PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the requirements for the supplying, producing, placing, and compaction of Rock Fill, Class “A”, and Class “B” in the areas as indicated.

1.2 REFERENCES

.1 ASTM C 117-04, Test method for material finer than 0.075 mm sieve in mineral aggregates by washing.

.2 ASTM C 131-06. Test method for resistance to degradation of small size coarse aggregate by abrasion and impact in the Los Angeles machine.

.3 ASTM C 136-6, Method for sieve analysis of fine and coarse aggregates, CAN/CGSB-8.2-M88, Sieves testing, woven wire, metric.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver and stockpile aggregates as directed by Departmental Representative.

1.4 MEASUREMENT FOR PAYMENT

.1 Rock Fill: The supply and installation of rock fill as specified will be measured by the cubic metre placed measure (CMPM) including all plant material, equipment, and labour required to complete the work. Geotextile as indicated on drawings to be placed prior to placement of rock fill will be considered incidental to unit price. Contractor shall survey post excavation and post rock fill installation to determine quantities. Survey shall be agreed and signed off by inspector.

.2 Class "A": The supply and installation of Class "A" will be measured in cubic metres of materials supplied and installed in the work. Include all costs in the unit price including plant, materials, equipment, and labour.

.3 Class "B": The supply and installation of Class "B" granular sub-base will be measured in cubic metres of materials supplied and installed in the work. Include all costs in the unit price including plant, material, equipment and labour.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Rock fill will be of hard, durable, evenly graded blasted stone having a maximum dimension of 300mm in major portion of fill and a maximum dimension of 150mm in upper 600mm of rock fill. Fill material will contain not more than 6 percent by weight passing the 25mm sieve. Rock fill to be evenly graded within the limits specified.

.2 Use of shale rock or late will not be permitted.

.3 Class "A" will consist of clean, hard, durable crushed gravel or stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested to ASTM C136 and ASTM C117 and giving a smooth curve without sharp breaks when plotted on a semi-chart.

ASTM Sieve Designation	% Passing
19.0 mm	100
9.51 mm	50-80
4.76 mm	35-60
1.20 mm	15-35
300 um	7-20
75 um	3-6 (Pit Source) 3-8 (Rock Source)

.4 Physical Requirements for Class “A”:
.1 Liquid Limit ASTM D4318: Maximum 0
.2 Plasticity Index ASTM D4318: Maximum 0
.3 Los Angeles Abrasion ASTM C131-81 Maximum % loss by weight: 35
.4 Crushed Fragments: 50%. The percent of crushed particles will be determined by examining the fraction retained on the 4.76mm sieve and dividing the weight of the crushed particles by the total weight retained on the 4.76mm sieve.
.5 CBR: ASSHTO T193-72 Min 100 when compacted to 100% of AASHTO T180-74 Method D.

.5 Class “B” will consist of clean, hard, durable crushed gravel or stone, free from shale, clay friable materials organic matter and other deleterious substances and graded within the following limits when tested to ASTM C136 and ASTM C117 and giving a smooth curve without sharp breaks when plotted on a semi-chart.

ASTM Sieve Designation	% Passing
50.8 mm	100
25.4 mm	50-100
4.76 mm	20-55
1.20 mm	10-35
300 um	5-20
75 um	2-6 (Pit Source) 2-8 (Rock Source)

.6 Physical Requirements for Class “B”:
.1 Liquid limit ASTM D4318: Maximum 25.
.2 Plasticity Index ASTM D4318: Maximum 0
.3 Los Angeles Abrasion ASTM C131-81 Maximum % loss by weight: 35
.4 Crushed Fragments: 50%. The percentage of crushed particles will be determined by examining the fraction retained on the 4.76 mm sieve and dividing the weight of the crushed particles by the total weight retained on the 4.76mm sieve.
.5 CBR: ASSHTO T193-72 Min 100 when compacted to 100% of AASHTO T180-74 Method D.

