

## CONSTRUCTION ENTRANCE

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### DESCRIPTION

A construction entrance is a stabilized pad of aggregate over a geotextile base and is used to reduce the amount of mud tracked off-site with construction traffic.

### CONDITIONS WHERE PRACTICE APPLIES

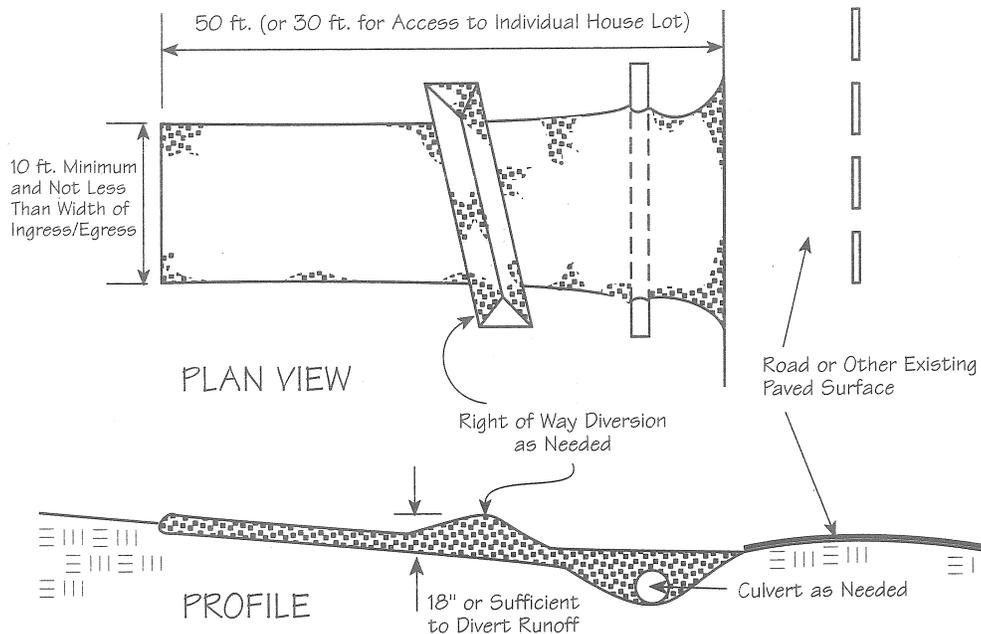
A construction entrance should be used:

- where construction vehicles leave active construction areas onto surfaces where runoff is not checked by sediment controls;
- at all points of egress to public roads;
- where frequent vehicle and equipment ingress/egress is expected such as at the entrance of individual building lots.

### PLANNING CONSIDERATIONS

This practice should not be relied on to remove mud from construction traffic. Most mud is flung from tires as vehicles reach speeds higher than is reached on-site. The best approach to preventing off-site tracking is to keep vehicles that frequently enter and leave a site, away from muddy areas in the first place. Vehicles should be restricted to stabilized areas to the extent practical, and areas where frequent ingress/egress is expected should be stabilized.

Specifications  
for  
Construction Entrance



1. Stone Size--Two-inch stone shall be used, or recycled concrete equivalent.
2. Length--The construction entrance shall be as long as required to stabilize high traffic areas but not less than 50 ft. (except on single residence lot where a 30-ft. minimum length applies).
3. Thickness--The stone layer shall be at least 6 in. thick.
4. Width--The entrance shall be at least 10 ft. wide, but not less than the full width at points where ingress or egress occurs.
5. Bedding--A geotextile shall be placed over the entire area prior to placing stone. It shall have a Grab Tensile Strength of at least 200 lb. and a Mullen Burst Strength of at least 190 lb.
6. Culvert--A pipe or culvert shall be constructed under the entrance if needed to prevent surface water flowing across the entrance from being directed out onto paved surfaces.
7. Water Bar--A water bar shall be constructed as part of the construction entrance if needed to prevent surface runoff from flowing the length of the construction entrance and out onto paved surfaces.
8. Maintenance--Top dressing of additional stone shall be applied as conditions demand. Mud spilled, dropped, washed or tracked onto public roads, or any surface where runoff is not checked by sediment controls, shall be removed immediately. Removal shall be accomplished by scraping or sweeping.
9. Construction entrances shall not be relied upon to remove mud from vehicles and prevent off-site tracking. Vehicles that enter and leave the construction-site shall be restricted from muddy areas.

## MULCHING

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### DESCRIPTION

Applying a protective layer of mulch, usually of straw, to bare soil is used to abate erosion by shielding it from raindrop impact to helping establish vegetation by conserving moisture and creating favorable conditions for seeds to germinate.

