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## GROUNDING OF BUILDINGS FABRICATED OFF SITE

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# IR E-1

References:

California Code of Regulations (CCR), Title 24  
Part 3: California Electrical Code (CEC)

Discipline: Structural

Revised 01-12-11  
Revised 11-03-10  
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This Interpretation of Regulations (IR) is intended for use by the Division of the State Architect (DSA) staff, and as a resource for design professionals, to promote more uniform statewide criteria for plan review and construction inspection of projects within the jurisdiction of DSA which includes State of California public elementary and secondary schools (grades K-12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is reviewed on a regular basis and is subject to revision at any time. Please check the DSA web site for currently effective IRs. Only IRs listed in the document at <http://www.dgs.ca.gov/dsa/Resources/IRManual.aspx> at the time of plan submittal to DSA are considered applicable.

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**Purpose:** The purpose of this Interpretation of Regulations (IR) is to provide guidelines for the proper grounding/bonding of modular buildings.

- 1. Metal Modular Buildings:** When metal buildings are made of components, each building component, including steel ramps, must be electrically bonded together in a manner acceptable to the Division of the State Architect (DSA). Paint on the surface of steel will inhibit passage of electrical current; therefore, bolted connections of component parts are not an acceptable electrical bond.
- 2. Wood Modular Buildings:** In wood frame modular buildings, the electrical system must be grounded as required in the California Electrical Code (CEC).
- 3. Grounding:** The electrical circuits are usually properly grounded. However, it is also necessary to independently ground the steel frames. This is particularly important when the building is supported on a foundation made of wood. An acceptable detail is shown on the attached drawing.

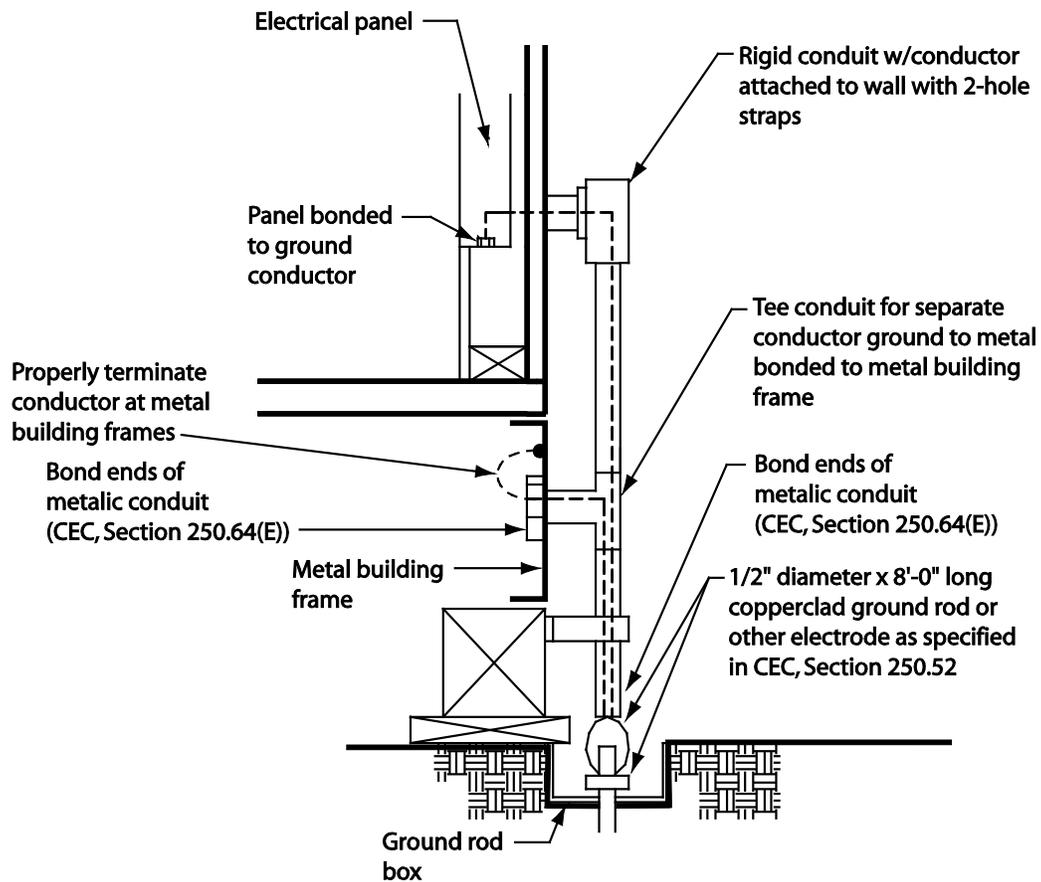
All metal building components must be electrically bonded together, and each building must be independently grounded. Multiple buildings are not to be grounded through the electrical system. All grounding systems are to be tested with a Megger unit, or in an otherwise acceptable manner. Refer to the 2007 or the 2010 CEC, Section 250.52 for specific grounding requirements.

Grounding tests are to be observed and reported by the Inspector of Record.

### Attachment

Figure 1

Figure 1



1. Size of conductors shall comply with CEC Table 250.66
2. Bond separate conductors from ground rod to electrical panel and to metal building frame (CEC 250.52). In addition to the detail shown above, bond the electrical ground to metal underground water pipe in direct contact with the earth for 10 ft. or more, if available (CEC 250.52).
3. All modules of metal frame buildings shall be electrically bonded together. (Bolting only is not acceptable bonding.)
4. Check resistance to ground. If resistance exceeds 25 ohms, install additional ground rod greater than six feet away (CEC 250.56). Once the second ground rod is installed, additional ground resistance testing is not required.
5. Where modular buildings are grouped together, a ground rod may be installed at the end buildings and a ground ring may be installed between them. Each intermediate modular building may be bonded to that ground ring. Where this method is used, ground resistance testing shall not be required.
6. Where modular buildings are installed on concrete foundations, a UFER ground shall be installed in the footing per [CEC 250.52 (A)(3)].
7. Other grounding methods identified in CEC 250 shall be acceptable means to achieve adequate grounding of metal buildings in compliance with the above.