Erosion Control Mulching

BENEFITS

	L	M	H
Flow Control	■		
Erosion Control	■	■	
Sediment Control	■		
Runoff Reduction	■		
Flow Diversion			

Description: Mulching is the application of organic material over soil that is bare or immediately over soil that has been seeded. Mulch prevents erosion by preventing the detachment of soil particles, slows runoff velocity, and retains moisture to improve germination and establishment of vegetative cover.

Typical Uses: This practice may be applied on exposed soils as a temporary control where soil grading or landscaping has taken place or in conjunction with temporary or permanent seeding. When time constraints prevent the establishment of vegetation (seeding), mulch such as wood chips, straw, or compost can be used independently as a temporary soil stabilization practice that protects the soil surface until vegetation establishment can be completed.

Advantages:
- Provides immediate surface protection.
- Suppresses weed growth.
- Conserves soil moisture.
- Acts as a thermal layer for seed.
- If used in conjunction with seed, allows seed growth through the mulch.
- Useful for dust control.

Limitations:
- If applied too thick, it may inhibit seed germination.
- Can blow or wash away if not anchored properly.

Longevity: Varies by material (three months to one year)

SUDAS Specifications: Refer to Section 9040, 2.17 and 3.20.

A. Description/Uses

Used alone or applied over seed, mulch provides immediate erosion protection. Mulching without seeding may be considered for very short-term protection. Mulch protects the disturbed soil surface by absorbing the impact of raindrops, thereby preventing the detachment of the soil particles. It also retains and absorbs water, slowing runoff. These properties allow for greater infiltration of water into the soil; help to retain seeds, fertilizer, and lime in place; and improve soil moisture and temperature conditions for seed germination. Mulch is essential in establishing good stands of grasses and legumes. To prevent movement by wind or water, the mulch must be anchored to the soil.

B. Design Considerations

The plans and specifications should address the type of mulch used, application rate, timing of the application, method of anchoring, and schedule for installation, inspection, and maintenance.

1. **Site Preparation:** The soil surface shall be prepared before the application of mulch to achieve the desired purpose and to ensure optimum contact between soil and mulch.

2. **Material Considerations:**

   a. **General:**
      1) Mulching should not be performed during periods of excessively high winds that would preclude the proper placement of mulch.
      2) Concentrated flows should be diverted around areas where mulch is applied.
      3) If ground is seeded, mulching should be completed during or immediately after seeding.
      4) Depending on the seeding period, a heavier application of mulch may be needed to prevent seedlings from being damaged by frost.
      5) In areas where lawn-type turf will be established, the use of tackifiers is the preferred anchoring method. Crimping tends to leave an uneven surface and netting can become displaced and entangled in mowing equipment.
      6) The product longevity should match the length of time the soil will remain bare or until vegetation occurs.

   b. **Straw:**
      1) Straw mulch should be applied in conjunction with temporary or permanent seeding, except when applied for short-term (less than 3 months) stabilization prior to the allowable seeding date.
      2) To prevent straw mulch from being windblown, it is anchored to the soil surface using tackifiers, nets, or a mulch crimping machine.
      3) Mechanical anchoring or crimping is recommended only for slopes flatter than 2:1. Mulch on slopes steeper than 2:1 should be anchored to the soil with netting, or other alternatives, such as a rolled erosion control product, considered.
      4) The use of straw mulch behind the curb line or at the edge of the roadway may be undesirable due to the potential for displacement by vehicle air turbulence. Anchor straw mulch with netting or consider the use of hydromulch, an erosion mat, or sod as an alternative.
      5) Only use straw free from all noxious weeds, seed bearing stalks, or roots.
      6) Expected longevity is less than 3 months.

c. Wood Chips/Grindings:

1) Do not use wood chips/grindings over newly seeded areas.
2) Chips may be produced from vegetation removed from the site.
3) Chips are effective on slopes up to 3:1.
4) Wood chips decompose over an extended period. This process may take nitrogen from the soil. To prevent nitrogen deficiency in the soil, the wood mulch should be treated with a nitrogen rich fertilizer.
5) Do not use in areas where fine turf will be established.
6) Expected longevity is less than 12 months.

d. Hydromulch: Hydromulching is normally conducted in conjunction with hydroseeding, but can also be applied as a stand-alone practice. Several different types of hydromulch are available, and each has different material properties and typical uses:

1) Wood Cellulose Fiber Hydromulch:

a) Produced from wood pulp and recycled paper
b) Most commonly used hydromulch
c) Use is limited to slopes 6:1 or flatter.
d) Typically requires 24 hours to dry before rainfall occurs to be effective against erosion.
e) Expected longevity is 3 to 12 months.

2) Bonded Fiber Matrix (BFM) Hydromulch:

a) Produced from strands of elongated wood fibers and a binding agent
b) May be used on slopes up to and including 2:1.
c) Typically requires 24 hours to dry before rainfall occurs to be effective against erosion.
d) Expected longevity is 3 to 12 months.
e) Provides significantly superior erosion protection than straw mulch or wood cellulose hydromulch.

3) Mechanically Bonded Fiber Matrix (MBFM) Hydromulch:

a) Produced from strands of elongated wood fibers and crimped synthetic fibers to create an interlocking mechanism between the fibers. Material is combined with additional binding agents.
b) May be used on slopes up to and including 2:1.
c) Provides immediate protection against erosion. No cure time is required to develop surface protection.
d) Expected longevity is 12 months or greater.
e) Provides significantly superior erosion protection than straw mulch or wood cellulose hydromulch.

e. Compost:

1) Compost may be used as mulch, either with or without seeding for erosion protection. See Section 7E-2.
2) Expected longevity is less than 12 months.

C. Application

1. **Mulching without Seeding:** Wood mulch and compost applied without seed, should be applied to a uniform depth of 1 to 3 inches depending on the slope. Straw mulch should be applied at a rate of 2 tons per acre to achieve the specified coverage rate. Wood cellulose fiber hydromulch should be applied at a rate of 2,600 pounds per acre. BFM and MBFM hydromulch should be applied at a rate of 3,600 pounds per acre.

The application of straw mulch over frozen ground or snow cover in the late fall or early winter, while not ideal, is one of the few practices available for this type of situation. Mulch placed over snow or frozen ground provides some level of erosion protection and surface stabilization as the snow melts or frost leaves the ground and before the application of other stabilizing practices in the spring.

2. **Mulching for Seeding:** Straw mulch over newly seeded areas should be applied at a rate of 1 1/2 tons per acre. This application provides some protection to the surface while allowing some sunlight to penetrate and air to circulate thereby promoting seed germination. When compost is used as mulch over newly seeded areas, a minimum thickness of 1 inch should be spread evenly over flat surfaces. For compost used as mulch on slopes, see compost blankets in Section 7E-2. Hydromulch products applied with seeding (hydroseeding) are applied at the same rate as without seeding (see paragraph above).

The NPDES General Permit No. 2 requires that stabilization measures be initiated immediately when earth disturbing activities have permanently ceased or if temporarily ceased and will not resume again for 14 or more days. Mulching is one way to meet this requirement.

D. Maintenance

Inspect mulched areas for signs of thin or bare spots. Add mulch as required to maintain the thickness of the cover. Areas that show signs of erosion should be repaired and may require additional protection with an erosion control blanket or another method.

E. Time of Year

Mulch applications for establishing vegetation should be done when weather and soil conditions are favorable. Mulch can be applied over bare frozen ground that has not been seeded to help prevent erosion until vegetation can be established.