Excavation and Trenching Procedures

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Effective Date: 8/1991
Applies To: Faculty, Staff, Students, Others
For More Information contact: EHS, Occupational Health & Safety, 860-486-3613; **ehs@uconn.edu**

I. Purpose

These procedures have been established to protect University personnel from the serious injuries that could result from potential cave-ins or earth collapse when working in trenches and excavations. These procedures are in accordance with the **Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910, Subpart P--Excavations.**

II. Scope

These procedures apply to all faculty, staff, students and all other University personnel working at the University of Connecticut Storrs, regional campuses and the Law School.

III. Policy Statement

As stated in the University's **Health and Safety Policy**, the University of Connecticut is committed to providing a healthful and safe environment for all activities under its jurisdiction and complying with federal and state health and safety standards. As such, to protect all excavation and trenching activities shall be carried out in accordance with these procedures.

IV. Enforcement

Violations of these procedures may result in appropriate disciplinary measures in accordance with University Laws and By-Laws, General Rules of Conduct for All University Employees, applicable collective bargaining agreements, and the University of Connecticut Student Conduct Code.

V. Definitions

Angle of repose

The maximum angle of incline of a stable slope of soil or other granular material. The angle of repose varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Benching (benching system)

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Competent person

An individual who is capable of identifying existing and predictable hazards in the work environment that may adversely affect employees and the general public, and who has the authority to take prompt corrective measures to eliminate them.

Protective system

A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Shielding (shielding system)

A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Also known as trench boxes or trench shields.

Shoring (shoring system)

A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sloping (sloping system)

A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to a safe angle of repose. When a sloping system is employed as a protective system, the excavtion walls must be sloped at an angle no greater that 34-degrees (1:1.5 slope) from horizontal in all directions.

Surface encumbrances

Any equipment, materials, supplies, buildings, roadways, trees, utility vaults, boulders, etc. that could present a hazard to employees working in the excavation.

VI. Procedures

A. Prior to Excavation

1. Underground Installations

Prior to starting any excavation work, all underground utilities (both public and University) will be marked as clearly as possible in order to identify potentially dangerous situations.

The supervisor or competent person will contact the "call before you dig" number so that the various public utilities will have the opportunity to locate and mark their lines.

2. Surface Encumbrances

All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

3. Barricades and Warnings

Excavations must be isolated from public access by a substantial physical barrier. Barricades, lighting and posting shall be installed as appropriate prior to the start of excavation operations. All temporary excavations of this type shall be backfilled as soon as possible

Due to the dangerous nature of the work and the high student population, exceptional measures to protect the public must be taken at all times. Barricades are not enough in high traffic areas near sidewalks and roadways subject to pedestrian traffic. Snow fencing shall be placed around the excavation in such a way as to provide maximum protection. As an additional precaution, barricades with flashing lights will be used whenever possible on pedestrian walkways and roadways. Employees exposed to public vehicular traffic shall be provided with, and shall wear warning vests or other suitable garments marked with or made of reflective or high-visibility material. The supervisor or competent person will contact the University Police Department and apprise them of the excavation and request that they check periodically for vandalism or any other unusual activity.

4. Competent Person

Each excavation site will have a competent person on site whenever employees are in the excavation. The competent person(s):

- Performs and documents the “Trench Safety Daily Field Report” (see **Appendix A**) at least daily and as needed.
- Must assure that the location of underground installations or utilities have been properly located.
- Must identify and ensure the use of adequate protective systems, work methods and personal protective equipment (PPE) on the excavation site.

VII. Excavation

1. Materials and Equipment

On any excavation where depth is expected to exceed four feet or where unstable soil is likely to be encountered, shoring or shielding equipment that will be used shall be on the site before any excavation actually begins. In addition, a radio-equipped truck, portable radio or cellular phone shall be on the site at all times when work is in progress.

2. Protection of Employees

No one shall enter an excavation of four feet or more in depth without having an adequate protective system in place. No one shall enter an excavation of less than four feet without a protective system in place unless authorized by a competent person. Excavations less than four feet in depth may not require this degree of protection if examination of the ground by a competent person provides no indication of a potential cave-in. Excavated material shall be stored at least two feet from the edge of the excavation and hard hats will be worn by all workers at the site when work is in progress. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

3. Inspections

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence.

These inspections are required when employee exposure can be reasonably anticipated. (See **Appendix A** for a Trench Safety Daily Field Report which may be used for this purpose).

Where the competent person finds evidence of a situation that could result in a possible cave-in, or shows indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Appendix A

UNIVERSITY OF CONNECTICUT
TRENCH SAFETY DAILY FIELD REPORT

DATE:

WORK ORDER NUMBER:

Project name:

Competent person:

Project Supt:

Location:

Weather Condition:

Rainfall amounts 24 hrs. previous:

I hereby attest that the following conditions existed and that the following items were checked or reviewed during this inspection: (circle appropriate response)

1. Open trench was inspected. Y N
2. All excavated material located proper distance from toe of slopes Y N
3. Were any tension cracks observed along top of any slopes? Y N
4. Were slopes cut at design angle of repose? Y N
5. Was any water seepage noted in trench walls or trench bottom? Y N
6. Was bracing system installed in accordance with design? Y N
7. Was there evidence of shrinkage cracks in trench walls? Y N
8. Was there any evidence of caving or sloughing of soil since the last field inspection? Y N
9. All short-term trench(s) covered within 24 hours? Y N
10. Trench box(s) certified? Y N
11. Type shoring being used:
12. Did shoring plan include adequate safety factor to allow for equipment actually being used? Y N
13. Traffic in area adequately away from trenching operations with barricades? Y N
14. Trees, boulders or other hazards in area. Y N
15. Vibrations from equipment or traffic too close to trenching operation? Y N

Competent Person Signature Date