

# SANTA CLARA COUNTY LOCAL FIRE SERVICE AND RESCUE MUTUAL AID PLAN

## APPENDIX 14c –LARGE AREA SEARCH

Revised Date: July 2024

Next Revision Date: July 2026

### Introduction

The search for victims in fire-involved structures is a fundamental fire ground objective. Rapid, systematic, and thorough search methods maximize survivability profiles for trapped victims and the safety and accountability of firefighters. Structures that present large search areas such as warehouses, office buildings, hotels, and apartment buildings, “big box” stores, etc., are difficult to search rapidly and challenge firefighter safety and accountability. The basic “buddy system” can be effective in small scale search or mitigation scenarios, however, is insufficient in the Large Area Search (LAS) environment. A systematic, standardized method must be utilized in order to rapidly and effectively search large areas, to prevent firefighter disorientation and/or separation, provide paths of egress, to rotate personnel for fatigue and effective air management, and finally, to maintain fire ground accountability at all times.

### Purpose

Large Area Search (LAS) Policy and Procedures are provided to support LAS operations through AutoAid and Mutual Aid throughout Santa Clara County by providing for standardized operations, terminology, and equipment.

### Policy

Fire agencies within Santa Clara County committing mutual-aid and/or auto-aid resources to incidents involving operations and/or search in large structures will follow LAS procedures as defined below.

All fire agencies within the county responding to mutual aid or auto-aid requests shall be prepared to support LAS operations.

IT IS CRITICAL THAT RESPONDERS EXERCISE LAS SKILLS IN ORDER TO OPERATE EFFECTIVELY IN ZERO VISIBILITY AND/OR HIGH STRESS CONDITIONS (I.E. RIC DEPLOYMENTS, DETERIORATING CONDITIONS, ETC.)

### Procedures

#### A. Equipment

The following equipment shall be assembled as one (1) LAS “Search Rope Pack”:

ITEM	QUANTITY	DESCRIPTION	SPECIFICATIONS
1. Search Rope	1	Rope configured with rings and knots to identify depth into structure, direction of travel (i.e., “rings out” or “knots in”), and to provide a tethering point for searchers.	200’ 7/16” Kevlar search rope w/ carabineer at end; 10’ red tape mark; 2 ½” metal rings at 20’ intervals preceding knot markings for each 20’ (20’ = 1 knot, 40’ = 2 knots, 60’ = 3 knots, etc.)

**APPENDIX 14C –LARGE AREA SEARCH**

Revised Date: July 2024

2. Search Rope Bag	1	“Stuff” sack for search rope	200’ rope end loaded first and secured; load remainder into one side of bag using the “stuff” method to avoid entanglement. Labeled “Search Rope” and company ID.
3. LAS Equipment Bag	1	Bag attached to Search Rope Bag for carrying LAS Kit contents	Labeled with company ID
4. Tether	2	Tether line to enable movement lateral to Search Rope line	20’ with snap-hook affixed to one end and a slip knot and metal ring at the other
5. Stopwatch	1	Timepiece to accurately track and record entry / air management times.	N/A
6. Air Management Chart & Writing Implements	1	Air Management / Personnel Accountability Tracking Form	8 ½” X 11” pre-printed tracking form; laminated; (Permanent marker, dry erase marker, wax pencil)
7. Thermal Imaging Camera* (TIC)	1	Thermal Imaging Camera (TIC) ruggedized for firefighting applications	(* with spare battery)
8. Forcible Entry Tool	2	Striking/Prying tool for firefighter “Forcible Exit” purposes	Halligan, Axe, etc.
9. Sounding / Sweeping Tool	1	Mid-length tool for reaching and for sounding support surfaces	Short pike pole, rubbish hook

