# Philadelphia (PA) Fire Department
# Health and Safety Office
## After Action Review

Line of Duty Death

## Lieutenant Matthew LeTourneau

## January 06, 2018

2240 N. Colorado Street
Box 7743: 18th Street and Dauphin Street

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# Executive Summary

On January 06, 2018, Lt. Matthew LeTourneau, a 42-year-old male and 11-year veteran of the Philadelphia Fire Department (PFD), died after becoming trapped from an interior structural collapse while engaged in interior firefighting operations. Two additional firefighters were injured during the collapse and one civilian occupant of the dwelling, who was removed during initial operations, also died. This After-Action Review (AAR)[1] was conducted by the PFDs Health and Safety Office, at the direction of Fire Commissioner Adam K. Thiel, to provide insight into the event and PFD operations from the time of dispatch to the time the fire was placed under control[2]; a time span of approximately 1 hour and 57 minutes.

A fire box assignment[3] was dispatched at 08:51:43 for a reported dwelling fire on the 2200 block of N. Colorado Street. Responding units were forced to overcome significant impediments including: a snow and ice-covered street, temperatures of approximately 9°F with a wind chill of -10°F (NOAA, 2018) and limited apparatus access to the front of the fire dwelling. Engine 45, a crew of three firefighters supervised by Lt. LeTourneau, was the first-due engine company and the first unit to arrive on location. Due to the limited width of the block (approximately fourteen feet wide) Engine 45 parked their apparatus at the corner of the street and walked with their equipment approximately two hundred and sixty feet to the fire dwelling. At approximately 08:55:05, Lt. LeTourneau reported a two story, fifteen feet by thirty-five feet, middle of the row dwelling with fire showing on the first floor. Lt. Letourneau placed two engine companies and two ladder companies in service to begin the initial fire suppression efforts.

[1] An After-Action Review (AAR) is a formalized process to analyze an incident.
[2] Known as the "elapsed time".
[3] A fire box assignment is a dispatch term utilized by the PFD when dispatching units for the report of a structure fire. The initial dispatch for a fire box is: 4 engine companies, 2 ladder companies, 2 Battalion Chiefs and 1 medic unit.

Fire companies on scene had a difficult time obtaining a steady water supply[4] and the fire dwelling was extremely cluttered with debris, which posed an extreme hazard and complicated interior operations. While working to overcome difficult conditions, firefighters gained access to the first floor, removed one civilian victim, and eventually accessed the second floor of the dwelling to attack the fire and complete a search for occupants. At approximately 09:33, almost 42 minutes after Engine 45's dispatch, an interior "V" shaped collapse[5] occurred trapping several firefighters, including Lt. LeTourneau. Two firefighters, who were trapped on the stairs leading to the second floor, were quickly located and extricated by nearby firefighters. A third firefighter, who is the only known firefighter to be on the second floor prior to and at the time of collapse, fell to the first floor and became trapped under debris; he quickly self-extricated to the rear of the dwelling[6].

Lt. LeTourneau was located by firefighters several minutes after the collapse but was severely entrapped by debris and structural components. After a significant effort, approximately 1 hour and 2 minutes later, Lt. LeTourneau was removed from the dwelling by members of the PFD's Special Operations units. PFD Paramedics and EMT's initiated lifesaving interventions and transported Lt. LeTourneau to a nearby trauma hospital where he was pronounced dead.

[4] Engine company drivers attempted to operate a total of eleven hydrants- **Six** of the eleven hydrants malfunctioned.
[5] A "V" shaped collapse is a type of interior structural collapse where the debris forms a "V" shape.
[6] This firefighter recently completed a firefighter survival training program at the Philadelphia Fire Academy and he attributed his post collapse actions, in large part, to that training.

Based on the review of PFD operations, the AAR Team acknowledges the following factors as having contributed to the Line of Duty Death of Lt. LeTourneau:

- Time Discipline
- Delayed Expansion of the Incident Command System
- Excessive Clutter Conditions of the Dwelling
- Deteriorated Structural Integrity of the Dwelling
- Extreme Weather for the Philadelphia Region
- Water Supply
- Crew Integrity
- Situational Awareness
- Communications

## Lessons Learned

Based on the review of PFD operations, the AAR Team believes the PFD can learn the following key lessons to improve fire ground operations and the health and safety of its members:

- Incident Commanders must closely monitor the elapsed incident time during fire ground operations to understand the effect of fire, and fire suppression activities, on structural components.
- Communications during fire incidents require Incident Commanders to ask direct and concise questions, with clear, descriptive answers being returned. All communications should paint an accurate picture of conditions, and if not, clarification must be sought.

- Incident Commanders should perform a risk assessment at regular intervals during fire ground operations, especially when operating in occupancies with unusual or excessive clutter conditions and when transitioning modes of attack.
- The live load, including the weight of water from fire hose streams, should be strongly considered during risk assessments as operational times increase. Additionally, in sub freezing environments, Incident Commanders should evaluate the impact of ice on the structure.
- All members should ensure their SCBA cylinders are full at the start of each shift.
- All members should know their individual consumption rate of SCBA cylinders for various levels of work (low, moderate and high performance) and should closely monitor their work time during operations.
- Expanding incidents require a timely expansion of the ICS organizational structure due to the complex and dynamic nature of evolving emergency incidents.
- Extreme weather conditions can mask true fire development.
- When water supply issues are encountered, crews should work together to establish at least one large diameter supply line for the fire ground and add more as time and conditions warrant.
- During extreme weather conditions, additional resources should be anticipated and dispatched early during the incident to account for reflex time.
- An applicable and sustainable, department-wide training and professional development program is essential in the PFD, with a strong focus on situational based critical thinking.
- It should be anticipated in older buildings that structural members and construction design methods may not be as sound as current building codes and standards.

# Acknowledgements

After Action Review Team:

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# After-Action Report Procedures

On January 06, 2018, after being notified by the PFD's Fire Communications Center (FCC)[7], Deputy Chief Vincent P. Mulray responded to the fire ground at 2240 N. Colorado St. with Captain Robert Kennedy. Prior to the arrival of Deputy Chief Mulray and Captain Kennedy, the fire was placed under control and Lt. LeTourneau had been transported to an area hospital.

On January 17, 2018, Philadelphia Fire Commissioner Adam K. Thiel ordered Deputy Chief Mulray to complete the PFD's AAR. Commissioner Thiel was clear in his instructions that the AAR was not to be considered or conducted as a fire investigation or a Line of Duty Death investigation. The only investigation would be conducted by the Philadelphia Fire Department's Fire Marshal's Office, Philadelphia Police Department and the United States Bureau of Alcohol, Tobacco, Firearms and Explosives (the "Investigative Team"). Fire Commissioner Thiel instructed Deputy Chief Mulray to ensure the AAR was a no-fault, comprehensive, thorough, objective, factual and transparent process focusing on the events between the time of dispatch and the time the fire was placed under control.

As part of the AAR process, the AAR Team reviewed the following information that was provided to them by various PFD units, subject matter experts and other local and federal partners:

- Interviews of PFD members and civilians conducted by the Investigative Team.
- Video footage from several sources, including: Lt. LeTourneau's helmet cam, Philadelphia Police Department body cam and civilian cell phone.

[7] The PFD's Fire Communications Center (FCC) is responsible for receiving 911 emergency calls and dispatching the appropriate PFD resource. Additionally, the FCC is the communications link between field units and internal and external agencies/resources.

- Audio transcripts from the PFD's North Fire, South Fire and South Tac 2 radio channels, incident history reports and a timeline from the PFD's FCC.
- Photographs of the fire scene and fire dwelling.
- Medical Examiner's findings and opinions. Case #18-0082
- Computerized drawings of the fire dwelling from the Investigative Team.
- Test results of Lt. LeTourneau's Self Contained Breathing Apparatus (SCBA)[8] conducted by Intertek. Report #103495252CRT-001; May 07, 2018
- Independent analysis of wood floor joist samples performed by Dr. DeVallance from West Virginia University.
- Independent analysis of building performance during fire operations provided by Mr. Christopher J. Naum, SFPE, CUSA.
- PFD National Fire Incident Reporting System (NFIRS) Reports.

The AAR Team developed a questionnaire that was distributed to PFD members who operated on the fire ground to assist the Team in developing a baseline for their review. The AAR Team conducted voluntary interviews of many PFD members who operated at the scene and solicited input from all members of the PFD who wished to share their story (via PFD General Memorandum #18-38, the PFD Weekly Update and the PFD TV channel). A Technical Review Committee convened and met for four days following the completion of the first draft of this report. The AAR Team provided a briefing to the Technical Review Committee and allowed several days for review of the draft. The Technical Review Committee provided recommendations and feedback for the AAR Team to include in the final report.

[8] A SCBA is the breathing assembly worn by firefighters to supply clean breathing air while engaged in firefighting operations.

Additionally, the following resources were utilized:

- The "Investigative Team"
    - Philadelphia Fire Department's Fire Marshal's Office
    - Philadelphia Police Department
    - United States Bureau of Alcohol, Tobacco, Firearms and Explosives.
- PFD's FCC
- GIS mapping and imagery assistance provided by Mr. Andrew Newell, PFD Senior Lead GIS Analyst
- City of Philadelphia Department of Records
- Philadelphia Water Department
- Philadelphia Medical Examiner's Office
- National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program
- Mr. Christopher J. Naum, SFPE.
- Mr. Dave Dodson
- Temple University Library Archives
- The Free Library of Philadelphia
- The Historical Society of Pennsylvania
- National Archives and Records Administration
- SCOTT Fire & Safety
- Safeware, Inc.
- West Virginia University: Division of Forestry, Wood Science and Technology.

It is not the intention of this report to place blame on any person, group or agency. The Boston Fire Department's Board of Inquiry Report (2016, p.14) for the Line of Duty Death investigation of Box 9-1579[9] best summarizes the purpose of an AAR which is "to prevent the same situation from occurring in the future". The AAR Team worked diligently to understand the facts that occurred during PFD operations, with the intention of helping the PFD learn and evolve from this incident.

[9] One of several Line of Duty Death investigation reports reviewed by the AAR Team.

# Biographical Data

Lt. Matthew LeTourneau was appointed to the Philadelphia Fire Department on January 08, 2007 as part of Cadet Class 183. Upon graduation from The Philadelphia Fire Training Academy, he was assigned to Engine 43 in Center City Philadelphia and later transferred to Engine 57 in West Philadelphia in January 2013. On February 27, 2015, LeTourneau was promoted to the rank of Fire Lieutenant and assigned to Engine 45, "A" platoon. While assigned to Engine 45, he also served as an adjunct instructor at the Philadelphia Fire Academy.

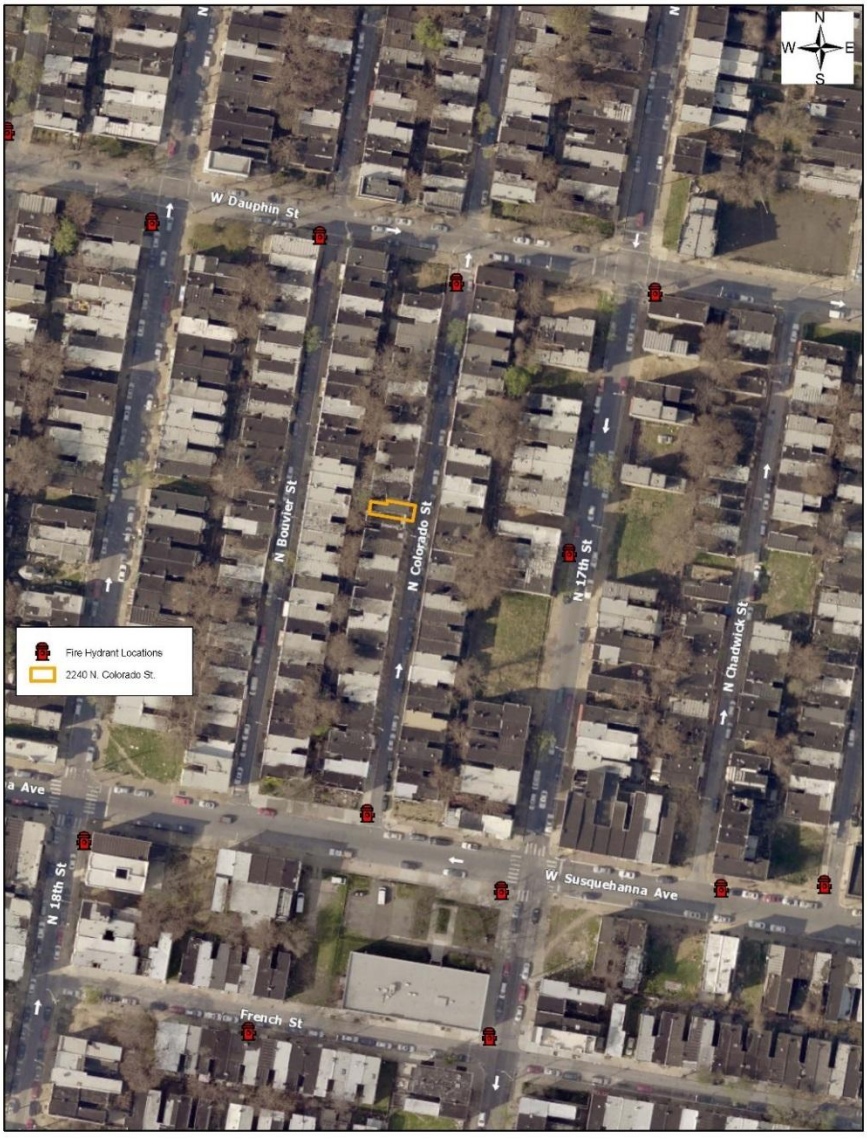
In addition to being a member of the Philadelphia Fire Department, Lt. LeTourneau served as a volunteer firefighter in Springfield, Delaware County, Pennsylvania for almost 27 years. Training records from both the Philadelphia Fire Department and Delaware County Fire Training Academy indicate Lt. Letourneau had an extensive training and educational background which included an Associate's Degree in Fire Science from Delaware County Community College.

Lt. LeTourneau was posthumously promoted to the rank of Fire Captain on January 11, 2018.

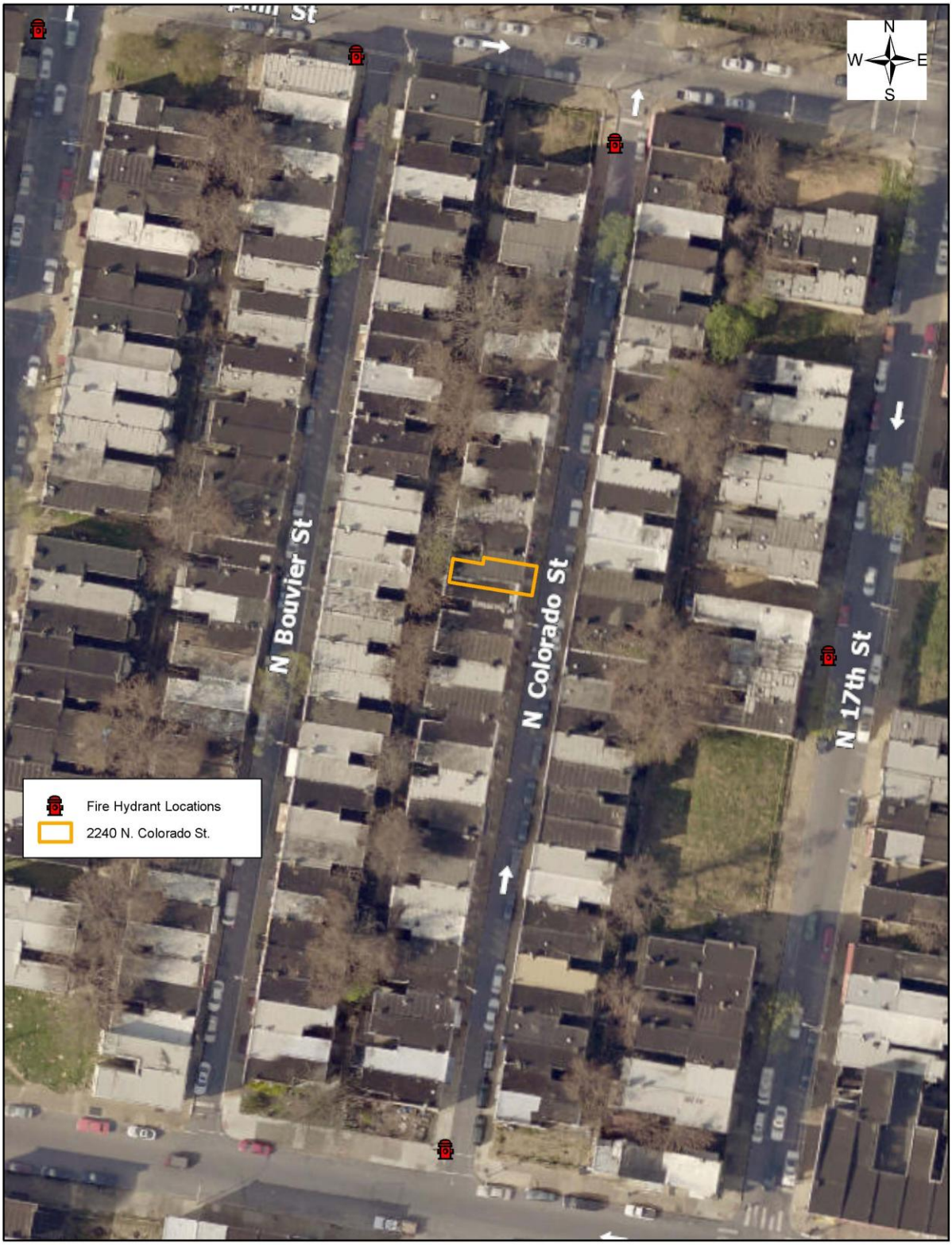
# Volume I: The Fire

## The Fire Dwelling: 2240 North Colorado Street

The 2200 block of North Colorado Street, located in the Stanton section of North Philadelphia, was once a neighborhood of large manufacturing and textile facilities until approximately the 1940's. The block is bordered to the North by Dauphin Street, to the South by West Susquehanna Avenue, to the East by North 17th Street and to the West by North Bouvier Street.




