

STRUCTURE TRIAGE, ASSESSMENT, AND MARKING SYSTEM

Significant damage and disruption to the existing infrastructure would be expected following an event such as tornado. A task force may be confronted with responsibility for a general area affected by the event that encompasses multiple buildings, with little or no search and reconnaissance information. The Structure Triage, Assessment, and Marking System has been designed to help identify, select, and prioritize the buildings with the highest probability of success with respect to finding and rescuing live victims. Information relative to building identification, conditions and hazards, and victim status can be posted in a standardized fashion. To maintain consistency, the systems identified in this section are used by federal and state USAR teams across the country.

INITIAL SIZE-UP

A task force may need to perform the following activities prior to beginning search and rescue operations:

- Identify buildings individually by address, physical location, unique design, etc.
- Provide general area triage, i.e. identify separate buildings from many in a given area that offer the highest potential for viable rescue opportunities.
- Provide hazard assessment and marking of buildings.
- Apply appropriate markings to identify buildings, search progress, and victim location.

When a task force arrives at their assigned location, local emergency response personnel may have already identified viable search or rescue opportunities for the task force. The location and/or identification of separate buildings may also be clearly identified. Many of the general size-up issues may have been conducted by the local personnel and the task force can base their initial actions and assignment of resources on this information. However, information provided by local sources must always be reviewed for validity.

In other cases, there may be little or no reconnaissance information when the task force arrives. They may be faced with a geographic area (several buildings, part of a block, several block area, etc.) with no tangible information as to where to concentrate initial efforts. In this case, the decision-making process and size-up of the situation becomes much more complex.

GENERAL STRUCTURE OR AREA RECON

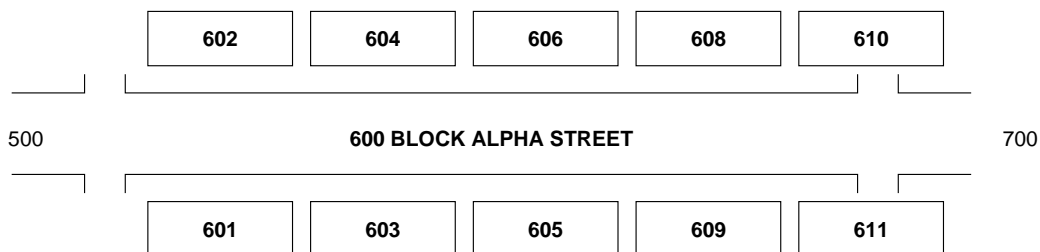
When a task force arrives at their assigned work area, it is imperative that the general layout and condition of the area be determined. This will speed operations, ensure efficiency, and prevent a duplication of efforts. Maps or floor plans obtained in route or on arrival will be valuable in this process. It may be necessary to deploy one or more Recon Teams to do a quick assessment of the affected area and/or buildings. Recon, while generally done by Search Squads, may be assigned to any task force personnel. The size and scope of the incident may require additional squads, or even the splitting of squads into smaller units.

This rapid assessment should determine the general structural condition in an area, the probable occupancy, hazards, potential rescue opportunities, etc. During this assessment, the Recon Team (s) will prepare a rough sketch of the general area and identify each building with GPS coordinates. Information & sketches can be quickly recorded on the Site Assessment form, on existing maps, or on blank paper. (See Forms Section for Site Assessment form)

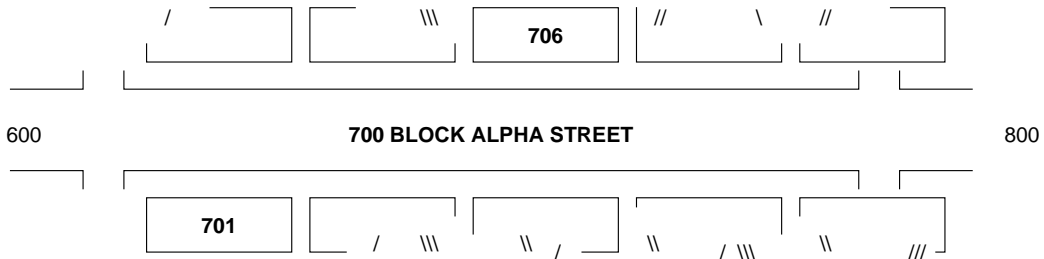
STRUCTURE IDENTIFICATION WITHIN A GEOGRAPHIC AREA

The Recon Team (s) needs to clearly differentiate buildings in groupings by blocks or areas/sectors. It is also imperative that each structure within a geographic area is clearly identified. This may occur during this quick assessment or during a more detailed assessment later. Either way, this identification is important from a technical documentation perspective, for preventing the duplication of efforts, and for maximizing safety. The primary method of identification should be the existing street name, hundred block, and building number. However, destruction often eliminates any or all of these. In these situations, it is important that the task force personnel implement the following system for structure identification. This system should build upon the normal pre-disaster street name, hundred block, and building number whenever possible. Structures and streets should be clearly marked with orange spray paint. As task force personnel establish a need to identify a structure within a given block they will:

