

**SMALL PROJECT/ LOW-HAZARD
EROSION CONTROL GUIDE**



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INTRODUCTION

Noticing low levels of sediment in the streams and rivers of Pennsylvania during times of high flows and velocities is a natural event. However, accelerated erosion and sedimentation pollution, resulting from human activities, smothers and destroys aquatic life in streams, causes losses of valuable topsoil, and impairs water quality. Sediment pollution is the single largest pollutant, by volume, to the streams and waterways of PA. Sediment pollution can be defined as any man-made disturbance that leads to increases in sediment (clay, silts, sands, and other “mud”) levels in streams, wetlands, and watercourses.

In an attempt to control accelerated erosion and sedimentation, the Department of Environmental Protection adopted Chapter 102, Erosion and Sedimentation Control Rules and Regulations, in accordance with the PA Clean Streams Law.

Under current Chapter 102 regulations, anyone disturbing (i.e. digging, grubbing, grading, or in any way disturbing the topsoil) 5000 square feet or more of ground is required to develop *and implement* an Erosion and Sediment Control Plan (E&S plan). This plan must be submitted to the county Conservation District if required by a municipality, if requested by the District, or if the total disturbance is 1 acre or more for the life of the project. **REMEMBER:** under the Clean Streams Law and the Chapter 102 regulations both the landowner *and* contractors may be held responsible when sediment-laden water is running or discharged from a construction site.

Purpose of This Guide

This document was designed to assist landowners in developing and implementing an E&S plan for small-scale, low-hazard projects. Use of this guide may be limited to:

- Projects where disturbance is less than 1 acre
- Projects where there are no slopes on or near the site exceeding 10%
- Projects with no associated impacts to wetlands, streams, or major waterways

Considerations in Plan Development

Practice Proper Site Grading-Hold Grading to a Minimum

The risk of severe erosion increases in relationship to the amount of site disturbance. Excessive cutting and filling may alter the ground water system, open seeps, or expose unstable soils. Improperly compacted fills may also be extremely erosive. Cutting, filling, and road grades over 10% require more intensive stabilization and often result in more long-term stabilization problems. All of the topsoil from areas where cuts and fills have been made should be stockpiled and redistributed uniformly after grading. This is the key to revegetating the site.

Save Existing Vegetation, Especially Trees

Vegetative cover is the best and most economical protection against soil erosion. Vegetation and trees should be roped off during construction to prevent damage from equipment (trees should be roped off under the crowns so that roots systems are not destroyed).

Minimize the Area and Time of Exposure

Any disturbed area should be stabilized as soon as earth disturbance is completed (usually this means the area should be seeded and mulched). Minimize the amount of disturbed ground at any given time. Sequence the construction such that only the areas to be immediately worked on are disturbed. Stabilization of the site should not wait until the entire project is completed. Applying a stone base immediately after the driveway is cut in is an example.

Protect Any Watercourses or Wetlands

Install temporary controls, such as compost filter sock, in order to prevent sediment pollution to water courses and drainages. Remember the basic idea: keep muddy water from getting into the streams.

Maintenance

Plan to inspect and repair all E&S controls (Best Management Practices, or BMPs) after every significant rain event, and at the end of each week, at a minimum. E&S controls/ BMPs are not totally maintenance free: silt fences fall; re-vegetated areas sometimes wash out before vegetation can get established.

What Should be Included in an Erosion and Sedimentation Control Plan?

1. Complete Plan Checklist (provided as Attachment A).
2. Existing topography of the site (slope directions and estimated grades).
3. Location of any water bodies (streams, ditches, springs, etc.).
4. Brief description of the proposed project.
5. Types of E&S controls to be used and their locations on the site.

Suggested Construction Sequence

1. Cut and install a stone-based driveway or access area for equipment.
2. Install all temporary E&S controls/ BMPs (such as compost filter sock, rock construction entrance, etc.).
3. Strip topsoil from areas where work will begin, stockpile for final stabilization of site.
4. Construct buildings.
5. Finish grading and permanently stabilize (seed, mulch, stone, etc.) the entire site.
6. Remove all temporary controls after the site is completely stabilized and vegetated.

Seeding and Mulching Recommendations

Temporary Seeding Recommendations/ Mixtures

If temporary seeding is necessary, follow the chart below. Then, when final stabilization is to be completed, apply the remainder of the recommendations below for lime and fertilizer prior to final seeding and mulching. Annual Ryegrass is a quick germinating species of grass that can be seeded at almost any time. If you plan to leave your project or part of your project area inactive before final stabilization/permanent cover is achieved, a temporary seeding should be applied immediately.

| | | |
|-----------------|-------------------|------------------------------|
| Lime | 1 ton per acre | 50 lbs. per 1000 square feet |
| Fertilizer | 150 lbs. per acre | 5 lbs. per 1000 square feet |
| Annual Ryegrass | 40 lbs. per acre | 1 lbs. per 1000 square feet |

Permanent Seeding Mixtures

Establishing a permanent vegetative cover is the final step to effective erosion and sediment pollution control. It is recommended that the Penn State Agronomy Guide be consulted (available from PSU Cooperative Extension or the County Conservation District). All mixtures below are for 100% PLS (Pure Live Seed). Depending on your percent PLS, you may have to adjust recommendations accordingly. General recommendations are as follows:

Lawn and Mowed Areas

| | | |
|-------------------------|------------------|-----------------------------|
| A. Kentucky Bluegrass | 30 lbs. per acre | 12 oz. per 1000 square feet |
| Redtop | 3 lbs. per acre | 2 oz. per 1000 square feet |
| Perennial Ryegrass | 20 lbs. per acre | 8 oz. per 1000 square feet |
| B. Pennlawn-Fine Fescue | 40 lbs. per acre | 16 oz. per 1000 square feet |
| Redtop | 3 lbs. per acre | 2 oz. per 1000 square feet |
| Perennial Ryegrass | 20 lbs. per acre | 8 oz. per 1000 square feet |

Slopes and Un-Mowed Areas

| | | |
|--------------------|------------------|-----------------------------|
| Crownvetch | 25 lbs. per acre | 10 oz. per 1000 square feet |
| Perennial Ryegrass | 25 lbs. per acre | 10 oz. per 1000 square feet |

Note: Crownvetch is a legume and requires an inoculant. Contact your seed supplier for more specific information. Although providing a thick ground cover, crownvetch is also an extremely aggressive invasive species, offering little wildlife benefit. Use with caution.

Timing of Permanent Seeding

For best results, grass and legume seedings should be completed in the spring; however, with proper establishment techniques, disturbed sites can be seeded almost anytime from spring to fall. General rules are: legume seedings need 10-12 growing weeks prior to hard frost, and grasses generally require 4-6 weeks of growth prior to hard frost.

Lime

Adding agricultural grade limestone to a site is often the key to establishing vegetation. Soil tests from a reputable source are recommended, but in the case where test results are not available, use the following guide.

Fertilizer – Commercial Type 10-20-20

The need for fertilizer cannot be underestimated. Soil tests are again recommended, but the guide below can be used in their absence.

