Instructional Leaflet **IL019117EN**

Effective July 2016
Supersedes December 2015

Installation guidelines for users of Magnum DS Low-Voltage Rear-Access Switchgear Assemblies for seismic applications

A representative Type Magnum DS® Low-Voltage Rear-Access Switchgear Assembly was attached to a seismic table and shaken to simulate the effects of an earthquake. The test exceeded the requirements of the 2012 International Building Code (IBC), the 2013 California Building Code (CBC), and OSHPD Seismic Pre-certification (OSP). The following guidelines were developed as a result of that test program, and they apply to standard and arc-resistant switchgear:

1. When Magnum DS Switchgear is subjected to an earthquake, it pulls on its foundation. The importance of an adequate foundation cannot be over emphasized; in fact, proper mounting is the single most important factor in withstanding a seismic event. The foundation must be level and continuous under the entire switchgear assembly. The foundation must be designed to withstand the reaction loads imposed on it by the equipment. The foundation must be designed to hold a quantity of six ½-13 SAE Grade 5 bolts per section. The anchoring system must be strong enough to prevent "pull-out" of these bolts. **The anchoring system should be put into place prior to switchgear installation to reduce effort associated with anchoring.** Welding to embedded steel members is acceptable, provided the weld strength is equivalent to that of six SAE Grade 5 bolts specified. For nuclear installations, weld per AWS D1.1, alternatively, welding procedures and personnel qualifications may be performed IAW ASME BPVC Section IX and the inspections be performed IAW AWS D1.1, and/or D1.3 and/or D9.1. See foundation drawings provided for the specific project to identify anchoring locations.
2. When Magnum DS Switchgear is subjected to an earthquake, it moves. The amount of motion depends on the magnitude of the earthquake. Eaton Pow-R-Way® and non-segregated phase bus ducts, and their associated switchgear flanges have been seismically qualified as a system. If other types of top entry, i.e., conduits, are necessary, attachments must be capable of accommodating a 3-inch front-to-back and side-to-side (6 inches peak-to-peak) cabinet motion.
3. **Center of gravity**
   For seismic calculations, the following dimensions should be used to locate the approximate center of gravity for Magnum DS switchgear. They are applicable to all types of line-ups:

Vertical	60 inches
From left-to-right	Center of line-up
From front	One-half the depth of the switchgear

   Enclosure weights are found on the equipment drawings provided for the specific project. Add breaker weights to enclosure weight.
4. When a switchgear assembly is separated into groups of vertical sections for shipment, the user must be sure to install all of the inter-unit tie bolts (see drawing 9253C18). Failure to join the shipping groups together properly could result in damage to the equipment during an earthquake.
5. It is recommended that incoming power cables be lashed together at least every 4 feet within the switchgear.
6. The drawout Magnum DS power circuit breakers should always remain in the connected position, or they should be secured remote from the switchgear.
7. The user should provide storage areas to secure mobile pieces of equipment (such as breaker lifting trucks, spare breakers, hand trucks, etc.) away from the switchgear so it is not damaged by being bumped during an earthquake. When the optional top-of-gear traveling circuit breaker lifter is provided, it must be secured in place with the hardware provided when not in use. Refer to the operating instructions provided with the switchgear for the details of this procedure.

