
Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 05 20 - Wire and Box Connectors (0-1000 V).
- .3 Section 26 05 43.01 - Installation of Cables in Trenches and in Ducts.
- .4 Section 33 65 73 - Concrete Encased Duct Banks and Manholes.
- .5 Section 33 65 76 - Direct Buried Underground Cable Ducts.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CSA C22.2 n° 0.3-09, Test Methods for Electrical Wires and Cables.
 - .2 CAN/CSA-C22.2 n° 131 R2012, Type TECK 90 Cable.
- .2 Underwriters Laboratories of Canada (ULC).
 - .1 ULC-S139-00, Method of Fire Test for Evaluation of Integrity of Electrical Cables.

1.3 PRODUCT DATA

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

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Packaging Waste Management: remove for reuse of packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 ACCEPTABLE PRODUCTS AND MATERIALS

- .1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products.

Part 2 Products

2.1 BUILDING WIRES

- .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 Copper Conductors: size as indicated, with 600 or 1000 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE or RWU90 XLPE, as indicated.
- .3 For lighting circuits, conductor size No. 12 AWG minimum, unless specified otherwise.
- .4 For receptacle outlets, conductor size No. 10 AWG minimum, unless specified otherwise.

2.2 TECK 90 CABLE

- .1 Conductors:
 - .1 Grounding conductor: copper.
 - .2 Circuit conductors: copper, size as indicated.
- .2 Insulation:
 - .1 Cross-linked polyethylene XLPE.
 - .2 Rating: 1000 V.
- .3 Inner jacket: polyvinyl chloride material.
- .4 Armour: galvanized steel.
- .5 Overall covering: thermoplastic polyvinyl chloride, compliant to applicable Building Code classification for this project.
- .6 Fastenings:
 - .1 One-hole galvanized steel straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm.
 - .2 Channel type supports for two or more cables at 1,500 mm centers.
 - .3 Threaded rods: 6 mm diameter to support suspended channels.
- .7 Connectors:
 - .1 Watertight, approved for TECK cable.

2.3 MINERAL-INSULATED CABLES

- .1 Mineral insulated cable to ULC-S139.
- .2 Conductors: solid bare soft-annealed copper, size as indicated.
- .3 Insulation: compressed powdered magnesium oxide or silicon dioxide to form compact homogeneous mass throughout entire length of cable.
- .4 Outer Covering: annealed seamless copper sheath, Type MI rated 600 V, 250 C.
- .5 Overall jacket: none.
- .6 Two-hour fire rating.
- .7 Connectors: watertight, approved for MI cable.
- .8 Termination Kits: approved for MI cable.

2.4 ARMOURED CABLES

- .1 Conductors: insulated, copper, size as indicated.
- .2 Type: AC90.
- .3 Armour: interlocking type fabricated from aluminum strip.
- .4 Connectors: anti-short connectors.

2.5 CONTROL CABLES

- .1 Type: LVT: 2 soft annealed copper conductors, sized as indicated:
 - .1 Insulation: thermoplastic.
 - .2 Sheath: thermoplastic jacket, and armour of closely wound aluminum wire.
- .2 Type: low energy 300 V control cable: stranded annealed copper conductors sized as indicated LVT: 2 soft annealed copper conductors, sized as indicated:
 - .1 Insulation: polyethylene.
 - .2 Overall covering: PVC jackets type FT-4 or protected with interlocked armour of flat galvanized steel.

2.6 ACCEPTABLE PRODUCTS

- .1 Prysmian.
- .2 Alcatel.
- .3 Southwire.
- .4 General Cable.
- .5 Replacement materials or products: approved by addendum according to Instructions to bidders.

Part 3 Execution

3.1 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests using method appropriate to site conditions and to approval of and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).
- .2 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.
- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .5 Wiring in Walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided, unless indicated.

- .6 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.
- .7 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

3.3 INSTALLATION OF BUILDING WIRES

- .1 Install wiring as follows:
 - .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.
 - .2 In underground ducts in accordance with Section 33 65 73 - Concrete Encased Duct Banks and Manholes or Section 33 65 76 - Direct Buried Underground Cable Ducts.

3.4 INSTALLATION OF TECK 90 CABLE (0 -1000 V)

- .1 Group cables wherever possible on channels.
- .2 Install cable exposed, securely supported by straps.

3.5 INSTALLATION OF MINERAL-INSULATED CABLES

- .1 Install cable exposed or concealed, securely supported by straps.
- .2 Support 2-hour fire rated cables at 1 m intervals.
- .3 Make cable terminations by using factory-made kits.
- .4 Cable Terminations: use thermoplastic sleeving over bare conductors.
- .5 Do not splice cables, unless indicated.
- .6 Identify cables every 3 m using adhesive strips marked 600 V.
- .7 Install MI cables in accordance to manufacturer's recommendations.

3.6 INSTALLATION OF ARMOURED CABLES

- .1 In general, all electrical wiring to be done in conduits. However, the following options are acceptable in the following special cases:
 - .1 Where false ceilings are accessible (removable tiles), the main lighting circuit shall be in conduit with junction boxes anchored to the building structure and homogeneously distributed over the entire surface of the installation. From these junction boxes, it is allowed to connect each fixture individually with AC-90 armoured cable. However, there must be no more than four fixtures individually connected to each junction box and the maximum allowable length of armoured cable is 5 m.
 - .2 The AC-90 armoured cable can also be used in the same way and under the same conditions for lighting for receptacle outlets and unit heaters in drywall partitions. The maximum allowable length of armoured cables is 5 m.

- .2 Group cables wherever possible on channels.
 - .1 Unless specified otherwise, all wiring is to be concealed within architectural elements. Unless specified otherwise, no exposed installation is permitted without the prior approval of the Departmental Representative.

3.7 INSTALLATION OF CONTROL CABLES

- .1 Install control cables in conduit.
- .2 Ground control cable shield.

3.8 INSTALLATION OF NON-METALLIC SHEATHED CABLE

- .1 Install cables provided with equipment, instruments, or components in conduits, flexible or rigid, metallic or non-metallic, depending on the application.
- .2 Use appropriate connectors.
- .3 Gland-type connectors are not accepted for connecting the wiring directly to an equipment, instrument or component.

END OF SECTION