**Eaton Guide Specification**

**Notes and instructions to specwriter**

The following guide specification is offered for your assistance in specifying this product as part of a CSI (Construction Specification Institute) compliant document.

This guide specification has been created in MS Word and uses Word features including **Styles** and **Review** to assist in editing and formatting. You may also find it helpful to view the document in **Outline** mode when editing or selecting sections to copy/paste into your base document.

**Styles**

Styles are provided for all paragraph types described in the CSI Masterformat. Applying a Style to text will provide the correct indentation, paragraph letter/number, font, capitalization, etc…. Styles are shown on the right-hand side of the Word “Home” ribbon.



**Review**

“Notes to Specwriter” (when available) are provided using the Reviews feature in Word. To view “Notes to Specwriter” select “All Markup” in the Tracking dropdown menu on the Review ribbon. To hide notes, select “No Markup”. You can advance from one note to the next using the Previous and Next buttons on the same ribbon. In earlier versions of MSWord hide notes by un-checking ‘Comments’ under Review>SH



**Outline view**

The Outline view within Word is often helpful when editing or copying sections from this Guide Specification. Also, when pasting sections from this document into a base document the specwriter may want to consider using right-click and “Merge Formatting’ or ‘Keep Text Only” features.

Section 26 25 00

BUSWAY – Low Voltage (pow-r-way iii)

# General

## Scope

### The Contractor shall furnish and install the busway system including all necessary fittings, hangers and accessories as specified herein and as shown on the contract drawings.

## Related Sections

### Section 16671A –Surge PROTECTIVE DEVICES

## References

### The low voltage busway and all components shall be designed, manufactured and tested in accordance with the latest applicable following standards of ANSI and NEMA:

#### NEMA BU.1

#### ANSI/UL 857

#### CSA

## Submittals – for review/approval

### The following information shall be submitted to the Engineer:

#### Master drawing index

#### Isometric drawing of each busway run

#### Component list

#### Busway ratings including:

##### Short-circuit rating

##### Voltage

##### Continuous current

#### Major component ratings including:

##### Voltage

##### Continuous current

##### Interrupting ratings

#### Cable terminal sizes

#### Product data sheets

## Submittals – for construction

### The following information shall be submitted for record purposes:

#### Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process

#### Certified production test reports

#### Installation information

#### Seismic certification and equipment anchorage details

## Qualifications

### The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

### For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

### The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

### Provide Seismic tested equipment as follows:

#### The equipment and major components shall be suitable for and certified by actual seismic testing to meet all applicable seismic requirements of the [latest International Building Code (IBC)] [latest California Building Code (CBC) with OSHPD Amendments]. [The equipment shall have OSHPD Special Seismic Certification (OSP) Pre-Approval.]

#### The Project Structural Engineer will provide site specific ground motion criteria for use by the manufacturer to establish SDS values required.

#### The IP rating of the equipment shall be 1.5

#### The Structural Engineer for the Site will evaluate the SDS values published on the [Manufacturer’s] [OSHPD] website to ascertain that they are "equal to" or "greater than" those required for the Project Site.

#### The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.

##### The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared and stamped by a licensed civil engineer in the state. Mounting recommendations shall be provided by the manufacturer based upon the above criteriato verify the seismic design of the equipment.

##### The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.

##### The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

## Regulatory Requirements

### The busway shall bear a UL label.

## Delivery, Storage and Handling

### Equipment shall be handled and stored in accordance with manufacturer’s instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

## Operation and Maintenance Manuals

### Equipment operation and maintenance manuals shall be provided with each assembly shipped, and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.

## Extra Products

### Spare parts shall be furnished for each rating of busway, consisting of:

#### One set of joint covers for each busway

# products

## manufacturers

### Eaton

### \_\_\_\_\_\_\_\_\_\_

### \_\_\_\_\_\_\_\_\_\_

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Engineer ten (10) days prior to bid date.

## ratings

### The busway shall be Eaton type Pow-R-Way III with voltage and current ratings as indicated on the contract drawings.

### [3-phase, 3-wire][3-phase, 3-wire with 50% housing ground and/or 50% internal ground][3-phase, 3-wire with 50% housing ground and/or 50% isolated ground][3-phase, 4-wire with 100% neutral][3-phase, 4-wire with 100% neutral, 50% housing and/or 50% internal ground][3-phase, 4-wire with 100% neutral, 50% housing and/or 50% isolated ground][3-phase, 4-wire with 200% neutral][3-phase, 4-wire with 200% neutral, 50% housing ground and/or 50% internal ground][3-phase, 4-wire with 200% neutral, 50% housing ground and/or 50% isolated ground]

### The busway shall have a minimum of 6-cycle short-circuit rating of 85 kA RMS symmetrical for ratings through 800 Amp, 100 kA RMS symmetrical for ratings through 1350 Amp, 125 kA RMS symmetrical for ratings through 1600 Amp, 150 kA RMS symmetrical ratings through 2500 Amp, and 200 kA RMS symmetrical for ratings through 5000 Amp.

