


# HIGH-RISE HOTEL FIRE

Virginia Beach,  
Virginia

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A fire in a ninth-floor room of this modern 11-story high-rise hotel on September 8, 1974 destroyed the room and eventually involved the nearby elevator lobby on that floor. A motel employee who attempted to extinguish the fire was killed. Of significance in this fire was the delayed alarm and the failure of certain fire protection devices to function properly.

The Cavalier Beachfront Hotel is a fire-resistive building about one year old. The first ten floors contained guest rooms, the eleventh floor held a restaurant, and the basement contained maintenance shops and a parking garage.

## CONSTRUCTION

The building was constructed entirely of reinforced concrete, including columns, beams, and floor slabs.

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This report was a cooperative effort by the National Bureau of Standards and the NFPA Fire Analysis Department. The author gratefully acknowledges the cooperation of Virginia Beach Fire Chief Harry Diezel.

The exterior curtain walls consisted of four-inch concrete blocks faced with four-inch brick. The exterior walls of the guest rooms consisted of fixed ¼-inch plate glass in aluminum frames and ¼-inch plate glass sliding doors opening to a continuous balcony on the north, south, and east sides of the building.

The floor slabs were poured in place and measured 5½ inches. The slab-to-slab height was 11 feet.

Interior walls were of ½-inch gypsumboard on metal studs. The stairways were enclosed by eight-inch cement blocks.

Doors to guest rooms were of 1¾-inch composite core wood. Stairway doors were of metal with frames listed for Class B locations.

Interior finish in rooms and hallways consisted of vinyl-covered wallpaper, wall-to-wall carpeting, and plastered and painted ceilings.

The building was provided with a manual fire alarm system that was designed to sound an alarm in the front desk area and in the maintenance office and then, after a time delay, to sound evacuation bells throughout the building. Operation of the evacuation bells could be cancelled by use of key-operated switches at the desk and at the manual pull stations. The system did not transmit an alarm to the Fire Department.

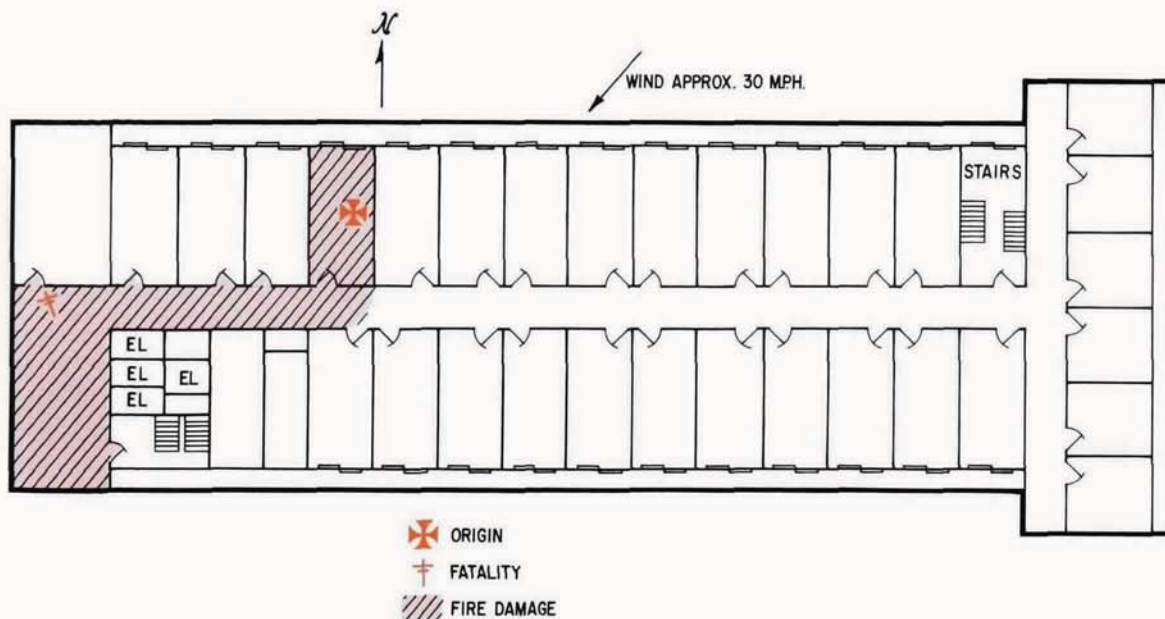


Figure 1. Floor plan for ninth floor.

A wet standpipe system was provided that consisted of 1½-inch hose cabinets in the hallways for occupant use and 2½-inch hose connections in the stairwells for Fire Department use. Automatic sprinklers were installed in the basement. Water for both the standpipes and the sprinklers was provided by an eight-inch supply from the public water system with an electrically-driven 1,000-gpm automatic fire pump. A Fire Department connection was also provided.

