CHAPTER 3 - SITE ACCESS

This chapter addresses site access during actual construction of a proposed project. It should be noted that site access for site preparation work (e.g. surveying, exploration drilling, etc.) should follow the same general principals. When it becomes necessary to remove vegetative cover or cross surface waters to conduct a survey, or complete required exploration drilling and sampling, appropriate BMPs must be provided to protect the surface waters. BMPs not addressed in this chapter may be reviewed by the Department on a case-by-case basis and approved if they are found to be equal to, or better than, the following BMPs.

ROCK CONSTRUCTION ENTRANCE - **Sediment Removal Efficiency: LOW. This device is not an ABACT for special protection watersheds.** 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).

Lake County Stormwater Management Department, Ohio

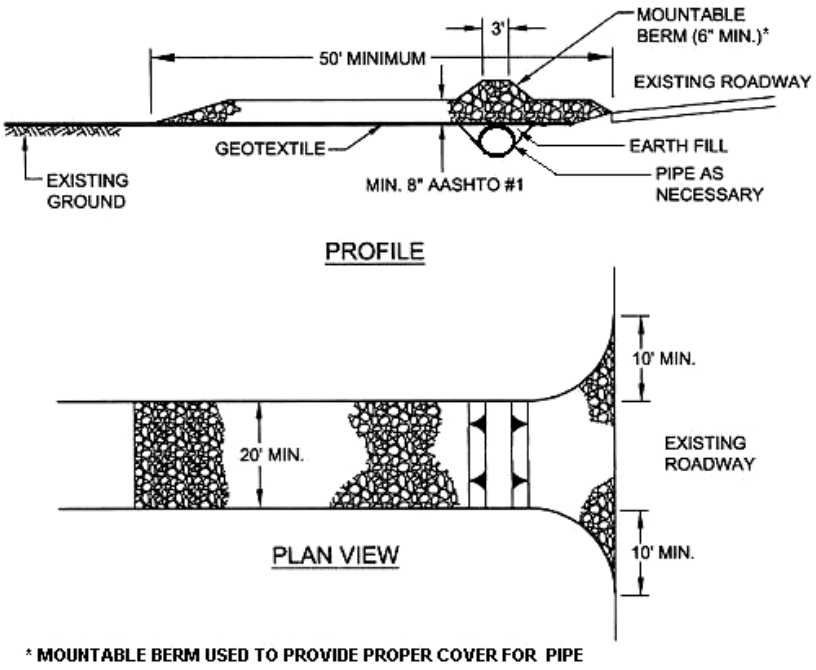
A geotextile underlayment should be placed over the existing ground prior to placing the stone. At a minimum, rock construction entrances should be constructed to the dimensions shown on Standard Construction Detail #3-1. Where site conditions warrant, it may be necessary to extend the length or width of the rock to ensure the effectiveness of the entrance. Wherever access to the site is across a roadside ditch, stream channel, natural drainage course, etc., a suitable means of conveying the flow past the entrance (e.g. a properly sized culvert pipe) should be provided. For such installations, a mountable berm is recommended to prevent crushing the pipe.

Rock construction entrances should be maintained to the specified dimensions and the capacity to remove sediment from the tires by adding rock when necessary. For some sites this could occur several times a day. A stockpile of rock material should be maintained on site for this purpose. It should be noted that occasionally the rock construction entrance can become too clogged and might have to be removed and replaced.

Sediment deposited on public roadways should be removed and returned to the construction site immediately. **Note: Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.**

Rock construction entrances are not effective sediment removal devices for runoff coming off the roadway above the entrance. Surface runoff should be directed off the roadway by means of appropriate drainage devices described later in this chapter. Where these devices do not discharge to a suitable vegetative filter strip, an appropriately sized sediment trap should be provided. For locations not having sufficient room for a conventional sediment trap, consideration should be given to use of a compost sock sediment trap. Compost sock traps may also be used instead of conventional sediment traps at other points of discharge. Where used, care should be taken to provide continuous contact between the sock and the underlying soil in order to prevent undermining. It is also important to properly anchor the sock (Standard Construction Detail #3-1).

STANDARD CONSTRUCTION DETAIL # 3-1
Rock Construction Entrance



Modified from Maryland DOE

Remove topsoil prior to installation of rock construction entrance. Extend rock over full width of 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.

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 - **Sediment Removal Efficiency: HIGH. This device is an ABACT for HQ and EV watersheds.** Rock construction entrances with wash racks should be considered wherever soil and/or traffic conditions require washing the construction vehicle wheels prior to exiting the site to avoid excessive tracking of mud onto a highway. Access to the site should be limited to the stabilized entrance(s). NOTE: Wash racks in construction entrances are for washing of tires only. Where it is necessary to wash an entire vehicle prior to leaving the site, this should be done at a site designed to prevent untreated nutrient-enriched wastewater or hazardous wastes from being discharged to surface or ground waters.

EPA

At a minimum, rock construction entrances with wash racks should be constructed to the length, width, and thickness dimensions shown on Standard Construction Detail #3-2. A metal wash rack (like the one illustrated above) is an acceptable alternative to the reinforced concrete one shown in the standard detail.

Approaches to the wash rack should be lined with AASHTO #1 at a minimum of 25' on both sides.

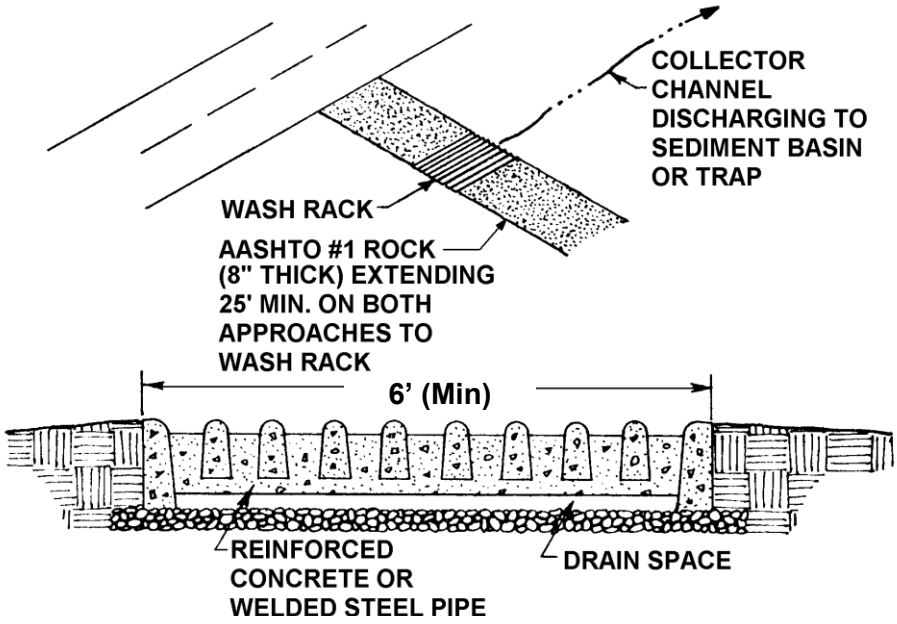
The wash rack should discharge to a sediment removal facility, such as a vegetated filter strip or into a channel leading to a sediment removal device (e.g. a sediment trap or sediment basin).

Rock construction entrances with wash racks should be maintained to the specified dimensions by adding rock when necessary at the end of each workday. A stockpile of rock material should be maintained on site for this purpose.

Sediment deposited on paved roadways should be removed and returned to the construction site. **NOTE: Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.**

Damaged wash racks should be repaired as necessary to maintain their effectiveness.

STANDARD CONSTRUCTION DETAIL # 3-2
Rock Construction Entrance with Wash Rack



Modified from Smith Cattleguard Company

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.

RUMBLE PAD

Pre-constructed rumble pads may be used instead of rock construction entrances provided they are installed according to manufacturer's recommendations and a sufficient number of pads are installed to provide for a minimum of four tire revolutions while on the pad. More pads may be needed depending on site conditions. Accumulated materials should be cleaned from the pads daily (more often if necessary) and disposed in the manner specified by the plan. Rumble pads are not ABACT.

All World Equipment

WHEEL WASH

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. Waste water from the wheel washes should either be recycled or run through an approved sediment removal device prior to discharge to a surface water.

NW Equipment Sales

TEMPORARY AND PERMANENT ACCESS ROADS

In order to construct perimeter BMPs such as basins, traps, channels, and even super silt fence, it is often necessary to construct temporary access roads. When temporary E&S BMPs are converted to PCSM BMPs, these access roads may become permanent. If not properly aligned, drained, and maintained, access roads can become significant sources of sediment pollution. Therefore, careful thought should be given to the location and construction of access roads. When considering the proper location for an access road, particular attention should be given to steep slopes, surface waters, rock outcrops, soil types, and other potential hazards.

Source Unknown

Once the most efficient point of ingress and egress has been determined, the next critical aspect to be considered is the grade. Ideally, road grades should be between 2 and 10 percent. Grades up to 20 percent are not recommended except where absolutely necessary and for short distances.

On long, continuous grades, runoff should be directed off the roadway by means of crowning, insloping, waterbars, broad-based dips, deflectors, or open-top culverts. All discharges should be to stable drainage courses, or to well-vegetated areas. Consideration should also be given to whether outlet protection is needed.

Access roads should be constructed above flood plains and avoid drainage courses wherever possible. Where it is not possible to avoid drainage courses, seeps, springs, or wet areas, proper drainage measures should be installed. Roadways paralleling surface waters should be located so that an adequate filter strip of undisturbed vegetation remains between the road and the stream. If this is not possible, a suitable sediment barrier should be installed. Appropriate Chapter 105 water obstruction and encroachment authorization must be obtained prior to construction in these areas.

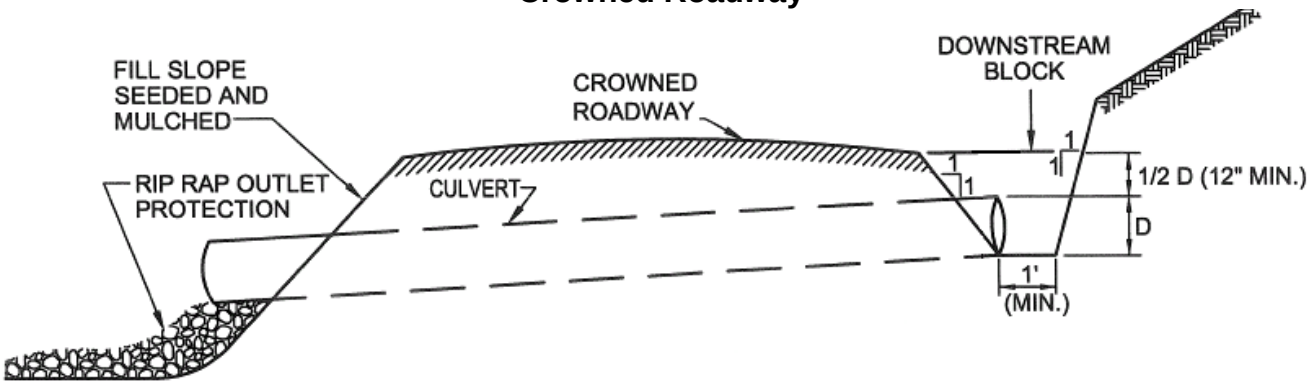
Wherever it is necessary to cross a watercourse, as defined bed and banks, a properly sized and stabilized temporary crossing must be provided. Ford type stream crossings are typically not acceptable for construction sites.

Cuts and fills should be minimized. Long and/or high cut/fill slopes are often difficult to stabilize. In soils with low shear strength, they also pose an increased potential for slope failures. Cuts deeper than

3 feet should be avoided wherever possible, and cut slopes not in competent bedrock should not be steeper than 2H:1V. Fill slopes should not be steeper than 2H:1V or exceed 5 feet in height wherever possible. All cut and fill slopes should be stabilized by seeding and mulching, blanketing, or other suitable method within 24 hours of reaching final grade. This will require the contractor to anticipate the date of completion and schedule ahead for seeding and mulching.