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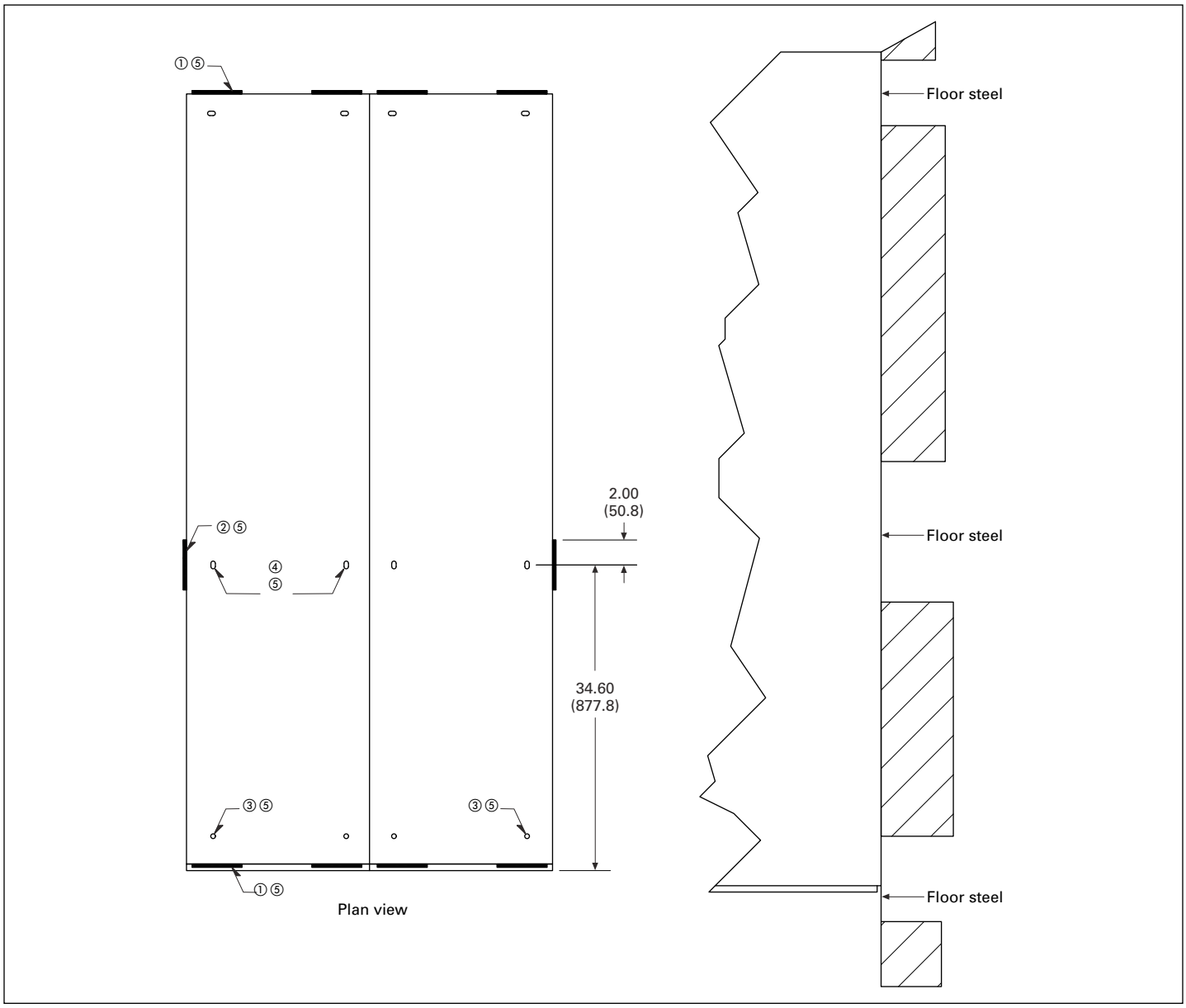

Figure 1. Welding of indoor structures to imbedded floor steel—rear-access MDS, MDN, MSB, and Series NRX®

① 0.19 inches (4.8 mm) weld, 4.00 inches (101.6 mm) long at two places on front and rear of each section starting 0.50 inches (12.7 mm) from each edge of structure.

② 0.19 inches (4.8 mm) weld, 4.00 inches (101.6 mm) long on each end of line-up in area of bus compartment.

③ Internal bracket on each end of line-up to be plug welded to floor steel.

④ Floor mounting holes, in bus compartment, to be plug welded to floor steel.

⑤ For nuclear installations, weld per AWS D1.1, alternatively, welding procedures and personnel qualifications may be performed IAW ASME BPVC Section IX and the inspections be performed IAW AWS D1.1, and/or D1.3 and/or D9.1.

