

## COLLAPSED STRUCTURE SEARCH AND RESCUE (CSSR)

### LESSON 8 — OVERVIEW

Rescue Strategies and Techniques

<b>Duration</b>	<b>Lecture:</b> 02 Periods <b>Practical:</b> 09 Periods    Total- 11 Periods	
<b>Main Points</b>	<ul style="list-style-type: none"> <li>• Approach strategies for search and rescue</li> <li>• Techniques for accessing and rescuing a patient</li> <li>• Steps to ensure and evaluate access conditions</li> <li>• Removing rubble</li> <li>• Procedures for cutting and penetrating metal, wood, concrete, block and brick</li> </ul>	
<b>Suggested Preparation</b>	<ul style="list-style-type: none"> <li>• Thoroughly study reference material (RM-08)</li> <li>• Based on the lesson objectives, highlight the reference material on related subjects.</li> <li>• Fill in the participant's manual to guide you in helping participants with needed information.</li> <li>• Have a hand any experiences, stories or comments related to this lesson.</li> <li>• Have the practical exercise stations prepared before the lesson.</li> <li>• Meet with all assistant instructors prior to the class for station assignments.</li> <li>• Have assistant instructors present for the lecture portion.</li> <li>• Any material needed for the practical exercise should be prepared a day in advance.</li> </ul>	
<b>Evaluation System</b>	<ul style="list-style-type: none"> <li>• Written test the next day</li> <li>• Demonstration in applying techniques for cutting and penetrating different materials conducted at four different stations.</li> </ul>	
<b>Materials and Resources Needed</b>	<ul style="list-style-type: none"> <li>• PowerPoint presentation (14)</li> <li>• Post-Test (1)</li> <li>• Evaluation sheet (1)</li> <li>• Practical exercise</li> <li>• Clipboards (5)</li> <li>• Radios (Instructor)</li> <li>• PPE</li> <li>• Level 24" (4)</li> <li>• Tape measure (4)</li> <li>• Generator (4)</li> <li>• Rotary rescue saw (4):               <ul style="list-style-type: none"> <li>- (2) metal blades</li> <li>- (2) concrete blades</li> </ul> </li> <li>• Claw Hammer</li> <li>• Chisel</li> <li>• Fire Extinguisher</li> </ul>	<ul style="list-style-type: none"> <li>• Spray paint</li> <li>• Tin snips</li> <li>• Spray bottle</li> <li>• Crow bar</li> <li>• Sledgehammer</li> <li>• Chain saw</li> <li>• Reciprocating saw (3):               <ul style="list-style-type: none"> <li>- (4) wood blades and</li> <li>- (4) metal blades</li> </ul> </li> <li>• Hammer drill (3)</li> <li>• Chipping hammer (3)</li> <li>• Drill (2):               <ul style="list-style-type: none"> <li>- (2) wood blades and</li> <li>- (2) metal blades</li> </ul> </li> </ul> <p><b>Other Materials</b></p> <ul style="list-style-type: none"> <li>• Exercise Guide (4)</li> </ul>
<b>Importance of This Lesson</b>	<ul style="list-style-type: none"> <li>• With the skills gained from the last lesson, this lesson will familiarize the participant with proper techniques of cutting and penetrating the various construction materials encountered during a CSSR operation, using the appropriate tool.</li> </ul>	

LESSON

# 08

## RESCUE STRATEGIES AND TECHNIQUES

Lecture: 02 Periods, Practical: 09 Periods, Total: 11 Periods

### LESSON OBJECTIVES

**Upon completion of this lesson,  
you should be able to:**

1. Describe the two ways of approaching a located trapped victim.
2. List the four techniques for accessing and rescuing a victim.
3. List the five factors to analyse when evaluating access conditions.
4. Describe the procedures for penetrating five different materials: wood, metal, concrete, brick and cinder block.
5. Demonstrate in a practical exercise the procedure for cutting and penetrating the five materials listed above, correctly using the required TEA.
6. List the steps for removing rubble.

