

The following safety plan is provided as a guide to assist trainers in performing safe trench rescue training operations and to be compliant with OSHA regulations, as well as to provide other helpful information. Each trainer should review the regulations for particular requirements applicable to their individual situation. Each trainer must evaluate their specific circumstances and conditions and make changes, deletions or additions to develop an effective and comprehensive safety program.

This safety plan must be in place in lieu of other safety measures as described in the OSHA regulation.

## Objective

This trench rescue safety plan has been developed to protect trainers and trainees from safety hazards that may be encountered during training exercises in trenches. This program is intended to assure that:

- A. Trainers and trainees who are working in trenches are aware of the hazards and how to operate safely;
- B. The training agency appoints one or more persons to assure compliance with the requirements of this program;
- C. All persons involved in the training have received an appropriate pre-briefing and understand safe training practices.

## Assignment of Responsibility

### A. TRAINING AGENCY

1. Monitor the overall effectiveness of the plan.
2. Provide protective systems as needed.
3. Provide atmospheric testing equipment as needed.
4. Provide training to affected personnel (i.e. trainers and trainees).
5. Review and update the plan annually or as needed.

### B. TRAINERS

1. Act as the trench competent person for the training agency.
2. Assure that the procedures described in this plan are followed.
3. Assure that trainees are properly equipped, briefed and performing training safely.
4. Assure that all inspections, tests and documentation have been performed.
5. Provide personal protective equipment as needed.
6. Provide training to trainees.

## C. TRAINEES

1. Provide personal protective equipment as needed.
2. Report hazardous situations or practices to the trainer or training agency.
3. Comply with this plan and training presented.

## Protective Systems

- A. Personnel in trenches shall be protected from cave-ins by using protective systems capable of resisting all loads that could reasonably be expected to be applied to the system. All protective systems utilized in rescue training shall be designed for Type C soil even if the soil tests as A or B.
- B. Support systems and other protective systems designed from manufacturer's tabulated data shall be constructed and used in accordance with all specifications, recommendations and limitations issued or made by the manufacturer.
- C. Support systems and other protective systems designed utilizing timber shall be constructed in accordance with the written design indicating sizes, types and configurations of the materials used in the protective system and approved by a registered professional engineer. (see the tabulated data for trench rescue shoring worksheets).
- D. Materials and equipment used for protective systems shall be free from damage or defects that might affect proper function.
- E. Members of support systems shall be securely connected together to prevent sliding, falling, kick-outs or other potential hazards. Positive connections of these members shall be completed by utilizing approved nailing techniques.
- F. Excavation of material to a level no greater than two (2) feet below the bottom of the system is allowed, but only if the system is designed to resist the forces calculated for the full depth of the trench.

## General Requirements

### A. SURFACE ENCUMBRANCES AND UNDERGROUND INSTALLATIONS

1. All equipment, materials, supplies, permanent installations (i.e. buildings or roadways), trees, poles, brush, boulders and other objects at the surface that could present a hazard to trainees or trainers in or around the trench shall be removed or supported as necessary to protect personnel.
2. The location of sewer, telephone, fuel, electric, water or any other underground installation shall be determined before any excavation is performed. Any utility in the training area shall be rendered safe and all personnel shall be advised of the location.

## **B. SOIL CLASSIFICATION**

1. 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 atmosphere or other hazardous condition. This inspection shall be documented on the Daily Trench Inspection Worksheet (See Appendix E).
2. Soil conditions shall be classified utilizing a recognized technique such as manual tests, soil penetrometer or shear vane.

## **C. INCIDENT ACTION PLAN (IAP)**

1. Before any training begins an IAP shall be completed by the lead trainer or his/her representative (see Appendix G).
2. Minimum IAP forms shall include ICS 201 (Incident Briefing), ICS 202 (Incident Objectives), and ICS 206 (Medical Plan).
3. All operations shall be in compliance with the IAP.

## **D. ATMOSPHERIC CONDITIONS**

1. Before any training begins the lead trainer or his/her representative shall assure that the atmosphere within the trench is within normal limits.
2. Atmospheric composition shall be monitored at 4-foot increments, monitoring first for oxygen, second for LEL, third for selected toxics including CO and H<sub>2</sub>S.
3. Document readings on daily trench inspection worksheet (see Appendix E).

## **E. PROTECTION OF THE PUBLIC**

1. During training operations in populated areas guardrails, barricades or fences shall be provided to keep pedestrian or vehicle traffic from entering the training site.
2. Trenches left unattended shall be secured in a manner that will eliminate unauthorized personnel from entering or falling into the trenches. Examples of techniques include fencing, barricades, warning banners, plates or sheeting.

## **F. PERSONAL PROTECTIVE EQUIPMENT**

1. All personnel in the operational area shall be equipped with PPE.
2. Minimum personal protective equipment will include:
  - a. Hard hat
  - b. Gloves
  - c. Safety boots
  - d. Eye protection

## G. LADDERS

1. Ladders shall be placed in the trench where no person shall travel more than 25 feet or travel past an intersecting trench or turn to reach a ladder.
2. Ladders shall be placed in trenches in a manner that the ladder extends 3 feet above the lip of the trench.
3. Ladders shall be secured to bridges in a manner that will not allow them to slip back into the trench or turn sideways in the trench.
4. Retrieval lines attached to personnel in the trench shall be placed over a minimum of two ladder rungs and maintained by a line tender to eliminate the possibility of falls from the ladders.

## H. FALL PROTECTION

1. All personnel working at the edge of the trench shall be protected from falling by a fall protection system. Ideally the system would be a guardrail, netting or appropriate lanyard system. When the use of these systems would increase the danger to trainees and trainers, or constructing the system equals or exceeds the original exposure, or would increase the risk, or the exposure is of short duration, a safety monitor shall be established to assure that adequate margins for safety from falling are provided. The safety monitor position may be handled by the safety officer and all operations shall have a designated safety officer.
  - a. The safety monitor shall be competent to recognize fall hazards.
  - b. The safety monitor shall warn personnel when they appear to be unaware of potential fall hazards or are acting in an unsafe manner.
  - c. The safety monitor shall be in visual sighting distance of personnel and shall be in communication with personnel being monitored.
  - d. The safety monitor shall not have other responsibilities that could take the monitor's attention from the monitoring function.
  - e. The safety monitor may also be the general safety officer.
2. Personnel in trenches installing shoring shall be wearing escape belts, ladder belts or type II or III harnesses with a retrieval line attached whenever they are in a system that is not fully pressurized with positive connections.
3. Personnel will be attached to the fall protection system when working off the ladder in the trench.
4. Personnel shall be prohibited from jumping over trenches or tossing equipment across trenches.

## I. SPOIL AND EDGE PROTECTION

1. All spoil shall be cleared down to virgin soil to a minimum distance of 2 feet from the trench lip.
2. Spoil piles shall be no higher than three (3 feet) unless the spoil pile is over 8 feet from the lip.
3. Personnel clearing spoil shall be standing on edge protection and facing the trench.
4. All trench lips where personnel are working shall have edge protection applied to provide a stable work area and minimize the possibility of lip-ins occurring.
5. Edge protection may be 2" x 8", 2" x 10", 2" x 12" or plywood material.

## J. SAFETY BRIEFING

1. All personnel shall receive a safety briefing prior to approaching or working around the trench. The safety briefing shall include:
  - a. Confirmation of PPE
  - b. Review of fall protection procedures and hazards
  - c. Edge protection requirements
  - d. General safety messages deemed necessary by the trainers
  - e. Emergency operations/actions

## K. EMERGENCY OPERATIONS

1. Before training begins all personnel shall be advised of the phrase or term to determine that the training has become a real incident or emergency.
2. All personnel shall be advised of the evacuation point to report to in the event of an actual emergency.
3. In the event of an actual emergency all other operations shall be halted, a personnel accounting report shall be completed at the evacuation point and trainers shall serve as the rapid intervention team for the immediate problem. The safety officer shall determine if further assistance is needed and make the appropriate notifications.