

DIVISION 7 TRAINING AND SAFETY NEWSLETTER

August 2016

38TH ANNIVERSARY OF "WALDBAUM'S"

Many of the more infamous fires in the history of the New York City Fire Department (FDNY) are given a name. The list is long. Father's Day, 9/11, Third Avenue Collapse, Wooster Street, Fitzpatrick/Frisby, Deutsche Bank, Watts Street, 23rd Street Collapse, Black Sunday are some of the named infamous fires. On Wednesday August 2, 1978, the FDNY responded to a fire in a supermarket at 2892 Ocean Avenue (corner of Avenue Y) in the Sheepshead Bay section of Brooklyn. This was a landmark fire in the FDNY and prompted a sea change in the way we approach fires involving trusses. The name of the fire is simply:

"Waldbaum's."

THE BUILDING

The Waldbaum's supermarket was located at 2892 Ocean Ave., Brooklyn on the corner of Ocean Avenue and Avenue Y. It was a one-story taxpayer 100' x 150'. There was a one story extension on the exposure 4 side. This one story extension was being constructed. The main store had a mezzanine which was used for office space and a compressor room for the air conditioning.

The roof was supported by 100 foot long heavy timber bowstring trusses. The trusses were spaced 20 feet apart. The trusses were measured 10 foot 1 inch high from the top chord to the bottom chord at the apex of the truss. There were sloping hip rafters that connected the first truss and the last truss to the front and rear walls. There were seven bowstring trusses supporting the roof of Waldbaum's. The trusses were numbered front to rear. All the even numbered trusses were covered with sheetrock. The trusses that were covered with sheetrock had a doorway so that workers could pass back and forth within the trusses. The characteristic curved roof shape that would indicate a bowstring truss roof support system was not visible from the street.

The roof had a "rain roof" applied to the roof surface. The roof had sagged and rainwater did not drain off the roof. This "rain roof" was installed at the center of the roof and ran the length of the building. This "rain roof" recreated the curve of the roof so rainwater could drain away. It was constructed of wooden beams and a roof deck which was on top of the old roof deck. The original roof deck was 6 to 8 inches below the new "rain roof".

There were two ceilings, a drop ceiling and an older tin ceiling above it. The tin ceiling was not removed when the new ceiling was installed. The drop ceiling was 18 inches below the ornamental tin ceiling which was attached to the bottom chord of the trusses and purlins. The original tin ceiling was 16 feet above the floor. There were renovations going on within the store while it was still occupied and open to the public.

THE FIRE

August 2, 1978 was going to be a hot summer day. At 0839 hours, Brooklyn Box 3300 was transmitted by the Brooklyn Fire Dispatchers. It was a telephone alarm for a fire at the Waldbaum's Supermarket on Ocean Avenue and Avenue Y.

Engines 254, 321, Ladders 153, 156 and Battalion 33 were dispatched to the fire. While responding, the Brooklyn Fire Dispatcher announced that they were "filling out the assignment" due to numerous phone calls. Engine 254, commanded by Lieut. Edward Smith, arrived at the box. He saw some flames near the exposure 4 side roof level near where the extension was being constructed. He transmitted a 10-75 at 0845 hours. He ordered his men to "drop two hand lines." One 1 ¾ inch hand line and one 2 ½ inch hand line were pulled from the hose bed. Lieut. Smith was told that the fire was in the mezzanine area. Engine 254 started stretching the 1 ¾ inch hand line through the front door toward the stairway of the mezzanine.





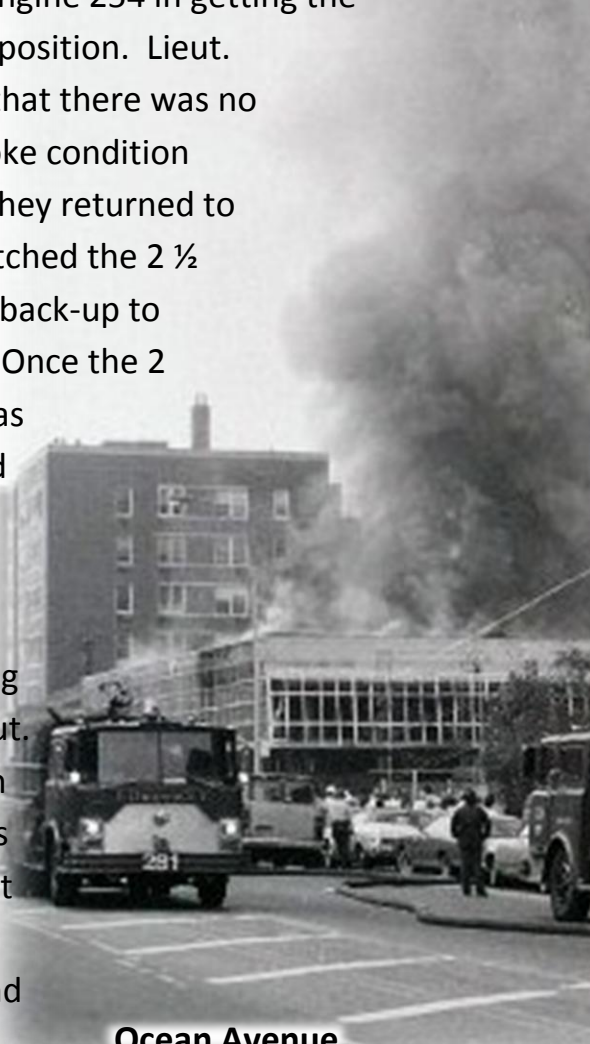
Ladder 153 was the first due Ladder Company led by Lieut. Peter Simeone. Fr. George Rice (Roof), Fr. James McManus (Outside Vent Firefighter), Fr. Frederick Bennis (Chauffeur), Fr. Donald Livingston

(Can Firefighter) and Fr. John Fitzpatrick (Irons Firefighter) made up Ladder 153's team. Lieut. Simeone was told that the fire was on the second floor (mezzanine). There was no visible fire but there was a light smoke condition. Ladder 153's inside team was assisting in clearing a path for the hose line and performing a search. The ceilings were being opened. There was little heat but some fire was observed near where the hose line was operating. The Roof, and Outside Vent Firefighters went to the roof to perform vertical ventilation.

Battalion Chief Arthur Clark of Battalion 33 arrived shortly after Engine 254 and Ladder 153. He transmitted the "All-Hands" for box 3300 at 0849 hours. He saw smoke blowing across Ocean Avenue. As Battalion Chief Clark approached the building, a man told him that there were oxygen, acetylene, and propane bottles in the rear of the store and the gas was shut off. A store employee spoke to Battalion Chief Clark and told him that all shoppers and employees were out of the building. In looking at the first floor, there was no smoke or heat on the first floor.