### Instructor Activity

► *PPT 8-1 to 8-3*

Introduce yourself and your assistant.

Present the lesson topic, explain the relevance of the lesson to the course, state the duration, and describe scheduled activities and method of evaluation.

This lesson is very important because depending on the type of material that is to be penetrated, different techniques are used based on the properties of that material.

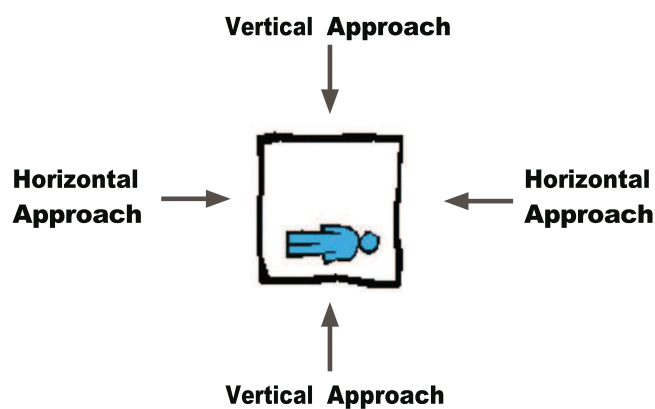
Present lesson objectives.  
Ask a participant to read them aloud from the workbook.

Ensure that the objectives are clear to all participants.

1

## Approach Strategies

Once the search has ended and the trapped victim has been located, it is then necessary to make a decision on how to approach the victim.



### Vertical Approach

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### Horizontal Approach

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## Instructor Activity

### ► PPT 8-4

Ask participants to close their workbooks.

Open a discussion by asking participants to share experiences and opinions on the subject of search strategies and techniques.

Guide the discussion in such a way as to arrive at the idea that rescuing a trapped victim is based on the ability to identify and explore the possibility of void spaces and apply the necessary techniques to gain access to these, using the minimum effort and greatest possible safety for both the rescuer and the victim.

Ask participants to identify a variety of approach and rescue strategies (keeping workbooks closed).

## APPROACH STRATEGIES

	Advantages	Disadvantages
<b>Vertical</b>	<ul style="list-style-type: none"> <li>• Body position is more comfortable</li> <li>• Easier to use tools and equipment</li> <li>• Easy access</li> <li>• Cleaner work conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Likely to work with concrete</li> <li>• Debris may fall on the victim (Must ensure piece being cut does not fall on the victim)</li> <li>• Time-consuming</li> </ul>
<b>Horizontal</b>	<ul style="list-style-type: none"> <li>• Easy penetration</li> <li>• Material in most cases is not concrete</li> <li>• Debris does not fall on the patient</li> </ul>	<ul style="list-style-type: none"> <li>• Uncomfortable body position</li> <li>• Crawling frequently required</li> <li>• Tool positioning awkward</li> <li>• Dirtier working conditions</li> <li>• Aftershocks risky to rescuer</li> </ul>

**Figure 1 ▼**  
*Vertical Approach*



**Figure 2 ▼**  
*Horizontal Approach*



### Instructor Activity

- Differentiate between strategy and technique.

### ► PPT 8-5

Discuss vertical and horizontal approaches and their main characteristics.

Use RM 8-1 as back-up material.

Participants may open their workbooks.

Instruct participants to fill in the table on vertical and horizontal approaches. Provide information as needed.

## 2

### Access and Rescue Techniques

#### 2.1 Removing rubble

#### 2.2 Shoring

#### 2.3 Cutting and penetrating

#### 2.4 Lifting and stabilising loads

### Instructor Activity

Discuss pictures of vertical and horizontal approaches during a rescue.

Review RM 8-1 and 8-2 on access techniques.

Comment on removing rubble and shoring in general terms.

#### ► PPT 8-6

Comment on removing rubble and shoring in general terms.

Ask participants to share any experiences.

Comment on cutting and penetrating.

Discuss lifting and stabilising loads.

3

Evaluating Access Conditions

At this point, the search has been conducted and victims located. Now the focus is to analyse access points to make sure the route is safe for victim extrication efforts to begin. The following five steps must also be taken:

3.1 Ensure utilities are cut off.

- Water lines
- Gas pipes
- Electrical system
- Air conditioning system

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3.2 Proceed to victim marking location.

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3.3 Mitigate hazards.

- Shoring

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3.4 Establish safety zones and escape routes.

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3.5 Secure your access area and remove rubble.

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Instructor Activity

PPT 8-7

Review access conditions as described in the steps.

Point out that an orderly sequence of steps is required for this process, in order to ensure the safest access possible during a rescue.



## 4

### Removing Rubble

When victims are trapped near the surface of a collapsed structure, you will need to remove the rubble surrounding them in order to extricate them. It is very important to be very **methodical** and work **gradually** when removing rubble. Use the following procedure:

#### CAUTION:

Be careful not to move pieces that may affect the stability of the structure or rubble pile.

When in doubt, consult a structural engineer.

4.1 Determine the manner in which the building collapsed and verify the condition of its components.

4.2 Remove small pieces first and only large pieces that may be loose. Never remove any pieces that are under pressure or wedged in place.

**Figure 3** ►

Rubble removal following an earthquake



4.3 To remove pieces that are under pressure it may be necessary to shore first.

4.4 Avoid cutting into load-bearing walls.

**Figure 4** ►

Rubble removal following an earthquake



**NOTE:** Simple methods such as a bucket brigade may be very effective for removing rubble.

### Instructor Activity

► Before reading from the workbook, ask participants to come up with the steps for removing rubble.

Generate a discussion on the type of rubble that can be generated during a rescue. Clarify that rubble removal is an on-going procedure that takes place before, during and after penetration.

#### ► PPT 8-8

Re-emphasise the caution in the highlighted box regarding the stability of the structure or rubble pile.

Discuss the steps for removing rubble.

Allow time for questions and answers.

► Emphasise taking extra care during penetrating in the event that an unconscious or immobilised victim is trapped against the other side of the material.

Comment on knowing the capabilities and limitations of the tools being used.

Comment on having the necessary manual skills to properly, cut, breach, break, and otherwise penetrate the various construction materials.

Review the concepts of tension, compression and shear, relating them to the weaknesses in the materials and the techniques used with tools, equipment and accessories.

Relate this lesson with the material covered in Lesson 3, where tools, equipment and accessories were discussed in detail.

## 5

**Procedures for Cutting and Penetrating Materials**

When breaching a wall or floor, always be aware that a **trapped victim** may be in direct contact with the other side of the material you are cutting through. Therefore, you must use extreme caution when cutting and penetrating to avoid accidentally injuring the person you are trying to save. Additionally avoid cutting too deeply to prevent damaging **structural elements**, wires, water pipes, etc.

To properly select a tool for a task, you should have a good understanding of the capabilities and limitations of the tools available to you. You must always work within the capabilities of the tool and use it properly.

**5.1 Cutting and Penetrating Metal and Wood**

Several tools and pieces of equipment are used in cutting and penetrating metal and wood:

Tools for Cutting Metal	Tools for Cutting Wood
<ul style="list-style-type: none"> <li>• Tin snips</li> <li>• Bolt cutters</li> <li>• Hacksaw</li> <li>• Reciprocating saw</li> <li>• File</li> <li>• Power drill</li> <li>• Rotary rescue saw</li> <li>• Circular saw (with metal-cutting blade)</li> <li>• Air chisel</li> <li>• Acetylene torch</li> </ul>	<ul style="list-style-type: none"> <li>• Axe</li> <li>• Hatchet</li> <li>• Hand saw</li> <li>• Power drill or hand drill</li> <li>• Chainsaw</li> <li>• Circular saw</li> <li>• Reciprocating saw</li> <li>• Rotary rescue saw</li> </ul>

**Instructor Activity**► **PPT 8-9**

Ask participants to outline the steps for cutting metal and wood without looking at their workbooks.

