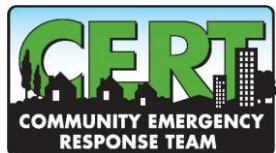


# CERT Basic Training

## Unit 7: Light Search and Rescue Operations



**FEMA**

# Unit Objectives



1. Identify and apply CERT size-up requirements for potential search and rescue situations
2. Demonstrate common techniques for light search and rescue
3. Demonstrate safe techniques for debris removal and survivor extraction during search and rescue operations

# *Unit Topics*



- Search and Rescue Size-up
- Conducting Interior and Exterior Search Operations
- Conducting Rescue Operations



PM 7-1

# Search and Rescue



- Search and rescue consists of three separate operations
  - Size-up: Using 9-step, continual model
  - Search: Locating survivors and documenting
  - Rescue: Extricating survivors



PM 7-1

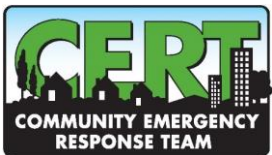
# Deciding to Attempt Rescue



- Rescue attempt decisions are based on three factors
  - Risks involved for the rescuer and survivor
  - Greatest good for the greatest number
  - Resources and manpower available



PM 7-1



# Goals of Search and Rescue



- Rescue greatest number in shortest amount of time
- Get walking wounded out first
- Rescue lightly trapped survivors next
- Keep the rescuers and survivors safe

PM 7-1



# Effective Search and Rescue

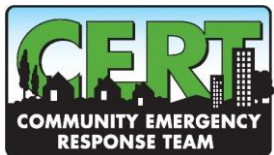


Depends on:

- Effective size-up
- Rescuer safety
- Survivor safety



PM 7-1



# CERT Size-up



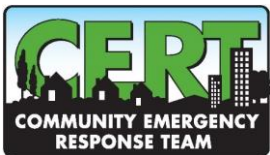
1. Gather Facts
2. Assess Damage
3. Consider Probabilities
4. Assess Your Situation
5. Establish Priorities
6. Make Decisions
7. Develop Plan of Action
8. Take Action
9. Evaluate Progress



**REMEMBER:**  
CERT SIZE-UP IS  
A CONTINUAL  
PROCESS

- Facts
- Anticipate
- Plan
- Act
- Review

PM 7-3





# Size-up Step 1



- **Gather Facts:**

- Time of event and day of the week
- Construction type/terrain
- Occupancy
- Weather
- Hazards
- Search subject profile



**CERT mission is to locate; assess; treat airway, major bleeding, and low body temperature (ABS); continue size-up**

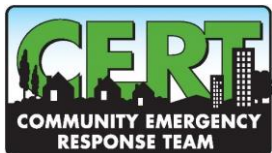
PM 7-5

# Size-up



- What does this tell you about the probable density for the affected area?
- What does this tell you about the facts that must be gathered?
- What impact could these facts have on search and rescue operations?
- What kinds of search and rescue operations are probable?
- What, if any, are the constraints that search and rescue personnel may face in this scenario?
- Can these constraints be overcome within the established CERT mission? If so, how?

PM 7-5



# Size-up Step 2



- **Assess and Communicate Damage**
  - The CERT mission changes if damage is light, moderate, or heavy

**When in doubt about the condition of a building, CERT volunteers should always use the more cautious assessment.**

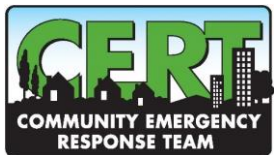
# Light Damage



- Superficial
- Broken windows
- Superficial cracks or breaks in wall surface
- Minor damage to the interior contents
- **Safe to enter and remain**



PM 7-6



# Moderate Damage



- Visible signs of damage
- Decorative work damaged or fallen
- Many visible cracks or breaks in wall
- Major damage to interior contents
- Building still on foundation
- **Enter only to save lives**



PM 7-6



# Heavy Damage



- Partial or total collapse
- Tilting
- Obvious structural instability
- Building off foundation
- Smoke, fire, gas leaks, or hazardous material
- Rising water



**Do not enter a building with heavy damage under any circumstances!**

PM 7-7

# Size-up Step 3



## • Consider Probabilities:

- How stable is the situation?
- What secondary factors should be considered?
- What else could go wrong?
- What does it mean for the search and rescue?

