

1.0 GENERAL

1.1 REFERENCES

- .1 Provide drill seeding in accordance with the following standards (latest revision) except where specified otherwise.
- .2 Government of Canada
 - .1 Seeds Act and Seeds Regulations
 - .2 Fertilizers Act and Fertilizers Regulations
- .3 Alberta Transportation
 - .1 Field Guide for Erosion and Sediment Control available at www.transportation.alberta.ca
- .4 Government of Alberta
 - .1 Weed Control Act and Weed Regulation.

1.2 SUBMITTALS

- .1 Provide the following submittals.
- .2 The following test results at least 15 days prior to the delivery of seeds to the Site.
 - .1 Certificate of Analysis for each lot of seeds to be supplied with test results showing:
 - .1 germination rate, or when native seeds are specified and are not a part of the seed tables, the Tetrazolium results, and
 - .2 purity.
 - .2 Seed mix composition expressed as a percentage of each seed species by dry mass for each seed mix specified.
- .3 Calibration certificate for the drill seeding equipment.

1.3 QUALITY CONTROL

- .1 Retain a Registered Seed Laboratory to conduct specified seed testing.
- .2 Calibrate drill seeding equipment at least 30 days prior to starting seeding operations.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Provide seed in standard containers clearly labelled with the following information:
 - .1 Supplier's name and address.
 - .2 Lot number.

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- .3 Net mass.
- .4 Mixture Composition: Names and percentages of individual seed species.
- .2 Protect seed from direct sunlight, moisture, mould, and other detrimental conditions, while in transit and storage.
- .3 Provide fertilizer in standard containers clearly labelled with the following information:
 - .1 Name and address of the manufacturer and supplier.
 - .2 Specified composition.
 - .3 Net mass.

2.0 PRODUCTS

2.1 MATERIALS

- .1 Provide materials in accordance with the following.
- .2 Seed Mix Composition:
 - .1 Common No. 1 Grade seeds in accordance with the Government of Canada Seeds Act and Seeds Regulations. Supply seed mixed by a conditioner and bulk storage facility approved by the authority responsible for Canada Seeds Act & Seeds Regulations.
 - .2 Seeds and seed mixtures subjected to moisture, mould, and detrimental conditions will not be accepted by the Minister.
 - .3 Agronomic Composition: Seed Mix per Zone [4] [] as shown in the following schedule titled Agronomic Seed Mix.

Agronomic Seed Mix

Common Name	Latin Name	Seed Mix – Percentage by Dry Weight	
		Zone 1, 2, 3, 6	Zone 4, 5
Pubescent Wheat Grass	<i>Agropyron trichophorum</i>	40%	32%
Dahurian Wildrye	<i>Elymus dahuricus</i>	22%	30%
Sheep Fescue	<i>Festuca ovina</i>	30%	30%
Perennial Ryegrass	<i>Lolium perenne</i>	8%	-
Cereal Rye	<i>Secale cereale</i>	-	8%

- .4 .4 Cover Crop: Add agronomic seed Common No. 1 Grade to the Seed Mix specified in the schedule titled Agronomic Seed Mix. Add cover crop seed using a seed variety selected by the Minister, when seeding is performed after September 15 of any year, or a later date if acceptable to the Minister.
- .5 .5 Native Composition: Seed Mix per Zone [4] [] as shown in the following schedule titled Native Seed Mix:

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Seed Mix Zone	Native Seed Mix		Percentage by Dry Weight
	Common Name	Latin Name	
4 Mixedgrass and Dry Mixedgrass	Slender Wheat Grass	<i>Agropyron trachycaulum</i>	30%
	Canada Wildrye	<i>Elymus canadensis</i>	15%
	Mountain Brome	<i>Bromus carinatus</i>	15%
	Northern Wheat Grass	<i>Agropyron dasystachyum</i>	10%
	Western Wheat Grass	<i>Agropyron smithii</i>	5%
	Indian Rice Grass	<i>Orzyopsis hymenoides</i>	5%
	Alkali Grass	<i>Puccinellia distans</i>	10%
	Needle and Thread Grass	<i>Stipa comata</i>	10%

.6 Ensure seed mixture is free of any weed seeds listed as “Prohibited Noxious” or “Noxious” under the Weed Control Act and seeds of other species that will interfere with the growth of the specified seed mixture.

.3 Fertilizers:

.1 In accordance with the Canada Fertilizers Act and Fertilizers Regulations.

.2 Compatible with the seed mix composition and soil conditions.

.3 Composition:

Nitrogen [16] []

Phosphates [20] []

Potash [0] []

.4 Water: Free of impurities that would inhibit or adversely affect germination and growth of the seed.

3.0 EXECUTION

3.1 PREPARATION

.1 Prepare areas as specified in Section 02910 – Topsoil and Subsoil Placement prior to drill seeding areas.

.2 Provide prepared surfaces that are free of frost and standing water.

.3 Locate and protect existing fencing, signs, culverts, structures, survey reference points, instrumentation, and other facilities from damage during seeding operations.

