

**PHOENIX REGIONAL  
STANDARD OPERATING PROCEDURES**

**TRENCH RESCUE OPERATIONS**

**M.P. 204.09**

**07/11-R**

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## **SCOPE**

This procedure establishes a standard structure and guideline for all fire department personnel operating at incidents involving trench rescue operations. The procedure outlines responsibilities for first-responders, TRT units, Command Officers, and other fire department personnel responding to such incidents. All other Phoenix Fire Department procedures shall apply to trench rescue operations where applicable.

## **PURPOSE**

The purpose of this procedure is to establish guidelines for the response of fire department personnel and equipment to trench rescue incidents. Because trench rescue operations present a significant danger to fire department personnel, the safe and effective management of these operations require special considerations. *It shall be the policy of the Phoenix Fire Department that NO personnel shall be allowed into an unsafe trench or excavation.* This procedure identifies some of the critical issues which must be included in managing these incidents.

## **TACTICAL CONSIDERATIONS**

*OSHA Regulations Standard 29 CFR 1926 Subpart P* regulates excavations for general industry and the rescue service and shall be considered the basis for emergency trench rescue operations. For the purpose of emergency response, an excavation shall be defined by any depression, hole, trench, or earth wall, man made or natural, of four feet or greater.

Trench collapses generally occur due to unstable soil conditions combined with improper or inadequate shoring. The potential for additional collapse is considered a primary hazard to personnel. Removing soil or debris, adding weight near the edge of an open cut, vibration (such as vehicle movement), rain, or simply the passage of time, may cause additional collapse at any time during the rescue operation.

Due to the inherent dangers associated with these operations, the Phoenix Fire Department *Risk Management Profile* shall be applied to all trench rescue operations and shall be continuously re-assessed throughout the incident. A phased approach to trench rescue operations which include; Arrival, Pre-entry operations, Entry operations, and Termination, can be utilized to safely and effectively mitigate these high-risk / low-frequency events.

**Additional technical information is available in the issued *Technical Rescue Field Operations Guide*.**

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**Phase I Arrival.**

**I. ESTABLISH COMMAND**

- A. First arriving company officer shall assume *Command* and begin an immediate size-up of the situation while ensuring that apparatus remains at least 50 feet from the location of the trench failure. Command shall announce that Level 1 staging should take place at least 150 feet from the trench failure.
- B. First arriving TRT unit that is staffed with a TRT Company Officer should be assigned *Rescue Sector*. The TRT Company Officer assigned as Rescue Sector should remain with his crew. Rescue Sector responsibilities include:
- Assuming technical rescue operations control.
  - Identifying hazards and critical factors.
  - Developing a rescue plan and back-up plan.
  - Communicating with and directing TRT resources assigned to Rescue Sector.
  - Informing Command of conditions, actions, and needs during all phases of the rescue operation.
- C. Designate a *Safety Officer*. Considerations for Safety Officer include:
- One of the Regional Special Operations qualified Safety Officers.
  - A Special Operations qualified Battalion Chief and/or FIT.
  - Any experienced TRT Company Officer assigned to the incident.
- D. Following the transfer of Command to a Command Officer, a *Technical Advisor* should be assigned to join the Command Team at their location, to assist in managing personnel and resources engaged in the technical aspects of the incident. The Technical Advisor is responsible for ensuring that the rescue plan developed by Rescue Sector and communicated to Command is a sound plan in terms of the safety and welfare of both victim(s) and rescuers. Considerations for the Technical Advisor include:
- A Special Operations qualified Battalion Chief and/or FIT.
  - One of the Regional Special Operations qualified Safety Officers.
  - Any experienced TRT Company Officer assigned to the incident.

*The Technical Advisor position within the Command Team should be filled prior to the implementation of any rescue plan proposed by Rescue Sector.*

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**II. Size-Up**

- A. Secure a witness or responsible party to assist in gathering information to determine exactly what happened. If no witnesses are present, Command may have to look for clues on the scene to determine what happened.
- B. Assess the immediate and potential hazards to the rescuers.
- C. Isolate immediate hazard area, secure the scene, and deny entry for all non-rescue personnel.
- D. Assess on-scene capabilities and determine the need for additional resources.

**Phase II Pre-entry Operations**

*It must be determined if this will be a RESCUE operation or a RECOVERY operation based on the survivability profile of the victim(s) which include factors such as the location and condition of the victim(s), and elapsed time since the accident occurred.*

**I. MAKE THE GENERAL AREA SAFE**

- A. Establish a hazard zone perimeter 50 feet from the collapse area.
  - Keep all non-essential rescue personnel out of the hazard zone.
  - Consider establishing Lobby to control rescue personnel entering the hazard zone.
  - Remove all non-essential civilian personnel at least 150 feet away from the collapse area.
- B. Control traffic movement.
  - Shut down roadway.
  - Stage apparatus at least 150 feet from the collapse area.
  - Re-route all non-essential traffic at least 300 feet from the collapse area.
  - Shut down all heavy equipment operating within 300 feet of the collapse area.