Engine 321 and Ladder 156 arrived at the fire. Engine 321, led by Lieut. Tim Howard, assisted Engine 254 in getting the first hand line into position. Lieut. Howard observed that there was no fire and a light smoke condition within the store. They returned to the street and stretched the 2 ½ inch hand line as a back-up to the first hose line. Once the 2 ½ inch hand line was charged, it suffered two burst lengths. The smoke was getting a little heavier, but nothing to be alarmed about. A third burst length occurred and it was replaced. The burst lengths were replaced quickly and had little effect on the operation. The hose line was advanced up the stairway to the mezzanine.



Ocean Avenue

Engine 276 arrived at the fire led by Lieut. James Nielsen. They started stretching a 2 ½ inch hose line through the one-story extension on the exposure 4 side due to seeing smoke in this area. They saw fire in the openings in the wall leading to the mezzanine in the original building. Chief Clark went to that area to personally observe what Engine 276 was seeing. This confirmed in Battalion Chief Clark's mind that they had a fire in the mezzanine. He told them to operate their hose line into those openings until Engine 254 had their hand line operating.

The time was 0854 hours. Engine 254 started operating their hose line into the ceiling. The heat was much more intense in the mezzanine area. There was little smoke. Battalion Chief Clark requested an additional Engine and Ladder to be sent to the fire.

Ladder 156 was the second due Ladder Company. Lieut. James Cutillo, Fr. Charles Bouton (Roof Firefighter), Fr. Donald King (Outside Vent Firefighter), Fr. Terrence Campbell (Chauffeur, detailed from Ladder 153), Pr. Fr. William "Billy" O'Connor (Irons Firefighter), and Pr. Fr. Thomas Higgins (Can Firefighter) began their operations. The forcible entry team initially went into the building to check on conditions. The remaining members of Ladder 156 went to the roof to begin vertical ventilation. After checking on operations inside the store, Lieut. Cutillo and Pr. Fr. O'Connor went to the roof to begin operations there. Pr. Fr. Tommy Higgins was told to remain at the front of the store at ground level. He was ordered to begin venting the show windows in the front of the building.



The wife and children of Probationary Fireman William "Billy" O'Connor arrived at the quarters of Ladder 156. They were going to go to a barbeque together at Breezy Point with other family members after the

tour ended at 0900 hours. The alarm for a fire at Waldbaum's was received at the firehouse as she pulled up. She decided to follow the fire trucks so they could see their loved one in action. When the O'Connor family arrived at the fire, they spotted Fireman Billy O'Connor on the ground floor of the supermarket. Louise O'Connor pointed out to her children which of the operating Firemen was their



Dad. He and other members of Ladder 156 were in route to the roof. They were climbing Ladder 156's aerial ladder. Once they arrived on the roof, Fireman Billy O'Connor's children were shouting and got their father's attention. He waved to them from the aerial ladder as he was about to go onto the roof.

Battalion 42 was the second to arrive Battalion Chief. Battalion Chief Peter Eisemann and Fr. Harold Hastings were on-duty. Chief Eisemann arrived and saw smoke in the area, but nothing to be alarmed about. Chief Eisemann reported into the first due Battalion Chief, Chief Arthur Clark. He told him to supervise roof operations. Chief Clark told Chief Eisemann about an air conditioner on the roof that was a concern of his. Both Battalion Chief Eisemann and Fr. Harold Hastings climbed Ladder 156's aerial ladder to supervise the roof operations.

Ladder 169 arrived at the fire. Battalion Chief Clark ordered them to take their saw to the roof and assist with vertical ventilation. Working in Ladder 169 was Captain David Harvey, Fr. Peter Viola (Chauffeur), Pr. Fr. Harold Plaut (Roof Firefighter), Fr. John Madigan (Outside Vent Firefighter), Fr. Patrick Mahaney (Irons Firefighter), and Fr. John Scasny (Can Firefighter, detailed from Engine 318).

They raised their aerial ladder and were working on the roof at the rear of the building. They were having difficulty cutting the roof through the “rain roof”. However, the roof seemed solid to them.

Deputy Chief James O'Malley of the 12th Division arrived at the fire at 0900 hours. He approached Battalion Chief Clark to get a report. He asked what actions were taken. Chief Clark filled him in as to the Engine, Ladder, and Rescue assignments already given. He was told that he had no exposure problems and that Battalion 42 is supervising roof operations. Deputy Chief O'Malley then sent Battalion Chief Clark into the store to supervise operations there. He ordered Rescue 2 to go into the store to help find the fire. Deputy Chief O'Malley transmitted a 2nd alarm at 0902 hours.

Rescue 2 was sent to the fire on the 10-75 signal. Working in Rescue 2 was Lieut. Howard Venetsky, Fr. John (Jack) Pritchard (Chauffeur), Fr. Tom Murphy (Can Firefighter), Fr. Tom Vallebuona (Roof Firefighter), Fr. Peter Bondy (Floor Above Team), Fr. John Thomas (Floor Above Team), and Fr. Donald Healy (Irons Firefighter). When they arrived at Waldbaum's, it did not appear to be a serious fire. There was no a wisp of smoke within the store. The hose lines were



operating in the mezzanine area. Fr. Tom Vallebuona went to the roof and the remaining members of Rescue 2 went to operate inside the store.

Conditions on the roof were different from those inside the store. Ladders 153 and 156 were cutting with their saws. Scuttle covers were removed and the scuttles showed heavy smoke. At first, there was very little smoke coming out of the cuts made by the saws. Unbeknownst to the operating members on the roof, there was a double roof, (a rain roof) installed. It took some time for the members operating on the roof to identify the "rain roof." The original roof would have had to be cut after the rain roof had been cut. This was not practicable due to the depth of the original roof. They moved the cutting operations away from the center of the roof and those holes showed heavy smoke. The main concern on the roof was a heavy air conditioner supported by wooden 4"x4"s. The roof seemed solid. The roof conditions were indicative of a more severe fire condition than was being observed inside the store. Battalion Chief Eisemann requested a hose line to the roof to protect the air conditioner. Engine 246 stretched a 2 ½ inch hand line up Ladder 156's aerial ladder to the roof to accomplish this task.



Engine 246 stretched a 2 ½ inch hand line to roof up Ladder 156 on Ocean Avenue, Exposure 1

Battalion Chief Eisemann of Battalion 42 observed fire encroaching upon the air conditioner on the roof that was supported by wooden beams. At this time, he requested an additional hose line on the roof due to the large area of the roof. The fire near the air conditioner was starting to spread. Engine 245 stretched a 2 ½ inch hand line to the roof via Ladder 169's aerial ladder on Avenue Y (exposure 2). It was 0907 hours. At 0910 hours, Deputy Chief O'Malley requested an additional Engine and Ladder, and requested that the Ladder be a Tower Ladder.

Lieutenant Robert Fernbacher of Engine 245 made it to the roof. He saw fire from the top of the aerial ladder. He had Engine 245's hand line charged. He saw some roofing material on the roof. He reported to Battalion Chief Eisemann of Battalion 42. They advanced the hose line toward the fire.



