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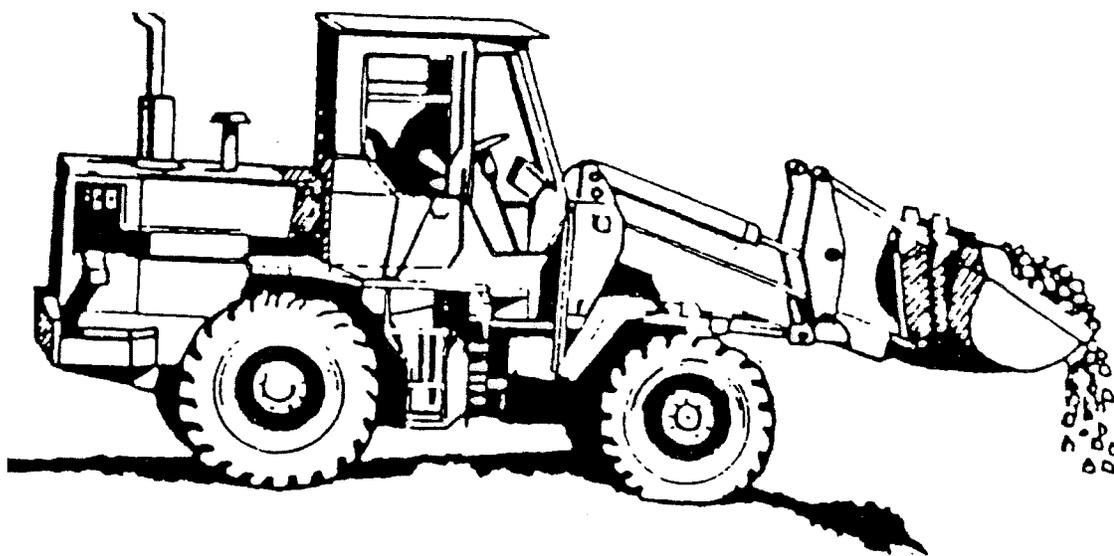
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# PROTECTING MAINE'S NATURAL RESOURCES

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## VOLUME III

### A Citizen's Guide to Best Management Practices to use with Maine's Construction General Permit



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# PROTECTING MAINE’S NATURAL RESOURCES

## A Citizen’s Guide to Best Management Practices To use with Maine’s Construction General Permit

### Table of Contents

DEP Standard Erosion & Sedimentation Control Measures.....	1
Preparing an “Erosion & Sedimentation Control Plan” for Maine’s Construction General Permit.....	2
Erosion & Sedimentation Control Plan Checklist.....	4
Construction Planning – Key Actions.....	5
Houselot Development.....	6
Commercial Site.....	7
Buffers.....	8
Sediment Barriers.....	9
Soil Stockpiles.....	10
Mulching.....	11
Vegetated Ditches.....	12
Riprap Ditches.....	13
Riprap Stabilization- Slope or Shoreline.....	14
Erosion Control Blanket Mulching.....	15
Culvert Outlet Protection.....	16
Construction Dewatering.....	17
Vegetation.....	18
Winter Stabilization.....	19



## **DEP STANDARD EROSION & SEDIMENTATION CONTROL MEASURES**

The standard erosion control measures listed below, also referred to in this guidance document as BMPs (Best Management Practices), are designed for your use wherever appropriate and practical for your project. The DEP developed these measures to assist you in developing an Erosion & Sedimentation Control Plan (ESC), when required. You can avoid developing a custom ESC plan for your project if you agree to follow them.

Attached you will find specific erosion control standards relating to:

- Construction Planning – Key Actions
- Houselot Development
- Commercial Site
- Buffers
- Sediment Barriers
- Soil Stockpiles
- Mulching
- Vegetated Ditches
- Riprap Ditches
- Riprap Stabilization
- Erosion Control Blanket Mulching
- Culvert Outlet Protection
- Construction Dewatering
- Vegetation
- Winter Stabilization



# **PREPARING an“EROSION & SEDIMENTATION CONTROL PLAN” for MAINE CONSTRUCTION GENERAL PERMIT**

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## **Background:**

Effective March 10, 2003, certain sized projects that involve disturbing soil and soil materials will be required to submit a “Notice of Intent” (NOI) to the DEP. Depending on the size and location of the project, an Erosion & Sedimentation Control Plan (ESC) will need to be submitted with the NOI. Projects requiring an ESC plan are those that:

1. disturb one or more acres and drain to an impaired waterbody (C); or
2. disturb three or more acres in any watershed

## **What makes up an ESC plan?**

An ESC plan typically includes a site plan and a written description explaining how a project will be constructed. For example, an ESC plan would describe how culverts will be installed, how soil and fill will be prevented from washing off-site, and how much seed and mulch will be used to permanently stabilize soil once the project is complete. A site plan also accompanies the ESC plan. The site plan shows such things as the location of roads and structures, slope or contour of the project area, and where erosion controls like silt fence will be placed to prevent any eroded soils from leaving the project area.

## **Can I develop an ESC plan myself?**

Yes, in many cases. However, if your project also requires a Site Location permit, an ESC plan prepared by a professional is required as part of that process. Some situations also require a professionally approved ESC plan if your project requires a Stormwater Management permit. Whenever the Stormwater Management or Site Location applications require an ESC plan, you do not need to submit a copy of that plan along with the NOI as long as you notify the DEP by checking off the appropriate box on the ESC Plan Checklist.

## **What are standard erosion and sedimentation control measures?**

The DEP has prepared a number of standard erosion control guidelines to assist you in preparing an ESC plan. These guidelines, sometimes referred to as BMPs, describe acceptable ways to stabilize ditches, culvert outfalls, install silt fence, etc. Attached are 15 standard erosion control measures that cover the majority of activities you are likely to perform when constructing your project. If, as the applicant, you agree to use any of these standard measures, you may check off the boxes on the ESC Plan Checklist and avoid preparing a written plan. You will still need to submit a site plan along with the Checklist.

## **What if my project involves activities not covered by standard erosion control measures?**

If there are some activities you plan to perform that are not covered by the standard BMPs, then you will need to provide an additional, written description of how you plan to construct that particular part of your project. However, these standard BMPs should fit most routine construction situations. If a detention basin is necessary or proposed, it is usually designed by an engineer who then also develops a specific plan on how to construct and stabilize the pond when completed. This would be an acceptable submission in addition to using the other standard BMPs where applicable.

