

1 General

1.1 RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.
- .2 Section 26 05 00 - Common Work Results - Electrical.
- .3 Section 31 23 33.01 - Excavation, Trenching and Backfill.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA),
 - .1 CAN/CSA-A3000, Cementitious Materials Compendium. Includes:
 - .1 CAN/CSA-A5, Portland Cement
 - .2 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/ Methods of Test for Concrete.
 - .3 CSA G30.3, Cold-Drawn Steel Wire for Concrete Reinforcement.
 - .4 CSA-G30.18, Billet-Steel Bars for Concrete Reinforcement.

1.3 SUBMITTALS

- .1 Submit manufacturer's test data and certification at least 2 weeks prior to commencing work.
- .2 Submit manufacturer's information data sheets and instructions.

1.4 DELIVERY STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.5 RECORD DRAWINGS

- .1 Provide record drawings, including details of pipe and duct bank materials, maintenance and operating instructions in accordance with Section 01 78 00 - Closeout Submittals.

2 Products

2.1 PVC DUCTS AND FITTINGS

- .1 Rigid PVC duct and conduit for exterior underground site lighting circuits and wiring below interior concrete floor slabs, size as indicated to CSA C22.2, with moulded fittings and minimum wall thickness at any point of 2.8 mm. Nominal length: 3 m plus or minus 12 mm.
- .2 Rigid PVC bends, couplings, reducers, bell end fittings, plugs, caps, adaptors same product material as duct, to make complete installation.
- .3 Rigid PVC 90° and 45° bends.
- .4 Rigid PVC 5° angle couplings.
- .5 Expansion joints as required.
- .6 Preformed, interlocking intermediate duct spacers for duct size as indicated.

2.2 SOLVENT WELD COMPOUND

- .1 Solvent cement for PVC duct joints.

2.3 CABLE PULLING EQUIPMENT

- .1 Pull rope: 6 mm stranded nylon polypropylene, tensile strength 5 kN, continuous throughout each duct run with 3 m spare rope at each end.

2.4 MARKERS

- .1 Provide 150 mm wide, 4 mil, polyethylene marker tape in all trenches. Use red colored tape with block letters which read "CAUTION CAUTION CAUTION ELECTRICAL LINE"
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BURIED BELOW". Install at depth as per drawings.

2.5 DUCT SPACERS

- .1 As required for installation at 1.5m center - center.

3 Execution

3.1 INSTALLATION GENERAL

- .1 Install underground duct banks and manholes including formwork.
- .2 Build duct bank on undisturbed soil or on well compacted granular fill not less than 150 mm thick, compacted to 95% of maximum proctor dry density.
- .3 Install ducts at elevations and with slope as indicated and minimum slope of 1 to 400.
- .4 Install base spacers at maximum intervals of 1.5m levelled to grades indicated for bottom layer of ducts.
- .5 Make transpositions, offsets and changes in direction using 5 degree bend sections, do not exceed a total of 20 degree with duct offset.
- .6 Use conduit to duct adapters when connecting to conduits.
- .7 Cut, ream and taper end of ducts in field in accordance with manufacturer's recommendations, so that duct ends are fully equal to factory-made ends.
- .8 Allow concrete to attain 50% of its specified strength before backfilling.
- .9 Use anchors, ties and trench jacks to secure ducts and prevent moving during placing of concrete. Tie ducts to spacers with twine or other non-metallic material. Remove weights or wood braces before concrete has set and fill voids.
- .10 Clean ducts before laying. Cap ends of ducts during construction and after installation to prevent entrance of foreign materials.
- .11 Immediately after placing of concrete, pull through each duct wooden mandrel not less than 300 mm long and of diameter 6 mm less than internal diameter of duct, followed by stiff bristle brush to remove sand, earth and other foreign matter. Avoid disturbing or damaging ducts where concrete has not set completely. Pull stiff bristle brush through each duct immediately before pulling-in cables.
- .12 Install four 3 m lengths of 15M reinforcing rods, one in each corner of duct bank when connecting duct to manholes or buildings. Wire rods to 10M dowels at manhole or building and support from duct spacers. Protect existing cables and equipment when breaking into existing manholes. Place concrete down sides of duct bank filling space under and around ducts. Rod concrete with flat bar between vertical rows filling voids.
- .13 In each duct install pull rope continuous throughout each duct run with 3 m spare rope at each end.

3.2 MARKERS

- .1 Install marker tape continuously over entire duct run.
- .2 Mark ducts every 150 m along straight runs and changes in direction.
- .3 Where markers are removed to permit installation of additional duct, reinstall existing markers.
- .4 Provide drawings showing locations of markers.

3.3 INSPECTIONS

- .1 Inspection of duct will be carried out by Departmental Representative prior to placing. Placement of concrete and duct cleanout to be done when Departmental Representative present.

END OF SECTION
