

SECTION 32 90 00

PLANTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Seeding and landscape materials.

1.2 RELATED REQUIREMENTS - NOT USED

1.3 DEFINITIONS

- A. Pesticide: Any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests and is specifically labeled for use by U.S. Environmental Protection Agency (EPA). Also, any substance used as plant regulator, defoliant, disinfectant, or biocide.
- B. Stand of Turf: 100 percent of established species.

1.4 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. American National Standards Institute (ANSI):
 - 1. Z60.1-2014 - Nursery Stock.
- C. American Society for Testing And Materials (ASTM):
 - 1. B221-14 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. B221M-13 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 3. C33/C33M-16-Concrete Aggregates.
 - 4. C136/C136M-14 - Sieve Analysis of Fine and Coarse Aggregates.
 - 5. C602-13a - Agricultural Liming Materials.
 - 6. D977-13e1 - Emulsified Asphalt.
 - 7. D5268-13 - Topsoil Used for Landscaping Purposes.
- D. Hortus Third: Concise Dictionary of Plants Cultivated in United States and Canada.
- E. Turfgrass Producers International (TPI):
 - 1. 2006 Guideline Specifications to Turfgrass Sodding.
- F. United States Department of Agriculture (USDA):
 - 1. DOA SSIR 42-2014 - Soil Survey Laboratory Methods Manual.
 - 2. Handbook No. 60 - Diagnosis and Improvement of Saline and Alkali Soils.

1.5 PREINSTALLATION MEETINGS – NOT USED

1.6 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Photographs: Color photographs of each plant species showing actual size and condition of plants to be provided with measuring device included for scale. Where more than 20 plants are required of any species, submit minimum three photographs of average, best, and worst quality plant to be provided. Include on each photograph, plant full scientific name, size, and source nursery.
 - 3. Installation instructions.
 - 4. Warranty.
- C. Samples:
 - 1. Organic and Compost Mulch: 0.5 L. (1 pint) sealed plastic bag of each required mulch, including label with percentage weight of each material and source representing material to be provided. Samples to match color, texture, and composition of installed material.
 - 2. Mineral Mulch: 1.0 kg (2 lb.) sealed plastic bag of mulch, including label with source. Samples to match color, texture, and composition of installed material.
 - 3. Filter Fabric: 300 by 300 mm (12 by 12 inches).
 - 4. Edging Materials and Accessories: Manufacturer's standard sizes.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Regularly installs specified products.
 - 2. Installed specified products with satisfactory service on five similar installations for minimum five years.
 - a. Project Experience List: Provide contact names and addresses for completed projects.
 - 3. Member in good standing of either Professional Landcare Network or American Nursery and Landscape Association.
 - 4. Field supervisor certified in one of following categories from Professional Landcare Network and submit one copy of certificate to Contracting Officer's Representative:

- a. Certified Landscape Technician (CLT) - Exterior, with installation irrigation specialty areas, designated CLT-Exterior.
 - b. Certified Ornamental Landscape Professional, designated
- B. Contracting Officer's Representative may review plant materials either at place of growth or project site before planting for compliance with requirements. Contracting Officer's Representative retains right to inspect trees and shrubs to determine if any unacceptable conditions exist and to reject any trees or shrubs at any time during Project. All rejected trees and shrubs must be immediately removed from Project site.
- C. Material Test Reports: For standardized ASTM D5268 topsoil
 - 1. For each unamended soil type, provide soil analysis and written report by qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of soil.
 - 2. Comply with USDA's Handbook No. 60 testing methods and written recommendations.
 - 3. Soil-testing laboratory to oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Contracting Officer's Representative. Take minimum /3 representative samples from varied locations for each soil to be used or amended for planting purposes.
 - 4. Report suitability of tested soil for plant growth.
 - 5. Based on test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 92.9 sq. m (1000 sq. ft.) or volume per 0.76 cu. m (1 cu. yd.) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
 - 6. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.8 DELIVERY

- A. Deliver packaged products in manufacturer's original sealed packaging.
- B. Bulk Products:

1. Deliver bulk products away from buildings, utilities, pavement, and existing turf and planted areas. Maintain dry bulk product storage away from contaminants.
2. Install erosion control materials to prevent erosion or displacement of bulk products.

1.9 STORAGE AND HANDLING

- A. Store seeds and other packaged materials in dry locations away from contaminants.
- B. Topsoil: Before stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation three to four weeks before stockpiling existing topsoil.
- C. Root Control Barrier and Weed Control Fabric: Store materials in site in enclosures or under protective covering in dry location out of direct sunlight. Do not store materials directly on ground.
- D. Handling: Do not drop or dump plants from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Remove damaged plants from Project site.

1.10 FIELD CONDITIONS

- A. Environment:
 1. Coordinate installation of planting materials during optimal planting seasons for each type of plant material required.
 2. Restrictions: Do not plant when ground is frozen, snow covered, muddy, or when air temperature exceed 32 degrees C (90 degrees F).
- B. Weather Limitations: Install plantings only during current and forecasted weather conditions that are comply with plant requirements. Apply associated products in compliance with manufacturers' instructions.

1.11 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."
- B. Manufacturer's Warranty: Warrant plantings and against material defects.
 1. Warranty Period: Two years.
 2. Plant and Turf Warranty Periods will begin from date of Substantial Completion.
 3. Contracting Officer's Representative will reinspect plants and turf at end of Warranty Period. Replace any dead, missing, or defective

plant material and turf immediately. Warranty Period will end on date of this inspection provided Contractor has complied with warranty work required by this specification. Comply with following requirements:

- a. Replace any plants more than 25 percent dead, missing or defective plant material before final inspection.
- b. Only one replacement of each plant will be required except when losses or replacements are due to failure to comply with these requirements.
- c. Complete remedial measures directed by Contracting Officer's Representative to ensure plant and turf survival.
- d. Repair damage caused while making plant or turf replacements.

PART 2 - PRODUCTS

2.1 PRODUCTS - GENERAL

A. Provide each product from one source or manufacturer.

1. Biobased Content:

- a. Organic Mulch: 100 percent.
- b. Peat: 100 percent.

2.2 PLANT MATERIALS

A. Plant Materials: ANSI Z60.1, conforming to varieties specified and be true to scientific name as listed in Hortus Third. Well-branched, well-formed, sound, vigorous, healthy planting stock free from disease, sunscald, windburn, abrasion, and harmful insects or insect eggs and having healthy, normal, and undamaged root system.

2.3 SOD - NOT USED

2.4 SEED

A. Grass Seed: State-certified seed of latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weed seed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will not be acceptable. Field mixes will be acceptable when field mix is performed on site in presence of Contracting Officer's Representative.

B. Seed Mixtures: Proportion seed mixtures by weight.

1. Full Sun: Bermudagrass or as requested by COR to match existing campus seed, minimum of 3 cultivars.

2.5 TURF SELECTIONS

A. Grasses for Cool Regions:

1. Bentgrasses: Redtop (*Agrostis alba*) and Colonial (*Agrostis tenuis*).
 2. Bluegrasses: Kentucky (*Popratisensis*), Rough-stalked (*Potrivialis*) and Canada(*Poa compressa*).
 3. Fescue: Red (*Festucrubra*), Meadow (*Festucpratensis*) and Tall (*Festucarundinacea*).
 4. Ryegrasses: Perennial (*Lolium perenne*).
- B. Grasses for Warm Regions:
1. Bermuda grass (*Cynodon dactylon*).
 2. Carpetgrass (*Axonopus affinis*).
 3. Centipedegrass (*Eremochloophiuroides*).
 4. St. Augustinegrass (*Stenotaphrum secundatum*).
 5. Zoysiagrass (*Zoysimatrella*).
- 2.6 SPRIGS - NOT USED**
- 2.7 PLUGS - NOT USED**
- 2.8 PLANTING SOILS - NOT USED**
- 2.9 INORGANIC SOIL AMENDMENTS - NOT USED**
- 2.10 ORGANIC SOIL AMENDMENTS - NOT USED**
- 2.11 PLANT FERTILIZERS - NOT USED**
- 2.12 WEED CONTROL FABRIC**
- A. Roll Type Polypropylene or Polyester Mats: Woven, needle punched, or non-woven fabric treated for protection against deterioration due to ultraviolet radiation. Minimum 99 percent opaque to prevent photosynthesis and seed germination, fabric allows air, water, and nutrients to pass through to plant roots.
1. Minimum weight: 0.11 kg per square meter (5 ounces per square yard).
 2. Minimum thickness: 0.50 mm (20 mils).
- 2.13 MULCH - NOT USED**
- 2.14 EDGING - NOT USED**
- 2.15 ANTIDESICCANT**
- A. Antidesiccant: An emulsion specifically manufactured for agricultural use that will provide protective film over plant surfaces permeable enough to permit transpiration.
- 2.16 EROSION CONTROL - NOT USED**
- 2.17 ROOT CONTROL BARRIER**
- A. Root Control Barrier: Flexible and permeable geotextile fabric with permanently attached time-release nodules. Pre-formed round, tapered cylinder barrier with integral vertical root deflecting ribs constructed of ultraviolet resistant polypropylene material.

2.18 BIOSIMULANTS - NOT USED

2.19 STAKING AND GUYING MATERIALS - NOT USED

2.20 TREE WRAP - NOT USED

2.21 TACKIFIERS AND ADHESIVES - NOT USED

2.22 WATER

- A. Water: Source approved by Contracting Officer's Representative and suitable quality for irrigation, containing no elements toxic to plant life, including acids, alkalis, salts, chemical pollutants, and organic matter. Use collected storm water or graywater when available.

