



**FONTANA HOTEL**

Miami Beach, FL

April 6, 1990



# **FIRE INVESTIGATIONS**

NATIONAL FIRE PROTECTION ASSOCIATION

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## **FIRE INVESTIGATION REPORT**

**HOTEL FIRE  
MIAMI BEACH, FLORIDA  
APRIL 6, 1990**

**PREPARED BY  
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REGIONAL REPRESENTATIVE  
NATIONAL FIRE PROTECTION ASSOCIATION**

### **I. INTRODUCTION**

The National Fire Protection Association (NFPA) investigated the Fontana Hotel fire in order to document and analyze significant factors that resulted in the loss of life and property.

This study was funded by the NFPA as part of its ongoing program to investigate technically significant incidents. The NFPA's Fire Investigation Department documents and analyzes incident details so that it can report lessons learned for life safety and property loss prevention purposes.

The NFPA became aware of the Fontana Hotel fire the day of its occurrence, April 6, 1990. J. C. Robertson, Regional Representative for NFPA, arrived in Miami Beach from his base in Gainesville, Florida late that afternoon. His on-site study and subsequent analysis of the event provided the basis for this report. Entry to the fire scene and data collection activities were made possible through the cooperation of the Miami Beach Fire Department and the Bureau of Alcohol, Tobacco, and Firearms, U. S. Department of the Treasury.

Publishers of the National Fire Codes® and National Electrical Code®

A non-profit membership organization dedicated to promoting safety from fire, electricity, and related hazards through research, codes and standards, technical advisory services, and public education since 1896.

This report is another of NFPA's studies having particularly important educational or technical interest. All information and details regarding fire safety conditions are based on the best data available and observations made during the on-site data collection phase and during the report development process. It is not NFPA's intention that this report pass judgment on, or fix liability for, the loss of life or property resulting from the Fontana Hotel fire. Rather, the NFPA intends that this report present the findings of the NFPA data collection and analysis effort and highlight the factors that contributed to the loss of life or property.

Current codes and standards were used as criteria for this analysis so that conditions at the Fontana Hotel on the day of the fire could be compared with state-of-the-art fire protection practices. It is recognized that these codes and standards may not have been in effect during construction or operation of the hotel. NFPA has not analyzed the facility as to its compliance with the codes and standards that were in existence when the building was constructed or during its operation.

The cooperation and assistance of Fire Chief Braniard Dorris and Fire Marshal Jerry Wallace, Miami Beach Fire Department, and Malcolm W. Brady, Assistant Special Agent in Charge, Miami District Office, Bureau of Alcohol, Tobacco and Firearms, U. S. Department of the Treasury, are greatly appreciated.

## **II. BACKGROUND**

### **Applicable Codes and Occupancy Classification**

The Fontana Hotel was originally constructed as the Del Prado Hotel in 1951. At the time, the City of Miami Beach was enforcing the Building Code of the City of Miami Beach, as adopted in 1941 and amended in 1949, as well as the *National Electric Code*<sup>®</sup> and a local fire prevention code. Under requirements of Florida law enacted in 1987, the City had adopted and was enforcing the provisions of the 1985 NFPA *Life Safety Code*<sup>®</sup>. In addition to covering new occupancies, this legislation provides for retroactive enforcement when the enforcing authority determines that a threat to life safety or property exists. According to the 1985 NFPA *Life Safety Code*, the building was classified as a residential occupancy and Chapter 17, "Existing Hotels and Dormitories," was applied by the enforcing authority. The City of Miami Beach also enforced the provisions of the South Florida Fire Prevention Code in this structure.

### **The Building**

The hotel was a three-story L-shaped structure measuring 220 ft by 80 ft at the greatest dimension. (See Figure 1.) The first floor contained the lobby and lounge, three office areas, a storage room, a terrace, an unused kitchen, and 24 guest rooms. The first floor guest rooms were located one-half story above the lobby level with a door separating the guest area from the lobby. The second and third floors each contained 38 guest rooms plus a storage room. Each guest room was approximately 12 ft by 15 ft with a bathroom and closet. Many of the rooms contained electrical hot plates or microwave ovens and small refrigerators in addition to the normal furnishings of a hotel room. Guest rooms appeared to be well maintained.

