4 Structural Triage and the INSARAG Marking System

Objectives

Upon completing this lesson, you will be able to:

1. Define structural triage.
2. List at least five basic rules for structural triage.
3. List at least five factors to consider in structural triage.
4. Define the INSARAG marking system.
5. List and describe the five categories of the INSARAG marking system.
6. Demonstrate in a written exercise the use of the INSARAG building marking system.

Approximate Duration:

– Lecture: 1 hour 30 minutes
– Practical component: None

1. Structural Triage

A rapid assessment of buildings during a CSSR operation, for the purpose of selecting those structures in which there is a _____ _____ of finding, accessing, and rescuing live victims.

Structural triage is conducted in two stages:

1. The overall area that has been most affected is assessed
2. Individual buildings are selected

2. Basic Rules for Structural Triage

The goal is to maximise the number of live victims rescued while minimizing risk to the victims and rescue squad. Structural triage must be conducted according to the following rules:

a. It is performed when _____ or more structures are assigned to a single CSSR squad.

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b. Performed by a team of structure specialists and hazardous materials specialists.

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c. For each group of buildings assigned to a CSSR squad, triage should be completed within _____ hours. Structural triage should take no more than 15 minutes per building or structure.

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d. Search and rescue operations can only begin _____ triage is completed and priorities are established.

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e. Once the initial buildings have been prioritised, a detailed assessment can be performed and structures marked during the initial search.

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f. If there are many buildings to inspect, two groups may be assigned to perform triage.

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g. Buildings that are found to be too hazardous in which to conduct rescue operations must be clearly marked with "_____ _____" except when there is a live victim in the building. In that situation, you need to consider the risk/benefit factor.

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h. Structural triage should be re-evaluated after live victims are found.

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i. Structural triage must be _____ after any significant event such as an after-shock or heavy equipment usage.

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3. Factors in Structural Triage

When performing structural triage, it is necessary to gather as much information as possible. The following factors must be considered:

- _____

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- Type of structure

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- Mechanism of collapse

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- _____, _____ and _____ of collapse

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- Prior intelligence

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- Availability of resources

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- Location of utility shut-offs

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- Possible presence of _____ _____

