

PROGRAM DIRECTIVE

Program Directive A-176
Issued December 1, 1990
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SUBJECT: Excavation Standards

AFFECTED CODES/

DIRECTIVES: Division 3, Construction

PURPOSE: These are inspection procedures and clarification to ensure uniform enforcement of the Excavation Standards.

SCOPE: This instruction applies to all OR-OSHA.

REFERENCES:

- A. Construction Safety and Health Standards, Subdivision P, 1926.650, 651, and 652.
- B. Oregon OSHA Field Inspection Reference Manual (FIRM).
- C. Oregon OSHA "Construction SAVES Manual."

CANCELLATION: OSHA Instruction STD 3-14.1, October 30, 1978, Citation Policy - Specific Trenching Requirements, is canceled.

ACTION: The Administrator and field offices must ensure that compliance officers follow these instructions and are familiar with the standards.

BACKGROUND: The Occupational Safety and Health Administration issued revised rules for Subpart P to 29 CFR 1926 (54 CFR 45894 October 31, 1989).

- A. The federal Advisory Committee on Construction Safety and Health (ACCOSSH) reviewed these rules and many of the changes reflect their recommendations and those of other interested parties.
- B. On April 15, 1987, OSHA issued a notice of proposed rulemaking on excavations (52 FR 12288). After an extensive comment period and public hearings, the hearing transcript and related submissions were certified and closed on December 15, 1988.

- C. The final rule resolves many issues raised in earlier attempts to regulate this activity within the construction industry. Many of these issues involved previous decisions under the existing standard.
 - 1. This rule establishes one set of requirements applicable to all excavations, including trenches.
 - 2. Where compliance requirements apply only to trenches, the final rule makes it clear that these requirements apply only to those excavations that are also trenches.

**INSPECTION
GUIDELINES
(COMPLIANCE
PROCEDURES):**

- A. Excavation Protection Programs. This standard provides requirements that give employers flexibility to develop programs that provide effective protection for employees working in excavations. In addition to the standard itself, the preamble provides further guidance and rationale for changes in the existing standard.
- B. Program Compliance. During all inspections at construction sites, where excavation standards are or will be applicable, compliance personnel must ensure that work complies with Division 3 1926, Subdivision P, Excavations.
 - 1. This review must include any documentation by employers of the methodology and background information used to determine whether they need shoring systems and the type of systems used.
 - 2. The Safety Compliance Officer/Health Compliance Officer (SCO/HCO) must evaluate the employer's compliance with the specific requirements of the standard.
- C. SCO/HCO Responsibilities. The following procedural guidance is a general framework designed to assist the SCO/HCO with inspections:
 - 1. Ask the employer for the basis on which they developed their employee excavation protection program.
 - 2. Interview a representative cross-section of employees to verify the employer's program. This must include an evaluation of their training and the effectiveness of the employer's enforcement of its program. (See 1926.20(b)(1) and 1926.21(b)(2).)

3. Evaluate compliance with requirements for daily inspection of excavations. (See 1926.651(k)(1).)
4. Identify all persons (competent person, registered professional engineer, etc.) responsible for excavation activities and/or operations.
5. Evaluate compliance with training requirements identified by periodic inspections or changes in equipment and/or procedures. This must include an evaluation of the effectiveness of the employer's inspection procedures and training program for assessment and correction of situations resulting in near misses and/or injuries or circumstances indicating that modifications are necessary. (See 1926.20(b)(1) and 1926.21(b)(2).)

D. Specific Excavation Requirements.

1. Scope and Application. This subdivision applies to all open excavations. Excavations include trenches. All trenches are excavations; all excavations are not trenches. (See 1926.650(a).)

NOTE: If installed form work or other similar obstructions reduce the depth-to-width dimensions for a particular excavation, it may become a trench as defined later in the specific requirements of this instruction.

2. Definitions. Rely on the definitions in the excavation standard to interpret and apply the standard properly. In some cases terms within a definition are themselves defined in the same section.

- a. Accepted Engineering Practices. SCO/HCO's must verify with the employer which aspects of the employee protection system were designed or approved by a registered professional engineer. Record the name of such individual or, if a firm, the firm's name, the name of the engineer of record that approved the work for the firm, and the registration number.

- (1) Field offices may review any work that must be certified as to the status of such certification with the State Board of Certification and Registration for Professional Engineers and Land Surveyors

in their respective States.

