# PART 1 General

## 1.1 REFERENCES

.1 ASTM International
.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
.2 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
.3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ftü) (600kN-m/mü).
.5 ASTM D1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ftü) (2,700kN-m/mü).
.6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
.7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canada Green Building Council (CaGBC)
.1 LEED Canada For New Construction and Major Renovations 2009.

.3 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.4 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
.1 OPSS 1004 November 2006, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.
.2 OPSS 1010 April 2004, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.5 U.S. Environmental Protection Agency (EPA) / Office of Water
.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

# PART 2 Products

## 2.1 MATERIALS

.1 Granular base: material in accordance with Section 31 23 33.01 and following requirements:
.1 Type 1 – Granular A as per OPSS 1010.

## PART 3 Execution

### 3.1 PREPARATION

.1 Temporary Erosion and Sedimentation Control:
.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### 3.2 PLACEMENT AND INSTALLATION

.1 Place granular A base after subgrade surface is inspected and approved in writing by Departmental Representative.

.2 Placing:
.1 Construct granular base to depth and grade in areas indicated.
.2 Ensure no frozen material is placed.
.3 Place material only on clean unfrozen surface, free from snow and ice.
.4 Begin spreading base material on crown line or on high side of one-way slope.
.5 Place material using methods which do not lead to segregation or degradation of aggregate.
.6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
.1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
.8 Remove and replace that portion of layer in which material becomes segregated during spreading.

.3 Compaction Equipment:
.1 Ensure compaction equipment is capable of obtaining required material densities.

.4 Compacting:
.1 Compact to density not less than 100% maximum dry density to ASTM D698.
.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
.3 Apply water as necessary during compacting to obtain specified density.
.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.
.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

**3.3 SITE TOLERANCES**

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

**3.4 CLEANING**

.1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.3 Waste Management: separate waste materials for reuse and recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Divert unused granular material from landfill to local quarry or facility approved by Departmental Representative.

**3.5 PROTECTION**

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

**END OF SECTION**

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## PART 1 General

### 1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ftü (600 kN-m/mü)).

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.5-M91(March 1999), Low Flash Petroleum Spirits Thinner (Reaffirmation of December 1991).
.2 CAN/CGSB-1.74-2001, Alkyd Traffic Paint.

.3 Government of Québec, Minister of Transport
.1 Cahier des charges et devis généraux (CCDG)-97.

.4 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS 302-November 2007, Construction Specification for Priming Granular Base.
.2 OPSS 310-November 2008, Construction Specification for Hot Mix Asphalt.
.3 OPSS 314-November 2004, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder, and Stockpiling.
.4 OPSS 1010-April 2004, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.
.5 OPSS 1103-November 2007, Material Specification for Emulsified Asphalt.
.6 OPSS 1150-November 2008, Material Specification for Hot Mix Asphalt.

### 1.2 SAMPLES

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit to Departmental Representative, samples of material for sieve analysis at least 4 weeks before beginning Work.

.3 Submit to Departmental Representative mix design at least 4 weeks before beginning work.

### 1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Divert unused aggregate materials from landfill to quarry for reuse as approved by Departmental Representative.

.6 Dispose of unused paint and paint thinner materials at official hazardous material collections site as approved by Departmental Representative.

.7 Fold up metal banding, flatten and place in designated area for recycling.

.8 Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.

.9 Divert unused asphalt from landfill to facility capable of recycling materials.

## PART 2 Products

### 2.1 MATERIALS

.1 Aggregates to: OPS 1010.
- .1 Granular A.
- .2 Select subgrade.

.2 Asphalt concrete: HL-3 to OPSS 1150.

.3 Asphalt cement: to AASHTO M320, grade PG 58-28 when tested to AASHTO R29.

## PART 3 Execution

### 3.1 FOUNDATIONS

.1 Foundations for parking lots to comprise:
- .1 300 mm compacted thickness of granular A base in accordance with Section 32 11 23.

.2 Compaction: compact each lift of granular material to 100% maximum dry density to ASTM D698. Maximum lift thickness: 150 mm.

### 3.2 PAVEMENT THICKNESS

.1 Pavements for driveways and walkways:
- .1 Wear course: 50 mm HL3.

### 3.3 PAVEMENT CONSTRUCTION

.1 Construction of asphalt concrete: OPSS 310.

