GRANULAR BASE COURSE

PART 1 GENERAL

1.01 OTHER CONTRACT DOCUMENTS

The General Conditions of the Contract, General Requirements and Supplemental Conditions attached hereto shall apply to and be a part of this Section.

1.02 DESCRIPTION OF WORK

The Work described herein shall be for the supply and installation of all materials necessary for the construction of a granular base course for roadway and concrete works.

1.03 RELATED WORK

Section 02212 Roadway Excavation & Grading
Section 02305 Soil Cement Base Course
Section 02510 Plant Mixed Bituminous Pavement
Section 02514 Concrete Construction
Section 02578 Geotextiles

1.04 CLASSIFICATION OF WORK

Base course granular material shall be classified on the basis of the aggregate gradation as shown in Part 2.01 of this Section. Unless specified otherwise in Section 01001 Supplemental Conditions, shown on the Drawings or directed by the Engineer, base course granular material shall be A Base.

1.05 SUBMITTALS

The analysis and approval of materials by the City will not relieve the Contractor from his duty to produce an acceptable product as stated in this Section.

The Contractor shall provide notice to the Engineer of the source or sources of supply of all Products and materials to be incorporated into the Work a minimum of fourteen (14) calendar days prior to commencing the Work or incorporating such Products and materials into the Work. The source of Product and material supply shall not be changed without the prior approval of the Engineer. Any material of a quality or nature not suitable for its intended use will be rejected. The Engineer reserves the right to prohibit the use of material from any source where, in his opinion, the character of the material or the method of manufacture is such as to make improbable the furnishing of material conforming to the requirements of this Section.

1.06 QUALITY ASSURANCE

The analysis and approval of materials by the City will not relieve the Contractor from his duty to produce an acceptable product as stated in this Section.

During the processing of aggregate, the Engineer will make a minimum of one aggregate analysis, to applicable ASTM (C136) test procedures. The crusher shall be equipped with a mechanical sampling device, approved by the Engineer. The Contractor shall stockpile the processed aggregate separate from the surge pile until testing has been completed and the processed aggregate has been approved. If the aggregate fails to comply with Part 2.01 and Part 2.02 of this Section on any two (2) consecutive tests, it shall be rejected for use in the Work. The Contractor shall transport approved processed aggregate directly from the crusher or stockpile to the Site. If the aggregate fails to comply with Part 2.01 and Part 2.02 of this Section on any two (2) consecutive tests taken while incorporating the aggregate into the Work the delivery of aggregate shall be terminated until Contractor has provided the Engineer with sufficient evidence that the aggregate again conforms to the requirements of this Section.

Quality assurance will be used to determine the acceptability of each layer of each layer of material as placed and compacted by the Contractor, prior to a succeeding layer being constructed. The frequency and number of quality assurance tests will be as determined by the Engineer. The Engineer will make density analysis, to ASTM Standard D698 and ASTM Standard D2922 test methods.

PART 2 PRODUCTS

2.01 AGGREGATE

The Contractor shall handle and stockpile all aggregate materials as described in Part 3.01 of this Section.

The aggregates shall be clean, uncoated, hard, durable, normal density particles of crushed rock, crushed stone, crushed gravel, natural sand or manufactured sand. The aggregates shall be free of deleterious material including but not restricted to organic matter, sod, roots, clay, silt, loam, thin, elongated (length in excess of 4 times width) or laminated particles, soft or flaking particles, shale, ironstone, alkali, mica, weathered gneiss or pyrite

Aggregate shall be clean, sound, durable particles of crushed rock, stone, sand and fines, free of thin or elongated particles, clay, sod, roots, organic material and other deleterious matter. Pit Run granular material shall contain no more than ten (10%) percent oversize material by mass of total dry aggregate retained on the 75 millimetre sieve provided no particle is greater than 150 millimetres in greatest dimension,

The gradation analysis will be performed according to ASTM C136 test procedures and the Los Angeles abrasion loss test will be performed according to ASTM C131 test procedures.

The aggregate shall conform to the following gradation:

Granular Base Course Aggregate	Percent Passing Sieve (by mass)		
Sieve Size	A Base	C Base	Pit Run
75 mm sieve	--	--	100%
37.5 mm sieve	--	100%	--
19 mm sieve	100%	70-85%	--
13 mm sieve	70-90%	--	--
4.75 mm sieve	40-70%	25-70%	25-50%
2.00 mm sieve	25-55%	--	--
425 um sieve	15-30%	15-40%	--
75 um sieve	8-15%	6-18%	0-20%
Maximum Friable Rock retained on a 4.75 mm sieve	15%	20%	--
Maximum Los Angeles Abrasion Loss	50%	50%	--

All aggregate retained on the 4.75 millimetre sieve and each coarser sieve shall contain a minimum of thirty five percent (35%) by mass of A Base granular particles or fifteen percent (15%) by mass of C Base granular particles having one or more freshly fractured face which are not shale or ironstone. Shale or ironstone content is defined as the percent by mass of particles retained on the 4.75 millimetre sieve that are shale or ironstone particles.