## construction

### The busway and associated fittings shall consist of [aluminum] [copper] conductors totally enclosed in a 2-piece extruded aluminum housing. Outdoor feeder, indoor feeder and indoor plug-in busway shall be interchangeable at the same rating without the use of adapters or special splice plates. Where indicated on the drawings provide indoor, sprinkler-proof plug-in busway. Fittings –(elbows, tees, flanges, etc.) shall be identical for use with both the plug-in and feeder types of busway. The busway shall be capable of being mounted flat-wise, edgewise, or vertically without derating. The busway shall consist of standard 10-foot sections with special sections and fittings provided to suit the installation. Horizontal runs shall be suitable for hanging on 10-foot maximum centers. Vertical runs shall be suitable for mounting on 16-foot maximum centers. Provide one (1) hanger for every ten (10) feet of horizontally mounted duct. On vertical runs provide one adjustable hanger per floor.

## bus

### Bus bars shall be fabricated from high strength, [55% conductivity aluminum] [98% conductivity copper] and suitably plated at all electrical contact surfaces.

### Bus bars shall be insulated over their entire length, except at joints and contact surfaces, with a UL listed insulating material consisting of a thermo set epoxy applied by fluidized bed process. Tape or heat-shrink sleeve insulation, or any other method of insulation, which can allow air-gaps or insulation breakdown, shall not be acceptable.

### The busway shall be capable of carrying rated current continuously without exceeding a temperature rise of 55 degrees C based on a 40 degrees C ambient.

## Bus Joints

### Each busway section shall be furnished complete with joint hardware and covers. The busway joints shall be a single-bolt, non-rotating, removable bridge design. All bridge joints shall be furnished with torque-indicating double head joint bolts and Belleville washers. The bridge joint shall utilize a captive nut retainer on the opposite side of the torque-indicating bolt. The bridge joint design shall ensure proper installation without the use of a torque wrench, and provide visual indication that the joint has been tightened to the proper torque value. Each busway joint shall allow for a minimum length adjustment of +/- 0.5 inches. De-energization of busway shall not be required for safe testing of joint tightness.

## housing

### The busway housing shall be a 2-piece design fabricated from extruded aluminum. The 2-piece housing shall be bolted together, along the bottom flange, using grade 5, 1/4x20 zinc-plated fasteners on 3-inch centers for maximum mechanical strength. The busway enclosure finish shall be ANSI 61 gray baked epoxy powder paint applied by an electrostatic process.

### Outdoor feeder busway housing shall be identical to indoor feeder busway housings, and shall be UL listed for outdoor use. Busway shall be completely weatherized at the factory, and designed such that only caulking of protective joint covers are required for outdoor application.

## plug-in busway

### Where required, busway shall be of the plug-in type. Plug-in busway shall be available in standard 2-, 4-, 6-, 8- and 10-foot lengths, with plug-in openings provided on both sides of the busway sections on 24-inch centers. Plug-in covers shall prohibit dirt and debris from entering contact plug-in openings in the busway. The design shall allow for ten (10) hinged cover outlets per ten (10) feet of plug-in length, and covers shall be field-convertible to hinge on either side. Covers for plug-in openings shall have a positive screw close feature and provisions for installation of power company seals. The contact surfaces for bus plug stabs shall be silver-plated and of the same material, thickness, and rating as the phase bars. The tabs shall be welded to the bus bars. A standard housing ground connection shall be supplied in each plug-in opening. Positive mechanical guides for plug-in units shall be provided at each plug-in opening to facilitate unit alignment and prevent improper installation.

### Where required, plug-in units of the types and ratings indicated on the plans and specifications shall be supplied. Plug-in units shall be mechanically interlocked with the busway housing to prevent their installation or removal while the switch is in the “ON” position. The enclosure of any plug-in unit shall make positive ground connection to the duct housing before the stabs make contact with the bus bars. All plug-in units shall be equipped with an interlock that can be defeated to prevent the cover from being opened while the switch is in the “ON” position and to prevent accidental closing of the switch while the cover is open. The plugs shall be provided with a means for padlocking the cover closed and padlocking the disconnect device in the “OFF” position. The operating handle and mechanism shall remain in control of the disconnect device at all times, permitting its easy operation from the floor by means of a hook stick or chain. All plug-in units shall be interchangeable without alteration or modification of plug-in duct.

### Fusible-type plugs shall have a quick-make/quick-break disconnect switch and positive pressure fuse clips

OR

### Circuit breaker-type plugs shall have an interrupting rating of not less than \_\_\_\_ symmetrical RMS amperes or be series-rated as otherwise shown in the contract document and shall meet all requirements of UL Standard 489. It shall be possible to increase the interrupting rating of a breaker plug-in device having ampere ratings through 400 Amp up to 100 kAIC at 480 VAC and 200 kAIC at 240 VAC by changing out the circuit breaker only and leaving the enclosure intact. All breaker plug-in devices shall be from the same manufacturer as the busway.

### Current-limiting circuit breaker-type plug-in devices shall be units, which provide integral time delay/thermal trip protection and current-limiting protection in one assembly. These breakers shall be UL rated at 200 kAIC at 240 VaC, and 150 kAIC at 480 VAC, and shall be series-rated to protect all molded case breakers downstream as shown on the drawings.

## surge protective devices

### Provide surge protective devices as specified in Section 16671A.

# execution

## factory testing

### Standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.

### The manufacturer shall provide three (3) certified copies of factory test reports.

## installation

### The Contractors shall install all equipment per the manufacturer’s recommendations and the contract drawings.