Mulch (Hay or Straw)

All areas that are seeded, for temporary or permanent stabilization, should be mulched. Mulch is a loose layer of hay or straw (or sometimes bark mulch) 1” deep. Mulch reduces erosion of soils and aids in seedling germination.

| | | |
|-----------------------------|-------------------|-------------------------------|
| <i>Lime</i> | 4 tons per acre | 190 lbs. per 1000 square feet |
| <i>Fertilizer</i> | 930 lbs. per acre | 25 lbs. per 1000 square feet |
| <i>Mulch (hay or straw)</i> | 3 tons per acre | 140 lbs. per 1000 square feet |

Above Site Drainage

It is important to consider the aspect of stormwater and off-site runoff as it could affect your site. Areas up-slope of your construction site may allow large amounts of water to run over your site. This water should be diverted around or through your site in such a way that clean, sediment-free water does not pick up sediment from the construction site. The basic concept is to keep the clean water clean, and treat the dirty (sediment-laden) water prior to allowing it to run off your site. Downspouts, swale outlets, parking lots, and other items that collect and concentrate water have the potential to cause soil erosion both on your site and on adjoining properties. Take care to plan for stormwater related issues during construction.

E&S Detail Sheets

The next section is devoted strictly to providing detailed installation instruction for E&S measures, and general rules of thumb as to when each practice should be used. This guide is designed so landowners can plan for and install erosion control practices to minimize accelerated erosion, and meet the Chapter 102 regulations and Clean Streams Law of Pennsylvania. The details that follow were developed from the Department of Environmental Protection Erosion and Sedimentation Pollution Control Manual, March 2000. These are not the only BMPs that can be used, but are ones that have been previously reviewed, approved, and recommended.

This guide is not intended to be a substitute for E&S plans developed for complex, several acre, or high-hazard sites. Professional engineering should be considered for sites requiring permanent E&S measures or on sites where the hazards of sediment pollution to streams and wetlands are high. The local Conservation District will gladly answer your questions regarding this E&S guide, as well as determining if a more detailed E&S plan would be necessary.

A copy of this plan should be kept on site during construction. Your contractor should have a copy of this plan. At your request the Conservation District will review your E&S plan for the associated fee(s) outlined in the “MCCD Application for Review” document on the District website.

Complete Plan Checklist

A Complete Plan Checklist is available for your use in developing an E&S plan. Depending on the site, some of the items on the checklist may not apply. The items indicated in this low-hazard E&S guide are those items typically applicable for such sites according to the Chapter 102 regulations.

TABLE 11.3
Plant Tolerances of Soil Limitation Factors

| Species | Growth Habit ¹ | Tolerates | | | | Minimum Seed Specifications ³ | | | | |
|----------------------------|---------------------------|-----------|----------|---------------|-----------------------------------|--|----------------|---------------|----------------|-------------------|
| | | Wet Soil | Dry Site | Low Fertility | Acid Soil (pH 5-5.5) ² | Purity (%) | Ready Germ (%) | Hard Seed (%) | Total Germ (%) | Seeds/lb (1,000s) |
| Warm-Season Grasses | | | | | | | | | | |
| Deertongue | bunch | yes | yes | yes | yes | 95 | 75 | | 75 | 250 |
| Weeping lovegrass | bunch | no | yes | yes | yes | 97 | 75 | | 75 | 1,500 |
| Switchgrass ⁴ | bunch | yes | yes | yes | yes | (60 PLS) | | | 390 | |
| Big bluestem | bunch | no | yes | yes | yes | (60 PLS) | | | 150 | |
| Cool-Season Grasses | | | | | | | | | | |
| Fine fescues | sod | no | no | yes | no | 95 | 80 | | 80 | 400 |
| Perennial ryegrass | bunch | yes | no | no | no | 95 | 85 | | 85 | 227 |
| Annual ryegrass | bunch | yes | no | yes | no | 95 | 85 | | 85 | 227 |
| Kentucky bluegrass | sod | no | no | no | no | 85 | 75 | | 75 | 2,200 |
| Reed canarygrass | sod | yes | yes | yes | no | 95 | 70 | | 70 | 520 |
| Orchardgrass | bunch | yes | yes | yes | yes | 95 | 80 | | 80 | 654 |
| Timothy | bunch | yes | no | yes | yes | 95 | 80 | | 80 | 1,230 |
| Smooth brome | sod | no | yes | yes | no | 95 | 80 | | 80 | 136 |
| Legumes⁵ | | | | | | | | | | |
| Flatpea | sod | no | no | yes | yes | 98 | 55 | 20 | 75 | 10 |
| Serecia lespedeza | bunch | no | yes | yes | yes | 98 | 60 | 20 | 80 | 335 |
| Cereals | | | | | | | | | | |
| Winter wheat | bunch | no | no | no | no | 98 | 85 | | 85 | 15 |
| Winter rye | bunch | no | no | yes | yes | 98 | 85 | | 85 | 18 |
| Spring oats | bunch | no | no | no | no | 98 | 85 | | 85 | 13 |
| Sundangrass | bunch | no | yes | no | no | 98 | 85 | | 85 | 55 |
| Japanese millet | bunch | yes | no | yes | yes | 98 | 80 | | 80 | 155 |

- ¹ Growth habit refers to the ability of the species to either form a dense sod by vegetative means (stolons, rhizomes, or roots) or remain in a bunch or single plant form. If seeded heavily enough, even bunch formers can produce a very dense stand. This is sometimes called a sod, but not in the sense of a sod formed by vegetative means.
- ² Once established, plants may grow at a somewhat lower pH, but cover generally is only adequate at pH 6.0 or above.
- ³ *Minimum seed lots are truly minimum, and seed lots to be used for revegetation purposes should equal or exceed these standards.* Thus, deertongue grass should germinate 75% or better. Crownvetch should have at least 40% readily germinable seed and 30% hard seed. Commonly, seed lots are available that equal or exceed minimum specifications. Remember that disturbed sites are adverse for plant establishment. Ready germination refers to seed that germinates during the period of the germination test and that would be expected, if conditions are favorable, to germinate rapidly when planted. The opposite of ready germination is dormant seed, of which hard seed is one type.
- ⁴ Switchgrass seed is sold only on the basis of PLS.
- ⁵ Need specific legume inoculant. Inoculant suitable for garden peas and sweetpeas usually is satisfactory for flatpea.
- ⁶ Birdsfoot trefoil is adapted over the entire state, except in the extreme southeast where crown and root rots may injure stands.

TABLE 11.4
Recommended Seed Mixtures

| Mixture Number | Species | Seeding Rate - Pure Live Seed ¹ | |
|----------------|--------------------------------------|--|---------------|
| | | Most Sites | Adverse Sites |
| 1 ² | Spring oats (spring), or | 64 | 96 |
| | Annual ryegrass (spring or fall), or | 10 | 15 |
| | Winter wheat (fall), or | 90 | 120 |
| | Winter rye (fall) | 56 | 112 |
| 2 | Birdsfoot trefoil, plus | 6 | 10 |
| | Reed canarygrass | 10 | 15 |
| 3 | Deertongue, plus | 15 | 20 |
| | Birdsfoot trefoil | 6 | 10 |
| 4 ³ | Switchgrass, or | 15 | 20 |
| | Big Bluestem, plus | 15 | 20 |
| | Birdsfoot trefoil | 6 | 10 |
| 5 | Orchardgrass, or | 20 | 30 |
| | Smooth brome grass, plus | 25 | 35 |
| | Birdsfoot trefoil | 6 | 10 |

Penn State, "Erosion Control and Conservation Plantings on Noncropland"

1. PLS is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds PLS shown on the seed tag. Thus, if the PLS content of a given seed lot is 35%, divide 12 PLS by 0.35 to obtain 34.3 pounds of seed required to plant one acre. All mixtures in this table are shown in terms of PLS.
2. If high-quality seed is used, for most sites seed spring oats at a rate of 2 bushels per acre, winter wheat at 1.5 bushels per acre, and winter rye at 1 bushel per acre. If germination is below 90%, increase these suggested seeding rates by 0.5 bushel per acre.
3. Do not mow shorter than 9 to 10 inches.

