



Trenching, Shoring, & Excavation

University Facilities

Internal Procedure: July 1, 2013

Effective date: July 1, 2013

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Approved by: Bob Wells

1.0 Program Objective

UF has adopted this program for the safety of employees when working in or around trenches and excavations from the following OSHA regulations:

§1926.651 – Specific Excavation Requirements

§1926.652 – Requirements for Protective Systems

2.0 Purpose and Scope

UF will ensure that all safety measures and systems are in place and correctly installed, all safety procedures are adhered to, and make regular inspections of excavations, trenches, and the general work site.

3.0 General Classifications of Soil and Rock Deposits

- 3.1 Each soil and rock deposit will be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with OSHA definitions.
- 3.2 The classification of the deposits will be made based on the results of at least one visual and at least one manual analysis. Such analyses will be conducted by a visual and at least one manual analysis. Such analyses will be conducted by a competent person using approved methods of soil classification and testing.
- 3.3 The visual and manual analyses will be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary or identify properly the properties, factors, and conditions affecting the classification of the deposits.
- 3.4 Layered systems will be classified individually where a more stable layer lies under a less stable layer.

3.5 If after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes will be evaluated by a competent person. The deposit will be reclassified as necessary to reflect the changed circumstances.

4.0 Employee Protection

4.1 Employees in an excavation will be protected from cave-ins by an adequate protective system designed in accordance with OSHA requirements, except when:

4.1.1 Excavations are made entirely in stable rock.

4.1.2 Excavations are less than 5 feet deep and examination of the ground by a competent person provides no indication of a potential cave-in.

5.0 Sloping and Benching Requirements

The slopes and configurations of sloping and benching systems will be selected and constructed by UF and will be in accordance with OSHA requirements of the following alternative options:

5.1 Option 1 – Allowable configurations and slopes

5.1.1 Excavations will be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless UF uses one of the other options listed below.

5.1.2 Specified slopes will be excavated to form configurations that are in accordance with the sloped shown for type C soil.

5.2 Option 2 – Maximum allowable slopes, and allowable configuration for sloping and benching systems, will be determined in accordance with the conditions and requirements set forth in §1926Subpart P – Appendices A and B.

5.3 Option 3 – Designs using other tabulated data.

5.3.1 Designs of sloping or benching systems will be selected from and in accordance with tabulated data, such as tables and charts.

5.3.2 The tabulated data will be in written form and will include all of the following:

5.3.2.1 Identification of the parameters that affect the selection of a sloping or benching system drawn from such data.

5.3.2.2 Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe.

5.3.2.3 Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

5.3.3 At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, will be maintained at the jobsite during construction of the protective system. After that time the data may be stores off the jobsite, but a copy the data will be made available to OSHA upon request.

5.4 Option 4 – Design by a registered professional engineer.

5.4.1 Sloping and benching systems not utilizing previous Options 1, 2, or 3 will be approved by a registered professional engineer.

5.4.2 Designs will be in written form and will include at least the following:

5.4.2.1 The magnitude of the slopes that were determined to be safe for the particular project.

5.4.2.2 The identity of the registered professional engineer approving the design.

5.4.3 At least one copy of the design will be maintained at the jobsite while the slop is being constructed. After that time the design need not be at the jobsite, but a copy will be made available to OSHA upon request.

6.0 Protective Systems, Materials, and Equipment

6.1 Materials and equipment used for protective systems will be free from damage or defects that might impair their proper functions

6.2 Manufactures materials and equipment used for protective systems will be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

6.3 When equipment used for protective systems is damaged, a competent person will examine the equipment and evaluate its suitability for continued use. If the competent person cannot assure the equipment is able to support the intended loads or is otherwise suitable for safe use, then equipment will be removed from service to be evaluated and approved by a registered professional engineer before being returned to service.

6.4 General installation and removal of support systems:

6.4.1 Members of support systems will be securely connected together to prevent sliding, falling, kick outs, or other predictable failure.

6.4.2 Support systems will be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

6.4.3 Individual members of support systems will not be subjected to loads exceeding those which those members were designed to withstand.

6.4.4 Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system will be permitted, but only if the system

is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

- 6.4.5 Installation of a support system will be closely coordinated with the excavation of trenches.
- 6.4.6 Before temporary removal of individual members begins, additional precautions will be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.
- 6.4.7 Removal will begin at, and progress from, the bottom of the excavation. Members will be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.
- 6.4.8 Backfilling will progress together with the removal of support systems from excavations.

6.5 Employees will not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

6.6 General shield systems requirements:

- 6.6.1 Shield systems will not be subjected to loads exceeding those which the system was designed to withstand.
- 6.6.2 Shields will be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.
- 6.6.3 Employees will be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
- 6.6.4 Employees will not be allowed in shields when shields are being installed, removed, or moved vertically.
- 6.6.5 Excavations of earth material to a level not greater than 2 feet below the bottom of a shield will be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open to a possible loss of soil from behind or below the bottom of the shield.

6.7 Regulation guardrails or barricades will be provided at all remotely located excavations. All wells, pits, and shafts, temporary or otherwise, will be barricaded or covered. Temporary wells, pits, and shafts will be backfilled when exploration and similar operations are completed.