

GROUNDING OF BUILDINGS FABRICATED OFF SITE: 2016, 2013, 2010 AND 2007 CEC

Disciplines:	Structural	History:	Revised 09/20/17	Revised 10/03/07
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Division of the State Architect (DSA) documents referenced within this publication are available on the [DSA Forms](#) webpage.

PURPOSE: This Interpretation of Regulations (IR) provides clarification of specific Code requirements relating to the proper grounding/bonding of modular and relocatable buildings.

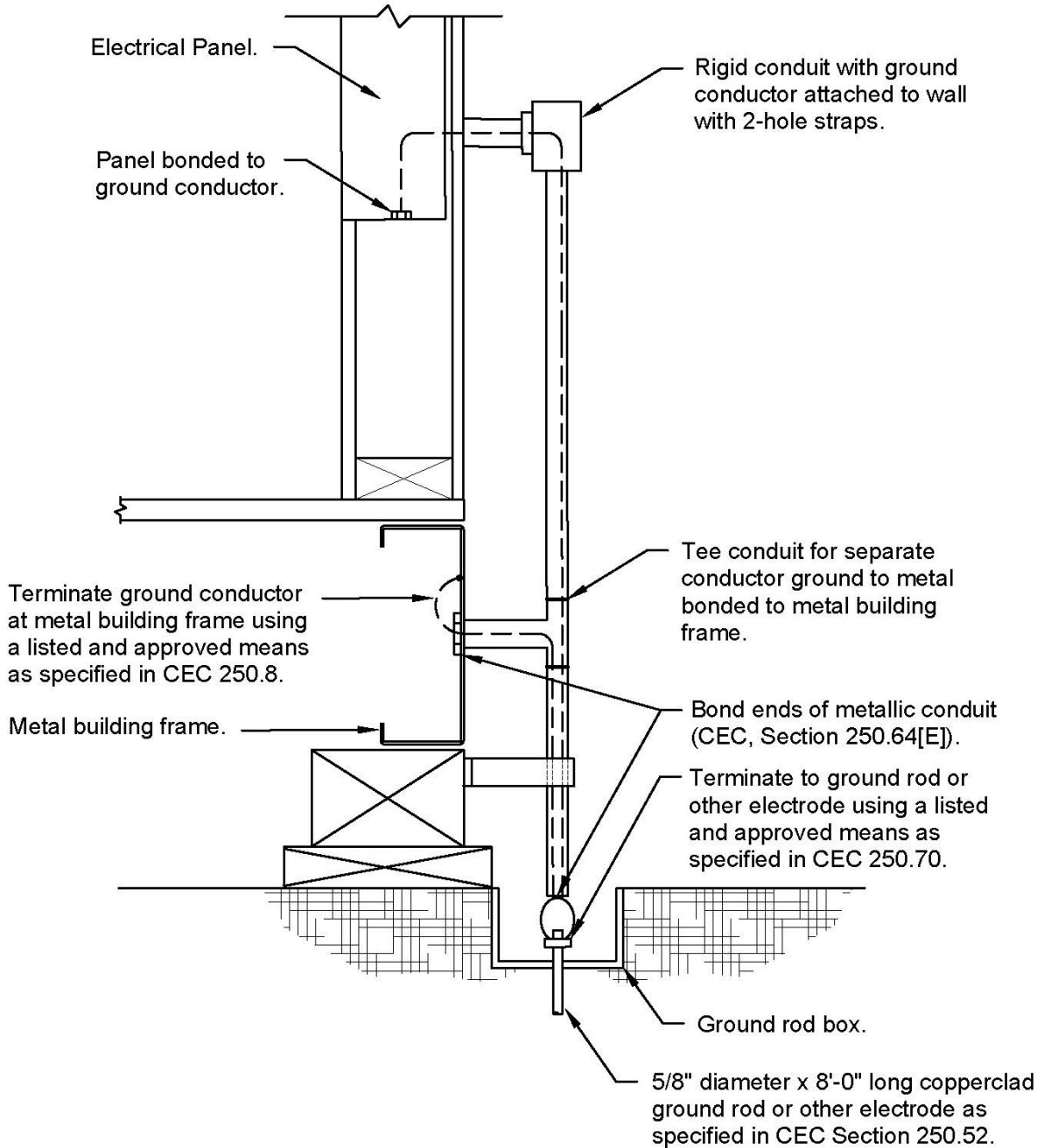
- 1. METAL MODULAR BUILDINGS:** When metal buildings are made of components, each building component, including steel ramps, must be electrically bonded together in a manner acceptable to DSA. Paint on the surface of steel will inhibit passage of electrical current; therefore, bolted connections of component parts are not an acceptable electrical bond.
- 2. WOOD MODULAR BUILDINGS:** The following grounding and bonding requirements apply to modular buildings constructed entirely of wood:
 - 2.1** The electrical system must be grounded to meet the requirements of the California Electrical Code (CEC).
 - 2.2** Metal ramps need not be bonded to modular buildings constructed entirely of wood framing.
- 3. GROUNDING:** The electrical circuits are usually properly grounded. However, it is also necessary to independently ground the steel building frames. This is particularly important when the building is supported on a foundation made of wood, as is frequently the case with relocatable buildings. An acceptable detail is shown on the attached drawing (Figure 1).

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 low-resistance ohmmeter, or in an otherwise acceptable manner. Refer to CEC Section 250.52 for specific grounding requirements.

Grounding tests are to be observed and reported by the Project Inspector in their semi-monthly report (form *DSA 155: Project Inspector Semi-Monthly Report*).

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FIGURE 1



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FIGURE 1 NOTES:

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. 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 six feet or greater away. Once the second ground rod is installed, additional ground resistance testing is not required. (CEC, § 250.53[A]&[B])
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 grounded to that ground ring. Where this method is used, ground resistance testing shall not be required. (CEC, § 250.52[A][4])
6. Where modular buildings are installed on concrete foundations, a concrete-encased electrode (Ufer) ground shall be installed in the footing per CEC Section 250.52(A)(3).
7. Other grounding methods identified in CEC Article 250 shall be acceptable means to achieve adequate grounding of metal buildings in compliance with the above.

REFERENCES:

California Code of Regulations (CCR), Title 24
Part 3, California Electrical Code (2016, 2013, 2010 and 2007), Section 250.52

This IR is intended for use by DSA staff and by design professionals to promote statewide consistency for review and approval of plans and specifications as well as construction oversight of projects within the jurisdiction of DSA, which includes State of California public schools (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.

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