

# 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

##### 1.2. 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 of 2000lbs per acre
- (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 warranted 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 samples of fertilizer to be used upon request of Engineer.
- (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.

- (1) 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 Hydro Straw 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. 30-10-10 analysis, pelleted, uniform in composition, free-flowing, and suitable for application with equipment used.
- c. Hydro Seeding Mulch Fiber shall be produced from a natural or recycled straw fiber; these materials should be free from plastic materials or other non bio-degradable substances. Fiber shall be of such character that the fiber will disperse into uniform slurry when mixed with water. It is imperative that the mulch be applied at the specified rate; too wet of a mixture will cause the fibers to be buried. Water content of the fiber not to exceed 14 percent of the dry mass fiber. The percentage of moisture content of the fiber shall be clearly marked on the package. Fiber shall be colored green to contrast the area on which the fiber is being applied, and shall not stain concrete or other surfaces in which it comes into contact with. Fiber and other mulch ingredients shall be free from growth or germination inhibiting ingredients.

## 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 beginning on the windward side of the project.
- 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 were purchased and have mulch available for inspection by site engineer if deemed necessary.

### **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. Brillion Cultipacker seeder or equivalent, or by broadcasting seed and harrowing or raking lightly to cover seed.

### 3.6. APPLICATION OF MULCH

- a. With the increased emphasis on air quality, stormwater control, and other environmental impacts, we have created a new application process to address these concerns thus allowing us to design treatments appropriate for both stormwater control and the maintenance of air quality. Hydraulically applied straw shall be comprised from turf grass straw that has been lightly processed into a long-fibered, flowable straw mulch that mixes readily into uniform slurry. Combined with a special binding material, this material makes porous yet strong and seed friendly mulch when correctly applied to the soil surface. A specified application of 2000 lbs per acre of hydraulically applied straw per acre. For additional erosion control on steeper incline areas a specified rate of 4000 lbs per acre is recommend with a two-step application method being introduced. The two-step method of application is as follows: when seeding, apply 2,000 lbs hydraulically applied straw, seed, fertilizer and other ingredients in the first application and then apply a second treatment of hydraulically applied straw only. For flat pads mulching rates in the range of 2,500 to 3,000 lbs per acre can provide good coverage from a single pass.

The most successful Hydraulic 2-Step application method has been to throttle back the machine and apply the material with a fan nozzle in a sweeping motion. Other methods that softly "lay in" the product have also been favored. Hydraulically applied straw comes packaged in 50 lb straw bales with a pre-blended binder. The material breaks up easily and may be mixed with water in ratios of 75 lbs of mulch per 100 gallons of water or more. Using hydraulically applied straw in a 3,000 gal hydroseeder the applicator may apply up to 4,500 lb per acre in two loads resulting in 100% soil coverage.

Mulch shall be applied uniformly in continuous blanket, using 1 - 2 tons per acre. Mulch shall be spread by the mechanical method of hydraulically hydro mulching. 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.

- 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**

The grass should be mowed when it reaches 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:  $\text{Percent Pure Live Seed} = \text{Percent Purity} \times \text{Percent Germination}$ .
- b. See attached seeding specifications.