

**SUBJECT:** STRUCTURAL COLLAPSE**SECTION:** 303.05**REVISED:** FEBRUARY 13, 2004**PAGE(S):** 5

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## PURPOSE

To provide guidance during "Technical Rescue Operation" that require search and rescue operations to occur in any form or type of collapsed structure or damaged structure.

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## REFERENCE

1. *IMS Model Procedures Guide for Structural Collapse and US&R Operations, 1<sup>st</sup> edition, 1998.*

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## PROCEDURE

### I. Response

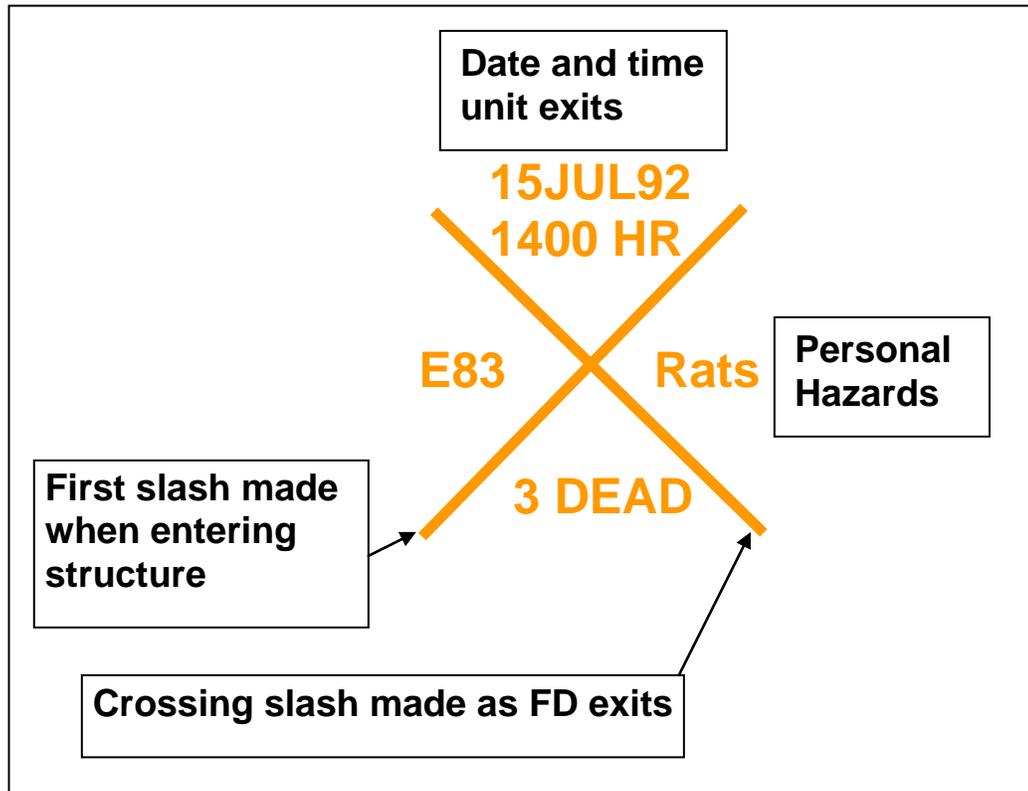
- A. Any incident involving structural collapse or damage where the possibility exists of victims being trapped or buried might require the response of the Hamilton County USAR team.
- B. No personnel should enter a collapsed or damage building to render patient care or extrication until a general survey and size up of damage is done.

### II. Search and Rescue Stages

- A. Reconnaissance. Provide for a general survey of the area and size up of the damage. Find out the following information:
  1. Building's use.
  2. Number of occupants.
  3. Number of victims trapped and their probable location.
  4. Are rescue operations currently underway?
  5. Presence of hazards:
    - a. Gas & utilities.
    - b. Flammables.

- c. Electrical.
    - d. Flooding from burst mains.
    - e. Plumbing and sewer disruption.
  6. Structural stability of adjoining buildings.
  7. Rescue efforts already underway by untrained personnel and/or citizens. Stop such efforts immediately.
- B. Immediate rescue of surface casualties
  1. Victims found on top of the debris or lightly buried should be removed first.
  2. All rescue efforts should be directed to the victims who can be seen or heard.
  3. Rescue efforts should be also directed to reach those victims whose location is known even if you cannot see or hear them.
- C. Scene organization and management
  1. Working within the Hamilton County Incident Management System is essential to a successful operation.
  2. The following checklist is to be followed:
    - a. Shut down all utilities.
    - b. Evaluate structural integrity, assign a safety officer.
    - c. Request an engineer or architect.
    - d. Direct rescue operations from a safety stand point.
    - e. Assign team leaders for each designated rescue team.
    - f. Divide the collapse area into manageable areas.
    - g. Draw up a contingency plan and place on standby.
- D. Entry into Structures
  1. Prior to entry into buildings the FEMA marking system (a 2x2 slashed marking by each entry) should be utilized:

## BUILDING MARKING SYSTEM SEARCH ASSESSMENT



### E. Exploration and Rescue from Likely Survival Places

1. Seek out casualties by looking in places that could have afforded a reasonable chance for survival. Typical areas that should be searched are:
  - a. Spaces under stairways.
  - b. Basement and cellar locations.
  - c. Locations near chimneys or fireplaces.
  - d. Voids under floors that are not entirely collapsed.
  - e. Undemolished rooms whose egress is barred.
  - f. Voids created by furniture or heavy machinery.
2. Locate casualties using the "hailing system."
  - a. Place rescuers in "call" and "listen" positions.

- b. Have the operations officer call for silence.
- c. Going "around the clock" each rescuer calls out or taps on something. A period of silence should follow each call.
- d. All members should attempt to determine a "fix" on any sound return.
- e. After a sound has been picked up, at least one additional "fix" should be attempted from another angle.
- f. Once communications with the victim have been established, it should be constantly maintained.

## F. Breaching and Shoring

1. In some instances, victims may be reached by breaching and shoring.
  - a. Initially try to avoid the breaching of walls. This may undermine the structural integrity of the rest of the building.
  - b. It is safer to cut holes in floors and use the shaft approach.
  - c. If you must breach a wall or cut a floor, cut a small hole first to assure that you are not entering a hazardous area.
2. Shoring may be used to support weakening walls or floors. The normal shoring operation of the Reading FD will be T-Shores and Cribbing
  - a. Shores should not be used to restore the structural elements to their original positions.
  - b. An attempt to force beams or walls into place may cause collapse.
  - c. If you decide to shore, keep the following in mind:
    1. The maximum length of a shore should be no more than 50 times its width.
    2. The strength of a shore is dependent on where it is anchored. If anchored to a floor, it will be dependent on the strength of the floor.
    3. Shoring should be attempted only by qualified personnel or under the supervision of technical rescue personnel.
    4. Air-shores may be used in place of timbers and will provide a stronger shoring system.
    5. Shoring should NEVER be removed once in place.

#### G. Selected Debris Removal

1. This stage of the rescue process will consist of reducing the size of the rubble.
2. This must be accomplished based on a pre-determined plan.
3. Cranes and heavy equipment may be needed to accomplish this portion of the rescue. Consult the fire department's resource log to obtain these.
4. Remove debris from the top down.
5. Remove debris from selected areas where information suggests that victims might be.

#### H. General Debris Removal

1. This should be employed after all other methods have been used.
2. This should be used only after the decision has been made by the incident commander that no other victims may be found alive.
3. This basically amounts to the demolition phase.

### III. General

- A. It is safer to reach entrapped victims from above.
- B. Diagram the building on the command board.
- C. Ensure control of all accesses to the site.
- D. Beware of "at will" response by volunteers or citizens.