TABLE 11.6
Mulch Application Rates

| Mulch Type | Application Rate (Min.) | | | Notes |
|------------|-------------------------|-------------------|-------------------|--|
| | Per Acre | Per 1,000 sq. ft. | Per 1,000 sq. yd. | |
| Straw | 3 tons | 140 lb. | 1,240 lb. | Either wheat or oat straw, free of weeds, not chopped or finely broken |
| Hay | 3 tons | 140 lb. | 1,240 lb. | Timothy, mixed clover and timothy or other native forage grasses |
| Wood Chips | 4 - 6 tons | 185 - 275 lb. | 1,650 - 2,500 lb. | May prevent germination of grasses and legumes |
| Hydromulch | 1 ton | 47 lb. | 415 | See limitations above |

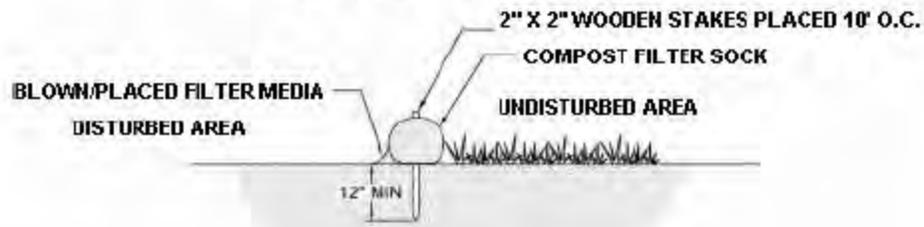
TABLE 11.5
Recommended Seed Mixtures for Stabilizing Disturbed Areas

| Site Condition | Nurse Crop | Seed Mixture (Select one mixture) |
|---|--|---|
| Slopes and Banks (not mowed) Well-drained Variable drainage | 1 plus 1 plus | 3, 5, 8, or 12 ¹ 3 or 7 |
| Slopes and Banks (mowed) Well-drained | 1 plus | 2 or 10 |
| Slopes and Banks (grazed/hay) Well-drained | 1 plus | 2, 3, or 13 |
| Gullies and Eroded Areas | 1 plus | 3, 5, 7, or 12 ¹ |
| Erosion Control Facilities (BMPs) Sod waterways, spillways, frequent water flow areas Drainage ditches Shallow, less than 3 feet deep Deep, not mowed Pond banks, dikes, levees, dams, diversion channels, And occasional water flow areas Mowed areas Non-mowed areas For hay or silage on diversion channels and occasional water flow areas | 1 plus 1 plus 1 plus 1 plus 1 plus 1 plus 1 plus | 2, 3, or 4 2, 3, or 4 5 or 7 2 or 3 5 or 7 3 or 13 |
| Highways ² Non-mowed areas Pure crownvetch ³ Well-drained | 1 plus 1 plus | 5 or 6 5, 7, 8, 9, or 10 |
| Variable drained Poorly drained Areas mowed several times per year | 1 plus 1 plus 1 plus | 3 or 7 3 or 4 2, 3, or 10 |
| Utility Right-of-way Well-drained Variable drained Well-drained areas for grazing/hay | 1 plus 1 plus 1 plus | 5, 8, or 12 ¹ 3 or 7 2, 3, or 13 |
| Effluent Disposal Areas | 1 plus | 3 or 4 |
| Sanitary Landfills | 1 plus | 3, 5, 7, 11 ¹ , or 12 ¹ |
| Surface mines Spoils, mine wastes, fly ash, slag, settling basin Residues and other severely disturbed areas (lime to soil test) Severely disturbed areas for grazing/hay | 1 plus 1 plus | 3, 4, 5, 7, 8, 9, 11 ¹ , or 12 ¹ 3 or 13 |

Penn State, "Erosion Control and Conservation Plantings on Noncropland"

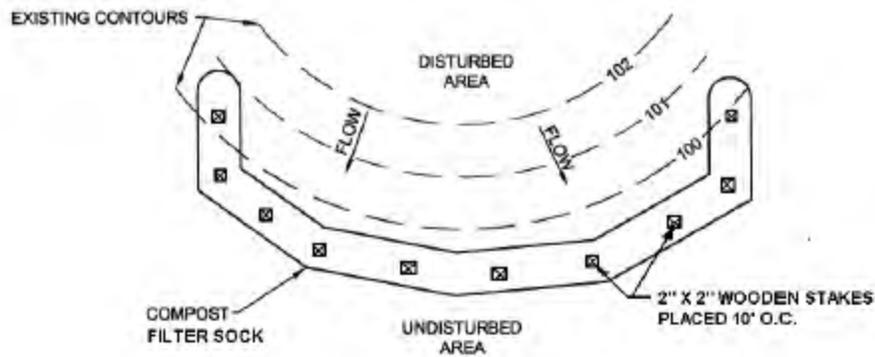
1. For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.
2. Contact the Pennsylvania Department of Transportation district roadside specialist for specific suggestions on treatment techniques and management practices.
3. Seed mixtures containing crown vetch should not be used in areas adjacent to wetlands or stream channels due to the invasive nature of this species.

STANDARD CONSTRUCTION DETAIL #4-1 COMPOST FILTER SOCK



SECTION VIEW

NTS



PLAN VIEW

NTS

Filtrex

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.

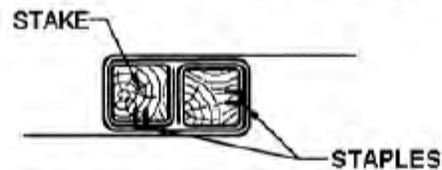
Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.

Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer's recommendations.

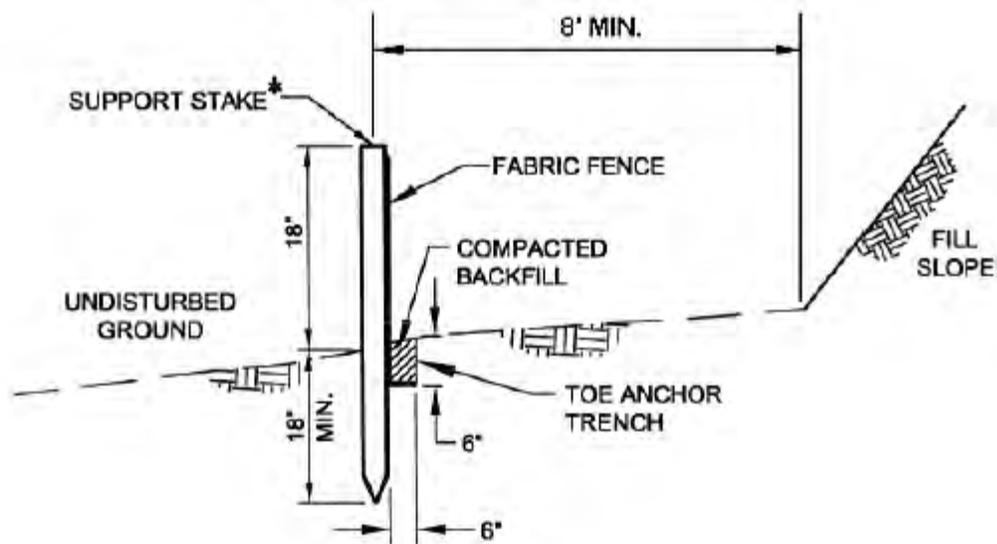
Upon stabilization of the area tributary to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed. In the latter case, the mesh shall be cut open and the mulch spread as a soil supplement.

STANDARD CONSTRUCTION DETAIL # 4-7
Standard Silt Fence (18" High)

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



JOINING FENCE SECTIONS



ELEVATION VIEW

PA DEP

Fabric shall have the minimum properties as shown in Table 4.3.

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

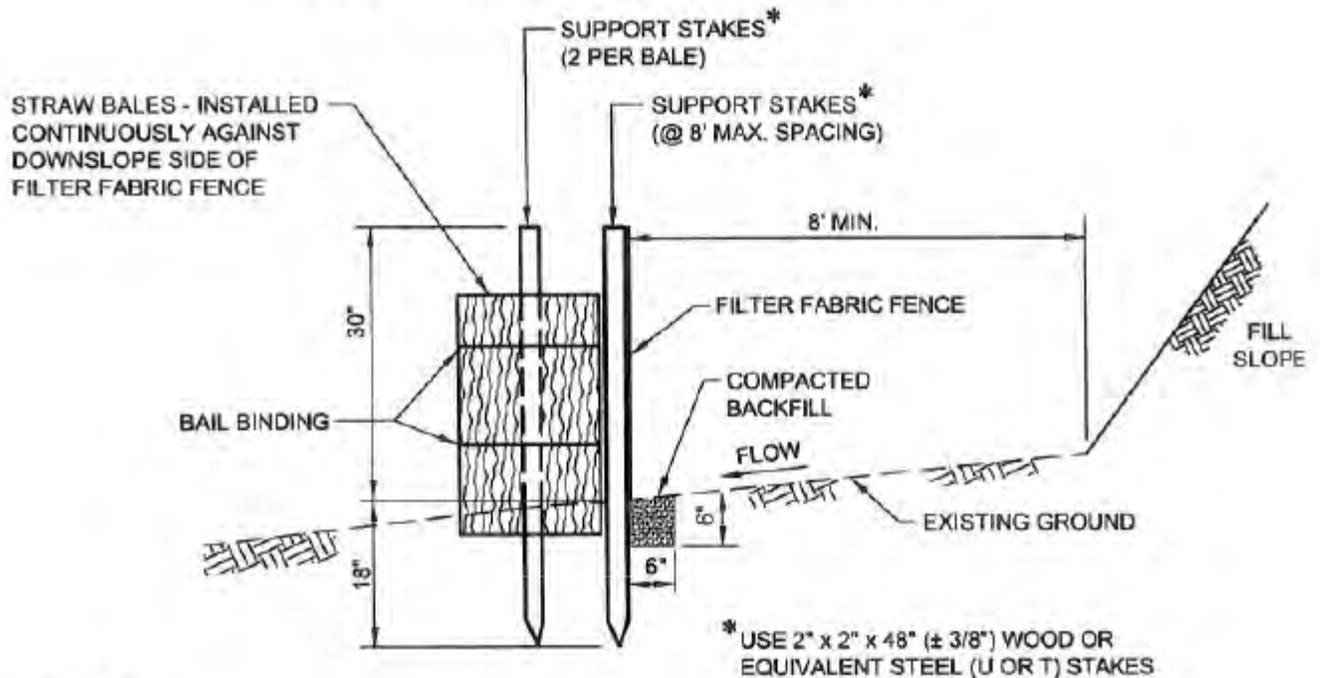
Silt fence shall be placed at level existing grade. Both ends of the fence shall be extended at least 8 feet up slope at 45 degrees to the main fence alignment (see Figure 4.1).

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 (Standard Construction Detail # 4-6).

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

STANDARD CONSTRUCTION DETAIL # 4-9 Silt Fence Reinforced by Staked Straw Bales



PA DEP

Fabric shall have the minimum properties as shown in Table 4.3.

This BMP is not suitable for projects lasting longer than 3 months unless bales are replaced quarterly.

Fabric width shall be 42" minimum. Stakes shall be hardwood or equivalent steel (U or T) stakes.

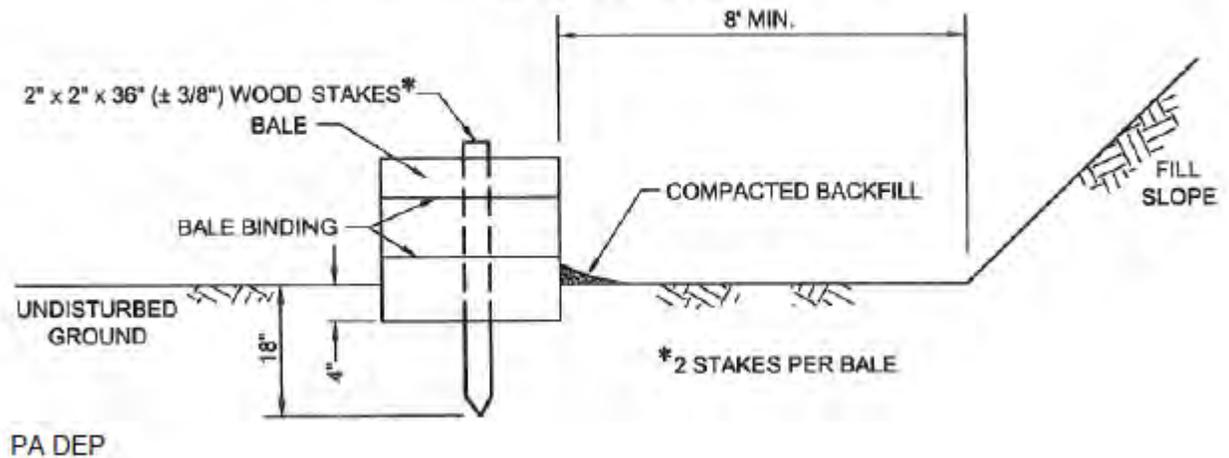
Silt fence shall be installed at existing level grade. Both ends of each fence section shall be extended at least 8 feet upslope at 45 degrees to the main fence alignment (Figure 4.1).

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

Any fence section which has been undermined or topped shall be immediately replaced with a rock filter outlet (Standard Construction Detail # 4-6).

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

STANDARD CONSTRUCTION DETAIL # 4-13 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 (see Figure 4.4). Both ends of the barrier shall be extended at least 8 feet up slope at 45 degrees to the main barrier alignment (see Figure 4.1).

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 (Standard Construction Detail # 4-6).

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

STRAW BALE BARRIER - Sediment Removal Efficiency: LOW. This device is not an ABACT for special protection watersheds. 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 3-month period, they should be considered as short-term control measures.

TABLE 4.5
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 |

PA DEP

Straw bale barriers should not be used in areas where rock prevents full and uniform anchoring of the bales.