Road surfaces should be sloped for drainage. In flatter areas, crowning is the most efficient means of draining the roadway (Standard Construction Detail # 3-3). For hillside construction, insloping with adequately spaced cross drains is recommended (Standard Construction Detail # 3-4). Outsloping roads can be very dangerous. Where crowning and insloping are not sufficient to address drainage requirements, waterbars, broad-based dips, deflectors, or culverts may be needed. All discharges should be to stable drainage courses, or to well-vegetated areas. Consideration should also be given if outlet protection is needed.

STANDARD CONSTRUCTION DETAIL # 3-3
Crowned Roadway



PA DEP

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 a surface water or within 100 feet of an HQ or EV surface water or where a suitable vegetative filter strip does not exist.

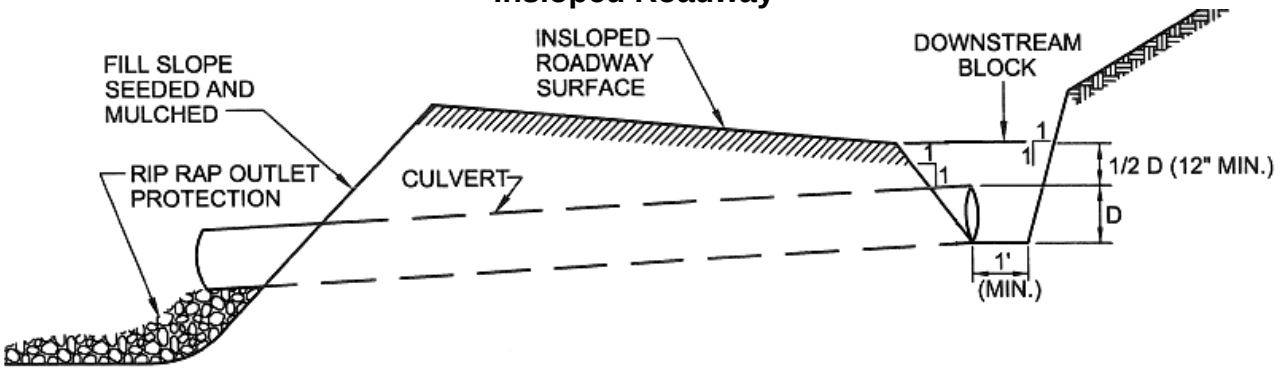
A top dressing composed of hard, durable stone shall be provided for soils having low strength.

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 courses. Ditch relief culverts or turnouts shall be provided at the intervals indicated on Table 3.3 or Table 3.4 for roadside ditches. 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.

STANDARD CONSTRUCTION DETAIL # 3-4
Insloped Roadway



PA DEP

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 a surface water or within 100 feet of an HQ or EV surface water or 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.

Adequately sized culverts or other suitable cross drains shall be provided at all seeps, springs, and drainage courses. Ditch relief culverts shall be provided at the intervals indicated on Table 3.3 or Table 3.4. 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.

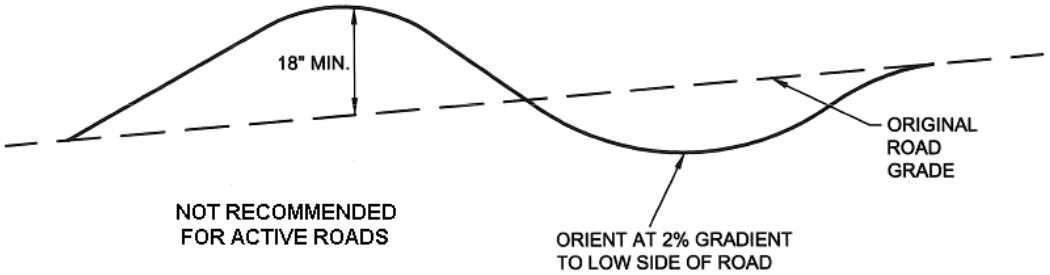
WATERBAR - **Sediment Removal Efficiency: VERY LOW. This device by itself is not an ABACT for special protection watersheds.** However, waterbars can be used to make ABACT such as vegetative filter strips work more effectively by reducing the volume of discharge to a filter strip at any one location.

Waterbars are typically used to control stormwater runoff on retired access roads 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 the difficulty of moving equipment over them as well as the need for continual maintenance due to damage from traffic. Where waterbars are used on active access roads, it is often necessary to provide reinforcement of the berm with a log, steel pipe, etc. to maintain the integrity of the waterbar between maintenance operations. All such waterbars should be restored to original dimensions at the end of each work day. Waterbars are not appropriate for incised roadways, where there is no opportunity to discharge runoff to either side.

York CCD

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 runoff will flow away from, not back onto the roadway, skid trail, or right-of-way. A 2% maximum gradient is recommended to ensure proper discharge of water entering the waterbar. Steeper gradients should be avoided to prevent erosion of the waterbar. Wherever erodible soils are present, or where there is not a sufficient vegetative filter strip between the waterbar and a receiving surface water, the waterbar should be provided with a temporary protective liner. All waterbars should be vegetated. Obstructions, (e.g. straw bales, silt fence, rock filters, etc.) should not be placed in or across waterbars.

STANDARD CONSTRUCTION DETAIL #3-5
Waterbar



Adapted from USDA Forest Service

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, skidtrail, or right-of-way has achieved permanent stabilization.

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

TABLE 3.1 – Maximum Waterbar Spacing

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

Adapted from USDA Forest Service

BROAD-BASED DIP - **Sediment Removal Efficiency: VERY LOW. This device by itself is not an ABACT for special protection watersheds, but like a waterbar can be used to make an ABACT BMP work more effectively.** 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 or sediment basins). Broad-based dips, unlike waterbars, are easily traversed by most 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%. Where access roads exceed 10% gradients, insloping or other deflection devices should be used to control runoff.

PA DEP

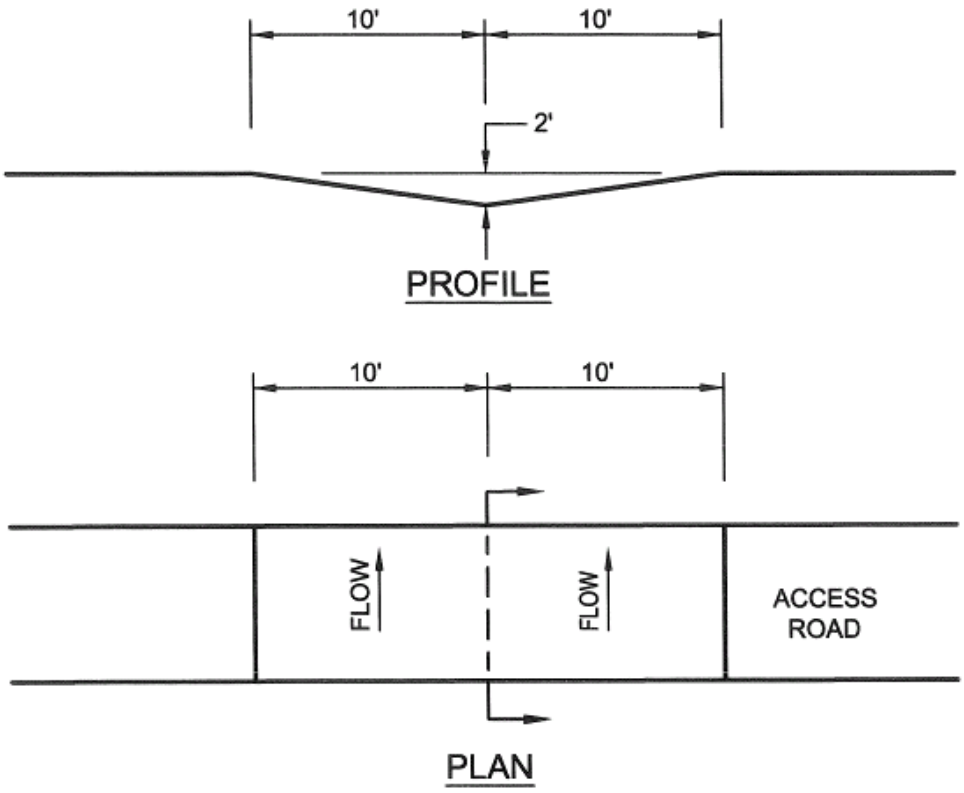
Discharges should be to the downslope side of access roads with a maximum gradient of 3% in the dip. For access roads with grades up to 5%, Standard Construction Detail # 3-6 should be used. Roadways with steeper grades should use Standard Construction Detail # 3-7.

TABLE 3.2 – Maximum Spacing of Broad-based Dips, Open-top Culverts and Deflectors

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

USDA Forest Service

STANDARD CONSTRUCTION DETAIL # 3-6
Broad-based Dip for Low Gradient (≤5%) Roadways



Maine DEP

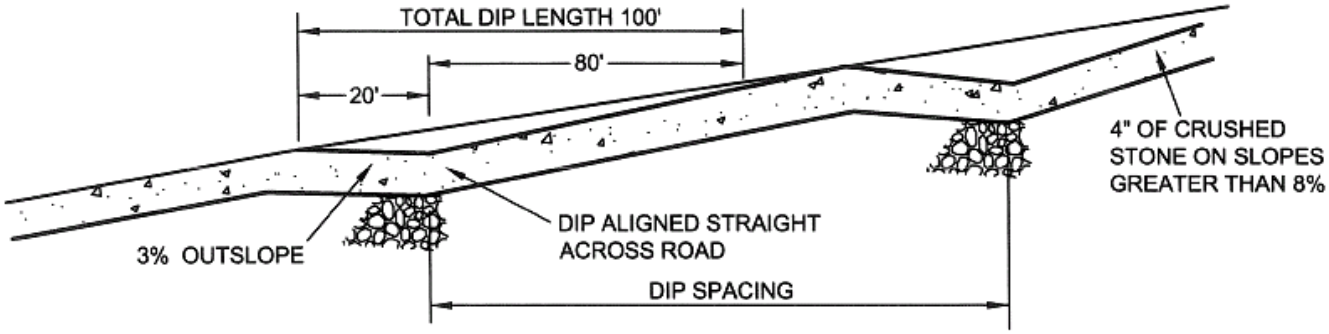
Broad-based dips shall be constructed to the dimensions shown and at the locations shown on the plan drawings.

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 Table 3.2

STANDARD CONSTRUCTION DETAIL # 3-7
Broad-based Dip for High Gradient (5% - 10%) Roadways



MINIMUM DEPTH = 12”

USDA Forest Service

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.

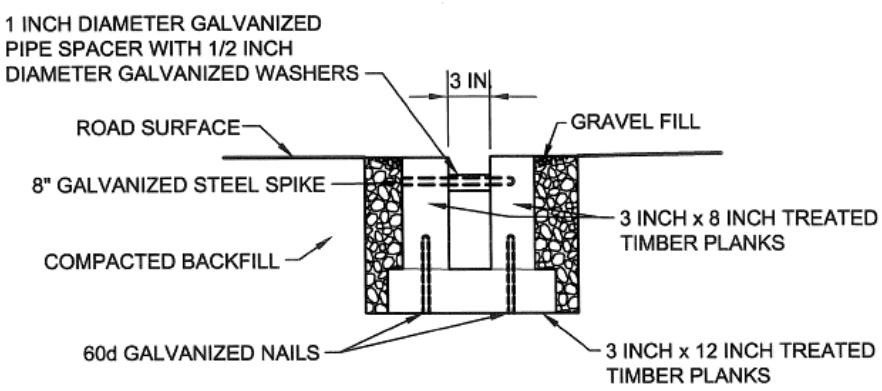
Dips shall be inspected daily. Damaged or non-functioning dips shall be repaired by the end of the workday.

