
HYDRO MULCHING

1.0 GENERAL

1.1 REFERENCE STANDARDS

- 1.1.1 Canadian Landscape Standard, First Edition
 - 1. Section 4: Grading and Drainage
 - 2. Section 6: Growing Medium
- 1.1.2 Canadian National Master Construction Specifications (NMS)

1.2 RELATED SECTIONS

- 1.2.1 07050 Seeding
- 1.2.2 07040 Topsoil and Fine Grading

1.3 PRODUCT HANDLING: DELIVERY - STORAGE

- 1.3.1 Use all means necessary to protect material before and during installation to prevent it becoming moldy, wet, or otherwise damaged in transit or storage.
- 1.3.2 In the event of damage make immediate replacements at no extra cost to the City of Lethbridge.

1.4 SITE PREPARATION

- 1.4.1 Areas to be brought to finish grade and acceptable tilth for success of seeding and hydro mulching to be done.
- 1.4.2 The preparation shall be approved by the Engineer prior to commencing work.
- 1.4.3 Scarify and/or aerate soil surface to allow for proper subsurface drainage.
- 1.4.4 IF Native Seed is to be applied as part of this work, apply seed using methods described in Section 07050 Seeding, Part 3.0.

1.5 VISUAL BENCH MARK

- 1.5.1 The Contractor shall notify the (Engineer /City) a minimum of 24/48 hours in advance of application of hydro-seed/mulch.
- 1.5.2 Contractor will calculate the mix ratios, and prepare and load (1) one (Tank/Truck) of slurry mix to their satisfaction with the constancy of the mix.
- 1.5.3 Contractor will calculate the total area the mix will cover, stake the area onsite and apply the mulch to the area. The Contractor and the Engineer will review the visual benchmark and if the visual bench mark is satisfactory, the application rate and mix ratio shall be used for the entire site / site condition.

HYDRO MULCHING

1.6 EQUIPMENT

- 1.6.1 Approved hydraulic seeding equipment is required for the application of seed, fertilizer, and a slurry of prepared Hydro Mulch. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amounts of materials. The pump pressure shall be such as to maintain a continuous non-fluctuating stream of solution.
- 1.6.2 Distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with nozzle to give alternative means of distribution.

1.7 QUALITY ASSURANCE

- 1.7.1 Contractor: experienced and knowledgeable in landscape work of contract.
- 1.7.2 Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and work of contract. Supervisor shall possess a Landscape Journeyman Gardener certification or other similar qualification acceptable to the Engineer.
- 1.7.3 Staffing: experienced, competent and trained landscape personnel who will perform all tasks and services in a knowledgeable and professional manner. Workers shall act safely and professionally at all times while working on site. Contractor shall not assign any worker that the Engineer deems incompetent, careless, insubordinate, or otherwise objectionable to work on site.
- 1.7.4 Contractor shall be responsible for ensuring that contract specifications are being adhered to. Failure of the Engineer to immediately reject unsatisfactory workmanship or to notify the Contractor of their deviation from the specification shall not relieve the Contractor of their responsibility to repair and/or replace unsatisfactory work.
- 1.7.5 Contractor shall obtain approvals as required by contract for suppliers, sub-contractors, and materials.
- 1.7.6 Contractor shall advise the Engineer, in writing, of any conditions or defects encountered on site before or during construction upon which the work of this section depends and which may adversely affect its performance.
- 1.7.7 Do not commence work until adverse conditions or defects have been evaluated by the Engineer and corrective measures taken.
- 1.7.8 Commencement of work shall imply acceptance of existing conditions and no claims for damages or extras resulting from such conditions or defects will be accepted later, except where such conditions could not have been known prior to commencing work.

1.8 SUBSTITUTIONS

- 1.8.1 Substitutions will require approval from Engineer.
- 1.8.2 Submit proof that the hydroseed or hydro mulch specified are unobtainable prior to making substitutions.
- 1.8.3 Substitutions shall be of nearest to specified hydroseed or hydro mulch.

HYDRO MULCHING

1.8.4 Substitution will not increase Contract Price bid.

2.0 PRODUCTS

2.1 GRASS SEED

2.1.1 Engineer to determine specific requirements for seed mixture.

2.1.2 Seed which has become moldy, wet, or otherwise damaged (after Contractor has taken delivery) shall not be accepted, and shall be replaced at the Contractor's expense.

