

ITEM 165

HYDRO-MULCH SEEDING
 (FOR EROSION CONTROL AND STABILIZATION)

165.1 Description. This Item shall govern for furnishing all labor, materials, equipment, supplies, supervision and tools and performing all work necessary to:

- seed,
- fertilize,
- water,
- maintain, and
- cleanup of side slopes and finished grades,

in accordance with these Standard Specifications, for the purpose of temporary erosion control or final stabilization.

The hydro-mulch seeding operations, together with all necessary related work, shall conform to the requirements specified in this section. The area(s) to be hydro-mulch seeded shall be as shown on the construction drawings.

165.2 Materials. Seed shall comply with the U. S. Department of Agriculture Rules and Regulations – Federal Seed Act. Seed bags shall have tags affixed for inspection in the field. Bags without tags will be rejected. Seed shall be tested and certified by a commercial or state laboratory not more than nine (9) months prior to the date of planting. Tags on seed bags shall show the name of the seed, locality and year of harvest, percentage purity, germination and dormant seed, Johnson grass content and noxious weed content. Seed shall be provided in clean, unopened and undamaged bags. Seed(s) shall be provided with no objectionable material, such as sticks, stems and unthreshed seed heads, which will hinder proper distribution. Seed that is wet, moldy, starting to germinate or otherwise damaged, will not be accepted by Harris County.

Standard seed plan, planting Dates, plant species and seeding rate are as shown on Table 1:

TABLE 1

<u>Seed Plan</u>	<u>Planting Dates</u>	<u>Species</u>	<u>Planting Rate Per Acre</u>
<u>1</u>	<u>Oct. 1- March 31 When soil temperatures fall below 75°F, or as directed.</u>	<u>Unhulled Bermuda Grass Tall Fescue and Durana Clover Crimson Clover</u>	<u>50 lbs. 25 lbs. 5 lbs. 5 lbs.</u>
<u>2</u>	<u>April 1-Sept. 30 When soil temperatures rise</u>	<u>Certified Bermuda Grass* Or Common Bermuda Grass,</u>	<u>50 lbs. or 50 lbs. PLS</u>

	<u>above 65°F, or as directed</u>	<u>minimum purity/germination of 95/85 Millet</u>	<u>10 lbs.</u>
<u>3</u>	<u>As directed</u>	<u>Certified Bermuda Grass Or Hulled Bermuda Grass minimum purity/germination 95/85 and Pensacola Bahia Grass Brown Top or Fox Tail Millet</u>	<u>50 lbs. or 50 lbs. PLS and 20 lbs. 20 lbs.</u>
<u>5</u>	<u>As directed</u>	<u>Annual Ryegrass and Fescue Or Millet</u>	<u>25 lbs. each 25 lbs.</u>
<u>6</u>	<u>As directed</u>	<u>Improved Bermuda Grass Cultivars</u>	<u>50 lbs.</u>
<u>7</u>	<u>As directed</u>	<u>Legume or Grain</u>	<u>20 lbs.</u>

Seeding shall be applied in accordance with the following:

- Planting dates are approximate, Harris County will determine which seed to use prior to start of seeding
- Seeding rate for "PureLive Seed". Is used to determine the actual application rate of bulk material to obtain.
- PLS= (%germination X %purity) 95x85 = 80.7%PLS
- Rate/PLS= LBS of seed needed for application 1/.807= 1.24 lbs of seed needed/1000 SF
- Certified Bermuda must have a Blue Tag and tested by an accredited seed testing lab

Commercial fertilizer as outlined in the Item 166 "Fertilizer", shall be applied to the entire seeded area at the prescribed rates. The fertilizer shall be delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State Fertilizer Laws and bearing the name and warranty of the producer.

Mulch shall be virgin wood cellulose fiber made from whole wood chips. Rate of application shall be 2000 pounds per acre. Soil stabilizers shall be applied at a rate of 40 pounds per acre. On side slopes Terra Type III (or approved equal) shall be used. On all other areas Terra Tack I (or approved equal) shall be used. Alternatively, Ultra Bond 2002 (or approved equal) shall be applied at a rate of one gallon per square yard in three applications. First application shall be at a rate of 1/2 gallon per square yard followed by another application in about two weeks at a rate of 1/4 gallon per square yard. The third application shall follow in about two months at a rate of 1/4 gallon per square yard. The concentrate shall be diluted in 1:5 ratio with water or as recommended by the manufacturer.

