

U.S. Fire Administration/Technical Report Series

Success Story at Retirement Home Fire

Sterling, Virginia

USFA-TR-040/December 1989



FEMA

U.S. Fire Administration Fire Investigations Program

The U.S. Fire Administration develops reports on selected major fires throughout the country. The fires usually involve multiple deaths or a large loss of property. But the primary criterion for deciding to do a report is whether it will result in significant “lessons learned.” In some cases these lessons bring to light new knowledge about fire--the effect of building construction or contents, human behavior in fire, etc. In other cases, the lessons are not new but are serious enough to highlight once again, with yet another fire tragedy report. In some cases, special reports are developed to discuss events, drills, or new technologies which are of interest to the fire service.

The reports are sent to fire magazines and are distributed at National and Regional fire meetings. The International Association of Fire Chiefs assists the USFA in disseminating the findings throughout the fire service. On a continuing basis the reports are available on request from the USFA; announcements of their availability are published widely in fire journals and newsletters.

This body of work provides detailed information on the nature of the fire problem for policymakers who must decide on allocations of resources between fire and other pressing problems, and within the fire service to improve codes and code enforcement, training, public fire education, building technology, and other related areas.

The Fire Administration, which has no regulatory authority, sends an experienced fire investigator into a community after a major incident only after having conferred with the local fire authorities to insure that the assistance and presence of the USFA would be supportive and would in no way interfere with any review of the incident they are themselves conducting. The intent is not to arrive during the event or even immediately after, but rather after the dust settles, so that a complete and objective review of all the important aspects of the incident can be made. Local authorities review the USFA’s report while it is in draft. The USFA investigator or team is available to local authorities should they wish to request technical assistance for their own investigation.

This report and its recommendations were developed by USFA staff and by TriData Corporation, Arlington, Virginia, its staff and consultants, who are under contract to assist the USFA in carrying out the Fire Reports Program.

The USFA appreciates the cooperation and assistance received from Fire Chief Scott W. Milligan of the Sterling Virginia, Fire Department and Assistant Director and Chief Fire Marshal R.J. (Ray) Nieves and Lieutenant Jeff Flippo of the Loudoun County Department of Fire and Rescue Services.

For additional copies of this report write to the U.S. Fire Administration, 16825 South Seton Avenue, Emmitsburg, Maryland 21727. The report is available on the Administration’s Web site at <http://www.usfa.dhs.gov/>

Success Story at Retirement Home Fire Sterling, Virginia

Investigated by: Hollis Stambaugh

This is Report 040 of the Major Fires Investigation Project conducted by TriData Corporation under contract EMW-88-C-2649 to the United States Fire Administration, Federal Emergency Management Agency.

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FEMA

Department of Homeland Security
United States Fire Administration
National Fire Data Center

U.S. Fire Administration

Mission Statement

As an entity of the Department of Homeland Security, the mission of the USFA is to reduce life and economic losses due to fire and related emergencies, through leadership, advocacy, coordination, and support. We serve the Nation independently, in coordination with other Federal agencies, and in partnership with fire protection and emergency service communities. With a commitment to excellence, we provide public education, training, technology, and data initiatives.



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Success Story at Retirement Home Fire Sterling, Virginia December 16, 1989

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OVERVIEW

On December 16, 1989, at 1629 a security guard at the Sommerset Retirement Home, 22355 Providence Village Drive in Sterling, Virginia, called 9-1-1 to report that alarm bells were sounding and that smoke was in the building. The facility was a new (one-year-old) three-story retirement home housing elderly people in apartment units.

Firefighters on the first arriving truck, which was at the scene two minutes after receiving the alarm, found smoke coming from the roof and a first-floor lobby filled with relatively calm elderly residents waiting to be evacuated from the building.

An Incident Command System (ICS) was established immediately to address three tasks simultaneously: establish an emergency shelter and quickly and safely move the residents to that staging area; conduct a thorough search of every apartment; and locate the seat of the fire and extinguish it.

SUMMARY OF KEY ISSUES

Issues	Comments
Cause	Two gas-burning tubes in the furnace assembly were rotated 180 degrees, thus projecting heat downward which over time cracked the cement pad and started a fire in the sub-flooring.
Detection & Reporting	The fire activated automatic sprinklers in the concealed space. In turn, the fire alarm system and audio visual signal devices alerted occupants to the fire and sent an automatic alarm to a supervised alarm. Simultaneously, a security guard called the fire department.
Fire Protection Systems	All the fire protection systems worked well, except for the smoke removal system which was damaged by the fire before the fire alarm system activated. Building also is equipped with a fire pump on the ground floor.
Code Compliance	The building not only met but exceeded all fire protection code requirements. Owners installed additional sprinklers in residential wings and provided extra rated protection in the boiler room and atrium. The system contained the fire.
Evacuation	Frequent fire drills that had trained residents on procedures and an ambulatory resident population contributed to an almost problem-free evacuation. There was no panic, no injuries, and no fatalities.
Incident Command	Excellent use of the ICS made possible simultaneous and efficient evacuation, location of fire, and extinguishment.

Ultimately, the 73 residents who were evacuated found refuge with family members living in the area, at another local senior citizen apartment complex, or at the nearby Holiday Inn after having been temporarily sheltered at an elementary school building a block away. No residents died or suffered injuries. Completion of the primary and secondary room searches took 45 minutes while firefighters and officers worked for almost 40 minutes to locate the seat of this hidden, contained fire in the concealed space between the second and third floors of the mechanical and boiler room.

The fire developed in the sub-flooring of the third floor mechanical room in the concealed space which was sprinklered. The fire alarm systems and audio visual signal devices were activated when the sprinkler system was activated; these in turn sent an automatic 9-1-1 call to Loudoun Fire Communications. The sprinkler system contained the horizontal spread of the fire to the room of origin, though, due to an unparapeted fire wall, flames eventually spread horizontally and vertically in concealed spaces and then through the roof of the atrium to the attic.

All fire protection systems, except for the smoke removal system worked as designed. The smoke removal system wiring was damaged by the fire before the fire alarm system activated.

Thirty-four fire, rescue, and service vehicles responded to the fire, bringing a total of 150 firefighter and rescue personnel from seven volunteer companies, neighboring counties, and Dulles International Airport.

The fire was declared under control at 1937, approximately three hours after the unit first arrived on the scene.

BUILDING STRUCTURE AND LAYOUT

The Sommerset Retirement Home was constructed in 1988 to house elderly, ambulatory, and self-sufficient citizens. It is a three-story slab on grade construction with four wings radiating from a central atrium. (See floor diagrams in Appendix A.)

The residential wings are classified by Building Officials and Code Administrators (BOCA) as an R-2 use group with Type 5A construction classification. Type 5A construction consists of combustible construction with exterior walls, bearing walls, floors, and roofs with a one-hour fire rating. Fire walls are required to have a two-hour fire rating. The residential wings are separated from the atrium by two-hour fire walls, with self-closing fire doors.

The three-story atrium, or central core area, is classified by BOCA as an A-3 use group with Type 3B construction. The atrium has two elevators enclosed wholly by non-combustible, two-hour fire walls. Off the atrium is the lobby and to the rear of the atrium, the dining room and kitchen (see Appendix A).

The wings on each floor are divided lengthwise by a hall, on either side of which are resident apartments. The north, south, and west wings have ten apartments on each level while the shorter east wing contains six. Room for a few apartments is "lost" to the dining room and model apartment on the first floor so the total number of units is 104. The boilers and other mechanical equipment are located on the second and third floors off the atrium.

CODES AND FIRE PROTECTION

This building not only complied with all current codes, including all requirements for fire protection and sprinklers at the time of construction, but went beyond the codes. It was required to be fully sprinklered in the atrium/central core area. The residential wings were not required to be sprinklered; however, the owners, Amurcon Corporation of Virginia opted to install a sprinkler system in the occupied areas of the residential wings at an added cost of 200,000 dollars. Amurcon also elected to provide one-hour rated protection in the boiler room and corridor of the atrium, though not required by code. The bathrooms, closets, and attic were not sprinklered in the residential wings, but the corridors were sprinklered throughout.

The sprinkler system pressure is augmented by the use of a fire pump located on the ground floor. The building also is equipped with a fire alarm system to monitor and supervise the sprinkler, fire pump, smoke control systems, and smoke detectors (both multistation and duct detectors). The fire alarm system monitors the manual pull stations and fire alarm signal devices (audio-visual) for alarms or operational problems.

The building is equipped with a smoke removal system as required by BOCA, for the atrium area. Additional exhaust vents were installed in the residential wings to exhaust smoke from the corridors. The exhaust was supported by forced make-up air supplied by air handlers in the third floor boiler room and the second floor air handler room.

