

CSSR
COLLAPSED
STRUCTURE
SEARCH AND
RESCUE COURSE

Participant's Pre-Work

Rev. October 2002

Participant's Name (print clearly)



Miami-Dade
Fire Rescue



Office of U.S. Foreign
Disaster Assistance



Asian Disaster
Preparedness Center

Collapsed Structure Search and Rescue Course

Pre-Work Overview

Dear Participant:

On behalf of the Office of U.S. Foreign Disaster Assistance (USAID/OFDA), the Miami-Dade Fire and Rescue Department and the Asian Disaster Preparedness Center, we extend you a warm welcome to the Collapsed Structure Search and Rescue (CSSR) Course. We wish you a very rewarding and productive learning experience.

Prior to participating in the CSSR Course you **must** study and complete the Pre-Work Questionnaire. The Pre-Work includes the following:

- Assignment: A research project based on a real CSSR case.
- An introduction to the concept of Collapsed Structure Search and Rescue and how it differs from Confined Space Rescue.
- An introduction to safety rules that will apply throughout the course. **(Please learn these rules thoroughly before coming to the course.)**
- A description of the tools, equipment and accessories that will be used during the course and associated terminology.

The purpose of the Pre-Work is to standardise terms and names, and introduce the basic knowledge required for this course.

Answer the questions and complete the drawings or fill in the blanks in the Pre-Work Questionnaire. **The Pre-Work will be collected on the first day of the Course. You must be ready to complete a Preliminary Questionnaire on the information contained in this document.**

Please include your full name on the cover page of the Pre-Work.

We look forward to working with you.

CSSR Course Coordinator

Enclosures:

- Course Brochure
- Course Schedule
- Course Registration Form
- Liability Release Form
- Health and Nutrition Form
- Course Lesson Summaries

Personal Equipment Needed for the Course

Required Equipment

- Hardhat (industrial or fire-fighter)
- Eye protection
- Ear protection
- Safety steel-toe boots
- Safety whistle
- Knee pads
- Work gloves
- Work clothes
- Cap or hat
- Canteen or water bottle, minimum 1-litre capacity
- Waterproof flashlight (mounted or hand-held) with spare batteries

Additional Required Materials

- 2 passport-size pictures for the course directory
- Uniform or suit for the opening and closing ceremonies

Optional Equipment

- Overalls or jumpsuit
- Sunscreen lotion
- Insect repellent
- Raincoat or poncho

CSSR Course Overview

The CSSR Course is part of an international training program conducted by Miami-Dade Fire Rescue under a cooperative agreement with the USAID Office of U.S. Foreign Disaster Assistance and the Asian Disaster Preparedness and Response Center.

Background

The Collapsed Structure Search and Rescue Course is based on the original work published by the California State Fire Marshal – Fire Service Training and Education system under a grant provided by the Federal Emergency Management Agency and administered through the California Office of Emergency Services. Original work published in Spanish by Miami-Dade Fire Rescue Department; Cuerpo de Bomberos del Distrito Federal, Caracas, Venezuela; Comisión Nacional de Emergencias, San José, Costa Rica; the Office of U.S. Foreign Disaster Assistance (OFDA) of the United States Agency for International Development and Latin American regional experts.

Course Purpose

This Course will provide the participants with the knowledge and skills necessary to search for, stabilize and extricate victims trapped in collapsed structures using the safest and most appropriate procedures.

Target Audience

Emergency and disaster first response groups such as fire departments, the Red Cross, police departments, and rescue groups associated with civil defense and protection.

Performance Objective

After completing the course, the students, working in teams of 5 to 6 and using the collapsed structure equipment kit, will be capable of searching for, locating, stabilizing and extricating two victims of a simulated collapse in no more than 4 hours.

Instructional Objectives

Upon completing the course, the participant will be able to:

1. Describe the organization and procedures required for initiating a collapsed structure rescue operation.
2. Describe and explain the classification procedures and marking system for collapsed structures.
3. List the security standards that must be followed in a collapsed structure operation.
4. Name, describe and explain the use and maintenance procedures for the tools, equipment and accessories used in a collapsed structure operation.

5. Describe and explain the different methods for locating voids and the steps to follow in locating possible victims.
6. Name and explain the basic techniques for penetrating a collapsed structure and gaining access to a victim.
7. Describe the medical protocol to follow in rendering assistance to one or more victims trapped in a collapsed structure.

Course Content

- Planning
- Rescue Scene Organization
- Search
- Basic Medical Care
- Emergency Building Shores
- Breaching and Breaking
- Lifting Heavy Objects
- Final Practical Exercise: Collapsed Structure Scenario

Requirements

- Participant must belong to a first response team with at least two years' experience in rescue operations.
- Successful completion of the Medical First Responder (MFR) Course.
- Application letter confirming sponsorship by an institution or organization.
- Medical and psychological certificate of health confirming good physical and mental - condition, precluding any claustrophobia or anxiety attacks.

Course Regimen and Duration

The CSSR Course may be conducted with participants housed on-site or off-site.
Duration: 7 continuous days (56 hours)

Methodology

The Collapsed Structure Search and Rescue course is taught using the interactive method of learning with continuous interaction between the participants and instructors. The course includes interactive lectures and demonstration practice sessions. Participants will be required to resolve several simulated incidents throughout the course, including the Final Practical Evaluation, during which they must successfully demonstrate the performance objectives of the course.