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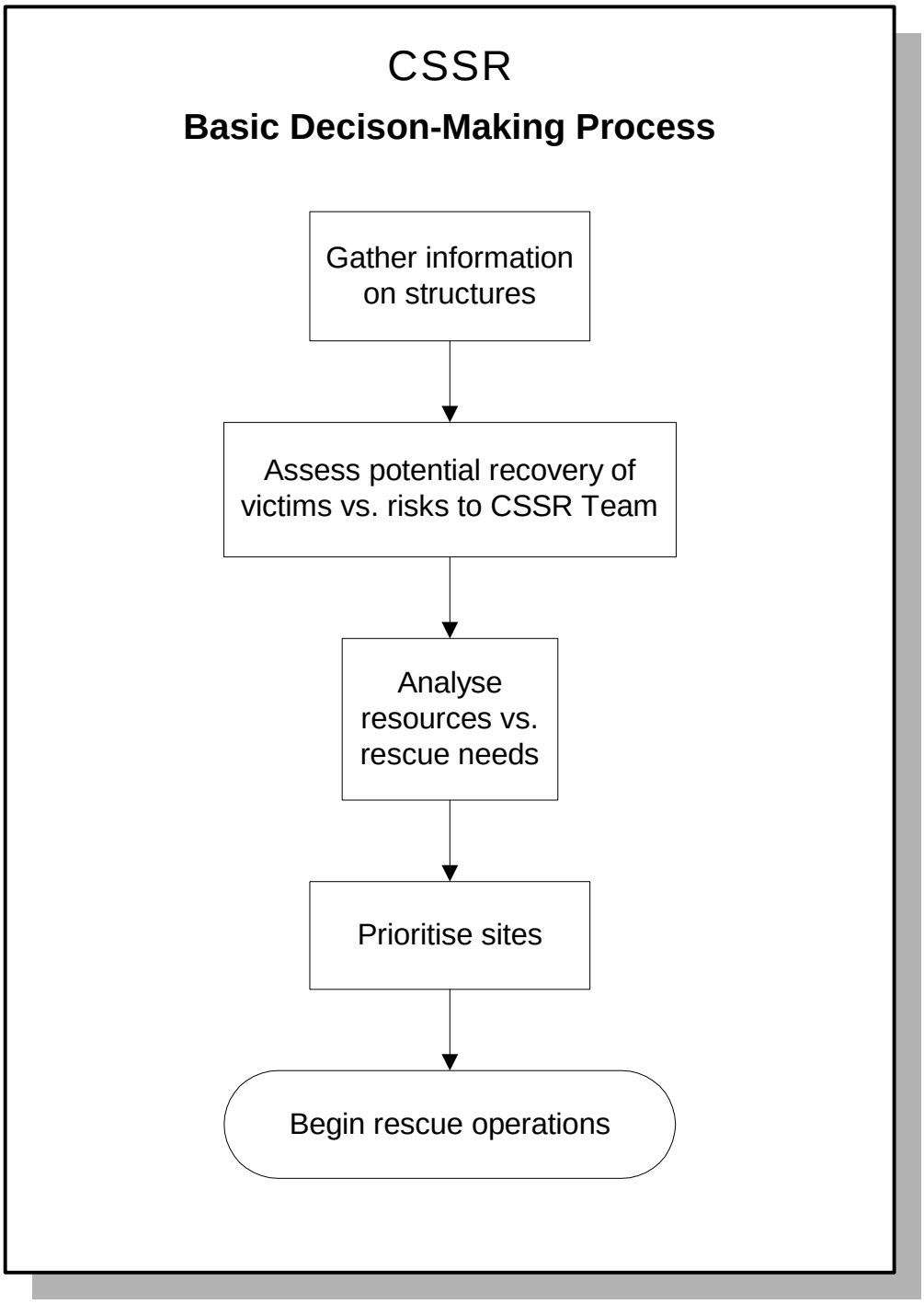

Figure 1. Simplified structural triage decision-making flowchart.

4. INSARAG Marking System

A _____ used to _____ structures, conditions, hazards and victim status in a standardised, simple and clear fashion that can be understood by _____ local, national and international rescue personnel.

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The CSSR marking system was developed by the International Search and Rescue Advisory Group (INSARAG). It provides for conspicuous identification of work site hazards, standardised mapping, sketch and landmark labelling with common symbols, ensures the accuracy of search assessment markings and documents CSSR team accomplishments.

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The building marking system incorporates the following elements:

- **Common identification system:** marking and signalling.

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- **Structure assessment:** go/no-go, search, rescue, and special hazards of a particular structure, victim location.

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- **Results:** warning, tracking, and continuity/ease of work transfer (interoperability).

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All markings must be conspicuous, using a high-contrast, durable, fluorescent colour.

5. Marking System Information Categories

The CSSR marking system can be divided into the following five categories:

- _____
- _____
- _____
- _____
- _____

5.1 Assigned Areas or Work Sites

Certain markings are used to _____ _____ individually (e.g., by address, physical location, unique design, etc.). If no maps are available, proceed with one of the following:

a. Sketch a map by hand.
b. Identify and label landmarks.
c. Assign a name to each site (using GPS references).

Establish structure orientation on the map or sketch, including exterior and interior.

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Location References of a Structure

It is important to identify locations within and around a single structure. On the exterior of the structure, the **address side** of the structure is defined as _____. Other sides of the structure shall be assigned numerically in a clockwise manner from SIDE 1, as shown in Figure 2.

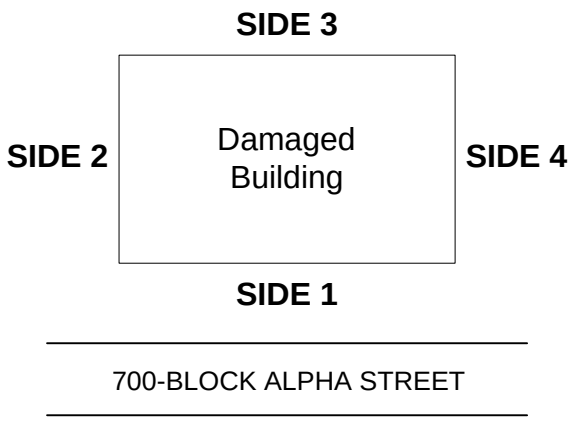

Figure 2. Exterior location references of a structure.

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The interior of the structure will be divided into _____. The quadrants are identified _____ in a clockwise manner starting from where SIDE 1 and SIDE 2 meet. The centre core, where all four quadrants meet, is identified as **QUADRANT E** (i.e., central lobby, etc.), as shown in Figure 3.

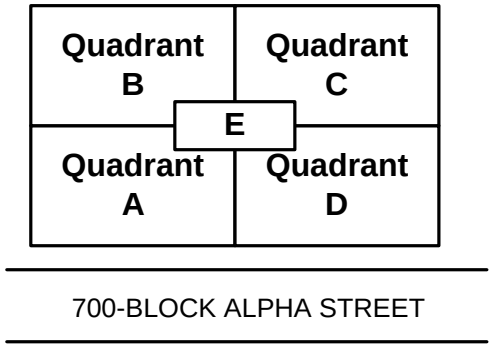

Figure 3. Interior location references within a structure.

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Identifying Floors: Multi-story structures must have each floor clearly identified. If this is not so, the floors should be numbered as referenced from the exterior. The **grade-level** floor is designated as the _____ floor**.** The floors above are numbered as **Floor ____ , Floor ____** , etc. Conversely, the floors below the ground floor are **Basement 1**, **Basement 2**, etc. Refer to Figure 4.

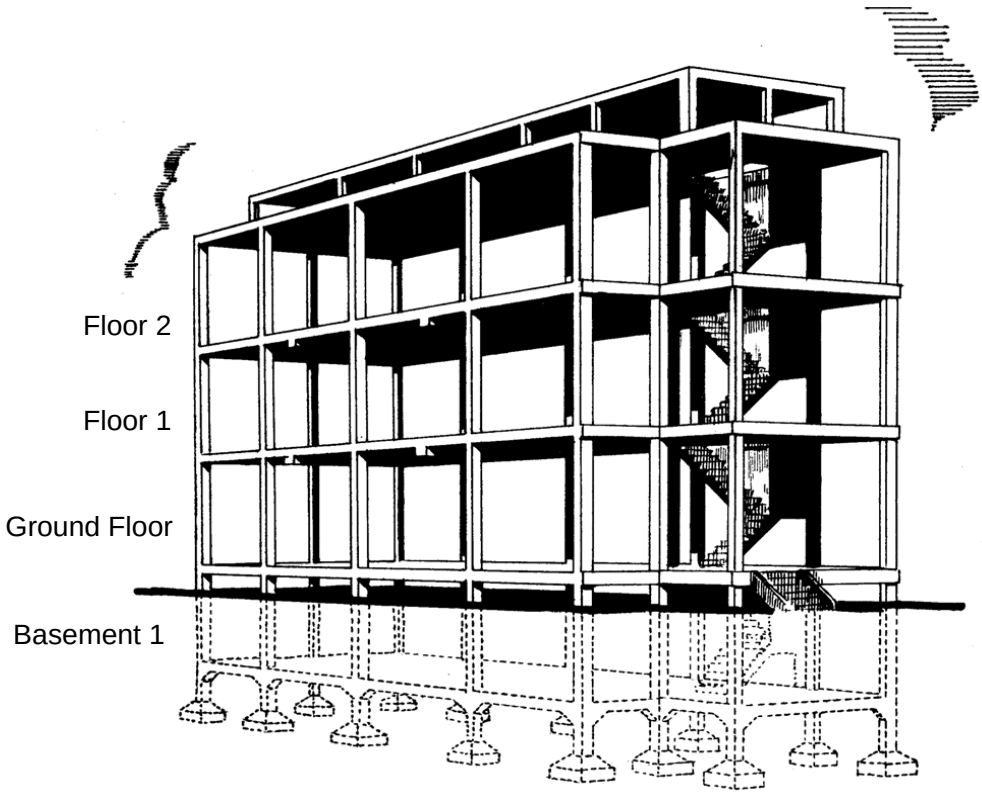

Figure 4. Identifying floors in a structure.

Identifying Columns

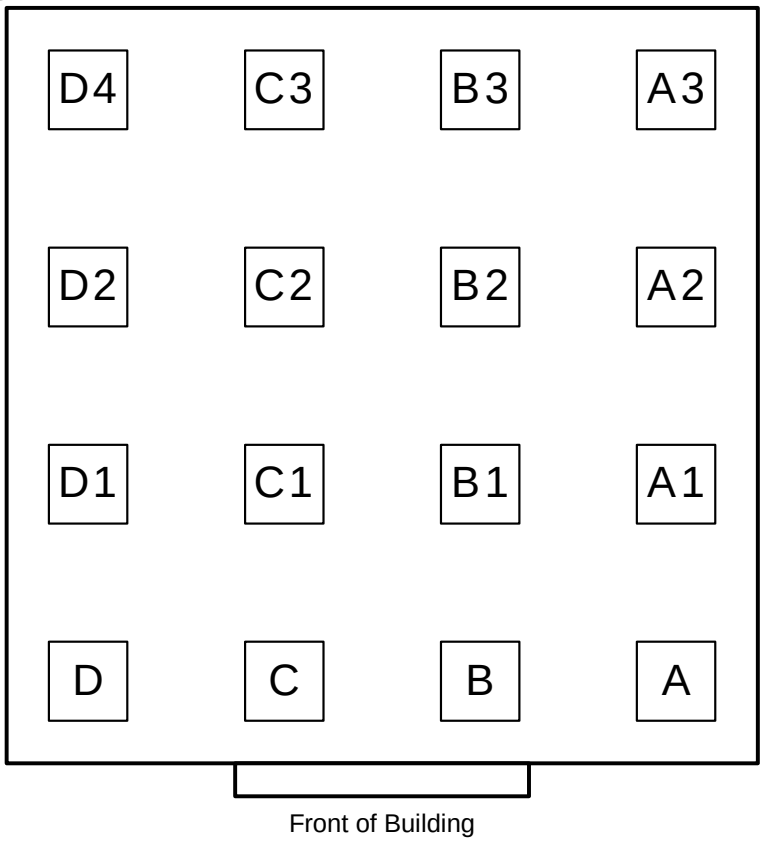

Figure 5. Identifying columns in a structure.

5.2 Structure Assessment Marking

Markings are also used to notate structure and hazards assessment as well as the location of victims. Figure 4 below shows the standard format for structure assessment marking. It identifies the _____ of the structure and associated _____ in addition to the _____ of victims. The symbol consists of a square figure, 1 metre by 1 metre, at the primary access point into any compromised structure.

Building marking must include the following information:

- Over the top of the box should appear information regarding the structure and possible hazards. This should also note hazards on the outside of building such as overhead hanging dangers.

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- On left side of box will appear number of _____ victims removed from the building.

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- On the right side of the box will appear the number of _____ removed from building.

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- At the bottom of box information on number of persons that are missing and possible location of victims within the building is written here.

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- Information contained inside the box; whether or not it is _____ to work in the building (**G**o or **N**o-Go), the name of the search and rescue squad doing the work in the building, the time and date that work was started, and the time and date that the squad left the building.