THE FIRE

Residents and several staff members at the Sommerset Retirement Home were looking forward to the hour of 1830 on December 16, 1989. At that time, a member of the staff was scheduled to be married in the common area of the home where residents often gathered to socialize. Right before

1630 that afternoon, however, a sprinkler head went off, automatically activating alarm bells and signaling trouble to the company supervising the system. An on-duty security guard at the home immediately notified the fire department which received the alarm at 1629 hours.

Some of the residents at the retirement home were away from the premises when the alarm went off, but 73 residents were in their apartments preparing for the wedding or otherwise getting ready for dinner and the evening. Quickly and without panic, they left their rooms, descended the stairwells, and congregated in the lobby. Many of the occupants believed it was another fire drill practice and voiced surprise as they exited their apartments that the home would have a fire drill so close to the time of the wedding. By the time they arrived in the lobby, light smoke was visible and residents realized that there was a fire somewhere in the building.

At 1631, the first Sterling Volunteer Fire Department truck arrived. Elderly residents already had reached the lobby or were en route via the stairwells. The security guard met the on-duty fire marshal at the door and told him that one of the elderly residents had shouted "Sorry about the fire, the food got away from me!" The guard did not know where the fire was and was not sure whether the resident who thought she started a fire was completely aware of her surroundings. However, that statement complicated the search for the fire since they could not rule out a kitchen fire in one of the apartment units.

Several tasks had to be accomplished immediately and simultaneously, so an ICS was established to:

- 1) Establish an evacuation center and evacuate the residents;
- 2) Search for others who might still be in their rooms; and,
- 3) Locate the fire and extinguish it.

The Incident Commander sectorized off several areas:

Interior Sector – A deputy chief managed the interior and assigned an assistant chief and a captain to maintain control over different floors.

Rear Sector – A captain took over the rear area and handled ventilation and equipment.

Emergency Medical Services (EMS) Sector – This sector was in charge of evacuating, sheltering, and treating the residents.

Safety Officer – The safety officer covered all matters pertaining to firefighter health and safety.

Media Sector – This contingent worked with the print and electronic media that arrived to cover the story.

The EMS sector immediately went to work. They made contact with the principal of an elementary school located a block away and he opened the school for the evacuees. Under more favorable weather conditions, the residents might have simply been able to be escorted to the shelter. However, frigid weather prevailed the night of the fire. The wind chill was minus 25 degrees, there were thick patches of ice covering street surfaces, and it was dark. Vehicles had to be called out to transport the residents. A few ambulances arrived on the scene in minutes and the Somerset activity bus was put into service. Meanwhile, fire personnel removed the residents' medical records for safekeeping and use at the shelter. A local drug store owner opened his doors to fill prescriptions or provide other medication that residents had had to leave behind in their apartments.

One resident was treated for smoke irritation and another person was taken to an area hospital for an undisclosed ailment, possibly not connected to the fire. Otherwise there were NO INJURIES AND NO DEATHS.

While evacuation was proceeding, firefighters and officers were conducting room-to-room searches and trying to locate the origin of the fire. The large, first-floor kitchen was checked for fire, but found to be clear. Fire officers examined the annunciator panel which showed “duct detector,” “sprinkler flow,” “fire pump run,” and smoke evacuation; the location of the activated sprinkler heads was not given.

By this time there was light to moderate smoke on all floors and a haze that built to 50-70 percent smoke obscuration in the third floor atrium. All fire doors leading to the residential wings closed upon activation of the fire alarm system so smoke was kept out of the residential areas. Four sprinkler heads were discharging and firefighters followed the trail of dripping water to try to find the seat of the fire.

While the sprinklers in the residential room corridors never needed to activate in this fire, the sprinklers in the area of the mechanical rooms successfully contained the flames and prevented the fire from spreading to occupied areas.

At 1659, the primary search of all four wings on each of the three floors was completed and the areas were ruled “all clear.” Fifteen minutes later firefighters finished the second search. At 1709, a working fire finally was found in the second floor mechanical room. No extension was found in the resident rooms immediately adjacent to the mechanical room, nor in the attic. Firefighters, hooking ceilings and pulling down ceiling tile, encountered cement, but no fire.

Four 1-3/4-inch lines were connected to the standpipe at 1715, and two minutes later all fire personnel were ordered off the roof due to deteriorating conditions. Finally, at 1724, fire was reported in the attic above Room 300. It took only three minutes to knock down the flames with a few shots of water from the 1-3/4-inch lines. Over the next hour most of the power was shut down and the utility companies arrived to help secure the systems. Ventilation and checking for hot spots continued for a while and by 1937 the fire was officially under control.

THE INVESTIGATION

At 0700 hours on Monday, December 18, the chief fire marshal of Loudoun County’s Department of Fire and Rescue Services held a debriefing meeting and kicked off the formal investigation. The investigator on-call had started to conduct an investigation the night of the fire, but was hampered at the time by unsafe conditions in the fire building. The floor of the room of origin had burned through in spots, and there was a 14-inch sag in the concrete under the three tons of boiler equipment. Heavy duty equipment and cranes had to be called in to shore up the building and make it sound enough for investigators to re-enter and decipher the puzzle of the fire. Meanwhile, the scene had been completely secured.

It was several days before the cause could be determined and the fire reconstructed. Investigators found heavy fire damage extending from under the 78-inch long concrete pad of Boiler 1. The pad was five inches deep and was poured over plywood. The damage traveled to the wall in the area of the electrical control panels which were examined and found to show no sign of failure or problems. The plywood under the pad showed severe burning and complete destruction from the top side – particularly in the area around a crack in the concrete measuring 39 inches from the end of the pad.

According to investigators, the fire spread from underneath the pad to the wall in the area of the electrical panels, then traveled upwards in the unchecked space between the wall and the fire stop towards the hallway through the trusses until it hit a sprinkler between the ceilings. As the sprinkler activated, the fire spread to the left, away from the sprinkler, then continued through the trusses until it reached a second sprinkler head. That sprinkler head stopped the fire's progress in that direction but the flames were able to continue spreading toward the rear of the room between the second floor ceiling and the third floor. Two sprinklers at that location held the fire in check until firefighters opened a few small holes searching for the source of fire. The fire then extended into the attic area through the atrium, and then jumped to the roof. Soon afterwards, firefighters extinguished the blaze. The diagrams found in Appendix A show the point of origin and fire spread.

The main question facing the investigators was – how did plywood under five inches of concrete ignite and burn? After the construction company shored up the building they removed both boilers. Investigators opened the bottom of the boiler that had sat on the damaged concrete pad and uncovered the assembly of gas-burning tubes. They discovered that two of the tubes, located side-by-side, were turned 180 degrees upside down so that the fire which was projected from the opening hit the concrete pad downward, and not upward through the boiler assembly that carried heat throughout the building. Measurements taken by the investigators showed that the gas tubes were 39 inches to 40 inches from the gas valve at the end of the boiler. The crack in the concrete pad likewise measured 39 inches from the end of the boiler. All other possible sources of ignition were checked again and ruled negative.

Thus, it is believed that over time, perhaps days or even weeks, the heat from the inverted tubes cracked the concrete and slowly established a situation where pyrolysis could take place in the plywood under the pad. Days of unseasonably cold weather preceding the fire had kept the boilers running almost continuously, such that finally enough heat accumulated to cause the smoldering fire to break into flames. It is surmised that before the fire, the vertical draft diverters carried the traces of smoke from pyrolysis up and out of the building which helped keep the problem undiscovered for a long time. Indeed, the interior of the one stack that was later examined was discolored from smoke.

DAMAGE ASSESSMENT

While actual structural damage caused by the fire was estimated at 100,00 dollars, the overall loss has been estimated to be one million dollars or more. That figure includes the physical damage, business loss, cost of relocating some of the residents to other facilities, and the engineering fees and labor charges incurred to shore up the building, lift two huge boilers out the roof, and eventually to replace them.

A room-by-room inspection documented some water damage in 15 rooms, and a total loss in Rooms 300 and 301. Additional damage was prevented by the sprinkler system which controlled the fire and allowed firefighters time to safely evacuate residents and to locate the seat of the fire.

LESSONS LEARNED

1. **Built-in fire protection systems make a critical difference.**

The outcome of this retirement center fire was vastly different from the outcome of several other nursing home/retirement center fires occurring within weeks of this incident. In the case of the Sommerset fire there were no injuries and no deaths in a structure equipped with automatic alarms, smoke detectors, and a sprinkler system. Dozens of lives were lost in the other related fires which occurred in non-sprinklered nursing homes or retirement homes. The Loudoun County Director of the Department of Fire and Rescue credits the sprinkler system at Sommerset with saving property and, possibly, lives. The detection and alarm systems worked to give early warning, and the indicator panel gave valuable information to the firefighters.

