stream name/watershed and designated/existing uses that may receive direct runoff within or from the oil and gas earth disturbance activity.

<u>Stream Name/Watershed</u>	<u>Designated/Existing Use</u>	<u>Siltation Impaired?</u>
_____	_____	<input type="checkbox"/> Yes
_____	_____	<input type="checkbox"/> Yes
_____	_____	<input type="checkbox"/> Yes
_____	_____	<input type="checkbox"/> Yes

E. BMP Description Narrative
<p>Site Access</p>
<p>General</p> <p><i>This section addresses site access during actual construction of a proposed project, including any site access for site preparation work. When it becomes necessary to remove vegetative cover or cross surface waters including streams and wetlands to conduct a survey, or complete required exploration drilling and sampling, appropriate BMPs will be installed to protect the surface waters. The BMPs as indicated below are proposed for use on the project.</i></p>
<p>1. Rock Construction Entrance</p>
<p>The purpose of the Rock Construction Entrance (RCE) is to remove sediment and excessive mud from tires and keep it off the public road. A RCE shall be installed at each entrance and constantly maintained. See Appendix A and PADEP Erosion and Sediment Pollution Control Manual (E&S Manual), March 2012, (No. 363-2134-008) pages 13-17. In special protection watersheds (High Quality (HQ) or Exceptional Value (EV)) rock construction entrance with wash rack will be installed. Wash water will be collected and treated for sediment removal prior to discharge to surface water. Where wash racks are not feasible, the following alternative method will apply:</p> <ul style="list-style-type: none"> • On paved surface public roads, a vacuum truck sweeper or sweeper with a catch bin attachment will be used to clean the roadway on a continuing basis. • On dirt or gravel surface public roads a rigorous manual removal of sediment and mud from vehicle/equipment tires prior to exiting construction sites, supplemented by immediate recovery, through manual or mechanical means will be necessary to keep excessive mud and/or sediment from being tracked from the project site onto public roadways. Dust control and/or compaction via rolling of the dirt public road surface will be implemented as needed. <p>For both of the alternative methods, the RCE will be extended to a minimum 100-ft. length.</p> <p>a. Will a RCE be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>b. Will a tire wash be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>c. Will either alternate explained above be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If no, to any of the above question, explain the reasoning.</p>
<p>2. Crowned/Sloped Roadways</p>
<p>Crowned/sloped roadways are typically installed where the topography allows for road surface drainage. All discharges should be to stable drainage courses or to well-vegetated areas. In situations where crowned roadways will not function properly (e.g. across steep slopes) an insloped roadway will be constructed. See Appendix A and PADEP E&S Manual pages 18-20.</p> <p>a. Will these BMPs be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>b. Will a crowned roadway be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>c. Will an insloped roadway be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If no to both b. and c. explain the reasoning.</p>

3. Waterbars

Waterbars are typically used to control stormwater runoff on retired access road and skid trails as well as pipeline and utility line right-of-ways. They are not recommended for active access roads or skid trails due to difficulty of moving equipment over them as well as the need for continual maintenance due to damage from traffic. Waterbars are not appropriate for incised roadways where there is no opportunity to discharge runoff to either side. Waterbars may be used to direct runoff to well vegetated areas or sediment removal facilities (e.g. sediment traps or sediment basins). They should discharge to the downslope side of the access road, skid trail, or right-of-way so that the runoff will flow away from, not back onto the roadway, skid trail, or right-of-way.

Compost diversion socks may be used in lieu of waterbars on surface waterline right-of-ways for oil & gas drilling. (Usually, there is little or no earthmoving during installation of surface waterlines, so no material is available to construct waterbars. Clearing and grubbing in wooded areas removes protective cover from the soils, so a BMP needed to direct runoff off the right-of-way.) **See Appendix A and E&S Manual pages 21-22.**

- a. Will this BMP be used? Yes No
- b. If yes, will waterbars be placed according to the spacing indicated in Appendix A? Yes No
If no to b., explain and provide supporting calculations.

4. Broad-Based Dips

Broad-based dips are used to direct runoff from active access roads to well vegetative areas or sediment removal BMPs (e.g. sediment traps or sediment basins). Broad-based dips, unlike waterbars, are easily traversed by most construction equipment and typically require less maintenance to ensure their integrity. There are two constructed forms of the broad-based dip – first, for low gradient roadways (less than or equal to 5 percent) and second, for high gradient roadways (greater the 5 percent and up to 10 percent). Due to the nature of broad based dips, they should not be constructed on roads with grades exceeding 10 percent. Spacing requirements for broad-based dips and the two forms of construction are presented in **See Appendix A and E&S Manual pages 23-25.**

- a. Will this BMP be used? Yes No
- b. If yes, will recommended spacing in Appendix A be used? Yes No
If no to b, explain and provide supporting calculations.

5. Roadside Ditch

In most cases, the ditches paralleling temporary access roads and haul roads need not be lined if sufficient ditch relief culverts are provided, erosion resistant soils are present, and flow velocities are less than 2 ft. per second (fps). However, protective liners are required for all roadside ditches discharging to special protection waters and directly to surface waters, additionally, where necessary to prevent the erosion of the channel itself. A typical cross-section for a roadside ditch and an access road layout with ditch relief culverts is shown in **Appendix A and the E&S Manual page 30.**

- a. Will this BMP be used? Yes No
- b. If yes, will recommended culvert spacing in Appendix A be used? Yes No
If no to b, explain and provide supporting calculations.

6. Ditch Relief Culvert (Cross Drain Culvert)

Ditch relief culverts minimize the potential for erosion of road side ditches as well as flooding of the roadway by reducing the volume of flow being conveyed by the ditch. In addition to providing a culvert wherever concentrated upslope drainage is encountered, it is important to provide additional culverts at intervals along the roadway where runoff is being conveyed by a ditch. Ditch relief culverts should be placed across the road at a 30-degree downslope angle with a pipe slope of 2 to 4 percent (Lower end should be at least 2 in. below upper end) to help keep the culvert clean and ensure water flow. Culverts should be installed before the ground freezes and will be 12 in. or larger in diameter. **See Appendix A and the E&S Manual pages 31-32.**

- a. Will this BMP be used? Yes No
- b. If yes, will recommended culvert spacing and sizing in Appendix A be used? Yes No (Culvert spacing may be adjusted slightly to take advantage of natural drainage courses.)
If no, explain and provide supporting calculations.

7. Turnout

Channels that drain water away from roadside ditches into well-vegetated areas are known as turnouts. Turnouts are typically located along crowned roadways where runoff cannot sheet flow off the roadway. Like ditch relief culverts, the purpose of turnouts is to minimize the volume of water in a roadside ditch. Spacing is similar to spacing for ditch relief culverts. Turnouts should be located so as to take advantage of natural drainage ways or buffer areas wherever possible. Where a suitable vegetative filter strip is not available, a compost sock, rock filter, or other sediment removal BMP should be installed at the outlet of the turnout. **See Appendix A and the E&S Manual page 33.**

Will this BMP be used? Yes No

8. Riprap Aprons

Riprap aprons may be used to prevent scour at pipe or channel outfalls where anticipated discharge velocities do not exceed 17 ft. per second, there is sufficient room to construct the apron, and where the aprons can be installed on a level grade. In cases where discharge velocities exceed 17.0 fps, a suitable means of velocity reduction should be used prior to discharging significant flows onto the riprap apron. In cases where there is no level grade, a drop box may be used to obtain sufficient level ground for proper installation. Aprons should be oriented so that the discharge enters the receiving channel at less than 90 degrees to channel flow direction. In no case should the discharge enter the channel at an angle equal to or greater than 90 degrees to the channel flow direction. **See Appendix A and the E&S Manual pages 232-235.**

Will this BMP be used? Yes No

9. Pumped Water Filter Bag

Pumped water filter bags may be used to filter water pumped from disturbed areas prior to discharge to surface waters. They may also be used to filter water pumped from the sediment storage areas of sediment basins and sediment traps. Bags shall be placed in well vegetated grassy areas and discharge onto stable, erosion resistant areas. Pumped water filter bags may be placed on filter stone to increase discharge capacity. Pumped water bags shall not be placed on slopes greater than 5 percent. Pumping rates shall not exceed 750 gpm. or half of the maximum rate specified by the manufacturer, whichever is less. **See Appendix A and the E&S Manual pages 53-55.**

Will this BMP be used? Yes No

Sediment Barriers and Filters

General

Sediment barriers and filters will be used as perimeter controls for small disturbed areas and as initial protection against sediment pollution during construction of other BMPs such as sediment basins or traps.

Each type of sediment barrier and filter has specific advantages and limitations. Care is exercised in the selection of all sediment barriers to ensure they are suited to the particular site conditions where they are installed. Sediment barriers are installed on existing level grade to ensure their effectiveness. The ends of sediment barriers and filters are turned up slope at 45 degrees to the main barrier and filter alignment for a distance sufficient to elevate the bottom of the barrier and filter ends to the elevation of the top of the barrier at the lowest point. See E&S Manual.

1. Compost Filter Sock

Compost filter socks should be used in lieu of silt fence in special protection watersheds, unless a vegetative filter strip meeting the requirements in the **E&S Manual pages 94-95** exists between the proposed fence location and the receiving surface water. Compost filter socks shall be installed on existing level grade. Wood chips may be substituted for the compost filler in HQ and non-special protection watersheds, but not in EV watersheds. The minimum diameter for a compost sock is 12 in. Where larger diameter socks are needed to meet slope length requirements, socks may be stacked in pyramid fashion (as when constructing a compost sock trap) to reach equivalent sock heights. Socks may be staked through the sock or immediately downslope. Rocks, tree limbs, and other objects shall be removed prior to installation to ensure continuous contact between the compost filter sock and the underlying soil. **See Appendix A and the E&S Manual pages 62-66.**

- a. Will this BMP be used? Yes No
- b. If yes to a, will the compost standards in Appendix A be met? Yes No
- c. If yes to a, will the maximum slope lengths listed in Appendix A be met? Yes No

If no to b or c, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

2. Rock Filter

Rock filters may be used to control runoff at the downstream end of constructed channels during construction until the channel protective lining is installed or during temporary disturbance within the channel. Rock filters may only be used in roadside ditches at inflows to ditch relief culverts on dirt or gravel roads or on temporary or permanent access roads. When used as an ABACT BMP in high quality watersheds, the sediment removal efficiency of rock filters must be raised by anchoring a 6-in. layer of compost on the up gradient side of the rock filter or staking a compost sock on the up gradient side of the rock filter. **See Appendix A and the E&S Manual pages 92-93.**

Will this BMP be used? Yes No

3. Rock Filter Outlet for Filter Fence or Straw Bale Barrier

Rock filter outlets may be used to address problems of concentrated flow to sediment barriers. Whenever a silt fence or straw bale sediment barrier has failed due to concentrated flow a rock filter outlet shall be installed. When used as an antidegradation best available combination of technologies (ABACT) BMP in HQ or EV watersheds, rock filter outlet sediment removal efficiency must be raised by anchoring a 6-in. layer of compost or staking a compost sock on the up gradient side of the rock filter outlet. **See Appendix A and the E&S Manual pages 73-74.**

Will this BMP be used? Yes No

4. Straw Bale Barrier

Straw bale barriers may be used to control runoff from small, disturbed areas provided that runoff is in the form of sheet flow. Since straw bales tend to deteriorate within a three-month period, they should be considered short-term control measures. Straw bale barriers should not be used in areas of concentrated flows (e.g. channels, swales, erosion gullies, across pipe outfalls, as inlet protection, etc.) or in areas where they cannot be properly staked (e.g. paved areas). **See Appendix A and the E&S Manual pages 89-91.**

- a. Will this BMP be used? Yes No
- b. If yes, will the maximum slope lengths listed in Appendix A be met? Yes No

If no to b, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

5. Standard Silt Fence

Silt fence must be installed on existing level grade below disturbed areas. Both ends of the fence must be extended at least 8 ft. upslope at 45 degrees to the main fence alignment. Silt fence may not be installed in stream channels, across ditches, or other areas of concentrated flow. Install silt fence before the ground freezes. Belted silt fence may be substituted for standard silt fence. **See Appendix A and the E&S Manual pages 75- 79.**

- a. Will this BMP be used? Yes No
- b. If yes to a., will the fabric properties listed in Appendix A be met? Yes No
- c. If yes to a., will the maximum slope lengths listed in Appendix A be met? Yes No

If no, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

6. Reinforced Silt Fence

Reinforced silt fence must be installed on existing level grade below disturbed areas. Both ends of the fence must be extended at least 8 ft. up slope at 45 degrees to the main fence alignment. Silt fence may not be installed in stream channels, across ditches or other areas of concentrated flow. Install silt fence before the ground freezes. A continuous row of staked straw bales immediately below the fence may be substituted for the guy wires. **See Appendix A and the E&S Manual page 78, 80- 81.**

- a. Will this BMP be used? Yes No
- b. If yes to a., will the fabric properties listed in Appendix A be met? Yes No
- c. If yes to a., will the maximum slope lengths listed in Appendix A be met? Yes No

If no, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

7. Super Silt Fence

Super silt fence may be used to control runoff from some small, disturbed areas where the maximum slope lengths for reinforced silt fence cannot be met and sufficient room for construction of sediment traps or basins does not exist. Both ends of the fence must be extended at least 8 ft. up slope at 45 degrees to the main fence alignment. Super silt fence is not to be used in areas where rock or rocky soils prevent the full and uniform anchoring of the fence or proper installation of the fence posts. It should be used only where access exists or can be made for the construction equipment required to install and remove the chain link fencing (e.g. trencher and posthole digger). **See Appendix A and the E&S Manual pages 78, 82-84.**

- a. Will this BMP be used? Yes No
- b. If yes to a., will the fabric properties listed in Appendix A be met? Yes No
- c. If yes to a., will the maximum slope lengths listed in Appendix A be met? Yes No

If no, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

8. Sediment Filter Log

Sediment filter logs are tube-shaped devices filled with straw, curled wood, flax, rice, or coconut fiber and wrapped with UV-degradable polypropylene netting, burlap, jute, or coir for longevity. They may be used to control runoff from small disturbed areas where silt fence would normally be used as well as certain locations where silt fence is not typically effective (e.g. above headwalls and end walls). In general, sediment filter log size requirements are determined by slope and slope lengths above the sediment filter logs. Curled wood sediment filter logs may be used in HQ watersheds. The other types of sediment filter logs are not appropriate in HQ or EV watersheds when used alone. **See Appendix A and the E&S Manual pages 85-86.**

- a. Will this BMP be used? Yes No
- b. If yes, will the maximum slope lengths listed in Appendix A be met? Yes No

If no to b, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

9. Wood Chip Filter Berm

Wood chip berms may be used on wooded or rocky slopes where staking and trenching of other BMPs is difficult or impossible. Large obstructions such as trees, limbs, boulders, etc. should be removed prior to placement of the wood chips. Wood chip filter berms should not be placed in areas of concentrated flow, they should be aligned parallel to existing contours below all disturbed areas. It is recommended that this BMP be used in conjunction with a vegetative filter strip meeting the requirements in **the E&S Manual, pages 94-95**. Wood chip filter berms may be used in HQ watersheds, but are not appropriate for use in EV watersheds unless the source of the chips is totally hardwoods. They are not recommended for use within 50 ft. of receiving surface water. **See Appendix A and the E&S Manual pages 87-88.**

- a. Will this BMP be used? Yes No
- b. If yes, will the maximum slope lengths listed in Appendix A be met? Yes No

If no to b, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

10. Vegetative Filter Strip

A vegetative filter strip consists of a well-vegetative, grassy area below a disturbed area that can be used to remove sediment from runoff prior to its reaching surface waters. To be effective, runoff should be in the form of sheet flow and the vegetative cover should be established prior to the disturbance. The minimum width of the filter strip depends on the slope between the disturbed area and the receiving surface water. Constructed filter strips are not recommended due to the time required to establish vegetation and the need to control runoff from the areas disturbed while constructing filter strips. Vegetative filter strips on neighboring properties should not be proposed unless permission to use that area as a vegetative filter strip has been obtained from the property owner along with an agreement to leave the filter strip area undisturbed until the earth disturbance is restored. **See Appendix A and the E&S Manual pages 94-95**

- a. Will this BMP be used? Yes No
- b. If yes to a, is the vegetative filter strip located on property owned or controlled by the applicant?
 Yes No

If no to b, provide an agreement with the property owner that allows the vegetative filter strip to remain undisturbed until the site is restored.

- c. Will the recommended width be used? Yes No

If no to c, what additional BMP will be provided at this location?

Runoff Conveyance BMPs (Channels)

General

All channels and berms are aligned to provide positive drainage throughout. Sharp turns, high angles of confluence, and very low gradients (<1% bed slope) are to be avoided wherever possible. Slopes are not averaged - channels with significant changes in slope are segmented and each segment of the channel designed separately for capacity to convey peak flow with the gentlest slope and protective liner suitable for the steepest slope. All channels are sized to convey calculated peak flows. All channels are provided with a suitable protective liner to prevent erosion within the channel. A summary table on the detail sheet provides channel dimensions and identifies protective liner(s). See Appendix A and the E&S Manual pages 127-149.

The type(s) of channels used in this project are checked below. (indicate all that apply)

	Temporary	Permanent
Diversion	<input type="checkbox"/>	<input type="checkbox"/>
Collector	<input type="checkbox"/>	<input type="checkbox"/>
Outlet	<input type="checkbox"/>	<input type="checkbox"/>

1. Vegetative Channels

Vegetative channels require separate calculations showing sufficient capacity and adequate protection both before and after establishment of vegetation. Unless the channel is sodded in accordance with page 148 and 279 of the E&S Manual, a suitable temporary liner must be provided that meets maximum shear stress and roughness coefficients provided by manufacturer's specifications or conforming to Table 6.2, Appendix A. The temporary liner (e.g. rolled fiber blanket) should be firmly anchored to the bottom and sides of the channel to hold soil in place until the vegetation becomes established. The seed mixture used in vegetative channels should be suitable for the anticipated flow conditions based on channel location and type of soil(s) encountered. The channel must be sized to accommodate calculated peak flow requirements before and after establishment of vegetation. **See Appendix A and the E&S Manual pages 127-133.**

Will this BMP be used? Yes No

2. Riprap Channels

Rock used for riprap should consist of sound, durable rock, insoluble in water. This does not exclude limestone since the rate of dissolving for limestone is very low for non-acid water. Riprap should be free of structural defects, shale seams and foreign materials such as quarry dust, soil, shale, and organic matter. Individual pieces should be sharply angular, whenever possible, block-shaped and have a minimum specific gravity of 2.5. No piece should have a length exceeding three times its width or depth. Minimum placement thickness should be equal to 1.5 times the maximum stone size. **See Appendix A and the E&S Manual pages 133-149.**

Will this BMP be used? Yes No

<p>3. Berm</p>
<p>Berms may be used in a similar manner to channels so long as flow can be maintained along the upslope side of the berm. The maximum tributary area to a berm should be 5.0 acres unless otherwise permitted by the reviewing agency. Objectionable materials should be removed from the berm alignment prior to construction. All berms must be properly compacted. Other design criteria for berms are the same as for channels.</p> <p>Will this BMP be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>4. Top-of-Slope Berm</p>
<p>Berms may be used in a similar manner to channels so long as flow can be maintained along the upslope side of the berm. The design criteria for berms are similar to channels. The maximum tributary area to a berm should not exceed 5 acres unless otherwise permitted by DEP or conservation district. Top-of-slope berms are typically used to prevent runoff from running over the edge of a fill and causing erosion on the fill slope. The top-of-slope berm captures runoff from the top of a fill and conveys it to a temporary slope pipe or groin ditch leading to a collector channel, sediment trap, or sediment basin. The channel behind the berm shall have positive grade to outlet and an appropriate protective lining. See Appendix A and the E&S Manual pages 150-152.</p> <p>Will this BMP be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>Sediment Traps/Basins</p>
<p>General</p> <p><i>Sediment Traps/Basins are designed to function as either temporary facilities (i.e. compost sock sediment traps) or incorporated into the permanent post construction stormwater management system (i.e. post construction stormwater management basins) upon completion of the project. Whenever possible, sediment traps/basins are located down gradient proposed areas of disturbance. Consideration is given to how the locations for all proposed traps/basins will be accessed. When a proposed location is not easily accessible, special attention to maintenance requirements and the construction of any access roads are provided. The location of traps/basins on steep slopes or on unstable soils is avoided wherever possible. Sediment traps are not to be located within stream channels or in wetlands.</i></p>
<p>1. Compost Sock Sediment Trap</p>
<p>Where there is little or no opportunity to direct runoff from an access road into a well vegetative area, a compost sock sediment trap may be used to treat the runoff prior to discharge. This BMP can be installed, used, and later removed with relatively little area disturbance. The compost within the sock can be used during cleanup as a vegetative growth medium. The maximum drainage area this is tributary to the compost sock trap is 5 acres. A minimum of 2000 cu. ft. of storage capacity for each acre that contributes to the tributary drainage acre should be provided with 12 in. of freeboard. No spillways are required for compost sock sediment traps. See Appendix A and the E&S Manual pages 34-35.</p> <p>Will this BMP be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>2. Embankment Sediment Trap</p>
<p>Embankment Sediment Traps may be used to control runoff from drainage areas up to 5 acres (disturbed and undisturbed). They must be sized to provide 2,000 cu. ft. of total storage capacity for each acre tributary to the trap. The sediment storage zone is considered to be 700 cu. ft. per acre. Outlets should be located as far from the inflow as possible. At a minimum, spillway widths in feet for embankment traps should be two times the acreage of the contributing drainage area. However, when not discharging directly into a waterway, the minimum spillway width in ft. is six times the contributing drainage area. See Appendix A and the E&S Manual pages 212-216.</p> <p>Will this BMP be used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>3. Barrel/Riser Sediment Trap</p>
<p>For barrel/riser sediment traps the crest of the riser should be set at the elevation at which the required 2,000 cu. ft./acre storage capacity is provided. The riser and outlet barrel should be sized to provide a discharge</p>

capacity of 1.5 cu. ft. per second/acre tributary to the trap. The embankment associated with the barrel/riser should provide at least 12 in. of freeboard above the maximum design water elevation – the elevation at which 1.5 cu. ft. per second/acre discharge capacity is provided. Perforations in the riser to dewater the trap should be limited to 1 in. diameter hole per vertical foot of riser with the lowest perforation at the sediment storage elevation. All supporting calculations should be provided. **See Appendix A and the E&S Manual pages 212-213, 217-222.**

Will this BMP be used? Yes No

4. Sediment Basins

Sediment basins may not be located within a stream channel, wetland; or the drainage area of a sediment trap, or sediment basin. The bottom elevation may not be located below the seasonal high water table, adjacent wetlands, or perennial stream channels. Due to maintenance requirements, access to sediment basins must be maintained for the life of the basin. Sediment storage of 1,000 cu. ft. per disturbed acre over the life of the project within the watershed of the basin is required. A dewatering zone of 5,000 cu. ft. for each disturbed and undisturbed acre tributary to the basin is also required. Sediment basins should have a flow length to width ratio of at least 2L:1W unless a turbidity barrier or a suitable sediment forebay is provided. In special protection watersheds a 4L:1W flow length to width ration should be provided. **See Appendix A and the E&S Manual pages 159-165.**

Will this BMP be used? Yes No

Stabilization Methods and Standards

General

As soon as slopes, channels, ditches, and other disturbed areas reach final grade they are stabilized. Upon completion or temporary cessation of the earth disturbance activity in a special protection watershed, the portion of the project site tributary to the special protection waters is immediately stabilized. In all other watersheds, cessation of activity for at least four days requires temporary stabilization. Keeping stabilization current with earthmoving is required for all projects, regardless of watershed characterization. See Appendix A and the E&S Manual pages 260-281.

1. Erosion Control Blanket

There are many varieties of erosion control blankets. They range from rolls of natural and artificial materials, which are typically installed by hand, to liquid, spray-on materials that make use of a bonding agent to hold natural or artificial fibers in place until vegetation becomes established. Erosion control blanketing (either rolled or sprayed) should be installed or applied on all slopes 3H:1V or steeper, disturbed areas within 50 ft. of a surface water (100 ft. of an HQ or EV surface water) or where soil conditions indicate blanketing is needed to achieve the required vegetative cover. Whether blanketing is rolled on or sprayed on manufacturer's recommendations must be followed. **See Appendix A and the E&S Manual pages 273-274.**

Will this BMP be used? Yes No

2. Temporary Stabilization

Upon temporary cessation of activity or any stage or phase of an activity where the cessation of earth disturbance activities will exceed four days (e.g. storage piles), the disturbed area will either be seeded and mulched with the temporary seed mixture capable of resisting accelerated erosion and sedimentation or an acceptable BMP which temporarily minimizes accelerated erosion and sedimentation. Soils should be tested to determine proper soil amendment application rates for the proposed seed mixtures. Mulch will be applied at a rate of 3-4 tons/acre. Prior to seeding, soil amendments will be applied as follows:

<u>Soil Amendment</u>	<u>Type</u>	<u>Rate of Application</u>
Fertilizer	_____	_____
Lime	_____	_____

<u>Seed Mixture</u>	<u>Rate of Application (lb./acre)</u>	<u>Area of Disturbance</u>

Explain any specialized techniques to be used for temporary stabilization.

3. Permanent Stabilization

Upon final completion of an earth disturbance activity or any stage or phase of an activity, the site shall immediately have top soil restored, replaced, or amended, seeded, mulched, or otherwise permanently stabilized and protected from accelerated erosion and sedimentation. Soils should be tested to determine proper soil amendment application rates for the proposed seed mixtures. Mulch will be applied at a rate of 3-4 tons/acre. Prior to seeding, soil amendments will be applied as follows:

<u>Soil Amendment</u>	<u>Type</u>	<u>Rate of Application</u>
Fertilizer	_____	_____
Lime	_____	_____

<u>Seed Mixture</u>	<u>Rate of Application (lb./acre)</u>	<u>Area of Disturbance</u>

Explain any specialized techniques to be used for permanent stabilization.

