



**LADDER COMPANY OPERATIONS:
PRIVATE DWELLINGS**

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1. GENERAL

1.1 Introduction

- 1.1.1 Private dwelling fires challenge the expertise of our fire fighting forces and require a coordinated team operation.
- 1.1.2 This type of building is usually constructed of combustible material. The furnishings and decorations used by the occupants have varying degrees of fuel content and flammability. Fire conditions will generate heat, toxic smoke and gases.
- 1.1.3 Complicating fire operations we may expect obstacles such as; hilly terrain, set backs, overhead wires, fences, trees, shrubbery diverse architectural features and numerous floor plans.
- 1.1.4 This bulletin - Ladders 4 - will detail the basic operations, assignment of members and tool complement of ladder companies operating in detached peak roof - private dwellings and will be considered as the SOP for operations in private dwellings.
- 1.1.5 The intent of this bulletin is to promote coordinated action of ladder companies and to fully utilize men and equipment with the ultimate goal of reducing loss of life and property in private dwelling fires.
- 1.1.6 Queen Anne type structures are dealt with in section 11.
- 1.1.7 Attached peak roof, attached flat roof and detached flat roof are covered to point out additional operational requirements.
- 1.1.8 The general concept of Fire Tactics and Procedures as contained in other department ladder bulletins has been incorporated in Ladders 4.
- 1.1.9 Assignment of tools remains basically the same as Ladders 3. However, Private Dwellings have unique problems and require slight variations in tool and position assignment.

1.2 Description of Private Dwellings (General)

- 1.2.1 Originally built for one or two family occupancy, these structures are usually one to three stories in height. They may be attached to adjoining buildings , semi-attached or detached. The interior of split level homes however, may have as many as five levels within a three story building.

- 1.2.2 Usually rectangular in shape, although alterations and extensions are common. They average approximately 20' x 40' in dimension, although there are many much larger in size and area.
- 1.2.3 Class 4 (Frame) - New Code II E or Class 3 (NFP) - New Code II B construction. Exterior walls of wood, brick, brick veneer, composition materials or aluminum siding are the most common.
- 1.2.4 Roofs are peaked or flat. Peaked roofs are designated according to construction features including Mansard, Gable, Hip, Shed or Gambrel types. Roof covering may be asphalt or asbestos shingles (rare) or asphalt roll roofing. Generally roll roofing is used for a low pitch roof. Flat roofs or roofs of low pitch usually have a scuttle and/or skylight. The installation of skylights in new construction and during renovations has become increasingly common on higher pitched roofs.
- 1.2.5 Windows may include the older wooden double hung type, jalousie, metal framed casement or aluminum sliding type.
- 1.2.6 Two entrances are usual. A main entrance in front and a secondary entrance on the side or rear. In structures more than one story, the interior stairs to the cellar will usually be located under the main stair. With semidetached structures or those with minimal space on one side, the inside cellar stair will usually be found near the side or rear entrance. Occasionally an outside entrance to the cellar will be found in the rear.
- 1.2.7 Fire stopping is limited depending on the type of construction. Fire stopping in balloon construction is particularly poor, having little or no vertical fire stopping between stories on exterior walls.

1.3 Special Problems

The following, although not found in all Private Dwellings, are quite common, and create special fire safety and fire fighting problems:

- 1.3.1 Open and unenclosed stairway. This is the major weakness from a fire fighting and fire protection standpoint.
- 1.3.2 Lack of secondary means of egress from upper floors.
- 1.3.3 Interior stairs are often narrow and sometimes turning. Landings are small. Movement of the operating force is often restricted, impeding an interior attack.
- 1.3.4 Bedrooms are usually located on upper floors and bedroom doors may be nonexistent, removed, poorly fitted, or left open. For an evident two family dwelling (separate entrances, mailboxes, etc.) assume bedrooms on both floors.

- 1.3.5 Individual window air conditioners in bedrooms may be installed in the only window in the room. The air conditioner may fall if the window is opened. Special care must be exercised if this window has to be entered from a ladder.
- 1.3.6 Windows of multiple varieties and dimensions are often inadequate in size for escape or rescue purposes.
- 1.3.7 Interior access to attic spaces is usually difficult or non-existent. Where access is provided, it may be via a very narrow stair, straight ladder in a closet, scuttle opening over the stair or in a bedroom closet, or a pull down type stairs.
- 1.3.8 Exterior access to attic space may be non-existent or difficult, as via small windows, louvered openings, etc.
- 1.3.9 Poor separation between cellars and first floor, e.g., open joists, flimsy doors, etc. Flooring is often burned through, even with limited fire.
- 1.3.10 Unenclosed boilers and hot water heaters without any boiler room or ceiling protection.
- 1.3.11 Attached and built in garages, with the attendant problem of automobile fires, flammable liquids, etc.
- 1.3.12 Central Air Conditioning - Carries smoke and toxic gases from a small fire throughout the building especially into sleeping areas. Combined heat and air-conditioning units will be in operation throughout the year.
- 1.3.13 "Do-it-yourself" alterations and repair using sub-standard materials, and often faulty workmanship.
- 1.3.14 Hard roofing, such as tile and slate, create special problem relative to laddering, footing, and falling debris.
- 1.3.15 Aluminum Siding - Fire involving the electrical service may charge the entire siding and the ground is completed when an aluminum ladder is placed against it.
- 1.3.16 Overhead Electrical Service supplying private dwellings require extra caution when operating around or near them with an aluminum ladder.
- 1.3.17 Shrubby - Thoroughly examine areas under windows, porch roofs etc. as persons may have jumped before arrival of the Fire Department. Particularly if the house is surrounded by trees and bushes they may be easily overlooked. The outside team of the 1st ladder to arrive shall check this possibility, especially if windows are fully opened. A secondary search and examination shall be made as soon as possible.

1.4 Life Hazard

- 1.4.1 A rapid build up of heat and smoke in the confined areas of a private dwelling aided by the normally open interior doors is an extreme threat to the occupants. A coordinated effort by the Inside and Outside Team to search for and remove all endangered occupants must be the primary consideration of all Ladder Company operations, especially on upper floors.
- 1.4.2 In many areas of the City, buildings which were originally constructed as one and two family dwellings have been illegally converted into multiple dwellings without appropriate safeguards. Additional families and "roomers" are found living in attic spaces, in basements, and in cellars.

1.5 General Areas of Responsibility

- 1.5.1 Due to the relatively small height and area of the private dwellings, as compared to the Multiple Dwelling discussed in Ladders 3, the 1st to arrive Ladder Company is responsible for forcible entry, ventilation, and search of both the fire floor and floors above. The 2nd Ladder to arrive will primarily be used to augment the search for Life and then to assist as needed.

1.5.2 First Ladder Company to Arrive

- A. Rapid comprehensive exterior size up of fire situation. Determine life hazard and rescue as required.
- B. Vent, Entry and Search of all occupied areas of the dwelling either via the interior, or by a combination of an interior/exterior approach.
- C. Nothing must delay primary search, but an examination of entire building must be made as soon as possible.
- D. After arrival of the 2nd Ladder Company, the 1st Ladder is generally responsible for the fire floor and floors below.

1.5.3 Second Ladder to Arrive

Report to the Officer in Command and prepare to:

- A. Augment or supplement laddering operations of 1st Ladder, where required.
- B. Search areas not yet covered by 1st Ladder Company.
- C. As soon as possible, assume responsibility for operations above the main body of fire, to include opening of the roof if necessary.

NOTE: Members of 2nd Ladder to arrive shall have their H.T. turned on to hear any transmissions of 1st Ladder on scene relative to possible location of occupants, ventilation required etc.

2. CONCEPT OF OPERATIONS.

2.1 Assumptions

- 2.1.1 There is a light to medium fire situation in an occupied detached private dwelling - peaked roof, with one or more rooms involved. The operations described herein are based on this hypothetical fire situation.
- 2.1.2 The 1st Ladder to arrive will operate in all areas of the building pending the arrival of the 2nd Ladder Company.
- 2.1.3 Search and Rescue operations must be anticipated and will be of primary importance
- 2.1.4 Ladder Companies are manned by an officer and five firefighters.
- 2.1.5 VES (ventilation, entry, search) as it is used in this bulletin is, when necessary, the COMPLETE removal of glass, window sash, curtains, blinds, etc., from the window selected for entry/search/rescue. This is accomplished in preference to rapid, incomplete, ventilation of all available windows, with the sole intent of facilitating the inside operation. The combined ventilation, entry, search operations will be hereafter referred to as VES.

2.2 The 1st Ladder Company on the scene will institute a Two Team offense that will attack on different levels of a Private Dwelling simultaneously.

2.2.1 An Inside Team consisting of:

- A. Officer
- B. Forcible Entry Firefighter
- C. Extinguisher Firefighter

Will make their entry to the building via an entrance on the 1st floor level and move to areas of probable life occupancy.

2.2.2 An Outside Team consisting of:

- A. Chauffeur
- B. OVM
- C. Roof Man

Will use ladders (Aerial/Tower Ladder/Portable) to make their entry into the building at the upper levels. This approach allows quick entry and search of bedrooms above 1st floor.

- 2.3 If Aerial or Tower Ladder is used the position of the Outside Team is:
 - 2.3.1 **Chauffeur** - At turntable or pedestal
 - 2.3.2 **OVM** - Ascends aerial or operates from basket for VES
 - 2.3.3 **Roof Firefighter** -To the rear/side/porch for portable ladder operations.
- 2.4 The objective of this concept is to remove all visibly endangered persons to safety and to search for and rescue any trapped or overcome occupants, and to do so in the shortest possible time.
- 2.5 To eliminate duplication of effort and to permit rapid entry and search of all bedrooms on upper floors requires that specific areas or rooms be assigned to each member/team of the first arriving ladder company. This SOP is as outlined in the diagram.