Maximum spacing of broad-based dips shall be as shown in Table 3.2.

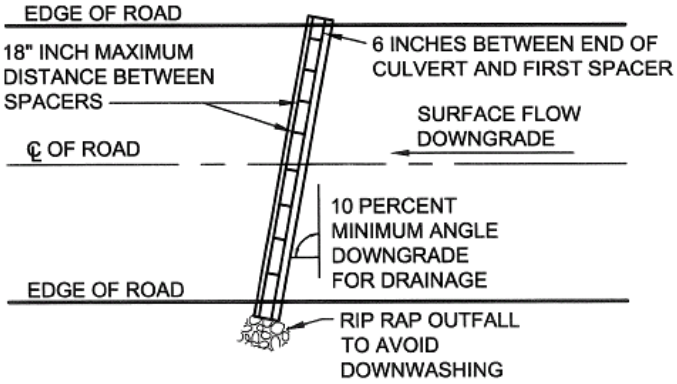
OPEN-TOP CULVERTS - **Sediment Removal Efficiency: VERY LOW. This device is not an ABACT for special protection watersheds, but may be used to make other BMPs that are ABACT work more effectively.** Open-top culverts may be used to intercept runoff from access or haul roads and divert it to well-vegetated (erosion resistant) areas or sediment removal facilities. Such culverts are typically more easily traversed than either waterbars or broad-based dips, but can require more maintenance if being crossed by heavy equipment or exposed to sediment-laden runoff. Open-top culverts are not acceptable for stream crossings and should not be used instead of pipe culverts. Spacing should be according to Table 3.2.

Source Unknown

STANDARD CONSTRUCTION DETAIL #3-8
Open-top Culvert



TYPICAL CROSS-SECTION



TYPICAL PLAN VIEW

USDA Forest Service

Culverts shall be inspected weekly and after runoff events.

Damaged or non-functioning culverts shall be repaired by the end of the workday.

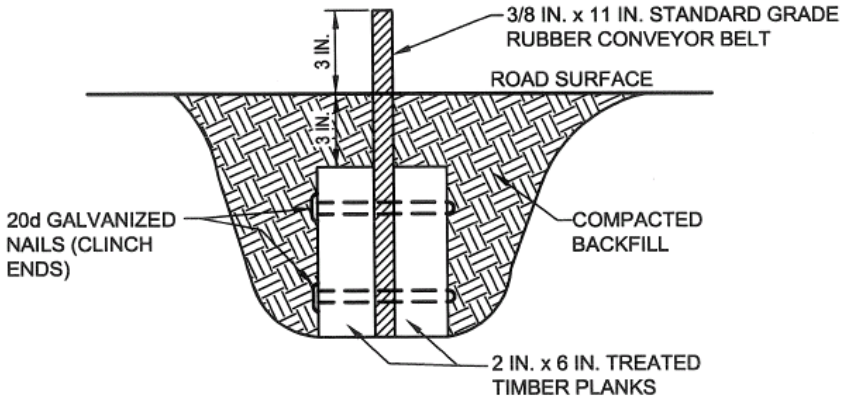
Accumulated sediment shall be removed within 24 hours of inspection.

Maximum spacing of open-top culverts shall be as shown in Table 3.2.

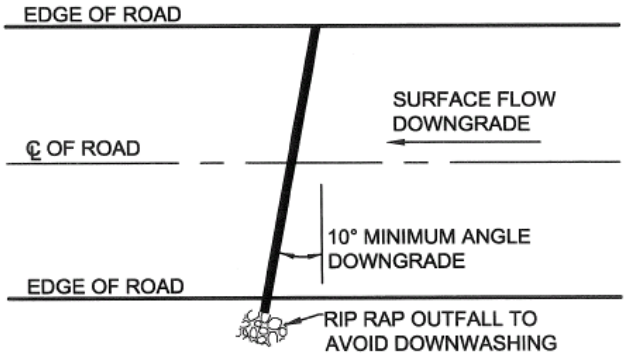
WATER DEFLECTOR - **Sediment Removal Efficiency: VERY LOW. This device is not an ABACT for special protection watersheds, but may be used to make other BMPs that are ABACT work more effectively.** Deflectors may be used instead of open-top culverts to direct runoff from an access road to a well-vegetated area or sediment removal facility. A deflector is typically constructed from rubber belting ranging from 5/16" to ½" thick held between two 2" X 6" wooden planks. This method of directing runoff from an access road works best on low traffic roads. Deflectors can be used on roads with grades exceeding 10%.

USDA Forest Service

STANDARD CONSTRUCTION DETAIL #3-9
Water Deflector



TYPICAL CROSS-SECTION



TYPICAL PLAN VIEW

USDA Forest Service

Deflector shall be inspected weekly and after each runoff event.

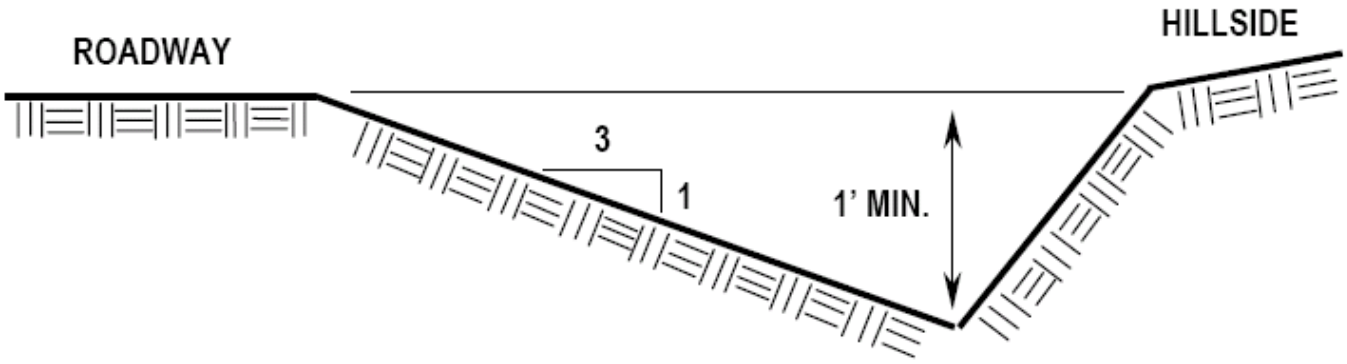
Accumulated sediment shall be removed from deflector within 24 hours of inspection.

Belt shall be replaced when worn and no longer effective.

Maximum spacing of deflectors shall be as shown in Table 3.2.

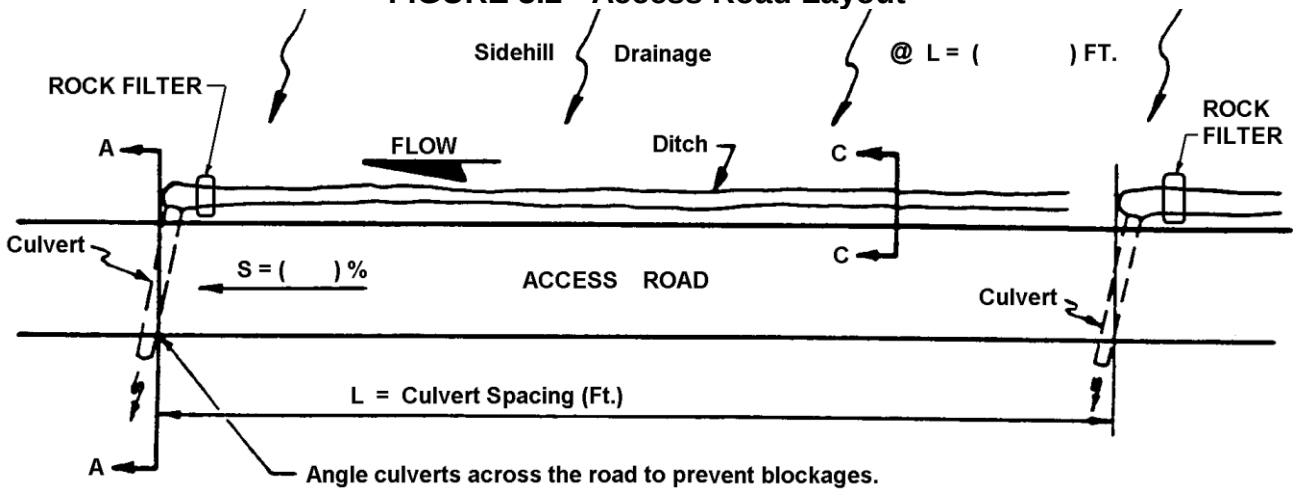
ROADSIDE DITCH - **Sediment Removal Efficiency: VERY LOW. This device is not an ABACT for special protection watersheds, but may be used to make other BMPs that are ABACT work more effectively.** In most cases, the ditches paralleling temporary access roads and haul roads need not be lined if sufficient ditch relief culverts are provided, erosion resistant soils are present, and flow velocities are less than 2 feet per second (fps). However, protective liners are required for roadside ditches discharging to special protection waters, where discharging directly to surface waters, or where necessary to prevent the erosion of the channel itself. A typical cross-section for a roadside ditch is shown in Figure 3.1.

FIGURE 3.1 - Typical Roadside Ditch Section



USDA Forest Service

FIGURE 3.2 - Access Road Layout



USDA Forest Service

Sizing and spacing of ditch relief culverts should be according to Table 3.3. Rock filters are not required where roadway surface is stabilized, ditches are provided with protective liners, and cut banks are stabilized. Suitable outlet protection should be provided at each culvert outfall.

DITCH RELIEF CULVERT (Cross Drains) - **Sediment Removal Efficiency: VERY LOW. This device is not an ABACT for special protection watersheds, but may be used to make other BMPs which are ABACTs work more effectively.** Ditch relief culverts minimize the potential for erosion of roadside 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 (Figure 3.2) (Standard Construction Detail #3-10).

Source Unknown

Ditch relief culverts should be placed with a slope of 2 to 4 percent to help keep the culvert clean and ensure water flow. Sizing and spacing of culverts should be according to Table 3.3 for temporary culverts and Table 3.4 for permanent culverts.

TABLE 3.3 - 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

Adapted from Maryland DOE

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

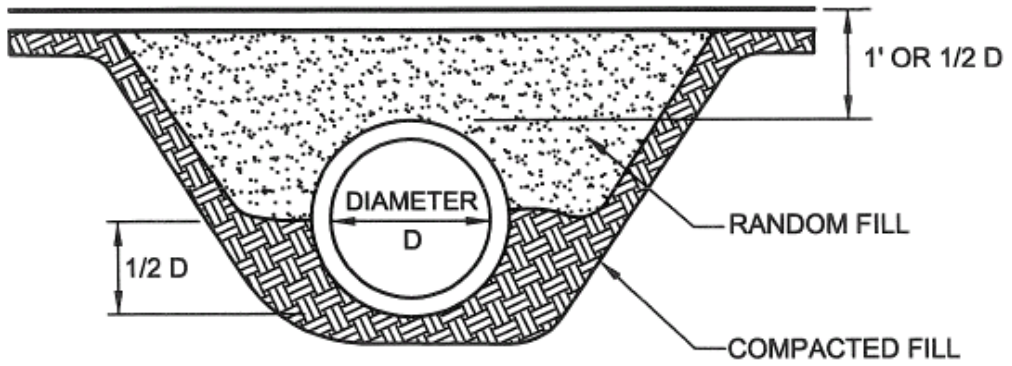
TABLE 3.4 - Recommended Maximum Spacing of Ditch Relief Culverts (18" dia. CMP) For Permanent Access Roads

Road Grade Percent	Soil Type in Ditch				
	Gravels, Sandy Gravels, Aggregate Surfacing	Silty Gravels, Clayey Gravels	Plastic and Nonplastic 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

Adapted from USDA Forest Service

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

STANDARD CONSTRUCTION DETAIL #3-10
Ditch Relief Culvert



USDA Forest Service

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.

