

Part 1 General

1.1 DESCRIPTION

- .1 This section specifies requirements for the excavating, trenching and backfilling for the underground electrical services associated with the wharf renovations as shown on the drawings and specified herein.

1.2 RELATED SECTIONS

- .1 Section 26 05 00 – Common Work Results for Electrical.
- .2 Section 33 65 73 – Concrete Encased Conduit Banks.

1.3 REFERENCE STANDARDS

- .1 ASTM C117-90, Test Method for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-92, Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D698-78(1990), Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 2.49 kg Rammer and 304.8 mm Drop.
- .4 ASTM D1557-78(1990), Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 4.54 kg Rammer and 457 mm Drop.
- .5 CAN/CGSB-8.1-M88, Sieves, Testing, Woven Wire, Inch Series.
- .6 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.4 PROTECTION OF EXISTING FEATURES

- .1 Existing buried utilities and structures:
 - .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .2 Prior to commencing any excavation work, notify applicable owner or authorities having jurisdiction to establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during work.
 - .3 Confirm locations of buried utilities by careful test excavations.
 - .4 Maintain and protect from damage any water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .5 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing. Costs for such work to be paid by the Owner.
 - .6 Record location of maintained, re-routed and abandoned underground lines.

- .2 Existing structure and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of existing buildings, service poles, wires, paving, survey bench marks and monuments which may be affected by work.
 - .2 Protect existing structure and surface features which may be affected by work from damage while work is in progress. In the event of damage, immediately make repair to approval of Departmental Representative.
 - .3 Where existing asphalt is removed to install underground electrical within existing paved areas, patch asphalt per existing construction to match adjacent surfaces. Minimum finished asphalt thickness 100mm.

1.5 SAFETY

- .1 Construction methods and procedures employed by the Contractor in carrying out the excavation must safeguard public and private property and must be carried out in strict compliance with Section 21 of Regulation 77-1 of the Occupational Health and Safety Act of the Province of New Brunswick.

Part 2 Products

2.1 MATERIALS

- .1 Backfill materials:
 - .1 Type 1 fill: selected materials from excavations, suitable to Departmental Representative for use intended, free from frozen materials, cinders, ashes, sods, organic materials, refuse or other deleterious substances.
 - .2 Type 2 fill:
 - .1 Granular sub-base to be durable, non-friable, well graded pit run sand and gravel having a maximum particle size of 75 mm and a maximum of 5% by weight passing the number 200 mesh sieve (0.075 mm size).
 - .2 Other properties as follows:
 - .1 Los Angeles Abrasion ASTM C131-81 (AASHTO T96-77) Gradation "A" Max. % Los by Weight 40.
 - .2 Minimum CBR requirements of 40 (ASTM D1883).
 - .3 Bedding material: well graded natural sand or crushed rock screenings to following grading requirements:

<u>ASTM Sieve Size</u>	<u>Percent Passing</u>
9.50 mm	100
4.75 mm	50-100
2.00 mm	30-90
425 µm	0-0.1

Part 3 Execution

3.1 STOCKPILING

- .1 Stockpile fill materials in areas designed by Departmental Representative. Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Stockpile excavated materials suitable for backfill in designated locations.
- .4 Separate materials containing sods, muck, frozen lumps, cinders, ashes, organic or other deleterious substances not suitable for backfill.
- .5 Dispose of unsuitable and surplus material at locations in a manner to approval of Departmental Representative.

3.2 DEWATERING

- .1 Provide pumps and other equipment and materials necessary to keep excavations free of water while work is in progress.
- .2 Do not pump during placing of concrete, or for a period of at least 24 hours thereafter, unless from a pump separated from concrete work by a watertight wall or other effective means.
- .3 Dispose of water in a manner not detrimental to public health, environment, public and private property, or any portion of work completed or under construction.

3.3 TRENCHING

- .1 Excavate to lines, grades, elevations and dimensions indicated or as directed by Departmental Representative.
- .2 Excavation must not interfere with normal 45° splay of bearing from bottom of any footing.
- .3 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of days operation.
- .4 Dispose of surplus and unsuitable excavated material off-site.
- .5 Do not obstruct flow of surface drainage or natural watercourses.
- .6 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .7 Notify Departmental Representative when soil at bottom of excavation appears unsuitable and proceed as directed by Departmental Representative.
- .8 Obtain Departmental Representative's approval of completed excavation.

- .9 Remove unsuitable material from trench bottom to extent and depth directed by Departmental Representative.
 - .10 Where required due to unauthorized over-excavation, correct as follows:
 - .1 Fill under bearing surfaces and footings with concrete specified for footings.
 - .2 Fill under other areas with granular sub-base compacted to minimum of 95% of maximum dry density, ASTM D1557-78 modified Proctor Density.
 - .11 Hand trim, make firm and remove loose material and debris from excavations immediately prior to placing concrete. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.
 - .12 Do not commence further work until Departmental Representative has inspected, measured and approved excavated surfaces.
- 3.4 BACKFILLING AROUND SERVICES
- .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 or frozen ground.
 - .3 Do not use backfill material which is frozen or contains ice, snow or debris.
 - .4 Backfilling around installations.
 - .1 Place bedding and surrounding material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing.
 - .3 Place layers simultaneously on both sides of installation work to equalize loading.
 - .4 Place material by hand under, around and over installations in 100 mm lifts until 300 mm of cover is provided. Dumping material directly on installations will not be permitted. Compact to 95% of maximum dry density ASTM D1557-78, Modified Proctor Density.

END OF SECTION