► **PPT 8-10**

Review the steps for cutting metal and wood.

See RM 8-10 for supporting material.

Allow time for questions and comments regarding the procedure.

# 5

## Procedures for Cutting and Penetrating Materials (Cont.)



**Figure 5 ▲**  
*Cutting sheet metal*



**Figure 6 ▲**  
*Cutting a wood panel*

### Procedure for Cutting Metal and Wood

1. Use full PPE.  
\_\_\_\_\_
2. Select the proper tool.  
\_\_\_\_\_
3. Make the work area is free of hazards.  
\_\_\_\_\_
4. Knock on the metal or wood to find a hollow area.  
\_\_\_\_\_
5. Make an inspection hole. Use caution when breaking through the other side.  
\_\_\_\_\_



6. Cut a triangular access hole, large enough to permit access. Additionally avoid cutting too deeply.  
\_\_\_\_\_
7. Remove the piece you have cut. Protect against any sharp edges by filing, covering them, or bending the metal back.  
\_\_\_\_\_
8. Shore if necessary.

## Instructor Activity

- ▶ Ask participants to outline the steps for cutting metal and wood without looking at their workbooks.

Review the steps for cutting metal and wood.

See RM 8-10 for supporting material.

Allow time for questions and comments regarding the procedure.

## Procedures for Cutting and Penetrating Materials (Cont.)

### 5.2 Cutting and Penetrating Concrete Block and Brick

The procedure discussed in this section refers to vertical walls that are still in or close to their original position. Penetration is horizontal. Other techniques would be used for these materials when collapsed or in a horizontal position.

A word of caution: It is best to avoid cutting through walls. Breaching through unreinforced masonry (URM) walls may cause **additional collapse** or building instability. Instead, you should look for existing natural or created horizontal openings.

#### Tools for Cutting Brick and Concrete Block

- Large and small sledgehammer
- Chisel
- Pick
- Pry bar or crowbar
- Chipping hammer
- Impact hammer
- Impact drill
- Rotary hammer drill
- Rotary rescue saw

**Figure 7 ▼**

*Breaching concrete block*



### Instructor Activity

#### ► PPT 8-11 to 8-12

Explain that this procedure is used only on vertical walls in their original position or close to it.

Discuss potential hazards of this type of breaching.

Review list of tools required for this procedure.

Make any appropriate comments on the pictures in the workbook.

Begin reviewing the procedure for cutting and penetrating concrete block and brick.

Finish reviewing the steps for cutting and penetrating concrete block and brick.

# 5

## Procedures for Cutting and Penetrating Materials (Cont.)

### Procedure for Cutting and Penetrating Concrete Block and Brick

1. Use full PPE.  
\_\_\_\_\_
2. Select the proper TEA.  
\_\_\_\_\_
3. Make the work area is free of hazards.  
\_\_\_\_\_
4. Make an inspection hole. Use caution when breaking through the other side.  
\_\_\_\_\_
5. Break into the block or brick, cutting a triangular hole, starting at the bottom (base of triangle). Additionally avoid cutting too deeply.  
  
With concrete block, first break into the hollow area (cell), which is weaker. With bricks, first break into the mortar between the bricks.  
\_\_\_\_\_
6. Remove the broken pieces. Always move the pieces out of the hole; do not push them in.  
\_\_\_\_\_
7. Shore if necessary.  
\_\_\_\_\_

**Figure 8** ►  
*Breaching  
a brick wall*



## Instructor Activity

**VERY IMPORTANT:**  
Review precautions regarding cutting pre-tensioned concrete reinforcements.

Review list of tools required for this procedure.

Before reviewing the steps from the workbook, ask participants to describe their own experience cutting reinforced concrete.

