SECTION 32 9219 - SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparation of subsoil.

B. Placing topsoil.

C. Hydroseeding, mulching and fertilizer.

D. Maintenance.

1.2 RELATED REQUIREMENTS

A. Division 31: For grading, excavation and trenching.

B. Section 32 8423 - Irrigation System: underground irrigation system.

C. Section 32 9300 - Plants: existing trees to remain.

1.3 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Certification: Submit certification of grass species and location of seed source.

C. Qualification Data for Seed Installer:

1. Submit license, personnel, insurance and equipment information to illustrate that Seed Installer is capable of and legally qualified to perform the type and scale of work required.

2. Submit a list of similar projects completed by Seed Installer demonstrating capabilities and experience. Include project names, addresses and year completed and include names and addresses of project contacts.

D. Construction Schedule: Indicating when the pre-installation conference will occur and how seeding activities, germination and establishment fit into the overall project construction

schedule and sequencing, including timing of substantial completion, final completion, maintenance and warranty periods.

E. Product Data:

1. Seed Tags:
    a. Seed bag tags and copies of invoices identified by project name.
    b. Product information shall include genus, species, variety, certification (if applicable), lot number, percentage pure live seed (or percentage purity and percentage germination), percentage crop seed/percentage inert/percentage weed seed, origin, test date, net weight, date of packaging and location of packaging.
2. Type and source of pesticides, herbicides, and fertilizers. Include project label, manufacturer's certified analysis, and manufacturer's application instructions specific to this project.
3. Type, source and composition of soil and soil amendments.
4. Type and source of mulch for overseeding and repair areas.

F. Product Samples:

1. Soils and Soil Amendments:
    a. Submit in sealed plastic bags labeled with composition of materials by percentage weight and source of material. Each sample shall be typical of the lot of material to be furnished and provide an accurate representation of color, texture, and makeup.
    b. Submit one quart volume sample of each material.

G. Soil Testing, Results and Recommendations:

1. Following award of the project, Contractor shall make recommendations for fertilizer and soil amendments for seed areas based on soil samples and testing by a regional laboratory during construction and prior to planting. Cost of testing is the responsibility of the Contractor.
2. Contractor shall submit results of soil tests for the seeding indicated on the drawings to the Architect, accompanied by the Contractor's recommendations for changes to the specified fertilizer and soil amendment materials and ratios/rates.
3. If there are additional costs associated with the change in recommended amendments, the Contractor may submit a proposal for this work at the time they submit the soil test results and recommendations.

H. Maintenance Data:

1. Two copies of recommended seed operations and maintenance procedures to be followed by the Owner for one full year. Submit prior to expiration of required maintenance period.
2. Include maintenance instructions related to weed control, irrigation, fertilization, soil amendments, pest control and erosion control.

I. Record Drawings:

1. At final acceptance, Contractor shall furnish Record Drawings prepared by a qualified draftsperson showing the entire completed seeded area. This is the responsibility of the Contractor and is not the responsibility of others. Insert a copy in the maintenance manual. Lack of providing Record Drawings shall be cause of nonpayment for any work.

J. Warranty: Sample of special warranty.

1.5 SUBSTITUTIONS

A. See Section 01 6000 - Product Requirements.

1.6 QUALITY ASSURANCE

A. Seed Producer: Company specializing in seed production and harvesting with minimum five years experience.

B. Installer Qualifications: Company specializing in seeding operations and maintenance with minimum five years experience.

C. Installer Field Supervision: Installer is required to maintain an experienced full-time supervisor on the project site when work is in session. Full-time supervisor must have a current copy of construction documents for the project on-site for reference at all times.

D. Maintenance Services: Performed by installer.

E. Seeding Observation:

1. Architect may observe seeding before installation for compliance with requirements for genus, species, variety, cultivar, condition of seed and general quality. Architect retains the right to observe seeding installation at any time during progress of work, to halt installation and to reject unsatisfactory or defective work or material. Contractor will remove rejected materials immediately from the project site at no cost to the Owner.
2. Coordination between Contractor and Architect for all observation shall be initiated by contractor a minimum of 48 hours prior to the intended observation. Required reviews are listed below:
    a. Seeded area before installation and after finished grade
    b. Condition immediately following installation
    c. During and after germination
3. Contractor shall not proceed with work of the next sequence without completing the previous work.

F. Pre-installation Conference: conduct pre-installation conference at project site prior to seeding operations.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Keep seeds, soil amendments, pest/weed control and related products in cool, dry storage away from contaminants.

B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

C. Seed tags and containers shall include the following information, percentage pure live seed (or percentage purity and percentage germination), year of production, net weight, date of packaging and location of packaging.

D. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

E. Do not dump or store bulk materials near structures, utilities, walkways, and pavements, or on existing turf areas or plants.

F. Provide erosion control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems or walkways.

1.8 FIELD CONDITIONS

A. Verify actual grade elevations, service and utility locations, irrigation systems components, and dimensions of planting and construction contiguous with new seeding before proceeding with seeding work.

B. Do not interrupt services or utilities to facilities occupied by Owner of others unless permitted to do so by the Owner or Architect. Do not proceed with interruption of services or utilities without Architect's written permission. Notify the Architect no fewer than two days in advance of proposed interruption of each service or utility.

1.9 SCHEDULING AND SEQUENCING

A. Scheduling:

1. Seeding restrictions: Soil temperature shall be consistently over 65 degrees. Winds shall be 10 mph or less.
2. Weather Limitations: Perform seeding only when existing and forecasted weather conditions permit planting to be performed that will have optimum results. Apply products during favorable weather conditions according to supplier's written instructions.

B. Sequencing:

1. Install seed after irrigation system and planting installations.
2. No more area may be seeded than can be completely installed in one day.

1.10 PROJECT CLOSEOUT

A. Substantial Completion: Shall be issued when the Contractor has completed the vast majority of work in the contract, the Architect is satisfied with the work, and the Architect is confident that the remaining work will be completed in a profession and timely manner.

1. Upon notification by the Contractor that work has been completed, the Architect will observe conditions and create a punchlist of items that are outstanding or in need of correction.
2. Upon receipt of the punchlist, the Contractor will propose a date for completion of the outstanding or corrected work.
3. The Architect may issue a certificate of substantial completion before, during or following the creation of the punchlist.
4. The maintenance period shall begin at Substantial Completion.
5. The warranty period shall extend one full year from the date of substantial completion, unless otherwise determined by the Architect.
6. Expectations for irrigated native seed installations: At the end of the maintenance period, a healthy, consistent, stand of native grasses and plant that were part of the seed blend has been established, free of weeds and surface irregularities, with coverage exceeding 30% over any 10 square feet and bare spots not exceeding 12 by 12 inches
7. Expectations for unirrigated seed installations will be in part dependent on precipitation. However, satisfactory seeded areas will have few weeds as a percentage of their overall grass coverage.

B. Final Completion: Upon notification by the Contractor that punchlist items have been addressed and work is complete, the Architect will observe conditions, and if the work meets expectations as expressed in the contract documents, the Architect shall issue notification of Final Completion. Final completion shall occur within the maintenance period.

C. Maintenance:

1. The Contractor shall maintain the seeded areas regularly throughout the installation and maintenance period of 90 days following substantial completion.
2. Owner shall provide maintenance afterwards, per the recommendations outlined in the maintenance manual.
3. The Contractor may address substantial completion punchlist items during the maintenance period.
4. See Part 3 for description of maintenance activities.
5. A minimum of one week prior to the end of the maintenance period, the Contractor shall notify the Architect and Owner of the date, to allow for observation of conditions and the orderly transition of maintenance obligations.
6. If maintenance obligations have not met the terms the plans and specifications, the maintenance period may be extended by the Architect.

D. Warranty:

1. Contractor shall warranty seed installation for a period of one full year after date of substantial completion against failures and defects including death and unsatisfactory growth as determined by the Architect, unless such failure is determined to be due to the Owner's negligence in following the Contractor's recommended maintenance procedure.

    a. Failures and defects may include, but are not limited to, death and unsatisfactory growth, settling, impacts from cold weather and deterioration of material beyond normal weathering.

2. At a minimum, remedial warranty actions shall include:

    a. Immediate removal and replacement of dead plant material, reseeding and mulching, unless required to plant in the next growing season.

3. Contractor shall regularly inspect seeded areas, and shall notify the Architect if they encounter site conditions unfavorable to the health of the plants.

4. Materials for reseeding or overseeding and mulching shall be of the same kind as used in the original installation unless directed otherwise by the Architect. It is the Contractor's responsibility to provide documentation of warranty treatment, repair or replacement. The Contractor shall coordinate documentation and any interim inspections with the Architect.

5. If an extended warranty period is enacted, an inspection will be conducted at the end of the extended warranty period to determine acceptance or rejection of seeding under the warranty requirements.

6. Where grass seeding is installed in areas without an irrigation system, no warranty shall be required after the date of substantial completion or the end of the 90-day maintenance period - whichever is later.

