

**SECTION 900
TURF ESTABLISHMENT**

901.0 DESCRIPTION

This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to turf restoration as indicated on the drawings or as specified herein. Unless noted otherwise, the provisions in this section are in addition to the referenced specification

902.0 MATERIALS

902.1 SEED (MnDOT Spec. 3876)

Seed type shall be MnDOT Mix Number 25-151, MnDOT Specification 3876.2, unless otherwise indicated on the plans and specifications.

Seed shall be tagged to comply with the requirements of the specified seed mixture and tags delivered to the Engineer.

902.2 SOD (MnDOT Spec. 3878)

Sod shall be Lawn Sod as described in MnDOT specification section 3878.2A unless otherwise indicated on the plans and specifications.

Not more than 24 hours shall elapse between cutting and placement of sod. Precautions shall be taken to prevent sod from drying out and from heating. Sod that shows visible signs of heating shall not be incorporated in the project.

902.3 TOPSOIL MATERIAL (MnDOT Spec. 3877)

The type of topsoil material placed on the project shall be called out in the Contract Documents.

902.3.1 LOAM TOPSOIL BORROW

Loam Topsoil Borrow as described in MnDOT specification section 3877.2 B shall meet the following requirements. The components consist of the following by volume:

Requirement	Range	Test Method
Material Passing the $\frac{3}{4}$ in [19.0 mm]	100%	ASTM D 422
Material passing the No. 4 [4.75 mm]	$\geq 90\%$	ASTM D 422
Clay	5% - 35%	ASTM D 422
Silt	10% - 60%	ASTM D 422
Sand	15% - 60%	ASTM D 422
Organic Matter	3 % – 15%	ASTM D2974
pH	6.1 – 7.5	ASTM G 51
Soluble salts	≤ 0.15 siemens/m [1.5 mmho/cm]	-

902.3.2 BOULEVARD TOPSOIL BORROW

Boulevard Topsoil Borrow as described in MnDOT specification section 3877.2 F shall meet the following requirements:

Provide topsoil borrow containing three blended components consisting of loam topsoil, sand, and compost for use as structural soil for plant establishment in streetscape boulevards. The components consist of the following by volume:

1. One-third topsoil meeting the requirements of Loam Topsoil Borrow;

2. One-third sand accordance with 3149.2J, —Fine Filter Aggregate; or 3149.2K, —sand cover and
3. One-third compost in accordance with 3890, —Grade 2 Compost.

902.4 **HYDROMULCH (MnDOT Spec. 3884 B.3)**

Type Stabilized Fiber Matrix (SFM) shall be used for hydroseeding in accordance with MnDOT Specifications Section 3884.

902.5 **NET FREE EROSION CONTROL BLANKET**

As part of the boulevard turf reestablishment and to maintain NPDES permit compliance for not having sediment controls along the back of curb, the Contractor may provide a net free erosion control blanket to stabilize the previously applied hydro-mulch, type to be determined by plans or as directed by the Engineer.

902.6 **OTHER MATERIALS**

Stakes for holding sod on slopes shall be wood 1 inch X 1/2 inch by 12 inch long and pointed. Where this length of stake does not provide firm bearing, a stake of sufficient length to secure firm bearing shall be used.

Commercial fertilizer shall be delivered in original unopened containers with labels indicating the manufacturer, brand name, and chemical analysis intact.

903.0 CONSTRUCTION REQUIREMENTS

For the following individual work items in addition to the general conditions required by MnDOT standard specifications for construction, individual special items shall apply as indicated.

903.1 **SEQUENCING AND SCHEDULING**

Sodding will be performed according to the MnDOT Specifications 2575 and the Inspection and Contract Administration Manual for MnDOT Landscape Projects, 2015 Edition.

Seed may be planted during the season of planting appropriate for the particular seed mixture. The season of planting is according to MnDOT Specifications 2575 and the Inspection and Contract Administration Manual for MnDOT Landscape Projects, 2015 Edition.

