

Part 1 General

1.1 GENERAL

- .1 This specification shall be read in conjunction with the drawings and all other sections of the contract documents.

1.2 WORK INCLUDED

- .1 The work covered by this section shall include excavation, trenching, backfilling, and disposal of excess materials, as required to complete the work covered elsewhere in the contract documents.
- .2 The contractor shall provide all labour, equipment, and materials to complete the works covered by this section.

1.3 CLASSIFICATION

- .1 Earth Excavation: will include the excavation of all materials except rock excavation classified hereinafter.
- .2 Rock Excavation: will include the excavation of all boulders more than 0.75 cubic metres in volume, or solid ledge rock or concrete foundations which, in the opinion of the Engineer, requires for its removal drilling and blasting or wedging or sledging or barring. No soft or disintegrated rock which can be removed with a pick, or loose, shaken or previously blasted rock will be measured or allowed. Frozen materials shall not be classified as rock nor will extra payment be allowed for excavating same.
- .3 Backfill: in areas other than existing roadways, machine backfilling using approved excavated material will be permitted from the top of the granular backfill.
- .4 Surplus Material: excavated material which not required for the completion of the work.
- .5 Suitable Backfill Material: material from excavation which in the opinion of the Engineer is suitable for use as backfill or for other processes.
- .6 Unsuitable Material: material from an excavation which in the option of the Engineer is not suitable for use as backfill or other processes.

1.4 OCCUPATIONAL HEALTH AND SAFETY ACT

- .1 It is specifically drawn to the attention of the tenderer that all excavations will have to conform strictly to the requirements of the latest Occupational Health and Safety Act adopted by Nunavut.

1.5 SAFETY MEASURES

- .1 Suitable warning signs, lights and barricades shall be erected for the protection of vehicles and pedestrians during construction. Watchmen or flagmen, when required, shall be supplied by the contractor at his own expense.
- .2 The contractor shall comply with the instructions of a safety inspector appointed or recognized by Nunavut whose duty is to enforce territorial acts governing the excavation of trenches and the protection of same.

- .3 The contractor shall inform the municipality's safety inspector of his intention to excavate at least 24 hours before commencing work.

1.6 CAUTION IN EXCAVATION

- .1 The contractor must exercise proper caution in excavating and must repair and make good at his own expense any and all damage done to underground services, culverts, pipes, sewers, house sewers, etc. Where necessary, the contractor shall make necessary explorations to discover location of existing pipes, conduits, services, etc.

1.7 INCONVENIENCE TO ADJACENT PROPERTY OWNERS

- .1 Construction of the work shall be carried out in such a manner that a minimum of inconvenience is caused to the owners and occupants of property adjacent to the works.

1.8 WORKING RESTRICTIONS

- .1 The contractor shall be responsible for maintaining adequate surface drainage during construction. He shall provide all necessary measures to ensure that natural drainage is not impeded to the detriment of the municipalities, private landowners, or the public. Water pumped out or removed from a trench shall not be discharged in the existing sewers unless permission in writing has been obtained from the authority having jurisdiction.
- .2 Steel-tracked equipment will not be allowed on the pavement at any time, unless the pavement is protected by planks, pads, or other devices.

Part 2 Products

2.1 MATERIALS

- .1 Granular Material: Granulars A, B, C, Modified C, Riprap and Sand shall meet the requirements set out in Section 31 05 17 – Aggregate Materials.

Part 3 Execution

3.1 GENERAL

- .1 The contractor shall read and be governed by the General Conditions, General Instruction, Instructions to Tenderers, Addenda, Form of Tender, Articles of Agreement, Plans and Specifications for this project.
- The complete work under each trade shall be governed by the dictates of good practice in all details of materials and methods even if not minutely specified. The complete work shall be properly co-ordinated with the work of other trades.

3.2 PREPARATION OF WORK

- .1 The contractor, at his own expense, shall clear the surface or road as may be necessary for the full width and length of the proposed trenches or structures and shall dispose of all refuse in a manner satisfactory to the Engineer. The unit prices for the work shall include all costs incurred in removing material of whatever nature from the surface of the ground or road.

3.3 DRAINAGE

- .1 The contractor shall keep all portions of the work properly and efficiently drained during construction and until completion. He shall be held responsible for all damage that may be caused as the result of water backing up or flowing over, through, from, or along any part of the work or surrounding properties due to his operation.
- .2 All costs associated with providing drainage for the work as required, shall be included in the unit prices of the related work items.

3.4 EXCAVATION

- .1 Excavation shall be taken to mean the removal of all materials of whatever kind encountered. All excavation shall be made exactly to the level as shown on the drawings or as established by the Engineer. Excavation and backfilling shall proceed at such a pace as to prevent permafrost degradation. It shall be braced and drained in a manner to insure that workers may work safely and efficiently therein.
- .2 Large rocks and boulders shall be removed to provide a clearance of at least 0.15 metres below and on each side of all insulation, forms and appurtenances.

