

**CHAPTER 15
URBAN SEARCH AND RESCUE
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INTRODUCTION

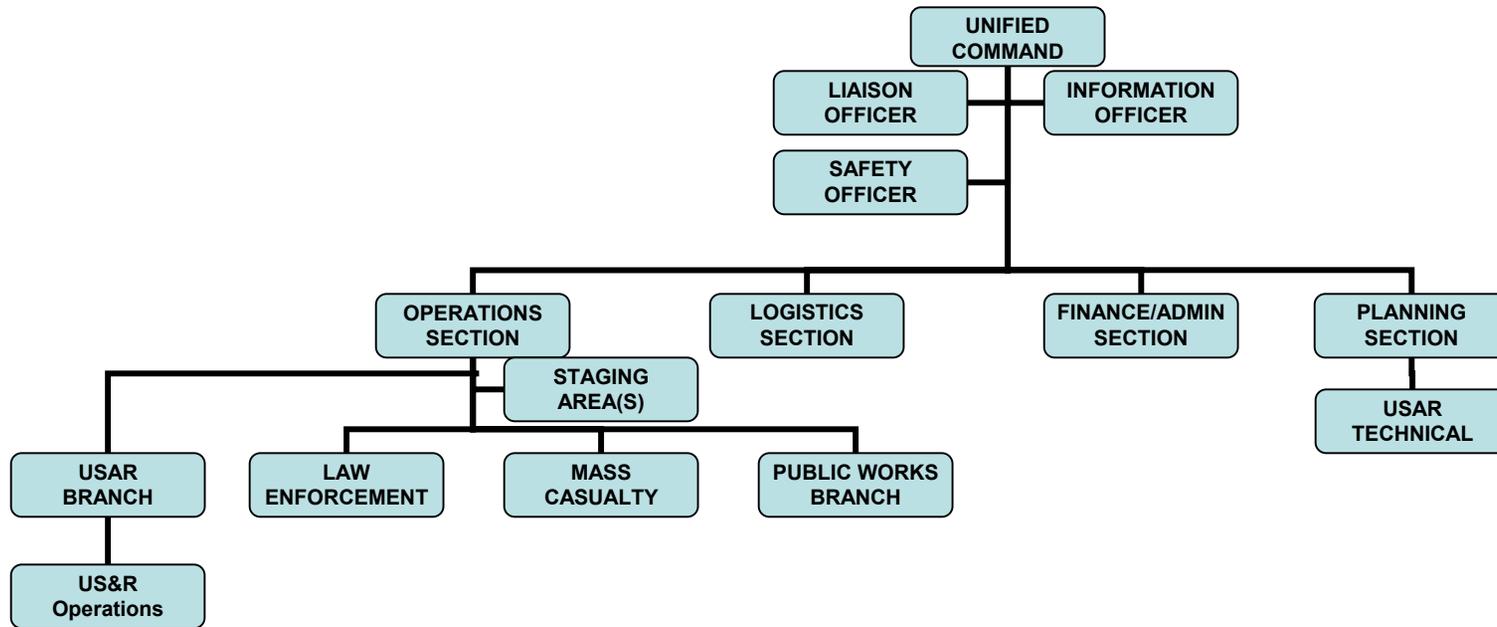
Every Urban Search & Rescue (USAR) incident is different. It is not possible to develop a document outlining a single chronology or sequence of actions. The order of operations depicted in this document may have to be altered to meet the situation. In some cases, various issues may have to be addressed simultaneously.

The Urban Search & Rescue (USAR) organizational module of the FOG is designed to provide an overview of the essential USAR functions at incidents where technical rescue expertise and equipment are required for safe and effective rescue operations. These incidents can be caused by a variety of natural events (i.e., earthquakes, floods, tornados, or hurricanes) that cause wide spread damage to a variety of structures, mass transportation accidents with multiple victims, or single site events such as excavation collapse or confined space rescue operations involving only a few victims. USAR operations are unique in that specialized training and equipment are required to mitigate the incident in the safest and most efficient manner possible.

USAR INCIDENT COMMAND SYSTEM INTEGRATION

- a) It is a planning assumption that an ICS system will be in place before the arrival of USAR elements,
- b) The first arriving USAR command officer will coordinate the command of USAR resources with the Incident commander. The following actions will be reviewed:
 - Size up of incident and command structure
 - Isolation and security of the scene (deny entry, establish control zones)
 - Staging of incoming units
 - Gather information regarding the involved structure/s type, possible number of people trapped etc.
 - Add ICS positions as needed
 - Assure proper notifications of law enforcement, hospitals local, state and federal agencies have occurred
 - Request additional resources as needed (i.e., Public Works, Heavy Lifting, etc.)
 - As the incident progresses, participate in the Unified Command