### CONDITIONS WHERE PRACTICE APPLIES

Mulch should be used liberally throughout construction to limit the areas that are bare and susceptible to erosion. Mulch can be used in conjunction with seeding to establish vegetation or by itself to provide erosion control when the season does not allow grass to grow. Mulch and other vegetative practices must be applied on all disturbed portions of construction-sites that will not be re-disturbed for more than 45 days.

Specifications  
for  
Mulching

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1. Mulch and/or other appropriate vegetative practices shall be applied to disturbed areas within 7 days of grading if the area is to remain dormant (undisturbed) for more than 45 days or on areas and portions of the site which can be brought to final grade.
2. Mulch shall consist of one of the following:
  - Straw--Straw shall be unrotted small grain straw applied at the rate of 2 tons/ac. or 90 lb./1,000 sq. ft. (two to three bales). The straw mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000-sq.-ft. sections and place two 45-lb. bales of straw in each section.
  - Hydroseeders--Wood cellulose fiber should be used at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
  - Other--Other acceptable mulches include mulch mattings applied according to manufacturer's recommendations or wood chips applied at 10-20 tons/ac.
3. Mulch Anchoring--Mulch shall be anchored immediately to minimize loss by wind or runoff. The following are acceptable methods for anchoring mulch.
  - Mechanical--Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but be left generally longer than 6 in.
  - Mulch Nettings--Use according to the manufacturer's recommendations, following all placement and anchoring suggestions. Use in areas of water concentration and steep slopes to hold mulch in place.
  - Asphalt Emulsion--For straw mulch, apply at the rate of 160 gal./ac. (0.1 gal./sy) into the mulch as it is being applied or as recommended by the manufacture.
  - Synthetic Binders--For straw mulch, synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Tack or equal may be used at rates recommended by the manufacturer.
  - Wood Cellulose Fiber--Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 lb./acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lb./100 gal. of wood cellulose fiber.

# MATTING

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## DESCRIPTION

Matting such as excelsior or jute matting is used to stabilize easily eroded areas such as channels and steep slopes while vegetation is becoming established.

## CONDITIONS WHERE PRACTICE APPLIES

Matting should be used on:

- Channels where the designed flow exceeds 3.5 fps,
- Steep slopes,
- Problem areas that have highly erosive soils,
- Areas that may be slow to establish adequate vegetative cover.

## DESIGN CRITERIA

**Materials--**Matting is available in many acceptable materials that provide excellent soil protection. Two acceptable materials are jute and excelsior matting. Excelsior matting is a wood fiber mulch covered with plastic netting on one or both sides. Jute matting is a woven cloth of jute yarn and may be used in conjunction with organic mulch. Both are widely available, easily installed, and adaptable to most site conditions.

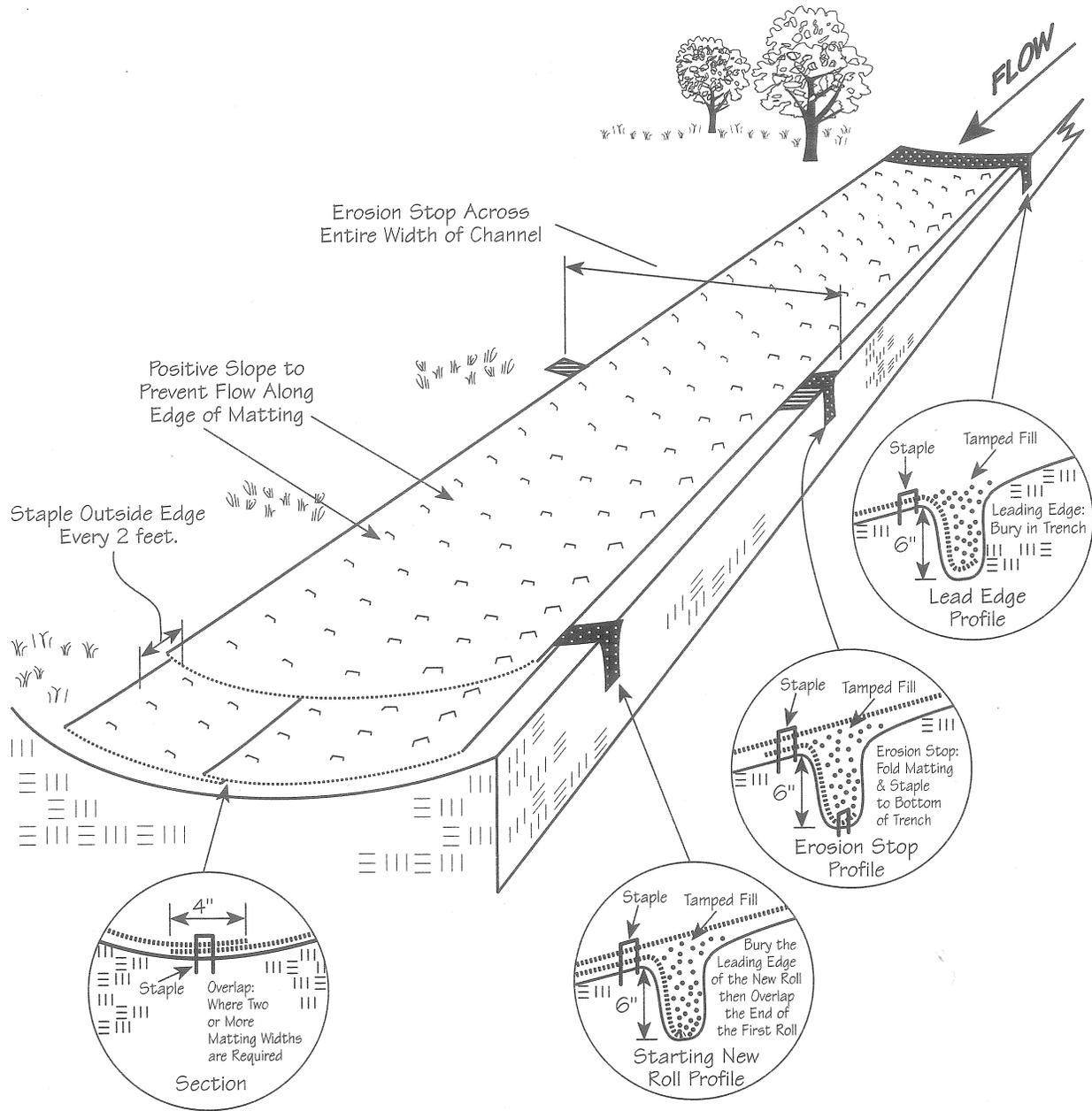
**Grade of Matting--**The specific grade of a matting should be specified. Matting is available in many different grades for a wide range of uses and site conditions.

