

Campbell County Fire Department Standard Operating Procedure		
Operations	Trench Rescue Operations	<i>404.70</i>

I. PURPOSE:

To ensure the safe and effective management of Trench Rescue Operations.

II. SCOPE:

This procedure applies to all Campbell County Fire Department (CCFD) firefighting personnel.

III. PROCEDURE:

1. Background/Definitions

1.1. Trench Rescue Operations present a significant danger to fire department personnel and may involve complex requirements for shoring, hand tools, earth-moving equipment and other specialized resources. The safe and effective management of these operations requires special considerations.

1.1.1. Therefore, it shall be the policy of the Campbell County Fire Department to NOT allow the entry of any personnel into an unsafe trench or excavation.

1.1.2. This procedure identifies some of the critical issues which must be included in managing these incidents.

1.1.2.1. 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 of depth or greater.

1.1.2.2. Cave-ins and collapses generally occur because of unstable soil conditions combined with improper or inadequate shoring. The potential for additional collapse must always be considered as a primary hazard and personnel must be aware that any action may disrupt the temporary stability and cause an additional collapse. The temporary stability, at any point in an operation, may be disturbed by removing soil or debris, by adding weight near the edge of an open cut, by vibration (such as vehicle movement), rain, or simply by the passage of time.

2. Tactical Considerations

2.1. Phase I: Arrive on Scene/Take Command/Size-Up.

2.1.1. Arrival on Scene

2.1.1.1. First arriving company officer should take Command and begin an immediate size-up of the situation.

2.1.1.2. Spotting Apparatus: The first-in company should spot the apparatus at least 100 feet from the location of the trench failure. Command should dictate Level -2 staging at least 250 feet from the scene.

2.1.2. Primary Assessment

2.1.2.1. Command should determine exactly what has happened.

2.1.2.2. Assess the potential hazards to the rescuers.

2.1.2.3. Secure a (responsible party), job foreman, or witness to the accident.

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- 2.1.2.4. An immediate assessment of the victim's injuries should be determined.
 - 2.1.2.5. Determine how many victims are affected by the accident.
 - 2.1.2.6. If there are victims, Command should determine how long the victim has been buried.
 - 2.1.2.7. An early decision must be made if this operation will be run in the rescue or recovery mode.
 - 2.1.2.8. Secure the site; stop any non-professional rescue attempts in progress.
 - 2.1.2.9. Halt the use of any equipment in the proximity of the rescue site.
 - 2.1.3. Secondary Assessment
 - 2.1.3.1. Assess on-scene capabilities.
 - 2.1.3.2. Assess the need for additional resources.
 - 2.1.3.3. Assign a safety officer (Safety Sector).
 - 2.1.3.4. Assign personnel. Staging Sector, Extrication Sector, EMS
 - 2.1.3.5. Assess on-scene equipment and operators as additional resources.

2.2. Phase II Pre-Entry Operations

2.2.1. Make the General Area Safe

- 2.2.1.1. Create a hot, warm, and cold zone
 - 2.2.1.1.1. Hot zone extends 0-50 feet
 - 2.2.1.1.2. Warm zone extends from 50-150 feet
 - 2.2.1.1.3. Cold zone extends from 150-300 feet
- 2.2.1.2. Control traffic movement
 - 2.2.1.2.1. Shut down roadway
 - 2.2.1.2.2. Re-route all non-essential traffic at least 300 feet around the scene
 - 2.2.1.2.3. Shut down all heavy equipment operating within 300 feet of the collapse
- 2.2.1.3. Control the crowd
 - 2.2.1.3.1. Remove all non-essential civilian personnel to the Cold Zone.
 - 2.2.1.3.2. Remove all non-essential rescue personnel to the Warm Zone.

2.2.2. Make the Rescue Area Safe

- 2.2.2.1. Control all hazards in the area, i.e., utilities, electric, gas, water.
- 2.2.2.2. De-water the trench if necessary.
- 2.2.2.3. Monitor the atmosphere in the trench.
- 2.2.2.4. Ventilate the trench if necessary.
- 2.2.2.5. Identify soil type and condition.

