

SECTION 603

SEEDING

I. GENERAL

1.1 DESCRIPTION OF WORK

The Contractor shall furnish all labor, supervision, material (except as herein provided), tools, equipment, supplies, and services; and, shall perform all Work necessary for providing and applying fertilizer, lime, seed and mulch in the quantities specified for areas designated in the Contract Documents or selected by the Owner.

1.2 MATERIALS

Seed, Fertilizer, Lime, Mulches, Hydraulic Erosion Control Products (HECPs), Fast Acting Lime, and Sediment Retention Products shall conform to the requirements of Section 200.

1.3 SUBMITTALS

Prior to use or placement, the Contractor shall submit certifications in the form of affidavits from the material suppliers, together with supporting data, attesting that the composition of lime, fertilizer, seed, mulch, fast acting lime and HECPs meet specification requirements.

II. EXECUTION

2.1 PROCEDURES

- A. Seeding operations shall not be performed when the ground is frozen or when soil or weather conditions would prevent proper soil preparation and subsequent operations. When hydroseeding is performed, nozzles or sprays shall not be directed toward the ground in a manner that will cause erosion or runoff. The Contractor shall notify the Owner at least 48 hours prior to beginning seeding operations.
- B. Preparing Soil
 1. Slopes 3:1 or flatter shall be loosened to a depth of approximately 3 inches by disking, harrowing, or other methods approved by the Owner.
 2. Excavated slopes steeper than 3:1: Loosening of soil on excavated slopes steeper than 3:1 will not be required except to eliminate hard or crusted surfaces.
 3. Shoulders and embankment slopes steeper than 3:1 shall be loosened to a depth of approximately 1 inch.
 4. Clods, loose stones, and other foreign material larger than 1 inch in any dimension shall be removed and disposed of in accordance with Section 106.04 or as directed by the Owner.
 5. Gullies, washes, and disturbed areas that develop subsequent to final grading shall be repaired before they are seeded. Soil preparation for overseeding shall include the repair

of gullies, washes, and disturbed areas that develop prior to final overseeding and project acceptance.

6. Topsoil, when specified, shall be applied in accordance with Section 602.

C. Applying Lime

- Agricultural Lime: Lime shall be uniformly applied to areas to be seeded at the rate of 2 tons per acre (unless specified otherwise by soil tests). Lime shall be uniformly incorporated into the prepared soil prior to seeding. Lime may also be applied through a hydraulic seeder. The method of application for all lime products shall be approved by the Owner prior to applying the lime. Lime applied by a hydraulic seeder shall be constantly agitated during application.
- Applying Fast Acting Lime: Fast acting lime may be applied in either liquid or dry form to provide an immediate pH adjustment. Apply liquid fast acting lime at the rate of 5 gallons per acre or as recommended by the manufacturer's instructions. Apply dry fast acting lime at the rate of 100 pounds per acre or as recommended by the manufacturer's instructions.

D. Applying Fertilizer

The Contractor shall apply fertilizer for temporary, permanent and overseeding applications in accordance with the requirements herein and at the rates and timeframes specified in the Contract Documents.

The Contractor may apply all slow release and slowly soluble fertilizer through a hydraulic seeder except for Sulfur Coated Urea (SCU). The method of application for all fertilizer products shall be approved by the Owner prior to applying the fertilizer. Fertilizer applied in liquid form or mixed with water shall provide the same value of nutrients per acre as specified for dry fertilizer. Fertilizer applied in liquid form shall be constantly agitated during application.

When dry fertilizer is used, it shall be applied uniformly to the seeding areas at the time of seeding at the rate of 600 pounds of 15-30-15 fertilizer, or an equivalent 1-2-1 fertilizer, per acre (unless specified otherwise by soil tests). The method of application shall be approved by the Owner before fertilizer is applied.

E. Applying Seed

Applying regular seed shall consist of preparing the seed bed and uniformly applying seed, fertilizer, lime, fast acting lime, and biological growth stimulants over the area designated to be seeded in the Contract Documents.