### **Who reviews and approves my ESC plan?**

If your project drains to an "Impaired Waterbody (C)", an ESC plan must be submitted to DEP for review with the NOI form and can only be approved by the DEP.

However, if the project includes 3 or more acres of disturbed area and discharges to any other waterbody, an ESC plan can be reviewed and approved by the DEP or it can be certified by other individuals before submitting the NOI. Others that can certify an ESC plan are:

- (1) a contractor certified in erosion control practices through the Maine Nonpoint Source Training Center (see list of certified contractors at <http://www.state.me.us/dep/blwq/stormwtr/ccec.htm>);
- (2) a person certified as a "professional in erosion and sedimentation control" under the nationally-certified CPESC program;
- (3) A Maine professional engineer who by education, training, or experience is knowledgeable in stormwater management and erosion and sedimentation control; or
- (4) Soil and Water Conservation District staff person trained to develop erosion and sedimentation control plans, working in an office with which the DEP has an agreement concerning review of these plans.

### **So what do I submit for an ESC plan?**

Attached is a sheet containing a number of check boxes that can be used to simplify the process for you. For example, if you agree to use the standard BMPs the DEP has developed, you can check off the boxes for those you plan to use and sign the check off form. This form, along with your site plan that shows the location of erosion controls, will constitute an acceptable ESC plan.

If you wish to follow some, but not all, of the standard BMPs, you will need to develop written directions on how you will construct that particular portion of your project and check off the boxes of the BMPs you chose to follow.

If you have had your plan certified by an appropriate individual prior to submitting the NOI, there is a check off box describing which type of professional certified the plan and a space to fill in with that individual's name. By signing the form when using this check off, you are attesting that the ESC plan was properly reviewed and certified by the individual you identified.

If you have already developed an ESC as part of the Site Location or Stormwater Management applications, there is a check off box for that as well.

The ESC Plan Checklist on the next page can be torn out for your use. Checklists are also available at all DEP regional offices.



## EROSION & SEDIMENTATION CONTROL PLAN CHECKLIST

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- ▶ My project involves:\*
  - 1 or more acres of disturbance that drains to an impaired waterbody (C)  
Name of waterbody: \_\_\_\_\_
  - 3 or more acres of disturbance that drains to a waterbody that is **not** impaired
  
- ▶ I have read, and agree to follow, the DEP standard erosion and sedimentation control measures when constructing my project as checked below:
 

<input type="checkbox"/> Construction Planning	<input type="checkbox"/> Riprap Ditches
<input type="checkbox"/> Houselot Development	<input type="checkbox"/> Riprap Stabilization
<input type="checkbox"/> Commercial Site	<input type="checkbox"/> Erosion Control Blanket
<input type="checkbox"/> Buffers	<input type="checkbox"/> Culvert Outlet Protection
<input type="checkbox"/> Sediment Barriers	<input type="checkbox"/> Construction Dewatering
<input type="checkbox"/> Soil Stockpiles	<input type="checkbox"/> Vegetation
<input type="checkbox"/> Mulching	<input type="checkbox"/> Winter Stabilization
<input type="checkbox"/> Vegetated Ditches	
  
- ▶ I have developed specific construction standards for the following portions of my project that are not covered by the DEP's standard erosion and sedimentation control measures.
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  - I have attached the written construction standards to this checklist.
  
- ▶ I have had my ESC plan certified by:
  - A contractor certified in erosion control practices by the DEP.  
Name: \_\_\_\_\_
  - A professional engineer licensed in Maine.  
Name: \_\_\_\_\_
  - A Soil & Water Conservation District staff person trained in erosion control practices.      Name: \_\_\_\_\_
  - A person certified in erosion control practices under the national CPESC program.      Name: \_\_\_\_\_
  
- ▶  I have shown the location of all erosion control measures to be used on my project on the attached site plan.
  
- ▶  I have submitted an ESC plan as part of a Site Location or Stormwater Management permit application.  
     DEP Site Location Application #L-\_\_\_\_\_ (if known)  
     DEP Stormwater Management Application #L-\_\_\_\_\_ (if known)
  
- ▶ By signing this form below, I agree to follow all erosion control measures as checked above, including any specific construction standards I have proposed, and attest that the information provided above is true and accurate.

\_\_\_\_\_  
Signature

Date: \_\_\_\_\_

• A list of impaired waterbodies [C] is included in the Volume III packet, and is also available at DEP regional offices or on the web at <http://www.state.me.us/dep/blwq/docstand/stormwater>

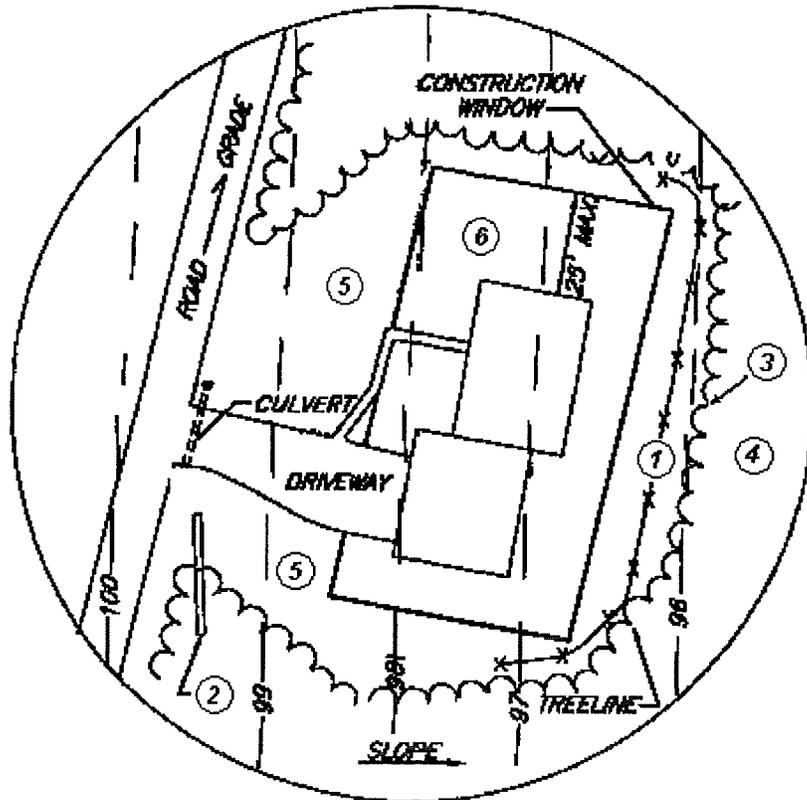
# **CONSTRUCTION PLANNING – KEY ACTIONS**

Successful erosion control depends on your performance. You can prevent erosion during the duration of your construction project if you use good judgement and act quickly. If you are diligent in doing the actions listed below, most erosion problems on your construction site will be prevented.

