Part 1 General

1.1 REFERENCE STANDARDS

.1 Specifications for aggregates and soils and the compaction of aggregates and soils refer to ASTM Sieve Analyses and ASTM Tests.

.2 Other materials are specified with reference to CGSB Standards, CSA Standards and ASTM Standards.

1.2 SUBMISSIONS

.1 At least two (2) weeks before beginning work, the Contractor shall submit to the Owner for review, a complete and detailed outline of the procedures and methods that he will employ for this section of the Work.

.2 The Contractor shall not begin work until the Owner has reviewed the submission.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to the site and store in a manner such that granular materials are kept in separate piles and manufactured materials are stored according to the recommendations of the manufacturer.

.2 Gravel material required shall be selected from available local sources. These sources shall be subject to the Owner's approval, and Land Use Permits must be obtained by the Contractor for the use of these materials. The contractor is responsible to obtain all necessary permits and will be responsible to pay for all permits and Royalties

.3 The Contractor is advised that crushing and/or screening and mixing of the material, especially for the fine gravel may be required to meet the specifications. The Contractor shall at no additional cost to the Owner screen and blend materials from one or more sources to achieve the gradations shown and to permit compaction to the required levels called for in this Section.

.4 The Owner reserves the right to have sampling of granular material and concrete, as well as compaction tests, carried out by an independent material testing firm to satisfy the specifications are met. Should results indicate that the specifications are not met, all costs related to the sampling, testing and correction of the problem will be charged to the Contractor, unless the Contractor can produce proof of compliance.

.5 Frozen material and ice will not be accepted as backfill material.

NOTE: No earthwork construction shall be done when the surface of the ground is frozen. Compaction at freezing temperatures is not effective.

1.4 JOB CONDITIONS AND REGULATIONS

.1 Perform work in accordance with the Safety Act and General Safety Regulations of Nunavut.

.2 Perform work in a manner that will cause the least disruption or danger to traffic and pedestrians.

.3 The Contractor is responsible for posting of warning and traffic signs, with supply and placing of barricades and protective hoarding.

1.5 QUALITY ASSURANCE

.1 Submit to the Owner, a list of sources of materials including sand, gravel and borrow materials.

.2 Provide samples, test results, sieve analyses and reports for preliminary approval of all materials.

1.6 MINIMUM QUALITY CONTROL TEST REQUIREMENTS

.1 The following frequencies of testing are the minimum required. The Contractor shall perform as many tests as are necessary to ensure that the Work conforms to the requirements of the contract regardless of the minimum number specified.

.2 Provide moisture/density curves for each type of material, from each source of material, to be compacted to a specified density.

.3 Field densities:

- Structures and Embankments (from excavated material) - one for each 400m^2 of each compacted layers.
- Subgrade Preparation - one field density for every 200m^2 of 150mm compacted layers.
- Sub-base and Base course - one field density for every 100m^2 of sub-base and one field density for every 100m^2 of base course.

1.7 DISPOSAL

.1 All materials on site, whether stockpiled, stored or excavated, are the property of the Owner, and the Owner reserves the right to keep any part or all of the material.

.2 The Contractor shall dispose of debris, waste, unsuitable material, rock or excess material in accordance with the Specifications.

.3 The Contractor is encouraged to reuse materials encountered on site to the extent they comply with the specifications in this Section.

.4 Disposal sites must be approved by the community and the Owner.

.5 The Contractor shall dispose of all materials at sites, located by the Contractor, in cooperation with the community.

Part 2 Products

2.1 GRANULAR MATERIALS

.1 Fine Gravel shall comply with the following gradation. It shall be native, clean, well graded, organic free gravel. It is recommended this material be crushed prior to placement.

Sieve Size	Percent Passing by Weight
25mm	100
20.0mm	95 - 100
12.5mm	65 - 95
5.0mm	35 - 65
1.25mm	20 - 35
0.315mm	10 - 20
0.08mm	2 - 8

.2 Coarse Gravel shall comply with the following gradation, except that no more than 10% of the fill material shall pass through a No. 200 sieve. It shall be native, clean, well graded, organic free gravel. It is recommended this material be crushed and/or screened prior to placement.

Sieve Size	Percent Passing by Weight
75 mm	100
5.0mm	25 - 50
0.08mm	2 - 8

2.2 COMMON FILL

.1 Shall be native material found on site or imported and free of stones larger than 100mm in size, frozen matter, rubbish, and organics or vegetation (except natural vegetation over permafrost).