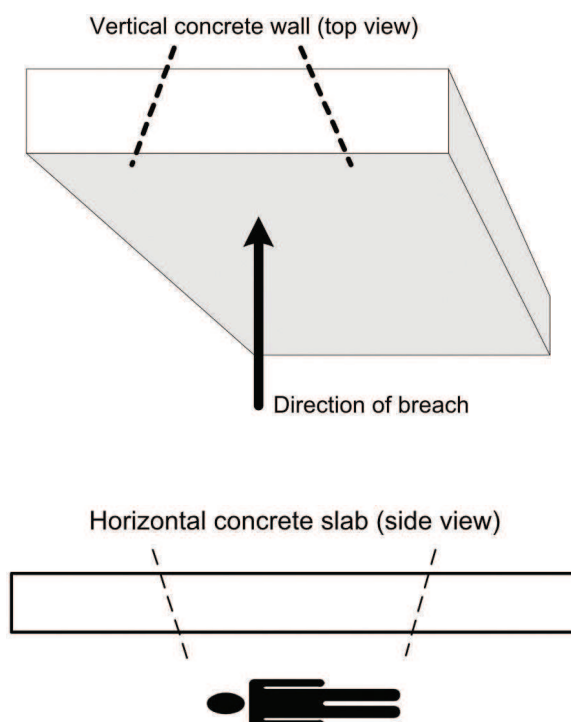
After discussion is complete, begin review the steps.

## Procedures for Cutting and Penetrating Materials (Cont.)

### 5.3 Cutting and Penetrating Reinforced Concrete

#### Tools for Cutting Reinforced Concrete

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Large and small sledgehammer</li> <li>• Chisel</li> <li>• Pick</li> <li>• Pry bar or crowbar</li> <li>• Chipping hammer</li> <li>• Impact hammer</li> <li>• Impact drill</li> <li>• Rotary hammer drill</li> <li>• Rotary rescue saw</li> </ul> | <b>For cutting steel reinforcements:</b> <ul style="list-style-type: none"> <li>• Reciprocating saw</li> <li>• Hacksaw</li> <li>• Bolt-cutter</li> <li>• Acetylene torch</li> </ul> |
|--|---|



**Figure 9 ▲**

*Cut concrete at an angle to prevent loose piece from falling on or toward victim.*

#### Instructor Activity

##### ► PPT 8-13 to 8-14

Explain when this procedure is used and the potential hazards of this type of breaching.

Explain cutting the concrete at angles to prevent the cut portion from falling on or toward the potential victim.

## 5

### Procedures for Cutting and Penetrating Materials (Cont.)

#### Procedure for Cutting and Penetrating Reinforced Concrete

Cable reinforcements need to be identified early to ensure the rescue team can recognise the difference between cables and rebar. Cutting pre-tensioned cables can result in the immediate failure of the slab or **structural member**. Generally, rescue teams should not cut tensioned cable or should cut them only under the direction of a structural engineer.

1. **Use full PPE.**
2. **Select the proper tool.**
3. **Make sure the work area is free of hazards.**
4. **If possible, make a inspection hole.** Use caution when breaking through the other side.
5. **Horizontal approach:** Your goal is to cut a **triangular** hole in the concrete.

5.1 Make the two upper cuts at a slight angle off perpendicular (80-85 degrees). This will prevent the cut portion from falling inward, where it could potentially injure a victim.

5.2 If the concrete is thicker than the depth of the saw blade, begin chiselling and remove pieces, starting from the bottom (base) and working upward.

#### Instructor Activity

##### VERY IMPORTANT:

Review precautions regarding cutting pre-tensioned concrete reinforcements.

Review list of tools required for this procedure.

Before reviewing the steps from the workbook, ask participants to describe their own experience cutting reinforced concrete.

After discussion is complete, begin review the steps.

Discuss steps for horizontal approach.

**Figure 10 ▼**

*Breaching on horizontal approach*



## Procedures for Cutting and Penetrating Materials (Cont.)

### 6. **Vertical approach:** Your goal is to cut a square/rectangular hole in the concrete.

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6.1 Make a small hole in the centre of the piece you will be cutting out, that you will use to lift the cut portion.

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6.2 Cut two opposing sides of the square at a slight angle off perpendicular (70-80 degrees). This will later prevent the cut portion from falling downward.

