

ARTICLE 250

GROUNDING AND BONDING

Introduction to Article 250—Grounding and Bonding

Article 250 covers the general requirements for bonding and grounding electrical installations. The terminology used in this article has been a source of much confusion over the years so pay careful attention to the definitions pertaining to Article 250. Understanding the difference between bonding and grounding will help you correctly apply the provisions of this article. Because of the massive size and scope of Article 250, Figure 250.1 in the *NEC* is provided as a reference for the locations of the different types of rules. Of the ten parts contained in this article only parts one through seven are covered in this material. *Topics* covered in this material for Article 250 include:

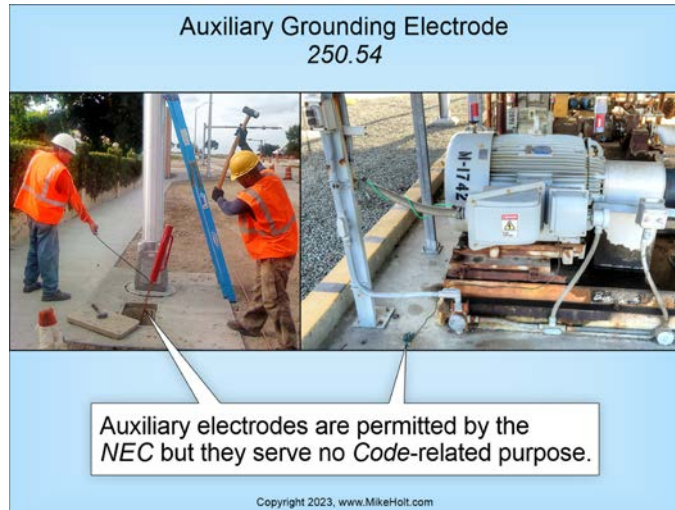
- ▶ General Requirements for Grounding and Bonding
- ▶ Objectionable Current
- ▶ Protection of Clamps and Fittings
- ▶ System Grounding Requirements
- ▶ Bonding Jumpers
- ▶ Generator Bonding
- ▶ Grounding Electrode System
- ▶ Service Equipment Bonding
- ▶ Piping System and Structural Steel Bonding
- ▶ Equipment Grounding conductors (EGCs)

Article 250 consists of ten parts:

- ▶ Part I. General
- ▶ Part II. System Grounding
- ▶ Part III. Grounding Electrode System and Grounding Electrode Conductor (GEC)
- ▶ Part IV. Enclosure, Raceway, and Service Cable Connections
- ▶ Part V. Bonding
- ▶ Part VI. Equipment Grounding Conductors (EGC)
- ▶ Part VII. Methods of EGC Connections
- ▶ Part VIII. Direct-Current Systems
- ▶ Part IX. Instruments, Meters, and Relays
- ▶ Part X. Grounding of Systems and Circuits of over 1000 Volts

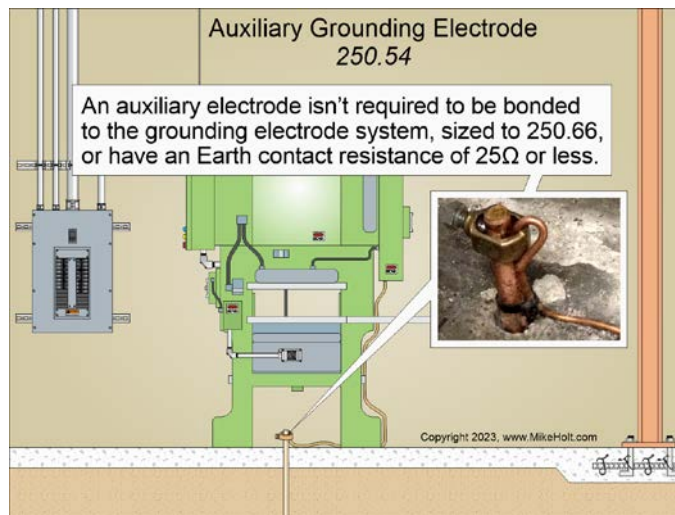
250.54 Auxiliary Grounding Electrodes

Grounding electrodes that are not required by the *NEC* are called “auxiliary electrodes” and 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 250-126



▶Figure 250-126

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 25Ω single ground rod requirement of 250.53(A)(2) Ex. ▶Figure 250-127