All members are now operating on roof. Engine 245 is operating. All six members of Ladders 153 and Ladder 156 are now operating between Truss 4 and 6 cutting roof. They are in the foreground. Battalion 42 and Rescue 2 can be seen behind them to the far left. Take notice of smoke condition 5-10 minutes before collapse. The arrow below is a land mark for position of units on roof.



Conditions on the inside of the store seemed to be improving. Engine 254 was hitting fire in the ceiling of the mezzanine. The smoke condition was light to moderate. Members of Ladder 153 and Rescue 2 were pulling ceilings to gain better access to the fire. They were utilizing 10 foot hooks to pull the ceilings.

THE COLLAPSE

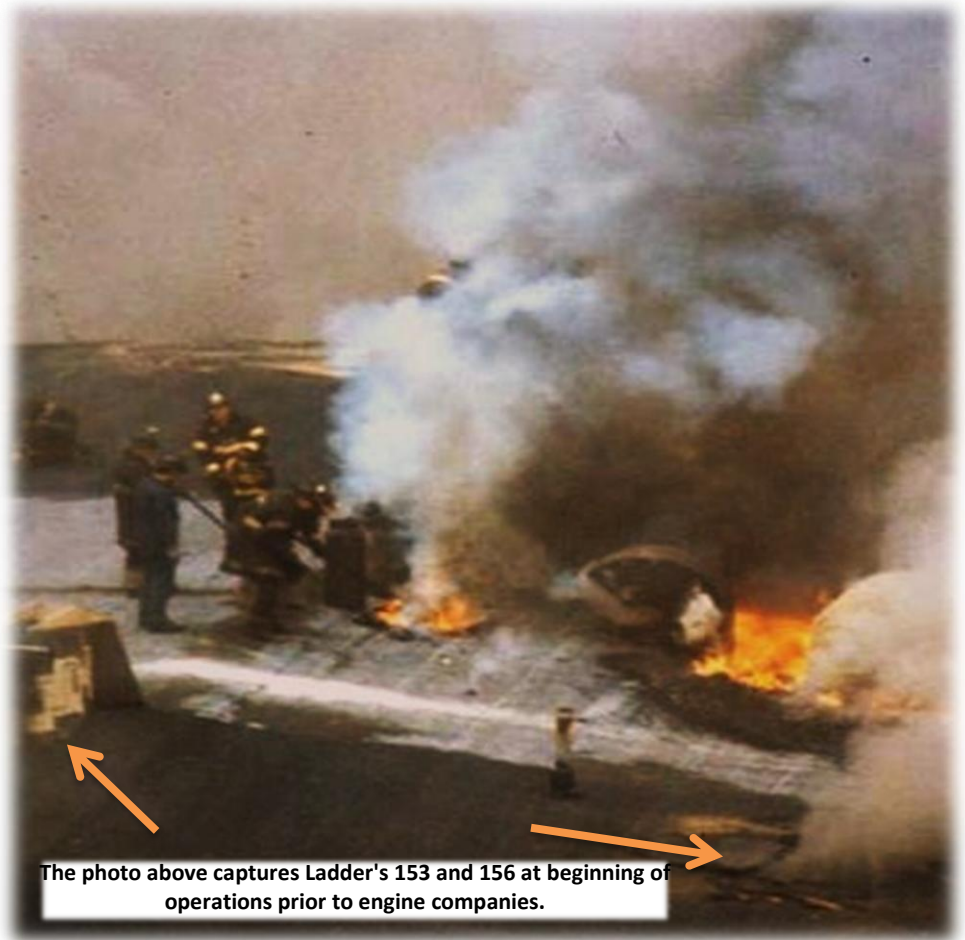
At approximately 0916 hours, inside the store, the members of Ladder 153 went outside to exchange their air cylinders.

Battalion Chief Clark of Battalion 33 was up in the mezzanine supervising extinguishing efforts there by Engine 254 and Engine 321.

Suddenly, out of the corner of his eye, Battalion Chief Clark saw fire to his left and heard a “whooshing” sound. He ordered the

companies to shut down the hose line and back-out. There was quite a bit of fire in the store now. A catastrophic event had occurred. Truss number 5 had collapsed.

On the roof, there were 24 members operating. Conditions on the roof were much more severe than they were inside the store. Heavy smoke and fire was showing near vent cowl and holes that were cut. The roof still felt strong. Suddenly, without warning, a section of the roof just folded in. There was no



The photo above captures Ladder's 153 and 156 at beginning of operations prior to engine companies.