Stream and Wetland Crossings
General <i>The types and locations of control measures needed at stream and wetland crossings depend upon the slope of the land and natural drainage at that location. Upslope runoff will be diverted around the work area by use of waterbars or other BMPs. Sediment barriers will be located downslope of trench or storage piles. Soil stockpiles will not be located in swales or ditch or within 10 ft. of a stream. See Appendix A and the E&S Manual page 284-289.</i>
1. Stream Crossing - Road
Unstable stream crossings present a potential for sediment pollution to waters of the Commonwealth, stream degradation, flooding, and safety hazards and should be avoided wherever possible. When it is unavoidable to cross an existing stream channel bridges, single culverts, or multiple culvert crossings (see Appendix A) must be installed. Temporary or permanent stream crossings must be provided wherever construction equipment, including clearing and grubbing equipment, must cross a stream channel. Only clean rock fill meeting Chapter 105 permitting standards may be placed within the stream channel. All stream crossings must conform to Chapter 105 permitting requirements. See Appendix A and the E&S Manual pages 36-40. Will a temporary stream crossing be constructed? <input type="checkbox"/> Yes <input type="checkbox"/> No Will a permanent stream crossing be constructed? <input type="checkbox"/> Yes <input type="checkbox"/> No
2. Wetland Crossing - Road
Unstable wetland crossings present a potential for sediment pollution to waters of the Commonwealth. Wetland crossings must be avoided wherever possible. Where wetland crossing is unavoidable, the location of the crossing and its orientation must be selected so as to have the least possible impact upon the wetland. Temporary crossings of wetlands should be constructed from materials that can be placed with minimum disturbance of the soil surface and completely removed when no longer needed. All wetland crossings must conform to Chapter 105 permitting requirements. See Appendix A and the E&S Manual pages 41-42. Will a temporary wetland crossing be constructed? <input type="checkbox"/> Yes <input type="checkbox"/> No Will a permanent wetland crossing be constructed? <input type="checkbox"/> Yes <input type="checkbox"/> No
3. Utility Line Flumed Stream Crossing
Utility line flumed stream crossings should be undertaken at minor streams, those less than or equal 10 ft. wide at normal flow depth, swales, ditches, channels, and water ways. The flume should be installed prior to trench excavation and should be of sufficient size to convey normal stream flow over the trench. Grubbing shall not take place within 50 ft. of top-of-bank until all materials required to complete crossing are on site and pipe is ready for installation. Water accumulating within the work area shall be pumped to a pumped water filter bag or sediment trap prior to discharge into any receiving surface water. Trench plugs shall be installed in the trench on both sides of the stream channel. Hazardous and/or pollutant material storage areas shall be located at least 100 ft. back from the top of streambank. All excess excavated material shall be immediately removed from the stream crossing area. All disturbed areas within 50 ft. of top-of-bank shall be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams. See Appendix A and the E&S Manual page 287. Will this BMP be used? <input type="checkbox"/> Yes <input type="checkbox"/> No
4. Utility Line Stream Crossing with Pump Bypass
Utility line stream crossings with pump bypass should be undertaken at minor streams, those less than or equal 10 ft. wide at normal flow depth, swales, ditches, channels and water ways. Grubbing shall not take place within 50 ft. of top-of-bank until all materials required to complete crossing are on site and pipe is ready for installation. Water accumulating within the work area shall be pumped to a pumped water filter bag or sediment trap prior to discharge into any receiving surface water. Trench plugs shall be installed in the trench on both sides of the stream channel. It is important that the bypass pump intake is maintained a sufficient distance from the stream bottom to prevent pumping of channel bottom material. Hazardous and/or pollutant material storage areas shall

be located at least 100 ft. back from the top of stream bank. All excess excavated material shall be immediately removed from the stream crossing area. All disturbed areas within 50 ft. of top-of-bank shall be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams. **See Appendix A and the E&S Manual page 288.**

Will this BMP be used? Yes No

5. Utility Line Stream Crossing with Cofferdam

Utility line stream crossings with cofferdam should be undertaken at major streams when flumed or pumped stream crossings are not feasible. As with pumped and flumed utility line stream crossings, grubbing shall not take place within 50 ft. of top-of-bank until all materials required to complete crossing are on site and pipe is ready for installation. Water accumulating within the work area shall be pumped to a pumped water filter bag or sediment trap prior to discharge into any receiving surface water. Trench plugs shall be installed in the trench on both sides of the stream channel. Hazardous and/or pollutant material storage areas shall be located at least 100 ft. back from the top of stream bank. All excess excavated material shall be immediately removed from the stream crossing area. All disturbed areas within 50 ft. of top-of-bank shall be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams. **See Appendix A and the E&S Manual page 289.**

Will this BMP be used? Yes No

6. Trench Plug

Trench plugs are used to avoid a preferential pathway for groundwater flow (i.e. "French Drain" effect within the utility trench). Properly installed trench plugs will block the flow of groundwater along the utility pipe/trench and maintain the natural ground water flow. Maintaining natural groundwater movement in these areas is important for sustaining baseflow in the stream and preserving wetland and riparian vegetation. The spacing and plug material are dependent upon the trench slope and are listed in Appendix A. **See Appendix A and the E&S Manual page 291.**

- a. Will this BMP be used? Yes No
- b. If yes to a, will recommended spacing as described in Appendix A be used? Yes No
- c. If yes to a, will recommended plug material as described in Appendix A be used? Yes No
- d. If no to b or c, explain and provide supporting data that demonstrates that the proposed alternative is equivalent or superior to standards in Appendix A.

7. Utility Line Stream and Wetland Crossings – Horizontal Directional Drilling (HDD)

Horizontal directional drilling (HDD) may be considered an ABACT BMP in special protection watersheds when implemented properly. However, HDD has its risks and there are certain E&S issues that need to be properly addressed. The two major E&S issues with HDD are associated with the drilling mud and the exposure of the workspace that is often in close proximity to sensitive areas such as streams and wetlands.

- Drilling mud must be properly managed through appropriate sediment removal BMPs such as a pumped water filter bag, as described in Standard Construction Detail #3-16, or Compost Sock Trap, as described in Standard Construction Detail #3-11 in the E&S Manual. If the volume of drilling mud is too great or the composition is such that it cannot be treated by either method, which may include HDD operations utilizing bentonite, it must be captured and removed from site or otherwise directed to a suitable treatment facility. If substances other than water are added to the drilling mud, all fluids must be captured and removed from site to a suitable treatment facility.
- Dry material removed from the drill hole must be placed out of the floodway of the stream or set back at least 10 ft. from a wetland. A sediment barrier BMP must be placed between the stockpile and the receiving water body.
- Workspace for an HDD may require clearing and grading, depending on the entry and exit sites selected for the drill. Since the drill entry location has to accommodate the drill rig and supporting equipment, the entry side location requires satisfactory access as well as stable ground conditions to support heavy equipment. The drill exit site is usually the location for the fabrication of the pipe string as well as the location where the pipe string is inserted into the borehole. The workspace required is typically longer to accommodate the pipe string and may require extra temporary workspace. Proper E&S BMPs must be incorporated into both disturbed areas. Depending upon the need for temporary staging, these areas can be larger than the permanent pipeline/utility line right-of-way.
- Appropriate erosion control BMPs (e.g. sediment barriers) must be installed between the entry and exits sites and the water body being crossed.
- Staging areas must be set back at least 50 ft. from the edge of any wetlands. Movement of equipment across wetlands must be minimized.
- Additives used in HDD may not be used in a manner that causes pollution or a threat of pollution to the waters of the Commonwealth. HDD additives which are certified for conformance with American National Standards Institute/National Science Foundation (ANSI/NSF) Standard 60 (Drinking Water Treatment Chemicals - Health Effects) are deemed acceptable to DEP, when used in the manner indicated in the certification of the additive. All conditions included as part of the additive's certification should be followed. Additives that are not certified for conformance with ANSI/NSF Standard 60 must be approved by DEP prior to use.

Due diligence shall be performed prior to initiating the drilling to determine whether geologic or hydro-geologic conditions at the proposed crossing could result in an inadvertent return (discharge) of drilling mud to the water body being crossed during drilling operations. Where such conditions exist, proper precautions must be taken to prevent such discharges. HDD operations shall include an inadvertent return response plan. The site must also have the necessary materials and equipment readily available to quickly respond in the event of an inadvertent return that may include isolating the area and pump bypassing the stream. The methods used to accomplish this are beyond the scope of this manual but are recognized in the HDD industry.

a. Will this BMP be used? Yes No

b. If yes to a, will additives other than bentonite and water be used? Yes No

c. If yes to b, are all additives are certified for conformance with ANSI/NSF Standard 60? Yes No

If yes to b or c, list the additives that will be used. NOTE: Additives that are not certified for conformance with ANSI/NSF Standard 60 must be approved by DEP prior to use.

See Appendix A and the E&S Manual pages 284-286 and 290.

BMPs Not Included In This Form

A description of any BMPs that are not included in this form, but are included in the *E&S Manual* should be provided below. Details and drawings should also be attached.

Alternative BMPs

Alternative BMPs not included in **Appendix A and the E&S Manual page 282** or using different design methods or standards that maintain existing water quality and existing designated uses may be approved. However, the burden of proof that the proposed BMPs are appropriate for the intended use lies with the plan designer. Sufficient documentation calculations and manufacturer's specifications should be included with the application to allow the reviewer to make an informed decision.

1. Will alternative BMPs be used?

Yes No

If yes, attach drawings showing the details, specifications, and spacing. Provide supporting calculations as necessary.

Identify any BMPs or alternative BMPs not identified in this plan to be used:

F. BMP Installation Sequence Narrative

The BMPs listed in this plan will be installed and maintained in accordance with the E&S Manual, as amended and updated and DEPs "Oil and Gas Operators Manual," (Technical Guidance No. 550-0300-001) as amended and updated. The BMPs contained in this plan will be installed as shown (or indicated) prior to earth disturbance (including clearing and grubbing) within the drainage area of the BMP in question. Appropriate BMPs will be provided before, during, and after each stage of activity (including, but not necessarily limited to, access road construction and maintenance, drilling pad, pits, impoundments, and pipelines). Each BMP will be kept functional until all earth disturbances within the BMPs drainage area is completed and all disturbed areas tributary to the BMP have been stabilized (minimum uniform 70 percent perennial vegetative cover, with density of resisting accelerated erosion and sedimentation) or other suitable permanent erosion protection has been installed.

Appropriate BMPs for sediment pollution control will be in place and functional before earth disturbance occurs in all areas contributing runoff to the BMP. This will ensure that earth disturbance will occur that is not tributary to an appropriate BMP.

The sequence of operation provided below is typical for a project and is intended to be used as a guide. Each project BMP sequencing may differ in content and sequence of activities.

1. **Pre-Construction Activities** – prior to commencement of any earth disturbance activity, including clearing and grubbing, the applicant shall clearly delineate sensitive areas, riparian forest buffer boundaries, areas proposed for infiltration practices, the limits of clearing, and trees that are to be conserved within the project site, and shall install appropriate barriers where equipment may not be parked, staged, operated, or located for any purpose. (NOTE: For projects which require authorization under Erosion and Sediment Control General Permit-2 (ESCGP-2), the permittee must hold a preconstruction meeting, unless otherwise notified by DEP or conservation district and provide all attendees, including DEP or conservation district, at least a 7-day notice prior to the preconstruction meeting. Additionally, the permittee must notify DEP at least 7 days prior to commencing earth disturbance). Describe pre-construction activities below.
2. **Site Access** – this is the first land-disturbance activity to take place at the site and should provide BMPs to minimize accelerated erosion and sedimentation from the following areas: entrance to the site, construction routes, and areas designated for equipment or other use at the site including parking and stockpiles areas.
3. **Sediment Barriers** – install perimeter BMPs after the construction site is accessed, keeping associated clearing and grubbing limited to only that amount required for installing perimeter BMPs. (NOTE: For projects which require authorization under ESGP-2, the permittee must provide notice to DEP when perimeter controls have been installed).
4. **Upslope Diversion Channels** – install upslope diversion channels, including outlet protection, to direct clean, undisturbed runoff from the upslope side of the project site around areas of earth disturbance, are constructed to divert upslope clean water runoff around the disturbed area (when necessary).
5. **Sediment Traps and Basins and Traps** – construct Sediment Traps and Basins, outlet protection, prior to the commencement of remaining clearing/grubbing and other earth disturbance activities tributary to the BMP(s).
6. **Sediment Laden Water Channels or Other Conveyance** – all channels and other water conveyances required to direct sediment laden runoff to BMPs such as Sediment Traps and Basins must be installed prior to the commencement of the remaining clearing/grubbing and other earth disturbance activities.

7. **Land Clearing and Grading** – implement clearing and grading only after all downslope E&S BMPs have been constructed and stabilized.
8. **Surface Stabilization** – apply temporary or permanent stabilization measures immediately to any disturbed areas where work has reached final grade, has been delayed or otherwise temporarily suspended.
9. **Construction of Buildings, Utilities, and Paving** – during construction, install and maintain any additional erosion and sediment control BMPs and implement any structural post construction stormwater BMPs that may be required.
10. **Final Stabilization** – after construction is completed; install stabilization BMPs including permanent seeding, mulching and riprap, and complete implementation of stormwater BMPs in this last construction phase. Stabilize all open areas, including borrow and spoil areas.
11. **Notice of Termination and Temporary BMP Removal** – after removal of all temporary BMPs and achieving permanent stabilization in accordance with §102.22, file a notice of termination in accordance with §102.7.

Provide the BMP installation sequence below.

G. Supporting Calculations and Measurements

Supporting calculations and measurements are presented below or are attached.

H. Maintenance Program
The maintenance program and schedule is outlined below.

I. Material Recycling and Disposal

All trash and garbage will be collected and disposed properly.

Oils, fuels, lubricants, and coolants will be placed in suitable containers and disposed properly.

Garbage, fuels, or any substance harmful to human, aquatic, or fish life, will be prevented from entering springs, streams, ponds, lakes, wetlands, or any watercourse or water body.

I.1. The plan to identify and manage construction waste is described below.

I.2. The procedures to ensure proper handling of other wastes that will be generated by the project are presented below.

J. Thermal Impacts

The following thermal impacts have been identified for the project.

Thermal impacts will be addressed utilizing BMPs as described below. For each checked box, describe how the BMP will be implemented. Check all that apply. **See E&S Manual page 6 and the "Pennsylvania Stormwater Best Management Practices Manual" (No.363-0300-002), December 30, 2006, Chapter 7.**

- Preserve canopy cover
- Minimize impervious cover
- Maximize vegetative stabilization
- Promote infiltration of runoff
- Allow for sheet flow over vegetated surfaces (i.e. vegetative filter strips, etc.)
- Avoid shallow traps/basins
- Allow for shading around traps/basins
- Draw water from the bottom of traps/basins
- Other (describe all others)

K. E&S Plan and PCSM or SR Plan Consistency

The project and how the E&S Plan will accommodate Post-Construction Stormwater Management (PCSM) or Site Restoration (SR) is discussed below including but not limited to (check all that apply).

- Entire site will be returned to approximate original contour & stabilized with minimum uniform 70 percent vegetative cover.
- Construction equipment will be restricted from entering areas proposed for infiltration.
- PCSM BMPs will be protected from sediment pollution.
- Temporary and permanent basins will utilize same location when possible.
- Size E&S and PCSM/SR basins in order minimize work to convert upon permanent stabilization.
- Other (describe all others)

L. Riparian Buffers

The following practices and activities are prohibited within the mandatory riparian buffer:

1. Soil disturbance by grading or stripping of topsoil.
2. Draining by ditching, underdrains, or other drainage systems.
3. Storing or stockpiling materials.
4. Off-road vehicular travel.

The following practices and activities are allowable in the mandatory riparian buffer when authorized by DEP:

1. Construction or placement of roads, bridges, trails, storm drainage, utilities, or other structures.
2. Water obstructions or encroachments.
3. Restoration projects.

The following practices and activities are allowed within the mandatory riparian buffer:

1. Buffer maintenance activities within the riparian buffer, including disturbance of existing vegetation and tree and shrub removal as needed to allow for natural succession of native vegetation and protection of public health and safety.
2. Emergency response and other similar activities.

For additional information regarding the implementation and maintenance of mandatory and voluntary riparian forest buffers, see PADEP "Riparian Forest Buffer Guidance," November 2010, Technical Guidance No. 394-5600-001.

L.1. Does this project require a permit under Title 25 Chapter 102 of the Pa. Code? Yes No

If no, a riparian buffer is not required, proceed to L.6.

L.2. Is any portion of the project site located in an EV or HQ watershed? Yes No

If no, a riparian buffer is not required, proceed to L.6.

L.3. Does this project qualify for an exception (see § 102.14(d)(1))? Yes No

If yes, indicate below the type of project for which the exception applies by marking the appropriate box.

Oil and gas activities for which site reclamation or restoration is part of the permit authorization in Chapter 78.

Road maintenance activities.

The repair or maintenance of existing pipelines and utilities.

Other (see §102.14(d)(1)):

If exceptions are checked, explain how existing riparian buffer will be undisturbed to the extent practicable.

L.4. Are you requesting a riparian buffer waiver for this project? Yes No

If yes, indicate below the type of project for which you are requesting a waiver by marking the appropriate box.

- Linear project that may include pipelines, public roadways, rail lines, or utility lines.
- Project is of a temporary nature where the site will be fully restored to its preexisting conditions during the ESCGP-2 permit term.
- Project where compliance with mandatory riparian buffers is not appropriate or feasible due to site characteristics or existing structures at the project site.
- Other(see §102.14(d)(2)):

If waivers are checked, explain how existing riparian buffers will be undisturbed to the extent practicable.

L.5 If 'Yes' to L.1 and L.2, **AND** 'No' to L.3 and L.4; check and describe as appropriate below;

When receiving waters are not classified impaired and there is no Total Maximum Daily Loads (TMDL)

- A riparian buffer management plan is not required.
- A 150 ft. setback is required.
- Describe how the 150 ft. setback will be established and maintained on the project.

or

When receiving waters are classified impaired or there is a TMDL

- Riparian forest buffer must be established, or if one exists, it must be modified to meet standards and be protected.
- Describe how a riparian forest buffer will be established or modified and maintained on the project.

L.6. A description of proposed voluntary riparian forest buffers, if proposed, is provided below.

M. Antidegradation Requirements

Projects located in Special Protection watersheds (HQ and/or EV), must consider nondischarge alternatives. An evaluation of nondischarge alternatives that identifies viable alternatives for the proposed project is provided below. A description of how each alternative was evaluated and why the proposed design was selected must be provided. **See E&S Manual pages 4, 7, 344.**

Alternative location

Alternative configuration

Alternative location of discharge

Limited Disturbed Area

Limiting Extent & Duration of Disturbance (Phasing, Sequencing)

Riparian Buffers (150 ft. min.)

Riparian Forest Buffer (150 ft. min.)

Drainage to HQ or EV watershed diverted to another (non HQ or EV) watershed.

Other (describe all others)

M.1 Antidegradation Best Available Combination of Technologies (ABACT)

Nondischarge alternatives are not practicable. ABACT BMPs for the proposed project are provided below and include (Check all that apply):

Treatment BMPs:

- Sediment basin with skimmer
- Sediment basin ratio of 4:1 or greater (flow length to basin width)
- Sediment basin with 4-7 day detention
- Flocculants

Land disposal:

- Vegetated filters
- Riparian buffers <150 ft.
- Riparian forest buffer <150 ft.

Pollution prevention:

- PPC Plans

- Immediate stabilization
- Street sweeping
- Channels, collectors, and diversions lined with permanent vegetation, rock, geotextile, or other non-erosive materials
- Stormwater reuse technologies:
 - Sediment basin water for dust control
 - Sediment basin water for irrigation
- Other

N. Additional Explanations and Clarifications

Additional explanations and clarifications are provided below, if needed.

III. MAPS AND PLAN DRAWINGS

A. Location Map

Indicate page or sheet number that includes the project location map:

B. Plan Drawings

Plan drawings must include the following items. Indicate page or sheet number(s) where they are located in the plans. If this plan is submitted as part of an ESCGP-2 NOI, the NOI Checklist may be used to satisfy this portion of the form.

1. Existing Topographic Features

Page(s) or sheet number(s) that include existing topographic features;

2. Soils Information

Page(s) or sheet number(s) that include the soils Information;

3. Earth Disturbance Activity

Page(s) or sheet number(s) that include the proposed earth disturbance activity, included proposed contours;

4. Project Site Runoff

Page(s) or sheet number(s) that include the Project Site Runoff, including maximum drainage areas to all proposed BMPs;

5. Surface Water Classification

Page(s) or sheet number(s) that include the receiving waters as identified in Section II.D of this Application;

6. BMPs and Maintenance Program

Page(s) or sheet number(s) that show the location of proposed BMPs as well as the maintenance program for each BMP;

7. Material Recycling and Disposal

Page or sheet number that includes the project material recycling and disposal information;

8. Soil Conditions and Geologic Formations

Page(s) or sheet number(s) that include the soil conditions and geologic formations;

9. Thermal Impacts

Page(s) or sheet number(s) that include the thermal impacts;

10. E&S Plan and PSCM/SR Plan Consistency

Page(s) or sheet number(s) that indicate and/or describe where consistency between the E&S Plan and PSCM/SR plan have been identified;

11. Riparian Forest Buffers

Page(s) or sheet number(s) that indicate locations of required or voluntary riparian forest buffers;

12. Antidegradation Requirements

Page(s) or sheet number(s) that indicate and/or describe locations and details of all non-discharge alternatives, if necessary on the project;

IV. CERTIFICATION BY PERSON PREPARING APPLICATION

EXPEDITED REVIEW PROCESS

Plans submitted using the expedited permit review process under ESCGP-2 must attach an E&S and SR Plan developed and sealed by a licensed professional engineer, surveyor, landscape architect, or professional geologist. The plans shall both contain the following certification:

I do hereby certify to the best of my knowledge, information and belief, that the Erosion and Sediment Control and Site Restoration Plan are true and correct, represent actual field conditions and are in accordance with the 25 Pa. Code Chapters 78 and 102 of the Department's rules and regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

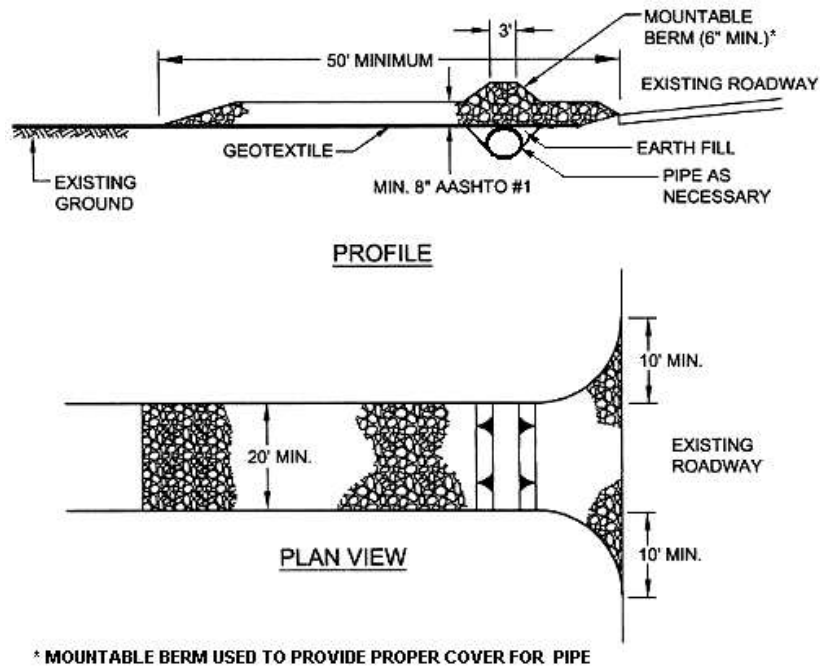
Print Name:	Signature:	
Company:		
Address:		
Phone:		

APPENDIX A

Note: Include only details for BMPs included in the E&S Plan. Detail drawings may be provided in alternate formats such as plan sheets.

A. SITE ACCESS

- 1. ROCK CONSTRUCTION ENTRANCE** - A rock construction entrance should be installed wherever it is anticipated that construction traffic will exit the project site onto any roadway, public, or private. Access to the site should be limited to the stabilized construction entrance(s).



Remove topsoil prior to installation of rock construction entrance. Extend rock over full width of entrance. Extend length of rock where necessary to provide minimum 4 revolutions of vehicle tires or where clay content of soils causes excess mud transport beyond construction entrance.

Runoff shall be diverted from roadway to a suitable sediment removal BMP prior to entering rock construction entrance.

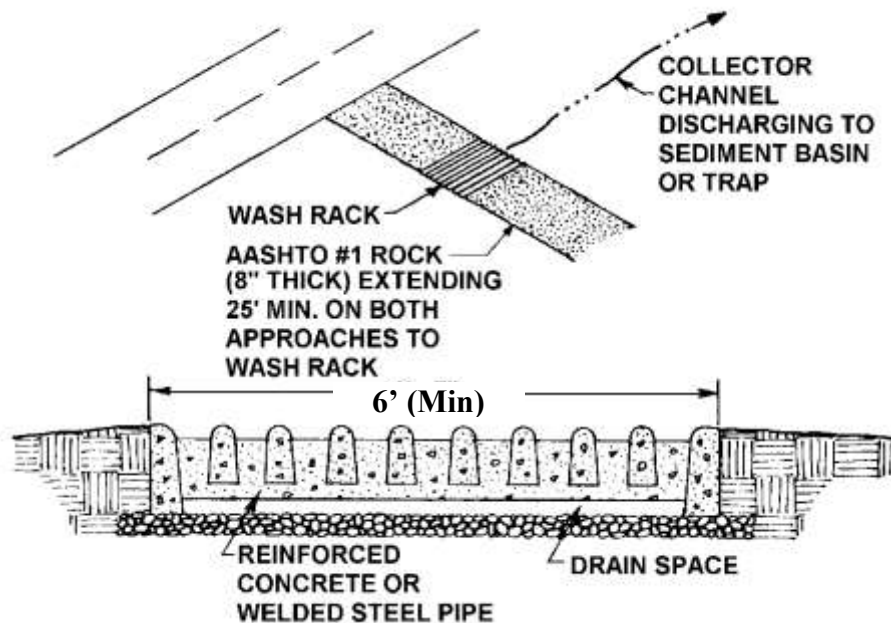
Mountable berm shall be installed wherever optional culvert pipe is used and proper pipe cover as specified by manufacturer is not otherwise provided. Pipe shall be sized appropriately for size of ditch being crossed.

Rumble pad or combination of rumble pads of equal length may be substituted for rock construction entrance. Street sweeping with vacuum sweeper, manual cleaning, rolling of dirt/gravel roads may be substituted for wash racks in special protection watersheds (HQ or EV).

MAINTENANCE: Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained on site for this purpose. All sediment deposited on paved roadways shall be removed and returned to the construction site immediately. If excessive amounts of sediment are being deposited on roadway, extend length of rock construction entrance by 50 foot increments until condition is alleviated or install wash rack.

Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.

Rock Construction Entrance with Wash Rack



Wash rack shall be 20 feet (min.) wide or total width of access.

Wash rack shall be designed and constructed to accommodate anticipated construction vehicular traffic.

A water supply shall be made available to wash the wheels of all vehicles exiting the site.

MAINTENANCE: Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile of rock material shall be maintained on site for this purpose. Drain space under wash rack shall be kept open at all times. Damage to the wash rack shall be repaired prior to further use of the rack. All sediment deposited on roadways shall be removed and returned to the construction site immediately. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.

Manufactured wheel washes may be used as ABACT in special protection watersheds or where special traffic safety issues exist. All such wheel washes should be installed and operated according to the manufacturer's specifications. Wastewater from the wheel washes should either be recycled or run through an approved sediment removal device prior to discharge to surface water.