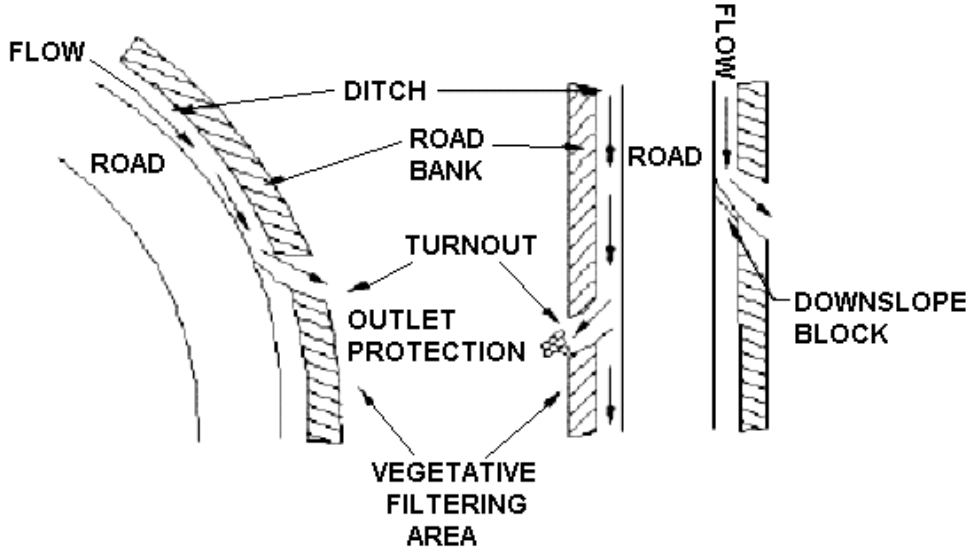
NOTE: This detail may be used for ditch relief culverts and for crossings of roadside ditches. It is not appropriate for stream crossings.

*** 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.**

TURNOUT - **Sediment Removal Efficiency: VERY LOW. This device is not an ABACT for special protection watersheds, but may be used to make other BMPs which are ABACT work more effectively.** Channels that drain water away from roads or roadside ditches into well-vegetated areas are known as turnouts. Turnouts (see Figure 3.3) 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 courses or buffer areas wherever possible. **An excavated sump at the end of the turnout can be effectively used to pond and settle out sediment prior to discharging to a vegetated buffer.** 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.

Source Unknown

FIGURE 3.3
Typical Turnout

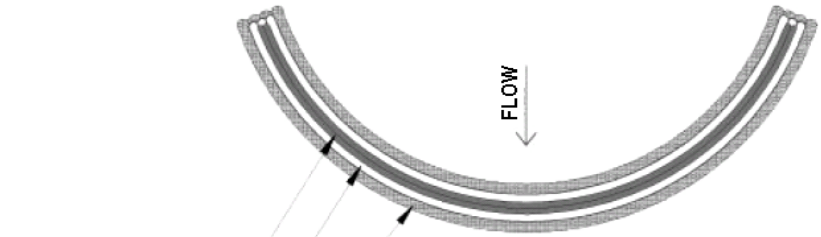


Indiana CCD

COMPOST SOCK SEDIMENT TRAP - **Sediment Removal Efficiency: HIGH. This device is an ABACT for HQ and EV watersheds.** In many locations, there is little or no opportunity to direct runoff from an access road into a well-vegetated area. This may occur at entrances or where surface waters are in relatively close proximity to the access road. At such locations it may still be possible to treat the runoff by means of a compost sock sediment trap. These structures can be installed, used and later removed with relatively little disturbance to the area. In fact, the compost within the sock can be used during cleanup as a vegetative growth medium. Runoff may be directed into the trap using any of the devices described above. Compost sock sediment traps are addressed in this chapter to emphasize their usefulness in controlling runoff from access roads. However, these devices may be used at some other locations where a temporary sediment trap is appropriate. The trap should be constructed according to Standard Construction Detail # 3-11. Sock material should meet the minimum standards provided in Table 4.1. Installation of an excavated sump immediately above the socks may increase trap efficiency where soil conditions permit their construction.

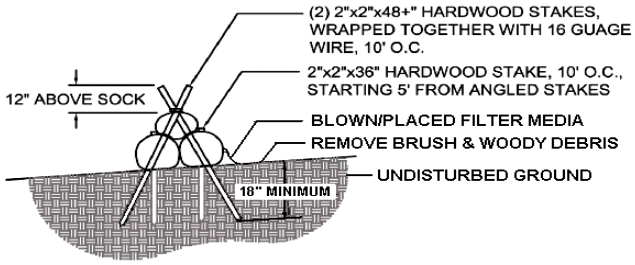
Filtrexx

STANDARD CONSTRUCTION DETAIL #3-11
Compost Sock Sediment Trap



1. Compost Sock Sediment Trap shall be sized to provide 2,000 cubic feet of storage capacity for each acre tributary to the trap.
2. Minimum base width is equivalent to the height.
3. Sediment accumulation shall not exceed 1/3 the total height of the trap.
4. Socks shall be of larger diameter at the base of the trap and decrease in diameter for successive layers as indicated to the left.
5. Ends of the trap shall be a minimum of 1 foot higher in elevation than the mid-section, which shall be located at the point of discharge.

PLAN VIEW



Adapted from Filtrexx

STAKING DETAIL

Sock material shall meet the standards of Table 4.1. Compost shall meet the standards of Table 4.2.

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.

STREAM CROSSING

Because of the potential for stream degradation, flooding, and safety hazards, stream crossings should be avoided wherever possible. Alternate routes to work areas should be considered before planning the installation of a temporary stream crossing. Temporary stream crossings must be provided wherever construction equipment (including clearing and grubbing equipment) must cross an existing stream channel (water course with a defined bed and bank). Wherever such crossings are installed, the appropriate Chapter 105 permits must be obtained from the Department or its designee. Designs must adhere to the conditions of those permits.

Source Unknown

DESIGN CRITERIA

1. All conditions listed on the General Permit-8 (GP-8) application must be met.

2. Ford type crossings should not be used by construction equipment**.** They should be used only where normal flow is shallow or intermittent across a wide channel and crossings are anticipated to be infrequent. Wherever possible, they should be located where a rocky stream bottom exists so as to minimize damage to the channel during crossings. Approaches should be stabilized with AASHTO #1. Fords are not authorized by general permits in special protection watersheds.

3. Temporary bridges should be installed as shown in Figure 3.4 and GP-8.

4. Culvert pipes must be installed according to GP-8 standards.

5. For crossings that will be in place for one year or less from the date of issuance (Chapter 105 temporary stream crossing permit), the pipe should be sized to handle flow under normal flow conditions. Normal flow refers to the flow conditions that exist in a given stream channel other than in response to storm or drought events. A common rule of thumb is to use a pipe or pipes with a diameter approximately twice the normal flow depth.

6. A series of pipes from stream bank to stream bank may be used where necessary.

7. The minimum pipe diameter is 12 inches.

8. Wherever multiple pipes are used, the minimum distance between pipes shall conform to Table 3.5.

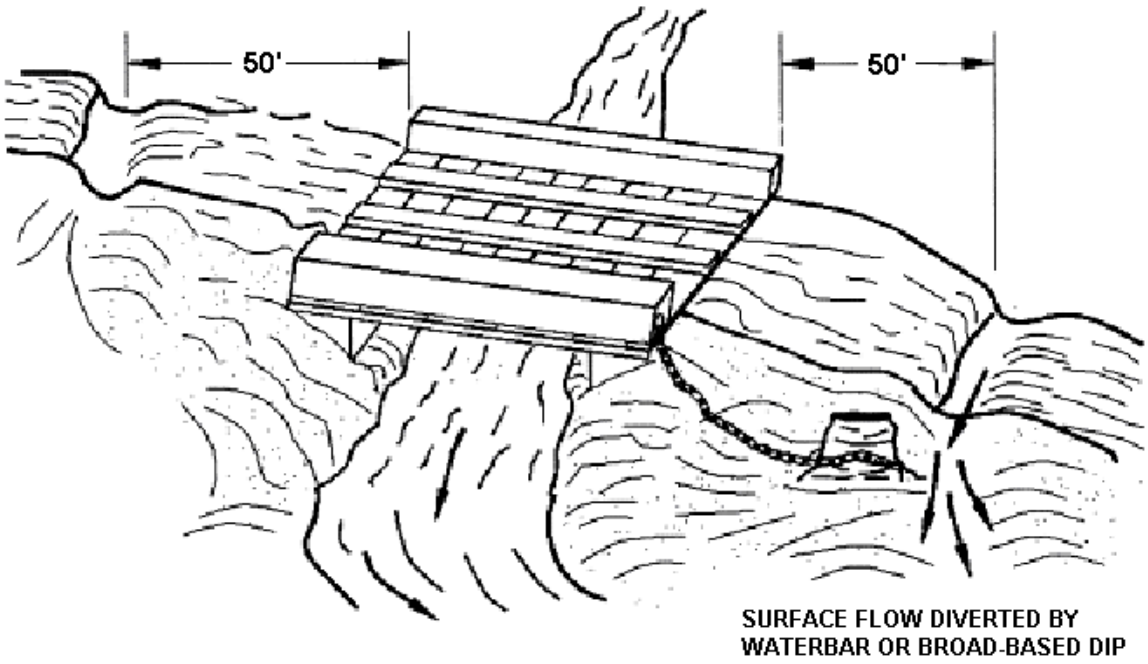
TABLE 3.5 - Minimum Distance Between Culvert Pipes

PIPE DIAMETER (D)	**MINIMUM DISTANCE (F)**
12” to 24”	12”
24” to 72”	½ Diameter (D)
72” to 120”	36”
PIPE ARCH SIZE (IN.)	**MINIMUM DISTANCE (FF)**
18 x 11 to 25 x 16	12”
25 x 16 to 72 x 44	1/3 Span of Pipe Arch
Above 72 x 44	30”

8. Only clean rock fill may be used. The rock must be sized according to the anticipated flow conditions. The rock size used shall conform to Chapter 105 General Permit requirements. The rock fill should be extended a minimum of 50’ from top of bank on each side of the crossing. The fill should be depressed a minimum of 6” over the channel to allow for overflow. The maximum depth of fill over the culvert is the minimum the manufacturer requires.

9. Suitable outlet protection should be provided where necessary to prevent scour at the pipe outlet. Wherever soft channel bed conditions exist, riprap protection should also be provided at the culvert entrance.

