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## **Collapse Search and Rescue Plan**

I get nauseous when I see on television a news reporter or the city manager tell the fire chief “Your department’s response to fires is down. The firefighters are not working as hard as they did in the 1970’s and 80’s”. I get even sicker when the silent fire chief does not correct this misconception. When will the fire service wake up. The service we provide to the people has changed. We do more than fight fires. Very few officials in government, the news media, and in the fire service realized this. If they do, they are not saying it. I will say it again; we do more than fight fires! The fire service today provides full service emergency response. Over the past decades our profession has drastically changed. We went from mostly fighting fires to responding to all types of emergencies. Today we are trained and equipped with tools and protective equipment to respond to every conceivable type of emergency. For example, we are first to arrive at terrorist bomb incidents, building collapses, medical emergencies, vehicle accidents, elevator emergencies, natural disasters, such as floods, hurricanes, tornadoes, snow blizzards. And most importantly the emergency service we provide arrives quickly.

When people are in trouble they call the police 911; but most of the time, firefighters respond. Firefighters arrive first and take control of the emergency. For example, in midtown Manhattan, New York City, if you call in an type of emergency, within 5 minutes you get one fire officer and 4 firefighters with tools, skills and equipment on the scene to: save you from dying by a heart attack, pull you from an car accident, or dig you out of collapsed building. No one in New York City can do anything within 5 minutes. The response time of an ambulance is 7 minutes, a police car 10 minutes or more. Think about a Doctors visit to your home? Think about a building department engineer inspection response visit? Think about a response from your local political leader?

One of the emergencies firefighters respond to throughout the nation and recently throughout the world with the advent of the Urban Search and Rescue Teams, is to save people buried in a structural collapse. Terrorist bombs, earthquakes, tornadoes, hurricanes, gas explosions, snow blizzards, renovations and fires, collapse buildings. During these natural and manmade disasters, people are sometimes buried alive under tons of rubble. Firefighters must be trained and ready to respond to rescue people trapped in a fallen structure when disaster strikes.

## **Collapse Search And Rescue Plan**

The search and rescue plan, used today by firefighters throughout the Nation to rescue victims trapped at a collapse disasters, was developed by the British during the German blitz of World War II. As German bombs exploded they collapsed buildings. Night after night during the war British firefighters responded. After extinguishing a fire they would search the ruins for buried victims, and they developed a five-step collapse rescue plan:

**Step 1 Size-up.** Firefighters first made a survey of the collapse structure. This survey included looking for trapped victims, collapse hazards, avenues of access to the rubble pile, hidden fire dangers. During this survey they looked at the type of construction of the building. Brick, concrete and wood construction all create different spaces and crevices where survivors may be found.

The type of construction also determines the type of rescue tools required. Most important during this survey was the locating of controls for gas, electric and water utilities. To prevent an explosion, fire or drowned victim, all utilities would be shut off. Secondary collapse dangers, a serious threat to rescuers, also were identified during this site safety survey, or size-up.

**Step 2- Rescue of surface victims.** At the same time as the site safety survey was being made, victims found lying on top of the rubble of the bombed-out building, or people partially buried, were quickly removed from the collapse.

**Step 3 - Void search.** A bombed-out structure creates small spaces where survivors may be trapped or unconscious. These spaces and crevices are created by the collapse of large sections of floors, roofs or partition walls, and they must be searched. Also, large pieces of furniture can create a void where a survivor of a collapse could be trapped. Void search was carried out by crawling into large spaces or shining a flashlight into small collapse voids, or by calling out and listening for a response.

**Step 4 -Tunneling and Trenching.** After steps 1, 2 and 3 of the collapse rescue plan were completed the fire chief would remove all rescuers from the bombed-out building. It is estimated that 75 percent of the victims of collapses were saved during the first three steps. There was less chance of rescuing a live victim by this point and a greater chance of having a rescuer killed, so certain safety procedures were carried out before rescuers would resume digging. For example, secondary collapse dangers would be removed or shored up so they would not injure rescuers.