UNIFIED COMMAND



FLORIDA INCIDENT FIELD OPERATIONS GUIDE JANUARY 2006

FLORIDA URBAN SEARCH & RESCUE RESOURCES TYPES

Resource	USAR TEAMS				TECHNICAL RESCUE TEAMS	
	TYPE I	TYPE II	TYPE III	TYPE IV	TYPE I	TYPE II
Florida Type	<i>Type I US&R Task Force</i>	<i>Type II US&R Task Force</i>	<i>Type I Collapse Search and Rescue Team</i>	<i>Type III Collapse Search and Rescue Team</i>	<i>Type II Collapse Search and Rescue Team</i>	<i>Type IV Collapse Search and Rescue Team</i>
NIMS Equivalent	<i>Type I US&R Task Force</i>	<i>Type II US&R Task Force</i>	<i>Type I Collapse Search and Rescue Team</i>	<i>Type III Collapse Search and Rescue Team</i>	<i>Type II Collapse Search and Rescue Team</i>	<i>Type IV Collapse Search and Rescue Team</i>
Florida Designation	FULL TASK FORCE	INTERMEDIATE TASK FORCE	HEAVY USAR TEAM	LIGHT USAR TEAM	HEAVY TRT	LIGHT TRT
Incident Type	Structural collapse, collapse situations including light frame, heavy wall, heavy floor and pre-cast concrete construction	Structural collapse, collapse situations including light frame, heavy wall, heavy floor and pre-cast concrete construction	Structural collapse, collapse situations including light frame, heavy wall, heavy floor and pre-cast concrete construction	Structural collapse, collapse situations including light frame, light wall, light floor and unreinforced concrete construction	Heavy, Industrial, Vehicle Extrication, Life safety rope rescue, confined space, trench/excavation	Heavy, Industrial, Vehicle Extrication, Life safety rope rescue, confined space, trench/excavation
Minimum Staffing	70	32	22	6	8	6
Max Time to Wheels Turning	< 6 hrs	< 6 hrs	< 3 hrs	Immediate	Immediate	Immediate
Operational Period	24-hour operations; Self-sufficient for first 72 hours	12-24 hour operations; Self-sufficient for first 72 hours	Capable of sustained heavy operations for 18-24 hours	Light operations for 6-12 hours; Typically require assistance from additional team for sustained 12-hour operations	Medium operations for 4-8 hours; Typically require assistance from additional team for sustained operations	Basic operations for 3-6 hours; Typically require assistance for sustained operations
Response Type	State or Federal	Regional, State, Federal	Local, Regional, State	Local	Local or Regional	Local
Training	NFPA 1670 Technician: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Trench and Excavation; NFPA 1670 Operations: Water, Wilderness SAR	NFPA 1670 Technician: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Trench and Excavation; NFPA 1670 Operations: Water, Wilderness SAR	NFPA 1670 Technician: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Trench and Excavation; NFPA 1670 Operations: Water, Wilderness SAR	NFPA 1670 Operations: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Trench and Excavation; NFPA 1670 Awareness: Water, Wilderness SAR	NFPA 1670 Technician: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Trench and Excavation	NFPA 1670 Operations: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Trench and Excavation

