FDNY Rescues Staten Island Worker Down a Shaft

by Firefighter Daniel A. Baron

Every July brings a proud event to the quarters of Rescue 5 and Engine 160. The Wounded Warriors Project arrives from several locations to meet up at the Clove Road firehouse. This is the kick-off for their week-long visit to the New York City area. They participate in many different water sports and excursions with local volunteers, many of whom are FDNY members. The members of Rescue 5 and Engine 160 work for days in preparation before this luncheon and eagerly look forward to the veterans' arrival. July 11, 2013, was the day for that year's kickoff. The firehouse was busy with activity and preparations. (See Photo #1.)

Building under construction

The new courthouse building--in the St. George section of Staten Island--also was busy with workers this particular morning. The new State Supreme Court Building occupies an entire block from Central Avenue to St. Mark's Place. The stately and sprawling building is 182,000 square feet and built on-grade, making it five to six stories tall. Its glass walls and other modern exterior materials add to the vision of the ongoing revitalization of this historic district near the Staten Island Ferry Terminal. It will include a vehicle trap and holding cells in the lower level, as well as NYPD and District Attorney offices. (See Photo #2.)

The civil and criminal courtrooms are on the first through fourth floors. Criminal courts are arranged in pairs, with holding cells between them. Offices will occupy the fifth floor. Because of the building's "mixed use," the measurement from each concrete floor to the one above varies from 16 to 24 feet. The sixth floor is a mechanical floor housing the HVAC equipment, plumbing and electrical appliances, piping and conduit. There are six elevator banks.

Directly behind the elevator shaft is a mechanical shaft that drops 72 feet to the basement. The shaft measures approximately nine by 12 feet. Multiple ducts supply conditioned air to the offices and court rooms below. The ducts traveling in this shaft are supported by two- by two-inch angle iron arranged in a grid. At each floor, above the drop ceilings, the ducts turn or branch off to run horizontally with sprinkler pipes, lighting circuits, communication lines and other wires, cables and conduit.

The shaft is closed, except for the opening at the top floor and basement and a service panel on the fourth floor. The walls of the shaft are fire-rated. They are constructed of double, 5/8-inch, fire-rated dry wall on each side of metal studding. The walls are insulated with a dense fiber batting. Workers have installed a two- by four-inch, wood-framed, safety railing at the top of the shaft. However, a staging plank extends across the iron grid at the top floor. One end of the plank is unsupported.

Worker down a shaft

At 1000 hours, the UCT-911 received a call stating, "a man fell down an elevator shaft." The Staten Island dispatcher sent out Box 0036 as a confined space rescue. The response included Engines 153, 152 and 156 and Ladders 78 and 80. Battalion Chief Albert Petrocelli, Battalion 21, also was assigned. The Rescue Task Force included Rescue 5 with its Collapse Unit, Tower Ladder 77 as the SOC Support Ladder and Squad 1. Tactical Support Unit 2, Rescue, Safety and Haz-Mat Battalions, Haz-Mat 1, FieldComm 1, a Rebreather Unit and the SOC Logistics Unit also were included on the Box.

Before the incident concluded, FDNY units operated on three separate floors, in the shaft and through two different wall breaches to effect the worker's rescue. Chief Petrocelli transmitted a confirmed worker down in a shaft and *all hands* operating. This report brought Deputy Chief Richard Howe, Division 8 Commander, and an additional Rescue Task Force that was turned around before arriving.

Ladder 78 was first-due. Members were met by the victim's coworkers and directed to the service panel on the fourth floor. From this vantage point, Lieutenant Tim Rail viewed an injured worker in the shaft. The worker fell from the top floor and struck the grid work. (See Photo #3.) Luckily, as the man hit the iron, bending it, his weight carried him backward and he landed on an 18-inch-wide duct after falling 24 feet. If he had bounced in any other direction, he would have plunged to the basement.