3. OPERATION OF FIRST LADDER COMPANY

- 3.1 Inside Team
 - 3.1.1 General duties will be to force entry, locate fire, search and removal of victims, ventilation as required.
 - 3.1.2 **Officer**
 - A. As the first officer on the scene, make a rapid size-up. With evident fire within building, members will prepare to initiate SOP under the supervision of the officer unless otherwise directed.
 - B. Order the positioning of the aerial ladder or tower ladder, if necessary.
 - C. Directly supervise the Inside Team. Determine the location of the fire, control ventilation, direct search and rescue.
 - D. Coordination of activities will be accomplished by handle-talkie. When outside operation is not necessary, notify members to prevent unnecessary window damage.
 - 3.1.3 **Forcible Entry Firefighter**
 - A. TOOLS:
Axe and Halligan tool.
 - B. POSITION:
At the door to the main entrance.

- C. DUTIES:
 - 1. Force main entrance to the building. This usually presents no problem in Private Dwellings since the door and lock assembly are generally of light construction. Often there is a glass insert in or adjoining the door. It is easier and less damaging to break this small pane, reach in and open the lock from the inside. In all cases try the door knob first.
 - 2. Forcing the main entrance, provides access to the interior stair for the protection and control of this vital area.
 - 3. If the main stair would not be endangered, and Engine Company could extinguish the fire more readily from the side entrance then it too shall be used.
 - 4. Conduct search of lower floors and ventilate as directed by the officer in command.

3.1.4 Extinguisher Firefighter

- A. TOOLS:

Extinguisher and a 6' hook.
- B. POSITION:

At the door to the main entrance.
- C. DUTIES:
 - 1 Operate with and assist the forcible entry man.
 - 2 Conduct search of lower floors and ventilate as ordered.
 - 3 Since search and removal of occupants are the prime consideration the extinguisher must be used with specific objectives in mind.
 - a. To cover members in search and removal operation, when working near or passing the main body of fire.
 - b. To enable members to get close enough to a room out of which fire is lapping, so as to close an open door and confine the fire.
 - c. To control a developing situation, as determined by the officer in command.
 - d. The practice of trying to expend the extinguisher into a fully involved room, solely for extinguishing purposes, has a minimal effect, and is a waste of much needed time.

3.1.5 Additional Considerations of the Inside Team

- A. Aggressive leadership by the officer is the most important factor in conducting the inside attack.
- B. The dominant consideration of the "inside team" is search and rescue of those occupants who have a chance of survival if immediately removed. Therefore, if officer and members of the inside team are met at the front door by fire they will not wait to advance in behind the line. Rather, they will seek another means of access into those rooms not yet involved in fire. In this event one man will be designated to remain with the Engine to perform any required Truck work as needed.
- C. The time of the incident plays a key role in search operations. During sleeping hours a heavy emphasis must be placed on bedroom search. Limited time is spent on Living Room, Dining Room and Kitchen areas. Concentration must be on first floor bedrooms (if any).
- D. When search of the first floor is completed, the inside team shall make a rapid advance to upper floor bedrooms via interior stair.
- E. Search of the cellar floor shall be the responsibility of the inside team when directed by the Officer.
- F. For a fire on a lower floor, where outside ventilation is necessary to permit the engine company to advance the line, the officer shall designate one member from the inside team to perform this operation.
- G. Ventilation of lower floor-windows should not jeopardize those members operating into upper stories via outside portable ladders.

3.2 Outside Team

3.2.1 Duties - General

- A. Ladder the building as directed by this bulletin.
- B. Make VES via upper level window or windows for search and rescue.
- C. Report the location or extension of fire to the officer in command.
- D. For upper level operation the Aerial or Tower Ladder may be used when directed by the officer.
- E. Both Aerial and Tower Ladders are more stable than portable ladders.
- F. Both Aerial and Tower Ladders can be used for roof operations as required.

Consideration should be given to removing skylights if required by fire conditions to provide vertical ventilation.

- G. Tower Ladder can reach front and side windows on upper levels and provide a better approach and a more efficient means of removing victims. Access will be faster, windows removed with greater ease and a safer egress provided in emergency for the firefighter conducting the search.
- H. Where the use of the aerial or tower ladder is negated by obstructions or topography, the Outside Team will perform their duties via portable ladders.

PORTABLE LADDER OPERATION

3.2.2 Roof Firefighter

- A. TOOLS:
Handie talkie, Portable Ladder 15/25' Metal Extension and a 6' hook or Halligan Hook.
- B. POSITION:
Generally front porch of building.
- C. DUTIES:
 - 1. Roof operations are generally not feasible during initial fire operations at fires in private dwellings with peaked roofs. Therefore, the Roof firefighter can be used to advantage in the VES.
 - 2. Where there is a porch or garage roof access to an upper floor window, a portable ladder will be raised to this roof. The Roof firefighter will operate from this area into the window.

This will enable the Roof firefighter to operate rapidly, by himself. All that is required to get to the porch roof is a small ladder, easily handled by the one man.
 - 3. If there is no porch access, the Roof firefighter will work from an area which provides a physical butt for the ladder, e.g., adjoining building, retaining wall, etc.
 - 4. If the conditions are such that methods 2 or 3 are not feasible, the Roof firefighter will work in the front of the building where, if need be, he can get the momentary assistance of any uncommitted member on the scene.
 - 5. Whenever the roof firefighter enters a window to search and is operating alone, he/she will notify his/her officer via handie talkie.
 - 6. This position will be reinforced by the 2nd to arrive ladder company or upon his call for assistance via handie talkie.

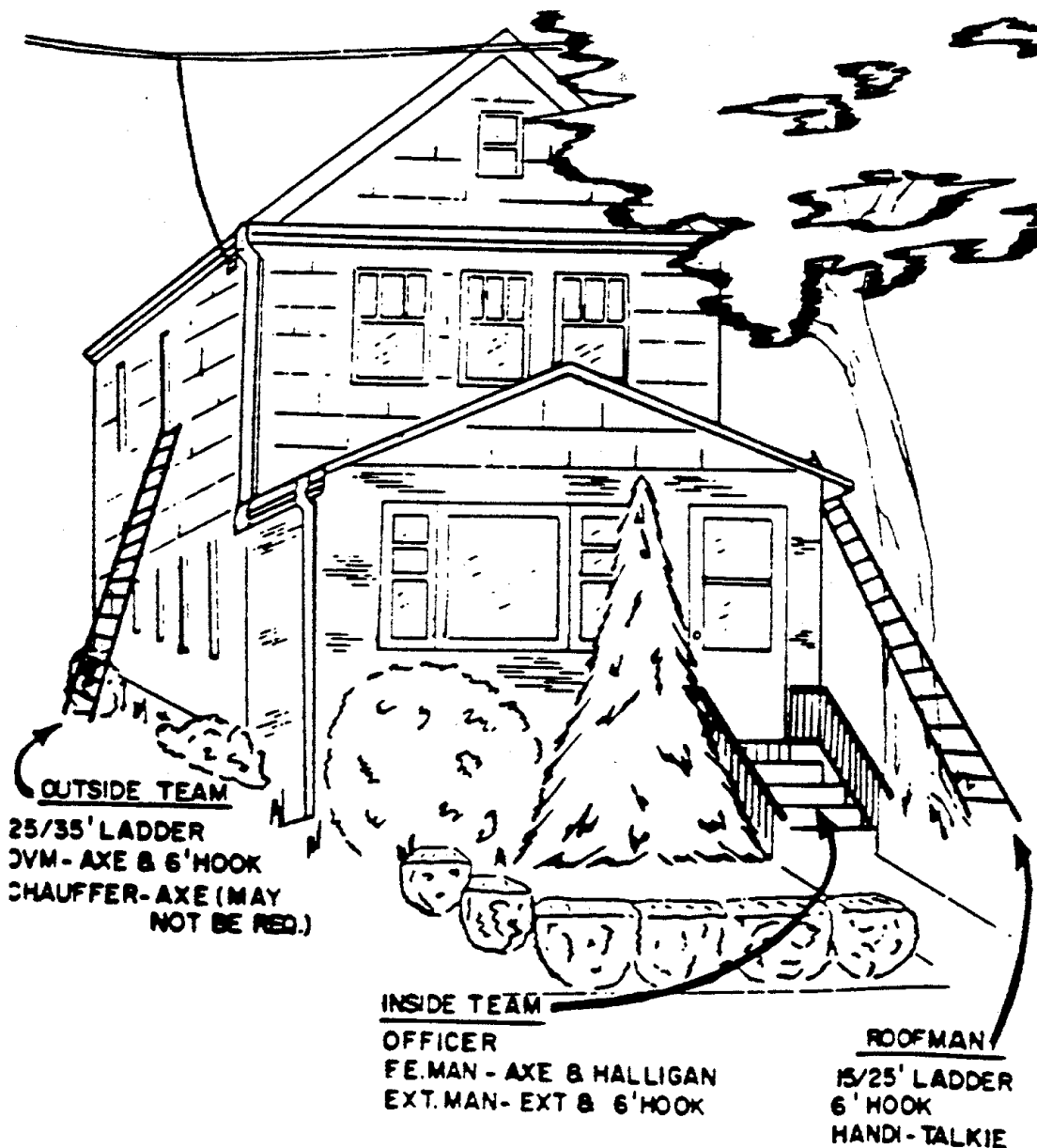
3.2.3 **Chauffeur**

- A. **TOOLS:**
Axe and Portable Ladder (25/35' Metal Extension) assisted by OVM.
- B. **POSITION:**
Generally rear/side of building.
- C. **DUTIES:**
 1. Initial laddering of the building as directed by this bulletin.
 2. Raise portable ladder to another usable porch or extension or to a window in another upper level room. If possible, ladders should be placed at the front and rear of the building.
 3. Perform VES of upper floor room or rooms via selected window.
 4. Proper operations at this window in carrying out VES requires the COMPLETE removal of glass, window sash, curtains, blinds, etc.
 5. VES will be carried out at other strategic windows as required.
 6. Perform outside ventilation of upper floors.