2.2 FERTILIZER

2.2.1 Use 16-20-0 (Nitrogen - Phosphorus - Potassium) fertilizer.

2.3 WATER

2.3.1 Water used for hydraulic seeding and wood cellulose fibre mulching shall be free of any impurities which would inhibit germination or otherwise adversely affect growth. Permits required to obtain water will be at 100% Developer/Contractor expense.

2.4 ASPHALT EMULSION BINDER

2.4.1 Asphalt emulsion to be used as an adhesive with the mulching material shall be specially refined petroleum asphalt emulsified in water containing no petroleum solvents or other components known to be a toxin to plant and animal life.

2.4.2 Asphalt emulsion shall conform to the following specific requirements.

1. Viscosity, 60 ml at 25° C, SSF 17-40 Residue by Distillation, % 55-58
Settlement 7 days, %
2. 5.0 Max Demulsibility, 50 m. of 0.10 N CaCl₂ 2.0 Max Sieve Test 0.10 Max Tests of Residue from Distillation Penetration, 25°C, 100 g., 5 sec. 100-200 Solubility, CCL₄, % 97.5 Min. Ductibility, 25°C, cm. 50 Min. Fireproofness Pass A sticking agent, Terratack or approved alternative may be used in place of asphalt emulsion binder.

2.4.3 Methods of testing shall be in accordance with ASTM Designation D244, except that for the settlement test, the settlement period shall be 7 days; for the solubility test, the solvent shall be trichloroethylene, and fireproofness requirement shall be met, if there is no flash or flame when the flame of a Bunsen burner is held in contact for 10 seconds with the surface of the material, as received.

2.5 MULCHING MATERIAL

2.5.1 The material used for mulching shall be specially prepared cedar wood cellulose fibre, of a type approved by the Engineer. It shall contain no growth or germination inhibiting factors, and shall form, after application, a blotter-like ground cover which will allow absorption and percolation of water.

2.5.2 The material shall be supplied to the contract site in stacks, each containing 454 kg. (air dry) of fibre, and each stack shall be further subdivided by means of conspicuous markers into bundles of fibre.

HYDRO MULCHING

- 2.5.3 Alternatively the material may be supplied to the contract site in moisture-proof bags. Each bag shall contain the same weight of material, and this weight shall be clearly shown.
- 2.5.4 It shall be the responsibility of the Contractor to provide to the Engineer before and as a condition of its use, a shipping bill issued by the supplier of the material, designating the supplier or the manufacturer and the type of material, and certifying the net weight of material in each truck or car load.
- 2.5.5 Throughout this specification, references to the weight of this material shall refer only to air dry weight of the fibre material. Air dry weight shall be determined in accordance with Canadian Pulp and Paper Association, Technical Section, Standard A2.

3.0 EXECUTION

3.1 TIME OF SEEDING

- 3.1.1 Seed shall not be applied until the seed bed has been properly prepared. All seeding shall be done in calm weather.

3.2 SOIL BED PREPARATION

- 3.2.1 Before seeding the soil surface shall be brought to a firm and acceptable tilth condition. The soil shall be graded in a workmanlike fashion to meet existing grades and existing growth, etc., using acceptable tillage practices to ensure a good catch of grass and to ensure control of erosion (ridges to run against grain to prevent runoff). Remove debris, rock and /or stones in excess of 75mm. Seed bed to be inspected and approved by the Engineer.

3.3 SEEDING

- 3.3.1 Hydro-Seed and Mulch Mixtures
 - 1. Hydro-Seed Mix
 - a) For slopes 3:1 or less
 - b) Application Rate: 1200 – 2500 kg/ha
 - c) Tackifier: 2 – 3%
 - d) Includes Seed
 - 2. Hydro-Mulch Mix (Erosion Control)
 - a) For slopes greater than 3:1
 - b) Application Rate: 2000 - 4000 kg/ha
 - c) Tackifier: 3 – 10%
 - d) Includes Seed
 - e) Does not include areas with running water, i.e. ditch bottoms and wet fringes.
 - f) Should conform to ASTM 6459 for Erosion Control Performance.
- 3.3.2 The Contractor shall review the site and determine the most appropriate application rate(s) for the site.
 - 1. Sites larger than 10 Hectares shall have application rates set for each site condition.
 - 2. Sites with special conditions (steep slopes) shall have applications rates set for each special condition.
 - 3. The Contractor shall consider all variables that will impact the Application Rates.

