

FORM 632



GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Transportation and Works
Highway Design Division

SECTION 632 HYDROSEEDING

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632.01 SCOPE

This section covers the requirements for the supply and application of fertilizer, grass seed and mulch by hydroseeding and hydromulching, together with the provision of maintenance during a one year warranty period provided by the Contractor.

The supply and application of lime is covered separately in Section 635 "Lime for Hydroseeding".

632.02 MATERIALS

The following materials shall be supplied by the Contractor and shall conform to the requirements as stated:

632.02.01 Grass Seed

Grass seed shall meet the requirements of the Seeds Act for Canada No. 1 seed, and shall be of the following varieties and respective percentages for standard applications:

BIRDSFOOT TREFOIL, VARIETY LEO	45%
WILD WHITE CLOVER	30%
CREEPING RED FESCUE, VARIETY BOREAL	10%
ANNUAL RYE GRASS	15%

The White Clover and Birdsfoot Trefoil seed must be inoculated with the following bacterial cultures at the specified rates in order to produce nodules. The inoculum is added to the hydroseed tank with the seed.

WHITE CLOVER INOCULUM	RATE: 100 GRAMS PER KG. OF WHITE CLOVER SEED
BIRDSFOOT TREFOIL INOCULUM:	BIRDSFOOT TREFOIL INOCULUM:

For late summer applications of hydroseeding the following seed mixture shall be used for slope treatment with this late condition of application:

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BIRDSFOOT TREFOIL, VARIETY LEO	25%
WILD WHITE CLOVER	10%
CREeping RED FESCUE, VARIETY BOREAL	20%
ANNUAL RYE GRASS	15%
CANADA BLUEGRASS	10%
TIMOTHY	10%
HARD FESCUE	10%

632.02.02 Fertilizer

Fertilizer shall be granular, non-burning, free flowing and free of lumps.

The fertilizer to be placed in the hydroseeding mixture shall have a plant food ratio of 10 nitrogen, 20 phosphorus and 20 potash plus 2% Fritted Trace Elements or 12 nitrogen, 24 phosphorus, 24 potash plus 2% Fritted Trace Elements. The fertilizer mixture shall be applied at the rate of 400 kg/ha. The fertilizer to be spread the following spring during the maintenance period shall be 5-10-30, applied at the rate of 300 kg/ha, or approved equivalent.

632.02.03 Mulch

The mulch shall be of a type consisting of natural sundried straw or wood fibres.

Straw fibres shall include; oat, barley, alfalfa or wheat fibres and shall be free from any weeds or other foreign matter which may be detrimental to plant life. Any straw fibre combination shall be maintained in a dry condition to allow even distribution when processed through a blower. The addition of other vegetative material consisting of hay, chopped corn stalks or other similar substances may be used with prior approval of the Engineer.

Wood fibres shall include any wood or wood cellulose fibres and shall be free from any germination or growth inhibiting components.

Any fibres to be included in a mulch mixture shall be processed in lengths of 20 mm - 40 mm and supplied air dry in packages not exceeding 50 kg in weight for proper storage and handling.

The mulch shall be capable of dispersing in water to form a homogeneous slurry and remain in such a state when agitated or mixed with other additives.

When applied, the mulch shall be capable of forming an absorptive mat, which will allow moisture to percolate into the underlying soil.

632.02.04 Binder

The binder must be capable of joining seeds, mulch and soil particles together on slopes and erodible surfaces until plant growth has been established. The binder must not form an impervious seal which would prevent the penetration of moisture to the underlying soil.

The binder shall be supplied as a water-soluble powder composed of polymerised and organic substances and must be absolutely non-toxic.

632.02.05 Water

Water used in hydroseeding and hydromulching shall be free of any impurities which would inhibit germination or otherwise adversely affect growth.

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632.03 HYDROSEEDING OPERATIONS

The Engineer shall designate the boundaries of areas for hydroseeding and mulching treatment. These areas will usually include a 300 mm wide overlap over adjoining vegetation so as to eventually provide a continuous cover of vegetation.

No area shall be hydroseeded until surface preparation has been completed to the approval of the Engineer, and the lime applied.

Hydroseeding shall be carried out as soon as possible after completion of the surface preparation, in order to prevent erosion by wind and water.

Contractor should wait for several days after the application of lime before hydroseeding.