2.3. Phase III Entry Operations

2.3.1. Make the Trench Lip Safe

- 2.3.1.1. Approach the trench from the ends if possible.

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- 2.3.1.2. Look for unidentified hazards (i.e., fissures, unstable spoil pile).
- 2.3.1.3. Remove any tripping hazards (i.e., shovels, shores, tree roots).
- 2.3.1.4. Provide level area for ground pads.
- 2.3.2. Make Trench Safe: Extrication Sector will be responsible for entry operations. Extrication Sector shall ensure that all personnel operating in the hot zone are wearing steel-toed boots, helmet, eye protection, and gloves.
 - 2.3.2.1. Place ingress and egress ladders in trench. There should be at least 2 ladders placed in the trench no more than 50 feet apart.
 - 2.3.2.2. Decide on shoring system to be used (hydraulic shore, pneumatic shore, timber shore).
 - 2.3.2.3. Create a safe zone in the uncollapsed portion of the trench (possibly from both ends). This shall be accomplished using an approved shoring system, i.e., pneumatic, hydraulic, timber or trench box if available.
 - 2.3.2.4. Remove the dirt from the collapsed zone. Rescuer shall remain in the safe zone while removing the dirt from the collapsed zone.
 - 2.3.2.5. Secure all unsecured utilities, pipe, or any other obstruction in the trench.
- 2.3.3. Victim Removal/WITHOUT Cave-In
 - 2.3.3.1. Create a safe zone around the victim.
 - 2.3.3.2. Remove objects trapping the victim (i.e., pipes, lumber, machinery).
 - 2.3.3.3. Assess victim's condition.
 - 2.3.3.4. Proper patient packaging.
 - 2.3.3.5. Remove victim from the trench (vertical haul, horizontal haul).
- 2.3.4. Victim Removal / WITH Cave-In
 - 2.3.4.1. Create a safe zone.
 - 2.3.4.1.1. Begin dirt removal, operating from a safe zone (buckets, small shovels, by hand).
 - 2.3.4.1.2. Continue extending safe zone into collapse zone.
 - 2.3.4.1.3. Uncover victim to below the diaphragm.
 - 2.3.4.1.4. Begin patient assessment if possible (ABC's).
 - 2.3.4.1.5. Begin ventilation if possible.
 - 2.3.4.1.6. Completely uncover the victim.
 - 2.3.4.1.7. Proper patient packaging.
 - 2.3.4.1.8. Remove the victim from the trench (vertical haul, horizontal haul).
 - 2.3.4.2. Treatment
 - 2.3.4.2.1. ABC's primary survey.
 - 2.3.4.2.2. C-Spine precautions.
 - 2.3.4.2.3. Secondary survey.

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2.3.4.2.4. Consider removing the victim from danger prior to providing definitive care.

2.4. Phase IV Termination

2.4.1. Prepare For Termination

2.4.1.1. Personnel accountability.

2.4.1.2. Remove tools and equipment from trench. If there has been a fatality, Extrication. Sector may consider leaving tools and equipment in place for investigative purposes.

2.4.1.3. Remove trench shoring system (last-in/first-out).

2.4.1.4. Secure the scene. This may include leaving the shoring system in place or covering the trench.

2.4.1.5. Return to service.

3. Additional Considerations

3.1. Sectors Established

3.1.1. Safety Sector

3.1.2. Staging Sector

3.1.3. Extrication Sector

3.1.4. EMS Sector

3.1.5. Resource Sector

3.2. Consider Ambient Conditions

3.2.1. Heat. Consider rotation of crews.

3.2.2. Cold. Consider affects of hypothermia on victim and rescuers.

3.2.3. Rain/Snow. Consider the affects of rain or snow on the hazard profile.

3.2.4. Time of day. Is there sufficient lighting for operations extending into the night.

3.2.5. Consider the affect on family and friends; keep family informed.

3.2.6. Consider news media; assign a P.I.O.

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