



ADDENDUM

Addendum: E1 **Project No.** 201-07859-00
Project Name: Guelph Food Research Centre Consolidated UPS **Date:** 2021-02-01
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This addendum is to be included in the tender for this project and is to be completed in accordance with the specifications and all terms and conditions of the contract documents.

Description

1. Refer to attached revised electrical specification section 26 05 19 “Low Voltage Conductors” being issued for Addendum E1,
 - a. **Clarification:** Teck cables are to be added as an acceptable alternative to conduit/cablling.
 - b. Item 2.05 added.
 - c. Item 3.04 added.

Addendum: E1

End of Addendum

1 GENERAL

1.01 SUBMITTALS

- .1 Submit shop drawings for products and accessories.
- .2 Submit samples of conductors, where requested in Contract Documents or when requested by Consultant.

2 PRODUCTS

2.01 GENERAL POWER CABLES

- .1 CSA approved, ULC labelled and certified. Unless otherwise noted, conductors to be copper and be suitable for applications as noted in governing local electrical code.
- .2 "T90 Nylon", CSA certified, single copper conductor to CSA C22.2 No. 75, 600 volts, maximum 90°C (194°F) dry conductor temperature, -10°C (-14°F) minimum installation temperature, PVC insulated, nylon covered.
- .3 "AC90" flexible armoured cable with "RW90" conductors and bare copper ground conductor and overall interlocked aluminium tape armour, to CSA C22.2 No. 51 (R2004).
- .4 Solid conductors to and including No. 10 AWG; stranded conductors in sizes larger than No. 10 AWG; branch circuit conductors constructed of 98% conductive copper; and approved for minimum 600 volts,.

2.02 CONNECTORS

- .1 General:
 - .1 materials: CSA approved and/or ULC listed and labelled as required by local governing authorities and codes;
 - .2 certification: CSA C22.2 No. 65;
 - .3 connectors marked with certification, manufacturer, manufacturer catalogue number and approval for conductor size and type.
- .2 Armoured cable connectors of proper squeeze type connectors and plastic anti-short bushings at terminations.
- .3 Connectors for conductors connecting to devices in accordance with local governing electrical requirements, equal to Ideal Industries No. 451, No. 452 and No. 453, "Wing-Nut", CSA certified, 600 volts rated, contoured wing design, fire retardant shell, twist on pressure type connectors.
- .4 For conductors sized 3/0 and greater, provide long barrel double crimp, 2-hole compression type lug connectors, unless otherwise noted.

2.03 STANDARD CONTROL AND COMMUNICATIONS CABLES

- .1 Type LVT 300 V
 - .1 CSA approved, FT4 rated.

- .2 Solid annealed copper conductors sized as indicated.
 - .3 Insulation: Polyethylene.
 - .4 Overall covering: PVC jackets.
 - .5 Where installed in plenums, cable to be certified to C22.2 No.214 and FT6 rated.
- .2 Type TEW
 - .1 ULC listed and labelled, CSA certified to C22.2 No. 127.
 - .2 Solid copper wire rated for 600 volts, No. 18 AWG.
 - .3 Thermoplastic insulated with overall nylon jacket.
 - .4 105°C (220°F) conductor temperature.
 - .5 Complete with required number of copper conductors and colour coding.

2.04 CONDUCTOR PULLING LUBRICANT

- .1 IDI Electric, "Ideal Yellow 77" or "Wire Lube" as required.

2.05 TECK CABLES

- .1 Nexans, "Firex II Teck" cables as follows:
 - .1 certified to CAN/CSA C22.2 No.131, Type TECK 90 Cable;
 - .2 rated for outdoor, weather resistant and wet locations including direct burial applications;
 - .3 1000 V rated;
 - .4 Conductor: Bare, Soft drawn, Class B Compact or Compressed Stranded Copper conductors per ASTM;
 - .5 insulation: chemically cross-linked thermosetting polyethylene (XLPE);
 - .6 bonding conductor (1/C Cable): Soft drawn bare copper;
 - .7 inner jacket: sunlight resistant PVC jacket tightly applied over assembly, to prevent slipping of core in a vertical position;
 - .8 armour: flexible interlocked aluminum armour, over inner jacket for mechanical protection;
 - .9 overall PVC jacket rated -40°C (-40°F);
 - .10 barrier tape over shield;
 - .11 terminations to suit specific applications.
- .2 Acceptable manufacturers are:

- .1 Nexans;
- .2 Prysmian Cables (Pirelli);
- .3 General Cable;
- .4 Aetna Cables;
- .5 Kerite Company;
- .6 Texcan.

3 EXECUTION

3.01 PROJECT CONDITIONS

- .1 If identified in documents, verify that field measurements and conditions are as identified.
- .2 Unless specifically noted, cable routing on drawings is schematic and approximate and not reflective of elevations. Route cable as required to meet project conditions. Determine exact routing and lengths on site.
- .3 Confirm fire protection ratings of construction to ensure that rooms and paths of conductors are fire rated in accordance with local governing codes requirements. Include fire rated conductors as required to meet local governing codes requirements.

3.02 CO-ORDINATION

- .1 Co-ordinate work with work provided under other electrical work and work of other trades.
- .2 Determine required separation between cable and other work.
- .3 Determine cable routing to avoid interference with other work.
- .4 Submit any alternative cable routing to Consultant for review prior to proceeding with work.

3.03 INSTALLATION OF CONDUCTORS

- .1 Provide required conductors. Provide fire rated conductors for applications as required by local governing codes and standards, and requirements of local governing authorities.
- .2 In applications where, multiple conductors in conduit are being run, provide trapeze configuration of Unistrut type metal C-channels and threaded rod hangers to support cable/conduit from ceiling slab. Wall mounted cable/conduit brackets and ring type conduit hangers may be permitted in applications approved by Owner and reviewed with Consultant. Provide required cable support system accessories which are not specified herein or shown on drawings but are required for proper installation.
- .3 Conductors, unless otherwise noted, to be as follows:

- .1 for conductors requiring fire rating by current regulations and local codes including feeders for emergency systems, fire fighter's elevators, fire alarm systems, other life safety systems and for applicable signal and control circuits of these systems - type "MI" CSA approved, ULC listed and labelled, 2-hour fire rated, copper sheathed mineral insulated copper conductors;
- .2 climate controlled areas branch circuit wiring in accessible ceiling spaces and within stud wall construction consisting of drops down to luminaries and drops down stud walls to devices and in furniture systems - "AC90" flexible armoured cable ("BX") (maximum 6 m (20') run permitted);
- .3 for connections to variable speed drives: Nexan DriveRX type cable for variable frequency drives as recommended by drive manufacturers;
- .4 for climate-controlled areas wiring except as noted above or specified elsewhere in Specification or as noted on drawings - "T90 Nylon" or "RW90".
- .4 Support flexible armoured cable in ceiling spaces and in stud wall construction with steel 2 holes cable straps to "Code" requirements. Run flexible armoured cables in neat manner parallel to building lines. Utilize centralized conduit runs to maintain maximum permitted runs of flexible armoured cables as recommended by cable manufacturer and as required by local governing codes. Provide insulating grommet at cut ends of flexible armoured cable to protect conductor insulation.
- .5 Install compression connectors with proper dies and compression tool as per connector manufacturer's instructions. Install cold shrink tubing and associated materials as per manufacturer's instructions.
- .6 Install control wiring as required and as indicated. Confirm exact type of control wiring with manufacturers of equipment/systems being interconnected, and as required by local governing electrical code. Provide required fire alarm cables for fire alarm system applications or security system applications as recommended by fire alarm system manufacturer, complying with requirements of local governing code and local governing authorities. Typically run control wiring in conduit. Conductors not installed in conduit or raceways to be fire insulated rated in accordance with latest governing code flame spread ratings requirements, and suitably mechanically protected by means acceptable to Owner and reviewed with Consultant. Ensure that conductors comply with fire rating - FT6 rating requirements when run in plenums and similar construction.
- .7 Coordinate responsibility for provision of control wiring for Mechanical Division equipment and equipment of other Divisions, with respective Divisions of the Work.
- .8 Generally, conductor sizes are indicated on drawings. Such sizes are minimum requirements and must be increased, where required, to suit length of run and voltage drop in accordance with applicable conductor voltage drop schedule on drawings or obtained from Consultant. Conductors not sized or specified of type, to be sized and of type in accordance with requirements of local governing electrical code.
- .9 Do not use conductors smaller than No. 12 AWG in systems over 30 volts, unless otherwise noted. Do not use conductors smaller than No. 6 AWG for exterior luminaire wiring unless otherwise noted.
- .10 Colour code conductors throughout to identify phases, neutrals and ground by means of self-laminating coloured tape, coloured conductor insulation, or properly secured coloured plastic discs. Colours, unless otherwise noted, to be as follows:

- .1 Phase A - red;
- .2 Phase B - black;
- .3 Phase C - blue;
- .4 Ground - green;
- .5 Neutral - white;
- .6 Control - orange.

- .11 When pulling wires into conduit use lubricant and ensure that wires are kept straight and are not twisted or abraided.
- .12 Control conductors, in addition, to be numbered with Brady Ltd. or Electrovert Ltd. Z type markers.
- .13 Colour code conductors for communications systems in accordance with system component manufacturer's recommendations.
- .14 Neatly secure exposed wire in apparatus enclosures with approved supports or ties.
- .15 Install low voltage conductors in conduits, unless otherwise noted within Documents.

3.04 INSTALLATION OF TECK CABLES

- .1 Provide cables as required for specific applications. Handle, install, and terminate in accordance with manufacturer's recommendations and instructions and as herein specified.
- .2 When pulling cable, apply pulling tension to conductor not in sheath of cable. Limit cable pulling tension to as recommended by cable manufacturer.
- .3 Terminate cable in equipment with lugs and termination kits as per cable manufacturer's instructions.
- .4 Installation of cable splices and terminations to be made by personnel skilled in this type of work.
- .5 Ground shielding as per cable manufacturer's instructions.
- .6 Take necessary precautions when handling cable on reel to ensure that no damage will result in uncoiling process.
- .7 No splices are allowed unless justified by cable pulling tension calculations and approved in writing by Owner and reviewed with Consultant. Where splices are permitted, locate in area accessible. Review locations of splices with Consultant, prior to start of Work.

END OF SECTION