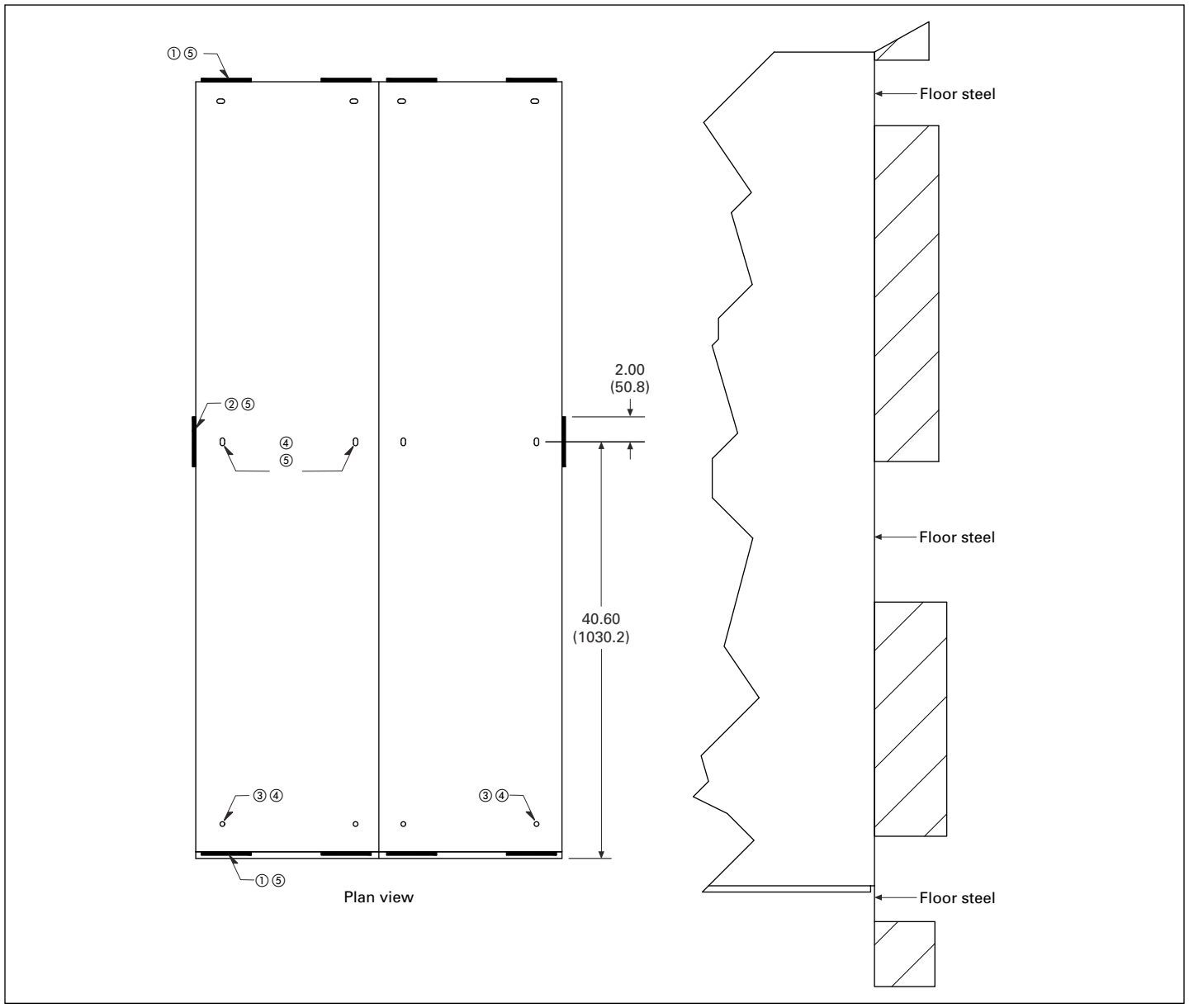

Figure 2. Welding of indoor structures to imbedded floor steel—rear-access MDSL

① 0.19 inches (4.8 mm) weld, 4.00 inches (101.6 mm) long at two places on front and rear of each section starting 0.50 inches (12.7 mm) from each edge of structure.

② 0.19 inches (4.8 mm) weld, 4.00 inches (101.6 mm) long on each end of line-up in area of bus compartment.

③ Internal bracket on each end of line-up to be plug welded to floor steel.

④ Floor mounting holes, in bus compartment, to be plug welded to floor steel.

⑤ For nuclear installations, weld per AWS D1.1, alternatively, welding procedures and personnel qualifications may be performed IAW ASME BPVC Section IX and the inspections be performed IAW AWS D1.1, and/or D1.3 and/or D9.1.

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