

**Part 1 General**

**1.1 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C117-95, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C131-96, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .5 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .6 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .7 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .3 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Metric.
- .4 City of Winnipeg (CW)
  - .1 City of Winnipeg Standard Construction Specifications.

**1.2 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver and stockpile aggregates in locations that are accessible to construction, but will not damage existing structures or landscape designated to remain. Stockpile minimum 50% of total aggregate required prior to beginning operations.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate metal, plastic, wood and corrugated cardboard packing and place in designated areas for disposal or recycling in accordance with Section 01 74 00 – Cleaning and Waste Management.

**Part 2 Products**

**2.1 GRANULAR BASE MATERIAL**

- .1 Class 'A' and Class 'B' aggregate in accordance with The City of Winnipeg Standard Construction Specifications CW 3110.

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**Part 3 Execution**

**3.1 PLACING**

- .1 Place granular base after subgrade is inspected and approved by the Contract Administrator.
- .2 Construct granular base to depth and grade in areas indicated on drawings.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean, unfrozen surface, free from snow and ice.
- .5 Place granular base materials using methods which do not lead to segregation or degradation.
- .6 For spreading and shaping material, use spreader boxes having adjustable templates or screens which will place material in uniform layers of required thickness.
- .7 Place material to full width in uniform layers not exceeding 150mm compacted thickness.
- .8 Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.
- .9 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .10 Remove and replace that portion of layer in which material becomes segregated during spreading.

**3.2 COMPACTION**

- .1 Compact to density of not less than 98% corrected maximum dry density.
- .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 by Contract Administrator.
- .5 Compaction along building edges, curb faces, and around utilities to be completed with vibratory rammer (jumping jack).
- .6 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 10 mm of elevation as indicated, but not uniformly high or low.

**3.4 CLEANING**

- .1 Perform cleaning after aggregate base course installation to remove construction and accumulated environmental dirt. Remove surplus materials, excess materials, rubbish, tools and equipment.

**3.5 ACCEPTANCE**

- .1 Obtain final approval of aggregate base courses via site inspection with the Contract Administrator.

**3.6 PROTECTION**

- .1 Maintain finished base in condition conforming to this section until succeeding base is constructed, or until granular base is accepted by the Contract Administrator.

**END OF SECTION**

**Part 1            General**

**1.1                QUALITY ASSURANCE**

- .1      Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2      Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3      Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

**1.2                SOURCE QUALITY CONTROL**

- .1      Advise Contract Administrator of sources of topsoil to be utilized 7 days in advance of stating time.
- .2      Contractor is responsible for soil analysis and requirements for amendments to supply topsoil as specified.
- .3      Soil testing by recognized testing facility for PH, P and K, and organic matter.

**Part 2            Products**

**2.1                TOPSOIL**

- .1      All topsoil required shall consist of a screened clay-textured or loam-textured dark topsoil, a fertile, friable material neither of heavy clay nor of very light sandy nature containing by volume, a minimum of four (4%) percent for clay loams and two (2%) percent for sandy loams to a maximum twenty-five (25%) percent organic matter (peat, rotted manure or composted material) and capable of sustaining vigorous plant growth.
- .2      Topsoil shall be free of subsoil contamination, roots, stones over 25mm in diameter, baler twine or subsoil clay lumps over 25mm in diameter and other extraneous matter.
- .3      Topsoil shall not contain quackgrass rhizomes, Canada thistle roots or other noxious weeds.
- .4      Upon delivery or thirty (30) days following delivery, salinity rating shall be less than 4.0mm hos/cm on a saturated paste basis. The pH range shall be between 6.0 - 8.0.
- .5      Topsoil may be either on-site topsoil or imported topsoil.
- .6      On-site topsoil which has been stockpiled, can be reused providing that it is shredded or screened prior to being re-spread and that it meets the requirements specified above for topsoil.
- .7      Topsoil shall not be blow-in dirt taken from wind erosion sites and topsoil shall not be taken from fields abandoned to corn production where such soil may contain soil incorporated herbicides, such as eradican and atrazine with lasting residual effects.

- .8 The Contractor shall inform the Contract Administrator of proposed source of topsoil to be supplied. The Contract Administrator reserves the right to reject topsoil not conforming to the requirements of this Specification.

## **2.2 FERTILIZER**

- .1 Chemical fertilizer with an N-P-K analysis of 1-2-1 ratio at a rate to provide 48 kg actual Nitrogen, 96 kg actual Phosphate and 48 kg actual Potassium per hectare.
- .2 Fertilizer shall be standard commercial brands meeting the requirements of the Canada Fertilizer Act and the Canadian Fertilizer Quality Assurance Program.
- .3 All fertilizers shall be granular, pelletized or pill form, and shall be dry and free flowing.

