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**2.20 SEEDING****2.20.1 GENERAL**

This specification covers preparing the area to be seeded, supplying and applying the seed and fertilizer and harrowing of the seeded area or protecting seeded areas by means of a mulch cover.

**2.20.2 MATERIALS****2.20.2.1 Supply of Materials**

Materials for seeding, including grass seed mix, fertilizer, mulch and water shall be supplied by the Contractor.

**2.20.2.2 Grass Seed**

Grass seed shall meet the requirements of the Seeds Act for Common No. 1 Seed and shall be of the composition specified in the Special Provisions. The seed shall be mixed and tested by a recognized seed house and shall be clearly marked with the name of the supplier and the certified mixture composition. The Contractor shall provide the Consultant with the Certificate(s) of Analysis of all the lots of seed used.

**2.20.2.3 Fertilizer**

Fertilizer shall be of the composition specified in the Special Provisions. Fertilizer shall be stored in standard containers clearly marked with the name of the manufacturer, weight and specified composition.

**2.20.2.4 Mulch**

Mulch material shall be cellulose fibre unless otherwise approved by the Consultant. Mulch shall be clean and free of weeds and other foreign matter.

**2.20.3 CONSTRUCTION****2.20.3.1 Traffic Safety**

When required by the Consultant, the Contractor shall, at his own expense, provide a truck mounted arrowboard in accordance with Specification 1.2, General, to assist in the accommodation of traffic during hydro-seeding operations. The arrowboard truck shall be equipped with an overhead revolving beacon with an amber lens a minimum of 180 mm high and 180 mm wide. The beacon shall be mounted on the top of the vehicle fully visible to traffic approaching from both front and rear.

The arrowboard shall be controlled from a console located in the vehicle cab.

When required by the Consultant, the hydro-seeding vehicle and the arrowboard truck shall each be equipped with a two-way radio for voice communication.

A "Slow Moving Vehicle" sign shall be mounted at the rear of the vehicle and be visible to the public only when hydro-seeding is being performed.

The Contractor shall ensure that the operation of the hydro-seeder and the arrowboard truck is with the traffic flow at all times.

The Contractor shall minimize any loading or unloading of materials or fueling of equipment on the highway surface. Field entrances or areas other than the highway surface shall be used as sites for these operations if possible.

#### 2.20.3.2 Notification of Commencement of Work

The Contractor shall notify the Consultant not less than 48 hours prior to any seeding operation and shall not begin seeding until all areas prepared or designated for seeding have been approved by the Consultant.

#### 2.20.3.3 Weather Conditions

The Contractor shall not proceed with the work when, in the opinion of the Consultant, weather conditions are unsuitable. The Consultant will not allow work to proceed when wind conditions are such that material is being carried beyond the designated work areas or that the material is not being uniformly applied. No work shall take place on frozen or unusually wet surface areas.

Generally, work shall not commence in the spring until the ground has completely thawed and soil temperatures have reached 10EC. Work shall be suspended in the fall when soil temperatures consistently fall below 5EC.

#### 2.20.3.4 Area to be Seeded

Areas to be seeded will include disturbed areas and exposed earth surfaces within the right-of-way and borrow and waste areas, as designated by the Consultant.

Areas to be seeded will be divided into two categories, one requiring seeding, fertilizing and harrowing, and the other requiring seeding, fertilizing and mulching. Generally, those areas which in the opinion of the Consultant are impractical to harrow due to the terrain characteristics or access problems will be designated for seeding, fertilizing and mulching.

#### 2.20.3.5 Surface Preparation

Any grading or topsoil placement forming part of the Contract shall be completed to the satisfaction of the Consultant prior to any surface preparation.

All eroded areas shall be corrected prior to surface preparation, as directed by the Consultant, using imported material or material adjacent to the area being filled.

When the Contract contains bid items for grading work or "Topsoil Placement", the correcting of eroded areas which were graded or topsoiled under this Contract will be considered incidental to the work and no separate payment will be made.

When the Contract does not contain bid items for grading work or "Topsoil Placement", payment for the correcting of eroded areas will be made as "Extra Work" in accordance with Specification 1.2, General.

Areas to be seeded shall be fine graded to a smooth and uniform surface and be loose to a depth of not less than 25 mm at the time of seeding. Where necessary, the surface shall be scarified and the Contractor shall dispose of stones and other debris as directed by the Consultant. Where mulch is to be applied, the surface must be sufficiently smooth to allow a uniform cover by seed and mulch material. No area shall be seeded or mulched until the surface preparation has been approved by the Consultant.

