

SECTION 2730

REVEGETATION - SEEDING, SODDING, HYDROSEEDING

1.00 GENERAL

1.01 Scope

A. Furnish labor, materials, equipment and services to complete the following work which shall include but not necessarily be limited to:

1. Soil Preparation and Scarification
2. Topsoil Placement
3. Seeding, hydroseeding or sodding
4. Fertilizing
5. Mulching
6. Installing erosion blanket
7. Maintaining areas

1.02 Related Work Specified Elsewhere.

Section 2110 - Excavation and Embankment
Section 2120 - Excavation and Backfill For Structures
Section 4200 - Underground Sprinkler System

2.00 MATERIALS

2.01 Seed Mix. Seed shall be at least 95% pure and shall have a minimum germination percentage of 85%. Seed shall be furnished separately or in mixtures in standard containers with the same seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: Name and address of laboratory, date of test, lot number of each kind of seed, and the results of tests as to name, percentage of weed content for each kind of seed furnished, and in case of a mixture, the proportions of each kind of seed.

(See Table Next Page)

| | | |
|----|---|---|
| A. | <u>Recommended Dryland Seed Mix</u> <u>(below 9000 feet)</u> | <u>% of Total/</u> <u>1000 Sq. Ft.</u> |
|----|---|---|

| | |
|---|------|
| Western Wheat Grass (50% split or as available) | 50% |
| Slender Wheat Grass (50% split or as available) | 50% |
| Green Needle Grass | 6¼% |
| Candy or Upland Bluegrass | 3¼% |
| Hard Fescue | 9½% |
| Creeping Red Fescue | 9½% |
| Kentucky Bluegrass "Troy" | 9% |
| Lupine (Wildflower substitutes are acceptable) | 12½% |
| Globe Mallow | |
| Scarlet Gilia | |
| Flax | |
| Aspen Daisy | |

B. Recommended Seed Mixture (9,000-10,500 feet)

| | |
|--------------------------|-----|
| Lincoln Smooth Brome | 25% |
| Orchard Grass (Pot Omac) | 20% |
| Nord Crest Wheat | 20% |
| Slender Wheat Grass | 20% |
| Russian Wild Rye | 15% |

C. Recommended Seed Mixture (10,500 feet and above)

| | |
|----------------------|-----|
| Kentucky Blue Grass | 25% |
| Timothy | 25% |
| Chewing Fescue | 10% |
| Pennlawn Red Fescue | 10% |
| Meadow Foxtail | 10% |
| Manchar Smooth Brome | 10% |
| Alsike Clover | 10% |

Note: As an addition to the basic above, add oats, barley or winter wheat as a seasonal cover crop.

2.02 Fertilizer. Fertilize all seeded areas with a commercial type 15-40-5 mixture of similar ratio. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate specified in these Specifications and shall meet the specified requirements of the applicable Federal and State laws. They shall be furnished in standard containers with name, weight and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

2.03 Topsoil. Material stripped from site consisting of loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, rocks, brush, weeds or other material detrimental to proper development of vegetative growth. Topsoil shall be a minimum depth of six inches (6").

2.04 Straw Mulch. Mulch all seeded and hydroseeded areas with straw mulch. Material for straw mulching shall consist of straw or oats, barley, wheat or rye and shall not contain seed of noxious weeds. Clean field hay may be substituted for straw when approved by the Engineer. Straw or hay in such an advanced stage of decomposition as to smother or retard the normal growth of grass will not be accepted.

2.05 Tacifier. Straw mulch shall be secured by TerraTack or approved equal.

2.06 Erosion Blanket. Erosion Blanket shall be as specified on Drawings. The blanket shall be smolder resistant, not toxic to vegetation or germination of seed and shall not be toxic or injurious to humans.

3.00 EXECUTION

3.01 Time of year to Seed and Hydroseed.

Spring Seeding

Fall Seeding

Spring thaw to July 1st

Oct. 15th until consistent ground freeze

- (a) "Spring thaw" shall be defined as the earliest date in a new calendar year in which seed can be buried 1/2 inch into the surface soil (topsoil) through normal drill seeding methods.
- (b) "Consistent ground freeze" shall be defined as that time during the fall months in which the surface soil (topsoil) due to freeze conditions, prevents burying the seed 1/2 inch through normal drill seeding operations. At no time shall seed be sown, drilled or otherwise planted when the surface soil or topsoil is in a frozen or crusted state.
- (c) Seeding at any time other than within the above seasons shall be allowed only when the Contractor submits a written request for permission to do so and permission is granted. In the request, the Contractor must agree to apply the specified seed at a rate of not less than 25 percent greater per unit area than the rates specified for use within the seeding season. The additional materials shall be furnished and placed at the Contractor's expense. The Contractor must also agree to reseed, re-mulch and repair any areas seeded out-of-season which fail to wind, erosion, lack of germination and/or disturbance by the Contractor.
- (d) Where out-of-season seeding is ordered, the cost of additional material if required will be paid for, and in this event, the Contractor will not be held responsible for damage or failure beyond his control due to out-of-season seeding.