<b>Exploding bomb</b>  Explosives; Self Reactive; Organic Peroxides	<b>Skull and Crossbones</b>  Acute toxicity (severe)	<b>Flame</b>  Flammables; Pyrophorics; Self-Heating; Emits Flammable Gas; Self Reactive; Organic Peroxides
<b>Gas Cylinder</b>  Gases under pressure	<b>Health Hazard</b>  Carcinogen; Mutagenicity; Reproductive Toxicity; Respiratory Sensitizer; Target Organ Toxicity; Aspiration Toxicity	<b>Flame over circle</b>  Oxidizers
<b>Corrosion</b>  Corrosives	<b>Exclamation mark</b>  Irritant; Skin Sensitizer; Acute Toxicity (harmful); Narcotic effects; Respiratory Tract Irritant; Hazardous to Ozone Layer	<b>Environmental</b>  Aquatic Toxicity (OSHA did not propose this pictogram)

**HEALTH HAZARD**  
4 DEADLY  
3 EXTREME DANGER  
2 HAZARDOUS  
1 SLIGHTLY HAZARDOUS  
0 NORMAL MATERIAL

**FIRE HAZARD**  
FLASH POINT:  
4 BELOW 73°F  
3 BELOW 100°F  
2 BELOW 200°F  
1 ABOVE 200°F  
0 WILL NOT BURN

**SPECIFIC HAZARD**  
OXIDIZER  
ACID  
ALKALINE  
CORROSIVE  
USE NO WATER  
RADIOACTIVE

**INSTABILITY**  
4 MAY DETONATE  
3 SHOCK + HEAT MAY DETONATE  
2 VIOLENT CHEM. CHANGE  
1 UNSTABLE IF HEATED  
0 STABLE

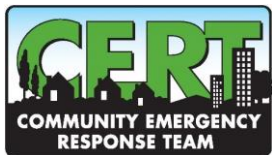
PM 7-8

# Size-up Step 4



- **Assess Your Situation:**

- Is the situation safe enough to continue?
- What risks will rescuers face?
- What resources are needed?
- What resources are available?





# Rescue Resources



- Personnel:
  - Firefighters
  - Police officers
  - Doctors, Nurses
  - Contractors
- Tools:
  - Crowbars
  - Auto jacks
  - Chainsaws
- Equipment



PM 7-9

# Size-up Step 5



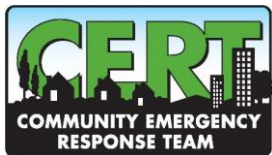
- **Establish Priorities:**

- What should be done?
- In what order?
- How do you rescue the greatest number in the shortest amount of time?



**Life  
Property**

PM 7-10



# Size-up Step 6

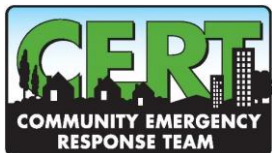


- **Make Decisions:**

- Keep in mind:

- Safety of CERT members
- Life safety for survivors and others
- Protection of the environment
- Protection of property

PM 7-10



# Size-up Step 7

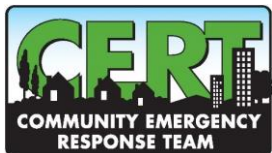


- **Develop Plan of Action:**

- Focus operation on established priorities and decisions
- Provide documentation to give to responding agencies
- Provide documentation to become part of CERT records