903.1.1 **SEEDING AND PLANTING DATES**

Plant seed mixtures during the seasons of planting for the various seed mixtures in accordance with the following Table:

Season of Planting		
Seed Mixture Number	Spring	Fall
21-112	N/A	Aug. 1 - Oct. 1
21-111	May 1 - Aug. 1	N/A
22-111, 22-112	April 1 - July 20	July 20 - Oct. 20
25-121, 25-131, 25-141, 25-151	April 1 - June 1	July 20 - Sept. 20
25-142	April 1- Sept. 1	N/A
Any seed mix that beginning with at "3"	April 15 - July 20	Sept. 20 - Oct. 20
Adjustments to growing dates may be modified by no more than 10 calendar days by the Engineer based on weather conditions. Provide temporary stabilization when outside the season of planting dates of the specified permanent seed mixture.		

A full warranty period is required to ensure proper vegetation establishment and longevity.

A 45 day maintenance period is required for all seeded areas. For seed that is planted after November 1, the 45 day maintenance period will not begin until the following April 15 and will continue for the full 45 days.

If the Contractor chooses to temporarily stabilize the areas to be seeded after November 1 instead of completing the final stabilization process, the Contractor may submit a temporary stabilization plan to the Engineer defining the temporary stabilization plan, to include erosion and sediment controls, schedule, and a maintenance plan. The costs to implement a temporary stabilization plan after November 1 will be considered incidental to this Contract.

A 30 day maintenance period is required for sod which shall not include days between November 1 and April 15.

903.2 GROUND PREPARATION

Topsoil shall be placed no more than five (5) working days before placement of sod or seed.

All areas disturbed by construction outside of paved areas shall be excavated to a depth of six (6) inches, and tilled to a depth of six (6) to twelve (12) inches to remove compaction, unless otherwise indicated.

Distribute only stockpiled and/or designated select topsoil borrow over the areas to be sodded or seeded to provide the specified depth of cover for the areas shown on the plans to be sodded and bring the entire site to grade. The depth of topsoil cover shall be six (6) inches, unless otherwise indicated.

Areas shall be worked until soil is completely fined and in a mellow condition to finish grade. Holes, depressions, and rivulets shall be filled in and brought to a smooth grade.

All sticks, branches, stones, or other debris on the surface over two (2) inch in size shall be picked up and removed.

No heavy equipment except lawn rollers shall be moved over turf areas after soil has been prepared, unless soil is again graded and loosened as specified above.

Grades not otherwise indicated shall be uniform between points where elevations are given or between such points and finish grades. The maximum slope shall be no steeper than one (1) vertical to three (3) horizontal. Abrupt changes in slopes shall be rounded. All holes, depressions, and rivulets shall be filled and brought to a smooth grade. All areas shall be graded to drain to the street or to a drainage structure.

If the placed topsoil is compacted, the topsoil shall be loosened to a minimum depth of six (6) inches using disks, harrows, field diggers, or other suitable cultivating equipment.

903.3 TOPSOIL

Submit a list of prospective sources for topsoil material to the Engineer at the preconstruction meeting to allow for inspecting, testing, and approving the sources. Submit preapproval test results to the Office of Environmental Stewardship, Erosion & Stormwater Management Unit. If federal or state chemical or biological requirements conflict, provide material meeting the most stringent requirement.

Test blended topsoil for each individual component before blending.

Fertility testing will be in accordance with the standard testing procedures of the University of Minnesota Soils and Testing Laboratory, Soil Science Department.

903.4 FERTILIZING TURF AREAS

A soil test shall be taken and commercial fertilizer shall be applied and raked in at the rate recommended for the Loam Topsoil Borrow provided for the areas identified for turf establishment.

Fertilizer application shall be per manufacturer's printed instructions.

Fertilizer must be dry and free flowing when applied. Caked or deteriorated materials will not be permitted.

Where liming is required, it shall be applied prior to sodding, and the soil shall be tilled at least once within 24 hours following the liming and prior to the sodding.

903.5 SODDING

Areas to be sodded shall be brought to within thickness of sod of finish grade. Allowance for settlement shall be made.