## **Part 3 Execution**

### **3.1 SITE SAFETY AND TRAFFIC CONTROL**

- .1 Where work is to be done in boulevard and median areas adjacent to roadways, the Contractor shall maintain traffic and ensure that protection is afforded to the road user and that the Contractor's operations in no way interfere with the safe operation of traffic.
- .2 The Contractor shall supply, erect and maintain all applicable traffic control devices in accordance with the provisions of the latest edition of the Manual of Temporary Traffic Control in Work Areas on City Streets issued by the Public Works Department of the City of Winnipeg.

### **3.2 PREPARATION OF EXISTING GRADE**

- .1 Subsoil shall be graded in accordance with Specification CW 3110 to eliminate uneven areas and low spots, ensuring positive drainage. Any soil contaminated by toxic materials shall be removed and disposed off site.
- .2 All surface debris, roots, vegetation, branches and stones in excess of 25mm shall be removed.
- .3 Grades on the area to receive topsoil that have been previously established in conformance with the
- .4 Construction Drawings and/or other applicable specifications shall be maintained in a true and even grade.
- .5 Prior to placing topsoil, all sub-grade areas within athletic fields and all athletic field "run out" areas as Identified on the construction drawings shall be scarified to a minimum depth of 75mm.
- .6 Topsoil shall be manually spread around trees, shrubs and other obstacles.
- .7 The Contractor shall ensure that topsoil does not come in contact with new asphaltic concrete pavement that is less than 2 weeks old.

### **3.3 APPLICATION OF FERTILIZER**

- .1 The Contractor shall provide the Contract Administrator with a report for each work site indicating the fertilizer formulation used, the rate of application and the date of application.
- .2 Fertilizer shall be spread uniformly over the entire area of topsoil at a rate to provide 48 kg actual Nitrogen, 96 kg actual Phosphate and 48 kg actual Potassium per hectare.

**3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL**

- .1 Place topsoil after Contract Administrator has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.
- .3 For sodded areas keep topsoil 50/100 mm below finished grade.
- .4 Spread topsoil as indicated to following minimum depths after settlement and 80% compaction:
  - .1 150 mm for seeded areas.
  - .2 135 mm for sodded areas.
  - .3 300 mm for flower beds.
  - .4 500 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

**3.5 FINISH GRADING AND ROLLING**

- .1 The area shall be fine graded and the topsoil loosened. Eliminate rough spots and low areas to ensure positive drainage. Prepare a loose friable bed by means of cultivation and subsequent raking.
- .2 Topsoil shall be rolled with a mechanical roller of a minimum weight of 220kg, minimum width of 760mm roller, to consolidate it in areas to be seeded or sodded, leaving the surface smooth, uniform and firm against deep foot printing and to the satisfaction of the Contract Administrator.

**3.6 ACCEPTANCE**

- .1 Contract Administrator will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading. Approval of topsoil material subject to soil testing and analysis.
- .2 Testing of topsoil will be carried out by testing laboratory designated by Contract Administrator. Soil sampling, testing and analysis to be in accordance with Provincial regulations and standards. Contract Administrator will pay for cost of tests as specified in Section 01 45 00 – Quality Control.

**3.7 RESTORATION OF STOCKPILE SITES**

- .1 Restore stockpile sites acceptable to Contract Administrator.

**3.8 SURPLUS MATERIAL**

- .1 Dispose of materials not required where directed by Contract Administrator.

**3.9 CLEANING**

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

**END OF SECTION**

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## Part 1 General

### 1.1 RELATED SECTIONS

- .1 Section 31 23 13 – Rough Grading
- .2 Section 32 91 19 – Topsoil and Finish Grading

### 1.2 SCHEDULE OF WORK

- .1 Coordinate the removal of weeds by herbicide application, cultivation of soil prior to commencing seeding operations.
- .2 Schedule seeding for best results prior to June 1st or between August 25th and September 15th.
- .3 Cultivate area to be seeded a minimum of 5 days and a maximum of 15 days after herbicide application has been completed.
- .4 Seed after recommended number of days following the herbicide application (usually 15-30).
- .5 Schedule work to be completed in one area before proceeding to next area.