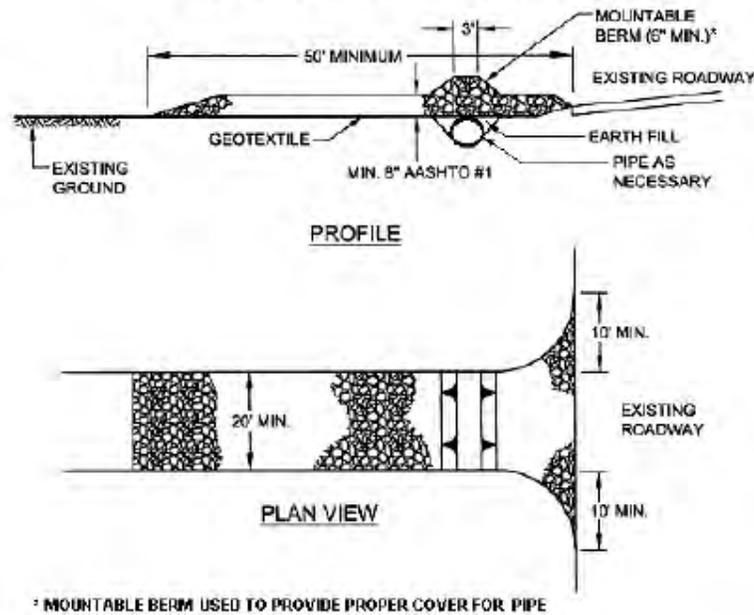
Straw bale barriers should be installed according to Standard Construction Detail # 4-13.

Bales should be installed in an anchoring trench. When improperly placed and installed (such as staking the bales directly to the ground with no soil seal or entrenchment), undercutting and other failures typically occur.

Two support stakes should be driven through each bale to a depth 18" below the ground surface.

The excavated soil should be backfilled and compacted on the upslope side of the bales.

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.

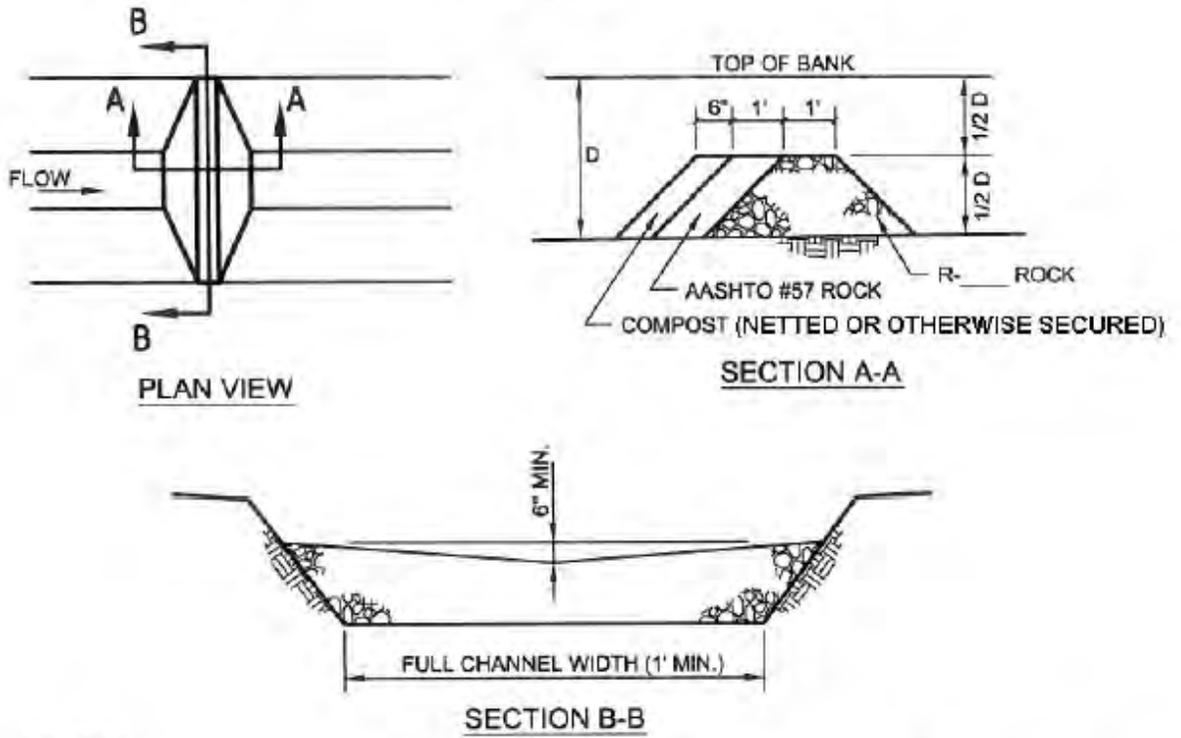
A one foot thick layer of AASHTO #57 (or smaller) stone should be placed on the upstream side of the filter. In special protection watersheds, a 6" layer of compost should be placed and anchored on top of the filter stone. NOTE: Filter fabric and straw bales should not be used in rock filters!

Rock filters should be inspected weekly and after each runoff event.

Clogged filter stone (AASHTO # 57) should be replaced.

Needed repairs should be initiated immediately after the inspection.

**STANDARD CONSTRUCTION DETAIL # 4-14
Rock Filter**



PA DEP

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

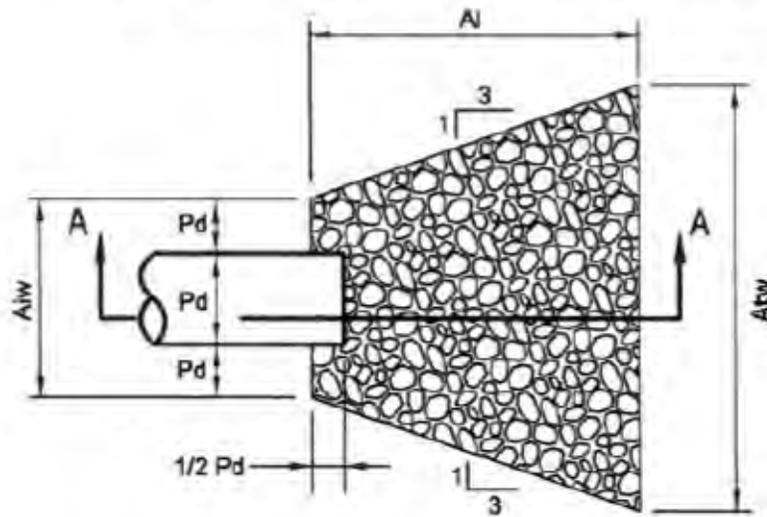
NOTE: This table is intentionally blank and should be filled in by the plan preparer.

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

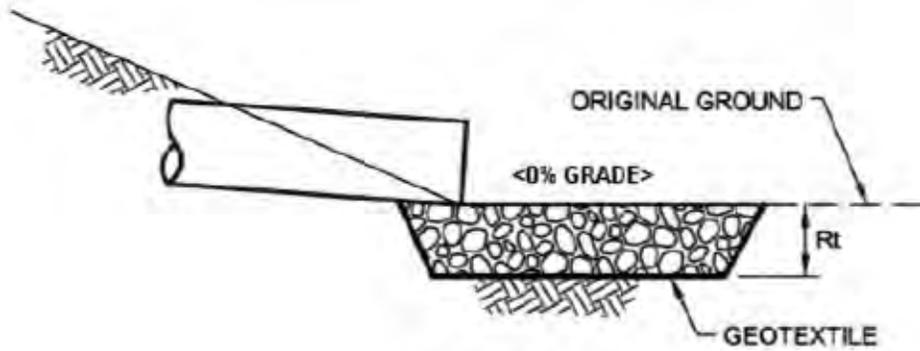
Sediment shall be removed when accumulations reach 1/2 the height of the filter.