**Do you have notebook for jotting notes?**

PM 7-11



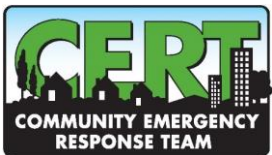
# Size-up Step 8



- **Take Action:**
  - Base action on plan developed during Step 7



PM 7-11

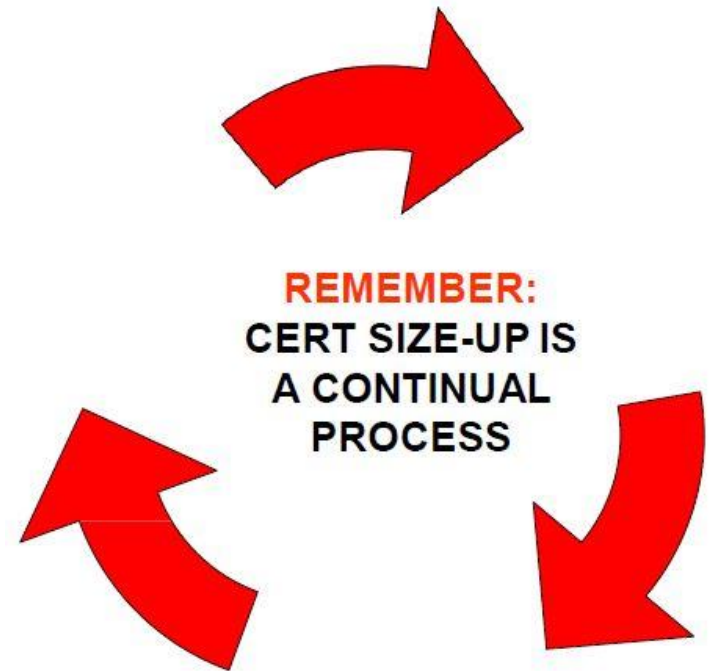


# Size-up Step 9



- **Evaluate Progress:**
  - Most critical step
  - Monitor plan's effectiveness and safety

Consider Progress & Safety



PM 7-11

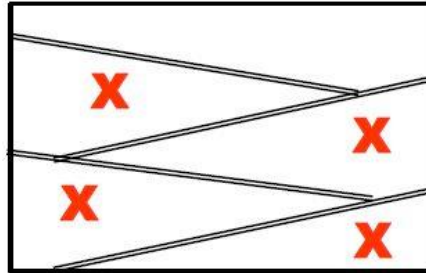


- Given the disaster and the specific building, answer the following questions
  - What are the pertinent facts that must be gathered?
  - What kind of prediction can you make regarding damage, based on the incident and the building construction?
  - What probable search and rescue problems can you identify?
  - What specific safety considerations can you identify?

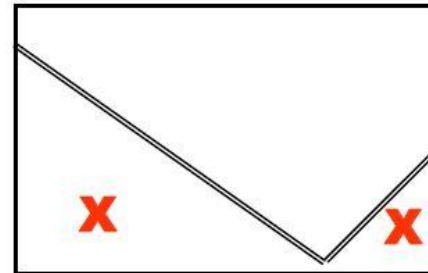
# Structural Voids



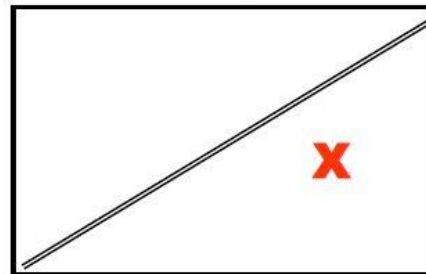
Hear signs of life  
REPORT IT



Pancake Void



'V' Void



Lean-to Void

**X** = Voids

If you see collapsed floors or walls, **GET OUT!**

PM 7-13





# Individual Voids



- Survivors may seek protection in various places
  - Inside bathtubs
  - Underneath desks
  - Inside cabinets
  - Under/next to beds
  - Inside closets



PM 7-13

# CERT S&R TEAM



- Be clear on your Mission – who & where is command. Communication plan.
- Set-up the Team
  - Team Leader
  - Safety Officer
  - Medical
  - Scribe, Communications
- Set Ground Rules before you take action
  - **Safety** is Paramount, PPE, Arms Length Apart, Pairs as a minimum
  - **Size-up, Documentation** is critical
  - Your **Limitation** must be known
  - Entry can be dangerous, Head on swivel, Listen, Feel Surfaces
  - Everyone contributes, Leader makes the decision
  - Plan and discuss the tactics



- Hazards, resources, improvise, search, entry, triage, rescue, size-up, be prepared to change mission, team formations and modifications, PPE.



# VERIFY TEAM PPE

- Personal and Team Safety is always the number one priority
- **Work as a Team – Buddy System of 2 or more on a task**
- Wear Personal Protective Equipment (PPE)
  - Vest
  - Gloves (medical & work)
  - N-95 Mask
  - Goggles
  - Helmet
  - Boots



- Note Paper to document key observations
- Lumber crayons, chalk

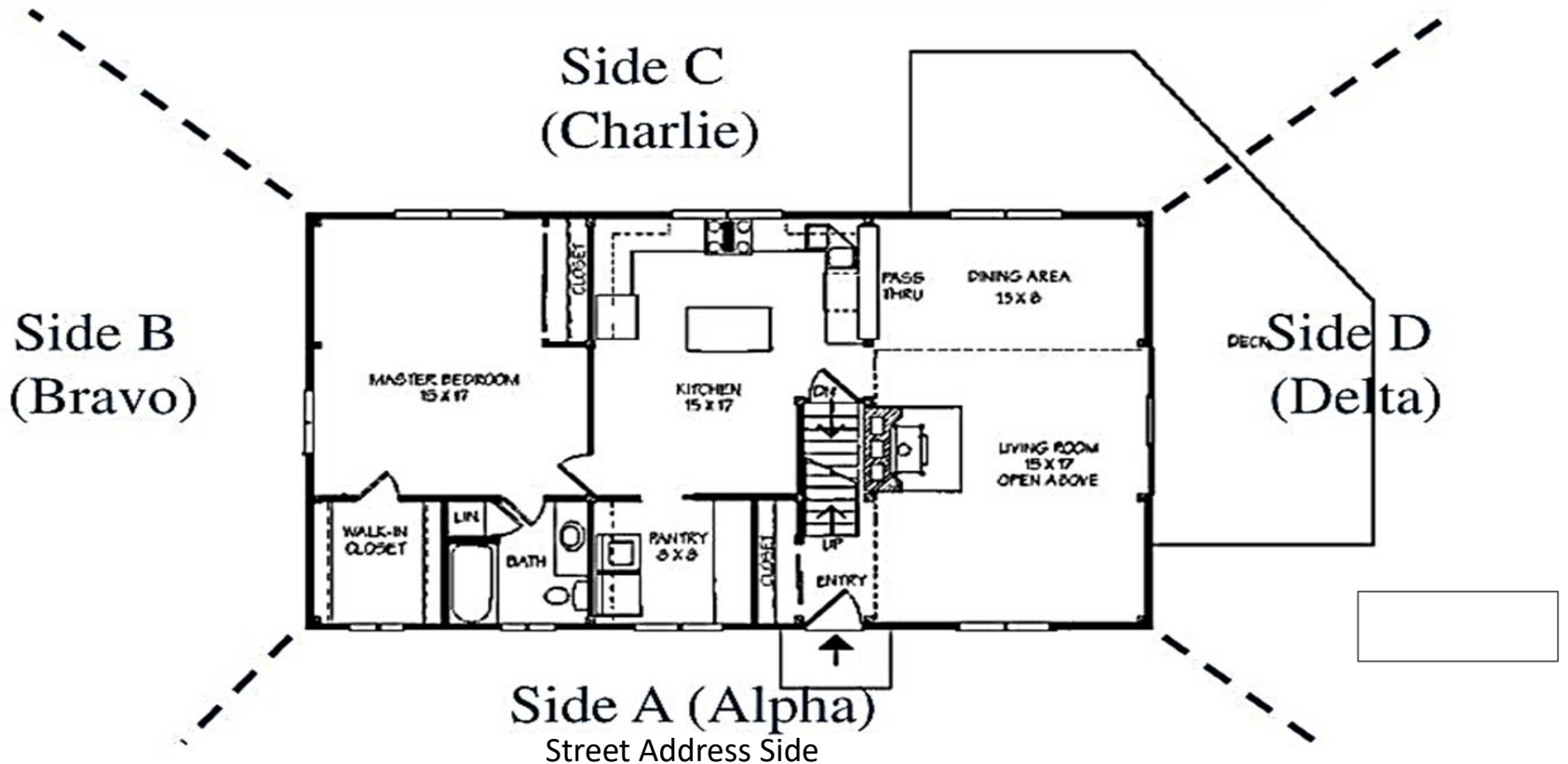
## GOAL

***DO THE GREATEST GOOD FOR GREATEST NUMBER In the shortest amount of time***



# LOCATION INFORMATION

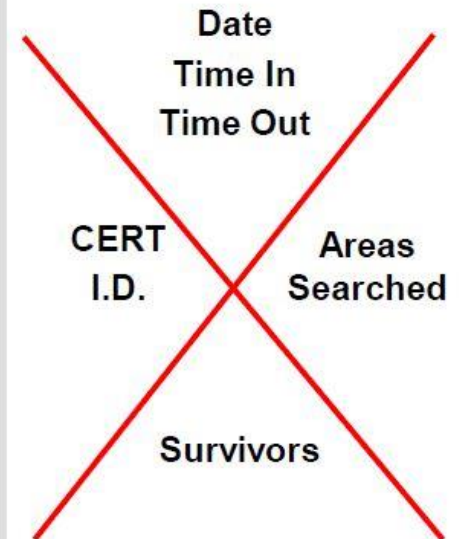
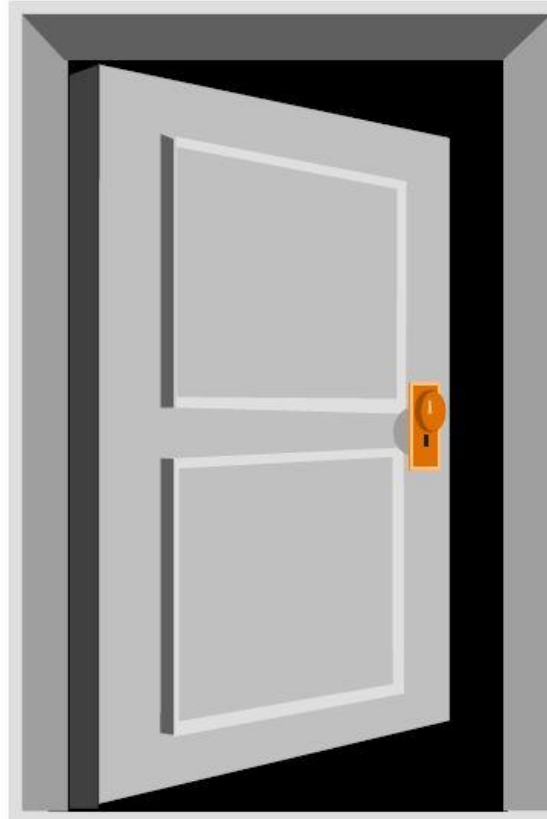
