

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 None.

**1.2 REFERENCES**

- .1 Not used.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Not used

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Not used.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Not used.

**Part 3 Execution**

**3.1 REMOVING PAVEMENT MARKINGS**

- .1 Remove rubber tire deposits and paint markings, in areas as directed by the Departmental Representative.
- .2 Exercise care to avoid dislodging of coarse aggregate particles, excessive removal of fines, damage to bituminous binder and damage to joint and crack sealers.

**3.2 PAVEMENT SURFACE CLEANING**

- .1 Perform cleaning using a vehicle fitted with a mechanical broom. Keep dust down to a minimum.

**3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal].
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 31 05 16 – Aggregate Materials.

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D422-63-98, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D698-12c2, 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>).
  - .5 ASTM D1557-12c1, Standard Test Methods 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>).
  - .6 ASTM D4318-10c1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Data sheets
  - .1 Submit the manufacturer's data sheets and documentation on aggregates. Data sheets must indicate the characteristics of products and grain diameters.
- .3 Samples
  - .1 Take the necessary measurements for the purpose of continuous sampling of aggregate materials by the Departmental Representative, during their production and installation.
  - .2 Allow the Departmental Representative access to the source of supply and the prepared materials for sampling purposes.
  - .3 Pay the costs of sampling and testing of the aggregates if they fail to meet stated requirements.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in such a way as to prevent segregation, contamination and degradation.
- .2 Deliver, store and handle materials in accordance with section 01 61 00 - Common Product Requirements.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Granular sub-base material: in compliance with drawings and meet the requirements of Section 31 05 16 - Aggregate Materials.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable and allow performance of work for granular sub-base installation 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 PLACING**

- .1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative.
- .2 Construct granular sub-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 or ice.
- .5 Begin spreading sub-base material on crown line or high side of one-way slope.
- .6 Place granular sub-base materials using methods which do not lead to segregation or degradation.
- .7 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
- .8 Place material to full width in uniform layers not exceeding 300 mm compacted thickness.
- .9 Shape each layer to smooth contour and compact to specify density before succeeding layer is placed.
- .10 Remove and replace portion of layer in which material has become segregated during spreading.

**3.3 COMPACTION**

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Equipped with device that records hours of actual work, not motor running hours.
- .3 Compact to density of not less than 95 %, maximum, dry density in accordance with standard ASTM D1557.
- .4 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

- .5 Apply water as necessary during compaction to obtain specified density.
- .6 In areas not accessible to rolling equipment, compact materials to the stipulated density using mechanical tampers approved by the Departmental Representative.
- .7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.5 SITE TOLERANCES**

- .1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low. However, this variance cannot be uniform over the entire sub-base layer.

### **3.6 PROTECTION**

- .1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

**END OF SECTION**



**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 None.

**1.2 REFERENCES**

- .1 *Ministère des Transports du Québec*
  - .1 *Cahier des charges et devis généraux. Infrastructures routières, Construction et réparation (CCDG) - 2016* (terms of reference and general project specifications. road infrastructure, construction and repair - 2016).
  - .2 Standard 4105 – Asphalt Emulsion.
  - .3 Standard 4104 – Road oil.
- .2 ASTM International
  - .1 ASTM D140/D140M-15, Standard Practice for Sampling Bituminous Materials.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt tack coat and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Samples:
  - .1 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work to ASTM D140.

**1.4 QUALITY ASSURANCE**

- .1 Upon request from Departmental Representative, submit manufacturer's test data and certification that asphalt prime material meets requirements of this Section.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
  - .1 Store materials and equipment in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect asphalt tack coats from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .3 Deliver, store and handle materials in accordance with ASTM D140.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Asphalt emulsion: meeting MTQ Standard 4105.
- .2 Cutback asphalt: meeting MTQ Standard 4104.
- .3 Water: clean, potable, free from foreign matter.

### **2.2 EQUIPMENT**

- .1 Equipment required for Work of this Section to be in satisfactory working condition and maintained for duration of Work.
- .2 Pressure distributor:
  - .1 Designed, equipped, maintained and operated so that asphalt material can be:
    - .1 Maintained at even temperature.
    - .2 Applied uniformly on variable widths of surface up to 5 m.
    - .3 Applied under uniform pressure at a pre-set rate adjusted to between 0.2 l/m<sup>2</sup> and 0.3 l/m<sup>2</sup>; allowable deviation under no circumstances to exceed 10%.
    - .4 Distribute in uniform spray without atomization at temperature required.
    - .5 The material shall be in accordance with article 13.2.3 of the CCDG.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt tack coat installation 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 APPLICATION**

- .1 Apply asphalt tack coat only on clean and dry surface.
- .2 Apply the asphalt tack coat uniformly to the surface to be paved as per the rate shown at the article 13.2.4 from the CCDG.
- .3 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .4 Apply asphalt tack coat only when air temperature greater than 10 degrees C and when rain is not forecast within 2 hours minimum of application.
- .5 Apply asphalt tack coat only on unfrozen surface.



- .6 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.
- .7 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .8 Keep traffic off tacked areas until asphalt tack coat has set.
- .9 Re-tack contaminated or disturbed areas.
- .10 Permit asphalt tack coat to set before placing asphalt pavement.
- .11 Inspect tack coat application to ensure uniformity.
  - .1 Re-spray areas of insufficient or non-uniform tack coat coverage.
  - .2 Ensure tack coating performed using hand held devices is consistent in appearance with adjacent areas of machine applied material.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**



## **Part 1 General**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 32 01 11.01 - Pavement Cleaning and Marking Removal.
- .2 Section 32 12 13.16 – Asphalt Tack Coat.

### **1.2 REFERENCES**

- .1 Ministère des Transports du Québec
  - .1 *Cahier des charges et devis généraux (CCDG) - Infrastructures routières – « Construction et réparation - 2016 »* (terms of reference and general project specifications – construction and repair - 2016).
  - .2 *Collection Normes – Ouvrages routiers, tome II « Construction routière - 2016 »* (standards – roadwork collection, vol. II “highway construction - 2016”).
  - .3 *Collection Normes – Ouvrages routiers, tome VII « Matériaux - 2016 »* (standards – roadwork collection, vol. VII “materials - 2016”).

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
  - .1 Allow the Departmental Representative to take samples during the work.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Submit to Departmental Representative copies of freight and waybills for asphalt cement as shipments are received.
  - .1 Departmental Representative reserves right to check weights as material is received.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Performance graded asphalt cement: compliant with the CCDG.
- .2 Mix type
  - .1 The stated mixes shown on the drawings must meet the requirements of the CCDG.

## **2.2 EQUIPMENT**

- .1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.
- .2 Rollers: sufficient number per paver of type and weight to obtain specified density of compacted mix.
- .3 Vibratory rollers:
  - .1 Drum diameter: 1200 mm minimum.
  - .2 Amplitude of vibration (machine setting): 0.5 mm maximum for lifts less than 40 mm thick.
- .4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
  - .1 Boxes with tight metal bottoms.
  - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
  - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
  - .4 Use only trucks which can be weighed in single operation on scales supplied.
- .5 Hand tools:
  - .1 Lutes or rakes with covered teeth for spreading and finishing operations.
  - .2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm<sup>2</sup> for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.
  - .3 Straight edges, 4.5 m in length, to test finished surface.
- .6 Plant testing facility: provide laboratory space at plant site for exclusive use of Departmental Representative, for performing tests, keeping records and making reports.

## **2.3 MIX DESIGN**

- .1 Mix design to be provided, approved in writing by Departmental Representative.
- .2 Mix design to be developed by testing laboratory approved in writing by an approved testing laboratory.
- .3 The mix must comply with the requirements of the MTQ's CCDG.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving 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 PREPARATION**

- .1 Reshape granular roadbed and asphalt pavement as indicated on the drawings.
- .2 When paving over existing asphalt surface, clean pavement surface in accordance with Section 32 01 11.01 - Pavement Cleaning and Marking Removal.
  - .1 When levelling course is not required, patch and correct depressions and other irregularities to approval of Departmental Representative before beginning paving operations.
  - .2 Apply tack coat in accordance with Section 32 12 13.16 - Asphalt Tack Coats prior to paving.
- .3 Prior to laying mix, clean surfaces of loose and foreign material.

### **3.3 TRANSPORTATION OF MIX**

- .1 Transport mix to job site in vehicles cleaned of foreign material.
- .2 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, at least daily or as required.
  - .1 Raise truck bed and thoroughly drain, and ensure no excess solution remains in truck bed.
- .3 Schedule delivery of material for placing in daylight, unless Departmental Representative approves artificial light for night placing.
- .4 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation.
  - .1 Do not dribble mix into trucks.
- .5 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.
- .6 Deliver loads continuously in covered vehicles and immediately spread and compact.
  - .1 Deliver and place mixes at temperature within range as directed by Departmental Representative, but not less than 135 degrees C.

### **3.4 TEST STRIP**

- .1 Not used.

