

Approved: 2006-12-31

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 74 21 – Waste Management
- .3 Section 31 23 33.01 – Trench Excavation
- .4 Section 26 05 00 – Electricity – General Requirements
- .5 Section 26 05 21 – Wires and Cables (0-1000V)

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA C22.2 No. 18-98(R2003)], Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
 - .2 CSA C22.2 No. 45-M1981(R2003), Rigid Metal Conduit.
 - .3 CSA C22.2 No. 83-M1985(R2003), Electrical Metallic Tubing.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 CABLES AND REELS

- .1 Provide cables on reels or coils.
 - .1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.
- .2 Each coil or reel of cable to contain only one continuous cable without splices.

2.2 CONDUITS

- .1 Rigid metal conduit: to CSA C22.2 No. 45, hot dipped galvanized steel, threaded.
- .2 Metal, corrosion resistant, conduit in areas exposed to bad weather, or underground: Columbex Green-Guard, model number CRG-10 (25mm dia.) and CRG-07 (19mm dia.)
- .3 90° Elbows, made for Green-Guard, model ELG-10
- .4 Reducers 25 x 19mm made for Green-Guard RBG-1007
- .5 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, [with couplings] [with expanded ends].

2.3 CONDUIT FASTENINGS

- .1 One hole steel straps to secure surface conduits 50 mm and smaller.
- .2 Channel type supports for two or more conduits at 1.5m on centre.

2.4 CONDUIT FITTINGS

- .1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified.
Coating: same as conduit.
- .2 Junction Box, indicated EGJ on the plan, manufactured by Crouse-Hinds/Eaton, covered by Green-Guard, model EGJ421-Green-Guard, with 2 sealed connections, model ES53-Green-Guard.
- .3 Junction Boxes, indicated GUATG on the plan, Green-Guard, model GUATG-207.
Installed with the cover accessible from above.
- .4 Junction Boxes, indicated GUABG on the plan, Green-Guard, model GUABG-207.
- .5 Sealed Connections on the plan, Green-Guard, model EYSG-10 (25mm dia.).
- .6 Level sensors, interstitial sensors, and liquid detection sensors, covered with: Material manufactured by Veeder-Root, Model to be chosen based on the sensor's wire diameter.
- .7 Junction Box 100mm x 100mm, mounted on the surface, for electric metal tubes (EMT), conforming to CAN/CSA 22.2 No.18 Standard, Specially fabricated for the prescribed documents.

2.5 FISH CORD

- .1 Polypropylene.

Part 3 Execution**3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.
- .3 Use rigid hot dipped galvanized steel, threaded, Green-guard corrosion resistant, conduit except in dangerous locations exposed to weather, and underground installations.
- .4 Use electrical metallic tubing (EMT) except in cast concrete in dry areas and not subject to mechanical injury.
- .5 Use explosion proof flexible connection for connection to explosion proof motors.
- .6 Install conduit sealing fittings in hazardous areas.
 - .1 Fill with compound.

- .7 Minimum conduit size for lighting and power circuits: 19 mm.
- .8 Bend conduit cold:
 - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .9 Mechanically bend steel conduit over 19 mm diameter.
- .10 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .11 Install fish cord in empty conduits.
- .12 Remove and replace blocked conduit sections.
 - .1 Do not use liquids to clean out conduits.
- .13 Dry conduits out before installing wire.

3.3 SURFACE CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Group conduits wherever possible on U support channels.
- .3 Do not pass conduits through structural members except as indicated.

3.4 CONDUITS UNDERGROUND

- .1 Replace existing underground conduits, redo the cables and reconnect.
- .2 Run parallel or perpendicular to building lines.
- .3 Slope conduits to provide drainage.
- .4 Coordinate the excavation work of the existing trench with the section 31 23 33.01 – Trench Excavation.
- .5 The backfill material must be new, and must not contain clay, sandy clay nodules, roots, pyretic shale, construction degree or organic matter.
- .6 The backfill material underneath the electric conduits: gravel based on section 31 23 33.01 – Trench Excavation.
- .7 Primary backfill around the underground is made of:
 - .1 Sand, based on section 31 23 33.01 – Trench Excavation.
- .8 Membrane around the underground conduits is and the primary backfill is of type Geotextile, non woven polypropylene.
 - .1 Properties

Properties	Test Method	Value
Tension rupture Resistance	ONGC 148.1 No.7.3	800 N
Elongation at Rupture	ONGC 148.1 No.7.3	45 – 105 %
Shear Resistance	ONGC 4.2 No.12.2	360 N
Burst Resistance	ONGC 4.2 No.11.1	2 275 kPa
Permeability	ONGC 148.1 No.4	0.20 cm/s
Permittivity	ONGC 148.1 No.4	0.96 s-1
FOS	ONGC 148.1 No.10	150 µm
Standard Width	ASTM D461.9	3.50 m
Standard Length	ASTM D461.8	100 m

- .2 Accepted Product: Texel model #7612 or equivalent

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION