

SECTION 329210 - TURF AND GRASSES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnish all labor, material, equipment related services and supervision necessary for or incidental to the installation of the lawns and grasses as shown or indicated on the Drawings and/or as specified.
- B. Work Included:
 - 1. Soil Preparations and Fine Grading.
 - 2. Fertilization.
 - 3. Grass Sodding.
 - 4. Grass Seeding.
 - 5. Grass Hydro Mulch.

1.2 SUBMITTALS

- A. Delivery Receipts and Invoices: Submit original delivery receipts and invoices for materials used.
- B. Product Data: Submit sample label or specification of fertilizer.
- C. Certificate: Submit State Certificate stating variety and purity of grass sod.
- D. Certificate: Submit State Certificate stating analysis of purity and germination of seed.
- E. Soil Fertility Test Reports:
 - 1. Submit analysis, test results and corrective recommendations to Architect.
 - 2. Two tests required of existing soil taken at different locations on the project site as directed by the Architect.

1.3 PROTECTION

- A. Protect paving surfaces, curbs, utilities, plant materials, and other existing improvements from damage by heavy equipment.
- B. Locate and stake irrigation heads, valve risers and equipment prior to beginning soil preparation work.
- C. During work and maintenance period, maintain topsoil in place at established grades. Replace topsoil and grass losses due to erosion.
- D. Exercise care to prevent the hydro mulch slurry from being sprayed inside reservoir basins or drainage ditches and channels which may impede the free flow of rainwater runoff or irrigation water.
- E. Clean paving and other surfaces of over-spray and spillage of hydro mulch slurry.
- F. During work and maintenance period, maintain topsoil in place at established grades. Replace topsoil and grass losses due to erosion.
- G. Protect in place work from damage by heavy equipment. Prepare, grade, level and replant damaged areas.

1.4 SUBSTANTIAL COMPLETION & PROJECT CLOSEOUT

- A. A Certificate of Substantial Completion will be issued when the Work performed under the Contract has been reviewed and found, to the Architect's best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion thereof is also the date of commencement of applicable guarantees as specified.

- B. A list of items to be completed or corrected will be attached to the Certificate of Substantial Completion. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract documents.
- C. The Contractor will complete or correct the Work on the list of items within a specific number of days as shown on the Certificate of Substantial Completion.
- D. Upon completion and re-inspection of all corrected items listed, the Architect will recommend to the Owner that the work of this Section is ready for final acceptance.

1.5 QUALITY ASSURANCE

- A. General: Comply with applicable Federal, State, County and local regulations governing landscape materials and work.
- B. Personnel: Employ only experienced personnel who are familiar with the required work. Provide supervision by a qualified foreman.

1.6 GUARANTEE

- A. Guarantee lawns and grasses for one year after date of Final Acceptance. At the end of this guarantee period, all lawn and grass areas will have achieved coverage of the specified grass at a density of 100% coverage, free of weeds, undesirable grass species, disease and insects. Replace dead materials and materials not in vigorous, thriving condition as soon as weather permits and on notification by the Architect.
- B. Replace lawns and grasses with same kind as originally planted, at no cost to the Owner. Protect irrigation system and other piping, conduit or other work during replacement. Repair damage immediately.

1.7 JOB CONDITIONS

- A. Do not install sod on saturated or frozen soil.
- B. Sod installation shall be subject to suitability of the weather and other conditions affecting sod growth.

1.8 PROGRESS MEETINGS

- A. Contractor shall attend all progress meetings as requested by the Architect/Owner during installation.

1.9 QUANTITY VERIFICATION

- A. The bidding contractor is responsible for the inclusion of all materials, labor and equipment as outlined in the plans and specification. The plant list is provided to the bidding contractor as a convenience and the quantities are approximate. VERIFICATION OF ALL QUANTITIES IS THE SOLE RESPONSIBILITY OF THE BIDDING CONTRACTOR. Any discrepancies must be reported to the Architect prior to submittal of bid.

PART 2 – PRODUCTS

2.1 GRASS

- A. Bermuda Sod:
 1. Sod shall be nursery grown on cultivated agricultural soils. Sod shall have been mowed regularly and carefully and otherwise maintained from planting to harvest.
 2. Sod shall be of species indicated.
 3. Thickness of Cut: Sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be plus or minus .25 inches on width and plus or minus 5% on length. Broken strips and torn or uneven ends will not be accepted.
 4. Strength of Sod Strips: Sod strips shall be strong enough to support their own weight and retain their size and shape if suspended vertically when grasped in the upper 10% of the section.
 5. Moisture Content: Sod shall not be harvested or transplanted when moisture content (excessively wet or dry) may adversely affect its survival. Sod shall be stored in a compact group to prevent drying out or freezing.

6. Time Limitations: Sod shall be harvested, delivered and transplanted within a 30-hour period unless the Architect prior to delivery approves a suitable preservation method. Sod not transplanted within this period shall be inspected for approval by the Architect prior to its installation.
 7. Thatch: Sod shall be free of thatch.
 8. Diseases. Nematodes and Insects: Sod shall be free of diseases, nematodes and soil-borne insects.
 9. Weeds: Sod shall be free of objectionable grassy and broadleaf weeds.
- B. Bermuda Grass Seed: *Cynodon dactylon* (Common Bermuda Grass).
1. Seed shall be harvested within one year prior to planting, free of Johnson grass, field bind weed, dodder seed and free of other weed seed to the limits allowable under the Federal Seed Act and applicable seed laws.
 2. The seed shall not be a mixture.
 3. The seed shall be hulled, extra fancy grade, treated with fungicide, and have a germination and purity that will produce, after allowance for Federal Seed Act tolerances, a pure live seed content of not less than 85%, using the formula: purity % times (germination % times plus hard or sound seed %).
 4. Seed shall be labeled in accordance with U.S. Department of Agriculture rules and regulations.
- C. Buffalo Grass Seed: *Buchloe dactyloides* (Buffalo Grass).
1. Seed Shall be harvested within one year prior to planting, free of Johnson grass, field bind weed, dodder seed and free of other weed seed to the limits allowable under the Federal Seed Act and applicable seed laws. The seed shall not be a mixture.
 2. The seed shall be hulled, extra fancy grade, treated with fungicide and have a germination and purity that will produce, after allowance for Federal Seed Act tolerances, a pure live seed content of not less than 70%, using the formula: purity % times (germination % times plus hard or sound seed %).
 3. Seed shall be labeled in accordance with U.S. Department of Agriculture rules and regulations.
- D. Native Grass Seed: See drawings for selected varieties.
1. Seed shall be harvested within one year prior to planting, free of Johnson grass, field bind weed, dodder seed and free of other weed seed to the limits allowable under the Federal Seed Act and applicable seed laws.
 2. The seed shall be hulled, extra fancy grade, treated with fungicide and have a germination and purity that will produce, after allowance for Federal Seed Act tolerances, a pure live seed content of not less than 70 % , using the formula: purity % times (germination % times plus hard or sound seed %).
 3. Seed shall be labeled in accordance with U.S. Department of Agriculture rules and regulations.
- E. Wildflower Seed: See drawings for selected varieties.
1. Seed shall be harvested within one year prior to planting, free of Johnson grass, field bind weed, dodder seed and free of other weed seed to the limits allowable under applicable seed laws.
 2. The seed shall have a germination and purity that will produce a pure live seed content of not less than 70%, using the formula: purity % times (germination % times plus hard or sound seed %).
 3. Seed shall be labeled in accordance with U.S. Department of Agriculture rules and regulations.

2.2 FERTILIZER

- A. General:
1. Fertilizer shall be commercial product, uniform in composition, free flowing, and suitable for application with approved equipment.
 2. Deliver fertilizer to site in fully labeled original containers.
 3. Fertilizer, which has been exposed to high humidity and moisture, has become caked or otherwise damaged, making it unsuitable for use, will not be acceptable.
- B. Application Rates:
1. Contractor to submit proposed application rates for approval, prior to application.

2.3 HYDRO MULCH MATERIALS

- A. The hydro mulch shall be composed of virgin wood cellulose fiber and contain no germination or growth-inhibiting factors. It shall have a consistent texture which disperses evenly and remains suspended in agitated water. It shall have a temporary green dye and the following property analysis:
- a. Moisture content: 9.0% ± 3% O.D. basis.

- b. Organic matter: 99.2% ± 0.8%
 - c. Ash content: 0.8% ± 0.2%
 - d. PH: 4.8% ± 0.5%.
 - e. Water Holding Capacity (grams of H₂O per 100 grams of fiber): 1150 minimum.
 - B. Source: Weyerhaeuser, Conweb or equal.
 - C. Hydro Mulching Additive (Binder): Ecology "Control-M-Binder" organic seeding additive or equal.
- 2.4 EROSION BLANKET: Curlex Blanket manufactured by American Excelsior Company (817 640-2161) or equal.

PART 3 – EXECUTION

3.1 GENERAL

- A. Execute grass-planting operations across slope and parallel to finished grade contours.