E. Final Acceptance: Shall be issued at the end of the warranty period, when the Architect has inspected and approved the work.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

B. All seed and seeding materials shall comply with the regulations and requirements of the State Department of Agriculture. Each bag of seed shall be sealed and labeled by the seed dealer in accordance with Federal Seed Laws and state Department of Agriculture Labeling Laws, having any necessary certification and tags.

2.2 SEED MIXTURE

A. Seed Mixture:

1. As noted on the drawings.

2. Seed mixture for overseeding and repair shall match existing.

3. Contractor to provide the following information on seed tags: genus, species, variety, certification (if applicable), lot number, percentage pure live seed (or percentage purity and percentage germination), percentage crop seed/percentage inert/percentage weed seed, origin, test date, net weight, date of packaging and location of packaging.

B. All seed shall be viable to the degree specified by the seller and true to source and species. Any seed that has been damaged due to moisture or other negative conditions shall not be accepted.

2.3 SOIL MATERIALS

A. Topsoil and Topsoil Blends:

1. Stockpiled soil from the site that is largely free of brush, debris, rocks in excess of 2 inch diameter, and sticks in excess of 6 inches long may be used as fill and cover for graded areas. For bidding purposes assume that 10% of soil needs for fine grading, replacement soil and seeded area cover will come from stockpiled soil.

2. Replacement soil where soil is contaminated or missing, soil shall be a blend similar to soils at Mesa del Sol, be capable of sustaining vigorous plant growth, and be of impurities, plants, weeds and seeds.

3. Soil conditioner (for placement in irrigated seed areas only) over exposed subgrade in irrigated seeding areas (1/2 inch depth after settling and prior to tilling), and over seeded areas (topdressing) (1/4 inch depth after settling), preapproved product basis of design is Soil Mender Soil Mix Topdress, consisting of composted cotton burrs and composted topsoil. Soil Mender Products, www.soilmender.com, 1-800-441-2498.

4. Use of high quality local sources is preferred and will be considered for use by the Architect

2.4 ACCESSORIES

A. Hydroseed/Hydromulch

1. Product Basis of Design: Enviro-Plus 100% Wood fiber with Tackifier Hydromulch

2. Hydroseed may include fertilizer and amendments.

3. Drill seeding is required in areas 4:1 or less, but all seeded areas must be covered in hydromulch with tackifier.

B. Fertilizer:

1. For bidding purposes, assume use of preapproved product basis of design Sustane 3-7-2 fertilizer - a blended slow release fertilizer with mycorrhizae and humates.

   a. Fertilizer shall be broadcast prior to drill seeding and hydromulching, or integrated into the hydromulch, whichever is recommend by manufacturer for project site conditions.

   b. Rates: for purposes of bidding assume manufacturer's low rate of 800 lbs per acre.

2. Amounts noted are included for purposes of bidding. Following award of the project, Contractor shall make recommendations for fertilizer based on results of soil samples taken from the site, and tested by a regional laboratory. Cost of testing is the responsibility of the Contractor.

C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

D. Edging: Steel, see Section 32 9300 - Plants.

2.5 TESTS

A. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that seeding area has been cleared and grubbed, as necessary.

1. For renovation areas, where overseeding or infill seeding is occuring, clearing and grubbing is not required.

B. Verify that no foreign or deleterious materials are located within the seeding area. If these materials are present in soil within the seeding area, Contractor shall remove contaminated soils and deleterious materials, legally dispose of them, replace soil with approved soil or soil blends, and bring seeding area to appropriate subgrade elevations.

C. Verify that finish grades are properly set and soil surface is prepared to accommodate seeding operations. Do not commence seeding operations until finish grades are properly set and approved.

D. Verify that irrigation system for irrigated seeding area is completed and operational. Verify that irrigation trenches are well compacted and there is no sign or ghosting of trenches.

E. Grade Stakes: Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

F. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated.

1. Notify Architect no fewer than two days in advance of proposed interruption of each service or utility.

2. Do not proceed with interruption of services or utilities without Architect's written permission.

G. Do not mix or place soils and soil amendments if frozen, wet or muddy conditions.

H. Suspend soil spreading, grading and tilling operations during periods of excessive soil moisture.

I. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

J. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install edging, where applicable, at periphery of seeded areas in straight lines to consistent depth.

B. Protect structure, utilities, sidewalks, pavements, landscaping, irrigation and other improvements from damage during seeding operations.

C. Install erosion-control measures to prevent erosion of displacement of soils and discharge of soil-bearing water runoff and airborne dust.

D. Limit subgrade preparation to areas to be seeded.

E. Limit soil disturbance and deep tilling within the drip line of trees. Should extensive tree roots be encountered, Contractor shall stop disturbance activities to discuss plan of action with Architect prior to further construction.

