PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for excavating and backfilling in those areas where new electrical conduit is installed.

1.2 RELATED SECTIONS

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 31 05 17 – Aggregate Materials.

.3 Section 31 23 25 - Rock and Gravel Fill.

.4 Section 32 11 16 – Granular Sub-Base.

.5 Section 32 11 23 – Aggregate Base Courses.

1.3 MEASUREMENT FOR PAYMENT

.1 No separate measurement for payment to be made under this section. Include all costs in the lump sum arrangement, as noted on the bid acceptance form.

1.4 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.
.3 Canadian Standards Association (CSA)
.1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction.

1.5 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 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.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.

.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.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular Base: As per Section 32 11 23 – Aggregate Base Courses.

.2 Granular Sub-Base: As per Section 32 11 16 – Granular Sub-Base.

.3 Asphalt Paving: As per 32 12 16 – Asphalt Paving.

.4 Bedding: Clean, hard durable sand, gravel or crushed stone, free from shale, clay, friable materials, organic matter and other delirious substances when tested to ASTM C136-B4a and ASTM C117-87 and giving a smooth curve without sharp breaks when plotted on a semi-log grading chart:

ASTM Sieve Designation	%Passing
9.5mm	100
4.75mm	50-100
2.00mm	30-90
0.075mm	0-10

PART 3 - EXECUTION

3.1 SITE PREPARATION

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

3.2 EXCAVATION

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

.2 Remove all cribwork and other obstructions encountered during excavation in accordance with Section 02 41 16 - Sitework, Demolition and Removal.

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

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

.5 Do not obstruct flow of surface drainage.

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

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

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

3.3 FILL TYPES AND COMPACTION

.1 Use fill of types as indicated.

3.4 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 150 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.

3.5 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.