The Contractor shall ensure that all biological growth stimulant applications strictly follow the manufacturer's rates and recommendations to avoid damage to or burning of the seedbed. Use approved hydraulic methods to apply biological growth stimulants.

Where temporary seeding is employed as a means of soil stabilization of unfinished areas it shall consist of applying seed, fertilizer, and mulch in accordance with the rates specified in the Contract Documents or specified herein to stabilize areas on which grading operations are anticipated to be suspended for durations greater than 14 days. Where temporary seeding is required or directed by the Owner, the cost for removal of vegetation once grading operations resume shall be included in the price of seeding.

For hydroseeding, seed shall be put in the mixture slowly to result in a uniform mixture before application. Hydroseeding mixtures shall be constantly agitated from the time of mixing until application on the seed bed and shall be applied within 8 hours from the beginning of mixing operations.

Overseeding shall generally consist of applying reduced quantities of seed and fertilizer on prepared areas as directed by the Owner.

Leguminous seeds shall be inoculated or treated with approved cultures as specified by the manufacturer or directed by the Owner before they are applied or mixed with other seeds to be applied. Leguminous seed shall be applied within 24 hours after treatment. When the hydroseeding method is used to accomplish seeding, leguminous seeds shall be treated with 5 times the amount of inoculant recommended by the manufacturer.

F. Applying mulch or hydraulic erosion control products (HECP) for seeding or erosion control:

The Contractor shall apply mulch or hydraulic erosion control products within 48 hours after completion of the seeding operation.

Selection of the appropriate seeding mulch or hydraulic erosion control product for seeding shall be based on the following table. Mulch will not be required for overseeded areas.

HECP Selection	Maximum Slope
HECP, Type 1	<= 4 to 1
HECP, Type 2	<= 3 to 1
HECP, Type 3	<= 2 to 1
HECP, Type 4	<= 1 to 1

HECP shall conform to the requirements of Section 200 and shall be applied at the following amounts per type:

1. HECP, Type 1 at the rate of 2,000 Pounds per acre. In lieu of applying Type I the Contractor may substitute one of the following for the HECP Type 1 with the approval of the Owner.
 - a. Straw and hay at the rate of approximately 2 tons per acre. Straw and hay shall be applied to a uniform thickness in such a manner that not more than 10 percent of the soil surface will be exposed once installed. Wet straw or wet hay shall not be used. Straw or hay shall be anchored to the seeded surface by spraying with a HECP, Type 1 at the rate of 750 pounds per acre; or using other materials or methods approved by the Owner. Straw or hay should not be used on medians or shoulders that are directly adjacent to roadways that are open to traffic.
 - b. HECP, Type 1 at a rate of 1,000 pounds per acre along with the installation of Rolled Erosion Control Products (RECP), EC 2 Type 1.
2. HECP Type 2 at a rate of 2,500 pounds per acre. In lieu of installing at the previous rate, the Contractor may substitute HECP, Type 2 at a rate of 1,000 pounds per acre along with the installation of RECP, EC 2 Type 1.
3. HECP Type 3 at a rate of 3,000 pounds per acre. In lieu of installing HECP, Type 3 at the

previous rate the Contractor may substitute one of the following with the approval of the Owner.

- a. HECP, Type 3 at a rate of 1,000 pounds per acre along with the installation of RECP, EC-2, Type 3 or,
 - b. A compost blanket at the rate of 806 cubic yards per acre (average depth of 2 inches).
4. HECP, Type 4 at a rate of 3,500 pounds per acre. In lieu of installing HECP, Type 3 at the previous rate the Contractor may substitute HECP, Type 4 at a rate of 1,000 pounds per acre along with the installation of Rolled Erosion Control Product EC 2, Type 4 with the approval of the Owner.