**1: Neighborhood overview. (Source: www.streetsmart.cyclomedia.com)**




**2: 2200 block of North Colorado Street and surrounding streets. (Source: www.streetsmart.cyclomedia.com)**

2240 N. Colorado Street was a two story (two floors above grade, one below grade), middle of the row, occupied dwelling (row house) of ordinary construction[10] with an approximate width of fifteen feet five inches and approximate depth of thirty-seven feet six inches. The dwelling had a flat roof, approximately 1,038 square feet of above grade living space (Property, 2018) and access to the interior of the structure via doors in the front and rear. The dwelling was likely built between 1884 and 1888[11]; it was demolished in the weeks after the fire.

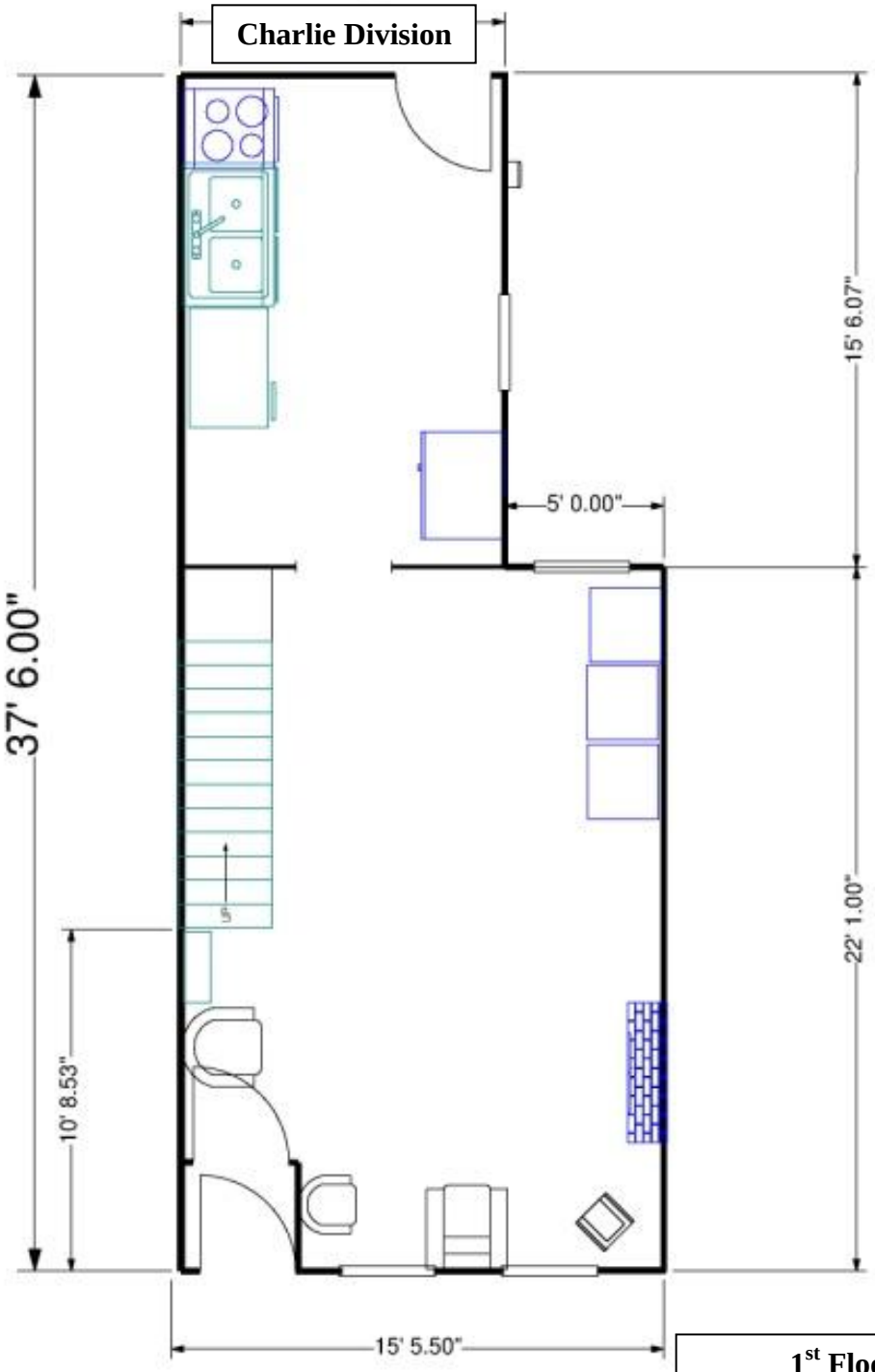
**3: Pictured from Left to Right: Bravo Exposure (green dwelling with white door); Fire dwelling (red dwelling with white door); Delta Exposure (red dwelling with red/white window awnings on the second floor). (Source: www.streetsmart.cyclomedia.com)**

[10] Ordinary construction is designed with non-combustible exterior walls and combustible interior walls.
[11] The AAR Team researched and found this information by referencing the 1884 "Atlas of the City of Philadelphia 21st and 28th Wards published by C.M. Hopkins, C.E." and the 1888 "Atlas of the City of Philadelphia 28th and 32nd Wards published by G.W. Bromley & Co."

**4: Street view of 2240 N. Colorado Street. (Source: www.streetsmart.cyclomedia.com)**

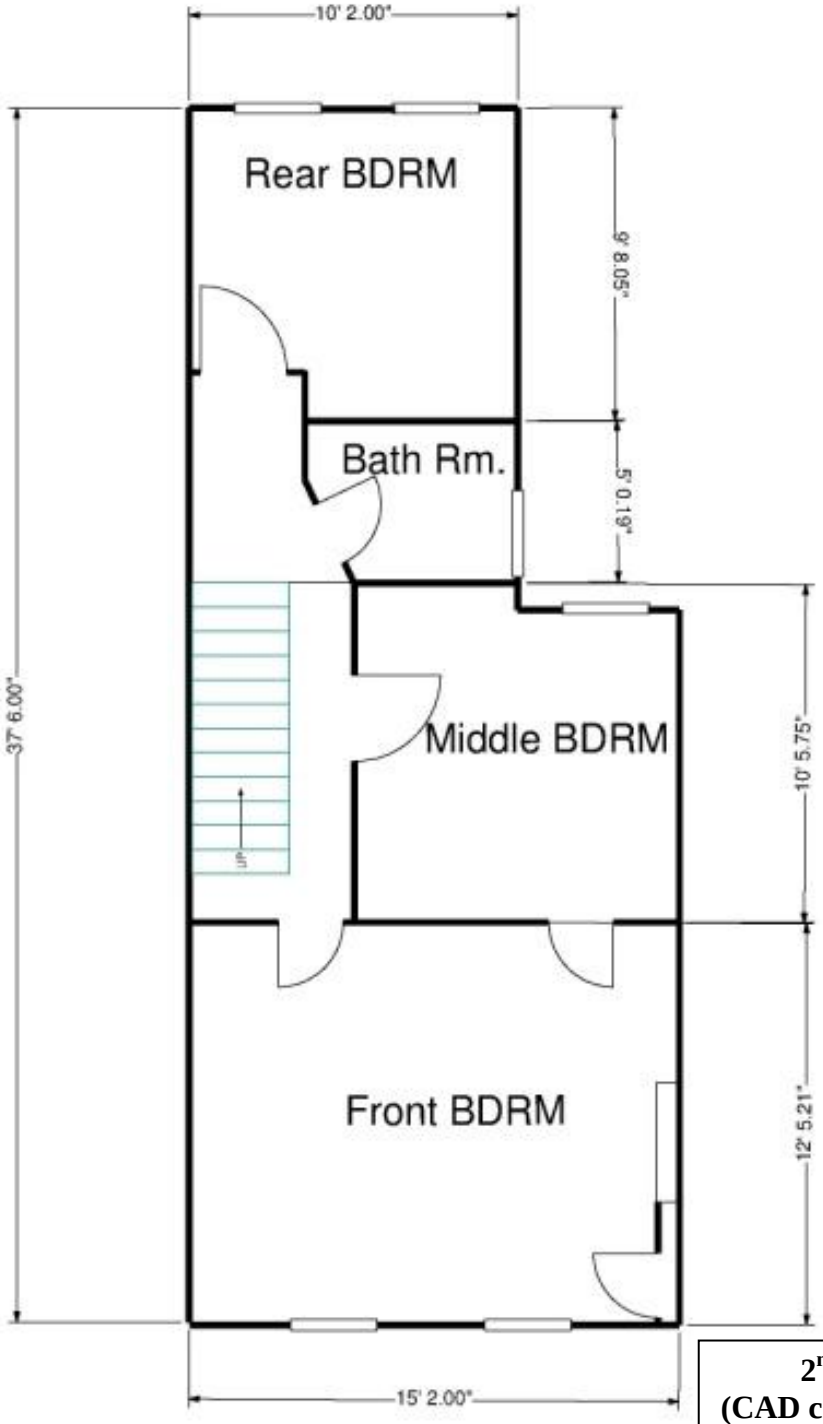

**5: Overview of 2240 Colorado Street. (Source: www.atlas.phila.gov)**

- The first floor of the dwelling included a vestibule entrance, living space and kitchen.



- The second floor consisted of three bedrooms and one bathroom.

**Charlie Division**




**Alpha Division**

**2nd Floor (CAD created by the Investigative Team)**

The Investigative Team reported the following information about the status of the electric and gas service for the dwelling:

- "Although electrical service to the residence was active, power had not been used since approximately May 7, 2016";
- "It was reported that gas service to the structure was off at the street valve prior to the fire".

Additionally, interviews conducted by the Investigative Team revealed the following information about the condition of the home in the years leading up to the fire:

- "[There] was a lot of stuff in [the home]".
- "There were holes in the walls. You could see the brick."
- "The bricks were all cracked and some of the mortar between the bricks [was] deteriorating".
- Because the roof leaked, "You could see water dripping down the walls…in between the kitchen and the living room on the right side".
- "There was a tree growing through the windows in the back".

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**The following is an excerpt from the Executive Summary of the report "Insights on Building Performance During Fire Operations" authored by Christopher J. Naum, SFPE, CUSA (pages 9 & 10)**

- **Construction System:** Type III Ordinary Construction (based on National Building Code, circa 1900-1915 ed.)
    - **Floor Joists:** Full dimensioned 3 in. x 7.5 in. Floor joists were pocketed into the masonry bearing walls. There were no internal joint strap anchors or tie-backs to the masonry bearing or non-bearing walls. (no external spreader plates were used

on the building facade) Bridging would not have been expected to be present between floor joists based on the short spans.

- **Wood Joist: Eastern Hemlock (Tsuga canadensis)**[9,10] 3 in. x 7.25 in

  The wood is moderately lightweight, (about 28 pounds per cubic foot at 12-percent moisture content), moderately weak in bending strength, moderately strong in end compression, low in splitting resistance, and average in nail-holding capacity, moderately low in strength, moderately stiff, and moderately low in shock resistance.[9]

- **Hemlock** is similar to spruce in appearance, though much inferior as a building material. The wood is very brittle, splits easily, and is very liable to be shaky. Its grain is coarse and uneven, and though it holds nails much more firmly than does pine, the wood is generally soft and not durable. Hemlock is used almost exclusively as a cheap, rough-framing timber. [8]

- **NOTE:** A sample taken from the building by the PFD was identified to have a moisture content of **3.6%**[1,17]

**Unique Feature of Note:** Within the Joist Void consisting of the 2nd Floor wood floor system; Commencing proximal to the first wood joist an approx. 1-inch x 1-inch notch was cut into the upper top portion of the wood joist to accommodate the installation of a pipe run into the occupancy for gas service to the residence in the late 1800's. These cut notches and legacy gas pipe run continues in each wood floor joist inward from the Alpha side wall area interior along an almost floor span center-line approx. 20 ft. or more.

  - **Stairwell Area:** The Single-run stairway and stairwell was located directly adjacent to the interior Bravo Division wall and was accessible immediately upon entry through the front door and vestibule. The wood floor joists span fully wall to wall in all interior areas except at the stairwell. An alternate method of assembly and structural system is present at this location
  - **Flooring:** 3-inch x 1-inch wood plank flooring is common for this building type and vintage consisting of a rough under floor planking attached to the wood floor joist, a finished upper flooring treatment was not apparent
  - Refer to Diagram for Typical Structural Floor System and Masonry Perimeter Wall and Floor Joist Orientation and Column Support Plan
- **Size:** Two Stories, with a full basement
  - Height: Curb line to Cornice- approx. 20 feet
- **Floor Area:** 37 feet approx. x 15 feet approx. [519 square feet per floor]
  - Total Floor Area: 1,038 Square feet est.
  - Closed- Compartmented Floor Plan
- **Interior Compartments:** Two (2) occupant spaces-rooms on the 1st Floor. Four (4) occupant spaces-rooms on the 2st Floor. Full basement; open space.
  - Compartment framing, wood timber construction, original plaster and lath wall treatment (fully, partial or removed)
  - As-found evidence of physical, material and maintenance neglect and progressive physical building and structure deterioration
  - Recommended practices and code ordinances at the time of the building's construction (1880-1888)

- **Roof:** Timber Rafters with Wood Deck and covering
    - The cornice had been modified and altered, with plywood panels partially installed to protect the roof cockloft void. Original brick and/or covering materials were absent at the time of the fire.
- **Masonry Perimeter Walls:** Masonry Brick Wall Construction Party Bearing Walls (Bravo and Delta Divisions; Brick walls and wood frame backing on Alpha and Charlie Divisions
    - Evidence of masonry brick wall deterioration of mortar joints, brick facing and wall integrity; Exposed rear walls and court-yard shape, Charlie Division.
    - The Front façade did not appear to have an observable deteriorated or compromising conditions.
    - Window Treatments: Conventional window treatment and sizing for residential occupancy spaces (Basement, 1st and 2nd floors).

## PFD Operations

The following narrative recounts the events from January 06, 2018 on Box 7743, from the time of dispatch, 08:51:43 hrs., to the time Lt. LeTourneau was transported to the hospital, 10:51:31 hrs. The AAR Team reviewed several sources of information to recap PFD Operations at Box 7743, including: FCC provided transcripts of the North Fire, South Fire and South Tac 2 radio channels[12], interviews conducted with PFD members and video footage of the fire ground obtained from the Investigative Team.

The AAR Team worked diligently to ensure the accuracy of information provided by cross referencing data between the various information sources. However, at times, there were slight differences between actual and recounted events, as well as inconsistencies and conflicting statements among members who were interviewed. It is the opinion of the AAR Team that such inconsistencies are a result of differing perspectives, varying memories and emotional factors and are not a deliberate attempt to mislead, distort or conceal facts and do not differ materially from actual events as they occurred.

The information in this section is not a word for word transcription. In some instances, the AAR Team abbreviated messages and/or paraphrased communications. However, the AAR Team did not misrepresent or pervert any communication with the intent of altering the message. All times listed in this report are considered estimates and do vary slightly from source to source. *(Note: Italicized text denotes information obtained from interviews and AAR Team review of video footage and audio communications.)*

[12] The FCC designates units to operate on specific radio channels based on the geographic location of the incident they are dispatched to and the nature of the assignment. The "North" and "South" fire bands are used to dispatch all fire assignments as well as for routine communications. While operating at a fire scene, fire companies use tactical channels designated by FCC, such as "South Tac 2", for person to person, incident specific communications.

**08:51:43 to 09:00:00 *[Elapsed time: 00:00:00 to 00:08:17]***

**Operational Summary**

- Fire visible on the first floor from the front of the fire dwelling
- Engine 45 arrives on location
- Battalion Chief 8 arrives on location and assumes Incident Command
- Firefighters make entry to the fire dwelling
- One civilian victim is removed from the dwelling by firefighters

At 08:51:43, the FCC dispatched Fire Box Assignment 7743, for a dwelling fire reported at 2220 N. Colorado Street[13]. The companies dispatched were: Engines 45, 13, 34, 59; Ladders 14, 12; Battalion Chiefs 8, 3 and Medic Unit 25. At 08:53:50, Engine 50, who was operating on a different assignment at the time Box 7743 was dispatched, became available and requested to be added to the assignment. At 08:54:17, the FCC dispatcher recalled Engine 59 and replaced them with Engine 50. The new Engine company positions were: Engines 45, 50, 13 and 34.

