SECTION 26 05 38
CABLE BUS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufacturers
2. Standards
3. Construction
4. Electrical
5. Accessories

B. Meet the following performance requirements:

1. Seismic performance: In accordance with Section 26 00 10.
2. The system shall comply with Article 370 of the National Electrical Code and shall be suitable for indoor and /or outdoor use.
3. The cable bus shall include all necessary straight sections, fittings, tap boxes, entrance fittings, conductors, cable connectors, cable terminations, and other accessories required to form a complete system.
4. A complete set of drawings shall be supplied for each system to facilitate system design and installation.

C. System Description:

1. Raceways to support electrical systems.

D. Supporting Documents

1. For additional information, refer to the following drawings
   a. E602
   b. E603
   c. E300D
   d. E301D

1.2 RELATED SECTIONS

A. Section 26 00 10 – Basic electrical requirements, is an integral part of this section. Requirements and work indicated in 26 00 10 are not repeated in this Section.

1.3 COORDINATION

A. Coordinate work under provisions indicated in Section 26 00 10.

1.4 QUALIFICATIONS / QUALITY ASSURANCE

A. Conform to requirements indicated in Section 26 00 10.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements indicated in Section 26 00 10.

1.6 SUBMITTALS

A. A complete certified ventilated metal enclosed system designed to suit the site conditions shall be provided; including: all necessary fittings, enclosures, connectors, entrance fittings, insulated conductors, electrical connectors, terminating kits and other accessories as required.

B. System to be a certified pre-assembled cable bus system.

C. The bus system shall be suitable for indoor and/or outdoor use with conductor spacing and ventilation maintained throughout the system.

D. All elements of the bus enclosure shall be so designed to eliminate any sharp edges or projections that may injure conductor insulations or personnel.

E. Cable bus shall have all conductors in a common enclosure.

F. The cable bus system shall be supplied complete with 3D layout drawings, enclosure drawings, wall/equipment seal drawings, cut sheets, analysis package, and installation manual.

1.7 EXTRA MATERIALS

A. Furnish under provisions indicated in Section 26 00 10.

1.8 PROJECT RECORD DOCUMENTS

A. Submit under provisions indicated in Section 26 00 10.

1.9 OPERATION AND MAINTENANCE DATA

A. Submit under provisions indicated in Section 26 00 10.

1.10 WARRANTY

A. Provide under provisions indicated in Section 26 00 10.

1.11 LEED / SUSTAINABILITY

A. Conform to requirements indicated in Section 26 00 10.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:

1. Superior Cable Tray Bus-Superior Bus – Superior Tray Systems, Inc.
2. MPHuskey Cable-Bus
3. MDF Cable Bus Systems
4. Substitutions: Under provisions of Section 26 00 10.

2.2 STANDARDS

A. The equipment shall be manufactured, tested, rated and furnished in accordance with the latest standards and regulations of the following:

1. ANSI: American National Standards Institute
2. NEMA: National Electrical Manufacturer’s Association

3. National Electrical Code
4. IEEE: Institute of Electrical and Electronic Engineers
5. CLASS 4662 01 Wireways and Busways – Busways
6. CLASS 4681 01 Wireways and Busways - Cabletroughs

PART 3 - CONSTRUCTION

3.1 CABLE TRAY APPLICATIONS

A. Bus enclosure fittings shall have a typical inner radius of eighteen (184) inches unless specified otherwise. The cable bus enclosure shall be manufactured from mill finish aluminum and suitable for indoor or outdoor use. Side rails, rungs, and splice plates shall be manufactured from 6063-T6 or 6061-T6 aluminum alloy and shall be 1/8 inch in thickness for maximum strength and maximum equipment ground conductor ratings.

B. The top and bottom surfaces of the cable bus enclosure shall be .080 5052 H32 aluminum with punched slotted holes (not louvered style) for ventilation. Punched slotted holes shall restrict entry of objects larger than 0.25” in diameter, and shall provide a minimum of 25% total open space in the top and bottom cover surfaces for efficient passage of air. The bottom covers shall be factory welded to the side rails and the top cover shall be a removable bolt-on type.

C. Splice joints between sections of the bus enclosure shall be attached using high pressure spline bolts (UL certified bonding connector) and the expansion joint shall be a limited-slip type.

D. Cable support blocks shall have a chamfered cable bore to eliminate any undo stress or damage to the cable insulation. The Cable Support block shall be manufactured from:

1. High Density Polyethylene (HDPE) UV resistant material suitable for indoor and outdoor use.

2. Fiberglass laminate manufactured in accordance with NEMA grade GPO-3.

Support blocks shall be spaced to withstand the forces due to the specified fault currents but in no case spaced greater than 36 inches for horizontal bus runs and 18 inches on vertical risers.

E. Termination, entrance and tap boxes shall be manufactured in material comparable with the cable bus enclosure and shall minimize galvanic corrosion effects. Weather proof seals shall be supplied with a rigid metallic mounting plate thick enough to resist buckling and deformation on uneven surfaces. The seal shall consist of a glass fiber reinforced polymer frame and appropriately sized cable sealers. The cable sealers shall capture the cables 360 degrees around its circumference and shall be sized appropriately to sufficiently hold the cable without damaging it. Both frames and cable sealer shall come with factory installed thermoplastic rubber gaskets. The thermoplastic gaskets shall seal all mating surfaces between the mounting plate, cable spacers and cable sealers. The assembled seal shall prevent moisture from passing in all weather conditions. The normal operating temperature of the seal shall be between -40c and 140c and shall be made of material that is non-magnetic and non-hydroscopic. The seal shall be electrical isolated from the bus and made of a non-conductive material. Areas where cables come into contact with the seal shall be made of a softer impact absorbing material and shall be free from any sharp corners.

F. Terminations for systems under 1000V shall be NEMA two (2) hole compression lugs.

G. All hardware supplied shall be of non-magnetic stainless steel 304 or better.

PART 4 - ELECTRICAL

A. All current carrying conductors shall be fully insulated and rated for the specified voltage. Cable insulation shall be rated for 90°C operating temperatures.

B. The conductors shall be phased and supported to maintain low impedance and assure the mechanical strength necessary to prevent cable movement or damage under short circuit currents, a minimum of 65,000A symmetrical for a duration of 60 cycles.

C. Maximum conductor ampacities shall not exceed allowable ampacities listed in the NEC and CEC.

D. The cable bus shall be designed so that the overall voltage drop from the source to termination point shall be no greater than 2% at the design full load of the bus unless specified otherwise. Calculations shall be proved at the design stage to illustrate the compliance with this requirement.

E. The conductors shall be arranged in a phasing pattern which exhibits minimal interphase unbalance accompanied by calculations. System shall have a maximum of 5% difference between the average line impedance per phase and line impedance; and a maximum of 5% difference between the average system impedance and the phase impedance.

F. Conductors shall be continuous length and pulled in after the bus enclosure is in place. Electrical connectors shall be used only at the termination of the conductor runs.

G. Cable bus enclosure shall have a continuous current rating of not less than 1000A (50°C rise) and the resistance across the enclosure section shall not exceed 50μΩ.

H. The bus enclosure shall be grounded at sufficient intervals for the purpose of preventing a potential above ground on the bus enclosure in the event of a fault. Cable bus enclosure shall be UL certified as a grounding conductor.

I. Loading on individual conductors in the cable bus system, voltage drop of each phase, impedance of each conductor and phase, and the heat generation of the system.

1. 4.9.2 Temperature rise of the conductors, insulation, enclosure and air leaving the system at the required loading and maximum ambient temperature of the site.

J. Calculations for the maximum value of magnetic field (EMF/EMI) at distances up to 4’ from the bus enclosure

PART 5 - ELECTRICAL

5.1 Environmental water-tight seal

A. Fire stop system – minimum two (2) hour rating

B. MCT fire stop system – minimum four (4) hour rating

C. S-fittings (low profile entry fittings)

D. Cable termination kits

E. UDP Aluminum to Steel isolators

F. Transformer Enclosure

G. Equipment Enclosure

H. Support structure

I. Cable expansion/contraction systems

J. Enclosure expansion/contraction systems

END OF SECTION