.

PART 1 - GENERAL

1.1 Related Sections

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 03 30 00 – Cast-in-Place Concrete.

.3 Section 31 05 17 – Aggregates: General.

.4 Section 31 23 16.26 – Rock Removal.

.5 Section 31 24 13 – Roadway Embankments.

1.2 References

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D698-07, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbs/ft^3) (600 kN-m/m^3).
- .5 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.3 Definitions

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
- .1 Rock : any solid material in excess of 0.25 m^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.

.2 Waste material: excavated material

unsuitable for use in Work or surplus to requirements.

.3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
.1 Owner-supplied stockpiles of blasted rock and crushed aggregates, suitable for further processing as 'Borrow', are available for use at Contractor's discretion. Stockpiles are located at Rocky Barachois (approx. 7.0km South of the site). Refer to Section 31 05 17 – Aggregates: General.

.4 Unsuitable materials:
.1 Weak and compressible materials under excavated areas.
.2 Frost susceptible materials under excavated areas.
.3 Frost susceptible materials:
.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1.

.2 Table

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 – 45

.3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

.5 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 Quality Assurance

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 For design of any temporary structures submit design and supporting data at least 2 weeks prior to installation or construction.

.3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.

.4 Keep design and supporting data on site.

.5 Engage services of qualified professional Engineer who is registered or licensed in Province of Newfoundland and Labrador, Canada in which Work is to be carried out to design and inspect shoring, bracing and underpinning required for Work.

1.5 Cofferdams, Shoring, Bracing, and Underpinning

.1 Shoring, Bracing or underpinning may be required to prevent undermining of adjacent structures, underground utilities and/or traffic areas.

.2 Comply with safety requirements and applicable local legislation to protect existing features.

.3 Engage services of qualified Professional Engineer who is registered in the Province of Newfoundland and Labrador to design and inspect cofferdams, shoring, bracing and underpinning required for work.

.4 At least 2 weeks prior to commencing work, submit design and supporting data.

.5 Design and supporting data submitted to bear the stamp and signature of qualified Professional Engineer licensed in the Province of Newfoundland and Labrador.

1.6 Existing Conditions

.1 Examine geotechnical report prepared by SNC-Lavalin Inc., dated April 11, 2014, Internal Ref. 616809-GEOT-4ER-0001_00, included in Appendix B.

PART 2 - PRODUCTS

2.1 Materials

.1 Rock Borrow: blasted or crushed rock consisting of durable crushed stones, having 100% by mass pass through a 150 mm x 150 mm screen, and a maximum 10% by mass pass through a maximum 100 mm x 100mm screen. Rock to consist of angular fragments obtained by breaking and crushing solid or natural rock, reasonably free from thin, flat

elongated or other objectionable pieces and fines or as otherwise approved by the Departmental Representative.

.2 Fill Against Structure:

.1 Blasted or crushed rock, as approved by the Departmental Representative.

.2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1 and CAN/CGSB-8.2

Sieve Designation	% Passing
112 mm	100
40 mm	60 - 85
5 mm	25 - 50
0.315 mm	5 - 15
0.080 mm	2 - 7

.3 Other properties as follows:

.1 Los Angeles Abrasion: Max. 45

.2 Plasticity Index: Max. 6 (sand portion)

.3 Select Backfill Material: selected material from excavations or other sources, approved by the Departmental Representative for use intended, unfrozen and free from rocks larger than 80 mm, cinders, ashes, sods, refuse or other deleterious materials.

PART 3 - EXECUTION

3.1 Site Preparation

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

.2 Sawcut pavement neatly along limits of proposed removal in order that surface may break evenly and cleanly

3.2 Dewatering

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

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

.3 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved runoff areas and in manner not detrimental to public and private property,

existing facilities, or portion of Work completed or under construction.
.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

.4 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.3 Excavation

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

.2 Excavation must not interfere with bearing capacity of adjacent foundations.

.3 Dispose of surplus and unsuitable excavated material in approved location off site.

.4 Do not obstruct flow of surface drainage.

.5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft, organic matter or unsuitable materials.
.1 For foundations and structures, excavate to level of competent bearing stratum, described in geotechnical report as compact, unaltered glacial till or bedrock. Do not disturb soil or rock below bearing surface.

.6 Notify Departmental Representative when bottom of excavation is reached.

.7 When competent bearing stratum is encountered, proof roll using a 10 - 12 tonne vibratory roller. Conduct a test strip to determine number of passes required to fully compact bearing surface. Obtain written approval from Departmental Representative to use non standard proof rolling equipment.

.8 If encountered, remove loose, soft or unsuitable material from excavation bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

.9 Obtain Departmental Representative's approval of completed excavation.

3.4 Fill Types & Compaction

.1 Use types of backfill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698.
.1 Rock Borrow: compact to 95% of maximum dry density.
.2 Fill Against Structure: compact to 95% of maximum dry density.
.3 Select Backfill Material: compact to 95% of maximum dry density.

3.5 Backfilling

.1 Do not proceed with backfilling operations until Departmental Representative has inspected and approved installations.

.2 Areas to be backfilled 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 200 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Backfilling around installations.
.1 Place bedding and surround material as specified elsewhere.
.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
.3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1.0 m.
.4 Larger compaction equipment should not be used within 1.5 m of concrete. Backfill material to be compacted using hand operated or walk-behind equipment.

3.6 Restoration

.1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.

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

.3 Restore site to its normal state prior to excavation.

END