Engine 45 announced they were responding at 08:53:06. Upon arrival, at approximately 08:54:32, Engine 45 positioned their apparatus on Dauphin Street just east of the 2200 block of N. Colorado Street. The PAK[14] Firefighter of Engine 45 stretched three-inch supply line and the TIP[15] Firefighter carried three lengths of 1 ¾ inch attack line[16] to the front of the fire dwelling[17] to prepare for service.

[13] 2220 N. Colorado Street was an incorrect address of fire.
[14] In the PFD, four members are assigned to an Engine Company (one officer and three firefighters). A responsibility of the PAK Firefighter at a fire scene is to assist hoseline advancement to the seat of the fire.
[15] The responsibility of the TIP Firefighter at a fire scene is to operate the nozzle of the hoseline.
[16] The standard attack hoseline used for interior fire operations of this occupancy type.
[17] The front of the dwelling is also referred to as the "Alpha Division".

**6: Civilian video of pre-arrival conditions in the Alpha Division (08:52:59 Hrs.)**

At 08:55:05, Engine 45's Officer, Lt. LeTourneau, gave his first-in fire report[18] over the South Fire Band. Lt. LeTourneau reported: "Engine 45, Ladder 14 are on location- 2240 N. Colorado Street- two story, middle of the row dwelling, fifteen by thirty-five, I've got fire showing first floor. Bravo/Delta same size and dimensions, all occupied" and he ordered two engines and two ladders ("two and two") into service.

**7: Lt. LeTourneau helmet cam of the Alpha Division looking towards Susquehanna Ave. (08:54:42 Hrs)**

[18] A first-in report is a required radio communication from the first arriving unit to describe the conditions of the incident and to provide initial orders for incoming units.

**8: Lt. LeTourneau helmet cam of the Alpha Division looking towards Susquehanna Ave. Battalion 8's vehicle in the distance. (08:55:05 Hrs.)**

Because Lt. LeTourneau placed two and two in service, per standard PFD protocol, the FCC dispatched the following companies at 08:56:29: Ladder 3 (Rapid Intervention Team[19]), Medic Unit 31, Squad 72 (a special operations capable engine company) and an Emergency Medical Control Officer- ES.9.

**9: Lt. LeTourneau helmet cam of the Alpha Division in front of the Bravo Exposure (08:55:20 Hrs.)**

[19] A ladder company designated to assist a lost, trapped or in distress firefighter.

Battalion 8 arrived on location at 08:55:47 and shortly thereafter, assumed the designation of "Command[20]". At 08:56:54, Command advised "Communications"[21] that the correct address was 2240 N. Colorado Street and that there were heavy fire conditions on the first floor. Command placed three engines and two ladders in service ("three and two"). Command raised Engine 34's Officer (on location at 08:59:24) and ordered them to go in service in the Delta Exposure[22] (2242 N. Colorado Street) with 1 ¾" hoseline. Command then raised Engine 50's Officer (on location at 08:57) and ordered them to stretch 1 ¾" hoseline into the front door of 2240 N. Colorado St. to assist Engine 45.

At approximately 08:57, Engine 45's Driver/Pump Operator (DPOP)[23] charged the three-inch supply line providing water to Engine 45's 1 ¾" hoseline. *The total capacity of Engine 45's onboard water tank is 500 gallons*. While members were attempting forcible entry through the front door, Lt. LeTourneau ordered the TIP Firefighter of Engine 45 to begin flowing water through the front first floor windows of the fire dwelling to extinguish the visible fire on the first floor. With a charged hoseline, the TIP Firefighter of Engine 45 opened the nozzle, but no water discharged. *In an interview, the TIP Firefighter of Engine 45 stated the nozzle was frozen*. Lt. LeTourneau then ordered the TIP Firefighter to remove the stream shaper of the nozzle[24] which proved to be effective in allowing water to be flowed. At approximately 08:58, Engine 45

[20] "Command" (an abbreviation for "Incident Commander") is the person ultimately responsible for all operations during an incident and for determining the overall strategy.
[21] "Communications" is the radio designation given to the 1st due Battalion Chiefs Driver/Aide. "Communications" is responsible for monitoring radio traffic during fire ground operations and relaying messages between Command and FCC.
[22] An "exposure" describes an adjoining or adjacent property to the fire dwelling. The PFD segments fire grounds into four "Divisions": "Alpha" (the front), "Bravo" (the left), "Charlie" (the rear) and "Delta" (the right). The Delta Division is the property to the immediate right of the fire dwelling.
[23] The Driver/Pump Operator (DPOP) is responsible for safely driving to the incident scene, establishing a water supply and operating the pump controls.
[24] The part of the nozzle which controls the stream shape and pattern; when removed (unscrewed) from the nozzle, the nozzle still functions, but only as a solid stream.

discharged water on the first-floor fire (approximately seven minutes after dispatch, and four minutes after arriving on the fire ground).

**10: Initial fire attack from the exterior in the Alpha Division while firefighters made forcible entry. Firefighters are also entering the Bravo Exposure. (08:57:49 Hrs.)**

After effecting forced entry to the fire dwelling, one civilian was located just inside the front door. Firefighters removed the deceased civilian to the exterior of the dwelling. Then, Engine 45's crew made entry with their charged 1 ¾" hoseline. *Engine 45 made initial entry with their TIP Firefighter, PAK Firefighter and Lt. LeTourneau. Engine 45's PAK Firefighter stated they first extinguished fire in the living room and then moved to the dining room. He*

*stated that it all went easily and smoothly.* Command raised Ladder 12's Officer (on location at 08:55:42) and ordered that he go to the Bravo exposure[25] (2238 N. Colorado Street) to do a search for occupants and ventilate heat and smoke by removing windows. Ladder 12's Officer acknowledged Command's order and reported[26] there was smoke showing from the first and second floor in the rear of the original fire dwelling. Command told Ladder 12's Officer to make sure the original fire dwelling was ventilated.

**09:00:00 to 09:10:00** ***[Elapsed time: 00:08:17 to 00:18:17]***

**Operational Summary**

- Fire visible on the second floor from the front of the dwelling
- Report of debris on the interior
- Report that units were having a difficult time locating the stairs to the 2nd floor
- Report that fire was extending in the breezeway in the rear of the dwelling
- All hands placed in service
- Command orders a transition to defensive, exterior operations
- Report of water supply problems

At 09:00:00, Command requested a Medic Unit immediately report to the front of the fire dwelling with a stretcher. Shortly thereafter, Charlie Division Supervisor[27] (Charlie Division) reported that fire had extended in the breezeway in the rear and he would need a hoseline. At 09:01:58, Ladder 14's Officer (on location at 08:55:05) reported that a primary search[28] was underway. At 09:02:06, Rescue 1 became available from another assignment and responded to

[25] The property to the immediate left of the fire dwelling.
[26] The first-in ladder company officer is typically responsible for providing an initial report of conditions from the rear.
[27] "Charlie Division Supervisor, abbreviated as "Charlie Division", is the designation given to the supervisor in the rear of the fire dwelling. During this fire, the Charlie Division Supervisor was Battalion 3, who on this day, was a Captain working out of rank as an Acting Battalion Chief due to the regularly assigned Battalion Chief working out of rank as the PFDs citywide Field Incident Safety Officer.
[28] The primary search is a rapid search of an area to check for occupants.

Box 7743; therefore, FCC recalled Squad 72 at 09:02:14. At 09:02:26, Command stated that fire had extended to the second floor.

**11: Fire showing on the 2nd floor in the Alpha Division. (09:05:16 Hrs.)**

At 09:05:06, Command told Lt. LeTourneau via radio that he had fire conditions on the second floor and informed Lt. LeTourneau that Engine 50 was coming in behind them on the first floor and he wanted Engine 45 to go to the second floor. Lt. LeTourneau responded that

they were having trouble getting to the stairs because of the debris inside. *At some point after Engine 50 entered, Engine 45's PAK Firefighter stated Engine 45 lost pressure in their hoseline and recalled hearing Engine 45's DPOP say over the fire ground tactical channel that he had a bad hydrant*[29]. *Engine 45's PAK Firefighter stated they remained on the first floor waiting for water while Engine 50 operated their hoseline on the first-floor interior.* At 09:06:37, Engine 50's DPOP reported he had a bad hydrant. *Engine 50's Officer stated the first floor wasn't really hot and he was able to walk standing up. He noted walking became difficult because he kept sliding/falling on debris that was on the floor.*

**12: Alpha Division (09:05:36 Hrs.)**

At 09:06:56, Communications provided a progress report to FCC that "All Hands" (four engines and two ladders) were in service and there was heavy fire on the first and second floors. Per PFD protocol, because "All Hands" was in service, at 09:07:44, FCC dispatched: Squad 72,

[29] A fire hydrant that provides an inadequate water supply or was inoperable.

Deputy 2, the Field Incident Safety Officer- SO.1 and the EMS Division Chief- ES.1. Deputy 2 did not confirm his response so FCC attempted to raise him via radio, per FCC transcripts, at 09:10:16, 09:13:06, 09:15:39, and 09:22:28. According to CAD[30], Deputy 2 confirmed his response to the fire ground at 09:43:14.

At 09:07:37, Communications relayed a message to Command from FCC regarding a report that an occupant in an exposure property was unable to evacuate. Command acknowledged and stated he would send someone right away. Around the same time, Lt. LeTourneau exited the fire dwelling and was approached by Command. *Audio recordings from Lt. LeTourneau's helmet cam footage reveals Lt. LeTourneau exited the dwelling because his SCBA was out of air*. Shortly after approaching Lt. LeTourneau, at 09:07:57, Command announced on the fire ground tactical channel: "Command to all companies operating on Colorado Street, I need you to exit the building we are going to switch to a defensive attack. All companies operating on Colorado Street exit the building we are switching to a defensive attack".

Command told Charlie Division that he was pulling everybody out of the building to get a Personnel Accountability Report (PAR)[31] and said they would re-group and then go back inside the dwelling. *Engine 45's PAK Firefighter stated that at some point before Command ordered an exterior attack, Engine 50 lost water.* At 09:08:06, FCC dispatched EMS Field Battalion Chief, ES.3.[32]

[30] Computer Aided Dispatch.
[31] A Personnel Accountability Report (PAR) is a roll call style report conducted by company supervisors to ensure accountability for their personnel. A PAR is usually conducted anytime there is a catastrophic or unusual event or the mode of attack changes.
[32] PFD Protocol is to dispatch ES.6, the EMS on duty Captain, but ES.6 was already operating at another assignment; therefore, the FCC dispatched ES.3.


**13: Lt. LeTourneau exited the fire dwelling and had a face to face conversation with the Incident Commander. (09:07:34 Hrs.)**

At 09:08:38, Charlie Division acknowledged Command and told him he had PAR with Ladder 12 in the rear and was still waiting for a hoseline. At 09:09:21, Engine 50's DPOP reported that he had a second bad hydrant. At 09:10:39, Engine 34's Officer informed his DPOP that they lost water pressure. *It was observed that Engine 50's Officer was the last member to exit the dwelling at 09:09:59.*


**14: The last member exits the dwelling while transitioning to an exterior attack. (09:09:59 Hrs.)**

**09:10:00 to 09:14:00 *[Elapsed time: 00:18:17 to 00:22:17]***

**Operational Summary**

- All firefighters are on the exterior of the building in a defensive mode of attack
- FCC informs Communications of an elapsed time of 20 minutes
- Charlie Division reports fire extension to the Delta Exposure and that he is still waiting for water in the rear
- Command requests two additional engine companies be dispatched to assist with water supply
- Engine 45 reestablishes a water supply

**15: Exterior operations. Hose stream demonstrates the water supply problems. (09:10:26 Hrs.)**

At 09:10:54, Command informed Communications they had transitioned to a defensive attack, all companies were out of the building and all members were accounted for. At 09:11:51, FCC informed Communications over the South Fire Band that the "elapsed time is 20 minutes" (*this information is not relayed to Command over the fire ground tactical channel).*

At 09:13:19, Charlie Division notified Command that Engine 13 (on location at 08:58:55) and Ladder 12 were with him in the rear, but they were still waiting for water. He also stated that fire was extending to the Delta exposure and he needed a response from the Philadelphia Electric Company (PECO)[33] due to arcing wires. At 09:13:20, FCC dispatched Medic Unit 36 at the request of Communications. At 09:13:58, Command contacted Communications and ordered a special call[34] for two additional engine companies to be dispatched. At 09:15:02, FCC dispatched Engines 59 and 29.

*During the time all companies withdrew to the exterior, Engine 13 stretched a 1 3/4" hoseline to the rear by going through the Delta exposure from the front. Engine 50's Officer and Lt. LeTourneau ordered their PAK Firefighters to return to their respective apparatus to assist the DPOPs' in obtaining a water supply.*

At approximately 09:12:15, Engine 45's DPOP reestablished a water supply with the help of Squad 72's DPOP (on location shortly before this time) and recharged Engine 45's three-inch hoseline.

[33] The City of Philadelphia's electric supply company.
[34] A "special call" occurs when Command requests units to be dispatched outside a standard response (i.e. if the Incident Commander only needs two engine companies, he could request them rather than an entire second alarm which brings more resources then may be needed).

**09:14:00 to 09:20:00 *[Elapsed time: 00:22:17 to 00:28:17]***

**Operational Summary**

- Command transitions back to interior operations
- Additional reports of water supply problems
- Additional reports of debris on the interior
- Firefighters begin to replace depleted SCBA cylinders
- EMS Operations switches to a separate radio channel

At 09:14:33, Command advised Charlie Division that Engine 34 was operating on the first floor of the fire dwelling[35] and that companies in front of the fire dwelling were experiencing water problems. Charlie Division responded that he would be able to help Command as soon as his companies could establish a water supply. Several seconds later, Engine 50's Officer raised his DPOP and told him they needed water. Engine 50's DPOP responded that he was still working to find a hydrant that worked. He said two hydrants were inoperable and he was trying a third. Engine 13's Officer then requested his DPOP send the water. At 09:15:40, Command radioed Communications and stated he needed the first engine company that arrived from the special call to assist Engine 50 in obtaining a water supply (this was assigned to Engine 59 by FCC). *In reality, Engine 29 was the unit that assisted Engine 50's DPOP obtain a water supply.*

After they reestablished a water supply, Command instructed Engine 45 to go back into the dwelling. *Recognizing they would need new SCBA cylinders before making reentry, according to Engine 45's TIP Firefighter, Lt. LeTourneau ordered him to return to the apparatus to bring back two full SCBA cylinders (one for each of them).* While waiting for the cylinders, Lt. LeTourneau used Engine 45's hoseline to discharge water from the exterior of the fire dwelling onto the first and second floors. *Engine 45's PAK Firefighter stated that while he was making his way back to the fire dwelling after assisting Engine 45's DPOP, he passed Engine*

[35] Engine 34 was operating only several feet inside the doorway.

*45's TIP Firefighter who was headed to their apparatus. He asked the TIP Firefighter to get him a new SCBA cylinder and bring it to the front of the fire dwelling.*

**16: Alpha Division (09:14:15 Hrs.)**

At 09:16:49, Command raised Charlie Division to tell him Engine 34 was coming to the rear with a charged hoseline through the Delta exposure and that Engine 45 was operating in the front of the fire dwelling with their hoseline. By 09:17:43, Engine 45's DPOP informed Lt. LeTourneau that they had "good water" and at 09:18:35, Engine 13's Officer raised Engine 13's TIP Firefighter to tell him the water was coming.

*When Engine 45's PAK Firefighter returned to the front of the fire dwelling, Lt. LeTourneau gave him Engine 45's hoseline and instructed him to continue discharging water onto the first floor. Engine 45's PAK Firefighter stated he had air remaining in his SCBA cylinder, so he made entry to the dwelling just inside the doorway to accomplish this task. At some point, Engine 45's TIP firefighter returned to the front of the dwelling with new SCBA cylinders. Seeing this, Engine 45's PAK Firefighter exited the dwelling to exchange his SCBA cylinder. At about this time, Lt. LeTourneau gave Engine 45's hoseline to Engine 50's Officer while he changed his SCBA cylinder (Engine 50 did not have a charged hoseline but did have air remaining in their SCBA cylinders). Engine 50's Officer reentered the fire dwelling through the front door in the Alpha Division and worked towards the kitchen area with Ladder 12's PAK Firefighter.*[36] *(The rotation of members and hoseline operations is depicted in the chart below).*

| Firefighter/Hoseline Summary | | |
|---|---|---|
| | **Engine 45's** Hoseline | **Engine 50's** Hoseline |
| **Members** | Engine 50's Officer<br>Ladder 12's PAK FF | Uncharged (Exterior of dwelling) |

[36] The responsibilities of the "PAK" firefighter in a ladder company include: conducting search and rescue operations and completing forcible entry tasks. This is a different role then the "PAK" firefighter assigned to an engine company.

ES.9 requested on the South Fire Band (because he was unable to get through on South Tac 2) that a tactical channel be designated for EMS Operations, as well as the dispatch of two additional Medic Units.[37] At 09:17:17, FCC dispatched Medic Units 34 and 44.

At 09:19:03, Ladder 12's Officer told Command that a search for occupants in the Delta exposure was negative and there didn't appear to be any fire extension. Command raised Engine 50's Officer and asked how they were doing on the first floor. Engine 50's Officer reported there was a lot of trash inside. Command then asked about fire conditions but there was no response. At 09:20:22, Communications informed FCC that EMS would be operating on South Tac 3.

*According to Engine 45's PAK Firefighter, around this time, Lt. LeTourneau replaced the PAK Firefighter's SCBA cylinder. Engine 45's PAK Firefighter then reentered the dwelling to replace Ladder 12's PAK Firefighter on the tip of Engine 45's hoseline. Ladder 12's PAK Firefighter exited the dwelling. With Engine 45's PAK Firefighter on the tip, and Engine 50's Officer closely behind, Engine 45's hoseline worked to extinguish fire in the kitchen area. Engine 45's PAK Firefighter stated that every time they would extinguish an area, it would reignite. (The rotation of members and hoseline operations is depicted in the chart below).*

| Firefighter/Hoseline Summary | | |
|---|---|---|
| | **Engine 45's** Hoseline | **Engine 50's** Hoseline |
| **Members** | Engine 50's Officer<br>Engine 45's PAK FF | Uncharged (Exterior of dwelling) |

[37]This resource request from ES.9 is contrary to PFD Operational Procedure #19 (2007, p.6) which states the Incident Commander "approves or disapproves requests for resources".

**09:20:00 to 09:29:00 *[Elapsed time: 00:28:17 to 00:37:17]***

**Operational Summary**

- A serious electrical problem is reported in the rear of the dwelling
- Firefighters continue replacing depleted SCBA cylinders
- Additional reports of debris on the interior
- Additional reports of water supply problems
- Water supply is established in the rear

At 09:20:30, Command asked Charlie Division how they were doing in the rear. He responded they were looking pretty good and that Engines 13 and 34 had extinguished fire that was impinging on the Delta exposure. He stated they were now working on the first-floor fire. Command informed Charlie Division that Engine 50 was operating on the first floor.

*Engine 45's PAK Firefighter stated that at some point while they were working to extinguish fire in the kitchen area they were getting hit by the stream of a hoseline operating from the rear of the dwelling. He recalled Engine 50's Officer communicating over radio to have that hoseline shut down (this transmission takes place at 09:20:22 on South Tac 2).*

Less than a minute later, Ladder 14's Roof Firefighter stated there was still fire showing in the breezeway on the second floor between the original fire dwelling and the Delta exposure. He said it was difficult to see if there was extension. Command asked Charlie Division if he had two hoselines in the rear. Charlie Division responded in the affirmative and informed Command there was a serious electrical problem. At 09:23:58, Ladder 14's Officer asked Charlie Division if it would be possible to have a unit extinguish the fire that was visible in the second-floor rear *(Ladder 14's Officer stated that he was referring to fire in the middle bedroom)*. Charlie Division responded that Engine 34 was in the process of doing that.

At 09:23:39, Communications requested a response from PECO through FCC for the second time. FCC acknowledged and informed Communications that Philadelphia Police

Officers were in an exposure dwelling (not affected by fire or smoke conditions) with a civilian in distress. Communications relayed that message to Command, who assigned ES.9 to investigate.

*After replacing their SCBA cylinders, Lt. LeTourneau instructed his TIP firefighter to follow him into the dwelling. Both members followed Engine 45's hoseline to where Engine 50's Officer and Engine 45's PAK Firefighter were operating. A brief conversation occurred between Engine 50's Officer and Lt. LeTourneau, then, Engine 50's Officer left the dwelling because his SCBA cylinder was low; he was followed out of the dwelling by Engine 45's PAK Firefighter. Engine 45's PAK Firefighter stated that Lt. LeTourneau assumed the tip.*

At 09:25:27, Command asked Engine 50's Officer for a progress report. Engine 50's Officer notified Command he was exiting the dwelling to change his SCBA cylinder, but Engine 45 had the hoseline and a positive water supply. Command then asked Lt. LeTourneau for a progress report. He responded that he had water on the fire on the first floor but there was a lot of debris inside the dwelling. He said they were trying to get to the second floor. *(The rotation of members and hoseline operations is depicted in the chart below).*

| Firefighter/Hoseline Summary | | |
|---|---|---|
| | **Engine 45's** Hoseline | **Engine 50's** Hoseline |
| **Members** | Lt. LeTourneau<br>Engine 45's TIP FF | Uncharged (Exterior of dwelling) |

At 09:27:41, Command ordered Charlie Division to have one of the engine companies operating in the rear assist Engine 45 on the first floor as they advance to the second. Charlie Division responded he would not be able to do that because there was a serious fire impingement

on the exposure and that Engine 34 was the only company with water in the rear. Ladder 14's Officer then asked his firefighter on the roof for a progress report. Ladder 14's Roof Firefighter explained the fire had been knocked down and the vent hole was doing its job.

*Engine 50's Officer stated that he walked to his apparatus to get a new SCBA cylinder. At this point, Engine 50's hoseline was still not charged, however, Engine 29 arrived to help Engine 50's DPOP obtain a water supply. Because of this, Engine 50's PAK Firefighter (who was originally assigned to assist E.50's DPOP obtain water) walked back to the front of the fire dwelling (E.29 arrives on the fire ground at 09:18:30).*

*Engine 45's PAK Firefighter stated he and Ladder 12's PAK Firefighter were standing outside the fire dwelling when they heard someone yell that a hoseline was needed on the interior. Engine 50's PAK Firefighter, who was now in front of the fire dwelling, stated he disconnected Engine 50's uncharged 1 ¾" hoseline from their uncharged 3" supply line and connected it to the unused side of Engine 45's gated wye.*[38] *Engine 50's Officer stated Command told him during a face to face conversation that he wanted him to take a hoseline to the second floor.*

*Engine 45's PAK Firefighter told Engine 50's Officer that he and Ladder 12's PAK Firefighter were going to take Engine 50's charged hoseline to the second floor. Engine 45's PAK Firefighter stated that before entering the fire dwelling they checked the location of the stairs in the Bravo exposure. According to Engine 45's TIP Firefighter, around this time, he and Lt. LeTourneau had located the stairs to the second floor. He stated Lt. LeTourneau had the tip of Engine 45's hoseline and had made his way approximately 1/3 of the way up the stairs to flow water onto the second floor.*

[38] A gated wye is an in-line appliance that is attached to a larger hoseline in order to distribute water to two smaller hoselines.

**09:29:00 to 09:33:33 *[Elapsed time: 00:37: 17 to 00:41:50]***

**Operational Summary**

- The Incident Safety Officer arrives on the fire ground
- E.45, E.50, E.13, E.34 have established a water supply
- Firefighters locate the stairs to the second floor
- First report of a firefighter being on the second floor
- The collapse occurs

At 09:29:27, Command informed Lt. LeTourneau that Engine 50 had a charged hoseline and were entering behind them. At 09:30:12, Engine 50's DPOP confirmed he established a water supply. At 09:30:33, Command told Charlie Division to send Engine 13 to the front of the fire dwelling to use the charged three-inch supply line in the front of the dwelling to pressurize their 1 ¾" hoseline *(presumably Engine 50's supply line).* Charlie Division responded affirmatively.

At 09:31:49, Command informed Lt. LeTourneau that he was to hold the first floor because Engine 50 was going to go to the second floor. *Engine 45's TIP Firefighter stated with this instruction, Lt. LeTourneau moved off the steps and handed him the tip. According to Engine 45's PAK Firefighter, upon his reentry with Engine 50's charged hoseline, he bumped into Lt. LeTourneau at the base of the steps (the interior of the dwelling was described as having "zero visibility" throughout the entire operation). Engine 45's PAK Firefighter stated that he informed Lt. LeTourneau that he was going to the second floor with Ladder 12's PAK Firefighter. In response, according to Engine 45's PAK Firefighter, Lt. LeTourneau told him he was going to remain on the first floor with Engine 45's TIP Firefighter. As Ladder 12's PAK Firefighter and Engine 45's PAK Firefighter ascended to the second floor with Engine 50's hoseline, Engine 45's TIP Firefighter and Lt. LeTourneau began making their way to the first-floor rear.*

*(The rotation of members and hoseline operations is depicted in the chart below).*

| Firefighter/Hoseline Summary | | |
|---|---|---|
| | **Engine 45's** Hoseline | **Engine 50's** Hoseline |
| **Members** | Lt. LeTourneau | Ladder 12's PAK FF |
| | Engine 45's TIP FF | Engine 45's PAK FF |
| | | Engine 50's PAK FF |

*Engine 50's Officer stated his entry was briefly delayed (approximately 30-45 seconds) because the webbing and straps of his SCBA mask were frozen. Once able to don his SCBA face piece, he rejoined Engine 50's hoseline on the steps to the second floor. The order to the second floor was Ladder 12's PAK Firefighter with the tip, then Engine 45's PAK Firefighter and lastly, Engine 50's Officer.*

*At about this time, it is evident in fire ground video that smoke conditions on the exterior, front of the dwelling changed. The smoke that consistently exited the dwelling and moved upward toward the roof line now began to accumulate at street level. This is also the approximate time and first known occurrence, that all four engine companies had secured a steady water supply*[39]*. The AAR Team believes that at this juncture in the operation, firefighters are beginning to extinguish a large volume of fire, causing the smoke and steam exiting the dwelling to cool and settle at street level. After the collapse, the smoke resumes its travel upwards toward the roofline.*

[39] Although at about this time, it is not believed that Engine 13 was actively discharging water.

**17: Alpha Division looking towards Dauphin Street. (09:30:08 Hrs.)**

**18: Alpha Division looking toward Susquehanna Avenue. (09:32:07 Hrs.)**

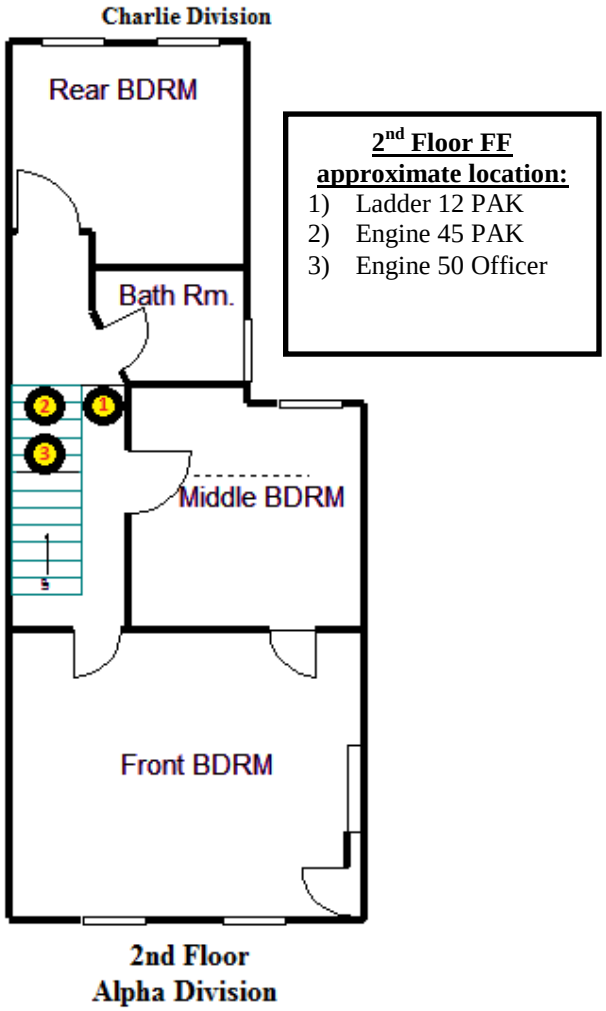
**19: Alpha Division looking toward Susquehanna Avenue. (09:33:03 Hrs.)**

*Ladder 12's PAK Firefighter stated he made his way onto the second floor and was positioned in the hallway a few feet past the top of the stairs toward the rear*[40]*. He stated he was discharging water into the rear bedroom. After the rear bedroom was extinguished, he turned towards the front of the dwelling because he could see fire in other rooms on the second floor. Simultaneously, on the first floor, Rescue 1's Search 1 Firefighter (on location at 09:16:45) told Engine 45's TIP Firefighter that there was fire toward the front of the dwelling. Engine 45's TIP*

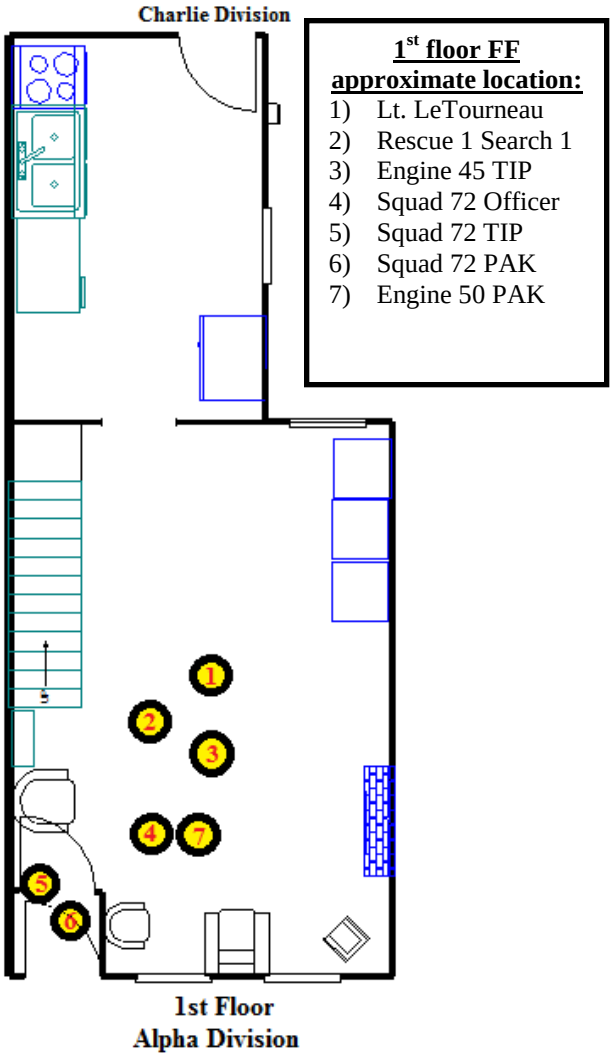
[40] Ladder 12's PAK Firefighter is the only firefighter to be on the second floor.

*Firefighter stated he and Lt. LeTourneau turned their hoseline from the rear and started making their way to the front of the dwelling.*

*At some point, Ladder 12's PAK Firefighter yelled to the members on the steps that he felt the second floor "drop". This report prompted Engine 50's Officer to order him off the second floor; however, before Ladder 12's PAK Firefighter could get to the steps, the second floor collapsed beneath his feet.*[41] The approximate location of fire personnel at the time of the collapse is believed to be depicted in the following diagrams:




[41] This occurs at approximately 09:33:18 Hrs.




*Engine 50's Officer stated he and Engine 45's PAK Firefighter were pushed face to face with each other and were slowly being compressed against the Bravo wall. He recalls being pushed so close together that their SCBA face pieces became dislodged from their faces. Squad 72's Officer, who was on the first floor at the time of the collapse, stated that when the collapse occurred, he heard a deafening crack. He said he immediately recognized the sound as a collapse and although he wasn't sure the severity of it, he went to the front door and told Command to "Get everybody out!". (This communication is heard in the audio of police body cam footage and occurs at approximately 09:33:30).*

*Members who were on the exterior of the dwelling at the time of the collapse recalled never knowing anything catastrophic had occurred on the interior until Squad 72's Officer appeared at the front door. Even then, they were not aware a collapse had occurred. Members who were in the Bravo exposure recall hearing a sound, but were not able to discern exactly what it was; they realized something bad had happened and thought it might have been a collapse.*

**09:33:33 to 09:34:00 *[Elapsed time: 00:41:50 to 00:42:23]***

**Operational Summary**

- Command orders all firefighters to exit the dwelling
- Four firefighters (Lt. LeTourneau, Ladder 12's PAK FF, Engine 50's Officer and Engine 45's PAK FF) are trapped
- Engine 45's PAK Firefighter is removed from the dwelling

At 09:33:33, Command announced on South Tac 2, "Command to all companies exit the building. Command to all companies operating on Colorado Street, exit the building. We are going to a defensive attack". Fourteen seconds later, Command repeats, "Command to all companies exit the building, we are switching to a defensive attack. Standby for a PAR".

*Engine 50's Officer stated he was trapped and unable to free himself. However, he was able to maneuver Engine 45's PAK Firefighter so that he was able to move more freely. Rescue 1's Search 1 Firefighter was then able to pull on the legs of Engine 45's PAK Firefighter freeing him. Rescue 1's Search Firefighter directed Engine 45's PAK Firefighter to the exit.*

**09:34:00 to 09:35:00 *[Elapsed time: 00:42:23 to 00:43:23]***

**Operational Summary**

- Command orders the emergency evacuation signal
- Mayday transmitted by Engine 50's Officer

At 09:34:08, FCC informed Communications there was an emergency activation[42] on South Tac 2 from the radio of Engine 50's Officer. At 09:34:24, Command told Communications to have FCC sound the emergency evacuation signal[43]. Communications then relayed to Command that there was an emergency activation signal transmitting from the radio of Engine 50's PAK Firefighter on South Tac 2.

Command attempted to raise Engine 50's Officer but was cut off by "MAYDAY, MAYDAY, MAYDAY[44], Engine 50's Officer. I can't find Ladder 12's PAK Firefighter. We are on the second floor". Command asked the member calling the Mayday to repeat who and where they are[45]. *Engine 50's Officer explained he called the Mayday because he wasn't sure where Ladder 12's PAK Firefighter was. He stated he heard Ladder 12's PAK Firefighter announce a Mayday message but didn't hear it broadcast over radio.*

[42] All firefighters in the PFD are assigned a portable radio. When in distress, firefighters are instructed to depress a specific button on their radio which supersedes all other radio traffic and provides several seconds of undisturbed transmission time.
[43] The emergency evacuation signal can be ordered by the Incident Commander to be broadcast by FCC over all radio channels. When activated, a tone is transmitted, and FCC informs all members operating at the incident to urgently evacuate the building. This message supersedes other communications.
[44] When a firefighter is in distress, lost, trapped or injured, they are instructed to depress their emergency activation button on their radio and announce "Mayday" three consecutive times followed by their location, identification and problem.
[45] Clarification was needed because the initial Mayday messages were not clearly discernible transmissions.

**20: Alpha Division looking towards Susquehanna Avenue. (09:34:26 Hrs.)**

**09:35:00 to 09:36:00 *[Elapsed time: 00:43:23 to 00:44:23]***

**Operational Summary**

- Additional Mayday transmitted by Engine 50's Officer
- FCC announces the emergency evacuation signal
- Ladder 12's PAK Firefighter self-extricates
- Engine 50's Officer is removed from the dwelling

"MAYDAY, MAYDAY, MAYDAY, Engine 50 Officer. I'm stuck in the stairwell. I don't have the location of Ladder 12 PAK Firefighter". At 09:35:07, FCC announced on the South Fire band that by orders of the Incident Commander, there is an urgent emergency evacuation for all companies operating on Box 7743. At 09:35:16, Command raised Engine 50's Officer and stated, "you are declaring a mayday, what is your location". Engine 50's Officer responds, "MAYDAY".

*Ladder 12's PAK Firefighter stated when the second floor collapsed, he slid down to the first floor. He said he was positioned on his back, with his head angled toward the rear/Delta corner of the dwelling and his feet pointed toward the front of the dwelling. He stated he was trapped under debris and his SCBA face piece was dislodged from his face. He was able to free himself enough to reseat his SCBA face piece and to depress his radio mic to transmit a Mayday message (unknowingly, this message did not broadcast over the fire ground tactical channel). Ladder 12's PAK Firefighter recalled seeing a light behind him (the rear of the dwelling). To free himself, he removed his foot from his boot and made his way to the light (which was the rear).*

At 09:35:24, Ladder 12's PAK Firefighter announced on South Tac 2 he made it out of the dwelling and that he was in the rear. Shortly thereafter, Charlie Division notified Command he had accountability for Ladder 12's PAK Firefighter and he was being taken to the front of the

fire dwelling. *Members in the rear stated Ladder 12's PAK Firefighter "appeared" in the kitchen doorway. They said they assisted him to his feet and escorted him to the front of the fire dwelling, through the Delta exposure, where he was treated, and later transported to an area hospital by PFD EMS units. Around the same time, on the interior of the fire dwelling, Engine 50's Officer was removed from the stairwell by Rescue 1's Search 1 Firefighter and escorted to exterior of the dwelling.*


**21: The Incident Safety Officer arrives in the Alpha Division after having just responded from another assignment in the city. (09:35:44 Hrs.)**

**09:36:00 to 09:45:00 *[Elapsed time: 00:44:23 to 00:53:23]***

**Operational Summary**

- Preliminary report that all firefighters are accounted for
- FCC dispatches a Mayday Response
- Command orders a PAR
- Lt. LeTourneau is unaccounted for
- FCC orders the single-banding of the North and South Fire bands
- Lt. LeTourneau is located, trapped by debris

**22: Alpha Division looking towards Susquehanna Avenue. (09:36:19 Hrs.)**

Command announced for all companies to standby for a PAR. Communications raised Command asking if they pulled "our guy out". Command responded "affirmative, we're conducting a PAR right now but preliminarily, we have all our guys accounted for". At 09:36:34, FCC again sounded the emergency evacuation tone over the South Fire Band. At 09:36:44, Command attempted to raise Lt. LeTourneau and FCC dispatched a Mayday Response[46] consisting of the following companies: Engine 55, Ladder 8, Medic Units 13 and 15, Battalion Chief 4 and Squrt 43 with Air Unit 1[47].

At 09:37:10, Command announced for all companies to standby unless they had a priority message. He attempted to raise Lt. LeTourneau over radio at 09:37:14 and again at 09:37:28. There was never a response from Lt. LeTourneau.

*PFD members stated that shortly after the PAR began they realized Lt. LeTourneau was not on the exterior of the dwelling. Engine 45's TIP Firefighter remembered telling several PFD members that when the collapse occurred, Lt. LeTourneau was right behind him. After hearing this, several members immediately donned their SCBA's and reentered the dwelling to search for Lt. LeTourneau. Members recalled it was only a short time (a few minutes) from when they initially evacuated the dwelling post collapse until they realized Lt. LeTourneau was missing and reentered to search for him.*

[46] A Mayday Response is a relatively new response in the PFD which is initiated when FCC is informed that a confirmed Mayday has been transmitted.
[47] Air Unit 1 is housed at Engine 13's station but not an independently staffed apparatus. When dispatched, the members of Engine 13 are trained to drive and operate the Air Unit. However, because Engine 13 was already operating at the assignment, Squrt 43 was dispatched to Engine 13's station to pick up and transport the apparatus to the fire ground.

**23: Alpha Division looking towards Susquehanna Avenue. (09:37:09 Hrs.)**

Communications raised Command at 09:37:53 and asked for the progress of the PAR. Command replied they were still looking for Lt. LeTourneau; at 09:38:09, Command again attempts to contact him. At 09:38:17, Charlie Division advised Command that all members were accounted for from Engines 34 and 13. At 09:38:32, FCC again announced an urgent emergency evacuation on South Fire. Command continued working to complete a PAR. At 09:42:10, Car 1 (Fire Commissioner) announced on the South Fire Band that he was responding to the fire ground. Then, at 09:42:13, FCC informed all units citywide to operate on the North Fire Band because the South Fire Band was reserved only for those units operating on Box 7743.

*The firefighters who reentered the dwelling to search for Lt. LeTourneau were primarily from Squad 72 and Rescue 1; however, there were a few firefighters from Engine 50 and the Rapid Intervention Team that were initially part of the search. When firefighters entered the dwelling, they were not sure the severity of the collapse due to zero visibility conditions. They also noted that they did not recall hearing a PASS Device[48] immediately upon their entry. The firefighters stated they split up: some searched along the Bravo wall while others searched along the Delta wall. Shortly after entry, one firefighter heard a PASS Device and directed the other firefighters by voice to the location where he heard the noise. The PASS Device was coming from Lt. LeTourneau's SCBA.*

*When firefighters located Lt. LeTourneau, they attempted to move him; however, they quickly realized he was heavily entrapped by structural components and debris. Lt. LeTourneau was found in a seated position facing the rear of the dwelling. His upper body was positioned between two second floor joists which pinned his SCBA cylinder. The lower half of his body was trapped beneath a significant amount of debris. When assessed, Lt. LeTourneau had no verbal*

[48] A PASS Device, which stands for Personal Alert Safety System, is integrated into each firefighter's SCBA and is activated when the firefighter turns the SCBA on. The purpose of the device is to emit a loud tone when the wearer is immobile for a certain period to alert others nearby to the location of the wearer.

*or physical reactions when engaged by firefighters. It was noted that his SCBA face piece was situated on his face and one interviewee stated he had a positive air supply with his vibra-alert activated.*

*Recognizing the severity of the situation, firefighters requested tools and equipment to assist their operation. Firefighters used cutting and spreading equipment along with shoring devices to lift, move and cut debris and structural components away from Lt. LeTourneau. During the operation, firefighters described the first floor as very unstable and so, as the operation extended, the Incident Safety Officer controlled access at the front doorway and allowed the special operations team members who were engaged in the rescue operation and the RIT Group Supervisor[49] to enter. Although, at several intervals and for extended durations, members of the on-scene Command Staff did enter the dwelling.*

*The firefighters expressed how precarious a situation the collapse had created. They mentioned they were diligent in splitting themselves into two teams: interior and exterior. Firefighters planned that if a secondary collapse occurred, the exterior team members would immediately begin search and rescue operations. During their operation, firefighters believed they were dealing with a "lean to" collapse[50] and only became aware the collapse was "V" shaped the next day, when they revisited the scene. Firefighters stated they discussed several ways to shore and stabilize the structure but decided the way they were operating was the quickest and most efficient way to give Lt. LeTourneau the best chance of surviving.*

[49] The Incident Commander initially assigned the Incident Safety Officer to supervise the Mayday operation until the Battalion Chief from the Mayday Response (Battalion 04) arrived on location (09:43:57). Battalion 04 then assumed the radio designation RIT Group Supervisor.
[50] A lean to collapse occurs when structural members fail at a point and fall leaving a void space between a wall and the point where the failed structure rests on the floor or surface.

**09:45:00 to 10:02:00 *[Elapsed time: 00:53:23 to 01:10:23]***

**Operational Summary**

- Car 1 arrives on the fire ground
- Command requests a Second Alarm
- The Second Alarm is dispatched
- The effort to rescue Lt. LeTourneau continues

Command asked Charlie Division if he could place a line in the rear to the second floor. Charlie Division responded that he could not because the rear kitchen floor was very unstable, and they had a partial collapse with fire extension. *Members attempted to make entry through the rear of the dwelling to access the collapsed area; they determined the floor was too unstable for entry.* At 09:46:06, Command ordered Engine 55 (on location at 09:40:17) to report to the front of the dwelling with a charged hoseline. At 09:47:04, Squad 72's Roof Firefighter reported there had been a partial roof collapse in the rear. At 09:47:35, Ladder 14's Officer ordered his members off the roof. *At this point in the operation, the roof team was operating from an exposure property, not the roof of the original fire dwelling.* At 09:47:29, Car 1 announces that he is on the fireground and requests through FCC that OEM (Office of Emergency Management) dispatch "CP1" (OEM's Mobile Command Post).

At 09:47:48, Command advised Communications that all companies were out of the dwelling *(in fact, firefighters were on the interior working to rescue Lt. LeTourneau)* and they had one member unaccounted for. Command requested a second alarm be struck and Collapse Unit 1[51] dispatched. At 09:48:25, Communications relayed Commands message to FCC.

[51] Collapse Unit 1 is housed at Engine 29's station but not an independently staffed apparatus. When dispatched, the members of Engine 29 are trained to drive and operate the Collapse Unit. However, because Engine 29 was already operating at the assignment, Engine 28 was dispatched to Engine 29's station to pick up and transport the apparatus to the fire ground.

Deputy 2 raised Command at 09:48:37 and asked him for a "situation and resources status" report. Command reported they had switched to a defensive mode of attack and one member was unaccounted for in the building. He advised that Rescue 1 was trying to remove the member and a second alarm had been requested. At 09:50:10, Deputy 2 raised Command and asked if all members were present and accounted for. Command replied that all members were accounted for except for Lt. LeTourneau *(in fact, Lt. LeTourneau was accounted for at this point in the operation).* Deputy 2 then asked if there was a Mayday in progress. Command responded there was. Command advised Deputy 2 that Rescue 1 was in service and a Battalion Chief was assigned to the Mayday operation and Lt. LeTourneau had been located. Deputy 2 then instructed Battalion Chief 8 to maintain Command and that he was about 5 minutes away.

At 09:50:15, Communications requested FCC strike the second alarm immediately; 12 seconds later, FCC dispatched the second alarm consisting of the following companies: Engine 20, Squrt 9, Engines 35, 25, 28 with Collapse Unit 1, Ladder 10, Battalion Chiefs 9, 11, 1 and 10. At 09:52:00, Command provided a progress report to Communications that they were still in a defensive, exterior attack *(although, in fact, there were firefighters operating on the interior)* and they were working to remove one member from the building.

**24: Alpha Division looking towards Susquehanna Avenue. (09:51:22 Hrs.)**

At 09:53:03, Car 05 (Deputy Fire Commissioner of Finance and Administration) announced on the South Fire Band that he was responding to the fire ground. At 09:54:06, the RIT Group Supervisor raised Command and asked him to minimize water on the second floor because any further water might compromise their operation. Command acknowledged. Then at 09:55:52, the RIT Group Supervisor requested for all hoselines be shut down because they needed quiet. Command repeated the message to all companies.

At 09:56:30, Command raised Communications to request a response from the Philadelphia Gas Works (PGW)[52]. At 09:58:42, the RIT Group Supervisor notified Command they were going to use hydraulic ventilation to clear the first floor of smoke *(still zero visibility)*. Command acknowledged. Subsequently, FCC announced on the South Fire Band that the staging area for all second alarm companies was 19th Street and Dauphin Street. At 10:01:12, Command raised Communications to check the status of Collapse Unit 1; Communications responded that Engine 28 was on their way to pick it up from Engine 29's station. At 10:00:24, PI-1 (Deputy Chief of the Fire Prevention Division) announced on the South Fire Band that he was responding to the fire ground.

**10:02:00 to 10:06:00 *[Elapsed time: 01:10:23 to 01:14:23]***

**Operational Summary**

- Deputy 2 arrives on the fire ground
- The effort to rescue Lt. LeTourneau continues

At 10:02:19, Deputy 2 announced via the North Fire Band that he was on the fire ground. Then at 10:02:45, Deputy 2 raised Command and asked for a progress report. Command replied the building was evacuated of all members *(in fact, firefighters were still inside the building)* and

[52] Natural Gas provider for the City of Philadelphia.

all members were accounted for except Lt. LeTourneau *(at this point in the operation, Lt. LeTourneau was accounted for but still trapped).* Command also stated that Rescue 1 and Squad 72 had located Lt. LeTourneau and were trying to remove him. The RIT Group Supervisor requested at 10:03:18 that fans be used to blow fresh air into the first floor for ventilation. Command assigned Ladder 12 to that task.

At 10:04:55, Car 04 (Deputy Fire Commissioner of Planning and Community Risk Reduction) announced on the South Fire Band that he was responding to the fire ground.

**10:06:00 to 10:17:00 *[Elapsed time: 01:14:23 to 01:25:23]***

**Operational Summary**

- Deputy 2 assumes Incident Command
- Command establishes a 2nd RIT Group in the rear of the dwelling
- The effort to rescue Lt. LeTourneau continues

At 10:06:04, Deputy 2 assumed Command and notified Communications that Battalion 3 was Charlie Division and Battalion 8 (formerly Command) would be "Operations"[53]. Shortly after, Command informed all companies on the fire ground they were to direct all radio communications through Operations. At 10:06:29, TS 2 (the PFD Apparatus Officer) was dispatched as standard protocol whenever a second alarm is dispatched.

At 10:07:09, Command raised Communications and requested two SEPTA buses for rest and rehabilitation operations. At 10:10:36, at the request of Command, Operations provided a progress report from the RIT Group Supervisor that there was an interior collapse; parts of the building were unstable, so they were conducting shoring operations. Command acknowledged and provided a progress report for Communications that they were in service with all members

[53] "Operations" is the abbreviated designation given to the Operations Section Chief. "Operations" is responsible for directing and controlling all tactical operations on the fire ground.

from the Box Alarm. He said the RIT Group 1 Supervisor[54] was still trying to ascertain rescue, there had been an interior collapse and Rescue 1 was trying to shore the first floor so they could proceed with rescue. Operations then told Communications he wanted Engine 29 to link up with the Collapse Unit. Communications passed the order to Engine 29 and they acknowledged.

**25: Alpha Division looking towards Susquehanna Avenue. (10:11:46 Hrs.)**

Command informed Operations he wanted Battalion 10 (on location at 10:02:37) to report to the rear with Charlie Division. He contacted Communications and asked what companies were in staging. Communications responded Engine 20, Squrt 9, Engine 35 and 25, Ladder 10 and 18. Command informed Communications he wanted Engine 20 (on location at 09:52:50) and Ladder 10 (on location at 09:59:03) to report to the rear as a RIT. Communications relayed the order to Engine 20 and Ladder 10, who both acknowledged. Command then informed Operations he was putting another RIT Group in the rear.

[54] There was only one RIT Group established.

**26: Alpha Division looking towards Susquehanna Avenue. (10:14:33 Hrs.)**

**10:17:00 to 10:27:00** ***[Elapsed time: 01:25:23 to 01:35:23]***

**Operational Summary**

- Collapse Unit 1 arrives on the fire ground
- Command establishes a Safety Officer in the Charlie Division
- The effort to rescue Lt. LeTourneau continues

At 10:17:27, Engine 28 arrived on location with the Collapse Unit and staged at Dauphin Street and Gratz Street. Engine 28 announced there was a vehicle in the street blocking their access. Communications relayed that message to Command.

At 10:19:09, the RIT Group Supervisor contacted Operations and requested the Collapse Unit standby. Then, at 10:19:28, the RIT Group Supervisor requested from Operations to have

fans placed in the rear to pull smoke out; Operations acknowledged. Charlie Division then informed Operations he had one fan in service from Ladder 14 and, Ladder 18 (on location at 09:58:42) was in the process of setting up a fan in the doorway. Operations and the RIT Group Supervisor both acknowledged.

At 10:20:11, Operations informed the RIT Group Supervisor that Collapse Unit 1 was on location. The RIT Group Supervisor acknowledged. At 10:22:13, Command raised Communications to provide the following progress report, "we have shored up the collapse on the first floor, we have located the downed firefighter and we're in the process of extricating him to the exterior of the building. We are still in service with the first alarm companies"[55]. Battalion 1 raised Operations and told him to direct the Collapse Unit southbound on 17th Street to Susquehanna Ave.

At 10:26:00, Command raised Charlie Division requesting a progress report. Charlie Division reported all fire was extinguished in the rear and he was standing by with Engines 13 and 34, RIT Group 10 and Battalion 10. Command told Charlie Division that Battalion 10 was the Safety Officer in the rear. Charlie Division acknowledged.

**10:27:00 to 10:35:00** ***[Elapsed time: 01:35:23 to 01:43:23]***

**Operational Summary**

- Car 5 assumes Incident Command
- Deputy 2 becomes the Operations Section Chief
- The effort to rescue Lt. LeTourneau continues

At 10:27:01, CAR 5 raised Communications and told him he was assuming Command and Deputy 2 (formerly Command) would be Operations. CAR 5 announced this message to all

[55] Interviews revealed that firefighters would conduct controlled lifting of the debris and structural components and would stabilize and shore the loads as operations proceeded.

companies on the fire ground. At 10:27:26, FM.1 (Fire Marshal), according to the CAD report, responded to the fire ground. At 10:28:06, Command raised Charlie Division and asked for a progress report in the rear. Charlie Division reported the rear looked pretty good, they were addressing one small hotspot in the kitchen, and Ladder 18 had a smoke ejector in the rear window. At 10:30:05, Command raised Communications and advised him that SEPTA buses were staged at 18th Street and Susquehanna Ave.

At 10:31:14, Charlie Division raised Operations and informed him there was fire on the Delta exposure roof and he should consider getting a hoseline to it. Operations confirmed with Charlie Division that there was an engine company in the rear. Operations then instructed Charlie Division to keep an eye on the exterior of the structure to identify any cues of possible collapse. Charlie Division raised Operations and told him there was fire in the area above where they were working and requested permission to extinguish it. Operations stated if he could do so from the exterior they could proceed only if it didn't put members at risk.

**10:35:00 to 10:40:00** ***[Elapsed time: 01:43:23 to 01:48:23]***

**Operational Summary**

- Lt. LeTourneau is extricated
- Command establishes a Rescue Branch

At 10:35:00, Communications told Command the Collapse Unit was at 17th Street and Dauphin Street trying to maneuver closer, but there were PFD vehicles blocking their access. Command advised Communications to have the Collapse Unit standby. At 10:35:49, Operations told Command they had extricated Lt. LeTourneau and they were on their way out. At 10:36:25, FM.2 (Deputy Fire Marshal) announced on the North Fire Band that he was responding to the

fire ground. At 10:36:53, Command raised Communications to tell him SOC 1 (PFD's Deputy Chief in charge of Special Operations Command) was now in charge of the Rescue Branch[56]. At approximately 10:37:17 *(according to the ATF's video)*, Lt. LeTourneau was removed from the dwelling. Shortly after, Command instructed all companies to conduct a PAR and report back to Operations.

**10:40:00 to 10:51:31*[Elapsed time: 01:48:23 to 01:59:54]***

**Operational Summary**

- A PAR is conducted- all members are accounted for
- The dwelling is evacuated
- The fire is placed under control
- Car 5 transfers Incident Command back to Deputy 2
- Lt. LeTourneau is transported to a nearby hospital

At 10:40:46, Command raised Communications and stated all members have exited the building and were accounted for. At 10:44:01, Charlie Division told Operations that there were hot spots in the rear and requested permission to continue extinguishment from the exterior. Operations gave permission and instructed Charlie Division to inform him if he needed more resources. Charlie Division responded he was OK with the companies he had. At 10:45:41, Alpha Division[57] (on location at 10:06:04) raised Charlie Division to tell him he was going to have Engine 55 flow water to the second floor via a ladder on the exterior. He advised that he prepare for the potential of water overshooting the interior and discharging to the rear.

At 10:47:17, Command inquired about the status of the PAR. Operations responded that all members were present and accounted for. Command then asked Operations how he felt about placing the fire under control; Operations concurred. Command then asked Charlie Division

[56] The Rescue Branch is the designation given to the units assigned to work as part of the rescue operation.
[57] Battalion Chief 1 is assigned "Alpha Division" by Operations (Deputy 2) via a face to face conversation.

how he felt about placing the fire under control. Charlie Division responded that he was OK with that and only had a few small hotspots in the rear.

At 10:48:21, Command raised Communications and stated, by "orders of CAR 5, place the fire under control, transitioning Command back to Deputy 2" (currently Operations).

At 10:49:07, FCC announced on the South Fire Band, "Fire under control on second alarm on Box 7743". At 10:51:31, Medic 25 transported Lt. LeTourneau to a nearby hospital.

## Diagrams

| Page # | Diagram # | Brief Description |
|---|---|---|
| 63 | 1 | The approximate location of parked apparatus. This diagram does not show every apparatus that responded. Arrows indicate the direction the front of the apparatus was facing. |
| 64 | 2 | First alarm and special call engine company locations; as well as, hoseline stretches and fire hydrant use. Arrows indicate the direction the front of the apparatus was facing. |
| 65 | 3 | Cross-Section of Rowhouse 2240 North Colorado Street |
| 66 | 4 | Typical Wood Floor Joist |
| 67 | 5 | Floor Joist Plan-Second Floor; Gas-line & Notch |
| 68 | 6 | Masonry Party Wall and Floor Joist Section |
| 69 | 7 | Stairwell Opening Framing and Second Floor Joists |
| 70 | 8 | Row house Floor Joist Plan-Second Floor |
| 71 | 9 | Cross-Section of Second Floor Collapse Configuration |
| 72 | 10 | Second Floor Collapse Areas |
| 73 | 11 | Second Floor Joist Reconstruction and Collapse Area (looking inward from the Alpha Division) |
| 74 | 12 | First Floor Collapse Zone Reconstruction and Orientation (looking inward from the Alpha Division) |


**Diagram #1**

The approximate location of parked apparatus. This diagram does not show every apparatus that responded. Arrows indicate the direction the front of the apparatus was facing.

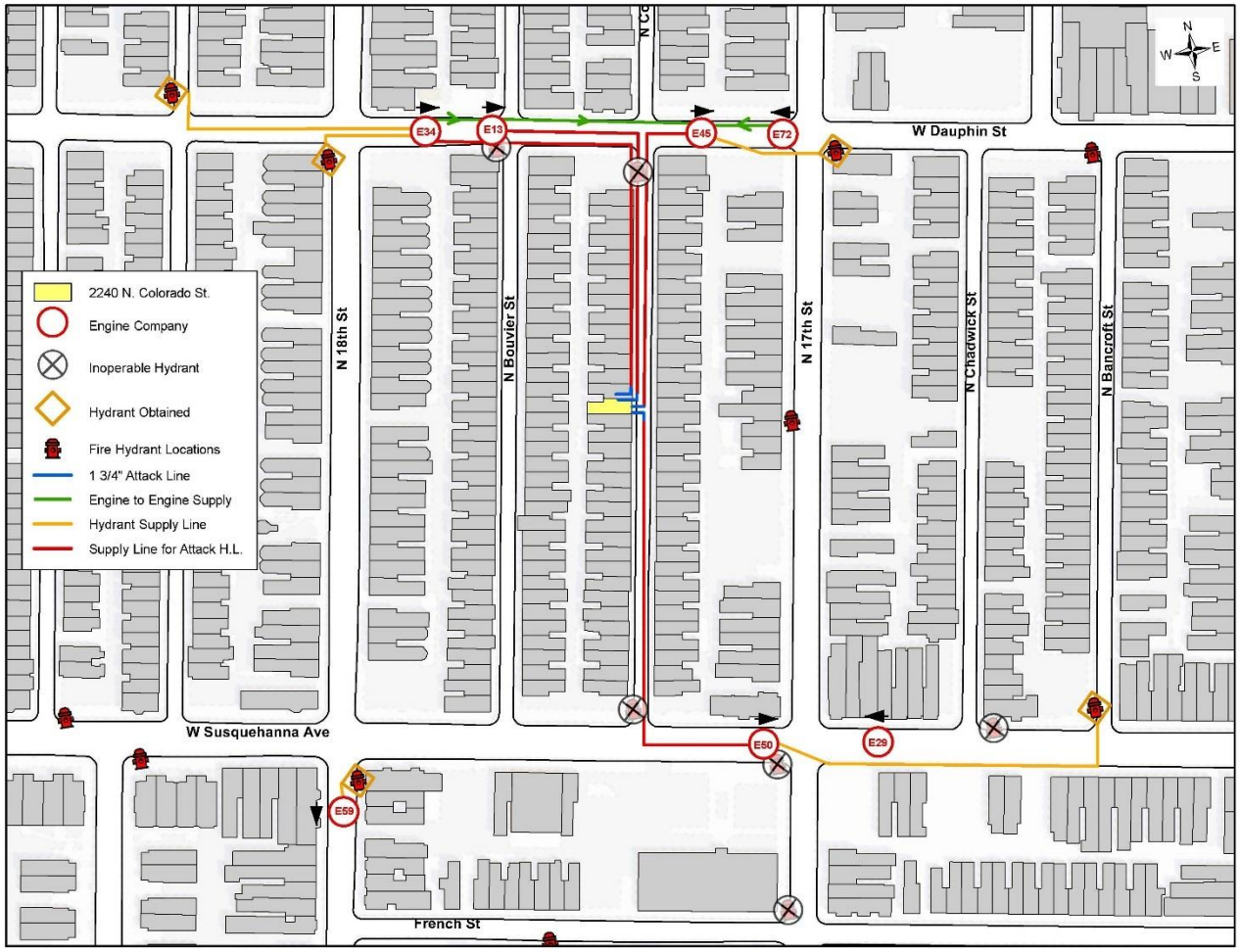



**Diagram #2**

First alarm and special call engine company locations; as well as, hoseline stretches and fire hydrant use. Arrows indicate the direction the front of the apparatus was facing.

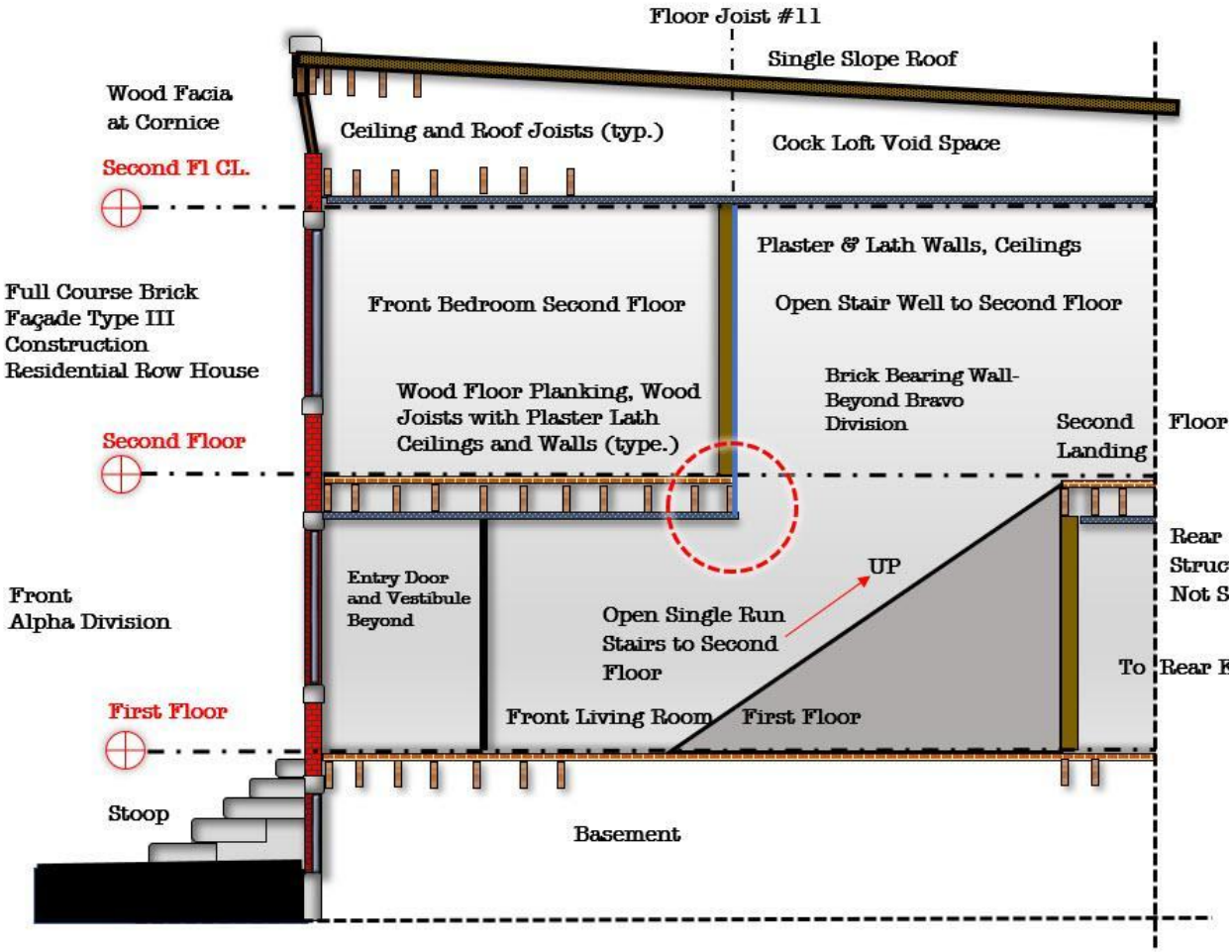



**Diagram #3**
Cross-Section of Row house 2240 North Colorado Street
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

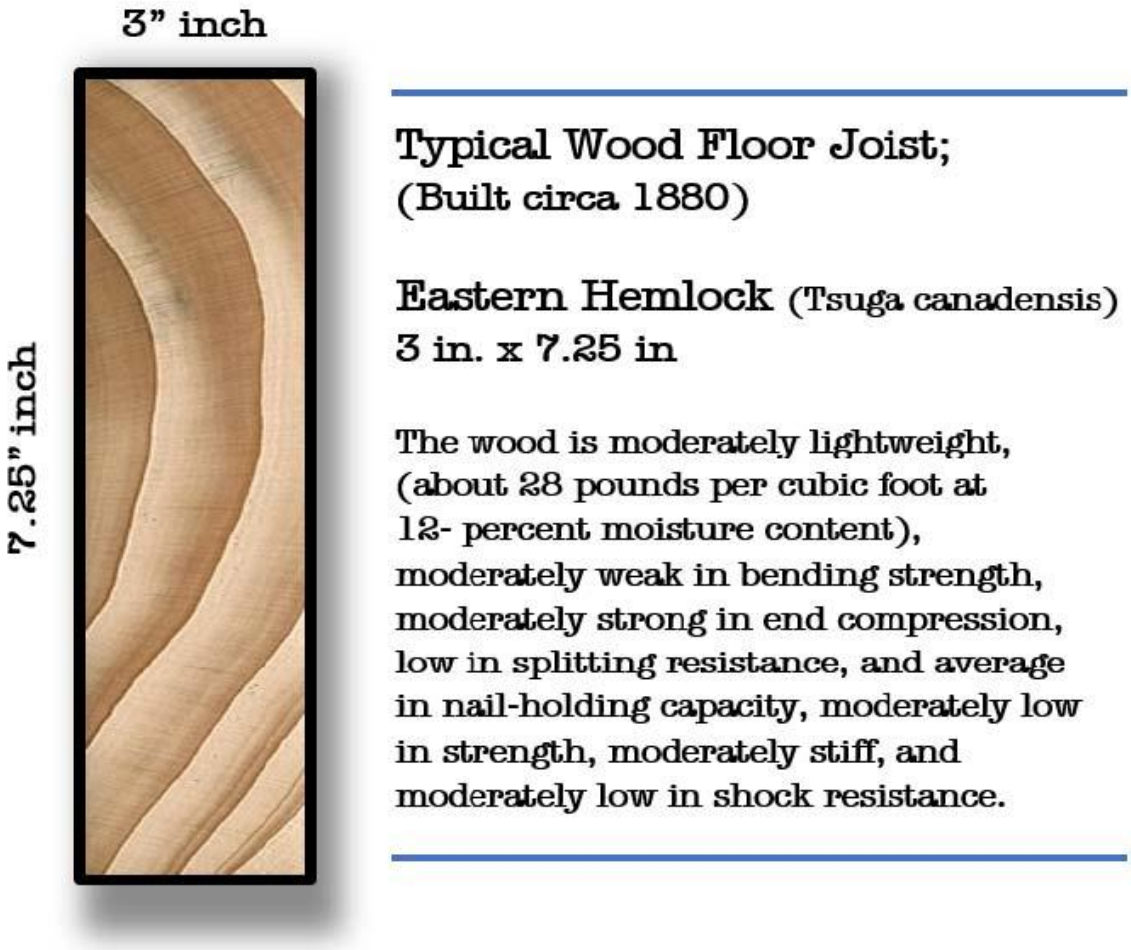



**Diagram #4**
Typical Wood Floor Joist
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

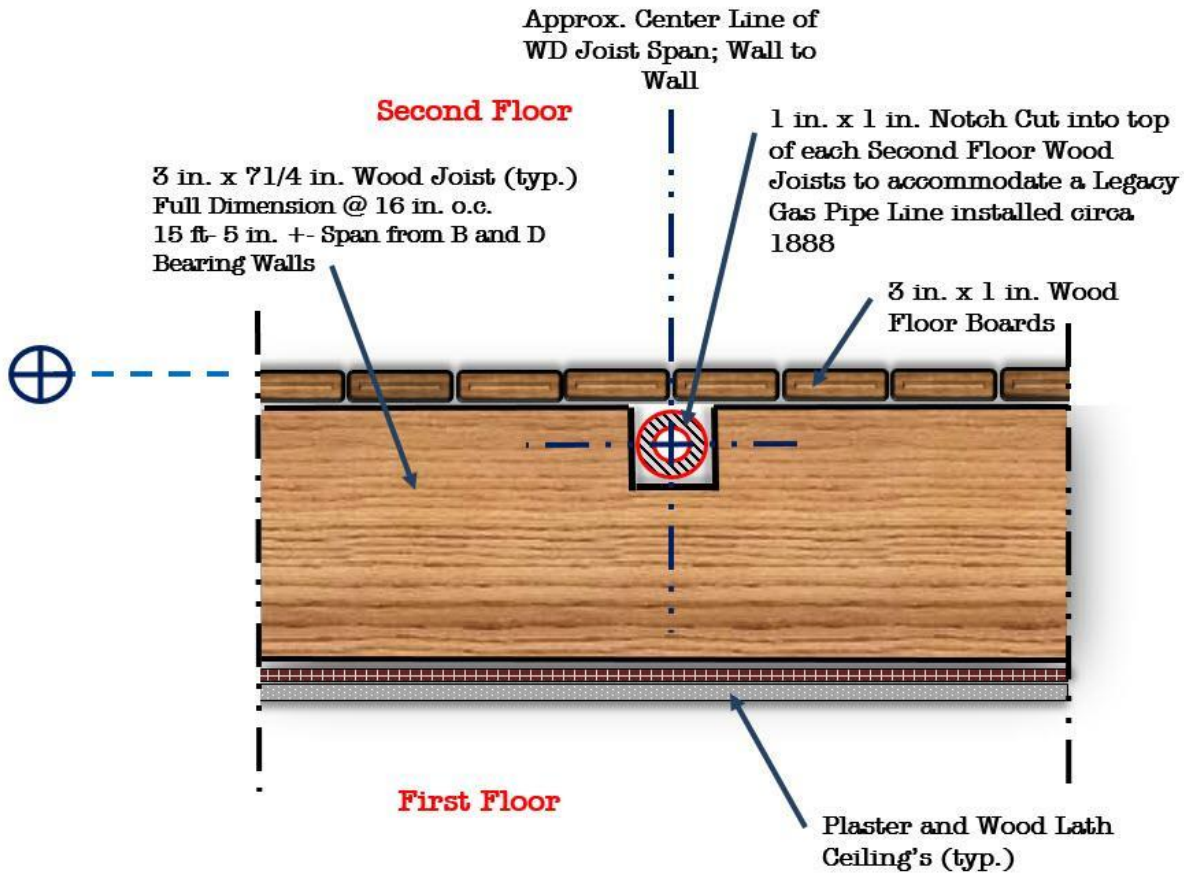



**Diagram #5**
Floor Joist Plan-Second Floor; Gas-line & Notch
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

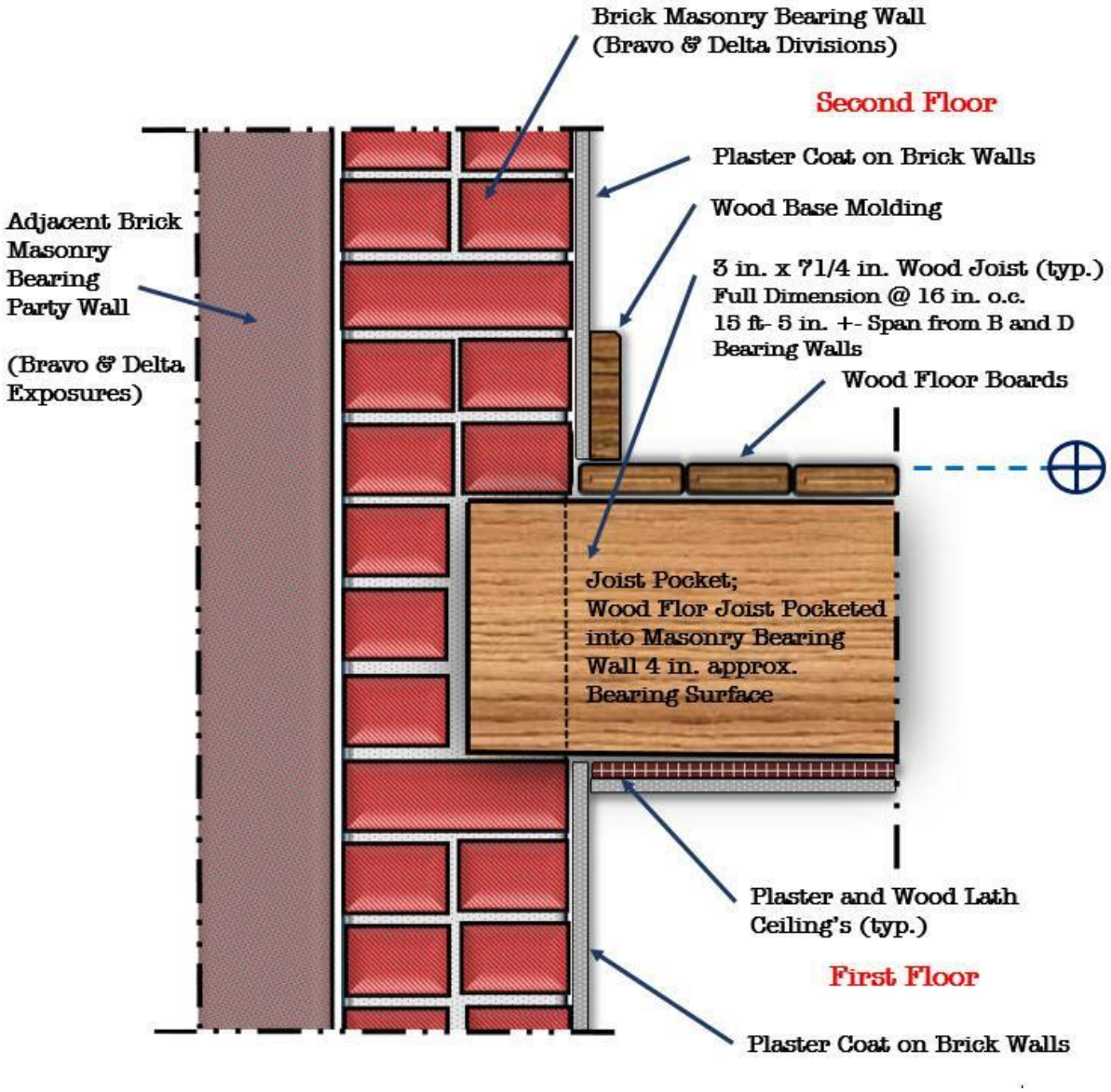



**Diagram #6**
Masonry Party Wall and Floor Joist Section
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

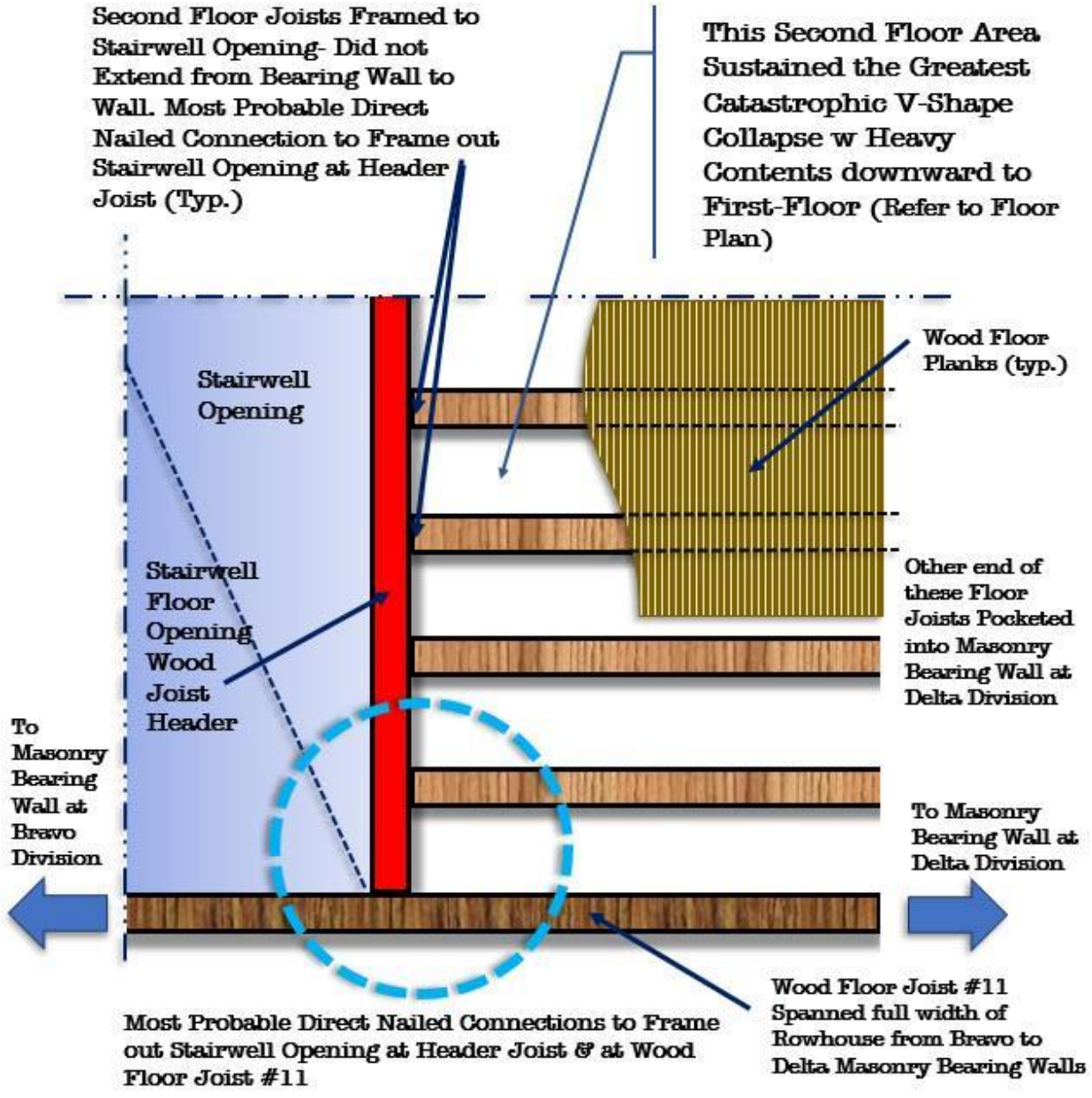



**Diagram #7**
Stairwell Opening Framing and Second Floor Joists
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

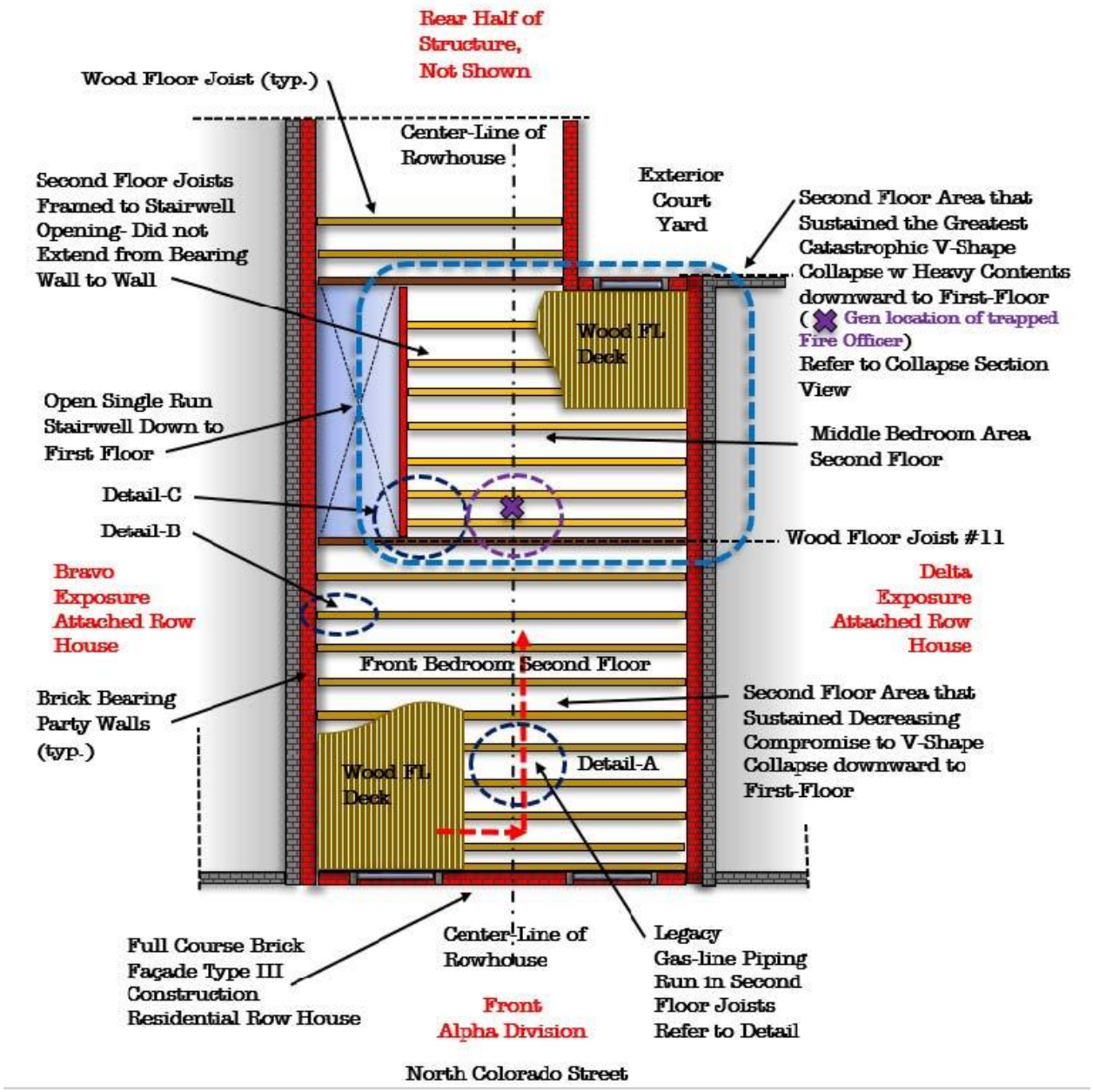



**Diagram #8**
Rowhouse Floor Joist Plan-Second Floor
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

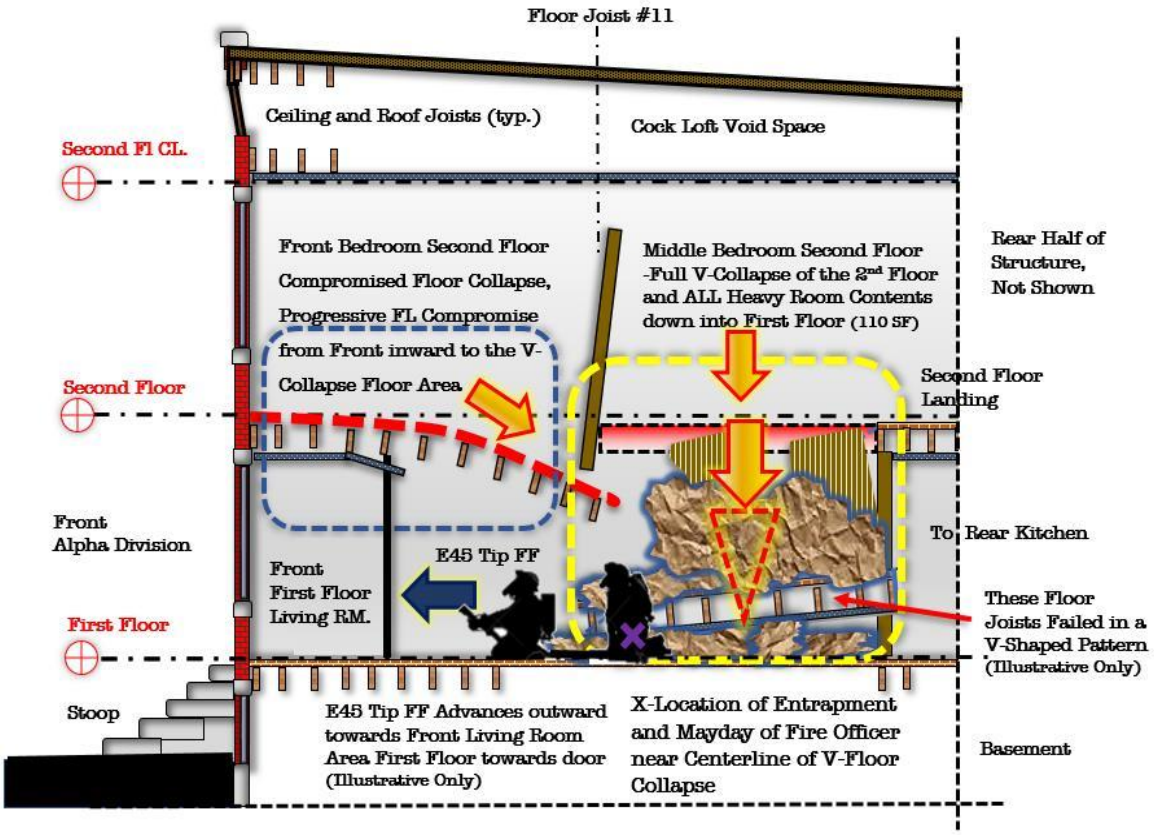
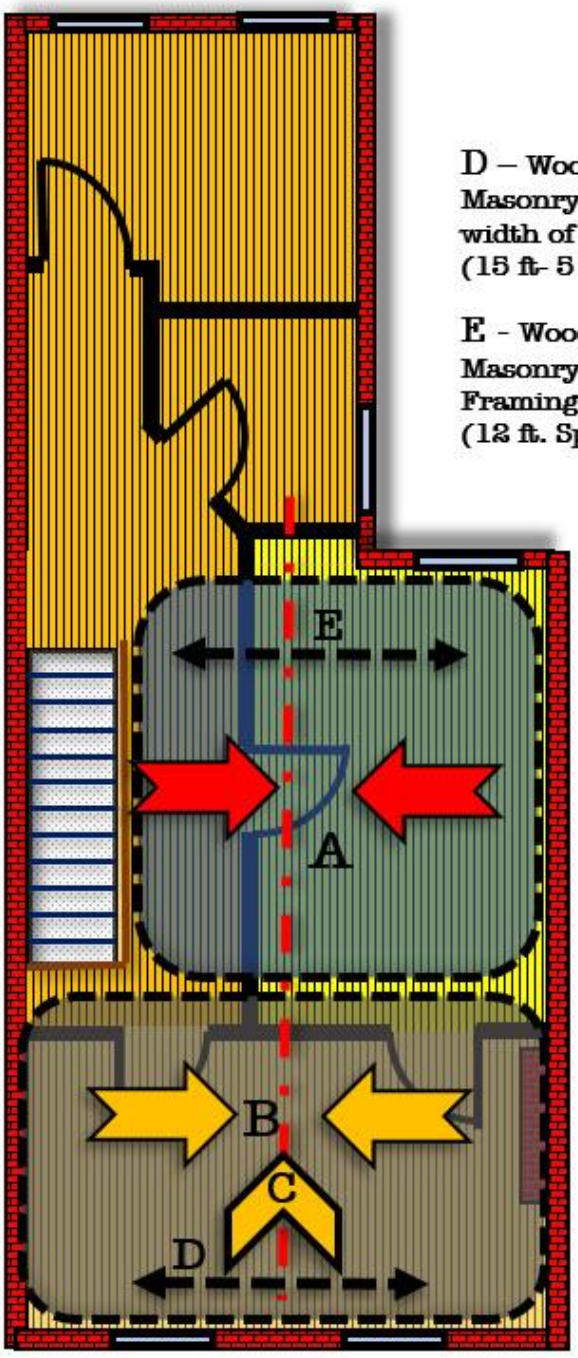



**Diagram #9**
Cross-Section of Second Floor Collapse Configuration
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)




D – Wood Floor Joist Span from Masonry Wall to Wall; Full Span width of Occupancy (15 ft- 5 in Span approx.)

E - Wood Floor Joist Span from Masonry Wall Delta Division to Floor Framing around Stairwell opening. (12 ft. Span approx.)

A - Primary V-Shape Collapse Area of Catastrophic Failure; Floor Joists and Floor Diaphragm Failed along a center line bringing all Heavy Contents from the Middle Bedroom down onto the First-Floor. The V- configuration followed the gas-line/notch travel path (110 SF Approx.)

B- The Front Bedroom Second Floor Joists and Floor Diaphragm Failed along the same center line but failed and collapsed in a Progressive V-Shape manner (C) with compromise commencing from the front Alpha Division Wall inward progressing with increased joist failures towards the Catastrophic Structural Floor Failure; (180 SF approx.)

**Diagram #10**
Second Floor Collapse Areas
Graphic Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

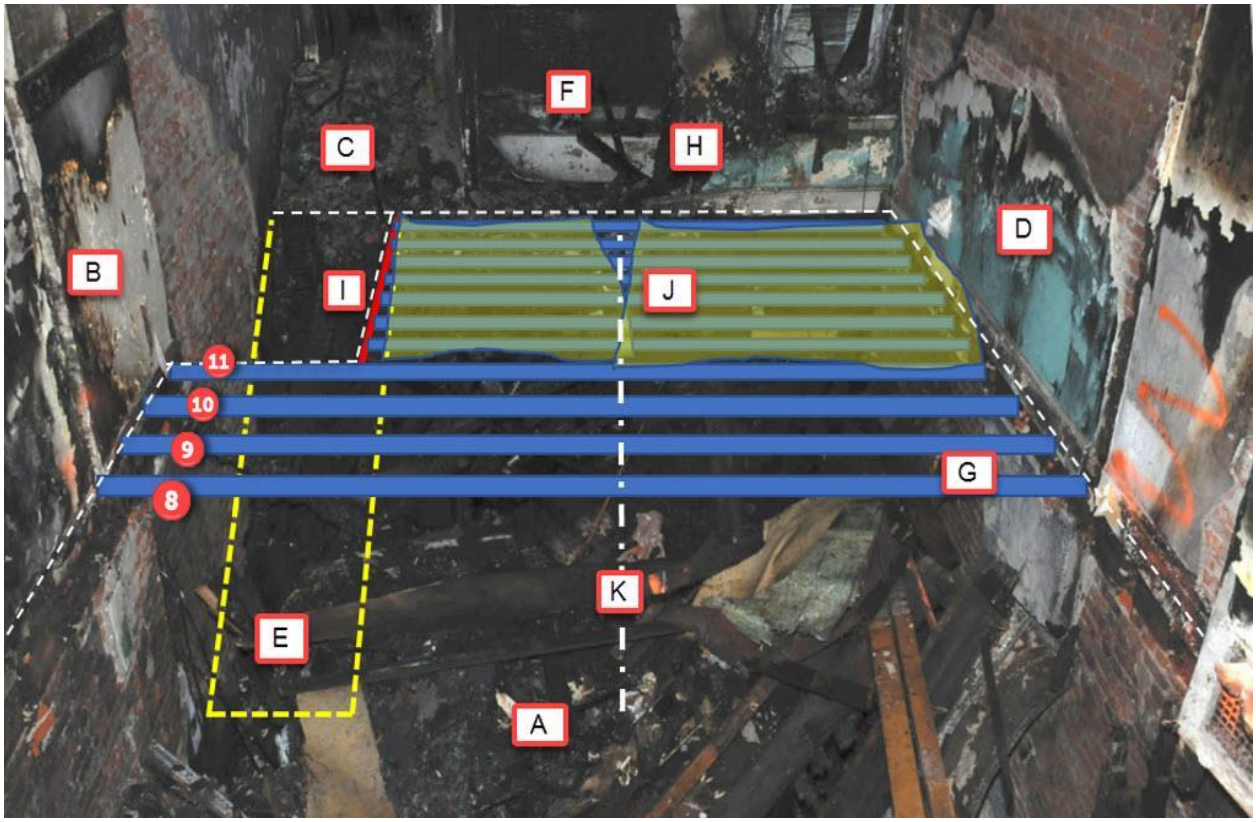
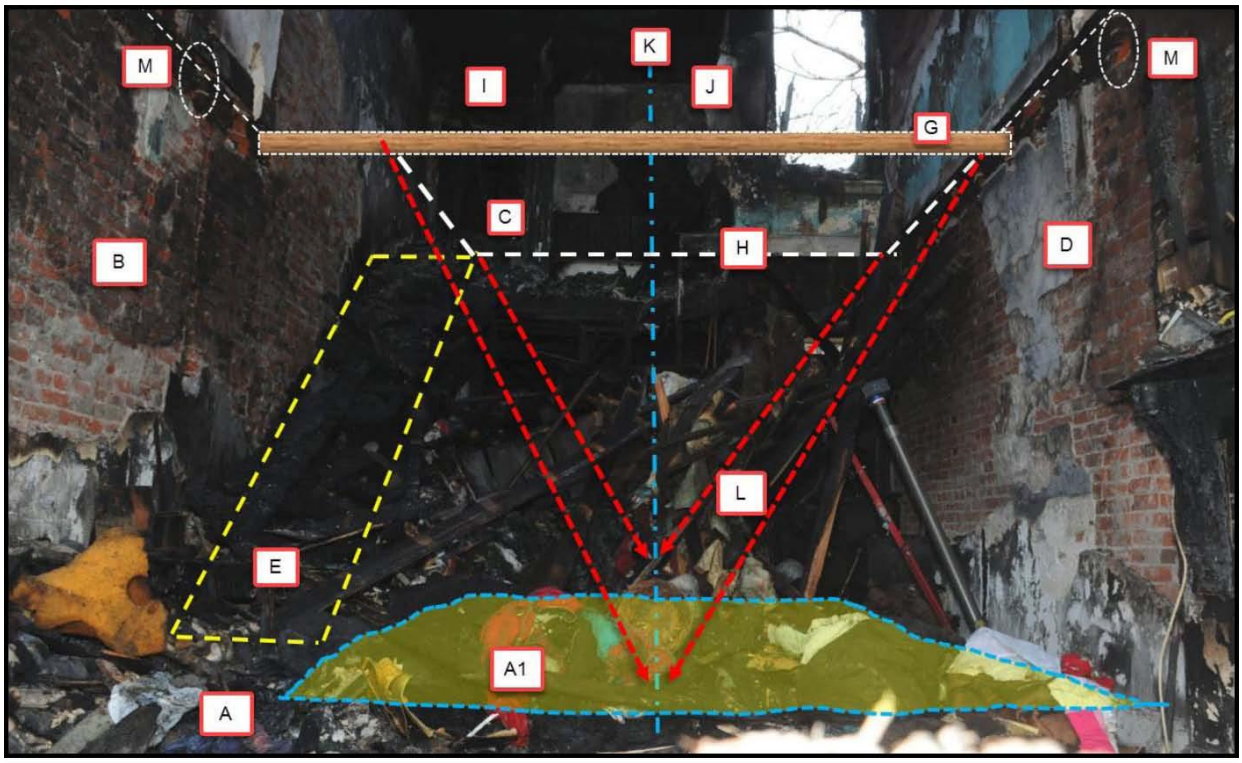



**Diagram #11**
Second Floor Joist Reconstruction and Collapse Area
Looking inward from the Alpha Division
Analysis Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)




Post Collapse and after debris removal from both First and Second areas

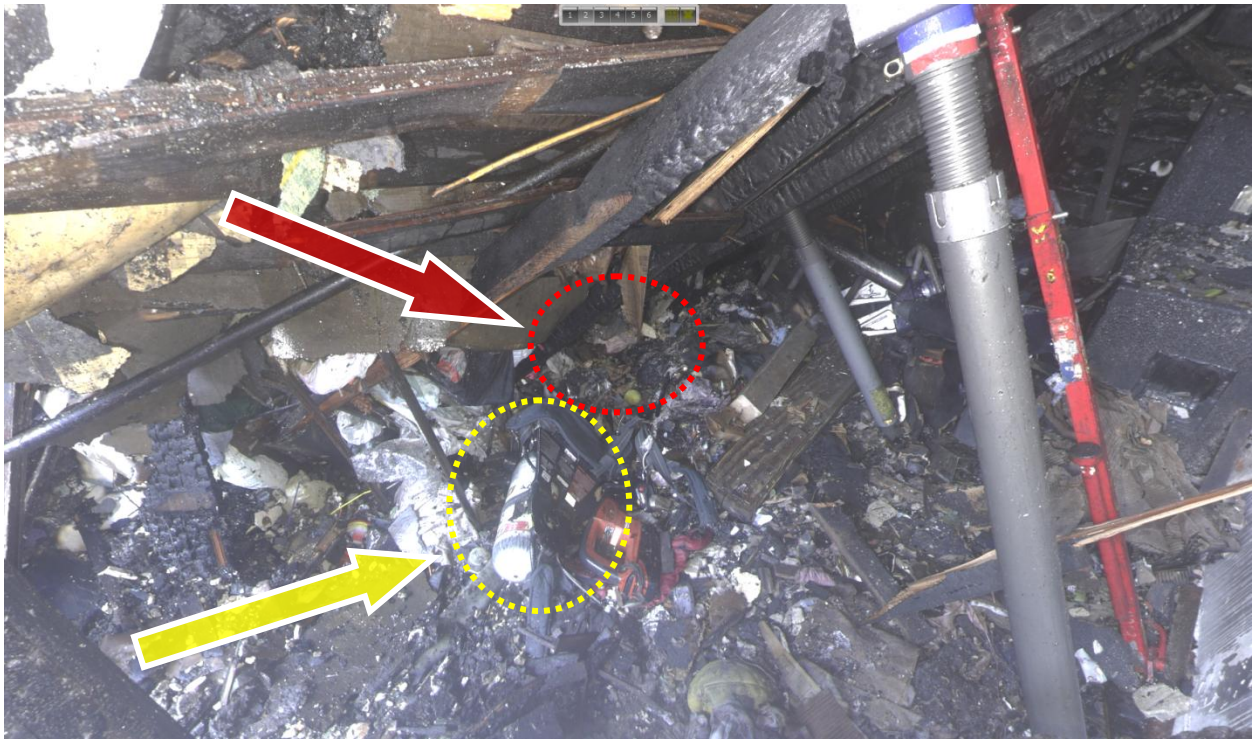
A. First Floor Front Living Room Area
A1. Primary Collapse Zone under the area of the Middle Second Floor bedroom above. This area had the predominate level of collapse severity and catastrophic level of building materials and debris pile from the V-Floor collapse profile. This collapse area consisted of both building materials, structural components and heavy content (Hording material) furnishing, etc. that created a significant matrix of materials, loads and mass.
