

# EARTHING MANAGEMENT STEEL FRAMING

## About this guide

AS/NZS 3000:2018 contains earthing requirements covering all types of materials and forms of construction in all types of building. Earthing in Light Gauge Steel (LGS) frames may require specific skills or practices to comply with AS/NZS 3000. This Guide contains information to make the job easier and to help you meet your obligation to comply with AS/NZS 3000 when working on steel framed buildings.



This resource was produced by the National Association of Steel-Framed Housing Inc and the College of Electrical Training.

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## PRE-MANUFACTURED LGS FRAMES

Prefabricated LGS frames are made in the factory. Connections may consist of self-tapping fasteners, self-drilling fasteners, rivets, bolts and welded connections. These frame sections are transported to site and assembled to form a structural house frame. All connections made in the factory or at site provide electrical continuity between components that are site-assembled to provide a structural house frame.

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## CONSTRUCTION MATERIALS

Building structures – residential, commercial and industrial – may be constructed from timber, steel, concrete, masonry and other materials. The use of LGS structures is not new and methods of safely installing electrical systems in LGS frames have existed for decades.

More recent developments have included the mixing of structural frame materials such as steel wall frames with timber roof truss, timber intermediate floor beams with LGS upper and lower walls, or LGS second storey addition to brick lower storey homes.

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## EARTHING OF LGS FRAMES

Steel structural framework must be earthed in accordance with the requirements of Clause 5.4.6 of AS/NZS 3000.

Structural metalwork must be earthed directly (i.e. not via a bonding conductor) with the protective earth conductor connected at one point (see Clause 5.4.6.2) to the metalwork. The maximum allowable resistance between the earth bar and any part required to be earthed shall not exceed  $0.5\Omega$ . This must be verified in accordance with Clause 8.3.5 of AS/NZS 3000.

Protective earthing conductor size is determined from Clause 5.3.3 and Table 5.1 of AS/NZS 3000.

In situations where parts of LGS frames in a building are not electrically continuous with others, they must be interconnected to meet the requirements of Clause 5.4.6.

## Earthing of LGS frames

In general, a LGS frame will be earthed when the electrician returns to site for rough-in of the wiring.

If a temporary electrical supply is installed to the site, a temporary meter box is typically located on star pegs generally near the wall area on which the switchboard will eventually be installed. The earth electrode is most likely to be placed at the base of this wall.

**A temporary power board for a construction site must comply with and be installed in accordance with AS/NZS 3000 & AS/NZS 3012. Requirements to be met for connection of a temporary power board to the network may vary between network operators.**

**All power to a construction site is RCD protected and correctly earthed**



Temporary meter box



Temporary meter box

**FAQ 006/2018:**

**AS/NZS 3000:2018, CLAUSE 5.4.6.2 Structural metalwork including conductive building materials – Connection to protective earthing conductors**

**Question 006/2018:**

**Is it necessary to earth individual lintels, posts, metal window frames and steel trusses mounted on timber walls?**

No, however in the case of unearthed structural metalwork and other conductive building materials the following must be considered:

- a) There shall be no risk of contact between insulated unsheathed cables coming into contact with the building material;
- b) There shall be no risk of contact between live parts of electrical equipment and the building material, and
- c) The breaking of a conductor at a termination or connection shall not result in the above mentioned contacts from occurring. (This can be achieved by shrouding, typing, restraining, lacing or clipping).