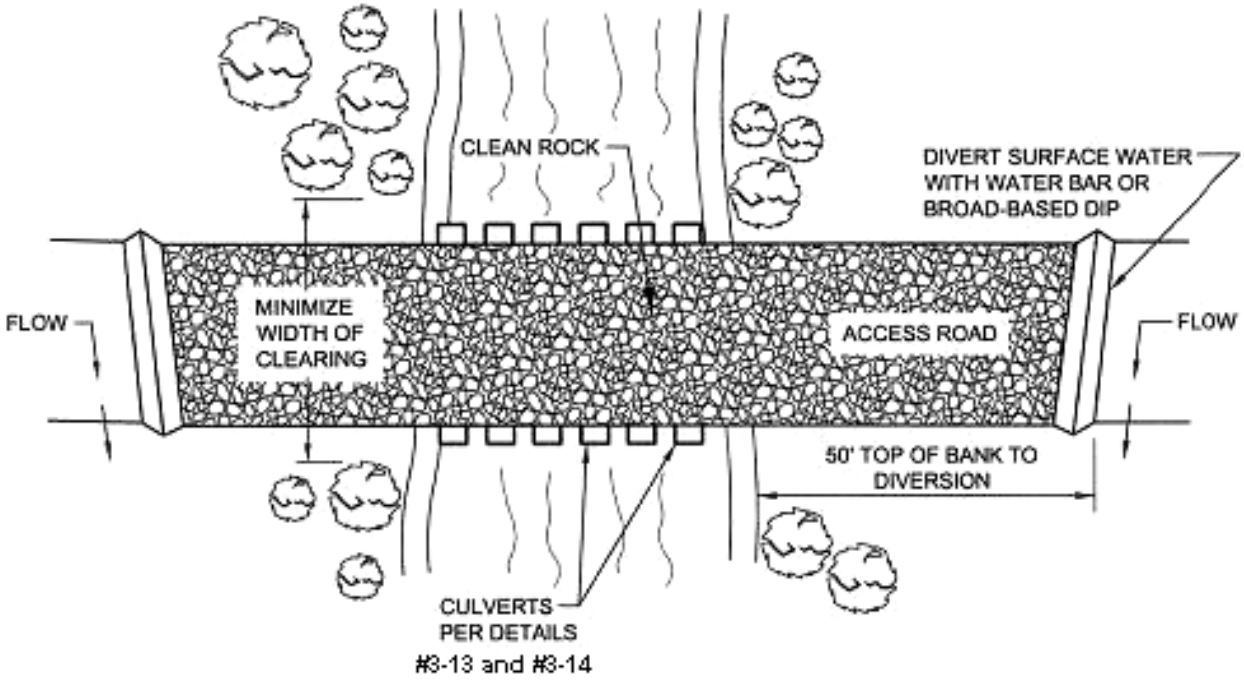
FIGURE 3.4
Temporary Bridge Stream Crossing



Adapted from Maryland DOE

Waterbars and broad-based dips shall discharge to sediment removal facilities.

STANDARD CONSTRUCTION DETAIL # 3-12
Temporary Stream Crossing - Plan View

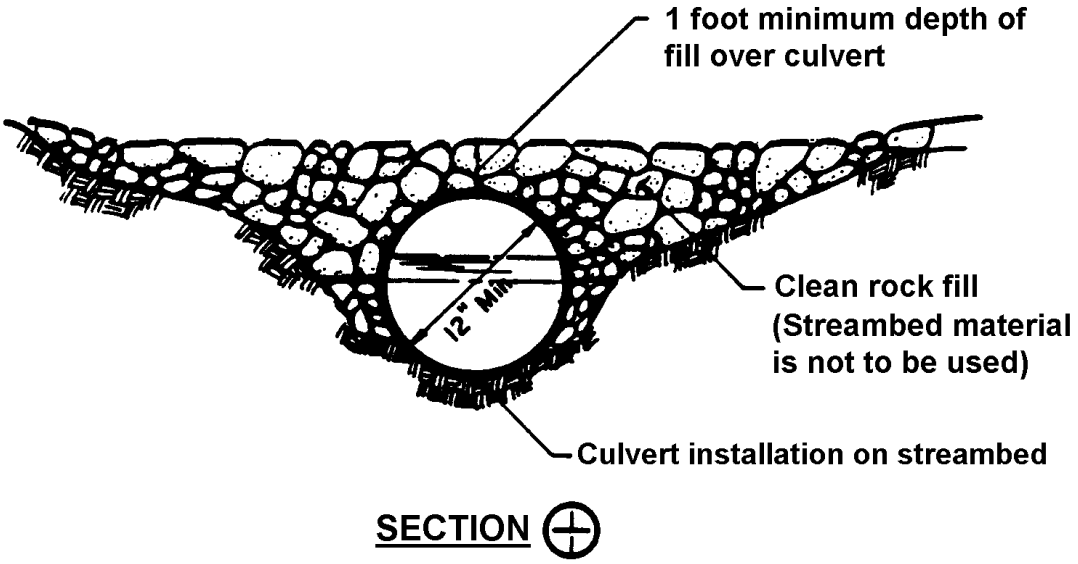


Adapted from Ohio EPA

Waterbars and broad-based dips shall discharge to sediment removal facility.
Clean rock shall conform to Chapter 105 permitting requirements.

Follow permit conditions regarding removal of crossing.

STANDARD CONSTRUCTION DETAIL # 3-13
Temporary Stream Crossing



PA DEP

Provide 50' stabilized access to crossing on both sides of stream channel (see Standard Construction Detail #3-12).

Pipes shall extend beyond the toe of the roadway.

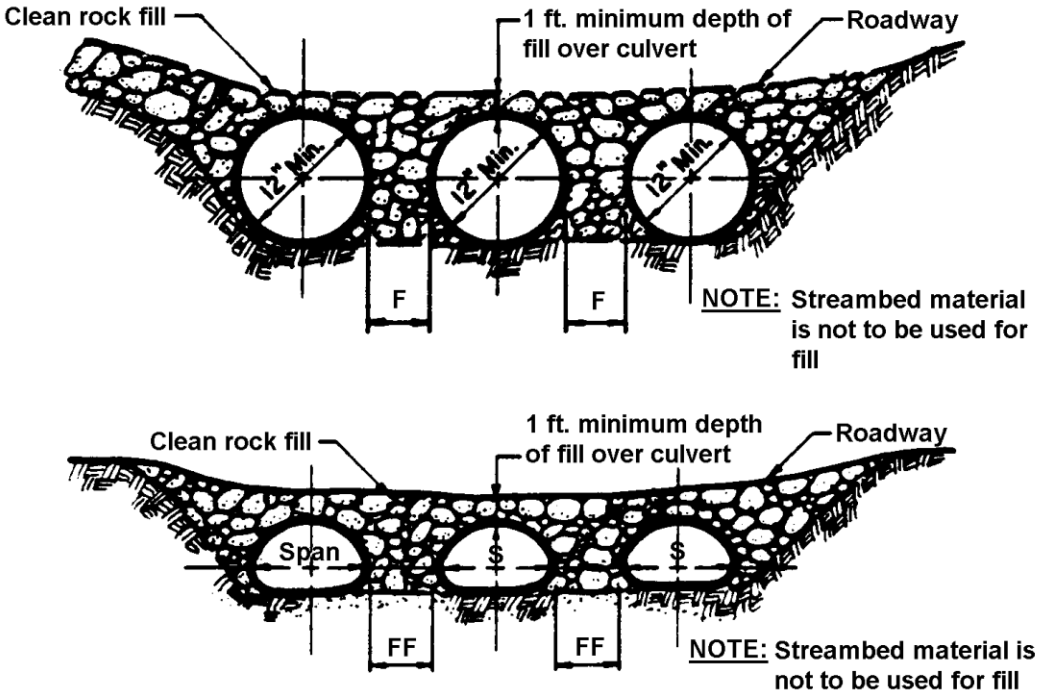
Runoff from the roadway shall be diverted off the roadway and into a sediment removal BMP before it reaches the rock approach to the crossing.

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.

STANDARD CONSTRUCTION DETAIL # 3-14
Temporary Stream Crossing - Multiple Pipes



SECTIONS

PA DEP

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 (Standard Construction Detail #3-12).

Pipes shall extend beyond the toe of the roadway.

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.

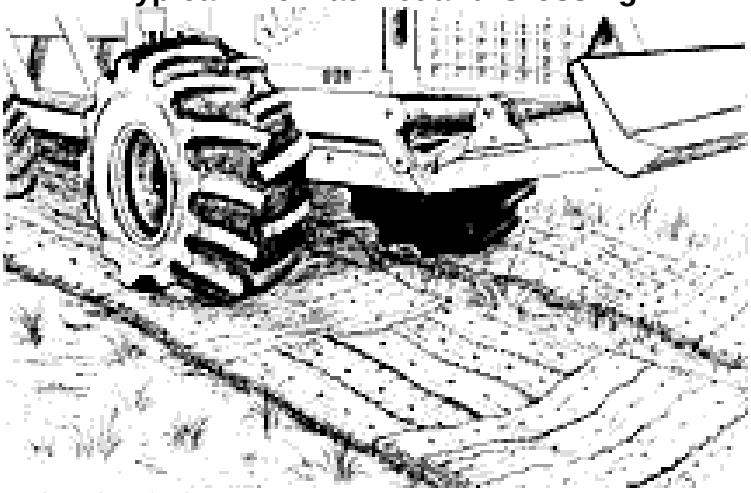
WETLAND CROSSING

Wetland crossings must be avoided wherever possible. Where 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.

All wetland crossings must conform to Chapter 105 permitting requirements.

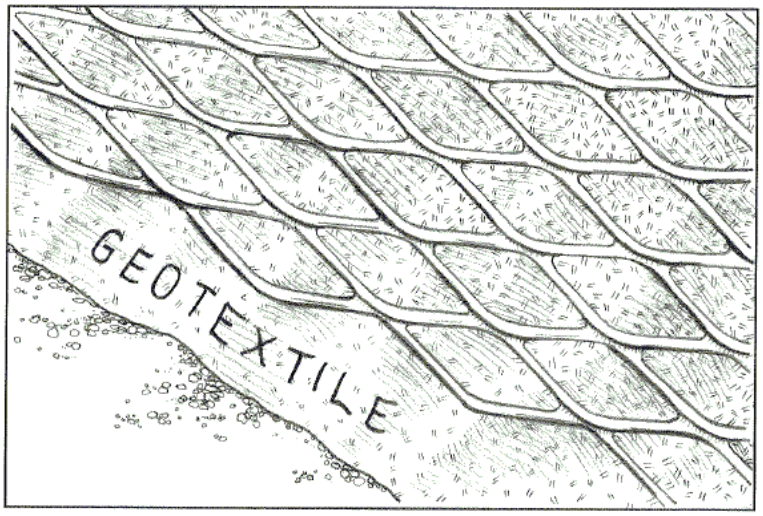
Temporary crossings should be constructed from materials that can be placed with a minimum of disturbance to the soil surface and completely removed when no longer needed. Some examples of stabilized crossing methods are illustrated in Figures 3.5 through 3.7 below.

FIGURE 3.5
Typical Tire Mat Wetland Crossing



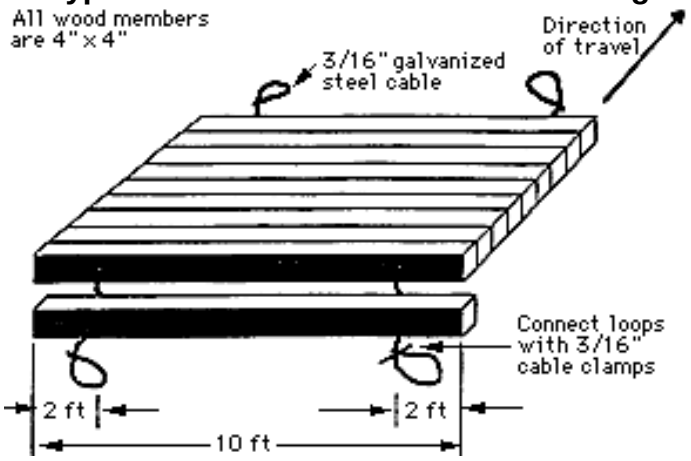
University of Minnesota FS 07013

FIGURE 3.6
Typical Expanded Metal Grating Wetland Crossing



University of Minnesota FS 07011

FIGURE 3.7
Typical Wood Mat for Wetland Crossing



University of Minnesota FS 07009

A geotextile underlayment shall be used under the wood mat.

EARTHWORK WITHIN STREAM CHANNELS

NOTE: Wherever the structures described in this section are installed, the appropriate Chapter 105 permits must be obtained from the Department. Designs must adhere to the conditions of those permits.

Whenever possible, work should be scheduled for low flow seasons. Base flows for minor stream channels are to be diverted past the work area. For major stream channels (normal flow width > 10 feet) base flow shall be diverted wherever possible. All such bypasses must be completed and stabilized prior to diverting flow. Where diversion is not possible or where it can be shown that the potential environmental damage would be greater with diverted flow, this requirement may be waived. In either case, the duration of the disturbance must be minimized. All disturbed areas within the channel must be stabilized prior to returning base flow to the portion of the channel affected by the earthwork (Chapter 15).