2.20.3.6 **Application Rates**

The following application rates are the minimum required:

Grass Seed Mix	25 kg/hectare
Fertilizer	75 kg/hectare
Wheat or Wheat/Wheatgrass hybrid	5 kg/hectare
Mulch	1150 kg/hectare(where applicable)

2.20.3.7 **Seeding, Fertilizing and Harrowing**2.20.3.7.1 Seeding and Fertilizing

Grass seed, Wheat or Wheat/Wheatgrass hybrid and fertilizer shall be uniformly mixed and distributed over the area designated for seeding by one of the following methods:

- use of an approved type of hydraulic seeder which utilizes water as the carrying medium and maintains a continuous agitator which will keep seed and fertilizer mixed in uniform distribution until pumped from the tank. The pump pressure must maintain a continuous non-fluctuating stream of solution; or
- use of an approved type of drill seeder which is capable of being calibrated to distribute seed and fertilizer into the soil at not less than specified minimum rates of application; or
- areas designated as or resulting from "sideslope improvement work" or areas inaccessible to the above methods may be seeded and fertilized by an approved cyclone seeder or hand methods.

Distribution of the seed and fertilizer is to be at a uniform rate and at not less than the minimum specified rate of application.

The Contractor shall measure the quantities of all material to be charged into the seeder either by weight or by a system of volume measurement as approved by the Consultant and shall provide all equipment required for this purpose.

2.20.3.7.2 Harrowing

The Contractor shall harrow areas designated for harrowing immediately after seed and fertilizer is applied.

2.20.3.8 **Seeding, Fertilizing and Mulching**

The seed, fertilizer and mulch shall be uniformly mixed and applied over the designated areas. The Contractor shall use approved type of hydraulic seeder which uses water as the carrying medium, and maintains a continuous agitator action which will keep the seed, fertilizer and mulch mixed in uniform distribution until pumped from the tank. The pump pressure must maintain a continuous non-fluctuating stream of solution.

In order to apply the required amount of mulch to the designated area, the Contractor may have to apply a second or third cover of material. Extension hoses may be required to propel mulch slurry to areas which are otherwise inaccessible.

**2.20.3.9 Protection**

The Contractor shall take reasonable care to prevent the contamination of structures, signs, guardrails, fences, utilities and other installations by his operations. Where such contamination occurs, he shall remove the offending material by approved methods to the satisfaction of the Consultant.

The Contractor shall be responsible for the protection of the work and shall, at his own expense, repair all areas damaged by any cause, until the work has been accepted by the Consultant.

**2.20.3.10 Reseeding**

The Contractor shall, at locations designated by the Consultant or the Department, reseed, refertilize and remulch or reharrow all areas which fail for any reason to show a uniform stand of grass during the calendar year following the year of initial seeding. The seeding work will be inspected during the month of May in the calendar year following the year of initial seeding and the Contractor shall complete any required reseeding work prior to June 15 of that year. This date will be extended if, in the opinion of the Consultant, the weather conditions prior to June 15 are not suitable for reseeding Work. A uniform stand of grass will be considered growth which shows no deterioration or bare spots greater than 1 square metre in size and provides a minimum of 80 percent ground cover as determined by the Consultant.

The requirement to reseed is considered to be a warranty requirement in accordance with Specification 1.2, General. Reseeding shall meet all the requirements for initial seeding, including fertilizing and harrowing or mulching as applicable. The Contractor will not be required to reseed any area more than once during the warranty period.

The Contractor shall supply all materials necessary for reseeding work and complete all reseeding work entirely at his own expense.

**2.20.4 MEASUREMENT AND PAYMENT****2.20.4.1 General**

Measurement will be made in hectares to the nearest 0.01 hectare based on horizontal measurements as determined by the Consultant. No allowance will be made for uneven or sloping ground.

**2.20.4.2 Seeding, Fertilizing and Harrowing**

Payment for seeding, fertilizing and harrowing will be made at the unit price bid per hectare for "Seeding, Fertilizing and Harrowing". This payment will be full compensation for supplying seed and fertilizer; preparing the surface; and seeding, fertilizing and harrowing the designated areas.

**2.20.4.3 Seeding, Fertilizing and Mulching**

Payment for seeding, fertilizing and mulching will be made at the unit price bid per hectare for "Seeding, Fertilizing and Mulching". This payment will be full compensation for supplying seed, fertilizer and mulch; preparing the surface; and applying the seed, fertilizer and mulch to the designated areas.