**B. POSITIONS AND RESPONSIBILITIES**

1. The following position assignments will comprise a Five (5) Person Team initiating a LAS:

<b>POSITION</b>	<b>EQUIPMENT</b>	<b>RESPONSIBILITIES / NOTES</b>
1. Rope Deployment	<ul style="list-style-type: none"> <li>• Search Rope Bag</li> <li>• Forcible Entry Tool</li> </ul>	Shall track LAS entry team movements including depth of entry and direction
2. Company Officer	<ul style="list-style-type: none"> <li>• TIC (w/ spare battery)</li> <li>• Sounding / Sweeping Tool</li> </ul>	Shall lead entry team; shall maintain PAR of entry personnel; shall monitor air usage of all personnel; shall scan areas with TIC; shall direct search operations; shall report conditions via radio to IC
3. Searcher 1	<ul style="list-style-type: none"> <li>• 20’ Tether</li> <li>• Forcible Entry Tool</li> </ul>	

**APPENDIX 14C –LARGE AREA SEARCH**

Revised Date: July 2024

4. Searcher 2	<ul style="list-style-type: none"> <li>• 20’ Tether</li> <li>• Forcible Entry Tool</li> </ul>	
5. Door Watch / Timekeeper	<ul style="list-style-type: none"> <li>• Stopwatch</li> <li>• Air Management Chart (Writing Implements)</li> </ul>	

2. The following position assignments will comprise a Four (4) Person Team initiating a LAS:

<b>POSITION</b>	<b>EQUIPMENT</b>	<b>RESPONSIBILITIES / NOTES</b>
1. Rope Deployment	<ul style="list-style-type: none"> <li>• Search Rope Bag</li> <li>• Forcible Entry Tool</li> </ul>	Shall track LAS entry team movements including depth of entry and direction travel
2. Company Officer	<ul style="list-style-type: none"> <li>• TIC (w/ spare battery)</li> <li>• Sounding / Sweeping Tool</li> </ul>	Shall lead entry team; shall maintain PAR of entry personnel; shall monitor air usage of all personnel; shall scan areas with TIC; shall direct search operations; shall report conditions via radio to IC

3. Searcher 1	<ul style="list-style-type: none"> <li>• 20’ Tether</li> <li>• Forcible Entry Tool</li> </ul>	
4. Searcher 2	<ul style="list-style-type: none"> <li>• 20’ Tether</li> <li>• Forcible Entry Tool</li> </ul>	
<b>OR</b>		
4. Door Watch / Timekeeper	<ul style="list-style-type: none"> <li>• Stopwatch</li> <li>• Air Management Chart (Writing Implements)</li> </ul>	Company Officer may assign this position in lieu of a second searcher based upon conditions and objectives

3. The following position assignments will comprise a Three (3) Person Team initiating a LAS:

<b>POSITION</b>	<b>EQUIPMENT</b>	<b>RESPONSIBILITIES / NOTES</b>
1. Rope Deployment	<ul style="list-style-type: none"> <li>• Search Rope Bag</li> <li>• Forcible Entry Tool</li> </ul>	Shall track LAS entry team movements including depth of entry and direction
2. Company Officer	<ul style="list-style-type: none"> <li>• TIC (w/ spare battery)</li> <li>• Sounding / Sweeping Tool</li> </ul>	Shall lead entry team; shall maintain PAR of entry personnel; shall monitor air usage of all personnel; shall scan areas with TIC; shall direct search operations; shall report conditions via radio to IC
3. Searcher 1	<ul style="list-style-type: none"> <li>• 20’ Tether</li> <li>• Forcible Entry Tool</li> </ul>	

### C. INITIATING LARGE AREA SEARCH

1. The following critical objectives shall be achieved upon deployment of a LAS Team.
  - a. Search Rope Deployment: The Search Rope is the key tool that provides continuous and accurate orientation for firefighters within the structure. Without this orientation tool, personnel accountability cannot be maintained. ALL PERSONNEL WILL REMAIN IN CONTACT WITH THE SEARCH ROPE (OR CONNECTED TETHER).
  - b. Air Management: Air management is a critical element of LAS. LAS utilizes the 1/3 rule for management of breathing air. This allows 1/3 of breathing air for entry and search, 1/3 of breathing air for egress, and 1/3 of air for EMERGENCY AIR RESERVE.
  - c. Personnel Accountability: LAS environments require highly disciplined accountability. Personnel entering the hazard zone must be identified and accounted for at all times.
  - d. Incident Command: Conformance to principles of Incident Command is critical in the LAS environment. Span of control and unity of command provide the foundation for effective command and control in these complex environments.
  