Any in-channel excavations should be done from top of bank wherever possible unless this would require removal of mature trees to access the channel. Where it is not possible to work from top of bank, a temporary crossing or causeway (Figure 3.8) may be used to provide a working pad for any equipment within the channel. Upon completion, the crossing or causeway must be removed and all channel entrances restored, as much as possible, to pre-construction configurations, and stabilized. If it can be shown that there would be less disturbance to the channel by not using work pads (e.g. certain stream restorations), work within a live stream channel may be approved by the Department on a case-by-case basis.

Except for pipeline & utility line projects (Chapter 13), all excavated channel materials that subsequently will be used as backfill are to be placed in a temporary stockpile located outside the channel floodway. A sediment barrier must be installed between the storage pile and the stream channel.

All excavated materials that will not be used on site shall be immediately removed to a disposal site having an approved E&S plan.

Any water pumped from excavated areas must be filtered prior to discharging into surface waters.

Suitable protection must be provided for the stream channel from any disturbed areas that have not yet achieved stabilization.

COMPOST FILTER SOCK - **Sediment Removal Efficiency: HIGH. This device is an ABACT for HQ and EV watersheds.** Compost filter socks are a type of contained compost filter berm. They consist of a biodegradable or photodegradable mesh tube filled, typically using a pneumatic blower, with a coarse compost filter media that meets certain performance criteria (e.g. hydraulic flow through rate, total solids removal efficiency, total suspended solids removal efficiency, turbidity reduction, nutrient removal efficiency, metals removal efficiency, and motor oil removal efficiency).

York County Conservation District

Compost filter socks are flexible and can be filled in place or in some cases filled and moved into position. They are especially useful on steep slopes. Heavy vegetation should be removed prior to installing the sock. Compost socks can also be used on rocky slopes if sufficient preparation is made to ensure good contact of the sock with the underlying soil along its entire length. They may also be used on pavement as a perimeter control. Socks used in this manner range in diameter from 8" to 32". **Note: The flat dimension of the sock should be at least 1.5 times the nominal diameter. Also, some settlement of the tube typically occurs after installation.** The nominal diameter of the tube is the dimension to be used for design purposes (i.e. Figure 4.2). Socks with diameters less than 12" should only be used for residential housing lots of ¼ acre or less that are tributary to a sediment basin or sediment trap.

As with other sediment barriers, filter socks should be placed parallel to contour with both ends of the sock extended upslope at a 45 degree angle to the rest of the sock to prevent end-arounds (Figure 4.1). Socks placed on earthen slopes should be anchored with stakes driven through the center of the sock (Standard Construction Detail #4-1) or immediately downslope of the sock at intervals recommended by the manufacturer. Where socks are placed on paved surfaces, concrete blocks should be used immediately downslope of the socks (at the same intervals recommended for the stakes) to help hold the sock in place.

The maximum slope length above a compost filter sock should not exceed those shown in Figure 4.2. **NOTE: Slope length is not addressed by use of multiple rows of compost socks.** The anticipated functional life of a biodegradable filter sock should be 6 months; for photodegradable socks it is 1 year. Some other types may last longer. Projects with disturbances anticipated to last longer than the functional life of a sock should plan to replace the socks periodically or use another type of BMP.

Upon stabilization of the tributary area, the filter sock may be left in place and vegetated or removed. In the latter case, the mesh is typically cut open and the mulch spread as a soil supplement. In either case, the stakes should be removed.

Filter socks using other fillers may be approved on a case-by-case basis if sufficient supporting information (including manufacturer's specs and independent test data) is provided. However, they might not qualify as ABACTs. Wherever compost socks are used, Table 4.1 should be placed on a detail sheet.

TABLE 4.1
Compost 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.					

Filtrexx & JMD

Compost should be a well decomposed, weed-free organic matter derived from agriculture, food, stump grindings, and yard or wood/bark organic matter sources. The compost should be aerobically composted. The compost should possess no objectionable odors and should be reasonably free (<1%

by dry weight) of man-made foreign matter. The compost product should not resemble the raw material from which it was derived. Wood and bark chips, ground construction debris or reprocessed wood products are not acceptable as the organic component of the mix.

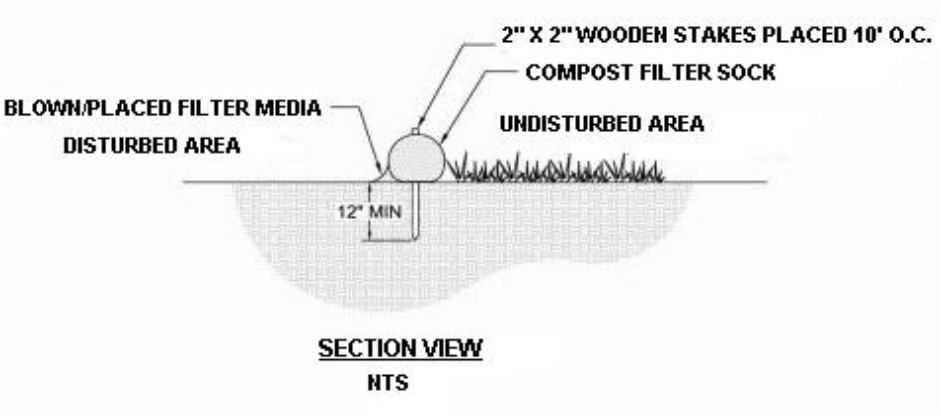
The physical parameters of the compost should comply with the standards in Table 4.2. The standards contained in the PennDOT Publication 408 are an acceptable alternative.

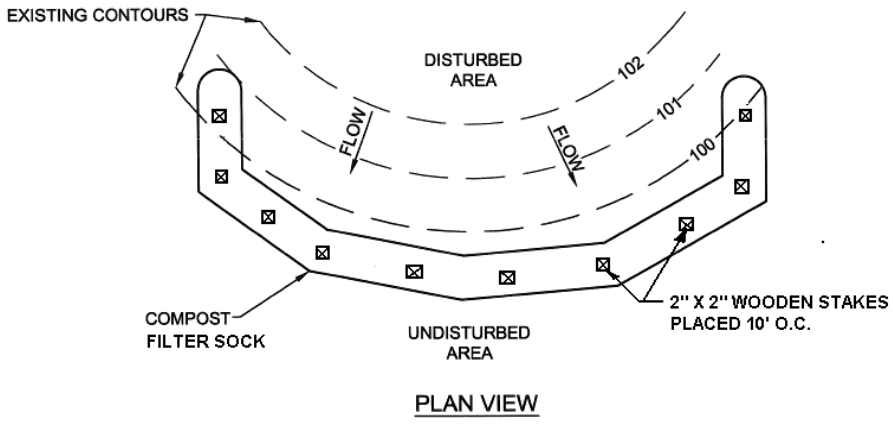
TABLE 4.2
Compost Standards

Organic Matter Content	80% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5 - 8.0
Moisture Content	35% - 55%
Particle Size	98% pass through 1” screen
Soluble Salt Concentration	5.0 dS/m (mmhos/cm) Maximum

Filtrexx

STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK





Filtrexx **NTS**

Sock fabric shall meet standards of Table 4.1. Compost shall meet the standards of Table 4.2.

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 (Figure 4.1). Maximum slope length above any sock shall not exceed that shown on Figure 4.2. Stakes may be installed immediately downslope of the sock if so specified by the manufacturer.

Traffic shall not be permitted to cross filter socks.

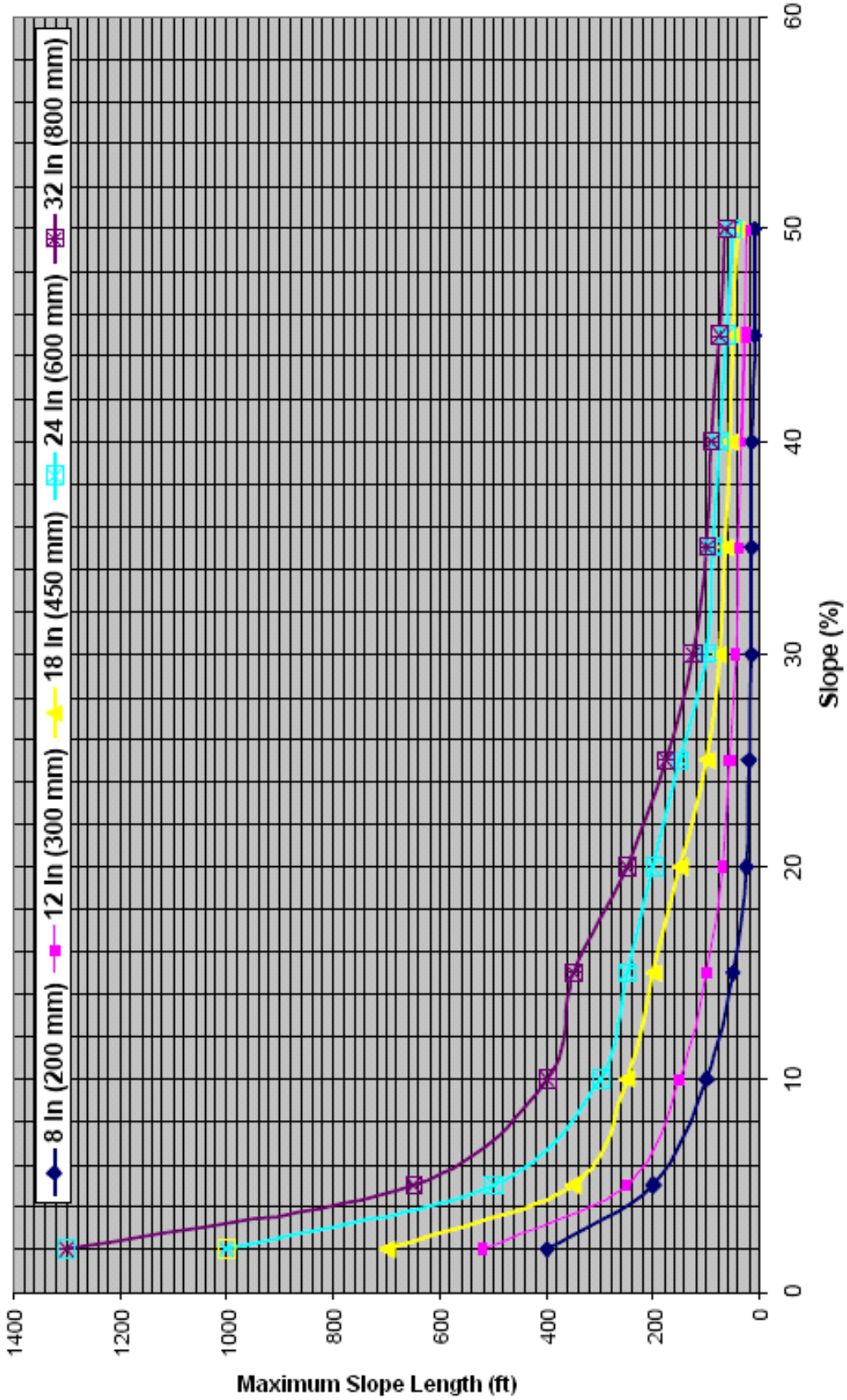
Accumulated sediment shall be removed when it reaches half the aboveground height of the sock and disposed in the manner described elsewhere in the plan.

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.

Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after 1 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.

FIGURE 4.2
MAXIMUM PERMISSIBLE SLOPE LENGTH ABOVE COMPOST FILTER SOCKS



NOTE: 8" diameter socks should only be used to control small (≤ ¼ acre) disturbed areas on individual house lots).

