
SEEDING

1.0 GENERAL

1.1 REFERENCE STANDARDS

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

1.2 RELATED SECTIONS

- 1.2.1 07040 Topsoil and Finish Grading
- 1.2.2 07030 Hydro Seeding / Hydro-Mulch

1.3 WORK INCLUDED

- 1.3.1 This section covers the seed requirements, the seed-bed operation, and the seeding and maintenance of the seeded area.

1.4 PRODUCT HANDLING: DELIVERY & STORAGE

- 1.4.1 Use all means necessary to protect material before and during installation to prevent it becoming moldy, wet, or otherwise damaged in transit or storage.
- 1.4.2 In the event of damage make immediate replacements at no extra cost to the City of Lethbridge.
- 1.4.3 All seed shall be stored in a dry weatherproof storage place and shall be protected from damage by heat, rodents or other causes.

1.5 SUBMITTALS

- 1.5.1 Submit product data for each type of product indicated.
- 1.5.2 Submit Proposed Native Seed Mix prepared by a Professional Biologist / Reclamation Agrologist. Submittals must include the following information:
 - 1. Professional Biologist / Reclamation Agrologist: Name, Qualifications and contact information.
 - 2. Seed Supplier: Name and contact information.
 - 3. Seed Species: Latin Name and Common Name
 - 4. Seed Mix Ratio
 - 5. Installation Method
 - 6. Application Rate
 - 7. Anticipated Viability
- 1.5.3 Submit seeding schedule indicating anticipated application dates for each type of seed.

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- 1.5.4 Submit maintenance instructions indicating recommended procedures to be established by Owner for maintenance of lawns following the required maintenance period.
- 1.5.5 Contractor shall provide the City with a seed analysis (regulation seed labels) for each batch of seed species with in the mix. Analysis must include the following:
 - 1. Pure live seed or tz, purity %
 - 2. Weed seed %
 - 3. Inert matter %
 - 4. Other crop %
 - 5. Germination rate.

1.6 SUBSTITUTIONS

- 1.6.1 Substitutions will require approval from Engineer.
- 1.6.2 Submit proof that the seed specified is unobtainable prior to making substitutions.
- 1.6.3 Substitutions shall be of nearest to specified seed mix.
- 1.6.4 Substitution will not increase Contract Price bid.

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 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.

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- 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.

2.0 PRODUCTS

2.1 GENERAL

- 2.1.1 The grass seed shall meet the requirements of The Seed Act for Canada No. 1 Seed, and shall be Canada Certified #1 Seed.
- 2.1.2 All Native Seed Mixtures shall be designed by a Professional Biologist / Restoration Agrologist:
1. The Professional Agrologist shall determine the following:
 - a) Seed Species and Ratios
 - b) Application Rate
 - c) Allowable Minimum Viability (Baseline = 95%)
 2. The Professional Biologist / Restoration Agrologist must conduct a field evaluation of the site and take into consideration all the appropriate criteria when designing the mixture, including, but not limited to:
 - a) Seed Type: Dryland, Coulee, Wetland, Wildflower
 - b) Site Conditions
 - c) Installation Method: Brillion, Mechanical Broadcast, Seed Drill, Slit Seeder
- 2.1.3 Desired Outcome: Restoration, Naturalization, High Traffic, Low Maintenance
- 2.1.4 All seed mixtures shall be mixed and supplied by a recognized seed house with the tested rates for germination of not less than the government standards rated. Written evidence shall be forwarded to the Engineer prior to seeding.
- 2.1.5 All cover crops shall be a sterile annual species. Contractor to obtain cover crop recommendations from a Professional Biologist / Agrologist and submit to Engineer for review and approval.
- 2.1.6 The Engineer may test the seed for purity and germination at his own expense.