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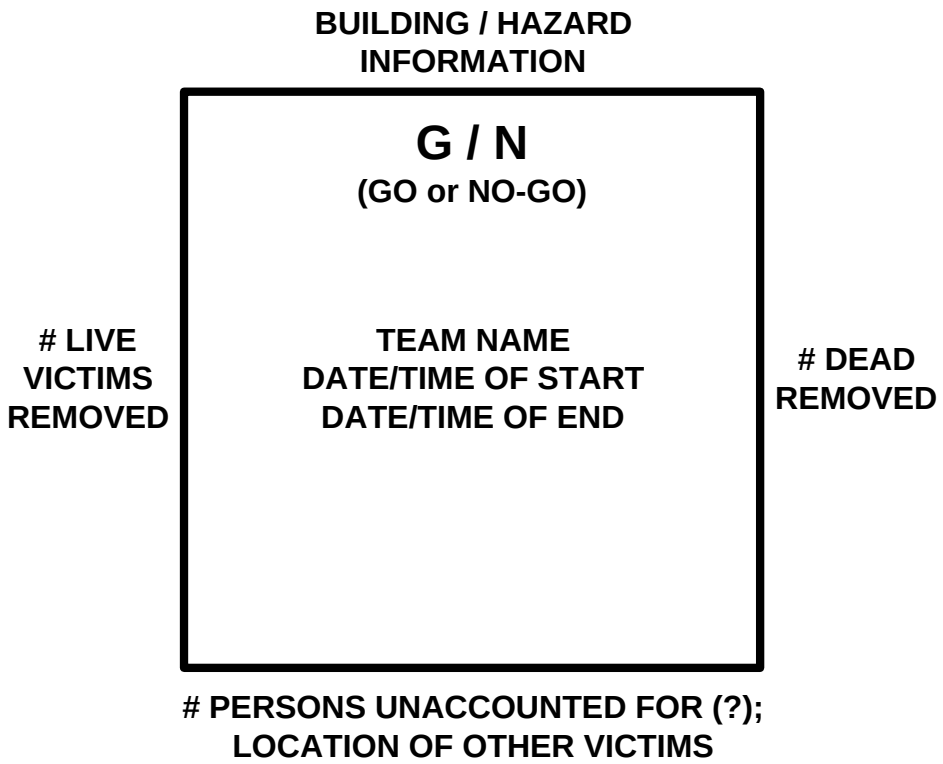

Figure 6. Format for structure assessment marking.

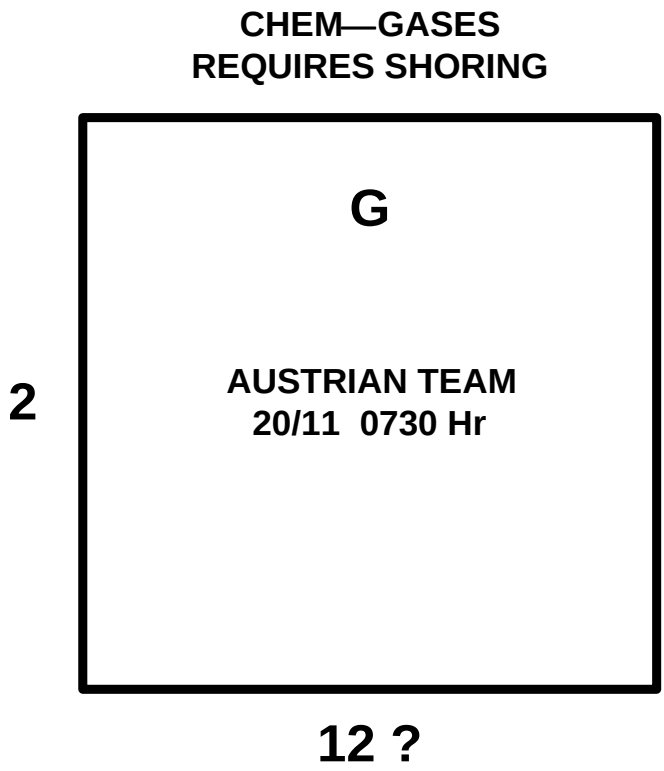

Figure 7. Sample marking box in progress, not complete.