### THE FIRE

A maid making her rounds on the ninth floor noticed smoke coming from around the door of Room 906 at about 11:35 am. She immediately pulled a fire alarm on the ninth floor. Hotel maintenance personnel responded to the ninth floor to determine the extent of the fire but upon arrival, they decided not to open the door to Room 906. The assistant hotel manager arrived and decided to attempt to fight the fire. He opened the door and an attempt was made to fight the fire from the doorway using a pressurized water extinguisher and one carbon dioxide extinguisher.

During this attempt, the plate glass sliding doors to the balcony were open and a 30-mph wind was driving the fire toward the corridor door.

The assistant manager told the other personnel to start evacuating anyone still on the ninth floor. As they moved down to the east end of the hall, the fire burst out of the room of origin into the hallway, isolating the assistant manager from the other personnel. Apparently the assistant manager was slightly burned, became disoriented, and could not find his way to the

stairway at the west end of the hall. At this time, another hotel employee called the Fire Department.

The Virginia Beach Fire Department received the call at 12:05 pm, and dispatched two engines and a ladder company. Arriving fire fighters attempting to enter the west stairwell were unable to proceed beyond the seventh floor because of smoke and heat in the stairway. Fire fighters wearing self-contained breathing apparatus were able to proceed to the ninth floor and attack the fire using lines from the Fire Department standpipe connections in the stairwells. Eventually four 2½-inch and five 1½-inch lines were used to control the fire.

The assistant manager was found in the northwest corner of the elevator lobby at the west end of the ninth floor hallway. He was transported to the hospital and pronounced dead on arrival. Cause of death was carbon monoxide poisoning (blood analysis showed 50 percent carbon monoxide content).

A few people were still inside the building at the time of the fire. Seven guests were rescued by fire fighters who had brought spare self-contained breathing apparatus up to the trapped people for their use as they were escorted down the stairs.

Thirty-one fire fighters suffered heat exhaustion.

### ANALYSIS

The fire was initially contained in the room of origin. If the room door had been left closed and the Fire Department had been called promptly, the damage would probably have been confined to that room. Once

the door was open, the fire was driven by the wind out into the hallway.

The west stairwell filled with smoke and heat early in the fire, although the door to the stairway was closed. It appears that a great deal of heat and smoke entered the stairwell because of poor installation of the stairwell door.

During fire-fighting operations, the eight-inch supply to the standpipes broke at a joint in the underground. There was no check valve in the piping between the standpipe and the public supply; thus all standpipe use was lost, as all water being pumped into the Fire Department siamese connection was discharging through the broken underground connection. Fortunately, the Fire Department had raised a ladder

with a ladder pipe to be used as an external standpipe, if needed, and it was promptly put into use to continue the fire fighting.

All exhaust ducts leading from the bathrooms were provided with curtain-type, gravity-drop fire dampers that were designed to close when a link fused. One of these dampers failed to operate as intended. Although the fusible link fused, the retaining bands failed to fall away and blocked the damper from falling.

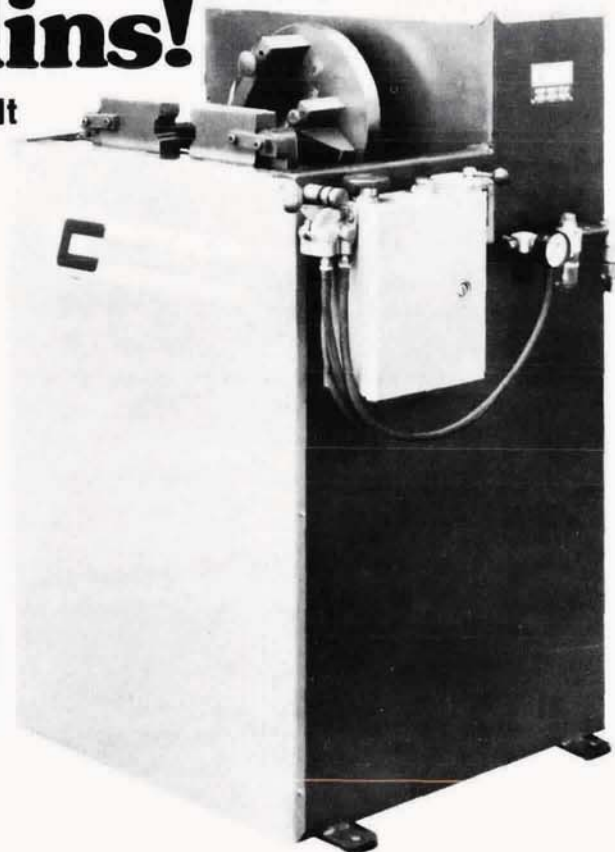
All the room doors had been undercut  $1\frac{1}{8}$  inch to  $1\frac{1}{4}$  inch. There was evidence of fire spread from the hall to nearby carpet inside rooms by means of these openings. If the fire duration had been longer, the possibility of the other rooms being involved is very likely, even though the room door was closed.  $\triangle$

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