G. Installing Sediment Retention Rolls as Slope Interrupters

The Contractor shall install sediment retention roll for use in conjunction with Hydraulic Erosion Control Product (HECP) applications prior to the HECP installation. The Contractor shall excavate a trench along (parallel) the contour of the slope to a depth that is 1/3 the diameter of the sediment retention roll. Place the excavated soil on the up-slope side of the trench. Place the tube into the trench so it contours to the soil surface, ensuring that no gaps exist beneath the tube. Compact the excavated soil against the tube on the up-slope side. Ensure the installation of the tube does not damage the prepared seedbed.

Where sediment retention rolls are installed with RECP applications; install them on top of the RECP after the RECP installation is completed. Tube trenching is not required for RECP applications. Ensure the installation of the roll does not damage the installed RECP.

Sediment retention rolls used as slope interrupters shall be installed in accordance with the incremental seeding requirements in Section 303. Sediment retention rolls used as slope interrupters shall be 18, 20, or 24 inches in diameter in accordance with the manufacturer's instructions and site conditions or as directed by the Owner.

2.2 ESTABLISHMENT AND MAINTENANCE

- A. Areas not showing signs of grass growth shall immediately be reseeded. Protection shall be provided against traffic or other use by erecting barricades immediately after treatment is completed, and by placing warning signs, as directed. The Contractor shall assume responsibility for proper care of seeded areas while grass is becoming established for three months after completion of treatment on the entire project, unless desired cover is established in a shorter period of time. When any portion of the surface becomes gullied or otherwise damaged or treatment is destroyed, the affected portion shall be repaired to re-establish condition and grade of soil and treatment prior to injury, as directed. Repair work required because of faulty operations or negligence on the part of the Contractor shall be performed without additional cost.
- B. Mulched areas shall be maintained until all work or designated portions thereof have been completed and accepted. Any damage shall be repaired, and mulch material that has been removed by wind or other causes shall be replaced and secured.

2.3 CLEANUP AND PROTECTION

- A. The Contractor shall keep pavements clean and work area in an orderly condition.
- B. The Contractor shall protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers; and, shall maintain protection during installation and maintenance periods.

III. MEASUREMENT FOR PAYMENT

- A. Lime will be measured in tons and will be paid for at the contract unit price per ton.
- B. Fertilizer will be measured in pounds and will be paid for at the contract unit price for the quantity of each of the three fertilizer components of the nitrogen-phosphoric acid-potash (N-P-K) ratio. Weights are determined by manufacturer certification of the N-P-K ratio and weight ticket from a certified scale in the case of bulk delivery. For a bagged product, the N-P-K ratio and weight on the bag shall be used.
- C. Regular Seed will be measured in pounds of seed applied and will be paid for at the contract unit price per pound.
- D. Temporary Seed will be measured in pounds of seed applied and will be paid for at the contract unit price per pound.
- E. Legume Seed will be measured in pounds of seed applied and will be paid for at the contract unit price per pound. This price shall include applying the inoculant during the seeding process.
- F. Overseeding will be in pounds of seed applied and will be paid for at the contract unit price per pound. This price shall include the repairing gullies, washes, and disturbed areas that develop subsequent to seeding and furnishing and applying seed and additional fertilizer and lime.
- G. Prices for seed shall include preparing seed beds; furnishing and applying seed, fast acting lime, biological growth stimulant, fertilizer, and lime; and maintaining seeded areas until final acceptance. When bags of seed are transferred from project to project, certified scales shall be used for weighing the seed. The Owner will not accept open bags for use.
- H. Hydraulic Erosion Control Products will be measured in square yards and will be paid for at the contract unit price per square yard for the type specified. This price shall include preparing seed beds; furnishing and installing, preparing slopes or channels as required.
- I. Sediment Retention Products will be measured in linear feet and will be paid for at the contract unit price per linear foot.
- J. Incidental items are identified in Section 109.I.1.2 and also include the following:

Maintaining seeded areas until final acceptance.

End of Section