### **3.5 PLACING**

- .1 Obtain Departmental Representative's approval of base, existing surface and tack coat prior to placing asphalt.
- .2 Place asphalt concrete to thicknesses, grades and lines as indicated on the drawings.
- .3 Placing conditions:
  - .1 Place asphalt mixtures only when air temperature is 5 degrees C minimum.
  - .2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.

- .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- .4 Place asphalt concrete in compacted lifts of thickness as indicated on the drawings.
- .5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.
- .6 Place individual strips no longer than 500 m.
- .7 Spread and strike off mixture with self-propelled mechanical finisher.
  - .1 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver.
    - .1 Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
  - .2 Maintain constant head of mix in auger chamber of paver during placing.
  - .3 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
  - .4 Correct irregularities in alignment left by paver by trimming directly behind machine.
  - .5 Correct irregularities in surface of pavement course directly behind paver.
    - .1 Remove excess material forming high spots using shovel or lute.
      - .1 Fill and smooth indented areas with hot mix.
      - .2 Do not broadcast material over such areas.
  - .6 Do not throw surplus material on freshly screeded surfaces.

### **3.6 COMPACTING**

- .1 Realize compacting works in accordance with the article 13.3.4.6 of the CCDG.

### **3.7**

### **3.7 JOINTS**

- .1 General:
  - .1 Remove surplus material from surface of previously laid strip.
    - .1 Do not deposit on surface of freshly laid strip.
  - .2 Construct joints between asphalt concrete pavement and Portland cement concrete pavement as indicated.
  - .3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
  - .4 Construct joints in accordance with the article 13.3.4.3 of the CCDG.
- .2 Transverse joints:
  - .1 Offset transverse joint in succeeding lifts by at least 600 mm.
  - .2 Scarify to half-depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.
  - .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.
- .3 Longitudinal joints:
  - .1 Offset transverse joint in succeeding lifts by at least 150 mm.

- .2 A cover seal is a seal at the place where the bituminous mixture has been implemented and compacted, and the temperature has dropped below 100 degrees Celsius before the placing the adjacent pavement.
  - .1 Make longitudinal joints in accordance with standardized drawing 010 of Vol. II, Chap. II of the collection “*Normes – Ouvrages routiers du MTQ.*”
- .4 Execute tapered joints at the indicated places in such a way that the thinnest part is composed of fine aggregates by modifying the composition of the mix or by removing coarse aggregates contained in the mix with a rake or a lute.
  - .1 Place and compact joint to ensure joint is smooth and without visible breaks in grade.

### **3.8 FINISH TOLERANCES**

- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.
- .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 3 m straight edge placed in any direction.

### **3.9 DEFECTIVE WORK**

- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.
  - .1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.
- .2 Repair areas showing checking, rippling, or segregation.
- .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

### **3.10 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**





**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 None.

**1.2 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-15.1-92, Calcium Chloride.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and section 01 61 00 – Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .1 Supply calcium chloride in quantities and at times as directed by the Departmental Representative.
  - .2 Deliver calcium chloride to site in moisture-proof bags. Indicate name of manufacturer, name of product, net weight or mass, and percentage of calcium chloride guaranteed by manufacturer.
- .3 Storage and Handling Requirements:
  - .1 Store bags of calcium chloride in weather-proof enclosures.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Calcium chloride, Type I: to CAN/CGSB-15.1, 35% aqueous solution.
- .2 Water: in accordance with Departmental Representative's.

**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 section 01 57 13 – Temporary Erosion and Sediments Control.

### **3.2 APPLICATION**

- .1 Apply calcium chloride and water with equipment approved by Departmental Representative when directed by Departmental Representative at a rate of 0.9 l/m<sup>2</sup>.
- .2 Apply water and aqueous calcium chloride with distributors equipped with means of shut-off and with spray system to ensure uniform application.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
  - .2 Place materials defined as hazardous or toxic in designated containers.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 31 05 16 – Aggregate Materials.
- .2 Section 31 23 33.01 – Excavation, Trenching and Backfilling.