The building was classified as "semi-fire resistive" under the provisions of the Building Code of the City of Miami Beach, 1949 edition, which was in effect at the time of construction. The definition of semi-fire resistive (Type II Buildings) was:

Structural framework of structural steel or reinforced concrete with exterior walls, panel walls, and vertical enclosure walls of masonry and/or reinforced concrete. Partition studding, floor joists and sheeting, ceiling joists and roof rafters and sheeting may be of wood, fire protected as provided herein.

According to NFPA 220, *Standard on Types of Building Construction*, 1985 ed., the building most closely resembled Type III (200) construction.<sup>1</sup> The building was subdivided with a fire wall in order to meet the 10,000-sq-ft area limitation of the Code. Structural members in this building were of reinforced concrete and exterior walls were block. All remaining partition studding, floor joists, ceiling joists, and roof rafters were wood. Where required by Code, these were protected by wire lath and plaster.

Enclosed fire-rated stair towers were provided in the rear, center, and front of the structure. An elevator opening in the lobby area connected all three floors. An air handling space was located adjacent to the elevator shaft on the upper two floors. Large concealed spaces between the ceiling of the lobby and the floor of the second floor contained plumbing, electrical service, and air conditioning ductwork. This space varied in height from 3 ft to 5 ft. The space contained exposed wood structural members as well as concrete beams, girders, and columns.

A sublevel basement was located under the east central part of the building with ingress/egress from the north and south sides. Two hot water boilers, general storage, and swimming pool equipment were contained therein. This area was not involved in the fire.

### **Means of Egress**

The walls between guest rooms and between the exit access corridors and guest rooms were considered to have a 1-hour fire resistance rating. Each guest room had been provided with a 20-minute fire resistance rating door with self closer. The Miami Beach Fire Department had required this change to replace louvered doors under the provisions of the previously mentioned Florida law. The maximum travel distance to reach one of the three exit stairways was approximately 60 ft. No dead-end corridors existed

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1 NFPA 220-1985, *Standard on Types of Building Construction*. A Type III (200) structure will have a 2-hour fire rating for the exterior bearing walls (first digit); 0-hour fire rating for structural frame or columns and girders supporting loads for more than one floor (second digit); and 0-hour fire rating for the floor assembly (third digit).

other than on the first level where occupants of several rooms had as their second means of egress travel through the lobby, which had combustible finish materials such as the ceiling tiles.

Although not an egress factor in this fire, each guest room was equipped with a jalousie-type window, which could be operated to provide ventilation. In addition, these windows could have been removed by occupants for emergency evacuation purposes.

Stair towers were designed to meet a 2-hour fire rating requirement; however, doors opening into the towers were Kalamein doors with large wire glass openings that had no latching devices.

Internally illuminated exit signs marked the location of exit stairways. Constant charge battery-operated emergency lighting units were installed in the exit access corridors and exit stairways as required by retroactive enforcement of the Miami Beach Fire Department.

#### **Fire Protection Systems**

In accordance with a City of Miami Beach ordinance, all guest rooms were equipped with battery-operated, single-station smoke detectors. Several years later, the State of Florida enacted a law requiring enforcement of the *Life Safety Code*. In order to comply with the new state law, hard-wired smoke detectors were installed in all guest rooms. The existing battery-operated, single-station smoke detectors were not removed during the installation of the hard-wired smoke detectors. All of the hard-wired, single-station smoke detectors and any operating battery-operated units provided an alarm only in the guest room in which they were installed.

In addition to these smoke detectors, a system of hard-wired smoke detectors was installed in the corridor, and manual pull stations were located near all access doors to the exit stairways. The corridor smoke detectors and manual pull station would initiate building-wide alarms only. The fire alarm system was also interlocked with the HVAC system. Alarm system activation would automatically shut down the HVAC

system. Fire department notification was to be made by on-duty staff in the building.

No automatic sprinklers were installed in the building. A standpipe system (2-1/2") equipped with 1-1/2" hose was provided in each of the three stairways and corridors. No occupant use of the standpipe system was reported.

Both survivors and fire fighters reported hearing fire alarms sounding. The severity of the fire made it impossible to determine the sequence of operation of these systems.

### **Fire Department Inspections**

Inspectors from the Miami Beach Fire Prevention Bureau inspected this building on a periodic basis. The most recent inspection had been performed in September, 1989. As previously noted, a great deal of attention had been given to retroactive enforcement of the NFPA *Life Safety Code* and many improvements had been accomplished as a result.

The report following a September, 1989 inspection noted problems with fire alarm maintenance, the provision of electrical smoke detectors in all guest rooms, maintenance of exit signs, provision of self-closing devices on several maintenance room doors, provision of a solid core door on a maid's storage room, and storage in a stairwell. All of these deficiencies had been corrected at the time of a re-inspection in October, 1989.

Replacement of louvered guest room doors by solid core doors plus self-closing devices on the doors had been required in earlier inspections. The manual fire alarm system was updated in 1975. A complete rewiring of the building also took place in that year. The *National Electrical Code* was used as the reference for this project. Sealing of the laundry chute had also been required by fire inspectors.

The building appeared to have been in compliance with most provisions of Chapter 17, *Life Safety Code*, "Existing Hotels and Dormitories," at the time of the fire. However, cane fiber combustible ceiling tile reportedly covered

the ceiling in the lobby, which was inconsistent with the requirement of Section 17-3.3.1.<sup>2</sup>

### **Occupant Activities**

At the time of the fire, 101 rooms were reported to have been occupied by 142 people ranging in age from a 7-month-old infant to a number of residents in their 80s and 90s. A majority of residents were elderly persons who lived in the property on a permanent or half-year basis; however, there were also younger transient guests. It appears that most, if not all, of the occupants at the time of the fire were registered guests asleep in their rooms. (See Figures 1-3.) The exceptions were three guests, one of whom was acting as night clerk, who were seated in the lobby. A number of survivors reported that they were alerted by "fire alarms" and "detectors."

While performing search and rescue activities, a Miami Beach Fire Department officer observed a flash and explosion in the area of the building's electrical panel. After this occurred, there apparently was no electrical power left in the building.

### **Weather Conditions**

The temperature in Miami Beach was 65°F and winds were from the south at 6 miles per hour. Skies were clear.

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<sup>2</sup> Although ceiling material in the lobby was completely destroyed by the intensity of the fire and extinguishing efforts, it was the belief of the Miami Beach Fire Department that the ceiling material was combustibile ceiling tile. This view is supported by the presence of such tile in adjoining offices that were less severely damaged and by the amount of fire rolling across the lobby ceiling as observed by arriving fire fighters.



### **III. THE FIRE**

#### **Fire Discovery**

The hotel guests who were seated in the lobby as well as the desk clerk observed the fire at the time it broke out from the crawlspace into the storage room at lobby level. The desk clerk then notified the fire department. One guest attempted to extinguish the fire with a bucket of water.

Simultaneous actions were taking place in the guest room areas on all three floors. Several guests started alerting other occupants by banging on doors. It was reported that alarms were sounding; however, it has been impossible to determine which of five possible alarm systems operated: the two types of smoke detectors found in each room, the corridor smoke detectors, the manual fire alarm stations, or the exit door alarms that were installed for security purposes. Investigating agencies feel that there is a strong possibility that the electrical circuit to the manual system was destroyed by the fire.

#### **Fire Department Notification and Response**

The Miami Beach Fire Department received the first call on this fire at 3:08 a.m. The first arriving companies were from the headquarters station less than a mile away. The first arriving division chief found the entire lobby fully involved, with fire extending out the front of the structure upon arrival at 3:11 a.m. While companies attacked the fire with handlines from the front, other companies went to the rear to begin evacuation and search and rescue operations on all floors. One crew made its way on the first floor to the door separating the lobby from the guest rooms but was soon forced to retreat. It should be noted that the first floor guest rooms were located one-half level above the lobby level.

First alarm response consisted of three engine companies, one ladder company, one rescue, one paramedic unit, and one division chief. Additional alarms were sounded immediately, which resulted in the response of a total of nine engines and three aerial companies plus

additional rescue and paramedic units. In addition to Miami Beach units, four companies were dispatched from Miami and one aerial company responded from the Metro-Dade Fire Department. At the peak of operations, 107 fire department fire fighters were on the scene.

Fire fighters conducted a methodical search of guest rooms. Each time a room was searched the mattress was turned up to indicate that the search had been completed. A number of occupants were assisted down the stairs by fire fighters. In addition, four were assisted from windows. The advanced stage of the fire made a room search impossible on the second and third floors in the front (east) section.

Emergency medical personnel established a triage location to provide evaluation and treatment to guests, many of whom were subsequently transported to three area hospitals. In some cases, a medical evaluation had to be conducted prior to relocation to another hotel.

The incident command system was employed at this fire scene. All three fire departments on the scene normally use this system.

