

## 650 ROADSIDE

### ITEM 659 - SEEDING AND MULCHING

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**659.01 Description.** This item shall consist of furnishing all seed, agricultural liming materials, commercial fertilizer, mulching material and placing and incorporating same as specified. Prior to seeding, fertilizer and lime shall be applied at the rate specified herein. No separate payment will be made for fertilizer *or lime*.

The areas to be seeded and paid for under this item shall include all areas designated by the Engineer within the right-of-way line, *easement*, and/or as described on the plans. All areas outside the specified limits where the vegetative growth has been injuriously disturbed or destroyed by the Contractor shall be restored and seeded in accordance with these specifications by the Contractor at the Contractor's own expense.

Commercial fertilizers and agricultural liming materials shall be obtained by the Contractor from a dealer or manufacturer whose brands and grades are registered or licensed by the State of Ohio, Department of Agriculture.

**659.02 Agricultural Liming Materials.** Agricultural Ground Limestone with a minimum total neutralizing power of 90, and at least 40 percent passing a No. 100 (150  $\mu\text{m}$ ) sieve, and at least 95 percent passing a No. 8 (2.35 mm) sieve, is considered standard. Other agricultural liming materials may be used at the ratio determined by the Engineer.

**659.03 Commercial Fertilizer.** Commercial fertilizer may be dry or liquid. Analysis may be either *10-20-10*, *12-12-12* or as otherwise approved by the Engineer.

**659.04 Seeds.** All seeds shall meet the following requirements:

Percent Purity - 95

Percent Germination - 87

The Contractor shall furnish the City a letter of certification that all seeds to be used come from a source approved by the State of Ohio or an approved testing laboratory and meet the requirements of these specifications. *The test date shall be marked on the seed bags. Sow seed within 9 months of the testing date.*

**659.05 Inoculating Bacteria.** The inoculate for treating leguminous seeds shall be a pure culture of nitrogen-fixing bacteria selected for maximum vitality, not more than 1 year old. All cultures shall be subject to the approval of the Engineer.

**659.06 Mulching Material.** Materials used for mulching shall be straw or other materials as may be processed or manufactured for this purpose. They shall be free of weed seed and such foreign materials as may detract from their effectiveness as a mulch or be injurious to desired plant growth.

**659.07 Inoculating Legumes.** All leguminous seed shall be inoculated or treated with the proper amount of approved culture mixed with sufficient water to thoroughly wet the seed with the solution. When seed is sown hydraulically, 4 times the amount of inoculate required above shall be placed directly into the slurry and thoroughly mixed immediately before seeding. Seed shall be sown within 24 hours after treatment with the inoculate.

**659.08 Fertilizing.** The standard application of fertilizer shall be at the rate of 20 pounds per 1,000 square feet ( $0.1 \text{ kg/m}^2$ ) for the analysis specified. Another analysis, in the same ratio, may be used by varying the application rate to produce the same values specified. Either dry or liquid fertilizer may be used and shall be distributed in an even pattern over the specified area, then thoroughly disked, harrowed or raked into the soil to a depth of not less than 2 inches (50 mm) unless otherwise directed by the Engineer.

Agricultural ground limestone as specified under Section 659.02 is considered as standard. It shall be applied on the surface at the rate of 92 pounds per 1,000 square feet (*2 tons per acre*) ( $0.5 \text{ kg/m}^2$ ) of area and thoroughly disked, harrowed or raked into the soil to a depth of not less than 2 inches (50 mm) unless otherwise directed by the Engineer.

Other agricultural liming materials may be used and the rate of application shall be varied according to the percent required of the standard rate of application specified under Section 659.02.

Fertilizer and agricultural liming material shall be applied not less than 24 hours nor more than 48 hours before the seed is to be sown. They must be applied separately, but can be disked or otherwise incorporated in the soil in the same operation.

