

**North Carolina Department of Labor
Division of Occupational Safety and Health**

Raleigh, North Carolina

Field Information System

Standards Notice 49A

Subject: 29 CFR 1926.404 (b) - Ground-Fault Protection in Construction Operations

A. Standard.

29 CFR 1926.404(b)(1): Ground-fault protection.

- i. General. The employer shall use either ground-fault circuit interrupters as specified in paragraph (b)(1)(ii) of this section or an assured equipment grounding conductor program as specified in paragraph (b)(1)(iii) of this section, to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.
- ii. Ground-fault circuit interrupters. All 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.
- iii. Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:
 - [A.] A written description of the program, including the specific procedures adopted by the employer, shall be available at the job site for inspection and copying by the Assistant Secretary and any affected employee.
 - [B.] The employer shall designate one or more competent persons (as defined in 1926.32(f)) to implement the program.
 - [C.] Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indication of possible internal damage. Equipment found damaged or defective may not be used until repaired.

[D.] The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:

- [1.] All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
- [2.] Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

[E.] All required tests shall be performed:

- [1.] Before first use;
- [2.] Before equipment is returned to service following any repairs;
- [3.] Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and
- [4.] At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

[F.] The employer may not make available or permit the use by employees of any equipment which has not met the requirements of this paragraph (b)(1)(iii) of this section.

[G.] Tests performed as required in this paragraph shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test, and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means, and shall be maintained until replaced by a more current record. The record shall be made available on the job site for inspection by the Assistant Secretary and any affected employee.

B. Discussion and Interpretation.

Since the initiation of enforcement of the ground-fault protection requirements of the OSHA standards, several questions have repeatedly occurred. They are:

1. **What is a construction site?** A construction site, for the purpose of ground-fault protection requirements, is any location where construction, alteration, and/or repair, including painting and decorating takes place, as set forth in 1910.12 and 1926.13. The term "alteration" includes demolition. This site may be on the site of or within an existing structure, or a completely new location. Regular manufacturing and production line operations are not included, such as mobile home manufacturing.
2. **Who is responsible for providing ground-fault protection?** Ground-fault protection in the form of GFCI or an assured grounding program shall be

provided by each employer of employees required to use 120 volt, 15- and 20-ampere receptacles on construction sites. In some cases, a contractor may make arrangements for ground-fault protection of a job site, thereby relieving him/herself of the physical operation of installing the protection. This arrangement, however, does not relieve these contractors of the legal responsibility for providing the ground-fault protection to their employees. In cases where no GFCI or assured grounding program is present, the employers of all employees exposed will be cited. In a situation where a contractor has been required by the job contract to provide temporary power and other general utilities on the construction site, his responsibility for providing ground-fault protection under the OSHA regulations only applies to the protection of his employees. Each contractor on the site is still legally responsible for protecting his own employees with some form of ground-fault protection. The contractor responsible for providing the temporary power on the site should notify each of the other contractors on the site of the existence or nonexistence of ground-fault protection at the 120 volt, 15- and 20-ampere receptacles on the construction site.