## **THE KEY ACTIONS**

- ◆ Limit the amount of soil disturbance at anyone time.
- ◆ Install sediment barriers before you disturb soils. (Disturbing soils includes stumping, grading, etc.)
- ◆ Retain as much natural vegetation as possible, especially natural downgradient buffer areas.
- ◆ Mark soil disturbance limits on your site.
- ◆ Mulch exposed soil as soon as possible and revegetate as soon as final grade is attained. Special attention should be paid to steep slopes and ditches.
- ◆ Where construction will occur within 100' of a water resource, minimize the time of exposure by mulching within 7 days from initial soil disturbance or prior to a predicted storm event (whichever comes first).
- ◆ Permanently stabilize all areas within 100' of a water resource within 24 hours after completing final grading.
- ◆ Inspect and repair erosion controls and sediment trapping measures weekly, and before and after every storm event.
- ◆ Stabilize all disturbed soils before winter ( Nov.1).
- ◆ Avoid earthwork, if possible, in the winter.
- ◆ If winter construction is unavoidable, use extra controls and follow the standards for Winter Construction. (See WINTER STABILIZATION measure)
- ◆ Remove temporary erosion controls within 30 days after permanent stabilization is attained.

## HOUSELOT DEVELOPMENT



### INSTALLATION

1. Install sediment barriers on your site before disturbing the soils. See the SEDIMENT BARRIERS measure for details on installing and maintaining these barriers.
2. Construct a diversion ditch to keep upslope runoff out of the work area.
3. Mark clearing limits on the site to keep equipment out of areas with steep slopes, with channeled flow, or adjacent surface waters and wetlands.
4. Preserve buffers between the work area and any downstream surface waters and wetlands. See the BUFFERS measure for details on buffer preservation.
5. Use temporary mulching and seeding to protect disturbed soils outside the active construction area. See the MULCHING measure and VEGETATION measure for details and specifications for these controls.
6. Permanently seed areas not to be paved within seven days of completing final grading. See the VEGETATION measure for information on proper seeding methods.

### MAINTENANCE

Every month the first year after construction and every year thereafter, inspect for areas showing erosion or poor vegetation growth. Fix these problems as soon as possible. Each spring remove any accumulation of debris or winter sand that would impede runoff from entering a buffer or ditch.

See *Maine Erosion and Sediment Control BMPs (3/2003)* for more information.

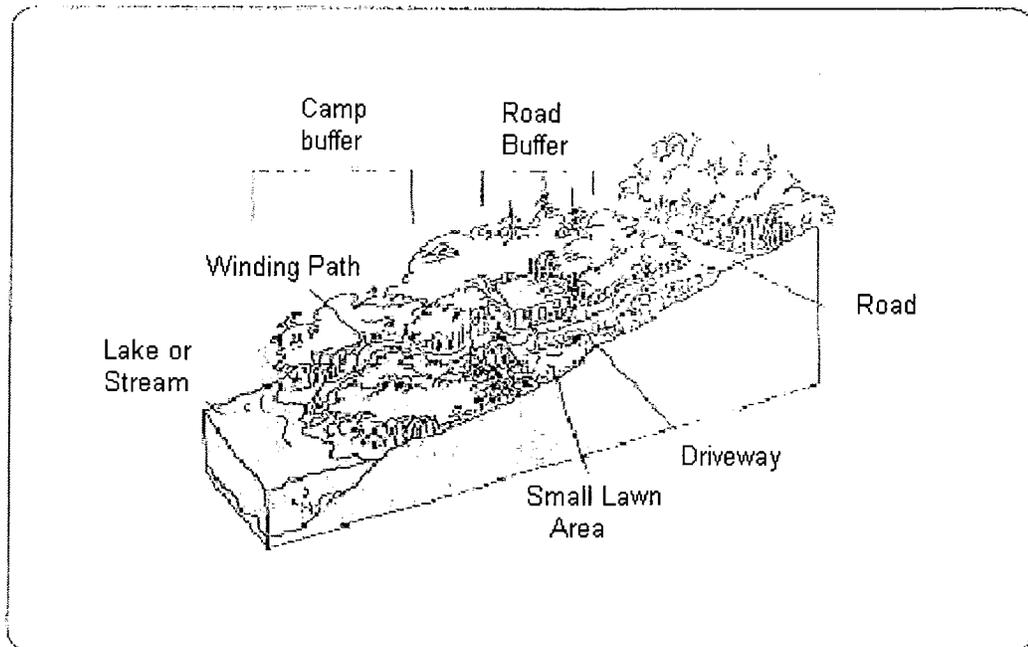
## COMMERCIAL SITE

### GRAPHIC NOT YET AVAILABLE

This sketch shows the intent and extent of the erosion and sediment control measures necessary for small commercial developments. Actual conditions, layouts, and measures will vary from site to site.

1. Install sediment barriers on your site before disturbing the soils. See the SEDIMENT BARRIERS measure for details on installing and maintaining these barriers.
2. Use a construction entrance of crushed stone when the site access is from a paved roadway.
3. Use an inlet sediment filter at each catch basin that will receive runoff from your site.
4. Construct a diversion ditch to keep upslope runoff out of the work area.
5. Mark clearing limits on the site to keep equipment out of areas with steep slopes, with channeled flow, or adjacent surface waters and wetlands.
6. Preserve buffers between the work area and any downstream surface waters and wetlands. See the BUFFERS measure for details on buffer preservation.
7. Stabilize ditches within 24 hours of completing their grading. See the VEGETATED DITCHES measure and the RIPRAP DITCHES measure for details on stabilizing ditches.
8. Install a plunge pool at the outlet of each culvert within 24 hours of installing the culvert. See the CULVERT OUTLET PROTECTION measure for details on outlet protection.
9. Use temporary mulching and seeding to protect disturbed soils from erosion during construction. See the MULCHING measure and VEGETATION measure for details and specifications for these controls.
10. Permanently seed areas not to be paved within seven days of completing final grading. See the VEGETATION measure for information on proper seeding methods.

## BUFFERS



Protect buffers between disturbed soils and downhill waterbodies so to remove sediments from your construction site's runoff. Buffers are also desirable for soil conservation and to protect wildlife habitat. The need for mowing and maintenance is also reduced when natural buffers are maintained instead of lawns. A buffer is effective only where water can sheet flow through it.