**END OF SECTION**

## PART 1 - GENERAL

### 1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM C117-[04], Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
.2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.4 ASTM D698-[07e1], Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft3) (600 kN-m/m3).

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-3.3-2007, Kerosene, Amend. No. 1, National Standard of Canada.
.2 CAN/CGSB-8.1-[88], Sieves, Testing, Woven Wire, Inch Series.

.3 Canadian Standards Association (CSA International)
.1 CSA-A23.1-[09]/A23.2-[09], Concrete materials and methods of concrete construction/Test methods and standard practices for concrete.

.4 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS 351-November 2010, Construction Specification for Concrete Sidewalk
.2 OPSS 353-November 2010, Construction Specification for Concrete Curb and Gutter Systems
.3 OPSS 904-November 2012, Construction Specification for Concrete Structures
.4 OPSS 1305-November 2008, Material Specification for Moisture Vapour Barriers
.5 OPSS 1315-November 2008, Material Specification for White Pigmented Curing Compounds for Concrete
.6 OPSS 1350-November 2008, Material Specification for Concrete – Materials and Production
.7 OPSS 1440-November 2004, Material Specification for Steel Reinforcement for Concrete

.5 Ontario Provincial Standard Drawings (OPSD)
.1 OPSD 310.020-November 2005, Concrete Sidewalk Adjacent to Curb and Gutter
.2 OPSD 310.030-October 1993, Concrete Sidewalk Ramps at Intersections
.3 OPSD 600.110-November 2012, Concrete Barrier Curb

### 1.2 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00.

.2 Product Data: submit WHMIS MSDS.

.3 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 4 weeks prior to commencing work.

.4 If materials have been tested by accredited testing laboratory testing laboratory approved by Departmental Representative within previous 2 months and have passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

.5 Submit concrete mix design to Departmental Representative at least 4 weeks prior to commencing work.

**1.3 DELIVERY, STORAGE AND HANDLING**

.1 Waste Management and Disposal:
- .1 Separate waste materials for reuse and recycling.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

.1 Concrete as specified below. Neither fly ash nor slag will be accepted in the mix.
- .1 Compressive Strength: 32 MPa minimum
- .2 Cement Content: 385 kg minimum per m3
- .3 Coarse Aggregate: 19mm maximum
- .4 Water/Cement Ratio: 0.43 maximum
- .5 Slump: 70mm +/- 20mm
- .6 Air Content: 7% +/- 1.5%
- .7 Class C-2

.2 Reinforcing steel: steel wire mesh (No. 9, 150x150mm) in accordance with OPSS 1440.

.3 Curing Compound: in accordance with OPSS 1315.

.4 Burlap: in accordance with OPSS 1305.

.5 Expansion joint material: 12mm thick bituminous fibre as per ASTM D 1751.

.6 Granular base: in accordance with Section 32 11 23.

**PART 3 EXECUTION**

**3.1 GRANULAR BASE**

.1 Obtain Departmental Representative's approval of subgrade before placing granular base.

.2 Place 150mm compacted thickness of granular base material in accordance with Section 32 11 23.

.3 Compact granular base in maximum 150 mm layers to at least 100% of maximum dry density to ASTM D698.

**3.2 CONCRETE**

.1 Obtain Departmental Representative's approval of granular base prior to placing concrete.

.2 Do concrete work in accordance with OPSS 351 and OPSS 353.

.3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.

.4 Provide edging as indicated with 10 mm radius edging tool.

.5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Departmental Representative can be demonstrated. Hand finish surfaces when directed by Departmental Representative.

.6 At no time will water be added to the concrete on site. Concrete which is unworkable or that is too stiff to produce a satisfactory product is to be discarded.

**3.4 BARRIER CURB**

.1 Reinstate damaged concrete barrier curb in accordance with OPSD 600.110.

.2 Construct depressed curb at driveways and sidewalk ramps.

**3.5 SIDEWALK**

.1 Reinstate damaged concrete sidewalk adjacent to curb in accordance with OPSD 310.020.

.2 Reinstate damaged concrete sidewalk ramps at intersections in accordance with OPSD 310.030.

.3 Place steel wire mesh reinforcing at all driveway entrances, sidewalk ramps, and where trees are adjacent to the sidewalk.

**3.6 TOLERANCES**

.1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.

**3.7 EXPANSION AND CONTRACTION JOINTS**

.1 Install tooled transverse contraction as per OPSS 351.