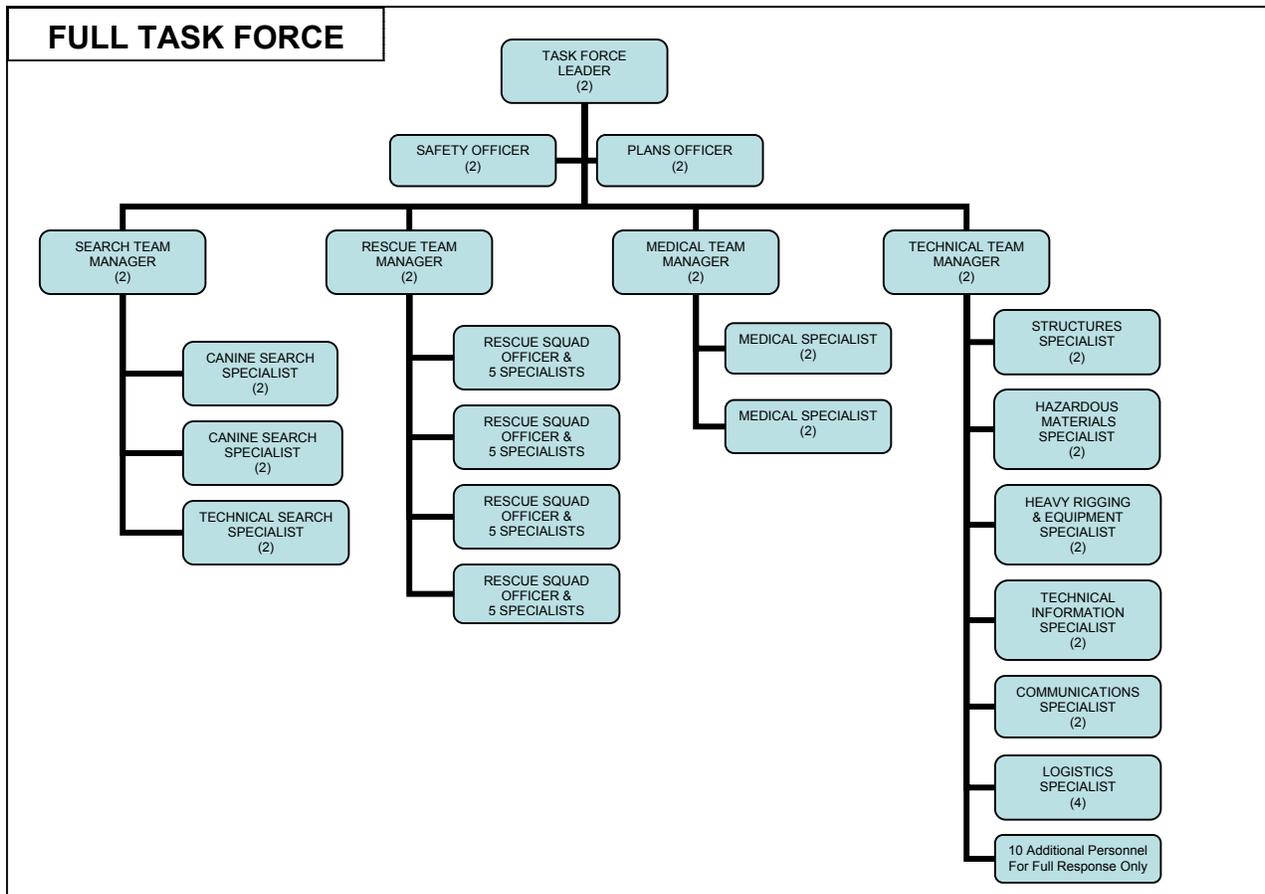
SYSTEM ORGANIZATION

The State of Florida USAR response system is based upon providing a coordinated response to disasters in urbanized environments. Special emphasis is placed on the capability to locate and extricate victims trapped in collapsed buildings, from light residential construction to heavy reinforced concrete structures.

The participating agencies maintain the capability of rapidly deploying resources based on the reported magnitude of the incident. The system is based on a tiered response that will assure the proper response of the closest appropriate resources for the incident.

Type I Full USAR Task Force

This is a State of Florida or Federal asset capable of twenty-four operations for a minimum of seventy-two hours without the need for outside resources and will consist of 68-70 personnel. The staffing for each twelve-hour shift of personnel is a minimum of 31 personnel.

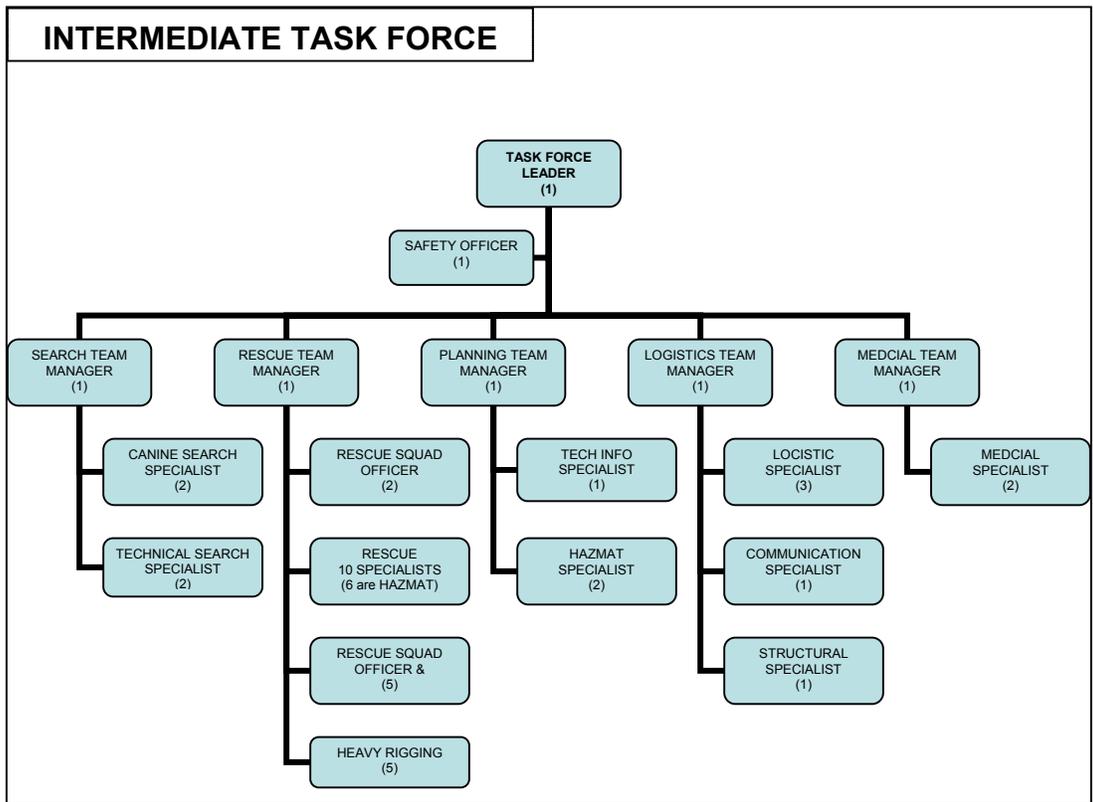


Florida Type I Teams	
Task Force 1 Miami Dade	Federal and State Deployable
Task Force 2 South Florida	Federal and State Deployable
Task Force 3 Tampa Bay	State Deployable

TYPE II INTERMEDIATE TASK FORCE

This is a State of Florida or Federal asset made up of local responders with the personnel, equipment and training equivalent to half of a FEMA Task Force. This unit is capable of twelve hour operations for a minimum of seventy-two hours without the need for outside resources. This resource will provide a scaled down version of a full Task Force and will be able to handle some collapse incidents without the need for additional assistance.