The worker, with severe leg injuries and an avulsion to his arm, now was perched between the fourth and fifth floors and had no means of exiting the shaft. Ladder 78's outside vent Firefighter, FF Alfred Trentalange, Jr., and forcible entry Firefighter, FF Chase Fredrickson, began to search for a way to access the injured man from the fourth floor. Roof Firefighter, FF Joseph Cicero, went to the fifth floor and began a wall-breaching operation. (See Photo #4.)

Photo #1--Every July, the Wounded Warriors Project meets at Engine 160/Rescue 5 to kick off their week of activities in the New York City area. The Warriors and their families share a lunch and camaraderie with FDNY members. Then, they board vintage fire apparatus and are escorted through Breezy Point and the Rockaways. They receive a deserved heroes' welcome there. To get involved with this annual event, go to www.legendsofvalor.com.

photo by the Staten Island Advance

Photo #2--The new State Supreme Courthouse in Staten Island is visible from the Staten Island Ferry Terminal. It is scheduled for completion in the summer of 2014 and cost $230 million to build.

Photo #3--Grids of two- by two-inch, steel angle-iron are affixed throughout the mechanical shaft. They support the air ducts on which the worker landed.

Photo #4--The view from the top. The fifth-floor breach is visible. Also, note the location where the worker landed.

The engine companies arrived in order. Engine 153, commanded by Captain Robert Schafer, reported to the fourth floor with EMS equipment and assisted Ladder 78 members with moving tools and construction materials as needed. Engines 152 and 156 members helped shuttle rescue equipment and provided much-needed direction for arriving units. Although there were dozens of construction workers on-scene, most of them had no idea that an emergency was underway or where it was. The engine company members identified the shortest route from the street to the rescue scene and eventually set up a relay.