**1.2 REFERENCES**

- .1 Bureau de normalisation du Québec (BNQ)
  - .1 BNQ 1809-500/2006 “*Travaux de construction, Trottoirs et bordures de béton*” (construction work, concrete sidewalks and gutters).
- .2 Canadian Standards Association (CSA International)
  - .1 CSA-B651.12 - Accessible built environment.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 4 weeks prior to commencing work.
- .3 If materials have been tested by independent 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.
- .4 Allow the Departmental Representative to take samples during the work.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Waste Management and Disposal:
  - .1 Separate waste materials for reuse or recycling or dispose of them 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 1809-500, art. 5.5 BNQ Standard.
- .2 Reinforcing steel: compliant with 1809-500, art. 5.4 BNQ Standard.
- .3 Steel mesh: compliant with 1809-500, art. 5.4 BNQ Standard.
- .4 Steel stud: compliant with 1809-500, art. 5.4 BNQ Standard.
- .5 Curing Compound: compliant with 1809-500, art. 5.7.1, type 2 BNQ Standard.
- .6 Granular base: material to Section 31 05 16 - Aggregate Materials following requirements:

- .1 Crushed stone, type MG20.
- .7 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water-soluble soap.
- .8 Compressible bituminous board compliant with 1809-500, art. 5.6 BNQ Standard.
- .9 Touch pad: compliant with 1809-500, art. 5.6 BNQ Standard.

### **Part 3 Execution**

#### **3.1 GRADE PREPARATION**

- .1 Do grade preparation work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Construct embankments using excavated material free from organic matter or other objectionable materials. Dispose of surplus and unsuitable excavated material in approved location on site or off site.
- .3 Place backfill materials and layers of at most 300 mm and compact to at least 95% of the modified Proctor value.

#### **3.2 GRANULAR BASE**

- .1 Obtain Departmental Representative's approval of subgrade before placing granular base.
- .2 Place granular base material to lines, widths, and depths as indicated.
- .3 Compact granular base in maximum 150 mm layers to at least 95 % of maximum density of the modified Proctor value.

#### **3.3 CONCRETE**

- .1 Obtain Departmental Representative's approval of granular base and reinforcing steel prior to placing concrete.
- .2 Do concrete work in accordance with BNQ-1809-500 Standard.
- .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.

#### **3.4 TOLERANCES**

- .1 As set out in BNQ 1809-500/2006 "*Travaux de construction – Trottoirs et bordures de béton.*"

#### **3.5 EXPANSION AND CONTRACTION JOINTS**

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 4.5 m maximum or as indicated in the drawings.

- .2 Install sidewalk expansion joints at maximum intervals of 18 m.
- .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

### **3.6 ISOLATION JOINTS**

- .1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.
- .2 Install joint filler in isolation joints in accordance with BNQ 1809-500 section 6.7 "*Joint de désolidarisation*" (isolation joints).
- .3 Seal isolation joints with sealant approved by Departmental Representative.

### **3.7 CURING**

- .1 Cure concrete by continuous exposure of finished exposed surfaces to a moist atmosphere, in compliance with the requirements of Section 6.12 of BNQ 1809-500.
- .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.
- .3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

### **3.8 BACKFILL**

- .1 Allow concrete to cure for 7 days prior to backfilling.
- .2 Backfill to designated elevations with material as directed.
  - .1 Compact and shape to required contours as indicated by Departmental Representative.

### **3.9 TOUCH PADS**

- .1 Install touch pads to specified locations, 150 to 200 mm from the face of the curb, in accordance with CSA B651 Standard.
- .2 The touch pads must be installed in fresh concrete according to the manufacturer's instructions.
- .3 Achieve the concrete finishing around the pad according to the manufacturer's instructions

### **3.10 CLEANING**

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Clean in accordance with section 01 74 11 – Cleaning.

**END OF SECTION**



## **Part 1 General**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 32 01 11.01 – Pavement Cleaning and Marking Removal.

### **1.2 REFERENCES**

- .1 *Ministère des Transports du Québec (MTQ)*
  - .1 *Ouvrages routiers – Tome V “Signalisation routière” – Chap. 6 - Marques sur la chaussée - 2015* (roadworks – Vol. V “Road Signage – Chap. 6 - Roadway marking - 2015”).
  - .2 *Ouvrages routiers – Tome VII “Matériaux” Chap. 10 – Peinture et pose de marquage - 2015* (roadworks – Vol. VII “materials – Chap. 10 – Painting and Marking - 2015”).
  - .3 *Cahier des charges et devis généraux (CCDG) “Infrastructures routières – Construction et réparation - 2016”* (terms of reference and general project specifications “road infrastructure – construction and repair - 2016”).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature and data sheets for pavement markings and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Submit to Departmental Representative a marking schedule at least 4 weeks prior to commencing work.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Paint and Markings:
  - .1 Paint: long-life epoxy resin pavement marking paint that meets the requirements of MTQ *Ouvrages routiers – Tome VII* (MTQ – roadworks – Vol. VII).

- .2 Colour: white or yellow, MTQ-accredited.
- .2 Thinner: supplied by a manufacturer recognized by the MTQ.
- .3 Glass reflective bead: in accordance with the CCDG requirements.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates and surfaces to receive pavement markings previously installed under other Sections or Contracts are acceptable for product installation in accordance with CCDG requirements prior to pavement markings installation.
- .2 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.
- .3 Epoxy marking shall not be applied on existing marking.
- .4 Proceed with work only after unacceptable conditions have been rectified.
- .5 Clean surface before marking in accordance with section 31 01 11.01 - Pavement Cleaning and Marking Removal.

#### **3.2 EQUIPMENT REQUIREMENTS**

- .1 Paint applicator: approved pressure type mobile with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at rates specified, and to dimensions as indicated. It must be fitted with an effective fast-action device to stop spray.
- .2 Distributor: capable of applying reflective glass beads as overlay on freshly applied paint.

#### **3.3 TRAFFIC CONTROL**

- .1 Ensure free, safe traffic movement at all times.
- .2 Proceed to work in accordance with section 01 35 00.06 - Special Procedures for Traffic Control.

#### **3.4 APPLICATION**

- .1 Carry out the work according to the phasing of work and provide the required additional mobilizations.
- .2 Repair the existing marking damaged by the works.
- .3 Axial lines are to be 112 to 138 mm wide.
- .4 Unless otherwise approved by Consultant, apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast.
- .5 Apply traffic paint evenly at rate of 3 m<sup>2</sup>/L.
- .6 Do not thin paint unless approved by Departmental Representative.
- .7 Symbols and letters to dimensions in accordance with the MTQ requirements – Vol. V.
- .8 Paint lines of uniform colour and density with sharp edges.



- .9 Thoroughly clean distributor tank before refilling with paint of different colour.

### **3.5 TOLERANCE**

- .1 Paint markings: within plus or minus 12 mm of dimensions indicated.
- .2 Remove incorrect markings in accordance with Section 32 01 11.0 - Pavement Cleaning and Marking Removal.

### **3.6 CLEANING**

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
  - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.

### **3.7 PROTECTION**

- .1 Protect pavement markings until dry.
- .2 Repair damage to adjacent materials caused by pavement marking application.

**END OF SECTION**



**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 None.

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A90/A90M-13, Standard Test Method for Weight of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
  - .3 A653/A653M-15c1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM A123/A123M-15, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
  - .2 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
  - .3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
  - .4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
  - .5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 CSA International
  - .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CSA A3000-13 – Cementitious Materials Compendium.
- .4 Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for concrete mixes, fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials in accordance with manufacturer's recommendations.
- .2 Store and protect fence and gate materials from damage.
- .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 MATERIALS AND HARDWARE**

- .1 Concrete mixes and materials for concrete: Compliant with instructions shown in the drawings and with CSA Standard A23.1.
  - .1 Nominal size of coarse aggregate: 20-5.
  - .2 Compression strength: At least 20 MPa at 28 days.
  - .3 Additives: Fly ash in compliance with CSA Standard A3000.
- .2 Fabric for chain link fences: In compliance with CAN/CGSB Standard 138.1.
  - .1 Type 1, category A, medium grade, quality 1.
  - .2 Fabric height: according to instructions 1.2 m.
  - .3 Link dimensions: 50 mm.
- .3 Posts, spacers and rails: Galvanized steel tubing, compliant with CAN/CGSB Standard 138.2, of stated dimensions.
- .4 Tie wire: Aluminum wire.
- .5 Tension bars: Galvanized steel, as per ASTM Standard A653/A653M, at least 5 mm x 20 mm.
- .6 Gates: CAN/CGSB Standard 138.4-compliant.
- .7 Gate frames: As per ASTM Standard A53/A53M, galvanized steel tubing of standard weight, of an external diameter of at least 45 mm for the peripheral frame and spacers.
  - .1 Gates manufactured according to instructions, with electric-welded joints, after welding.
  - .2 Fence fabric attached to the gates so that the twisted edge is on top.
  - .3 Gates fitted with hinges, latches and bolt catches of galvanized malleable cast iron, able to receive a padlock that can be handled from both inside and outside.
  - .4 Two-leaf gates fitted with a hook and chain to keep them open, and with a central support with the vertical bolt to keep them closed.
- .8 Assembly parts and hardware as per CAN/CGSB Standard 138.2.
  - .1 Galvanized steel tension bands at least 3 mm x 20 mm, or aluminum at least 5 mm x 20 mm.
  - .2 Waterproof post caps attached solidly to the posts and bearing the top rail.
  - .3 Extensions 300 mm long forming a 45° angle to horizontal.
  - .4 Press-forged tensioners.
- .9 Zinc-rich organic coating: Compliant with CAN/CGSB Standard 1.181.
- .10 Grounding rods: "Copperweld" copper-plated 16 mm in diameter and 3 m long.
- .11 Anchoring to the concrete road divider ("Jersey"): Each post must be welded to a galvanized steel plate anchored to the concrete divider with a concrete screw.