2. **Fire drills familiarize occupants with correct evacuation procedures and reduce panic.**

Response by the elderly residents was exceptionally orderly and calm. No one panicked and they used the stairwells, avoiding the elevators. In large part this appears to be due to the fact that fire drills were practiced frequently and the residents knew what to do automatically. The calm evacuation also was helped along by the hour of the fire. Had residents awakened to alarm bells in the middle of the night, reactions might have been somewhat different. Nevertheless, staff and residents alike knew the right actions to take and they responded accordingly.

3. **Emergency training for staff and written emergency action plans contribute greatly to proper response in the event of fire.**

The staff on-duty at the Sommerset Retirement Center responded properly when the fire alarm sounded. The security guard called 9-1-1 immediately and reported their location and the conditions. Staff remained to help residents and to wait for the fire department. All had been trained on proper emergency procedures and were familiar with the written plan, "Sommerset Retirement Community Fire Emergency Policy and Procedures," dated April 1989 (see Appendix C). This was a textbook example of how to do things right.

4. **Incident Command is a valuable fire command management system.**

By immediately establishing an ICS, the Sterling, Virginia, Volunteer Fire Department took control over several critical tasks that needed to be solved simultaneously. This was accomplished efficiently and effectively with a control line of communication and command. "Nobody was freelancing," commented Sterling Fire Chief Scott Milligan, who oversaw the operation. A detailed record of key incidents and the time they were reported was maintained and helped fire officers to reconstruct events in each of the incident sectors for the purpose of the investigation and critique of operations.

5. **A painstakingly thorough investigation was required to determine cause.**

The Loudoun County Fire Marshal's Office and the Sterling Volunteer Fire Department did a commendable job investigating this fire, the cause of which was an enigma. Investigators left no stone unturned and completely documented each step of the investigation until they discovered the inverted burner tubes and could confirm their location at the exact point above the crack in the concrete pad. It is notable that investigators did not settle for an unspecified "accidental" or an "undetermined" as the cause, but, rather, pursued the case until they could derive a clear, defensible ruling of cause.

SUPPLEMENTAL REPORT

A Second Sprinkler Success, Crozet, Virginia

A December 6, 1989, fire originating in a fifth floor bed at the Windham Home for the Elderly in Crozet, Virginia, was extinguished by a single sprinkler. The six-story facility housed 143 patients. The fire caused no injuries to patients. In fact, the resident of the room of origin walked out to her balcony when the smoke became heavy. She was found standing on the balcony when firefighters entered the room.

The six-story facility was fully sprinklered with the fire alarm connected to a central station. The fire department received both the fire alarm and a confirming telephone call.

Smoke and water spread throughout the fifth floor, which required evacuation of about 20 patients on the floor. The facility remained in operation. Three engines, one truck company, and a high volume smoke removal unit were called to the incident.

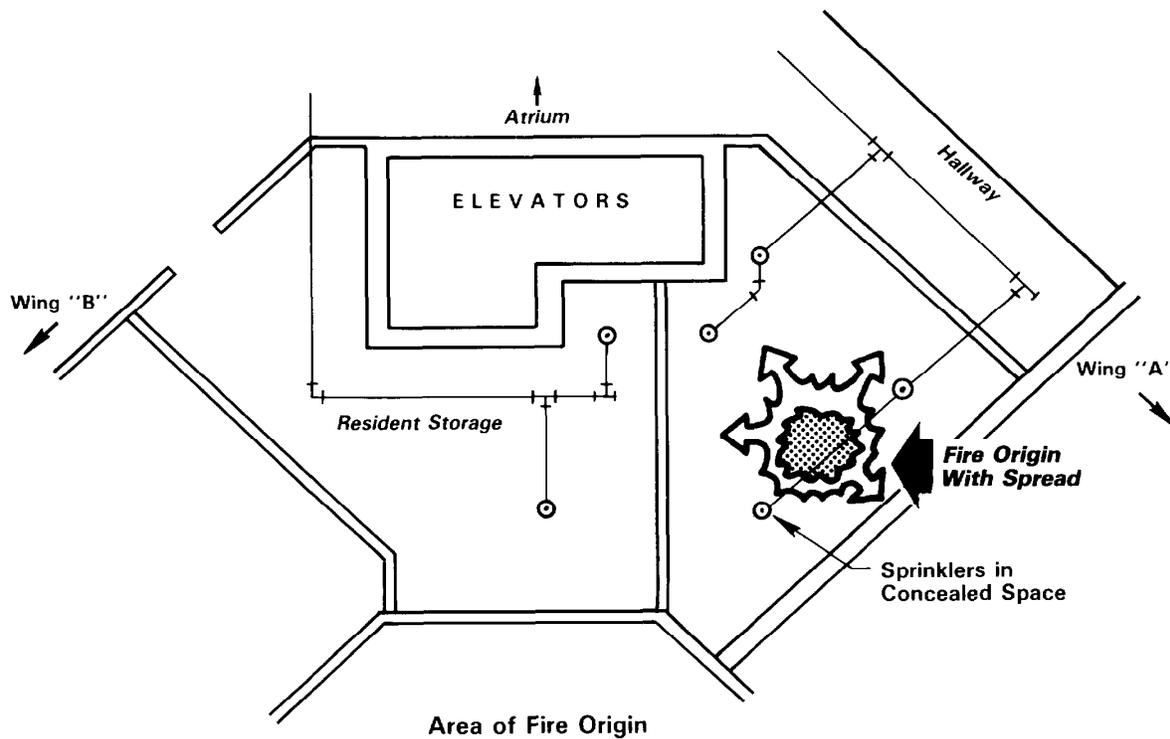
Two staff members of the facility were treated for smoke inhalation after attempting fire control and rescue actions. Fire damage was confined to the mattress. Water from the sprinkler leaked into several rooms below the fire room, which required relocation of several patients. Total time on the scene was about two and one-half hours.

APPENDICES

- A. Diagrams of Area of Fire Origin, Fire Spread, and Floor Plans.
- B. Sterling Fire Department Fire Incident Report, Log of Events/Actions, and List of Vehicles Used.
- C. Amurcon Sommerset Retirement Community “Fire Emergency Policy and Procedures,” April 1989.
- D. Photographs

APPENDIX A

Diagrams of Area of Fire Origin, Fire Spread, and Floor Plans



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Appendix A (Continued)