Contact Information

To obtain additional information regarding the CSSR Course and other courses, please contact our offices:

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Miami Dade Fire Rescue
International Programs Bureau
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Miami, FL 33173
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E-mail: garciar@miamidade.gov



**Disaster Preparedness and Response Program
USAID/OFDA -- Miami-Dade Fire Rescue**

Collapsed Structure Search and Rescue SAMPLE SCHEDULE

Day 0

09:00 – Registration
10:30 – **Lesson 1** Course Introduction

Day 1

08:00 – **Opening Ceremony**
08:30 – **Lesson 1:** Course Introduction
10:00 – Break and group photograph
10:30 – **Lesson 2:** Organizing and Starting a CSSR Operation
12:30 – Lunch
14:00 – **Lesson 3:** Construction Materials, Structures and Damage Types
15:30 – Break
15:45 – **Lesson 4:** Structural Triage and the INSARAG Building Marking System
17:00 – Daily Course Evaluation

Day 2

08:00 – **Post-Test Review:** Lessons 2, 3 & 4
08:30 – **Lesson 5:** Operational Safety
10:30 – Break
11:00 – **Lesson 6:** Search and Location Techniques (lecture and practice)
01:00 – Lunch
14:30 – **Practical Evaluation:** Lesson 6
16:00 – Break
16:15 – **Lesson 7:** Tools, Equipment and Accessories (Lecture)
18:00 – Daily Course Evaluation

Day 3

08:00 – **Post-Test Review:** Lesson 5 & 6
08:30 – **Lesson 7:** Demonstration and Practice
10:30 – Break
11:00 – **Lesson 7:** (cont'd.)
 Demonstration and Practice
01:00 – Lunch
14:30 – **Lesson 7:** (cont'd.)
 Demonstration and Practice
16:00 – Break
16:15 – **Practical Evaluation** (cont'd.)
18:00 – Daily Course Evaluation

Day 4

08:00 – **Post-Test Review:** Lesson 7
08:30 – **Lesson 8:** Rescue Strategies and Techniques
10:30 – Break
11:00 – Lesson 8 Demonstration and Practice:
 Breaking and Breaching Techniques
01:00 – Lunch
14:30 – **Practical Evaluation:** Lesson 8
16:00 – Break
16:30 – **Practical Evaluation** (cont'd.)
18:00 – Daily Course Evaluation

Collapsed Structure Search and Rescue
SAMPLE SCHEDULE (cont'd.)

Day 5

08:00 – **Post-Test Review:** Lesson 8
 08:30 – **Lesson 9:** Shoring Methods
 10:30 – Break
 11:00 – Lesson 9 (cont'd.)
 Demonstration and practice
 1:00 – Lunch
 14:30 – Lesson 9 (cont'd.)
 Demonstration and practice
 16:00 – Break
 16:15 – **Practical Evaluation:** Lesson 9
 18:00 – Daily Course Evaluation

Day 6

08:00 – **Post-Test Review:** Lesson 9
 08:30 – **Lesson 10:** Lifting and Stabilising
 Loads
 09:30 – Lesson 10 (cont'd.)
 Demonstration and practice
 10:30 – Break
 11:00 – **Practical Evaluation:** Lesson 10
 1:00 – Lunch
 14:30 – **Practical Evaluation** (cont'd.)
 16:00 – Break
 16:30 – Daily Course Evaluation

Day 7: Free Day**Day 8**

08:00 – **Post-Test Review:** Lessons 9 & 10
 08:30 – **Lesson 11:** Pre-Hospital Treatment
 10:30 – Break
 11:00 – Daily Course Evaluation
 1:00 – Lunch
 14:30 – Instructors prepare for Final Practical
 Exercise

Day 9

00:00 – **FINAL PRACTICAL EXERCISE:**
 Preparation, Notification and
 Instructions
 06:00 – **Phase 1**
 07:30 – **Post-Test Review:** Lesson 11
 08:45 – **Phase 2**
 09:30 – **Phase 3**
 12:30 – Working Lunch (continue exercise)
 14:00 – **Phase 3** (cont'd.)
 15:45 – **End Final Practical**
 16:00 – Break
 16:30 – Daily Course Evaluation
 17:00 – Closing Ceremony

Schedule subject to change without notice.

 		Disaster Preparedness and Response Program USAID/OFDA -- Miami-Dade Fire Rescue											
Collapsed Structure Search and Rescue (CSSR) Course Course Registration Form													
COURSE LOCATION		PASTE PHOTO HERE											
COURSE DATES START: _____ END: _____													
PARTICIPANT'S FULL NAME													
DATE OF BIRTH Month / Day / Year	SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE												
HOME ADDRESS		WORK ADDRESS											
HOME TELEPHONE:		WORK TELEPHONE:											
HOME FAX:		WORK FAX:											
PERSONAL E-MAIL ADDRESS		WORK E-MAIL ADDRESS											
PRESENT POSITION (JOB/TITLE/RANK)													
SCHOOLING COMPLETED <input type="checkbox"/> PRIMARY <input type="checkbox"/> SECONDARY <input type="checkbox"/> UNIVERSITY		TEACHING EXPERIENCE <input type="checkbox"/> NO <input type="checkbox"/> YES HOW LONG? _____											
EXPERIENCE IN EMERGENCY SERVICES <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> FIRST AID</td> <td><input type="checkbox"/> GENERAL SERVICES</td> </tr> <tr> <td><input type="checkbox"/> FIRE FIGHTING</td> <td><input type="checkbox"/> VEHICLE RESCUE</td> </tr> <tr> <td><input type="checkbox"/> TRANSPORTATION</td> <td><input type="checkbox"/> CONFINED SPACE RESCUE</td> </tr> <tr> <td><input type="checkbox"/> EQUIPMENT MAINTENANCE</td> <td><input type="checkbox"/> ADMINISTRATION</td> </tr> <tr> <td><input type="checkbox"/> EMERGENCY MEDICAL SERVICES</td> <td><input type="checkbox"/> COMMAND</td> </tr> </table>				<input type="checkbox"/> FIRST AID	<input type="checkbox"/> GENERAL SERVICES	<input type="checkbox"/> FIRE FIGHTING	<input type="checkbox"/> VEHICLE RESCUE	<input type="checkbox"/> TRANSPORTATION	<input type="checkbox"/> CONFINED SPACE RESCUE	<input type="checkbox"/> EQUIPMENT MAINTENANCE	<input type="checkbox"/> ADMINISTRATION	<input type="checkbox"/> EMERGENCY MEDICAL SERVICES	<input type="checkbox"/> COMMAND
<input type="checkbox"/> FIRST AID	<input type="checkbox"/> GENERAL SERVICES												
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<input type="checkbox"/> EQUIPMENT MAINTENANCE	<input type="checkbox"/> ADMINISTRATION												
<input type="checkbox"/> EMERGENCY MEDICAL SERVICES	<input type="checkbox"/> COMMAND												
PRINT your name below as you would like it to appear on the Certificate of Completion.													
PLEASE SIGN AND DATE THIS FORM													
SIGNATURE: _____		DATE: _____											

 	<p>Disaster Preparedness and Response Program USAID/OFDA -- Miami-Dade Fire Rescue</p>
<p>Collapsed Structure Search and Rescue (CSSR) Course Health and Dietary Requirements Form</p>	
<p><i>This form will provide the coordinator with important information regarding your health or diet. Turn this form in at the beginning of the course. Please print clearly or type.</i></p>	
COURSE LOCATION	COURSE DATES
	START: _____ END: _____
PARTICIPANT'S FULL NAME	
<p>ARE YOU VEGETARIAN OR DO YOU HAVE ANY OTHER DIETARY RESTRICTIONS?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>IF YES, PLEASE SPECIFY: _____</p> <p>_____</p> <p>_____</p>	
<p>DO YOU HAVE ANY FOOD ALLERGIES?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>IF YES, PLEASE EXPLAIN: _____</p> <p>_____</p> <p>_____</p>	
<p>ARE YOU UNDER ANY MEDICAL TREATMENT, USING MEDICATIONS OR HAVE ANY PHYSICAL DISABILITIES?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>IF YES, PLEASE EXPLAIN: _____</p> <p>_____</p> <p>_____</p>	
PLEASE SIGN AND DATE THIS FORM	
SIGNATURE:	DATE:

 	Disaster Preparedness and Response Program USAID/OFDA -- Miami-Dade Fire Rescue
Collapsed Structure Search and Rescue (CSSR) Course Liability Release Form	
<p><i>All non-staff individuals involved in any part of the CSSR Course must complete and sign this form and submit it to the Course Coordinator by the start of the first day of class. Please print clearly or type.</i></p>	
COURSE LOCATION	COURSE DATES START: _____ END: _____
PARTICIPANT'S FULL NAME (PRINTED)	
PARTICIPANT'S PASSPORT NUMBER OR OTHER GOVERNMENT-ISSUED IDENTIFICATION NUMBER NUMBER: _____ ISSUING COUNTRY: _____	
LIABILITY RELEASE <p>I hereby acknowledge that I am fully aware of the risks to which I may be exposed during the CSSR Course, with potential minor and major accidents that may cause me or other persons bodily harm and/or illness. I fully understand and accept that the U.S. Office of Foreign Disaster Assistance (USAID/OFDA), the Miami-Dade Fire Rescue Department (MDRFD), as well as the course coordinator, instructors and assistant personnel, have taken every precaution possible to prevent accidents, injuries and illness during the course.</p> <p>I agree to comply strictly with each and every safety standard of the CSSR Course. These safety standards have been made available to me in the Course Pre-Work and will be explained to me during the first lesson and throughout the course. I furthermore pledge to ensure my own safety and the safety of all other course participants to the best of my ability.</p> <p>On the basis of the aforesaid, in the event of any accident that may cause me bodily injury or illness during or after the CSSR Course, I hereby release the U.S. Office of Foreign Disaster Assistance (USAID/OFDA), the Miami-Dade Fire Rescue Department (MDRFD), the course coordinator, instructors and assistant personnel from all legal liability thereof.</p>	
PLEASE SIGN AND DATE THIS FORM SIGNATURE: _____ DATE: _____	
ACCEPTED BY COURSE COORDINATOR SIGNATURE: _____ DATE: _____	

Lesson Summaries

Lesson 1: Introduction

Introduction of personnel. Expectations. Materials to be utilized in the course. Inspection of personal protective equipment. Course purpose. Course schedule. Performance objectives. Training objectives. Evaluation system and forms. Registration forms. Liability Release agreement. Ground rules and safety rules. Emergency procedures. File.

Lesson 2: Organizing and Starting a CSSR Operation

Definition of Collapsed Structure Search and Rescue (CSSR). Definition of Confined Space Rescue. Definition of a CSSR team. Overview of an Incident Command System. Scope of operation. Phases of a CSSR operation. Stages of the operations phase of a CSSR incident. Steps of the initial assessment. Basic organization of a CSSR team.

Lesson 3: Structures, Materials and Damage Types

Construction materials. Structure classifications. Forces acting upon materials. Characteristics of concrete, metal, wood, and brick. Construction methods. Types of structures. Characteristics of structures. Damage types and failures. Types of collapse.

Lesson 4: Structural Triage and the INSARAG Building Marking System

Structural triage. Basic criteria. Factors in triage. Building marking system (INSARAG – International Search and Rescue Advisory Group).

Lesson 5: Operational Safety

Factors affecting safety. Operational guidelines. Unsafe actions and conditions. Safety rules. Safety considerations for each phase of a CSSR mission.

Lesson 6: Search and Location Techniques

Void spaces. Types of structures. Collapse patterns. Locating void spaces. Stages of searching and locating: recognition, determine access route, locate. Conventional search techniques. Unconventional search techniques.

Lesson 7: Tools, equipment and accessories

Definitions of tools, equipment and accessories. Classification by use. Classification by power source. General steps for using tools. Using a chipping hammer. Using an rotary hammer drill. Using saws.

Lesson 8: Rescue Strategies and Techniques

Vertical and horizontal approach (advantages and disadvantages). Rescue techniques. Steps for assessment of access areas. Breaking and breaching techniques.

Lesson 9: Shoring Techniques

Definition of shoring. Types of shoring. Conditions for shoring. Procedures for building shores.

Lesson 10: Lifting and Stabilizing Loads

Lifting techniques. Use of hydraulic jack. Cribbing.

Lesson 11: Pre-hospital Treatment

Quick review of Medical First Responder Course. Crush syndrome. Compartment syndrome.

Lesson 12: Final Practical Exercise

Three practical exercises incorporating all methods and tools of the course.

Participant Pre-Work

Objectives

Upon completing the pre-work, you will be able to:

1. Define **collapsed structure search and rescue** and how it differs from **confined space rescue**.
2. Define first response team.
3. Describe the purpose of the CSSR Team.
4. List the safety rules to be observed in a CSSR operation.
5. Define equipment, tools, and accessories.
6. Identify and describe the use of each piece of equipment, tool and accessory to be used in the CSSR Course, using the terms established in the Pre-Work.

Background

Population growth and urban development processes, trends in land occupation, the growing and impoverishment of major population segments and the use of inadequate construction methods have caused a disproportionate rise in the population's vulnerability when faced with various threatening natural, technical and social phenomena. These factors, in addition to expanding terrorism, are creating situations that require specialised rescue techniques for **collapsed** structures.

In this frame of reference, the word **disaster** is frequently applied, often defined by specialists as an unsolved problem in human development, meaning that disasters are simply a product of an unbalanced relationship between the environment in which humans create settlements and the level of development they wish to reach.

Such a situation can pose a the problem in that regardless of how well we try to do things, we will always have the possibility of an emergency taking place which, given its magnitude and impact on the population and infrastructure, becomes a disaster.

Thus the need to have systems in place that will ensure a timely response by the organisations responsible for the community's protection and safety, as one of the components in the Emergency Prevention and Mitigation System of a locality, region or country.

On the basis of these factors and according to existing standards such as the NFPA (National Fire Protection Association) and IFSTA (International Fire Service Training Association), we need technical groups provided with special equipment and tools engaged in responding immediately to any event that endangers human life and property.

These specially-equipped groups are known as **first response teams** which form a part of a national, regional or local response system. Their mission is to perform under emergency situations such as fires, explosions, urban and rural accidents, hazardous materials spills or leaks,

entering hostile environments, etc., in which victims need to be recovered using special techniques and who may also require medical pre-hospital treatment.

Collapsed structure search and rescue is often confused with **confined space rescue**. We are defining both terms below for clarification:

Collapsed structure search and rescue: A rescue operation conducted in a structure that due to natural or man-made events has sustained significant damage to its load-bearing structural elements. The damage may cause total or partial destruction, potentially leaving void spaces where trapped persons may survive within the rubble.

Confined space rescue: A rescue operation conducted in a location with limited means for entry and exit that is not designated for continuous human occupancy. Such a location may lack ventilation and may contain or generate toxic contaminants, oxygen-deficient air, and/or flammable vapours.

While it is true that a collapsed structure can create confined spaces, we refer to these as **void spaces**, in order to differentiate them.

The complexity of CSSR activity demands that personnel meet certain **qualifications**, both **personal** and **academic**, have the **proper attitude** and **abilities** that will form the strong backbone of a good CSSR Team. In addition, first response groups are supported by engineers, doctors, architects, chemists, psychiatrists, psychologists and other professionals, who are all prepared to work as a team under strict standards of discipline, and always goal-oriented.

It is also very important to have as members of a CSSR team persons with **special abilities** and **skills**, for example, carpentry, welding, electrical, use of heavy machinery, etc., which if not directly related to search and rescue techniques, are of great value when working with collapsed structures. Candidates selected should, in addition to those abilities and demonstrated experience as rescuers, possess **mechanical ability** and **good physical** and **mental condition**.

CSSR differs significantly from normal rescue. Special qualities are required to ensure caring and professional performance under the conditions present in a CSSR situation, in order to maximise the number of persons rescued, with the least effort and time possible.

Studies of real-life situations have shown that CSSR team members must have the following qualities to perform properly:

- Capacity to accomplish the mission in tense situations.
- Capacity to adequately evaluate dangerous situations.
- Knowledge of CSSR operations.
- Ability to make fast and firm decisions.
- Ability to communicate.
- Good physical and mental condition.
- Manual skill and dexterity.
- Must not suffer from vertigo or claustrophobia.
- Must have no fear of rodents, insects or snakes.

It is important to keep in mind that in CSSR cases, the handling of a situation depends on the effectiveness of the responding individuals or groups; therefore, it is necessary for each one of the participants to assume his duties, but also to allow and assist others in performing their tasks.

The CSSR Squad

The CSSR squad is an active component of an emergency response system whose purpose is to search for, locate, gain access to, stabilise and extricate trapped victims from a collapsed structure. The squad is one of several smaller groups within a CSSR team. The squad's job is to perform rescue at a specific location in a disaster area.

CSSR teams are formed due to a need in modern society where cities have developed vertical structures that house large numbers of people. The structures are often vulnerable to physical phenomena of natural or man-made origin. The complexity of these vertical structures after a collapse requires combining work teams that are organised and qualified to handle them.

As a result of these conditions, there is also a need for the team to be able to perform a planned, well-organized operation that can be properly managed and directed in each one of its required tasks.



Research Project

The purpose of this project is for you to become familiar and further motivated with regard to collapsed structure search and rescue, and to create a bank of case studies for later use. Your assignment is to research real-life cases described in print media (newspapers, magazines, etc.).

Investigate a real rescue of one or more persons who have been extricated alive from a collapsed structure incident. Preferably, you should choose a rescue that occurred in the country where you live. However, if you are unable to find information on a local rescue, you may research a rescue in another country.



You will be required to turn in this research project together with the CSSR Pre-Work Questionnaire at the beginning of the course.

Your research project should include the following information:

- Type of event and rescue.
- Place, date and time (exact time of day, possible)
- Organization or person(s) who performed the rescue
- Brief description of how the search and rescue operation was conducted.
- List of sources (bibliography), including place and date of publication.
- Maximum of two typewritten pages in length.

Safety Rules

Incidents that involve CSSR operations, even more than any other kinds of incidents, may involve a significant danger to rescuers as well as for the individuals they attempt to rescue. Due to the risks involved in using equipment and tools, and the environment in which the CSSR course is taught, all personnel including participants, instructors, assistants and other support staff entering the practice area must comply with the following safety rules:

Before participating in the CSSR Course all participants must provide the Course Coordinator documentation confirming their good physical and mental condition, and an absence of claustrophobia and anxiety, as requested in the invitation letter.

You must comply with the following Safety Rules at all times during the CSSR Course:

1. Practice areas: No one is allowed to enter the practice areas without explicit prior authorisation from the instructor in charge or the Course Coordinator.
2. Personal protective equipment: Anyone entering the practice area must be wearing (in the correct manner) all required personal protective equipment described in Lesson 1 (Course Introduction).
3. Hygiene: To reduce as much as possible the possibility of contamination or contagion, you must wash your hands with soap and water before and after entering the work area; before and after eating; and before and after using the bathroom.
4. Safety officer: During the exercises and practicals, one individual from the Course personnel will be the designated safety officer and will be clearly and visibly identified. This person will be in charge of all safety-related matters throughout the entire course, and will have the authority to partially or completely halt all activities if needed.
5. Group safety: Each instructor and team leader will also be responsible for the safety of the people in their respective groups. Should you observe any unsafe action or condition, or an emergency, immediately alert the Safety Officer. For this purpose, everyone will receive an emergency whistle to use in an emergency.
6. Whistle signals: The Safety Officer will use the whistle to give alarm signals and alerts in the work area using the following signal system:
 - **One long signal:** stop all work and listen for instructions.
 - **One long, one short:** continue working.
 - **Three short signals:** alarm signal, evacuate the area immediately to a previously designated safety zone.
7. Safety Zone: The Safety Officer will establish a safety zone near the work area. The safety zone will be used in case of any emergency requiring immediate evacuation of the work area.
8. Emergency medical services: A medical first responder kit and a means of communications must be made available to ensure EMS arrival within 15 minutes, should the need ever arise.

9. Fire extinguisher: A portable 20-pound (9-kilo) dry-chemical fire extinguisher will be available in case of fire. You must be aware of its location during the course, especially when refuelling or lubricating equipment used in this course.
10. Drinking water: During all practical exercises you must carry a canteen or drinking bottle filled with drinking water, to prevent dehydration. A water container for all participants will be available near the work area.
11. Maintenance: You are responsible for maintaining all tools, equipment and accessories. Instructions and standards for maintenance are described in their respective manuals. Additionally, the instructor in charge of each particular exercise or practical session may provide instructions for maintenance.
12. Rotations: Each work group must complete personnel rotations as directed by the Safety Officer. Under normal conditions rotations will be every 15 minutes, but weather may be a factor.
13. Trash: All trash must be placed into designated trash cans or waste containers. No littering is permitted.
14. Smoking and drinking: No smoking or drinking are allowed in the work area.
15. Weather conditions: The Safety Officer will decide whether exercises can continue in the work area during adverse or threatening weather.
16. Safety markings: All objects or areas in the work area that may pose a hazard to anyone must be marked with scene tape or safety cones.
17. Team Safety: All operations involving the use of tools and equipment must be conducted in pairs, so that one person can use the tool or equipment while the other acts as a safety lookout. The safety lookout will use a signal system in which one tap on the shoulder means to stop working, and two taps means to continue.
18. Safety violations: Any participant who repeatedly violates or disregards the safety rules of this course, endangering him/herself or others, may be expelled from the course at the discretion of the Course Coordinator. No certificate or letter of attendance will be issued in this case.
19. Miscellaneous: The Course Coordinator will resolve any other safety issue not specifically covered in the CSSR Course Safety Rules.

SAFETY IS PRIORITY #1

Tools, Equipment and Accessories (TEA)

For the safety, efficiency, effectiveness and fulfilment of the CSSR Team mission, it is fundamental that it be supported by a number of components that we will designate as tools, equipment and accessories, which, among other things, will ensure the rescuer's protection, his best task performance, a better output, and a more productive effort/achievement ratio.

The distinctions between tools, equipment and accessories must be quite clear for the rescuer, and in that sense we will now describe each one of them.

EQUIPMENT: A piece of equipment is a machine or device that performs a physical task, whose operation depends on an outside power source in order to increase work capacity.

TOOLS: A device that is used to perform or facilitate manual or mechanical work, and uses only the strength of the operator.

ACCESSORY: An object that supplements or completes a tool or piece of equipment, and which increases or expands the operator's ability to perform a task.

In summary, we can say that **tools, equipment and accessories, within the context of CSSR, include all devices used by a rescue team in the various stages of a collapsed structure search and rescue operation. These devices are the operational foundation for all CSSR teams.**

Though many ETA are sophisticated or complex, not all of them are. They are in large part familiar to most of us as tools and equipment for the house and automobile. However, due to their versatility they are frequently used in rescue operations and are accepted by CSSR as standard equipment.

Because there are so many types of tools, equipment and accessories that are used in CSSR operations we use the following tool-rule:

“A place for every tool and every tool in its place.”

This slogan reflects the importance of being organised for a CSSR team to function effectively. Having every tool in its proper place will avoid wasting time searching for it when it is needed. It also simplifies the process of maintaining all tools and equipment.

Maintaining a strict inventory of all ETA is also critical, and having them well organised also helps to do this. It is necessary to develop a database for all ETA containing their features/characteristics, components, serial numbers and replacement parts. This will enable the team to monitor exactly which items are being used, who is using them, and where they are, during every rescue mission.

In order to simplify and standardise ETA terminology during CSSR training, we have assigned each ETA one single term for use during the course. Different countries may use different terms.

The following pages contain a list and graphics of the tools, equipment and accessories that will be used in the CSSR Course. The list shows their primary names and alternate names, and what use they will have in the Course. Additional space is provided next to each graphic in which you may add your notes.

CSSR Tool Pictionary

Pictures and graphics described in the Pictionary are not to scale.

EQUIPMENT	
 <p style="text-align: center;">CHIPPING HAMMER</p>	<p>Other names:</p> <p style="text-align: center;">Boulder cutter</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Light to medium chipping or breaking concrete</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">CHAINSAW</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To cut lumber for shoring</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">GENERATOR</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To provide portable electric power to work sites</p> <hr/> <p>Notes:</p>

EQUIPMENT	
 <p style="text-align: center;">HYDRAULIC JACK</p>	<p>Other names:</p> <p style="text-align: center;">Bottle jack</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Lifting heavy objects</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">ROTARY RESCUE SAW</p>	<p>Other names:</p> <p style="text-align: center;">Circular Saw, Cut-Off Saw, K-12</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To cut concrete slabs, walls</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">ROTARY RESCUE SAW (electric)</p>	<p>Other names:</p> <p style="text-align: center;">Electric cut-off saw</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To cut concrete slabs or walls</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">WALKIE-TALKIE</p>	<p>Other names:</p> <p style="text-align: center;">Portable two-way radio</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Communicating with other team members</p> <hr/> <p>Notes:</p>

EQUIPMENT	
 <p style="text-align: center;">RECIPROCATING SAW</p>	Other names: Sawzall (brand)
	Use(s): To cut wood or metal
	Notes: Electrically powered
 <p style="text-align: center;">WOOD CIRCULAR SAW</p>	Other names: Circular saw, Skil Saw (brand)
	Use(s): Cutting lumber
	Notes: Electrically powered
 <p style="text-align: center;">ELECTRIC DRILL</p>	Other names: Drill
	Use(s): To drill holes to install fasteners, etc.
	Notes:

EQUIPMENT	
 <p style="text-align: center;">ROTARY HAMMER DRILL</p>	<p>Other names:</p> <p style="text-align: center;">XXXXX</p>
	<p>Use(s):</p> <p style="text-align: center;">Similar to the chipping hammer but also capable of drilling holes. Used to make inspection holes.</p>
	<p>Notes:</p>
 <p style="text-align: center;">COME-ALONG</p>	<p>Other names:</p> <p style="text-align: center;">Ratcheted puller</p>
	<p>Use(s):</p> <p style="text-align: center;">To secure objects together or for lifting or pulling</p>
	<p>Notes:</p>

TOOLS	
 <p style="text-align: center;">PLIERS</p>	Other names:
	Use(s): <p style="text-align: center;">For gripping and turning small objects</p>
	Notes:
 <p style="text-align: center;">WISE GRIP (BRAND)</p>	Other names: <p style="text-align: center;">Adjustable locking pliers</p>
	Use(s): <p style="text-align: center;">Lock onto an object for gripping and turning</p>
	Notes:
 <p style="text-align: center;">PRY BAR</p>	Other names: <p style="text-align: center;">Pinch bar, crowbar</p>
	Use(s): <p style="text-align: center;">To align, adjust, move and pry</p>
	Notes:
 <p style="text-align: center;">MEASURING TAPE</p>	Other names:
	Use(s): <p style="text-align: center;">To measure lumber dimensions for shoring</p>
	Notes:

TOOLS	
<div style="text-align: center;">  <p>BOLT CUTTER</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p>To cut soft to medium-hard materials such as rebar, wire, mesh etc.</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>ROPE</p> </div>	<p>Other names:</p> <p>XXXXX</p> <hr/> <p>Use(s):</p> <p>To secure objects, to raise and lower tools</p> <hr/> <p>Notes:</p> <p>Different types – synthetic, manila, kernmantle, etc.</p>
<div style="text-align: center;">  <p>SCREWDRIVER</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p>To fasten and loosen screws</p> <hr/> <p>Notes: Two standard types – Philips and flathead</p>

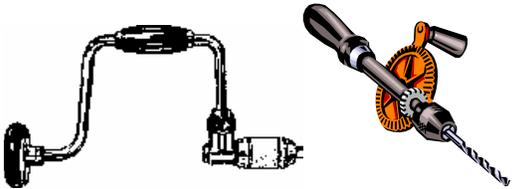
TOOLS	
 <p style="text-align: center;">FRAMING SQUARE</p>	<p>Other names:</p> <p style="text-align: center;">Carpenter's square</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To mark right angles for cutting lumber and assembling shoring</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">FLATHEAD AXE</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Cutting lumber or as a striking tool</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">HATCHET</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Cutting small lumber and hammering</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">WORK LAMP</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To illuminate a work area, or as an extension cord</p> <hr/> <p>Notes:</p>

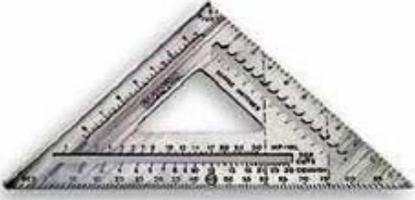
TOOLS	
 <p style="text-align: center;">FILE</p>	<p>Other names:</p> <p>Use(s): Sharpen tools or smooth rough edges</p> <p>Notes:</p>
 <p style="text-align: center;">TORCH</p>	<p>Other names: Flashlight</p> <p>Use(s): Provides illumination</p> <p>Notes:</p>
 <p style="text-align: center;">ADJUSTABLE WRENCH</p>	<p>Other names: Crescent wrench</p> <p>Use(s): To tighten or loosen nuts and bolts</p> <p>Notes:</p>
 <p style="text-align: center;">PIPE WRENCH</p>	<p>Other names:</p> <p>Use(s): To tighten round fittings or pipes</p> <p>Notes:</p>