F. Newly Graded Subgrades:

1. Loosen subgrade to a minimum depth of 6 inches. Till soil in two directions at right angles to each other. Remove stones larger than 2 inch in any dimension, and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
2. Set subgrades to allow for new topsoil and amendments in addition to seed and mulch, such that the required finish grades will be met when completed.
3. If required, spread topsoil and amendments to a uniform depth after firming, but not less than required to meet finish grades after light rolling and natural settlement.
4. Rototill or thoroughly mix soil and amendments into top 6 inches of subgrade. Till soil to a homogeneous mixture of fine texture. Remove and disposed of stones and debris as noted above. Reduce elevation of subgrade as necessary to meet finish grades.

G. Finish Grading:

1. Grade seeding area to a smooth, uniform surface plant with a loose uniformly fine texture.

2. Spread fertilizers over seeding area immediately before seeding operations, where recommended by the manufacturer. Spread over loosened subgrade. Rake into top 2 inches of soil
3. Drill Seeding: Grade to 1/2 inch below finish elevation. Rake and roll area, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
4. Hydroseeding: grade per manufacturer's recommendations, which might include further compaction, rolling or imprinting of soil depending on slope conditions.

H. Before seeding, obtain Architect's acceptance of finish grading.

3.3 RENOVATION SEEDING

A. Renovate or repair existing seeding areas impacted by construction.
1. Grade disturbed area and prepare subgrades as described for newly graded areas.
2. Install new topsoil, topsoil blends and fertilizers as required.
3. Seed, mulch and topdress as required.

B. Renovate other desert grassland areas.
1. Remove vegetation from diseased or unsatisfactory areas. Do not bury vegetation in soil.
2. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.
3. Remove weeds before reseeding or overseeding. Where weeds are extensive, apply selective herbicides as required, taking extreme care not to apply on existing plant materials to remain or within existing tree root zones. Do not use pre-emergent herbicides.
4. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
5. Add topsoil to stripped, bare, and compacted areas and mix thoroughly to a depth of 6 inches. Mix thoroughly into soil except where tilling may damage visible tree roots.
6. Install new topsoil to fill low spots and meet finish grades.
7. Apply seed as required for renovation. Seed may installed with a drill or hydromulch, or be hand broadcasted. Hand broadcast seeding must be raked into the top 1 inch of soil.
8. In irrigated areas, lightly water newly seeded areas to a depth of 4 inches, and keep moist until new turf or meadow is established.

3.4 HYDROSEEDING

A. Apply seeded slurry with a hydraulic seeder at the rate indicated on the drawings.

B. Follow manufacturer's direction for mixing and application.

C. Spray the slurry from multiple intersecting directions and angles (when possible) to ensure complete and proper coverage. The mulch shall form a blotter-like material. Direct the spray operation so that this procedure will drill and mix the slurry components into the soil. Maintain clear of shrubs, trees, and site improvements.

D. Do not hydroseed area in excess of that which can be mulched on same day.

E. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

F. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

G. Treated areas shall not be disturbed after application.

H. Following germination, immediately re-seed areas without germinated seeds that are larger than 8 by 8 inches.

3.5 PROTECTION AND CLEANUP

A. Promptly remove soil, debris and mulch created by seeding work from paved areas and other improvements.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after seeding areas are established, or as directed by the Owner and Architect, but no longer than the end of the warranty period.

C. Remove non-biodegradable erosion-control measures after 90-day maintenance period or as directed by the Owner and Architect.

3.6 MAINTENANCE

A. Provide maintenance of seeded areas for three months from Date of Substantial Completion.

B. Maintain and establish seeded areas by watering, fertilizing, weeding, mowing, trimming, reseeding, and performing other operations as required to establish healthy, viable turf or meadow areas. Roll, regrade, and reseed bare or eroded areas and remulch to produce a uniformly smooth turf or meadow. Provide materials and installation the same as those used in the original installation.

1. Mow native seed and meadow areas as necessary for weed control. Otherwise limit mowing to fall or winter after grasses have gone to seed.
2. In irrigated areas, water to prevent seed and soil from drying out.
    a. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed.

b. Schedule watering to keep soil uniformly moist to a depth of 4 inches.

3. Roll surface to remove minor depressions and irregularities.

4. Control growth of weeds with manual weeding and mowing. Use herbicides only as a last resort, and only with Architect's prior approval.

C. Immediately reseed in areas that show deterioration, bare spots or subsidence. Roll, regrade and reseed area to produce uniformly smooth turf or meadow. Provide materials and installation the same as those used in the original installation.

END OF SECTION