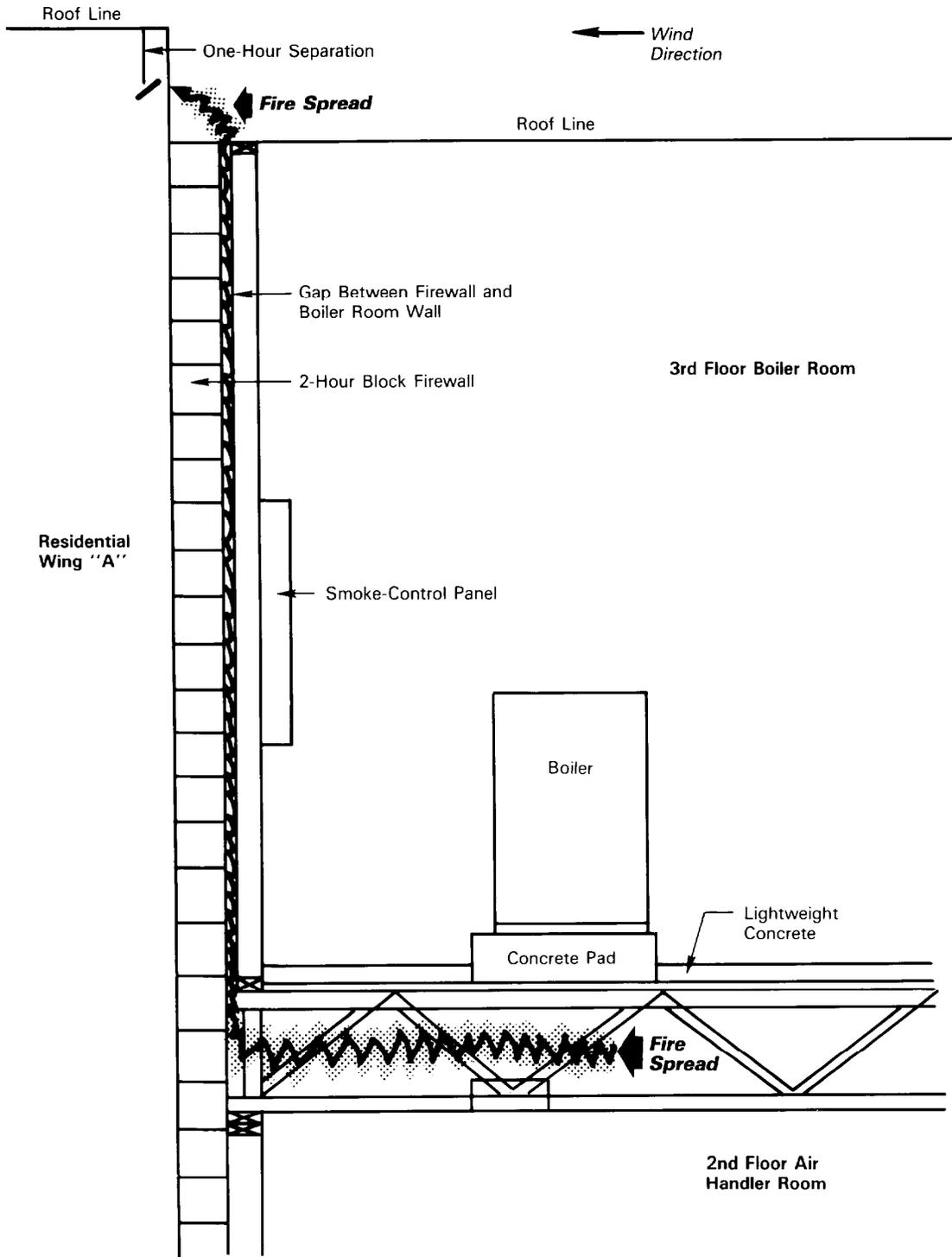
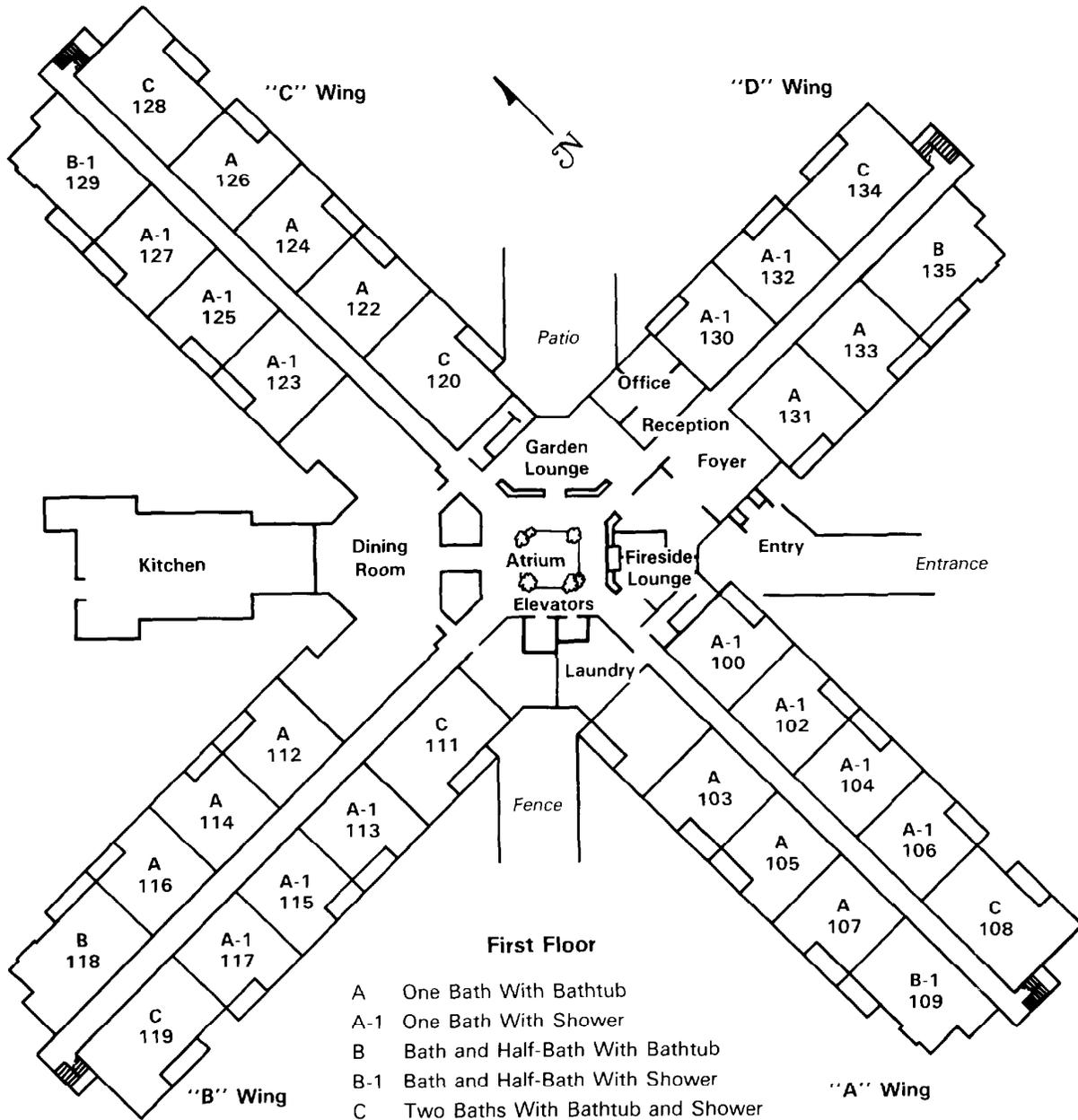
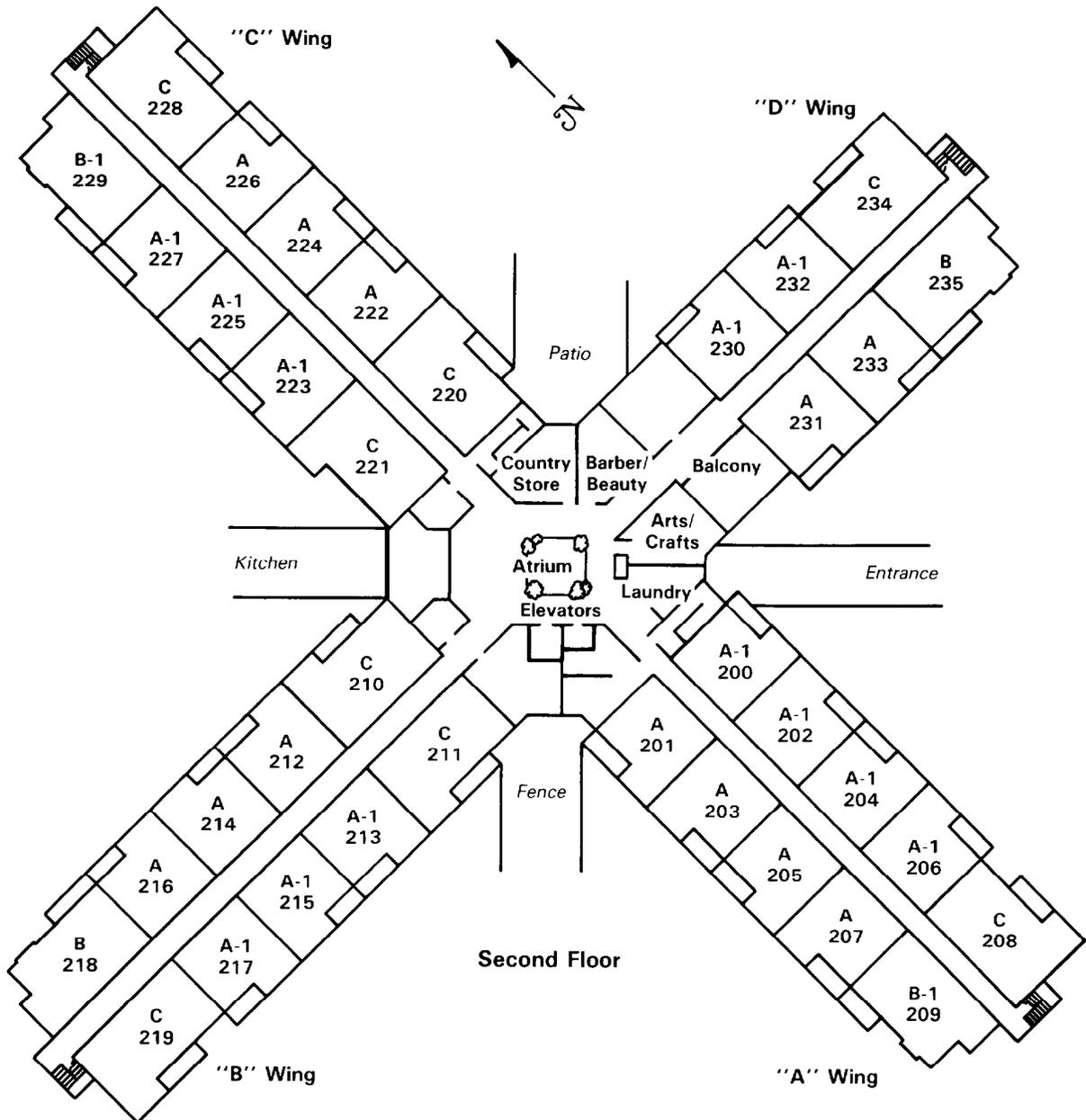