3.2.4 **Outside Vent Member (OVM)**

- A. **TOOLS:**
Axe and 6' hook, assist chauffeur with 25/35' metal extension ladder.
- B. **POSITION:**
Generally rear/side of building.
- C. **DUTIES:**
 1. The OVM will operate with, assist and reinforce the duties of the chauffeur.
 2. When the chauffeur enters a window from a portable ladder to search, the OVM will butt the ladder and otherwise assist as required.
 3. If a second window is selected for entry and search the OVM will exchange positions with the chauffeur. He will make the search and the chauffeur will butt the ladder.
 4. This exchanging of positions will continue if more windows have to be entered.
 5. If removal of a victim is necessary, the ladder should be lowered to sill level, the buttman shall call for assistance to butt the ladder and climb to a point where he can receive the overcome individual and descend. Dependent upon the size and weight of the rescued person, he may need back up while descending the ladder.

6. If it is possible to butt the ladder by some physical source the buttman may climb the ladder to window height after #1 man has entered the window. This is to assist him in any way possible, render support, and to vocally direct the inside member back to the window area, if this becomes necessary due to an exceptionally heavy smoke condition. Similarly, once the room has been entered, the buttman might perform additional outside ventilation as long as he is alert to assist the other member upon his return to the window.



AERIAL LADDER OPERATION

3.2.5 Chauffeur

- A. POSITION:
Front of Building.
- B. DUTIES:
 - 1. Raise and position Aerial Ladders as ordered.
 - 2. Ascend ladder and assist OVM in VES and removal of endangered occupants.
 - 3. Remove skylights where possible.

3.2.6 OVM

- A. POSITION:
Front of Building.
- B. DUTIES:
 - 1. Ascends aerial ladder and performs VES.
 - 2. Remove skylights where possible.

3.2.7 Roof Firefighter

- A. POSITION:
Rear/side porch.
- B. DUTIES:
As outlined in 3.2.2.C.

TOWER LADDER OPERATION

3.2.8 Chauffeur

- A. POSITION:
Front of building.
- B. DUTIES:
Raise and position Tower Ladder as ordered.

3.2.9 OVM

- A. POSITION:
In basket of Tower Ladder.
- B. DUTIES:
 - 1. VES of windows on front and side of building.
 - 2. Remove skylights where possible.

3.2.10 Roof Firefighter

- A. POSITION:
Rear/side porch.
- B. DUTIES:
As outlined in 3.2.2.C.

3.3 Additional Considerations of the Outside Team

3.3.1 Under light smoke and heat conditions a completely interior operation may be feasible. Under any other condition however utilization of ladders (Aerial/ Tower Ladder/Portable) to upper sleeping areas is usually preferable and provides for:

- A. A two sided approach to any potential area of life occupancy on upper floors.
- B. Members on ladders are often working in relatively "clean" air until actual entry into rooms.
- C. Proper positioning of ladders, based on knowledgeable outside size-up, assures putting members into two of the usual three bedrooms of the upper level. (Inside attempt to locate rooms, doors, etc., is often more difficult due to heat, smoke, and limited visibility.)
- D. Member entering rooms via ladder normally will not be more than ten feet (average room) from the ladder. Chances of getting disoriented or lost are lessened.

3.3.2 Since possible attic occupancy must be considered by the Chauffeur OVM team, visible indications that attic spaces or upper levels are being utilized for living purposes are:

- A. Adequate height (approximately seven feet)
- B. Dormered attic areas.
- C. Windows of fair size and normal appearance.
- D. Screens and/or storm windows.
- E. Curtains, drapes, venetian blinds, etc.
- F. Air conditioner at this level.
- G. Bells, Mail Boxes.
- H. Fire Escapes

4. OPERATION OF 2nd LADDER TO ARRIVE

4.1 Communications

4.1.1 Members shall have Handie-Talkies turned on en-route to hear any transmission of 1st Ladder on scene relative to possible location of occupants, ventilation required etc. and to receive any instructions from the Officer in Command. If no instructions are received en-route, report to Officer in Command on arrival.

4.2 Operations

4.2.1 Assignment of members to perform required tasks shall be the duty of the Officer in Command of the 2nd ladder to arrive.

4.2.2 When necessary, assign members to assist the Outside Team of the 1st Ladder in portable ladder operations where occupants are being removed, butting of ladders where required, ascending ladders to assist in VES and raising additional portable ladders. Reinforce Inside Team of 1st Ladder to arrive.

4.3 Tools

4.3.1 **OVM** - Axe and 6' Hook.

4.3.2 **Roof Firefighter** - 6' Hook and Halligan.

4.3.3 **Chauffeur** - Axe.

4.3.4 **Forcible Entry Member** - Axe and Halligan.

4.3.5 **Extinguisher Member** - 6' Hook and Extinguisher.

4.4 Search

4.4.1 Search all areas not yet covered by 1st Ladder Company via interior or exterior or both.

4.4.2 Assume responsibility for operations above the fire.

4.5 Aerial Ladder Used

4.5.1 **Chauffeur**

- A. POSITION:
Front/side of building.
- B. DUTIES:
 1. Raise and Position Aerial Ladder as directed by Officer in Command.
 2. Ascend ladder and assist OVM in VES and removal of endangered occupants.
 3. Remove skylights where possible.

4.5.2 **OVM**

- A. POSITION:
Front/side of building.
- B. DUTIES:
 1. Ascends aerial ladder and performs VES.
 2. Remove skylights where possible.

4.5.3 **Roof Fighter**

- A. POSITION AND DUTIES:
As directed by officer.

4.5.4 **Forcible Entry Team**

- A. POSITION AND DUTIES:
 1. As assigned by the Officer and may include - assisting 1st Ladder Company in a Portable Ladder Operation.
 2. Raise additional portable ladders if necessary, reinforce Inside Team of 1st ladder to arrive, force side entrance or cellar doors, if necessary.

4.6 Tower Ladder Used

4.6.1 **Chauffeur**

- A. POSITION:
At Pedestal of Tower Ladder.
- B. DUTIES:
Raise and position basket as directed by Officer in Command.

4.6.2 OVM

A. POSITION:

In basket of Tower Ladder.

B. DUTIES:

- 1 To VES of windows on front and side of building.
2. Remove skylights where possible.

4.6.3 Roof Fighter

A. POSITION AND DUTIES:

As directed by Officer.

4.6.4 Forcible Entry Team

A. POSITION AND DUTIES:

As assigned by the Officer and may include - assisting 1st Ladder Company in a Portable Ladder Operation, raise additional portable ladders if necessary, reinforce Inside Team of 1st Ladder to arrive, force side entrance or cellar doors, if necessary.

5. VENTILATION

5.1 Venting for Fire.-Accomplished to facilitate the Engine Company advance to, and extinguishment of, the fire. This venting is normally delayed until the Engine Company has its water, and is ready to "move in".

5.1.1 On lower floor levels, ventilation of the fire area will be carried out by a member of the Forcible entry team, on direction of the Officer.

5.1.2 For a fire on upper level, ventilation must be accomplished via ladder. In addition to ventilation of the fire room, ventilation must be provided to facilitate movement of the Engine Company up the interior stairs. There is often a window right at the head of this stair; in other buildings, a bathroom located at the top of the stair may be vented to improve the interior situation.

5.1.3 To conserve time when using portable ladders, ladders might be raised to proper height and dropped against the windows to break out the larger sections of glass. Stand clear of the ladder when it is dropped into the windows to prevent injury from pieces of glass sliding down the ladder.

- 5.1.4 Porch or garage roofs provide a stable platform from which to operate and should be used whenever possible. They afford protection from fire venting below and provide a temporary refuge for rescued occupants. Screened or open porches may not provide protection from fire venting below, and must be evaluated before use.
 - 5.1.5 When breaking windows with a tool, member should be to the side. Break the upper panes first and then the lower panel, keeping the tool on an angle so glass does not slide down the handle.
 - 5.1.6 Avoid ventilation which will endanger members operating from portable ladders to upper stories.
 - 5.1.7 Ventilate in a manner so as not to create auto-exposure or exposure of unprotected nearby structures. Particularly avoid venting under overhanging eaves.
 - 5.1.8 Under heavy smoke and heat conditions, proper window ventilation entails removal of all shades, venetian blinds, drapes etc., that might hinder the free flow of the smoke and heat, out of the building. This cannot be accomplished from yard level by dropping portable ladders against the windows. To complete their removal would require ascending the ladder.
- 5.2 Venting for Life - Accomplished to facilitate movement of member(s) into an area where there is a known or suspected life hazard. With an inherent calculated risk of eventually "pulling fire" it is performed as part of attempt to reach possible survivors as soon as possible.
- 5.2.1 Portable Ladder may be placed at side of window.
 - A. Insures that member is not hit by falling glass.
 - B. Permits him to operate at different heights for complete removal of sash without undue reaching and stretching.
 - C. Permits him to step off ladder directly on the sill for entry and search.
 - D. If it is necessary to remove a victim, the ladder must be repositioned at the sill level by the butt man. In the case where the roof man is working alone he shall use his Handie Talkie to call for assistance.
- Note:** An alternate method would be to vent the window as in 5.1.3 and/or 5.1.5, then lower ladder to sill level to facilitate entry.

5.2.2 Tower Ladder Operation

- A. Ladders 6 (Section 5) describes the proper procedures when using a Tower Ladder.

5.3 Window Size-Up

- 5.3.1 One of the most important features affecting the outside operation is the type and size of the windows encountered. If the upper floor windows are inaccessible or cannot be entered due to size or construction, they should be vented if possible and the entry/search phase of the operation completed from the interior.

5.4 Window Problems

- 5.4.1 Sash construction is usually of wood, aluminum or steel (common in casement type). When necessary, complete removal of the wood or aluminum sash is readily accomplished with the tools available. Additionally, locking devices added for security reasons has complicated the problem of opening windows.
- 5.4.2 The steel casement window is more difficult to disassemble. Attack the sash at the weld points or at the window pivot pins.
- 5.4.3 Ventilating louvers or attic windows too small to enter, can be broken or removed to vent upper levels.
- 5.4.4 Storm windows and screens complicate the problem of VES and will have to be removed.
- 5.4.5 "Ranch type Windows", short wide windows, have a sill that is approximately chest high, requiring a drop to the floor by member entering from the outside. A stable piece of furniture may be placed below the window to assist in egress.

6. SEARCH AND RESCUE

6.1 Search

Hints as per diagram contain the basic elements of good search procedures for upper floors. All members shall know them thoroughly.

6.2 Rescue

6.2.1 Immediately upon entering the room, if an excessive amount of heat and smoke is pushing in from the interior hall, close the door. Once this door has been closed a more detailed search/rescue will be permitted since the completely removed window will adequately vent the room and the possibility of pulling fire toward the vented room will have been negated.

6.2.2 When no overcome persons have been found in the room, and in the event the door to the interior hall has been closed to facilitate the search/rescue, it should be reopened before leaving the room via ladder.

A. This will assist overall interior ventilation.

B. This door should be reopened carefully. In the event there is any possibility that fire in the interior hall might be pulled into the room toward the open window, it shall be left closed.

6.2.3 Private Dwellings present a unique problem in that rescue of trapped occupants may have to be accomplished only by portable ladders.

6.2.4 If you discover an overcome occupant, give first consideration to removal down the interior stair. When possible and consistent with safety, open the door to the hall and call for assistance from members inside the building.

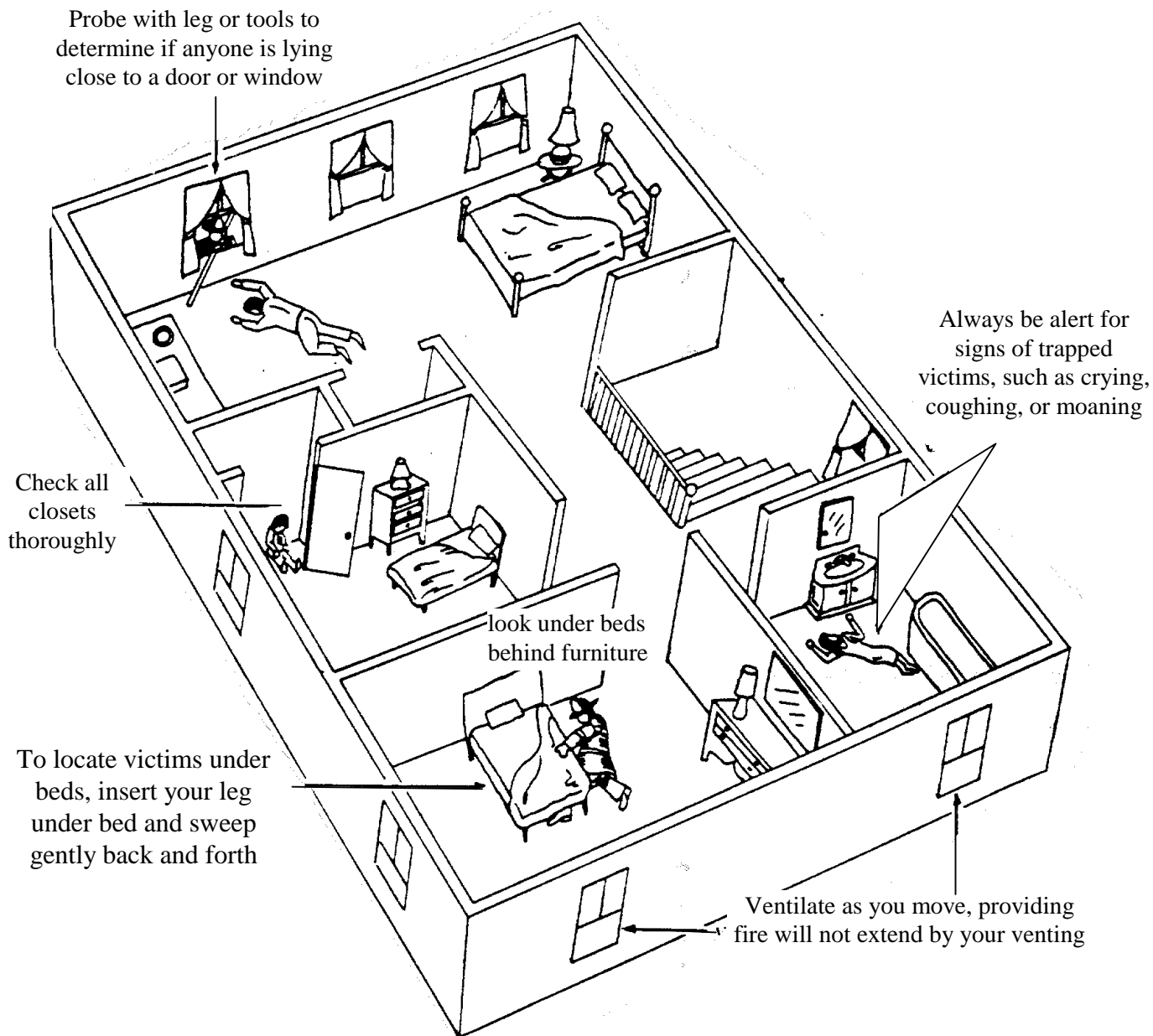
6.2.3 If interior removal is not possible, prepare for removal via ladder or out on to porch roof.

6.2.6 In the case where several occupants have been found on an upper floor, all hands not committed to actual control of the fire must be directed toward their removal. The Engine Company's primary function during this critical period should be to protect the interior stair, and the rescued persons should be removed via this stair.

6.2.7 Removal of an unconscious victim via portable ladder will require the Butt man to ascend the ladder to assist. If additional help (including civilians) cannot be obtained to butt the ladder, it shall be secured at the tip. Other possible means of butting the ladder may be: against an adjoining building or fence, tree or shrubbery, curb of driveway, wedge or tool forced into ground.

Drills and preplanning in these procedures will pay off when the occasion for their use arises.

SEARCHING HINTS



- IF FIRE IS DISCOVERED ON FLOOR ABOVE THE FIRE FLOOR, A CHARGED LINE SHOULD BE CALLED FOR
- OFTEN, CLOSING A DOOR MAY TEMPORARILY CONTAIN A FIRE, ALLOWING SEARCH OF OCCUPANCY
- IF HEAT AND SMOKE PREVENT ENTRANCE INTO AREA, PROBE GENTLY WITH ARMS OR LEGS OR TOOLS TO DETERMINE IF ANY VICTIMS ARE LYING CLOSE TO DOOR
- FLIP MATTRESS INTO "U" POSITION INDICATING ROOM HAS BEEN SEARCHED.
- DO NOT WANDER AIMLESSLY, PLAN YOUR SEARCH
- MOVE TOWARD LIGHT, VENTILATION, AND SECONDARY MEANS OF EGRESS

7. ROOF OPERATIONS

7.1 General Procedures

- 7.1.1 Physically cutting and opening the roof is usually not considered an initial operation in Peaked Roof - Private Dwelling Fires.
- 7.1.2 The venting or removing of attic windows or louvers, the size of which may be enlarged, is frequently sufficient for vent purposes.
- 7.1.3 Due to the pitch of many roofs and particularly when they are wet or icy, opening the roof may be a slow and difficult job.

If a skylight is present and fire conditions warrant, the skylight should be removed.
- 7.1.4 Once fire is under control, ladder company members, operating from within the attic may push out roof boards, etc., in case additional ventilation is needed.
- 7.1.5 If it is necessary to open the roof from the exterior, this task is assigned to the second ladder company to arrive.

7.2 Roof Access

- 7.2.1 Priority for roof operations is if available:

- A. Tower Ladder**

- 1. Power Saw can be used from the basket.
 - 2. More efficient and quicker operation.
 - 3. More stable platform.
 - 4. Better overall reach and maneuverability.
 - 5. Safety to operating members.

- B. Aerial Ladder**

- 1. Shall be used in preference to portable ladders as they provide a more stable platform, with better maneuverability and safety for members.

- C. Portable Ladders**

- 1. Shall be used where obstructions, setbacks etc., prevent use of Tower Ladder or Aerial Ladder.
 - 2. A hook ladder in conjunction with any of the above three ladders may be necessary to reach the peak.