**Channel Width--**Channels often require several widths of mattings. The width of coverage should be specified for individual sections of channel.

**Manufacturers Instructions--**Matting manufacturers usually provide detailed installation instructions for their products. The manufacturer's instructions should be referenced during design and included in construction plans. If instructions are not available, the following guidelines listed in the specifications for matting may be used.

**Erosion Stops--**Erosion stops are made of strips of matting placed in narrow trenches 6-12 in. deep across the full cross section of the channel. The strips are installed under the channel lining matting. Erosion stops prevent undermining and gullies from forming beneath the matting. They should be specified when recommended by the matting manufacturer and for areas of high-erosion potential such as where rocky conditions may prevent good soil matting contact, erosive soils or steep slopes. Depending on erosion potential, specifications should require erosion stops spaced from 20-100 ft. apart.

# Specifications for Matting



Specifications  
for  
Matting

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1. Material--Excelsior matting shall be 48 in. wide and weigh an average of 0.75 lb./sq. yd. or greater. Jute matting shall be 48 in. wide and weigh an average of 1.2 lb./yd or greater. Matting made of other material and providing equal or greater stabilization than the above may be substituted.
  - 2 ft. in rows the entire length of the matting. Every other row of staples running the length of the matting should be staggered.
2. Site Preparation--After the site has been shaped and graded, a seedbed shall be prepared that is relatively free of foreign material, clods or rocks that are greater than 1.5 in. in diameter. The site shall be prepared to ensure that the matting has good soil contact and the matting will not "bridge" or "tent" over obstructions.
  - To join two rolls together, cut a trench to anchor the end of the new roll and secure it the same as the top roll. Overlap the end of the previous roll 18 in. over the new roll. Continue to staple as described above.
  - When using excelsior matting, the plastic netting shall be on top of the wood fiber.
3. Matting shall be held in place as recommended by the manufacturer as adequate for the site conditions or with sod staples. Sod staples are U-shaped wire staples used for fastening sod, jute or excelsior matting and other erosion-control materials to the soil surface. Sod staples shall be No. 11 gauge or heavier and be 6-10 in. in length. In loose or sandy soils longer staples shall be used.
4. Planting--Lime and fertilizer shall be used according to the recommendation of a soil test or the seeding plan. Seed according to the matting manufacturer's recommendations; or, for excelsior matting, seed area to be protected before installation; or, when using jute matting, apply half the seed before and half the seed after installation.
5. Matting shall be installed as specified by the manufacturer as appropriate for the site conditions or the following procedure may be used:
  - After the site is prepared and erosion stops are installed, start laying the mat from the top of the slope or channel and unroll the matting allowing 4-in. overlaps at the edges.
  - Secure the matting by burying the top ends in a trench 6 in. deep and staple the folded ends to the bottom of the trench. Backfill and tamp firmly to the established grade.
  - Staple matting every 12 in. across the width beginning at the edges and every
6. Erosion stops shall be used where recommended by the matting manufacturer and on areas specified where high-erosion potential may cause undermining and gullies to form beneath the matting.
  - Erosion stops shall be made of strips of matting placed in narrow trenches 6-12 in. deep that cover the full cross section of the channel. They shall be spaced according to the manufacturer's recommendations or by the following:
    - 3 ft. down the channel from each point of entry of concentrated flow,
    - at points where change in gradient or direction of channel occurs, and
    - on long slopes at spacing from 20-100 ft. depending upon the erodibility of the soil, velocity and volume of flow.
  - Erosion stops shall extend beyond the channel liner to the full design width of the channel, this will check any rills that might form outside or along the edge of the channel lining.
  - Erosion stops shall be constructed with 6 in. deep trench, stapled to the bottom of the trench, backfilled and tamped firmly to conform with the cross section of the channel.
  - If seeding has been done prior to installation of erosion stops, reseed disturbed areas prior to placement of channel liner.

