

**PART 1        GENERAL**

**1.1            RELATED REQUIREMENTS**

- .1        31 05 16 – Aggregates for Earthworks

**1.2            REFERENCE STANDARDS**

- .1        ASTM International
  - .1        ASTM C117-17, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
  - .2        ASTM C131-14, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3        ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4        ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .5        ASTM D1557-12e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .6        ASTM D1883-16, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .7        ASTM D4318-17, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2        Canadian General Standards Board (CGSB)
  - .1        CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2        CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

**1.3            DELIVERY, STORAGE, AND HANDLING**

- .1        Deliver and stockpile aggregates in accordance with Section 31 05 16 - Aggregate Materials. Stockpile minimum 50% of total aggregate required prior to beginning operation.
- .2        Store cement in weathertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

**PART 2        PRODUCTS**

**2.1            MATERIALS**

- .1        Granular base: material in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
  - .1        Crushed stone or gravel.

- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.
- .1 Gradation to:
- | Sieve Designation | % Passing (Base Type 1) |
|-------------------|-------------------------|
| 100 mm            | -                       |
| 75 mm             | -                       |
| 50 mm             | -                       |
| 37.5 mm           | -                       |
| 25 mm             | -                       |
| 19 mm             | 100                     |
| 12.5 mm           | -                       |
| 9.5 mm            | 55-80                   |
| 4.75 mm           | 35-60                   |
| 2.00 mm           | -                       |
| 1.20 mm           | 17-35                   |
| 0.425 mm          | -                       |
| 0.180 mm          | -                       |
| 0.075 mm          | 3-6                     |
- .2 Liquid limit: to ASTM D4318, maximum 25
- .3 Plasticity index: to ASTM D4318, maximum 6
- .4 Los Angeles degradation: to ASTM C131. Max. % loss by weight: 45
- .5 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.
- | Passing |    | Retained on |
|---------|----|-------------|
| 50 mm   | to | 25 mm       |
| 25 mm   | to | 19.0 mm     |
| 19.0 mm | to | 4.75 mm     |
- .6 Soaked CBR: to ASTM D1883, min 100, when compacted to 100% of ASTM D1557.

### **PART 3 EXECUTION**

#### **3.1 PLACEMENT AND INSTALLATION**

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

- .5     Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
- .6     Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .7     Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3     **Compaction Equipment**
  - .1     Compaction equipment to be capable of obtaining required material densities.
- .4     **Compacting**
  - .1     Compact to density not less than 100% corrected maximum dry density ASTM D698.
  - .2     Shape and roll alternately to obtain smooth, even and uniformly compacted base.
  - .3     Apply water as necessary during compacting to obtain specified density.
  - .4     In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
  - .5     Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

**3.2     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.

**3.3     PROTECTION**

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

**END OF SECTION**