7.3 Opening a Peaked Roof

7.3.1 The Power Saw may only be used from the basket of a Tower Ladder as described in Sec. 4.2 and 4.3 of Ladders "6".

7.3.2 Cutting the Roof with an Axe.

- A. Member carefully sizes up operation to assure that he does not cut himself off from safe return to his ladder.
- B. Working from a position straddling the peak, member cuts hole over the fire, parallel to and on the lee side of the ridge.
- C Working from a ladder is only justified when the stability of the roof is in question, and a ladder is necessary for safety.
- D. The size of the opening is limited by the member's reach and maneuverability. (Generally 2' x 3')
- E. Dependent upon the type of roof shingles, member either cuts through asphalt or breaks up tile or slate over the selected area. Shingles are then removed by either hand or scraped up with an axe.
- F. He then cuts through roof boards, removing all boards in one operation, after all sides of the hole have been cut.
- G A 6' hook has to be brought to the roof to push down the ceiling on the top floor after the hole has been cut in the roof.

Note: Since the member straddling the peak, or working from the ladder has much less maneuverability and speed than would a member in a standing position, he must be extremely careful not to be caught by erupting fire, once the hole has been cut.

8. ATTIC AND ROOF OVERHAULING

8.1 General

8.1.1 The examination or pre-control phase of overhauling is that part of the discussed search for fire which takes place up-to the point where the fire is under control. Post control overhauling is the continued operation, taking place after the fire is under control, to insure that there is complete fire extinguishment. For both pre-control and post control overhauling a sound knowledge of the building construction is necessary.

8.2 Extension

8.2.1 Fire may originate or extend to the attic from either the interior or exterior.

8.2.2 In Balloon Frame Construction, the studs are continuous and extend from the sill (located on the top of the foundation wall), to the top floor ceiling, where they are capped with a top plate. In balloon framed structures, fire can extend from the cellar to the attic and bypass the first and second floors. This vertical void exists because of the use of continuous length 2x4's. This will only occur on the exterior walls. The interior walls are capped on the top and bottom creating a firestop.

Fire traveling vertically in a balloon framed exterior side wall, will extend in two directions when it reaches the attic floor joists. It will extend into the eaves and then upward to the underside of the roof. It will also travel horizontally between the joists.

8.2.3 In Platform Construction, fire in the exterior walls of an upper floor can extend between wall studs out into the eaves area and then upward between the roof rafters, bypassing the top plate on wall studs.

The exterior wall studs extend only from the floor to the ceiling of each individual floor. They are capped at the ceiling level of each floor with a horizontal 2x4 called a top plate. The floor joists on the floor above rest on this top plate. This construction feature acts effectively as a fire stop, and prevents vertical extension via the exterior walls.

8.2.4 Once fire has spread into the attic, it communicates to the roof boards, and through the opening between the boards to the underside of the roof shingles.

8.2.5 Finished attic areas create hidden voids and channels for fast travel. The illustration shows these areas that must be checked.

8.2.6 Particular attention must be paid to the Eaves, Gables and Cornices. These construction features tend to trap fire and heat. Of special concern would be the presence of louvers, for ventilation, built into the underside of the Eaves (soffit). Fire in this area readily communicates to the attic and roof.

8.2.7 Fire will extend horizontally between joists. Joists that rest on an interior bearing wall will not be firestopped. If fire is in one room check for extension in an adjoining room.

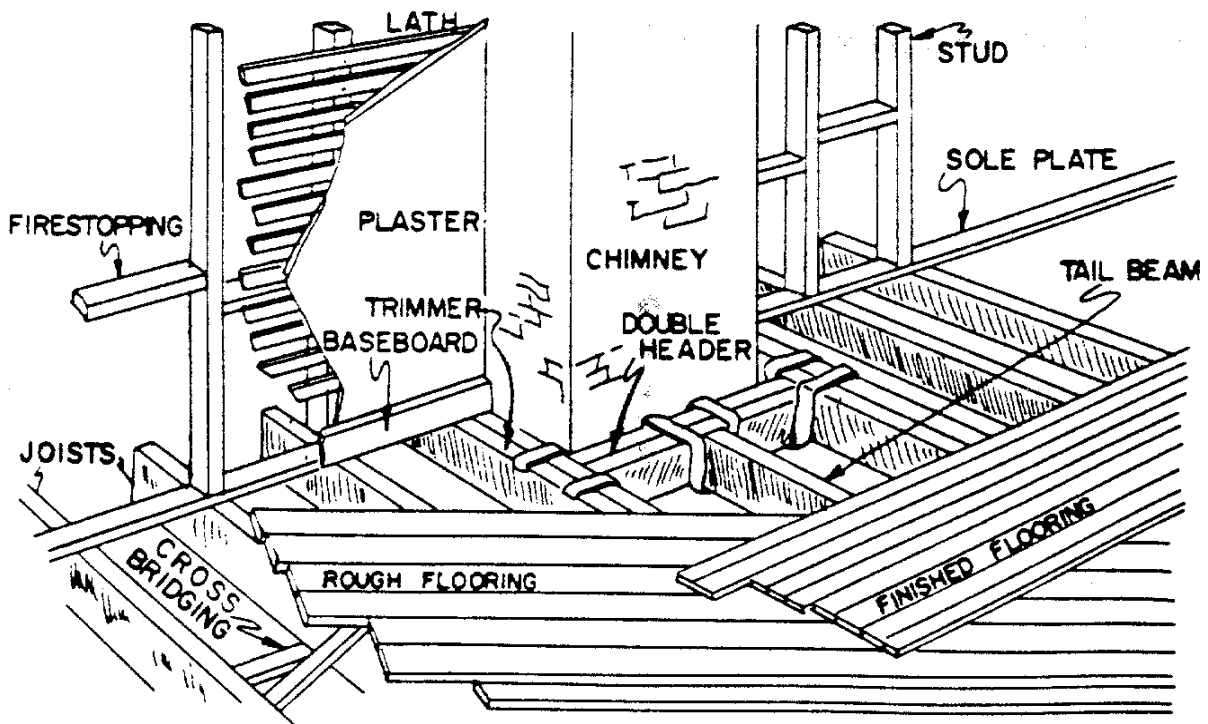
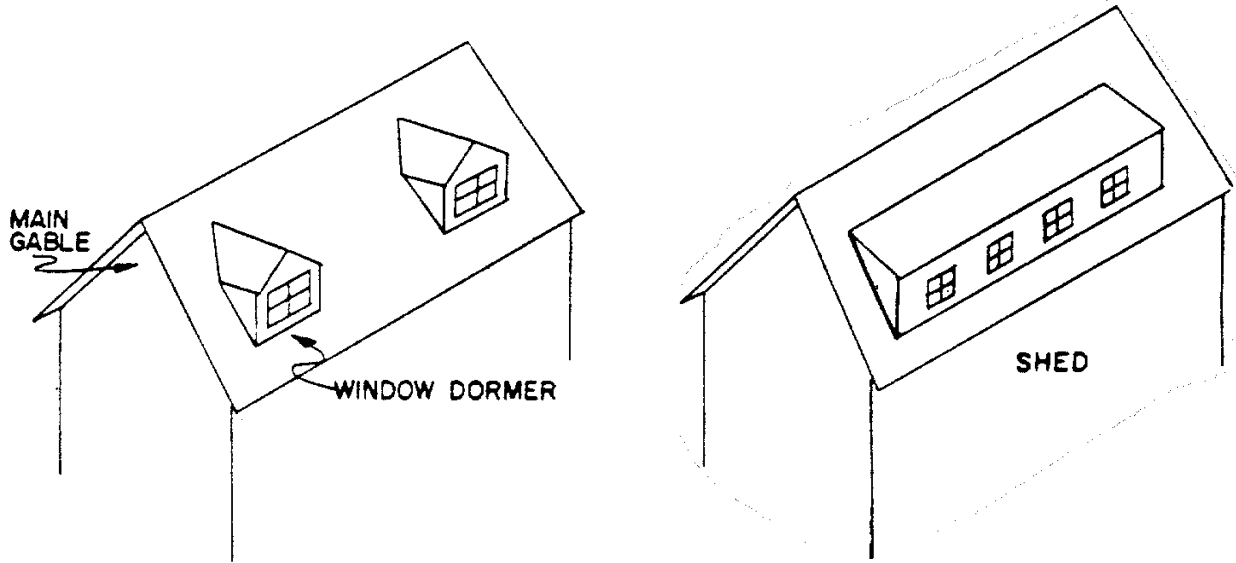
8.3 Examination

8.3.1 Periodic examination of the attic must be made to insure that the fire has not extended and is completely extinguished.