The deleterious percentage is the percentage by mass of total dry aggregate particles retained on the 4.75 millimetre sieve and each coarser sieve which are determined by the Engineer to be a deleterious material.

The crush count is the percentage by mass of total dry aggregate of the blended aggregate particles retained on the 4.75 millimetre sieve and each coarser sieve which are not deleterious and have least one or more freshly fractured face.

Changes in the source of aggregate supply or aggregate gradation during the Work will not be permitted without the approval of the Engineer. In the event that, by authorization of the Engineer, changes are made during the progress of the Work, each different kind of material shall be entirely used in the operations or otherwise disposed of before the use of another material from an alternative source is used.

2.02 MINERAL BINDER

Mineral Binder shall be fine pulverized mineral soil particles with one hundred (100%) percent of the material passing the 19 millimetre sieve and a minimum of seventy-five (75%) percent of the material passing the 425 micrometre sieve. The fraction of the mineral binder material passing the 425 micrometre sieve shall have a liquid limit not greater than 50 and a plasticity index of not less than ten 10. No more than fifty (50%) percent of the mineral binder material shall contain lagoon ash.

PART 3 EXECUTION

3.01 STORAGE AND HANDLING

The Contractor shall clear the stockpile area of all debris, vegetation, rocks, cobbles, snow and other objectionable material prior to placing aggregate or binder. The stockpile shall be located to allow equipment access and prevent contamination of the material from other stockpiles or material sources. The stockpile shall be constructed in a manner which prevents segregation of the constituent materials and the intrusion of excessive amounts of moisture. Conning of the stockpile or spilling material over the edges of the stockpile will not be permitted.
Material from a stockpile which becomes mixed with other stockpiles of a different kind, class, source or gradation, becomes contaminated with deleterious materials, or display excessive segregation will not be used in the Work.

When the portion of the A Base granular material passing the 425 micrometre sieve has:

- A liquid limit not greater than 35 and a plasticity index of 4 to 10. The granular material shall be used as is without the addition of mineral binder.
- A liquid limit not greater than 35 and a plasticity index of less than 4. Mineral binder shall be added to the granular material to increase the plasticity index to no more than a maximum of 10.
- A liquid limit not greater than 35 and a plasticity index greater than 10. Additional approved granular material, lagoon ash or lime shall be added to the material to reduce the plasticity index to less than a maximum10.

The Contractor shall supply and incorporate supplementary material in such quantities and in a method which produces a homogeneous granular material that conforms to the requirements stated in Part 2.01 and Part 2.02 of this Section. Supplementary material shall be separately stockpiled and added, by belt conveyor, to the granular base course aggregate at the location where it first enters the crusher. The addition of supplementary material shall be considered incidental to Granular Base Course for which no additional payment will be made.

3.03 PLACING AND SPREADING

The Contractor shall not place any Granular Base Course material until the Engineer has inspected and approved the sub-grade or previous granular base course layer. The Contractor shall place each class of granular base course material in uniform layers to the elevation and cross-section shown on the Drawings, stated in Section 01001 Supplemental Conditions or as set out on the Site by the Engineer. Unless directed otherwise by the Engineer, each layer of granular base course shall not exceed 100 millimetres in depth when compacted.

3.04 COMPACTION

Each layer of granular base course shall be compacted to the full width of the roadway or shoulder by rolling with vibratory rollers or other equipment approved by the Engineer. Each layer shall be compacted to a minimum of one hundred (100%) percent of Standard Proctor Dry Density, as determined by the Engineer. The Contractor shall blade the compacted material to maintain the specified elevation and cross section during compaction operations. Layers which become segregated shall be scarified, reshaped and compacted. Granular base course materials shall be compacted adjacent to street hardware such as manholes, valve casings and catch basins with hand operated mechanical compaction equipment to ensure that the density of the material is equal to or greater than the adjacent material.

The moisture content of the aggregate at the time of compaction shall be between plus or minus of (± 1%) percent of the optimum moisture content. The Contractor shall not place granular base course on a compacted granular layer until, in the opinion of the Engineer, the moisture content ofthe granular layer is at or below optimum. The Engineer may require the addition of water to bring the granular layer to optimum moisture content prior to or during compaction.

The Contractor shall supply water in a motor propelled unit equipped with a spray system. Granular base course which has been placed at a moisture content greater than that required for maximum compaction, shall be scarified and remixed to bring the moisture content to the optimum for compaction. As an alternative, the saturated granular base course may be excavated and replaced with dry granular base course material, at the Contractors sole expense.

The Contractor shall maintain each layer of granular base course material to the required cross section and density, free from ruts and waves until the next layer of base course material, pavement or concrete is placed on the granular base course material. Granular base course material placed as a finished surface shall be maintained as stated elsewhere in the Contract Documents.

END OF SECTION