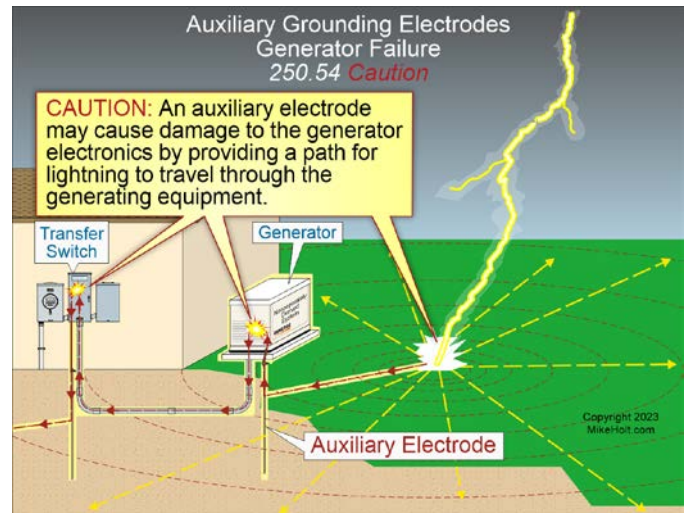


▶Figure 250-127

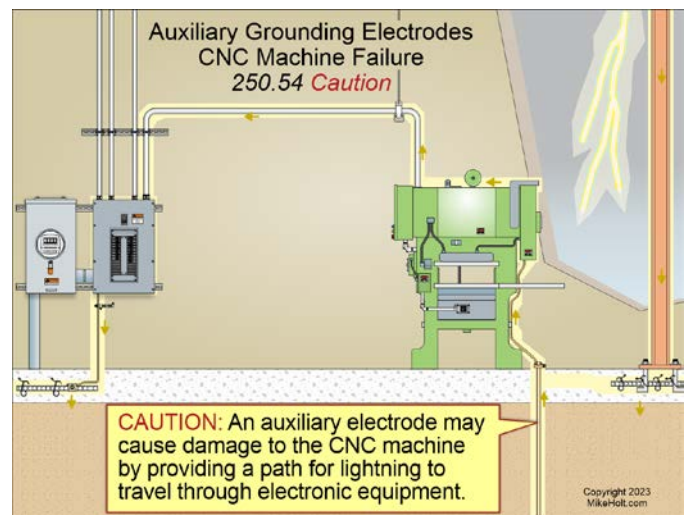
Caution



CAUTION: An auxiliary electrode may cause damage to the generator electronics by providing a path for lightning to travel through the generating equipment. ▶Figure 250-128 and ▶Figure 250-129

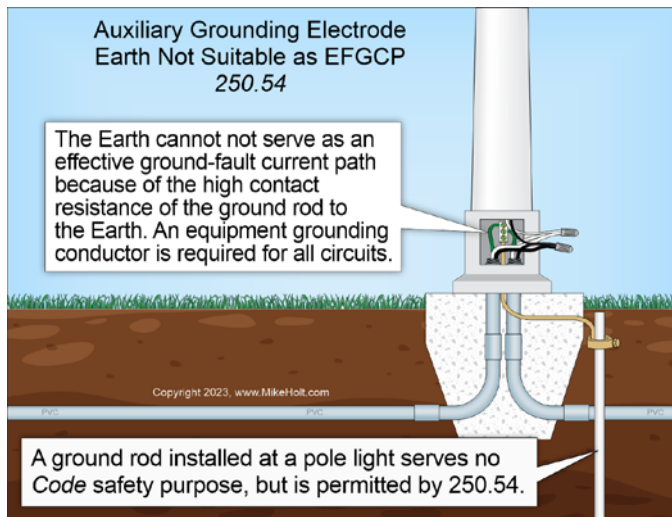


▶Figure 250-128

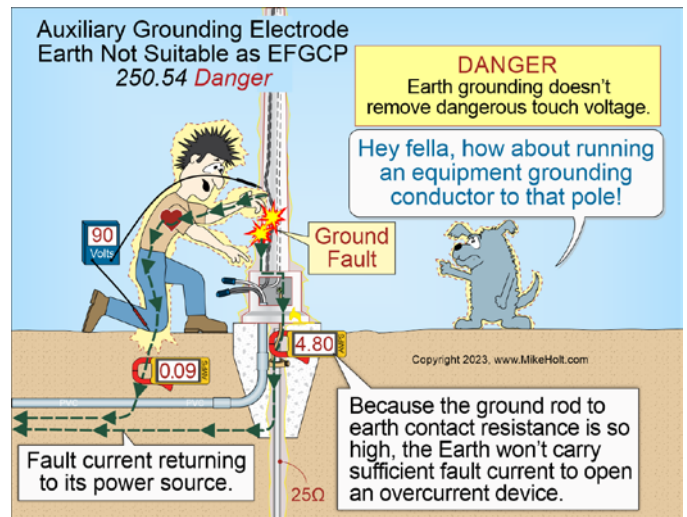


▶Figure 250-129

The Earth is not to be considered the effective ground-fault current path specified in 250.4(A)(5). ▶Figure 250-130



►Figure 250-130



►Figure 250-131

Danger

DANGER: Because the contact resistance of an electrode to the Earth is so great, very little fault current returns to the source 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 250-131