ORIGINATION FORM

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

(The person who receives or originates the issue and needs to forward the issue for action.)

☒ Modify Specification _____570_____

Section/File number

☐ New Section _____.

Section number

Subject: Turf

Origination date: June 20, 2005

Originator: David Sadler, Office of Construction
Office/Phone: 414-5203
Email address/ Userid: david.sadler@dot.state.fl.us CN982DA

Problem statement: All grassing operations are being combined under one specification. The Design Standards will need to be updated to reflect these changes.

Information source: David Sadler, Office of Construction; David Sumner, Maintenance; Jeff Caster, Environmental Management Office, Frances Thomas, Specifications and the consulting firm of Hatch Mott MacDonald.

Background data: To combine and update like specifications and pay items and to clarify the work involved

Recommended Usage Note: All Jobs

Desired implementation date: Beginning with the July 2006 letting.

Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

DENVER J. STUTLER, JR.
SECRETARY

M E M O R A N D U M

DATE: September 12, 2005

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer

SUBJECT: Proposed Specifications Change: 5700000.D01 - Turf

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Turf.

This change was proposed by David Sadler of the State Construction Office to combine all grassing operations under this one specification section.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after October 10, 2005 may not be considered. Your input is encouraged.

DFB/jf

Attachment

COMMENTS: _____

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Submitted by: _____ Phone #: _____

TURF.
(REV 9-7-05)

SECTION 570 (Pages 665-668) is deleted and the following substituted:

SECTION 570
~~GRASSING (BY SEEDING)~~*TURF*

570-1 Description.

Establish ~~a stand of grass~~*turf* on slopes, shoulders and *other* specified ~~other~~ areas, by *furnishing materials; and* seeding, ~~or by~~ seeding and mulching, *hydroseeding, or placing sod*. Perform *all construction and maintenance operations necessary to establish a healthy and vigorous stand of turf.*~~seeding and mulching, fertilizing, and wildflower seed application as required, and maintain the grassed areas until the completion of the project.~~

The Engineer may eliminate, at his discretion, any of the items of work covered by this Section.

570-2 Materials.

Meet the following requirements:

Mowing	*104-7.2*
Grass Seed	981-1
Wildflower Seed	981-1
Sod	*981-2*
Mulch	981-3
Fertilizer~~, Type I~~	Section 982
Water	Section 983
Compost	Section 987

~~Prior to planting, furnish the Engineer a certification from the grower stating the age of all seed.~~

570-3 Construction Methods.

~~570-3.1 General:~~ *Install turf at the locations shown in the plans, as early in the construction process as is practical.*

Perform the installation in the following sequence: apply finish soil layer in accordance with Section 162; prepare the area to be seeded or sodded; seed, hydroseed or place sod; spread and anchor mulch and fertilize, as applicable. In preparing the ground, disk-harrow and condition the soil to an average depth of 6 inches [150 mm]. Make the soil true to grade, not compacted, free of large clods, roots, and other material which will interfere with the work or subsequent mowing and maintenance operations. Do not begin subsequent operations until the Engineer has approved the condition of the

prepared areas. Limit preparation to those areas that will be seeded or sodded within 48 hours. Prior to sodding, thoroughly water areas and allow surface moisture to dry so as to prevent a muddy soil condition.~~Do not seed or mulch when wind velocities exceed 15 mph [25 km/h]. Sow seed only when the soil is moist. Do not perform any seeding when the ground is frozen, unduly wet or otherwise not in a tillable condition.~~

~~Whenever a suitable length of roadway slopes or adjacent areas has been graded, prepare the area and perform grassing in accordance with the Contract Documents. Incorporate grassing into the project at the earliest practical time.~~

~~Complete all grassing on shoulder areas prior to the placement of the friction course on adjacent pavement, unless the friction course is to be placed directly on a non-asphalt base.~~

~~**570-3.2 Sequence of Operations:** Perform the operations in the following sequence: Apply finish soil layer materials in accordance with Section 162, prepare the area to be seeded, seed, spread and cut-in mulch and fertilize.~~

