

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Section 32 11 23 - Aggregate Base Courses.

### **1.2 REFERENCES**

- .1 City of St. John's Department of Engineering Specifications Book (Latest Edition).
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM C 117-04, Standard Test Method for Materials Finer Than 0.075 mm (no.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C 131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3 ASTM C 136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM D 422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
  - .5 ASTM D 698-12, 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>).
  - .6 ASTM D 1557-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .7 ASTM D 1883-07e1, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .8 ASTM D 4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .3 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 WASTE MANAGEMENT AND DISPOSAL**

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

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Granular "B" material in accordance with Item 323.02 of city of St. John's Department of Engineering Specifications Book (Latest Edition).

<b>TABLE 1 GRADATION REQUIREMENTS</b>				
<b>Sieve Sizes</b>	<b>Percent Passing by Dry Weight</b>			
	<b>Granular "A"</b>	<b>Granular "B"</b>	<b>Maintenance Grade No. 1</b>	<b>Quarter Minus</b>
38.1mm		100		
25.4mm		60 - 90		
19.0mm	100		100	
15.9mm		45 - 80`		
9.51mm	55 - 80		55 - 80	
6.30mm				100
4.76mm	35 - 60	25 - 55	35 - 60	55-80
2.00mm				35-55
1.20mm	17 - 35	12 - 35	17 - 35	
4.25mm				12-30
300mm	7 - 20	7 - 20	7 - 20	
075mm	3-6 (Pit Source) 3-8 (Rock Source)	3-6 (Pit Source) 3-8 (Pit Source)	6 - 12	4-10

- 1. The percentage of material finer than the 0.075mm sieve shall be determined by ASTM C117-80.
- 2. Where Granular "A" and Granular "B" materials are produced from natural gravel deposits, a maximum of six percent (6%) passing the 0.075mm sieve will be allowed.
- 3. Where forty percent (40%) or more of Other Material is blended to a rock source for the production of granular materials it shall then be treated as a pit source.

**PART 3 - EXECUTION**

**3.1 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.
- .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 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.
- .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .8 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 Compact to density of not less than 100% of Corrected Maximum Dry Density.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .4 Apply water as necessary during compaction to obtain specified density.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

### **3.3 QUALITY CONTROL TESTING**

- .1 Inspection and testing shall be carried out by the Contractor.
    - .1 Minimum Test Frequency: 1 test per 250 m<sup>2</sup>/Lift.
  - .2 Submit compaction test results to Departmental Representative for review and approval.
  - .3 Contractor shall conduct and submit satisfactory compaction test results to Departmental Representative prior to placement of subsequent materials.
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### **3.4 SITE TOLERANCES**

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

### **3.5 PROTECTION**

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