2. LAS Team Deployment: Pre-Entry
  - a. Company Officer: will assemble LAS Team and equipment at identified entry point.
    - i. Assign positions to each team member
    - ii. Conduct pre-entry crew safety inspection
    - iii. Ensure radios are on correct frequency iv. TIC and spare battery in hand
  
  - b. Rope Deployment Firefighter:
    - i. Will anchor the Search Rope with Search Rope Bag to a secure anchor near the entry point and note rope length at entry point (10' mark is ideal)
  
  - c. Search Firefighter (s):
    - i. 20' Tether in hand
    - ii. Forcible entry tool in hand
  
  - d. Doorperson/Timekeeper: (If no personnel are available to assume this position, Company Officer should utilize IC or communications to perform these functions)
    - i. Note entrant names and air levels on Air Management Sheet
    - ii. Start stopwatch upon team entry
  
3. LAS Team Deployment: Entry & Search
  - a. Rope Deployment Firefighter: enters first deploying search rope (ring closest to entry point / knots deeper into structure)

- i. Keeping search rope taught at all times
    - ii. Anchoring search rope to secure objects at changes of direction
    - iii. Advancing as directed by the Company Officer, and no further than the full length of the search rope
  - b. Company Officer: will enter immediately with Rope Deployment firefighter with a TIC and sounding tool to survey areas and direct search patterns (Target Area or Fan Search).
    - i. Maintaining accountability of entry team
    - ii. Maintaining air awareness/air management
    - iii. Reporting progress/conditions to IC.
  - c. Searcher(s):
    - i. Conduct Target Area or Fan Search sweeps as directed
    - ii. Maintain contact with search rope at all times with left hand; or,
    - iii. Conduct lateral sweeps from tether clipped to search rope with slip knot on wrist iv. Two (2) searchers may connect tether to tether extending laterally up to 40 feet, provided they maintain no greater than 20' spacing between them
  - d. Doorperson/Timekeeper: (If no personnel are available to assume this position, Company Officer should utilize IC or communications to perform these functions)
    - i. Start stopwatch upon team entry
    - ii. Provide 5-minute interval alerts via radio to entry team
    - iii. Record reported air levels and depth of entry iv. Brief relief search teams
- 4. Relief Search Team(s): Pre-Entry
  - a. Relief Company Officer will assemble relief LAS Team and equipment at entry point.
    - i. OBTAIN BRIEFING/SITUATIONAL (FROM IC OR DOOR PERSON/TIMEKEEPER)
    - ii. Assign positions to each team member
    - iii. Conduct pre-entry crew safety inspection
    - iv. Ensure radios are on correct frequency
    - v. TIC and spare battery in hand
    - vi. Ensure Door Person/Timekeeper functions are performed
  - e. Relief Rope Deployment Firefighter: enters first following deployed search rope to end of deployment
    - i. Keeping search rope taught at all times
    - vii. Anchoring search rope to secure objects at changes of direction

- viii. Advancing as directed by the Company Officer, and no further than the full length of the search rope
  - f. The Relief Company Officer: will enter immediately with Rope Deployment firefighter with a TIC and sounding tool to survey areas and direct search patterns (Target Area or Fan Search).
    - i. Advancing to last position of previous search team
    - ii. Maintaining accountability of entry team
    - iii. Maintaining air awareness/air management iv. Reporting progress/conditions to IC
  - g. Searcher(s):
    - i. Conduct Target Area or Fan Search sweeps as directed
    - ii. Maintain contact with search rope at all times with left hand; or,
    - iii. Conduct lateral sweeps from tether clipped to search rope with slip knot on wrist iv. Two (2) searchers may connect tether to tether extending laterally up to 40 feet, provided they maintain no greater than 20' spacing between them
5. Incident Commander (IC)
- a. LAS Support: IC shall maintain situational awareness regarding interior conditions and search team accountability.
    - i. Assign relief crews to support extended search operations
    - ii. Assign RIC(s)
    - iii. Ensure sufficient air bottles or request Breathing Support Unit iv. Establish Rehab as appropriate