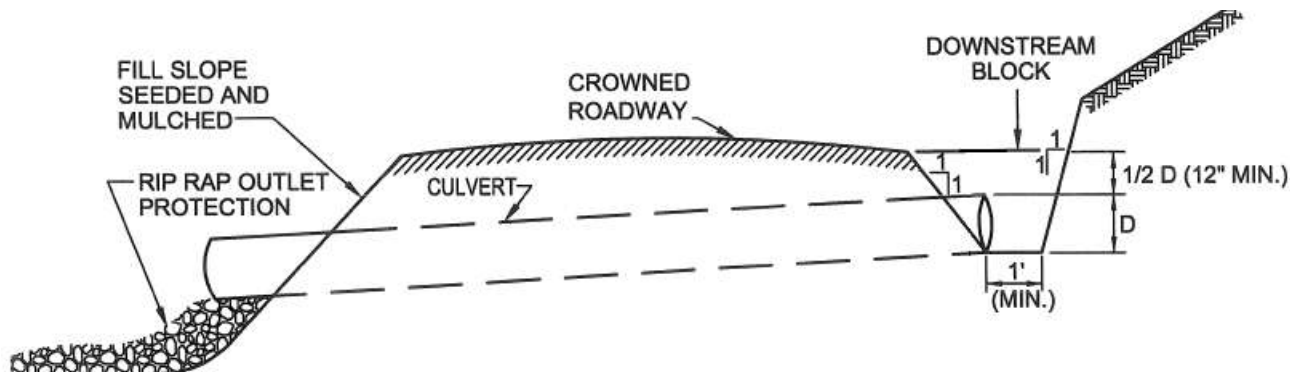
Note: Where tire washes are not feasible the following alternative method will apply:

On paved surface public roads, a vacuum truck sweeper, or sweeper with a catch bin attachment will be used to clean the roadway on a continuing basis.

On dirt or gravel surface public roads a rigorous manual removal of mud/dirt from vehicle/equipment tires prior to exiting construction site, supplemented by immediate recovery, by manual or mechanical means, of soil which may become discharged onto public roadways. Dust control and/or compaction via rolling of the dirt public road surface will be implemented as needed.

For both of the alternative methods, the rock entrance will be extended to a minimum 100 foot length.

2. CROWNED / INSLOPED ROADWAY



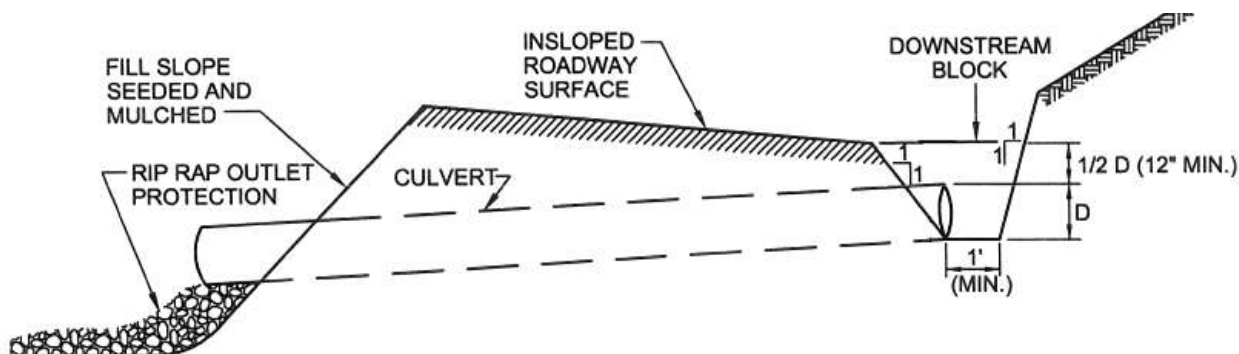
Cut and fill slopes shall be stabilized immediately upon completion of roadway grading. These areas shall be blanketed wherever they are located within 50 feet of surface water or within 100 feet of surface water where a suitable vegetative filter strip does not exist.

A top dressing composed of hard, durable stone shall be provided for soils having low strength.

Roadside ditches shall be provided with adequate protective lining wherever runoff cannot sheet flow away from the roadway.

Adequately sized culverts or other suitable cross drains shall be provided at all seeps, springs, and drainage ways. Ditch relief culverts shall be provided at the intervals indicated on the tables below. Riprap outlet protection to be sized according to anticipated discharge velocity.

Roadway shall be inspected weekly and after each runoff event. Damaged roadways, ditches, or cross drains shall be repaired immediately.



Sizing and Spacing of Ditch Relief Culverts for Temporary Access Roads

Road Grade (%)	Culvert Spacing* (ft)	Length of Upslope Drainage (ft)				
		< 300	300 - 400	400 - 500	500 - 600	>600
		Minimum Culvert Size (in)				
2	300	12	15	15	15	18
3	235	12	15	15	15	18
4	200	12	15	15	15	18
5	180	12	12	15	15	15
6	165	12	12	12	15	15
7	155	12	12	12	12	15
8	150	12	12	12	12	15
9	145	12	12	12	12	15
10	140	12	12	12	12	15
12	135	12	12	12	12	15

*Culvert spacing may be adjusted slightly to take advantage of natural drainage courses.

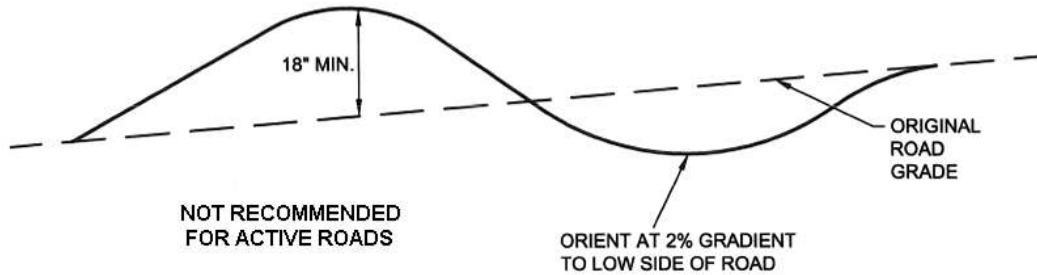
Recommended Maximum Spacing for 18 Inch Diameter CMP Ditch Relief Culverts for Permanent Access Roads

Road Grade Percent	Soil Type in Ditch				
	Gravels, Sandy Gravels, Aggregate Surfacing	Silty Gravels, Clayey Gravels	Plastic and Non-plastic Inorganic Clays	Inorganic Silts, Silty, or Clayey Sands	Sands, Silty Sands, and Gravelly Sands
	Culvert Spacing Feet*				
2	390	315	245	170	95
4	335	275	210	145	85
6	285	230	180	125	75
8	240	195	150	105	65
10	200	160	125	90	55
12	160	130	105	75	45
14	135	110	85	60	35

*Culvert spacing may be adjusted slightly to take advantage of natural drainage courses.

3. **WATERBARS** - Waterbars are typically used to control stormwater runoff on retired access roads as well as pipeline right-of-ways. They are not recommended for active access roads due to the difficulty of moving equipment over them as well as the need for continual maintenance due to damage from traffic. Waterbars will be installed before the ground freezes and will be spaced as indicated below:

TYPICAL WATERBAR



Maximum Waterbar Spacing

PERCENT SLOPE	SPACING (FT)
<5	250
5 - 15	150
15 - 30	100
> 30	50

Waterbars shall discharge to a stable area.

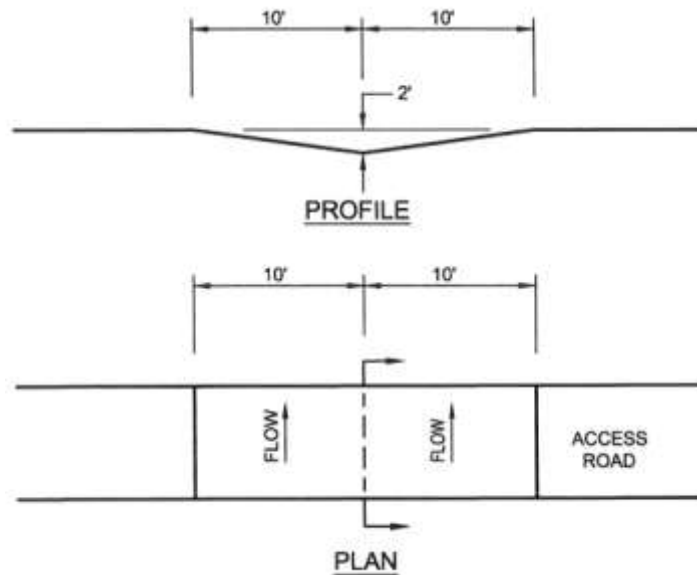
Waterbars shall be inspected weekly (daily on active roads) and after each runoff event. Damaged or eroded waterbars shall be restored to original dimensions within 24 hours of inspection.

Maintenance of waterbars shall be provided until roadway, skid trail, or right-of-way has achieved permanent stabilization.

Waterbars on retired roadways, skid trails, and right-of-ways shall be left in place after permanent stabilization has been achieved.

- 4. BROAD-BASED DIPS** - Broad-based dips may be used to direct runoff from active access roads to well-vegetated areas or sediment removal BMPs (e.g. Sediment traps). Broad-based dips, unlike waterbars, are easily traversed by construction equipment and typically require less maintenance to ensure their integrity. Due to the nature of broad-based dips, they should not be constructed on roads with grades exceeding 10 percent. Where access roads must exceed 10 percent gradients, insloping should be used to control runoff.

TYPICAL BROAD-BASED DIP for Low Gradient ($\leq 5\%$) Roadways



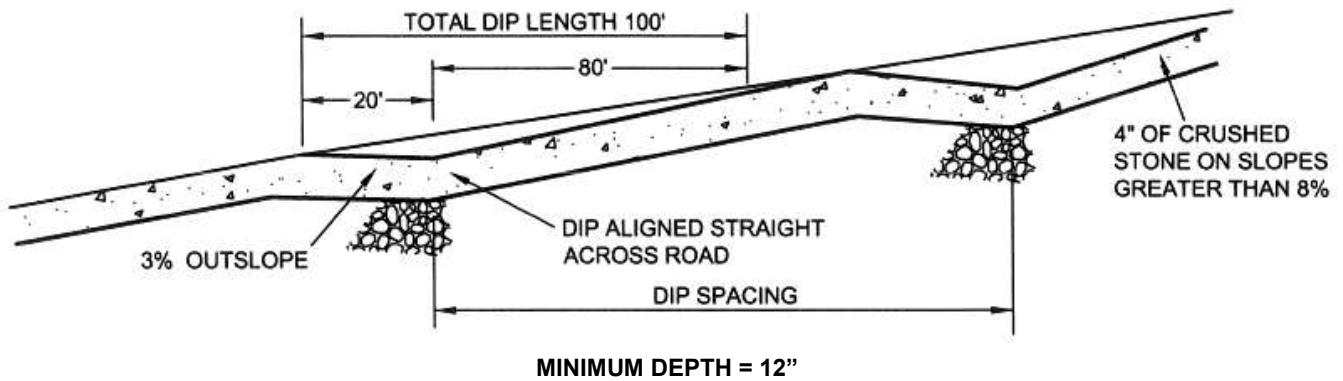
Broad-based dips shall be constructed to the dimensions shown and at the locations shown on the plan drawings.

Dips shall be oriented so as to discharge to the low side of the roadway.

Dips shall be inspected daily. Damaged or non-functioning dips shall be repaired by the end of the workday.

Maximum spacing of broad-based dips shall be as shown in the table below.

Broad-based Dip for High Gradient (5% - 10%) Roadways



Broad-based dips shall be constructed to the dimensions shown and at the locations shown on the plan drawings.

Dips shall be oriented so as to discharge to the low side of the roadway.

Dips shall be inspected daily. Damaged or non-functioning dips shall be repaired by the end of the workday.

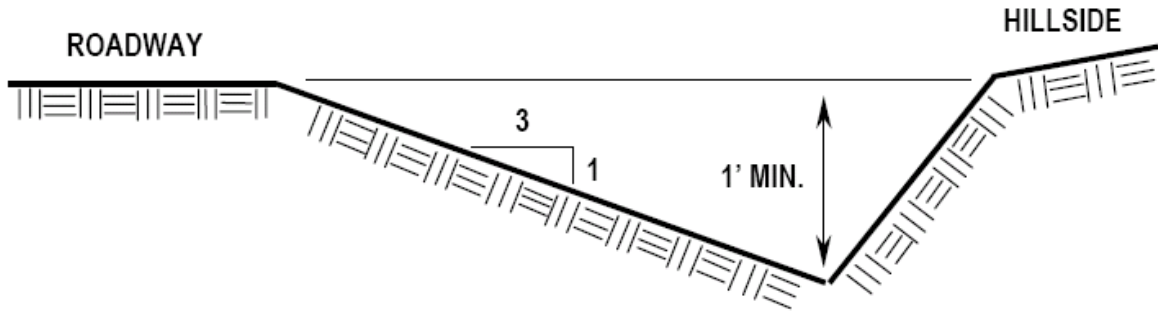
Maximum spacing of broad-based dips shall be as shown in the table below.

Maximum Spacing of Broad-based Dips

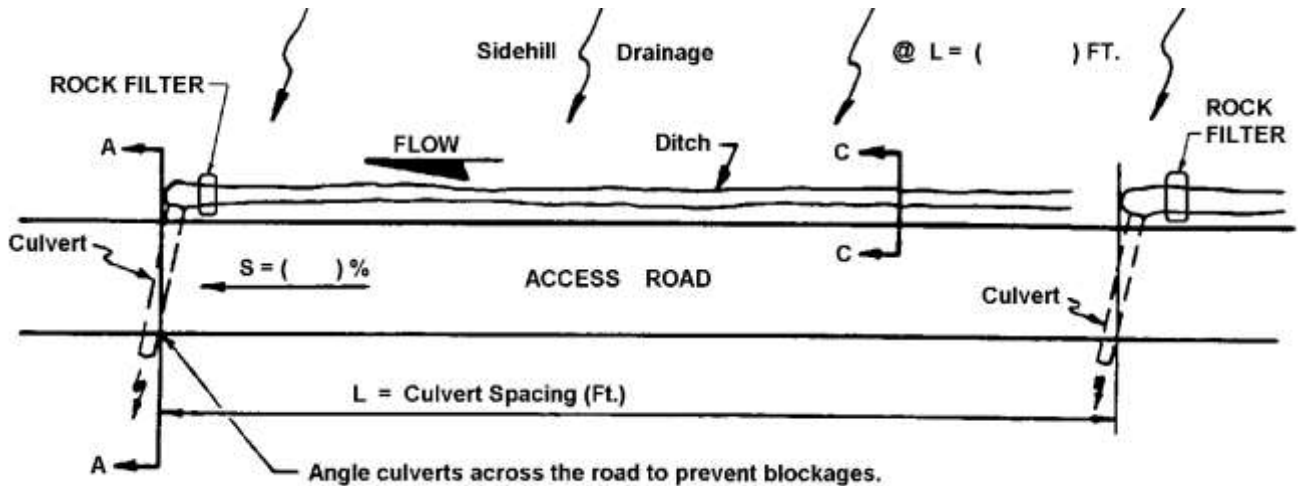
Road Grade (Percent)	Spacing Between Dips, Culverts, or Deflectors (feet)
<2	300
3	235
4	200
5	180
6	165
7	155
8	150
9	145
10	140

5. **ROADSIDE DITCH** - In most cases, the ditches paralleling temporary access roads and haul roads need not be lined if sufficient ditch relief culverts are provided, erosion resistant soils are present, and flow velocities are less than 2 fps. However, protective liners are required for roadside ditches discharging to special protection waters, where the discharging directly to surface waters, or where necessary to prevent the erosion of the channel itself.

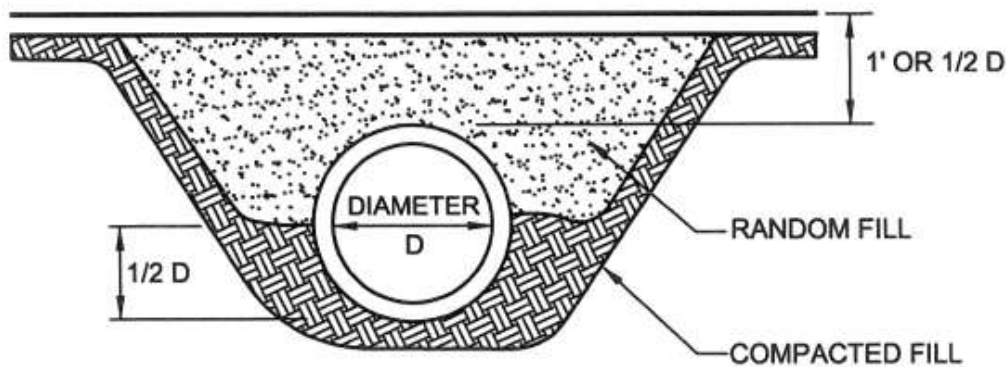
Typical Roadside Ditch Section



Access Road Layout



6. DITCH RELIEF CULVERTS (CROSS DRAIN)



Minimum diameter for any culvert is 12"; otherwise culvert shall be sized for anticipated peak flow. Place culvert so bottom is at same level as bottom of ditch or adjoining slope. Culverts shall be placed with a slope of 2 to 4%. Lower end shall be at least 2" below upper end.

Extend culvert 12" beyond base of road fill on both sides. Firmly pack fill around culvert, especially the bottom half.

Provide suitable outlet protection* and, where appropriate, inlet protection.

Inspect culvert weekly: remove any flow obstructions and make necessary repairs immediately.

NOTE: This detail may be used for ditch relief culverts and for crossings of roadside ditches. It is not appropriate for stream crossings.

*For steep slope ($\geq 2H: 1V$) outfalls, a minimum 20 foot long R-5 apron is recommended for temporary access roads where the recommended culvert spacing is used. For permanent access roads, a minimum R-6 rock size is recommended.

Sizing and Spacing* of Ditch Relief Culverts for Temporary Access Roads

Road Grade (%)	Culvert Spacing* (ft.)	Length of Upslope Drainage (ft.)				
		< 300	300 – 400	400 – 500	500 – 600	>600
		Minimum Culvert Size (in)				
2	300	12	15	15	15	18
3	235	12	15	15	15	18
4	200	12	15	15	15	18
5	180	12	12	15	15	15
6	165	12	12	12	15	15
7	155	12	12	12	12	15
8	150	12	12	12	12	15
9	145	12	12	12	12	15
10	140	12	12	12	12	15
12	135	12	12	12	12	15

*Culvert spacing may be adjusted slightly to take advantage of natural drainage-ways.

Maximum Spacing* of Cross Drain Culverts (18" dia. CMP) For Permanent Access Roads

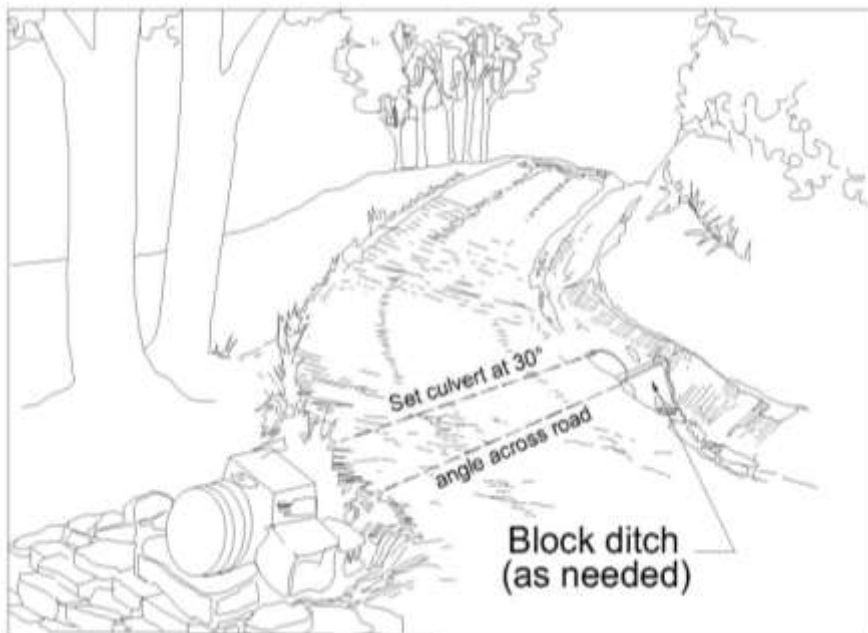
Road Grade	Soil Type in Ditch				
	Gravels, Sandy Gravels, Aggregate Surfacing	Silty Gravels, Clayey Gravels	Plastic and Non-plastic Inorganic Clays	Inorganic Silts, Silty or Clayey Sands	Sands, Silty Sands, and Gravelly Sands
Percent	Feet				
2	390	315	245	170	95
4	335	275	210	145	85
6	285	230	180	125	75
8	240	195	150	105	65
10	200	160	125	90	55
12	160	130	105	75	45
14	135	110	85	60	35

R-4 (Min.) Riprap protection will be provided at all outfalls.

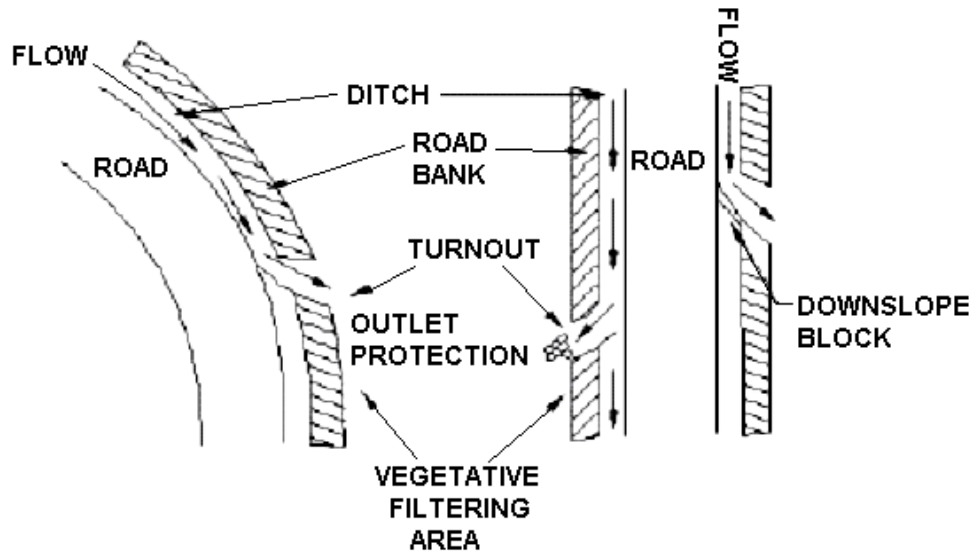
At all stream crossing locations, runoff must be directed to a sediment removal area, i.e., filter strip, straw bale, silt fence, sump, or trap for treatment. Waterbars and/or broad based dips should be installed and maintained as required on the approaches to the stream crossing.

*Culvert spacing may be adjusted slightly to take advantage of natural drainage-ways.

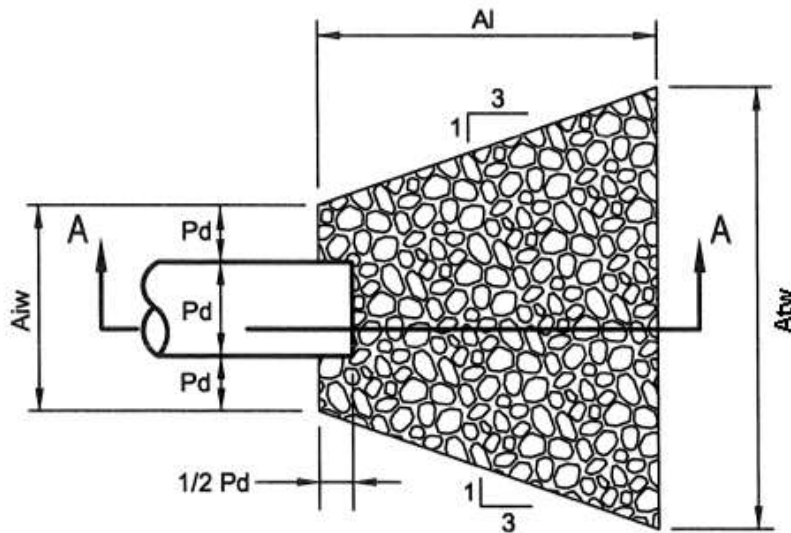
Typical Ditch Relief Culvert Installation



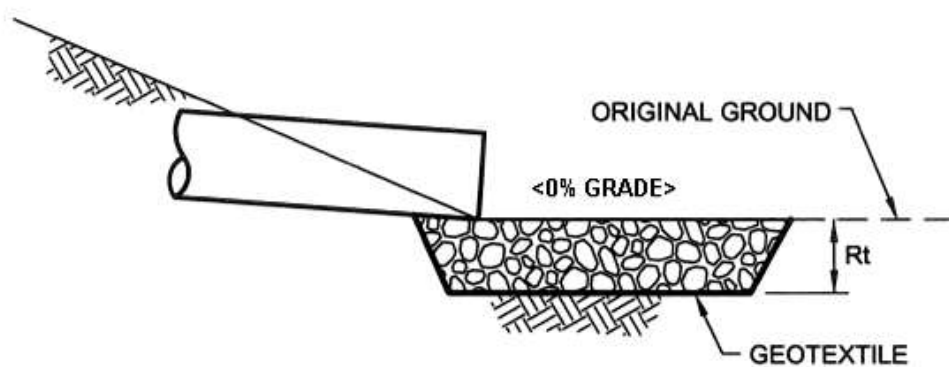
7. **TURNOUT** - turnouts are typically located along crowned roadways where runoff cannot sheet flow off the roadway. Like ditch relief culverts, the purpose of turnouts is to minimize the volume of water in a roadside ditch. Turnouts should be located so as to take advantage of natural drainage ways or buffer areas wherever possible. Where a suitable vegetative filter strip is not available, a compost filter sock, rock filter or other sediment removal bmp should be installed at the outlet of the turnout.



8. RIPRAP APRON AT PIPE OUTLET WITHOUT FLARED ENDWALL



PLAN VIEW



SECTION A - A

OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP		APRON		
		SIZE (R-___)	THICK. Rt (IN)	LENGTH Ai (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH Atw (FT)

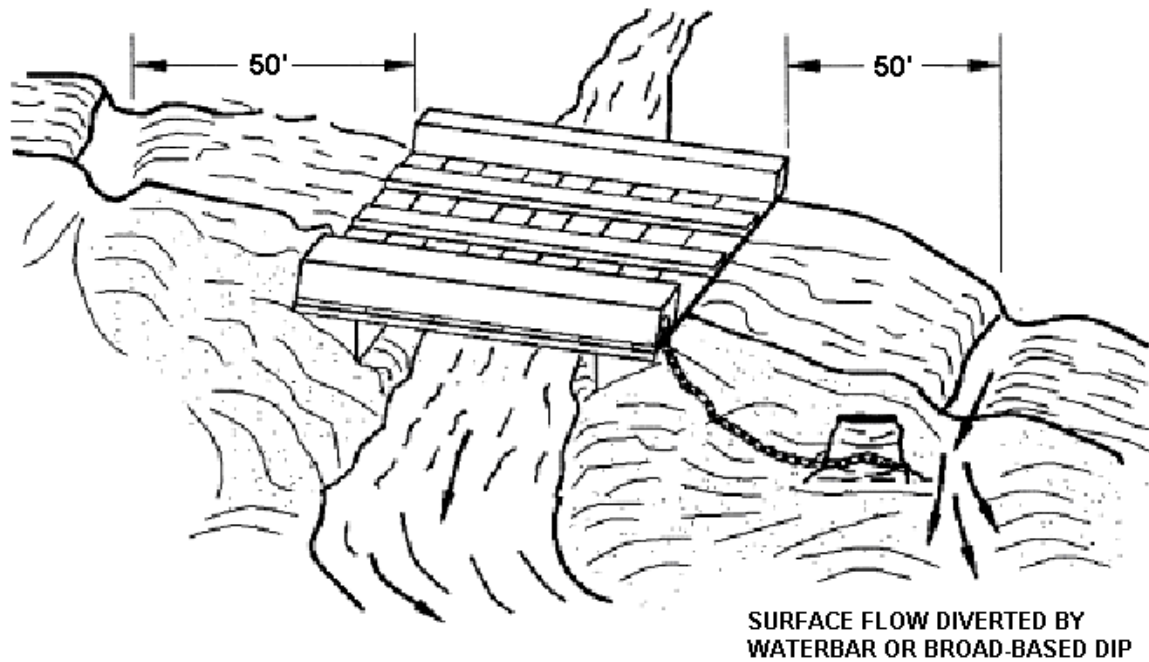
All aprons shall be constructed to the dimensions shown. Terminal widths shall be adjusted as necessary to match receiving channels.