## How do we describe Divisions around buildings?



# Search Markings



- Upon entering search area:
  - Make a slash
  - Enter info
- Upon leaving search area:
  - Complete 'X'
  - Enter info

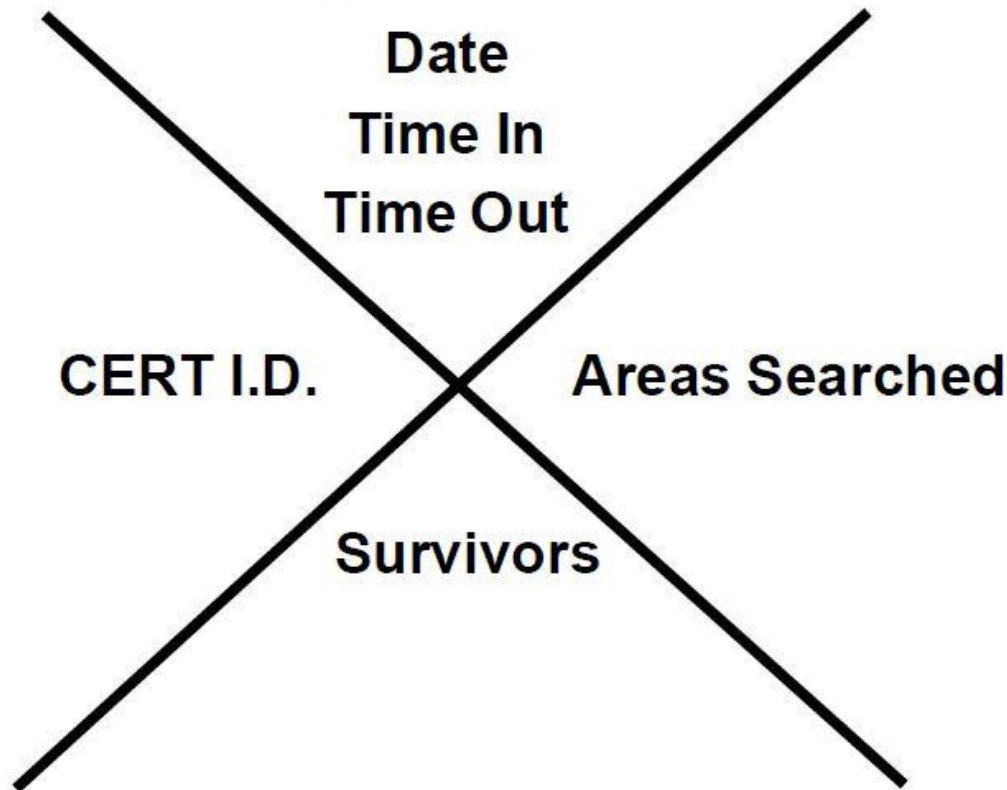


PM 7-14

# Search Markings



- What information do you mark?