Fire fighters and police officers successfully evacuated 50 guests from the Prince Michael Hotel immediately south of the Fontana. The fire was prevented from spreading to this exposure, which was only 10 ft from the southeast point of the Fontana.

### **Guest Response**

The majority of the guests in the building were able to escape without the assistance of fire fighters. Most escaped by use of the exit corridors and stairs, especially the center and rear stairs. Fire fighters entering from the rear of the building searched all three floors and assisted several occupants in evacuating the building. At least one guest, a 31-year-old male, jumped from a second floor window, and one elderly resident was assisted out of a first level window by another guest who had already escaped. Several survivors reported hearing alarms as well as knocks on their doors. Heavy smoke conditions were reported to have existed during the evacuation,

especially on the upper two floors. Guests also reported that smoke entered their rooms through the building ventilation system.

### **Casualties**

Nine hotel guests died in this incident. (See Figures 4-6.) One victim was found in the ground level corridor, and another victim, an 88-year-old female, was found in Room 205 which was west of the fire wall. A third victim was found in the elevator, and a fourth body was found near the southeastern stairwell. Four more victims were found in the rubble of the upper two floors which had collapsed and fallen into the lobby area. Three days after the fire was extinguished, the last victim was found. It appeared that this person may have died in the third level guest room corridor before the structural collapse occurred.

Twenty-one persons were treated for injuries, primarily smoke inhalation. Many of the persons who had been Fontana Hotel guests were relocated to other hotels. Most of these individuals were examined by on-scene emergency medical personnel prior to being transported by the Red Cross and other relief agencies. In addition, three fire fighters were injured during the performance of their duties.

It should be noted that three of the victims were in their 90s, five were between 85 and 90, and one was 75. Advanced age was a contributing factor; however, the rapid spread of smoke and fire in the east end that brought about total floor collapse negated any ability to determine whether the majority of the victims had exited their rooms in an effort to escape.

At least one elderly survivor was removed through a first floor window by a younger survivor. At least one person jumped from a second floor window, and fire fighters assisted in the evacuation of a number of guests through the corridors and stairway system.

No rescues by fire department aerial devices were reported.

**Damage**

The fire heavily damaged the front (east) section adjacent to Collins Avenue. There was total floor collapse of the second and third floor levels in that section. This area contained 30 guest rooms. Fire spread through the entire cockloft area including the section west of the fire wall. There were several breaches in this fire wall.

Fire damage was less pronounced on the guest room floors west of the fire wall; however, smoke permeated the entire structure through the corridors and HVAC system. The lightest smoke damage was in the first floor corridor west of the fire wall. Many of the more remote guest rooms had little smoke damage. Fire spread was upward from the point of origin and then west at the upper levels.

Major destruction of the front portion, coupled with the loss of the cockloft, led to a decision to raze the structure several months after the fire.

## **IV. ANALYSIS**

### **Cause and Origin**

Investigators from the Miami Beach Fire Department, the Florida State Fire Marshal's Office, and the Bureau of Alcohol, Tobacco, and Firearms, U.S. Department of the Treasury, listed the cause of this fire as "undetermined." The investigation revealed the area of origin to have been within the horizontal 10-sq-ft utility crawlspace above the east portion of the storage room and vending machine area adjacent to the lobby. It is recognized that the complete collapse of the upper floors into the lobby area coupled with arduous search for bodies in this area compounded the difficulty in determining the cause of this fire. These factors disrupted normal investigative procedures.

### **Fire and Smoke Spread**

It is believed that fire burned out of the utility crawlspace and ignited preheated combustible ceiling tile which, in turn, rapidly ignited the lobby area, bringing about the extensive fire condition reported by first arriving fire fighters. This observation is based upon statements of witnesses, including two guests who were watching television in the lobby at the time of the fire and the hotel desk clerk who was also a hotel resident. They estimated that the lobby was involved within three minutes.

It appears that smoke from the lobby was able to travel up to the second and third floor corridors through a utility shaft near the lobby, normal cracks, and voids in the structural and HVAC ductwork. The accumulating smoke on these floors made conditions in the corridors untenable, and egress from the guest rooms eventually became impossible. Seven of the nine fatalities occurred in this area, and one of the two other fatalities occurred while the victim was attempting to vacate this area.

The fire spread upward into the cockloft above the third floor and then progressed toward the fire wall in the center at a rapid rate. Both observations of fire fighters on the scene and post-fire examination confirm that the greatest amount of heat was on the second level, substantiating the belief that space between the first and second levels was the point of origin.

## V. DISCUSSION

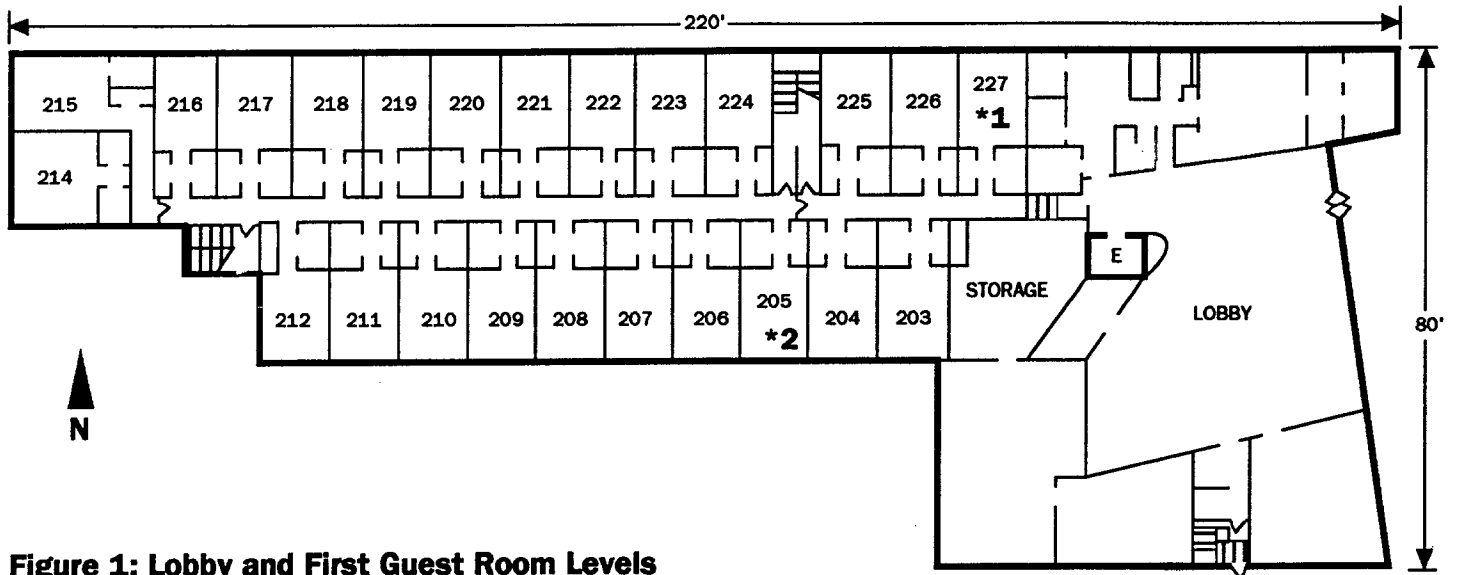
Although the building was considered a "semi-fire resistive structure," combustible materials in a crawlspace (the area of origin) contributed to the rapid spread of fire. In addition, combustible ceiling tile in the lobby also contributed to the rapid fire growth.

Retroactive application of the NFPA *Life Safety Code* by the Miami Beach Fire Department contributed to the large number of survivors in this incident. This is especially remarkable when the general construction of the building, advanced age of the majority of guests, and time of alarm are considered. More than 90 percent of the building population survived. Well-constructed stair towers contributed to the evacuation of guests in the center and west sections.

It should be noted that Florida's retroactive hotel sprinkler law, which requires hotels of three stories or more with interior means of egress to be fully sprinklered, was undergoing "sunset review" in the state legislature at the time of this fire. Although the final compliance date had not been reached and the Fontana Hotel had yet to comply with the law, "sunsetting" would have completely relieved noncomplying hotels, including the Fontana, from adherence to this law. Many legislative observers credit the publicity surrounding this fire with the decisive refusal to eliminate retroactive sprinkler requirements from Florida statutes.