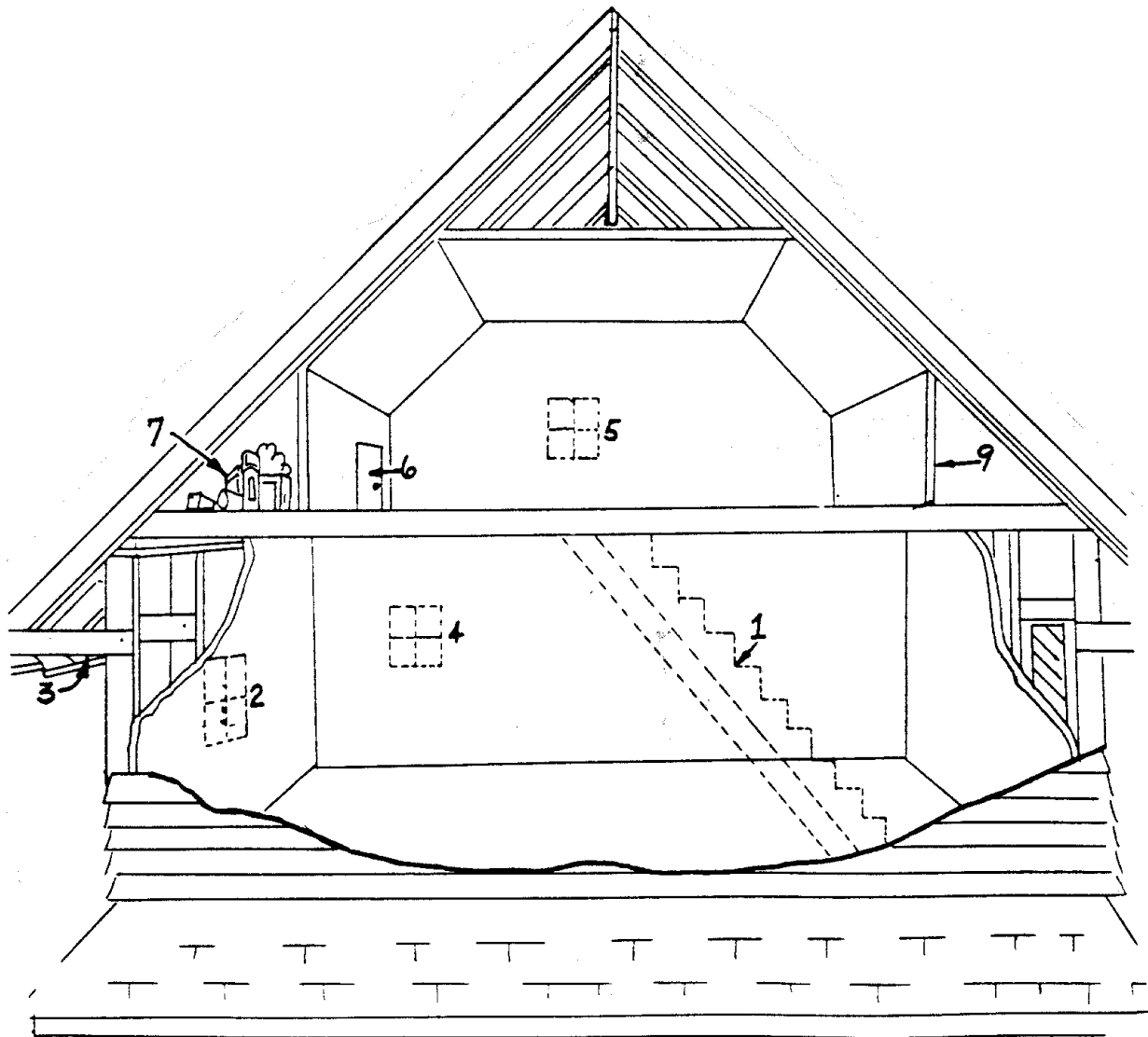
8.3.2 Look for access doors or panels into kneewall, and remove drawers of "built in" furniture for visual inspection of hidden areas. Area behind kneewall is often used for storage purposes and such material must be examined and/or removed.

- 8.3.3 The chimney could have been the original source of the fire, heat getting through loosened bricks or mortar into the chimney header and trimmer beams, spreading into the structure. Some buildings have been found with floor supports butted against or built right in to the chimney. If this is the case, considerable structural damage may be necessary to open up and expose this area.
- 8.3.4 A quick determination as to whether a structure is Balloon framed is to remove a baseboard on an exterior wall and check for the presence of a sole plate. If none is found, treat the building as balloon construction. Particularly in this type of construction, examine bays in walls that do not contain windows or doors. Door and window framing provide a built in fire stop at these locations.
- 8.3.5 Once fire has extended into the attic area we have a particularly difficult fire problem:
- A. Limited access; narrow stair or scuttle opening.
 - B. No built in roof ventilation.
 - C. Only lateral ventilation will be through small windows, or still smaller attic ventilators.
- 8.3.6 Due to the limited access, the Ladder Company must be prepared to assist the Engine Company in alternate means of getting water on the fire.
e.g.: operating from the floor below.
- A. Bring a small extension ladder into the building, pull a 3 foot section of the ceiling, enabling the Engine Company to work off the ladder, sweeping the attic with the line.
 - B. Of course, this is practical only in the case of an unfinished attic. If the attic is finished, flooring will be in place, and not readily removed.
 - 1) If wood is encountered when first exposing attic, shift about three feet to one side and make another examination opening. You may have encountered an attic catwalk. Shifting may enable you to pull the top floor ceiling and then work the hose line directly into the attic as in A.
 - C. Whenever feasible, when pulling ceilings for examination or operation, operate from within closets (after removing clothes), or small rooms, to make replacement or repair of ceiling less expensive.
- 8.3.7 Examine to determine if fire has extended to area between roof boards and outer covering. Although not much visible fire may be seen, this makes for a particularly smoky condition in the attic, and extensive removal of roof boards is sometimes necessary to insure complete extinguishment. It is again recommended that these roof boards be "pushed out" from within the attic using hand tools or small portable ladders. This is a quicker, safer operation, than trying to open up large sections of peaked roofs from the exterior.

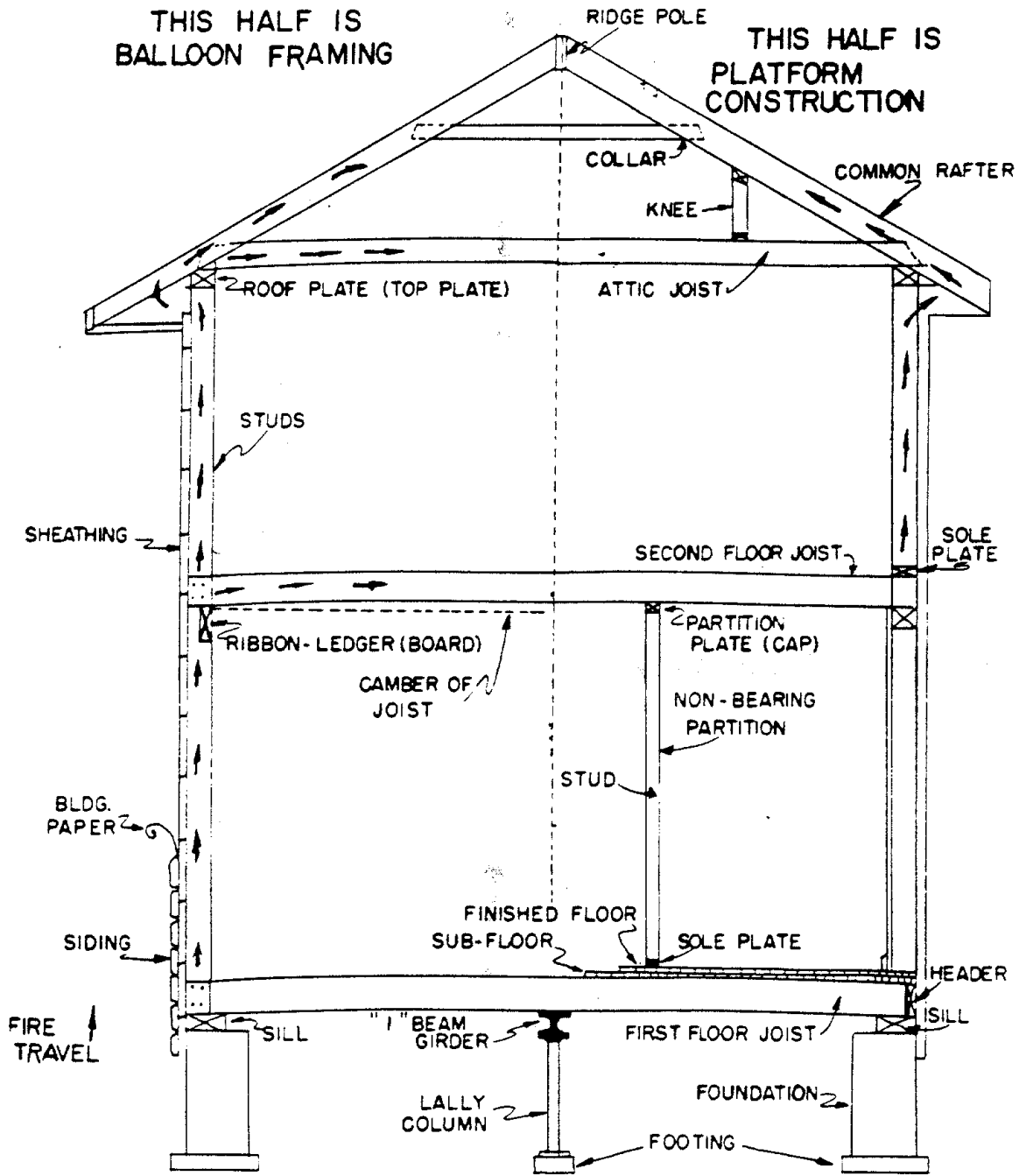
DORMERS AND GABLES



FINISHED - ATTIC CONSTRUCTION



- | | | |
|--------|------------|--|
| 1. | STAIRS | May or may not exist. |
| 2. | WINDOW | Uncontrolled venting can extend fire to eaves. |
| 3. | EAVES | Eaves (not firestopped) extend fire to attic. |
| 4 & 5. | WINDOWS | Normal window venting - where possible. |
| 6. | DOOR | Existence of door indicates closet. |
| 7. | BOXES | Possible storage of combustibles. |
| 8. | WALLS | Attic may be finished (all or part) concealing fire. |
| 9. | INSULATION | Insulation with combustible covering may exist. |



9. FLAT ROOF - DETACHED PRIVATE DWELLING

- 9.1 The concept of operation remains basically the same as Section 3 with the roof firefighter having the responsibility of going to the roof and removing any scuttle, skylight, etc., and advising officer of conditions.
- 9.2 To facilitate operation:
- 9.2.1 When Aerial or Tower Ladder is not used, one extension ladder of sufficient size is brought to scene and extended to roof, adjacent to upper window selected for OVM vent, entry, search operation.
- 9.2.2 Unless roof has deep eaves area, roof firefighter can ascend to roof, and OVM commences his operation without any further movement of ladder.
- 9.2.3 Roof fighter opens up scuttles, removes skylights, ventilates upper floor window as necessary from the roof, and when necessary, opens up returns to check for fire extension into cockloft.
- A. If fire is indicated in cockloft, he obtains an axe from the Chauffeur below, and commences opening up hole in roof.
- B. Roof fighter shall never proceed to the lower floors via the scuttle ladder.
- C. Roof fighter of a Tower Ladder Company may reenter bucket to assist OVM in VES, after completion of roof operation.