~~In preparing the ground for sowing of seeds, disk-harrow and thoroughly pulverize the soil to an average depth of 6 inches [150 mm]. Make the soil true to grade, not compacted and free of large clods, roots, and other material which will interfere with the work or subsequent mowing and maintenance operations. Do not begin subsequent operations until the Engineer has approved the condition of the prepared areas.~~

570-3.~~3~~*.1* ~~**Seeding:**~~ While the soil is still loose, scatter the *specified* seed uniformly over the ~~grassing~~ *prepared* area and immediately mix it into the seed bed to a depth of 1/4 inch [6 mm]. ~~using the specified seed.~~

~~Thoroughly dry-mix the separate types of seed immediately before sowing. Do not use wet seed.~~

The Engineer will allow ~~the~~ wildflower seed to be included in the ~~grassing~~ *turf seeding* operation or performed separately from the ~~grass~~ *turf* seeding operation in areas shown ~~i~~*o*n the plans.

Ensure that the wildflower seed is uniformly planted by drilling or placing the seed into the soil at an average depth of 1/8 inch [3 mm], but not exceeding 1/4 inch [6 mm], ~~into~~*on* the designated area at the specified rate.

~~**570-3.4 Mulching:** When areas require mulch, as shown on the plans~~*Where the plans indicate seeded areas to be mulched*, apply approximately *1*~~2~~ inch~~es~~ [~~50~~*25* mm], loose thickness, of the mulch material uniformly over the seeded area.~~, and cut the mulch material into the soil to produce a loose mulched thickness of 3 to 4 inches [75 to 100 mm]. Do not use harrows.~~ The Contractor may use compost meeting the requirements of Section 987 ~~in lieu of~~ *as* mulch.

When mulching on steep slopes, where the use of a machine for ~~the cutting in process~~ *anchoring mulch* is not practica~~l~~*ble*, secure the mulch after the seeding operation by either using an erosion control fabric, *erosion blanket or BFM (see 570-3.4)*.~~or; spread~~*ing* ~~a string net over the mulch using stakes driven flush with the top of the mulch at 6 foot [1.8 m] centers and string parallel and perpendicular with diagonals in both directions.~~

570-3.2 Placing Sod: *Place the sod on the prepared surface, with edges in close contact, and embed it firmly and smoothly by light tamping with appropriate tools. Do not use sod which has been cut for more than 48 hours.*

Place the sod to the edge of all landscape areas and to the edge and 1 inch [25 mm] below adjoining pavement with an even surface and edge. Peg sod at locations where the sod may slide. Drive pegs through sod blocks into firm earth, flush with the sod soil surface, at intervals approved by the Engineer.

Place rolled sod parallel with the roadway and cut any exposed netting even with the sod edge. In areas with steep slopes, place rolled sod in the following manner:

1. From the top of the slope break point, roll the sod down the slope to the toe, with sod overlapping 3 inches [75 mm], and peg in the overlap locations;

2. At the top of the slope adjacent to the edge of pavement, place rolled sod parallel to the roadway with sod overlapping the previously placed sod rolled down the slope.

For sod blocks, stagger the setting of the sod pieces as shown in the Design Standards, Index 105 to avoid a continuous seam along the line of flow. Tamp the outer pieces of sod to produce a feathered edge effect.

Remove and replace any sod as directed by the Engineer.

***570-3.3 Hydroseeding:** Use equipment specifically designed for mixing the wood fiber, seed, fertilizer, tackifier and dye, and applying the slurry uniformly over the areas to be hydroseeded.*

Use wood fiber that is made of 100% hardwood or softwood and does not contain reprocessed wood or paper fibers. Ensure that a minimum of 50% of the fibers are equal to or greater than 0.15 inch [4 mm] in length and a minimum of 50% of the fibers will be retained on a twenty-five mesh screen. Mix the wood fiber with water meeting the requirements of Section 983 at the rate of approximately 50 pounds [23 kg] of fiber to 100 gallons [380 liters] of water.

Mix fertilizer into the hydroseeding slurry at the rates specified in 570-3.7.

Mix seed into the slurry at rates in accordance with Design Standards, Index 104.

Use tackifier that is a guar gum in powder form, pre-packaged in the hydroseeding mix, at the rate of 1.5 pounds [1 kg] per 50 pounds [23 kg] of wood fiber, with minimum viscosity of 4,500 cps.

Use dye that is pre-packaged in the hydroseeding mix. Ensure that the dye does not contain growth or germination inhibiting chemicals.

Do not use acrylamide and polyacrylamide containing materials in hydroseeding. These may include tackifiers, flocculants or moisture-holding compounds.

If the moisture content of air-dry wood fiber exceeds 15%, proportionally increase wood fiber material as directed by the Engineer. Maintain the slurry uniformity by continuously agitating the mixture during the application, and use within 24 hours of combining materials with water. Apply the hydroseeding slurry at the rate of 2,000 pounds [908 kg] of material per acre for slopes up to 4:1, and at the rate of 2,500 pounds [1,135 kg] of material per acre for slopes up to 3:1. For slopes 3:1 or greater, or slope lengths greater than 40', use Bonded Fiber Matrix (see section 570-3.4 below), in place of wood fiber and tackifier, at manufacturer's specified rates.

570-3.4 Bonded Fiber Matrix (BFM): *Meet the minimum physical and performance criteria of this Specification for use of BFM in hydroseeding operations or temporary non-vegetative erosion and sediment control methods.*

Ensure that the BFM is composed of long strand, thermally processed wood fibers held together by crosslinked hydro-colloid tackifier (>10%), which, upon drying becomes water-insoluble and non-dispersible. Ensure that the BFM contains biodegradable dye to aid in uniform application of the material and that the resulting matrix performs in a manner equal or superior to biodegradable erosion control blankets (ECBs). Provide documentation of manufacturer's testing at an independent laboratory to the Engineer, demonstrating superior performance of BFM as measured by reduced water runoff, reduced soil loss and faster seed germination in comparison to erosion control blankets.

Use only BFMs that contain all components pre-packaged by the manufacturer to assure material performance. Deliver materials in UV and weather resistant factory labeled packaging. Store and handle products in strict compliance with the manufacturer's directions.

Do not use acrylamide and polyacrylamide containing materials in the BFM slurry. These may include tackifiers, flocculants or moisture-holding compounds.

Meet the following requirements after application of the formed matrix:

Ensure that the tackifier does not dissolve or disperse upon re-wetting.

Ensure that the matrix has no gaps between the product and the soil and that it provides 100% coverage of all disturbed soil areas after application.

Ensure that the matrix has a minimum water holding capacity of 1.2 gal/lb [1 liter/100g].

Ensure that the matrix has no germination or growth inhibiting properties and does not form a water-repelling crust.

Ensure that the matrix is comprised of materials which are 100% biodegradable and 100% beneficial to plant growth.

Provide certification of successful completion of training by the BFM manufacturer in the proper procedures for the mixing and application of the product. Mix and apply the BFM in strict compliance with the manufacturer's recommendations.

Apply the BFM to geotechnically stable slopes at the manufacturer's recommended rates. Use specially designed hydraulic seeding/mulching machines with fan-type nozzle (50-degree tip) for the application. Apply the BFM from opposing directions to the soil surface in successive layers, thereby reducing the "shadow effect" and achieving 100% coverage of all exposed soil. Do not apply the BFM immediately before, during or after rainfall, so that the matrix will have an opportunity to dry for up to 24 hours after the installation. In difficult conditions of extreme slope or daily precipitation, where applications of BFM may fail, Engineer may allow use of alternative technologies to accomplish necessary seeding operations.

Degradation of BFM will occur naturally as a result of chemical and biological hydrolysis, UV exposure and temperature fluctuations. Re-application, as determined by the Engineer, will be required if BFM-treated soils are disturbed or water quality or turbidity tests show the need for an additional application. The work and materials for reapplication, will be paid for as Unforeseeable Work.

Provide evidence of product performance testing, manufacturer's certification of training and material samples to the Engineer at least seven calendar days prior to installation.

570-3.5 Rolling: Immediately after seeding *or sodding*, roll the entire ~~grassed or mulched~~ area with a cultipacker, ~~traffic roller~~*lightweight turf roller* or a horticultural roller. Make at least two passes over the entire area. *Provide a true and even surface without any displacement of materials or deformation. Do not roll hydroseeded or BFM-treated areas*.

570-3.6 Watering: *Water all turf areas as necessary to produce a healthy and vigorous stand of turf. Ensure that the water used for turf irrigation meets the requirements of Section 983.*

~~Provide a vehicle for applying water to the grassed~~ *turf* ~~areas equipped with either a calibrated tank or an approved metering device installed at such point on the vehicle as to measure the water at~~ *the* ~~time of application.~~ *Thoroughly water sod immediately after placing, but* ~~Do not water newly seeded areas to force the seed germination.~~

~~———————~~*do not apply water to hydroseeded or BFM treated areas for at least 24 hours after installation.*~~Do not apply more than 1 inch [25 mm] of water per week for sustaining the grass growth. Use water only on vegetated areas when permitted by the Engineer.~~

570-3.7 Fertilizing: *Based on a soil test performed in accordance with Section 162, spread an initial application of an appropriate fertilizer formulation at the rate recommended by the soil testing laboratory. Refer to Section 982 for fertilizer rate calculations.*

For bid purposes, base estimated quantities on an initial application of 265 lbs/acre [300 kg/ha] and one subsequent application of 135 lbs/acre [150 kg/ha] of 16-4-8.

Spread the fertilizer by hand on steep slopes or other areas where machine-spreading may not be practical.

Seeding: Spread the fertilizer over the ~~grassed~~ *seeded* area*, in one or more applications as specified above,* four to five weeks after the ~~grass~~*grass* seed germinates.

~~in one or more applications as specified below.~~

Sodding: Spread the fertilizer over the area, in one or more applications as specified above, one to two weeks after the sod placement.

Hydroseeding: An initial application of fertilizer shall be mixed into the hydroseeding slurry. The Engineer will determine if additional fertilization may be necessary.

~~———————Spread an initial application of 265 lbs/acre [300 kg/ha] of 16-4-8.~~

~~———————If the project has not reached final acceptance in accordance with Article 5-11, spread subsequent applications of 135 lbs/acre [150 kg/ha] of 16-4-8 approximately 60 calendar days after the initial application without mixing into the soil.~~

~~———————The Contractor may spread the fertilizer by hand on steep slopes or other areas where machine-spreading may not be practicable.~~

570-4 ~~Maintenance~~*Establishment Period*.

~~Maintain the planted areas as an acceptable stand of grass until final acceptance of the project at no expense to the Department.~~ *Perform all work to sustain an established turf until final acceptance, at no additional expense to the Department.* ~~Include in such maintenance~~*Provide* the filling, leveling, and repairing of any washed or eroded areas, as may be necessary.

~~An acceptable stand of grass~~*Established turf* is defined as *follows:*

~~a 1 by 1 foot [300 by 300 mm] area containing a minimum of 16 live, viable, healthy wildflower and/or grass seedlings.~~

Established root system (leaf blades break before seedlings or sod can be pulled from the soil by hand).

No bare spots larger than one square foot [0.1m^2].

No continuous streaks running perpendicular to the face of the slope.

No bare areas comprising more than 1% of any given 1,000 square foot [100 m^2] area.

No deformation of the turf areas caused by mowing or other Contractor equipment.

Monitor turf areas and remove all competing vegetation, pest plants, and noxious weeds (as listed by the Florida Exotic Pest Plant Council, Category I "List of Invasive Species", Current Edition, www.fleppc.org). Remove such vegetation regularly by manual, mechanical, or chemical control means, as necessary. When selecting herbicides, pay particular attention to ensure use of chemicals that will not harm desired turf or wildflower species. Use herbicides in accordance with 7-1.7.

Begin mowing turf after establishment of a healthy root system. Mow turf to the height of not less than 6 inches [150 mm]. Do not mow wildflower areas until at least three weeks after the peak of the bloom period and do not mow lower than 6 inches [150 mm]. Do not use selective herbicides in wildflower areas.

The Department will *only* pay for replanting as necessary due to factors determined to be beyond *the* control of the Contractor.

~~Mow the planted grass areas to a height of 6 inches [150 mm] when competing vegetation height exceeds 20 inches [500 mm] in height. Do not mow wildflower areas until at least three weeks after the peak of the bloom period and do not mow lower than 6 inches [150 mm]. Do not use selective herbicides in wildflower areas.~~

570-5 Method of Measurement.

