

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 31 22 14 - Airfield Grading.

### **1.2 REFERENCES**

- .1 Canadian Standards and Recommendations Practices: Airport Engineering.
  - .1 ASG-06 Pavement Construction: Materials and Testing 1996.
  - .2 ASG-20 Pavement Construction: Methods and Inspection 1996.
- .2 Ontario Provincial Standard Specifications (OPSS).
  - .1 OPSS.PROV 1001, November 2018, Material Specifications for Aggregates – General.
  - .2 OPSS.MUNI 1010, April 2013, Material Specification for Aggregates – Base, Subbase, Select Subgrade, and Backfill Material.
  - .3 OPSS 206 (November 2013) - Construction Specification for Grading.
  - .4 OPSS 501 (November 2014) - Construction Specification for Compacting.

### **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination, and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain water content.

## **PART 2 – PRODUCTS**

### **2.1 MATERIALS**

- .1 Granular sub-base material: in accordance with the following requirements:
  - .1 Quarried bedrock to OPSS Granular B Type II specifications.
  - .2 Gradations to be within OPSS limits.

## **PART 3 – EXECUTION**

### **3.1 PLACEMENT AND INSTALLATION**

- .1 Place granular sub-base after subgrade is inspected and approved by Contract Administrator.
- .2 Construct granular sub-base to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 Place granular sub-base materials using methods which do not lead to segregation or degradation.

- .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
- .7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.
- .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .9 Remove and replace portion of layer in which material has become segregated during spreading.

### 3.2            COMPACTION

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from Contract Administrator before use.
- .3 Equipped with device that records hours of actual work, not motor running hours.
- .4 Compact to density of not less than 98% maximum dry density in accordance with ASTM D698 / ASTM D1557.
- .5 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .6 Apply water as necessary during compaction to obtain specified density.
- .7 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.
- .8 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

### 3.3            SITE TOLERANCES

- .1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

### 3.4            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 the Departmental Representative.

END OF SECTION

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 31 22 14 - Airfield Grading.

### **1.2 REFERENCES**

- .1 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 206 (November 2013) - Construction Specification for Grading.
  - .2 OPSS 501 (November 2014) - Construction Specification for Compacting.
  - .3 OPSS 1001 (November 2013) - Material Specification for Aggregates - General.
  - .4 OPSS 1010 (November 2013) - Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

### **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination, and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain water content.

## **PART 2 – PRODUCTS**

### **2.1 MATERIALS**

- .1 Granular base: material in accordance with the following requirements:
  - .1 Crushed stone or gravel to OPSS Granular A specifications.
  - .2 Gradations to be within OPSS limits.

## **PART 3 – EXECUTION**

### **3.1 PLACEMENT AND INSTALLATION**

- .1 Place granular base after subbase surface is inspected.
- .2 Construct granular base in accordance with OPSS.MUNI 1010 and Section 31 22 14 - Airfield Grading.

### **3.2 COMPACTION**

- .1 Compact to density not less than 100% maximum dry density in accordance with OPSS – 1010 - Material Specification for Aggregates.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .3 Apply water as necessary during compacting to obtain specified density.

- .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Representative.
- .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

### 3.3 SITE TOLERANCES

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

### 3.4 PROTECTION

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

END OF SECTION

## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 310 (November 2012) - Construction Specification for Hot Mix Asphalt.
  - .2 OPSS 1101 (November 2013) - Material Specification for Performance Graded Asphalt Cement.
  - .3 OPSS 1103 (November 2016) – Material Specifications for Emulsified Asphalt.
  - .4 OPSS 1151 (November 2006) - Material Specification for Superpave and Stone Mastic Asphalt Mixtures.
  - .5 OPSS 1010 (November 2013) - Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS AND EQUIPMENT**

- .1 Asphalt tack coat: to CAN/CGSB-16.2, grade SS-1.

## **PART 3 – EXECUTION**

### **3.1 APPLICATION**

- .1 Obtain Contract Administrator's approval of surface before applying asphalt tack coat.
- .2 Apply asphalt tack coat only on clean and dry surface.
- .3 Dilute asphalt emulsion with water at 1:1 ratio for application.
- .4 Mix thoroughly by pumping or other method approved by Contract Administrator.
- .5 Apply asphalt tack coat evenly to pavement surface and do not to exceed 0.7 L/m<sup>2</sup>.
- .6 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .7 Do not apply asphalt tack coat when air temperature is less than 10 degrees C or when rain is forecast within 2 hours of application.
- .8 Apply asphalt tack coat only on unfrozen surface.
- .9 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Contract Administrator.
- .10 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .11 Keep traffic off tacked areas until asphalt tack coat has set.
- .12 Re-tack contaminated or disturbed areas as directed by Contract Administrator.
- .13 Permit asphalt tack coat to set before placing asphalt pavement.