3.5 ROCK EXCAVATION

- .1 Any boulders greater than 0.75 cubic metres in volume and any rock that cannot be excavated with a 0.5 cubic metre or larger trackmounted machine, will be paid for as rock. Volume of individual boulders will be determined by measuring three mutually perpendicular dimensions. When rock is encountered, the Engineer must be notified at once, so that measurements can be made.
- .2 Measurements for rock volume shall be taken from the top of the rock strata to the bottom of the strata. If the rock strata extends below the elevation of the invert of the pipe or culvert, then an allowance of 0.15 metres below the bottom of the pipe insulation or culvert will be used in calculating the volume of rock.
- .3 Soft shale, soft sandstone, or other rock that can, in the opinion of the Engineer, be successfully excavated with a 0.5 cubic metre backhoe or equivalent without blasting and without unusual wear and tear to the machine will not be classified as "rock excavation". Hardpan will not be classified as "rock excavation". Frozen subgrade material or permafrost will not be classified as "rock excavation".

3.6 BLASTING

- .1 Blasting is not permitted on this job.

3.7 BRACING AND SHORING

- .1 Bracing and shoring is the sole responsibility of the contractor. Open-cut trenches shall be sheeted and braced as required by the Workers' Compensation Board and Municipal ordinances, and as may be necessary to protect life, property, and work.
- .2 When close sheeting is required, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting. The Engineer reserves the right to order the sheeting driven to the full depth of the trench or to such additional depths as may be required for the protection of the work. Where the soil in the lower limits of the trench has the necessary stability, the Engineer, at his discretion, may permit

the contractor to stop the driving of sheeting at some designated elevation above the trench bottom. The granting of permission by the Engineer, however, shall not relieve the contractor in any degree from his full responsibility under the contract. Sheeting and bracing, which have been ordered left in place, must be cut off and removed for a depth of one metre below the established road grade or the existing surface of the road, whichever is lower. Trench bracing, except that which must be left in place may be removed as the backfilling proceeds. Backfilling and withdrawal of sheeting shall proceed together; no voids shall be left in the trench by the withdrawal of the sheeting. Sheeting shall not be driven any further below the bottom of the trench than is necessary to insure proper support for the sheeting.

- .3 The cost of furnishing, placing and removing the sheeting and bracing shall be included in the price bid for the work. When sheeting and bracing have been ordered left in place by the Engineer, the payment for such material shall be as an extra at cost of the material, plus 20% and shall include the upper one metre of "cut-off" section of the sheeting.

3.8 TRENCHING BY HAND

- .1 In any location where the use of digging machinery might cause property or utility damage the contractor shall carry out the excavation by hand at no extra cost to the owner.

3.9 EXCAVATED MATERIAL

- .1 All excavated material shall be piled into three piles –
 - .1 Suitable material that can be used for backfill
 - .2 Unsuitable material that can not be used for backfill or other processes, and
 - .3 Frozen Material. If upon inspection by the engineer, the thawed material is deemed suitable for use as backfill, this material can be classified as suitable, otherwise the material will be classified as unsuitable.
- .2 Excavated material not required for the completion of the work shall be considered surplus material, and disposed of according to Clause 3.11, "Cleaning Up and Disposal of Surplus Excavated Material".
- .3 Unsuitable material shall be considered surplus material.
- .4 All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing roadways and driveways. Hydrants under pressure, access vaults and other utility controls shall be left unobstructed and accessible. Gutters and swales shall be kept clear or other satisfactory provisions made for roadway drainage, and natural watercourses shall not be obstructed.

The earth taken from the trench shall be neatly deposited at the sides in such a manner as to obstruct the road or driveway as little as possible. When it is impractical, in the opinion of the Engineer, to place the earth at the side of the trench it shall be removed and deposited as designated by the Engineer. In either case, a clear space must be left on one side of the trench to accommodate the survey stakes.

- .5 Permafrost excavated from the trench shall not be stockpiled on top of material to be used as backfill. Materials which are unsatisfactory after permafrost has been stockpiled on top of it shall be considered contaminated and removed from the site by the contractor. The contractor shall be governed by Clause 3.10, "Ownership of Excavated

Materials", and Clause 3.11, "Cleaning Up and Disposal of Surplus Excavated Material", when disposing of the contaminated material.

- .6 Extra backfill material required because of the disposal of material contaminated by permafrost shall be supplied, placed, and compacted by the contractor at his expense; see Clause 3.15 "Backfilling", for specifications on the approved backfill materials and methods.