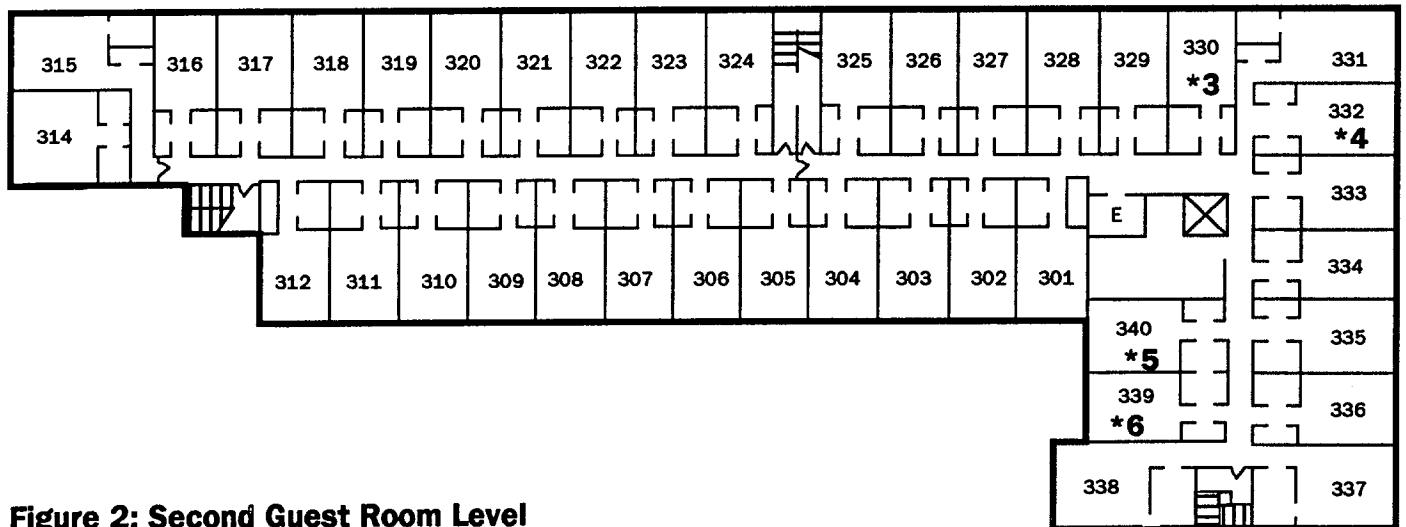
This incident illustrates the need for a method of recording the names of guests in a manner that cannot be destroyed by fire. Two days after the fire, 21 guests were still unaccounted for as many of them merely went to the rooms of friends in other hotels or apartments after exiting the burning building. Perhaps something like the "black box" in aircraft is needed for occupancies of this type.

Had this building been equipped with automatic sprinklers installed and maintained in accordance with NFPA Standard No. 13, the fire fatality toll would have been much smaller. Early operation of sprinklers in the concealed space probably would have precluded any loss of life.



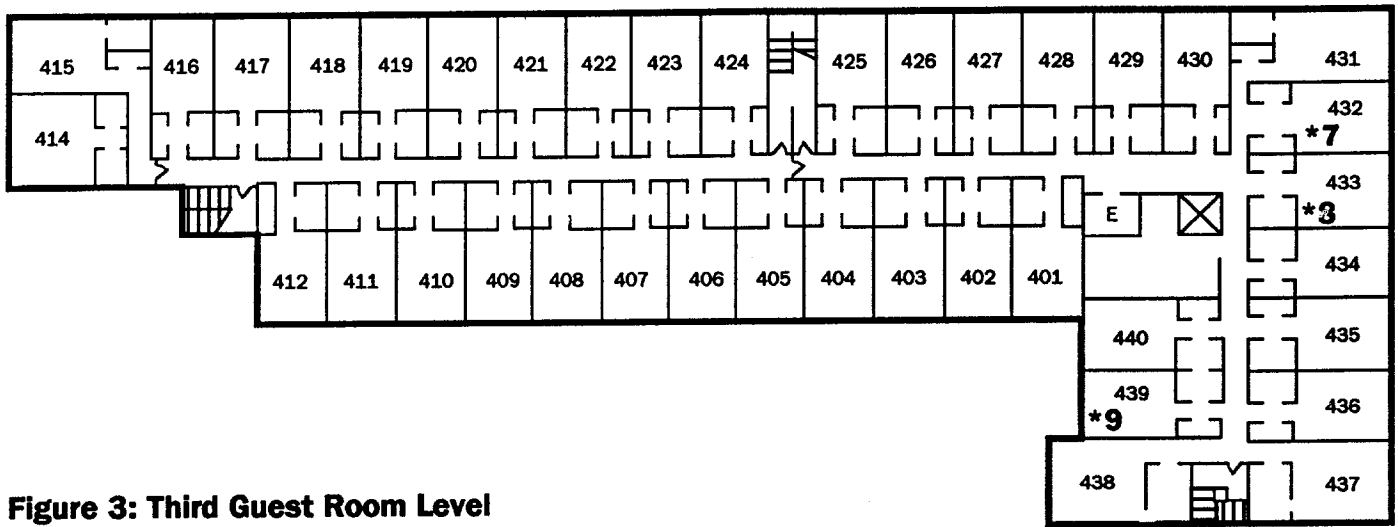
**Figure 1: Lobby and First Guest Room Levels**