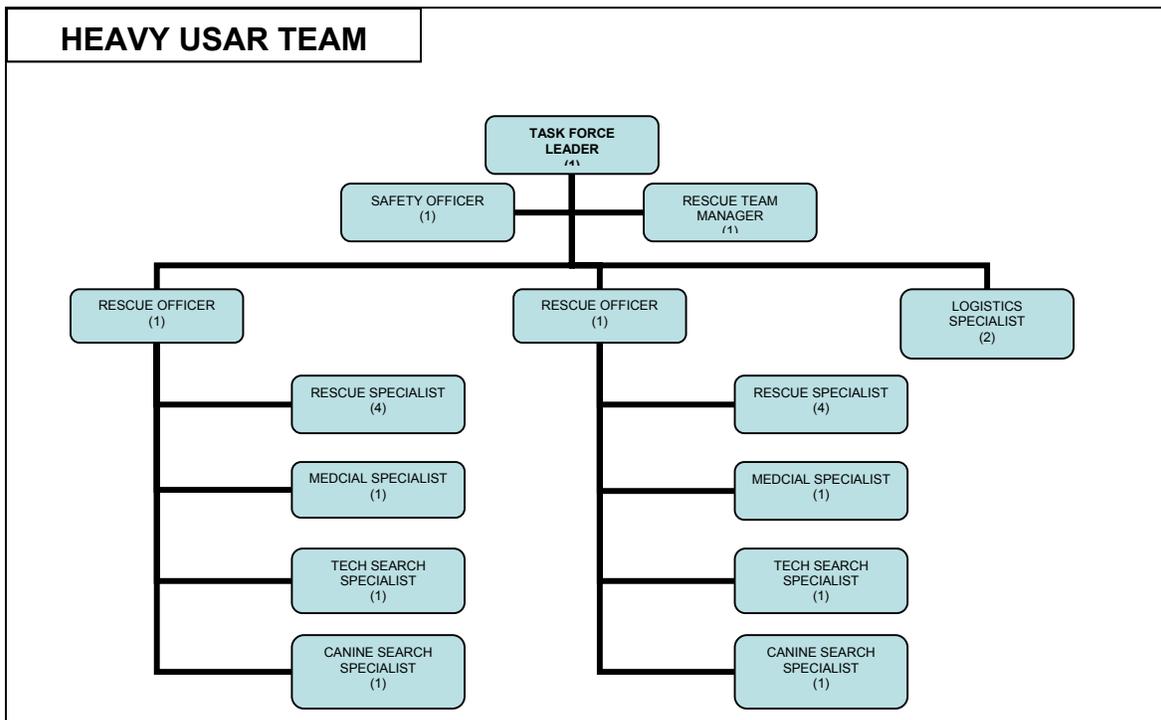
Type II consists of a minimum of 32 personnel capable of working for twelve hours. Intermediate teams will typically require relief by a full task force or another intermediate team for twenty-four hour operations.



Florida Type II Teams	
Task Force 4 Central Florida	State Deployable
Task Force 5 North Florida	State Deployable
Task Force 6 South West Florida	State Deployable

TYPE III HEAVY USAR TEAM

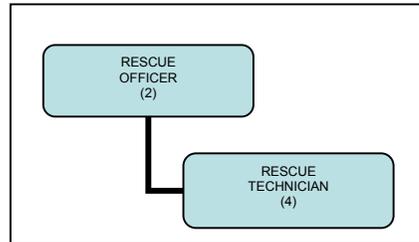
A Type III Heavy USAR Team will consist of a minimum of 22 personnel capable of working for up to twelve hours. A Type III response requires relief by an intermediate or full task force for prolonged or twenty-four hour operations.



Florida Type III Teams	
Task Force 7 Tallassee	State Deployable
Task Force 8 North Central Florida	State Deployable
Task Force 9 Volusia	State Deployable

TYPE IV LIGHT USAR TEAM

This is a State of Florida asset made up of local responders with the personnel, equipment and training for a basic USAR role. This unit is capable of assisting other resources or initial response to USAR incidents.



