

# **Specifications for SEEDING FOR EROSION CONTROL**

## **1. GENERAL**

### **1.1. SCOPE**

Provide all supervision, labor, materials, tools, equipment and related items required for preparing ground, providing for sowing of seeds and fertilizing, mulching with straw, watering weed control, and other management practices required for erosion control and to obtain a grass cover. Areas requiring seeding for erosion control will include the levee and roadway embankment, drainage ditches, outfall channel, all borrow areas, and all areas disturbed by construction, including the working easement.

### **1.2. RELATED WORK**

### **1.3. QUALITY ASSURANCE**

#### a. Regulatory Requirements

- (1) Seed shall comply with U.S. Department of Agriculture rules and regulations under the Federal Seed Act:
- (2) Bags of fertilizer shall be fully labeled complying with applicable State fertilizer laws and shall bear the name, trade name, trademark, and warranty of producer.

#### b. Contractor Quality Control

- (1) Contractor shall inspect and test for compliance with requirements including, but not limited to, the following:
  - (a) Seed bed preparation and fertilizer application rate and uniformity
  - (b) Planting seed: Rate, uniformity, and cultipacking
  - (c) Application of mulch: Rate
- (2) Furnish copy of records of inspection and tests, as well as records of corrective action taken, to Owner's representative at job site on the following workday or less frequently as approved by Engineer.

c. Purity and Germination. Percent of purity and germination (see Plant Schedule this Section) shall be warrantied by seed supplier.

d. Certification. Suppliers shall certify that laboratory and field testing of their product has been accomplished and that their product meets the product specifications in this Section based on such testing.

e. Water. For watering plantings, use water free of impurities harmful to plant growth.

### **1.4. SUBMITTALS**

#### a. Certificates.

- (1) Furnish signed statement from vendor certifying that each lot of seed is equivalent to specified requirements.
- (2) Obtain certification and copies of official seed analysis or official seed tags from vendor and furnish prior to commencement of planting operations.

b. Samples.

- (1) Furnish and test samples of each lot of fertilizer.
- (2) Sampling and testing shall be in compliance with Official Methods Analysis of the Association of Official Analytical Chemists.
- (3) Furnish mulch samples proposed to be used upon request of Engineer.

c. Invoices.

- (1) Fertilizer: Furnish Engineer copies of invoices showing quantities and grade of each fertilizer furnished.
- (2) Mulch: Furnish to Engineer duplicate copies of invoices showing quantities of bags and total weight at delivery of each load.

## 1.5. PRODUCT HANDLING

a. Seed.

- (1) Furnish seed in sealed standard containers.
- (2) Seed that has become wet, moldy, or otherwise damaged in transit or in storage shall not be used.
- (3) Wet, moldy, or otherwise damaged seed will be rejected and removed from site.

b. Fertilizer. Deliver to site in bags

## 1.6. MEASUREMENT AND PAYMENT

No separate payment will be made for the work specified in this section. Include the cost of the work under this section in the respective contract lump sum price. Payment of the work shall be as follows:

- (1) 75% of Scheduled Value upon application of seeding, fertilizing and hay mulch application.
- (2) 25% of the Scheduled Value upon establishment of turf and the watering, maintenances and mowing completion, and acceptance by Owner. Acceptance requires a minimum of two times mowing as specified and 95% coverage per square yard by the primary grass per planting season is achieved.
- (3) 100% of the Scheduled Value, as a separate payment, upon installation of a temporary irrigation system.

## 2. PRODUCTS

### 2.1. MATERIAL

a. Seed. Refer to Planting Schedule this Section.

b. Fertilizer. 10-20-10 grade, pelleted, uniform in composition, free-flowing, and suitable for application with equipment used.

c. Straw or Hay Mulch. Straw mulch shall be oat, wheat, or rice straw mulch. Hay mulch shall be prairie grass, Bermuda grass, or other hay as approved. The mulch shall be free of Johnson grass or other noxious weeds and foreign materials. It shall be kept in a dry condition and shall not be molded or rotted.

### **3. EXECUTION**

#### **3.1. GENERAL**

- a. Accomplish seeding, mulching, and fertilizing work, within one of the planting periods specified in paragraph entitled "Planting Schedule" of this section; or combine planting periods, at no additional cost to owner, if planting takes place between September 1 through February 15.
- b. If factors prevail to such an extent that satisfactory results are not likely to be obtained stop any phase of the work and resume work when desired results are likely to be obtained.
- c. Conduct seeding and mulching operations across slope.
- d. Accomplish seeding and mulching as specified on areas indicated on drawings, on areas disturbed during construction, all fill areas graded areas, 20 feet on each side of new roadways, drainage channels, outfall, levee and all borrow areas.