2.23 PESTICIDES

- A. Consider IPM (Integrated Pest Management) practices to minimize use of all pesticides and chemical products. Obtain Contracting Officer's Representative's approval for allowable products, product alternatives, scheduling, and application procedures. Evaluate existing weather and site conditions before application. Apply products during favorable weather and site conditions according to manufacturer's instructions and warranty requirements.

2.24 FINISHES - NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
 - 1. Verify that no materials that would inhibit plant growth are present in planting area. If such materials are present, remove soil and contaminants as directed by Contracting Officer's Representative and provide new planting soil.
 - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 3. Suspend soil spreading, grading, and tilling operations if soil moisture becomes excessive. Resume soil preparations when moisture content returns to acceptable level.
 - 4. If soil is excessively dry, not workable, and too dusty, moisten uniformly.
 - 5. Special conditions may exist that warrant variance in specified planting dates or conditions. Submit written request to Contracting Officer's Representative stating special conditions and proposed variance.

- B. Proceed with planting operations only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect existing and proposed landscape features, elements, and site construction and completed work from damage. Protect trees, vegetation, and other designated features by erecting high-visibility, reusable construction fencing. Locate fence no closer to trees than drip line. Plan equipment and vehicle access to minimize and confine soil disturbance and compaction to areas indicated on drawings.
- B. Install erosion control materials at all areas inside or outside limits of construction that are disturbed by planting operations. Provide erosion control and seeding with native plant species to protect slopes.

3.3 PLANT BED PREPARATION - NOT USED

3.4 GROUND COVER AND PLANT INSTALLATION - NOT USED

3.5 TREE, SHRUB, AND VINE PLANTING - NOT USED

3.6 MECHANIZED TREE SPADE PLANTING - NOT USED

3.7 TREE WRAP - NOT USED

3.8 TREE AND SHRUB PRUNING - NOT USED

3.9 STAKING AND GUYING - NOT USED

3.10 ROOT CONTROL BARRIER INSTALLATION - NOT USED

3.11 MULCH INSTALLATION - NOT USED

3.12 EDGING INSTALLATION - NOT USED

3.13 SODDING - NOT USED

3.14 SPRIGGING - NOT USED

3.15 PLUGGING - NOT USED

3.16 SEEDING

- A. Broadcast and Drop Seeding: Uniformly broadcast seed at rate of 15 pounds coated seed per acre on areas disrupted and disturbed by new construction. Do not overseed. Use broadcast or drop seeders. Sow one-half seed in one direction and sow remainder at right angles to first sowing. Cover seed uniformly to maximum 6 mm (1/4 inch) deep in clay soils and 13 mm (1/2 inch) deep in sandy soils by means of spike-tooth harrow, cultipacker, raking, or other approved device.
- B. Rolling: Immediately after seeding, firm entire area, except for slopes in excess of 3 to 1, with roller not exceeding 130 kg/m (90 lb./ft.) of roller width.

3.17 HYDROSEEDING - NOT USED

3.18 TURF RENOVATION

- A. General: Restore to original condition existing turf areas damaged during turf installation and construction operations. Keep at least one paved pedestrian access route and one paved vehicular access route to each building clean at all times. Clean other paving when work in adjacent areas is complete.
- B. Overseeding: Apply seed according to applicable portions of "Seed Application Method" at rates specified in "Seed Composition."

3.19 PLANT MAINTENANCE - NOT USED

3.20 SLOPE EROSION CONTROL MAINTENANCE - NOT USED

3.21 REMOVAL OF DYING OR DEAD PLANTS - NOT USED

3.22 TURF MAINTENANCE - NOT USED

- A. Mow turf to uniform finished height measured from soil. Perform mowing in manner that prevents scalping, rutting, bruising, uneven and rough cutting. Before mowing, remove and dispose of all rubbish, debris, trash, leaves, rocks, paper, and limbs or branches on turf areas. Sweep or vacuum clean adjacent paved areas.
- B. Apply fertilizer in manner that promotes health, growth, vigor, color and appearance of cultivated turf areas. Determine method of application, fertilizer type and frequencies by results of laboratory soil analysis. Apply fertilizer by approved methods and according to manufacturer's instructions.
- C. Watering: Perform irrigation in manner that promotes health, growth, color, and appearance of cultivated vegetation, complying with Federal, State, and local water agency and authority directives. Prevent overwatering, water run-off, erosion, and ponding due to excessive quantities or rate of application.

3.23 CLEANING

- A. Remove and legally dispose of all excess soil and planting debris.

3.24 PROTECTION

- A. Protect plants from traffic and construction operations.
- B. Provide temporary fences or enclosures and signage, at planted areas. Maintain fences and enclosures during maintenance period.
- C. Remove protective materials immediately before acceptance.
- D. Repair damage.

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