Florida Type IV Teams	
101-Panama City Fire Dept.	533-Volusia County Fire Services
102-Okaloosa Special Operations	540-Clermont Fire Dept.
103-Jackson County Fire Dept.	634-Charlotte County Fire & EMS
104-Escambia County Fire Dept.	635-Golden Gate Fire & Rescue
105-South Walton Fire District	636-Arcadia Fire Dept.
206-Dixie County Fire Dept.	637-Desoto County Fire Dept
207-Quincy Fire Dept.	638-Highlands County Fire Rescue
208-Jefferson County EMS	640-Cape Coral Fire Rescue & EMS
309-Alachua County Fire	641-Fort Myers Fire Dept
310-Gainesville Fire Dept	642-Iona-McGregor Fire Dept.
311-Clay County Fire Dept.	643-City & County of Okeechobee Fire Dept.
313-Ocala Fire Dept.	644-Cedar Hammocks Longboat Key-W.Mant Fire
315-Palatka Fire Dept	645-North Port Fire Dept.
316-St Johns County/St. Augustine Fire Dept.	746-Boynton Beach Fire Dept.
417-Citrus County Fire Dept.	747-Broward SO Fire Rescue Dept.
418-Springhill Fire Rescue	748-Davie Fire Rescue Dept.
419-Bradenton Fire Rescue	749-Ft. Lauderdale Fire Dept.
420-New Port Richey Fire Rescue	750-Indian River Fire-EMS
421-Bartow Fire Dept	751-Martin County Fire Rescue
422-Polk County Fire Rescue	752-Miami Beach Fire Dept.
423- Hardee County Fire Rescue	753-Key West Fire Dept.
524-Palm Bay Fire Dept.	754-Monroe County Dept.
526-Lake County Fire Services	755-City of West of Palm Beach Fire
528-Osceola County Fire Rescue	756-Palm Beach County Fire Rescue
529-Winter Park Fire Rescue	757-St Lucie County Fire Rescue
530-Sanford Fire Dept	758-Sunrise Fire Rescue
531- Dayton-Ormond Beach Fire	
532- Deltona Fire Rescue	

Search Strategy

Two general considerations are used to deploy search resources:

1. **Area to be Searched** – This involves the division of the designated area into manageable sections. Depending upon the size of the damaged area and the search resources available, an area may be sectorized by city block, or other easily definable criteria (i.e., Section, Township, and Range). The available search resources will be divided and apportioned to each sector for search operations.
2. **Priorities** – The search area is evaluated for priorities in terms of the type of occupancies affected, amount of damage, pre-evacuation, etc. Areas with the highest likelihood of survivability (in terms of type of construction) and the number of potential victims (in terms of the type of occupancy of the building) will receive attention first. Occupancies such as schools, hospitals, nursing homes, high rise and multi-residential buildings, office buildings, etc., would be high priorities.

Operations Site Set-up

- Once an area is identified with an active rescue, control of the area immediately surrounding the site will be established before rescue operations commence.
- An **Operational Work Area** is established to control access to the rescue work site except for assigned Task Force (TF) members and other local rescue personnel involved in an operation, and to provide safe and secure work areas for the personnel supporting the rescue operations.
- A Collapse/Hazard Zone is established to control access to the immediate area that could be affected or impacted by further building collapse, falling debris, or other hazardous situations (i.e., aftershocks). The only individuals that will be allowed within this area are the primary TF personnel directly involved in the search for or extrication of victims. All other TF personnel must be located outside the hot zone until assigned or rotated.
- When establishing the perimeter of the operational work area, the needs of the following areas will be properly identified:

- **Access/Entry Routes (Personnel Accountability Location)** – a clearly defined avenue(s) should be planned and identified for access to and from the rescue work site. Personnel, tools, equipment, and other logistics needs would be safely channeled through this route. In addition, controlled egress will be required to quickly evacuate a victim or injured TF member.
- **Emergency Assembly Area** – location(s) where TF personnel assemble following an emergency evacuation.

Structure/Hazards Markings

A standardized marking system is used to assure rescuer safety and to avoid needless duplication of search efforts. In order to be easily seen, the search mark must be large and of a contrasting color to the background surface. Orange spray paint is the most easily seen color on most backgrounds. Line marking or downward spray cans apply the best paint marks. A lumber marking device may be used to write additional information inside the search mark itself when it would be difficult to write the additional information with spray paint.

A "Main Entrance" search marking will be completed in two steps:

- First, a large (approximately 2') single slash shall be made near the main entrance at the start of the search with the search team identifier, date and time that they entered marked to the left of the mid point of the slash.
- After the search of the entire structure has been completed a second large slash shall be drawn in the opposite direction forming an "X". Additional information will be placed in the remaining three quadrants of the Main Entrance "X" summarizing the entire search of the structure.
- The left quadrant will already contain the search team identifier, date and time when the team first entered the structure.
- The top quadrant is for the date and time the search team left the structure.
- The right quadrant is for any significant hazards located inside the structure.
- The bottom quadrant is for the number of "LIVE" or "DEAD" victims still inside the structure this will be indicated with "L" or "D".
- Use a small "x" in the bottom quadrant if no victims are inside the structure.

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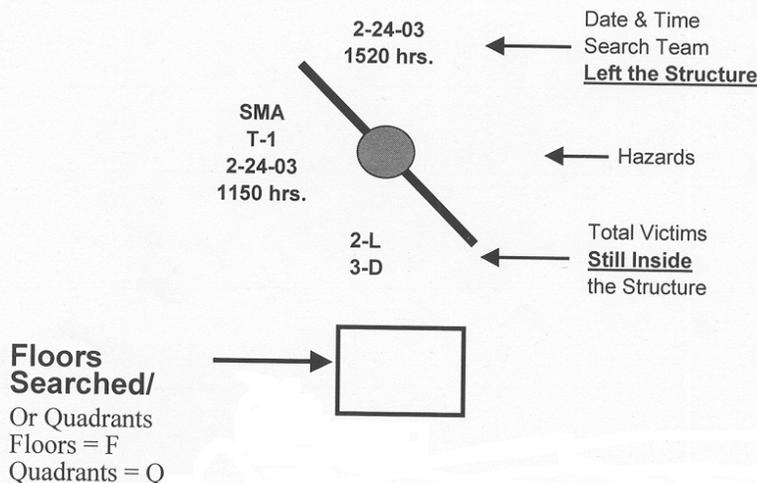
- During the search function while inside the structure a large single slash shall be made upon entry of each room or area.
- After the search of the room or area has been completed a second large slash shall be drawn in the opposite direction forming an “X”.
- The only additional information placed in any of the “X” quadrants while inside the structure shall be that pertaining to any significant hazards or the number of “LIVE” or “DEAD” victims.
- If multiple floors are searched a box under the X will show how many floors/quadrants have been searched in the positive. Indicate “F” for floors and “O” for quadrants.

SEARCH MARKINGS

Main Entrance Search Marking- WHEN YOU ENTER

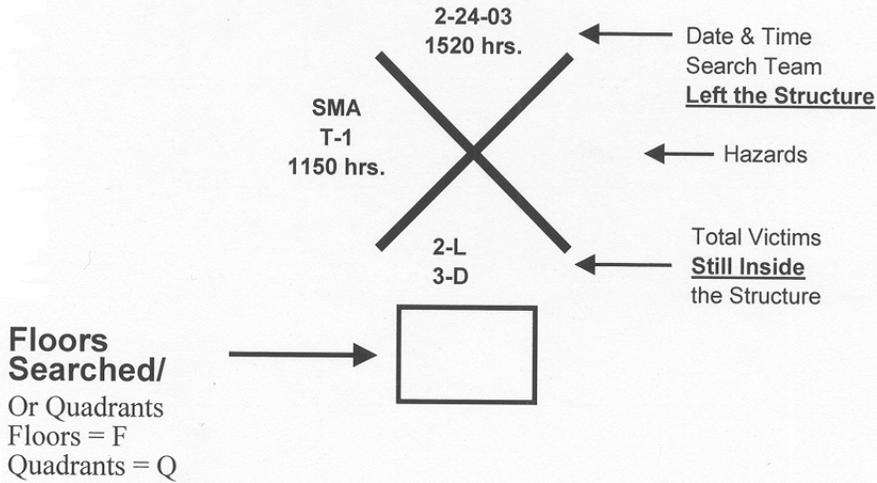
* Search Team Identifier → SMA
Time of Entry → T-1
1150 hrs.

Main Entrance Search Marking- WHEN YOU EXIT – INCOMPLETE SEARCH



Main Entrance Search Marking

WHEN YOU EXIT— COMPLETED SEARCH

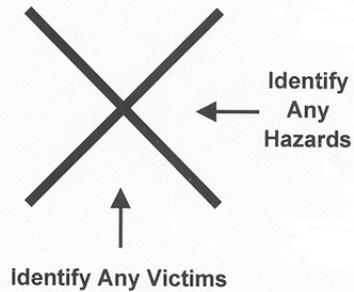


Interior Search Markings- EACH ROOM OR AREA

WHEN YOU ENTER

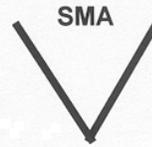


WHEN YOU EXIT

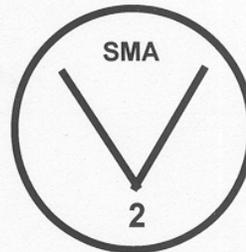


US&R VICTIM MARKING SYSTEM

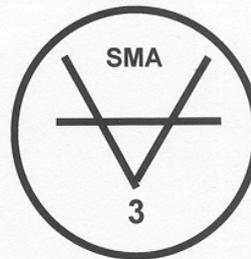
Make a large (2' x 2') "V" with orange spray paint near the location of a **potential** victim. Mark the name of the search team or crew identifier in the top part of the "V" with paint or a lumber marker type device.



Paint a circle around the "V" when a potential victim is **confirmed** to be **alive** either visually, vocally, or hearing specific sounds that would indicate a high probability of a live victim. If more than one confirmed live victim, mark the total number of victims under the "V".



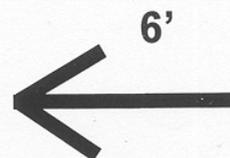
Paint a horizontal line through the middle of the "V" when a **confirmed** victim is determined to be **deceased**. If more than one confirmed deceased victim, mark the total number of victims under the "V". Use both the live and deceased victim marking symbols when a combination of live and deceased victims are determined to be in the same location.



Paint an "X" through the confirmed victim symbol after the **all** victim(s) have been removed from the specific location identified by the marking.



An arrow may need to be painted next to the "V" pointing towards the victim when the victim's location is not immediately near where the "V" is painted. Show distance on arrow.