### **SPECIFICATIONS**

1. Leave the area in its natural vegetative cover until construction is ready to start.
2. Establish and protect the buffer prior to any soil disturbance. Locate the buffer downgradient of the disturbance, along the contours, and within 150 feet of the disturbed area.
3. Use existing vegetation rather than replanting.
4. Maintain as big as a buffer as possible. The minimum width of the buffer is 25 feet, increased proportionately for slopes longer than 150 feet.
5. Do not allow any construction within the buffer area.
6. Contact the Land Use Regulation Commission (LURC) for the needed widths of buffers in unorganized areas and the local CEO for additional ordinance requirements.

### **MAINTENANCE**

- ◆ Do not remove vegetation or trees other than dead plants and debris from the buffer.
- ◆ Maintain a specific and stable foot path and do not walk unnecessarily within the buffer.

See *Maine Erosion and Sediment Control BMPs* (3/2003) Section C-5 for more information on buffers.

## **SEDIMENT BARRIERS**

GRAPHIC NOT YET AVAILABLE

This sketch shows the general requirements for properly using sediment barriers. Actual barrier layouts will vary from site to site. Acceptable sediment barriers include erosion control mix berms, silt fences, and haybale dikes.

### **INSTALLATION:**

Install sediment barriers prior to disturbing soils on the site.

1. Install a sediment barrier at the downhill edge of each area to be disturbed.
2. Install each sediment barrier parallel to the land's contours so that the barrier is not running down the slope.
3. Curve the ends of the sediment barrier uphill so to prevent runoff from flowing around the barrier.
4. Do not have more than one-quarter acre of land draining to each 100-foot section of barrier.
5. Do not install sediment barriers across ditches, brooks, streams, or other channels.
6. Immediately mulch any area below which it is impossible to properly install or maintain a sediment barrier.

### **MAINTENANCE:**

- ◆ Check each sediment barrier prior to every storm event to ensure the barrier is in working order. Repair any gaps, tears, or blow-outs in the barrier immediately.
- ◆ Check each sediment barrier after every storm to determine if it has been effective. Look for evidence of runoff flowing around, under, or over the barrier. Repair, reinstall, or adjust any section of the barrier where these problems are evident.
- ◆ Remove accumulated sediments trapped behind each barrier when the sediment height reaches six inches. Dispose of the sediments uphill of the barrier by working the sediments into the soil, seeding, and mulching.
- ◆ Remove each sediment barrier only after you have stabilized permanently the disturbed area draining to it.

See *Maine Erosion and Sediment Control BMPs* (3/2003) Section B-1 for more information on using sediment barriers.

# **SOIL STOCKPILES**

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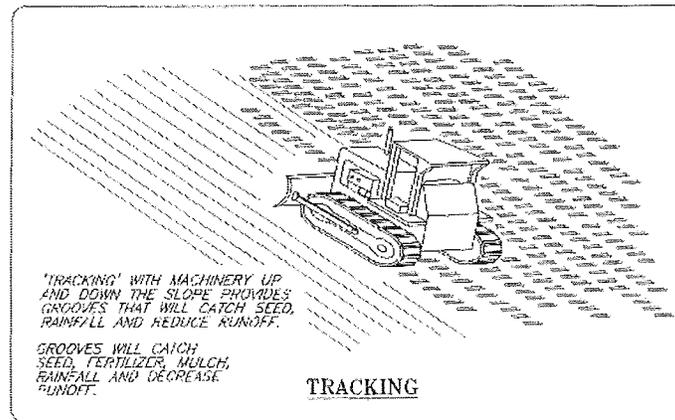
Many construction activities require the stockpiling of soil. This may vary from the desire to retain the prime topsoil for reuse on the site, to excavated spoils from cuts, to construction pre-loading, to other uses. The following standards will help to retain as much of this material as possible.

1. Install a sediment barrier down-slope of the stockpile. See the **SEDIMENT BARRIERS** measures in this Citizen's Guide.
2. Large Stockpiles: Use mulch or temporary seeding per their recommendations for cover. See "Vegetation" measures in this Citizen's Guide.
3. Small Stockpiles: Use a tarp for cover.
4. Do not site stockpiles in areas of concentrated flow or potential flooding.
5. Maximize the distance to protected resources.

## **MAINTENANCE**

- ◆ Inspect and repair erosion controls and sediment trapping measures weekly, and before and after every storm event.
- ◆ Remove all collected soil material behind sediment barriers once the soil has reached one half of the barriers height.

## MULCHING



Apply temporary mulch on disturbed areas within 14 days of the initial disturbance or prior to any storm. For areas within 100 feet of a wetland or waterbody, apply temporary mulch on all disturbed soils at the end of each work day. Install a permanent mulch within seven days of completing the finish grading for any area not to be vegetated, paved, or covered by riprap.

### INSTALLATION

1. Do not apply erosion control mix or hay mulch in areas of concentrated water flows.
2. Do not use erosion control mix or hay mulch for slopes steeper than two (2) horizontal to one (1) vertical.
3. Follow the WINTER STABILIZATION measure when mulching for over-winter protection.
4. Mulch over all seeding. See the VEGETATION measure for seeding instructions.

### Erosion Control Mix

1. Use erosion control mix as a long-term soil cover that will eventually allow the growth of vegetation, if desired.
2. Erosion control mix includes shredded or composted bark, stump grindings, or other composted wood products. Wood chips, ground construction debris, or processed wood are not acceptable.
3. Apply the erosion control mix as a layer at least three inches thick. Do not compact the mix with equipment.