Wood cellulose fiber mulch, for use in the grass seed and fertilizer, shall be processed in such a manner that it will not contain any germination or growth inhibiting factors. It shall be dyed an appropriate color to allow visual metering of its application. The wood cellulose fibers shall have the

property of becoming evenly dispersed and suspended when agitated in water. When sprayed uniformly on the surface of the soil, the fibers shall form a blotter-like ground cover which readily absorbs water and allows infiltration to the underlying soil. Weight specifications from suppliers, shall refer only to the air dry weight of the fiber. The mulch material shall be supplied in packages having a gross weight not greater than 100 pounds and must be marked by the manufacturer to show the dry weight content. Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished and that it meets all of the preceding requirements.

Water shall be free from oil, acid, alkali, salt and other substances harmful to the growth of grass. The water source shall be subject to approval, prior to use.

165.3 Execution. Immediately after the finished grade has been approved, begin hydro-mulching operations to reduce erosion and excessive weed growth.

Hydraulic equipment used for the application of fertilizer, seed and slurry of prepared wood fiber mulch shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to 40 pounds of fiber plus a combined total of 70 pounds of fertilizer solids for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which provide even distribution of the slurry on the area to be seeded. The slurry tank shall have a minimum capacity of 800 gallons and shall be mounted on a traveling unit, which may either be self-propelled or drawn with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded, so as to provide uniform distribution without waste. The Engineer may authorize equipment with a smaller tank capacity, provided the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

Slurry preparation shall take place on the worksite. The slurry preparation should begin by adding water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, good re-circulation shall be established and seed shall be added. Fertilizer shall then be added, followed by wood pulp mulch. The wood pulp mulch shall only be added to the mixture after the seed and when the tank is at least one-third filled with water. The engine throttle shall be opened to full speed when the tank is half filled with water. All the wood pulp mulch shall be added by the time the tank is two-thirds to three-fourths full. Spraying shall commence immediately when the tank is full. The operator shall spray the area with a uniform visible coat, by using the green color of the wood pulp as a guide.

165.4 Application. The Contractor shall obtain approval of hydro-mulch area preparation from the Engineer prior to application. If rain is imminent,

then the application of hydromulch seeding and fertilizer shall be postponed until weather conditions exist such that the potential for the runoff of the slurry and fertilizer from the site is minimized.

Operators of hydro-mulching equipment shall be thoroughly experienced in this type of application. Apply the specified slurry mix to form a uniform mat at the specified rate. The Contractor shall avoid getting the hydromulch on paved areas. Keep paved and planting areas clean during maintenance operations. Contractor shall confine hydro-mulching within the areas designated on the plans and keep it from contact with other plant material. Immediately after application, thoroughly wash off any plants, planting areas or paved areas not intended to receive slurry mix.

If the Engineer notes any unmulched areas after hydro-mulching, the Contractor shall be required to seed the unmulched areas with the grasses that were to have been planted at no additional cost to Harris County.

- 165.5 Contractor's Maintenance & Guarantee Period. It shall be the responsibility of the Contractor to maintain all hydromulch seeded areas until satisfactory growth has occurred as determined by the Engineer and for 60 days after the successful completion of all punch list items. Maintenance shall consist of watering, weeding, repairing of all erosion, and reseeding, as necessary to establish a uniform stand of the specified grasses. A minimum of 95 percent of the area seeded shall be covered with the specified grass with no bare or dead spots greater than 10 square feet. The Contractor shall make as many repeat seedings as necessary to achieve the required level of coverage. Such reseeding is to be performed within 14 calendar days of notification by the Engineer.

The Contractor shall be responsible for 1 mowing per month in the months of April through October. The Contractor shall also be responsible for 1 mowing every 6 weeks in the months of November through March. In addition, the Contractor shall water all grassed areas as often as necessary to establish satisfactory growth and to maintain its growth throughout the duration of the project; including the 60 day period after the punch list is completed as described above.

- 165.6 Submittal Required. The Contractor shall submit copy of seed tag(s) and letter from the supplier attesting that the seed meets the requirements as stated herein. Certification shall include common name; botanical name, percent by weight of each plant species; year of harvest; percent purity, germination and dormant seed; percent noxious weed content; and date of certification. The Contractor shall certify on the application of the project.

- 165.7 Measurement. The unit of measurement for all work performed and materials furnished, as described herein, shall be by the acre or per station as indicated in the bid documents. Measurement shall be done upon completion of the work performed within the limits shown on the

drawings and as described herein. The area measured for payment will be computed to the nearest 1/10 acre or station.

- 165.8 Payment. Payment for hydro-mulch seeding will be made at the contract unit price per acre or per station and includes final grading, mulch, seed, fertilizer, watering, maintenance and clean-up. Additional payment shall not be made for those areas that are reseeded as provided in Section 165.5 above.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications.

Item 166 "Fertilizer"
Item 725 "General Source Controls"

END OF ITEM 165