All aprons shall be inspected at least weekly and after each runoff event. Displaced riprap within the apron shall be replaced immediately.

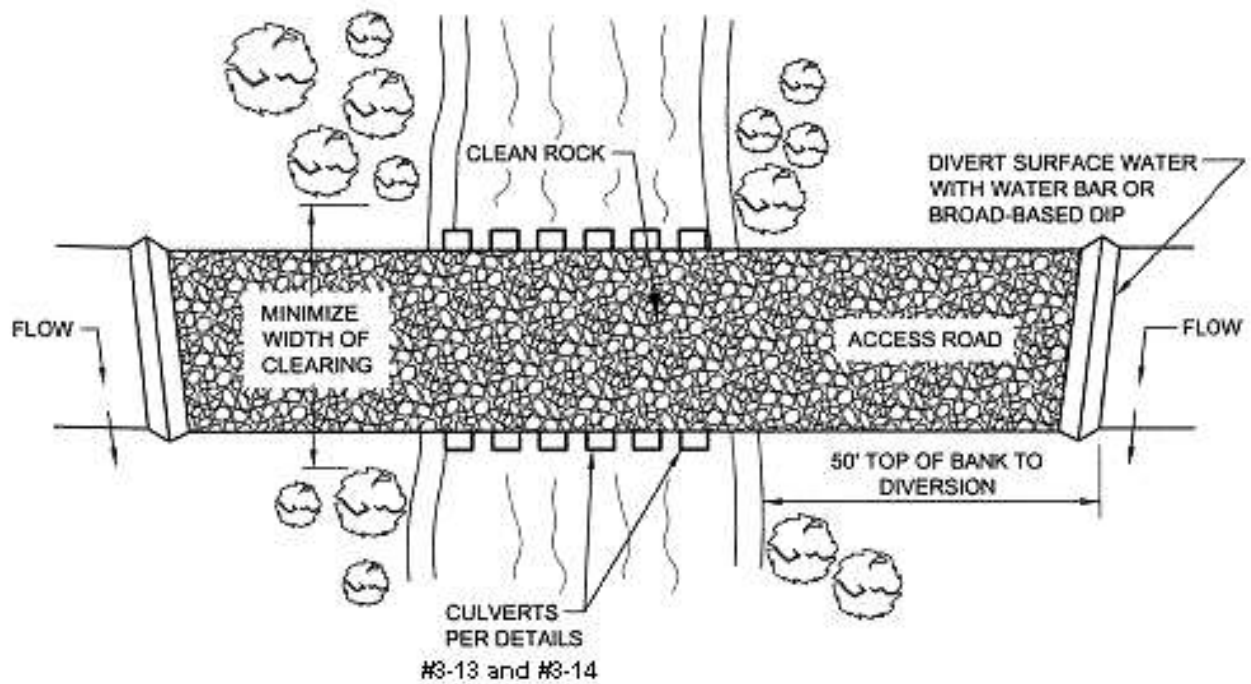
Extend riprap on backside of apron to at least 1/2 depth of pipe on both sides to prevent scour around the pipe.

9. TEMPORARY STREAM CROSSINGS

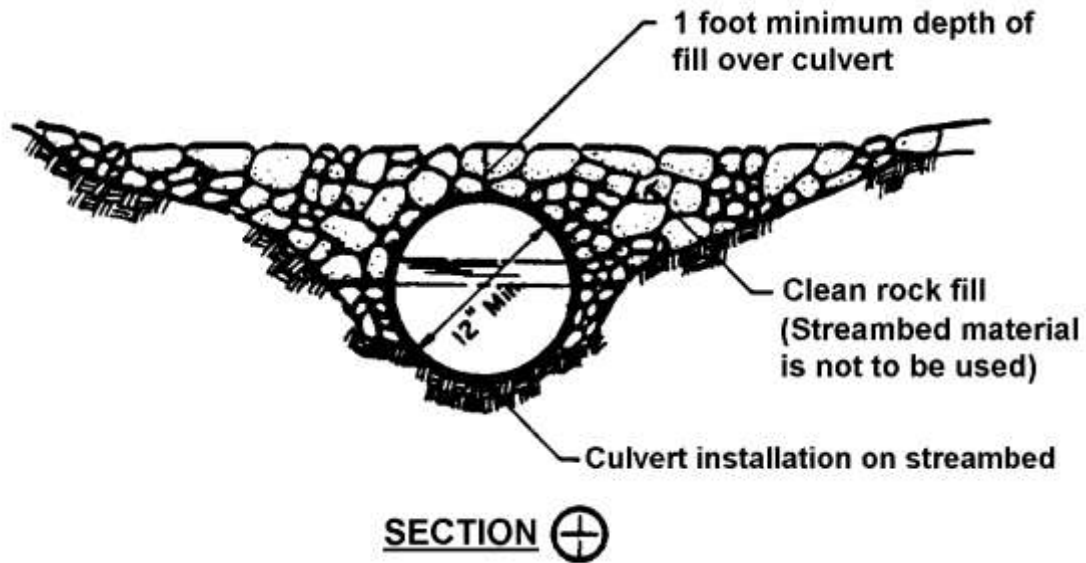
Typical Bridge Crossing



Temporary Stream Crossing - Plan View



Single Culvert Temporary Stream Crossing - Section



Provide 50 ft stabilized access to crossing on both sides of stream channel.

Pipes shall extend beyond the toe of the roadway.

Clean rock fill shall conform to Chapter 105 permitting requirements.

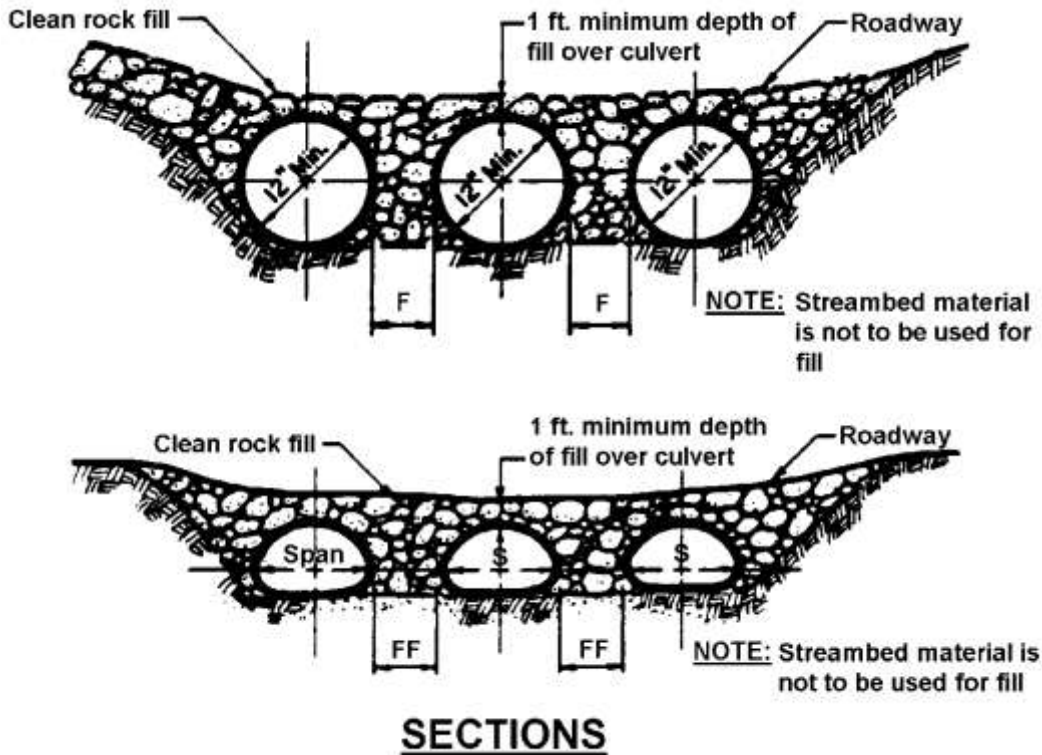
Runoff from the roadway shall be diverted off the roadway and into a sediment removal BMP before it reaches the rock approach to the crossing.

MAINTENANCE

1. Temporary stream crossings shall be inspected on a daily basis.
2. Damaged crossings shall be repaired within 24 hours of the inspection and before any subsequent use.
3. Sediment deposits on the crossing or its approaches shall be removed within 24 hours of the inspection

As soon as the temporary crossing is no longer needed, it shall be removed. All materials shall be disposed of properly and disturbed areas stabilized.

Multiple Culvert Temporary Stream Crossing - Section



Multiple pipes and multiple span bridges and culverts, which may tend to collect debris, contribute to the formation of ice jams and increase head losses shall be avoided to the maximum extent practicable. Crossings of less than 15 feet shall be by one span, except where conditions make it impractical to affect the crossing without multiple spans (Section 105.162).

Provide 50' stabilized access to crossing on both sides of stream channel.

Pipes shall extend beyond the toe of the roadway.

Clean rock fill shall conform to Chapter 105 permitting requirements.

Runoff from the roadway shall be diverted off the roadway and into a sediment removal BMP before it reaches the rock approach to the crossing.

MAINTENANCE

1. Temporary stream crossings shall be inspected on a daily basis.
2. Damaged crossings shall be repaired within 24 hours of the inspection and before any subsequent use.
3. Sediment deposits on the crossing or its approaches shall be removed within 24 hours of the inspection

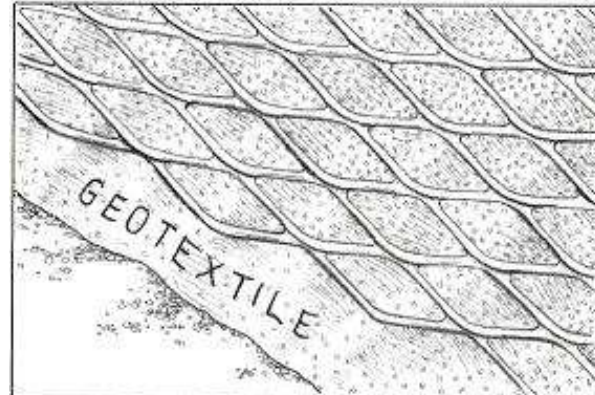
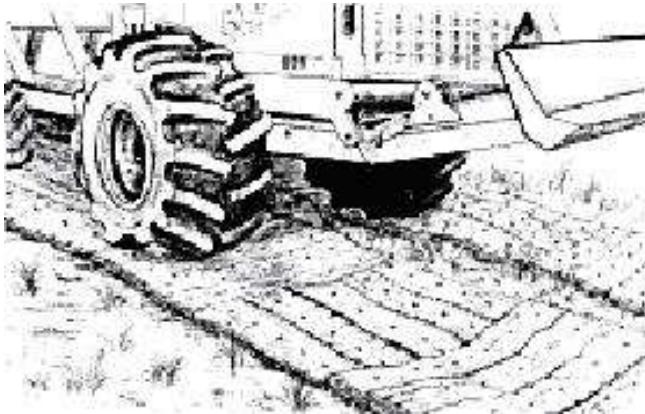
As soon as the temporary crossing is no longer needed, it shall be removed. All materials shall be disposed of properly and disturbed areas stabilized.

10. TEMPORARY WETLAND CROSSING

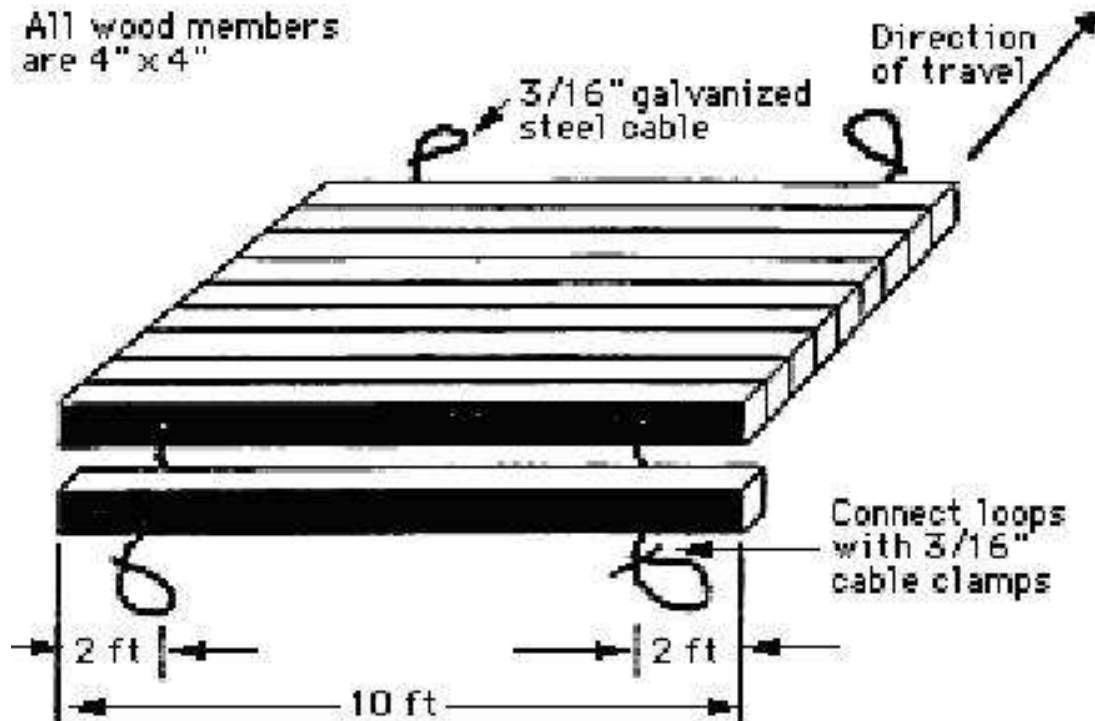
Wet land crossings must be avoided wherever possible. When that is not possible, the location of the crossing and its orientation must be selected so as to have the least possible impact upon the wetland.

Temporary crossings should be constructed from materials that can be placed with minimum of disturbance to the soil surface and completely removed when no longer needed. Typical examples are shown below.

Typical Tire Mat Wetland Crossing

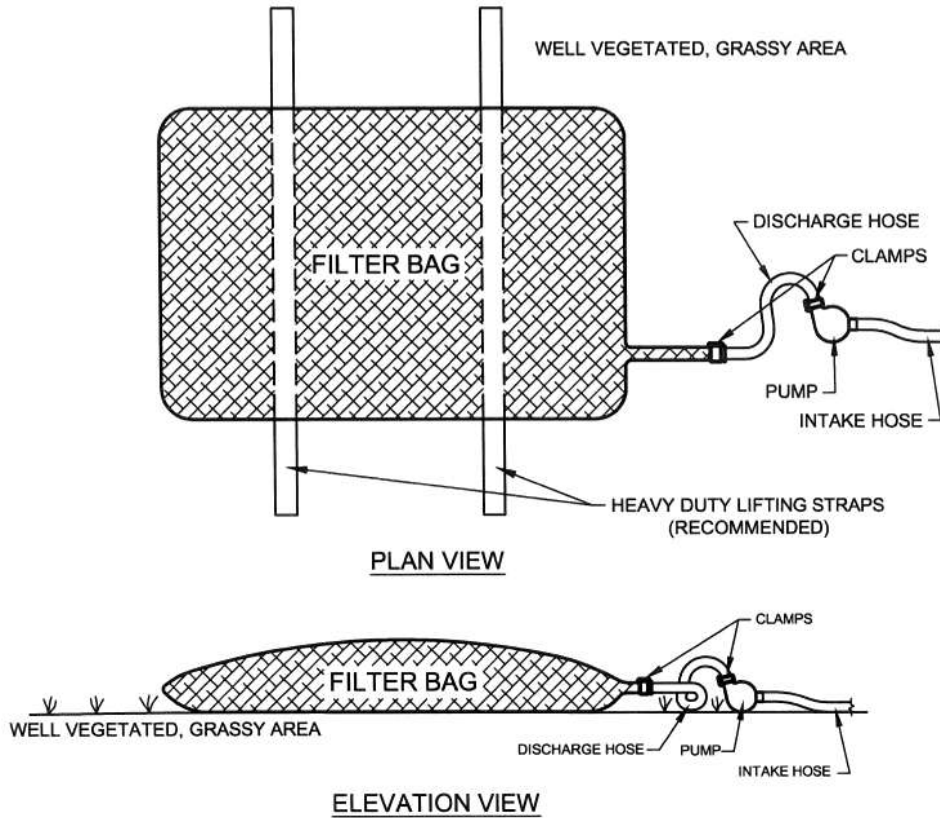


Typical Expanded Metal Grating Wetland Crossing



Typical Wood Mat for Wetland Crossing

11. PUMPED WATER FILTER BAG



Low volume filter bags shall be made from non-woven geotextile material sewn with high strength, double stitched “J” type seams. They shall be capable of trapping particles larger than 150 microns. High volume filter bags shall be made from woven geotextiles that meet the following standards:

Property	Test Method	Minimum Standard
Avg. Wide Width Strength	ASTM D-4884	60 lb/in
Grab Tensile	ASTM D-4632	205 lb
Puncture	ASTM D-4833	110 lb
Mullen Burst	ASTM D-3786	350 psi
UV Resistance	ASTM D-4355	70%
AOS % Retained	ASTM D-4751	80 Sieve

A suitable means of accessing the bag with machinery required for disposal purposes shall be provided. Filter bags shall be replaced when they become ½ full of sediment. Spare bags shall be kept available for replacement of those that have failed or are filled. Bags shall be placed on straps to facilitate removal unless bags come with lifting straps already attached.

Bags shall be located in well-vegetated (grassy) area, and discharge onto stable, erosion resistant areas. Where this is not possible, a geotextile underlayment and flow path shall be provided. Bags may be placed on filter stone to increase discharge capacity. Bags shall not be placed on slopes greater than 5%.

For slopes exceeding 5%, clean rock or other non-erodible and non-polluting material may be placed under the bag to reduce slope steepness.

No downslope sediment barrier is required for most installations. Compost berm or compost filter sock shall be installed below bags located in HQ or EV watersheds, within 50 feet of any receiving surface water or where grassy area is not available.

The pump discharge hose shall be inserted into the bags in the manner specified by the manufacturer and securely clamped. A piece of PVC pipe is recommended for this purpose.

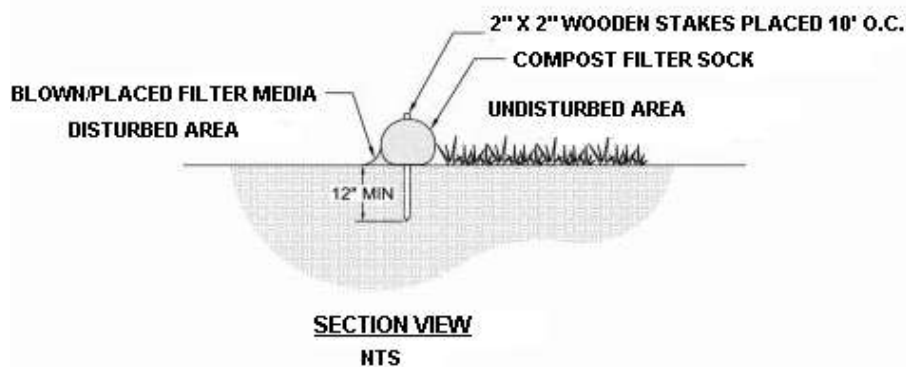
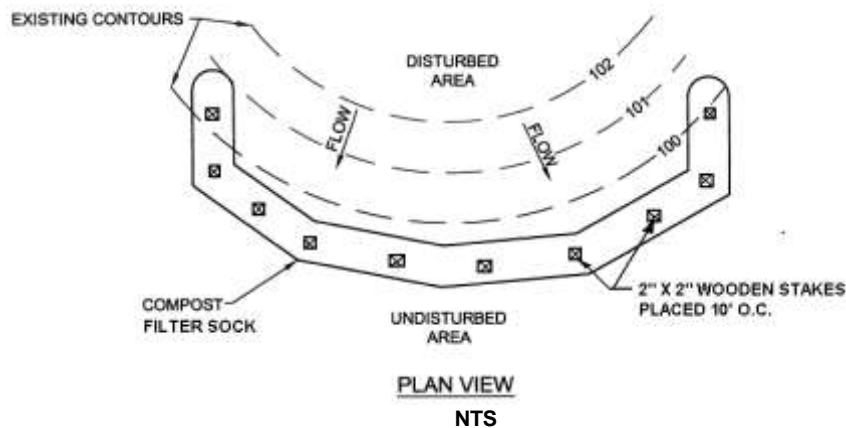
Note: *The following shall be placed on the detail sheets for Pumped Water Filter Bags:*

The pumping rate shall be no greater than 750 gpm. or ½ the maximum specified by the manufacturer, whichever is less. Pump intakes shall be floating and screened.

Filter bags shall be inspected daily. If any problem is detected, pumping shall cease immediately and not resume until the problem is corrected.

B. SEDIMENT BARRIERS and FILTERS

1. COMPOST FILTER SOCK



Compost sock fabric and compost material shall meet the standards in the tables below.

Prior to placement of the sock, obstructions such as tree limbs, rocks, etc. shall be removed. Compost filter sock shall be placed at existing level grade. Both ends of the sock shall be extended at least 8 feet up slope at 45 degrees to the main sock alignment. **Maximum slope length above any sock shall not exceed that shown in the Figure below.** Stakes may be installed immediately downslope of the sock if so specified by the manufacturer.

Traffic shall not be permitted to cross filter socks or wood chip socks.

Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.

Accumulated sediment shall be removed when it reaches half the above-ground height of the sock and disposed in the manner described elsewhere in the plan.

Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after one year. Polypropylene socks shall be replaced according to manufacturer's recommendations.

Upon stabilization of the area tributary to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed. In the latter case, the mesh shall be cut open and the mulch spread as a soil supplement.

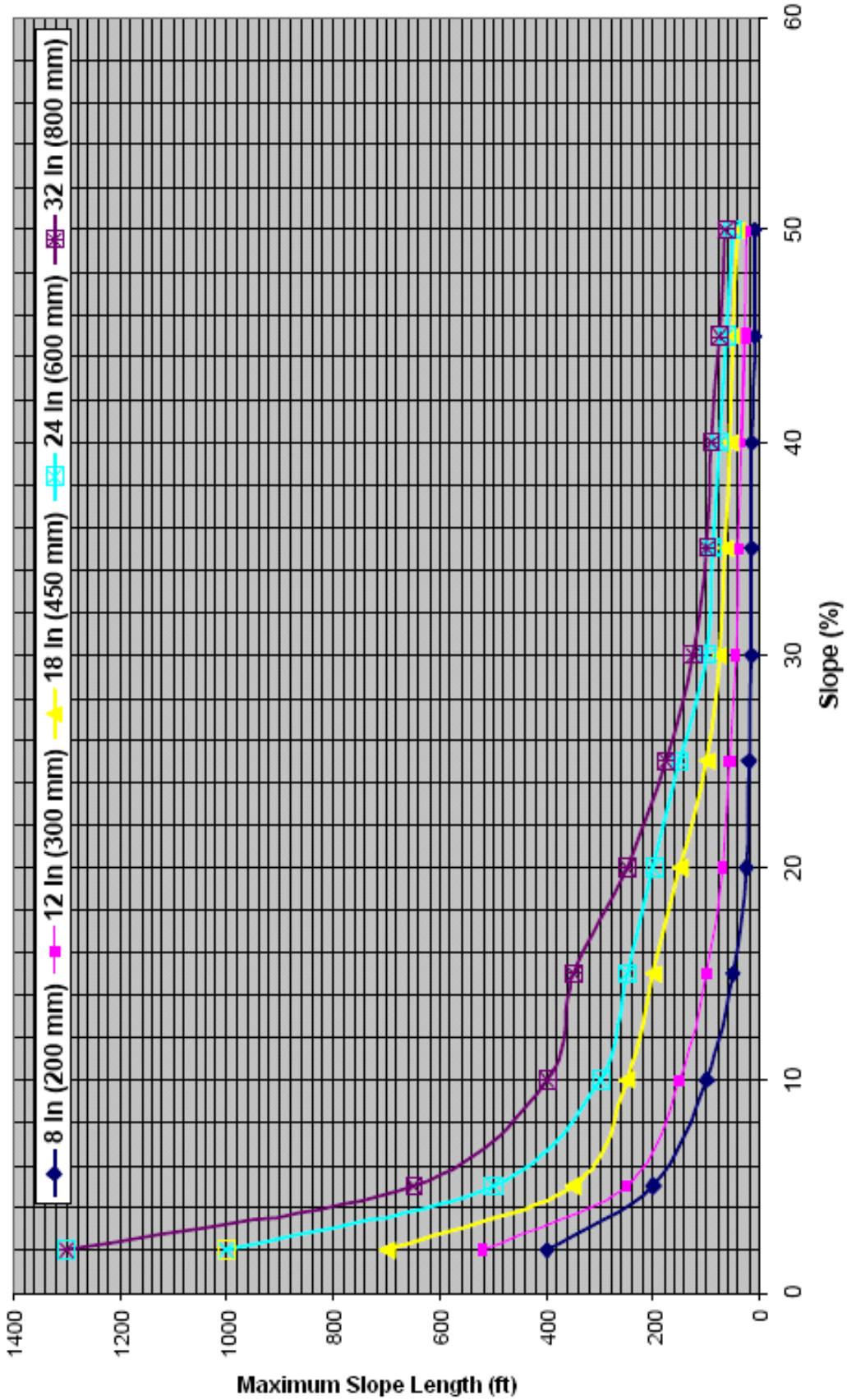
Compost Standards

Organic Matter Content	25% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5 - 8.5
Moisture Content	30% - 60%
Particle Size	30% - 50% pass through 3/8" sieve
Soluble Salt Concentration	5.0 dS/m (mmhos/cm) Maximum

Compost Sock & Wood Chip Sock Fabric Minimum Specifications

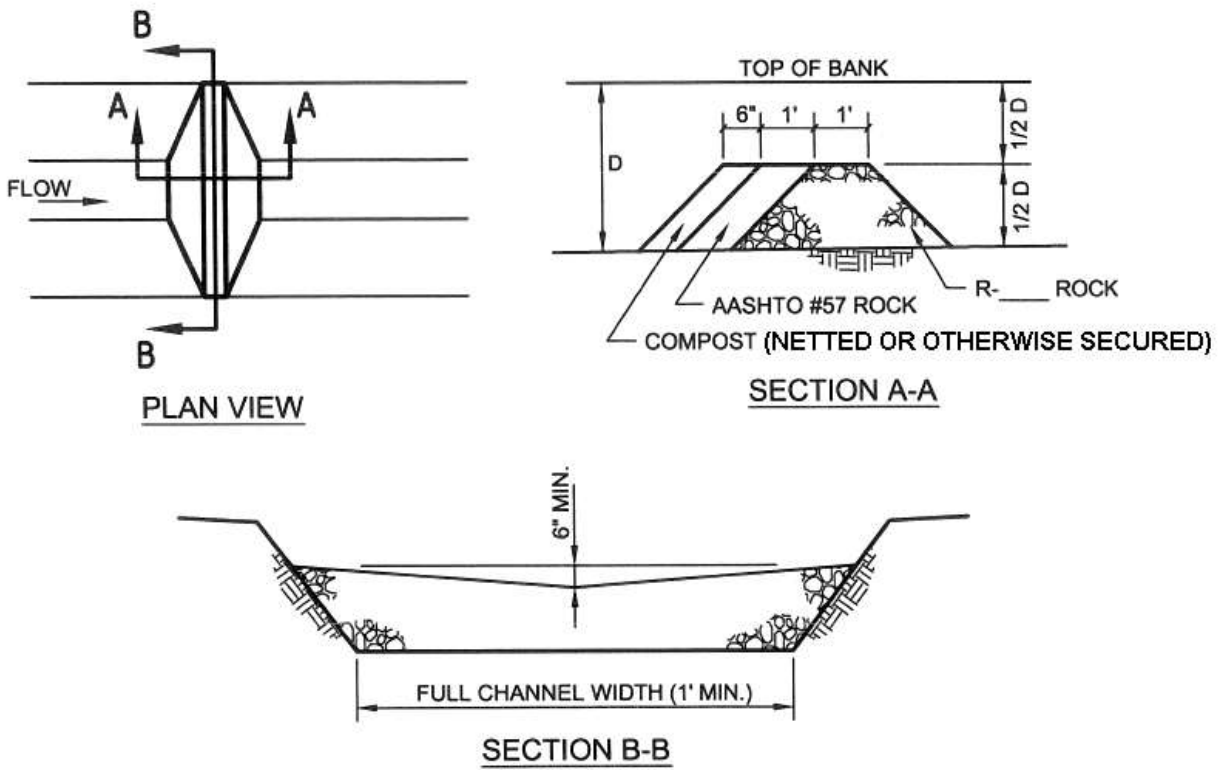
Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years
Two-ply systems					
Inner Containment Netting	HDPE biaxial net				
	Continuously wound				
	Fusion-welded junctures				
	3/4" X 3/4" Max. aperture size				
Outer Filtration Mesh	Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch)				
	3/16" Max. aperture size				
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					

MAXIMUM PERMISSIBLE SLOPE LENGTH ABOVE COMPOST SOCKS



NOTE: 8" diameter socks should only be used to control small ($\leq 1/4$ acre) disturbed areas on individual house lots).