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6.3 Complete the square by cutting the remaining two sides in a normal perpendicular fashion.

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6.4 Then lift out the piece using the hole in the centre. If the concrete is thicker than the depth of the saw blade, you will need to chisel and remove pieces.

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**Figure 11 ▼**

*Breaching during a vertical approach*



### Instructor Activity

Discuss steps for vertical approach.

Be sure to allow time for questions and comments before continuing.

## 5

### Procedures for Cutting and Penetrating Materials (Cont.)

**7. Cutting reinforcements:** A different approach is required when encountering reinforced concrete with steel rebar or stranded cable. Loosen the concrete around the rebar to make room for tools. Then you can use a reciprocating saw, bolt cutters, rebar cutters or a torch to cut the individual bars away. If for any reason it becomes necessary to cut cables, you should use a torch to cut **one strand at a time** to allow for slow de-tensioning.

**8. Shore if necessary**

### Instructor Activity

Discuss the step for cutting reinforcements.  
Re-emphasise extreme caution.

## Instructor Activity

▶ Practical Exercise.

▶ Review EG for Safety Briefing.

▶ Ask participants to complete the Lesson Evaluation form.

### ▶ **REVIEW**

Lesson objectives and other main points.

Ensure that lesson objectives have been met.

### ▶ **EVALUATION**

Remind participants to study the RM in preparation for Post-Test.

### ▶ **CLOSING**

Collect Lesson Evaluation forms from everyone.

Thank class for their participation and announce the next lesson.

## POST-TEST | LESSON 8

### Rescue Strategies and Techniques

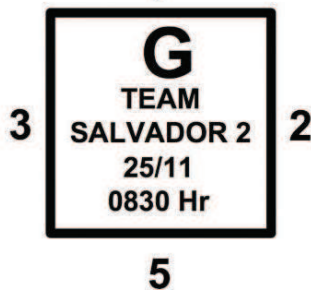
1. When a victim trapped in a collapsed structure is found, the two types of approaches used can be either vertical or horizontal. State two advantages and disadvantages of each type of approach.

	Advantages	Disadvantages
<b>Vertical</b>	<ul style="list-style-type: none"><li>• <u>Body position is more comfortable</u></li><li>• <u>Easier to use tools and equipment</u></li><li>• <u>Easy access</u></li><li>• <u>Cleaner work conditions</u></li></ul>	<ul style="list-style-type: none"><li>• <u>Likely to work with concrete</u></li><li>• <u>Debris may fall on the victim</u></li><li>• <u>Time-consuming</u></li><li>• <u>Must ensure piece being cut does not fall</u></li></ul>
<b>Horizontal</b>	<ul style="list-style-type: none"><li>• <u>Easy penetration</u></li><li>• <u>Material in most cases is not concrete</u></li><li>• <u>Debris does not fall on the patient</u></li></ul>	<ul style="list-style-type: none"><li>• <u>Uncomfortable body position</u></li><li>• <u>Tool position awkward</u></li><li>• <u>Dirtier working conditions</u></li><li>• <u>Aftershocks risky to rescuer</u></li></ul>

2. List the four different techniques used for gaining access and rescuing a victim.

- Removing rubble
- Shoring
- Cutting and penetrating
- Lifting and stabilizing loads

3. You arrive with your CSSR squad at the collapsed building pictured below. The building was evaluated and two potential victims were detected. What steps would you and your squad take to evaluate access conditions? Please make your answer brief.



1. Ensure utilities are cut off.
2. Proceed to victim marking location.
3. Mitigate hazards.
4. Establish safety zones and escape routes.
5. Secure your access area and remove rubble.