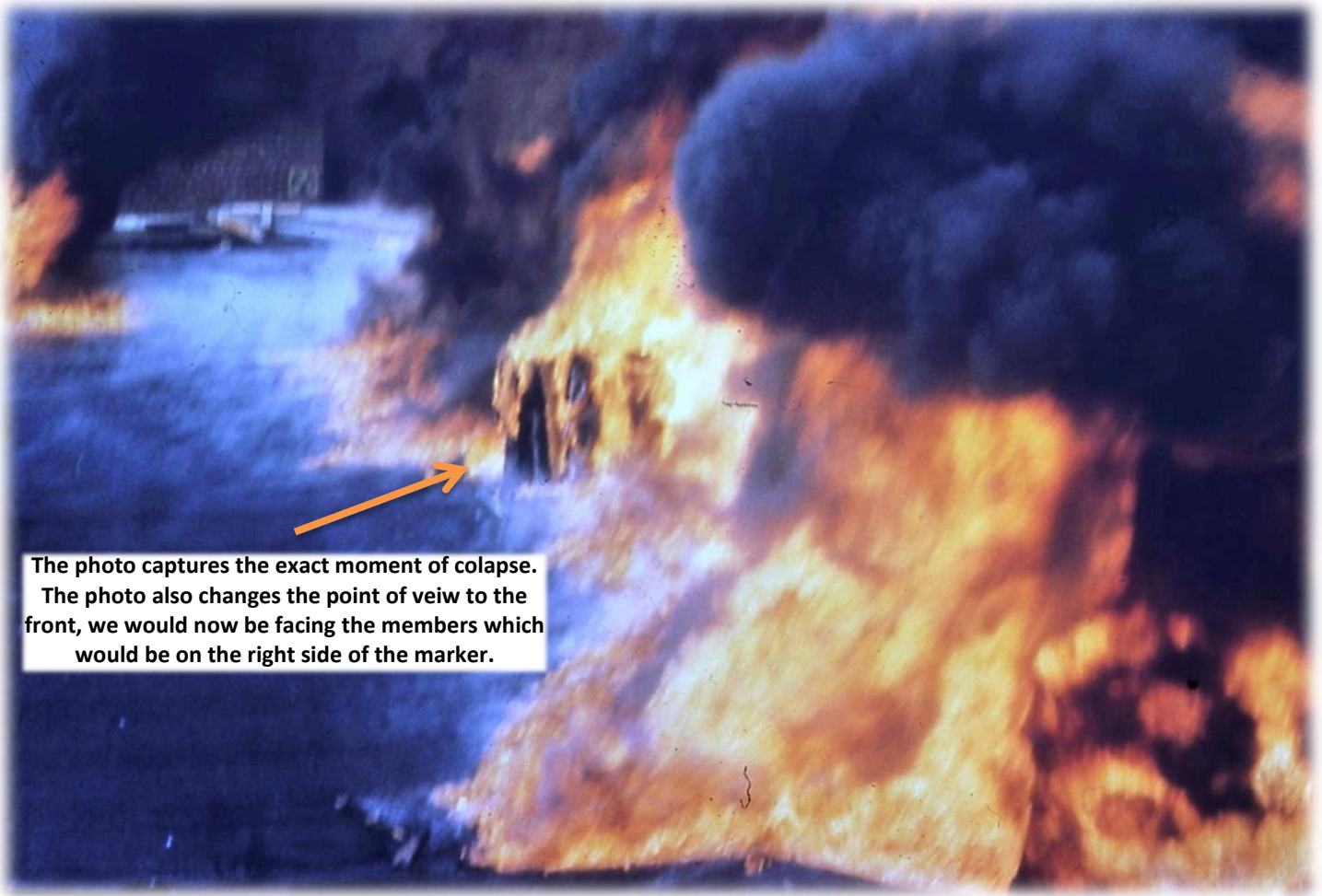


sound. There was no vibration. An area of 100 feet x 40 feet, which was a total of 4,000 square feet opened up and erupted into intense fire. Everyone that was in that area was swallowed into the fire. 12 Firefighters fell into the inferno. They were: Lieut. James Cutillo L-156, Fr. Charles Bouton L-156, Pr. Fr. William "Billy" O'Connor L-156 Fr.

James McManus L-153, Fr. George Rice L-153, Fr. Harold Hastings Battalion Aide Bn. 42, Fr. William Kelly E-246, Fr. John Madigan L-169, Pr. Fr. Harold Plaut L-169, Fr. Donald King L-156, Fr. Terrence Campbell L-156 (detailed from L-153), and Fr. Thomas Vallebuona R-2.

This is the last photo that captures 10 out of the 12 members moments before they fell through the roof. The far right of photo shows the start of the collapse.





The photo captures the exact moment of collapse. The photo also changes the point of view to the front, we would now be facing the members which would be on the right side of the marker.

Deputy Chief O'Malley of the 12th Division started to see a heavier volume of smoke coming out the front of the building. There was no loud sound. There was nothing to indicate to him that a collapse had occurred. All of a sudden, Firefighters came stumbling out of the front of the store. Deputy Chief O'Malley ran to one of the Firefighters coming out and the Firefighter told him: "there's men in there." It was 0916 hours. Deputy Chief O'Malley transmitted a 3rd alarm. One minute later, at 0917 hours, he transmitted a 4th alarm. At 0919 hours, Deputy Chief O'Malley of the 12th Division notified the Brooklyn Dispatcher that a collapse occurred with possible victims, and to notify the Fire Department Chaplains. The collapse of truss number 5 happened approximately 32 minutes after the arrival of Engine 254, the first unit.

On the roof, members who had not fallen into the fire were scrambling to get to a wall or a ladder. Captain David Harvey, Fr. Pat Mahaney, Fr. Peter Viola, and Fr. John Scasny of Ladder 169 scrambled to the parapet wall on the exposure 2 side (Avenue Y) and grabbed it as the fire erupted behind them. They made it to

Arial shot of Waldbaum's roof collapsed. Middle of photo shows Engine 245 line burst and left as members evacuated off of roof.
Again notice markers of roof vents from prior photos



the top of the parapet wall. Battalion Chief Eisemann grabbed Engine 254's hose line and operated it as a protection line so that Engine 245 could make it to Ladder 169's aerial ladder on the exposure 2 side. Fr. Pat Mahaney of Ladder 169, seeing that Battalion Chief Eisemann was close to falling into the blazing hole, started yelling: "the Chief is going in!" He ran across the parapet to try to save Battalion Chief Eisemann. He grabbed him. Fr. Mahaney, Battalion Chief Eisemann and the remaining members of Ladder 169 made it to the rear near Avenue Y. An off-duty Battalion Chief, Chief Howell, commandeered a ladder from a telephone company truck and raised it so the Firefighters could escape off the roof.

Inside the store, a sound of a falling wooden timber was accompanied by a sudden eruption of fire in the rear of the store. It wasn't readily apparent what had just happened. The smoke condition worsened. Fr. Jack Pritchard Rescue 2 was near the front of the store when the collapse occurred. He ran into Fr. Tom Vallebuona of Rescue 2. Fr. Vallebuona was severely injured. Fr. Vallebuona fell from the roof into the truss area and onto the tin ceiling. He landed on his feet onto the ceiling. He was in complete blackness inside the truss void for a few seconds, and then it lit up. He knew where the front of the store was. He yelled for help. He could hear some of the other Firefighters that fell into the truss area. He got low and saw a hole. He dove for the hole and fell to the floor of the store. He said to Fr. Pritchard: "I think members are still in there." He led Fr. Pritchard to the area near the Avenue Y side. Fr. Pritchard told Fr. Vallebuona to leave the area. Fr. Pritchard started searching. He found a Firefighter who was dazed and injured. He led him to the front of the store. He went back and found a second and a third Firefighter. The third Firefighter was caught on a shelf. He was pulled out and removed to the front of the store. Fr. Tom Murphy of Rescue 2 came upon Fr. Tom Vallebuona as he was making his way to the front, and helped him out of the store.



Fr. Donald King L-156, Pr. Fr. Harold Plaut L-169, Fr. John Madigan L-169, Fr. Terrence Campbell L-156 (detailed from L-153), Fr. William Kelly E-246 and Fr. Tom Vallebuona R-2 fell through the truss area to the floor of the store. Some of them had to punch their way through the ceiling. Some were initially hung up on cables before they fell through to the floor of the store. They all were severely injured.

There were still six Firefighters who were hung up in the truss area. They were: Lieut. James Cutillo L-156, Fr. Harold Hastings Battalion 42 Aide, Pr. Fr. William "Billy" O'Connor L-156, Fr. Charles Bouton L-156, Fr. George Rice L-153, and Fr. James McMannus L-153. The truss area of the building was a raging inferno. They all fell into the hole between trusses 4 and 6, closer to truss 4.

Deputy Chief O'Malley made his way toward Avenue Y. He saw Battalion Chief Eisemann after he came off the roof. Chief Eisemann told Deputy Chief O'Malley that he had Firefighters fall through the roof. It was around this



time that Battalion Chief Eisemann realized his Aide, Fr. Harold Hastings was missing.

At 0924 hours, the Brooklyn Dispatcher would receive orders from Car 5A, to request additional Rescue Companies respond to the scene. Rescue 1, Rescue 3, Rescue 4, and Squad 1 would respond.