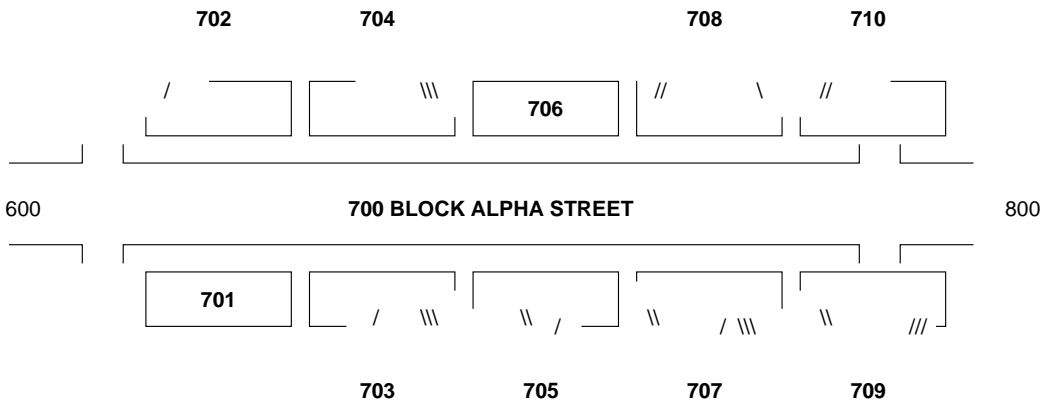
Identify each structure by existing street name or building number.



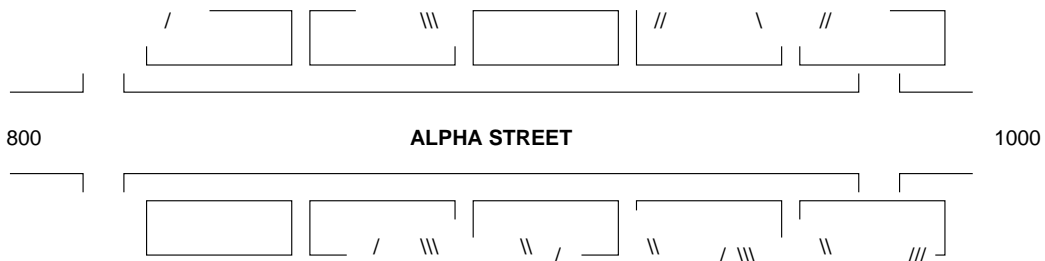
If some previously existing numbers have been obliterated, an attempt should be made to reestablish the numbering system based upon one or more structures that still display an existing number.



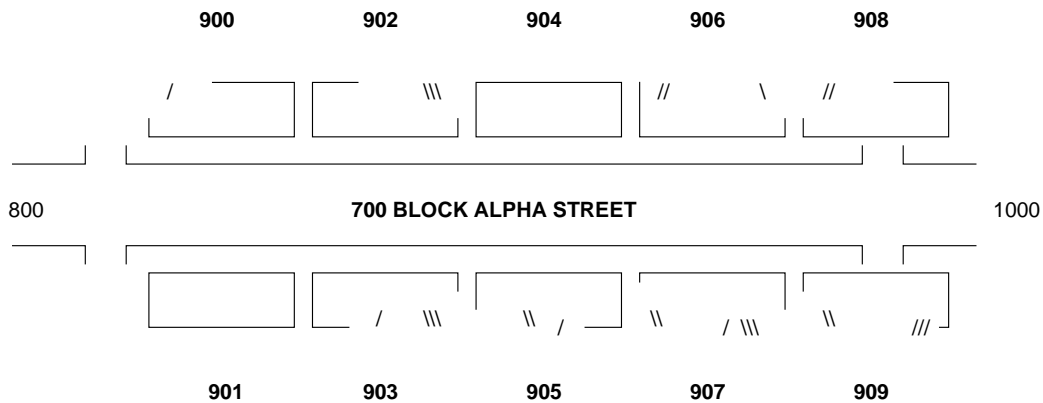
The damaged buildings would be assigned numbers to separately identify them as indicated. The front of the structures in question should be clearly marked using International Orange spray paint with the new number being assigned.



If no number is identifiable in a given block, then task force personnel will identify the street name and the hundred block for the area in question, based on other structures in proximity to the site in question.



Structures should be assigned the appropriate numbers to designate and differentiate them. The front of the structures in question should be clearly marked using International Orange spray paint with the new number being assigned.



It is also important to identify locations around and within a single structure. The address side of the structure (typically street/front) shall be defined as Side A-Alpha. Other sides of the structure shall be assigned going clockwise as Side B-Bravo, Side C-Charlie, and Side D-Delta.

The interior of the structure can be divided into QUADRANTS. The quadrants should be identified numerically in a clockwise manner starting at the A/B corner. The center core, where all four quadrants meet can be identified as Quadrant 5 (i.e., central core lobby, etc.).

Multi-story buildings must have each floor clearly identified. If not clearly discernable, the floors should be numbered as referenced from the exterior. The grade level floor would be designated Floor 1. Conversely, the first floor below grade level would be Basement 1.

If a structure contains a grid of structural columns, they should be marked with 2' high, orange letters/numbers and used to further identify enclosed areas. If plans are available, use the existing numbering system. If plans are not available, search personnel should number the columns for future reference.

DETAILED STRUCTURE ASSESSMENT

Once a general sweep and rapid assessment of the assigned area has been completed, task force supervisory personnel should identify a priority for a more detailed analysis of potential rescue work sites/buildings. Any identifiable structure should be given a more detailed assessment to determine risk, accessibility, potential victims, etc. If not already completed, this detailed

structure assessment can be performed by Search Squads assigned to a specific area, prior to conducting further search operations. A Structure Specialist (building engineer) should also be included, if one is available. The Rapid Structure Triage form may be used to facilitate this detailed assessment.

In general, the following factors should be considered in determining priorities for search and rescue operations:

- Occupancy – refers to building use, not the number of occupants.
- Collapse Mechanism – how the building failed will provide an indication of the potential for voids wherein a victim could survive.
- Time of Day – refers to the time of the event that caused the collapse.
- Information from the general public relating to known trapped victims.
- Search and Rescue Resources Available – does the particular building require resources beyond what is readily available to the task force?
- Structural Condition of the Building – Can search and rescue operations proceed with minimal stabilization effort?
- Condition of voids - Open, survivable voids are often found under wooden floor panels that are collapsed into angular, interlocking planes, and in reinforced concrete structures where floors have projecting beam elements, parts of columns/walls and furnishings that hold the slabs apart. Partially collapsed structures may have large triangular blocked avenues or exits. These large voids have the best chance of having surviving entrapped victims.
- Time required to access victims - this will be an estimate of the time required to get to the first victim. It should include the time it would take to mitigate hazards, cut through floors, walls, roofs, etc., and to shore and brace the access route as well as appropriate adjacent structures.
- Chance of secondary collapse – This may indicate that shoring or bracing may be required before beginning operations.
- Special occupancy information - increased attention will be given to certain types of target hazards, especially those involving children, schools, day care centers, hospitals, etc.
- "NO GO" conditions - these would include structures that are on fire, have significant hazardous material spills or exposures, or otherwise have conditions that would make search and rescue operations too perilous.

TASK FORCE MARKING SYSTEMS

Information gathered by task force personnel must be represented in a standardized fashion to ensure uniformity and clarity. A standardized USAR Marking System is identified and divided into two sections:

- Structure/Hazards Evaluation Marking
- Search Assessment Marking.

The Structure/Hazards Evaluation and Search Assessment marking procedures are designed to identify specific information pertinent to each affected building. Each component can be completed independent of the other, although normally the Structure/Hazards Evaluation would be completed first. Symbols will be made with spray paint of International Orange color to permanently identify and mark safe entrances to a structure and to note search assessment findings. The two marking systems use differing formats to distinguish between the two as outlined in their respective sections.

STRUCTURE/HAZARDS EVALUATION MARKING

Personnel will outline a 2' X 2' square box at any entrance accessible for entry into a compromised structure. Aerosol cans of spray paint, International Orange color, will be used for this marking. It is important that an effort is made to mark all normal entry points to a building under evaluation to ensure that task force personnel can identify that it has been evaluated.