HYDRO MULCHING

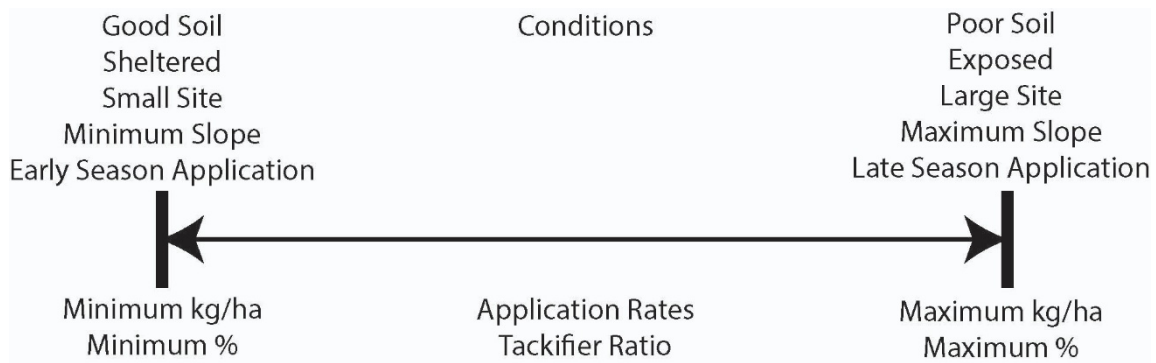


Figure 1: Application Rate Considerations

4. An example calculation is as follows, quantities and rates will vary by manufacturer:
 - a) Product is to be applied at 5000 kg/ha with an 11356 liter tank.
 - b) One 22.7 kg bag of hydro-mulch per 340 liters of water (as per manufacturers specs)
 - c) 1 tank holds 33 bags of hydro-mulch, for a total of 749 kg in each tank.
 - d) 1 tank will then cover 1498 m².

$$\frac{\text{tank size}}{\text{water per bag}} = \text{bags per tank}$$

$$\text{bags per tank} \times \text{bag weight} = \text{weight per tank}$$

$$\frac{\text{weight per tank}}{\text{application rate}} = \text{hectares per tank}$$

$$\text{hectares per tank} \times 1000 = \text{square meters covered}$$

Figure 2: Hydro-Seed / Mulch Mix Calculations

5. The work shall be done only in good weather and on ground free of frost, snow, ice or standing water.
6. No area shall be seeded in excess of that which can be mulched on the same day as it is sown.
7. After charging, no water or other material shall be added to the mixture in the hydro mulcher.
8. Areas inaccessible to the above method of application, or designated by the Engineer, shall be seeded and fertilized by approved, accepted methods. Distribution of the material shall be uniform and at the rates specified.
9. The Contractor shall notify the Engineer as to the slurry tank capacity and coverage area in square meters/tank to meet application rates specified. Prior to seeding, the Contractor shall place marker stakes to delineate the area to be covered by two (2) tankfuls of slurry mix which shall be used as a test area. This application rate shall be used for the remainder of the project.
10. Areas inaccessible to the above method of application or as designated by the engineer shall be seeded and fertilized by other approved methods. Distribution of material shall be uniform and at rates specified.

HYDRO MULCHING

3.4 PROTECTION AND MAINTENANCE

3.4.1 Landscaping shall be maintained by the Contractor for the duration of the warranty. The certificate shall be issued when a thick, uniform growth of grass has been established. Bare grass areas shall be reseeded during the Period of Maintenance. The Period of Maintenance will be extended until the reseeded bare area have a thick, uniform growth of grass acceptable to the Engineer/Consultant. Damage resulting from erosion, gullies and washouts, etc., shall be repaired by filling with topsoil ramping, cultivating, and reseeded, at the Contractor's expense.

4.0 MEASUREMENT AND PAYMENT

- 4.1 Payments will be based on unit price bid. Payment shall include the supply and installation of all materials shown on the drawings, and all materials incidental to the completion of the work, and shall include all costs for the maintenance and warranty of the system.
- 4.2 Progress claims submitted by the contractor shall be based on the unit prices submitted or the percentage of work completed in the tender form for the work completed at date of claim and approved by the engineer and owner prior to payment.
- 4.3 No payment shall be made for materials delivered and stored onsite that have not been properly installed and tested.
- 4.4 The unit prices for supply shall include supplying, delivering, loading, unloading and all allowances for handling, storage, breakage and waste. Payment will be made only for material actually installed and tested in the work.

END OF SECTION