

ARTICLE 250

GROUNDING AND BONDING

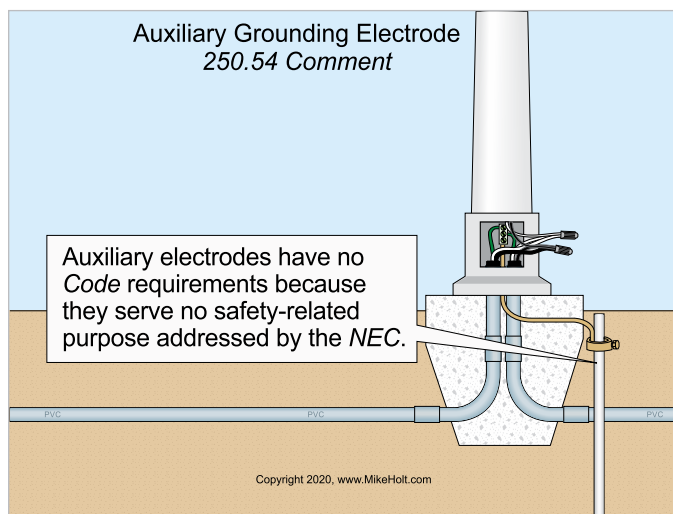
Introduction to Article 250—Grounding and Bonding

No other article can match this one for misapplication, violation, and misinterpretation. The terminology used in Article 250 has been a source of much confusion but has been improved during the last few *NEC* revisions. It is very important for you to understand the difference between grounding and bonding in order to correctly apply the provisions of this article. Pay careful attention to the definitions of important terms located in Article 100 that apply to grounding and bonding. Article 250 covers the grounding requirements for providing a path to the Earth to reduce overvoltage from lightning strikes, and the bonding requirements that establish a low-impedance fault current path back to the source of the electrical supply to facilitate the operation of overcurrent protective devices in the event of a ground fault.

This article is arranged in a logical manner as illustrated in Figure 250.1 in the *NEC*. It may be a good idea for you to just read through the entire article first to get a big picture overview. Then, study Article 250 closely so you understand the details and remember to check Article 100 for the definitions of terms that may be new to you. The illustrations that accompany the text in this textbook will help you better understand the key points.

250.54 Auxiliary Grounding Electrodes

Grounding electrodes that are not required by the *NEC* are called “auxiliary electrodes” and can be connected to the equipment grounding conductors. Since they serve no purpose related to the electrical safety addressed by the *Code*, they have no *NEC* requirements. ▶ [Figure 250-132](#)



▶ [Figure 250-132](#)

If an auxiliary electrode is installed, it is not required to be bonded to the building grounding electrode system, to have the grounding conductor sized to 250.66, nor must it comply with the 25-ohm single ground rod requirement of 250.53(A)(2) Ex.

Caution



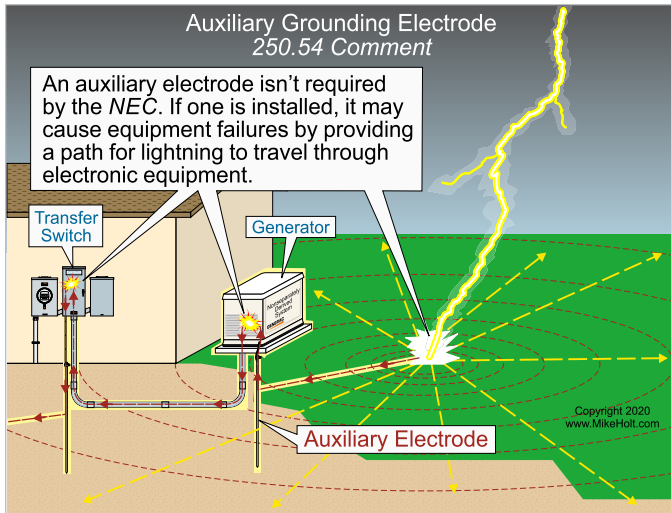
An auxiliary electrode may cause equipment failures by providing a path for lightning to travel through electronic equipment. ▶ [Figure 250-133](#) and ▶ [Figure 250-134](#)

