

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
3. Section 31 05 16 - Aggregate Materials.

### **1.2 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 D422 63(1998), Standard Test Method for Particle Size Analysis of Soils.
  5. ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft lbf/ft<sup>3</sup>) (600 kN m/m<sup>3</sup>).
  6. ASTM D1557 00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft lbf/ft<sup>3</sup>) (2,700 kN m/m<sup>3</sup>).
  7. ASTM D1883 99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  8. 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-8.188, Sieves, Testing, Woven Wire, Inch Series.
  2. CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

### **1.3 WASTE MANAGEMENT AND DISPOSAL**

1. Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  2. Transport the excess aggregate materials that can be reused to a local, authorized site. Obtain necessary permits and authorizations necessary beforehand, and notify the Departmental Representative.
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## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

1. Granular sub-base material: MG 112 and in accordance with requirements of Section 31 05 16 - Aggregate Materials. Thickness of materials placed will be in accordance with the value indicated on the drawings.
2. Granular base material: MG 20 and in accordance with the requirements of Section 31 05 16 - Aggregate Materials. Thickness of materials placed will be in accordance with the value indicated on the drawings.
3. The materials of the granular coating layer (stone dust) must be 2.5 - 5.0 mm and comply with the requirements of Section 31 05 16 - Aggregate Materials. The thickness of the materials will be in accordance with the value indicated on the drawings.

## **PART 3 - EXECUTION**

### **3.1 FINAL PROFILE AND VERIFICATIONS**

1. The profile and geometry indicated on the plans are indicated for information purposes only. The profile and the final geometry will be determined on site, after implementation, in collaboration with the Contractor and the Departmental Representative, taking drainage and existing facilities into account.
  2. The implementation of alignments and levels must be subjected to the following procedure:
    1. Install alignments stakes, levels and benchmarks for sidewalks or curbs every 10 meters maximum, at the low and high points of the vertical layout, where trajectory changes and at the manholes that must remain in place, based on the profiles indicated on the plans.
    2. Conduct a joint audit with the Departmental Representative to optimize the profile of the finished ground, so as to adapt to existing conditions, taking into account the existing buildings, the proper drainage of accesses and parking lots and the existing manholes that must remain in place.
    3. With the Departmental Representative, create a new list of elevations, if applicable.
    4. Change or correct the alignments, levels and bench marks, if applicable, taking the new list of elevations into account.
  3. When verifying the proposed levels of each sub-base layer and infrastructure, the supervisor will follow the following procedure:
    1. Access roads measured based on chainage: Implement levels and bench marks at the center line and at the two (2) ends of the road, every ten (10) meters maximum (just chaining; 0+010, 0+020, etc.), at the low and high points of the vertical layout, where trajectory changes and at the manholes that must remain in place, based on the profiles indicated on the plans.
    2. Linear elements without chainage: implement levels and bench marks at every 10 meters of sidewalk or curb maximum, at the low and high points of the vertical layout, where trajectory changes, where elevation is indicated on the plans, at the existing or projected manholes, based on the profiles and superelevations indicated on the plans. At the request of the supervisor, gird large road surfaces every 10 meters.
    3. Allow a reasonable amount of time for Departmental Representative to carry out audits prior to the placement of the next layer of material.
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**3.2 PLACEMENT**

1. Place granular sub-base after the inspection and approval of the subgrade by the Departmental Representative.
2. Construct the granular sub-base, the granular base and granular pavement lining where indicated and in accordance with specified depths and grades.
3. Ensure that no frozen material is placed.
4. Place material only on clean unfrozen surface, free from snow or ice.
5. Place the granular sub-base, granular base and granular pavement lining using methods which do not lead to segregation or degradation.
6. Place material in even layers to the full width of the work.
7. Shape each layer of material to create an even profile and then compact to the specified density before the next layer is placed.
8. Remove and replace any portion of layer where material has become segregated during placement.