3.02 Topsoil Excavation. Remove all sod, topsoil, organic earth, stockpile topsoil as designated on Drawings or as directed by Engineer.

3.03 Topsoil Placement.

- A. General: When job site has been shaped and ready for placement of topsoil, cover all cut-fill areas and construction scars with topsoil to depth of 6". Contour all surfaces to approximate grade and blend with existing adjacent terrain in accordance with detail drawings.

- B. Slope Rounding: Round top and bottom of slopes and feather into undisturbed natural terrain. Avoid abrupt grade changes, making smooth transitions from slopes to more level areas.
- C. Slope Molding: Avoid long continuous slope faces by molding face of slope to accent existing adjacent terrain. Steepened slope faces near ridges and bluffs, laid back to link to natural draws, creating an undulating face.
- D. Surface Roughing: Gouge slope surfaces of 2:1 or steeper with horizontal ridges and trenches to depth of 6" minimum, creating roughened surface to lessen erosion, improve moisture percolation and soil layer binding. Trenches or ridges shall not be longer than 30' to prevent water accumulation and flowing water to cause rivulets.

3.04 Preparation for Planting of Lawns.

- A. Grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
- B. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- C. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.
- D. Preparation of Unchanged Grades. Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows:

Till to a depth of not less than six inches, apply soil amendments and initial fertilizers as specified; remove high areas and fill depressions; till soils to a homogeneous mixture of fine texture free of lumps, cods, stones, roots and other extraneous matter.

3.05 Fertilizing. Apply fertilizer at the rate of 100 lbs. per acre.

3.06 Seeding and Sodding.

- A. HYDROSEEDING
 - 1. Seed and fertilizer shall be applied by spraying them on slopes of 3:1 or greater gradient in the form of an aqueous mixture and by using the methods and equipment described herein.
 - 2. Spraying Equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square inch. The pump shall be mounted in a line which will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipelines shall be capable of providing clearance for 5/8" solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supported stand in such a manner that it can be rotated through 360° horizontally and inclined vertically from at least 20° below to at least 60° above the horizontal.

There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over a distance varying from 20 feet to 100 feet. One shall be a close-range jet nozzle. For ease of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected.

3. Mixtures. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds of these combined solids shall be added to and mixed with each 100 gallons of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is determined to be unsuitable by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Engineer.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds. The mixture shall be applied by means of a high-pressure spray which shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with Specifications shall be used to cover specified sections of known area. Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

Seeding shall be at 1.5 lbs. per 1000 sq. ft. or 65 lbs. per acre.

B. DRYLAND SEEDING

1. Do not use wet seed or seed which is moldy or otherwise is damaged in transit or storage.
2. Sow seed using a spreader, seeding machine or drill seeder. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
3. Sow not less than 1.5 lbs. per 1000 sq. ft.
4. Rake seed lightly into top 1/8" of soil, roll lightly, and water with a fine spray.

C. SODDING NEW LAWNS

1. Lay sod within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
2. Lay sod to form a solid mass of with tightly-fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering or adjacent grass.
3. Secure sod on slopes with wood pegs to prevent slippage. Water sod thoroughly with a fine spray immediately after planting.
4. Maintain sodded lawns by watering, fertilizing, weeding, mowing, trimming and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas until project is accepted by the Owner.

3.07 Mulching. Straw Mulching. All seeded areas shall be mulched, as a separate process, with straw at a rate of 1½ tons/acre. Straw shall be applied in a uniform manner using standard straw blowing equipment. Areas not accessible, by reach, to straw blowing equipment shall be mulched by hand.

Areas not properly mulched or damaged shall be repaired and re-mulched in an acceptable manner, at Contractor's expense. Mulch removed by circumstances beyond the Contractor's control shall be repaired as ordered.

3.08 Tacifier. Straw mulch not covered by erosion blanket shall be secured by TerraTack tacifier or approved equal. TerraTack shall be applied at a rate of 180 lbs/acre.

3.09 Erosion Blanket. Areas requiring erosion blanket are designated on the Drawings and are generally on slopes of 1½:1 or greater. The blanket must be placed no later than 24 hours after seeding. The material shall be applied smoothly but loosely on the soil surface without stretching. The upslope end of each piece of blanket shall be buried in a narrow trench six inches deep. After the blanket is buried, the trench should be tamped firmly closed.

In cases where one roll of blanket ends and a second roll starts, the upslope piece should be brought over the buried end of the second roll so that there is a twelve (12) inch overlap to form a junction slot.

Overlaps of blanket which run down the slope, outside edges and center, shall be stapled on two foot intervals. Each width of jute mesh shall have a row of staples down the center as well as along the edge. Check slots and junction slots will be stapled across at six inch intervals.

End of Section