The Earth is not to be considered the effective ground-fault current path specified in 250.4(A)(5). ▶ [Figure 250-135](#)

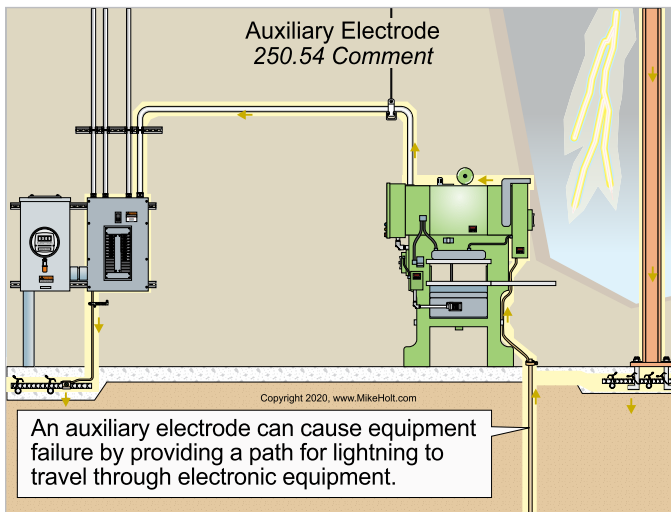
Danger



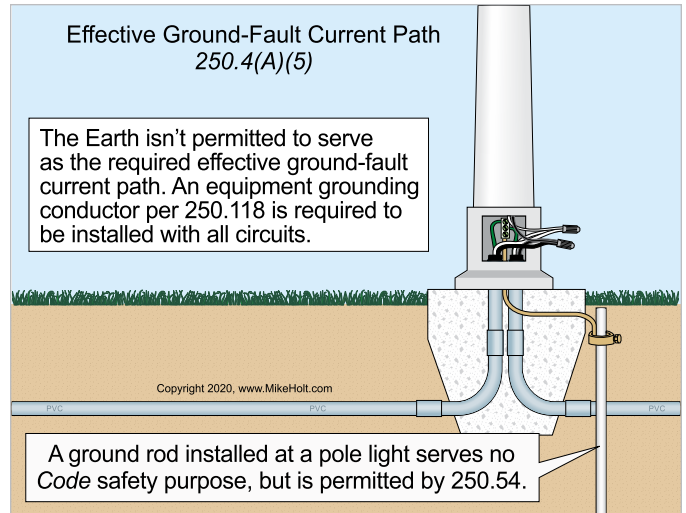
Because the contact resistance of an electrode to the Earth is so great, very little fault current returns to the power supply if the Earth is the only fault current return path. As a result, the circuit overcurrent protective device will not open and clear the ground fault, and all metal parts associated with the electrical installation, metal piping, and structural building steel will become and remain energized. ▶ [Figure 250-136](#)



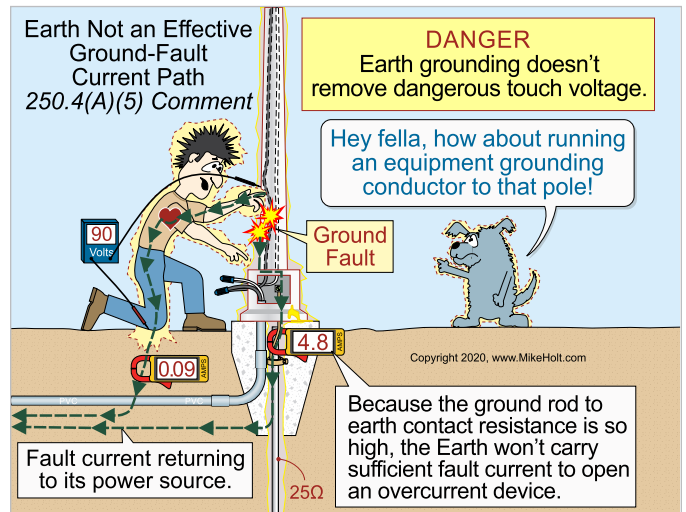
►Figure 250-133



►Figure 250-134



►Figure 250-135



►Figure 250-136