

SECTION 262500 - ENCLOSED BUS ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Feeder-bus assemblies.
- B. Related Sections include the following:
 - 1. Division 01 Section "Alternates", administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. TVSS: Transient voltage surge suppressor.

1.4 SUBMITTALS

- A. Shop Drawings: For each type of bus assembly.
 - 1. Show fabrication and installation details for enclosed bus assemblies. Include plans, elevations, and sections of components. Designate components and accessories, including clamps, brackets, hanger rods, connectors, straight lengths, and fittings.
 - 2. Show fittings, materials, fabrication, and installation methods for listed fire-stop barriers.
 - 3. Indicate required clearances, method of field assembly, and location and size of each field connection.
 - 4. Detail connections to switchboards.
- B. Coordination Drawings: Floor plans and sections, drawn to scale. Include scaled bus-assembly layouts and relationships between components and adjacent structural, mechanical, and electrical elements. Show the following:
 - 1. Vertical and horizontal enclosed bus-assembly runs, offsets, and transitions.
 - 2. Clearances for access above and to the side of enclosed bus assemblies.
 - 3. Vertical elevation of enclosed bus assemblies above the floor or bottom of structure.

- 4. Support locations, type of support, and weight on each support.
- C. Location of adjacent construction elements including light fixtures, HVAC and plumbing equipment, fire sprinklers and piping, signal and control devices, and other equipment.
- D. Product Certificates: For each type of enclosed bus assembly, signed by product manufacturer.
- E. Qualification Data: For testing agency.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data: For enclosed bus assemblies to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
 - 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- B. Source Limitations: Obtain enclosed bus assemblies through one source. Manufacturer shall be same as switchboards.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NEMA BU 1, "Busways."
- E. Comply with NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle enclosed bus assemblies according to NEMA BU 1.1, "General Instructions for Proper Handling, Installation, Operation and Maintenance of Busway Rated 600 Volts or Less."

1.7 COORDINATION

- A. Coordinate layout and installation of enclosed bus assemblies and suspension system with other construction that penetrates ceilings or floors or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements of this section.

2.2 ENCLOSED BUS ASSEMBLIES

- A. Feeder-Bus Assemblies: NEMA BU 1, low-impedance bus assemblies in nonventilated housing; single-bolt joints; ratings as indicated.
1. Voltage: 120/208V; 3 phase; 100 percent neutral capacity.
 2. Temperature Rise: 55 deg C above 40 deg C ambient maximum for continuous rated current.
 3. Bus Materials: Current-carrying copper conductors only, fully insulated with Class 130C insulation except at joints; plated surface at joints.
 4. Ground:
 - a. 50 percent capacity internal bus bars of material matching bus material.
 5. Enclosure: Steel with manufacturer's standard finish.
 6. Fittings and Accessories: Manufacturer's standard.
 7. Mounting: Arranged flat, edgewise, or vertically without derating.
 8. Field measure feeder bus to verify offsets, rises, and drops.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Support bus assemblies independent of supports for other elements such as equipment enclosures at connections to switchboards, pipes, conduits, ceilings, and ducts.
1. Design each fastener and support to carry **200 lb** or 4 times the weight of bus assembly, whichever is greater.
 2. Support bus assembly to prevent twisting from eccentric loading.
 3. Support bus assembly with not less than **3/8-inch** steel rods. Install side bracing to prevent swaying or movement of bus assembly. Modify supports after completion to eliminate strains and stresses on bus bars and housings.
 4. Fasten supports securely to building structure according to Division 26 Section "Hangers and Supports for Electrical Systems."
- B. Install expansion fittings at locations where bus assemblies cross building expansion joints. Install at other locations so distance between expansion fittings does not exceed manufacturer's recommended distance between fittings.
- C. Construct rated fire-stop assemblies where bus assemblies penetrate fire-rated elements such as walls, floors, and ceilings. Seal around penetrations with approved firestopping.

- D. Coordinate bus-assembly terminations to equipment enclosures to ensure proper phasing, connection, and closure.
- E. Tighten bus-assembly joints with torque wrench or similar tool recommended by bus-assembly manufacturer. Tighten joints again after bus assemblies have been energized for 30 days.

3.2 CONNECTIONS

- A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Remove and replace units that do not pass tests and inspections and retest as specified above.
- D. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of bus assembly including joints and plug-in units.
 - 1. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
 - 2. Perform 2 follow-up infrared scans of bus assembly, one at 4 months and the other at 11 months after Substantial Completion.
 - 3. Prepare a certified report identifying bus assembly checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.
- E. Test Labeling: On completion of satisfactory testing of each unit, attach a dated and signed "Satisfactory Test" label to tested component.

3.4 ADJUSTING

- A. Set field-adjustable, circuit-breaker trip ranges and overload relay trip settings as indicated.

3.5 CLEANING

- A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

3.6 PROTECTION

- A. Provide final protection to ensure that moisture does not enter bus assembly.

END OF SECTION 262500