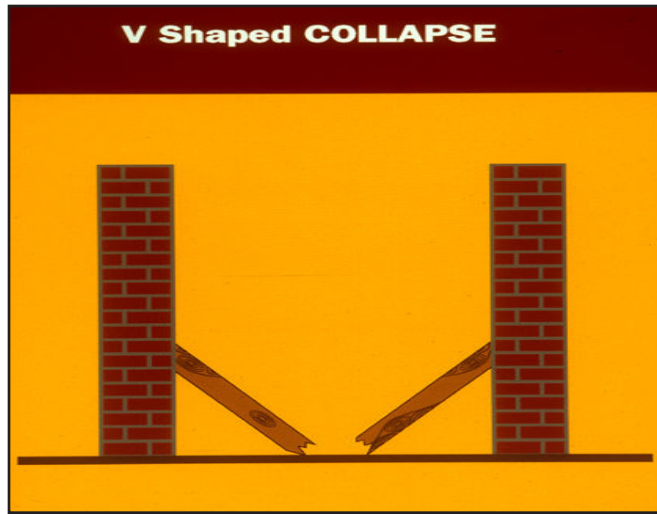
Lighting would be increased and the utilities would be confirmed shut off. During this period the location of buried victims would be determined. Survivors, neighbors, ambulance workers and staff from nearby hospitals would be questioned. Missing persons would be identified and the locations in which they were last seen would be pinpointed. (See victim tracking officers duties below) Hand digging by rescuers to specific locations where missing persons were last seen, or determined to be buried would start. Specific debris removal is what the British call it; we call it tunneling and trenching to specific sites. This was not a hit-or-miss effort. A specific location was the objective of this tunneling and trenching by rescuers using shovels and hand picks. This step continued until all sites where victims could be buried were uncovered.

**Step 5-Removal of rubble.** After all hand digging was completed and all specific locations where victims could be buried were uncovered and searched heavy machinery such as cranes, bulldozers and 3payloaders<sup>2</sup> were used to continue the search. Cranes would remove the collapse rubble to nearby areas, drop it, then rescuers would search the rubble for victims. Bulldozers would sweep away the rubble and payloaders would deposit it into trucks for carting to a designated dump site. The entire collapse structure would be removed this way.

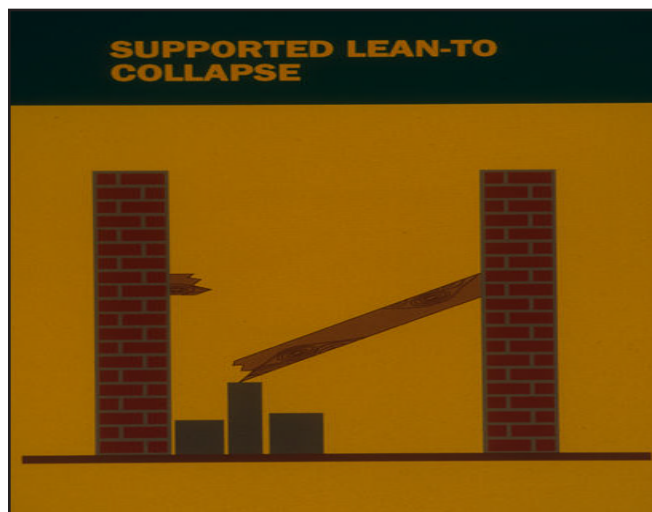
#### **Victim Tracking in a collapse rubble pile.**

One of the most complex tasks facing rescuers is identifying and locating buried victims. A victim tracking officer should be assigned as soon as possible to determine the number and location of buried victims. The victim-tracking officer is one of the most important parts of a collapse rescue plan. Part of the incident management planning team this officer gathers information, analyzes the building collapse and makes a determination where individuals are buried. This information is necessary before tunneling and trenching to a specific location begins. Before rescuers start the fourth stage of a collapse rescue plan, tunneling and trenching, searching for a missing person, a victim-tracking officer must be able to report to the incident commander the following information:

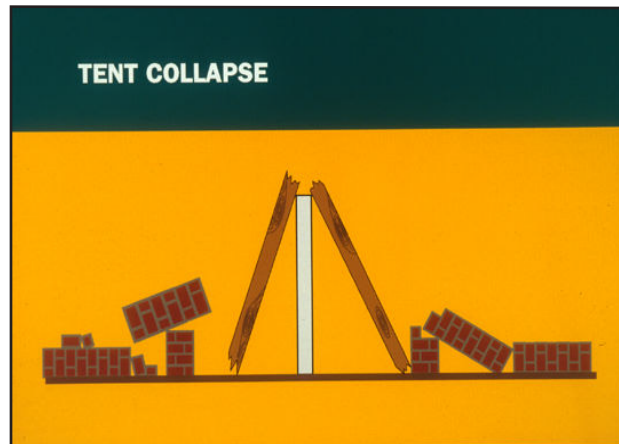
1. There is a missing person confirmed, by a co-worker, to have been inside the building during the collapse.
2. The reported missing person is not at a nearby hospital or in an ambulance, or not being treated at a first-aid station or he or she has not left the scene and gone home.
3. The approximate area and floor the missing person was last seen before the collapse.
4. The type of floor collapse and how it could shift the victim in the rubble during the collapse.  
For example, if a person is determined to have been on a floor during a collapse:



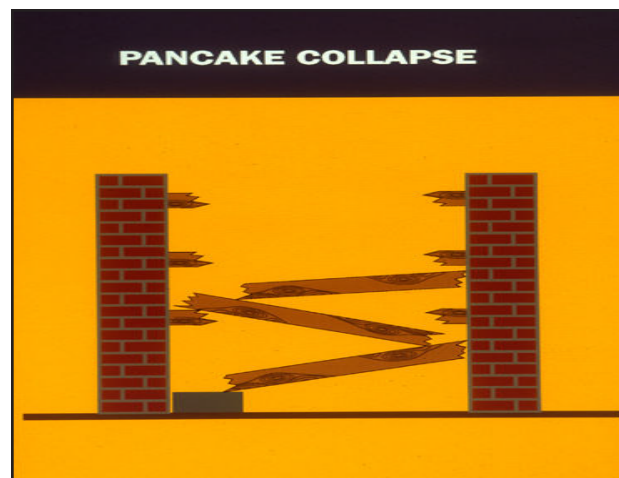
A. A V-shape collapse of the floor may shift the victim to the bottom of the V.



B. A lean-to collapse of the floor may shift the victim to the lowest end of the collapse.



C. A tent or A-frame collapse of a floor may shift the victim to the lower, outer ends of the collapse.



D. A pancake collapse of several floors may not shift the victim. Instead, the victim may fall straight down with the collapsing floors.

Police, fire marshals and firefighters must be assigned to assist a victim-tracking officer at a large collapse rescue operation. These investigators must question survivors and check hospitals, ambulances and first-aid stations. They may have to visit residences of reported missing victims to confirm that those people did not leave the scene and go home.

**Lessons learned:**

Today the fire service in America may use new and different management terms and jargon to describe a collapse rescue procedure. Also, today the incident command system may apply new sectors and functions to a technical rescue at a collapse site, but they will still proceed according to the logical, five-step rescue plan used by British firefighters during World War II.

**QUESTIONS:**

1. List three utilities which must be shut off during a collapse search and rescue operation:

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

2. Most of the victims (75%) are saved during after what steps of the collapse rescue plan?

A. After step 1

B. After steps 1 and 2

C. After steps 1,2 and 3

D. After steps 1,2,3and 4.

Answer\_\_\_\_\_

3. Firefighters should be recalled from the collapse rescue site and a safety survey made. Secondary collapse dangers should be shored up or removed; utilities should be confirmed off, and lighting provided at night. When should this safety survey be carried out?

A. After step 1

B. After step 2

C. After step 3

D. After step 4 and 5

Answer\_\_\_\_\_

4. Which one is the most correct answer? During step 1 the firefighters make a 360 degree survey and they look for what items?

- A. Trapped victims
- B. Secondary collapse dangers
- C. Access areas to the collapse pile
- D. Fire spread dangers
- E. All of the above

Answer\_\_\_\_\_

5. Which is an incorrect answer regarding analyzing a floor collapse rubble pile?

- A. At a v shape collapse the victims on the floor may be found in the bottom of the v
- B. At a tent shape collapse the victim on the floor may be found at either end of the tent collapsed floor
- C. At a lean-to collapse the victim may be found at the top of the lean-to
- D. A pancake collapse the victim on the floor may fall straight down with the collapse.

Answer\_\_\_\_\_

Answers: 1.Gas, electricity, and water; 2.C; 3.C; 4.E; 5.C

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1. Read the newsletter.
2. Print out the newsletter.Copy for each firefighter.
3. Use bold print as key words for training presentation.
4. Use questions for discussion.
5. Use questions to test firefighters.