2. ROCK FILTER



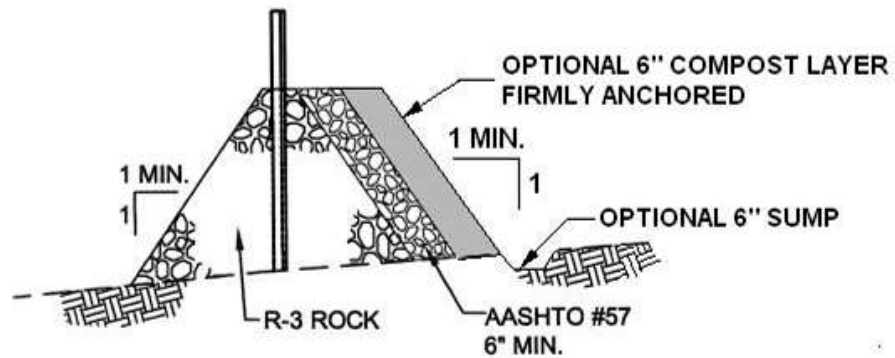
FOR $3' \leq D$ USE R-4
 FOR $2' \leq D < 3'$ USE R-3
 NOT APPLICABLE FOR $D < 2'$

ROCK FILTER NO.	LOCATION	D (FT.)	RIPRAP SIZE

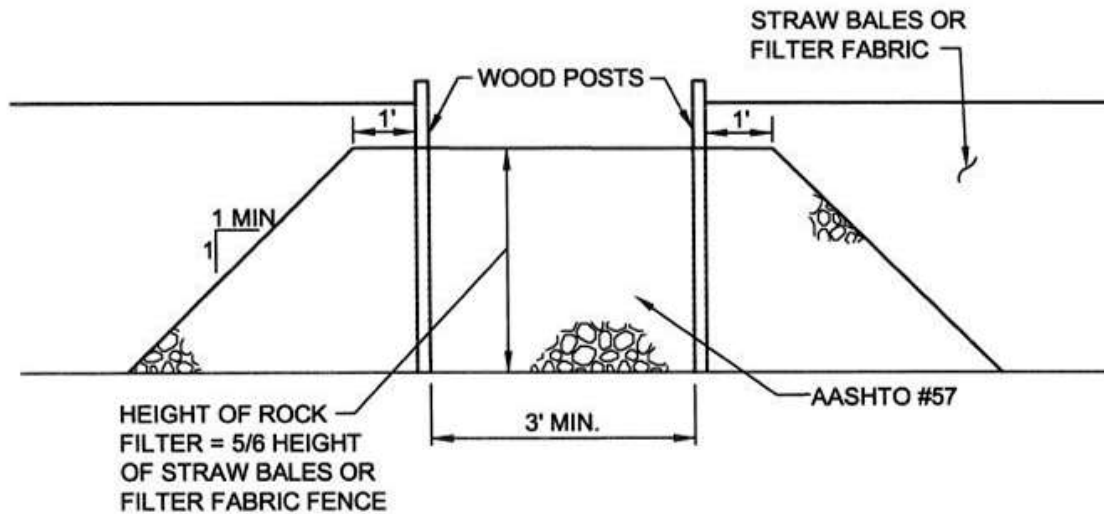
Sediment shall be removed when accumulations reach 1/2 the height of the filter.

Immediately upon stabilization of each channel, installer shall remove accumulated sediment, remove rock filter, and stabilize disturbed areas.

3. ROCK FILTER OUTLET FOR SILT FENCE OR STRAW BALE BARRIERS



OUTLET CROSS-SECTION

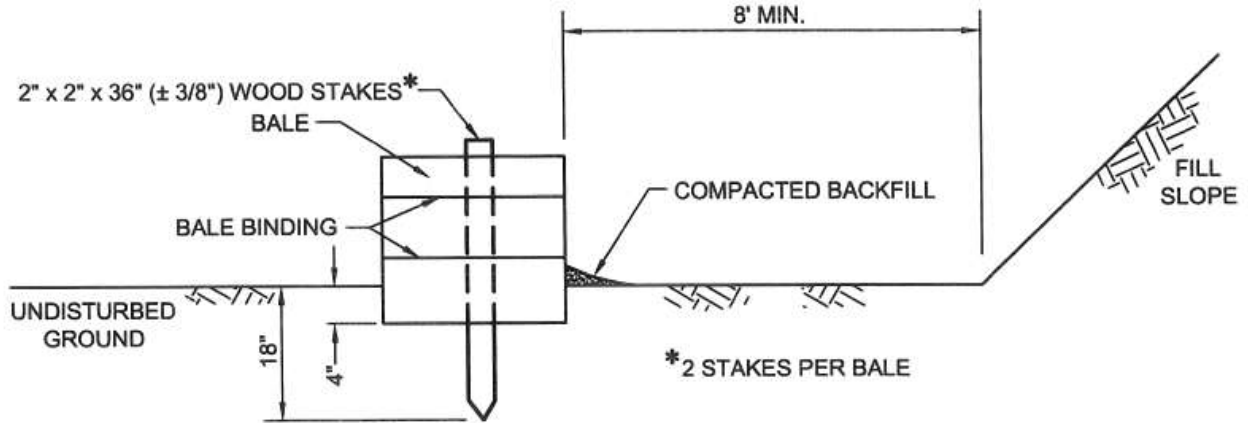


UP-SLOPE FACE

A rock filter outlet shall be installed where failure of a silt fence or straw bale barrier has occurred due to concentrated flow. Anchored compost layer shall be used on upslope face in HQ and EV watersheds.

Sediment shall be removed when accumulations reach 1/3 the height of the outlet.

4. STRAW BALE BARRIER



Straw bale barriers shall not be used for projects extending more than 3 months.

Straw bale barriers shall be placed at existing level grade with ends tightly abutting the adjacent bales. First stake of each bale shall be angled toward adjacent bale to draw bales together. Stakes shall be driven flush with the top of the bale. Both ends of the barrier shall be extended at least 8 feet up slope at 45 degrees to the main barrier alignment.

Compacted backfill shall extend approximately 4 inches above ground level.

Sediment shall be removed when accumulations reach 1/3 the aboveground height of the barrier. Damaged or deteriorated bales shall be replaced immediately upon inspection.

Any section of straw bale barrier which has been undermined or topped shall be immediately replaced with a rock filter outlet.

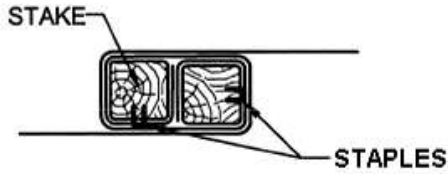
Bales shall be removed when the tributary area has been permanently stabilized.

Maximum Slope Length for Straw Bale Barriers and Wood Chip Filter Berms

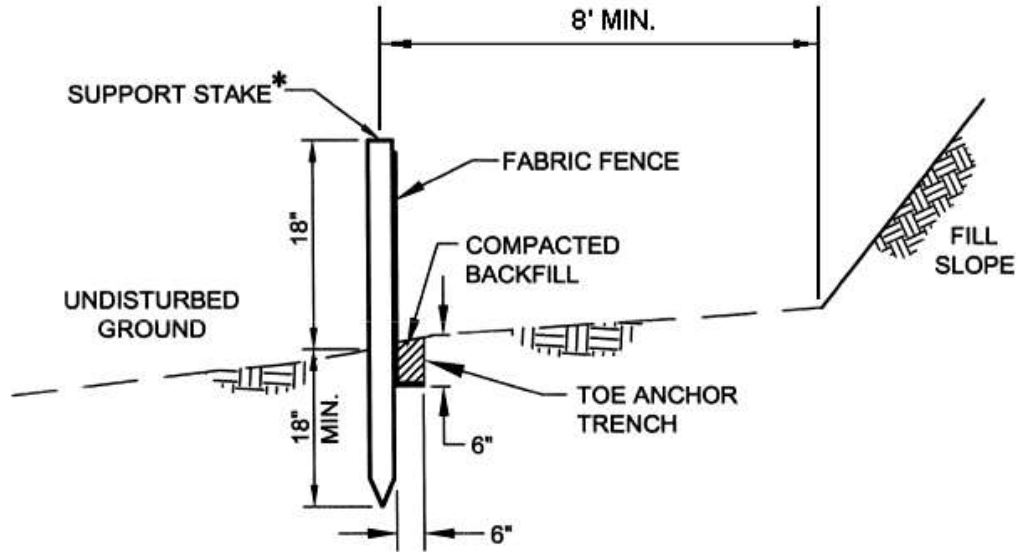
Slope - Percent	Maximum Slope Length (ft.) Above Barrier
2 (or less)	150
5	100
10	50
15	35
20	25
25	20
30	15
35	15
40	15
45	10
50	10
> 50	Not Permitted

5. STANDARD SILT FENCE (18" HIGH)

*STAKES SPACED @ 8' MAX.
 USE 2" x 2" (± 3/8") WOOD
 OR EQUIVALENT STEEL
 (U OR T) STAKES



JOINING FENCE SECTIONS



ELEVATION VIEW

Fabric shall have the minimum properties as shown in Table below.

Fabric width shall be 30" minimum. Stakes shall be hardwood or equivalent steel (U or T) stakes.

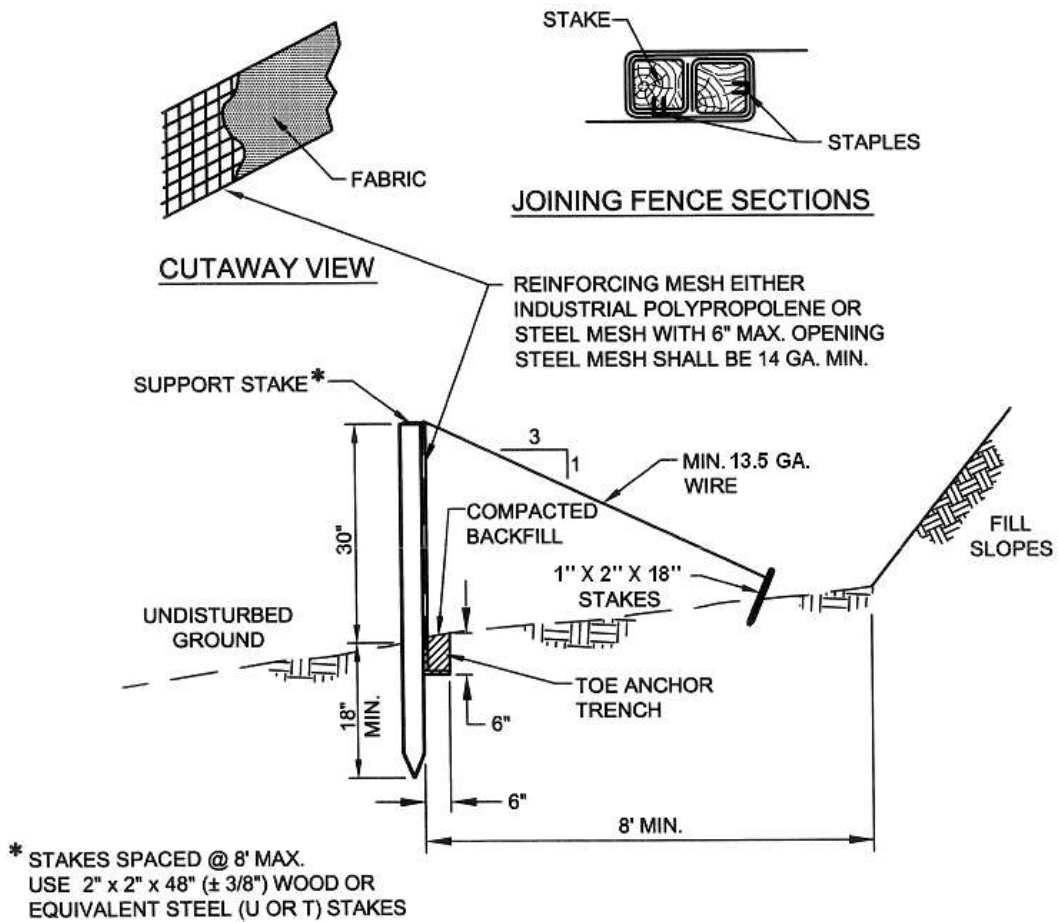
Silt fence shall be placed at level existing grade. Both ends of the fence shall be extended at least 8 feet up slope at 45 degrees to the main fence alignment. Maxim slope lengths tributary to the silt fence are listed in the Table below.

Sediment shall be removed when accumulations reach half the aboveground height of the fence.

Any section of silt fence which has been undermined or topped shall be immediately replaced with a rock filter outlet.

Fence shall be removed and properly disposed of when tributary area is permanently stabilized.

6. REINFORCED SILT FENCE (30" HIGH)



Fabric shall have the minimum properties as shown in Table below.

Fabric width shall be 42" minimum. Stakes shall be hardwood or equivalent steel (U or T) stakes. An 18" support stake shall be driven 12" minimum into undisturbed ground.

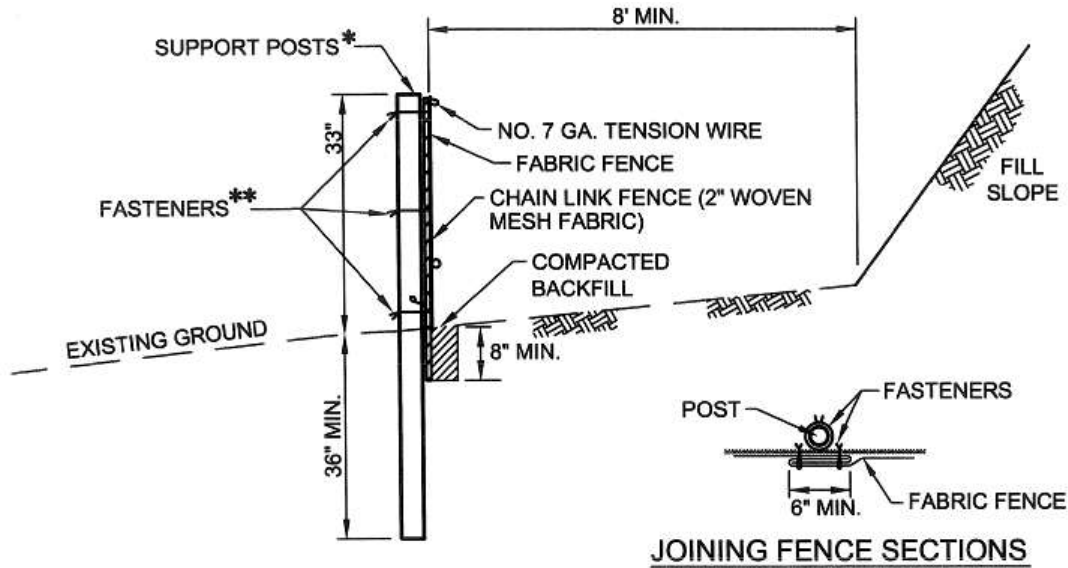
Silt fence shall be installed at existing level grade. Both ends of each fence section shall be extended at least 8 feet upslope at 45 degrees to the main fence alignment. Maxim slope lengths tributary to the silt fence are listed in the Table below.

Sediment shall be removed where accumulations reach half the aboveground height of the fence.

Any section of silt fence which has been undermined or topped shall be immediately replaced with a rock filter outlet.

Fence shall be removed and properly disposed of when tributary area is permanently stabilized.

7. SUPER SILT FENCE



* POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. HEAVY DUTY GALVANIZED OR ALUMINUM POSTS.

** CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 9 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 13.5 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX C. TO C.

Fabric shall have the minimum properties as shown in Table below.

Filter fabric width shall be 42" minimum.

Posts shall be installed using a posthole drill.

Chain link shall be galvanized No. 11.5 Ga. steel wire with 2 1/4" opening, No. 11 Ga. aluminum coated steel wire in accordance with ASTM-A-491, or galvanized No. 9 Ga. steel wire top and bottom with galvanized No. 11 Ga. steel intermediate wires. No. 7 gage tension wire to be installed horizontally through holes at top and bottom of chain-link fence or attached with hog rings at 5' (max.) centers.

Silt fence shall be placed at existing level grade. Both ends of the fence shall be extended at least 8 feet upslope at 45 degrees to main barrier alignment. Maxim slope lengths tributary to the silt fence are listed in the Table below.

Sediment shall be removed when accumulations reach half the aboveground height of the fence.

Fence shall be removed and properly disposed of when tributary area is permanently stabilized.

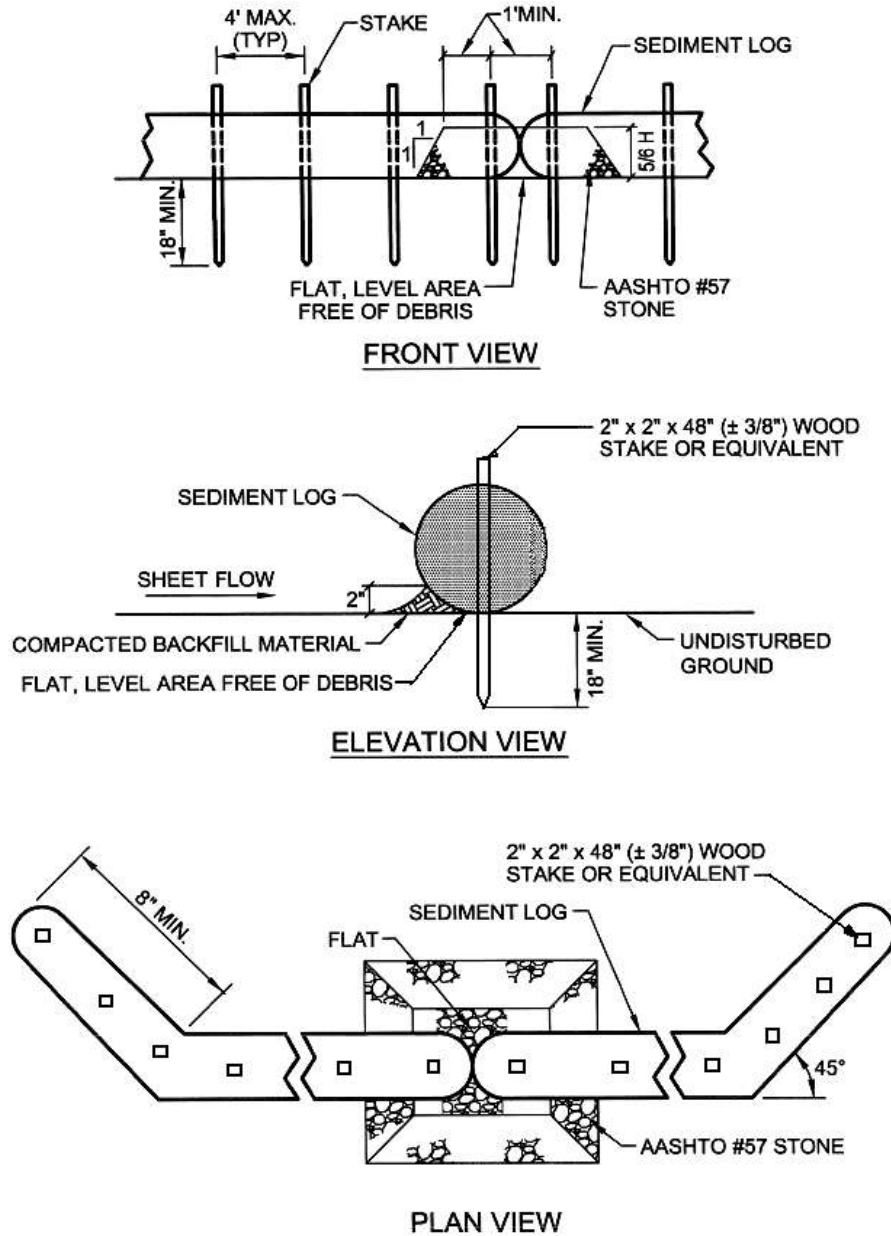
Fabric Properties for Silt Fence

Fabric Property	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lb)	120	ASTM D1682
Elongation at Failure (%)	20% Max.	ASTM D1682
Mullen Burst Strength (psi)	200	ASTM D 3786
Trapezoidal Tear Strength (lb)	50	
Puncture Strength (lb)	40	ASTM D 751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	ASTM 5141
Equivalent Opening Size	30	US Std. Sieve CW-02215
Ultraviolet Radiation Stability (%)	80	ASTM G-26

Maximum Slope Length for Silt Fence

Slope - Percent	Maximum Slope Length (ft.) Above Fence		
	Standard (18" High) Silt Fence	Reinforced (30" High) Silt Fence	Super Silt Fence
2 (or less)	150	500	1000
5	100	250	550
10	50	150	325
15	35	100	215
20	25	70	175
25	20	55	135
30	15	45	100
35	15	40	85
40	15	35	75
45	10	30	60
50	10	25	50

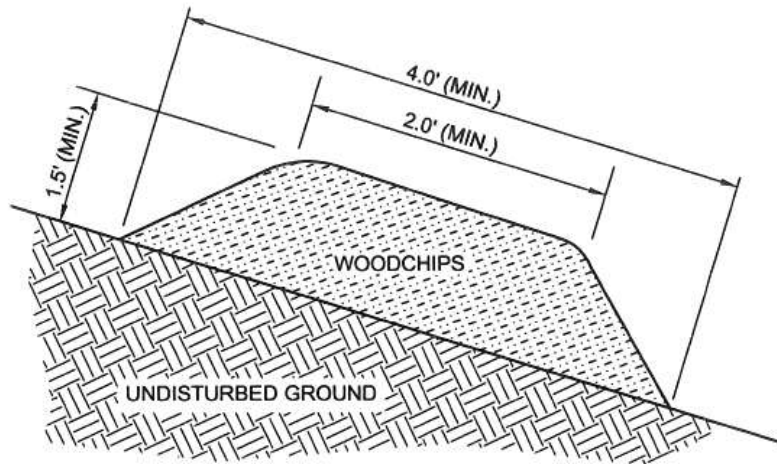
8. SEDIMENT FILTER LOG, FIBER LOG, STRAW WATTLE, OR CURLED WOOD LOG



Sediment log placement area shall be prepared so that it is free of all debris, including rocks, sticks, roots, etc. A 2" layer of compacted fill material shall be placed on the upslope side of the log to prevent undercutting. Where more than one log is required to obtain specified length, logs shall be tightly abutted and securely staked (or overlapped by 12" min.). A layer of AASHTO #57 stone shall be placed where abutting logs come together (extending 2 ft. on both sides of the log). A 6" thick layer of compost on the upslope side may be substituted for the stone. Sediment filter logs shall be placed at existing level grade. Ends shall be extended upslope at 45° to the main filter log alignment for a minimum of 8 feet.

Sediment filter logs shall be inspected weekly and after each runoff event. Sediment deposits shall be cleaned from the log when it reaches half the height of the log. Damaged filter logs shall be replaced within 24 hours of inspection. A supply of filter logs shall be maintained on site for this purpose.

9. WOOD CHIP FILTER BERM



Adapted from Lebanon County Conservation district Conservation district

Prior to placement of the berm, obstructions such as tree limbs, large rocks, etc. shall be removed.

