

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 American Society for Testing and Materials (ASTM)
    - .1 ASTM C 117-95, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
    - .2 ASTM C 131-96, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
    - .3 ASTM C 136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
    - .4 ASTM D 698-00a, 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 D 1557-00, 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 D 1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
    - .7 ASTM D 4318-00, 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.
- 1.2 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.
- 1.3 MEASUREMENT FOR PAYMENT
- .1 Granular Base Type I - Granular Base Type I materials will be measured in tonnes of compacted material incorporated into the work within the areas and to the thicknesses indicated on the Contract Drawings unless otherwise specified.
  - .2 Only loads certified by the Departmental Representative as being placed in the works at the required locations shall be included in measurement

1.3 MEASUREMENT FOR .2  
PAYMENT  
(Cont'd)

(Cont'd)  
for payment. The weight shall be computed in tonnes,  
rounded to one decimal place.

- .3 Measurement for Payment will only be made for those materials accepted for use under this specification and then only when incorporated into the work at the required locations and thicknesses as indicated on the plans.
- .4 Excavation of base, sub-base and sub-grade materials to correct deficiencies in sub-grade discovered during placing of base or sub base shall not be measured but shall be considered included in the unit price for placement of granular base and sub-base.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Testing of materials shall be carried out by an approved testing company.
- .2 Cost of testing shall be paid for by the Departmental Representative.
- .3 Testing company shall issue reports on quality of material to Departmental Representative.
- .4 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 C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.2.

- .1 Gradation Method # 1 to:

Sieve			% Passing
Designation			
19	mm	-	100
12.5	mm	-	70-100
9.5	mm	-	-
4.75	mm	-	40-70
2.00	mm	-	23-50
0.425	mm	-	7-25
0.180	mm	-	-
0.075	mm	-	3-8

- .2 Liquid limit: to ASTM D 4318, maximum 25

2.1 MATERIALS  
(Cont'd)

.3 (Cont'd)

.2 (Cont'd)

.3 Plasticity index: to ASTM D 4318, maximum 6.

.4 Los Angeles degradation: to ASTM C 131.  
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 C 136.

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 D 1883, min 10, when compacted to 100% of ASTM D 1557.

PART 3 - EXECUTION

3.1 SEQUENCE OF  
OPERATION

.1 Place granular base after subgrade 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 100 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 Compaction testing shall be carried out by approved testing company.

3.1 SEQUENCE OF  
OPERATION  
(Cont'd)

- .4 (Cont'd)  
.2 Cost of testing shall be paid for by the Contractor.  
.3 Testing company shall issue reports on compaction to Departmental Representative.  
.4 Compact to density not less than 100% in accordance with maximum dry density ASTM D 698.  
.5 Shape and roll alternately to obtain smooth, even and uniformly compacted base.  
.6 Apply water as necessary during compacting to obtain specified density.  
.7 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.  
.8 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.