ITEM 165

HYDRO-MULCH SEEDING
(FOR EROSION CONTROL AND STABILIZATION)

165.1 Description. The work covered by this section consists of furnishing all plant, labor, materials, equipment, supplies, supervision and tools and performing all work necessary to provide top soil, seed, fertilize, water, maintain and cleanup of side slopes and finished grades, all in accordance with these 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. All seed must meet the requirements of the U.S. Department of Agriculture Rules & Regulations as set forth in the Federal Seed Act and the Texas Seed Law.

Standard type of seed, purity and germination requirements, rate of application and planting dates are as shown on Table 1:

TABLE 1

Plant Type	Rate of Application in Pounds of Seed per Acre	Planting Date
Common Bermuda Grass (60% Unhulled and 40% Hulled by weight)	60	Apr. 1 to Sep. 30
* "Foxtail" Millet	15	Apr. 1 to Sep. 30
Common Bermuda Grass (60% Hulled and 40% Unhulled by Weight	50	Oct. 1 to Mar. 31
* "Gulf Annual Ryegrass	15	Oct. 1 to Mar. 31
Crimson Clover & Inoculant	20	Oct. 1 to Mar. 31
*"KY 31" Tall Fescue	15	Oct. 1 to Mar. 31

*Indicates MAXIMUM APPLICATION RATE ALLOWED

Table 1 shall be used except for special applications. For special applications, the seed mix, rate of application, and planting dates shall be as shown in the plans.

Commercial fertilizer as outlined in the Item 166, “Fertilizer”, shall be applied to the entire seeded area at the prescribed rates. The fertilizers hall 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. Within the fiber mulch material, at least 20 percent of the fibers will be 10.7 mm in length and 0.27 mm in diameter. Rate of application shall be 2000 pounds per acre. Soil stabilizers such as Terra Type III (or approved equal) shall be applied at a rate of 40 pounds per acre on side slopes and Terra Tack I (or approved equal) shall be applied at a rate of 40 pounds per acre on flatter portions. 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 ½ gallon per square yard followed by another application in about two weeks at a rate of ¼ gallon per square yard. Third application shall follow in about two months at a rate of ¼ 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 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 for all applications shall refer only 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 in excess of 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 foregoing 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 forty (40) pounds of fiber plus a combined total of 70 pounds of fertilizer solids for each 100gallons 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.

Care shall be taken that the slurry preparation take place on the site of the work. 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 hydro-mulch 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 in a motion to form a uniform mat at the specified rate. Operators shall keep the hydro-mulch within the areas designated and keep from contact with other plant material. Immediately after application, thoroughly wash off any plant material, planting areas or paved areas not intended to receive slurry mix.

Keep all paved and planting areas clean during maintenance operations. Contractor shall keep hydro-mulching within the areas designated and keep from contact with other plant material.

If in the opinion of the Engineer, unplanted areas are noted after hydro-mulching, the contractor shall be required to seed the unplanted areas with the grasses that were to have been planted at no additional cost to the City of Deer Park.

165.5 Contractor's Maintenance & Guarantee Period. It shall be the responsibility of the contractor to maintain all hydro-mulch 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% 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 be responsible for one (1) mowing per month between the months of April to October. The Contractor shall also be responsible for one (1) mowing every six (6) weeks between the months of November to 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 sixty (60) day period described above.

The Contractor shall make as many repeat seedings as necessary to achieve a minimum of 95% of the area planted covered with the specified grass with no bare or dead spots greater than 10 square feet. Such replanting is to be performed within 14 calendar days of notification by the Engineer.

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.

165.67 Measurement. The unit of measurement for all work performed and materials furnished, as described herein, shall be by the **acre**. 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.

165.8 Payment. Payment for hydro-mulch seeding will be made at the contract unit price per acre and includes top soil (when required), smoothing, mulch, seed fertilizer, watering, maintenance and clean-up. Additional payment shall not be made for those areas that are replanted.

END OF ITEM 165