2.3 RIP RAP

.1 Use Class 1 Nominal Size 300mm hand placed rock rip rap.

.2 Rip Rap shall be:

- 100% smaller than 450mm or 136kg
- 20% larger than 350mm or 68kg
- 50% larger than 300mm or 36kg
- 80% larger than 200mm or 11kg

Part 3 Execution

3.1 CONSTRUCTION METHODS - GENERAL

.1 The Contractor is advised that the Drawings and Specifications are not based on a legal survey plan of the existing facilities, or detailed survey information of existing site conditions.

.2 The location of property limits, fences and benchmarks are shown on the Plot Plans and the Grading and Drainage Plans. The Contractor is responsible to maintain and safeguard these throughout the construction period.

.3 Should a benchmark have to be relocated for the purpose of construction, it shall be relocated on a permanent structure and properly identified.

.4 The elevations and dimensions shown on the Project Drawings are for the purpose of construction, measurement and evaluating progress payments. The Contractor shall ensure that final elevations are adhered to.

.5 The Contractor is responsible for all construction surveys and documentation to verify quantities.

.6 The Owner reserves the right to carry out independent testing of backfill materials and concrete as indicated in other Sections. This does not relieve the Contractor of his responsibility to provide his own testing to ensure proper installation of the materials.

3.2 SITE PREPARATION

.1 At all developed areas.

.1 Prior to proceeding with any backfill operation, the Contractor shall prepare the sites as indicated below or as specifically directed by other parts of the Contract Documents.

.2 Any trees and brush should be carefully removed if any so as not to disturb the surface of the peat. Frost-stable fill should be placed and compacted in lifts of 150 mm maximum thickness on the peat.

.3 Remove all boulders resting on the ground in excess of 300mm in size. Buried boulders in excess of 300mm in size and so protruding from the grade that they interfere with new work, shall be removed and the hole left in the ground shall be backfilled immediately with fine gravel compacted to 95% standard proctor density (SPD). Extent of backfill shall exceed the hole by at least 1,000mm on all sides and extend a minimum of 450mm above adjacent ground elevations. Slope backfill sides at 2:1 maximum.

.4 Level off areas as required and prepare for backfilling operation as outlined below in order to reach the finish levels shown on the Drawings.

.5 Clear as required by the Drawings.

.6 Proper precautions shall be taken during excavation so as not to expose unduly the permafrost surface. Prolonged exposure of the frozen soil may result in excessive thawing and water accumulation in the excavation. Backfill operation must follow soon after the excavation is undertaken. Limit and minimize the extent of clearing to allow backfill operation to follow soon after, so as to ensure that a 150mm minimum layer of backfill material is present at all times over excavated areas.

3.3 PLACING AND COMPACTION OF BACKFILL MATERIAL

.1 Backfill material shall be in accordance with the Specifications outlined in *Clause 2.1*

.2 Throughout the developed areas, coarse gravel material shall be added, as required, in maximum 200mm lifts (150 mm compacted thicknesses) to 150mm from the final grade. Each lift shall be compacted to 95% SPD.

.3 Under slab:

.1 Provide a granular pad exceeding the slab layout by a minimum of 250mm all around. The fine gravel material shall be added in 150mm thickness in order to provide a level pad for the concrete slab. The backfill shall be level and compacted to 98% SPD.

3.4 DRAINAGE OF EXCAVATIONS

.1 The Contractor shall take all the necessary measures to keep the excavations free of water at all times and to protect the excavations from damage that may be caused by rain, surface water run- off, ground thawing or otherwise. Create low points as required for pumping water out of the excavations or create temporary ditches to direct water away from the excavations.

.2 The Contractor shall, at his cost, be responsible for any additional excavation and backfill that may be required due to lack of proper drainage of the excavations, and which would have as an effect, the softening of the ground, and consequently, reduction in its load bearing capacity.

3.5 DITCHES

.1 Ditches and drainage swales shall to be provided where necessary and as shown on the project drawings.

3.6 CLEANUP

.1 The Contractor shall cleanup and dispose of all excess material, boulders and other debris as the Work progresses. Any fuel contaminated soil shall be reported to the Owner.

.2 Before the Work is considered complete, the Contractor shall remove all construction equipment, appliances, barricades, surplus materials, etc., and do such other work as may be necessary to leave the site or any other premises occupied by him in a neat, workmanlike condition, as required by the Owner.

END OF SECTION