2.2 GRASS SEED MIXTURES

- 2.2.1 Parks / Boulevard Seed Mix (A Mixture)
- | | |
|-----|---------------------|
| 60% | Fescue Varieties |
| 20% | Kentucky Bluegrass |
| 20% | Perennial Rye Grass |
1. Cover crop to be approved on a site-specific basis. Erosion and time of year that the seeding will occur will influence the seed variety used.
 2. All Seed varieties to have low water requirements
 3. Application Rates
 - a) Hydro-Seed or difficult conditions: 200 – 250 kg/Ha
 - b) Mechanical Seed: 50 – 60 kg/Ha

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- 2.2.2 Sports Field / Free Play Areas Seed (B Mixture)
- 50% Kentucky Bluegrass
 - 40% Creeping Red Fescue
 - 10% Perennial Ryegrass
1. Cover crop to be approved on a site-specific basis. Erosion and time of year that the seeding will occur will influence the seed variety used.
 2. All Seed varieties to have low water requirements.
 3. Application Rates
 - a) Hydro-Seed or difficult conditions: 200 – 250 kg/Ha
 - b) Mechanical Seed: 50 – 60 kg/Ha

- 2.2.3 Dryland Seed (C Mixture)
- 30% Slender Wheat
 - 20% Western Wheat
 - 15% Green Needle
 - 10% June Grass
 - 10% Streambank Wheat
 - 10% Blue Grama Grass
 - 5% Indian Rice
1. Cover crop to be approved on a site-specific basis. Erosion and time of year that the seeding will occur will influence the seed variety used.
 2. Application Rates
 - a) Hydro-Seed or difficult conditions: 200 – 250 kg/Ha
 - b) Mechanical Seed: 50 – 60 kg/Ha

2.2.4 Native Grass Seed (D Mixture)

GRASS SPECIES		
Common Name	Botanical Name	Conditions
Western Wheat Grass	Agropyron smithii	Dry / moist
Sand Reed Grass (Northern or Southern)	Calamagrostis inexpansa	Dry / sandy
June Grass	Koeleria macrantha	Dry
Blue Grama Grass	Bouteloua gracilis	Dry
Canada Wild Rye	Elymus canadensis	Wet / moist
Green Needlegrass	Stipa viridula	Dry / moist
Northern Wheatgrass	Agropyron dasystachyum	
Slender Wheatgrass	Agropyron trachycaulum	
Needle & Thread Grass	Stipa comata	Dry
Sandberg Blue Grass	Poa sandbergii	Moist
Slough Grass	Beckmannia syzigachne	Moist (<i>but rare in Lethbridge</i>)
Alkali Grass	Spartina gracilis	Moist (<i>but rare in Lethbridge</i>)
Green Needle Grass	Stipa viridula	Moist

1. Cover crop to be approved on a site-specific basis. Erosion and time of year that the seeding will occur will influence the seed variety used.
2. Application Rates
 - a) Mechanical Seeding: 50 – 60 kg/Ha

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2.2.5 Native Wildflower Seed (E Mixture)

WILDFLOWER SPECIES		
Common Name	Botanical Name	Condition
Broomweed	Butierrezia sarothrae	Dry
Umbrella Plant	Eriogorum flavum	Dry
Brown Eyed Susan	Gaillardia aristata	Moist
Butte Marigold	Hymenoxis acaulis	Dry
Colorado Rubber Plant	Hymenoxis richardsonii	Dry
Yellow Flax	Linum rigidum	Dry
Locoweed	Oxtropis sericea	Dry
Prairie Cone Flower	Ratibida columnifera	Dry
Goldenrod	Solidago missouriensis and Solidago mollis	Dry / moist
Golden Bean	Thermopsis rhombifolia	Dry / moist
Prairie Crocus	Anemone patens	Moist
Smooth Aster	Aster laevis	Dry / Moist
Prairie Milkvetch	Astragalus adsurgens	
Harebell	Campanula rotundifolia	Moist
Three Flowered Avens	Geum triflorum	Moist
Northern Sweetvetch	Hedysarum boreale	Dry / moist
Dotted Blazing Star	Liatris punctata	Dry
Blue Flax	Linum perenne	Dry
Scarlet Mallow	Malvastrum coccineum	Dry
Bergamot	Monarda fistulosa	Moist
Smooth Blue Beard Tongue	Penstemon nitidus	Dry
Purple Prairie Clover	Petalostemon purpureum	Dry