.2 Install expansion joints as per OPSS 351.

.3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

**3.8 CURING**

.1 When the air temperature is less than 27°C, two layers of damp burlap shall be carefully laid on the surface of the concrete. Strips shall overlap by 75mm and shall be held down as required against displacement by wind or otherwise. The burlap shall be maintained and kept thoroughly wet for a minimum of 24 hours. Once the burlap is removed after a 24 hour period, curing will continue with the application of curing compound at a rate of not less than 1 litre per 5 square meter of exposed surface.

.2 When the air temperature at any time during the day will exceed 27°C, two layers of burlap will be required as described above but for a four day period. Curing compound will not be required

**3.9 WEATHER CONSIDERATIONS**

.1 During hot weather, Contractor must cool down the forms and aggregates as outlined in OPSS 904.

.2 During cold weather, Contractor must place and protect concrete in accordance with OPSS 904.

**3.10 BACKFILL**

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with material as directed by Departmental Representative.
.1 Compact and shape to required contours as directed by Departmental Representative.

**3.11 PROTECTION**

.1 Contractor shall ensure supervision until concrete sets. All defaced concrete must be removed and replaced by the Contractor at the Contractor's expense.

**3.12 CLEANING**

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

## PART 1 General

### 1.1 REFERENCES

.1 Agriculture and Agri-Food Canada
.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment
.1 PN1340-2005, Guidelines for Compost Quality.

.3 Canadian Green Building Council (CaGBC)
.1 LEED Canada-NC 2009, LEED (Leadership in Energy and Environmental Design) Canada For New Construction and Major Renovations 2009.

.4 U.S. Environmental Protection Agency (EPA) / Office of Water
.1 EPA 833-R-06-004, May 2007, Developing Your Stormwater Pollution Prevention Plan - A Guide for Construction Sites.

.5 Canadian Nursery Landscape Association (CNLA)
.1 Canadian Standards for Nursery Stock, 8th Edition, 2006.

### 1.2 DEFINITIONS

.1 Compost:
.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminates.

### 1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Quality control submittals:
.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### 1.4 QUALITY ASSURANCE

.1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

## 1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling.

.2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.

.3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

# PART 2 Products

## 2.1 TOPSOIL

.1 Topsoil for seeded areas: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
- .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
- .2 Contain no toxic elements or growth inhibiting materials.
- .3 Finished surface free from:
  - .1 Debris and stones over 50 mm diameter.
  - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
- .4 Consistence: friable when moist.

## 2.2 SOIL AMENDMENTS

.1 Fertilizer:
- .1 Fertility: major soil nutrients present in following amounts:
- .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
- .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
- .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
- .5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
- .6 Ph value: 6.5 to 8.0.

.2 Peatmoss:
- .1 Derived from partially decomposed species of Sphagnum Mosses.
- .2 Elastic and homogeneous, brown in colour.
- .3 Free of wood and deleterious material which could prohibit growth.
- .4 Shredded particle minimum size: 5 mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.5 Limestone:
.1 Ground agricultural limestone.
.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.6 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

**2.3 SOURCE QUALITY CONTROL**

.1 Advise Departmental Representative of sources of topsoil and manufactured topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

**PART 3 Execution**

**3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**3.2 STRIPPING OF TOPSOIL**

.1 Begin topsoil stripping of areas as indicated or as directed by Departmental Representative after area has been cleared of brush, weeds, and, grasses and removed from site.

.2 Strip topsoil to depths as indicated or as directed by Departmental Representative.
.1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.3 Stockpile in locations as directed by Departmental Representative.
.1 Stockpile height not to exceed 2 m.

.4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.
.5 Protect stockpiles from contamination and compaction.

## 3.3 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.
  .1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
  .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
  .2 Remove debris which protrudes more than 75 mm above surface.
  .3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
  .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

## 3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

.1 Place topsoil after Departmental Representative has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 Spread topsoil to following minimum depths after settlement.
  .1 150 mm for seeded areas.

.4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

## 3.5 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.
  .1 Prepare loose friable bed by means of cultivation and subsequent raking.
.2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.
  .1 Leave surfaces smooth, uniform and firm against deep footprinting.

## 3.7 ACCEPTANCE

.1 Departmental Representative will inspect topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

## 3.8 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site.

## 3.9 CLEANING

.1 Proceed in accordance with Section 01 74 11.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

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# PART 1 General

## 1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

.2 Scheduling:
.1 Schedule hydraulic seeding to coincide with preparation of soil surface.
.2 Schedule hydraulic seeding using grass mixtures between dates recommended by Provincial Agricultural Department.