#### **3.2. INSPECTION AND TEST**

- a. Seed.
  - (1) Each lot of seed may be re-sampled and retested in compliance with the latest rules and regulations under Federal Seed Act at discretion of Engineer.
  - (2) Make re-sampling and retesting by or under supervision of Engineer.
  - (3) If these tests reveal seed to be below specified pure live seed content, plant additional seed to compensate for deficiency at no additional cost of Owner.
  - (4) Seed retests. Conducted by approved laboratory.
  - (5) Make allowance for actual pure live seed content of specified grasses in determining actual planting rate.
- b. Fertilizers.
  - (1) Retain fertilizer bags and upon completion of project, final check of total quantities of fertilizer used will be made against total area treated.
  - (2) If minimum rates of application have not been met, distribute additional quantities of these materials to make up minimum application specified.
- c. Mulch. At least five (5) days prior to commencement of mulching operations, notify Engineer of sources from which mulch materials are available and quantities thereof.

#### **3.3. SEED BED AND PREPARATION**

- a. General.
  - (1) Perform seeding after designated areas for seeding and fertilizing have been graded and smoothed to finished lines and grades and typical cross-sections.
  - (2) Equipment necessary for proper preparation of ground surface and for handling and placing required materials shall be on hand and in good condition before work is started.
- b. Grading.

- (1) Maintain grades on areas to be seeded in true and even condition without ruts of tracks.
- (2) Maintenance shall include any necessary repairs to previously graded area prior to planting of seed.

c. Tillage.

- (1) Accomplish in such manner as to prepare acceptable seedbed.
- (2) Use tractors with adequate horsepower and heavy-duty tillage equipment to accomplish specified tillage operations.
- (3) Till areas with heavy duty disk, as necessary, followed by disking with disk harrow, and smoothing with weighted spike tooth harrow, railroad irons, or bridge timber float drag.
- (4) Cultivate seedbed to state of good tilth so that soil particles on surface are small enough and lie close enough together to prevent seed from being covered to deep for optimum germination.
- (5) Leave areas smooth for ease of mowing.
- (6) Depth of tillage: 4 inches.

d. Cleanup.

- (1) Prior to seeding, clear surface of stone, stumps, or other objects larger than 1 ½ inches in thickness or diameter and roots, brush, wire, grade stakes, and other objects that might be a hindrance to maintenance operations.
- (2) Mow, rake and remove vegetation that may interfere with operations from site.

### **3.4. APPLICATION OF FERTILIZER**

- a. Fertilizer shall be applied 24 hours in advance of tilling operations. The fertilizer distributor box shall be equipped with baffle plates to prevent downward movement of fertilizer when operating on the slope. Fertilizer shall be distributed with a fertilizer distributor at a rate of 400 pounds per acre prior to tilling.
- b. The planted areas shall be refertilized 6 weeks after commencement of maintenance operations. Fertilizer shall be applied at a rate of 400 pounds per acre using a fertilizer distributor. Apply when vegetation is dry and water within 24 hours.

### **3.5. PLANTING SEED**

a. General.

- (1) Conduct seeding equipment calibration tests as a means of determining coverage per load to plant seed at specified rates.
- (2) If unplanted skips are noted after germination and growth of grass, seed unplanted areas with grasses that were to have been planted at no additional cost to Owner.

b. Seeding.

- (1) Rate of application. Refer to Planting Schedule in this section.
- (2) Uniformly plant the seed to depth of ¼ inch to ½ inch by use of approved grain drills, native grass seed drills. Billion Cultipacker seeder or equivalent, or by broadcasting seed and harrowing or raking lightly to cover seed.