## **2.2 FINISHES**

- .1 Galvanizing
  - .1 Chain link fabric: As per CAN/CGSB-138.1, category 2.
  - .2 Posts: Zinc coating of at least 550 g/m<sup>2</sup>, as per ASTM A90.
  - .3 Other assembly parts: As per ASTM A123/A123M.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation 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 PREPARATION**

- .1 Grading:
  - .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
    - .1 Provide clearance between bottom of fence and ground surface of 50 mm.

### **3.3 ERECTION OF FENCE**

- .1 Erect fence along lines as indicated in the drawings and as per CAN/CGSB-138.3.
- .2 Excavate post holes to dimensions indicated in the drawings or attach them to the road divider.
- .3 Space line posts 3 m apart, measured parallel to ground surface.
- .4 Space straining posts at equal intervals not to exceed 60 m on all straight, continuous sections of fence installed on ground of a reasonably uniform level.
- .5 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.
- .6 Install corner post where change in alignment exceeds 10 degrees.
- .7 Install end posts at end of fence and at buildings.
  - .1 Install gate posts on both sides of gate openings.
- .8 Place concrete in post holes then embed posts into concrete to depths indicated on the drawings.
  - .1 Extend concrete 50 mm above ground level and slope to drain away from posts.

- .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .9 Install fence fabric after concrete has cured, minimum of 5 days.
- .10 Install top and bottom rails between and solidly attached to the posts. Fasten the overhanging connectors and caps.
- .11 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300-mm intervals.
- .12 Fasten the fabric to the top posts, the line posts and the bottom straining wire with tie wire placed at 300-mm intervals.
  - .1 The tie wire must be twisted at least two (2) turns.
- .13 Install grounding rods as indicated, if required on drawings.

### **3.4 INSTALLATION OF GATES**

- .1 Install gates in locations as indicated in the drawings.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .3 Determine position of centre gate rest for double gate.
  - .1 Cast gate rest in concrete as directed.
  - .2 Dome concrete above ground level to shed water.
- .4 Install gate stops where indicated.

### **3.5 TOUCH UP**

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas.
  - .1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

### **3.6 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

**1.2 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.

**1.3 DEFINITIONS**

- .1 Compost
  - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch or soil amendment.
  - .2 Compost comprises 40% or more of processed organic matter, the percentage to be determined by Walkley-Black or LOI (loss on ignition) testing.
  - .3 The substance must be sufficiently stable (matter sufficiently decomposed) to prevent any deleterious effect on plant growth (C/N ratio below 50:1) and must contain no toxic substances or growth inhibitors.
  - .4 Composted solid matter of biological origin must meet the criteria for compost quality, category (A), set out in a document published by the Canadian Council of Ministers of the Environment (CCME).

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Documents to be submitted for quality control purposes
  - .1 Soil analysis: Submit test reports certifying that the products, materials and equipment meet the requirements for physical characteristics and performance criteria.
  - .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Sort waste for recycling/reuse in accordance with section 01 74 21 – Construction-Demolition Waste Management and Disposal.
- .2 Take unused soil amendment products to an accredited site for the disposal of hazardous substances.
- .3 Dumping of unused soil amendment products into sewers, a watercourse, or a lake, or onto the ground or any other place where this could constitute a risk to health or to the environment is prohibited.

## **Part 2 Products**

### **2.1 GRASS SEED**

- .1 Topsoil for seeded areas and planting beds/areas: a mixture of particles, microorganisms and organic matter constituting a favourable medium for the growth of the desired plants.
  - .1 Texture based on the Canadian System of Soil Classification: soil made up of 20% to 70% sand, at least 7% clay and 2% to 10% organic matter by weight.
  - .2 Containing no toxic substances or growth inhibitors.
  - .3 Producing a finished surface free from:
    - .1 debris and stones more than 50 mm in diameter;
    - .2 coarse plant material more than 10 mm in diameter and 100 mm in length making up more than 2% of the volume of the soil.
  - .4 Consistency: soil friable when wet.

