

BULLETIN 10-14-6

Bonding of non-electrical equipment

Rules 10-400, 10-406 and 10-814

Issued May 2012
Supersedes Bulletin 10-14-5

Scope

- (1) Bonding interior metal gas piping – (includes natural gas & propane piping)
- (2) Bonding of drain to ground

(1) Bonding interior metal gas piping – (includes natural gas & propane piping)

Rule 10-406(4) requires that interior metal gas piping which may become energized, shall be made continuous and be bonded to ground.

Questions have arisen regarding what needs to be bonded, what are acceptable bonding methods, who is responsible for installing the bond conductor, and does the bond conflict with any Gas Codes.

Background

Bonding of interior metal gas piping is required by the Ontario Gas Bulletin 4/92 to minimize hazards associated with:

- accidental contacts between metal gas piping and energized electrical circuits,
- accumulation of static charges, and
- stray currents and potential differences between various sections of piping.

Bonding is required for new buildings with metal gas piping installed at the time of construction. Bonding is also required for short sections of metal gas piping that is newly installed for fireplaces, pool heaters and other appliances on existing buildings. This bonding requirement applies to both natural gas and propane gas installations.

There is generally electrical wiring in the areas where gas piping is installed. This creates the possibility that the gas pipe, appliance or even an associated metal chimney may become energized. Appliances such as gas fireplaces may have electrical wiring installed right in the unit in close proximity to the gas piping.

Direction

For new buildings with gas piping installed at that time, the contractor responsible for making application for inspection of the electrical service is responsible for bonding all the gas piping to ground as required by Rule 10-406.

For electrical service upgrades in existing buildings with gas piping present and not bonded to the main service ground as required by Rule 10-406, the building owner is to be notified of the deficiency together with a recommendation the deficiency be corrected for safety reasons.

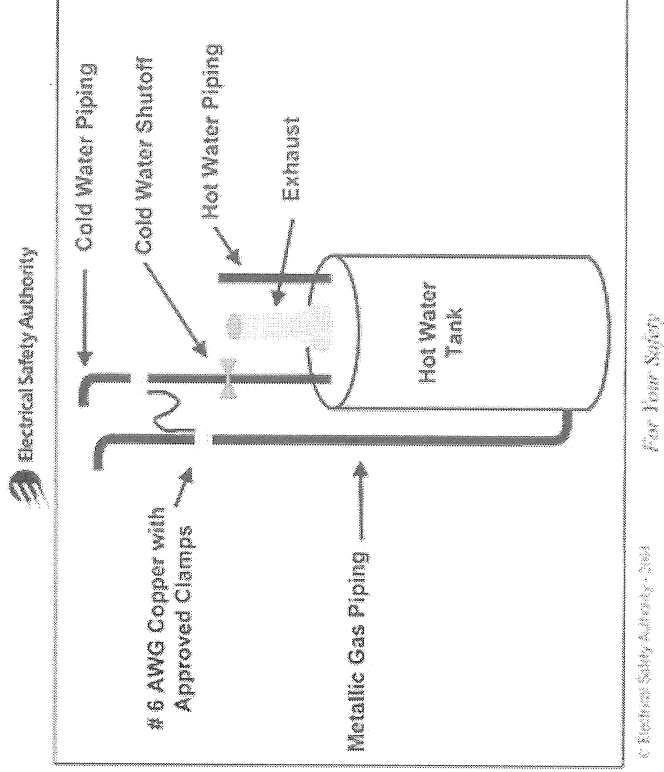
Where gas piping is being installed for the first time in a building to supply new gas appliances and there is no change in the main electrical service, the contractor responsible for making application for inspection of the electrical work associated with the appliances is responsible for the bonding.

For replacement or upgrade of existing gas appliances where the existing gas piping is not bonded to the main service ground as required by Rule 10-406, the owner of the premises is to be notified of the deficiency together with a recommendation that the deficiency be corrected for safety reasons.

Where a section of new metal gas piping is added for a new appliance and the existing metal gas piping is not bonded to the main service ground as required by Rule 10-406, the contractor responsible for making application for inspection of the electrical work associated with the new appliance is responsible for bonding of the new section of gas piping to the main service ground.

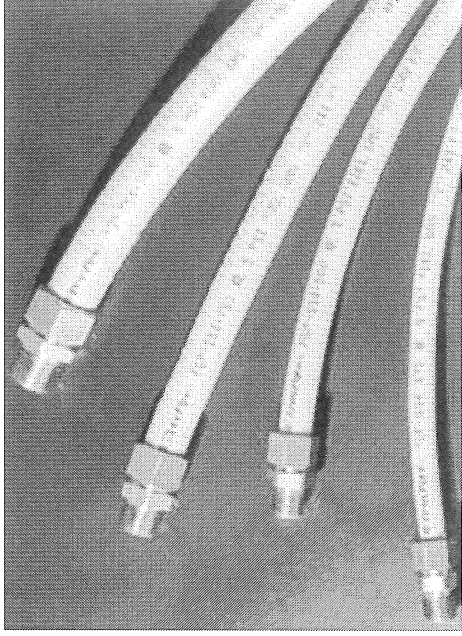
The requirements of this rule can be satisfied by installing a #6 copper bond wire, with approved clamps, from the metal gas pipe after the gas meter, to the nearest cold water pipe, or directly to the main service ground. (Commonly installed at the hot water tank, see Diagram B1). The Electrical Inspector must be satisfied that the water piping system is electrically continuous to the system grounding conductor.

Diagram B1 – Bonding at the hot water tank



The gas bonding conductor may be connected to the black iron or copper gas piping with appropriately sized and approved clamps or devices. The bonding conductor clamp shall not be attached directly to corrugated stainless steel tubing (CSST) unless information can be provided showing compliance to the tubing manufacturer's installation instructions. Most manufacturers of CSST tubing do not permit bonding clamps to be attached directly to their product.

Photo B1 – Typical Corrugated Stainless Steel Tubing



The Ontario Gas Utilization Code, 6.14.6 of the B149.1 - 05 does not permit the underground gas piping to "be used for an electrical ground" (i.e. grounding electrode). Grounding electrode(s) must be installed as per Rule 10-700 for electrical system grounding.

(2) Bonding of drain to ground

The section of the metal wastewater piping that shall be bonded is the section that is in contact with the earth. For the purposes of the rule, that will be considered a continuous system. Once there is an insulating section, or an insulating type coupling, the portion beyond need not be bonded to the electrical ground and will not be considered part of the continuous drain system.

The routing and use of the drain is more important than the length. The major concern in the rule is voltage differences. A length of drain, which is continuous from where it contacts a remote ground, is of more concern than a length, which is isolated at some point and then continues for some distance. The latter has no ground reference and can transfer no potential; the former can.