Sod strips shall be placed tightly against each other so no open joints are apparent. Joints between ends of strips shall be staggered at least one (1) foot between adjacent rows. At the edge of walks, curbs, and drives, sod shall have the same finish grade as hard surfaced area. Sod shall be laid so water from adjacent areas will have free flow onto sodded area. Light rolling of sod will be required to achieve smooth planes and so no void occurs between sod and subsoil. Edges of sod where rolls abut each other or another material shall be cut, not torn.

Sod covering drainage swales and on slopes steeper than three (3) to one (1) shall be held in place by wooden stakes driven through the sod into subsoil until flush with top of sod or by other approved method to hold sod in place.

Sod areas shall be fertilized, watered, and mowed, if necessary, to assure that sod areas are uniformly moistened and maintained in a moist condition for a minimum of thirty (30) growing days or until sod work has been approved by final acceptance and responsibility for maintenance accepted by the Engineer.

903.6 SEEDING

Seed application rate is 150% of MnDOT's recommended rate.

Seeding shall be applied by a Hydroseeder as described in MnDOT specification section 2575.

Firming the seedbed with a corrugated cultipacker or other approved method will be required.

Seeding shall be performed only during the season(s) of planting associated with the specified seed mixture unless indicated in the plans and specifications or approved by the Engineer in writing. The season(s) of planting are as outlined in MnDOT Specification Section 2575.

All seed shall conform to the requirements of the latest seed laws of the State and to the requirements of MnDOT Specification 3876.

All seeded areas in drainage swales and/or on slopes 3:1 or greater shall be covered with ECB Category 3B Wood Fiber (MnDOT Specifications 3885) erosion control blanket and staples installed according to manufacturer's installation instructions as approved by the Engineer.

903.7 NET FREE EROSION CONTROL BLANKET

Before installing net free erosion control blankets, the seedbed shall be inspected by the Engineer to ensure it has been properly compacted and fine graded to remove any existing rills. It shall be free of obstructions, such as tree roots, projections such as stones, and other foreign objects. The contractor shall proceed when satisfactory conditions are present. After the area has been properly shaped, per MnDOT specification based on slopes, hydro-seeded, fertilized, and compacted, locate the start of the roll, making sure the roll is facing toward the area to be covered, and then roll out the blanket. Blankets shall be rolled out flat, even, and smooth without stretching the material then anchored to the subgrade.

Place the blankets the same day after sowing of the seed on that area. Roll out or lay the blankets without netting on top of hydro-mulch. Roll out blankets flat and parallel or perpendicular to the direction of water flow. Evenly spread the blankets without stretching, allowing the fibers to come in direct contact with the soil over the entire area. Shingle and overlap the edges parallel to water flow by at least 4 inches. Shingle and overlap the edges perpendicular to water flow by at least seven (7) inches. Staple overlaps on slopes at 1½ ft intervals, see MnDOT Table 3885-5 for further stapling information.

903.8 TESTING

All testing of materials and densities in this section as directed by the Engineer shall be taken by the Engineer or an independent testing laboratory. Cost of these tests shall be paid by the Owner, except that any retesting of areas that fail to meet specifications shall be paid by the Contractor.

903.9 WATER

The Contractor shall work with the Engineer to obtain permits required for obtaining the water required to spray the Turf Establishment Areas.

The Contractor shall maintain a log of watering dates and volumes and provide them to the Engineer to review for payment.

904.0 TURF ACCEPTANCE

The Contractor shall be solely responsible for Turf Establishment as outlined in the plans and specifications for this project. The Engineer and Contractor shall inspect the turf prior to final closeout.

Contractor will be responsible for any and all repairs required to achieve the required vegetative cover.

904.1 SEED

Seeded areas maintenance period is 45 calendar days. Water within one day after areas have been seeded. Apply water at a rate that prevents any damage to hydro-mulch, erosion blanket, and so that no runoff should occur from the seeded areas.