It is important that the squad's name is clear so if there are any questions about the building, others will know where to go for this information.

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As the situation _____ in the building, whether it is the securing of a hazardous condition or as victims are removed or new ones found, it is important that the markings on the building reflect this new information. If a new box is needed to show this new information make sure that old markings are clearly _____ _____ so there is no confusion with the new markings.

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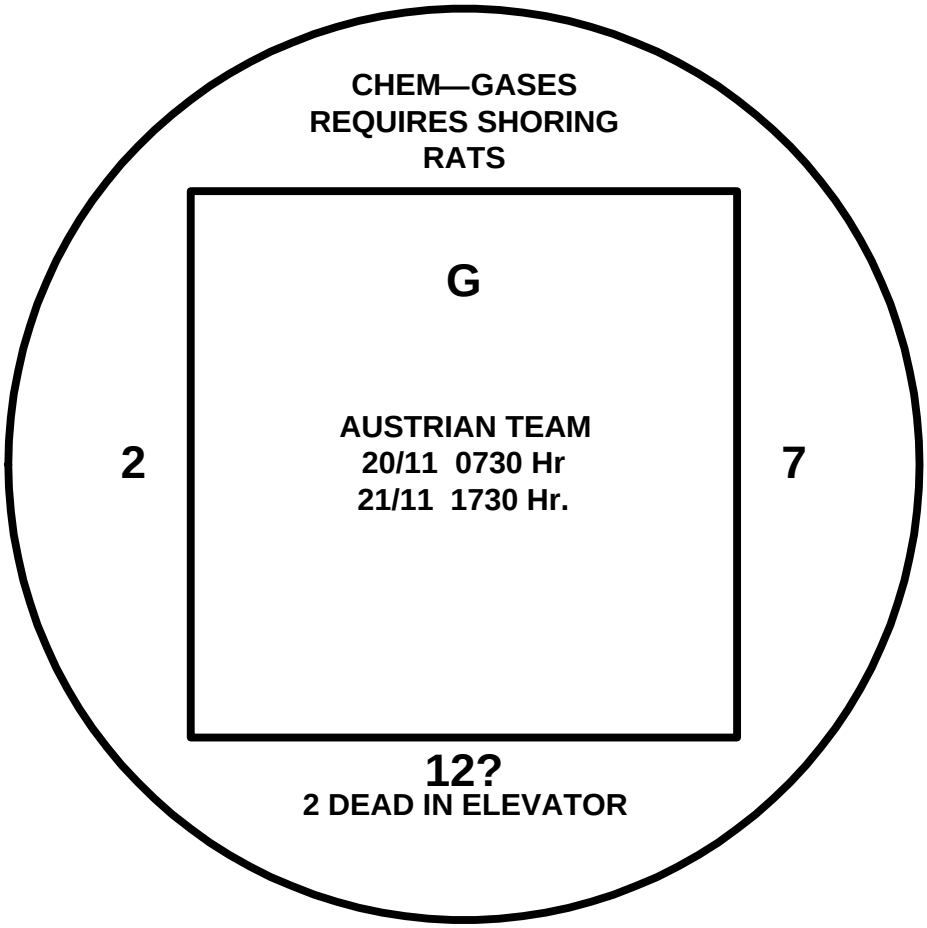

Figure 8. Sample marking box showing operation is complete.

Marking Victim Locations

During the _____ function, it is necessary to identify the location of any _____ or _____ victim. The amount and type of debris in the area may completely cover or obstruct the location of the known or potential victim.

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The search squad or other individuals conducting search and rescue operations should make victim location markings _____ _____ a known or potential victim is located and not immediately removed.

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Method: Draw a large **'V'** as close as possible to the location of known or potential victims.

- If there is only the potential presence of a victim(s) place only a 'V' at a point closest to the potential victim's location (Figure 9).

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- If the presence of a live victim(s) is confirmed, place an arrow pointing toward the victim(s) location next to the 'V' (Figure 10). Confirmation of a victim requires either visual or audible contact.

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- If the victim(s) are confirmed dead, draw a horizontal line through the 'V' along with an arrow indicating victim's location (Figure 12).

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- Draw a separate 'V' to indicate either a live and/or dead victim(s).

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Canine Alerts: All search dogs must be certified search canines (K-9). A single canine alert requires a 'V' marking only (no arrow) to indicate the location of a potential victim. If a second canine alerts at the same location, draw an arrow next to the 'V'.

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Figure 9. Potential victim location.

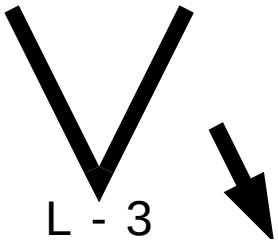

Figure 10. Confirmed live victim.

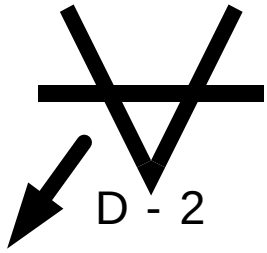

Figure 11. Confirmed dead victims.

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The numbers **L-3** and **D-2** under the 'V's indicate the number of _____ and _____ victim(s) at this location. This number will decrease or increase as known victims are removed, debris is moved and possibly new victims found.

Figure 12 shows that as victims are removed crossing out the number located below the 'V' is acceptable. It will then be replaced with the new number of victims.

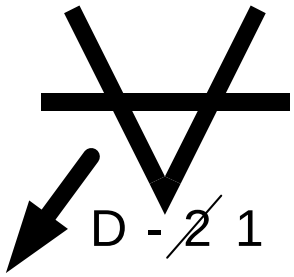

Figure 12. Update of victim count.

Completion of Victim Extrication

To indicate that all victims, alive or dead, have been removed, draw a _____ around the 'V' markings.

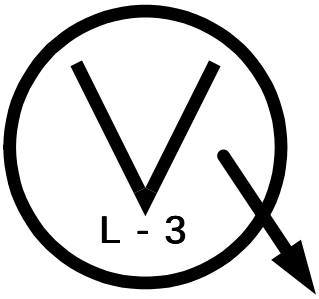

Figure 13. Extricated live victims.

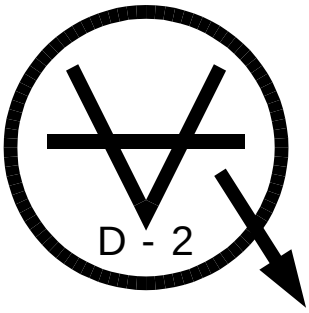

Figure 14. Extricated dead victims.

5.3 General Hazard Marking

General cordon markings (cordon banners, flagging, etc.) should be used for a small, defined area. The area can be expanded to include other non-buildings (such as bridges, danger zones, nuclear-biological-chemical [NBC], security, etc.). Large areas may require barricades/fences/patrol, etc. An operational work zone requires a _____ strand of tape _____ the perimeter; a collapse or hazard zone requires _____ strands crossed like an 'X'.

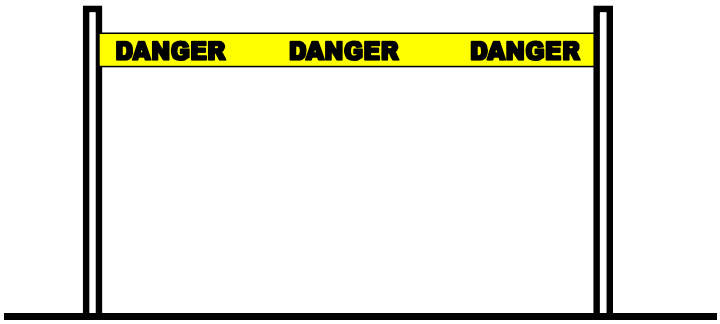

Figure 15. Operational work zone.