10. ATTACHED PRIVATE DWELLINGS

- 10.1 Although this Bulletin is devoted primarily to the detached Private Dwelling, we cannot ignore the fact that such buildings are often attached on one, or both sides.
- 10.1.1 There is possibility of extension directly across cellar beams, which may butt against each other.
- 10.1.2 There is possible extension directly through party walls, which may only be normal studded construction partition, brick nogged or hollow tile.
- 10.1.3 Extension via common cockloft or common cornice is also a likely possibility.
- 10.1.4 Exposures will require examination for fire extension from cellar to roof

11. THE "QUEEN ANNE"

11.1 General Information

11.1.1 Due to its size, construction (especially attic and roof area) and overall internal features, the Queen Anne type of Private Dwelling presents a far more complex fire problem than the average Private Dwelling.

11.1.2 The unique features and problems encountered in the Queen Anne are described and illustrated. These buildings were generally custom built and have been altered over the years so that no two are alike.

11.1.3 In areas where they exist, prefire planning and training at Multi-Unit drills, in conjunction with the operations outlined herein will prepare us to meet the challenges of these large old buildings.

11.1.4 The concept of operation with an inside and outside team as previously outlined shall be the same for Queen Anne's with the exception that roof ventilation shall be initiated immediately by Chauffeur and OVM.

11.1.5 Because of the number of firefighters that may be needed for portable ladder rescue and the number of sleeping areas that may have to be entered and searched it is good practice to special call an additional ladder company. This must be a consideration when encountering a fire of sizable proportion in a Queen Anne, especially at night.

11.2 Description

11.2.1 Built in the early 1900's, most are now over 50 years old with inherent structural deterioration.

11.2.2 The overall size of these structures range from 2 1/2 to 3 1/2 stories in height, 25 to 30 feet in width and 30 to 50 feet in depth.

11.2.3 Construction is wood frame with general exteriors of wood siding, asphalt shingles, brick veneer or stucco.

11.2.4 The roofs have many peaks, dormers, overhanging eaves and possibly a cupola. (A Cupola/Turret is a tower-like room with a round or dome shaped roof.) The roof coverings are roof tile, slate or layers of asphalt shingles over the original wood shingles. Multiple variations in size and number of dormers and gables creates a maze of peaks and valleys at roof level.

11.2.5 Balloon construction is most common and early attempts at built-in fire stopping is negated by poor workmanship, opening holes for house service lines etc.

- 11.2.6 Large open stairs in the living room connect the 1st and 2nd floors. A narrow rear or side stair connects the 1st, 2nd and 3rd floors or a stair may lead directly to the 3rd floor from the 1st floor.
- 11.2.7 Vertical arteries supplied by old hot air ducts, dumbwaiter shafts, boxed in space around fireplaces and the usual pipe recesses, contribute to undetected and fast upward fire travel.
- 11.2.8 Hidden voids in attics around hips, valleys, dormers, ridges etc.
- 11.2.9 Some have been converted to 2 or 3 family dwellings or rooming houses. They may have a fire escape on the side or rear, or a sprinklered stairway.
- 11.2.10 They are usually set 30 to 50 feet back from the curb.
- 11.2.11 Rooms located in attics were finished when the houses were built. The ceilings are low, and there is a cockloft above them. A wall that is built against sloping rafters is called a knee wall. The space behind these walls are often big enough to crawl through, and they are large hidden horizontal voids.

11.3 Operations

11.3.1 Life

The objective is to remove all visibly endangered persons to safety and to search for and rescue any trapped or overcome occupants, and to do so in the shortest possible time.

11.3.2 First Ladder Company to Arrive

A. **Inside Team Duties**

Force entry, locate the fire, ventilate, search and remove victims via an inside attack.

B. **Outside Team Duties**

1. Perform roof ventilation and VES on upper floors via ladders as directed by the Officer. This may be an all portable ladder operation or a combination of aerial or tower ladder and portable ladder.
2. Roof ventilation is performed by the OVM in Queen Annes in order to maintain the integrity of the Chauffeur OVM Team concept in private dwellings.

Note: One window which shall not be entered for VES is the one immediately over the side entrance door. This window is generally at the top of an interior stair.

C. **Roof Firefighter Duties**

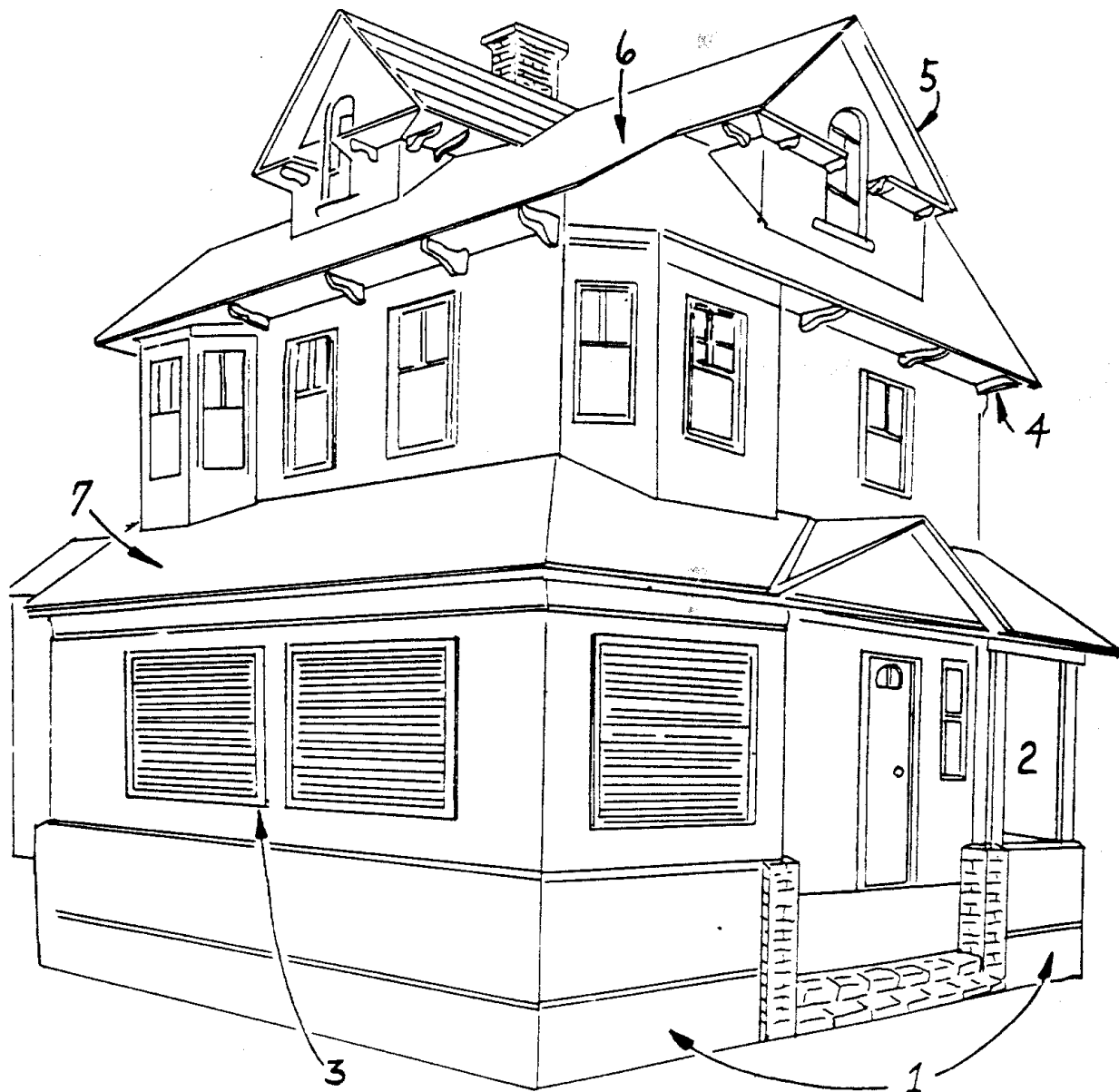
As per section 3.2.2.

11.3.3 Second Ladder Company to Arrive

Will operate as per Section 4 of this bulletin.