**659.09 Seeding and Mulching.** All areas to be seeded shall be free of rock and other foreign material 3 inches (76 mm) or greater in any dimension and shall be satisfactorily shaped and finished as provided in Item 203. *All residential lawn areas* and other areas indicated on the plans, shall be free of all stone 1 inch (25 mm) or greater in

any dimension and shall have a smooth surface. In such areas hand raking will be required if inaccessible to machines, and may be required if machines do not provide results equivalent to hand raking. *Prior to seeding, fertilizer and lime shall be applied per 659.08 and the seed bed shall be thoroughly tilled to loosen the soil to a depth of 2 inches (50 mm).* Payment for the work necessary for proper preparation of the seed bed shall be included in the various items in the contract.

The seed shall be thoroughly mixed and then evenly sown over the prepared areas at the rate of 4 pounds per 1,000 square feet (20 g/m<sup>2</sup>). Seed shall be sown dry or hydraulically.

All areas to be seeded which are considered to be urban in character shall be seeded with the following mixture: (Percentages are by weight)

40% Kentucky Bluegrass (*Poa pratensis*)

40% Creeping Red Fescue (*Festuca rubra*)

20% Annual Ryegrass (*Lolium Multiflorum*)

All other areas, except those previously mentioned, shall be seeded with the following mixture:

30% Kentucky Bluegrass (*Poa pratensis*)

60% Kentucky 31 Fescue (*Festuca clatior* var. Ky. 31)

10% Perennial Ryegrass (*Lolium Perenne*)

All areas to be seeded with Crown Vetch shall be seeded at a rate of 1 1/2 pounds per 1,000 square feet (7 g/m<sup>2</sup>) with the following mixture:

33% Crown Vetch (*Coronilla Varia*)

67% Perennial Ryegrass (*Lolium Perenne*)

Immediately after sowing, the area shall be raked, dragged or otherwise treated so as to cover the seed to a depth of approximately 1/4 inch (6.4 mm).

The operation of seed sowing shall not be performed when the ground is frozen or muddy, or when the soil or weather conditions would prevent the proper soil preparation and subsequent operations as specified. *Proper soil preparation includes the incorporation or placement of suitable topsoil material, if necessary.* All seeding performed between October 15 and March 15 shall be temporary seeding in accordance with 207. However, for projects which will be completed in the same calendar year,

permanent seeding may be performed with permission of the Engineer. Sowing of Crown Vetch shall not be permitted during September or October.

Seeding shall be done prior to or concurrently with Items 660, 667, 668 or 670.

Within 48 hours after any given area is seeded, vegetative mulching material conforming to Section 659.06 shall be evenly placed over all seeded areas at the rate of approximately 2 tons per acre (0.5 t/1000m<sup>2</sup>) for straw, or 3 tons per acre (0.7 t/1000 m<sup>2</sup>) for hay, when seeding is performed between the dates of March 15 and October 15, and at the approximate rate of 3 tons per acre (0.7 t/1000 m<sup>2</sup>) for straw, or 4 1/2 tons per acre (1.0 t/1000 m<sup>2</sup>) for hay, when seeding is performed between the dates of October 15 and March 15 of the succeeding year.

Mulching materials shall be kept in place with asphalt emulsion applied at a minimum rate of 60 gallons per ton (25 L/t) of mulch or by methods or tacks as are approved. An additional application of 30 gallons of asphalt emulsion per ton (12 L/t) of mulch shall be applied to the shoulder area, starting at the berm edge and extending out for a distance of 10 feet (3.0 m). On curbed streets with speed limits of 35 MPH (56 k/hr) or higher, additional emulsion shall be applied to the area between the curb and sidewalk. On streets without sidewalks, additional emulsion shall be applied a distance of 10 feet (3.0 m) behind the curb. Asphalt emulsion for vegetative mulch shall conform to Section 702.04. Emulsion shall be nontoxic to plants and shall be so prepared that it will not change in transportation or storage. Mulching which is displaced shall be replaced at once but only after the seeding or other work which preceded the mulching and which work was damaged as a result of displacement of mulching material has been acceptably repaired.

The Contractor shall maintain all seeded and mulched areas until final inspection. Maintenance shall also include repairing any areas damaged following the seeding or mulching operation due to wind, water, fire, tire tracks or other causes *including* failure of the seed to germinate *for any reason*. Such damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall then be refertilized, reseeded and remulched as directed by the Engineer. Maintenance, including repairing, reseeding, refertilizing and remulching shall be accomplished as directed by the Engineer at no *additional* cost to the City.

When an estimated quantity of "Item 659 Repair Seeding and Mulching" is listed in the proposal, it is to provide for repair of damages or erosion where the regular seeding and mulching operations have been acceptably performed in stages on significant portions of the project. Such repairs of these areas shall be made at the direction of the Engineer when the damage or erosion is not due to fault or negligence of the Contractor. The repairs shall be made prior to completion of the project by reworking or reshaping to grade and then refertilizing, reseeding and mulching. Reworking or reshaping of slope shall include bringing in additional material, if necessary, and using whatever equipment is necessary to restore slopes to grade. Such work will be measured and paid for as "Repair Seeding and Mulching". When damage or erosion of these areas occurs as a

result of the fault or negligence of the Contractor, the areas shall be satisfactorily repaired and refertilized, reseeded, and mulched at no additional cost to the City.

Unless otherwise directed by the Engineer, the seed bed shall be thoroughly watered, as soon as the seed is covered, at the rate of 120 gallons per 1,000 square feet (5 m<sup>3</sup>/1000 m<sup>2</sup>). The water shall be applied by means of a hydro-seeder or a water tank under pressure with a nozzle that will produce a spray that will not dislodge the mulching material. A second water application shall be made no sooner than 7 days or later than 10 days after the first application, providing significant rainfall has not occurred within 7 days after the first application. When significant rainfall occurs within 7 days after the first application, the Engineer may delay or omit entirely the second application, depending on weather conditions. The rate of the second application shall be 120 gallons of water per 1,000 square feet (5 m<sup>3</sup>/1000 m<sup>2</sup>). *The first and second water applications shall be included in the unit price bid for Item 659, Seeding and Mulching. Additional waterings shall be paid for and listed separately under Item 659, Water.*

**659.10 Wildlife Seeding.** When areas of the project are designated to be seeded for wildlife, the following mixture shall be used at the rate of 2 pounds per 1000 square feet (10 g/m<sup>2</sup>).

60% Brome Grass (*Bromus inermis*).

18% Red Clover (*Trifolium pratense*).

22% Perennial Ryegrass (*Lolium perenne*).

**659.11 Method of Measurement.** Commercial fertilizer and agricultural liming *will not be paid for separately, but the Contractor will be required to furnish weigh tickets showing the number of tons (kilograms) of each converted to the standard application rate for the standard mixture ratio, furnished, spread and incorporated.* Seeding and mulching, *including fertilizer and lime,* to be paid for shall be the number of square yards (square meters) of the area seeded and mulched in accordance with these specifications. Repair seeding and mulching to be paid for shall be the number of square yards (square meters) of damaged or eroded areas reshaped, seeded, and mulched at the direction of the Engineer on portions of the project where seeding and mulching had previously been acceptably completed and where the damage was due to no fault or negligence of the Contractor. The quantity of water *for additional waterings* shall be the amount in thousands of gallons (cubic meters) applied in accordance with the requirements of this item and measured in tanks, tank wagons or trucks of predetermined capacity, or by means of meters of a type satisfactory to the Engineer and furnished and installed by the Contractor at his own expense, or determined by weight conversion.

Areas disturbed for water line construction to be seeded as a result of the Contractor's operations incident to open trench work shall be measured for payment within the lines given by the Engineer, but in no case shall such payment lines be set more than 10 feet (3.0 m) apart, measured at right angles to the centerline of the trench, to

accommodate the Contractor's operations. In the event that it may prove necessary or desirable for the City to have areas seeded outside of the specified payment lines, the Contractor shall be ordered, in writing, to do such seeding provided however, that such seeding exterior to the specified payment lines which has become necessary by reason of the Contractor's operations or by reason of settlement subsequent to construction, shall be replaced by and at the expense of the Contractor.

**659.12 Basis of Payment.** Payment will be made at the contract price for:

<b>Item</b>	<b>Unit</b>	<b>Description</b>
659	Square Yard (Square Meter)	Seeding and Mulching
659	Square Yard (Square Meter)	Seeding and Mulching for Wildlife
659	Square Yard (Square Meter)	Repair Seeding and Mulching
659	M Gallons (Cubic Meter)	Water