## PERMANENT SEEDING

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### DESCRIPTION

Permanent seeding includes the seedbed preparation, seeding, and the establishment of perennial vegetation used to permanently stabilize soil, prevent sediment pollution, reduce runoff by promoting infiltration, and provide stormwater quality benefits offered by dense vegetation.

### CONDITIONS WHERE PRACTICE APPLIES

Permanent seeding should be applied to:

- Areas or portions of construction-sites which can be brought to final grade. Applications of permanent seeding should not be delayed while construction on limited portions of the site is being completed.
- Areas that will be regraded, but will be dormant for a year or more.

## PLANNING CONSIDERATIONS

Healthy dense turf will have a dramatic long lasting effect on stormwater quality as well as promoting infiltration and reducing the amount of runoff. To establish quality vegetation, careful preparation of the seedbed, soil, even subsoil is highly encouraged.

**Soil Compaction**--Stormwater quality and the amount of runoff both vary significantly with soil compaction. Non-compacted soils improve stormwater by promoting:

- dense vegetation,
- high infiltration & lower runoff rates,
- pollutant filtration, deposition & absorption, and
- beneficial biologic activity in the soil.

Construction activity can cause highly compacted soils but also offers the opportunity to improve soil condition. The best time for improving soil condition is during the establishment of permanent vegetation. It is highly recommended that subsoilers, plows or other implements be specified as part of final seedbed preparation. Use discretion in slip-prone areas.

**Minimum Soil Conditions**--Vegetation cannot be expected to stabilize soil that is unstable due to its texture, structure, water movement or excessively steep slope. The following minimum soil conditions are needed for the establishment and maintenance of a long-lived vegetative cover. If these conditions cannot be met, see the Standards and Specifications for Resoiling.

- Soils must include enough fine-grained material to hold at least a moderate amount of available moisture.
- The soil must be free from material that is toxic or otherwise harmful to plant growth.

Specifications  
for  
**Permanent Seeding**

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**SITE PREPARATION**

1. A subsoiler, plow or other implement shall be used to reduce soil compaction and allow maximum infiltration. (Maximizing infiltration will help control both runoff rate and water quality.) Subsoiling should be done when the soil moisture is low enough to allow the soil to crack or fracture. Subsoiling shall not be done on slip-prone areas where soil preparation should be limited to what is necessary for establishing vegetation.
2. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation and seeding.
3. Resoil shall be applied where needed to establish vegetation.

**SEEDBED PREPARATION**

1. Lime--Agricultural ground limestone shall be applied to acid soil as recommended by a soil test. In lieu of a soil test, lime shall be applied at the rate of 100 lb./1,000 sq. ft. or 2 tons/ac.
2. Fertilizer--Fertilizer shall be applied as recommended by a soil test. In lieu of a soil test, fertilizer shall be applied at a rate of 12 lb./1,000 sq. ft. or 500 lb./ac. of 10-10-10 or 12-12-12 analysis.
3. The lime and fertilizer shall be worked into the soil with a disk harrow, spring-tooth harrow, or other suitable field implement to a depth of 3 in. On sloping land the soil shall be worked on the contour.

**SEEDING DATES AND SOIL CONDITIONS**

Seeding should be done March 1 to May 31 or Aug 1 to September 30. These seeding dates are ideal but, with the use of additional mulch and irrigation, seedings may be made any time throughout the growing season. Tillage/seedbed preparation should be done when the soil is

dry enough to crumble and not form ribbons when compressed by hand. For winter seeding, see the following section on dormant seeding.

**DORMANT SEEDINGS.**

1. Seedings shall not be planted from October 1 through November 20. During this period the seeds are likely to germinate but probably will not be able to survive the winter.
2. The following methods may be used for "Dormant Seeding":
  - From October 1 through November 20, prepare the seedbed, add the required amounts of lime and fertilizer, then mulch and anchor. After November 20, and before March 15, broadcast the selected seed mixture. Increase the seeding rates by 50% for this type of seeding.
  - From November 20 through March 15, when soil conditions permit, prepare the seedbed, lime and fertilize, apply the selected seed mixture, mulch and anchor. Increase the seeding rates by 50% for this type of seeding.
  - Apply seed uniformly with a cyclone seeder, drill, cultipacker seeder, or hydro-seeder (slurry may include seed and fertilizer) on a firm, moist seedbed.
  - Where feasible, except when a cultipacker type seeder is used, the seedbed should be firmed following seeding operations with a cultipacker, roller, or light drag. On sloping land, seeding operations should be on the contour where feasible.

## MULCHING

1. Mulch material shall be applied immediately after seeding. Seedings made during optimum seeding dates and with favorable soil conditions and on very flat areas may not need mulch to achieve adequate stabilization. Dormant seeding shall be mulched.

### 2. Materials

- Straw--If straw is used it shall be unrotted small-grain straw applied at the rate of 2 tons/ac. or 90 lb./1,000 sq. ft. (two to three bales). The mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000-sq.-ft. sections and spread two 45-lb. bales of straw in each section.
- Hydroseeders--If wood cellulose fiber is used, it shall be used at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other--Other acceptable mulches include mulch matings applied according to manufacturer's recommendations or wood chips applied at 6 tons/ac.

### 3. Straw Mulch Anchoring Methods

Straw mulch shall be anchored immediately to minimize loss by wind or water.

- Mechanical--A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but, generally, be left longer than 6 in.

- Mulch Nettings--Nettings shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.

- Asphalt Emulsion--Asphalt shall be applied as recommended by the manufacturer or at the rate of 160 gal./ac.

- Synthetic Binders--Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Tack or equal may be used at rates recommended by the manufacturer.

- Wood Cellulose Fiber--Wood cellulose fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lb./100 gal. of wood cellulose fiber.

## IRRIGATION

1. Permanent seeding shall include irrigation to establish vegetation during dry or hot weather or on adverse site conditions as needed for adequate moisture for seed germination and plant growth.

2. Excessive irrigation rates shall be avoided and irrigation monitored to prevent erosion and damage from runoff.

| Permanent Seeding                                     |              |                           |                                |
|---|--------------|---------------------------|--------------------------------|
| Seed Mix  | Seeding Rate |                           | Notes:                         |
|   | lb./ac.      | lb./1,000ft. <sup>2</sup> |                                |
| General Use   |              |                           |                                |
| Creeping Red Fescue                                   | 20-40        | ½-1                       |                                |
| Domestic Ryegrass                                     | 10-20        | ¼-½                       |                                |
| Kentucky Bluegrass                                    | 10-20        | ¼-½                       |                                |
| Tall Fescue   | 40           | 1                         |                                |
| Dwarf Fescue  | 40           | 1                         |                                |
| Steep Banks or Cut Slopes                             |              |                           |                                |
| Tall Fescue   | 40           | 1                         |                                |
| Crown Vetch   | 10           | ¼                         | Do not seed later than August. |
| Tall Fescue   | 20           | ½                         |                                |
| Flat Pea  | 20           | ½                         | Do not seed later than August. |
| Tall Fescue   | 20           | ½                         |                                |
| Road Ditches and Swales                               |              |                           |                                |
| Tall Fescue   | 40           | 1                         |                                |
| Dwarf Fescue  | 90           | 2¼                        |                                |
| Kentucky Bluegrass                                    | 5            |                           |                                |
| Lawns   |              |                           |                                |
| Kentucky Bluegrass                                    | 60           | 1½                        |                                |
| Perennial Ryegrass                                    | 60           | 1½                        |                                |
| Kentucky Bluegrass                                    | 60           | 1½                        | For shaded areas               |
| Creeping Red Fescue                                   | 60           | 1½                        |                                |
| Note: Other approved seed species may be substituted. |              |                           |                                |

Specifications  
for  
**Maintenance of Permanent Seeding**

1. Permanent seeding shall not be considered established for at least 1 full yr. from the time of planting. Seeded areas shall be inspected for failure and vegetation reestablished as needed. Depending on-site conditions, it may be necessary to irrigate, fertilize, overseed, or reestablish plantings in order to provide permanent vegetation for adequate erosion control.
2. Maintenance fertilization rates shall be established by soil test recommendations or by using the rates shown in the following table.

| Maintenance for Permanent Seedings<br>Fertilization and Mowing |          |         |                               |  |                          |
|--|----------|---------|-------------------------------|--|--------------------------|
| Mixture  | Formula  | lb./ac. | lb./1,000<br>ft. <sup>2</sup> | Time   | Mowing                   |
| Creeping Red Fescue<br>Ryegrass<br>Kentucky Bluegrass          | 10-10-10 | 500     | 12                            | Fall,<br>yearly or as<br>needed.   | Not<br>closer<br>than 3" |
| Tall Fescue  | 10-10-10 | 500     | 12                            |  | Not<br>closer<br>than 4" |
| Dwarf Fescue   | 10-10-10 | 500     | 12                            |  | Not<br>closer<br>than 2" |
| Crown Vetch<br>Fescue  | 0-20-20  | 400     | 10                            | Spring,<br>yearly<br>following<br>establish-<br>ment and<br>every 4-7<br>yr.<br>thereafter | Do not<br>mow            |
| Flat Pea<br>Fescue   | 0-20-20  | 400     | 10                            |  | Do not<br>mow            |

Note: Following soil test recommendations is preferred to fertilizer rates shown above.

## **SODDING**

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### **DESCRIPTION**

Sod is used to provide immediate soil stabilization in erosive areas such as drainageways and on steep slopes.

### **CONDITIONS WHERE PRACTICE APPLIES**

Sod may be used where immediate cover is required or preferred and where vegetation will be adequate stabilization such as minor swales, around drop inlets, and lawns.

Specifications  
for  
**Sodding**

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**MATERIALS**

1. Sod shall be harvested, delivered and installed within a period of 48 hr. Sod not transplanted within this period shall be inspected and approved prior to installation.
2. The sod shall be kept moist and covered during hauling and preparation for placement on the sod bed.
3. Sod shall be machine cut at a uniform soil thickness of 0.75 in., plus or minus 0.25 in., at the time of cutting. Measurements for thickness shall exclude top growth and thatch.

**SITE PREPARATION**

1. A subsoiler, plow or other implement shall be used to reduce soil compaction and allow maximum infiltration. (Maximizing infiltration will help control both runoff rate and water quality.) Subsoiling shall not be done on slip-prone areas where soil preparation should be limited to what is necessary for establishing vegetation.
2. The area shall be graded and resoiling shall be done where needed.
3. Soil Amendments:
  - Lime--Agricultural ground limestone shall be applied to acid soil as recommended by a soil test. In lieu of a soil test, lime shall be applied at the rate of 100 lb./1,000 sq. ft. or 2 tons/ac.
  - Fertilizer--Fertilizer shall be applied as recommended by a soil test. In lieu of a soil test fertilizer shall be applied at a rate of 12 lb./1,000 sq. ft. or 500 lb./ac. of 10-10-10 or 12-12-12 analysis.
  - The lime and fertilizer shall be worked into the soil with a disk harrow, spring-tooth harrow, or other suitable field implement to a depth of 3 in.
4. Before laying sod, the surface shall be uniformly graded and cleared of all debris, stones and clods larger than 3-in. diameter.

**SOD INSTALLATION**

1. During periods of excessively high temperatures, the soil shall be lightly irrigated immediately prior to laying the sod.
2. Sod shall not be placed on frozen soil.
3. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered in a brick-like pattern. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would dry the roots.
4. On sloping areas where erosion may be a problem, sod shall be laid with the long edge parallel to the contour and with staggered joints. The sod shall be secured with pegs or staples.
5. As sodding is completed in any one section, the entire area shall be rolled or tamped to ensure solid contact of roots with the soil surface. Sod shall be watered immediately after rolling or tamping until the sod and soil surface below the sod are thoroughly wet. The operations of laying, tamping and irrigating for any piece of sod shall be completed within 8 hr.

**SOD MAINTENANCE**

1. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4 in.
2. After the first week, sod shall be watered as necessary to maintain adequate moisture and ensure establishment.
3. The first mowing shall not be attempted until sod is firmly rooted.

## TEMPORARY SEEDING

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### DESCRIPTION

Temporary seeding provides erosion control on areas in between construction operations. Grasses which are quick growing are seeded and usually mulched to provide prompt, temporary soil stabilization. It effectively minimizes the area of a construction-site prone to erosion and should be used everywhere the sequence of construction operations allows vegetation to be established.

### CONDITIONS WHERE PRACTICE APPLIES

Temporary seeding should be applied on exposed soil where additional work (grading, etc.) is not scheduled for more than 45 days. Permanent seeding should be applied if the areas will be idle for more than a year.

### PLANNING CONSIDERATIONS

This practice has the potential to drastically reduce the amount of sediment eroded from a construction-site. Control efficiencies greater than 90% will be achieved with proper applications of temporary seeding. Because practices used to trap sediment are usually much less effective, temporary seeding is to be used even on areas where runoff is treated by sediment trapping practices. Because temporary seeding is highly effective and practical on construction-sites, its liberal use is highly recommended.

Specifications  
for  
Temporary Seeding

| Temporary Seeding Species Selection                   |   |                            |          |
|---|---|----------------------------|----------|
| Seeding Dates   | Species   | Lb./1,000 ft. <sup>2</sup> | Per Ac.  |
| March 1 to August 15                                  | Oats  | 3                          | 4 bushel |
|   | Tall Fescue   | 1                          | 40 lb.   |
|   | Annual Ryegrass                                       | 1                          | 40 lb.   |
|   | Perennial Ryegrass                                    | 1                          | 40 lb.   |
|   | Tall Fescue   | 1                          | 40 lb.   |
|   | Annual Ryegrass                                       | 1                          | 40 lb.   |
| August 16 to November 1                               | Rye   | 3                          | 2 bushel |
|   | Tall Fescue   | 1                          | 40 lb.   |
|   | Annual Ryegrass                                       | 1                          | 40 lb.   |
|   | Wheat   | 3                          | 2 bushel |
|   | Tall Fescue   | 1                          | 40 lb.   |
|   | Annual Ryegrass                                       | 1                          | 40 lb.   |
|   | Perennial Ryegrass                                    | 1                          | 40 lb.   |
|   | Tall Fescue   | 1                          | 40 lb.   |
|   | Annual Ryegrass                                       | 1                          | 40 lb.   |
| November 1 to Spring Seeding                          | Use mulch only, sodding practices or dormant seeding. |                            |          |
| Note: Other approved seed species may be substituted. |   |                            |          |

1. Structural erosion- and sediment-control practices such as diversions and sediment traps shall be installed and stabilized with temporary seeding prior to grading the rest of the construction-site.
2. Temporary seed shall be applied between construction operations on soil that will not be graded or reworked for 45 days or more. These idle areas should be seeded as soon as possible after grading or shall be seeded within 7 days. Several applications of temporary seeding are necessary on typical construction projects.
3. The seedbed should be pulverized and loose to ensure the success of establishing vegetation. However, temporary seeding shall not be postponed if ideal seedbed preparation is not possible.
4. Soil Amendments--Applications of temporary vegetation shall establish adequate stands of vegetation which may require the use of soil amendments. Soil tests should be taken on the site to predict the need for lime and fertilizer.
5. Seeding Method--Seed shall be applied uniformly with a cyclone seeder, drill, cultipacker seeder, or hydroseeder. When feasible, seed that has been broadcast shall be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used, the seed and fertilizer will be mixed on-site and the seeding shall be done immediately and without interruption.

## MULCHING TEMPORARY SEEDING

1. Applications of temporary seeding shall include mulch which shall be applied during or immediately after seeding. Seedings made during optimum seeding dates and with favorable soil conditions and on very flat areas may not need mulch to achieve adequate stabilization.

### 2. Materials:

- Straw--If straw is used, it shall be unrotted small-grain straw applied at the rate of 2 tons/ac. or 90 lb./1,000 sq. ft. (two to three bales). The mulch shall be spread uniformly by hand or mechanically so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000-sq.-ft. sections and spread two 45-lb. bales of straw in each section.
- Hydroseeders--If wood cellulose fiber is used, it shall be used at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other--Other acceptable mulches include mulch mattings applied according to manufacturer's recommendations or wood chips applied at 6 tons/ac.

3. Straw mulch shall be anchored immediately to minimize loss by wind or water. Anchoring Methods:

- Mechanical--A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but, generally, be left longer than 6 in.
- Mulch Nettings--Nettings shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentration runoff and on critical slopes.
- Asphalt Emulsion--Asphalt shall be applied as recommended by the manufacturer or at the rate of 160 gal./ac.
- Synthetic Binders--Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Tack or equal may be used at rates recommended by the manufacturer.
- Wood-Cellulose Fiber--Wood-cellulose fiber binder shall be applied at a net dry weight of 750 lb./ac. The wood-cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lb./100 gal.

## TREE PRESERVATION AREA

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### DESCRIPTION

Trees that exist on-site prior to development may be protected so they will continue to survive after construction. Tree preservation may be used to protect areas of forest such as buffer strips along streams or to protect individual specimen trees.

### PLANNING CONSIDERATIONS

**Forest Delineation**--Tree preservation must begin before the location of buildings, roads and utilities is determined. The early site planning should include an inventory of trees. The tree inventory should be considered along with other site characteristics such as topography, streams and wetlands. Useful information in the inventory includes:

- Individuals trees over a given size (ie., 6 in. in diameter),
- Number of trees per size,
- Total number of species,
- Specimen trees.