Avenue Y, Exposure 2



At this time, there were 8 or 9 Firefighters actively searching and yelling for anyone who could be trapped. The aisles were partially open and searches could be made despite the encroaching fire. A rapid search was made for other survivors. Deputy Chief O'Malley then ordered everyone out of the store because of the dangerous fire conditions and collapse potential. The remaining roof collapsed in the front of the store shortly after all operating Firefighters were in the street. An emergency roll call had been ordered by Deputy Assistant Chief John Stancarone.

Deputy Assistant Chief Stancarone sectorized off the rescue effort. Deputy Chief O'Malley of the 12th Division was in charge of exposure 1, Battalion Chief Peter Eisemann of Battalion 42 was in charge of exposure 2. Battalion Chief Arthur Clark of Battalion 33 was in charge of exposure 3. Battalion Chief William Cooper of Battalion 42 was in charge of exposure 4.



A desperate rescue effort had begun. The rescue efforts in front of the store were particularly hazardous due to the front truss and the sloping hip rafters hanging precariously overhead.

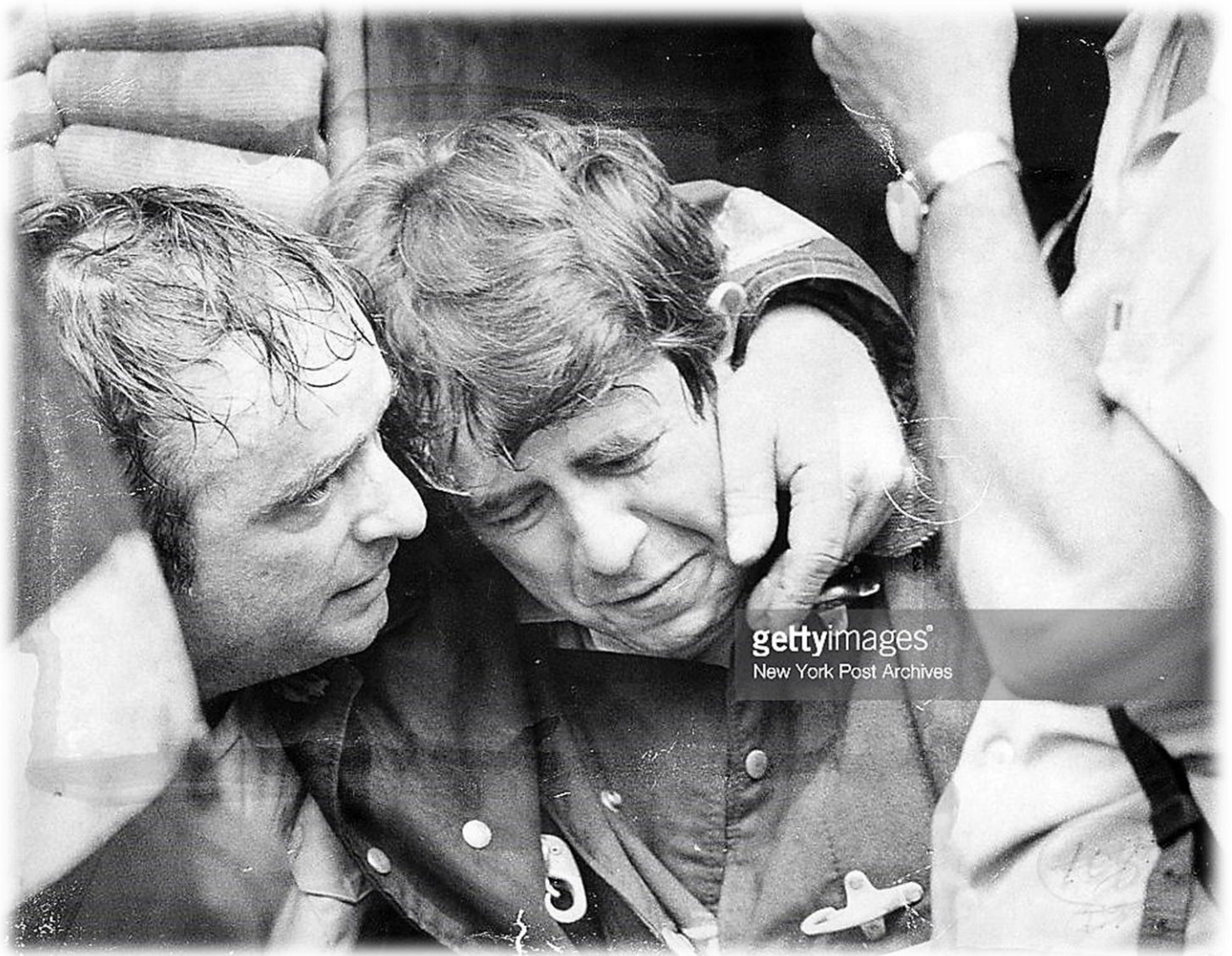


Engines 254, 248, 281 and Rescue 2 were making an attempt to get through via the front of the store. The exposure 2 side (Avenue Y) was a point of attack to rescue the unaccounted for Firefighters. There was a door there towards the rear.



Firefighters from Rescue 2 and Ladder 161 used a battering ram to breach a hole in the wall near where the 5th truss would have been located. Engines 243, 245, and 247 operated their hand lines on the exposure 2 side. Inside the store was a landscape of collapsed roof decking, trusses, cables and debris. There was a heavy smoke condition and fire pumping through and from the debris. Walls were also breached in the rear and in the exposure 4 side in an attempt to gain better access.

Watching the fire in front of the building was Louise O'Connor and her three children. She knew something horrible had happened. Her husband's Uncle, Phil Ruvolo, was the firefighter working in Engine 254 that tour. The Ruvolo family lived nearby. She left the scene and went to the Ruvolo home and dropped off her three children. She returned to the fire with young Phil Ruvolo who was a month away from being appointed to the FDNY. They returned to the fire and saw chaos. Young Phil Ruvolo saw a Firefighter coming out of the store. The firefighter looked completely spent, beaten, and exhausted. It wasn't until the Firefighter got much closer to him that he recognized who it was, it was his Father. He just said "Billy's back there. I can't get him."



The two firemen above are unidentified in the New York Post photo but it captures the raw emotions of the loss and heartache the men felt that day.

Rescue 1 arrived at Waldbaum's around 0955 hours. Lieut. James Curran of Rescue 1 was told that there are 10 Firefighters unaccounted for. (The results of the roll call were not complete at this time.) They entered via the breeched wall and looked to relieve Rescue 2. The Rescue 2 Firefighters (Fr. Peter Bondy and Fr. Jack Kleehaas) would continue to operate. They made their way through the difficult terrain that was generating the acrid smoke. Fr. George Kreuscher of Rescue 1 had the nozzle followed by Fr. Bobby Burns and Fr. Mike Walsh. As they made their way through the rubble, they were searching for any signs of the missing men.



