

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Section 31 05 17 - Aggregate Materials.
- .3 Section 31 23 10 – Excavating, Trenching & Backfilling
- .4 Section 32 11 16 – Granular Sub-Base.

### **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 D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .5 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .6 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .7 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .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 17 - 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 1 - GENERAL**  
**(CONT'D)**

**1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Divert unused granular material from landfill to local facility as approved by Departmental Representative.

**1.5 MEASUREMENT FOR PAYMENT**

- .1 Granular Base: Measure granular base in cubic meters place measure (CMPM) of compacted material incorporated into Work within the areas and to the thicknesses indicated on the drawings unless otherwise specified.
- .2 No separate measurement for payment to be made for Granular Base material used in new electrical trenches. Include all costs in the electrical portion of the lump sum price.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Granular base: material in accordance with Section 31 05 17 - 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 and CAN/CGSB-8.2.
    - .1 Gradation Method to:

Sieve Designation	% Passing
19 mm	100
9.5 mm	55-100
4.75 mm	35-60
1.20 mm	17-35
0.300 mm	39-68
0.075 mm	39-51

- .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.

## **PART 3 - EXECUTION**

### **2.1 MATERIALS (CONT'D)**

- .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
19.0 mm	to	4.75 mm

### **3.1 SEQUENCE OF OPERATION**

- .1 Place granular base after 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 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.
  - .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.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.3     PROTECTION**

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