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

**STANDARD CONSTRUCTION DETAIL # 9-2
Riprap Apron at Pipe Outlet without Flared Endwall**



PLAN VIEW



SECTION A - A

Adapted from USDOT, FHA HEC-14

NOTE: This table is intentionally blank and should be filled in by the plan preparer.

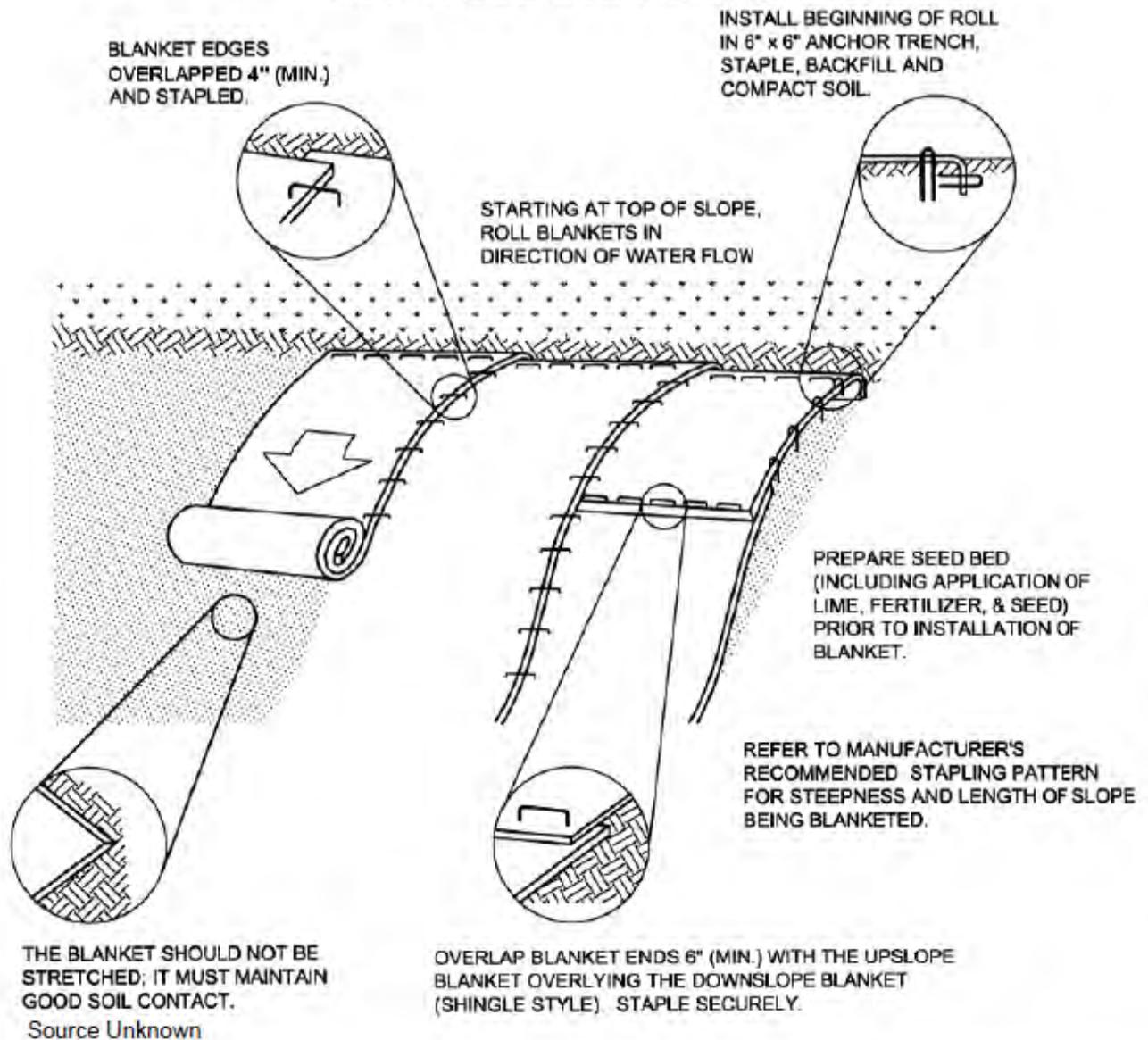
| OUTLET NO. | PIPE DIA Pd (IN) | RIPRAP | | LENGTH Al (FT) | APRON | |
|------------|------------------|------------|----------------|----------------|------------------------|-------------------------|
| | | SIZE (R-) | THICK. Rt (IN) | | INITIAL WIDTH Aiw (FT) | TERMINAL WIDTH Atw (FT) |
| | | | |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

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 back side of apron to at least 1/2 depth of pipe on both sides to prevent scour around the pipe.

STANDARD CONSTRUCTION DETAIL # 11-1 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.

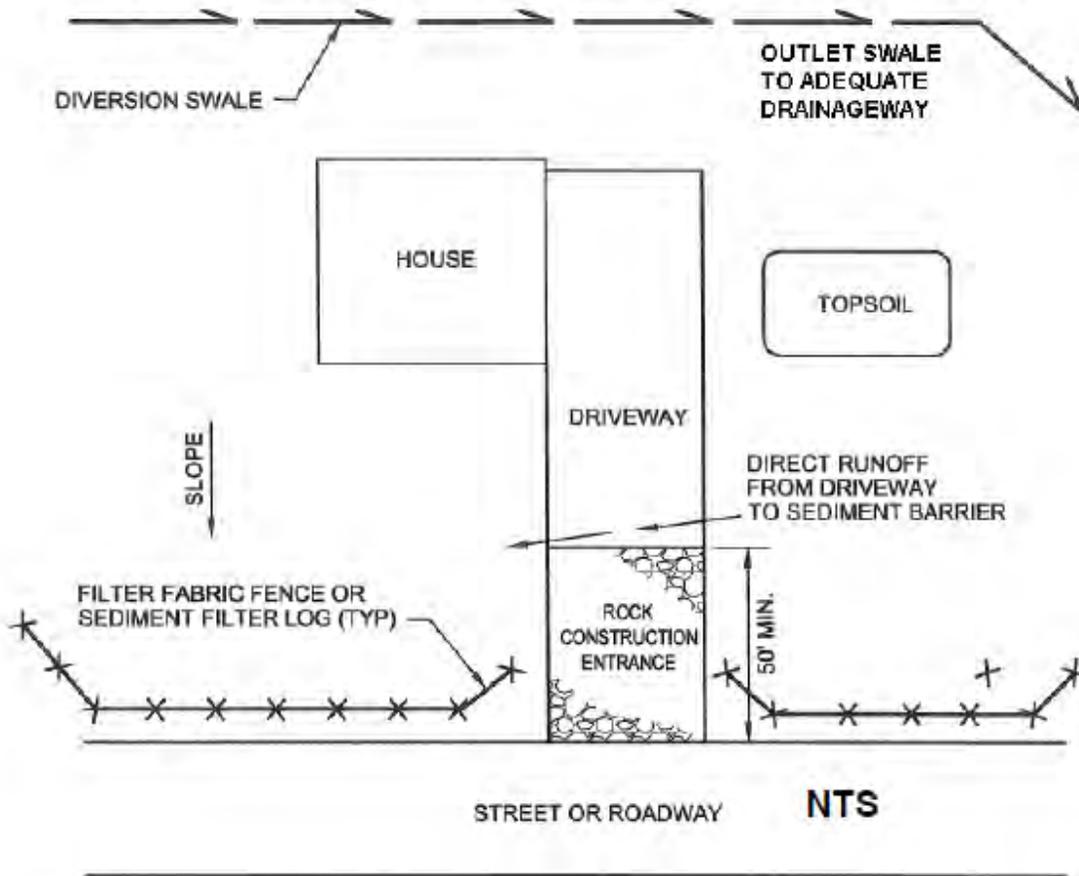
Slope surface shall be free of rocks, clods, sticks, and grass.

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.

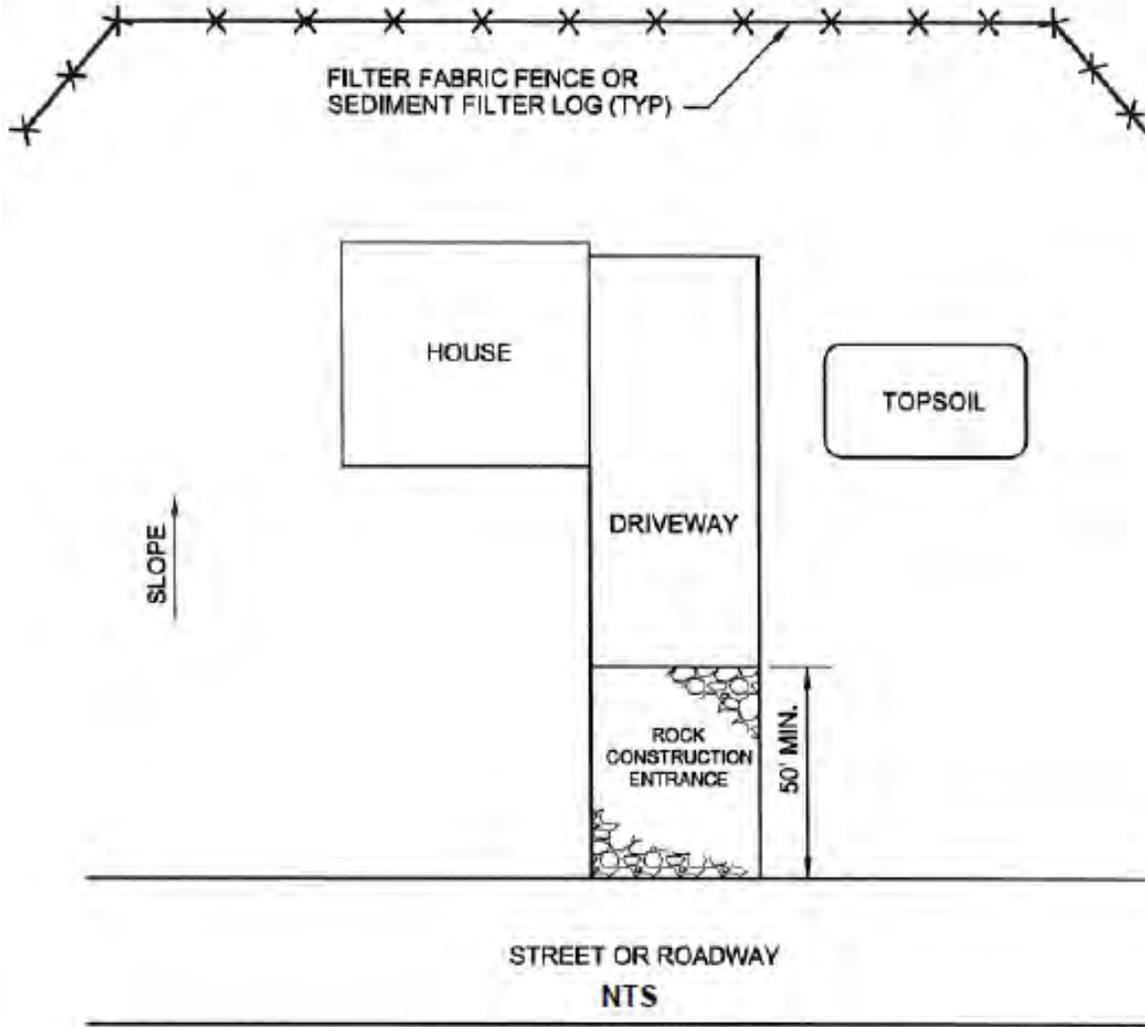
Blanketed areas shall be inspected weekly and after each runoff event until perennial vegetation is established to a minimum uniform 70% coverage throughout the blanketed area. Damaged or displaced blankets shall be restored or replaced within 4 calendar days.

STANDARD CONSTRUCTION DETAIL #10-1 Typical On-lot BMPs for Lot Above Roadway



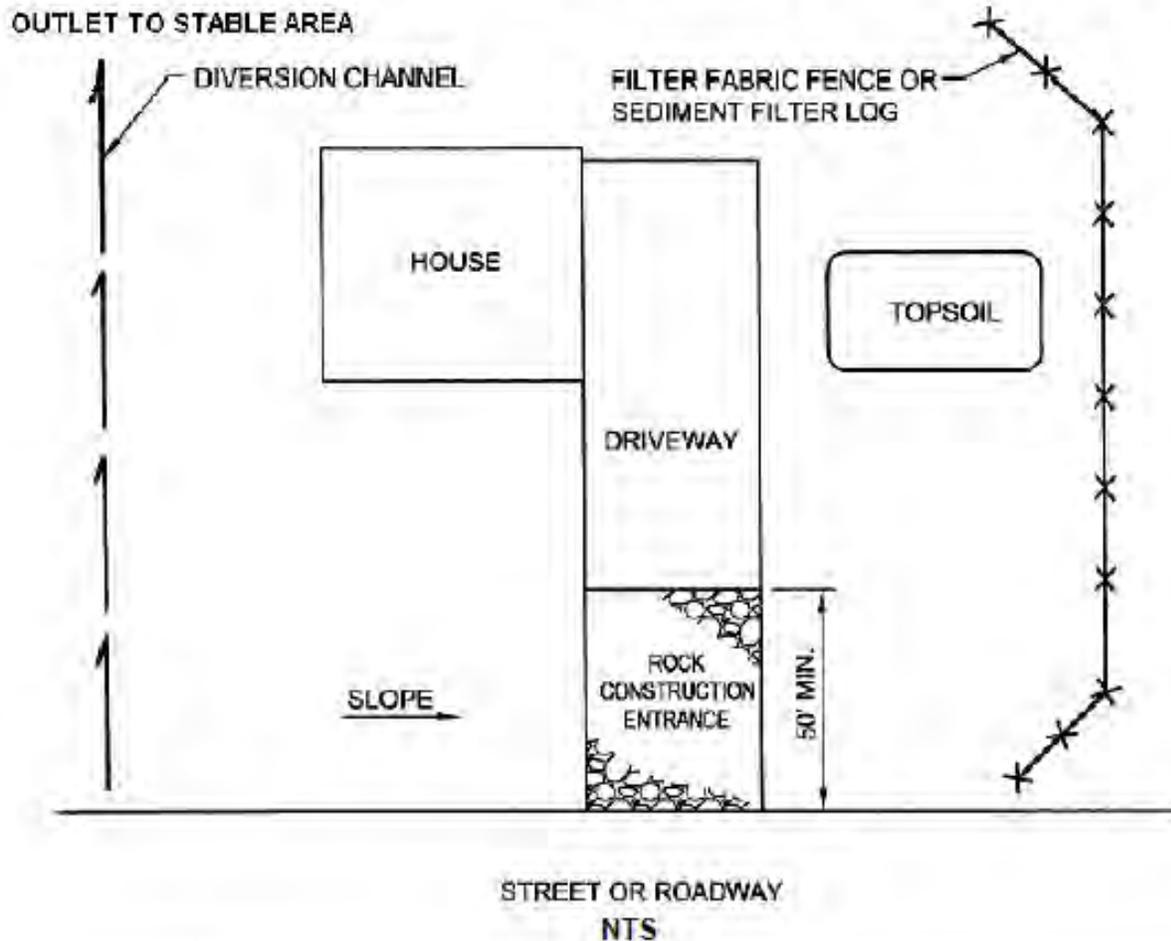
THE UPSLOPE DIVERSION CHANNEL SHOULD BE INSTALLED WHEREVER THE LOT EXTENDS MORE THAN 150 FEET ABOVE THE ROADWAY OR WHERE RUNOFF FROM AREAS ABOVE THE LOT IS NOT OTHERWISE DIVERTED AWAY FROM THE LOT. THE CHANNEL SHOULD BE PROPERLY SIZED AND PROVIDED WITH A SUITABLE PROTECTIVE LINING. THE DESIGNER MUST EXERCISE CAUTION TO PROTECT ALL DOWNSTREAM PROPERTY OWNERS WHEN SELECTING THE DISCHARGE POINT FOR THIS CHANNEL.