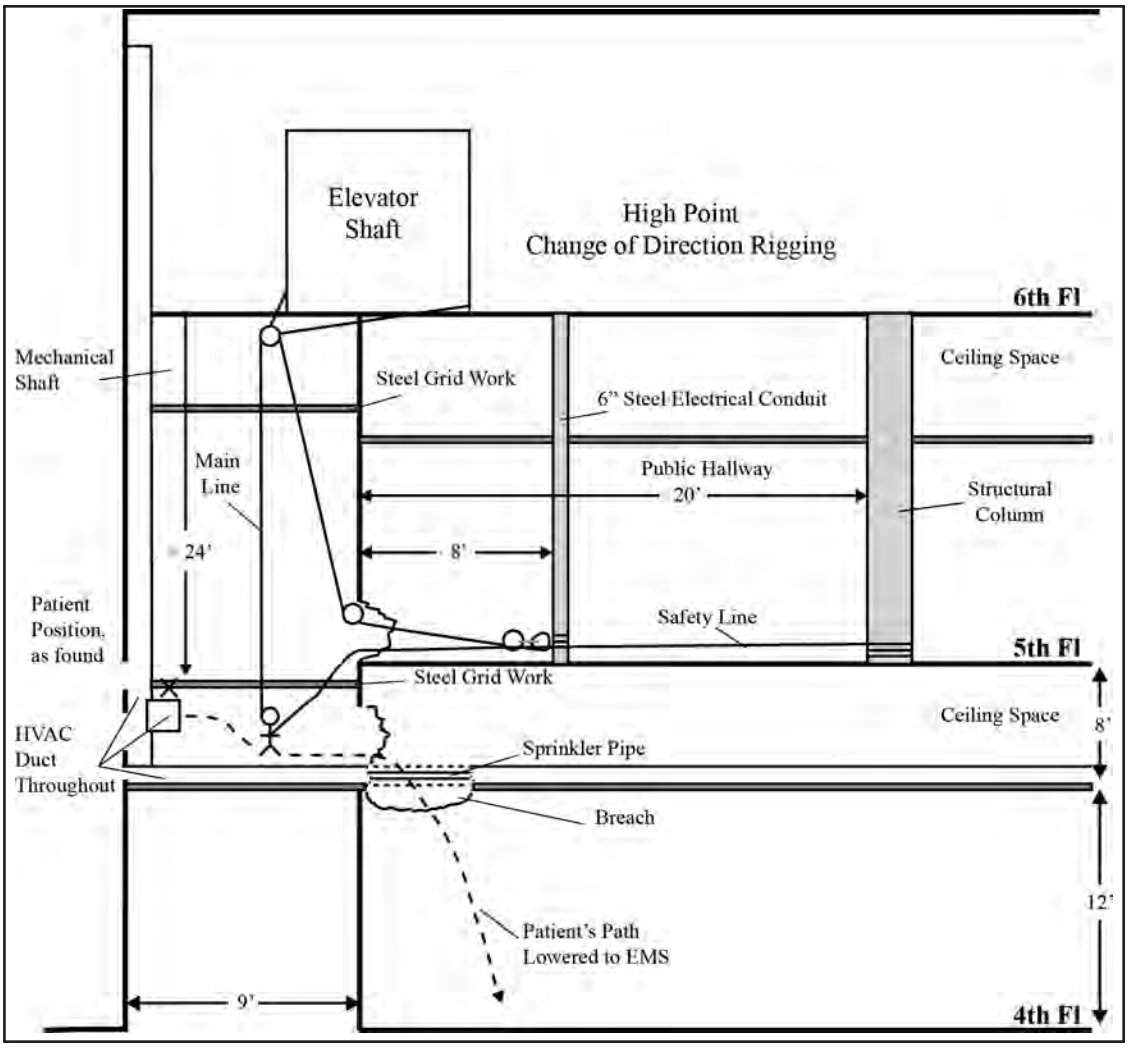
Complex operation

Rescue 5 arrived at 1010 hours and was directed to the fourth floor. Lieutenant Thomas Clair and inside team Firefighters--Daniel Baron with the irons and Ronald Pinaud with the can--arrived on the fourth floor with the main line and safety line bags. Size-up suggested that the team had to get above the worker's position. They proceeded to the fifth floor.

The Rescue 5 inside team was assigned the Entry 1 and Entry 2 positions. On arrival, these members were wearing Class III rescue harnesses, full-body harnesses that include a seat harness and an upper body component. This chest component has straps that pass over the rescuer's shoulders to allow him/her to invert and operate upside-down without slipping. The entire assembly has met strength standards set forth in NFPA 1983, the same Standard that governs the qualities of the FDNY Life Saving Rope.

FF Pinaud began to collect intelligence from the construction workers and other Firefighters. FF Baron made verbal contact with the patient through the breach to reassure him that help was coming. Rescue 5 outside Firefighters Robert Unger and Robert Brunone arrived on the fifth floor to assist.

Lieutenant Clair directed FF Baron to access the patient as soon



artwork by Kristin Eng

Photo #5--The main line was anchored to six-inch-diameter steel conduit on the fifth floor. This was eight feet back from the breached wall. This breach is where FF Baron entered the shaft. The main line and safety line were operated on this floor.

Photo #6--This photo was taken after the patient was removed to the ambulance. The service panel opening where Ladder 78 first made contact with the injured worker is visible in the background. The main line is on the left in the photo. Note that the main line was attached to a two-legged bridle. The bridle was attached to the LSP (Life Support Products) Half Back Extrication Device at two points. This practice of using a bridle spreads the patient's weight out and can make a device less constricting. Also on the main line is an anti-chafing sleeve that slides down when the rope no longer is under tension. The safety was connected to the LSP at another attachment point. The LSP Half Back Extrication Device is a tool that can be applied to a patient to provide rapid immobilization and vertical lift/lower extrication. It is a padded, full-body harness that uses clips to attach it to the patient. These clips allow the rescuer to apply the device with minimal patient movement. The Half Back also has a rigid insert with a head immobilizer for use when trauma is suspected.

as the breach was large enough. FF Baron secured the main line to a six-inch, steel, electrical conduit, approximately eight feet back from the breached wall and connected the free end to his harness. (See Photo #5.) FFs Brunone with the hook and Cicero completed enlarging the breach and took control of the lowering device to belay Entry 1. FF Baron entered the shaft, on rope, through the breach and climbed across the bent iron grid to reach a point above the worker. FF Unger assisted FF Pinaud in securing the safety line. (See Photo #6.) They had to strip the plastering off a steel column to rig the anchor strap to structural steel. The column was 20 feet back, across the hallway and actually in another room. However, this anchor point was in direct line with the breach in the wall.

