

PART 1 - GENERAL

<u>1.1 Related Section</u>	.1	Section 01 45 01 Weigh Scales
	.2	Section 31 05 16 Aggregates - General
	.3	Section 03 30 00 Cast-in-place concrete
	.4	Section 31 32 21 Geotextiles
<u>1.2 References</u>	.1	New Brunswick Department of Transportation and Infrastructure (NBDTI) 2019 standard Specifications
<u>1.3 Measurement Procedures</u>	.1	<u>Granular Base 31.5mm</u> : to be measured in metric tonnes, (Tonnes), of material supplied and acceptably placed in the works to the lines and grades specified.
	.2	<u>Granular Sub Base 75mm</u> : to be measured in metric tonnes, (Tonnes), of material supplied and acceptably placed in the works to the lines and grades specified.
	.3	<u>Granular SubBase R5 Random</u> : to be measured in metric tonnes, (Tonnes), of material supplied and acceptably placed in the works. R5 Random is measured a sacrificial layer on breakwater road if required (not shown on drawings).
	.4	Mobilization/demobilization of equipment will not be measured separately for payment.
	.5	Construction and maintenance of haul roads will not be measured separately for payment.
	.6	Weighing will not be measured separately for payment, but will be considered as incidental to the work

of this section.

1.4 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C88-05, Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
 - .2 ASTM C117-13, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .4 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
 - .5 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .6 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600kNm/m³))
 - .7 ASTM D1557-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³ (2,700kN-m/m³)).
 - .8 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted 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.

PART 2 - PRODUCTS

2.1 Material

.1 Granular base and Subbase material: to
Section 31 05 16 Aggregates - General
and following requirements:

.1 Crushed stone or gravel consisting
of hard, durable, angular
particles, free from clay lumps,
cementation, organic material,
frozen material and other
deleterious materials.

.2 Gradations to be within following
limits when tested to ASTM C136
and ASTM C117 and to have a smooth
curve without sharp breaks when
plotted on a semi-log grading
chart. Sieve sizes to
CAN/CGSB-8.1.

.1 Granular base 31.5mm:

<u>ASTM SIEVE</u> <u>BY DESIGNATION</u>	<u>% PASSING</u> <u>WEIGHT</u>
37.5 mm	100
31.5 mm	95-100
25.0 mm	83-100
19.0 mm	70-90
12.5 mm	55-78
9.5 mm	45-72
4.75 mm	30-57
2.36 mm	20-46
1.18 mm	14-35
0.300 mm	5 - 19
0.075 mm	0 - 6

.2 Granular base 75mm:

<u>ASTM SIEVE</u>	<u>% PASSING</u>
<u>BY DESIGNATION</u>	<u>WEIGHT</u>
75.0 mm	95 - 100
63.0 mm	86 - 100
50.0 mm	75 - 95
37.5 mm	61 - 87
19.0 mm	38 - 70
9.5 mm	28 - 56
4.75 mm	19 - 46
2.36 mm	13 - 37
1.18 mm	9 - 30
0.300 mm	4 - 16
0.075 mm	0 - 7

.3 Granular Subbase Random R5:

<u>ASTM SIEVE</u>	<u>% PASSING</u>
<u>BY DESIGNATION</u>	<u>WEIGHT</u>
220.0 mm	100
190.0 mm	70 - 90
150.0 mm	40 - 55
120.5 mm	-
70.0 mm	0 - 15

- .3 Liquid Limit: to ASTM D4318
Maximum 25.
- .4 Max. % loss by weight: 35.
- .5 Crushed particles: at least 60%
of particles by mass retained on
the 4.75 mm sieve to have at least
two freshly fractured face.
- .6 Petrographic Number (maximum)
135.
- .7 Magnesium Sulphate Soundness to
ASTM C88, max. % by mass: 15.
- .8 Flat and elongated particles:
maximum % by mass: 15.

PART 3 - EXECUTION

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| <u>3.1 Inspection of
Underlying
Subgrade Surface</u> | .1 | Do not place granular base until finished granular sub-base is inspected and approved by Departmental Representative. |
| <u>3.2 Placing</u> | .1 | Ensure no frozen or blended recycled asphalt product is placed with granular base material. |
| | .2 | Place material only on clean unfrozen surface, properly shaped and compacted and free from snow or ice. |
| | .3 | Begin spreading base material on crown line or high side of one-way slopes. |
| | .4 | Place granular base materials using methods which do not lead to segregation or degradation of aggregate. |
| | .5 | Place granular base immediately upon approval of granular sub-base placement. |
| | .6 | Place material to full width in uniform layers not exceeding 200 mm compacted thickness. |
| | .7 | Shape each layer to a smooth contour and compact to specified density before succeeding layer is placed. |
| | .8 | Remove and replace portion of a layer in which material becomes segregated during spreading. |
| | .9 | R5-Random placed on breakwater to be limited to a thickness of maximum 300mm. |
| <u>3.3 Compaction
Equipment</u> | .1 | Compaction equipment must be capable of obtaining required densities in materials used in the Work. |

- .2 R5 Random on breakwater has no requirement for mechanical compaction.
- 3.4 Compacting
 - .1 Compact to a density not less than 95% in accordance with ASTM D698, (Standard Proctor).
 - .2 Shape and roll alternately to obtain a smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compacting to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
 - .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- 3.5 Finish Tolerances
 - .1 Finished base surface shall be within plus or minus 10 mm of established grade, but not uniformly high or low.
 - .2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

END OF SECTION