

SECTION 70

SEEDING

70.1 DESCRIPTION

A. General: This work consists of preparing a seedbed and furnishing and planting seed on disturbed areas identified within the limits of the work.

B. Related Work:

Section 18	Erosion, Sediment, and Water Pollution Control
Section 71	Fertilizing
Section 72	Mulching
Section 76	Compost
Section 203	Submittals

70.2 MATERIALS

A. General: The seed shall comply with the requirements of the South Dakota Seed Law.

B. Origin Limitations: Grass seed furnished shall be the grass species listed in the plans or these specifications. The Contractor may use one of the grass varieties listed in the plans for the specified grass species or the Contractor may use a different grass variety of the same grass species specified. If the Contractor uses a grass variety listed in the plans for the specified grass species, the grass seed origin limitations will not apply. If the Contractor uses a grass variety not listed in the plans for the specified grass species, the grass seed furnished must originate in South Dakota, North Dakota, Montana, Wyoming, Nebraska, Iowa, Minnesota, Kansas, Colorado, or Wisconsin. Grass seed grown outside this area may be approved after the Contractor has furnished written certification from three seed suppliers confirming seed grown within this area is not readily available.

Forb, sedge, rush, shrub, and wildflower seed must originate in the United States or Canada. Forb, sedge, rush, shrub, and wildflower seed grown outside the United States and Canada may be approved after the Contractor has furnished written certification from three seed suppliers confirming seed grown within the two countries is not readily available.

C. Seed Testing: Seed shall be tested within 9 months prior to planting, exclusive of the calendar month in which the test was completed. Testing shall be performed by a State Seed Lab, Commercial Seed Testing Lab, or a registered member of the Society of Commercial Seed Analysts (Registered Seed Technologist). A certified test report shall be furnished prior to the start of seeding operations. If the seed is not planted within the 9 month period, the Contractor shall have the seed retested for germination, as described above, and a current germination report with the certified

test report shall be furnished prior to starting seeding operations. The retest will be based on a sample obtained from the seed out of compliance.

D. Labeling: Each bag of seed delivered to the project shall bear a tag which shows the following information:

1. Name and address of supplier.
2. County and project number for which seed is to be used.
3. Suppliers lot number for each kind of seed in the mixture.
4. Origin (where grown) for each kind of seed.
5. Purity, germination, and other information required by South Dakota Seed Law, for each kind of seed.
6. Pounds of bulk seed of each kind of seed in each bag.
7. Total pounds of bulk seed mixture in each bag.
8. Pounds of pure live seed (PLS) of each kind of seed in each bag.
9. Total pounds of PLS mixture in each bag.
10. Dormant seed and hard seed.

When bulk seed is referred to, it is defined as total seed, including PLS, inert matter, crop seed, and weed seed.

E. Inoculation of Legumes: Prior to seeding, legumes (alfalfa, clovers, etc.) shall be inoculated with fresh culture of the appropriate nitrogen fixing bacteria in accordance with instruction accompanying the inoculant. A certification of the inoculation shall be furnished.

F. Seed Mixes: Seed mixes for seeding areas over two (2) acres shall be designed to meet site-specific requirements, such as soil type, orientation, slope, irrigation/no-irrigation, soil nutrients, and other.

Seed mixes for small applications, under two acres, may be the following:

1. Irrigated Turf Mix:

- 30% Gaelic Kentucky Bluegrass
- 25% Shannon Kentucky Bluegrass
- 25% SPF-30 Kentucky Bluegrass
- 10% Benchmark Perennial Ryegrass
- 10% Salinas II Perennial Ryegrass
- Drilled Rate: 4 lbs per 1000 square feet

2. Non-Irrigated Lawn Mix:

35% Fairmont Chewings Fescue
 30% Cardinal Creeping Red Fescue
 25% Brigade Hard Fescue
 10% Blue Heron Blue Fescue
 Drilled Rate: 4 lbs per 1000 square feet

3. Reclamation Blend (Road Ditch Mix):

40% Ephraim Crested Wheatgrass
 30% Perennial Ryegrass
 20% Hard Fescue
 10% Annual Ryegrass
 Drilled Rate: 2 lbs per 1000 square feet

4. Alkali Turf Mix:

The Contractor shall submit a seed mix listing the specific varieties of seed in the mix intended for use for each project.

70.3 CONSTRUCTION REQUIREMENTS

- A. General Requirements:** Within seasonal limitations, seeding shall be done as soon as finish grading and placing topsoil on each section have been completed.

Seeding or related work shall not be done when the ground is frozen or the condition of the soil is such that a satisfactory seedbed or uniform seed placement cannot be obtained. Seed shall not be sown, when the wind interferes with uniform seed application, or on areas under water.

Slopes shall be worked longitudinally, on contour, during the preparation of areas, drilling, and after seeding.

Fertilizing and mulching shall be provided as specified in Sections 71 and 72.

The Engineer may approve necessary adjustments in the requirements outlined to obtain the most satisfactory results under varying conditions.

- B. Seasonal Limitations:** Seeding shall not be done between June 15 and August 31 without written authorization from the Engineer.

Seeding may be done when the ground is not frozen and condition of the soil permits preparation of a satisfactory seedbed. Seeding shall not be done without authorization from the Engineer.

- C. Application Rate:** The seed mixture shall be applied at the plan specified rate of pounds of PLS per acre.

The primary method of application shall be by drill. Hydroseeding or broadcast seeding shall be allowed only with permission of the Engineer. The Engineer may require up to two (2) times the application rate for hydroseeding or broadcast seeding with no additional cost to the City above the cost to drill the seed.

The Contractor will be required to calibrate the drill or hydroseeder on each project. Calibration runs may be performed on areas to be seeded.

- D. Cover Crop Seeding:** When specified in the plans or directed by the Engineer, cover crop shall be seeded. Engineer may determine that specific areas may be excluded from cover crop seeding.

Cover crop seed shall consist of 56 pounds of oats, spring wheat, winter wheat, or cereal rye (minimum 75% PLS) per acre.

Cover crop seeding may be done at any time when the soil and weather conditions are suitable, as determined by the Engineer. Oats or spring wheat shall be used April through July, and winter wheat and cereal rye shall be used August through November.

E. Equipment and Methods:

- 1. Seedbed Preparation:** The Contractor shall work areas to be seeded to a depth of approximately 3 inches. The Contractor shall take every effort to obtain this depth on the first pass with tillage equipment. The Contractor shall remove and dispose of logs, stumps, brush, weeds, cobbles, and other foreign material which interferes with the proper operation of drills and other implements. After the initial seedbed preparation, the Contractor shall prepare seedbeds according to the type of grass seed mixture to be planted.

- a) Turf Grass Seed Mixtures:** The Contractor shall remove rocks larger than one (1) inch. The Contractor shall construct the surface to be seeded to the required cross section. The Contractor shall shape the surface to remove mounds and low spots to provide a smooth even surface to match grade and cross section as shown in the plans. After seeding and fertilizing, the seedbed shall be rolled or otherwise worked by a method approved by the Engineer to firm the seedbed and break up lumps and clods so they are no larger than one (1) inch in size.

- b) All Other Grass Seed Mixtures:** Lumps and clods exposed by the initial pass of tillage equipment over 3 inches in diameter shall be broken up. The implement used shall be a tool carrier with rigid shanks with sweeps or chisels, or a heavy-duty disk as appropriate to the conditions. The implement shall have positive means of controlling depth of penetration. The number of passes required to break up lumps and clods shall be kept to a minimum. Working the soil to a fine pulverized condition shall be avoided. The final prepared seedbed shall be left in a roughened condition consisting mainly of lumps 2 to 3 inches in diameter, for maximum resistance to erosion. After

seedbed preparation has been completed, the Contractor shall pick up and dispose of all loose stones and boulders having a vertical projection of 3 inches or more above the soil surface.

2. **Reseeding of Previously Seeded Areas:** Existing vegetation and cover crop shall be preserved for mulch. The seed shall be drilled directly into existing cover if possible, or by mowing and disking to permit penetration of drill openers and placement of seed to the specified depth.
3. **Drilling:** The specified seed mixture shall be uniformly drilled using a press drill equipped with individually mounted, adjustable, spring loaded, double disk furrow openers fitted with depth control bands or drums.

The depth control bands or drums shall be of a size to provide a final planting depth of 1/4 to 1/2 inch behind the press wheel.

The press drill shall be mounted on rear press wheels, which carry a major portion of the weight of the drill, and shall have no weight carrying wheels at the ends of the seedbox. The press wheels shall be mounted independently of the furrow openers. A press wheel shall follow directly behind each opener to compact the soil over the drill row.

Seeding may be done with drills other than press drills provided they are equipped with baffles, partitions, agitators, or augers which keep the seed distributed throughout the seed box. They must also have packer wheels which follow directly behind double disk furrow openers and provide compaction of the seeded drill rows similar to the compaction obtained by a press drill. No-till drills will be allowed for seeding into cover crop or existing vegetation as long as the seed is planted to the required depth.

The seedbox shall be equipped with positive feed mechanisms which will accurately meter the seed, and agitators which will prevent bridging in the seedbox and keep the seed uniformly mixed during drilling. The drill shall conform to the following:

Drill Width Maximums:

- a) Single units..... 10 feet
- b) Flex coupled side by side units 16 feet (maximum two 8 foot members)
- c) Max. drill row (openers) spacing 8 inches

Each drill shall be equipped with a metering device which will measure the area covered by the drill.

Each drill shall be equipped with fabricated baffles or partitions mounted a maximum of 2 foot on centers and flush with the top of the seedbox and extending

downward to within 4 inches of the bottom of the seedbox.

On areas where a press drill cannot be operated satisfactorily, hydraulic, cyclone or knapsack hand operated, or other broadcast type seeders may be used.

4. **Hydroseeding:** The equipment shall be designed specifically for hydroseeding. The nozzle shall be adaptable to hydraulic seeding requirements. Storage tanks shall have a means of estimating the volume used or remaining in the tank. Hydroseeding shall be allowed only with permission of the Engineer.
5. **Broadcast Seeding:** The Contractor shall rake or drag (incorporate) all seed broadcast within the top 1/4 to 1/2 inch of topsoil. The Engineer may waive this requirement when raking or dragging is deemed, in the Engineer's sole discretion, not feasible by conventional methods. Broadcast seeding shall be allowed only with permission of the Engineer.

- F. **Care During Construction and Final Inspection:** Dirt ridges which result from seeding operations or from traffic shall be smoothed so they will not interfere with future mowing operations.

Following completion of seeding operations, foot, vehicular, or equipment traffic over the seeded area shall be avoided. Areas damaged from such traffic shall be reworked and reseeded.

Before the acceptance of the project, any area on which the original seed has been lost or displaced shall be reseeded.

Engineer may determine that specific areas may be excluded from seeding.

- G. **Watering:** After seed, fertilizer and mulch have been placed, it shall be watered to provide a moist condition through the mulch as well as into the underlying soil bed. For a period of three (3) weeks after seeding and initial watering, the Contractor shall apply adequate water to insure proper germination of the seed and growth of the grass. The Engineer may waive watering requirements if adequate natural moisture has been present. At the end of the three (3) week watering period, the Engineer will inspect to determine if the grass is alive and growing. If seed has not satisfactorily rooted into the soil and is not alive and growing, the Engineer will determine if new seed and/or additional watering, at the Contractors expense, are required. Replaced seed shall be watered as required for the original.

After the Engineer acceptance of the newly seeded areas, the Contractor shall notify all affected property owners, with notification of watering requirements provided by the Owner, that they will be responsible for watering the newly seeded areas. The Contractor shall provide written verification that affected property owners have both been notified and have accepted the condition of the newly seeded areas.

The growing season is defined as May through September.

70.4 METHOD OF MEASUREMENT

- A.** Permanent seed will be measured to the nearest pound of PLS furnished and planted. Unauthorized increases in the specified rate of seeding will not be measured for payment. Seed required for calibration of the drill will be measured. Reseeding of areas damaged from causes beyond the control of the Contractor will be measured and added to the original quantities used.
- B.** The weight of PLS is computed by multiplying the purity, times the sum of the germination and dormant seed value, times the weight of bulk seed applied. The purity, dormant seed, and germination values will be as shown on the bag tag. If the seed has been retested, the retested value will be used in determining PLS. Seed bag tickets shall be submitted to the Engineer no later than 48 hours after seeding.
- C.** Cover crop seeding shall be measured per bushel. For purposes of measurement, one bushel of cover crop seed shall be considered to be 56 pounds of bulk seed regardless of whether oats, spring wheat, or winter wheat is used.

70.5 BASIS OF PAYMENT

- A.** PLS will be paid for at the contract unit price per pound of permanent seed. Payment will be full compensation for the preparation of the seedbed, labor, tools, equipment, inoculant and its application, and incidentals necessary.
- B.** Cover crop seeding shall be paid for at the contract unit price per bushel. Payment will be full compensation for the preparation of the seedbed, labor, tools, equipment, inoculant and its application, and incidentals necessary.
- C.** Water for seeding shall be considered incidental and shall be included in the unit price bid for seeding.

END OF SECTION