SOUTHERN METHODIST UNIVERSITY

OFFICE OF RISK MANAGEMENT

EXCAVATION AND TRENCHING SAFETY PROCEDURE

INTRODUCTION:

Trenching and excavation procedures are performed thousands of times a day across the United States. Unfortunately, about 60 people are killed in trenching accidents each year. Contractors and construction laborers should understand the laws and regulations applicable to trenching and excavation occupations. These statutes are in effect for the express purpose of protecting those who work in trenching and excavation situations.

PRECAUTIONS:

Identification of Buried Utilities

All underground utilities (public and University) must be clearly marked to identify potentially hazardous situations prior to starting work requiring excavation.

Surface Encumbrances

Remove, support or safeguard all surface encumbrances located at the site that may create a hazard to employees.

Competent Person

At each excavation site there must be a designated "competent" person whenever employees are digging or in the excavation. A "competent" person means someone capable of identifying existing and predictable hazards in the surroundings, or working conditions that unsanitary, hazardous, or dangerous to employees. The competent person has authorization to take prompt corrective measures to eliminate any unsafe condition.

INSPECTIONS:

A competent person must make daily inspections of excavations, the adjacent areas, and protective systems for evidence of possible cave-ins, indications of protective systems failure, hazardous atmospheres, or other hazardous conditions.

The competent person must conduct an inspection:

- Prior to the start of work and as needed throughout the shift
- After every rainstorm or other hazard increasing occurrence
- As dictated by the activity taking place in the trench
- When fissures, tension cracks, sloughing, under cutting, water seepage, bulging at the bottom or other similar circumstances occur
- When there is any change in the size, location or placement of the soil pile
- When there is any indication of change or movement in adjacent structures

• Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmosphere, or other hazardous conditions, remove exposed employees from the hazardous area until safety measures are in place.

BARRICADES AND WARNINGS:

Take special measures to protect the public because the danger excavation work presents and the high student population on campus. Simple barricades are not enough protection in high traffic areas near sidewalks, and roadways subject to pedestrian traffic. In high traffic areas, place snow fencing around the excavation to provide maximum protection. An additional precaution is to use barricades with flashing lights whenever possible on pedestrian walkways and roadways.

Provide employees exposed to public vehicular traffic with warning vests or other suitable garments marked with reflector or high-visibility material.

PROCEDURE:

- A contractor or university department that will be performing the work shall notify the Project Manager at least five (5) days in advance of the start of excavation.
- No associates shall be permitted underneath loads handled by lifting or digging equipment. Associates shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.
- When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.:
- Where oxygen deficiency (atmosphere containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before associates enter excavations greater than 4 feet (1.22 m) in depth.
- Adequate precautions shall be taken to prevent associate exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of 29 CFR 126.50 - 126.170.
- Adequate precaution shall be taken such as providing ventilation, to prevent associate exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.
- When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended while in use.
- Associates shall not work in excavations where there is accumulated water, or in excavations in
 which water is accumulating, unless adequate precautions have been taken to protect associates
 against the hazards posed by water accumulation. The precautions necessary to protect associates
 adequately vary with each situation, but could include special support or shield systems to protect
 from cave-ins, water removal to control the level of accumulating water, or use of a safety
 harness and lifeline.
- If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.
- If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable mans shall be used to prevent surface water form entering the excavation, and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs 8 & 9 above.
- Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protections of associated.
- Excavation below the level of the base or footing of any foundation, or retaining wall that could be reasonably expected to pose a hazard to associates shall not be permitted except when: a support system such as underpinning is provided to ensure the safety of associates and the stability of the structure; or the excavation is in stable rock; or a registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or a registered professional engineer has approved the determination that such excavation work will not pose a hazard to associates.
- Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system
 or another method of protection is provided to protect associates from the possible collapse of
 such structures.
- Adequate protection shall be provided to protect associates from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide adequate protection.
- Associates shall be protected from excavated or other material or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such material or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

- 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 only required when associate exposure can be reasonably anticipated.
- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed associates shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- Walkways shall be provided where associates or equipment are required to cross over excavations. Guardrails shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.
- Adequate barrier, physical protection, shall be provided at all excavations. All wells, pits, shafts, trenches, etc shall be barricaded or covered. Upon completion of exploration and other similar operations, temporary wells, pits, shafts, trenches, etc., shall be backfilled.