

1. Description

Seeding and mulching is used to provide permanent or temporary stabilization to areas of disturbance. This operation consists of site preparation, soil amendments, seedbed preparation, seeding and mulching.

2. Site Preparation

- 2.1** Prior to the start of operations, the Contractor shall install all erosion and sediment control measures as may be shown on the Project Drawings.
- 2.2** The Contractor shall perform all final grading operations at right angles to the slope. Final grading and shaping may not be required for temporary seeding.

3. Soil Amendments

- 3.1** The GCSWCD has performed soil tests to determine the exact ratios and application rates for both lime and fertilizer. Contractors shall refer to the rates and types of materials to be applied as shown in Table 11-a of this specification.
- 3.2** Fertilizers shall be of uniform composition and shall be suitable for accurate application by approved equipment. Fertilizers shall be delivered to the site in their manufacturer's packaging, and shall meet all applicable state or federal laws related to labels. The manufacturer's name, fertilizer formulation and other required information shall be clearly marked on the packaging.
- 3.3** When lime is required, the materials shall be ground limestone, hydrated lime or burnt lime. Lime materials shall contain a minimum of 50% total oxides and shall be ground such that 50% passes a #100 mesh sieve and 98-100 % shall pass a #20 mesh sieve. Lime will be incorporated into the top 3"-6" of soil by disking or other suitable means.

4. Seedbed Preparation, Temporary Seeding

- 4.1** For temporary seeding, the Contractor shall prepare a suitable seedbed by loosening soil to a depth of 3"-6" by means of suitable equipment.
- 4.2** The area shall not be rolled, or smoothed. On slopes greater than 3:1, the surface shall be tracked with heavy equipment such that the surface is irregular with track ridges running parallel to the slope contour.

5. Seedbed Preparation, Permanent Seeding

- 5.1** The Contractor shall loosen all disturbed areas to depth of 3"-6". In areas where repeated access by heavy equipment or trucks has caused compaction, the Contractor shall loosen the soil to a depth of 12". The Contractor may use agricultural or construction equipment to perform the task.
- 5.2** The Contractor shall conduct final grading of all disturbed areas in conformance with the Project Drawings. All surfaces shall be smooth and free of large rocks. On sloped areas (greater than 3:1), the Contractor shall use track equipment to compact the slope and produce ridges parallel to the slope contour.
- 5.3** When topsoil has been stockpiled during the construction of the project, the contractor shall spread the topsoil on the disturbed areas after the soil has been loosened and the rough grading completed.
- 5.4** Apply soil amendments as shown in Table 11-b of these specifications. Mix amendments into the top 3"-5" of the top soil by disking or other suitable means.
- 5.5** In lawn areas as shown on the Project Drawings, the Contractor shall rake the seedbed surface to remove rocks and other large debris. The surface shall be clear of obstructions and debris and must be suitable for mowing upon establishment of the seeding.

6. Seed Specifications:

- 6.1** All seed must meet all applicable state and federal regulations and must include labeling indicating the supplier, formulation, germination rates and seed date. Seed may be subject to re-testing by a certified lab. The Contractor shall submit a copy of the seed label for approval by the Contracting Officer.
- 6.2** When inoculates are required for legume seed, the inoculate shall be provided by the same supplier as the seed. Inoculates shall be fresh and viable and must not have exceeded their expiration date. The Contractor shall apply the inoculates in accordance with the manufacturers recommended application rate and procedures. In hydro-seeding operations, inoculates shall be applied at a rate four times (4x) the recommended rate.
- 6.3** The Contractor shall use a seed mix and application rate as set forth in Table 11-c of this specification.

7. Methods of Seeding:

- 7.1** Hydro-seeding - The application of a combination of seed, fertilizer and mulch in a slurry mixture.

- a. If fertilizer is applied at time of seeding, the application rate will not exceed 100 lbs/Ac Nitrogen, 200 lbs/Ac P and 200 lbs/Ac K.
- b. When lime is to be applied by the hydro-seeder, the rate shall not exceed 3 tons/Ac. Burnt or hydrated lime shall not be used.
- c. Hydro-seeding mixtures shall be prepared on site, and applied immediately. No seed/mulch mix that has been left in the seeder for more than eight (8) hours shall be used.