3.10 OWNERSHIP OF EXCAVATED MATERIAL

- .1 Surplus earth and other excavated materials will remain the property of the owner.
- .2 All surplus or other material of any kind arising from, or during the construction of the works or any portion, thereof which belongs to the owner shall not be sold, thrown away, dumped, wasted or otherwise disposed of, except as directed by the Engineer. If so disposed of by the contractor, the Engineer shall ascertain, as nearly as he can, the quantity and value thereof, and shall direct the contractor or his sureties to pay unto the owner the amount thus found, or the owner may deduct it from any subsequent progress estimate.

3.11 CLEANING UP AND DISPOSAL OF SURPLUS (EXCESS) EXCAVATED MATERIAL

- .1 All surplus and excess materials that arise out of the construction of the works shall be removed there from and neatly piled, evenly spread or deposited where and as directed by the Engineer, and the whole expense of loading, hauling, unloading, piling, spreading or otherwise dealing with the said waste material shall be borne by the contractor. If any material is dropped or spilled it shall be promptly removed to the satisfaction of the Engineer.

3.12 WATER IN EXCAVATION

- .1 All water pumped or drained from the work shall be disposed of in a suitable manner satisfactory to the Engineer, without damage to the Construction work.
- .2 The expense of removing the water, regardless of origin, is the responsibility of the contractor. The contractor shall be wholly responsible for any damage that may occur due to ground water or storm water entering the trench during the period of construction.
- .3 No extra payment shall be made for additional excavation and backfill that is required due to subgrade that has become unstable due to water from any source.

3.13 BACKFILLING

- .1 Excavations shall be backfilled with materials taken from the excavations, if in the opinion of the Engineer, they are suitable for use as compacted backfill. Otherwise granular "B" or backfill approved by the Engineer shall be supplied by the contractor as backfill.
- .2 All backfill shall be mechanically compacted in even layers not exceeding 0.15 metres in thickness so that there is no subsequent subsidence in the trench. The backfill shall be compacted to a density of 95% of the maximum density at optimum moisture content as determined by the Standard Proctor Test.
- .3 Any deficiency in the quantity of material for backfilling the trenches or filling depressions caused by settlement shall be supplied by the contractor at his expense.

- .4 Trenches shall be backfilled to the original ground line level. The remaining fill shall be classified as surplus excavated material and disposed as per Clause 3.11 "Cleaning Up and Disposal of Surplus Excavated Material".
- .5 No frozen material will be accepted as backfill. Surfaces that have settled as a result of using frozen backfill will be regraded at the contractor's expense.

3.14 RESTORATION OF SURFACES AND/OR STRUCTURES

- .1 Except where otherwise specified, the contractor shall restore granular road surfaces, pavement, ditches, fences, or other disturbed surfaces or structures to a condition equal to that before the work began and to the satisfaction of the Engineer, and shall furnish all labour and materials incidental thereto at his own expense.
- .2 In open field areas upon completion of all trenching and backfill, the entire disturbed area shall be bladed level.

Part 4 Measurement and Payment

4.1 MEASUREMENT

- .1 **Rock Excavation:** Rock excavation shall be measured on a cubic metre basis. The quantity shall be calculated using the in-field depths from the top of the pipe. The width shall be determined by utilizing the theoretical trench width in accordance with the detailed drawing herein.

Section shall be taken by the Engineer at a minimum of 3 metre intervals or at major changes in rock elevation.
- .2 **Granular Material:** Granular material will be measured on the cubic metre basis by previously measured truck boxes. All trucks are to be full and level at time of delivery. All truck loads will be signed for by the Engineer's agent before dumping.
- .3 **Excavation and Subexcavation:** Excavation and Subexcavation will be measured in cubic metres. The quantity shall be determined by the Engineer through sections taken in the field.

4.2 PAYMENT

- .1 **Earth Excavation:** Where earth excavation is a separate item it shall be paid by the cubic metre as measured in Clause 4.1.3. If earth excavation is considered as a part of an item, all costs associated with excavation will be included in that item. Any excavation required because of actions of the contractor will be at his own expense.
- .2 **Rock Excavation:** Rock excavation shall be paid by cubic metre as measured by the Engineer, as described in Section 4.1.1, at the unit price tendered by the contractor.

Rock excavation shall be considered separate from the cost of pipe installation.
- .3 **Backfill:** Where backfill is considered as a part of the item, all costs associated with backfill will be included in that item. If backfilling is required as a result of the actions of a contractor it will be at his own expense.

- .4 Granular Material: Granular material required under a specific item will be paid for under that item. Granular material ordered by the Engineer and not included under a tender item will be paid for per cubic metre, as measured under Clause 4.1.2. Granular material ordered by the Engineer because of actions of the contractor will be at the contractor's expense. The cost of granular material will include supply, placing, and compacting.

END OF SECTION