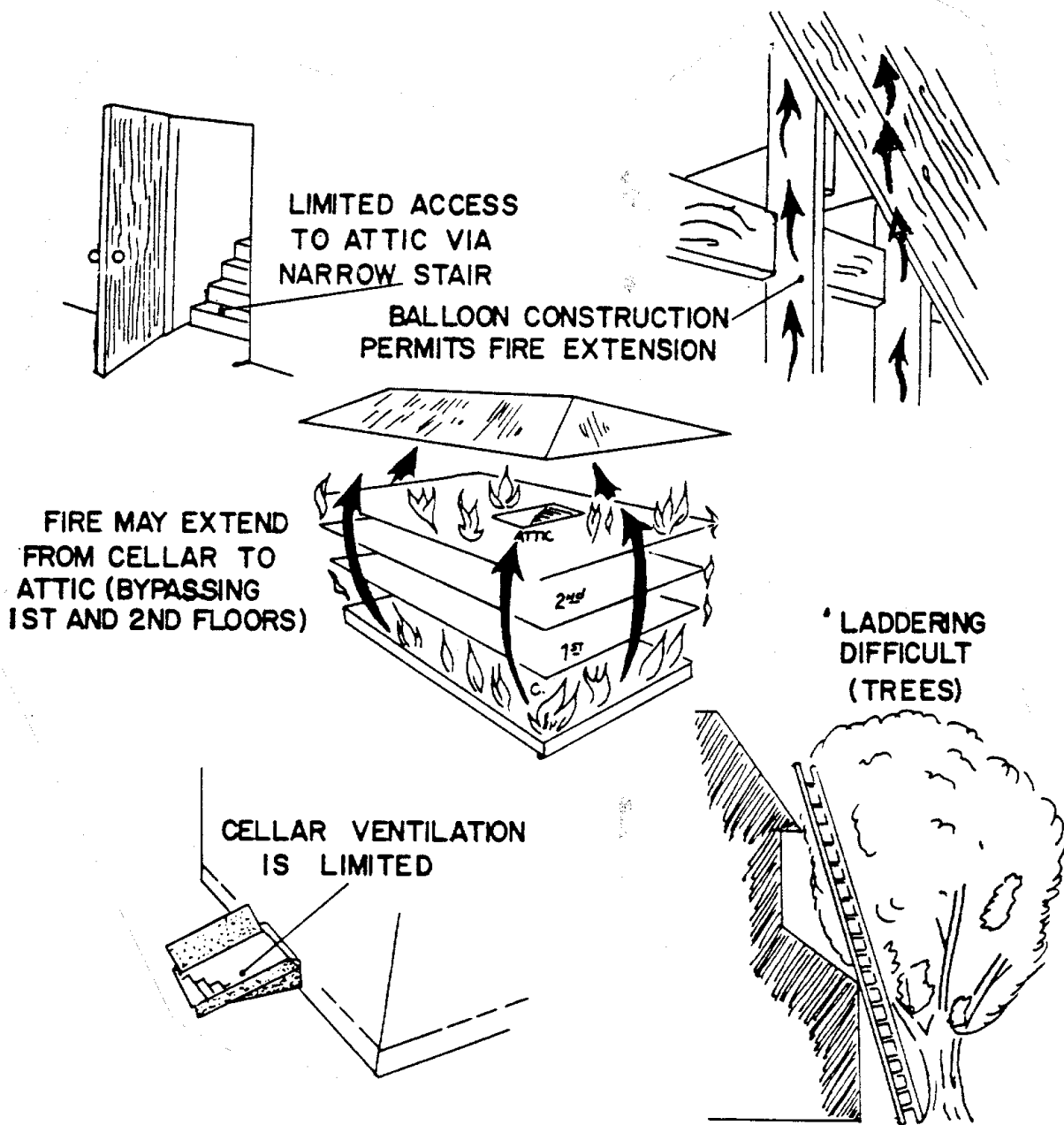
11.3.4 Section 7 pertaining to roof operations, will be expanded in Section 11.4 as it relates to Queen Anne structures.

PRIVATE DWELLING (QUEEN ANNE TYPE)



1. Under porch area is not a ventilation point. Cellar windows rarely exist here and would be inaccessible. Windows may exist in the rear however.
2. Open porch permits ventilation and easy access to first floor.
3. Enclosed porch inhibits access and ventilation.
4. Roof overhang (eaves) can permit fire to extend into attic if fire is out a window.
Three levels of eaves are shown.
- 5 & 6. Sharply pitched roofs with many peaks and gables are difficult to walk on.
7. Rear and side extensions present other means of entry and escape. An outside cellar entrance usually exists at rear or side. The inside cellar entrance is generally located in the kitchen.

QUEEN ANNE (DETAILS)



11.4 Queen Anne Roof Operations

11.4.1 Every Queen Anne fire does not require the roof to be cut open. However if the fire is of any consequence, the roof shall be cut open as soon as possible to facilitate control and extinguishment of the fire.

- 11.4.2 In private dwellings this duty is assigned to the second ladder company to arrive. In the Queen Anne type structure the Officer of the first ladder company may vary the procedure and order the roof vented by the Chauffeur and OVM.
 - 11.4.3 Once inside the building the Officer of the first ladder company may decide that roof ventilation is not necessary. He shall then notify the Chauffeur and OVM of this decision and issue necessary orders.
 - 11.4.4 The first hole should be made at the main gable. A center hall usually follows the same direction as the main gable. A hole at the main gable, with the ceiling pushed down, will vent the blind attic space, the knee walls and the attic hall and rooms below thereby allowing the advancement of lines and VES by the inside team.
 - 11.4.5 Fires in large dormers etc. may be spectacular and direct the attention of the Officer to venting them. However, these cones or cupolas, will not appreciably affect the heat and smoke conditions in the main attic.
 - 11.4.6 The main gable has to be vented first unless the fire in the cupola or dormer presents a known life hazard requiring immediate VES
- 11.5 Roof Access
- 11.5.1 The priority for roof operations is, if available:
 - A. Tower Ladder
 - B. Aerial Ladder
 - C. Portable Ladders
 - 11.5.2 In all cases a 10' hook will be needed to push down ceilings after the roof is opened.
 - 11.5.3 A hook ladder in conjunction with any of the above 3 ladders may be necessary to reach the peak.
- 11.6 Tower Ladder
- 11.6.1 Positioning
 - A The Tower Ladder is the most versatile, efficient and safest method to ventilate the roof of a Queen Anne.
 - B. If possible position the Tower Ladder parallel to the front of building, so the basket can be placed over the corner of the building near the peak of the roof.

- C. This has an added advantage of being able to cover two sides and would facilitate:
 - 1. Rescue of occupants or operating forces at 2nd and 3rd floor levels.
 - 2. Ventilation of the front and side.
 - 3. Entering these areas when stairs are unusable.
 - 4. Stretching hand lines.
 - 5. Overhauling hard to reach or unstable areas.
- D. If the apparatus cannot be placed in the preferred position, or by virtue of distance the ladder will not reach the peak, place it to the "valley" area and try for the peak by climbing directly from basket to peak, or by using hook ladder when it will facilitate the operation.

11.6.2 Tools

The tools to be carried in the Tower Ladder basket includes: Power Saw, Safety Belts, Life Saving Rope, Utility Cord, Axe, 10' Hook, Halligan Tool and Hook Ladder.

11.6.3 Power Saw

Using the power saw from the basket is the most efficient means of opening the roof. These operations are described in Section 4.2. and 4.3 of Fire Tactics and Procedures - Ladders 6 Tower Ladder.

11.7 Aerial Ladder

11.7.1 Positioning

- A. Position the apparatus to facilitate raising and extending the ladder over the corner of the building, permitting maximum coverage of both the front and one side of the building.
- B. Aerial to be raised as close as possible to the center of the main gable or to a point on the main gable over the interior stairs (if known).
- C. Extend ladder 5' above and to one side of the peak, if possible. This permits easy mounting and dismounting from the aerial and assures that it will be visible in heavy smoke conditions. This position will also prevent the member climbing the ladder from passing directly in front of and over the upper window in the event the fire were to vent itself out of this window.
- D. If the ladder cannot be placed adjacent to the main peak, position it in the valley between dormer roof and main roof. This may allow member to climb to the ridge of the main gable or a hook ladder may be used to reach it.
- E. The apparatus may have to be placed in a driveway, on the sidewalk or a lawn to reach the objective. Support tormentors when not on solid pavement.

F. Sometimes it will be more expeditious to back the trailer into the driveway for better positioning of the aerial.

11.7.2 When the peak cannot be reached with the available apparatus, the Officer in Command should consider special calling a 100' aerial ladder.

11.7.3 Two men should go to the roof at all times because of the tools required; axe, 10' hook and possibly Hook Ladder. This will provide a safer and quicker operation as described in Section 7.3 opening a Peaked Roof.

11.8 Portable Ladders

11.8.1 If topography, obstructions, etc., prevent the use of the Aerial or Tower Ladder to gain access to the roof then Portable Ladders shall be used.

11.8.2 In some circumstances Portable Ladders may be quicker than Aerial or Tower Ladders to reach the roof.

11.8.3 A 35' extension ladder may be raised to a dormer roof or into the valley on the side of the dormer. Members may then be able to climb to the peak. A Hook Ladder may have to be carried up to reach the peak.

11.8.4 If the pitch of a porch roof permits, a portable ladder may be used to the porch roof and a portable extension ladder used from the porch roof to the main peak.

11.8.5 Where a fire escape is present, it may be possible to raise a portable ladder from the fire escape landing to the roof.

12. EXPOSURE PROTECTION

12.1 The spacing between buildings can present a serious exposure hazard. Many frame buildings are erected with little space between them, even a space of 6-8 feet at ground level is often cut down still further at eaves level to approximately 2-3 feet.

12.2 Fire "lapping" out of a window, or burning on the exterior of a building also presents a serious auto-exposure problem.

12.3 Whenever there is a problem of "flying brands" examination must be made of all possible crevices in which they might have become lodged. They have often been a source of ignition of remote parts of the original fire building or nearby structures.

12.4 An Exterior stream can be used to cover these exposed points when fire threatens.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT