

# Explosion, Fire, & Collapse!



## ... gas explosion levels Bronx dry cleaners at Box 3318

*"Bronx to Battalion 19. Respond to Box 3318. Be advised that the alarm you are responding to is reported to be an explosion and a building collapse. Several persons are reported trapped inside the fallen structure, which is involved in fire."*

*"Battalion 19 to Bronx, 10-4."*

That short communication between the fire dispatcher and Battalion Chief John Connelly set in motion an "all hands" fire and rescue operation that would tax the endurance and expertise of our fire-fighting forces for some thirty-six hours.

When Chief Connelly arrived at 184th Street and Morris Avenue, at 1121 hours, on that sunny Spring morning of June 11, 1980, he was confronted with the aftermath of a severe explosion—a burning pile of timbers and brick rubble. All that debris represented a building that had been a one story, 20' x 70', brick and joist commercial occupancy, housing a dry cleaners in one half of the structure and a self-service laundromat in the other half.

### CONDITIONS ON ARRIVAL

The entire seventy foot frontage of sidewalk on 184th Street (Exposure #1) was covered with large sections of brick wall, broken plastic windows, and twisted metal security shutters. Three sections of "I" beams, attached end-to-end, forming a single seventy foot lintel to span the large window opening in the

bearing wall, was lying at the curb.

The Morris Avenue sidewalk (Exposure #2) was also buried beneath a twisted mass of steel, masonry, and plastic.

The rear 12" bearing wall (Exposure #3), which supported the roof, had its parapet section broken off. Although the wall remained standing, a fifteen foot section, near the Morris Avenue side had cracked two feet above the floor level. When Chief Connelly arrived, he noted that the wall was leaning dangerously in toward the fallen roof.

The Exposure #4 wall of the building was intact and presented no danger.

The entire 20' x 70', tar covered, wood beamed roof had collapsed. Most of the roof over the dry cleaners had pancaked<sup>1</sup> into the store. However, a partition wall remained standing during the blast and a portion of the fallen roof collapsed over it. As a result, two supported lean-to voids were created; one on each side of the partition. The roof over the self-service laundry had fallen as an unsupported lean-to. The beam ends of the roof supported by the wall on the Exposure #3 side were resting precariously on that wall. The other ends of the roof beams, on the 184th Street side, were hanging, unsupported, two feet above the sidewalk. The roof section over the laundromat formed the largest void.

1. Joseph E. Contrastano, "Collapse!" W.N.Y.F., July, 1960.



There was no cellar beneath the laundromat, however, there was a cellar beneath the dry cleaners. During the explosion, the flooring of the dry cleaners remained intact creating an "individual" cellar void which had to be searched for possible victims.

Fire was burning beneath the fallen roof and had spread to a large section of asphalt siding of a three story, wood frame dwelling on the Exposure #3 side. The heat from the fire was so intense, that it cracked a stairway window on the third floor of that dwelling. If flames were allowed to reach the eaves of the roof overhang, fire would, undoubtedly, spread into the attic.

Battalion Chief Connelly, a ten year veteran of the 19th Battalion, ordered the members of Ladder Co. 33 to make an immediate search of the collapsed structure for surface victims that might be partially buried in the rubble, or who might possibly be dazed or injured and not able to extricate themselves from the wreckage. He then directed the members of the first arriving company (Engine Co. 48) to stretch a handline to extinguish the fire burning beneath the collapsed roof, and to use their portable deluge nozzle atop their apparatus to knock down the fire that was traveling up the siding of Exposure #3.

### PROBLEMS ENCOUNTERED

As the crowd of sightseers grew, many people came forth with information about persons they believed were trapped in the collapse.

"I just left the laundromat," one woman said, "and there were seven people inside when the explosion occurred. An elderly lady and her husband work in the dry cleaners," she continued, "and I think that they are still inside."

"A woman with a small child in a carriage were

inside the dry cleaners when the building collapsed," a young boy stated.

Despite the fact that Chief Connelly was aware that many people had already been removed to hospitals, he had to operate under the assumption that there might still be more victims trapped in the collapse. All of the information received from the crowd, however uncertain, was recorded and relayed to the fire companies assigned to search the areas where persons were reported to be last seen.

Immediately upon their arrival, units discovered a man who was pinned beneath two large chunks of fallen masonry. He was lying face up on the sidewalk on 184th Street. Apparently he had been walking past the building when the wall blew out on top of him. One large, seemingly immovable, chunk of masonry was crushing his chest. Another section of masonry and brick had pinned his hips and legs.

Rescue Co. 3, directed by an alert Bronx dispatcher to respond on the initial report of an explosion and collapse, arrived on the scene at the same time as the first alarm units. They were immediately directed to remove the pinned victim.

Deputy Chief Vincent Dunn, 7th Div., arrived at the collapse scene at 1128 hours and assumed command of the operation. He was quickly briefed by Chief Connelly on the size and occupancy of the fallen structure, the search results, and the fire extinguishment efforts that were underway.

At this point in time, one victim had been found, and the fire extension to Exposure #3 had been "knocked down." The handline that had been stretched to fight the fire in the rubble appeared to have that fire under control. Chief Dunn ordered another handline stretched into Exposure #3 to cover any possible extension of the fire in that structure. A preliminary

Illustration shows devastated structure, and the various types of collapses encountered at this operation.

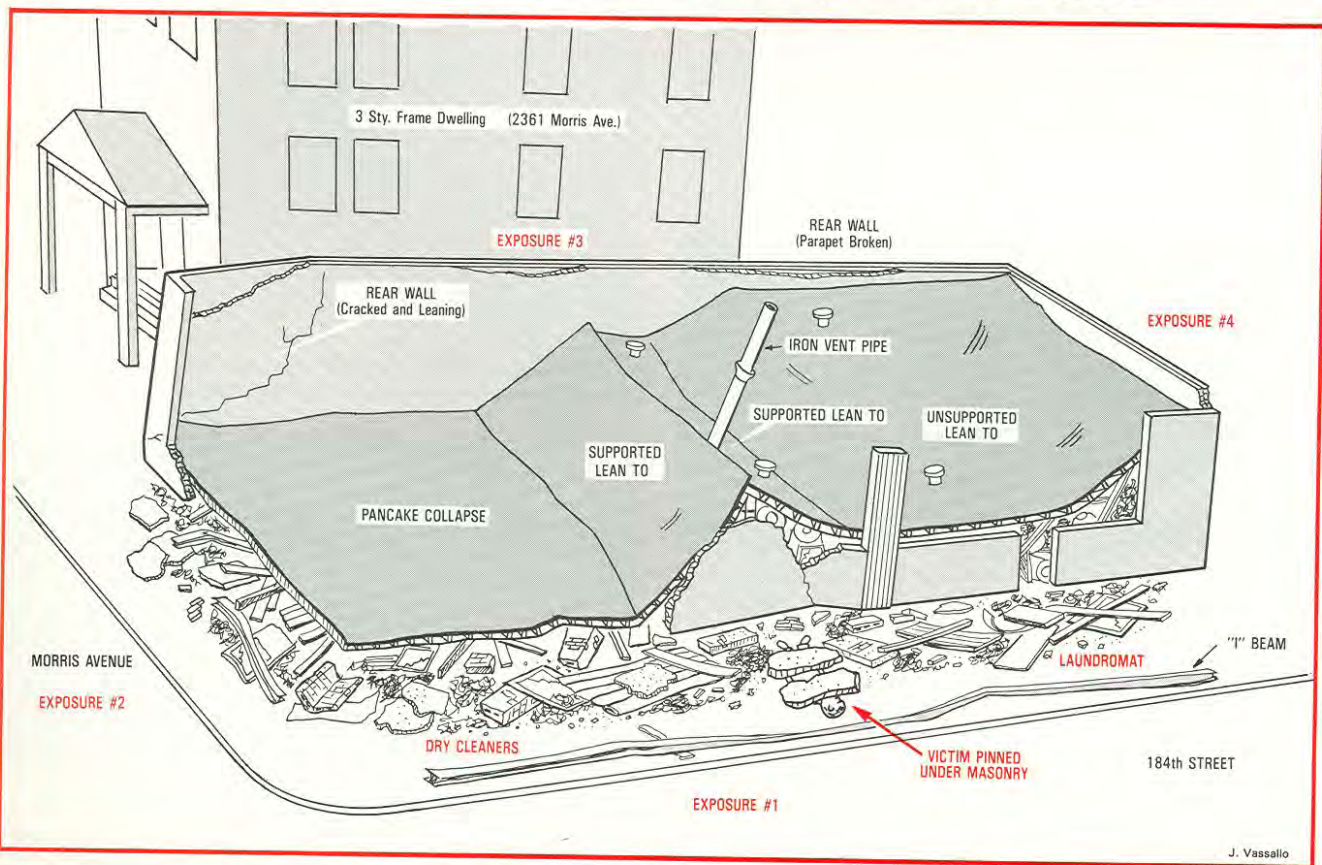






Photo by D. Handschuh

Bird's eye view of the destruction with which fire forces were met upon their arrival.

report was transmitted to the dispatcher with information relating to the size, occupancy, height of the collapsed building, and exposures, along with a description of the fire conditions and civilian injuries. Chief Dunn also requested the response of utility companies, and special-called an additional engine company, ladder company, and battalion chief.

The importance of shutting off the gas and electrical supply in any building collapse situation is self-evident. Leaking natural gas could collect in voids, subjecting the area to still another explosion. Gas, accumulating in cellars and voids, could also displace the oxygen and suffocate searching firefighters, or anyone unfortunate enough to be trapped in those areas. With these thoughts in mind, the members of Ladder Co. 38 were ordered, prior to the arrival of the utility company, to commence shutting off the gas.

A distinct danger to those members of our operating forces who were searching for buried victims was created by a heavy cast iron waste vent pipe. After the roof had collapsed, this pipe was left standing, unsupported, some twenty feet in the air, and was leaning dangerously. Members of Ladder Co. 33 were directed to position their tower ladder bucket next to the unstable pipe and remove that hazard.

Still another hazard was the brick wall near Morris Avenue, which was cracked and leaning in toward the fallen building. A type of "raked shoring" was made from roof beams that were cut by power saws and was used as a temporary brace for the wall. In addition to the shoring operation, a member was directed to continuously observe the wall and report any sign of movement or shifting to the officer in charge. Despite the shoring, the wall continued to move from the vertical and threaten the members operating in the area. Apparently, floor vibrations, created by the

removal of large portions of the collapsed building, had caused further shifting of the wall. Operations near the wall were temporarily ceased and members were directed to stand clear of the area by orders of Bronx Borough Commander George Willett. Chief Willett had arrived at the scene moments before and had assumed command of operations. In the interest of ensuring a safe operation, Chief Willett ordered the teetering wall to be toppled. When that was accomplished, search operations in that area were resumed.

Anticipating an extensive search operation, Chief Willett ordered the response of another rescue company and several pieces of heavy construction equipment. Rescue Co. 4, a Department of Sanitation front-end loader, dump truck, and an overhead crane were dispatched to the scene.

The roof section of the laundromat which sustained a dangerous unsupported (one portion hanging free) lean-to type of collapse.  
Photo by A. Guerriera, F.D.N.Y. Photo Unit





## STRATEGY EMPLOYED

The collapse rescue plan used by the Fire Department in the past was the strategy employed at this operation: reconnaissance or survey; immediate rescue of surface victims; exploration of voids, lean-tos, and potential shelters created by the fallen structure; selected debris removal to gain access to specific buried locations where persons were last seen prior to the collapse; and, finally, general rubble clearance down to the foundation and examination of the debris for bodies.

By the time the chief of the 7th Division arrived at the scene, the 19th Battalion Chief had the first two stages of the collapse rescue plan in progress. Firefighters had surveyed the entire collapsed building, the sidewalk, and the area beneath the parked cars in the street. They had not found any other surface or half-buried victims besides the man that Rescue Co. 3 members were attempting to free. The "immediate rescue" of that one victim, discovered pinned beneath the fallen wall, was being carried out effectively.

At this collapse, the survey technique of locating conscious, buried victims by the method known as "round the clock"<sup>2</sup> was not feasible during the reconnaissance stage of the rescue plan. The extremely high noise level in the area prevented its implementation. The sirens of incoming fire trucks and ambulances, together with the noise of the pumping engines and the power saws, made listening for the cries of victims impossible.

Lieutenant William O'Meara and the members of Rescue Co.3 were assigned the task of removing the unfortunate victim pinned beneath the fallen brick wall. The major problem confronting them was how to raise the two large sections of masonry that were crushing him without causing him any further injury. Each of these sections weighed several hundred pounds, and could not be lifted by hand. Of immediate concern was the fact that the man's breathing was being severely hampered by the tremendous weight on his chest. At this point, his shallow breathing was being assisted by the use of a rescuator.

Lieutenant O'Meara decided to employ Vetter air bags to extricate the man. Two flat, uninflated Vetter air bags were placed beside the victim; one on each side. The bags were then slowly inflated with air from a Scott air pak, supplied through a high pressure hose and controlled by a pressure regulator. Within two minutes, the air bags swelled and lifted the masonry several inches above the man's chest. Wooden chocks were quickly positioned to secure the lift that was gained. Once the masonry was secured, the bags were deflated and repositioned to remove the stone that was pinning the man's legs. Again the bags were inflated and the weight removed from the man.

Throughout the entire operation, Lieutenant O'Meara kept a continual line of conversation going with the man in order to keep up his morale and to determine if he was experiencing any additional pain. He wasn't. When all the weight of the masonry sec-



Photo by D. Handschuh

Mountains of debris from collapsed structure severely hamper firefighters as they conduct their primary search for possible victims.

tions were sufficiently raised and chocked, the victim was carefully removed and placed on a stretcher. After the rescue operation was completed, the injured man was transferred to the care of the emergency medical personnel assigned to the ambulance.

The Vetter air bag proved to be a highly successful device at this operation. On this occasion, it quickly and efficiently removed a man being crushed by large chunks of masonry. At another time and

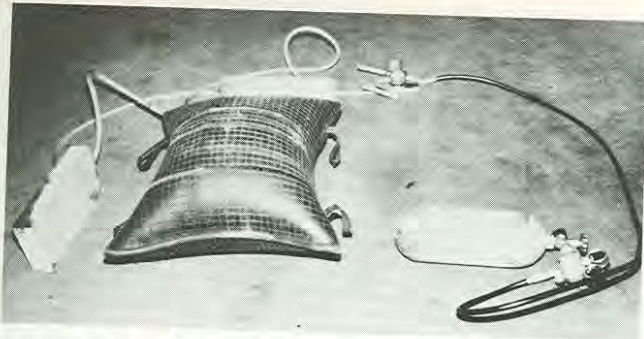
Members of E.75 and L.33 transport victim to ambulance after extricating him from beneath collapsed front wall of structure. Vetter air bags proved most efficient in effecting this rescue.

Photo by D. Handschuh



2. As described in Chief Contrastano's "Collapse!" article, "Round the Clock" procedure is as follows: Men are placed in calling and listening positions. Complete silence is then instituted. Operating in a clockwise fashion, each firefighter calls out, or taps on some object. All others listen to determine a "fix" of any sound made by a trapped person. After a sound has been heard, at least one additional "fix" is attempted from another angle to confirm the location. Once communications are established, it is maintained. Maintaining communications serves a twofold purpose: It bolsters the morale of the trapped person, and provides guidance for the tunneling firefighters.





Above: A typical Vetter air bag with necessary equipment. Vetter air bags come in various sizes; use of which depends upon particular need. Below: In a demonstration of the air bag's capabilities, the front end of a Fire Department pumper is easily raised.



Photo by P. Verso, F.D.N.Y. Photo Unit

place, it might be the very device that will save a firefighter trapped beneath a parapet wall.

As a matter of general information, the Vetter air bag operates on the same principle as the steel belted tire. When filled with air, this steel lined, neoprene air bag (depending upon its size) is capable of lifting forty tons to a height of between one and two feet.

At this collapse, there were four sheltered areas where a person might be trapped, and survive: the large unsupported lean-to void beneath the roof in the laundromat; the two smaller supported lean-to voids on each side of the partition wall that separated the two occupancies; and the cellar beneath the dry cleaners.

The first shelter searched was the space beneath the laundry roof. A small opening beneath the hanging roof on 184th Street allowed the officer and a member of Ladder Co. 33 to crawl into the void to search for victims. Although it had been reported that seven people were trapped inside this store, none were found.

Often, the quickest way to gain access to voids or sheltered areas, where a roof or floors have fallen, is from below. Many times, a cellar sidewalk entrance metal door allows access to a cellar. In that instance, a firefighter can enter the cellar from the outside of the building. He can then find an interior cellar stair leading up to the interior of the collapse area and reach a trapped person faster than by digging out the rubble from above. The sidewalk around the collapsed building on 184th Street was examined for such a door, but none was found. The apron wall below the store window is another quick way to gain access to a cellar to launch a search from below.

However, the apron wall on this structure was made of brick, and access through the brick wall was not feasible.

The two lean-tos created by the partition wall had to be searched. These voids were completely sealed. There were no openings through which a firefighter could gain access to these areas. It was necessary to employ power saws to cut holes in the fallen roof. Then, after punching holes in the ceilings, the areas were examined. Again, no people were found.

After clearing away some of the rubble, an opening to the cellar was discovered. The members of Rescue Co. 3 were directed to search this area. Because of the many hazards involved in examining the below grade area of a collapsed structure extra precautions were taken. Due to the dangerous nature of this operation, the officer in command of the fire directed a chief officer to closely supervise the search. In addition to the use of self-contained masks, a lifeline was attached to all members entering the cellar. The possibility of escaping natural gas from a broken pipe, an accumulation of carbon monoxide from the smoldering fire beneath the collapsed roof, or fumes from dry cleaning fluids made this operation extremely hazardous. Once again, no one was found.

After the sheltered areas were searched for the second time and no victims were found, it became apparent that the persons who were reported trapped inside the building at the time of the collapse had escaped from the wreckage by their own actions prior to the arrival of the Fire Department. In order to determine exactly how many persons were injured and left the scene before our arrival, a Fire Marshal was directed to check all nearby hospitals for persons who might have been treated for injuries caused by this collapse. It was discovered that nine persons were in nearby hospitals, receiving treatment. One infant, struck by the fallen wall was listed as D.O.A. A woman was being treated for burns. The others, receiving minor injuries, were treated and released. The search at the collapse site continued.

One hour into the operation, all the voids and sheltered areas where a person could have been trapped were searched. At this point, the focus of the search shifted to the area of the dry cleaners. This was the area where the roof had pancaked into the store. The most frequent report from bystanders told of a woman and a small child inside the dry cleaners prior to the explosion. Rescue Co. 4 was special-called to the scene and directed by Chief Willet to systematically cut up and remove the collapsed roof which had fallen into the store. Up to that time, all reports indicated that the woman and the infant were last seen in that area. (Unknown to us, the mother and child were taken to a hospital by police prior to our arrival. The child was the fatality the Fire Marshal would report to us upon his return.)

The chances of a surviving victim being found in this "selected debris removal" stage were slim. There were no large voids, as the roof lay almost flat on top of the store floor. However, this was the location where persons were reported last seen alive, and so every piece of roofing had to be removed to expose every square foot of flooring.

First the roof was cut into pieces and passed from man to man and placed on the sidewalk. A Department of Sanitation front-end loader made periodic sweeps of the sidewalk and removed large piles of material to an awaiting Sanitation dump truck. When





Photo by A. Guerriera, F.D.N.Y. Photo Unit

A Department of Sanitation crane lifts a section of the building for inspection and eventual removal. Other City agencies and utility companies were of tremendous assistance at this operation.

the truck was filled, the rubble was taken to a designated dump site, previously agreed upon with the Fire Department officials on the scene. As every small piece of the roof was cut away, every sheltered space, regardless of size, was carefully examined for the body of the child that was reported missing. Large immovable building sections were tied with a cable and attached to the Sanitation Department's front-end loader. Upon a given signal, the section was pulled out of the wreckage by the vehicle. The entire floor area was uncovered. No victims were found.

At this point in time, the Fire Marshal returned with the information gained from the hospital check. It began to look as though all the victims were accounted for. However, we could not be sure until every last piece of rubble was removed, down to the foundation.

General rubble clearance had begun when the first Sanitation Department front-end loader arrived on the scene. As soon as the victim beneath the fallen wall was removed, the cars parked in the street, around the collapsed structure, had to be removed. Tow chains were attached to the automobiles and they were pulled out of the area. Once the street was clear, the sidewalk rubble was examined for possible victims buried beneath the fallen material. After this was done, the Sanitation Department's heavy equipment shoveled the sidewalk clean of all masonry and steel "I" beams. Firefighters could now remove pieces of the structure to the sidewalk where they were scooped up and loaded into awaiting dump trucks.

After the entire dry cleaning store was cleared and the search proved negative, it was decided to remove the entire building down to its foundation. This was

slowly and carefully accomplished by the heavy crane. Each load was swung out and placed in the street. Firefighters, once again, examined the debris. Front-end loaders then scooped up this material and placed it in dump trucks. It was then taken to a dump site for final reexamination by investigators.

Thirty-six hours after the initial alarm, the building was removed down to its foundation. No other victims were found.

### LESSONS LEARNED

**Communications.** Of critical importance at an operation of this type is a central information center. That need was fulfilled at this alarm by the Field Communications Unit, supervised by Battalion Chief John Short, 18th Batt. All information concerning missing persons and known injured victims was correlated by this unit. Pertinent information, with relation to fire and rescue operations, was processed through the Field Communications Unit and transmitted to the concerned operating chief. In addition, all radio and T.V. news was disseminated from this unit, reducing the number of distractions to operating chiefs and company officers by news people requesting information and interviews.

**Coordination of Agencies.** An important part of a collapse rescue plan involves the coordination of the various agencies that are called to the scene for assistance. And, at a collapse situation, where fire involves the premises the Fire Department has the command responsibility. This operation required the close coordination of the Police Department, Sanitation Department, utility companies, and medical personnel.

The police were requested to remove the large crowd of sightseers from the immediate area. Crowd control was a continuing problem throughout the operation.

Ambulance crews and medical personnel, while working within fire lines, operated under the control of the Fire Department.

Utility personnel were assigned the task of shutting down all of the utilities, and were accompanied by firefighters to ensure their safety.

The Sanitation Department quickly responded to our call with as much men and heavy equipment as was needed. Under the supervision of a chief officer and a Sanitation supervisor they did an outstanding job of removing parked cars, large portions of the collapsed structure, and tons of rubble.

**Vetter Air Bag.** The Vetter air bag, used by Rescue Co. 3, proved to be an extremely valuable tool at this operation. Its versatility in adapting to this type of collapse situation was most effective.

**Borough Log Book.** The importance of listing all pertinent information in the Borough Log Book (BLB) cannot be overemphasized. The following data was recorded in the BLB with regard to this operation: All official agencies operating at the scene; the findings of the investigating Fire Marshals; unusual structural factors which could provide evidence of the explosion cause; a listing of fatalities and injuries; and the time that the operation ended.

The information listed in the BLB provided invaluable assistance in preparing the fire report, the fatal fire report, and the fire review. It will no doubt be used in the litigation which has resulted from this disaster.

*(Continued on page 19.)*