### Hay Mulch

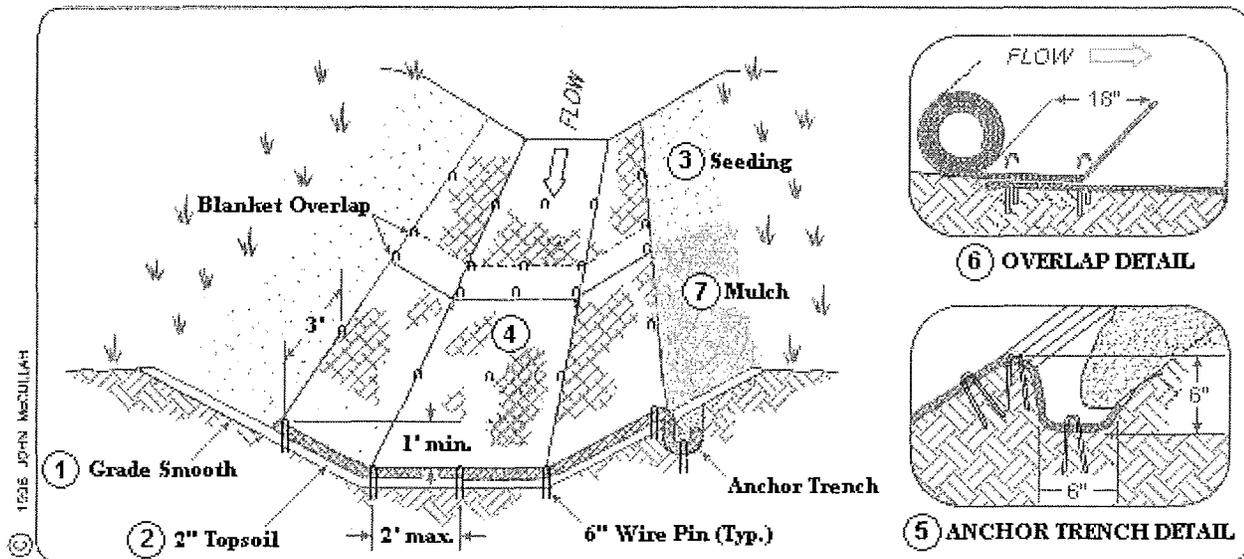
1. Use hay mulch as a temporary measure to protect bare soils or to cover newly seeded areas.
2. Apply at a rate of two square bales (70-90 pounds) per 1000 SQ FT or 1.5 to 2 tons (90-100 bales) per acre.
3. Anchor the hay mulch using one of the following methods:
  - Staple jute or plastic netting over the mulch according to the net or jute manufacturer's recommendation.
  - Stretch twine between pegs in a criss-cross pattern over the mulch (4-6 pegs per sq yd).
  - Track equipment over the mulch by driving up and down the slope so that the cleat marks run across the slope. Tracking is suitable for areas that are less than 3% and not subject to severe winds.

### MAINTENANCE

- ◆ Until grass is abundant, inspect hay mulch periodically and after each rainstorm for erosion. Immediately repair and add more mulch until grasses are firmly established.
- ◆ If hay mulch has been anchored by plastic netting, raise the mower deck when mowing the new vegetation until the netting has degraded sufficiently so as not to get tangled in the mower blades.

See ' MAINE EROSION AND SEDIMENT CONTROL BMPS' (3/2003) Sections A-1 and C-4 for more information.

## VEGETATED DITCHES



This sketch shows the general requirements for stabilizing a ditch with vegetation. The ditch must have a grade less than 6%, side slopes no steeper than 1V:2H, and a contributing drainage area less than five acres. While the sketch shows a trapezoidal ditch, the ditch may also be parabolic or V-shaped.

### INSTALLATION

Install the permanent ditch lining within 24 hours of completing the final grading for each section of ditch. Start the installation at the lowest point and work your way upstream. Installation of vegetated linings must be done during the growing season prior to September 1<sup>st</sup>. Installations done after this date will likely fail to prevent erosion within the ditch the following spring.

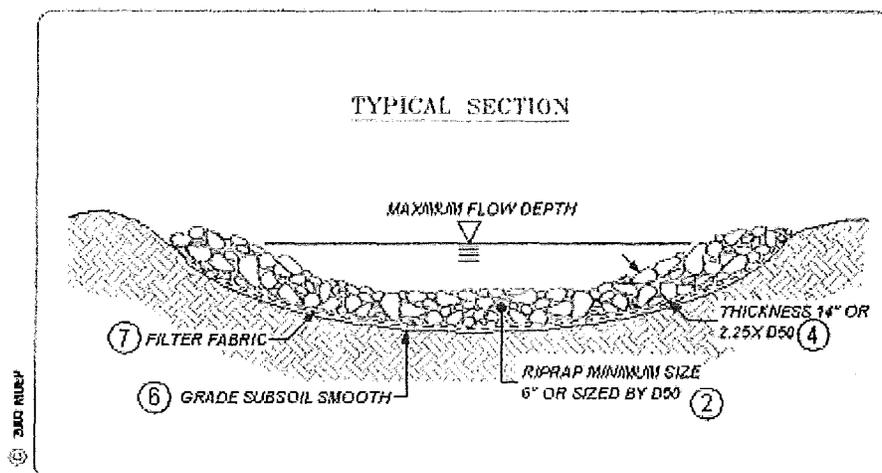
1. Grade the ditch line to a smooth, even surface. Remove any protruding rocks, stumps, and roots.
2. If needed, spread two inches of topsoil over the ditch surface and till the topsoil into the underlying soil.
3. Broadcast the seed over the entire ditch surface and rake it into the soil. See the VEGETATION measure for information on the permanent seeding of disturbed soils.
4. Install the erosion control blanket using the manufacturer's guidelines. If these are not known, then use the pin spacing and overlap method shown in the above sketch. Pins along the ditch's length should be no more than three feet apart. Pins across the ditch's width should be no more than two feet apart. Install pins working from the center of the blanket out. It is critical that the blanket has firm, continuous contact with the underlying soil. If needed, use additional pins than shown.
5. Anchor the sides of the blanket in a trench if the underlying soil is loose sands or silts. Pin the blanket in the trench as shown in the detail and firmly pack soil in the trench so to cover the blanket edge.
6. Overlap the ends of blankets at least 18 inches. The upstream blanket must lap over the downstream blanket. Pin the ends of both blankets along the overlap.
7. Mulch the upper portions of the ditch's side slopes using hay or straw. See the MULCHING measure for mulching rates and methods.

### MAINTENANCE

- ◆ The first year after installation, inspect the ditch lining monthly for slumping of the lining, downcutting of the ditch's base, or undercutting of the banks. Fix these problems as soon as possible. After the first year, inspect the ditch yearly.
- ◆ Mow or brush-cut the ditch yearly to prevent the establishment of woody vegetation within the channel.
- ◆ Each spring remove any accumulation of winter sand that would impede pavement runoff from entering the ditch.

See *Maine Erosion and Sediment Control BMPs (3/2003)* Section E-4 for more information on stabilizing ditches with vegetation.

## RIPRAP -- DITCHES



Typical installation of riprap ditches is shown above with specifications below. Riprap is a permanent, erosion-resistant ground cover constructed of large, loose, angular or sub-angular (rounded) stone. This practice is applicable where the soil conditions, water turbulence and velocity, expected vegetative cover, etc., are such that the soil may erode under the design flow conditions.