Diagram of Fire Spread

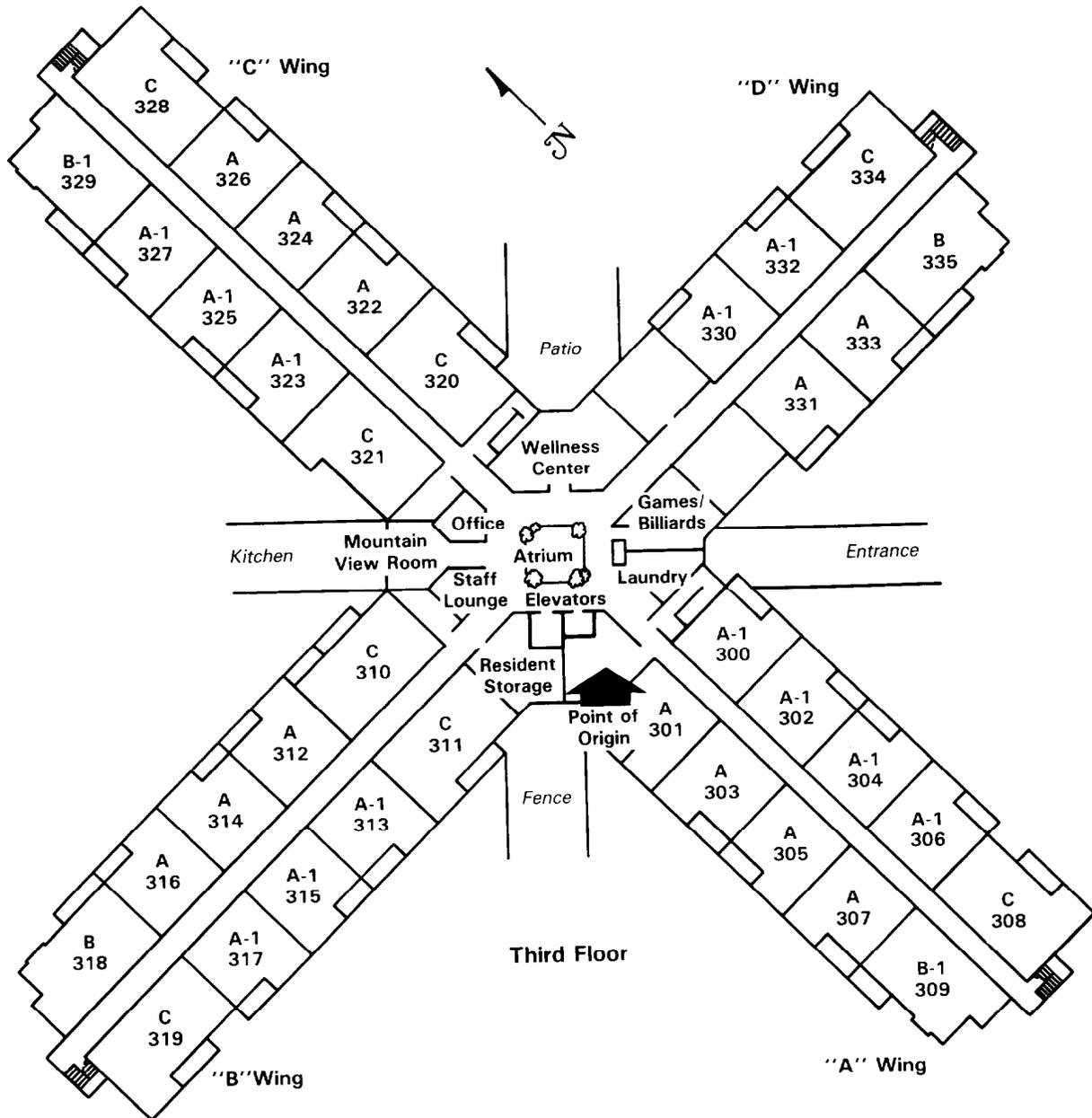
Appendix A (Continued)



Appendix A (Continued)



Appendix A (Continued)



Appendix B (Continued)

<u>TIME</u>	<u>ACTION</u>
1629	ALARM
1631	W-11 ON SCENE
1659	PRIMARY SEARCH COMPLETE - ALL CLEAR
1709	WORKING FIRE FOUND 2ND FLOOR MECHANICAL
1710	NOT IN ATTIC
1714	SECONDARY SEARCH COMPLETE - ALL CLEAR
1715	4 1 $\frac{3}{4}$ " LINES CONNECTED TO STANDPIPE
1717	ORDER PERSONNEL OFF ROOF DUE TO CONDITIONS
1724	OWENS REPORTS FIRE IN ATTIC ABOVE RM 301
1725	ADDITIONAL SEARCH DUE TO ACCOUNT OF 1 PERSON MISSING, FINDS NOTHING. (PERSON HAD LEFT PRIOR TO FIRE, 1830)
1727	OWENS REPORTS ATTIC KNOCKED DOWN
1730	UEPCO ON SCENE, MOST POWER SHUT DOWN.
1732	SMITH REPORTS ELECTRICAL GENERATOR START, (SECURED 1734)
1730	LCSA AUTHORITY NOTIFIED
1735	KISER REPORTS ROOF OK, CONTINUE VENTILATION
1745	T-64 Q.O.S. HYDROLOGICS
1800	4TH ALARM CALLED 4 ADDITIONAL ENGINES
1805	BUILDING INSPECTOR ON SCENE
1820	GAS UTILITIES SECURED
1853	2ND FLOOR UNDER CONTROL, 3RD FLOOR HOOKING, AND GETTING H SPOT
1937	DISPATCH NOTIFIED FIRE UNDER CONTROL, OVERHAUL MEN. OF 2 $\frac{1}{2}$ HOURS
1956	ALL POWER REMOVED FROM THE BUILDING

Appendix B (Continued)

Vehicles Responding

<u>12</u> <u>ENGINES</u>	<u>2</u> <u>TANKERS</u>	<u>3</u> <u>TRUCKS</u>	<u>5</u> <u>RESCUE</u>
W-11	T-1	T-11	M15-2
W-18	FX-12	FX-36	M15-4
W-6		D-64	R15-5
E-6			A13-4
W-9			M-64
W-7			
W-5			
FX-4			
FX-12			
FX-36			
FX-15			
D-64			
<u>2</u> <u>SQUADS</u>	<u>5</u> <u>SERV</u>	<u>5</u> <u>SPECIAL</u>	
S-15	S-11	FX ASST CHIEF	
FX-21	U-11	FX DEP CHIEF	
	S-1	FX COMMAND BUS	
	C-7	FX LIGHT + AIR 31	
	FX BATT 1	FX CAVE-IN 21	

APPENDIX C

Amurcon Sommerset Retirement Community “Fire Emergency Policy and Procedures,” April 1989

Table of Contents:

Fire Emergency Policy

Fire Emergency Procedure – Residents

Fire Drills – Residents
(for employees, see policy)

Fire Emergency Procedure – Business Hours

**Fire Emergency Procedure – Evening
Security/Housekeeping**

Fire Emergency Procedure – Night Security

FIRE EMERGENCY POLICY

Sommerset Retirement Community 4/89

(also see Fire Emergency Procedures for Residents & Employees)

It is the policy of Sommerset Retirement Community to have written fire emergency procedures in order to provide for the safety and well being of the residents and staff should such an emergency situation arise. So that these plans are effective, they will be put into practice according to the guidelines below.

ORIENTATION – RESIDENTS

New residents will receive a written Fire Emergency Procedures for Residents at the time of move-in. Also, they will be verbally instructed and shown how the plan works and their evacuation route from their apartment.

Current residents will receive a written Fire Emergency Procedures for Residents and verbal instruction at resident meetings set aside for this purpose. This will serve to implement the Fire Emergency Policy and Fire Emergency Procedures for Residents.

ORIENTATION – EMPLOYEES

New employees will receive a copy of the Fire Emergency Policy and Fire Emergency Procedures for both residents and employees. They will be instructed in the policy and procedures and the role they are expected to take.

Current employees will receive a copy of and instruction in the Fire Emergency Policy and Procedures for both residents and employees at an employee meeting(s) held for this purpose.