Adapted from Filtrexx

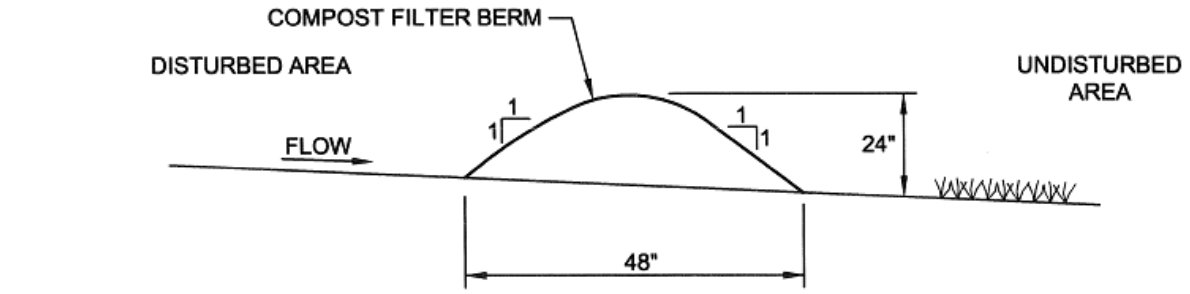
COMPOST FILTER BERM - **Sediment Removal Efficiency: MODERATE. This device is an ABACT for HQ but not EV watersheds unless used in conjunction with another BMP (e.g. silt fence or vegetative filter strip).** Although compost is typically viewed as a means of stabilization, it may also be used to construct a filter berm for sediment control. Composts denser in nature and containing particles that range in size produce the most stable berms. Do not use compost filter berms in channels or other concentrated flows. As with other types of sediment barriers, compost filter berms should be located where runoff is anticipated to be in sheet flow. Concentrated or channelized flows should be directed to sediment basins or traps, not filter berms. The maximum slope length above a compost filter berm should be that shown in Table 4.4 for the standard silt fence (18" high fence).

Carolina Compost

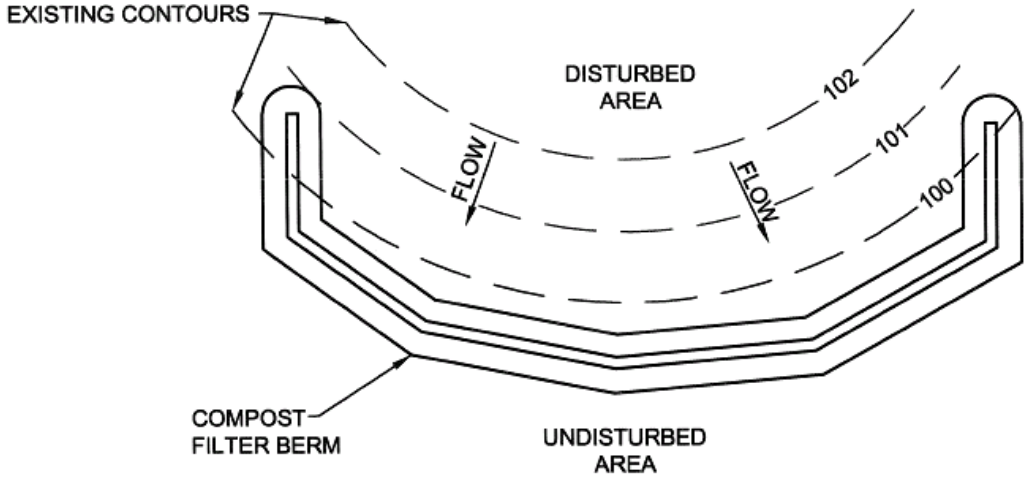
Compost filter berms may be vegetated or unvegetated. Vegetated filter berms are usually left in place and provide long-term filtration of stormwater as a post-construction BMP. Unvegetated berms are typically broken down after stabilization of the tributary drainage area is achieved. The compost is spread around the site as a soil amendment or mulch.

Compost filter berms may not be used to construct sediment traps or other impoundments.

STANDARD CONSTRUCTION DETAIL #4-2
Compost Filter Berm



SECTION VIEW



PLAN VIEW

Adapted from PennDOT

Compost shall meet the standards in Table 4.2.

Compost filter berms 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 (see Figure 4.1).

The maximum slope length above a compost filter berm shall not exceed that shown in Table 4.4 for the standard silt fence (18" high fence).

Tall grass shall be cut prior to installation to minimize potential for undercutting. Berm shall be netted or otherwise anchored after installation.

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

Any section compost filter berm which has been undermined or topped shall be immediately replaced. Concentrated flows shall not be directed toward any compost filter berm.

Installation - Compost filter berms may be installed by hand, by using construction equipment (e.g. backhoe, wheel loader, or skid loader), or with specialized equipment such as a pneumatic blower or side discharge spreader with a berm attachment. The compost should be uniformly applied to the soil surface, compacted, and shaped into a rough trapezoid. Filter berms may be installed on frozen or rocky ground. Heavy vegetation should be cut down or removed to ensure proper contact with the underlying soil surface.

Vegetated berms may be seeded by hand, by incorporating seed into the compost prior to installation — a typical procedure when installed by pneumatic blower or mixing truck with side discharge — or by hydraulic seeding after berm construction.

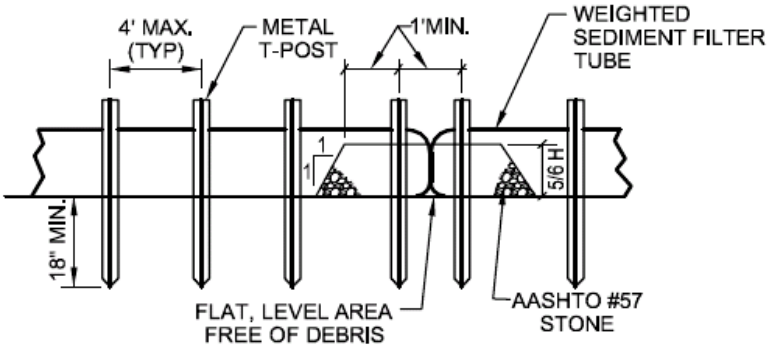
WEIGHTED SEDIMENT FILTER TUBE - **Sediment Removal Efficiency: MODERATE. This device is an ABACT for HQ but not EV watersheds.** Weighted sediment filter tubes are tube-shaped devices filled with non-biodegradable filter materials for longevity and reuse. They may be used to control runoff from small disturbed areas where silt fence would normally be used as well as certain locations where a silt fence is not typically effective (e.g. above headwalls and endwalls). In general, the maximum slope length for standard silt fence may be used for 12" diameter tubes and slope lengths for reinforced silt fence (Table 4.4 or Figure 4.3) may be used for 18" to 20" diameter tubes. However, longer slope lengths may be considered by the Department on a case-by-case basis. The tubes can also be used instead of rock filters or as filters for storm sewer inlets located in sump areas. Standard Construction Details # 4-3 through # 4-5 may be used for weighted sediment filter tubes installation and maintenance. When the area tributary to a tube has been stabilized, an undamaged tube may be removed and used at another location.

ACF

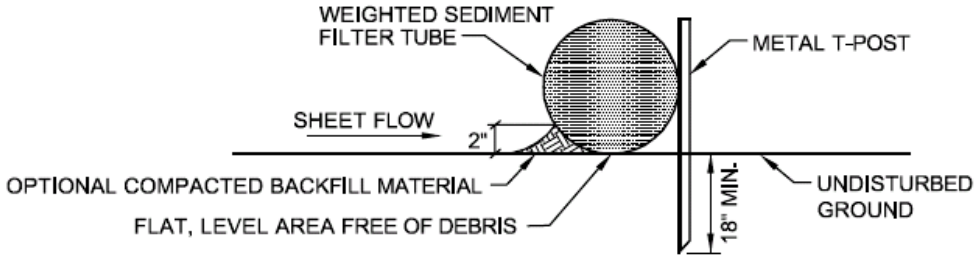
Weighted sediment filter tubes may be placed in areas of concentrated flow in lieu of rock filters if installed according to manufacturer's recommendations or Standard Construction Detail # 4-4. Weighted sediment filter tubes may not be used in lieu of protective liners in constructed channels.

Where flow path widths exceed the length of one filter tube, Standard Construction Detail # 4-5 should be used.

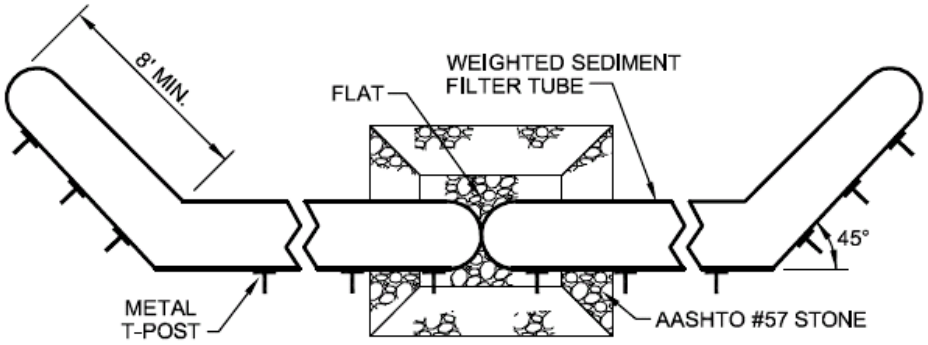
STANDARD CONSTRUCTION DETAIL # 4-3
Weighted Sediment Filter Tube Installation



FRONT VIEW



ELEVATION VIEW



PLAN VIEW

Adapted from PA Turnpike Commission

Sediment tube placement area shall be prepared so that it is free of all debris, including rocks, sticks, roots, etc. A 2" layer of AASHTO #57 stone shall be placed where the logs come together. Ends of tubes may be overlapped according to manufacturer's specifications instead of the AASHTO #57 stone.

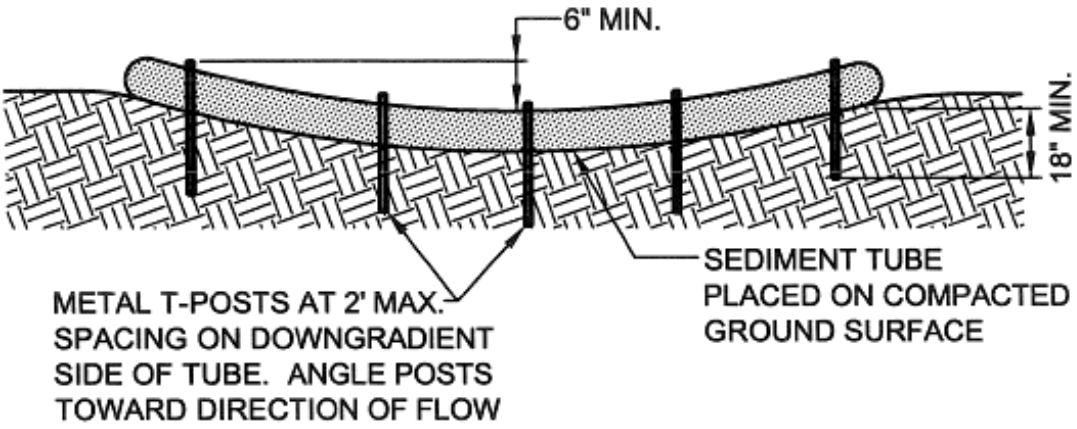
Sediment tubes shall be placed at existing level grade. Ends shall be extended upslope at 45^{O} to the main filter log alignment for a minimum of 8 feet (Figure 4.1).

Sediment tubes shall be inspected weekly and after each runoff event.

