

COLLAPSE RESCUE

STRUCTURE COLLAPSE SEARCH AND RESCUE

Purpose

To provide the Incident Commander with basic information needed to make the control of search and rescue operations at the site of a building collapse more manageable.

Scope

To provide guidance during “Technical Rescue Operations” which require search and rescue operations to occur in any form or type of collapsed structure.

Assessment

The officer assigned to the operations section should determine the following.

A. IS THE BUILDING:

1. **UNFRAMED:** Structure in which the weight of the floor and roof are supported by bearing walls.
2. **FRAMED:** Structures that are erected by constructing structural steel or reinforced concrete skeleton made of horizontal beams and vertical columns.

B. POTENTIAL FOR SECONDARY COLLAPSE:

1. **WALLS OUT OF PLUMB:** Walls that have large bows in the middle, or are leaning or separated from the floor.
2. **SMOKE OR WATER MOVEMENT THROUGH BRICKS:** At the scene of fire ground collapses.
3. **BEAMS PULLING AWAY:** Be alert for the separation of support beams from the walls to which they are attached.
4. **BUCKLED STEEL BEAMS:** After heavy fire loads, look for beams that sag or are distorted.
5. **LARGE CRACKS, PLASTER FALLING:** Large cracks that appear in walls, roofs, floors, or other structural components.
6. **NO RUN-OFF OR SOGGY FLOORS:** As a result of firefighting operations or as a result of weather.
7. **OVERLOADING OR AGE:** Look for sagging roofs, floors, or spans that creep.

8. NOISE: Listen for buildings that creak, moan, groan, snap, crackle or pop.

Void Detection

Voids may be formed for a variety of reasons and in a variety of forms. During the search phase, survivors are most likely going to be found inside of voids. These voids may be of different sizes and shapes, and are affected by the nature in which the building collapses. Be able to spot certain types of collapses and identify the following types of voids.

1. LEAN-TO-FLOOR COLLAPSE: Occurs when one of the supporting walls fails or when floor joists break at one end. This type of collapse usually creates a large void.
2. LEAN-TO-CANTILEVER: This form occurs when one end of the floor or roof section is still attached to portions of the wall. The other end will stand unsupported. **THIS TYPE OF COLLAPSE IS EXTREMELY DANGEROUS.**
3. V-SHAPE VOID: This occurs when heavy loads cause the floor to collapse at the center. **OCCUPANTS ABOVE THE TRAPPED FLOOR WILL USUALLY BE FOUND IN THE BOTTOM END OF THE COLLAPSE . VICTIMS BELOW THE COLLAPSE FLOOR WILL BE FOUND IN VOIDS.**
4. PANCAKE COLLAPSE: Is the result of the total bearing wall or column failure of an upper floor causing the upper floors to pancake down on the floors below. Victims may be found between floors or in voids created by household or office furniture which supports the floors.

Search and Rescue Stages

A systematic approach to dealing with building collapse will enable the Incident Commander or rescue operations officer to increase efficiency and reduce injury to both rescue personnel and civilians.

Stage I

Reconnaissance

Provide for a general survey of the area and size up of the damage. Find out the following information:

- A. Building=s use
- B. Number of occupants
- C. Number of victims trapped and the probable location
- D. Are rescue operations currently underway
- E. Presence of hazards
 1. Gas and utilities

2. Flammables
 3. Electrical
 4. Flooding from burst mains
 5. Plumbing/sewer disruption
- F. Structural stability of adjoining buildings

Immediate Rescue of Surface Casualties

- A. Victims found on top of the debris or lightly buried should be removed first.
- B. All rescue efforts should be directed to the victims who can be SEEN or HEARD.
- C. Rescue efforts should also be directed to reach those victims WHOSE LOCATION IS KNOWN even if you cannot see or hear them.

Scene Organization and Management

- A. Working within the incident command system is essential to a successful operation.
- B. The following checklist may assist:
 1. Are all utilities shut down?
 2. Is structural integrity assured or evaluated and a safety officer and observer on site?
 3. Has an engineer or architect been requested?
 4. Are rescue operations being directed?
 5. Are team leaders for each rescue team designated?
 6. Is the collapse area divided into manageable areas?
 7. Is a contingency plan on stand-by?

Additional Aid

The Western Reserve Joint Fire District does not have the training or equipment to conduct in-depth collapse rescue operations. Additional help should be summoned immediately. This help will include:

1. Youngstown Fire Department T.R.O.T.
2. Howland Rescue
3. Regional and State U.S.A.R. Teams
4. F.E.M.A. U.S.A.R. Teams