1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 35 29.06 – Health and Safety Requirements

.3 Section 01 35 43 – Environmental Procedure

.4 Section 02 65 00 – Aboveground Storage Tank Removal

1.2 NOT USED

.1 Not Used

1.3 REFERENCES

.1 Latest edition of American Society for Testing and Materials International (ASTM)

.2 ASTM C117, Standard Test Method for Material Finer Than 0.080 mm Sieve in Mineral Aggregates by Washing.

.3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D422-63, Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft3 (2,700 kN-m/m3))

.6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.7 Latest edition of Canadian General Standards Board (CGSB)

.8 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.

.9 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.10 Latest edition of New Brunswick Department of Transportation (NBDTI) Standard Specifications.

1.4 DEFINITIONS

.1 Excavation class: one class of excavation will be recognized: common excavation.

.2 Common excavation: excavation of materials of whatever nature.

.3 Topsoil:
- .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25mm in any dimension.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Preconstruction Submittals:
- .1 Submit records of underground utility locates, indicating: location plan of relocated and abandoned services to Departmental Representative, as required.

.2 Samples:
.1 Inform Engineer at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.
.2 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
.3 Ship samples to Engineer, in tightly closed containers to prevent contamination and exposure to elements.

1.6 QUALITY ASSURANCE

.1 Do not use soil material until written report of soil test results are reviewed and approved by Engineer.

.2 Health and Safety Requirements:
.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.7 EXISTING CONDITIONS

.1 Existing buried utilities and structures:
.1 Prior to beginning excavation Work, notify Engineer to establish location and state of use of buried utilities and structures. Contractor to have locations clearly marked to prevent disturbance during Work.

.2 Confirm locations of buried utilities by careful test excavations.

.3 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.4 Where utility lines or structures exist in area of excavation, obtain direction of Engineer.

.5 Record locations of maintained, re-routed,

and abandoned underground lines.

2.1 MATERIALS

.6 All materials shall be supplied by the Contractor.

.7 Approved Backfill

.1 Unsuitable construction material/debris (non-contaminated) must be completely removed from the excavation until a suitable material is encountered. Soil review will be conducted with soils Consultant.

.2 Following removal of unsuitable material from the excavation, the unsuitable material must be removed from site.

.3 Following completion of unsuitable material removal, exposed sub-grade shall be proof rolled under direct Geotechnical supervision.

.4 Soft spots or loose areas defined by the proof rolling process will be excavated and refilled with 100mm Crushed Gravel fill and compacted to 95% of the material’s maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor).

.5 Excavation to be backfilled with approved 100mm Crushed Gravel. The top 300mm below finished surface grade is to be 31.5mm Crushed Gravel material (see herein);

.6 Fill shall be placed in lifts not exceeding 300mm in loose thickness, and be compacted throughout the lift thickness to a maximum of 95% the material’s maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor). Depending on the compaction equipment, thinner lifts may be necessary in order to achieve the specified compaction criteria.

.7 In the event of winter construction,

fill shall be placed and compacted in an unfrozen condition.

3.1 SITE PREPARATION

.8 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.9 Cut pavement neatly along limits of proposed excavation.

3.2 PREPARATION / PROTECTION

.1 Keep excavations clean, free of standing water, and loose soil.

.2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.3 Protect natural and man-made features required to remain undisturbed.

.4 Protect buried services that are required to remain undisturbed.

3.3 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.3 Protect open excavations against flooding and damage due to surface run off.

3.4 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as indicated.

.2 For trench excavation, unless otherwise authorized by Engineer in writing, do not excavate more than 30m of trench in advance of installation operations and do not leave

open more than 15m at end of day's operation.

.3 Keep excavated and stockpiled materials a safe distance away from edge of trench as directed by Engineer.

.4 Restrict vehicle operations directly adjacent to open trenches.

.5 If surplus or unsuitable materials are excavated, Contractor shall notify the Departmental Representative to confirm the material is not contaminated. Any required testing will be completed and paid for by the Departmental Representative. If not contaminated, Contractor shall dispose of surplus and unsuitable excavated material off site.

.6 Do not obstruct flow of surface drainage or natural watercourses.

.7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.8 Notify Engineer when bottom of excavation is reached.

.9 Obtain Engineer approval of completed excavation.

.10 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Engineer.

.11 Correct unauthorized over excavation as follows:

.1 Fill under areas with NBDTI 100mm Crushed Gravel compacted to not less than 95% of the material’s maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor).

.12 Hand trim, make firm and remove loose material and debris from excavations.

.13 Where material at the bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.5 FILL TYPES AND COMPACTION

.1 31.5mm Crushed Gravel
.1 Shall meet the requirements of NBDTI 31.5mm Crushed Gravel Aggregate Base.

.2 100mm Crushed Gravel
.1 Shall meet the requirements of NBDTI 100mm Crushed Gravel Aggregate Subbase.

.3 Sand
.1 Where required, shall meet the requirements of Concrete Sand CSA A23.1

3.6 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated.

.2 Place bedding and surround material in unfrozen condition.

3.7 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:
.1 Until directed by Departmental Representative
.2 Inspecting, testing, and recording location of underground utilities.

.2 Areas to be backfilled are to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 300mm in loose thickness up to

grades indicated. Compact each layer to the density specified prior to placing the succeeding layer.

3.8 RESTORATION

.1 Replace topsoil as directed by Departmental Representative.

.2 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.3 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.