**3.3 COMPACTION**

1. The compaction equipment must be able to achieve the required material densities.
  2. The efficiency of compaction equipment other than that which is listed in these specifications must prove to be at least as efficient as the equipment specified and at no extra cost. In addition, written approval from the Departmental Representative must be received before the equipment is used.
  3. Compaction equipment will be equipped with a meter that will record the hours of actual compaction work, not the amount of time that the motor has been running.
  4. Compact MG 112 granular sub-base to the minimum threshold of 95% of the reference density, as determined by modified Proctor testing in accordance with the CAN/BNQ 2501-255 standard.
  5. Compact MG 20 granular base to the minimum threshold of 98% of the reference density, as determined by modified Proctor testing in accordance with the CAN/BNQ 2501-255 standard.
  6. Shape and roll alternately to obtain smooth, even and uniformly compacted granular base.
  7. Apply water as necessary during compaction to obtain specified density.
  8. In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
  9. Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.
  10. Unless otherwise specified, the Contractor will use static compaction methods at all times. He will also obtain the approval of the Departmental Representative prior to using dynamic compaction methods.
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**3.4 SITE TOLERANCES**

1. The finished granular base surface is to be within 10 mm of the specified elevation. However, this 10 mm will not be consistent over the entire surface of the granular base.

**3.5 PROTECTION**

1. Maintain the finished granular base in a condition that complies with the provisions of this section until the next layer is constructed or until the granular base is accepted by the Departmental Representative.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 31 05 16 – Aggregate Materials.

### **1.2 REFERENCES**

1. Canadian General Standards Board (CGSB)
  1. CAN/CGSB-15.1-92, Calcium Chloride.
2. 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.
3. Ministère des Transports du Québec – Cahier des charges et Devis généraux (CCDG) – Latest edition

### **1.3 SUBMITTALS**

1. Submit submittals and data sheets in accordance with Section 01 33 00 – Submittal Procedures.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

1. Water: Subject to the Departmental Representative's approval.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

1. Temporary erosion and sedimentation control:
    1. Implement temporary erosion and sedimentation control measures to prevent soil erosion and the accumulation of sediments from runoff or airborne dust on adjacent properties and walkways, this in accordance with the requirements of the authorities having jurisdiction.
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**3.2 APPLICATION**

1. Apply water using approved equipment when directed by the Departmental Representative.
2. Apply water with a sprayer system equipped with a shut-off device in order to ensure an even uniform application.

**3.3 CLEAN UP**

1. Cleaning during construction: clean in accordance with Section 01 74 11 - Cleaning.
  1. Clean the work area at end of each day.
2. Final cleaning: upon completion of the work, remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 31 05 16 - Aggregate materials.
3. Section 32 11 16.01 - Granular sub-base.

### **1.2 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 05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  3. ASTM D260-86(2001), Standard Specification for Boiled Linseed Oil.
  4. ASTM D698 00ae1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft lbf/ft<sup>3</sup>) (600 kN m/m<sup>3</sup>).
2. Canadian General Standards Board (CGSB).
  1. CAN/CGSB 3.3 F99 (March 2004), Kerosene, Amend. No. 1, National Standard of Canada.
3. Canadian Standards Association, (CSA International).
  1. CSA A23.1 F04/A23.2 F04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
4. Bureau de Normalisation du Québec (BNQ).
  1. NQ 2520-110 – “Bordure et musoir de granite”.
  2. NQ 1809-500 – “Travaux de construction – Trottoirs et bordures de béton”.

### **1.3 SUBMITTALS**

1. Submittals in accordance with Section 01 33 00 - Submittal Procedures.
  2. Inform the Departmental Representative of the proposed source of materials and provide access for sampling at least four weeks prior to commencing work.
  3. If materials have been tested by an accredited testing laboratory approved by the Departmental Representative within the previous two months and have passed tests satisfying the requirements of this specification, submit the test certificates from the testing laboratory showing the suitability of materials for this project.
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## **1.4 DELIVERY, STORAGE AND HANDLING**

1. Waste management and disposal
  1. Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction / Demolition Waste Management and Disposal.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

1. Concrete mixes and materials: In accordance with Section 03 30 00 - Cast-in-Place Concrete.
2. Reinforcing steel: In accordance with Section 03 20 00 - Concrete Reinforcing.
3. Granular base: Material to Section 31 05 16 - Aggregate Materials and following requirements:
  1. Type: MG 20.
4. Non-staining mineral-type form release agent: Chemically active release agents containing compounds that react with free lime to provide water-soluble soap.
5. Boiled linseed oil: In accordance with ASTM D260.
6. Kerosene: In accordance with CAN/CGSB-3.3.