**\* Victim number and the respective room in which each victim was registered**



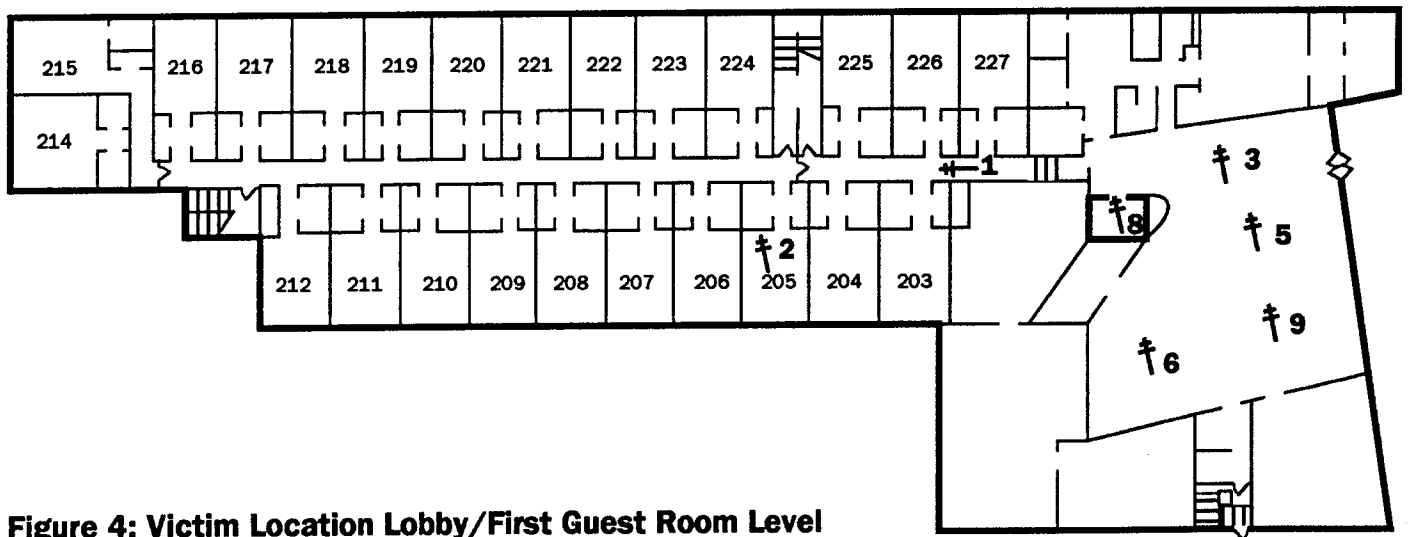
**Figure 2: Second Guest Room Level**

**\* Victim number and the respective room in which each victim was registered**



**Figure 3: Third Guest Room Level**

**\* Victim number and the respective room in which each victim was registered**

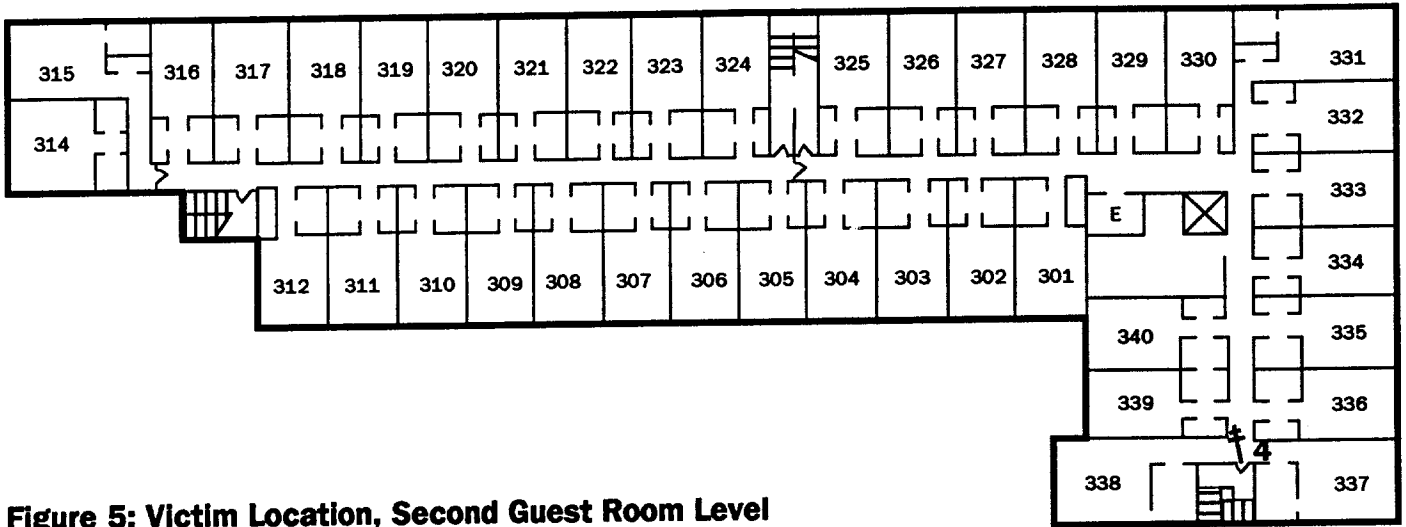