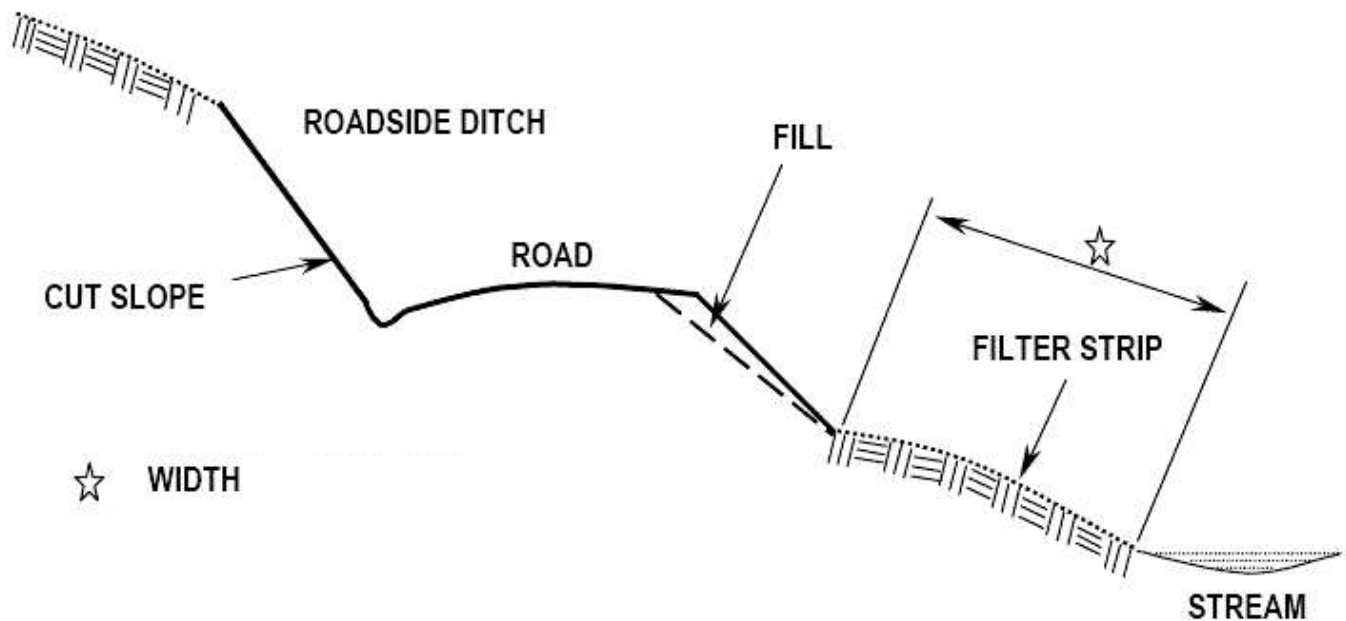
Wood chip filter berm shall be placed at existing level grade. Both ends of the berm shall be extended at least 8 feet up slope at 45 degrees to the main berm alignment. Wood chip berms shall not be located in areas of concentrated flow or used to construct sediment traps or other impoundments.

A 6" thick layer of compost shall be added to the upslope side of any wood chip filter berm located in an HQ watershed. This BMP shall not be routinely used in EV watersheds.

Berms shall be inspected weekly and after each runoff event. Sediment shall be removed when accumulations reach half the height of the berm. Damaged or deteriorated portions of the berm shall be replaced immediately upon inspection.

Berms may be leveled when the tributary area has been permanently stabilized or left in place.

10. VEGETATIVE FILTER STRIP



The total width of the filter strip should be at least half the width of the disturbed area tributary to it.

If at any time, the width of the vegetative filter strip has been reduced by sediment deposition to half its original width, suitable alternative BMPs should be installed immediately. The E&S Plan should specify what BMPs will be installed should this occur.

PA DEP

Minimum Vegetative Filter Strip Widths

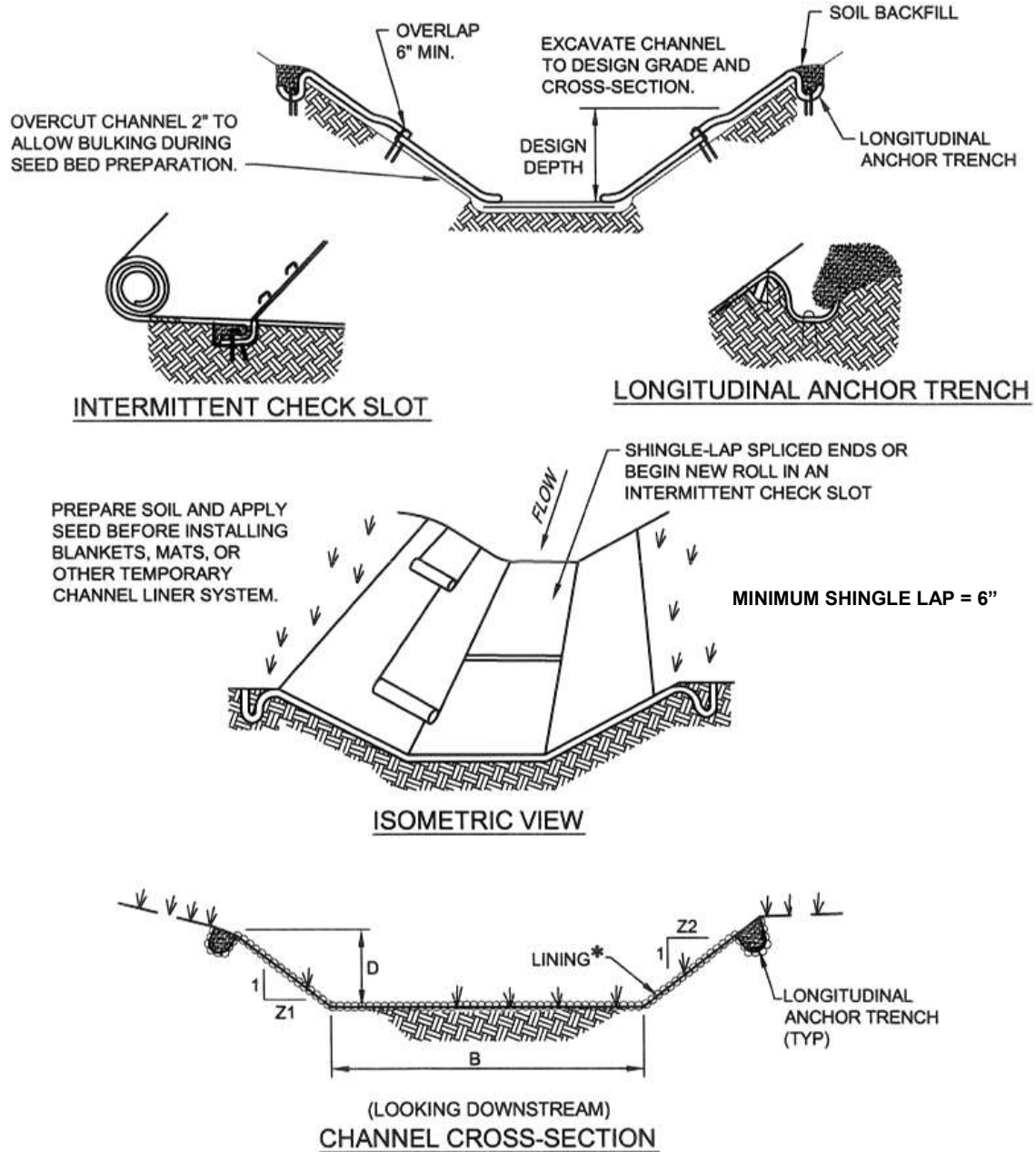
Land Slope (%) [*]	Minimum Filter Strip Width (ft.) Meadow
≤ 10	50
20	65
30	85
40	105
50	125
60	145
70	165

^{*}Land Slope is at location of filter strip.

Adapted from Professional Timber Harvesters Action Packet

C. Runoff Conveyance BMPs

1. VEGETATED CHANNEL



* SEE MANUFACTURER'S LINING INSTALLATION DETAIL FOR STAPLE PATTERNS, AND VEGETATIVE STABILIZATION SPECIFICATIONS FOR SOIL AMENDMENTS, SEED MIXTURES AND MULCHING INFORMATION.

The Table below should be included in the E&S Plan Drawings to identify the location of all channels, channel linings and provide channel dimensions.

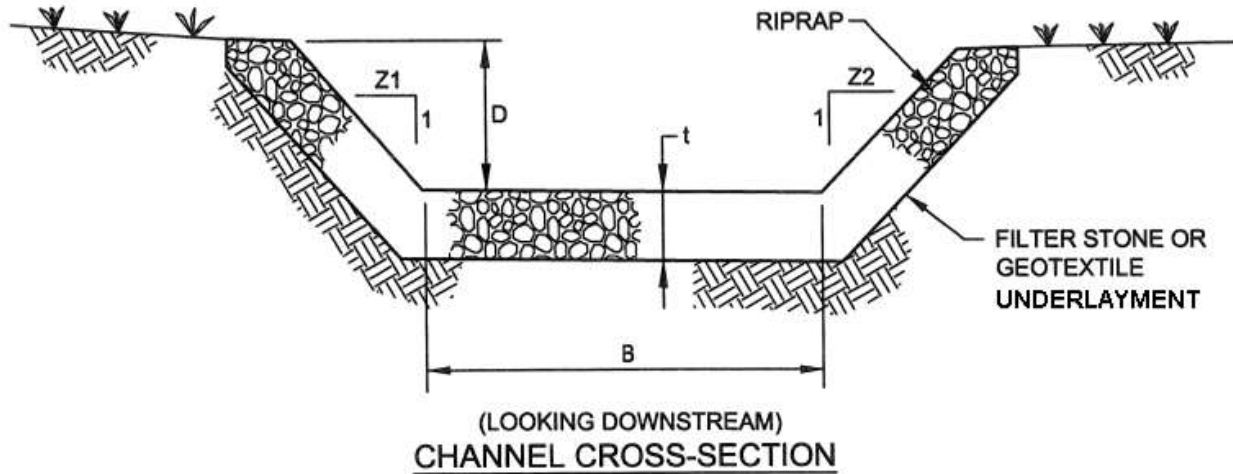
CHANNEL NO.	STATIONS	BOTTOM WIDTH B (FT)	DEPTH D (FT)	TOP WIDTH W (FT)	Z1 (FT)	Z2 (FT)	LINING*

Anchor trenches shall be installed at beginning and end of channel in the same manner as longitudinal anchor trenches.

Channel dimensions shall be constantly maintained. Channel shall be cleaned whenever total channel depth is reduced by 25% at any location. Sediment deposits shall be removed within 24 hours of discovery or as soon as soil conditions permit access to channel without further damage. Damaged lining shall be repaired or replaced within 48 hours of discovery.

No more than one third of the shoot (grass leaf) shall be removed in any mowing. Grass height shall be maintained between 2 and 3 inches unless otherwise specified. Excess vegetation shall be removed from permanent channels to ensure sufficient channel capacity.

2. RIPRAP CHANNEL



The Table below should be included in the E&S Plan Drawings to identify the location of all riprap channels, channel underlayment, riprap gradation, rock thickness and provide channel dimensions

Channel	Stations	B	D	Z1	Z2	Riprap Gradation	t	Underlayment	Underlayment Thickness

Filter stone underlayment for bed slopes ≥ 0.10 ft/ft shall be used.

Channel dimensions are for the completed channel after rock placement. Channel must be over-excavated a sufficient amount to allow for the volume of rock placed within the channel while providing the specified finished dimensions.

Channel dimensions shall be constantly maintained. Channel shall be cleaned whenever total channel depth is reduced by 25% at any location. Sediment deposits shall be removed within 24 hours of discovery or as soon as soil conditions permit access to channel without further damage.

Damaged lining shall be repaired or replaced within 48 hours of discovery.

The minimum rock thickness (t) shall be 1.5 times the max rock size.

STANDARD DESIGN FOR PERMANENT RIPRAP CHANNELS WITH 2:1 SIDE SLOPES & 2 FOOT TOTAL DEPTH

ACRES	1	2	3	4	5	6	7	8	9	10					
Bottom Width (Ft)	2	4	2	4	2	4	2	4	6	4					
Bed Slope (Fv/Ft)	RIPRAP R-SIZE														
0.10	R-3	R-4	R-3	R-5	R-4	R-6	R-4	R-5	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.11	R-3	R-4	R-3	R-5	R-4	R-6	R-4	R-5	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.12	R-3	R-4	R-3	R-5	R-4	R-6	R-4	R-5	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.13	R-3	R-4	R-3	R-5	R-4	R-6	R-4	R-5	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.14	R-3	R-4	R-3	R-5	R-4	R-6	R-4	R-5	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.15	R-3	R-5	R-4	R-5	R-4	R-7	R-5	R-6	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.16	R-3	R-5	R-4	R-5	R-4	R-7	R-5	R-6	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.17	R-3	R-5	R-4	R-5	R-4	R-7	R-5	R-6	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.18	R-3	R-5	R-4	R-5	R-4	R-7	R-5	R-6	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.19	R-3	R-5	R-4	R-5	R-4	R-7	R-5	R-6	R-4	R-5	R-4	R-5	R-4	R-6	R-5
0.20	R-3	R-5	R-4	R-5	R-4	R-7	R-5	R-6	R-4	R-5	R-4	R-5	R-4	R-6	R-5

STANDARD DESIGN DIMENSIONS AND LINING FOR A PERMANENT GRASS CHANNEL WITH 2H:1V SIDE SLOPES AND 2 FOOT TOTAL DEPTH

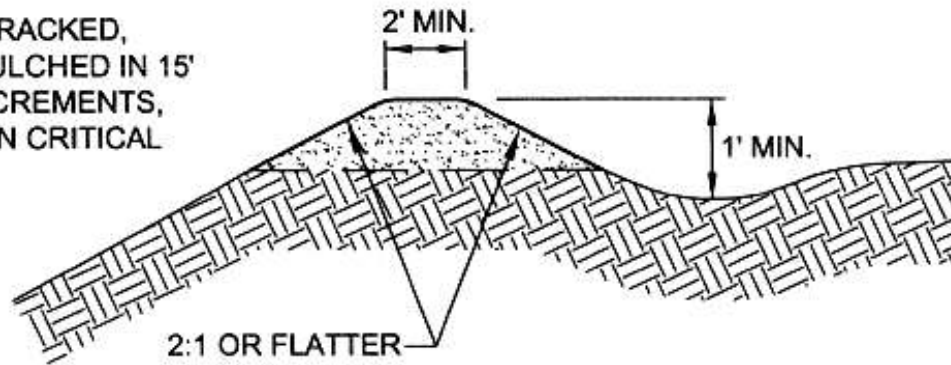
ACRES	1	2	3	4	5	6	7	8	9	10	
Channel Bottom Width (Ft)	2	4	2	4	2	4	2	4	6	4	
Bed Slope	CHANNEL LINER = GRASS PLUS										

0.01	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.02	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.03	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.04	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.05	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.06	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.07	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.08	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB
0.09	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB	ECB

ECB = Erosion Control Blanket; TRM = Turf reinforcement Matting

3. TOP-OF-SLOPE BERM

FILL SLOPE TRACKED,
SEEDED & MULCHED IN 15'
VERTICAL INCREMENTS,
BLANKETED IN CRITICAL
AREAS



Temporary berms shall be placed, maintained, and adjusted continuously until 90% vegetative growth is established on the exterior slopes with permanent storm drainage facilities functioning.

Berms shall outlet to slope pipes, channels, or other approved means of conveying runoff to a sediment trap, sediment basin, or collector channel.

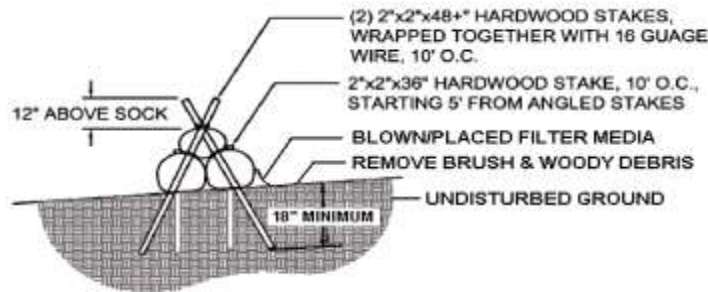
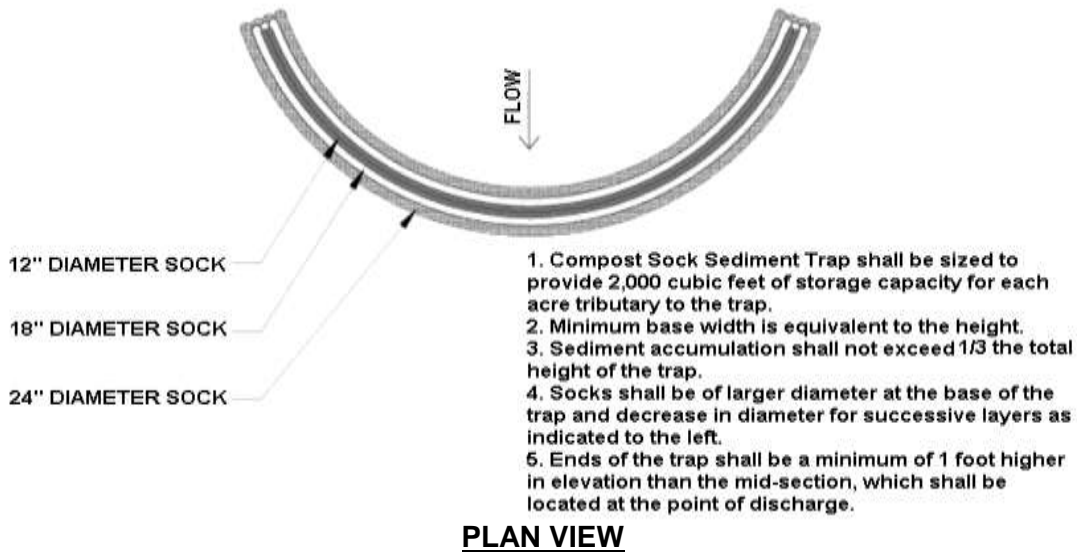
Channel behind berm shall have positive grade to outlet and an appropriate protective lining.

Berm shall be adequately compacted to prevent failure.

An acceptable alternative to top-of-slope berm is to continuously grade the top of fill to direct runoff away from the fill slope to a collector channel, sediment trap, or sediment basin.

D. Sediment Traps

1. COMPOST SOCK SEDIMENT TRAP



Adapted from Filtrexx

STAKING DETAIL

Sock material and Compost shall meet the standards in the Tables below.

Compost sock sediment traps shall not exceed three socks in height and shall be stacked in pyramidal form as shown above. Minimum trap height is one 24" diameter sock. Additional storage may be provided by means of an excavated sump 12" deep extending 1 to 3 feet upslope of the socks along the lower side of the trap.

Compost sock sediment traps shall provide 2,000 cubic feet storage capacity with 12" freeboard for each tributary drainage acre. (See manufacturer for anticipated settlement.)

The maximum tributary drainage area is 5.0 acres. Since compost socks are "flow-through," no spillway is required.

Compost sock sediment traps shall be inspected weekly and after each runoff event. Sediment shall be removed when it reaches 1/3 the height of the socks.

Photodegradable and biodegradable socks shall not be used for more than 1 year.

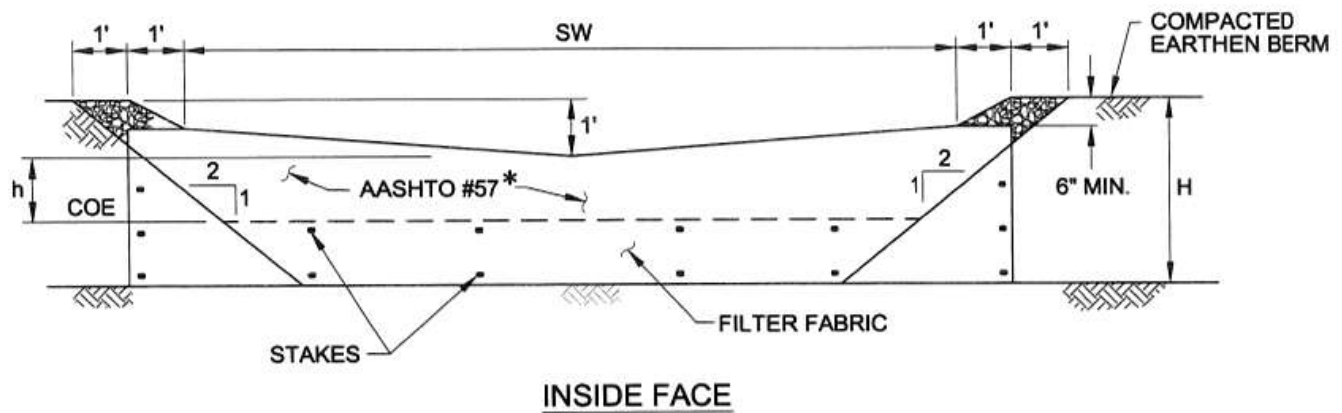
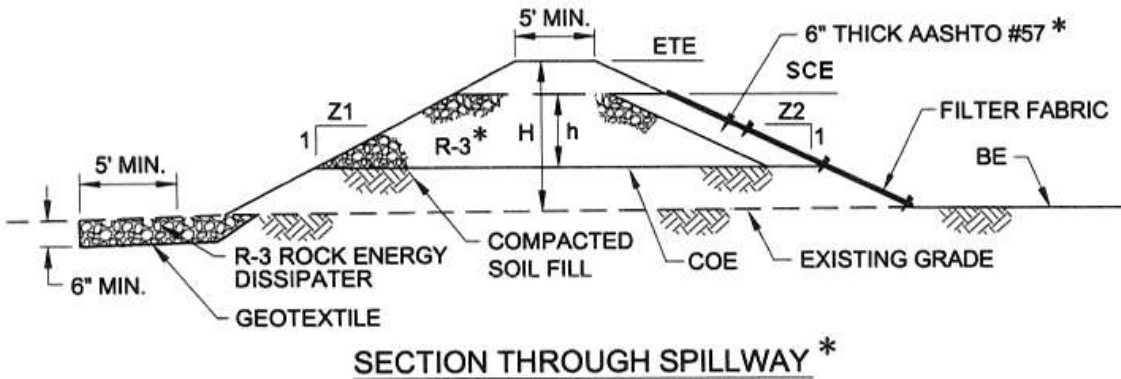
Compost Standards

Organic Matter Content	25% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5 - 8.5
Moisture Content	30% - 60%
Particle Size	30% - 50% pass through 3/8" sieve
Soluble Salt Concentration	5.0 dS/m (mmhos/cm) Maximum

Compost Sock & Wood Chip Sock Fabric Minimum Specifications

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years
Two-ply systems					
Inner Containment Netting	HDPE biaxial net				
	Continuously wound				
	Fusion-welded junctures				
	3/4" X 3/4" Max. aperture size				
Outer Filtration Mesh	Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch)				
	3/16" Max. aperture size				
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					

2. EMBANKMENT SEDIMENT TRAP



Embankment outlet shall be composed entirely of rock above clean out elevation (COE); main body R-3 or larger — R-4 to be used for drainage areas greater than 3.0 acres, inside face AASHTO # 57 stone or smaller. A 6" thick layer of compost, compost sock, or clean sand shall be installed on top of the AASHTO #57 stone and securely anchored in HQ watersheds. 24" diameter compost sock(s) shall be used in place of filter fabric and AASHTO #57 stone in EV watersheds.

Fill material for the embankments shall be free of roots, or other woody vegetation, organic material, large stones, and other objectionable materials. The embankment shall be compacted in layered lifts of not more than 9". The maximum rock size shall be no greater than 6".

Upon completion, the embankment shall be seeded and mulched or otherwise stabilized according to the specifications of the E&S plan drawings.

All sediment traps shall be inspected at least weekly and after each runoff event.

Access for sediment removal and other required maintenance activities shall be provided.

A clean out stake shall be placed near the center of each trap. Accumulated sediment shall be removed when it has reached the clean out elevation on the stake and the trap restored to its original dimensions. Dispose of materials removed from the trap in the manner described in the E&S Plan.

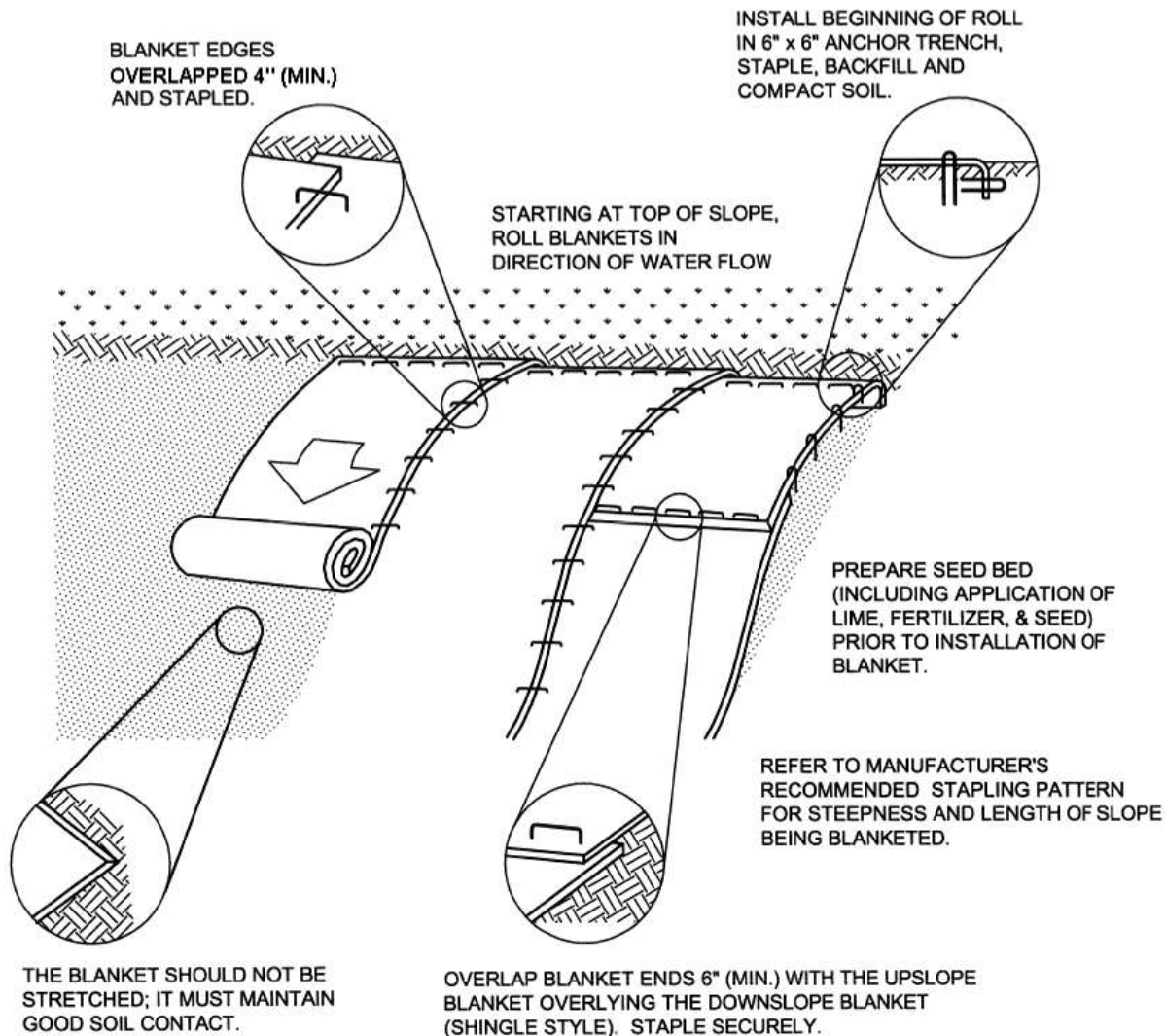
Check embankments, spillways, and outlets for erosion, piping and settlement. Clogged or damaged spillways and/or embankments shall be immediately restored to the design specifications. Displaced riprap within the spillway or outlet protection shall be replaced immediately.