### **3.6. APPLICATION OF MULCH**

- a. Mulch shall be spread uniformly in continuous blanket, using 2 tons per acre. Mulch shall be spread by hand or by an approved blower-type mulch spreader. Blower-type mulch spreaders shall be adjusted and operated in such a manner as to prevent excessive breakage of the mulch material. If this cannot be accomplished, the mulch shall be spread by hand. Care shall be exercised to ensure that all wire from baled hay is collected as it is removed from the bale and then removed from the site. Mulching shall be started at the windward side of relatively flat areas, or at the upper right of a steep slope, and continued uniformly until the area is covered. The mulch shall not be bunched.
- b. Within four (4) hours following spreading the mulch shall be anchored in the soil to a depth of two to three inches. An approved machine equal to a disk harrow with cupped disks removed and replaced with straight rolling coulters spaced not more than eight (8) inches apart and having edges approximately 1/8 inch wide shall be used to anchor the mulch. The machine shall be weighted and operate in such manner as to secure the hay firmly in the ground to form a soil-binding mulch and prevent loss or bunching by the Finning Equipment Co. of Cincinnati, Ohio, or approved equal. The mulch machine shall be anchored as required to prevent downward movement of the equipment and the formation of ridges and ruts. Suitable anchoring equipment shall be on hand and ready for use prior to applying the mulch. The coulters shall be at least 10 inches in diameter. The number of passes needed, not to exceed three, will be determined by the Contracting Officer.
- c. Keep mulch moist by daily application of water, if necessary, for a minimum of ten days, or until seeds in the mulch have germinated.

### **3.7. MAINTENANCE OF TURF**

#### a. General.

- (1) Contractor is responsible for maintaining areas during planting period and until other work under contract has been completed.
- (2) Maintenance shall consist of protection, replanting, maintaining existing grades, and repair of erosion damage.

#### b. Protection.

- (1) Protect seeded mulched areas against traffic of other use immediately after seeding is completed.
- (2) Maintaining protection of these areas until completion of work under contract.

#### c. Replanting.

- (1) Prepare, reseed and remulch areas in which acceptable coverage is not obtained.
- (2) Replant as specified for original planting.
- (3) Perform replanting required without cost to Owner.

#### d. Maintenance of Grades and Repair of Erosion Damage.

- (1) Contractor is responsible for maintaining grades of slopes after commencement of planting operations and during maintenance period.
- (2) Promptly repair any damage to finished surface grades.
- (3) Promptly repair damage in the event erosion occurs from rainfall or other causes.
- (4) Correct ruts, ridges, tracts and other surface irregularities and replant areas where required prior to acceptance.

### **3.8. WATERING AND MAINTENANCE**

Apply water after compaction and seeding. Apply water using portable pipe or hose lines with rotating sprinklers within 24 hours after seeding. Sprinkling may be done with water trucks and hoses in certain locations where it is impractical to use portable lines or hoses. Supervise sprinkling to prevent runoff of water. The Contractor shall furnish all pumps, hoses, pipe lines, water trucks and sprinkling equipment required. Water as required to achieve acceptable grass coverage. Do not water at rates exceeding 5,000 gal/AC/hr., to prevent runoff.

### **3.9. WEEDING**

Keep all seeded areas relatively free from weeds and undesirable grasses, using approved methods, materials and timing.

### **3.10. DISEASE AND INSECT/PEST CONTROL**

Upon discovery of any disease or insect pest infestation, identify or have identified the nature or species of infestation and submit the proposed method of control for approval prior to application of control measures.

### **3.11. MOWING**

Mow the grass should be the height reach 3 ½ inches or greater on the average before final acceptance. Mow to a height of 2 ½ inches. Mow a minimum of two times and as required until work is accepted.

### **3.12. PLANTING SCHEDULE**

- a. Minimum percentage by weight of pure live seed in each lot of seed shall be as follows:  
seed planted at rate per acre indicated under pure live seed required per acre. Note:  
Percent Pure Live Seed = Percent Purity times Percent Germination.

## PLANTING PERIODS

### APRIL 1 THROUGH MAY 30

<u>Type of Seed</u>	<u>Minimum % Pure Live Seed Required</u>	<u>Pounds Per Live Seeds Required Per Acre</u>
(a) Common Bermuda Grass (Unhulled) (Cynodon Dactylon)	85	15
(b) Common Bermuda grass (Hulled) (Cynodon Dactylon)	85	15
(c) Blue Stem	65	10
(d) Side Oats Grama	65	10
(e) Ermelo Love Grass	85	<u>15</u>
<b>(Total a + b + c + d + e)</b>		<b>65</b>

### SEPTEMBER 1 THROUGH FEBRUARY 15

(a) Winter Wheat	75	40
(b) Fescue	85	<u>15</u>
<b>(Total a + b)</b>		<b>55</b>

- Weed seed shall not exceed 10 percent by weight of total of pure live seed and other material in mixture.
- Johnson grass nut grass or other noxious seed in mixture will be cause of rejection of seed.