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3.2 NOTIFICATION OF COMMENCEMENT OF WORK

- .1 Notify the Minister at least 48 hours prior to any seeding work. Do not commence seeding operations until all areas designated for seeding have been prepared to the satisfaction of the Minister.
- .2 Do not commence seeding operations until the Minister has reviewed the Certificate of Seed Analysis and verified the specified seed mix composition supplied.

3.3 WEATHER CONDITIONS

- .1 Do not proceed with the work when, in the opinion of the Minister, weather conditions are unsuitable. The Minister 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.

3.4 APPLICATION

- .1 Drill seed the areas specified in the Contract Documents or as directed by the Minister.
- .2 Measure the quantities of seeds [and fertilizer] by weight.
- .3 Apply the following:
 - .1 Drill seed mix composition at a rate of [8] kg/hectare.
 - .2 Fertilizer composition at a rate of [150] [] kg/hectare.
 - .3 Cover crop seed at a rate of 5 kg/hectare.
- .4 Apply the seeding materials during calm weather.
- .5 Perform drill seeding as follows:
 - .1 Perform seeding by press drilling.
 - .2 Regulate the seed drill to uniformly distribute the seeds at the specified application rate.
 - .3 Regulate the seed drill so that the seeds are properly placed in the soil and covered to a depth of between 20 mm and 40 mm.
 - .4 Apply the seeds in rows oriented crosswise to the slope. Do not apply seeds using rows that follow the slope unless Surface Tracking is immediately provided to eliminate all preferential paths for surface runoff.
 - .5 Do not apply fertilizer at the same time as the seeds unless the seed drill is equipped to sideband and uniformly distribute the fertilizer. Mixing the fertilizer with the seeds prior to their application is not permitted.
- .6 Regulate the equipment to apply the fertilizer uniformly at the specified rate.
- .7 Where the seeding adjoins existing vegetation, overlap the seeding application at least 300 mm into adjacent vegetated areas.

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- .8 Do not seed on hardened, crusted or rutted soil.
- .9 Do not use seeding operations that causes soil displacement or erosion.
- .10 Protect seeded areas against erosion or damage as specified in Section 02930 – Soil Erosion Protection.

3.5 BROAD CAST SEEDING

- .1 In areas that are inaccessible to drill seeding equipment, as determined by the Minister, use broad-cast seeding methods.
- .2 Use a cyclone seeder or hand methods as authorized by the Minister.
- .3 Provide a means of verifying the quantities of seed [and fertilizer] applied using cyclone or hand-methods. Use either quantity by weight, or a system of volume measurement as authorized by the Minister.
- .4 Apply the broad-cast seed mix composition at a rate of [16] kg/hectare.
- .5 Immediately following broad-cast seeding, harrow the seeded area to provide a a soil cover between 20 mm and 40 mm over the seeds, and Surface Track the seeded area.

3.6 SURFACE TRACKING

- .1 Surface Tracking is the roughening of the Topsoil by moving a tracked tractor or dozer, or other mechanical equipment acceptable to the Minister, up and down the slope leaving depressions perpendicular to the slope direction, to provide a serrated texture that will reduce erosion potential.
- .2 Perform Surface Tracking in accordance with Alberta Transportation's B.M.P #34 (a-c) of the Field Guide for Erosion and Sediment Control except as modified herein.
- .3 During Surface Tracking, avoid turning movements or changes in directions that causes loosening or disturbance of the soil. Limit the number of track passes to 1 or 2 times to avoid overcompaction.

3.7 WATERING

- .1 Water the seeded areas after seeding to achieve germination and a uniform stand of grass. [The Minister will determine when watering will be required, and will provide the Contractor with at least 24 hours advance notice to commence watering seeded areas.] [Determine when watering will be required, provide the Minister with at least 24 hours advance notice, and obtain authorization from the Minister prior to proceeding.]
- .2 Apply water uniformly to seeded areas without causing displacement or erosion of seeds, [fertilizer] or soil.
- .3 Minimize travel on seeded surfaces.
- .4 Use watering equipment and techniques authorized by the Minister.
- .5 Watering of seeded areas will be valued in accordance with Section 00725 – General Conditions, clause 8.3 - Valuation of Changes in the Work.

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3.8 RESEEDING

- .1 At locations that fail to show a uniform stand of grass for any reason during the calendar year following the year of initial seeding, repair the defective locations as determined by the Minister. A uniform stand of grass will be considered as grass growth that shows no deterioration or exposed soil greater than 1 square metre in size, and provides a minimum of 80 percent ground cover as determined by the Minister.
- .2 The Minister will inspect the seeded areas during the month of May of the calendar year following the year of initial seeding. Complete any required reseeding work prior to June 15 of that year. This date will be extended if, in the opinion of the Minister, the weather conditions prior to June 15 are not suitable for reseeding Work.
- .3 Meet all the requirements for initial seeding, including seeding method, seed mix composition, [fertilizer composition], application rates, harrowing, surface tracking as applicable.
- .4 Contractor will not be required to reseed any area more than once.

3.9 ADVERSE VEGETATION CONTROL

- .1 Control adverse vegetation as specified in Section 01392 – Environmental Management.

END OF SECTION