**II. MAKE THE RESCUE AREA SAFE**

*These pre-entry operations shall be conducted under the direction of Rescue Sector by trained Technical Rescue Technicians.*

- A. Approach the trench from the ends if possible.
- B. Look for unidentified hazards such as fissures or an unstable spoil pile.
- C. Assess the spoil pile for improper angle of repose and general raveling.
- D. Remove any tripping hazards from around the trench.
- E. Place ground pads around the lip of the trench.

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- F. Secure all hazards in the area: utilities, electric, gas, water, etc.
- G. De-water the trench if necessary.
- H. Monitor the atmosphere in the trench.
- I. Ventilate the trench.

**Phase III      Entry Operations**

*Entry operations shall be conducted under the direction of Rescue Sector by trained Technical Rescue Technicians.*

Rescue Sector shall be responsible for entry operations. Rescue Sector shall ensure that all personnel operating in the hazard zone are accounted for and wearing appropriate PPE.

**I. MAKE THE TRENCH SAFE**

- A. Place ingress and egress ladders into the trench. There should be at least 2 ladders placed into the trench no more than 50 feet apart.
- B. Decide on the shoring system to be used (i.e. hydraulic shore, pneumatic shore, timber shore).
- C. Create a safe zone in the non-collapsed area of the trench, from both ends if possible, by implementing an approved shoring system.
- D. Remove dirt from the collapsed zone while remaining in the safe zone.
- E. Secure all utilities, pipe, or other obstructions in the trench.

**II. VICTIM REMOVAL / INCIDENTS WITHOUT COLLAPSE**

- A. Create a safe zone around the victim.
- B. Remove objects trapping the victim such as pipes, lumber, machinery, etc.
- C. Assess victim's condition.
- D. Properly package the patient and remove from the trench.

**III. VICTIM REMOVAL / INCIDENTS WITH COLLAPSE**

- A. Begin dirt removal while operating from a safe zone.
- B. Continue extending safe zone into collapse zone.
- C. Create a safe zone around the victim.
- D. Uncover victim to below the diaphragm utilizing small shovels, buckets, or by hand, and assess the victim's condition.
- E. Completely uncover the victim, properly package the patient and remove from the trench.

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**IV. TREATMENT**

- A. Conduct a primary survey upon reaching the victim.
- B. Initiate C-spine precautions as soon as possible.
- C. Conduct a secondary survey and correct any life threatening conditions.
- D. Consider removing the victim from danger prior to providing definitive care.
- E. Provide ALS level treatment and transportation to a hospital as indicated.

**Phase IV Termination**

- A. Ensure personnel accountability.
- B. Remove tools, equipment, and the trench shoring system (last-in / first-out) from the trench. In cases of a fatality, consider leaving everything in place until the investigative process has been completed.
- C. Consider a Post Incident Critique (may be more appropriate at a later date).
- D. Return to service after turning the scene over to the responsible party and ensuring the scene is secure.

**ADDITIONAL CONSIDERATIONS**

**I. COMMAND STRUCTURE**

- A. The first arriving unit shall assume *Command* of the incident. This unit shall remain in Command until Command is transferred to improve the quality of the Command organization. A Command Team shall be assembled to include, at a minimum, a Chief Officer and a Technical Advisor.
- B. Considerations for the *Technical Advisor* include:
  - A Special Operations qualified Battalion Chief and/or FIT.
  - One of the Regional Special Operations qualified Safety Officers.
  - Any experienced TRT Company Officer assigned to the incident.

The first arriving TRT unit that is staffed with a TRT Company Officer shall be assigned *Rescue Sector*. Rescue teams, Lobby, Ventilation, Air Monitoring, Shoring, Cut teams, and any other such functional team operating in the hazard zone shall be under the direction of Rescue Sector. Rescue Sector will communicate directly with TRT units assigned to these functions within Rescue Sector and shall keep Command informed during all phases of the rescue operation.

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C. Considerations for *Safety Officer* include:

- One of the Regional Special Operations qualified Safety Officers.
- A Special Operations qualified Battalion Chief and/or FIT.
- Any experienced TRT Company Officer assigned to the incident.

D. *Treatment Sector* should be assigned to any ALS company assigned to the incident.

II. OTHER CONSIDERATIONS

- A. Consider the effects of inclement weather on the hazard profile, the victim(s), and the rescuers.
- B. Maintain awareness of the time of day and ensure sufficient lighting is available on the scene if operations extend into the night.
- C. Trench incidents attract the news media; consider assigning a P.I.O.
- D. Request OSHA response if there has been a serious injury or death.