.7 Materials from deposits acceptable as to the quality of the particles, but deficient in sizes to provide the required gradation, may be accepted if the contractor furnishes and satisfactorily incorporates into the product supplementary sizes from other sources to produce the required grading. If the deficiencies occur in Class “A” or Class “B” materials, corrections may be attempted by crushing to a smaller maximum particle size. In that event, the Departmental Representative will furnish special grading limits on the actual maximum particle size.

.8 Material shall be considered unsuitable even though particle sizes are within the specified gradation limits if particle shape or any other characteristic precludes satisfactory compaction or fails to provide a roadway suitable for traffic. If, in the opinion of the Departmental Representative, an improved particle shape can be achieved by using a different crushing unit for that proposed by the contractor, then the Contractor shall supply and use a crushing unit of the type directed by the Departmental Representative.

.9 Class “A” and Class “B” shall be processed by crushing and, when necessary, to eliminate surplus fines passing the 4.76m sieve, shall be screened and washed.

PART 3 – EXECUTION

3.1 INSTALLATION

.1 Only rock fill material approved by Departmental Representative will be placed. Material will be placed uniformly across full cross-section in layers not exceeding 300mm loose depth.

.2 Use suitable earth moving and surface grading equipment to place and spread backfill in continuous and uniform horizontal layers.

.3 Compact rock fill after each 300mm lift.

.4 Place Class “A” after Class “B” sub-base surface is inspected and approved by Departmental Representative.

.5 Placing:

.1 Construct Class “A” to depth and grade in area indicated.

.2 Ensure no frozen material is placed.

.3 Place material only on clean unfrozen surface, free from snow and ice.

.4 The contractor shall place all Class “A” and Class “B” in such a manner as to prevent contamination by other materials and to prevent segregation. If, in the opinion of the Departmental Representative, the methods and techniques used by the Contractor cannot overcome contamination or segregation, then the Departmental Representative may direct a modification in these methods which may require the use of an approved spreader box or other acceptable device.

.5 All Class “A” and Class “B” shall be placed in uniform layers such that the thickness of the compacted layer does not exceed 50mm.

.6 Prior to closing down operations for each working day, all granular materials shall be bladed and compacted to the specified density.

.7 The materials shall be sprayed with water when and as directed by the Departmental Representative, either to aid compaction or reduce dust nuisance or both. When water is added to aid compaction, it shall be applied immediately ahead of the compacting unit.

.8 Each layer of Class “A” and Class “B” shall be bladed shaped and compacted as necessary to produce the required profile and cross-section. The finished surface shall not deviate at any place on a 3 m

straight edge by more than 10mm for Class “A” and Class “B”. The upper layer shall be maintained to these tolerances and to the specified density until compaction of the contract. This may require keeping the moisture content at the appropriate value during periods of dry weather in addition to regarding and re-compacting as frequently as may be deemed necessary by the Departmental Representative.

.6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.7 Compaction Equipment:
.1 Compaction equipment to be capable of obtaining required material densities.

.8 Compacting:
.1 All Class “A” and Class ”B” materials shall be compacted to not less than 100% of the maximum Standard Proctor Dry Density ASTM D698-07el Method D.
.2 Compaction operations shall be carried out as closely as possible behind the placing and spreading operation. At the end of each working day, all materials placed shall have been compacted to the specified density.
.3 Each layer of material shall be graded and compacted as specified before the next layer is placed.
.4 Where necessary to obtain the required compaction, the contractor shall apply sufficient water by means of an approved distributor.

3.2 TESTING

.1 Testing of materials and compaction will be carried out by testing laboratory designated by the Departmental Representative.

.2 Contractor will pay costs for inspection and testing.

.3 Sieve Analysis: proposed granular material will be tested to confirm suitability for intended use and conformity with specifications.

.4 Frequency of Tests: to be determined by the Departmental Representative.

3.3 TOLERANCES

.1 Finished base surface to be within plus or minus 10mm of established grade and cross section but not uniformly high or low.

3.4 PROTECTION

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