Ladder 77 Captain Timothy Bennet contacted Lieutenant Clair to advise him that the top of the shaft was open and provided access to the worker. Lieutenant Clair and Chief Petrocelli proceeded to the top floor and agreed that this area would be useful for the operation. The Rescue 5 outside team reported to Lieutenant Clair to rig a high point by repurposing the 4:1 haul line. The pulleys were removed from the rope. Lieutenant Clair selected the elevator shaft as the anchor. (See Photo #7.) The members wrapped the elevator shaft and positioned a knot and pulley centered over the mechanical shaft. The two- by four-inch railing created an obstacle and a section had to be removed. Chief Howe arrived and assumed command.

FF Baron lowered himself with his arms to slowly add his weight to the duct work where the patient was situated. He secured himself to the iron grid with a loop of webbing and disconnected the main line from his harness to allow that rope to be repositioned. The patient was wearing a work harness. FF Baron determined the harness to be in good order and connected a prusik loop from the harness to the grid work. The man now was secure.

Ladder 78 operated above the drop ceiling of the fourth floor. FF Trentalange used a cordless reciprocating saw to breach a large opening into the shaft below and opposite the victim. FF Pinaud lowered the safety line to FF Trentalange, which he attached to his personal harness. FF Keith McTarsney, Rescue 5, but detailed to TSU-2, assisted with the belay.

Rescue 5 chauffeur, FF Tom Ihnken, arrived on the fifth floor with the LSP Half Back Extrication Device and the stokes basket. FF Baron requested the LSP Device for its compact size and stabilizing functions. The worker was packaged with a cervical collar and the LSP Device. His injuries--including an open fracture of his ankle--although severe, were stable and addressed by EMS personnel. EMS Unit 23R2 Rescue Paramedics were in position to enter the shaft for packaging, but the lowering operation began.

Ladder 77 roof Firefighter David Brown provided his roof rope to lower from the top of the shaft. FF Pinaud attached the main line

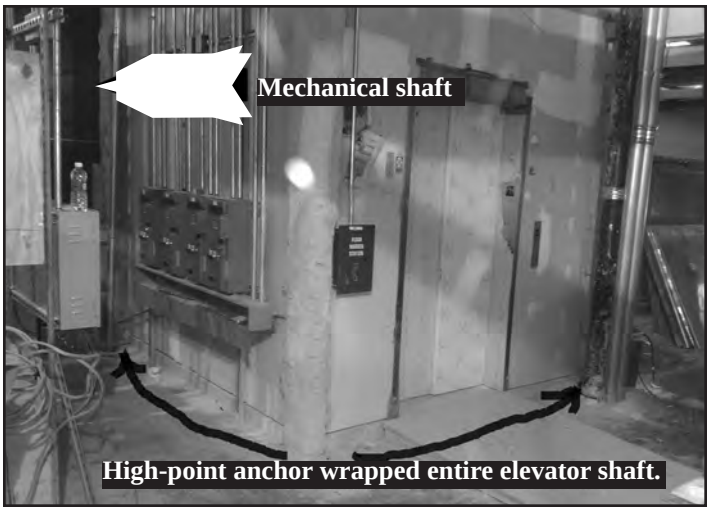


Photo #7--The worker fell into the mechanical shaft directly behind this elevator bank.

Photo #8--The route through which the worker was lowered left little room to spare. A stokes basket would not fit past the obstructions. The man was guided physically during the entire lowering operation.

to the roof rope and it was hauled up. The main line ran from the anchor through the lowering device. It passed through a change of direction pulley at the breach and also at the high point. Then, it connected to the LSP Device, which was applied to the patient. (See diagram on page 5.) FF Trentalange cleared away some wires and cables near the breach. He backed into the ceiling area to the ladder and disconnected the safety line and passed it to FF Baron to attach to the worker. The worker now was connected to both ropes.