4. **(True or False). When removing rubble from a collapsed structure, it is best to remove debris that is found under pressure first and then proceed to the lighter and looser debris next.**

**False**

5. **When removing rubble from a collapsed structure, if you have any doubts pertaining to what you can or cannot remove, you should consult with: (Circle one.)**

- a) Safety Officer
- b) Disaster Engineer
- c) Incident Commander
- d) Structural Engineer**

**For the following questions, please fill in the missing steps.**

6. **Procedure for cutting and penetrating concrete block and brick.**

- 1. **Use full PPE.**
- 2. Select the proper tool.
- 3. Make sure the work area is free of hazards.
- 4. **Make an inspection hole. Use caution when breaking through the other side.**
- 5. Break into the block or brick, cutting a triangular hole, starting at the bottom (base of triangle). Additionally avoid cutting too deeply.
- 6. Remove the broken pieces. Always move the pieces out of the hole; do not push them in.
- 7. **Shore** if necessary.

7. **Procedure for cutting metal and wood.**

- 1. Use full PPE.
- 2. Select the proper tool.
- 3. Make the work area is free of hazards.
- 4. **Knock on the metal or wood to find a hollow area.**
- 5. Make an inspection hole. Use caution when breaking through the other side.
- 6. **Cut a triangular, access hole large enough to permit access.**  
**Avoid cutting too deeply.**
- 7. Remove the piece you have cut. Protect against any sharp edges by filing, covering them, or bending the metal back.
- 8. Shore if necessary.

## 8. Procedure for penetrating reinforced concrete.

1. Use full PPE.
2. Select the proper tool.
3. Make sure the work area is free of hazards.
4. If possible, make an **inspection hole**.
5. Horizontal approach: cut a **triangular** hole in the concrete.
  - (1) The two upper cuts should be \_\_\_\_\_ (perpendicular/**angled**).
  - (2) If the concrete is thicker than the depth of the saw blade, begin **chiseling** and remove pieces, starting from the **bottom** and working **upward**.
6. Vertical approach: cut a **square/rectangular** hole in the concrete.
  - (1) Make a small hole in the centre of the piece you will be cutting out, that you will use to **lift the cut portion**.
  - (2) Cut two opposing sides of the square \_\_\_\_\_ (perpendicular / **angled**). This will later prevent the cut portion from falling downward.
  - (3) Complete the square by cutting the remaining two sides in a normal perpendicular fashion.
  - (4) Then lift out the piece using the hole in the centre. If the concrete is thicker than the depth of the saw blade, you will need to **chisel and remove pieces**.
7. Cutting reinforcements: Chip away the concrete around the rebar to make room for tools. Then you can use a reciprocating saw, **bolt** rebar cutters or a **torch** to cut the individual bars away. If for any reason it becomes necessary to cut cables, you should use a **torch** to cut one strand at a time to allow for slow de-tensioning.
8. Shore if necessary.

# LESSON 8

## — PPT's

8-1



PPT 8-1

8-2

### OBJECTIVES

Upon completing this lesson, you will be able to:

- 1 Describe the two ways of approaching a located trapped victim.
- 2 List the four techniques for accessing and rescuing a victim.
- 3 List the five factors to analyse when evaluating access conditions.

PEER | CSSR | INDIA

PPT 8-2

8-3

### OBJECTIVES

Upon completing this lesson, you will be able to:

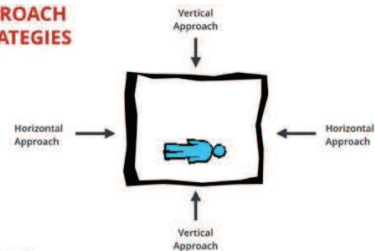
- 4 Describe the procedures for penetrating five different materials: wood, metal, concrete, brick and cinder block.
- 5 Demonstrate in a practical exercise the procedure for cutting and penetrating the five materials listed above, correctly using the required TEA.
- 6 List the steps for removing rubble.