### INSTALLATION

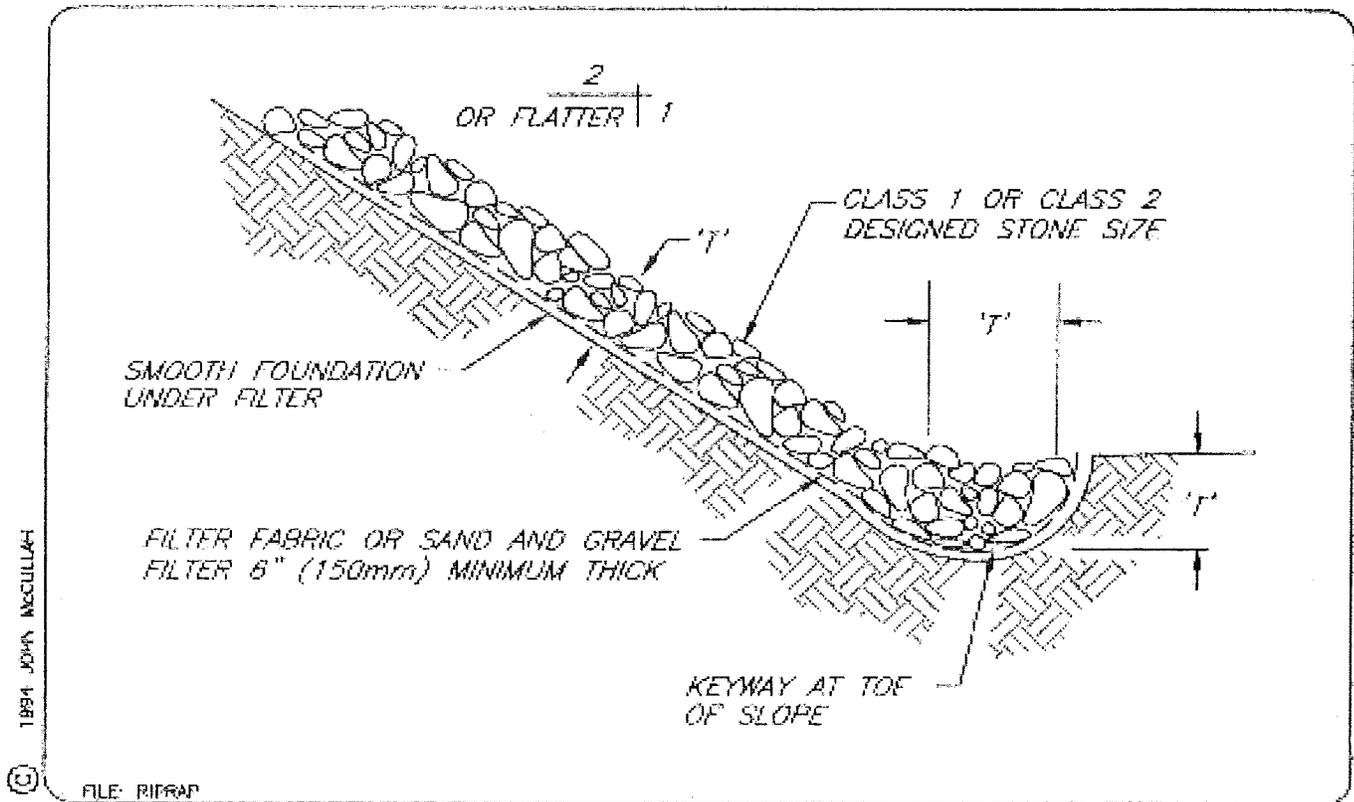
1. Stabilize slopes greater than 8% with riprap.
2. The minimum riprap D50 size is 6 inches. The D50 size refers to the median diameter of the stone. This is the size for which 50 percent, by weight, will be smaller and 50 percent will be larger.
3. Use sub-angular fieldstone or rough unhewn quarry. The stone must be hard and resistant to weathering.
4. Make the riprap layer 2.25 x D50 in thickness. The minimum thickness for a D50 of 6 inches would be 14 inches.
5. Remove brush, trees, stumps and other objectionable material (i.e., organic matter).
6. Compact the subgrade to a density approximating that of the surrounding undisturbed material.
7. Install a geotextile filter cloth in the ditch according to the manufacturer's recommendations. The upper end should be buried and the lower end should be toed in. Fabric should fit to the soil in the ditch line without gaps.
8. Start stone placement at the bottom of the ditch line and work upwards, making sure the layer is at least two stones thick and completely covers the fabric.

### MAINTENANCE

- ◆ Inspect riprap swales periodically to determine if high flows have caused scour beneath the riprap or dislodged any stone. Repair immediately.

See *Maine Erosion and Sediment Control BMPs* (3/2003) Section E-6 for more information.

## RIPRAP STABILIZATION -- SLOPE OR SHORELINE



This sketch shows the general requirements for installing riprap on a slope or shoreline. Use riprap where the erosion potential is high and the slope is no greater than 1½ horizontal to 1 vertical. Riprap may not be installed along a surface waterbody without the permission of the DEP and Army Corps of Engineers.

### INSTALLATION

Install riprap for shoreline and slope stabilization within 24 hours of completing the final grading of the slope.

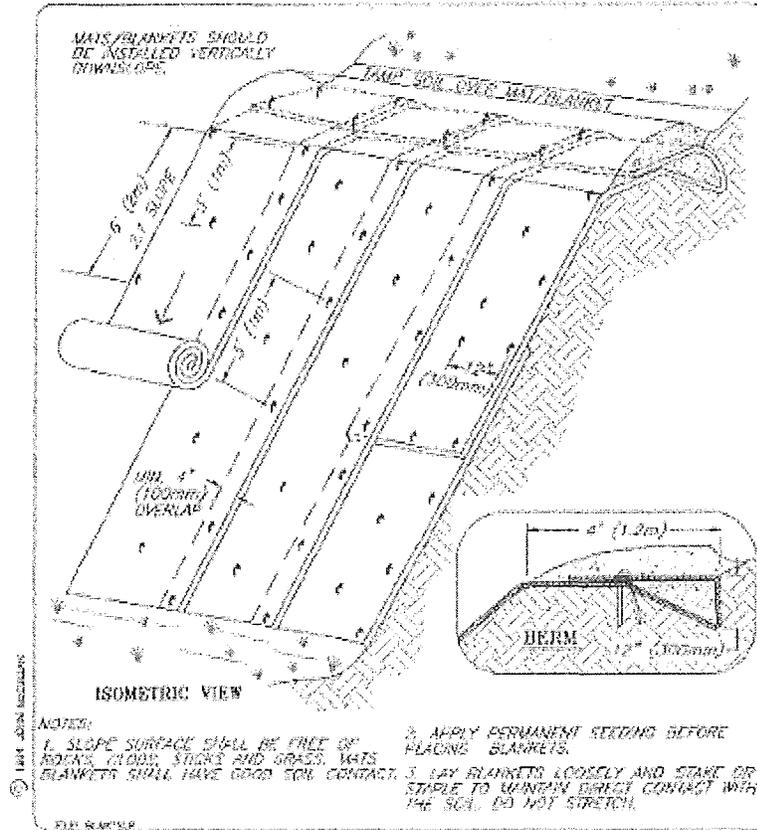
1. Use riprap where the erosion potential is high and the slope is no greater than 1½ horizontal to 1 vertical.
2. The minimum riprap D50 size is 4 inches. The D50 size refers to the median diameter of the stone. This is the size for which 50 percent, by weight, will be smaller and 50 percent will be larger.
3. Use sub-angular fieldstone or rough unhewn quarry. The stone must be hard and resistant to weathering.
4. Make the riprap layer 2.25 x D50 in thickness. The minimum thickness for a D50 of 4 inches would be 9 inches.
5. Remove brush, trees, stumps and other objectionable material (i.e., organic matter).
6. Compact the subgrade to a density approximating that of the surrounding undisturbed material.
7. Install a geotextile filter cloth on the graded slope according to the manufacturer's recommendations. The upper end of the geotextile should be buried and the lower end should be toed in.
8. Key-in the riprap at the toe of the slope using a trench at least one foot deep. Start placing stones at the bottom of the toe trench and work upwards to the top of the slope. The stone must completely cover the underlying fabric.

### MAINTENANCE

- ◆ The first year after installation, inspect on a monthly basis the ripraped slope for slumping and loss of stones. Fix the problems as soon as possible. After the first year, inspect the riprap yearly.

See 'MAINE EROSION AND SEDIMENT CONTROL BMPS' (3/2003) Sections D-1 and D-2 for more information.

## EROSION CONTROL BLANKET MULCHING



This sketch shows the general requirements for using erosion control blankets for stabilizing a slope to be vegetated. The slope must not be steeper than two (2) horizontal to one (1) vertical.

### INSTALLATION

1. During the growing season (April 15 - September 15) use blankets on the base of grassed waterways, soil slopes having a grade greater than 15%, or anywhere where hay mulch has proven to be ineffective at controlling sheet erosion. Erosion control blankets are a manufactured combination of mulch and netting designed to prevent erosion and retain soil moisture.
2. For over-winter protection, apply erosion control blankets on the base and side slopes of grassed waterways and on slopes steeper than an 8% grade.
3. Grade the slope to a smooth, even surface. Remove any protruding rocks, stumps, or roots.
4. Anchor the uphill end of each blanket in a trench at the top of the slope. Pin the blanket in the trench as shown in the detail and firmly pack soil in the trench so to cover the blanket edge.
5. Roll the blanket down the slope and pin the blanket in accordance with the manufacturer's recommendations. It is critical that the blanket has firm, continuous contact with the underlying soil. If needed, use additional pins to ensure firm contact.
6. Overlap the sides and ends of blankets at least four inches. Uphill blankets must lap over downhill blankets. Pin the ends along the overlap.

### MAINTENANCE

- ◆ Until grass is abundant, inspect periodically and after each rainstorm to check for erosion. Immediately repair and add more mulch until grasses are firmly established.
- ◆ Do not mow the first year.

See 'MAINE EROSION AND SEDIMENT CONTROL BMP'S' (3/2003) Sections A-1 and C-4 for more information.

## **CULVERT OUTLET PROTECTION**

### **GRAPHIC NOT YET AVAILABLE**

This sketch shows the requirements for stabilizing the outlets of pipes and culverts having a diameter of 36 inches or less. Do not use this stabilization measure for culverts installed on brooks and streams without first consulting with the Department of Environmental Protection and the Department of Inland Fisheries and Wildlife about fish passage needs.

#### **INSTALLATION**

Stabilize each culvert's outlet within 24 hours of installing the culvert.

1. Excavate to form a pool that will be four culvert diameters long by two culvert diameters wide by one culvert diameter deep after the stone lining is placed. For example, the finished plunge pool for an 18-inch culvert would be six feet long, three feet wide, and 18 inches deep. These are the finished dimensions of the pool. To account for the stone lining, your initial excavation would need to be about two feet longer, two feet wider, and one foot deeper.
2. Smooth the surface of the excavated pool and remove any protruding rocks and roots. The sides of the plunge pool sloping to the pool's center must be no steeper than 1V:2:H. A 1V:2H slope rises one foot for every two feet of level distance.
3. Line the pool with a non-woven geotextile or with six inches of clean, bank-run gravel free of clays, silts, and fine sands.
4. Machine place or hand place a 12-inch layer of six to twelve inch stones over the geotextile or gravel bedding. Do not dump the stone onto the geotextile or gravel bedding directly from a truck or loader. Use only hard, angular stones whose lengths are no more than four times their width. Do not use shale, sandstone, or other stones showing signs of splitting or spalling. Do not use rounded stones.
5. Finish the stone lining by hand, filling voids and gaps to provide an interlocking, uniform surface.

#### **MAINTENANCE**

- ◆ Inspect the plunge pool yearly or after severe storms for dislodged stones or slumping of the stone lining. Reposition stones to restore the pool's original dimensions and uniform surface. If the stone lining shows failure that exposes the underlying geotextile, gravel bedding, or native soil, then see a professional engineer for assistance in designing a new outlet structure.
- ◆ Clean yearly any accumulated sediments and debris from the plunge pool.
- ◆ Cut or remove yearly any woody vegetation growing within the pool.

See *Maine Erosion and Sediment Control BMPs (3/2003)* Section E-3 for more information on stabilizing culvert outlets.

## **CONSTRUCTION DEWATERING**

GRAPHIC NOT YET AVAILABLE

### **INSTALLATION NOTES**

This sketch shows the general requirements for the proper installation of Construction Dewatering areas. Actual locations of onsite protections will vary.