## **PART 3 - EXECUTION**

### **3.1 GRADE PREPARATION**

1. Prepare grade in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### **3.2 GRANULAR BASE**

1. Before placing and grading the granular base, have the Departmental Representative approve the subgrade.
2. Grade the granular base taking the indicated paths, widths and depths into account.
3. Compact the granular base in 50 mm thick layers maximum and compact at least 95% of the maximum dry density as determined in the modified Proctor, in compliance with the NQ 2501-255 standard.

### **3.3 CONCRETE SIDEWALKS**

1. Concrete sidewalk
    1. Surface finish:
      - a. Concrete surface: the concrete surface will be consolidated using a vibrating screed. The imperfections will be corrected with a wooden trowel and the surface will be textured by
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- dragging a damp piece of burlap. The fabric must make contact with the surface over a minimum length of 1200 mm.
- b. Edges: along the forms, the edges will be rounded to a 6 mm radius using a suitable instrument, without leaving surface marks. Rub off the sharp edges of exposed concrete with a carborundum stone to obtain edges rounded to a 3 mm radius, unless otherwise indicated in the drawings.
  - c. Joints: Joints will not be finished with a trowel.
2. Construction joints:
- a. The location of the construction joints separating each concrete pour must correspond to that which is indicated on the plans and be approved by the Departmental Representative. The latter may require that the joints be closer together or arranged differently.
  - b. No construction joints (saw kerf) already indicated in the plan, should not be moved or deleted without prior authorization from the Departmental Representative.
  - c. Immediately prior to resuming concreting against or above a construction joint, clean and scarify the surface of the hardened concrete in order to remove any free fragment and laitance, moisten the surface and let dry in order to obtain saturated concrete with a dry surface.
3. Control joints in concrete surfaces:
- a. Make transverse control joints at regular intervals or as indicated on the plans. These joints consist of kerfs at a depth of one third of the concrete's thickness or 35 mm deep and 6 mm wide. The kerfs will be made as soon as the concrete is strong enough or with a saw designed for concrete joints before the concrete begins to harden.
  - b. The kerfs must be made between 8 and 24 hours after concrete placement.
  - c. Control joints will be filled with a self-leveling sealant. The sealant color is to be selected by the Departmental Representative 28 days after the kerfs are made.
4. Expansion joints:
- a. Make transverse expansion joints at regular intervals of 6 000 mm c/c or as indicated on the landscaping plans.
  - b. Required expansion joints:
    - 1) Where work was stopped, between two concrete placements and at any interval not exceeding 6000 mm or as indicated in the architecture plan.
    - 2) Place smooth dowels, greased and sleeved, 15M at 600 mm to 300 mm c/c (see plans) to prevent adherence.
    - 3) Install a 12 mm thick flexible board, such as Rodofoam, stopping 15 mm from all exposed surfaces and covering the entire remaining section of concrete. Fill the remaining joint with a suitable self-leveling sealant. The sealant color will be selected by the Departmental Representative.
5. Isolation joints
- a. At intersecting points and along any rigid structure or element protected from frost, such as poles, walls, etc., or where indicated by the Departmental Representative.
  - b. Where isolation joints are required:
    - 1) Install a 12 mm thick flexible board, such as Rodofoam, stopping 15 mm from all exposed surfaces and covering the entire remaining section of concrete.
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- 2) Fill the remaining joint with a suitable self-leveling sealant. The sealant color will be selected by the Departmental Representative.

### **3.4 TOLERANCES**

1. Finish surfaces to within 3 mm over a distance of 3 m, as measured with a 3-meter straight edge placed on the surface.

### **3.5 BACKFILLING**

1. Backfill with material indicated by the Departmental Representative up to the indicated elevations.
  1. Compact and shape as instructed by the Departmental Representative.

### **3.6 CLEAN UP**

1. Clean in accordance with Section 01 74 11 - Cleaning.
2. Upon completion of the work and performance verifications, remove surplus materials, waste, tools and equipment.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 33 00 - Submittal Procedures
3. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
4. Section 32 92 19.16 – Hydraulic seeding.
5. Section 32 92 23 – Sodding.

### **1.2 REFERENCES**

1. Agriculture et Agroalimentaire
  1. The Canadian System of Soil Classification, Third Edition, 1998.
2. Canadian Council of Ministers of the Environment (CCME)
  1. PN1340 (2005), Guidelines for Compost Quality.
3. Ministère des Transports du Québec - Cahier des charges et devis généraux (CCDG) – Latest edition.
4. U.S. Environmental Protection Agency (EPA)/Office of Water
  1. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### **1.3 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 contaminants.
  4. Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.

### **1.4 SUBMITTALS**

1. Provide submittals in accordance with section 01 33 00 - Submittal Procedures.
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## **1.5 QUALITY ASSURANCE**

1. Pre-placement meeting: A pre-placement meeting is to be held one week prior to the beginning of the work covered by this section for the purpose of reviewing project requirements, placement instructions and the terms of the warranty.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

1. Separate waste materials for reuse in accordance with section 01 74 21 - Construction/Demolition Waste Management and Disposal.
2. Transport unused soil amendments to an official hazardous material collection site approved by the Departmental Representative.
3. Do not dispose of unused soil amendments into sewer systems, lakes or streams, on the ground or in locations where they will pose health or environmental hazards.

## **PART 2 - PRODUCTS**

### **2.1 TOPSOIL**

1. Topsoil for seeded or sodded areas: mixture of particulates, micro-organisms and organic matter that will provide a 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 contains 2 to 10% organic matter by weight.
  2. Contains no toxic elements or growth inhibiting materials.
  3. Finished surface will be free of:
    - a. Debris and stones with a diameter larger than 50 mm.
    - b. Coarse vegetable matter 10 mm in diameter and 100 mm long, occupying more than 2% of soil volume.
  4. Consistency: friable when moist.

### **2.2 SOIL AMENDMENTS**

1. Fertilizer:
    1. Fertility: main soil nutrients will be present in the following amounts:
    2. Nitrogen (N): 20 to 40 micrograms of available nitrogen 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.
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2. Peat moss:
  1. Consisting of partially decomposed varieties of sphagnum moss.
  2. Elastic and homogeneous, brown in colour.
  3. Free of wood and deleterious material which could prohibit growth.
  4. Minimum size of shredded particles: 5 mm.
3. Sand: washed coarse silica sand, medium to coarse texture.
4. Organic matter: Category A compost in accordance with the CCME's PN1340 document, unprocessed organic matter, such as manure muck, hay, straw, bark residues or sawdust, meeting organic matter, stability and contaminant requirements.
5. Category B compost will be used to return dump sites or large scale industrial applications to original conditions.
6. Lime:
  1. Ground agricultural lime.
  2. Grade requirements: 90% percentage passing by weight through 1.0 mm sieve, 50% passing through 0.125 mm sieve.
7. Fertilizer: standard industry-accepted medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable for specific plant species or applications or defined by soil tests.

### **2.3 SOURCE QUALITY CONTROL**

1. Inform the Departmental Representative of the sources of topsoil to be utilized and give sufficient advance notice for testing.
2. The Contractor is responsible for the assessment of soil amendment needs in order to provide topsoil as specified.
3. Soil testing for pH, P, K and organic matter will be performed by an accredited laboratory.
4. Topsoil tests will be carried out by the laboratory selected by the Departmental Representative.

## **PART 3 - EXECUTION**

### **3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

1. Implement temporary erosion and sediment control measures in order to prevent soil erosion caused by runoff or wind, as well as the accumulation of sediments from runoff or airborne dust on adjacent properties and walkways, this in accordance with the requirements of the authorities having jurisdiction ,
  2. Inspect, repair, and maintain erosion and sediment control measures during construction until permanent vegetation is been established.
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3. Remove erosion and sediment controls when appropriate and restore and stabilize the areas disturbed during construction.

### **3.2 STRIPPING OF TOPSOIL**

1. Begin stripping the topsoil in the areas identified by the Departmental Representative after the area has been cleared and the brush, weeds and grasses have been removed from the site.
2. Strip topsoil to indicated depths.
  1. Avoid mixing topsoil with the subsoil if there is a chance that the resulting topsoil texture topsoil will become unacceptable *versus* the established parameters and intended use.
3. Stockpile in locations as directed by the Departmental Representative.
  1. Stockpile height will not to exceed 2 m.
4. Dispose of unused topsoil in an environmentally responsible manner but not in at a landfill site, as directed by the Departmental Representative.
5. Protect stockpiles from contamination and compaction.

### **3.3 PREPARATION OF EXISTING GRADE**

1. Verify that the grade is correct.
  1. Should discrepancies occur, notify the Departmental Representative and do not commence work until instructed by the Departmental Representative.
2. Grade the soil to eliminate uneven areas and depressions in order to ensure adequate drainage.
3. Remove debris, roots, branches, and stones in excess with diameters larger than 50 mm, as well as other deleterious materials.
  1. Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
  2. Remove debris protruding more than 75 mm above the surface.
  3. Dispose of removed material off site.
4. Loosen the soil in the entire area where topsoil is to be placed, to minimum depth of 100 mm.
  1. Loosen the soil again transversally where equipment used for hauling and spreading has compacted the soil.

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

1. Place topsoil only after the Departmental Representative has accepted the subgrade.
  2. Spread the topsoil in even layers not exceeding 150 mm in thickness.
  3. For sodded areas, keep the topsoil 15 mm below the finished grade.
  4. Spread the topsoil as indicated below to obtain the following minimum depths after settlement:
    1. 100 mm for seeded areas.
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2. 100 mm for sodded areas.
3. 300 mm for flower beds.
4. 500 mm for shrub beds.
5. Manually spread the topsoil/planting soil around trees, shrubs and obstacles.

### **3.5 FINISH GRADING**

1. Grade to eliminate rough spots and low areas and to ensure appropriate drainage.
  1. Prepare loose friable bed by means of cultivation and subsequent raking.
2. Consolidate topsoil to required bulk density using equipment approved by the Departmental Representative.
  1. Leave surfaces smooth, even and sufficiently firm to keep foot prints from forming.

### **3.6 ACCEPTANCE**

1. The Departmental Representative will inspect and test the topsoil in place and determine the acceptance of the material, the depth and grade finish.

### **3.7 SURPLUS MATERIAL**

1. Dispose of surplus materials, with the exception of topsoil, off site.

### **3.8 CLEANING**

1. Proceed in accordance with Section 01 74 11 - Cleaning.
2. Upon completion of the work, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 33 00 - Submittal Procedures
3. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
4. Section 32 91 19.13 - Topsoil Placement and Grading.

### **1.2 SUBMITTALS**

1. Datasheets:
  1. Submit product data sheets in accordance with Section 01 33 00 - Submittal Procedures.
  2. Provide product datasheets for:
    - a. Seed and mixture composition
    - b. Mulch.
    - c. Tackifier.
    - d. Fertilizer.
  3. Submit the following in writing to the Departmental Representative seven days prior to commencing work:
    - a. Volume capacity of hydraulic seeder in liters.
    - b. Amount of product to be used per tank based on volume.
    - c. Number of tank loads required per square meter to apply specified slurry mixture rate per square meter.