## DESIGN CRITERIA

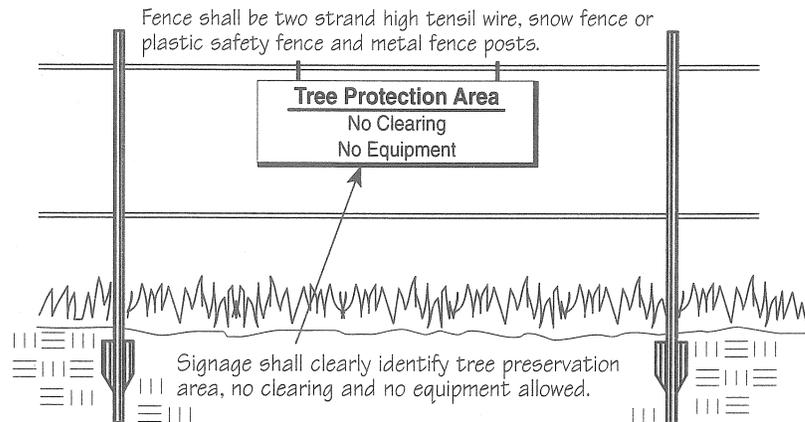
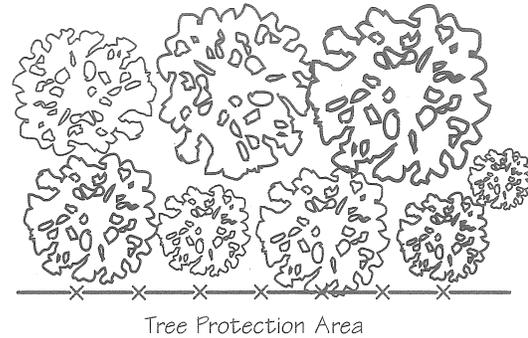
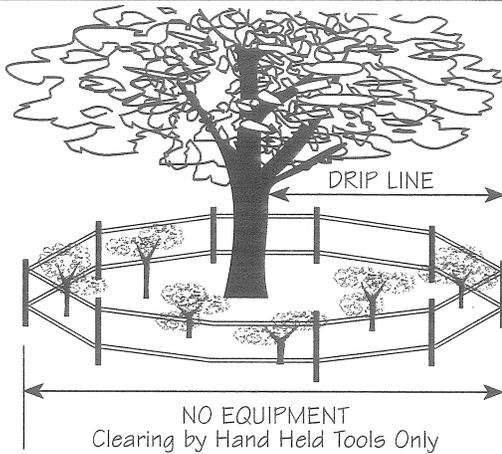
**Site Plan**--For tree preservation to be effective, the following should be part of the site plan and erosion-control plan:

- Limits of clearing and grubbing and tree preservation areas,
- Specimen trees identified by size and type,
- Measures to protect preservation areas during construction,
- Measures to protect preservation areas following construction,
- Areas for reforestation.

**Protection During Construction**--Tree protection areas must be made visible during construction. A physical barrier of a fence and signage must be in place prior to clearing and remain in place throughout construction. A tree's root zone is critical to its ability to survive. Damaging the root zone during construction will lead to that tree's death, whether that occurs within 1 yr. or 10. Ninety-five percent of a tree's roots are in the upper 12-18 in. of soil, and the majority of the roots supplying nutrients and water are found just below the soil surface. The critical root zone extends at least to the drip zone of a tree and must be protected from soil compaction, grubbing small trees and other disturbance.

**Permanent Visual Barrier**--Protecting forest vegetation requires permanent visual barriers to encroachment. It is not enough to protect areas with conservation easements, deed restrictions or even separate ownership. Forested stream buffers, parks and valuable wood lots are often severely degraded by mowing, removal of understory and ground cover, and dumping yard waste. Permanent signs or fences should identify the area and describe allowable uses.

Specifications  
for  
**Tree Preservation Area**



1. Tree preservation areas shall be fenced prior to beginning clearing operations.
2. Fence materials shall be metal fence posts with two strands of high tensile wire, plastic fence or snow fence.
3. Signage shall clearly identify the tree protection area and state that no clearing or equipment is allowed within it.
4. Fence shall remain around tree protection areas until after final grading has been completed.
5. Fence shall be placed as shown on plans and beyond the drip line or canopy of trees to be protected.
6. If any clearing is done around specimen trees it shall be done by cutting at ground level with hand held tools and shall not be grubbed or pulled out. No clearing shall be done in buffer strips or other preserved forested areas.