- (2) Also verify all other aspects of the onsite excavation conditions that the employer indicates are under the direct supervision of a registered professional engineer.

Refer all inquiries relating to the adequacy of the engineering design to the field office.

The field office may refer deficient or inadequate engineering designs of protective systems to the State Building Codes and Registration for Professional Engineers.

- (3) Note on the OR-OSHA AVD, any equipment, shoring devices, shields or other special aspects of an employer's excavation program in which the compliance investigation reveals the use of a Registered Professional Engineer. Issue citations if such devices, shields or other special aspects of the employer's program do not comply with the requirements of the standard.

b. Competent Person. SCO/HCOs must pay particular attention to the investigation and documentation of data to establish that any person serving in this capacity is able to identify existing and potential hazards for workers.

- (1) To be a "competent person" under this standard, a person must have training in, and be knowledgeable about, soils analysis, the use of protective systems and the requirements of this standard.
- (2) The competent person with such training and knowledge must be able to identify existing and predictable hazards in excavation work and have the authority to take prompt measures to abate these hazards. Thus, a backhoe operator who would otherwise meet the requirements of the definition is not a competent person if they lack the authority to take prompt corrective measures to eliminate existing or potential hazards.

- c. Hazardous Atmospheres. The SCO/HCO must check for hazardous or oxygen deficient atmospheres. For example, these include irritating atmospheres that could be in areas close to a landfill, where it is not uncommon to find hydrogen sulfide (H₂S).
- d. Registered Professional Engineer. The SCO/HCO must determine that the Registered Professional Engineer of record is in fact working within a discipline applicable to the excavation work; i.e., it would be inappropriate for an electrical engineer to approve shoring design for an excavation. See also the definition for acceptable engineering practices in this instruction.
- e. Tabulated Data. The SCO/HCO must examine and ensure that all tabulated data for protective systems are approved by a Registered Professional Engineer.

NOTE: The use of tabulated data appearing in the appendices to this standard is excluded from this requirement.

3. General Requirements.

- a. Surface Encumbrances. The standard requires removal or support of all surface encumbrances that create a hazard to employees. The requirement is the same as the existing 1926.651(b) and applies to all employees at the construction worksite. (See 1926.651(A).)
- b. Excavator to give notice of proposed work. The excavator must give notice of the proposed work according to the requirements of OAR 437-001-0010 through 0090. These rules and the entire notice process are the jurisdiction of the Oregon Utility Notification Center at 1-800-332-2344.
- c. Hazardous Atmospheres. In addition to the requirements in Subdivisions D and E of this division (1926.50 -- 1926.107), to prevent exposure to harmful levels of atmospheric contaminants and to ensure acceptable atmospheric conditions, the following additional requirements apply: (See 1926.651(g).)

- (1) Make air quality tests before employees enter excavations more than 4 feet in depth when a hazardous atmosphere exists or could exist.
- (2) Test as often as necessary to ensure the quality and quantity of the atmosphere. This includes checks for flammable gases and oxygen (O₂) deficiency.
- (3) Where hazardous atmospheres exist or may exist, emergency rescue equipment must be on the worksite and readily accessible to employees. (See 1926.651(g)(2)(i).)
- (4) There must be daily inspections by a competent person. Evidence of the lack of such inspections may include indication of failure of protective systems or employees exposed to hazardous atmospheres. (See 1926.651(k)(1) and (2).)

4. Requirements for Protective Systems.

- a. When the employer elects to protect employees by sloping, 1926.652(b)(1) requires that the slope be not steeper than 1.5H:1V "unless the employer uses one of the other options"
 - (1) In a contested case proceeding once OR-OSHA shows that no support system was used and that the sides of the excavation were steeper than 1.5H:1V, the employer has the burden of showing its compliance with one of the other sloping options.
 - (2) The SCO/HCO, however, must document all relevant facts to evaluate the hazard to obtain information that may be necessary for rebuttal of the employer's case.
- b. If the SCO/HCO suspects a protective system is inadequate or in danger of failure, they must notify the employer's representative or competent person immediately to remove any employees in the excavation until such danger of failure is abated. (See 1926.652(a)(2).)