### **2.2 SOIL AMENDMENTS**

- .1 Fertilizer
  - .1 Fertility: substance providing the principal nutrients in the following proportions.
  - .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, sulphur and trace elements present in a balance that will foster germination and/or establishment of the desired vegetation.
  - .6 pH value: between 6.5 and 8.0.
- .2 Peat moss
  - .1 Composed of different varieties of partially decomposed sphagnum moss.
  - .2 Elastic, homogeneous consistency, brown in colour.
  - .3 Free from wood and harmful substances likely to inhibit growth.
  - .4 Composed of shredded particles at most 5 mm in diameter.
- .3 Sand: washed silica sand, medium to coarse textured.
- .4 Organic matter: category A compost, according to CCME document PN1340, unprocessed organic matter such as decomposed manure, hay, straw, bark residue or sawdust, meeting the requirements for organic content, compost stability (maturity) and contaminant content.
- .5 Lime
  - .1 Ground agricultural lime.
  - .2 Grain diameter requirements (% passing by weight): 90% of the lime must pass through a 1.0-mm sieve, and 50% through a 0.125-mm sieve.
- .6 Fertilizer: Common industry standard product, containing nitrogen, phosphorus, potassium and any other micronutrient suitable for the plant species or the specific applications, or determined based on soil analyses.



## **2.3 QUALITY CONTROL AT SOURCE**

- .1 Give the Departmental Representative sufficient notice of the proposed sources of supply for topsoil to allow analyses to be carried out.
- .2 The Contractor shall determine the needs for soil amendments in order to be able to supply topsoil that meets stated stipulations.
- .3 The soil analysis must be performed by a recognized laboratory and test the pH value and the phosphorus, potassium and organic matter content.
- .4 Topsoil analysis will be performed by the testing laboratory designated by the Departmental Representative.
  - .1 Soil sampling, testing and analysis must be performed in accordance with the applicable provincial standards.

## **Part 3 Execution**

### **3.1 TEMPORARY EROSION AND SEDIMENT CONTROL METHODS**

- .1 See section 01 57 13 – Temporary Erosion and Sediments Control.

### **3.2 TOPSOIL STRIPPING**

- .1 Begin removing topsoil in the indicated areas once brush, weeds and grass have been cleared and taken off site.
- .2 Remove topsoil to the depth determined by the Departmental Representative.
  - .1 Avoid mixing topsoil with soil from the subsoil if this is likely to render the texture of the topsoil noncompliant with acceptable parameters, and taking the planned use of the soil into account.
- .3 Stockpile the topsoil in places determined by the Departmental Representative.
  - .1 The height of piles must not exceed 2 m.
- .4 Dispose of unused topsoil in an ecological manner but not in a landfill, as per the Departmental Representative's instructions.
- .5 Protect the piles against contamination and compacting.

### **3.3 PREPARING THE EXISTING BEARING SOIL**

- .1 Check the ground level to ensure that it is appropriate.
  - .1 If not, notify the Departmental Representative and do not begin work before receiving his or her authorization.
- .2 Level the soil, eliminating depressions and bumps, and profiling a slope that will provide good water runoff.
- .3 Remove debris, roots, branches, stones more than 50 mm in diameter and other undesirable substances.
  - .1 Remove soil contaminated by calcium chloride, toxic substances or petroleum products.
  - .2 Remove any debris protruding more than 75 mm above the soil surface.
  - .3 Dispose of all removed material off site.

- .4 Loosen the soil over the entire area that is to receive a layer of topsoil, down to a depth of at least 100 mm.
  - .1 Repeat the operation perpendicularly to the first passes on surfaces where transportation and spreading equipment has compacted the soil.

### **3.4 LAYING AND SPREADING TOPSOIL AND HUMUS**

- .1 Once the Departmental Representative has accepted the existing bearing soil, lay the topsoil.
- .2 Spread the topsoil in uniform layers not exceeding 150 mm in thickness.
- .3 In areas to be sodded, bring the level of the topsoil layer to within 15 mm of the final ground level.
- .4 Spread the topsoil in accordance with instructions, in layers of the following minimum thickness after compaction:
  - .1 150 mm for areas to be seeded
  - .2 100 mm for areas to be sodded
  - .3 300 mm for flowerbeds and borders
  - .4 500 mm for shrub beds
- .5 Spread topsoil and humus by hand around trees, shrubs and obstacles.

### **3.5 SOIL AMENDMENT**

- .1 For areas to be sodded: apply amendment products and mix well throughout the entire thickness of the stated topsoil layer.