As the searching firefighters continued their mission, Fr. Peter Bondy and

Fr. Bobby Burns dropped down to an area where an aisle was. One of them said: "We found a 6 foot hook." Then, a Firefighter's helmet was found. Lieut. Jim Curran of Rescue 1 looked around closely and said: "There they are." Two of the fallen Firefighters were found. Realizing that the other missing members could be nearby, the other Firefighters were



straining to look through the heavy smoke condition. Fr. George Kreuscher of Rescue 1 started pulling roofing material apart near his location. Suddenly, the other four fallen Firefighters were discovered. The grim task of recovering the bodies and carrying them out of the building was underway. They were covered and carried out on Stokes Basket Stretchers. Every attempt was made to shield the bodies of the fallen from news cameras. The Brooklyn Fire Dispatcher was notified at 1052 hours that there were six 10-45's (a fire fatality).



The fire was placed “under control” at 1245 hours. There were 25 Firefighters injured that required Medical Leave.

This fire was horrific. Six Firefighters received fatal burns as a result of the fire and collapse. Six other Firefighters eventually fell through the truss area to the floor and

sustained serious injuries. To this day, some hardened, veteran Firefighters who were at this fire still become emotional when talking about the events of “Waldbaum’s”. There were six wives that lost their husbands and 18 children that were left fatherless as a result of this fire.





The Firefighters that were killed were:

Lieutenant James E. Cutillo, Battalion 33 (Working in Ladder 156)

Firefighter Charles S. Bouton, Ladder 156

Probationary Firefighter William O'Connor, Ladder 156

Firefighter James P. McMannus, Ladder 153

Firefighter George Rice, Ladder 153

Firefighter Harold F. Hastings, Battalion 42

May they all rest in peace. Never Forget!

Random thoughts on Trusses

Prior to this fire, there was very little written about fires in trusses. There was fire experience in certain areas of the City, such as the Hunts Point section of the Bronx that had seen the dangers of Bowstring Trusses. Firefighting Procedures Taxpayers had not been written yet. Deputy Chief Vincent Dunn (Ret.) said that “Waldbaum’s” “shook me to the core.” He also said that if he were in command of that fire, he would have lost those men too. This fire was a catalyst to Deputy Chief Dunn writing about collapse of burning buildings.

Trusses are composed of two major structural elements, a top chord and a bottom chord. When the truss is supported at both ends, the top chord is under compression and the bottom chord is under tension. The smaller members connecting the top chord and the bottom chord are called web members. Web members that are under compression are called struts and web members that are under tension are called ties. Remember, when a structural element is under tension, it only has to fail at one point for it to fail.

Wooden bowstring trusses are common in supermarkets, bowling alleys, factories, warehouses, etc. They have a characteristic curved roof shape which may or may not be spotted from the street. Parapet walls and signs may conceal the roof shape. “The longer the span, the higher the bow.” Parallel chord trusses are much more difficult to identify. *Firefighting Procedures Taxpayers, section. 3.3.3*

Bowstring trusses are designed by engineers. The original tensile strength of the wood may have deteriorated over the years. It is estimated that bowstring truss roofs may only support 40% of their originally designed load carrying capacity. Beware of any alteration of trusses. Any alteration of a truss is contrary to its design and is dangerous.

The ends of bowstring trusses may have rotted due to poor drainage from the roof.

Trusses can be overloaded with snow loads or even the live load of operating firefighters. Bowstring truss supported roofs have collapsed without the assault of a fire.

Timber trusses (Bowstring trusses) are connected with metal connections. These metal connections (bolts) are good heat conductors and cause pyrolysis of the wood near the connection under fire conditions. Failure of a connection can cause the collapse of the truss.



“All parts and connections of a truss are vital to its stability. The failure of one element of a truss may cause the entire truss to fail.” *Building Construction for the Fire Service, 3rd Edition, pp. 522. Francis L. Brannigan*

As was the case at “Waldbaum’s”, wooden Bowstring trusses give no warning prior to collapse. In addition, Bowstring trusses may be attached to one another by purlins, which gives them more stability under normal conditions. The failure of one truss may bring down other trusses.



Bowstring trusses are spaced 10 to 20 feet apart. As was the case with “Waldbaum’s”, the trusses were spaced 20 feet apart. Initially, only one truss failed. The failure of the one truss opened up an area 40 feet x 100 feet.

If you find yourself on a bowstring truss roof that is in danger of collapse, it is recommended that you move to the next safe truss and then to the parapet wall. The trusses are 20 feet apart. If you are in the center of a roof that is supported by a bowstring truss, you are 50 feet away from the parapet wall. If you head for the parapet wall first, you may go down if the truss collapses. By going to the next safe truss, and then to the parapet wall, you may temporarily be safe as you make your way off the roof.

At Bowstring truss buildings, sloping hip rafters frequently attach the front and rear trusses to the front and rear walls. These hip rafters are attached to the masonry front and rear walls by encasing it in a brick cavity. If the front or rear truss fails, it can cause an explosive inward/outward collapse of the front or rear walls. The hip rafters would act as a lever on the wall if there is no fire cut in the

hip rafters. The fronts of these buildings are more susceptible to this type of collapse because there are more openings in the front wall than the rear wall, which makes them less stable.



There are three ways in which a timber truss collapse can kill or injure Firefighters. The front or rear of the building can have an inward/outward collapse and injure or kill Firefighters on the sidewalk. Firefighters can be on the roof of a timber truss roof and fall through the roof. Firefighters can be inside the building and be trapped by collapsing trusses.

Identifying a truss roof support system is a key step in ensuring Firefighter safety. Never assume that the Chief in Command can see what you are seeing. If you are on a roof and you identify a truss, communicate that to the Chief in Command.