Once a year, a meeting will be held to instruct every employee in the use of fire extinguishers. If a fire can be contained by the use of an extinguisher, employees will need to know how to handle themselves and the protection equipment provided at Sommerset.

FIRE DRILLS

Staff, and most of the time residents too, will participate in fire drills each month. One drill will be held each month involving one (1) of the three (3) shifts. The three (3) shifts will rotate their involvement so that each shift will be drilled four (4) times per year.

Management and maintenance will conduct the monthly drills by actually pulling an alarm station. The Fire Emergency Procedures will be put into practice just as if it was a real emergency. During this drill, residents are to go from their apartments to their designated primary exit or alternate exit, or the closest exit if not in their apartment. Depending on the weather, the actual evacuation portion of the procedure may be skipped at the discretion of management. On the midnight to 8 a.m. shift, an actual alarm may not be pulled and residents will then not be expected to participate. This will be decided upon by management.

At the convenience of the fire department and rescue squad, a mock evacuation will be held at least once a year. (See Fire Drills addressed in Fire Emergency Procedures for Residents.)

After each monthly fire drill, management may hold a fire emergency procedure meeting for all residents and staff. The purpose of this meeting is to review the procedure and identify and discuss any resident hardships, concerns or suggestions.

A record will be kept of each drill. The record will reflect the date, time, number of residents and staff participating, and the amount of time it took to conduct the drill.

ACCOUNTING FOR RESIDENTS

A roster of all residents will be kept in the security book at the front desk (maroon) and in the key cabinet in the community manager's office. This roster will be used to account for each resident at the three (3) designated meeting places for residents. They are:

A and B Wing

Exit and meet on the grass at the fenced area by the steps to the private sidewalk.

C Wing

Exit and meet on the grass at the corner of the service road and Holly Avenue (across from the stop sign). Use caution when taking the C wing fire stairwell exit. The angle of descent from this exit is steep.

D Wing

Exit and meet at the sidewalk that leads to Holly Avenue through the wooded area.

At each of the three (3) designated meeting places, residents are to stay clear of the paths used by the emergency vehicles. They may even be driving on the lawn.

The roster will be kept up-to-date at all times. It will include the residents' names, apartment numbers, and a code for those who may have a specific need during an evacuation.

V – visually handicapped

H – hearing impaired

M – mobility impaired (cane, walker, or wheelchair)

Those residents needing assistance during a drill or an actual emergency can be helped by other residents if they themselves are capable and not in immediate danger.

(NOTE: It is not the residents' responsibility to provide assistance during a drill or evacuation. They may do so at their own choosing and risk).

The fire department will provide assistance or rescue to those residents who are not accounted for during an evacuation.

KEY ACCESS

The four (4) management personnel (community manager, assistant community manager, maintenance director, and food service director) will each have a grand master key. One (1) additional grand master key will be passed on to and signed for by the security shifts as they relieve each other. The grand master key gains access to the community manager's office where the key box is kept. The key box is to be kept locked at all times. Apartment locks are not on the grand master key. Each apartment has a duplicate key in the key box. These keys are to be signed out and in as they are taken from the box.

TESTING

ANSUL SYSTEM – The Ansul Extinguishing System in the main kitchen is under contract to be serviced every six months. A record of this servicing will be kept on file in the management office.

EMERGENCY LIGHTING – Once every six (6) months the generator will put under load where it will provide the current expected in a power outage. The emergency lighting will be tested by virtue of this generator test. Maintenance will check the building for the proper functioning of emergency lighting.

Weekly the generator itself will be run in order to test the functioning of the generator.

FIRE ALARM TESTING – Each month in which there is a “sounded” fire drill, a different pull station will be used. The monthly fire drill record will show the functioning of the station pulled. Once each year, the fire alarm system will be checked by an independent company.

FIRE EXTINGUISHERS – Monthly, evening security/housekeeping will visually check the extinguishers for proper pressure. This check will be recorded on the extinguisher tag provided for this purpose. Annually, an independent company will check each fire extinguisher.

SPRINKLER SYSTEM – The pressure of the sprinkler system will be checked and recorded monthly by maintenance. The system will be checked for proper operation at least once per year. Every five (5) years, the system will be put through a hydrostatic test.

FIRE DEPARTMENT AND LOCAL RESCUE SQUAD

The Fire Emergency Policy and the Fire Emergency Procedures for Residents and Employees will be reviewed and approved by the State fire marshal’s office and/or by the local fire department, whichever is available and appropriate.

The local fire department will be invited to conduct the training seminar on the use of fire extinguishers for employees, as well as, other fire safety programs for residents and staff alike. They, along with the rescue squad, will be asked to take part in the annual Fire Emergency Procedures review meetings for residents and staff and an actual mock evacuation.

The local fire department and rescue squad will be extended an open invitation for members to visit Sommerset in order to familiarize themselves with the facility, staff, and residents. At least once a year, a formal date will be set up for this purpose.

These various invitations will be initiated by management.

REVIEW AND REVISION

This Fire Emergency Policy and the Fire Emergency Procedures for Residents and Employees will be reviewed and revised, accordingly, at least annually. Any revisions are to be approved by the State fire marshal’s office and/or the local fire department, whichever is appropriate.

Additional review and revision will also take place during the post fire drill meetings and during the planned training seminars.

Revisions are to be communicated in writing to residents and staff.

RESIDENTS

FIRE EMERGENCY PROCEDURE

Somerset Retirement Community 4/89

When the fire alarm sounds:

DO NOT second guess the alarm. Assume that it is an actual emergency and exit your apartment in the following manner:

1. Do Not PANIC! Remain Calm!
2. LEAVE YOUR APARTMENT IN AN ORDERLY MANNER!

Shut your apartment door behind you but do not lock it. If the fire department makes a search of the building, it will be important for the door to be unlocked. Do make sure the door is shut. A closed door slows the air supply and can help to control a fire.

3. Go the fire exit stairwell nearest to your apartment. This is your PRIMARY exit route. Proceed to the lowest level possible. Stay at this level and wait for further instructions. (We will practice relocation instead of evacuation. You do not have to go out the exit door to the outside unless told to do so or if danger is imminent.)
4. If there is a need to evacuate the building, you will be instructed to do so either by the fire department or management. Do not question the evacuation order. Proceed out the exit door to the outside. Go to your designated meeting place listed below so you will be counted as present and safe. Move as far away from the building as possible and stay out of the way of the fire department and rescue vehicles.

A and B Wing

Exit and meet on the grass at the fenced area by the steps to the private sidewalk.

C Wing

Exit and meet on the grass at the corner of the service road and Holly Avenue (across from the stop sign). Use caution when taking the C wing fire stairwell exit. There is a slight grade to the service road at this exit.

D Wing

Exit and meet at the sidewalk that leads through the wooded area to Holly Avenue.

At each of the three (3) designated meeting places, residents are to stay clear of the paths used by the emergency vehicles. These vehicles may even be driving on the lawn.

WHAT IF: You should see smoke, fire, or smell gas or a strong odor?

Do not wait for the evacuation order. Instead, proceed down the stairwell **farthest away from** the fire and exit the building.

Each apartment has a PRIMARY exit path which is to the fire exit stairwell nearest the apartment. There is also an ALTERNATE path to follow should the PRIMARY

exit path be blocked by fire. This ALTERNATE path is the fire exit stairwell which is the next closest stairwell to the apartment.

A map on the wall at each fire pull station will show the designated paths for that area. A copy of your paths should be included in your move-in information packet. Current residents will be given a copy of their paths. Please study your designated paths.

WHAT IF: You are not in your apartment at the time the alarm sounds?

DO NOT RETURN TO YOUR APARTMENT! Follow the exit path for the area you are in and proceed with the fire emergency plan through step three (3) just as you would as if in your apartment. It is important that you become familiar with the various fire exits and stairwells, evacuation paths, and the three (3) designated meeting places. If you should be asked to evacuate the building, go to the designated meeting place nearest to the exit you took. Do not attempt to return to the designated meeting place assigned to your wing. You may be hit by an emergency vehicle. Your presence at any of the three (3) designated meeting places will be noted.

WHAT IF: You discover a fire either in your apartment or elsewhere in the building?

Go to the nearest alarm pull station (located on either end of the halls) and pull down on the red handle. Do not attempt to put the fire out yourself. If you can, shut the door to the area of the fire. Quickly proceed to the nearest fire exit stairwell and evacuate the building. Proceed to the designated meeting place nearest to the exit you took.

5. The fire department and/or management will tell you when it is safe for you to return to the building or where you are to go for shelter if there is an actual emergency which prohibits a return to the building.

HELPFUL HINTS FOR A SAFER YOU!

DO NOT USE THE ELEVATOR DURING A FIRE DRILL OR AN ALARM!

USE THE FIRE EXIT STAIRWELLS ONLY, NEVER AN ELEVATOR!

DO NOT IGNORE THE SOUND OF A FIRE ALARM! One never knows the actual reason for the sound at the time it is heard. FOLLOW THIS PROCEDURE WITHOUT DELAY no matter what you are doing (or wearing) at the time.

Should the smoke be thick in your area, the safest way to exit is by crawling on your hands and knees to the fire exit nearest to your location.

If you find yourself trapped in your apartment because the fire is outside your door, DO NOT PANIC! Stuff wet towels under your door to prevent smoke from entering your apartment. Then, stand on your balcony until help arrives. Leave your balcony door closed so you do not feed oxygen to the fire.

Do not try to gather up your belongings. You are the safest possession you own. Get yourself out first.

Do not attempt to go back to your apartment or enter any other part of the building until you are told by the fire department and/or management that it is safe to do so. Leave the daring rescue attempts to the fire department and rescue squad.

If residents have an impairment which is visual, hearing or mobility related, this will be so noted on a master resident census list which will be used by the fire department and rescue squad, and management. Special assistance and attention will be given to these residents.

RESIDENTS FIRE DRILLS

Somerset Retirement Community 4/89

Each month, the management and maintenance of Somerset will conduct a fire drill. The purpose of the drill is to continually educate and train residents and staff on the Fire Emergency Procedure. Residents may not be required to participate in every monthly drill. When resident participation is required, the day of the fire drill will be announced at least one day in advance. This will be done so as not to create unnecessary stress and hardship. The time of the fire drill will not be announced.

DO NOT IGNORE THE ALARM. Even though we announce the day of the drill, a fire could still break out on that day. All residents must participate in the drill. It is for your protection.

During a fire drill, follow the Fire Emergency Procedure just as stated, step by step. We normally will not evacuate the building during a fire drill. We **will** follow the procedure through step three (3) where residents are to proceed to the lowest possible level of their fire exit stairwell. Periodically during the year, we will actually evacuate the building. At the convenience of the fire department and rescue squad, a mock evaluation will be held once each year.

Fire drills, in which there is resident participation, will be followed by a meeting of the residents in the dining room. At this time, we will discuss the drill and any hardships, concerns, or suggestions for improvements in the Fire Emergency Procedure.

EMPLOYEES

FIRE EMERGENCY PROCEDURE

Somerset Retirement Community 4/89

SHIFT: Business Hours
Monday-Friday, 8 A.M. – 5:30 P.M.
Saturday & Sunday, 8 A.M.-5 P.M.
Management Personnel On-Duty.

When the fire alarm sounds:

DO NOT second guess the alarm. Assume that it is an actual emergency and follow the procedures below.

1. Make sure the front doors are **not** on the night mode.
2. Go to the fire alarm annunciator panel between the two (2) front doors and locate the alarm location.

DO NOT SILENCE THE ALARM!

3. Call 9-1-1, without delay!

CALMLY STATE:

“I am calling from Somerset Retirement Community in Sterling.”

“We have a fire alarm situation at Somerset.”

“Our address is 22355 Providence Village Drive in Sterling.” “The location of the alarm in the building is (state location of alarm from annunciator panel).”

“The residents are (1. still in the building but relocating to the exits or 2. are evacuating the building).”

“I am (your name) and my telephone number is 450-6411.”

4. Post an employee (if available) at the front door to wait for the fire department and rescue squad.

The posted employee is to call the following employees who are not present:

Manager on-Duty (M.O.D.)	PAGER – [REDACTED]
[REDACTED]	[REDACTED]
Community Manager	
[REDACTED]	[REDACTED]
Assistant Community Manager	
[REDACTED]	[REDACTED]
Maintenance Director	
[REDACTED]	[REDACTED]
Food Service Director	

If no employee is available to post at the front door, then call one (1) employee on the list.

- inform them of the alarm
- instruct them to call others not present.

Employees living at Sommerset are to respond to the alarm when heard and report to the reception desk to assist the person on-duty.

5. Go to the alarm location.

A. If no fire or danger is evident, do not give the evacuation order. Wait for the fire department and rescue squad to arrive.

With the fire department and rescue squad, determine the reason for the alarm and the necessity of giving the evacuation order.

B. If the alarm is false or no evacuation order is given and there is no danger, DO NOT SILENCE the alarm unless the fire department tells you to do so. Silence it according to the following procedures:

1. Obtain keys to fire alarm annunciator panel from key box in community manager's office.
2. Reset panel by inserting and turning key. Do not leave keys in annunciator panel.

Tell the residents that the alarm situation is over and that they may return to their apartments. There is no danger.

C. If there is a fire, instruct the residents in the immediate area to evacuate the building. Try to contain the fire with an extinguisher. If this fails, close off the area if possible by closing a door.

Do not spend a great deal of time fighting the fire. Only try if it is small and can be put out or at least subdued quickly. The first priority is to:

Evacuate the building:

1. The immediate area and floor of danger zone.
2. The rest of wing in danger zone – the floors above and/or below.
3. The rest of the building by wings or floors depending on which is easiest in relation to location of danger zone.

When the building is evacuated, the most senior manager on site at the time is to go to the three (3) designated meeting places and account for the residents as provided for in the Fire Emergency Police (see ACCOUNTING FOR RESIDENTS). The names and apartment numbers of those residents who are not accounted for are to be given to the fire department.

If the evacuation is to be permanent, shelter will be arranged with Sully Elementary School and the Sterling Community Center. The minibus can be used for transportation.

Should the office area be in danger of fire, the resident files and the key box should be removed to safety.

REMEMBER

STAY CALM!

DO NOT PANIC!

DO NOT USE THE ELEVATORS DURING A FIRE DRILL OR ALARM!

USE FIRE EXIT STAIRWELLS ONLY, NEVER AN ELEVATOR!

The fire department and rescue squad will be on sight within minutes. They will look at the fire annunciator panel, determine the location of the alarm, and join you at the alarm location.

If you are alone, there is always someone on their way as long as you dialed 9-1-1 and called one (1) employee from the list of contacts.

EMPLOYEES

FIRE EMERGENCY PROCEDURE

Somerset Retirement Community 4/89

SHIFT: EVENING SECURITY/HOUSEKEEPING
Monday-Friday, 5:30 P.M. – 12 MIDNIGHT
Saturday & Sunday, 5 P.M. – 12 MIDNIGHT
Evening Security/Housekeeping Personnel On-Duty.

When the fire alarm sounds:

DO NOT second guess the alarm. Assume that it is an actual emergency and follow the following procedure.

1. Make sure front doors are **not** on the night mode.
2. Go to the fire alarm annunciator panel between the two (2) front doors and locate the alarm location.

DO NOT SILENCE THE ALARM!

3. Call 9-1-1 without delay!

CALMLY STATE:

“I am calling from Somerset Retirement Community in Sterling.”

“We have a fire alarm situation at Somerset.”

“Our address is 22355 Providence Village Drive in Sterling.”

“The location of the alarm in the building is (state location of alarm from annunciator panel).”

“The residents are (1. still in the building but relocating to the exits or 2. are evacuating the building).”

“I am (your name) and my telephone number is 450-6411.”

4. CALL:

Manager On-Duty (M.O.D.) – use the telephone before you try the beeper. The telephone will give you actual contact.

Have the M.O.D. call one of the following employees and instruct him or her to call the rest on the list. They are to come in if there is a fire or just stand by should the situation be not fully known. The M.O.D. is to immediately come to Somerset.

██████████
Community Manager

██████████

██████████
Assistant Community Manager

██████████

██████████
Maintenance Director

██████████
Food Service Director

Employees living at Sommerset are to respond to the alarm when heard and report to the reception desk to assist the person on-duty.

5. Go the alarm location.

- A. **If no fire or danger is evident**, do not give the evacuation order. Wait for the fire department and rescue squad to arrive.

With the fire department and rescue squad, determine the reason for the alarm and the necessity of giving the evacuation order.

- B. **If the alarm is false or no evacuation order is given and there is no danger**, DO NOT SILENCE the alarm unless the fire department tells you to do so. Then silence it according to the following procedures:

1. Obtain keys to fire alarm annunciator panel from key box in community manager's office.
2. Reset panel by inserting and turning key. Do not leave keys in annunciator panel.

Tell the residents that the alarm situation is over and that they may return to their apartments. There is no danger.

- C. **If there is a fire**, instruct the residents in the immediate area to evacuate the building. Try to contain the fire with an extinguisher. If this fails, close off the area if possible by closing a door.

Do not spend a great deal of time fighting the fire. Only try if it is small and can be put out or at least subdued quickly. The first priority is to:

Evacuate the building:

1. The immediate area and floor of danger zone.
2. The rest of wing in danger zone – the floors above and/or below.
3. The rest of the building by wings or floors depending on which is easiest in relation to location of danger zone.

When the building is evacuated, the most senior manager on sight at the time is to go to the three (3) designated meeting places and account for the residents as provided for in the Fire Emergency Policy (see ACCOUNTING FOR RESIDENTS). The names and apartment numbers of those residents who are not accounted for are to be given to the fire department.

If the evacuation is to be permanent, shelter will be arranged with Sully Elementary School and the Sterling Community Center. The minibus can be used for transportation.

Should the office area be in danger of fire, the resident files and the key box should be removed to safety.

REMEMBER

STAY CALM!

DO NOT PANIC!

DO NOT USE THE ELEVATORS DURING A FIRE DRILL OR ALARM!

USE FIRE EXIT STAIRWELLS ONLY, NEVER AN ELEVATOR!

The fire department and rescue squad will be on site within minutes. They will look at the fire annunciator panel, determine the location of the alarm, and join you at the alarm location.

If you are alone, there is always someone on their way as long as you dialed 9-1-1 and called the M.O.D.

EMPLOYEES
FIRE EMERGENCY PROCEDURE
Sommerset Retirement Community 4/89

SHIFT: NIGHT SECURITY
7 Days A Week From 12 MIDNIGHT – 8 A.M.
Night Security Personnel On-Duty.

When the fire alarm sounds:

DO NOT second guess the alarm. Assume that it is an actual emergency and follow the following procedure.

1. Make sure front doors are **not** on the night mode.
2. Go to the fire alarm annunciator panel between the two (2) front doors and locate the alarm location.

DO NOT SILENCE THE ALARM!

3. Call 9-1-1, without delay!

CALMLY STATE:

“I am calling from Sommerset Retirement Community in Sterling.”

“We have a fire alarm situation at Sommerset.”

“Our address is 22355 Providence Village Drive in Sterling.”

“The location of the alarm in the building is (state location of alarm from annunciator panel).”

“The residents are (1. still in the building but relocating to the exits or 2. are evacuating the building).”

“I am (your name) and my telephone number is 450-6411.”

4. CALL:

Manager On Duty (M.O.D.) – use the telephone before you try the beeper. The telephone will give you actual contact.

Have the M.O.D. call one of the following employees and instruct him or her to call the rest on the list. They are to come in if there is a fire or just stand by should the situation be not fully known. The M.O.D. is to immediately come to Sommerset.

██████████
Community Manager

██████████

██████████
Assistant Community Manager

██████████

██████████
Maintenance Director

██████████
Food Service Director

Employees living at Sommerset are to respond to the alarm when heard and report to the reception desk to assist the person on-duty.

5. Go the alarm location.
 - A. **If no fire or danger is evident**, do not give the evacuation order. Wait for the fire department and rescue squad to arrive.

With the fire department and rescue squad, determine the reason for the alarm and the necessity of giving the evacuation order.

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Tell the residents that the alarm situation is over and that they may return to their apartments. There is no danger.

- C. **If there is a fire**, instruct the residents in the immediate area to evacuate the building. Try to contain the fire with an extinguisher. If this fails, close off the area if possible by closing a door.

Do not spend a great deal of time fighting the fire. Only try if it is small and can be put out or at least subdued quickly. The first priority is to:

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If the evacuation is to be permanent, shelter will be arranged with Sully Elementary School and the Sterling Community Center. The minibus can be used for transportation.

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The fire department and rescue squad will be on site within minutes. They will look at the fire annunciator panel, determine the location of the alarm, and join you at the alarm location.

If you are alone, there is always someone on their way as long as you dialed 9-1-1 and called the M.O.D.

APPENDIX D

Photographs

1. Entrance to Sommerset Retirement Community.
2. Overturned cement “pad” on which furnace sat. Note smoke discoloration on underside.
3. Charred remains of boiler room sub flooring destroyed by the fire.
4. Flames and smoke traveled in the space between the exterior wall and the fire wall.
5. Another view of boiler room sub flooring.
6. Note crack in cement caused by rotated burner tubes.
7. Note burner tubes in center rotated 180 degrees.
8. Close-up of crack in cement caused by rotated burner tubes.
9. Vertical draft diverter on left shows smoke damage. Note clean diverter on right.
10. Section of roof where fire broke through (now covered).



1. Entrance to Somerset Retirement Community.



2. Overturned cement "pad" on which furnace sat. Note smoke discoloration on underside.



3. Charred remains of boiler room sub flooring destroyed by the fire.



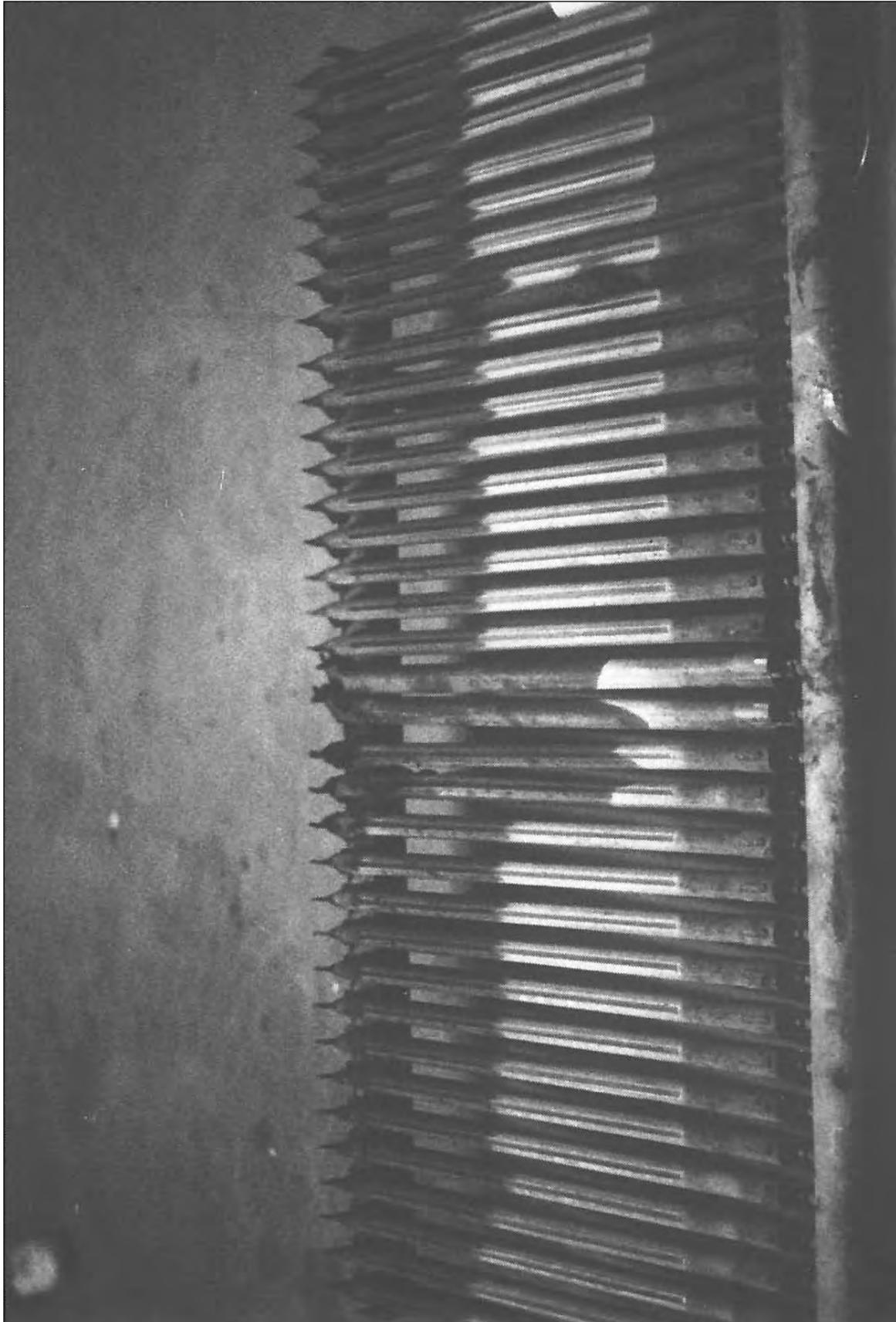
4. Flames and smoke traveled in the space between the exterior wall and the fire wall.



5. Another view of boiler room sub flooring.



6. Note crack in cement caused by rotated burner tubes.



7. Note burner tubes in center rotated 180 degrees.



8. Close-up of crack in cement caused by rotated burner tubes.



9. Vertical draft diverter on left shows smoke damage. Note clean diverter on right.



10. Section of roof where fire broke through (now covered).