## 1.2 REFERENCES

.1 Canada Green Building Council (CaGBC)
.1 LEED Canada For New Construction and Major Renovations 2009.
.2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.

## 1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.
.2 Submit 2 copies of WHMIS MSDS.

.3 Submit in writing 7 days prior to commencing work:
.1 Volume capacity of hydraulic seeder in litres.
.2 Amount of material to be used per tank based on volume.
.3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

.4 Samples:
.1 Submit 0.5 kg container of each type of fertilizer used.

.5 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.6 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

## 1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements:
.1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.
.2 Inoculant containers to be tagged with expiry date.

.3 Storage and Handling Requirements:
.1 Store fertilizer in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Replace defective or damaged materials with new.

**1.5 WARRANTY**

.1 For seeding, 12 months warranty period is extended to 1 full growing season.

.2 End-of-warranty inspection will be conducted by Departmental Representative.

**PART 2 Products**

**2.1 MATERIALS**

.1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
.1 Grass mixture: "Certified", "Canada No. 1 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".

.1 Mixture composition:
.1 55% Creeping Red Fescue
.2 27% Canada Blue Grass
.3 15% Perennial Rye Grass
.4 3% White Clover

.2 Mulch: specially manufactured for use in hydraulic seeding equipment, as per OPSS 572.

.3 Water: free of impurities that would inhibit germination and growth.

.4 Fertilizer:
.1 To Canada "Fertilizers Act" and Regulations.
.2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.

.5 Inoculants: inoculant containers to be tagged with expiry date.

**PART 3 Execution**

**3.1 EXAMINATION**

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with

manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

## 3.2 PROTECTION OF EXISTING CONDITIONS

.1 Protect structures, signs, guide rails, fences, plant material, utilities and other surfaces not intended for spray.

.2 Immediately remove any material sprayed where not intended as directed by Departmental Representative.

## 3.3 PREPARATION OF SURFACES

.1 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

.2 Fine grade areas to be seeded free of humps and hollows.
.1 Ensure areas are free of deleterious and refuse materials.

.3 Cultivated areas identified as requiring cultivation to depth of 25 mm.

.4 Ensure areas to be seeded are moist to depth of 150 mm before seeding.

.5 Obtain Departmental Representative's approval of grade and topsoil depth before starting to seed.

## 3.4 PREPARATION OF SLURRY

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Departmental Representative. Supply equipment required for this work.

.2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.

.3 After materials are in seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

## 3.5 SLURRY APPLICATION

.1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

.2 Hydraulic seeding equipment:

.1 Slurry tank.
.2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
.3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.
.4 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".

.3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
.1 Using correct nozzle for application.
.2 Using hoses for surfaces difficult to reach and to control application.

.4 Blend application 1,000 mm into adjacent grass areas or previous applications to form uniform surfaces.

.6 Re-apply where application is not uniform.

.7 Remove slurry from items and areas not designated to be sprayed.

## 3.6 CLEANING

.1 Progress Cleaning:
.1 Leave Work area clean at end of each day.
.2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
.1 Clean and reinstate areas affected by Work.

.3 Waste Management: separate waste materials for reuse and recycling.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
.2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.

## 3.7 PROTECTION

.1 Protect seeded areas from trespass until plants are established.

.2 Remove protection devices as directed by Departmental Representative.

## 3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Ensure maintenance is curried out under supervision of certified Landscape Maintenance Supervisor.

.2 Perform following operations from time of seed application until acceptance by Departmental Representative.

.3 Grass Mixture:

.1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

.2 Mow grass to 50 mm whenever it reaches height of 70 mm. Remove clippings which will smother grass.

.3 Fertilize seeded areas after first cutting in accordance with a fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles.

.4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.

.5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

## 3.9 ACCEPTANCE

.1 Seeded areas will be accepted by Departmental Representative provided that:

.1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.

.2 Areas have been mown at least twice.

.3 Areas have been fertilized.

.2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

## 3.10 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:

.1 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.

.2 Mow areas seeded, remove clippings that will smother grassed areas, as directed by Departmental Representative.:

.3 Fertilize seeded areas in accordance with a fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right.

**END OF SECTION**

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