Accumulated sediment shall be removed and disturbed areas inside the trap shall be stabilized before conversion to a stormwater management facility. To assist in removing sediment, which may be saturated, a device such as is shown in Standard Construction Detail #7-18 may be used to dewater the sediment prior to its removal.

TRAP NO.	Z1 (FT)	Z2 (FT)	H (FT)	h (FT)	EMBANK. TOP ELEV. ETE (FT)	SPILLWAY CREST ELEV. SCE (FT)	CLEAN OUT ELEV. COE (FT)	BOTTOM ELEV. BE (FT)	SPILLWAY WIDTH SW (FT)

E. Stabilization Methods and Standards

1. EROSION CONTROL BLANKET INSTALLATION



Seed and soil amendments shall be applied according to the rates in the plan drawings prior to installing the blanket.

Provide anchor trench at toe of slope in similar fashion as at top of slope.

Slope surface shall be free of rocks, clods, sticks, and grass.

Blanket shall have good continuous contact with underlying soil throughout entire length. Lay blanket loosely and stake or staple to maintain direct contact with soil. Do not stretch blanket.

The blanket shall be stapled in accordance with the manufacturer's recommendations. Blanketed areas shall be inspected weekly and after each runoff event until perennial vegetation is established to a minimum uniform 70% coverage throughout the blanketed area. Damaged or displaced blankets shall be restored or replaced within 4 calendar days.

Spray-on erosion control blankets (e.g. bonded fiber matrix or flexible growth medium) may be used in lieu of roll-on blankets if manufacturer's recommendations are followed.

Recommended Permanent Seed Mixtures Cool and Warm Season Grass

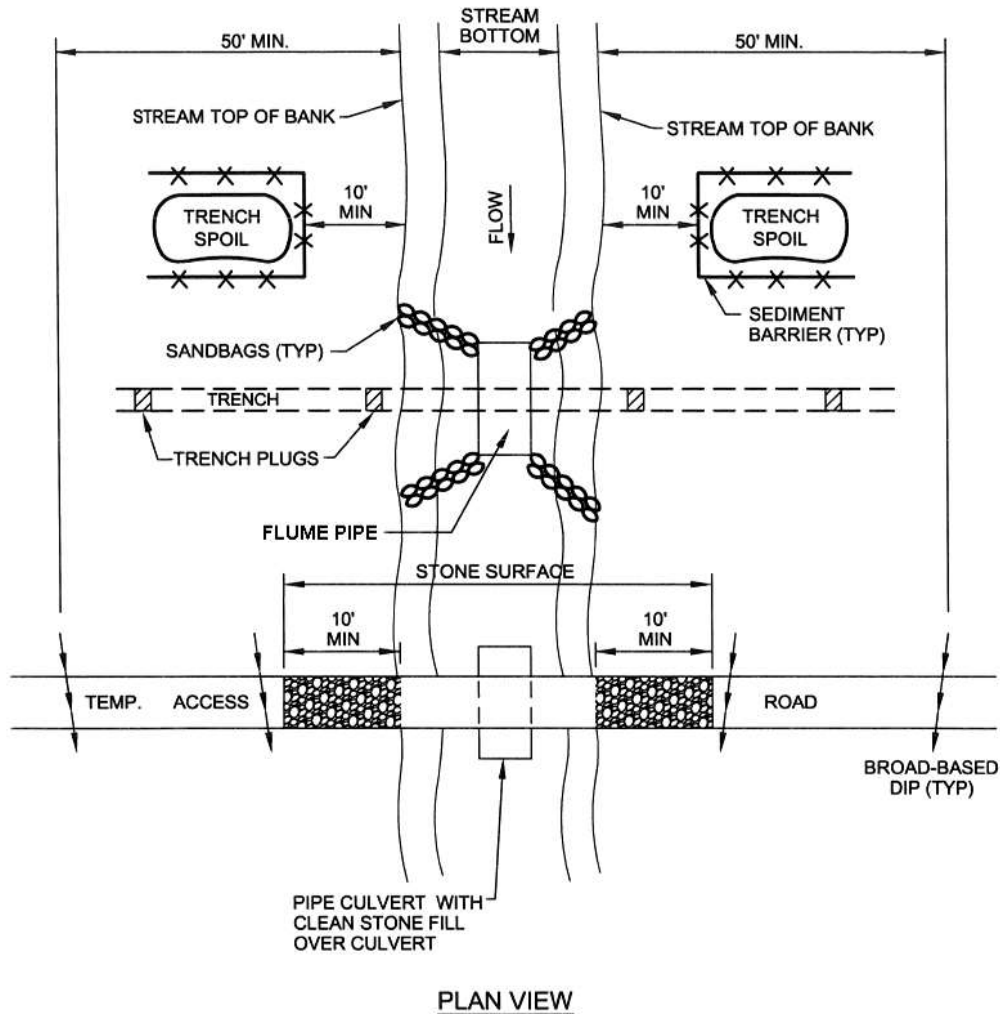
Mixture Number	Season	Species	Seeding Rate lb./ac.
1	Cool	Tall fescue*, or	79
		Fine fescue, plus	46
		Redtop, or	4
		Perennial ryegrass, plus	19
		Birdsfoot trefoil	8
2	Cool	Birdsfoot trefoil,	8
		plus Tall fescue*	40
3	Cool	Orchardgrass, or	26
		Smooth bromegrass, plus	33
		Birdsfoot trefoil	8
4	Warm	Flatpea, plus	27
		Tall fescue*, or	26
		Perennial ryegrass	25
5	Warm	Deertongue, plus	21
		Birdsfoot trefoil	8
6	Warm	Switchgrass, or	15
		Big Bluestem, plus	15
		Birdsfoot trefoil	8

Recommended Seed Mixtures for Stabilizing Disturbed Areas

Site Condition	Seed Mixture (Select One Mixture)
Cut Slopes and Fills (not mowed)	
Well-drained	2, 4, or 6
Variable drainage	2
Cut Slopes and Fills (mowed)	1
Cut Slopes and Fills (grazed/hay)	1, 2, or 3
Gullies and Eroded Areas	2 or 6
Erosion Control BMPs	1 or 2
Channels, Drainage ditches, Trap embankments, etc.	2 or 3
Right-of-way	
Well-drained	4 or 6
Variable drainage	2
Well-drained areas for grazing/hay	2 or 3
Strip Mined Areas	
Spoils, waste areas, fly ash, slag, etc.(lime to soil test)	2, 4, or 5
For grazing/hay	2, 3, or 6

F. Utility Line Stream Crossings

1. TYPICAL UTILITY LINE FLUMED STREAM CROSSING WITH OPTIONAL ACCESS ROAD



Grubbing shall not take place within 50 feet of top-of-bank until all materials required to complete crossing are on site and pipe is ready for installation.

Pipe culvert for access road and flume pipe may be one continuous pipe.

Trench plugs shall be installed within the trench on both sides of the stream channel.

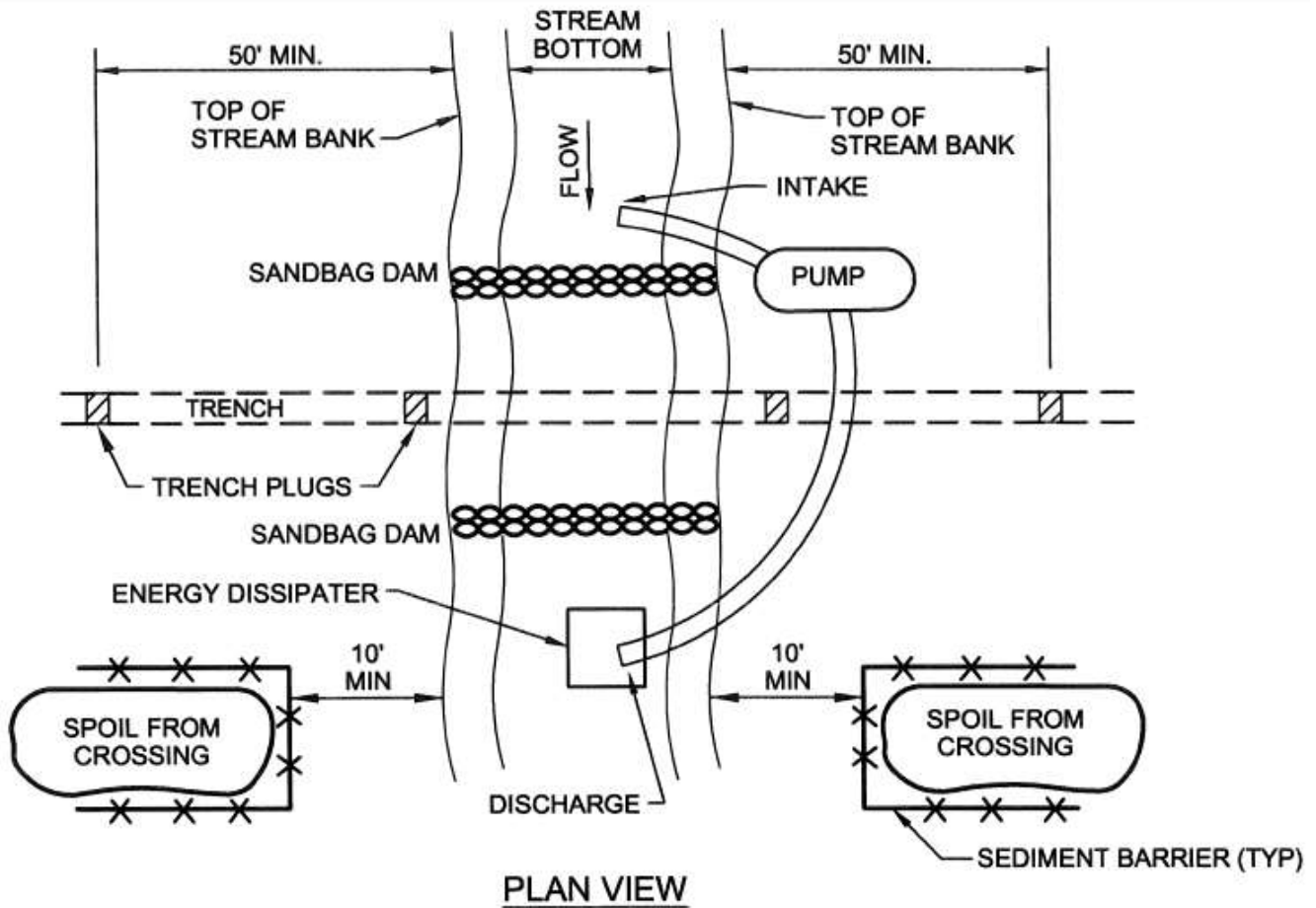
Water accumulating within the work area shall be pumped to a pumped water filter bag or sediment trap prior to discharging into any surface water.

Hazardous or pollutant material storage areas shall be located at least 100 feet back from the top of streambank.

All excess excavated material shall be immediately removed from the stream crossing area.

All disturbed areas within 50 feet of top-of-bank shall be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams unless otherwise authorized. Appropriate streambank protection shall be provided within the channel.

2. TYPICAL UTILITY LINE STREAM CROSSING WITH PUMP BYPASS



Grubbing shall not take place within 50 feet of top-of-bank until all materials required to complete crossing are on site and pipe is ready for installation.

Bypass pump intake shall be maintained a sufficient distance from the bottom to prevent pumping of channel bottom materials.

Trench plugs shall be installed within the trench on both sides of the stream channel.

Water accumulating within the work area shall be pumped to a pumped water filter bag or sediment trap prior to discharging into any receiving surface water.

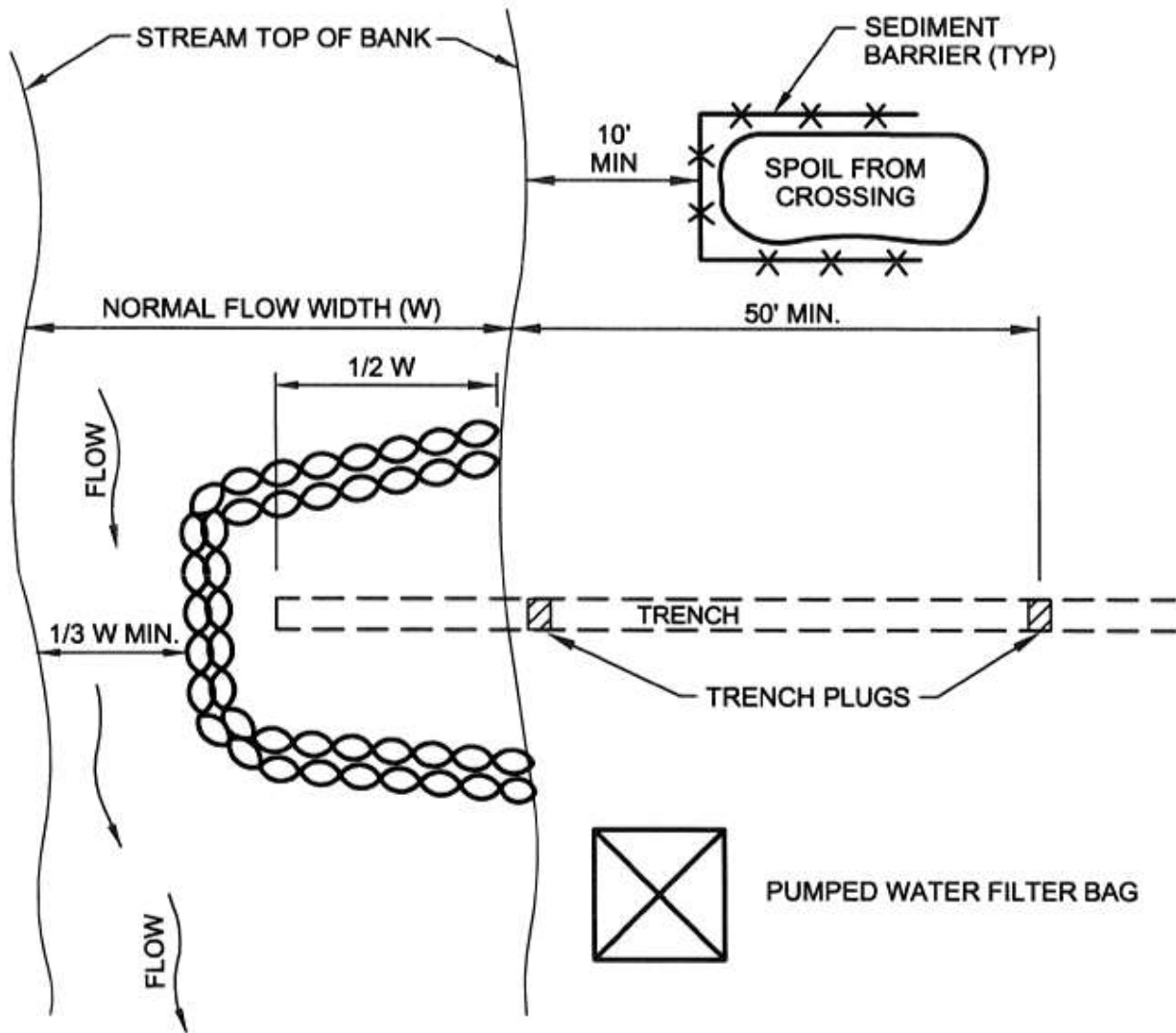
Hazardous or pollutant material storage areas shall be located at least 100 feet back from the top of streambank.

All excess excavated material shall be immediately removed from the stream crossing area.

All disturbed areas within 50 feet of top-of-bank shall be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams unless otherwise authorized.

Appropriate streambank protection shall be provided within the channel.

3. TYPICAL UTILITY LINE STREAM CROSSING WITH COFFERDAM



PLAN VIEW

Grubbing shall not take place within 50 feet of top-of-bank until all materials required to complete crossing are on site and pipe is ready for installation.

Trench plugs shall be installed within the trench on both sides of the stream channel.

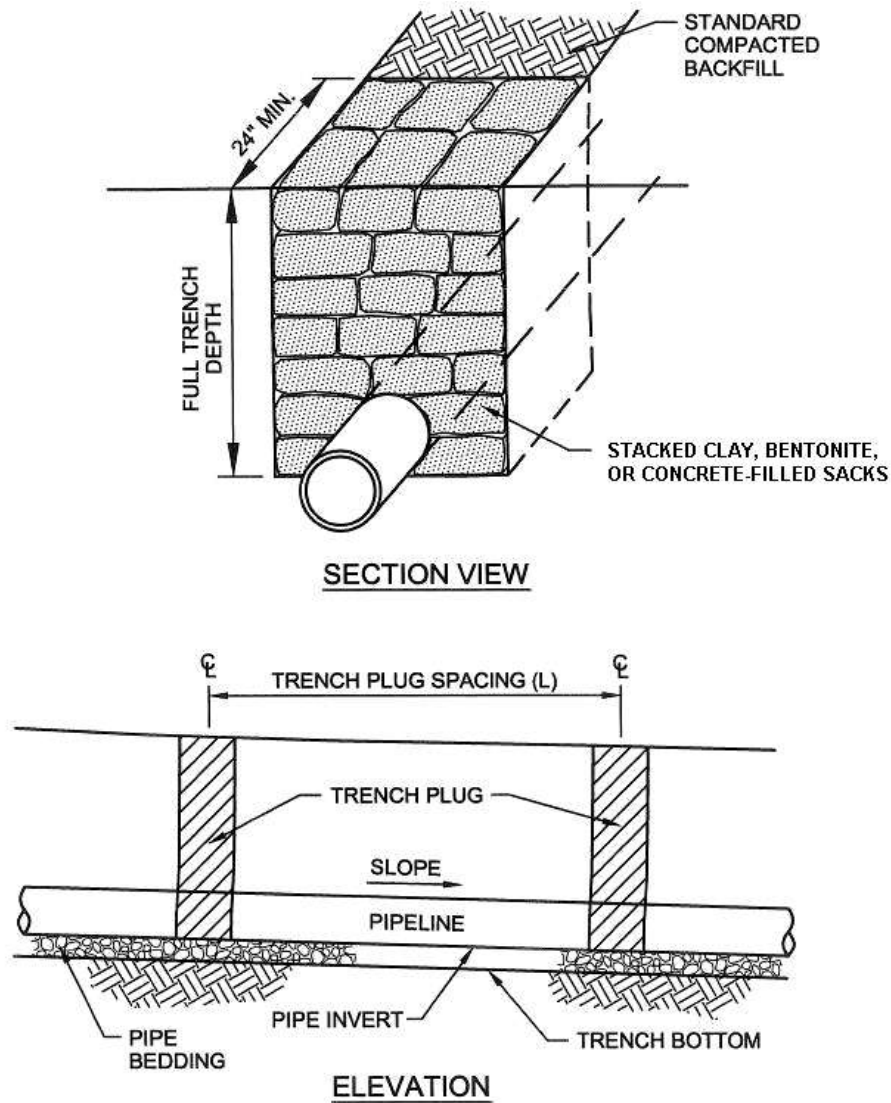
Water accumulating within the work area shall be pumped to a pumped water filter bag or sediment trap prior to discharging into any receiving surface water.

Hazardous or pollutant material storage areas shall be located at least 100 feet back from the top of streambank.

All excess excavated material shall be immediately removed from the stream crossing area.

All disturbed areas within 50 feet of top-of-bank shall be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams unless otherwise authorized.

4. TYPICAL TRENCH PLUG INSTALLATION



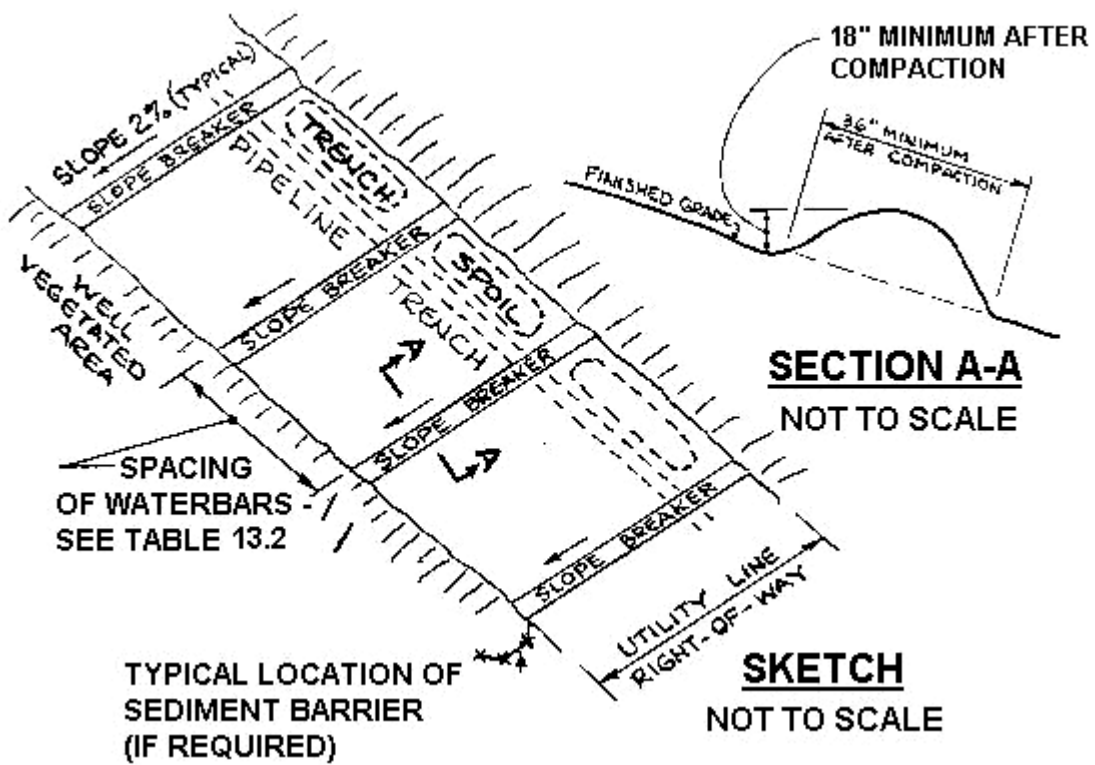
Maximum Spacing and Materials for Trench Plugs

Trench Slope (%)	Spacing L (FT)	Plug Material
< 5	1,000	* Clay, Bentonite, or Concrete Filled Sacks
5 - 15	500	* Clay, Bentonite, or Concrete Filled Sacks
15 - 25	300	* Clay, Bentonite, or Concrete Filled Sacks
25 - 35	200	* Clay, Bentonite, or Concrete Filled Sacks
35 - 100	100	* Clay, Bentonite, or Concrete Filled Sacks
> 100	50	Cement Filled Bags (Wetted) or Mortared Stone

*TOPSOIL MAY NOT BE USED TO FILL SACKS.

Impervious trench plugs are required for all streams, river, wetland, or other water body crossings. Spray foam trench plugs may be used in lieu of sacks when manufacturer's recommendations are followed.

5. WATERBAR INSTALLATION ON A UTILITY LINE RIGHT-OF-WAY



Maximum Spacing for Permanent Waterbars on a Utility Line Right-of-way

Percent Slope	Spacing (FT)
< 5	250
5 - 15	150
15 - 30	100
> 30	50

APPENDIX B

NOTE: This Appendix is provided for reference only, DO NOT submit with the E&S Plan.

LIMITATIONS OF PENNSYLVANIA SOILS PERTAINING TO EARTHMOVING PROJECTS

(Absence of an X does not mean "No Potential Limitation")

NOTE: THIS IS NOT NECESSARILY AN ALL-INCLUSIVE LIST.