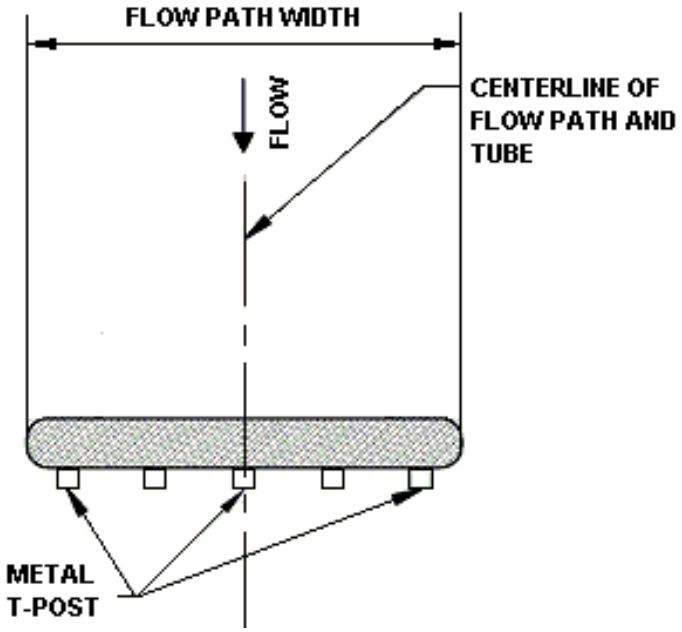
Sediment deposits shall be cleaned from the log when it reaches half the height of the tube.

Damaged tubes shall be replaced within 24 hours of inspection. A supply of tubes shall be maintained on site for this purpose.

STANDARD CONSTRUCTION DETAIL # 4-4
Weighted Sediment Filter Tube Installation in a Concentrated Flow Area



FRONT VIEW



Adapted from ACF

PLAN VIEW

NOTE: This detail applicable to flow paths with widths ≤ one tube length.

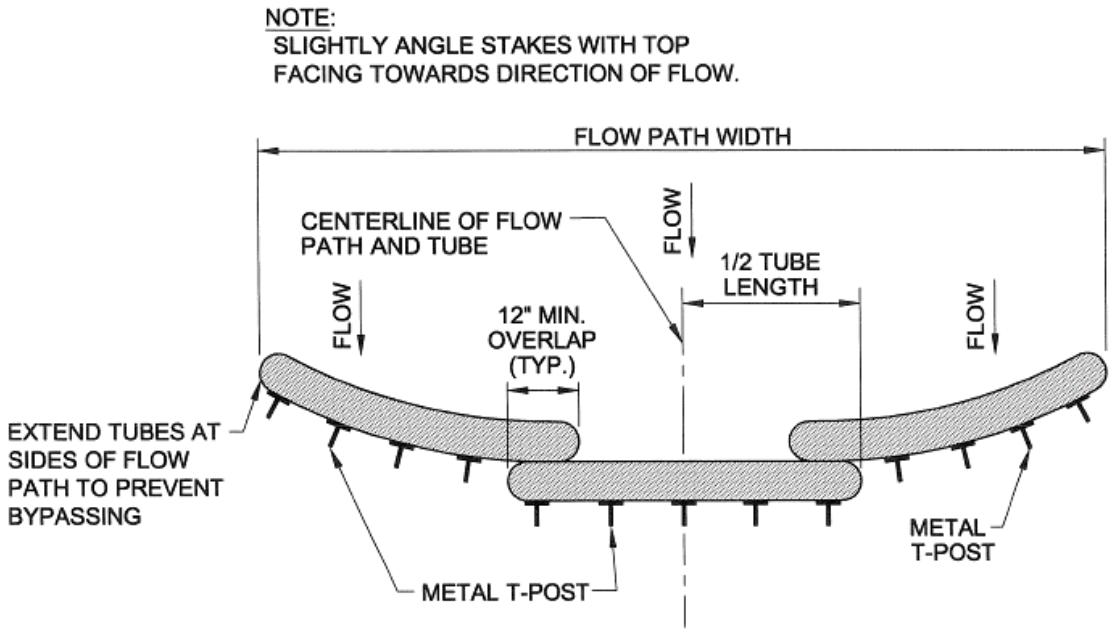
Metal T-posts shall be installed at the center and at each end of the tube. Additional T-posts shall be installed as needed to meet the maximum 2-foot spacing.

Sediment tubes shall be inspected weekly and after each runoff event.

Accumulated sediment shall be removed when it reaches half the height of the tube and disposed as directed elsewhere in the E&S plan.

Damaged tubes shall be repaired or replaced within 24 hours of inspection. A supply of tubes shall be kept on site for this purpose.

STANDARD CONSTRUCTION DETAIL # 4-5
Weighted Sediment Filter Tube Installation Across a Wide Flow Path



PLAN VIEW

Adapted from ACF

Metal T-posts shall be installed at the center and at each end of the tube. Additional T-posts shall be installed as needed to meet the maximum 2-foot spacing.

Sediment tubes shall be inspected weekly and after each runoff event.

Accumulated sediment shall be removed when it reaches half the height of the tube and disposed as directed elsewhere in the E&S plan.

Damaged tubes shall be repaired or replaced within 24 hours of inspection. A supply of tubes shall be kept on site for this purpose.

WOOD CHIP FILTER BERM - **Sediment Removal Efficiency: MODERATE. This device is an ABACT for HQ but not for EV watersheds.** Wood chip berms may be used on wooded or rocky slopes where staking and trenching of other BMPs is very difficult or impossible. Since they do not require trenching, wood chip filter berms disturb less soil during installation than silt fence or straw bale barriers. However, large obstructions such as tree limbs, boulders, etc. should be removed prior to placement of the wood chips. Once the tributary drainage area is permanently stabilized, the wood chip filter berm may either be leveled or left in place.

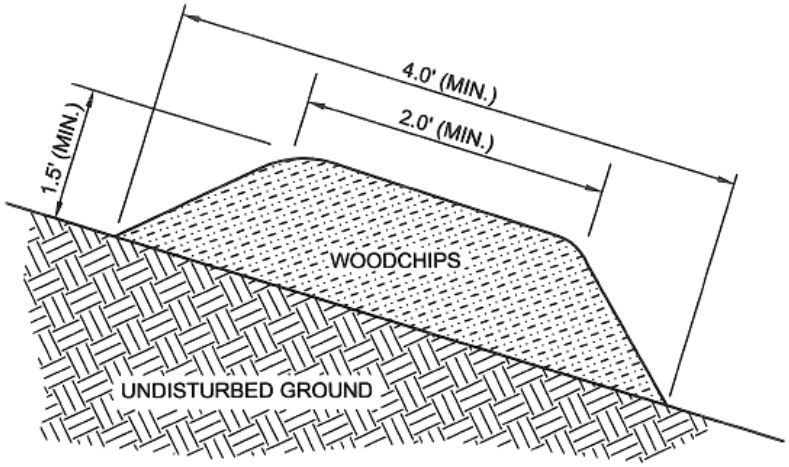
PA DEP

Wood chip filter berms should not be placed in areas of concentrated flow. They should be aligned parallel to existing contours and located below all disturbed areas. It is recommended that this BMP be used in conjunction with a vegetated filter strip as described later in this chapter. They are not recommended for use within 50 feet of a receiving surface water.

The maximum slope length above a wood chip filter berm should not exceed those in Table 4.5.

Wood chip filter berms should be constructed as shown in Standard Construction Detail # 4-12.

STANDARD CONSTRUCTION DETAIL # 4-12
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 (Figure 4.1). 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.

VEGETATIVE FILTER STRIP - **Sediment Removal Efficiency: MODERATE when used in series with another sediment removal BMP that does not result in a concentrated discharge onto the vegetative filter strip. This device, when used in this way, is an ABACT for HQ but not for EV watersheds.** A vegetative filter strip consists of a well-vegetated, grassy area below a disturbed area that can be used to remove sediment from runoff prior to its reaching surface waters.

Lebanon County Conservation District

To be effective, runoff should be in the form of sheet flow, and the vegetative cover should be established prior to the disturbance. Due to the time required to establish vegetation and the need to control runoff from the areas disturbed while constructing filter strips, constructed vegetative filter strips are not recommended. The suitability of natural vegetative filter strips should be either field verified by the Department or conservation district or documented by photo(s) submitted by the applicant prior to approval. 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 owner of the property along with an agreement to leave the filter strip area undisturbed for as long as it is needed. Where control of the filter strip cannot be assured throughout its intended use, a substitute BMP that will be installed should the filter strip no longer be available should be specified in the E&S Plan.

Vegetative filter strips may be used to remove sediment from project runoff that is directed to the strip as sheet flow. The minimum filter strip width should be determined from Table 4.6.

Vegetation should be an existing, well-established, perennial grass. Wooded and brushy areas are not acceptable for purposes of sediment removal.

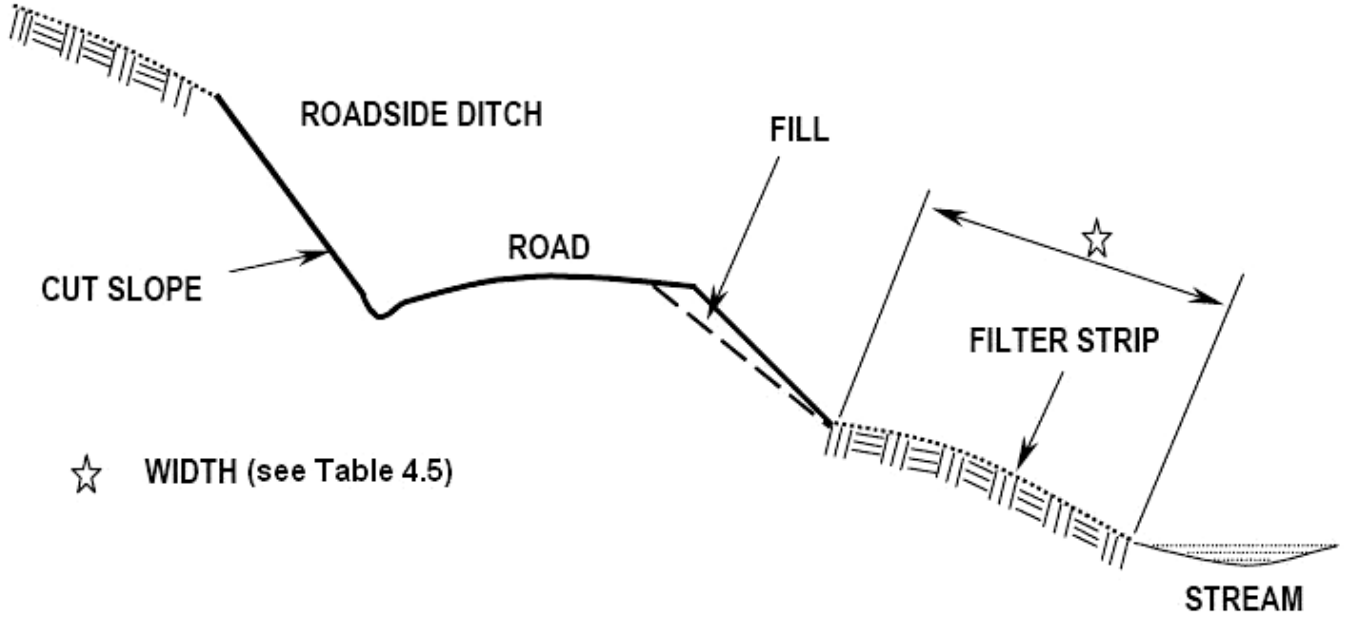
The total width of the filter strip should be at least half that of the disturbed area tributary to it. Minimum width of the filter strip should be:

W_{min} = 2S + 25 ft (50 ft min. or ½ that of the disturbed area tributary to it, whichever is longer)

Where: W_{min} = Minimum filter width in feet
S = Average slope (in percent) of the filter strip

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. Specifications, typical details, locations, etc. should be included.

FIGURE 4.5
Vegetative Filter Strip



PA DEP

TABLE 4.6
Minimum Filter Strip Widths for Sediment Removal

Land Slope (%)*	Minimum Filter Strip Width (ft.)
≤ 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