Specific markings will be clearly made inside the box to indicate the condition of the structure and any hazards at the time of this assessment. Normally the square box marking would be made immediately adjacent to the entry point identified as safe. An arrow will be placed next to the box indicating the direction of the safe entrance if the Structure/Hazards Evaluation marking must be made somewhat remote from the safe entrance.

The following information; TIME, DATE, and SPECIALIST ID, will also be noted outside the box at the upper right-hand side. This information will be made with pieces of carpenter's chalk or lumber crayon. An optional method may be to apply duct tape to the exterior of the structure and the detailed information written on the tape with a grease pencil or black magic marker. All task force personnel must also be aware of other Structure/Hazards Evaluation markings made on the interior of the building.

SEARCH ASSESSMENT MARKING

A separate and distinct marking system is necessary to denote information relating to the victim location determinations in the areas searched. This separate Search Assessment marking system is designed to be used in conjunction with the Structure/Hazards Evaluation marking system. The Canine Search

Specialists, Technical Search Specialists, or any other task force member performing the search function will draw an "X" that is 2' X 2' in size with International Orange color spray paint. This X will be constructed in two operations - one slash drawn upon entry into the structure (or room, hallway, etc.) and a second crossing slash drawn upon exit.

As with the Structure/Hazards Evaluation, it is important that markings are made specific to each area of entry or separate part of the building. If an area is searched and no victims are found, it must be noted with an X. It is also important that situation updates be noted as they are available, to reduce needless duplication of search efforts. Previous search markings would be crossed out and a new marking would be placed next to it with the most recent information.

VICTIM LOCATION MARKING SYSTEM

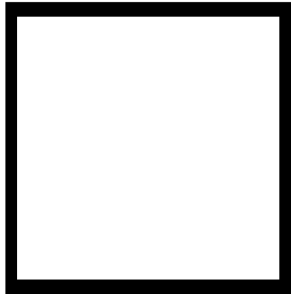
During the search function it is necessary to identify the specific location of potential and known victims that are not easily removed so that this information can be relayed to rescue squads. Since the amount and type of debris in the area may completely cover or obstruct the location of any victims, victim location markings are made by the search squad. If the victim is lightly trapped and can be removed by the Search Squad, the location should be noted on the SAR214 but not marked at the site. The victim location marking symbols should also be made with orange spray paint.

A large "V" (approximately 2 ft.) is painted near the location of the known or potential victim. An arrow may need to be added next to the "V" pointing towards the victim's location if not clearly visible, or is not immediately nearby. The task force identifier is then placed in the top part of the "V". A circle is painted around the "V" when the location of a potential victim has been **Confirmed** either visually, vocally, or by hearing sounds that would indicate a high probability of a victim.

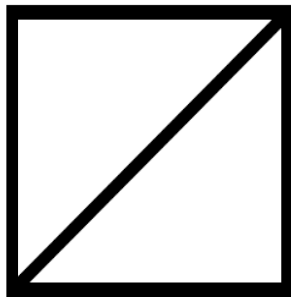
Paint a horizontal line through the middle of the "V" when the victim is **Confirmed** to be deceased. Paint an "X" through the **Confirmed** victim symbol after all victims have been removed from the specific location identified by the marking.

Paint new victim marking symbols next to additional victims that are later located near where the original victim(s) were removed (assuming the original symbol has been "X"ed out). The victim location marking symbols and numbers of victims, if known, will also be kept on the developing site map during the search of the structure or area.

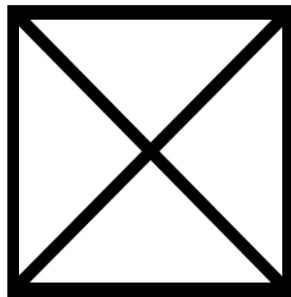
FEMA Structures/Hazards Marking



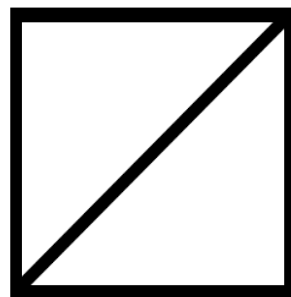
- 2x2ft (60x60cm)
- Structure relatively safe for US&R operations



- Structure significantly damaged
- Shoring/removal of hazards may be required



- Structure not safe for normal US&R operations
- Extensive safety measures must be taken before entry

