S.O.P #: TACTICAL OPERATIONS MANUAL #14

SUBJECT: STRUCTURAL COLLAPSE INCIDENTS

DIVISION: EMERGENCY OPERATIONS

Objective: To serve as a guide for all Fire Department personnel operating at or near structural collapse incidents regardless of the cause.

Section 1: Purpose

A. This procedure establishes command and operational guidelines to be followed and adhered to by all members of the fire department operating at structural collapse incidents during rescue or recovery operations. The well being of emergency and civilian personnel is not to be endangered for an activity that is not essential to the immediate protection of life.

Section 2: Definition

A. A structural collapse shall be defined as any building or structure, natural or manmade, that has potential to collapse or has collapsed that involves life hazards or presents significant hazards to the mitigation process. Incidents that require the positioning of individuals in a potentially unsafe area should be considered for a collapse response or a structural scene evaluation from the ranking on duty ATR officer or their designee.

Section 3: Response

A. A structural collapse response shall consist of the following levels of response. This response is for the rescue operations and should not be confused with requests for fire suppression related duties.

1. 1st Alarm – (2) Engines, (1) Truck, (2) Heavy Rescue Squads, (1) Battalion Chief, (1) ALS Medic Unit, (1) EMS Supervisor, Co. 29 for the Collapse Rescue Team, Station 17 with the ATR Team and Station 55 for their Engine and Collapse Unit 55.

2. Working Rescue – (1) Heavy Rescue, (1) Truck as the RIT, (1) Battalion Chief, (1) ALS Medic Unit, Haz-Mat 114, Rehab Unit.

   NOTE: Dispatch will also notify the Director of Homeland Security and Emergency Management, appropriate Division Chief, Safety Officer, MOSH Baltimore County Utilities, and Public Information Officer.

3. 2nd Alarm – (4) Engines, (2) Trucks, (1) Flood Light Unit, (1) Air Unit, (1) Satellite Haz-Mat Unit, (1) Heavy Rescue Squad, EMS-1, (2) ALS Medic Units, Division Chief One and the next closest Collapse Rescue Team. (It will be the responsibility of the Officer in Charge from the ATR team to advise command of that unit.)

B. Due to the level of training and specialized equipment housed and jointly carried at Station 17, Station 29, and Station 55, these stations/teams or CIU-55 unit should be dispatched as a team where feasible. This will also include any out of county response regardless of the request from the incident commander. Once the on-duty officer arrives from Station 17, he/she can determine the need for any or all units. Our first priority must be for the members of our department.

Section 4: Safety

A. Safety of operating personnel shall, at all times, be the primary factor in decisions made in the course of operations. However, it is recognized that technical rescue operations by their nature impose certain unknowns and risks to personnel that are accepted by the fire and rescue service. Within the scope of decision-making, personnel shall weigh the risks and attempt, as best as possible, to identify the unknown factors within each situation to affect a positive outcome. To ensure for the safety of all personnel involved the incident command system will be used on all structural collapse incidents regardless of rescue or recovery. If units have arrived and the incident meets the above definition(s) command will implement and follow these guidelines.

1. Request a structural Collapse Rescue assignment.
2. Radio a brief initial report.
3. Establish Staging.
4. Establish initial Hot and Warm Zone.
5. Secure utilities and other hazards.
6. Survey the extent of the incident, i.e., single or multiple site.
7. Determine construction type.
8. Estimate casualties.
9. Consider potential for further collapse.
10. Consider secondary explosives or threat problems.
11. Consider request for outside resource local and state.
12. Consider request for command or major command mode.
13. Institute Command Net as soon as possible.

Section 5: Command Considerations

A. Command must consider the fact that if strong control of an incident is not gained quickly, the incident may easily escalate to an out-of-control situation. Typical structural collapse incidents have unorganized, well-intentioned efforts by civilians, and at times, fire service personnel to aid the trapped or injured, often placing themselves at great risk. This situation may subject trained rescuers to additional, unnecessary risks, making the entire operation unsafe. Command must focus attention early on to building a strong "Command" presence and structure that will support an extended operation. Command should refer to and begin to use the IMS 200 forms and in particular the building collapse scene assessment card.

1. Hot Zone – defined as a distance of one and one-half (1 ½) the height of the structure involved. NOTE: If multiple building involved consider zone as a geographic area.
2. Warm Zone – defined as a distance of 1000 ft. or greater if multiple buildings involved.
3. Cold Zone – defined as a distance of 3000 ft. or greater.