**Figure 4: Victim Location Lobby/First Guest Room Level**

**† Fatality**

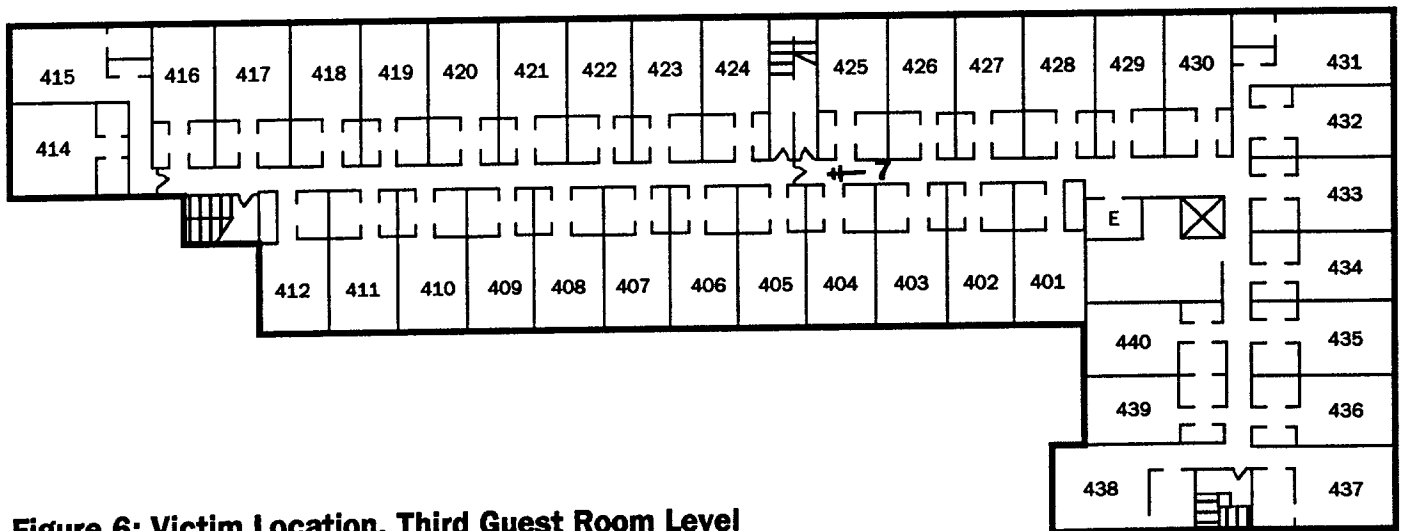
*NOTE: Victims were found after the structural collapse; therefore this diagram may not show the level on which the victim(s) was (were) located before the collapse occurred.*





**Figure 5: Victim Location, Second Guest Room Level**

† Fatality



**Figure 6: Victim Location, Third Guest Room Level**

† Fatality