### **1.3 QUALITY ASSURANCE**

1. Test Reports: submit certified test reports showing product, material and equipment compliance with specified performance characteristics and physical properties.
2. Certificates: submit certificates signed by manufacturer, certifying that products, materials and equipment comply with specified performance characteristics and physical properties.
3. Pre-installation meeting: A pre-installation meeting will be held one week prior to the start of the work covered by this section in order to review project requirements, installation instructions and warranty requirements.

### **1.4 WORK SCHEDULE**

1. Schedule hydraulic seeding to coincide with the preparation of the soil's surface.
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2. Schedule hydraulic seeding using grass mixtures between the dates recommended by the provincial agricultural authority.

## **1.5 WASTE MANAGEMENT AND DISPOSAL**

1. Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
2. Transport unused fertilizer to an official hazardous material collection site approved by the Departmental Representative.
3. Do not dispose of unused fertilizer in sewer systems, lakes and streams, on the ground or in locations where it will pose health or environmental hazards.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

1. Seed: "Canada pedigreed grade" in accordance with the Government of Canada Seeds Act and Regulations.
  2. Hydro seeding: Rate of 2,5 kg per 100 m<sup>2</sup>:
    1. 50 % - Creeping red fescue.
    2. 30 % - Kentucky bluegrass.
    3. 10 % - Colonial Bentgrass.
    4. 10 % - Perennial rye grass.
  3. Mulch HydraCX<sup>2</sup> or equivalent: Adapted for 1:1 slopes and specially manufactured for use in hydraulic seeding equipment, non-toxic, water-activated, green colouring, free of germination-inhibiting and growth-inhibiting factors with following properties:
    1. Composition :
      - a. 65% ( $\pm 3\%$ ) mechanically processed straw.
      - b. 25% ( $\pm 3\%$ ) mechanically processed cotton fibers and by products.
      - c. 10% ( $\pm 3\%$ ) proprietary hydrocolloidal tackifiers and activators
    2. Organic matter content: 95% ( $\pm 0.5\%$ ).
    3. pH: 6.0
    4. Potential water absorption: 900%.
    5. Application rate: 5100 kg/ha.
  4. Tackifier: water soluble, liquid dispersion.
  5. Water: free of impurities that would inhibit germination and growth.
  6. Fertilizer: Slow release, synthetic composition, with a 10-30-10 formula and granular dolomitic lime, 12% Mg as filler.
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7. Inoculants: inoculant containers to be tagged with expiry date.

## **PART 3 - EXECUTION**

### **3.1 WORKMANSHIP**

1. Do not spray onto structures, signs, guide rails, fences, plant material, utilities and elements other than the intended surfaces.
2. Immediately clean-up any material sprayed where not intended, to the satisfaction of the Departmental Representative.
3. 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.
4. Protect seeded areas from trespassers until plants are established.

### **3.2 PREPARATION OF SURFACES**

1. Fine grade the areas to be seeded to eliminate depressions surface asperities. Ensure that the areas are free of deleterious and refuse materials.
2. Loosen the identified surface up to a depth of 25 mm.
3. Ensure that the areas to be seeded are moist to a depth of 150 mm before seeding.
4. Have the Departmental Representative approve the grade and topsoil depth before seeding.

### **3.3 PREPARATION OF THE SEEDING MIXTURE**

1. Measure the quantities of seeds based on weight using a weight-calibrated measuring instrument to the satisfaction of the Departmental Representative. Supply the equipment required for measuring.
2. Load the required amount of water into the hydraulic seeder. Turn on the mixer before adding the seeds. Pulverize the mulch and slowly feed it to the seeder.
3. Once all of the products are loaded into seeder and mixed well, load the tackifier in the seeder and mix thoroughly to create the seeding mixture.
4. Continue to add water slowly while adding the HydraCx<sup>2</sup> product at a steady rate. Mix 50 lbs of product per 100 gallons of water. All of the product should be into the reservoir by the time the latter is approximately three-quarters full of water.
5. Mix for at least 15 minutes after the last of the product was added.

### **3.4 APPLICATION OF THE SEEDING MIXTURE**

1. Use hydraulic seeding equipment that meets the requirements listed below.
    1. Mixing tank.
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2. Mixing system capable of operating during loading and seeding, and of ensuring mechanical mixing and/or recirculation of the seeding mixture.
  3. Equipped with 50 m hand-operated hoses and appropriate nozzles.
  4. Tank capacity certified by competent authorities and identified by a plate issued by said authority.
2. Ensure that areas to be seeded are moist to a depth of 100 mm before seeding.
  3. Spread the seeding mixture consisting of the following components. The quantities listed below are suitable for one hectare.
    1. Seed: grass mixture, 250 kg.
    2. Mulch: Type I, 1400 kg.
    3. Tackifier: According to application rate recommended by manufacturer.
    4. Water: Minimum 30,000 L.
    5. Fertilizer: 75 kg, ratio 1-3-1.
  4. Apply the seeding mixture evenly, at an optimum angle of application to ensure adherence to surfaces and the germination of the seed.
    1. Use the appropriate nozzle for application.
    2. Use hoses for difficult-to-reach surfaces and to control application.
  5. Apply the mixture 300 mm into adjacent grass areas or sodded areas to ensure even coverage.
  6. Re-apply where application is not even.
  7. Remove the seeding mixture from elements and areas not intended for seeding.
  8. Protect the seeded areas from trespassers to the satisfaction of the Departmental Representative.
  9. Remove protection devices as directed by the Departmental Representative.

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

1. Perform the following maintenance tasks from the time of seeding until acceptance is given by the Departmental Representative.
  2. Grass Mixture
    1. Repair and reseed dead or bare spots to allow the establishment of the seeds prior to acceptance.
    2. Mow the grass to a height of 50 mm whenever growth reaches a height of 70 mm. Remove clippings that may smother the grass as directed by the Departmental Representative.
    3. Fertilize the seeded areas after 10 weeks provided that the plants have matured to the true leaf stage, in accordance with the fertilizing program. Spread half of the required amount of fertilizer in one direction and the other half of the fertilizer perpendicularly. Water well to ensure fertilizer penetration.
    4. Control the weeds through mechanical or chemical means utilizing acceptable integrated pest management practices.
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5. Water the seeded areas to maintain an optimum soil moisture level for germination and continued growth. Control the watering rate to avoid washout.

### **3.6 ACCEPTANCE**

1. The seeded areas will be accepted by the Departmental Representative provided that:
  1. Plants are evenly established. Seeded areas will be 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 the fall will receive final acceptance in the following spring, one month after the beginning of the growing season, provided acceptance conditions are fulfilled.

### **3.7 MAINTENANCE DURING WARRANTY PERIOD**

1. Perform the following operations from the time of acceptance until end of the warranty period.
2. Repair and reseed dead or bare spots to the satisfaction of the Departmental Representative.
3. Fertilize the seeded areas in accordance with the established fertilizing program. Spread half of the required amount of fertilizer in one direction and apply the other half perpendicularly. Water the area well.

### **3.8 CLEANING**

1. Upon completion of the work, remove surplus materials, rubbish, tools and safety barriers.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 33 00 - Submittal Procedures
3. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
4. Section 32 91 19.13 - Topsoil Placement and Grading.

### **1.2 SUBMITTALS**

1. Submit samples in accordance with section 01 33 00 - Submittal Procedures.

### **1.3 QUALITY ASSURANCE**

1. Test Reports: submit certified test reports showing that products, materials and equipment comply with specified performance characteristics and physical properties.
2. Certificates: submit certificates signed by the manufacturer attesting that products, materials and equipment comply with specified performance characteristics and physical properties.
3. Pre-installation meeting: A pre-installation meeting will be held one week prior to the start of the work covered by this section in order to review project requirements, installation instructions and warranty requirements.

### **1.4 SCHEDULING**

1. Schedule sod laying to coincide with the preparation of the soil's surface.

### **1.5 WASTE MANAGEMENT AND DISPOSAL**

1. Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  2. Transport unused fertilizer from to an official hazardous material collection site approved by the Departmental Representative.
  3. Do not dispose of unused fertilizer in sewer systems, lakes, and streams, on the ground or in locations where it will pose health or environmental hazards.
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## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

1. The grass used must come from first rate sod and be free of weeds. It must also meet the requirements of the NQ 0605-300 standard.
2. Water: will be free of impurities that could hinder grass growth.
3. Chemical granular slow-release fertilizer with a 10-30-10 formula and including 12% Mg granular dolomitic lime as filler.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

1. Verify that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil Placement and Grading. If deviations occur, notify the Departmental Representative and do not commence work until instructed by the Departmental Representative.
2. Do not perform work under adverse field conditions, such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
3. Fine grade the surface so that it is even, free of depressions and soil asperities, as per the elevations specified.
4. Remove and dispose of weeds, debris, stones with a diameter of 50 mm or larger, and soil contaminated by oil, gasoline and other deleterious materials off site.

### **3.2 SOD PLACEMENT**

1. Lay the sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.
2. Lay the sod sections in rows and stagger the joints. Butt all joints tightly together without overlapping or leaving gaps between the sections. Cut out irregular or narrow sections with sharp instruments.
3. Roll the sod as instructed by the Departmental Representative. Use a light roller to ensure contact between the sod and soil. Using a heavy roller to correct surface irregularities is not permitted.

### **3.3 SOD PLACEMENT ON SLOPES AND PEGGING**

1. Install and secure geotextile fabric in the areas indicated, in accordance with the manufacturer's instructions.
  2. Start laying the sod at the bottom of slopes.
  3. Peg sod on slopes steeper than 3H :1V, within 1 m of catch basins and within 1 m of drainage channels and ditches, as follows:
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1. 100 mm below the top edge, 200 mm on centre for first sod sections along contours of slopes.
2. Not less than 3-6 pegs per square metre.
3. Not less than 6-9 pegs per square metre in drainage structures. Adjust pattern as directed by the Departmental Representative.
4. Drive pegs to 20 mm above soil surface of sod sections.

### **3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD**

1. Perform following operations from time of installation until acceptance.
2. Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
3. Cut grass to 50 mm when or prior to it reaching height of 75 mm. Remove clippings which will smother grassed areas, as directed by the Departmental Representative.
4. Maintain sodded areas 95% weed free.
5. Fertilize areas in accordance with the fertilizing program. Spread half of required amount of fertilizer in one direction and the remainder at right angles. Water in well.

### **3.5 ACCEPTANCE**

1. Turf Grass Nursery Sod areas will be accepted by the Departmental Representative provided that :
  1. Sodded areas are properly established.
  2. Sod is free of bare and dead spots.
  3. No surface soil is visible from a height of 1500 mm when the grass has been cut to a height of 50 mm.
  4. Sodded areas have been cut a minimum of 2 times prior to acceptance.
2. Sodded Commercial Grade Turf Grass Nursery Sod areas will be accepted by the Departmental Representative provided that:
  1. Sodded areas are properly established.
  2. The extent of surface soil visible when the grass has been cut to a height of 60 mm is acceptable.
  3. Sod is free of bare or dead spots and the extent of weeds apparent in grass is acceptable.
  4. Sodded areas have been cut a minimum of 2 times prior to acceptance.
  5. Fertilizing in accordance with fertilizer program has been carried out at least once.
3. Areas sodded in the fall will be accepted in the following spring one month after the beginning of the growing season, provided that acceptance conditions are fulfilled.

### **3.6 MAINTENANCE DURING WARRANTY PERIOD**

1. Perform the following operations from the time of acceptance until the end of the warranty period:
  2. Repair and re-sod dead or bare spots to the satisfaction of the Departmental Representative,
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3. Fertilize the areas in accordance with the fertilizing program. Spread half of required amount of fertilizer in one direction and the remainder at right angles. Water in well.

**3.7 CLEANING**

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

**END OF SECTION**

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