END OF SECTION

## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 310 (November 2012) - Construction Specification for Hot Mix Asphalt.
  - .2 OPSS 1101 (November 2013) - Material Specification for Performance Graded Asphalt Cement.
  - .3 OPSS 1103 (November 2016) – Material Specifications for Emulsified Asphalt.
  - .4 OPSS 1151 (November 2006) - Material Specification for Superpave and Stone Mastic Asphalt Mixtures.
  - .5 OPSS 1010 (November 2013) - Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS AND EQUIPMENT**

- .1 Asphalt prime: to CAN/CGSB-16.1, grade RM-20 CAN/CGSB-16.2, grade SS-1.

## **PART 3 – EXECUTION**

### **3.1 APPLICATION**

- .1 Cutback asphalt:
  - .1 Heat asphalt prime for pumping and spraying in accordance with CAN/CGSB-16.1.
  - .2 Apply cutback asphalt prime to granular base, at rate directed by Contract Administrator, but do not exceed 2.2 L/m<sup>2</sup>.
  - .3 Apply on dry surface, unless otherwise directed by Contract Administrator.
- .2 Emulsified asphalt:
  - .1 Dilute asphalt emulsion with clean water at 1:1 ratio for application. Mix thoroughly by pumping or other method approved by Contract Administrator.
  - .2 Apply diluted asphalt emulsion at rate directed by Contract Administrator but do not exceed 5 L/m<sup>2</sup>.
  - .3 Apply on damp surface unless otherwise directed by Contract Administrator.
- .3 Do not apply prime when air temperature is less than 5 degrees C or when rain is forecast within 2 hours.
- .4 If asphalt prime fails to set within 24 hours, spread sand blotter material in amounts required to absorb excess material. Sweep and remove excess blotter material.

END OF SECTION

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 32 11 16.01 - Granular Sub-Base.
- .2 Section 32 11 23 - Aggregate Base Courses.

### **1.2 REFERENCES**

- .1 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 310 (November 2012) - Construction Specification for Hot Mix Asphalt.
  - .2 OPSS 1101 (November 2013) - Material Specification for Performance Graded Asphalt Cement.
  - .3 OPSS 1103 (November 2016) – Material Specifications for Emulsified Asphalt.
  - .4 OPSS 1151 (November 2006) - Material Specification for Superpave and Stone Mastic Asphalt Mixtures.
  - .5 OPSS 1010 (November 2013) - Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

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

- .1 Samples:
  - .1 Submit Samples in accordance with the Construction Contract.
  - .2 Submit to the Departmental Representative samples of materials for sieve analysis at least 4 weeks before beginning Work.

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

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .3 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.
- .4 Provide approved storage, heating tanks and pumping facilities for asphalt cement.
- .5 Submit to the Departmental Representative copies of freight and waybills for asphalt cement as shipments are received.
  - .1 The Departmental Representative reserves right to check weights as material is received.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Asphalt cement: to OPSS 1151 and 310.
- .2 Base aggregates: in accordance with Section 32 11 23 - Aggregate Base Courses.
- .3 Subbase aggregates: in accordance with Section 32 11 16.01 - Granular Sub-Base.

## 2.2 EQUIPMENT

- .1 Equipment shall be in accordance with OPSS 310.

## 2.3 MIX DESIGN

- .1 Mix designs:
  - .1 Surface course: Superpave 12.5, PGAC 64-34
  - .2 Binder course: Superpave 19, PGAC 64-34
  - .3 Ontario Traffic Category as per Table on plans
- .2 Job mix formula to be approved by Contract Administrator.
- .3 Do not change job-mix without prior approval of Contract Administrator. When change in material source proposed, new job-mix formula to be approved by Contract Administrator.

## **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 the Departmental Representative.
  - .2 Inform the Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

### 3.2 PLANT AND MIXING REQUIREMENTS

- .1 Plant and Mixing Requirements in accordance with OPSS 1151 and 310.

### 3.3 CONSTRUCTION

- .1 Asphalt Pavement Construction shall be in accordance with OPSS 310.

### 3.4 COMPACTING

- .1 Compact to the Standard Compaction Requirements in OPSS.
- .2 Compaction to be carried out in accordance with OPSS.

### 3.5 JOINTS

- .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
- .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .3 For cold joints, cut back to full depth vertical face and tack face with hot asphalt.
- .4 For longitudinal joints, overlap previously laid strip with spreader by 25 to 50 mm.



### 3.6 FINISH TOLERANCES

- .1 Tolerances shall be to OPSS.

### 3.7 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.

### 3.8 CLEANING

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

END OF SECTION