Worker removed

With the arrival of Squad 1 at 1020 hours, more eyes were available for safety checks and monitoring edges for any sharp contact points. Lieutenant Clair monitored the high point and viewed the operation below him. Lieutenant William Ryan, Squad 1, was on the fifth floor for a view of the main line and safety operation. All safety checks were completed and control of the lowering process was given to FF Baron. FF Pinaud worked all of the slack out of the main line and it was locked off. Then, the main line was deflected, pulled or pushed to create an angle in a taut rope. This gently raised the man off of his ledge so that FF Baron could position him in the middle of the shaft and align him with his exit. When the deflection was corrected, the worker was completely supported by the rope.

FF Baron called for the lower to be done slowly. The man was spun to fit between ducts and pipes, guided through Ladder 78's breach and finally through the fourth-floor ceiling. (See Photo #8.) The lower continued until the worker was approximately four feet from the floor. EMS personnel were staged on the fourth floor to receive the patient. The stretcher was positioned below the worker and, finally, his weight transferred to it. The ropes were disconnected and care of the man was transferred to EMS personnel. Chief Howe transmitted that the worker had been removed and the incident was placed *under control* at 1049 hours.

Lessons learned/reinforced

- ***Access***--Whenever possible, first-arriving units should announce the location of the best access point for the incident. Interconnected locations, such as building complexes, construction sites and large, multi-level subway stations, can be confusing and take incoming units costly minutes and energy to decipher. Do not assume that bystanders will be knowledgeable about the location or that informed people will return to direct additional units. Once identified, the best route can be marked with a "relay" of members if staffing allows.
- ***Communications***--Sometimes, the EMS Branch is unaware regarding where their presence is required. Consideration should be made to identify where they are needed early and get that information to the ranking EMS personnel. When a technical plan is about to be executed, announce the details of that operation so that all members are on the same page.
- ***Elevators***--Control of elevators should be secured early in the incident. Once FDNY members have control of the elevators, be sure to direct priority members and equipment to them.
- ***Specialized operations***--Specialized operations and tools should be identified and announced as soon as possible. Procedures such as wall-breaching and the materials encountered should be relayed to later-arriving units so that they may bring the appropriate tools and equipment.
- ***Flexibility***--Members must be flexible and able to change roles as new tasks are identified. With any ongoing size-up, the best strategy may evolve with time. The objective--in this case, removing the worker as soon as possible without compromising Firefighter safety or the victim's injuries--must remain the highest priority. If a better method, procedure or route presents itself during an operation, it should be considered. Ultimately, the Incident Commander (IC) may have to weigh the options and determine the final plan.
- ***Edge protection***--The most common cause of failure of a rope system is a sharp, unprotected edge. As a system is operated, it may come in contact with edges other than those initially protected. In those cases, the movement of the rope must be halted and the edge addressed. Sometimes, the path of the rope can be changed.

Conclusion

Emergencies challenge FDNY members every day. Units must develop multiple, flexible plans that coordinate with the purposes of other units at that incident. These goals somehow must be melded and members work together to accomplish the IC's objective. At complex rescues, superior leadership, intricate teamwork and each member's commitment to training on the best available equipment position the FDNY for successful outcomes.

At this operation, the rescue plans developed for extricating the trapped worker included using a portable ladder, a roof rope lowering of a member, a high-angle stokes basket raise and, finally, lowering the patient through a breached wall in the LSP Device. These methods were developed by multiple Officers operating from different vantage points. In the end, the evolution of this operation involved parts of all these rescue plans to complete the objective. The bottom line: Another person in peril was safely and efficiently rescued by members of the FDNY.

About the Author...

FF Daniel A. Baron is a 15-year veteran of the FDNY. He is assigned to Rescue 5. Prior assignments include Engines 4 and 66. He holds a Paramedic certificate and attended Northeastern University. This is his second article for WNYF.