3. **What is the difference between temporary and permanent wiring as it applies to ground-fault protection?** Temporary wiring is a class or method of wiring which is specifically permitted by the National Electrical Code (ANSI/NFPA No. 70) for use during periods of construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment of similar items. Permanent wiring is a complete system or portion thereof, which has been accepted by the customer, owner, and electrical inspector. Such a permanent system would require covers, conduits, conductors, grounds, bonds, anchors, etc. Where extension cords or any similar nonpermanent wiring is used with permanent wiring, the extension cord and all nonpermanent wiring will be considered temporary wiring and 29 CFR 1926.404 will be cited accordingly. The alternative method of complying with 29 CFR 1926.404(b) is an assured equipment grounding program.
4. **What ground-fault protection must be provided where double-insulated tools are used?** When double insulated tools are encountered on a construction site, professional judgment must be exercised in evaluating the presence of a violation and the extent of the hazard. The National Electrical Code exempts tools protected by an approved system of double insulation from the requirements for electrical grounding. There is no such exemption from the ground-fault protection requirements under 29 CFR 1926.404(b). If an inspector encounters double insulated tools on a construction site, he or she must determine if these are the only tools likely to be used by the employees on the site. Where double insulated tools are the only type present, the extent of the hazard may be low and issuing a citation may not be necessary. If employees use power tools which are not double insulated, the hazard to employees is greater and some form of ground-fault protection is required.
5. **What testing and evaluation methods should be used when inspecting ground-fault circuit interrupting devices?** In testing and evaluating ground-fault circuit interrupting devices on a construction site, the specific instruction on the GFCI unit being used should be followed. All GFCI devices are required to have a test button that places greater than a 6 milliamperes “leak” on the circuit.

This amperage is supposed to trip the device. A reset button or switch is also provided.

After warning anyone using that circuit, the CSHO will ask the employer to push the test button. If there is no outlet-type GFCI (the type that is installed in the outlet box) or cord-connected GFCI visible, there may be a GFCI installed further up the circuit. The CSHO may use an approved external GFCI tester at the outlet to determine compliance. If the circuit fails to trip, then the CSHO must do further investigation and visually determine if there is a GFCI device installed on the circuit.

The failure of a GFCI to operate properly should be cited under 29 CFR 1926.404(b)(1)(ii).

All GFCI devices and circuits should also be tested for ground using the Woodhead 1750 tester or equivalent device.

6. **What effect does a ground-fault circuit interrupting device have on the requirement for electrical grounding of tools and extension cords?** As indicated above, the use of a GFCI device does not remove the requirement for electrical grounding of handheld, cord- and plug-connected equipment on job sites. The extent of the hazard is greatly reduced by the use of approved GFCI device. This should be taken into consideration when determining what citation or penalty should be proposed.
7. **What items must be evaluated in determining an acceptable "assured grounding program"?** In evaluating an "assured equipment grounding conductor program" method of ground-fault protection on a construction site, at a minimum, the items listed below must be considered. All of these items are necessary for an effective "assured equipment grounding conductor program", and the weakness or the absence of any specific item may make the program ineffective and unacceptable. The CSHO must exercise professional judgment in evaluating the effectiveness of such a program and the level of protection provided to employees.
 - a. The program must cover all cord sets, receptacles (not part of permanent wiring), and cord- and plug-connected equipment available for use by the employees.
 - b. There must be a written description of the program, including specific details, present at the job site. This program must represent what is actually being carried out by the employer on that particular site.
 - c. A competent person or persons must be responsible for implementing the program. One person may have the overall responsibility for the program and the actual cord and equipment testing and recording for several sites, while other competent individuals may conduct daily visual inspections and remove questionable or unsafe equipment from service on each individual site.
 - d. A competent person must conduct visual inspections and carry out procedures intended to prevent the use of damaged or defective tools.
 - e. Appropriate test equipment and procedures must be used when conducting the continuity tests and the wiring and attachment evaluations

of equipment grounding conductors on cords, plugs, and temporary receptacles.

- f. Appropriate test intervals must be established in accordance with the provisions of the standards. Additional tests must be conducted before returning repaired cords or equipment to service and before first use of a new cord or tool.
- g. Effective procedures or policies must be instituted by the employer to prevent the use of untested cords and equipment on the site.
- h. An effective method of record keeping and identification of equipment and test intervals must be established on the site. The methods may range from detailed records to simple color coding system with the code being included in the written program

C. Effective Date.

SN 49 is canceled. This SN is effective on the date of signature. It will remain in effect until revised or canceled by the Director.

Signed on Original
Kevin O'Barr
Safety Standards Officer

Signed on Original
Allen McNeely
Director

8/09/05
Date of Signature