### 1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data for:
  - .1 Seed

## Part 2 Products

### 2.1 GRASS SEED

- .1 All seed is to be Certified Canada No. 1 in accordance with Government of Canada “Seeds Act” and “Seeds Regulations”, having minimum purity of 97%, free of disease, weed seeds, or other foreign materials, and meeting the standard mix blend listed below. Seeding ratio rate of 1 kg/100 sq.m., as per the City of Winnipeg Standard Specification, CW 3520.
  - .1 Seed Type 1 – all seeded areas
    - .1 85% Kentucky Bluegrass (100% Class 1 cultivars, 3 named cultivars in equal proportion) / *Poa pratensis*
    - .2 15% Perennial Rye Grass / *Lolium perenne*

**Note: Substitutions for above must be approved by the Contract Administrator.**

- .2 In packages individually labeled in accordance with “Seeds Regulations” and indicating name of supplier and date bagged.
- .3 Product data for seed:
  - .1 Seed Analysis
    - .1 % of pure seed by weight.
    - .2 % of germination or % of pure living seed.
    - .3 Year of seed production.
  - .2 Seed Tags Stating
    - .1 Date when tagged.
    - .2 Location.
    - .3 Weight.
    - .4 Name and address of distributor.
    - .5 % of seed variety by weight in seed mixture.

## **2.2 WATER**

- .1 Free of impurities that would inhibit germination and growth.

## **2.3 HERBICIDES**

- .1 Herbicides shall be standard commercial products registered for sale and use in Canada under the Pest Control Products Act.

## **2.4 FERTILIZER**

- .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
- .2 Synthetic or organic slow release starter fertilizer with N-P-K analysis of ration 24-25-4, applied in an amount as recommended by written manufacturer's instructions.

## **2.5 EQUIPMENT**

- .1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

## **Part 3 Execution**

### **3.1 QUALITY OF WORK**

- .1 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil covered with snow, ice, or standing water.
- .2 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site as directed by the Contract Administrator.

### **3.2 FERTILIZING PROGRAM**

- .1 Fertilize areas to be seeded two (2) weeks or less, prior to seeding operations with starter fertilizer.

### **3.3 SEED BED PREPARATION**

- .1 Verify that grades are correct. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by the Contract Administrator.
- .2 Fine grade surface free of humps and hollows to smooth, even grade, to elevations indicated to tolerance of plus or minus 15 mm, with finished surface draining naturally.
- .3 Cultivate and roll seeding bed prior to seeding.

### **3.4 SEED PLACEMENT**

- .1 The Contractor shall not commence seeding operations until the finished topsoil surface is reviewed and approved by the Contract Administrator.



- .2 The Contract Administrator shall be notified minimum thirty-six (36) hours prior to commencing seeding, and will provide periodic monitoring of seeding operations. The Contractor is not to proceed with any Work under this section without the Contract Administrator's representative present on site.
  - .1 Sow all seed types using a "Brillion" type mechanical landscape seeder which accurately places seed at specified depth and rate and rolls in a single operation.
- .3 Blend applications into existing adjacent grass areas to form uniform surfaces.
- .4 Sow half of required amount of seed in one direction and remainder at right angles as applicable.
- .5 Incorporate seed by light raking in cross directions.
- .6 Immediately after seeding, consolidate seeded areas by rolling area to form a uniform even surface, level with adjoining curbs, sidewalks or sod, using equipment approved by the Contract Administrator.
- .7 Seeding operations shall be completed within a 3-day (72 hour) period after the commencement of seeding operation.
- .8 Provide temporary fencing, to protect seeded areas against damage. Remove this protection as directed by the Contract Administrator once seed has germinated and established.

### **3.5 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following operations from time of installation until seeded area is ready for acceptance by the Contract Administrator.
  - .1 Water seeded area in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
  - .2 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
  - .3 Cut grass to 60 mm whenever it reaches height of 75 mm. Do not remove clippings.

### **3.6 FINAL ACCEPTANCE**

- .1 Acceptance of seeded areas is performance, not time-based. Areas will be amended or re-seeded until they meet the minimum standards in clause 3.6.2.
- .2 Seeded areas will be accepted by Contract Administrator upon completion of the maintenance during establishment period, subject to the following requirements:
  - .1 Areas are uniformly established and turf is free of rutted, eroded, bare or dead spots and free of weeds.
  - .2 Areas have grown to full height and are filling in.
  - .3 Areas have been fertilized.

### **3.7 SITE CLEAN-UP**

- .1 All sidewalks, streets, approaches and driveways in the vicinity of the seeding operations shall be kept clean at all times by the Contractor.
- .2 All excess material and debris shall be removed from the site immediately upon completion of the job.

**END OF SECTION**