STRUCTURAL COLLAPSE RESCUE OPERATIONS

SCOPE

This procedure establishes a standard structure and guideline for all fire department personnel operating at incidents involving structural collapse 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 structural collapse rescue operations where applicable.

PURPOSE

The purpose of this procedure is to establish guidelines for the response of fire department personnel and equipment to structural collapse rescue incidents. Because structural collapse rescue operations present a significant danger to fire department personnel, the safe and effective management of these operations require special considerations. This procedure identifies some of the critical issues which must be included in managing these incidents.

TACTICAL CONSIDERATIONS

Due to the inherent dangers associated with these operations, the Phoenix Fire Department *Risk Management Profile* shall be applied to all structural collapse rescue operations and shall be continuously re-assessed throughout the incident. A phased approach to structural collapse rescue operations which include; Arrival, Pre-rescue operations, Rescue 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.*

Phase I Arrival.

During the Arrival phase of a structural collapse incident, Command must take strong control of the incident to prevent the situation from quickly deteriorating into a chaotic event. A structural collapse incident is likely to have unorganized, volunteer rescue efforts being conducted by civilian personnel which creates an unsafe situation for the volunteers as well as rescuers. Command must focus attention early on building a strong Command structure that will ensure the safety of rescue personnel and support this complex campaign operation.

I. ESTABLISH COMMAND

A. First arriving company officer shall assume *Command* and begin an immediate size-up of the situation.

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.

II. Size-Up

A. Spot apparatus outside of any potential secondary collapse zone.

B. 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.

C. Assess the immediate and potential hazards to the rescuers. Hazards associated with structural collapse include:

- Secondary collapse.
- Explosion and fire.
- Broken gas and water lines.
- Energized electrical lines.
- Falling debris.

D. Isolate immediate hazard area, secure the scene, and deny entry for all non-rescue personnel.

E. Assess on-scene capabilities and determine the need for additional resources. Consider establishing Level 2 staging and calling for heavy machinery and equipment such as cranes and front-end loaders.

Phase II Pre-rescue Operations

The Phoenix Fire Department is the sponsoring agency of AZ-TF1, which is one of 28 FEMA Urban Search & Rescue task forces in the nation. This team is highly trained and equipped to respond to incidents involving structural collapse. Consideration should be given to utilize the personnel and equipment from this task force for incidents involving structural collapse.

I. MAKE THE GENERAL AREA SAFE

A. Establish a hazard zone perimeter around the collapse area.

- Keep all non-essential rescue personnel out of the hazard zone.
- Remove all non-essential civilian personnel at least 150 feet away from the hazard zone perimeter.

II. MAKE THE RESCUE AREA SAFE

A. Secure all hazards. If it is not possible to secure all hazards, rescue personnel operating in the area must be made aware of the hazard(s).

B. Establish a Lobby Sector. Command should establish a Lobby Sector to control the flow and maintain personnel accountability of rescue personnel in the collapse area.

C. Establish a Treatment Sector. Command should establish a Treatment Sector to identify and set-up a triage and treatment area a safe distance from the collapse area for the treatment and transportation of victims.

D. Establish a Building Triage team. Rescue Sector should establish a Building Triage team which shall consist of a Technical Rescue Technician trained and knowledgeable in structural collapse shoring techniques, a structural engineer, and a Hazardous Materials Technician. This team will asses the structural integrity and hazardous conditions of the building(s) involved and will utilize a building marking system to indicate their findings. Consider establishing additional Building Triage teams if the area of collapse is widespread and involves numerous buildings.

E. Establish a Search team. Rescue Sector should establish a Search team to search the collapse area and locate victims. A Search team shall consist of TRT personnel trained in the use of specialized search equipment, and search canines with their handlers (if available). Consider establishing additional Search teams if the area of collapse is widespread and involves numerous buildings.

F. Establish a Rescue team. A Rescue Team shall consist of TRT personnel trained in the use of specialized rescue equipment and techniques. Consider establishing additional Rescue teams if the area of collapse is widespread and involves numerous buildings.

G. Establish a transportation corridor. Command shall ensure roadways are clear in and out of the collapse site so that apparatus and other heavy equipment and machinery have access to the site. Consider establishing a liaison with the Police Department to accomplish this function.

Phase III Rescue Operations

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

I. RESCUE SECTOR

Rescue Sector responsibilities shall include the following:

- Ensure that all personnel operating in Rescue Sector are accounted for and wearing appropriate PPE.
- Develop a rescue plan and a back-up plan.
- Ensure the plan and a back-up plan, which include emergency procedures, are communicated to all personnel operating on the incident.