**URBAN SEARCH AND RESCUE
GLOSSARY OF TERMS**

GLOSSARY OF COMMON TERMS

Activation – Formal request from State of Florida to a Task Force via the Point of Contact, that an event has occurred or is projected to occur, that requires mobilization and response for a mission.

Advisory – Formal notification by to TFs that an event is imminent or has occurred but does not require action at this time.

Alert – Formal notification by the State of Florida to identified TFs that an incident is imminent or has occurred that may result in an activation.

Assembly Point (AP) – Location or facility where TF members initially report after receiving activation orders from the sponsoring organization.

Cache – A State of Florida approved complement of tools, equipment, and supplies stored in a designated location, available for emergency use.

Collapse hazard zone – The area established by the TF for the purpose of controlling all access to the immediate area of the collapse.

Emergency signaling – Signals produced by warning devices on the USAR work site to address evacuation of the area, cease operations or quiet the area, and resume operations.

Engagement/disengagement – Procedures followed by a TF when beginning or ending operations at a specific work site or assigned area.

Heavy Wall Construction - Materials used for construction are generally heavy and utilize an interdependent structural or monolithic system. These types of materials and their assemblies tend to make the structural system inherently rigid. This construction type is usually built without a skeletal structural frame. It utilizes a heavy wall support and assembly system to provide support for the floors and roof assemblies. Occupancies utilizing

tilt-up concrete construction are typically one to three stories in height and consist of multiple monolithic concrete wall panel assemblies. They also use an interdependent girder, column and beam system for providing lateral wall support of floor and roof assemblies. Occupancies typically include commercial, mercantile and industrial. Other examples of this type of construction type include reinforced and unreinforced masonry (URM) buildings typically of low rise construction, one to six stories in height, of any type of occupancy.

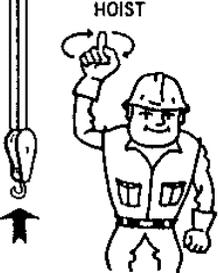
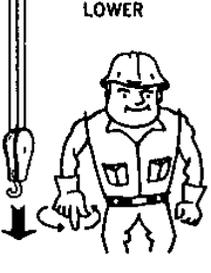
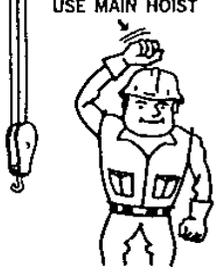
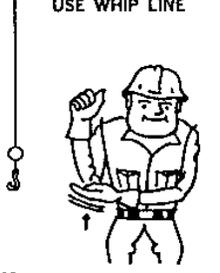
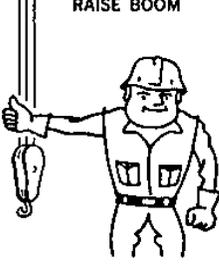
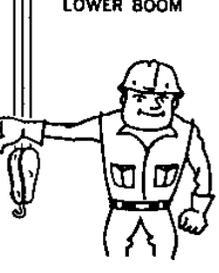
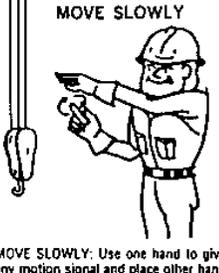
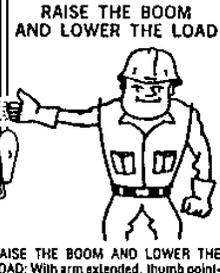
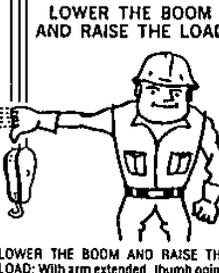
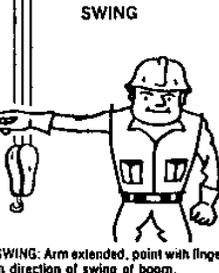
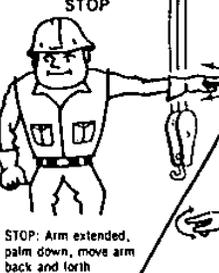
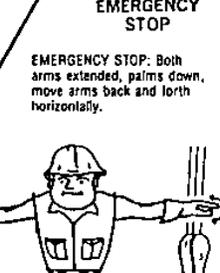
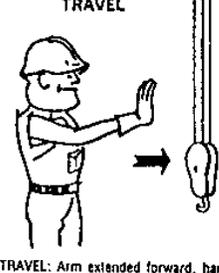
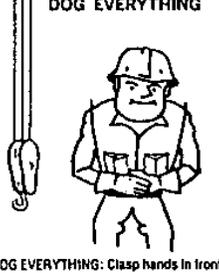
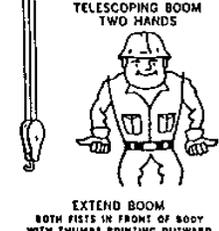
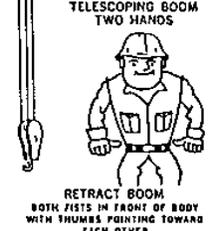
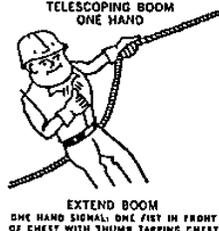
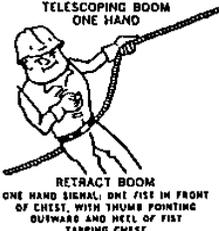
Heavy Floor Construction - Structures of this type are built utilizing case-in-place concrete construction consisting of flat slab panel, waffle or two way concrete slab assemblies. Pre-tensioned or post-tensioned reinforcing steel rebar or cable systems are common components for structural integrity. The vertical structural supports include integrated concrete columns, concrete enclosed or steel frame, which carry the load of all floor and roof assemblies. This type includes heavy timber construction that may use steel rods for reinforcing. Examples of this type of construction include offices, schools, apartments, hospitals, parking structures and multi-purpose facilities. Common heights vary from single story to high-rise structures