Supply water to seed daily for the first 15 calendar days at a rate to keep soil surface moist. For the remainder of the 30 calendar days, water seeded areas as needed to provide one (1) inch per week. The maintenance period is suspended at freeze up and resumes April 15th.

During the maintenance period, contractor shall repair seeded areas that have dried, died, that have been damaged, displaced, or weakened or is infested with over 50 percent of invasive species and does not have desired outcome.

Prior to the expiration of maintenance period, the Engineer and Contractor will inspect the seeded areas to determine if the seeded areas have established a uniform 70 percent or greater vegetative cover. If the uniform 70 percent or greater cover has not been established, the contractor is responsible for any and all maintenance and repairs necessary to achieve the uniform cover.

The City will pay no more than 60 percent of the contract unit price for each seed, hydro-mulch, and net free erosion blanket until the seeded areas have achieved a uniform 70 percent or greater vegetative cover.

The City will make final payment after final inspection and acceptance of the 70 percent or greater vegetative cover and the completed project.

904.2 SOD

The contractor is responsible for the warranty of all sod installation. The warranty period for sod is 30 growing days. New sod must be watered within four hours of placement. Apply water at a rate that prevents any damage to sod, minimizes runoff, and keeps the sod moist. The sod should be watered a minimum of twice per day for the first 10 days and a minimum of once per day beyond the first 10 days. The contractor must maintain a log of the watering which shows the date, time, and amount of water which was used. This log must be provided to the engineer upon request.

Failure to water the sod within 4 hours of placement or less than the minimum number of occurrences as provided above will result in a \$500 penalty per occurrence.

During the warranty period, the contractor shall repair sodded areas that have dried, died, that have been damaged, displaced, or weakened or is infested with over 40 percent of invasive species and does not have desired outcome.

At the expiration of the warranty period, the Engineer and Contractor will inspect the sodded areas to determine if they have established a uniform growth. If the uniform growth has not been established, the contractor is responsible for any and all maintenance and repairs necessary to achieve the uniform growth.

905.0 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

All other work under this section is incidental to the contract for this section unless specifically listed in the Special Conditions. The basis of measurement and payment shall be as follows:

905.1 FERTILIZER TYPE 3

Payment for Fertilizer shall be by the weight of each type applied. If the Contractor provides fertilizer with different type than as shown on the plans, the Engineer will adjust the application rate of the fertilizer provided to meet the equivalent type proportions of the fertilizer shown on the plans.

905.2 _____ TOPSOIL BORROW (LV)

Payment for “_____ Topsoil Borrow” shall be by the cubic yard. If the topsoil fails to meet the requirements of the testing, and no suitable replacement material is found, a reduction of 10% will be applied to the Topsoil Borrow item in the Proposal. Unit prices in the Proposal shall prevail with no adjustment being made due to an increase or decrease in quantities.

905.3 SODDING TYPE LAWN

Payment at the unit price for “Sodding Type Lawn” shall be by the square yard of sod as measured in place. Measurement and payment shall be full compensation for all materials, delivery, ground preparation, placement, rolling, staking, specified maintenance, coordination and associated work complete and in place.

The City will pay up to 60 percent of the contract unit price for each sodded area during the warranty period.

The City will pay up to 95 percent of the contract unit price for each sodded area that has been accepted by the engineer.

905.4 WATER (TURF ESTABLISHMENT)

Payment for “Water (Turf Establishment)” shall be by the M gallons. The Unit prices in the Proposal shall prevail with no adjustment being made due to an increase or decrease in quantities.

Water paid for under this item will be used only on this Contract for Turf Establishment.

905.5 HYDROSEED

Payment at the unit price for “Hydroseed” shall be by the square yard of seeded area as measured in place and payment shall be based at the contract unit price. Measurement and payment shall include all materials, delivery, ground preparation, seeding, rolling, hydromulch, specified maintenance, coordination and associated work complete and in place.

905.6 NET FREE EROSION CONTROL BLANKET

Net free erosion control blankets shall be measured by the square yard that has been installed.

Net free erosion control blankets shall be paid for by the square yard that has been installed.