PM 7-14

# Search Markings



Sample

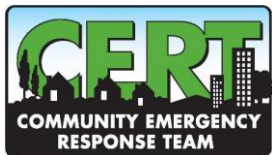
**2/15/08**  
**In: 1430**  
**Out: 1515**

**CERT-23**

**FL 1-2 searched**  
**Stairs to FL-3 unsafe**

**2L**  
**Moved to**  
**CERT-23 med**  
**ops**

PM 7-14



# Search Methodology



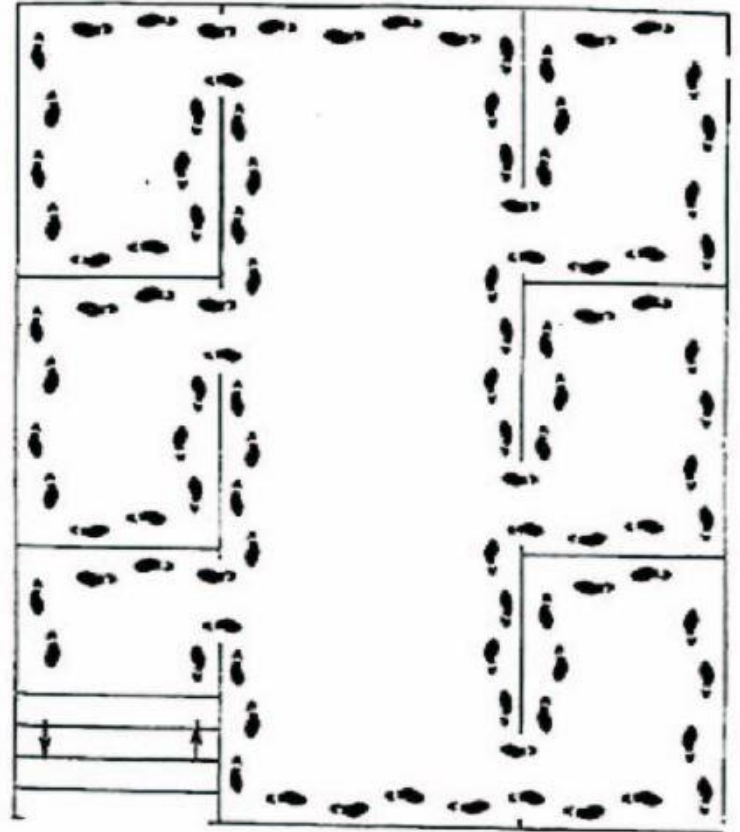
- Remain **within arm's reach** of one other CERT member
- Call out to survivors, “**If anyone can hear my voice, come here**”
- **Ask any survivors** who do respond for more information about the building or others who may be trapped
- Survivors might be in **shock or confused**



# Search Methodology



- **Bottom-up/top-down** for a multi-story building
- **Right wall/left wall** for a single floor
- Stop frequently to listen