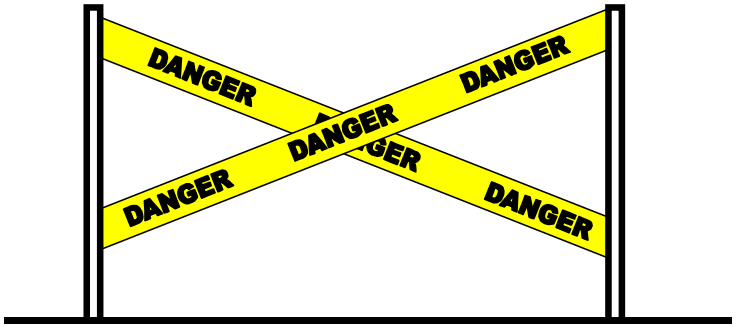

Figure 16. Collapse / hazard zone.

5.4 Facility and Vehicle Markings

Facilities: Iconic flags, banners, balloons, or other must be used to identify the team, team medical facility, the command post, etc.

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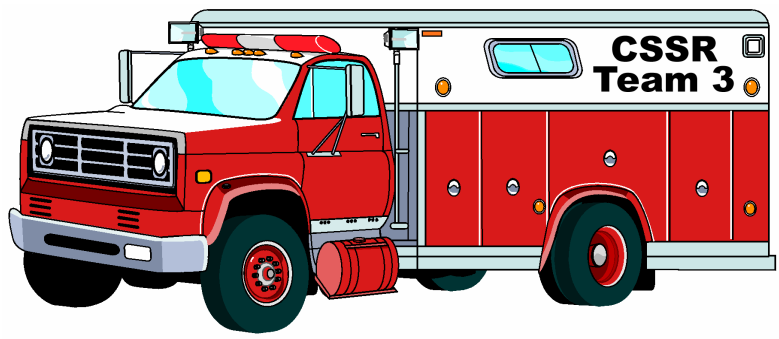

Vehicles: Vehicles must be marked with team name and function by a flag, magnetic sign, etc.

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5.5 Team and Function Markings

The following information must be clearly displayed on all emergency personnel:

- Response _____ identity (country and team name) by uniform, patch, etc.
- Personnel positions must be colour-coded and labelled in _____ plain text (using vests, arm bands, helmet colour, etc.)
  — Management position(s): white
  — Medical position(s): red cross/crescent
  — Safety/security position(s): orange

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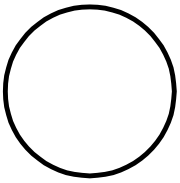
5.6 Other Symbols

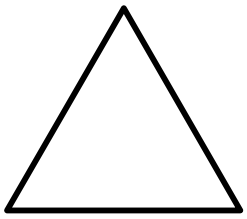
Facilities — circles



Zones — irregular shapes

_____ — box

Reference point — triangle



Time notation

(with arrow pointing to activity site)

22/11 0700 Hrs.
23/11 1900 Hrs.

Collapsed Structure Search and Rescue Course

Lesson Evaluation for Participants

Do not write your name on this form. Please complete a copy of this form at the end of every lesson.

Your evaluations are very valuable toward improving the course. For ratings, please use a scale system from 1 to 7, as follows:

1	2	3	4	5	6	7
Very poor	Poor	Below Average	Average	Good	Very Good	Excellent

Course Location: _____ **Date:** _____

Please fill in the required information.	**Lesson Number**	**Lesson Name**
	Instructor's Name	
Use a scale from 1 to 7 as described above to rate the various lesson components.	**Lesson Rating** (rate 1 to 7) Content _____ Instructor _____ Method _____ Workbook _____ Interaction _____	
Mark your selection with an "X"	**Instruction Level** (mark with an "X") Appropriate _____ Too basic _____ Too advanced _____	
	Duration (mark with an "X") Appropriate _____ Too short _____ Too long _____	
	Usefulness Was this lesson useful to you? Yes _____ No _____	
Rate from 1 to 7	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____	
If you need additional space, please use the back of the sheet.	**Comments and Observations**	

Thank you for your help. Your input is valuable. Please turn in this completed form to the instructor.