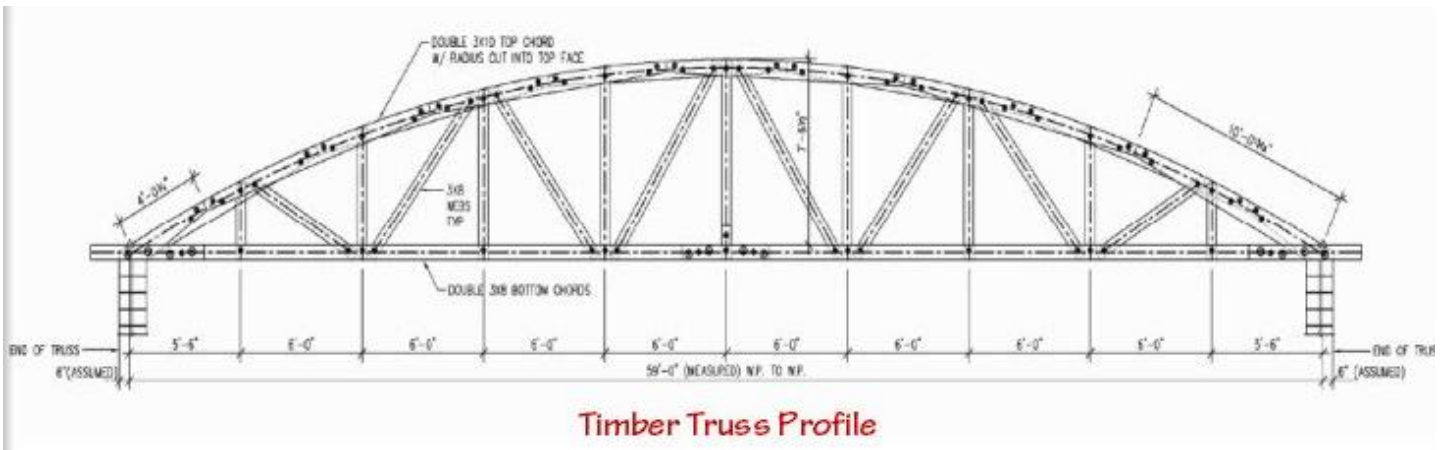


The large curved ceiling of the inside of a Bowstring truss roof can act as a heat collector or a heat sink. This can lead to a false sense of security by the Firefighters operating inside the building. The heat is taken away from the interior forces. High heat may go undetected.



When a Chief Officer receives conflicting reports about the severity of the fire between the roof firefighters and the interior firefighters, the Chief must act on the most severe report. Two of the most deadly Bowstring truss fires had conflicting size-up reports. Both “Waldbaum’s” and the fire in 1988 at the Hackensack N.J. Ford Dealership that killed 5 Firefighters, showed much a much more severe fire condition on the roof than inside the building.

There are three indicators that a building has a truss roof configuration. 1. Occupancy. There are certain occupancies, such as supermarkets, bowling alleys, garages, theaters, places of worship, that frequently have truss roofs. 2. Unsupported spans. If you look inside a building and you see large open areas without columns, suspect a truss. 3. Roof Shape (Only if it is a Bowstring Truss). If you see a curved roof shape, suspect a Bowstring Truss. **OUR: Occupancy, Unsupported span, Roof shape.**

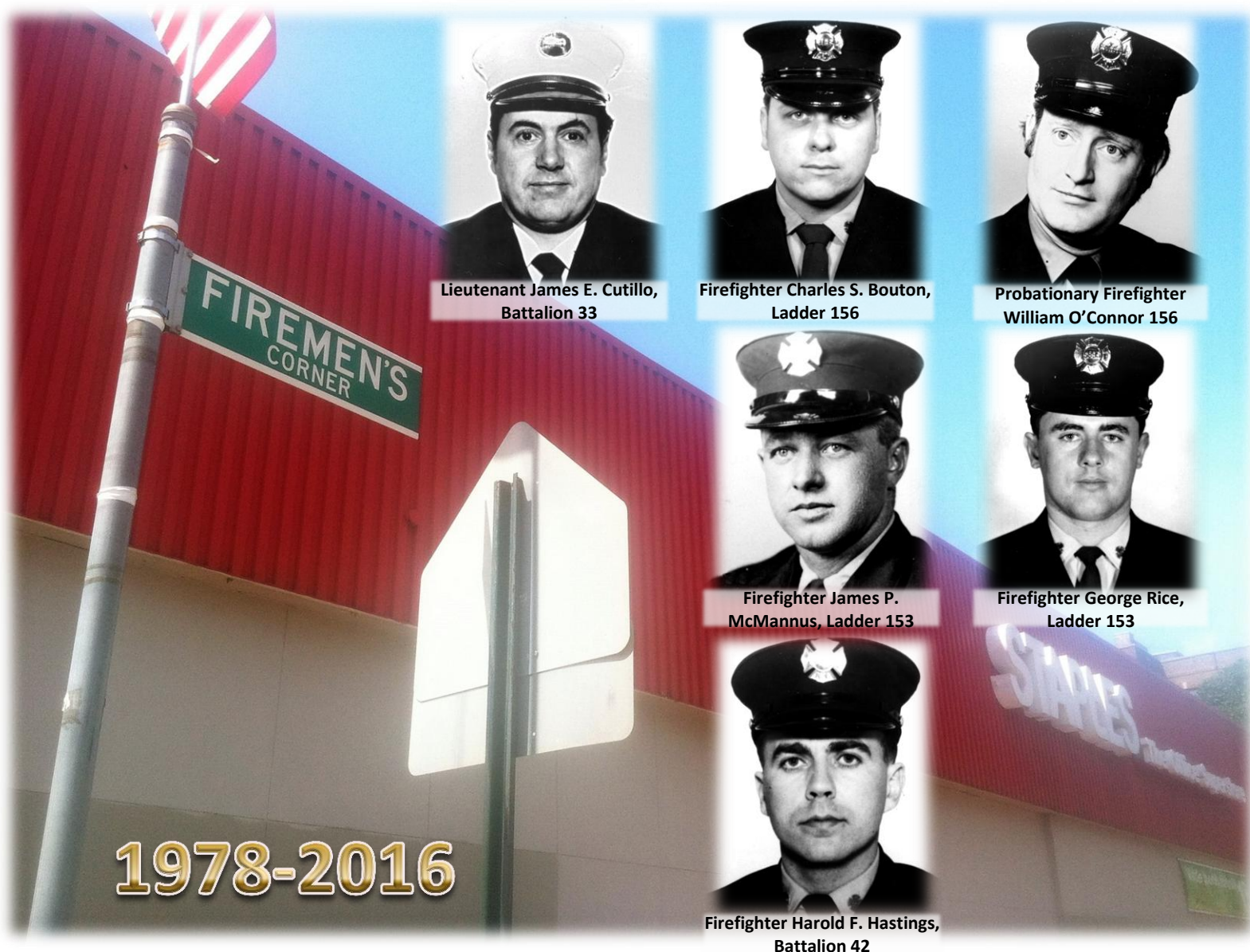


“The fire strategy of a first-arriving engine company at a timber truss roof building **without a ceiling** should be to attack the fire directly with a large-diameter hose line (2 ½ inch). A powerful water stream, capable of reaching a distance of 50 feet, will be needed to extinguish fire in the upper portions of the trusses. This first hose line should attack the main body of fire. If this first stream does not control the flames within the first few seconds of water discharge, and it appears that the fire will increase, interior firefighting should be discontinued and Firefighters withdrawn.” *Collapse of Burning Buildings, 2nd Ed., pp. 113.*

"If the first hose line is successful and controls the fire at floor level or in a single timber truss, and it appears that the fire will not spread, a back-up, large-diameter (2 ½ inch) hose line should be stretched into the building. This second hose line should sweep the underside of the roof, if necessary. This technique will extinguish any possible secondary fire hidden behind the smoke and heat at ceiling level." *Collapse of Burning Buildings, 2nd Ed., pp. 113.*

"Under no circumstances shall any member operate on the roof of any building involved in a content or structural fire with a wooden, metal or combination Bowstring truss design." *Firefighting Procedures Taxpayers", Section 5.5.25*

"Those who don't know history are doomed to repeat it." Edmund Burke



DEPUTY CHIEF JAY JONAS, DIVISION 7

Resources: "Collapse of Burning Buildings", 2nd Edition, Vincent Dunn; "Building Construction for the Fire Service", 3rd Edition, Francis L. Brannigan; "FDNY Firefighting Procedures, Taxpayers"; "The Fires", Joe Flood; "Fireman", George R. Kreuscher; "Fire: A War That Never Ends", Ernie DiMaria; Fire Report from Brooklyn Box 4-4-3300; Report from Deputy Assistant Chief John Stancarone to Fire Commissioner Augustus A. Beekman.

