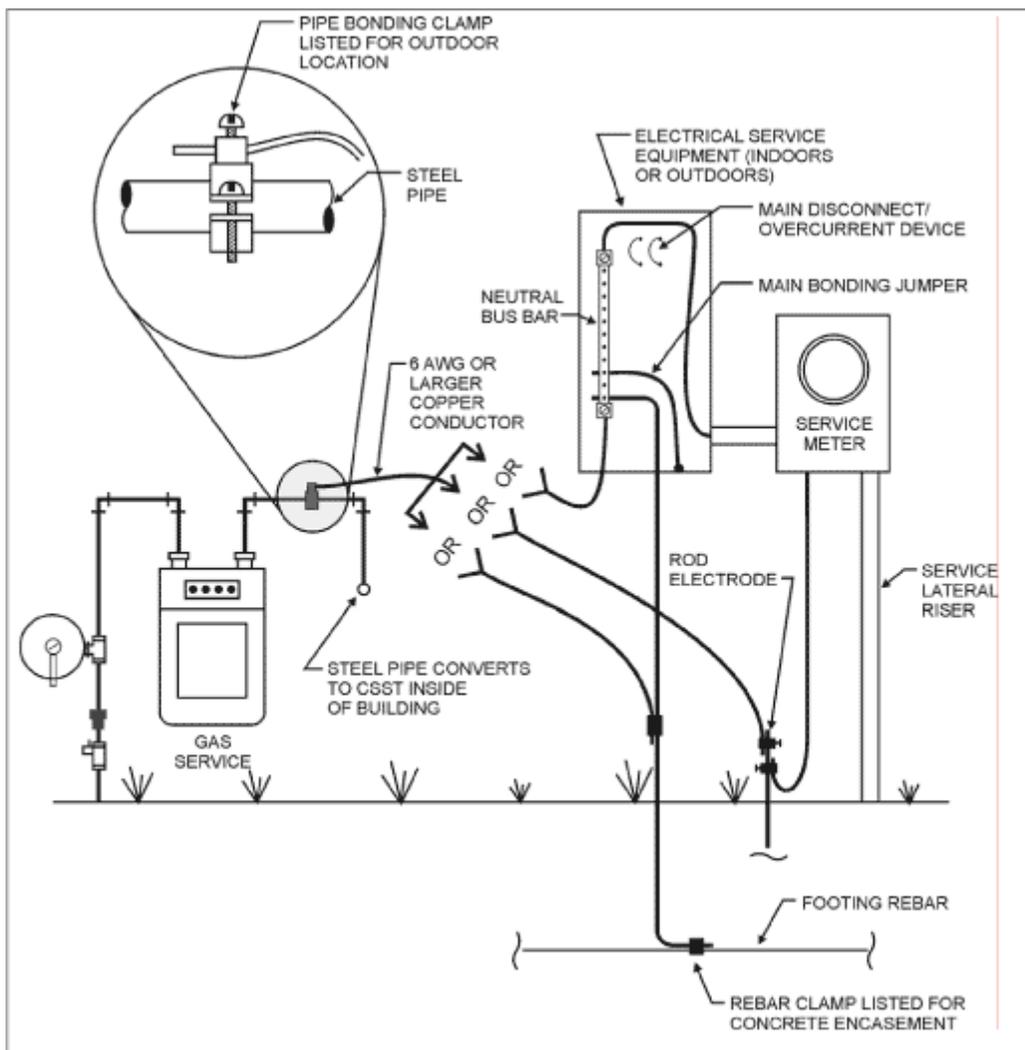


## Electrical Bonding of CSST Gas Piping Systems

There has been some confusion as to whether Section 310.1.1 of the International Fuel Gas Code (IFGC)/2009 and Section G2411.1.1 of the International Residential Code (IRC)/2009 are in direct conflict with Section 309.1 and Section G2410.1, respectively, of the same codes, along with Section 250.104(B) of the National Electrical Code (NEC)/2008. We believe the confusion lies in the words of Section 309.1 (IRC)/G2410.1 (IFGC) as follows: "Gas piping shall not be used as a grounding electrode." In short, bonding the gas CSST piping system does, by default, make it part of the electrical service grounding electrode system, it however is not being USED as the grounding electrode.

The IRC/2009 and IFGC/2009 state: "G2411.1.1 (310.1.1) CSST. Corrugated stainless steel tubing (CSST) gas piping systems shall be bonded to the electrical service grounding electrode system at the point where the gas service enters the building. The bonding jumper shall be not smaller than 6 AWG copper wire or equivalent."

The purpose of the bonding jumper required by these sections is to reduce the likelihood of damage to the CSST caused by the electrical energy from an indirect lightning strike. As you know, NOTHING is capable of protecting ANYTHING from a direct lightning strike. In the case of an indirect strike, the electrical energy could travel along metal piping and tubing and "jump" off to other metal components in the building. This causes an arcing that could burn and perforate the wall of CSST tubing due to the lack of thickness of its exterior wall thus causing a gas leak. Per the IRC/2009 Commentary, the bonding of the CSST directly to the electrical service grounding electrode system has been shown in laboratory testing to greatly reduce this risk. Remember that the bonding clamp must connect to the rigid steel piping at the point where the gas service enters the building and may be located either inside or outside the building. The bonding conductor must be continuous with the other end connected to the steel enclosure of the electrical service equipment or the grounded conductor at the electrical service or the grounding electrode conductor (if of sufficient size) between the service equipment and the grounding electrode(s) or one or more of the grounding electrodes for the electrical system. The bonding jumper may be connected as per the diagram below. The diagram is a reprint, with permission from the International Code Council (ICC), from the IRC/2009 Commentary. As you can see, ICC Commentaries provide wonderful insight into the intent of the code provisions and are a useful tool in any code official's library.



Source: Rob Austin, Suzanne Borek, Tom Pitcherello  
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