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PPT 8-3

8-4

### APPROACH STRATEGIES



PEER | CSSR | INDIA

PPT 8-4

8-5

#### Vertical Approach



PEER | CSSR | INDIA

#### Horizontal Approach



PPT 8-5

8-6

### ACCESS AND RESCUE TECHNIQUES

- 1) Removing rubble
- 2) Shoring (Lesson 9)
- 3) Cutting and penetrating
- 4) Lifting/stabilising loads (Lesson 10)

PEER | CSSR | INDIA

PPT 8-6

# LESSON 8

## — PPT's

8-7

### EVALUATING ACCESS CONDITIONS

- 1) Ensure utilities are cut off
- 2) Proceed to victim marking location
- 3) Mitigate hazards
- 4) Establish safety zones and escape routes
- 5) Secure access area and remove rubble

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PPT 8-7

8-8

### REMOVING RUBBLE

- 1) Determine manner of collapse and verify conditions
- 2) Remove small pieces first
- 3) Shore before removing pieces under pressure
- 4) Avoid cutting into load-bearing walls

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PPT 8-8

8-9

### Cutting Metal



PEER | CSSR | INDIA

PPT 8-9

8-10

### Cutting Wood



PEER | CSSR | INDIA

PPT 8-10

8-11

### Cutting Cinder Block



PEER | CSSR | INDIA

PPT 8-11

8-12

### Cutting Brick



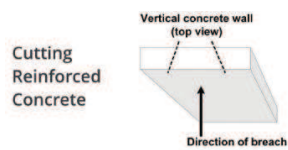
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PPT 8-12

## LESSON 8

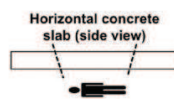
# — PPT's

8-13



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PPT 8-13



8-14

Cutting Reinforced Concrete



PEER | CSSR | INDIA

PPT 8-14

## COLLAPSED STRUCTURE SEARCH AND RESCUE (CSSR)

### LESSON 9 — OVERVIEW

Shoring Methods

<b>Duration</b>	<b>Lecture:</b> 02 Periods <b>Practical:</b> 09 Periods <b>Total:-11</b> 11 Periods	
<b>Main Points</b>	<ul style="list-style-type: none"> <li>• Definition of shoring</li> <li>• Elements that make up a shoring system</li> <li>• Factor for the selection and design of a shoring system</li> <li>• Types of shoring</li> <li>• Members and functions of a shoring system</li> <li>• Procedures to construct two types of shoring</li> </ul>	
<b>Suggested Preparation</b>	<ul style="list-style-type: none"> <li>• Thoroughly study reference material (RM-09)</li> <li>• Based on the lesson objectives, highlight the reference material on related subjects.</li> <li>• Fill in the participant's manual to guide you in helping participants with needed information.</li> <li>• Have an hand any experiences, stories or comments related to this lesson.</li> <li>• Have the practical exercise stations prepared before the lesson.</li> <li>• Meet with all assistant instructors prior to the class for station assignments and to clarify and doubts.</li> <li>• Have assistant instructors present for the lecture portion.</li> <li>• Any material needed for the practical exercise should be prepared a day in advance.</li> <li>• Use flip chart outside for practical exercise demonstration.</li> </ul>	
<b>Evaluation System</b>	<ul style="list-style-type: none"> <li>• Written test the next day</li> <li>• Demonstration of steps to construct a vertical shore and a window/door shore will be conducted after each lecture.</li> </ul>	
<b>Materials and Resources Needed</b>	<ul style="list-style-type: none"> <li>• PowerPoint presentation (19)</li> <li>• Lesson flipcharts (9)</li> <li>• Flipchart board (2)</li> <li>• Post-Test (1)</li> <li>• Evaluation sheet (1)</li> <li>• Practical exercise</li> <li>• Clipboards (5)</li> <li>• Radios (Instructor)</li> <li>• PPE</li> <li>• Wood</li> </ul>	<ul style="list-style-type: none"> <li>• Nails</li> <li>• Hammers</li> <li>• Level (2)</li> <li>• Tape measure (4)</li> <li>• Pencils (4)</li> <li>• Square</li> </ul>
<b>Importance of This Lesson</b>	<ul style="list-style-type: none"> <li>• To familiarize participants with proper techniques needed to stop a building from collapsing by selecting the proper shoring systems for each specific situation.</li> </ul>	

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.