**Check all six sides  
Ceiling and the floor**

PM 7-15

# Search Methodology



- Stop frequently to listen for:
  - Tapping
  - Movement
  - Voices

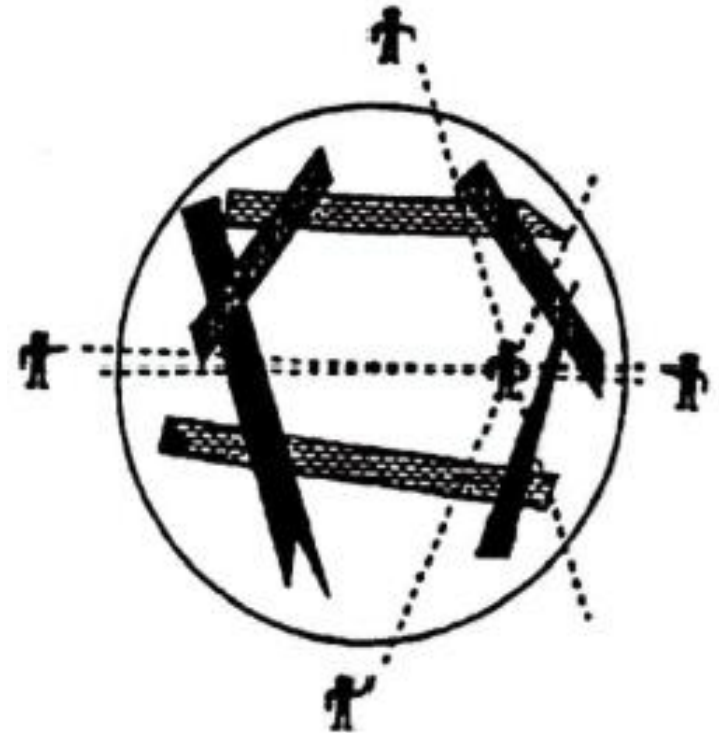


PM 7-15

# Search Methodology



- Triangulation allows rescuers to view a location from several perspectives



**Should not be used as an initial search method**

PM 7-15

# *Search Methodology*

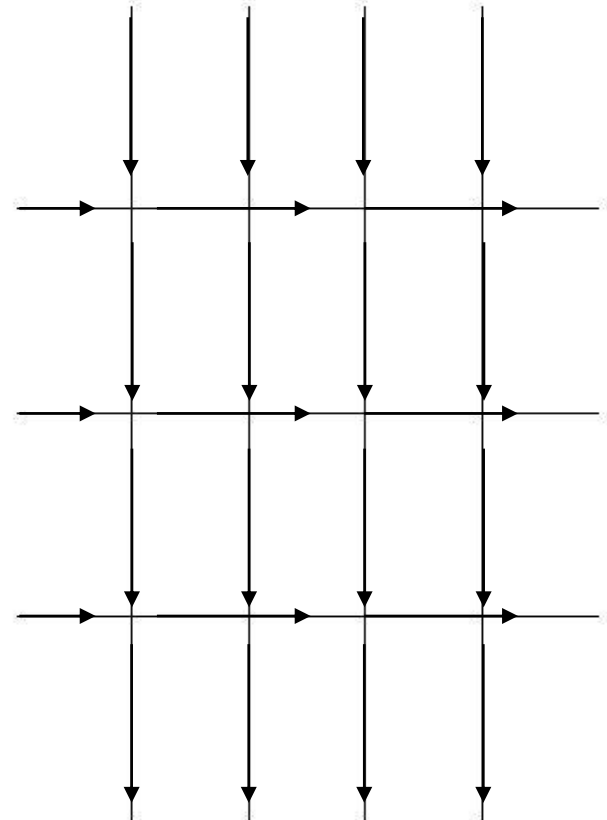


- Keep records of rescued survivors and of those who remain trapped or who are dead
- Report information to emergency services personnel

# Exterior Search



- Set up a grid search:
  - Set distance between searchers according to visibility and debris
  - Overlap patterns for full coverage
  - Search in as straight a line as possible
  - Mark areas that have been searched



PM 7-15

# Rescue Operations



- Remove objects and debris to free survivors and create safe rescue environment
- Assess survivors
- Remove survivors



PM 7-17

# *Creating a Safe Environment*



- Maintain rescuer safety
- Assess survivors in lightly and moderately damaged buildings
- Evacuate survivors as quickly as possible