7.2 Dry Seeding - This includes the use of conventional drop or broadcast spreader.

- a. Dry seed applications shall be incorporated into the subsoil at the rates prescribed in **Table 11-c** of this specification
- b. Upon seeding, the Contractor shall use a weighted roller over the area to provide for good seed to soil contact.
- c. Where practical, seed shall be applied in tow directions perpendicular to each other. Apply half of the seeding rate in each direction.

7.3 Drill/Cultipacker Seeding - The use of mechanized spreaders that apply and cover seed with soil.

- a. Seedings completed by cultipacker shall bury the seed to a minimum depth of 1/4" and the seedbed must be firm after planting.
- b. Where practical, seed shall be applied in tow directions perpendicular to each other. Apply half of the seeding rate in each direction

8. Mulch Materials

8.1 Straw

Straw mulch shall consist of well threshed wheat, rye or oak straw and shall be reasonably bright. Mulch must be free of mold and noxious seed and shall not be musty, caked, decayed or excessively dusty.

8.2 Wood Cellulose Fiber Mulch (WCFM)

WCFM shall consist of prepared wood cellulose processed into a uniform fibrous physical state, and shall contain a dye to facilitate visual inspection of the uniformity of the application. WCFM shall not contain germination or growth inhibiting factors.

9. Mulching Application

- 9.1** All areas shall be mulched immediately upon completion of the seeding operations. Mulch shall be applied so as to provide a uniform cover on all seeded areas.
- 9.2** When straw mulch is specified, the Contractor shall provide for anchoring of the mulch. Anchoring may be accomplished by mechanical equipment designed to punch and anchor mulch or by the use of a liquid binder.
- 9.3** When liquid binders are used, they shall be applied at a uniform rate as provided for in the manufacture's directions. The Contractor shall provide the Contracting Officer with a copy of the manufacture's literature prior to use of any liquid binder.
- 9.4** Mulch shall be applied at the rate shown in Table 11-d of this specification.
- 9.5** In areas where plant materials such as facines are to be installed at a later date, the Contractor shall apply a heavy layer of mulch to provide temporary protection to the disturbed surface. Temporary mulch shall be applied at the rate shown in Table 11-d of this specification.

10. Method Of Payment

- Method 1: Lump Sum - Contractor shall estimate total disturbed area and provide a lump sum price for completion of the work under this specification.
- Method 2: Unit Price - Contractor shall provide a unit price for items of work under this specification. The Contractor shall measure and submit to the Contracting Officer for approval, a sum total of the work completed and a total cost based on the contract unit price. The Contractor shall review the submitted units completed and confirm the measurements prior to payment for work under this specification.

Under both methods, final payment shall be considered full compensation for this item of work, and shall include but is not limited to costs for labor, equipment and supplies required for the work.

11. Special Conditions

In addition to the conditions set forth above, the Contractor shall meet all of the following requirements. Each requirement corresponds to the numbering in the preceding sections

11.1 Soil Amendments

The Contractor shall apply soil amendments at the following rate and formulation.

Table 10-a Soil Amendment Application Rate

Amendment	Application Rate Lbs/Ac	Application Rate Lbs/1000sf
Lime	None	None
Fertilizer (10-10-10)	None	None

11.2 Seed Specifications

The Contractor shall apply seed at the following mixture and application rate. A conservation seed mix of comparable formulation may be used only if the label is provided to the Contracting Officer for approval prior to seeding.

Table 10-b Seed Specifications & Application Rate

Species	Application Rate Lbs/Ac	Application Rate Lbs/1000 SqFt
Birdsfoot Trefoil	8	.20
Tall Fescue	8	.20
Perennial Rye	5	.10

11.3 Methods of Seeding

Under this contract, all seeding and mulching shall be conducted using the hydro-seeding method of seeding. No lime or fertilizer will be required.

11.4 Mulch Materials

Under this contract, Wood Cellulose Fiber Mulch (WFCM) shall be used in the hydro-seeding operations. The Contractor may substitute a manufactured, recycled paper mulch if such mulch has been developed specifically for hydro-seeding, and it meets the conditions as set forth in this specification.

11.5 Mulching Applications

Table 11-d: Mulch Application Rate

	Application Rate Lbs/Ac	Application Rate Lbs/1000 SqFt
Temporary Mulching	2000	45.9
Permanent Mulch	1500	34.5

11.6 Method of Payment

Method #2: Unit Bid Price will apply. Payment will be paid on a per Square Foot (sqft) basis