1. Cover crop to be approved on a site-specific basis. Erosion and time of year that the seeding will occur will influence the seed variety used.
2. Application Rates
 - a) Mechanical Seeding: 50 – 60 kg/Ha

3.0 EXECUTION

3.1 SITE PREPARATION

- 3.1.1 Areas to be brought to finish grade and acceptable tilth for success of seeding.
- 3.1.2 The preparation shall be approved by the Engineer prior to commencing work.
- 3.1.3 Scarify and/or aerate soil surface to allow for proper subsurface drainage.
- 3.1.4 The surface shall be floated to achieve the design elevations after the fertilizer has been spread and cultivated.

3.2 INSTALLATION

- 3.2.1 Acceptable Seeding Methods
- 3.2.2 Hydro-Mulch over one of the following: Brillion, Mechanical Broadcast, Seed Drill, Slit Seeder.

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- 3.2.3 Seeded area shall be floated and rolled to a smooth surface to a tolerance of 15 mm in 3000 mm when measured in any direction after application.
- 3.2.4 Seeding shall be carried out during calm conditions when the wind is less than 8 km/h.
- 3.2.5 Seeding operations shall not be carried out during the following conditions:
 - 1. Between November 1st and April 1st. Seeding may be permitted before or after these dates at the discretion of the City.
 - 2. Summer Drought Period if not irrigated
 - 3. Snow / Heavy rain
 - 4. When daytime high temperatures exceed 25 degrees Celsius
- 3.2.6 The Contractor shall notify the Engineer in writing that the seeding has been completed.
- 3.2.7 **Deficiency Resolution for Irrigated Areas**
Re-apply seed to all areas that do not show a uniform stand of grass. Perform such reapplication to allow for establishment prior to Substantial Performance of the work. For irrigated areas, a uniform stand of grass will be considered growth that shows no bare spots greater than 50 mm by 50 mm in size and provides a minimum of ninety-five percent ground cover.
- 3.2.8 **Deficiency Resolution for Non-Irrigated Areas**
 - 1. Re-apply seed to all areas that do not show a uniform stand of grass. Perform such reapplication to allow for establishment prior to Substantial Performance of the work. For non-irrigated areas, a uniform stand of grass will be considered growth that shows no bare spots greater than 150 mm by 150 mm in size and provides a minimum of ninety percent ground cover.

4.0 MAINTENANCE OF SEEDED AREAS

- 4.1 Maintenance of turf areas shall be provided by the contractor and shall include all measures necessary to establish and maintain grass in a healthy and vigorous growing condition.
- 4.2 Watering shall be carried out when the seed is first applied to prevent grass and the underlying soil from drying out.
- 4.3 Management of the seeded areas will occur in the second growing season to control the establishment and growth of undesirable vegetation such as Canada thistle.
 - 4.3.1 **Park / Boulevard and Sports Field Seed Mixtures**
 - 1. Establishment expected within 2nd growing season.
 - 2. Weed Control
 - a) May use Selective Herbicides or Mechanical Vegetation Control (Mowing).
 - b) Vegetation to be 90% free of weeds.
 - 3. Watering
 - a) Contractor is responsible to increase watering as required during hot / dry periods.
 - b) Seed bed must not be allowed to dry and must be kept moist at all times.
 - 4.3.2 **Dryland / Native / Wildflower Seed Mixtures**
 - 1. Establishment expected within 2nd growing season.

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2. Weed Control
 - a) Mechanical Vegetation Control (Mowing) only.
 - b) Vegetation to be 90% free of weeds.
3. Watering
 - a) Contractor is responsible to increase watering as required during hot / dry periods.
 - b) Seed bed must not be allowed to dry and must be kept moist at all times.

5.0 MEASUREMENT AND PAYMENT

- 5.1 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.
- 5.2 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.
- 5.3 No payment shall be made for materials delivered and stored onsite that have not been properly installed and tested.
- 5.4 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