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/SEASONAL HIGH WATER TABLE	HYDRIC/HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Abbottstown	X	C/S		X		X	X	X	X	X	X	X				X
Aeric Epiacquents	X	C/S	X			X	X				X	X				X
Albrights	X	C/S	X	X		X	X	X	X	X	X	X				X
Alden	X	C/S				X	X	X	X	X	X	X	X		X	X
Aldino	X	C/S				X	X	X	X	X		X				
Allegheny	X	C		X			X	X	X	X	X	X				
Allenwood	X	C/S					X	X	X	X	X	X				
Allis	X	X	X			X	X	X	X	X	X	X	X			
Alluvial Land	X	C/S			X	X	X		X	X	X	X		X		X
Alton	X	C	X						X		X	X				
Alvira	X	C/S	X	X		X	X	X	X	X	X	X				X
Amwell	X	C/S		X		X	X	X	X	X		X				
Andover	X	C/S	X	X		X	X	X	X	X	X	X				X
Aquepts	X	C/S				X	X	X	X	X	X	X			X	X
Aquults	X	C/S		X		X		X	X	X	X	X	X			X
Arents							X									
Arendtsville	X	C	X			X			X	X	X	X				X
Armagh	X	C/S				X	X	X	X	X	X	X	X			X
Arnot	X	C	X	X				X	X		X	X				
Ashton	X				X			X	X	X						
Atherton	X	S				X	X	X	X	X	X	X			X	X
Athol	X	C					X		X	X	X	X				
Atkins	X	C/S			X	X	X	X	X	X	X	X				X
Bagtown	X	C				X	X		X		X	X				X
Baile	X	C/S		X		X	X	X	X	X	X	X	X		X	X
Barbour	X	C	X		X	X	X				X	X				X
Basher	X	C/S			X	X	X	X	X	X	X	X				X
Bath	X	C/S				X	X		X		X	X				
Beach & Riverwash	X	C/S				X	X	X		X		X				
Beach Sand	X	C/S			X	X	X		X		X					
Bedington	X	C	X	X			X		X		X	X				
Belmont				X									X			
Beltsville	X	C/S		X		X	X	X	X	X	X	X				
Benson	X	C	X					X	X	X	X	X				
Berks	X	C	X	X			X		X	X	X					
Bermudian	X	C		X	X	X	X	X		X	X	X				X
Berrien	X	S		X		X	X		X	X		X			X	
Bethesda	X	C/S	X			X	X	X	X		X	X				X
Birdsall	X	C/S				X	X	X	X	X	X	X	X		X	X

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Birdsboro	X	C/S		X		X	X		X	X	X	X				X
Blairton	X	C/S		X		X	X	X	X	X	X	X				X
Bowmansville	X	C/S			X	X	X	X	X	X	X	X				X
Braceville	X	C/S	X	X		X	X	X	X	X	X	X				X
Brandywine	X	C	X	X				X	X		X					
Brecknock	X	C	X						X	X	X	X				
Brinkerton	X	C/S	X	X		X	X	X	X	X	X	X	X			X
Brooke	X	S						X	X		X	X	X			
Brownsburg	X	C		X			X	X	X	X	X	X				
Buchanan	X	C/S	X	X		X	X	X	X	X	X	X				X
Buckingham	X	C/S		X		X	X	X	X	X	X	X				X
Bucks	X	C						X	X	X	X	X	X			
Burgin						X		X	X			X	X			
Butlertown	X	C/S		X		X	X	X	X	X		X				
Califon	X	C/S				X		X	X			X				X
Calvert	X	C/S		X		X	X	X	X	X	X	X	X			X
Calvin	X	C	X	X			X			X		X				
Cambridge	X	C/S		X		X	X	X	X	X		X			X	X
Canadice	X	S		X		X	X	X	X		X	X	X		X	X
Canaseraga	X	C/S		X		X		X	X	X		X				X
Caneadea	X	C/S		X		X	X	X	X		X	X	X			X
Canfield	X	C/S		X		X	X	X	X	X		X				X
Carbo	X	S	X	X				X	X		X		X	X		
Catden	X	S				X		X	X			X			X	X
Carlisle	X	S				X	X		X			X			X	X
Catoctin	X	C/S	X								X					
Cattaraugus	X	C	X			X			X		X	X				
Cavode	X	C/S		X		X	X	X	X	X		X	X			X
Cedarcreek	X	C/S	X			X	X	X			X					
Ceres	X	C						X	X		X	X				
Chagrin	X	C		X	X	X	X	X	X	X		X	X		X	X
Chalfont	X	C/S		X		X	X	X	X	X	X	X				X
Chavies		C		X	X			X		X		X				
Chenango	X	C	X		X	X	X		X	X	X	X				
Chester	X	C		X				X	X	X	X	X				
Chewacla	X	C/S			X	X	X	X	X	X		X				X
Chili	X	C					X	X	X		X	X				
Chippewa	X	C/S	X	X		X	X	X	X	X		X	X		X	
Chrome	X	C/S	X					X	X		X	X	X			
Clarksburg	X	C/S		X		X	X	X	X	X	X	X	X	X		X
Clearbrook	X	C/S	X				X	X	X	X	X	X	X			
Clymer	X	C	X	X			X	X	X	X	X	X				X
Codorus	X	C/S			X	X	X	X	X	X		X				X
Cokesbury	X					X			X	X		X				

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH/ LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Collamer	X	C/S		X		X	X	X	X	X	X	X				X
Colonie	X	C	X					X	X		X					
Comly	X	C/S	X	X		X	X			X	X	X				
Comus	X	C		X	X		X	X	X	X		X				
Conestoga	X	C/S						X	X	X		X		X		
Congaree	X	C		X	X		X	X	X	X		X				
Conotton	X	C/S	X	X		X	X	X	X	X	X	X				
Conowingo	X	C/S		X		X		X	X	X		X	X			X
Cookport	X	C/S	X	X		X	X	X	X	X	X	X				X
Covegap	X	C/S							X		X	X		X		
Craigsville	X	C	X		X		X	X			X	X				
Croton	X	C/S		X		X	X	X	X	X	X	X			X	X
Culleoka	X	C		X				X	X	X	X	X				
Culvers	X	C/S	X			X		X	X	X		X				X
Dalton	X	C/S		X		X	X		X	X	X	X			X	
Darien	X	C/S				X		X	X	X	X	X	X			X
Dekalb	X	C	X					X	X	X	X	X				
Delaware	X	C			X		X		X			X				
Deposit	X	C/S	X		X	X	X		X		X					X
Dormont	X	C/S		X		X	X	X	X	X	X	X	X	X		X
Downsville	X	C							X		X	X		X		
Doylestown	X	C/S	X	X		X	X	X	X	X	X	X				X
Drifton	X	C/S		X		X	X	X	X		X	X				
Dryrun	X	C/S		X		X	X		X		X	X				
Duffield	X	C/S		X			X	X	X	X	X		X	X		X
Duncannon	X	C		X				X	X	X		X				
Dunning	X	C/S		X	X	X	X	X	X		X		X	X	X	X
Dystochrepts	X	C/S	X	X	X	X	X	X	X	X	X	X				
Edgemere	X	C/S				X	X	X	X	X	X	X			X	X
Edgemont	X	C	X				X		X		X	X				
Edom	X	S	X	X				X	X	X	X	X	X	X	X	
Elk	X	C/S		X			X	X	X	X						
Elkins	X	c/s			X	X	X	X	X	X	X	X	X			
Elko	X	C/S	X			X		X	X			X	X			X
Ellery	X	C/S	X			X	X	X	X	X	X	X			X	X
Elliber	X	C	X						X		X	X		X		
Elnora	X	C	X			X			X		X					X
Empyville	X	C	X			X	X		X		X	X				
Erie	X	S	X	X		X	X	X	X	X	X	X			X	X
Ernest	X	C/S		X		X	X	X	X	X	X	X	X			X
Evendale	X	C/S				X	X	X	X	X	X	X	X	X		X
Fairplay	X	S		X	X	X	X	X	X	X	X	X			X	
Fairpoint	X	C/S	X				X	X	X		X	X	X	X		
Fitchville	X	C/S				X	X	X	X	X	X	X	X			X

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH/ LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Fountainville	X	C/S		X		X		X	X	X		X				
Fleetwood	X	C	X					X			X					X
Fluents	X	C/S	X	X	X	X	X			X		X				
Fluvequents	X	C/S	X	X	X	X	X	X		X		X				
Fredon	X	C/S	X	X		X	X	X	X		X	X				X
Freetown	X	C/S				X	X	X				X			X	
Frenchtown	X	C/S		X		X	X	X	X	X	X	X			X	X
Freshwater Marsh	X	S				X	X	X	X		X	X			X	
Funkstown	X	S		X	X	X		X	X	X		X				X
Gageville	X	C/S		X		X		X	X	X	X	X	X			X
Gaila	X	C/S						X	X		X	X				
Gibraltar	X	C/S		X	X	X	X	X	X	X		X				
Gilpin	X	C	X	X			X	X	X	X	X	X				
Ginat	X	C/S		X		X	X	X	X	X	X	X	X		X	X
Gladstone	X	C		X			X		X			X	X			
Glenelg	X	C		X			X	X	X	X	X	X				X
Gleneyre	X	C/S			X	X	X	X	X	X	X	X			X	X
Glenford	X	C/S				X	X	X	X	X		X	X			
Glenville	X	C/S				X	X	X	X	X	X	X				X
Gresham		X		X			X	X	X	X		X				X
Guernsey	X	C/S		X		X	X	X	X		X	X	X	X		X
Guthrie							X									
Hagerstown	X	S		X		X	X	X	X	X	X	X	X	X		
Halsey	X	C/S		X	X	X	X	X	X	X	X	X				X
Hanover	X	C/S				X	X	X	X	X		X	X			
Harbor	X	C/S				X		X	X			X	X			
Haplaquents							X									
Hartleton	X	C	X					X	X	X	X	X				
Hatboro	X	C/S			X	X	X	X	X	X	X	X				X
Haven	X	C	X					X	X			X				
Hazleton	X	C	X	X			X	X	X	X	X	X				
Henrietta	X					X		X	X		X	X			X	
Highfield	X	C	X				X		X		X	X				
Hollinger	X	C						X	X	X		X		X		
Holly	X	C/S			X	X	X	X	X	X	X	X			X	X
Hornell	X	C/S	X	X		X		X	X		X	X	X			X
Howard	X		X	X			X		X		X	X				
Howell	X	C/S		X		X		X		X		X	X			
Hublersburg	X	C/S						X	X	X	X	X	X			
Huntington	X	C			X	X	X					X		X		
Hustontown	X	C/S	X			X	X		X	X		X				
Itmann	X	C/S	X					X	X		X	X				
Ivory	X	C/S		X		X	X	X	X	X	X	X	X			
Jimtown	X	C/S				X	X	X			X	X				X

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Joanna	X	C					X	X	X	X		X				
Jugtown	X	S			X	X	X	X	X	X		X		X		
Kedron	X	C/S				X	X	X	X	X	X	X				X
Kanona							X									
Kimbles	X	C/S				X	X	X	X		X	X				X
Kingsville	X	C/S	X			X	X		X		X	X			X	X
Kinzua	X	C						X	X		X	X				
Klinesville	X	C/S	X	X			X		X		X	X				
Knauers	X	C/S	X		X	X	X	X	X		X	X			X	X
Kreamer	X	C/S		X		X	X	X	X	X		X		X		
Lackawanna	X	C	X			X	X	X			X	X				X
Laidig	X	C/S	X	X		X	X	X	X	X	X	X				
Lakin	X	C	X						X							
Lamington	X	C/S		X		X	X		X	X	X	X			X	X
Langford	X	S	X	X		X	X	X	X		X	X			X	X
Lansdale	X	C	X					X	X		X	X				
Lantz	X	C/S		X	X	X	X	X	X	X	X	X	X			X
Lawrenceville	X	C/S		X		X	X	X	X	X		X				X
Leck Kill	X	C						X	X	X	X	X				X
Leetonia	X	C	X	X			X				X					
Legore	X	C/S	X					X	X	X	X	X	X			
Lehew	X	C	X						X		X					
Lehigh	X	C/S				X	X		X	X	X	X				X
Lewisberry		C								X	X	X				
Library	X	C/S		X		X	X	X	X		X	X	X	X		X
Lickdale	X	C/S		X		X	X	X	X		X	X	X			
Linden	X	C			X	X	X	X	X	X		X				
Lindsay	X	S			X	X	X	X	X	X		X		X		X
Lobdell	X	C/S		X	X	X	X	X	X	X		X	X			X
Lordstown	X	C	X	X				X	X	X		X				
Loudonville	X	C/S						X	X	X		X	X			
Lowell	X	C/S						X	X	X	X	X	X	X		
Luray		X		X		X		X	X	X	X	X	X		X	X
Macove	X	C/S						X	X		X	X				
Mahoning	X	C/S		X		X	X	X	X	X	X	X	X		X	X
Manlius	X	C	X				X		X		X	X				
Manor	X	C		X				X	X	X	X	X				
Mardin	X	S	X	X		X	X	X	X	X		X				X
Markes	X	C/S	X			X		X	X		X	X				X
Matapeake	X	C/S		X				X	X			X				
Matewan	X	C	X						X		X					
Mattapex	X	C/S		X		X	X	X	X	X		X				
Maurertown	X	C/S		X	X	X	X	X	X	X	X	X	X		X	

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Meckesville	X	C/S				X		X	X	X	X	X				X
Medihemists	X	S				X	X	X				X			X	X
Medifibrists	X	S				X	X					X			X	X
Medisaprists		S				X	X	X				X			X	X
Melvin	X	S		X	X	X	X	X	X	X	X	X	X	X	X	X
Mertz	X	C/S								X		X				
Middlebury	X	S			X	X	X		X	X		X	X			
Mill	X	C/S				X	X	X	X	X	X	X	X		X	X
Millheim		C/S		X				X	X	X	X		X			
Miner	X	C/S				X	X	X	X		X	X	X		X	X
Monongahela	X	C/S		X		X	X	X	X	X		X	X			X
Montalto	X	C/S					X	X	X		X	X	X			
Montevallo		C/S	X				X	X			X	X				
Morris	X	C/S	X	X		X	X	X	X		X	X				X
Morrison	X	C		X				X	X			X		X		
Mt. Airy	X	C	X				X				X	X				
Mt. Lucas	X	C/S				X	X	X	X	X	X	X				X
Mt. Zion	X	C/S		X		X	X	X	X	X	X	X	X			
Muck		X			X	X	X			X					X	X
Muck and Peat	X	S				X	X	X	X		X	X	X		X	X
Murrill	X	C/S					X	X	X	X	X	X		X		
Myersville	X	C/S						X	X	X	X	X				
Nanticoke	X	C			X	X	X	X	X	X	X				X	X
Natalie							X									
Neshaminy	X	C/S				X	X	X	X	X	X	X				
Newark	X	S		X	X	X	X	X	X	X	X	X		X		
Nockamixon	X	C/S		X		X	X	X	X	X		X				X
Nolin	X	C			X	X	X	X	X	X				X		
Nollville	X	C/S						X	X		X	X	X	X		
Nolo	X	C/S	X			X	X	X	X	X	X	X				X
Norwich	X	C/S	X	X		X	X	X	X		X	X			X	X
Ochrepts	X	C	X						X		X	X				
Onoville	X	C/S	X			X		X	X	X	X	X	X			X
Opequon	X	S	X	X				X	X		X	X	X	X		
Oquaga	X	C	X	X			X		X			X				
Orrville	X	C/S			X	X	X	X	X	X		X				X
Otego	X	S		X	X	X		X	X	X		X				X
Othello	X	C/S				X	X	X	X	X	X	X				X
Ottawa	X	C	X						X			X				
Painesville	X	C/S				X	X		X	X	X	X				X
Palms	X	C/S				X	X	X	X		X	X			X	X
Papakating	X	C/S			X	X	X	X	X	X	X	X			X	X
Parker	X	C	X						X		X	X				
Paupack	X	S				X	X		X			X			X	X

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Pecktonville	X	C/S		X		X		X	X		X	X	X	X		
Pekin					X		X			X		X				
Penlaw	X	C/S		X		X	X	X	X	X	X	X	X	X		X
Penn	X	C	X				X	X		X	X	X				
Penn Val	X	C/S							X		X	X				
Pequea	X			X						X	X	X				
Phelps	X	S		X		X	X		X	X	X	X				X
Philo	X	C/S		X	X	X	X	X	X	X	X	X				X
Platea	X	C/S		X		X	X	X	X	X		X				X
Pocono	X	C	X						X		X					
Pope	X	C/S		X	X		X	X	X	X	X	X				
Portville	X	C/S				X	X		X	X	X	X	X			
Potomac	X	C	X		X						X					
Psammets	X	C	X		X	X			X		X					
Purdy	X	C/S		X		X	X	X	X	X	X	X	X			X
Rainsboro	X	X		X		X	X	X	X			X				
Ramsey		C	X						X		X					
Raritan	X	C/S				X	X		X	X	X	X				X
Ravenna		C/S		X		X			X	X	X	X				X
Ravenrock	X	C/S				X			X		X	X				
Rayne	X	C		X				X	X	X	X	X				
Readington	X	C/S		X		X	X	X	X	X	X	X				X
Reaville	X	C/S	X	X		X	X		X	X	X	X				X
Red Hook	X	C/S		X	X	X	X		X	X	X	X				
Rexford	X	C/S	X		X	X	X	X	X	X	X	X				X
Rimer	X	C/S	X	X		X	X		X	X	X	X	X			X
Riverhead	X	C	X					X	X		X	X				X
Riverwash							X									
Rohrersville	X	C/S		X		X	X	X	X	X		X	X			X
Rowland	X	C/S		X	X	X	X	X	X	X	X	X				X
Rubble Land											X					
Rushtown	X	C	X						X							
Ryder	X	C/S						X	X	X		X		X		
Sassafras	X	C						X	X			X				
Scio	X	C/S		X		X	X	X	X	X		X				X
Sciotoville	X	C/S		X		X	X	X	X	X		X	X			X
Sebring	X	C/S				X	X	X	X	X	X	X	X		X	X
Sequatchie		X		X						X						
Sheffield	X	C/S				X	X	X	X	X		X			X	
Shelmadine	X	C/S	X			X	X	X	X	X	X	X				
Shelocta	X	C						X	X		X	X				
Shohola	X	C/S	X			X	X	X	X	X	X	X				X
Shongo	X	C/S				X	X	X	X	X	X	X	X			X

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Sideling	X	C/S				X			X	X	X	X	X			
Skidmore	X	C	X		X	X	X		X		X					
Sloan	X	S		X	X	X	X	X	X	X	X	X	X			X
Solon	X	C	X					X			X	X				
Stanhope	X	C/S		X	X	X	X	X	X	X	X	X	X			X
Steff					X	X	X	X				X				
Steinsburg	X	C	X						X		X					
Stoney Land											X					
Swanpond	X	S		X		X		X	X		X	X	X			X
Suncook	X	C	X		X		X		X		X					
Swartwood	X	C	X	X		X		X	X	X	X					
Thorndale	X	C/S				X	X	X	X	X	X	X	X	X		X
Thurmont	X	C/S				X		X	X		X	X				
Tilsit	X	C/S		X		X	X	X	X	X						X
Tioga	X	C		X	X	X	X		X							
Timberville	X	C			X			X	X	X	X	X	X			
Titusville	X	C/S		X		X	X	X	X	X		X	X			X
Towhee	X			X		X	X	X	X	X	X	X	X			
Trego	X	C/S		X		X		X	X		X	X	X			
Trumbull	X	C/S		X		X	X	X	X	X	X	X	X		X	X
Tunkhannock	X	C	X				X		X		X					
Tygart	X	C/S		X		X	X	X	X	X	X	X	X			X
Tyler	X	C/S		X		X	X	X	X	X	X	X	X			X
Udifluents	X	C/S			X	X	X		X	X		X				
Udorthents	X	C/S	X	X				X	X		X	X				
Unadilla	X	C		X			X	X	X	X		X				
Ungers	X	C		X				X	X			X				
Upshur	X	C/S	X	X				X	X		X	X	X			
Urbana						X						X				
Valois	X	C					X	X	X		X	X				
Vandergrift	X	C/S		X			X	X	X		X	X	X			X
Vanderlip	X	C	X						X							
Venango	X	C/S		X		X	X	X	X	X	X	X				X
Volusia	X	C/S	X	X		X	X	X	X	X	X	X				
Wallington	X	C/S		X		X	X	X	X	X	X	X				X
Warners		S		X	X	X	X	X	X		X	X			X	X
Washington	X	S				X	X	X	X	X		X	X	X		
Watchung	X	C/S		X		X	X	X	X	X	X	X	X			X
Watson	X	C/S	X			X	X	X	X	X		X	X			

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Wauseon	X	C/S				X	X	X	X	X	X	X			X	X
Wayland	X	S		X	X	X	X	X	X	X	X	X			X	X
Wehadkee	X	C/S			X	X		X	X	X		X				X
Weikert	X	C/S	X				X	X	X	X	X	X				
Weinbach	X	C/S		X		X	X	X	X	X	X	X	X			X
Wellsboro	X	C/S	X	X		X	X	X	X	X		X				X
Westmoreland	X	C		X				X	X	X		X				
Weverton	X	C/S	X					X	X		X	X				
Wharton	X	C/S		X		X	X	X	X	X	X	X	X			X
Wheeling	X	C						X	X	X		X				
Whiteford																
Whitwell																
Wick	X	C/S		X	X	X	X	X	X	X	X	X				X
Wickham																
Williamson	X	C/S		X		X	X	X	X	X		X				X
Wiltshire					X					X						
Woodglen																
Woodstown	X	C/S				X		X	X	X	X	X				X
Wooster	X	C		X		X		X	X	X	X	X				
Worsham	X	C/S		X		X	X	X	X	X	X	X	X			
Worth	X	C	X	X		X	X		X	X	X	X				
Wurno	X		X					X	X		X	X		X		
Wurstboro	X	C/S				X	X		X		X	X				
Wyalusing	X	C/S			X	X	X	X	X		X	X				X
Wyoming	X	C	X				X		X		X					
Zipp		X				X	X	X		X	X	X	X			
Zoar	X	C/S				X	X	X	X	X		X	X			

APPENDIX C - STANDARD E&S PLAN NOTES

The following notes should be placed on the E&S plan drawings.

1. All earth disturbances, including clearing and grubbing as well as cuts and fills shall be done in accordance with the approved E&S plan. A copy of the approved drawings (stamped, signed and dated by the reviewing agency) must be available at the project site at all times. The reviewing agency shall be notified of any changes to the approved plan prior to implementation of those changes. The reviewing agency may require a written submittal of those changes for review and approval at its discretion.
2. At least 7 days prior to starting any earth disturbance activities, including clearing and grubbing, the owner and/or operator shall invite all contractors, the landowner, appropriate municipal officials, the E&S plan preparer, the PCSM plan preparer, the licensed professional responsible for oversight of critical stages of implementation of the PCSM plan, and a representative from the local conservation district or the Department to an on-site preconstruction meeting.
3. At least 3 days prior to starting any earth disturbance activities, or expanding into an area previously unmarked, the Pennsylvania One Call System Inc. shall be notified at 1-800-242-1776 for the location of existing underground utilities.
4. All earth disturbance activities shall proceed in accordance with the sequence provided on the plan drawings. Deviation from that sequence must be approved in writing from the local conservation district or by the Department prior to implementation.
5. Areas to be filled are to be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots and other objectionable material.
6. Clearing, grubbing, and topsoil stripping shall be limited to those areas described in the construction sequence. General site clearing, grubbing and topsoil stripping may not commence in any stage or phase of the project until the E&S BMPs specified by the BMP sequence for that stage or phase have been installed and are functioning as described in this E&S Plan.
7. At no time shall construction vehicles be allowed to enter areas outside the limit of disturbance boundaries shown on the plan maps. These areas must be clearly marked and fenced off before clearing and grubbing operations begin.
8. Topsoil required for the establishment of vegetation shall be stockpiled at the location(s) shown on the plan maps(s) in the amount necessary to complete the final grading of all exposed areas that are to be stabilized by vegetation. Each stockpile shall be protected in the manner shown on the plan drawings. Stockpile heights shall not exceed 35 feet. Stockpile slopes shall be 2H:1V or flatter.
9. Immediately upon discovering unforeseen circumstances posing the potential for accelerated erosion and/or sediment pollution, the operator shall implement appropriate best management practices to minimize the potential for erosion and sediment pollution and notify the local conservation district or the regional office of the Department.
10. All building materials and wastes shall be removed from the site and recycled or disposed of in accordance with the Department's Solid Waste Management Regulations at 25 Pa. Code 260.1 et seq., 271.1, and 287.1 et. seq. No building materials or wastes or unused building materials shall be burned, buried, dumped, or discharged at the site.
11. All off-site waste and borrow areas must have an E&S Plan approved by the local conservation district or the Department fully implemented prior to being activated, and any required permits approved by the agency responsible for oversight of the regulated activities, i.e. county conservation districts and/or DEP Regional Offices.
12. The contractor is responsible for ensuring that any material brought on site is clean fill. Form FP-001 must be retained by the property owner for any fill material affected by a spill or release of a regulated substance but qualifying as clean fill due to analytical testing.
13. All pumping of water from any work area shall be done according to the procedure described in this plan, over undisturbed vegetated areas.

14. Until the site is stabilized, all erosion and sediment BMPs shall be maintained properly. Maintenance shall include inspections of all erosion and sediment BMPs after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean out, repair, replacement, regrading, reseeding, remulching and renetting must be performed immediately. If the E&S BMPs fail to perform as expected, replacement BMPs, or modifications of those installed will be required.
15. A log showing dates that E&S BMPs were inspected as well as any deficiencies found and the date they were corrected shall be maintained on the site and be made available to regulatory agency officials at the time of inspection.
16. Sediment tracked onto any public roadway or sidewalk shall be returned to the construction site by the end of each workday and disposed in the manner described in this plan. In no case shall the sediment be washed, shoveled, or swept into any roadside ditch, storm sewer, or surface water.
17. All sediment removed from BMPs shall be disposed of in the manner described on the plan drawings.
18. Areas which are to be topsoiled shall be scarified to a minimum depth of 3 to 5 inches — 6 to 12 inches on compacted soils — prior to placement of topsoil. Areas to be vegetated shall have a minimum 4 inches of topsoil in place prior to seeding and mulching. Fill out slopes shall have a minimum of 2 inches of topsoil.
19. All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence or other related problems. Fill intended to support buildings, structures and conduits, etc. shall be compacted in accordance with local requirements or codes.
20. All earthen fills shall be placed in compacted layers not to exceed 9 inches in thickness.
21. Fill materials shall be free of frozen particles, brush, roots, sod, or other foreign or objectionable materials that would interfere with or prevent construction of satisfactory fills.
22. Frozen materials or soft, mucky, or highly compressible materials shall not be incorporated into fills.
23. Fill shall not be placed on saturated or frozen surfaces.
24. Seeps or springs encountered during construction shall be handled in accordance with the standard and specification for subsurface drain or other approved method.
25. All graded areas shall be permanently stabilized immediately upon reaching final grade. Cut slopes in competent bedrock and rock fills need not be vegetated. Seeded areas within 50 feet of a surface water, or as otherwise shown on the plan drawings, shall be blanketed according to the standards of this plan.
26. Immediately after earth disturbance activities cease in any area or subarea of the project, the operator shall stabilize all disturbed areas. During non-germinating months, mulch or protective blanketing shall be applied as described in the plan. Areas not at finished grade, which will be reactivated within 1 year, may be stabilized in accordance with the temporary stabilization specifications. Those areas which will not be reactivated within 1 year shall be stabilized in accordance with the permanent stabilization specifications.
27. Permanent stabilization is defined as a minimum uniform, perennial 70% vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated erosion. Cut and fill slopes shall be capable of resisting failure due to slumping, sliding, or other movements.
28. E&S BMPs shall remain functional as such until all areas tributary to them are permanently stabilized or until they are replaced by another BMP approved by the local conservation district or the Department.
29. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, the owner and/or operator shall contact the local conservation district for an inspection prior to removal/conversion of the E&S BMPs.
30. After final site stabilization has been achieved, temporary erosion and sediment BMPs must be removed or converted to permanent post construction stormwater management BMPs. Areas disturbed during removal or conversion of the BMPs shall be stabilized immediately. In order to ensure rapid revegetation of disturbed areas, such removal/conversions are to be done only during the germinating season.
31. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, the owner and/or operator shall contact the local conservation district to schedule a final inspection.

32. Failure to correctly install E&S BMPs, failure to prevent sediment-laden runoff from leaving the construction site, or failure to take immediate corrective action to resolve failure of E&S BMPs may result in administrative, civil, and/or criminal penalties being instituted by DEP in accordance with Section 602 of The Clean Streams Law (35 P.S. § 602). The Clean Streams Law provides for up to \$10,000 per day in civil penalties, up to \$10,000 in summary criminal penalties, and up to \$25,000 in misdemeanor criminal penalties for each violation.

OPTIONAL NOTES

The following notes should be added to plan drawings as applicable.

1. Concrete wash water shall be handled in the manner described on the plan drawings. In no case shall it be allowed to enter any surface waters or groundwater systems.
2. All channels shall be kept free of obstructions including but not limited to fill, rocks, leaves, woody debris, accumulated sediment, excess vegetation, and construction material/wastes.
3. Underground utilities cutting through any active channel shall be immediately backfilled and the channel restored to its original cross-section and protective lining. Any base flow within the channel shall be conveyed past the work area in the manner described in this plan until such restoration is complete.
4. Channels having riprap, Reno mattress, or gabion linings must be sufficiently over-excavated so that the design dimensions will be provided after placement of the protective lining.
5. Sediment basins and/or traps shall be kept free of all construction waste, wash water, and other debris having potential to clog the basin/trap outlet structures and/or pollute the surface waters.
6. Sediment basins shall be protected from unauthorized acts by third parties.
7. Any damage that occurs in whole or in part as a result of basin or trap discharge shall be immediately repaired by the permittee in a permanent manner satisfactory to the municipality, local conservation district, and the owner of the damaged property.
8. Upon request, the applicant or his contractor shall provide an as-built (record drawing) for any sediment basin or trap to the municipal inspector, local conservation district or the Department.
9. Erosion control blanketing shall be installed on all slopes 3H:1V or steeper within 50 feet of a surface water and on all other disturbed areas specified on the plan maps and/or detail sheets.
10. Fill material for embankments shall be free of roots, or other woody vegetation, organic material, large stones, and other objectionable materials. The embankment shall be compacted in maximum _____layered lifts at _____% density.