- c. In evaluating the design of sloping and benching systems, the SCO/HCO must refer to the decision chart in Appendix B, Selection of Protective System. (See 1926.652(b)(1) through (b)(4).)
- d. In evaluating the design of support systems, shield systems and their protective systems, the SCO/HCO must refer to the decision chart in Appendix C and D, Selection of Protection Systems. (See 1926.652(c)(1) through (c)(4).)
- e. The SCO/HCO must examine appropriate structural members of any protective system for damage or defects. (See 1926.652(d)(1).)
- f. Observation by SCO/HCOs of excavations beneath the protective system requires confirmation that the support system is able to resist forces calculated for the full depth of the trench. (See 1926.652(e)(2)(i) and (g)(2).)

5. Appendices in the Standard.

- a. The following compliance guidelines apply whenever SCO/HCOs find excavation operations where employers provide protective systems using the appendices in this standard. SCO/HCOs must provide documentation, including soil tests where applicable, to support or reject the employer's decisions on protective systems.
- b. When the employer elects to use sloping option 2 or support option 1, the soils classification procedures are mandatory. Employer guesses or other shortcuts taken in classifying soils do not meet the intent of the standard.
 - (1) Issue citations where there are one or more violations of Appendix A even if the degree of sloping turns out to be appropriate.
 - (2) Example: A backhoe operator slopes an excavation at what turns out to be an appropriate slope, but the operator is not a competent person within the meaning of the standard, and his determination was not based on both one visual and one manual

test. Cite 1926.652(a), but reduce the gravity of the violation. (See 1926.652(a)(1))

6. Appendix A to Subpart P - Soil Classification. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions and on the structure and compaction of earth deposits. Appendix A contains further definition directly related to soil classification.

a. Base the classification of soil and rock deposits on the results of at least one visual and one manual test.

(1) A competent person must do the analysis using the tests in paragraph (d) of this appendix.

(2) The specific soil tests referenced in this Appendix are examples for an employer to use in making a soil classification. However, other recognized methods of soil classification and testing, such as those adopted by the American Society for Testing Materials (ASTM), are acceptable for purposes of compliance with the standard.

(3) The competent person conducting the soil classification may not base a classification by "feeling" the strength or composition of the soil through the use of heavy equipment.

(a) This method is not an acceptable "other recognized method" of soil classification and testing" contemplated by Appendix A, (c)(2).

(b) OR-OSHA believes this is too indirect a method to classify properly the qualitative as well as the quantitative properties of soil.

(c) For example, an employer may not classify the soil as Type A solely because its backhoe experienced difficulty digging the excavation.

b. Each soil and rock deposit must be classified by a

competent person as either stable rock, Type A, Type B, or Type C in accordance with the definitions in paragraph (b) of Appendix A.

- c. In a layered system, the system must be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.
 - d. If, after classifying soils and rock deposits, the properties, factors, or conditions affecting its classification change in any manner, such as after a rainstorm, the competent person must evaluate the change.
7. Appendix B to Subdivision P - Sloping and Benching. Under section (c)(3)(ii) of this Appendix, whenever the will be surcharge loads from stored material or equipment, operating equipment, or traffic, the competent person's determination of the degree to reduce the slope below the maximum allowable slope must be based on (c)(3)(ii). The requirement to slope back according to (c)(3)(ii) is triggered where the surcharge loads cause signs of distress.
 8. Appendix C to Subdivision P - Tables. The compliance officer should note that Tables C-1.1-1.3 are actual size measurements based on mixed oak or equivalent with a bending strength not less than 850 psi. On the other hand, Tables C-2.1, 2.2 and 2.3 are nominal (S4S-Surface 4 Sides) measurements based on Douglas fir or equivalent with a bending strength not less than 1500 psi.
 9. Appendix D to Subdivision P - Aluminum Hydraulic Shoring for Trenches. This appendix has criteria to use when using aluminum hydraulic shoring in trenches less than 20 feet deep, in the absence of manufacturer's tabulated data. The appendix is for those situations where manufacturers' data, permitted under paragraph 1926.652(c)(2), was lost or otherwise not available. When referenced, use Appendix D in conjunction with Appendix A, Soil Classification.

TRAINING:

Training for field staff will include information on the technical nature of soils classification and protection systems requirements of new standard. To classify soils properly, use visual and manual tests. Field staff will receive training in the techniques used in these tests. The training program will consist of detailed instructions on the standard and this directive.

SAVEs. Existing SAVEs for 1926.651 and 1926.652 as found in the existing Division 3, 1926 section of the SAVEs Manual.

**EFFECTIVE
DATE:**

This directive is effective immediately and will remain in effect until cancelled or superseded.