1. Discharge to areas with well-established vegetation. Where possible, choose natural wooded buffer areas. Never discharge to areas that are bare or newly vegetated.
2. Maximize the distance to the nearest water resource (e.g. ditch, wetland, stream, lake, or other), while minimizing the slope of the discharge area. Discharge in sheet flow.
3. Discharge pumped water to a sediment removal structure at an appropriate rate.
4. A sediment removal structure is a temporary enclosure constructed with hay bales, silt fence, or both. Erosion control mix also may be incorporated with silt fence or hay bales. (Alternate: Dirt Bag, or equivalent installed on a crushed stone bed with a down-gradient sediment barrier.)
5. Flow to the sediment removal structure may not exceed the structure's capacity to settle and filter flow or the structure's volume capacity.
6. Install diversion ditches or berms to minimize the amount of clean stormwater runoff allowed into the excavated area.

### **MAINTENANCE**

- ◆ Do not discharge water contaminated by oil, grease, other petroleum products, or toxic and hazardous materials without approved treatment.
- ◆ Dewatering in periods of intense, heavy rain, when the infiltrative capacity of the soil is exceeded, should be avoided.
- ◆ Provide maintenance during the dewatering process, paying careful attention to the receiving buffer area for erosion and to be sure that no additional treatment is needed.

See *Maine Erosion and Sediment Control BMPs (3/2003)* Section G-3 for more information.

## VEGETATION

A permanent vegetative cover should be used to stabilize disturbed areas where the soils are structurally stable, the slopes are less than 2H:1V, and there is no groundwater seepage. Complete seeding of areas brought to finish grade within seven days.

### INSTALLATION

1. Grade the area and apply two inches of loam, if needed.
2. Broadcast the seed over the entire ditch surface and rake it into the soil.
3. Apply hay mulch according to the MULCHING measure. All newly seeded areas will need mulching.
4. Vegetation on slopes steeper than 2:1 may not develop roots that will sustain the plant nor hold the slope. Alternative slope stabilization measures will need to be implemented.
5. Protect newly vegetated areas from concentrated water flow, and vehicle and pedestrian traffic, until the vegetation is well established.
6. Minimize use of nutrients and pesticides, in order to protect surface and ground water quality. If possible, test the soil for fertilizer needs. Soil sample mailers are available through the local Cooperative Extension Service Office.

**Dates for summer seeding:** April 15 to September 1 - Permanent seeding should not be done within 45 days prior to the first killing frost.

**Dates for seeding a temporary annual grass for winter stabilization:** October 1 to November 1

**Date for dormant seeding:** November 15 or after the first killing frost and before snowfall. Before that, the seeds are likely to germinate but will not survive the winter.

**Seed mixtures** must be appropriately selected for the soil type, moisture content, the amount of sun exposure, and the level of use as found at the site. Examples are as follows:

Lots of sun and mostly dry:	Creeping red or tall fescue, perennial rye grass and clover
Shady areas:	Creeping red fescue, Kentucky bluegrass, Canada bluegrass
Wetlands:	Creeping red fescue, Reed canary grass, Timothy
Steep slopes:	Crownvetch, clover

The mixture should include some annual rye for quicker green-up. Apply at the approximate rate of 0.5 -1 lbs per 1,000 SF (30-50 lbs per acre). Contact your Soil and Water Conservation District for specific mixtures.

**Temporary seed** all areas that will remain disturbed for longer than 30 days. Use oats for spring seeding, an annual ryegrass for quick summer growth, and a winter rye for fall/winter growth. Apply at the rate of 1 to 2 lbs per 1,000 SF.

**Dormant Seeding** must be applied at double the recommended rate and must be anchored extremely well on all slopes. Do not use dormant seeding in watersheds sensitive to water quality impacts.

**Sodding** is an important emergency measure, which may be used between September 15 and November 15 when new seeding cannot be guaranteed. Follow supplier's instructions for installation.

### MAINTENANCE

- ◆ Permanent stabilization means 90 % coverage with healthy grass growth without soil erosion.
- ◆ All new seeding requires a close inspection in the spring. All areas where cover is inadequate must be immediately reseeded and mulched.
- ◆
- ◆ Rework, seed and mulch areas that have spotty plant germination are sparsely vegetated, or where soil erosion is evident.
- ◆
- ◆ Fertilize grasses cast every two years. Use phosphorus-free fertilizer in lake watersheds.

See *Maine Erosion and Sediment Control BMPs (3/2003)* Sections A-2 and C-3 for more information.

## **WINTER STABILIZATION**

Use overwinter stabilization and winter construction measures from November 1 to April 15 for Southern Maine and October 15th to April 30th for Northern Maine.

### **OVERWINTER STABILIZATION**

If an area is not stabilized with temporary or permanent measures by November 15, then the site must be protected with additional stabilization measures.

1. Permanent stabilization consists of at least 90% vegetation, pavement/gravel base or riprap.
2. Do not expose slopes or leave slopes exposed over the winter or for any other extended time of work suspension unless fully protected with mulch.
3. Apply hay mulch at twice the standard rate (150 lbs. Per 1,000 sf). The mulch must be thick enough such that the ground surface will not be visible and must be anchored.
4. Use mulch and mulch netting or an erosion control mulch blanket or mix for all slopes greater than 8 % or other areas exposed to direct wind.
5. Install an erosion control blanket in all drainageways (bottom and sides) with a slope greater than 3 %.
6. See the Vegetation Measures for more information on seeding dates and types.

### **WINTER CONSTRUCTION**

In addition to the items above, the following must be implemented:

1. Winter excavation and earthwork shall be completed as such that no more than 1 acre of the site is without stabilization at any one time.
2. An area within 100 feet of a protected natural resource must be protected with a double row of sediment barrier.
3. Temporary mulch must be applied within 7 days of soil exposure or prior to any storm event, but after every workday in areas within 100 feet from a protected natural resource.
4. Areas that have been brought to final grade must be permanently mulched that same day.
5. In the event of a snowfall greater than 1 inch (fresh or cumulative), the snow shall be removed from the areas due to be seeded and mulched.
6. Loam shall be free of frozen clumps before it is applied.

### **MAINTENANCE**

- ◆ Inspect periodically and after each storm to check for erosion. Repair immediately.
- ◆ In the springtime, remove the excess mulch, seed and monitor for erosion and plant growth.
- ◆ Immediately repair any sign of erosion by adding more mulch until grasses are established.

See *Maine Erosion and Sediment Control BMPs (3/2003)* Sections A-3 or more information.