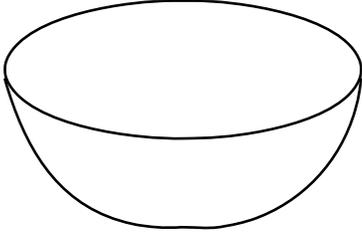
TOOLS	
 <p style="text-align: center;">MACHETE</p>	<p>Other names: Bolo, chopper</p> <p>Use(s): To cut light debris and foliage</p> <p>Notes:</p>
 <p style="text-align: center;">MALLET</p>	<p>Other names: Sledgehammer</p> <p>Use(s): To break concrete, drive stakes</p> <p>Notes:</p>
 <p style="text-align: center;">HAMMER</p>	<p>Other names:</p> <p>Use(s): Drive nails and pull nails</p> <p>Notes:</p>
 <p style="text-align: center;">BRICK HAMMER</p>	<p>Other names: Mason's hammer</p> <p>Use(s): To cut or break concrete block</p> <p>Notes:</p>

TOOLS	
<div style="text-align: center;">  <p>POCKET KNIFE</p> </div>	<p>Other names:</p> <p style="text-align: center;">XXXXX</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Light cutting</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>Torpedo Level</p>  <p>LEVEL</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To determine if surfaces or structural members are level or plumb</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">   <p>SHOVEL</p> </div>	<p>Other names:</p> <p style="text-align: center;">XXXXX</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">XXXXX</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>CROWBAR</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To pry, remove nails, or align</p> <hr/> <p>Notes:</p>

TOOLS	
 <p>PICK MATTOCK</p>	Other names:
	Use(s): Digging, loosening dirt or debris
	Notes:
 <p>HACKSAW</p>	Other names:
	Use(s): For cutting metal, bolts etc.
	Notes:
 <p>HAND SAW</p>	Other names: Wood saw
	Use(s): Cutting wood
	Notes:
 <p>KEYHOLE SAW</p>	Other names: Wallboard saw
	Use(s): Cutting light wood in unusual shapes or in a confined area
	Notes:

TOOLS	
 <p>HAND DRILL</p>	<p>Other names:</p> <p style="text-align: center;">Brace and bit</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Light drilling</p> <hr/> <p>Notes:</p>
 <p>TIN SNIPS</p>	<p>Other names:</p> <p style="text-align: center;">Bulldog, snips</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Cutting light-gauge sheet metal or mesh</p> <hr/> <p>Notes:</p>
 <p>CHISEL</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Cutting or removing metal or concrete</p> <hr/> <p>Notes:</p>
 <p>COMPASS</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Aids in orientation and navigation</p> <hr/> <p>Notes:</p>

TOOLS	
 <p style="text-align: center;">RAFTER SQUARE</p>	<p>Other names:</p> <p style="text-align: center;">Speed square</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Measuring angle cuts on wood beams</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">CHANNEL LOCKS</p>	<p>Other names:</p> <p style="text-align: center;">Slip-joint pliers</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Gripping and turning</p> <hr/> <p>Notes: Large, adjustable pliers</p>
 <p style="text-align: center;">HOE</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Digging, moving earth and debris</p> <hr/> <p>Notes:</p>
 <p style="text-align: center;">FOLDING SHOVEL</p>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Digging, moving earth and debris</p> <hr/> <p>Notes:</p>

TOOLS	
 PAN	Other names:
	Use(s): Removal of debris and soil
	Notes:

ACCESSORIES	
<div style="text-align: center;">  <p>CARPENTER'S APRON</p> </div>	Other names: <p style="text-align: center;">Tool pouch</p>
	Use(s): <p style="text-align: center;">Holds small hand tools, nails, accessories</p>
	Notes:
<div style="text-align: center;">  <p>DRILL BIT</p> </div>	Other names:
	Use(s): <p style="text-align: center;">Multiple types, used for drilling holes through wood, metal, or concrete</p>
	Notes:
<div style="text-align: center;">  <p>HOLE SAW</p> </div>	Other names:
	Use(s): <p style="text-align: center;">As a drill bit for making large holes in wood or light metals</p>
	Notes:
<div style="text-align: center;">  <p>CHIPPING BIT</p> </div>	Other names:
	Use(s): <p style="text-align: center;">For use with the chipping hammer</p>
	Notes:

ACCESSORIES	
 NAIL	Other names:
	Use(s): To join wood members together when building shoring.
	Notes: Duplex nails allow for easier removal.
 GAS CONTAINER	Other names: Fuel container
	Use(s): To transport small amounts (5-20 litres) of gasoline or fuel
	Notes:
 EXTENSION CORD	Other names: Multi-tap extension cord
	Use(s): Extends electrical power to the work site
	Notes:
 HACKSAW BLADE	Other names:
	Use(s): Replacement blade for hacksaw
	Notes:

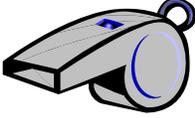
ACCESSORIES	
<div style="text-align: center;">  <p>CIRCULAR SAW BLADE</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Replacement blade for the circular saw</p> <hr/> <p>Notes: Different types available for cutting wood, metal, or concrete</p>
<div style="text-align: center;">  <p>RECIPROCATING SAW BLADE</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Replacement blades for reciprocating saw</p> <hr/> <p>Notes: Different types available for cutting wood or metal</p>
<div style="text-align: center;">  <p>TARP</p> </div>	<p>Other names:</p> <p style="text-align: center;">Salvage cover</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To cover or protect tools and equipment from rain, or as a staging area for tools</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>LUBRICANT / HYDRAULIC FLUID</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Machine and tool maintenance and lubrication</p> <hr/> <p>Notes:</p>

ACCESSORIES	
<div style="text-align: center;">  <p>SPRAY PAINT</p> </div>	Other names:
	Use(s): In structural triage, to mark damaged structures with information
	Notes:
<div style="text-align: center;">  <p>WATER COOLER</p> </div>	Other names:
	Use(s): To provide drinking water at work site
	Notes:
<div style="text-align: center;">  <p>BUCKET</p> </div>	Other names:
	Use(s): To carry small hand tools, collection/removal of light debris
	Notes:
<div style="display: flex; justify-content: space-around;">   </div> <p>COME-ALONG CHAIN(S)</p>	

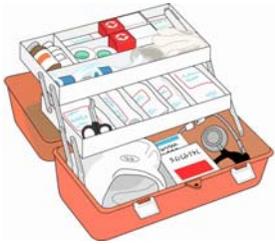
PPE	
 COVERALLS	Other names: Use(s): <p style="text-align: center;">Provides an additional layer of protection and prevents contact with contaminants</p> Notes:
 SAFETY BOOTS	Other names: Use(s): <p style="text-align: center;">Foot protection against falling objects and sharp objects that could pierce the sole</p> Notes: Boots should have steel toes and shanks.
 CANTEEN	Other names: Use(s): <p style="text-align: center;">To carry drinking water</p> Notes:
 RAINCOAT	Other names: Use(s): <p style="text-align: center;">Protection against water and rain</p> Notes:

PPE	
 <p>SAFETY HELMET</p>	Other names:
	Use(s): Head protection against impact
	Notes:
 <p>BACK SUPPORT</p>	Other names:
	Use(s): Provides additional support to the lower back for lifting
	Notes:
 <p>EXAMINATION GLOVES</p>	Other names: Latex gloves
	Use(s): Provide protection against bodily fluids and contaminants
	Notes:
 <p>WORK GLOVES</p>	Other names: Leather gloves
	Use(s): Provide hand protection for workers
	Notes:

PPE	
<div style="text-align: center;">  <p>SAFETY GLASSES</p> </div>	<p>Other names:</p> <p style="text-align: center;">Goggles</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Protect eyes from flying debris and dust</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>DUST MASK</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">Protects against inhaling dust and airborne contaminants</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>EAR PROTECTION</p> </div>	<p>Other names:</p> <p style="text-align: center;">Hearing protection, ear muffs</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To prevent hearing loss</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>KNEE PADS</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To protect the knees during collapsed structure search and rescue work</p> <hr/> <p>Notes: Elbow pads similar.</p>

PPE	
 WHISTLE	Other names:
	Use(s): To hail or warn workers
	Notes:

GENERAL SAFETY EQUIPMENT	
<div style="text-align: center;">  <p>SAFETY VEST</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To identify workers on a site; also increases visibility in low-light or night operations</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>SCENE TAPE</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To secure and identify a work area</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>SAFETY CONE</p> </div>	<p>Other names:</p> <p style="text-align: center;">Traffic cone</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To identify work areas or to divert traffic</p> <hr/> <p>Notes:</p>
<div style="text-align: center;">  <p>FIRE EXTINGUISHER</p> </div>	<p>Other names:</p> <hr/> <p>Use(s):</p> <p style="text-align: center;">To extinguish small fires</p> <hr/> <p>Notes: Different types should be used depending on the type of fire.</p>

GENERAL SAFETY EQUIPMENT	
<div style="text-align: center;">  <p>MEDICAL BOX</p> </div>	<p>Other names:</p> <p style="text-align: center;">First aid kit</p>
	<p>Use(s):</p> <p style="text-align: center;">Contains a variety of medical supplies used to treat injuries</p>
	<p>Notes:</p>
<div style="text-align: center;">  <p>MEGAPHONE</p> </div>	<p>Other names:</p>
	<p>Use(s):</p> <p style="text-align: center;">Voice amplification for calling to victims or hailing workers</p>
	<p>Notes:</p>
<div style="text-align: center;">  <p>VENTILATION FAN</p> </div>	<p>Other names:</p> <p style="text-align: center;">Blower</p>
	<p>Use(s):</p> <p style="text-align: center;">Provides fresh air to workers and/or victims in confined spaces</p>
	<p>Notes:</p>

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Collapsed Structure Search and Rescue Course

**CSSR Course
Pre-Work
Questionnaire**

Participant's Full Name

**OFFICE OF U.S. FOREIGN
DISASTER ASSISTANCE**



**MIAMI-DADE
FIRE RESCUE**

Pre-Work Questionnaire

This document will be collected on the first day of the Course. You must be ready to complete a pre-test on the material contained in the Pre-Work.

Answer the questions or fill in the blanks in the drawings as requested.

1. Define first response team.

2. Explain the difference between collapse structure search and rescue and confined space rescue.

4. (...continued)

5. Define equipment.

6. Define tool.

7. Define accessory.

8. On the following pages, identify each tool, piece of equipment, and accessory shown. In the space to the right of each one, write the name that will be used in the CSSR Course for each of them.

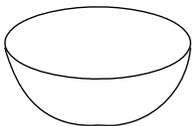














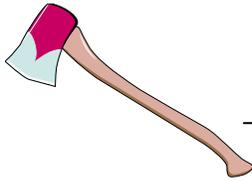


























































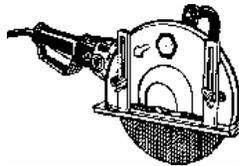


















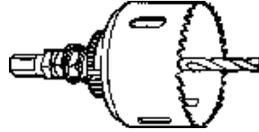










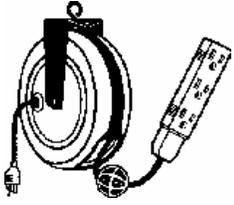


























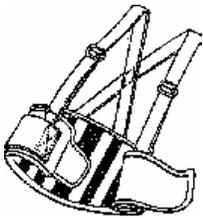














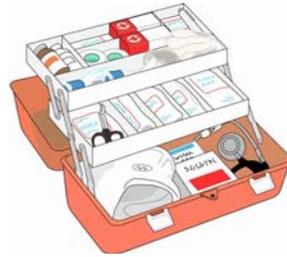
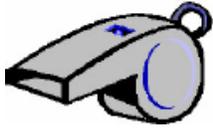












Note: When returning this questionnaire completed, please attach your CSSR research report.

Thank you.