II. THE RESCUE PLAN

Rescue operations should be conducted with as little risk to the rescuers as necessary to affect the rescue. Low-risk operations may not always be possible but should be considered first. The rescue plan shall be developed through consultation with Rescue Sector, Safety, Command, and the Technical Advisor. The plan and a back-up plan, which include emergency procedures, shall be communicated to all personnel operating on the incident.

III. THE RESCUE

A. Remove surface victims. First responders should be assigned to remove victims and the "walking wounded" from the surface of the collapse area. Rescuers shall use extreme caution during the early stages of rescue operations due to significant hazards which have not yet been identified. Following the removal of surface victims and the "walking wounded", all rescue personnel should be removed from the collapse area and a personnel accountability report (PAR) shall be obtained. This will allow for a re-grouping of rescue personnel and the implementation of a detailed search and rescue plan to locate and remove any other victims from the collapse area.

After surface victims and the "walking wounded" have been removed from the collapse area, all non-TRT rescue personnel shall be removed from the collapse area and Technical Rescue operations shall begin under the direction of Rescue Sector by trained Technical Rescue Technicians.

B. Building Triage. Assign the Building Triage team to identify, select, and prioritize the building(s) with the highest probability of success with respect to finding and rescuing live victims. Additionally, the Building Triage team shall be responsible for using a building marking system to indicate structural conditions and hazards present to search and rescue personnel.

C. Locate victims. Following the structural and hazard assessment by the Building Triage team, the Search team(s) shall be assigned to locate entrapped victims by utilizing search canines (if available), and specialty search equipment such as search cameras and acoustic listening devices. Search teams shall not enter buildings which have been determined to be structurally unsafe until appropriate shoring and stabilization measures have been taken.

D. Extricate entrapped victims. Once the Search team has located an entrapped victim, the Rescue team(s) shall be responsible for utilizing their specialized rescue equipment and techniques to extricate victims from the collapse area. The breaking and breaching of walls, floors and roofs, will typically be associated with shoring and other methods of stabilization which make these operations manpower and resource intensive. Consider calling for additional resources and establishing a Resource Sector. Rescue teams shall not enter buildings which have been determined to be structurally unsafe until appropriate shoring and stabilization measures have been taken.

E. Selected debris removal. If the Search team(s) has not been able to locate victims through other methods, or if a victim location is known, either by credible witness or search team verification, debris may be selectively removed to gain access to the victim and/or otherwise unsearchable locations within the collapse area. Special care must be exercised while removing debris to avoid a secondary collapse. Heavy equipment such as a crane may be necessary to accomplish selected debris removal. The selected debris removal process should be stopped periodically to conduct search operations for additional victims. Once the debris has been removed and search operations determine that there are no other victims in the area, rescue personnel shall be accounted for and removed from the area.

F. General debris removal. Once it has been determined that no other live victims can be located in the collapse area, a general debris removal operation may be started. Removal crews shall be alert to possible deceased victims and/or victim body parts and the coroner and/or other investigative personnel shall be notified to handle the removal of the remains. As debris is removed, each load should be marked as to the general location found and final location of the debris to aid in the investigative process. Command may elect to turn general debris removal over to the responsible party (RP) for final disposition of the building. If this option is exercised, the RP should be informed as to the proper handling of debris for investigative purposes.

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. Consider decontamination of rescuers.

C. Recover all tools and equipment used in the rescue/recovery. In cases of a fatality, consider leaving everything in place until the investigative process has been completed.

D. Consider a Post Incident Critique (may be more appropriate at a later date).

E. Return to service after returning all equipment to apparatus.

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.

C. The first arriving TRT unit that is staffed with a TRT Company Officer should be assigned *Rescue Sector***.** Building Triage team, Search team, Rescue team, and any other such functional team operating in the collapse area shall be under the direction of Rescue Sector. Rescue Sector shall communicate directly with TRT units assigned to the various functions within Rescue Sector and shall keep Command informed during all phases of the rescue operation.

D. 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.

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

II. OTHER CONSIDERATIONS

A. Structural collapse incidents may present rescuers with a confined space situation. Prior to entering any space, the atmosphere in that space must be monitored by a qualified Hazardous Materials Technician with an appropriate air monitoring device to determine if the space is safe to enter. If the atmosphere is determined to be unsafe, it must be changed and made safe prior to any entry. If the atmosphere cannot be changed, and entry must be made to retrieve a viable victim, rescue personnel shall follow M.P. 204.08 *Confined Space Rescue Operations* to ensure the safety of rescue personnel entering the space. Rescue Sector must be informed of any confined space rescue operation and will keep Command informed of the operation.

B. Rescue teams should consider the effects of lifting/moving heavy objects off victims and have ALS level treatment available at the rescue site.

C. Consider the effects of inclement weather on the hazard profile, the victim(s), and the rescuers.

D. Incidents involving structural collapse will attract the news media; consider assigning a P.I.O.