B. The Incident Commander should continually monitor the condition of all personnel, as well as existing and potential environmental conditions during these events and take appropriate action with regard to staffing and resource allocation. The minimum positions to be filled within the command structure for this type of incident shall be as follows:

1. Assistant Safety Officer – This position is in addition to the overall safety officer. This position will primarily be concerned with the scene and personnel safety in the Hot and Warm Zone.

2. Rescue Branch– will be responsible for the development and implementation of the rescue action plan in the Hot and Warm Zone.

3. Logistics Officer – will be responsible for ascertaining and establishing supplies, equipment, hardware needed for the incident.

4. Technical Information Specialist – This position shall be appointed by the Rescue Manager. This person shall be responsible for the overall collection of information and documentation of the entire incident to be accessible to the Incident Commander as needed. This includes but is not limited to assuring that all IMS 200 forms are being completed, digital photos, collection of reports and potential media releases.

5. Rescue Group Supervisor – will be responsible for the (4) four Rescue Specialists assigned to their group. This person reports directly to the Rescue Manager.

6. Rescue Specialist – will report directly to the Rescue Group Officer.

7. Medical Specialist – This position shall be appointed by the Rescue Manager. This person shall be responsible to provide care for the members in the Hot Zone.

Section 6: Rescue/Recovery Operations

A. Remove surface victims.
B. Establish a defined perimeter (hot zone) with barrier tape; enlist the aid of police or others, if necessary, to assist completing this operation.
C. Remove civilian and non-essential rescue personnel from hazardous environments and the hot zone.
D. Complete a Preliminary Hazard Assessment of the scene. This assessment is a perimeter walk around to identify the following:
    1. Size/height of the structure or structures.
    2. General conditions such as debris areas, obvious wall misalignments or other structural instability, haz-mat issues, etc.
    3. Identification of points of entry. (No entry should be made at this time)
    4. Location of visible trapped victims.
    5. Utility hazards not under control.
    6. Assessment of potential for secondary collapse.

Section 7: Major Command Considerations

A. Implementation of Baltimore “Command Net” radio and communication procedures.

1. Talkgroup assignments as needed.

B. Implementation of a “Multi-Agency, Unified Command” structure.

1. Immediate designation of individuals to fill the following IMS functions as a minimum:

    a. Safety
    b. Operations Branches
        1. Search Group
        2. Rescue Group
        3. Medical Group
        4. Staging

2. Plans

3. Logistics

    a. Other functions to address issues such as fire conditions, hazardous materials, mass casualty may also be necessary.

4. Request for Red Cross and/or Salvation Army support.

Section 8: Command Staff Responsibilities/Actions

A. Safety Officer

1. Establish Level II accountability to the "Hot Zone".
2. Review the established "Hot Zone" perimeter for adequacy.
3. Establish (as necessary) "Warm" and "Cold" Zones.
4. Address the need for a Rapid Intervention Team capability.
5. Address any specific hazards such as secondary collapse zones, hazardous materials situations, personal protective equipment issues, etc.

B. Operations Officer

1. Establish and deploy "Structure Triage Team(s)".

2. Structure Triage Teams are comprised of a Structures Specialist and a Hazardous Materials Specialist.

a. Designate a Search Group and Officer.
b. Designate a Rescue Group and Officer
c. Designate a Medical Group and Officer
d. Designate a Staging Officer.
e. Designate a Hazardous Materials Group and Officer
f. Operational Considerations:
Analyze information received from the Structure Triage Team to determine the best risk to benefit radio of available opportunities.
g. Prioritize rescue sites.
h. Start recon of void spaces – confined space situations may exist.
i. Establish clear transportation paths in and out of the area.
j. Determine need for heavy equipment – consult with Structures Specialist and Rescue Officers as to specific type and capacities.

C. Plans Officer

1. Establish the Victim Locator Unit.

A. Ascertain the need for Technical Specialists.

a. Structures Specialists.
b. FD Surgeons
c. Heavy Rigging and Equipment Specialists.
d. Canine Search Specialists
e. Operational Considerations
f. Assign Technical Specialists to Operations as needed.
g. Ascertain the complexity of the incident with regard to on-scene, requested, and anticipated resources. Consideration of the technical capabilities of the crews involved – Technician Level? Operations Level?
h. Implement the "baseline" equipment and apparatus request to the Department of Public Works as described in the Baseline Incident Action Plan. Ascertain the needed response of the Department of Public Works for various other equipment and apparatus types.
i. Ascertain the extent of the incident and develop necessary geographic plans of the site/area. (Structure Triage Teams will have much of this information on return from their assessments.)

Expand upon and develop the "baseline" Incident Action Plan into a working document/operational plan.

j. Document and develop the incident management system organizational chart.

k. Evaluate the anticipated time line of the incident and the need to establish operational shifts – usually 12 hour rotations.

B. Logistics Section Chief

1. Operational Considerations:

a. Ascertain the immediate need for and/or establish the following:
   1. Supplies of building materials, fuel
   2. On and off-site communications
   3. Site facilities such as tents or other shelters.
   4. Site transportation issues.
   5. Relief personnel.
   6. Medical care for rescuers/rehab.
   7. Additional apparatus/equipment
   8. Staging of apparatus/equipment.
   9. Ascertain the long term need for the following:
   10. Site issues such as:
   11. Food Service Facilities
   12. Housing Facilities
   13. Command and Operations Facilities

b. Public Information Disbursements Facilities
   1. Equipment Repair Facilities
   2. Critical Incident Stress Debriefings
   3. Red Cross Operations

Section 9: Disaster Operations

A. Definition

1. Disaster operations constitute the response that is generated as a result of an emergency declaration by the executive of the jurisdiction where the incident occurs. This would be the County Executive, Governor, or the President of the United States. The federal government, through the Department of Homeland Security and the Federal Emergency Management Agency (FEMA), will respond to significant disasters, when requested, to assist in the command, search, rescue, medical, and technical support. FEMA US&R task forces are located throughout the United States, and specialize in complex search and rescue operations.

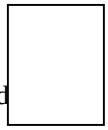
Section 10: Marking Systems

A. The identity and location of individual structures is crucial at incidents involving several structures or large areas of damage. The use of existing street names and addresses should always be considered first.

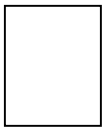
B. Structure/Hazard Evaluation Marking System

1. Structural hazards identified during initial size-up activities and throughout the incident should be noted. A structure/hazards mark should be made on the outside of all normal entry points. International Orange spray paint is the most easily seen color on most backgrounds and line marking (or downward spray cans) apply the best paint marks. Lumber chalk or lumber crayons should be used to write additional information inside the mark itself. (Duct tape and black magic marker work also.) Chalk or crayons are used as they are easier to write with than spray paint.

2. Thought and care should be exercised in the marking of structures – marking causes additional, sometimes unwelcome damage, to repairable structures. A piece of plywood or sheetrock, when propped next to an entry point, provides and adequate location for marking. Consider the circumstances.



Make a large (2' x 2') square box with orange spray paint on the outside of the normal Entry points to a structure. Place the time, date, and team (or company) indentifier to outside , upper right of the box. Also note any hazardous materials cond



Structure is accessible and safe for search and rescue operations. Damage is minor with little danger of further collapse.

Structure is significantly damaged. Some areas are relatively safe, but other areas May need shoring, bracing, or removal of falling and collapse hazards. The structure May be completely pancaked.

Structure is not safe for search/rescue operations – may be subject to sudden additional Collapse. Remote search ops may proceed at significant risk. If rescue ops are undertaken, safe haven areas and rapid evacuation routes should be created.

C. Search Assessment Marking System

1. The Search Assessment Marking System is designed to be used in conjunction with the Structure/Hazards Evaluation (and other) marking systems.
2. International orange spray paint is the most easily seen color on most backgrounds and line marking (or downward spray cans) apply the best paint marks. Lumber chalk or lumber crayons should be used to write additional information inside the four quadrants. (Duct tape and black magic marker work also.) Chalk or crayons are used as hey are easier to write with than spray paint.
3. An "X", that is 2' x 2' in size will be made with spray paint. The X is constructed in two operations.
4. Prior to entry into the structure (or room, hallway, etc.), one diagonal slash is drawn.
5. A second (crossing) slash is drawn upon exit.
6. Distinct markings are made inside each of the four quadrants of the X to clearly denote the search status and findings at the time of the assessment.
7. It is important that markings are made specific to each area of entry or separate part of the building.
8. Situation updates are noted as they become available:
    a. Previous search markings are crossed out.
    b. New markings with the most recent information are placed below or adjacent to the original.

Section 11: Victim Location Marking System

A. Victim location marks are made by the search team whenever a known or potential victim is located and not immediately removed.

B. The victim location marking symbols and numbers of victims, if known, must be kept on the developing site map during the search of the structure or area. This information shall be reported and transcribed to the Victim Locator Unit of the Planning Section upon return of the Search Team.

C. International Orange spray paint is the most easily seen color on most backgrounds and line markings (or downward spray cans) apply the best paint marks. Lumber chalk or lumber crayons should be used to write additional information inside the "V". (Duct tape and black magic marker work also.) Chalk or crayons are used, as they are easier to write with than spray paint.