

## SECTION 02900

### LANDSCAPING

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

###### A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and perform landscaping Work.
2. The extent of the landscaping Work shall be performed as shown and includes establishment of turf for all areas disturbed during the Work.
3. The types of landscaping Work required include the following:
  - a. Topsoil stockpiled for reuse.
  - b. Topsoil from offsite sources if topsoil stockpiled is insufficient to complete the Work of this Section.
  - c. Lawn areas.
  - d. Maintenance Work as specified until completion of the Contract.
  - e. Soil amendments.
  - f. Fertilizers.
  - g. Fencing.
  - h. Signs.
  - i. Mailboxes.
  - j. Guardrails.
  - k. Shrubs and ornamental landscaping.
  - l. Other miscellaneous items impacted by construction.
  - m. Guarantees.

###### B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with the landscaping.
2. Notify other contractors in advance of the installation of the landscaping to provide the other contractors with sufficient time for the installation of items included in their contracts that must be installed before the landscaping.
3. Notify Property Owners 48 hours prior to working on their property.

###### C. Related Sections:

1. Section 02220, Excavation and Backfill.

## 1.2 QUALITY ASSURANCE

### A. Source Quality Control:

1. General:
  - a. Ship landscape materials with certificates of inspection as required by governmental authorities.
  - b. Comply with governing regulations applicable to landscape materials.
  - c. ENGINEER may request inspection of delivery slips for materials to verify specified quantities of bulk deliveries of soil amendments, fertilizers, and seed.
  
2. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Analytical Chemists, wherever applicable or as further specified.
  
3. OffSite Topsoil: Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the site of the Work. Obtain topsoil only from naturally well drained sites where topsoil occurs in depth of not less than 4 inches; do not obtain from bogs or marshes.
4. Topsoil stockpiled for reuse: Topsoil may be inspected by ENGINEER before reuse. At the time of inspection ENGINEER may require representative soil samples to be tested for physical properties, hydrogen ion value, organic matter, and available phosphoric acid and potassium. Supply sufficient sample amount.. If deficiencies in the topsoil are found, as a result of this analysis, they shall be corrected at no additional expense to SD1.

### B. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified.

1. ANSI Z60.1, American Standard for Nursery Stock.
2. ASTM C 602, Agricultural Liming Materials.
3. ASTM D 2487, Classification of Soils for Engineering.
4. ASTM D 977, Emulsified Asphalt.
5. Association of Official Analytical Chemists, Official Methods of Analysis.
6. American Joint Committee on Horticultural Nomenclature, Standardized Plant Names.
7. Official Seed Analysts of North America, Standards of Quality.
8. FSOF241D, Fertilizer, Mixed, Commercial.

9. FSOP166E, Peat Moss; Peat, Humus; and Peat, Reedsedge.

### 1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
  1. Before delivery of offsite topsoil, a written statement giving the location of the properties from which the topsoil is to be obtained and the names and addresses of the suppliers.
  2. Manufacturer's specifications and installation instructions for all materials required.
- B. Test Reports: Submit for approval the following:
  1. Before delivery of offsite topsoil, a soil analysis made by an approved soil testing laboratory stating porosity, the percentages of silt, clay, sand and organic matter, the pH and the mineral and plant nutrient content of the topsoil. Supply topsoil with 5 percent organic matter minimum.
- C. Certificates: Submit for approval the following:
  1. Certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. For standard products submit other data substantiating that materials comply with specified requirements.
  2. Certificates from seed vendors certified statement for each seed mixture required, stating botanical and common name, percentage by weight and percentages of purity, germination, and weed seed for each species.

### 1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials:
  1. Do not deliver seed until site conditions are ready for planting.
  2. Deliver packaged materials in original, unopened containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery.
  3. Furnish seed in sealed, standard containers.
  4. Notify ENGINEER of delivery schedule in advance so plant material may be inspected upon arrival at job site.
  5. Remove unacceptable material immediately from project site.
- B. Storage of Materials:
  1. Store and cover materials to prevent deterioration. Remove packaged materials which have become wet or show deterioration or water marks from the site. Replace at no further cost to SD1.
  2. Seed that is wet or moldy or that has been otherwise damaged in transit or storage is not acceptable. Replace at no further cost to SD1.

## 1.5 JOB CONDITIONS

### A. Environmental Requirements:

1. Proceed with and complete the Work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of landscape Work required.
2. Minimize the disturbed construction area and begin temporary or final stabilization and restoration within fourteen (14) days per the Erosion Prevention and Sediment Control Plan or Per State and Local Requirements.
3. Do not spread seed when wind velocity exceeds 5 miles per hour.
4. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.

### B. Scheduling:

1. Plant or install materials only during normal planting seasons for each type of landscape Work required. Correlate planting with specified maintenance periods to provide maintenance until occupancy by SD1.
2. Fall seeding shall be performed between the dates of August 15 and October 1. Spring seeding will be permitted as soon as the ground can be worked to May 31, provided severe drought and high wind conditions do not exist.
3. Other planting schedules may be approved by SD1 upon request.

## 1.6 ALTERNATIVES

- A. Do not make substitutions, unless approved in writing by SD1. . Submit to ENGINEER proof of nonavailability and proposal for use of equivalent material.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### A. Topsoil:

1. Topsoil may not be available onsite for landscape/restoration Work. If topsoil is available, it shall be removed and stockpiled prior to trench excavation and kept separate from trench excavation spoils. If topsoil stockpiled is insufficient to complete the Work in this section as specified, or if topsoil is not available onsite, topsoil from approved offsite sources shall be provided. No additional costs will be paid by SD1 for this Work.
2. Provide offsite topsoil as required, which is fertile, friable, natural loam, surface soil, capable of sustaining vigorous plant growth, free of any admixture of subsoil, clods of hard earth, plants or roots, rocks, sticks or other extraneous material harmful to plant growth. Supply topsoil with the following analysis:

- a. No. 10 Sieve: 95 to 100 percent passing by weight.  
No. 270 Sieve: 40 to 85 percent passing by weight.  
Silt (0.05 – 0.005 mm): 20-65 percent passing by weight  
Clay (passing 0.005 mm): 10-35 percent passing by weight.
- b. pH 5.0 to pH 7.5. If approved by ENGINEER, natural topsoil not having the hydrogen ion value specified may be amended by CONTRACTOR at his own expense.
- c. Organic content not less than 5 percent and no more than 20 percent, as determined by ignition loss.
- d. Free of pests and pest larvae.

B. Commercial Fertilizers:

1. Complete fertilizer of neutral character, with a minimum of 75 percent nitrogen derived from natural organic sources or ureaform; 40-50 percent of the nitrogen shall be water soluble. Available phosphoric acid derived from superphosphate, bone, or tankage. Potash derived from muriate of potash, containing 60 percent potash. Uniform in composition, free-flowing and suitable for application with approved equipment. Provide fertilizer with the following percentages of available plant nutrients:
  - a. For grass apply only at a rate sufficient to supply 1 pound phosphoric acid and not less than 1.5 pounds potassium, and provide not less than .75 pounds of actual nitrogen per 1000 square feet of lawn area. For 18-24-12 with 25% SCU use 7 pounds per 1000 square feet.

D. Grass Materials:

1. Grass Seed Mixture: Provide fresh, clean, newcrop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.
2. The seed shall comply with seed laws and noxious weed restrictions in strict accordance with the standards of the American Association of Nurserymen as set forth in the latest edition of American Standard for Nursery Stock, ANSI-Z60.1. Seed shall also meet the requirements for purity and germination as specified in the Proceedings of the Association of Official Seed Analysis, Rule for Testing Seeds.
3. Seed shall be furnished in sealed standardized containers of the vendor bearing the date of last germination, which shall be within a period of 6 months prior to planting. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be acceptable.
4. The Schedule of Grass Seed Requirements is as follows. One of the following mixes shall be used:

## SCHEDULE OF GRASS SEED REQUIREMENTS

**MIX #1** (For shaded lawn areas only)

Application

<u>By Weight</u>	<u>Name of Grass</u>	<u>Purity</u>	<u>Germination</u>	<u>per 1000 square feet</u>
60% pounds (minimum)	Kentucky Bluegrass Blend * Poa pratensis	95%	80%	1.8
20% pounds (minimum)	Chewings Red Fescue Festuca rubra commutata	97%	85%	.6
20% pounds	Certified Pennfine Rye Grass Lolium perenne	98%	90%	.6
				3.0
pounds				

**MIX #2**

Application

<u>By Weight</u>	<u>Name of Grass</u>	<u>Purity</u>	<u>Germination</u>	<u>per 1000 square feet</u>
29.90% pounds	Crew Cut Tall Fescue	95%	94%	2.4
29.90% pounds	Tulsa Tall Fescue	95%	94%	2.4
19.95% pounds	Grande Tall Fescue	95%	94%	1.6
19.30% pounds	ICE Perennial Ryegrass	95%	91%	1.6
				8.0
pounds				

**MIX #3 –**

<u>By</u> <u>Weight</u>	<u>Name of Grass</u>	<u>Purity</u>	<u>Germination</u>	<u>per 1000</u> <u>square feet</u>
29.52% pounds	Stetson Tall Fescue	95%	94%	2.4
29.42% pounds	Legitimate Tall Fescue	95%	94%	2.4
29.32% pounds	Padre Tall Fescue	95%	94%	2.4
9.74% pounds	Evening Shade Perennial Ryegrass	95%	91%	0.8
				<hr/> 8.0
pounds				

**MIX #4 – Riparian and Natural Areas**

<u>By Weight</u>	<u>Name of Grass</u>	<u>Purity</u>	<u>Germination</u>	<u>Application per 1000 square feet</u>
27%	Annual Rye	95%	90%	0.14 pounds
9%	Creeping Red	95%	85%	0.05 pounds
18%	Canada Wild Rye	70%	75%	0.09 pounds
18% pounds	Riverbank Wild Rye	70%	75%	0.09
5% pounds	Indian Grass	70%	75%	0.02
5% pounds	Big Blue Stem	70%	75%	0.02
9%	Little Blue Stem	70%	75%	0.05 pounds
5%	Fox Sedge	90%	75%	0.02 pounds
5% pound	Frank's Sedge	90%	75%	0.02
				0.51
pounds				

5. The following requirements apply to all mixes:
  - a. Weed seed content not over 0.25 percent and free of noxious weeds.
  - b. Provide bluegrass blend consisting of half of each of the following:
    - 1) Adelphi.
    - 2) Glade.
  - c. All seed shall be rejected if the label lists any of the following grasses:
    - 1) Timothy.
    - 2) Orchard.
    - 3) Sheep Fescue.
    - 4) Meadow Fescue.
    - 5) Canada Blue.
    - 6) Alta Fescue.
    - 7) Bent Grass.

- H. Miscellaneous Landscape Materials:
  1. Mulch: Provide clean, seedfree salt hay or threshed straw of wheat, rye, oats or barley, free from noxious weeds.
  2. Water: Potable.



## PART 3 – EXECUTION

### 3.1 RESTORATION

- A. CONTRACTOR shall restore all areas disturbed by construction activity as the Work progresses. During construction, no more than 500 feet of length as measured along the pipeline shall be left non- Permanently or Temporarily Restored after pipeline construction in the area is complete. Temporarily restoring areas will only be permitted when site conditions are such that Permanent Restoration cannot be accomplished as described in Section 02900 1.5. Job Conditions. Areas that are Temporarily Restored shall be restored with Mulch and Annual Rye or Winter Wheat.
- B. Failure to provide restoration and landscaping as the work progresses and as specified herein to SD1's satisfaction may be grounds for non-approval of the CONTRACTOR's applications for payment.
- C. All areas of the project site disturbed by construction activities shall comply with the sediment and erosion control requirements of SD1 and as shown on the drawings. These requirements shall be in addition to the restoration requirements specified herein.

### 3.2 INSPECTION

- A. CONTRACTOR and his installer shall examine the subgrade, verify the elevations, observe the conditions under which Work is to be performed, and notify ENGINEER of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

### 3.3 PREPARATION

- A. Seed Turfbed Preparation:
  - 1. Loosen subgrade of turfbed areas to a minimum depth of 4 inches. Remove from the site stones over 1 inches in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation. Lose stone shall be removed by utilization of a mechanical device designed for removing loose rock or stone.
  - 2. Spread topsoil to a minimum depth of 6 inches after natural settlement and light rolling. Grade turfbed areas to smooth, even surface with loose, uniformly fine texture.
    - a. Do not spread topsoil while in a frozen condition or when moisture content is so great that excessive compaction will occur nor when so dry that dust will form in the air or clods will not break readily.
  - 3. Apply commercial fertilizers in the following quantities:
    - a. For grass apply only at a rate sufficient to supply 1 pound phosphoric acid and not less than 1.5 pounds potassium, and provide not less than .75 pounds of actual nitrogen per 1000 square feet of lawn area. For 18-24-12 with 25% SCU use 7 pounds per 1000 square feet

5. Apply commercial fertilizers during seeding operations.
6. Restore turfed areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

### 3.4 INSTALLATION

- A. Determine location of underground utilities and perform Work in a manner which will avoid possible damage. Hand excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes until removal is mutually agreed upon by all parties concerned.
- B. CONTRACTOR shall provide all materials, labor, and equipment to complete all seeding work.
- C. Seeding Lawns:
  1. Sow seed using a spreader or seeding machine.
  2. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
  3. Sow not less than the quantity of seed specified.
  4. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations.
    - a. Spread uniformly to form a continuous blanket not less than 1 1/2 inch loose measurement over seeded areas. Provide mulch. Place mulch using either of the following methods:
      - 1) Place mulch with equipment that will blow or eject, by means of a constant air stream, controlled quantities of the mulch in a uniform pattern over the specified area to achieve 80 to 90 percent of the ground is covered. If the mulch is excessively cut or broken take measures to reduce the cutting or breakage to a limit approved by ENGINEER.
      - b) Thru all residential yards mulch must be anchored using either of the following methods:
        - 1) 2) Anchor mulch in place with a mechanical crimper to incorporate straw mulch into the soil.
        - 3) A tackifying agent maybe used to glue the mulch together with the soil surface. The tackifier agent shall be selected based on longevity and ability to hold the mulch in place. Apply tackifier at a rate specified by the manufactor.
    5. Do not leave seeded areas unmulched for longer than 1 day. Reseed areas which remain without mulch for longer than 1 day.
    6. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched area. Reseed areas damaged as a result of such activity.
    7. Water seeded areas thoroughly with a fine spray. Watering seed will be the responsibility of the CONTRACTOR until grass has established.
  - D. Slopes Steeper than 4:1 low maintenance areas:
    1. For slopes steeper than 4:1 low maintenance areas, walk bulldozer or other tracked equipment up and down slopes before seeding to create tread-track depressions for catching and holding seed.

2. For slopes steeper than 2:1 install erosion control blankets or turf mates according to manufacturers' recommendations
  3. Use seed mix #4 for slopes steeper than 4:1 low maintenance areas.
- E. Reconditioning Existing Turf:
1. Recondition existing turf areas damaged by CONTRACTOR'S operations including storage of materials and equipment and movement of vehicles. Also recondition existing turf areas where minor regrading is required.
  2. Provide fertilizer, seed or sod and soil amendments as specified for new turf and as required to provide a satisfactorily reconditioned turf. Provide new topsoil as required to fill low spots and meet new finish grades.
  3. Cultivate bare and compacted areas thoroughly to provide a satisfactory planting bed.
  5. Remove diseased and unsatisfactory turf areas; do not bury into soil. Remove topsoil containing foreign materials resulting from CONTRACTOR'S operations including oil drippings, stone, gravel and other loose building materials.
  5. In areas approved by ENGINEER, where substantial turf remains (but is thin), mow, rake, aerate if compacted, fill low spots, remove humps and cultivate soil, fertilize, and seed. Remove weeds before seeding or if extensive, apply selective chemical weed killers as required. Apply a seedbed mulch, if required, to maintain moist condition.
  6. Water newly planted areas and keep moist until new turf is established.
- F. Be prepared to provide potable water and maintain temporary piping hoses and watering equipment as required to convey water from water source and to keep landscape Work moist as required for proper growth. CONTRACTOR shall supply required irrigation materials, equipment and potable water.
- G. Any fences, signs, mailboxes, guardrails, shrubs, ornamental landscaping, or other miscellaneous items that need to be removed to facilitate sewer construction operations shall be replaced, in kind or with repairs satisfactory to SD1 at the CONTRACTOR'S expense. Replacement of fences, signs, mailboxes, guardrails, shrubs, ornamental landscaping, or other miscellaneous items shall be considered a part of the sewer installation and shall be done immediately after the installation and backfilling of the sewer. The cost for the removal and replacement shall be included in the contract price bid for restoration.
- H. All drainage ditches, culverts, and storm pipes disturbed by the CONTRACTOR'S work shall be restored, reshaped, and graded to drain properly per the contract unit price bid for restoration.
- I. Pavement restoration shall be in accordance with the restoration sections on the Standard Detail sheets in the Contract Documents and the provisions of the Governing Agency responsible for the particular road.

### 3.5 PROTECTION AND MAINTENANCE

- A. Begin maintenance immediately after planting.
- B. Seeded areas shall be protected against traffic. All seeded areas shall be maintained by the CONTRACTOR until final acceptance of the project. Maintenance shall include watering, reseeding, repair of erosion damage, maintenance of mulch, cleanup and all other operations necessary for the satisfactory development of the grass.
- C. Mulch shall be maintained until covered with growing grass seedlings. Material that has been removed from the site by wind or other causes shall be replaced and secured.
- D. Original grades of grass areas shall be maintained after commencement of planting operations and until final acceptance. Any damage to the finished surface from construction operations shall be promptly repaired. In the event erosion occurs from either watering operations or rainfall, such damage shall be corrected and areas reseeded where required. Ruts, ridges, tracks, and other surface irregularities shall be corrected and areas reseeded where required.
- E. Maintain lawns by watering, fertilizing, ~~weeding, mowing, trimming~~ and other operations such as rolling, regrading, and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.
  - 1. After grass has started, reseed repeatedly all areas until a uniform density of at least 80 percent grass cover or greater has been achieved , as determined by SD1 .
  - 2. After seeded areas are uniform in color, leaf texture, and shoot density, and reasonably free of weeds, with plants at two inches tall, minimum and a minimum of two grass mowings apply a post-emergent herbicide, including a commercial fertilizers in the following quantities: a rate sufficient to supply 1 pound phosphoric acid and not less than 1.5 pounds potassium, and provide not less than .75 pounds of actual nitrogen per 1000 square feet of lawn area. For 18-24-12 with 25% SCU use 7 pounds per 1000 square feet
- F. Prior to final acceptance, seeded areas that show signs of substantial desiccation, as evident by a loss of color and a distinct yellowing or where no germination is evident, shall be considered as failed and shall be reseeded until an acceptable cover is obtained.

### 3.5 CLEANUP AND PROTECTION

- A. During landscape Work, store materials and equipment where directed. Keep pavements clean and work area in an orderly condition.

- B. Protect landscape Work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape Work as directed.
- C. Remove all rubbish, equipment and rejected materials from the site.
- D. Protection includes all temporary fences, barriers and signs and other Work incidental to proper maintenance.

### 3.6 INSPECTION AND ACCEPTANCE

- A. When the landscape Work is completed, including maintenance, ENGINEER will make an inspection to determine acceptability.
- B. Where inspected landscape Work does not comply with the requirements, replace rejected Work and continue specified maintenance until reinspected by ENGINEER and found to be acceptable. Remove rejected plants and materials promptly from the project site.
- C. Seeded lawns will be acceptable provided all requirements, including maintenance, have been compiled with, and a healthy uniform, close stand of the specified grass is established, free of weeds, bare spots and surface irregularities.
- D. Restoration of disturbed areas in a timely manner is a priority. Payments to the CONTRACTOR may be withheld by SD1 for the sewer installation if there is poor or untimely restoration.

### 4.7 GUARANTEE

- A. The CONTRACTOR shall guarantee all work and materials for a period of one year after completion of seeding work. All seeded areas shall have a uniform stand of grass in a density acceptable to SD1 during the guarantee period, all turf which dies shall be replaced by and at the expense of the CONTRACTOR. Replacement made under the CONTRACTOR's guarantee shall be covered by a like guarantee for a period of one year after completion of the replacement.

### 4.8 SETTLEMENT

- A. CONTRACTOR shall be responsible for all erosion and settlement of backfill, fills, and embankments which may occur within the correction period stipulated in the General Conditions.

- B. CONTRACTOR shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after notice from ENGINEER or SD1.

++ END OF SECTION ++