~~570-5.1 General:~~ The quantities to be paid for will be *plan quantity based on the area shown in the plans, completed and accepted. This includes grass seed, wildflower seed, hydroseeding or BFM application, sod, water and fertilizer.* ~~for the following items accepted:~~

~~(1) The area, in square feet [square meters], of seeding.~~

~~(2) The area, in square feet [square meters], of seeding and mulching.~~

~~(3) The weight, in pounds [kilograms], of grass seed.~~

~~(4) The weight, in tons [metric tons], of mulch material.~~

~~(5) The weight, in tons [metric tons], of fertilizer.~~

~~(6) The volume, in thousand gallons [kiloliters], of water.~~

(7) The weight, in pounds [kilograms], of wildflower seed.

(8) The area, in acres [hectares], of mowing.

570-5.2 Area Quantities: For the quantities paid for on a square foot [square meter] basis, no deductions will be made for the areas occupied by turnouts in rural sections.

570-5.3 Seed: The quantity of grass or wildflower seed will be determined from packaged weights or by other appropriate methods.

570-5.4 Mulch Material: The quantity will be determined by weighing on truck scales, or by other appropriate methods. The Contractor shall advise the Engineer of the time and place of such weighing. Weighing will be done in the general vicinity of the project.

570-6 Basis of Payment.

570-6.1 General: Prices and payments will be full compensation for all work and materials specified in this Section.

The work and materials for pegging of sod and re-planting as directed by the Engineer (as provided in 575-3.2), will be paid for as Unforeseeable Work.

570-6.2 Seeding: When mulching is not specified, price and payment will be full compensation for all work and materials not specifically included in the items of separate payment shown below. The item of Seeding will include specifically all preparations of the ground, the application of the seed, the rolling, tilling or other specified work.

570-6.3 Seeding and Mulching: When mulching is specified, price and payment will be full compensation for everything specified in 570-6.2 and, in addition, will include the cost of applying, cutting-in, rolling, and anchoring, where required, of the mulch material, but will not include the furnishing of the mulch material.

570-6.4 Seed: Price and payment for Grass Seed (Permanent Type) and, Grass Seed (Quick-Growing Type) will be full compensation for the furnishing of the seed, at the site of its use. Price and payment for Wildflower Seed will include furnishing, applying, and mixing the seed into the seed bed.

570-6.5 Mulch Material:

570-6.5.1 General: Price and payment will be full compensation for the furnishing and spreading of the mulch material, at the site of its use.

570-6.6 Water: The quantity of water, ordered at the specific time of its being applied and which is actually used, determined by the specific metering device or by calibrated tank, will be paid for at the Contract price per thousand gallons [kiloliters] of Water for Grassing. Such quantity will include all water authorized by the Engineer, which is used until the time of acceptance of the work.

570-6.~~7~~*1* Payment Items: Payment will be made under:

Item No. 104- 4- Mowing - per acre.
Item No. 2104- 4- Mowing - per hectare.
Item No. 570- 1- Seeding,*Turf Complete* - per square yard.
Item No. 2570- 1- Seeding,*Turf Complete* - per square meter.
Item No. 570- 2- Seeding and Mulching - per square yard.
Item No. 2570- 2- Seeding and Mulching - per square meter.
Item No. 570- 3- Grass Seed (Permanent Type) - per pound.
Item No. 2570- 3- Grass Seed (Permanent Type) - per kilogram.
Item No. 570- 4- Mulch Material - per ton.

~~Item No. 2570- 4 Mulch Material - per metric ton.~~
~~Item No. 570- 5 Fertilizer - per ton.~~
~~Item No. 2570- 5 Fertilizer - per metric ton.~~
~~Item No. 570- 9 Water for Grassing - per thousand gallons.~~
~~Item No. 2570- 9 Water for Grassing - per kiloliters.~~
~~Item No. 570- 10 Grass Seed (Quick-Growing Type) - per pound.~~
~~Item No. 2570- 10 Grass Seed (Quick-Growing Type) - per kilogram.~~
~~Item No. 570- 12 Wildflower Seed - per pound.~~
~~Item No. 2570- 12 Wildflower Seed - per kilogram.~~