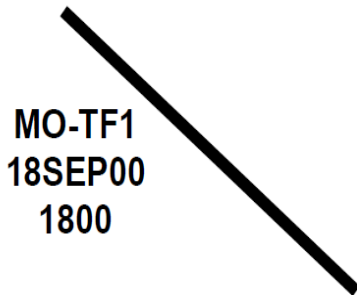


28 JUNE 2003
NATURAL GAS
1432HRS
NE-TF1

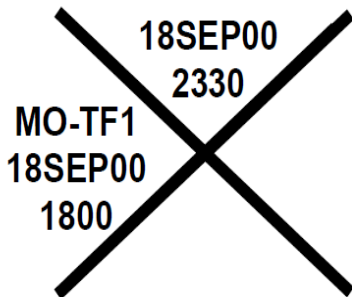
- To right of box:

- Date
- Hazards
- Time
- TF ID

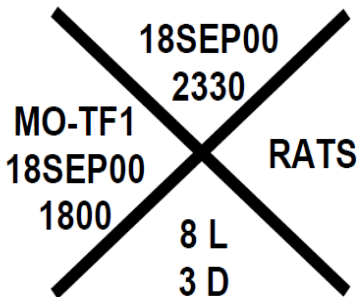
FEMA Search Assessment Marking



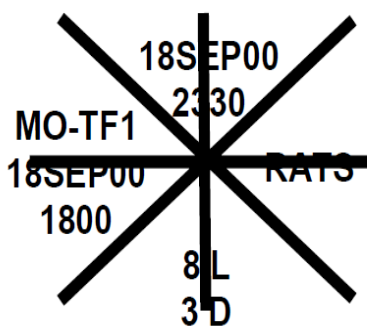
- Single slash upon entry into structure
 - TF ID, date & entry time noted
 - Indicates ongoing search
-



- Crossing slash upon exit
 - Upon exit, date and time noted in top field
 - Additional information placed in open areas of "X"
-



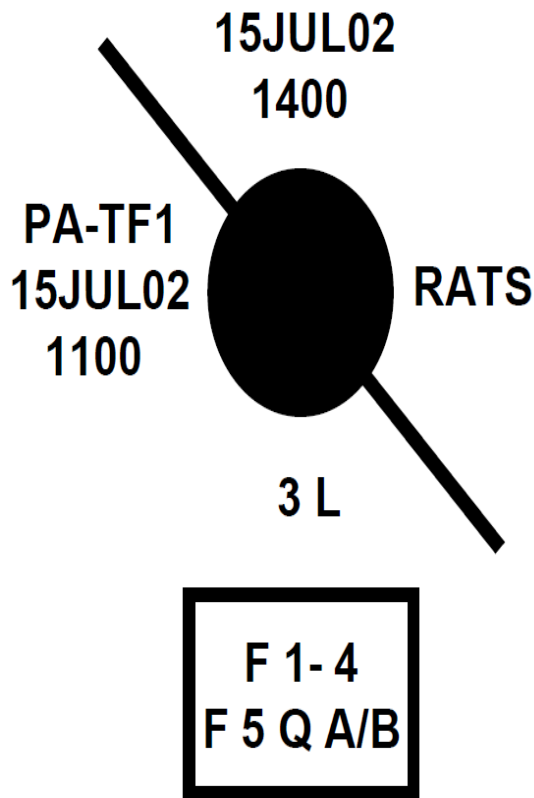
- Right - hazards
 - Bottom - # of victims
-



- When new search completed, cross out previous, and complete new search assessment marking

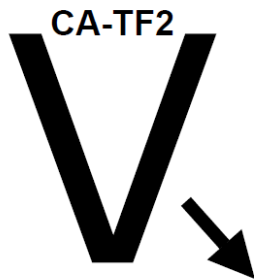
FEMA Search Assessment Marking

Incomplete Search Marking



- When search terminated prior to completion:
 - Place filled circle at center of slash
 - Add date & time search terminated in top field
 - Note hazards to right
 - Note victims beneath
 - Place box below slash, and note areas searched
 - Use “F” to ID floors searched
 - Use “Q” to ID quadrants searched

FEMA Victim Location Marking



- “V” indicates possible victim location
- Arrow may be used to pinpoint location



- Line through “V” indicates confirmed deceased victim



- Circle around “V” indicates confirmed live victim



- Cross out marking when victim is removed