# *Precautions to Minimize Risk*



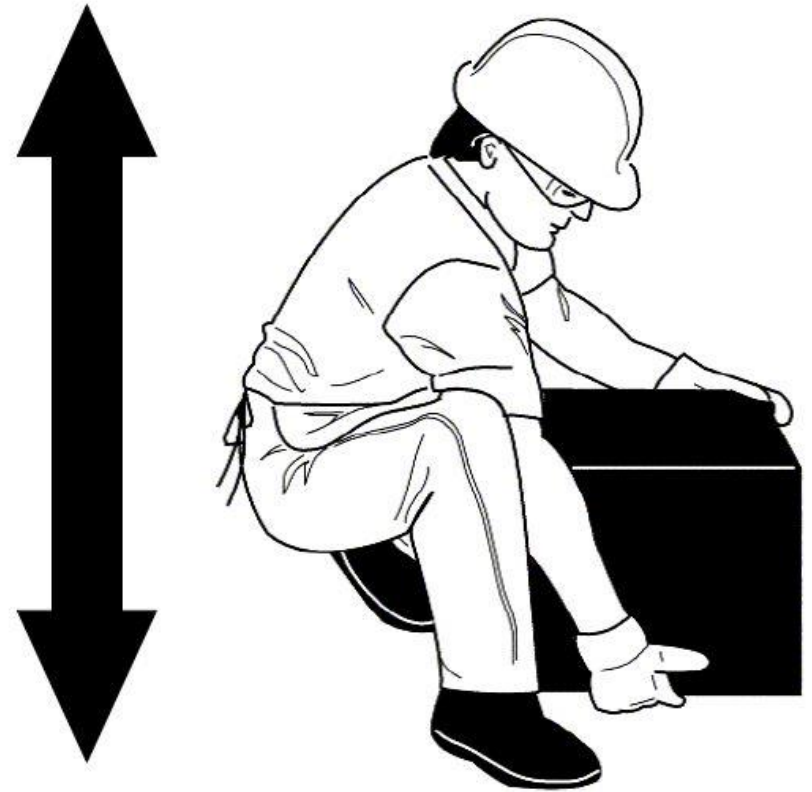
- Know your limitations
- Follow safety procedures
- Remove debris by leveraging and cribbing



# Proper Lifting Procedures



- Back straight
- Bend knees
- Keep load close to body
- Push up with legs



PM 7-18

# Leveraging and Cribbing



- For heavy lifting
- Performed in tandem
- Helps extricate survivors



- Various materials and objects may be used

PM 7-18

# Two Types of Removal



1. Self removal or assist; and
2. Lifts and drags



PM 7-21

# Which Extrication Method?



- Extraction method depends on a number of criteria
  - General stability of the immediate environment
  - Number of rescuers available
  - Strength and ability of the rescuers
  - Condition of survivor



PM 7-21

# One-Person Arm Carry



- Lift around survivor's back and under his or her knees
- Lift survivor by keeping your own back straight and lifting with your legs

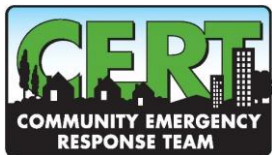


PM 7-21

# Pack-Strap Carry



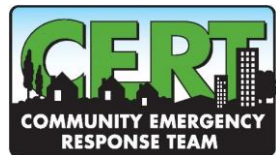
PM 7-22



# Two-Person Carry



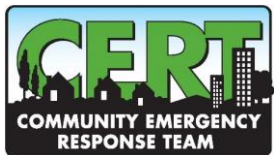
PM 7-22



# Chair Carry



PM 7-23





# Blanket Carry



PM 7-24



# Log Rolling



PM 7-25



# *Blanket Drag*



PM 7-25

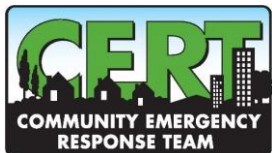


# Exercise 7.3



- Break into teams of seven
- Members of your team will volunteer to be “victims” that other team members will move using the drags and carries demonstrated in the class
- Use chairs and other items as needed to perform the drags and carries
- Trade off “victim” and “rescuer” roles so that everyone on your team has a chance to practice the drags and carries
- Know your limits! Do not attempt any lift or carry that will not be safe for you and the victim

PM 7-26



# Exercise 7.4



- Break into teams of seven
- Your team will be directed to a “damage site.” Consider your plan of action
- Enter “damage site” and conduct room search. Locate victims and make plan to extricate them from debris
- Leverage and crib as needed to free the survivor
- Use appropriate lifts and drags to remove victims from the room (and, if possible, from the building)
- If there is a second “damage site,” conduct another rescue operation

PM 7-26

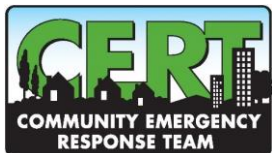


# Unit Summary



- You should know
  - How to decide whether to attempt rescue
  - The objectives of interior and exterior search and rescue
  - How to perform search and rescue size-up
  - Building markings
  - Rescue functions
  - How to remove debris
  - How to extricate survivors

PM 7-27



# *Homework Assignment*



1. Read unit to be covered in next session
2. Bring necessary supplies to next session
3. Wear appropriate clothes to next session

PM 7-27