The hydroseeding procedure to be applied to designated areas shall be undertaken in one operation. The operation shall consist of the distribution of a slurry composed of: the required seed mixture, the fertilizer, mulch, and binder.

The rate of application of the ingredients of hydroseeding slurry shall be as follows for standard applications:

SEED MIXTURE	80 kg/ha
FERTILIZER	400 kg/ha
BINDER	20kg/ha
MULCH	1600kg/ha
INOCULUM	IN ACCORDANCE WITH SECTION 632.02.01

For late summer applications of hydroseeding the following seed mixture shall be used for slope treatment with this late condition of application:

SEED MIXTURE	150 kg/ha
FERTILIZER	600 kg/ha
BINDER	20kg/ha
MULCH	1250kg/ha
INOCULUM	IN ACCORDANCE WITH SECTION 632.02.01

The Contractor shall measure the quantities of each of the materials to be charged into the seeder, either by mass or by a system of mass-calibrated volume measurements approved by the Engineer and the Contractor shall provide all equipment required for this purpose.

The ingredients required for the hydroseeding operation shall be thoroughly mixed with water in a hydroseeding tank.

In order to prevent all of one type of seed being planted on one part of the job, and all of another type of seed being planted on another part of the job, it is imperative that the hydroseeding slurry be continuously agitated during the hydroseeding operation to ensure that a homogeneous slurry is spread.

The distribution of the slurry shall be by means of an approved hydroseeder and shall be applied uniformly and in such a manner as to prevent puddling and movement of the soil surface.

Work shall proceed only in calm weather and on ground free of frost, snow, ice or standing water and when, in the opinion of the Engineer, weather and seasonal conditions are suitable. Hydroseeding shall not be carried out during periods of rainfall.

632.04 PROTECTION OF ENVIRONMENT

The Contractor shall take all reasonable care to prevent the contamination by his operations, of structures, signs, guide rails, fences, utilities and all such installations and, where such contamination occurs, he shall remove it to the satisfaction of, and by means approved by the Engineer.

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The Contractor shall take whatever precautions may be necessary and shall ensure that fertilizer in solution shall not come in contact with the foliage of any trees, shrubs or other susceptible vegetation.

Should the Contractor fail to meet this requirement, he shall immediately spray the affected vegetation with water, as required by the Engineer, to remove such contamination.

Mechanical damage to trees and shrubs shall, at the Contractor's expense, be repaired by trimming and painting or replacement, as required.

Such action as is herein required shall not relieve the Contractor of further responsibility should it not effectively remedy the damage, or of his liability as set out elsewhere within the contract.

632.05 MAINTENANCE

The Contractor shall be responsible for maintaining hydroseeded areas to ensure proper and adequate growth of the vegetation during the warranty period. The Contractor shall also be responsible for an additional application of fertilizer the following spring. This application shall be by a method approved by the Department. The fertilizer shall be 5-10-30 and shall be applied at a rate of 300 kg/ha. No additional payment will be made for maintenance or the extra application of fertilizer.

632.06 CONTRACTOR'S WARRANTY PERIOD

All areas hydroseeded under this contract shall have a warranty period of one year starting from the date of initial acceptance. This warranty shall cover any defects in materials and workmanship, and damages caused by the elements of weather. During this period, any defect brought to the attention of the Contractor by the Engineer shall be fixed, repaired or made good to the satisfaction of the Engineer and at no additional cost to the Department.

632.07 MEASUREMENT FOR PAYMENT

The slope area actually hydroseeded, from within the limits as staked by the Engineer, will be measured in square metres, rounded to the nearest whole number.

632.08 BASIS OF PAYMENT

Payment of the contract price for hydroseeding shall be compensation in full for all labour, materials and equipment-use for: supplying the inoculated seed mixture as specified; supplying the fertilizer, binder and mulch; carrying-out the hydroseeding operation; and supplying and placing the fertilizer in the following spring; together with a one year warranty period, during which time the Contractor shall be responsible for making good any defect to the growth of the vegetation.

Full payment shall not be made until the final acceptance of the work on satisfactory completion at the end of the warranty period. A holdback in the amount of 25% of the total payment for hydroseeding shall be retained for the warranty period and until additional application of fertilizer the following spring as per Section 632.05 of this specification.