STANDARD CONSTRUCTION DETAIL #10-2 Typical On-lot BMPs for Lot Below Roadway



THE AREA DOWNSLOPE FROM THE FILTER FABRIC FENCE MAY NOT BE UNDER DEVELOPMENT OR OTHERWISE DISTURBED .

STANDARD CONSTRUCTION DETAIL #10-3
Typical On-lot BMPs for Lot Along Ascending or Descending Roadway

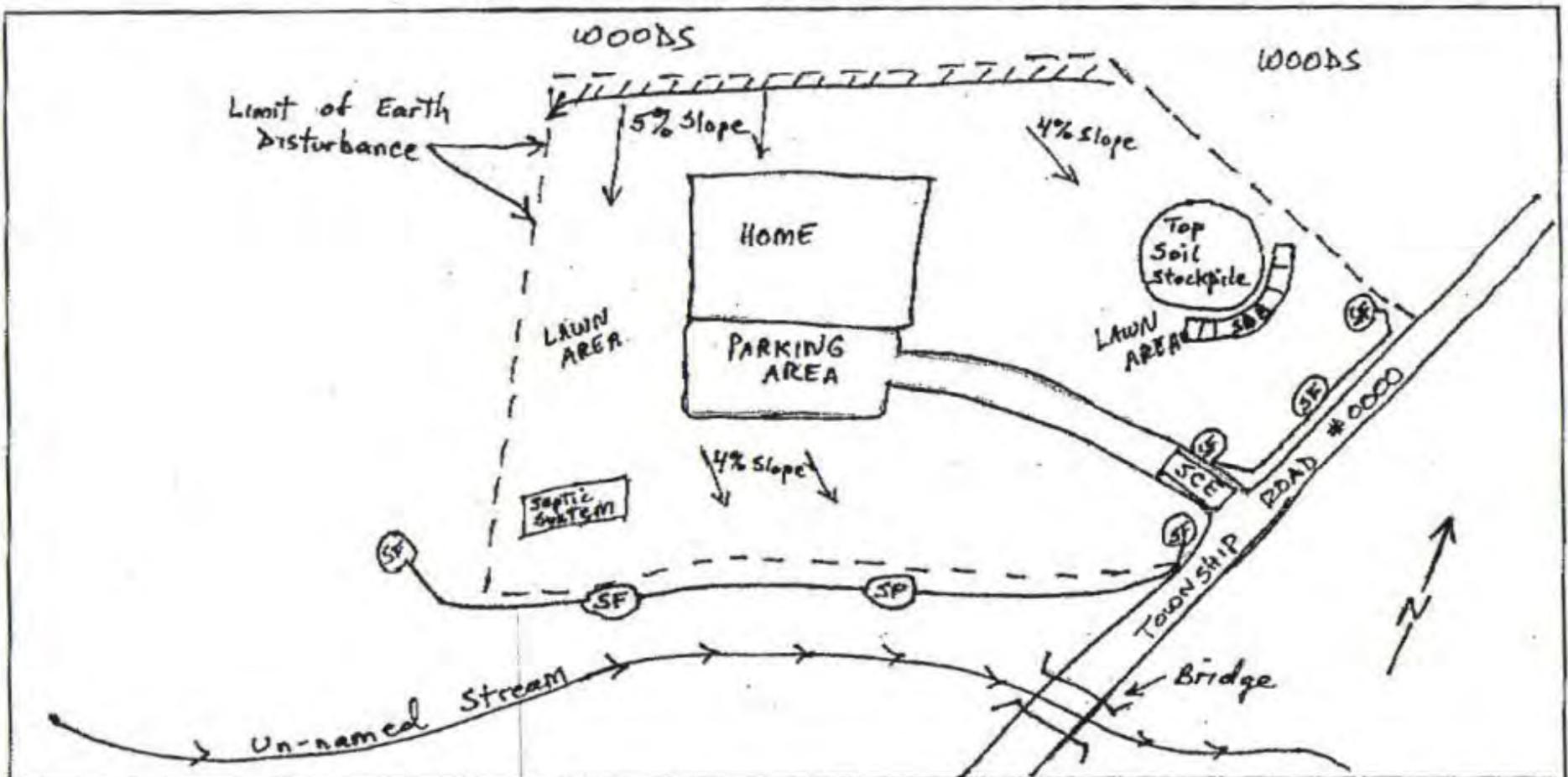


THE AREA DOWNSLOPE FROM THE FILTER FABRIC FENCE MAY NOT BE UNDER DEVELOPMENT OR OTHERWISE DISTURBED .

THE UPSLOPE DIVERSION CHANNEL SHOULD BE INSTALLED WHEREVER RUNOFF FROM AREAS ABOVE THE LOT IS NOT OTHERWISE DIVERTED AWAY FROM THE LOT. THE CHANNEL SHOULD BE PROPERLY SIZED AND PROVIDED WITH A SUITABLE PROTECTIVE LINING.

SAMPLE PLAN

Erosion and Sedimentation Pollution Control Plan



Legend and Symbols

- ROAD
- STREAM
- SLOPE
- STONE CONSTRUCTION ENTRANCE

- STRAW BALE BARRIER
- SILT FENCE
- Upslope Diversion Swale

Project Name: John Doe / Jane Doe Project
 Developed By: Mr. Home Owner
 Municipality: Conserve Twp.
 Date: 00-00-00 Approx. scale: 1" = 50'

Erosion and Sediment Control Plan Information Sheet

Property Owner: _____ Date: _____

Address: _____ City: _____ State & Zip: _____

Phone Number: _____ Municipality: _____

Contact Person (if other than owner): _____

Location of Project: _____

Name of Nearest Receiving Stream, Wetland, or Waterbody: _____

Estimated Dates for Start-up and Completion: Start: _____ End: _____

Project Acres (entire site): _____ Disturbed Acres: _____

Present Site Conditions (i.e. type of land use): _____

Narrative (give specific description of the proposed work):

Sequence of Construction (specifically, what will be done first, second, last, etc.):

Erosion and Sedimentation Control Plan

Project Name: _____ Developed By: _____

Municipality: _____