### **3.6 FINISH LEVELING**

- .1 Level the soil in order to eliminate depressions and bumps, and promote good stormwater runoff.
  - .1 Create a layer of friable earth by stirring and raking the soil.
- .2 Firm the topsoil layer in order to obtain the stipulated apparent density, using equipment approved by the Departmental Representative.
  - .1 Leave the surfaces smooth, uniform and firm such that a person's weight does not leave deep footprints.

### **3.7 RECEPTION**

- .1 The Departmental Representative will examine, if required, the topsoil laid and have it analyzed, and will determine whether the material, thickness of the topsoil layer and finish levelling are acceptable.

### **3.8 CLEANING**

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

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 32 91 19.13 – Placing of Topsoil and Final Grading.

**1.2 REFERENCES**

- .1 Bureau de normalisation du Québec
  - .1 BNQ-0605-100 – *Aménagement à l'aide de végétaux, partie IV, "Engazonnement – 2001"* (landscaping with plants, part IV, "sodding - 2001").

**1.3 ADMINISTRATIVE REQUIREMENTS**

- .1 Scheduling:
  - .1 Schedule sod laying to coincide with preparation of soil surface.
  - .2 Schedule sod installation when frost is not present in ground.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit the requested action/informational submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for sod, geotextile and fertilizer and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Certificates: submit product certificates signed by manufacturer certifying products and materials comply with specified performance characteristics and criteria and physical requirements of seed mix, seed purity, and sod quality.
- .4 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties of seed mix, seed purity, and sod quality.

**1.5 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Landscape Contractor: to be a Member of the *Association des paysagistes professionnels du Québec* (Quebec association of landscapers).
  - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Soft cape Installation designation.
  - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

**1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials in accordance with supplier's recommendations.
- .2 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.
  - .1 In accordance with the requirements of the BNQ 0605-100, Part IV, art. 3.2 Standard.
- .2 Sod establishment support:
  - .1 Geotextile fabric: biodegradable, square mesh.
  - .2 Wooden pegs: 17 x 8 x 200 mm.
- .3 Water:
  - .1 Supplied by the Contractor.
- .4 Fertilizer:
  - .1 To BNQ 0605-100, Part IV, art. 3.3.4 Standard.

### **2.2 SOURCE QUALITY CONTROL**

- .1 Obtain written approval from Departmental Representative of sod at source.
- .2 When proposed source of sod is approved, use no other source without written authorization from Departmental Representative.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sod installation 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.

### **3.2 PREPARATION**

- .1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil Placement and Grading. If discrepancies occur, notify Departmental Representative and commence work when instructed by 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 surface free of humps and hollows to smooth, even grade, to tolerance of plus or minus 8 mm, for Turf Grass Nursery Sod, surface to drain naturally.

- .4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in accordance with current laws and regulations.

### **3.3 SOD PLACEMENT**

- .1 Carry out the work in accordance with BNQ 0605-100, Part IV, article 3.3.5 Standard.
- .2 Ensure sod placement is done under supervision of certified Landscape Planting Supervisor.
- .3 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.
- .4 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
- .5 Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

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

- .1 Install and secure geotextile fabric in areas indicated, in accordance with manufacturer's instructions.
- .2 Start laying sod at bottom of slopes.
- .3 Peg sod on slopes steeper than 3 horizontal to 1 vertical, within 1m of catch basins and within 1 m of drainage channels and ditches to following pattern:
  - .1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.
  - .2 Not less than 3 pegs per square metre.
  - .3 At least 6 pegs per square metre, in the case of surfaces adjacent to stormwater runoff structures, modify the pegging layout according to instructions from the Departmental Representative.
  - .4 Drive pegs to 20 mm above soil surface of sod sections.

### **3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – 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: Sort waste.
  - .1 Remove recycling and compost 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.

### **3.6 PROTECTION BARRIERS**

- .1 Protect newly sodded areas from deterioration with snow fence on rigid.

- .2 Remove protection 2 weeks after installation, after inspection] as directed by Departmental Representative.

### **3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following operations from time of installation until acceptance.
  - .1 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
  - .2 Cut grass to 50 mm when or prior to it reaching height of 75 mm.
  - .3 Maintain sodded areas weed free 95%.
  - .4 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.
  - .5 Temporary barriers or signage to be maintained where required to protect newly established sod.

### **3.8 ACCEPTANCE**

- .1 Turf Grass Nursery Sod areas will be accepted by 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 height of 1500 mm when grass has been cut to height of 50 mm.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.
- .3 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.

### **3.9 MAINTENANCE DURING WARRANTY PERIOD**

- .1 Repair and resold dead or bare spots to satisfaction of Departmental Representative.
- .2 Eliminate weeds by mechanical means.

**END OF SECTION**