3.2 PRE-PLANT WEED CONTROL

- A. Irrigated Grass Areas Only:
 1. After irrigation system is operational, apply water for 5 to 10 days as needed to achieve weed germination. Apply contact herbicides and wait as needed before planting. Repeat as needed.
 2. Maintain lawn and grass areas weed free until final acceptance by Owner utilizing mechanical and chemical treatment.

3.3 SOIL PREPARATION

- A. Site:
 1. General Contractor to leave all turf areas 1" below proposed finish grade.
 2. Landscape Contractor to bring in 1" of "Imported Topsoil" to achieve final finish grade.
- B. Tillage:
 3. Tillage shall be accomplished to loosen all areas of compacted soil. When placement of topsoil is specified, till compacted areas prior to placement.
 4. Till with heavy duty disc, rototiller, or chisel-type breaking plow, chisels set not more than 10 inches apart. Till to a depth of 1 to 3 inches.
 5. Initial tillage shall be done in crossing pattern for double coverage then followed by a disc harrow.
- C. Cleaning:
 1. Remove debris, building materials, rubbish, weeds, and stones larger than ¾" inch in diameter.
 2. Use Rock Pick or other machinery to gather surface stones larger than ¾" inch in diameter.
 3. Final finish grade to be within ¼" plus/minus from specified finish grade prior to placement of sod.
- D. Fine Grading:
 1. After tillage and placement of topsoil, level, fine grade, and drag with a weighted spike harrow or float drag.
 2. Eliminate ruts, depressions, humps and objectionable soil clods.

3.4 FERTILIZING

- A. The fertilizer types and rates specified herein are applicable unless countermanded by the soil fertility test corrective recommendations, in which case they will be applicable.
- B. Bermuda Grass Sprigging and Sodding:
 1. Initial Application: Apply no more than 5 days prior to commencement of sprigging or sodding operations at a rate of 20 pounds per 1,000 square feet. Incorporate into soil with a chain harrow.
 2. Second and Third Applications: Apply every 25 days after sprigging or sodding at a rate of 10 pounds per 1,000 square feet.
 3. Irrigate the area with a minimum of .25 inches of water to properly incorporate the fertilizer into the turf.

3.5 PLANTING SOD

- A. Weather Conditions:
 1. Schedule work for periods of favorable weather.
 2. Sod placement on days, which, in the judgment of the Landscape Architect, are too hot, cold, sunny, dry or windy for optimal installation, may be prohibited.
- B. Placement Pattern:
 1. The first row shall be laid in a straight line with subsequent rows parallel to the first row and tightly abutting each other.
 2. Lateral joints shall be staggered. Care shall be exercised to insure that the sod is neither stretched nor overlapped. Joints must be butted tightly to prevent voids that could permit air to dry out root.
 3. Immediately after placing, sod shall be pressed firmly into contact with bed by tamping or rolling to eliminate air pockets. Following tamping, screened topsoil shall be used to fill all cracks and excess soil shall be worked into the sod with rakes or other suitable equipment. Sod shall not be smothered with excess fill soil.
 4. On slopes steeper than 3 to 1, sod shall be secured by galvanized pins, wood pegs or other methods approved by the Landscape Architect.
 5. Immediately after sodding operations have been completed, the entire surface shall be compacted with a roller or other approved equipment. The completed area after sodding shall be uniformly even, firm and true to finished grade lines.
- C. Watering:
 1. Initial Installation: Water must be applied within 2 hours of exposure of the sod to sun or wind. Water newly laid sod until saturation of the entire area is apparent. As a result of initial irrigation, standing water may be present and moderate to heavy run off may occur. Continue to irrigate on a daily basis in shorter durations so the entire area stays thoroughly wet but without standing water. The length of irrigation time and frequency of applications will vary at different locations due to weather conditions and individual site characteristics.
 2. After 7 to 10 days: Check for new root growth by lifting corners of sod blocks. If consistent root growth over the entire site is observed, water applications can be reduced to once every other day.
 3. After 12 to 14 days: Recheck for additional rooting. If sod blocks are difficult to pull up or additional new roots are present allow the area to dry to the extent that mowing can be performed.