Joint Management Team (JMT) – The JMT provides a group of specialists readily available for rapid assembly and deployment to a disaster area. The JMT furnishes Federal, State, and local officials with technical assistance in acquiring and using USAR resources. It provides advice, Incident Command assistance, management, and coordination of USAR Task Forces, and USAR logistics support.

Light Frame Construction- Materials used for construction are generally light weight and provide a high degree of structural flexibility to applied forces such as earthquakes, hurricanes, tornadoes, etc. These structures are typically constructed with a skeletal structural frame system of wood or light gage steel components, which provide support to the floor or roof assemblies. Examples of this construction type are wood frame structures used for residential, multiple low rise occupancies and light commercial occupancies up to four stories in height. Light gage steel frame buildings include commercial business and light manufacturing occupancies and facilities.

Pre-cast Construction- Structures of this type are built utilizing modular

pre-cast concrete components that include floors, walls, columns and other sub-components that are field connected upon placement on site. Individual concrete components utilize imbedded steel reinforcing rods and welded wire mesh for structural integrity and may have either steel beam, or column or concrete framing systems utilized for the overall structural assembly and building enclosure. These structures rely on single or multi-point connections for floor and wall enclosure assembly and are a safety and operational concern during collapse operations. Examples of this type of construction include commercial, mercantile, office and multi-use or multi-function structures including parking structures and large occupancy facilities.

<h1>CRANE SIGNALS</h1> <p>ALWAYS STAND IN CLEAR VIEW OF YOUR CRANE HOIST ENGINEER</p> <p>BE SURE TO STAY A SAFE DISTANCE FROM HOOK, BLOCK OR BOOM</p> <p>Published by SPECIALIZED CARRIERS & RIGGING ASSOCIATION</p> <p>In accordance with the American National Standards Institute</p>		<p>HOIST</p>  <p>HOIST: With forearm vertical, forefinger pointing up, move hand in small horizontal circles.</p>	<p>LOWER</p>  <p>LOWER: With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>
<p>USE MAIN HOIST</p>  <p>USE MAIN HOIST: Tap fist on head, then use regular signals.</p>	<p>USE WHIP LINE</p>  <p>USE WHIP LINE: (Auxiliary Hoist) Tap elbow with one hand; then use regular signals.</p>	<p>RAISE BOOM</p>  <p>RAISE BOOM: Arm extended, fingers closed, thumb pointing upward.</p>	<p>LOWER BOOM</p>  <p>LOWER BOOM: Arm extended, fingers closed, thumb pointing downward.</p>
<p>MOVE SLOWLY</p>  <p>MOVE SLOWLY: Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example)</p>	<p>RAISE THE BOOM AND LOWER THE LOAD</p>  <p>RAISE THE BOOM AND LOWER THE LOAD: With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	<p>LOWER THE BOOM AND RAISE THE LOAD</p>  <p>LOWER THE BOOM AND RAISE THE LOAD: With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>	<p>SWING</p>  <p>SWING: Arm extended, point with finger in direction of swing of boom.</p>
<p>STOP</p>  <p>STOP: Arm extended, palm down, move arm back and forth horizontally.</p>		<p>EMERGENCY STOP</p>  <p>EMERGENCY STOP: Both arms extended, palms down, move arms back and forth horizontally.</p>	
<p>TRAVEL</p>  <p>TRAVEL: Arm extended forward, hand open and slightly raised, making pushing motion in direction of travel.</p>		<p>DOG EVERYTHING</p>  <p>DOG EVERYTHING: Clasp hands in front of body.</p>	
<p>TELESCOPING BOOM TWO HANDS</p>  <p>EXTEND BOOM BOTH FISTS IN FRONT OF BODY WITH THUMBS POINTING OUTWARD</p>	<p>TELESCOPING BOOM TWO HANDS</p>  <p>RETRACT BOOM BOTH FISTS IN FRONT OF BODY WITH THUMBS POINTING TOWARD EACH OTHER</p>	<p>TELESCOPING BOOM ONE HAND</p>  <p>EXTEND BOOM ONE HAND SIGNAL: ONE FIST IN FRONT OF CHEST WITH THUMB TAPPING CHEST</p>	<p>TELESCOPING BOOM ONE HAND</p>  <p>RETRACT BOOM ONE HAND SIGNAL: ONE FIST IN FRONT OF CHEST, WITH THUMB POINTING OUTWARD AND HEEL OF FIST TAPPING CHEST</p>