Thanks go to the following people who contributed to this essay: Deputy Chief Vincent Dunn (Ret.), Battalion Chief John (Jack) Pritchard (Ret.), Captain Phillip Ruvolo (Ret.), Lieutenant Thomas Higgins (Ret.), Battalion Chief Thomas Vallebuona (Ret.), FDNY Safety Battalion, FM Dan Maye (Mand Library), Katie Clements (FDNY Photo Unit), Leslie Ifill (Fire Records Unit), Captain Patrick Mahaney (Ret.) Fr. Chris Roberto

6 FIREMEN DIE AS ROOF FALLS

36 Injured in Brooklyn Blaze



NEW YORK POST FINAL

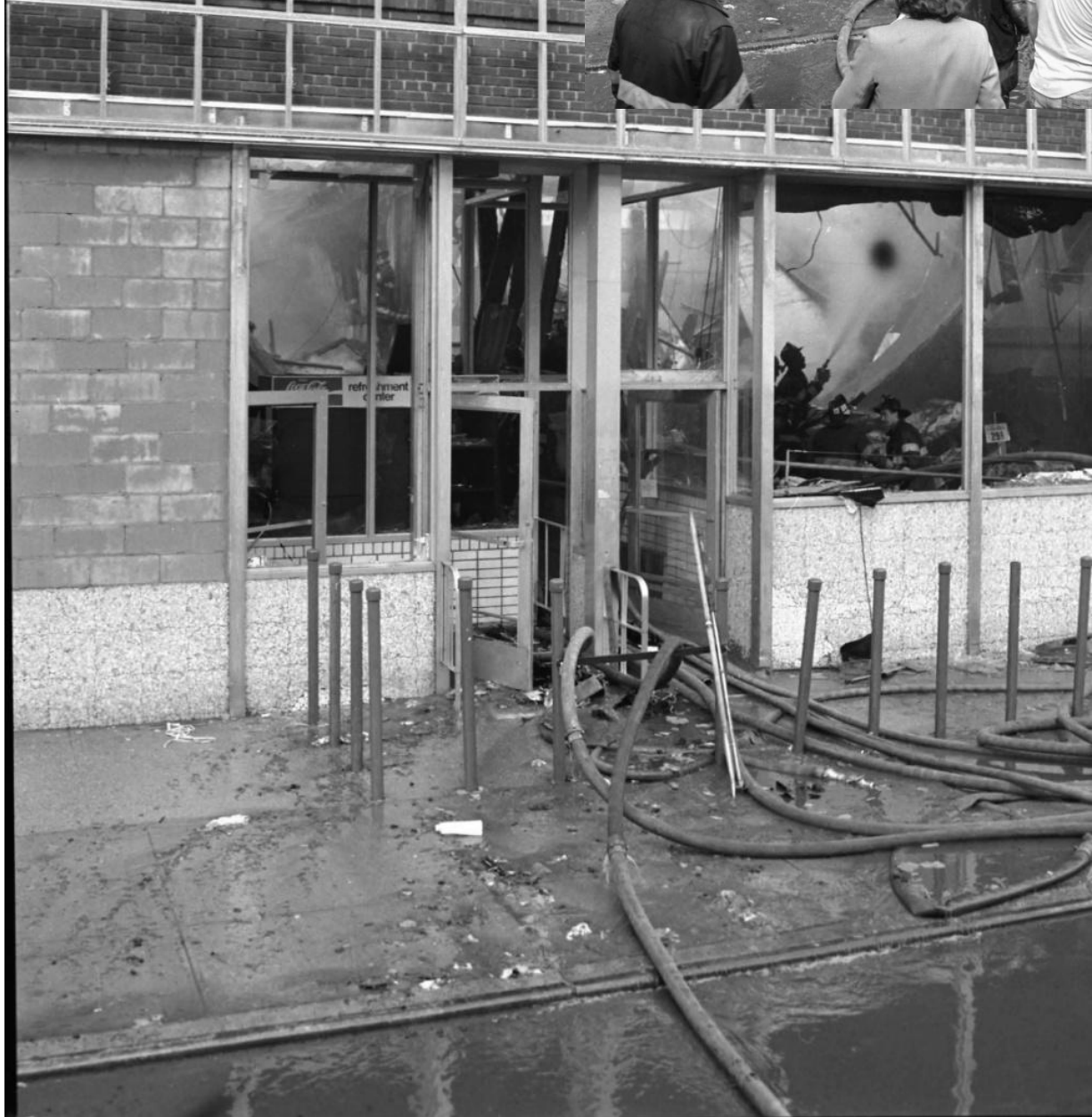
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6 FIREMEN KILLED

Roof falls in Brooklyn store blaze

By Larry Nathanson and Len Shashoua
Six firemen were killed today when they plunged through the burning roof of a Brooklyn supermarket while battling a spectacular four-alarm blaze.
It was the worst disaster for the city's fire department in 22 years.
Twenty-one other firemen and one boy were injured—most of them in desperate efforts to climb through the burning rubble to find the five men trapped inside.
Most of the injuries were minor, mostly sprains or lacerations, but three firemen were reported serious and two others were suffering from burns for possible heart failure.
The names of the six who were not immediately listed.
All of them had to be lifted to the roof of St. Albans at 24th Street and Avenue N, in Sunset Park.
Crane and belfry hoisted them to the

More stories and pictures on Pages 2, 3 and 13







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Roof Collapse Sends Six Firemen to Death in Sea of Flames



NEW YORK (AP) — Six firemen were killed and 11 others injured when a section of the roof of a five-story building collapsed into a sea of flames and smoke early Monday morning.

The collapse occurred at the intersection of Broadway and West 11th Street, where a large fire had been burning since about 10 p.m. Sunday. The fire was caused by a gas leak in a restaurant on the ground floor.

The fire department received the call at 12:15 a.m. and arrived at the scene about 15 minutes later. The fire was quickly brought under control, but the roof collapse occurred while firefighters were working to extinguish the flames.

The fire department is currently investigating the cause of the collapse. It is believed that the roof was weakened by the fire and the weight of the debris.