3.6 PLANTING HYDRO MULCHED GRASS AREAS

- A. Provide pre-plant weed control as specified above.
- B. Apply hydro mulch in the form of a slurry consisting of cellulose fiber, seed, chemical additives, commercial fertilizer and water. When hydraulically sprayed on the soil surface, the hydro mulching shall form a blotter-like groundcover impregnated uniformly with seed and fertilizer and shall allow the absorption of moisture and rainfall to percolate to the underlying soil.
- C. Prepare slurry at the site of work beginning 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, full recirculation shall be established; and at this time the seed shall be added. Fertilizer shall then be added, followed by mulch. The mulch shall only be added to the mixture after the seed and after the tank is at least one-third filled with water. All the mulch shall be added by the time the tank is two-thirds to three-fourths full. Commence spraying immediately when tank is full.
 1. Mix: Mix Bermuda Grass seed, mulch, and water together and apply as follows. Use hydro mulch equipment by Bowie Machine Works or equal.

<u>ITEM</u>	<u>RATE PER THOUSAND SQUARE FEET</u>
Bermuda Grass Seed	2.0 pure live seed pounds
Water	as Needed
Wood Fiber Mulch	50 Pounds
Fertilizer	as Specified

- D. Application: Spray with a uniform visible coat by using the green color of the mulch as a guide. Apply in a sweeping motion, in an arched stream so as to fall like rain allowing the wood fibers to build on each other until a good coat is achieved and the material is spread at the required rate per acre.
- E. Time Limit: Slurry mixture which has not been applied within two hours after mixing will be rejected and shall be removed from the project at Contractor's expense.
- F. Immediately following application of hydro mulch, wash excess material from previously planted materials and architectural features. Avoid washing or eroding mulch materials from area.
- G. Timing: Hydro mulch Bermuda Grass from May 1 to August 30.
- H. When hydro mulch installation of the permanent grass variety does not fall within the dates specified, Annual Rye Grass will be hydro mulched at 10 pounds per 1,000 square feet using the approved equipment. Conversion to the permanent grass variety is part of this scope of work and will take place as and when specified.

3.7 PLANTING SEEDED GRASS AREAS

- A. Apply Bermuda Grass seed evenly at the rate of 2.0 pure live seed pounds per 1,000 square feet using and approved no-till drill seeder specifically designed for grass seed, installation.
- B. Apply Buffalo Grass seed evenly at the rate of 1.5 pure live seed pounds per 1,000 square feet using an approved no-till drill seeder specifically designed for grass seed installation.
- C. Apply native grass seed at the rate specified using a no-till grass seed drill or a broadcast spreader. Evenly spread seed over the entire area. If using a broadcast spreader, use a roller-packer or rake to press the seed into the soil. Most seeds should never be buried more than twice their diameter. Do not bury small seeds.
- D. Apply wildflower seed at the rate specified. Spread half the seed evenly over the whole area. Then cross back in the opposite direction and spread the remaining seed evenly over the entire areas. Follow with a roller-packer or rake to press the seed into the soil.
- E. Place erosion Blanket over seeded areas sloped 1 inch to 3 inches and steeper.
- F. Anchor Erosion Blanket with wire staples at edges, through center and using trenched in edges per manufacturer recommendation.
- G. Water seeded areas to depth of 4 inches.
- H. Timing:
 - 1. Drill seed Bermuda Grass from May 1 to August 30.
 - 2. Drill seed Buffalo Grass from May 1 to August 30.
 - 3. Broadcast or drill seed native grass seed from early spring to late summer when soil temperatures are above 65 degrees.
 - 4. Broadcast wildflower seed from August to late November.
- I. When seeding installation of the permanent grass does not fall within the dates specified, Annual Rye Grass will be seeded at 10 pounds per 1,000 square feet using an approved no-till drill seeder specifically designed for grass seed installation. Conversion to the permanent grass variety is part of this scope of work and will take place as and when specified.

3.8 GRADING

- A. Maintain existing established grades, protect true and even during operations.

3.9 EROSION CONTROL

- A. During work and maintenance period, maintain topsoil in place at established grades. Replace topsoil and turfgrass losses due to erosion.

3.10 CLEAN-UP

- A. Remove excess material and debris from site.

3.11 MAINTENANCE

- A. Until Final Acceptance, maintain lawn and grass areas by watering, mowing, weeding, spraying, cleaning and replacing as necessary to keep the turf and grass in a vigorous, healthy condition.
 - 1. Watering: As necessary. Provide temporary above ground sprinklers over un-irrigated areas including temporary water meter if required. Water cost will be paid separately by the Owner or General Contractor unless noted differently on the drawings or bid form.
 - 2. Mowing: Bermuda Grass Sod: Mow newly planted grass areas weekly after initial growth reaches 1.5 to

- 2 inches.
3. Weeding: Remove weeds and foreign grass over lawn and grass areas at least once a week. Herbicides may be used only when approved by the Owner and Architect.
 4. Follow landscape maintenance procedures outlined in specification section 329510 – Planting Maintenance.

END OF SECTION