B. Masonry Brick Bearing Party Wall- Bravo (B) Division
C. Second Floor Stair Landing
D. Masonry Brick Bearing Party Wall- Delta (D) Division
E. Single Run Straight Stairway from First Floor to Second Floor
F. NA
G. Typical Wood Floor Joist; Location of Joist #11 spanning from Bravo (B) Division to Delta (D) Division Masonry Brick Bearing Party Walls; Approximate Span 16 feet
H. Second Floor Joist Outline at the Bathroom wall area not involved in the subsequent floor collapse
I. Second Floor Hallway leading to Rear Bedroom
J. Second Floor Bathroom
K. Approximate Centerline of the Rowhouse floor-span & approx. CL of the Second Floor V-Collapse Profile
L. Depiction of the directional movement of the second-floor assembly and floor diaphragm failing approx. mid-span resulting in a V- Collapse profile
M. Typical Masonry Wall Pockets for Floor Joist bearing (Refer to Diagram 5)

**Diagram #12**
First Floor Collapse Zone Reconstruction and Orientation
Looking inward from the Alpha Division
Analysis Courtesy of Buildingsonfire.com | C.J. Naum (Naum, 2018)

## Post Fire Photographs

| Page # | Photo # | Brief Description |
|---|---|---|
| 76 | 1 | Front of fire dwelling with exposures (Alpha Division). |
| 77 | 2 | The approximate location where Lt. LeTourneau was located. This picture was taken from approximately the middle of the living space, along the Delta side wall looking towards the Bravo side of the dwelling. |
| 78 | 3 | This picture is taken from near the Alpha wall looking towards the Charlie wall. |
| 79 | 4 | This picture is taken from near the Alpha/Delta corner looking towards the Charlie wall. |
| 80 | 5 | "V" shaped collapse looking from near the Alpha/Bravo corner towards the Charlie wall. |
| 81 | 6 | This is a picture showing the notched floor joist taken from the sidewalk in the Alpha Division on the exterior of the dwelling looking up toward the second floor. |
| 82 | 7 | This picture is taken from near the Alpha wall looking towards the Charlie wall. |
| 83 | 8 | This picture shows the approximate area where Ladder 12's PAK Firefighter landed when he fell from the second floor. The picture is taken from near the middle of the living space looking towards the Charlie wall. |
| 84 | 9 | This picture is taken from near the Alpha wall looking towards the Charlie wall. |
| 85 | 10 | This picture shows a view of the roof looking from the near the Alpha wall towards the Charlie wall. |
| 86 | 11 | This picture shows a view of the rear of the dwelling approximately where Ladder 12's PAK Firefighter was located after he self-rescued. |

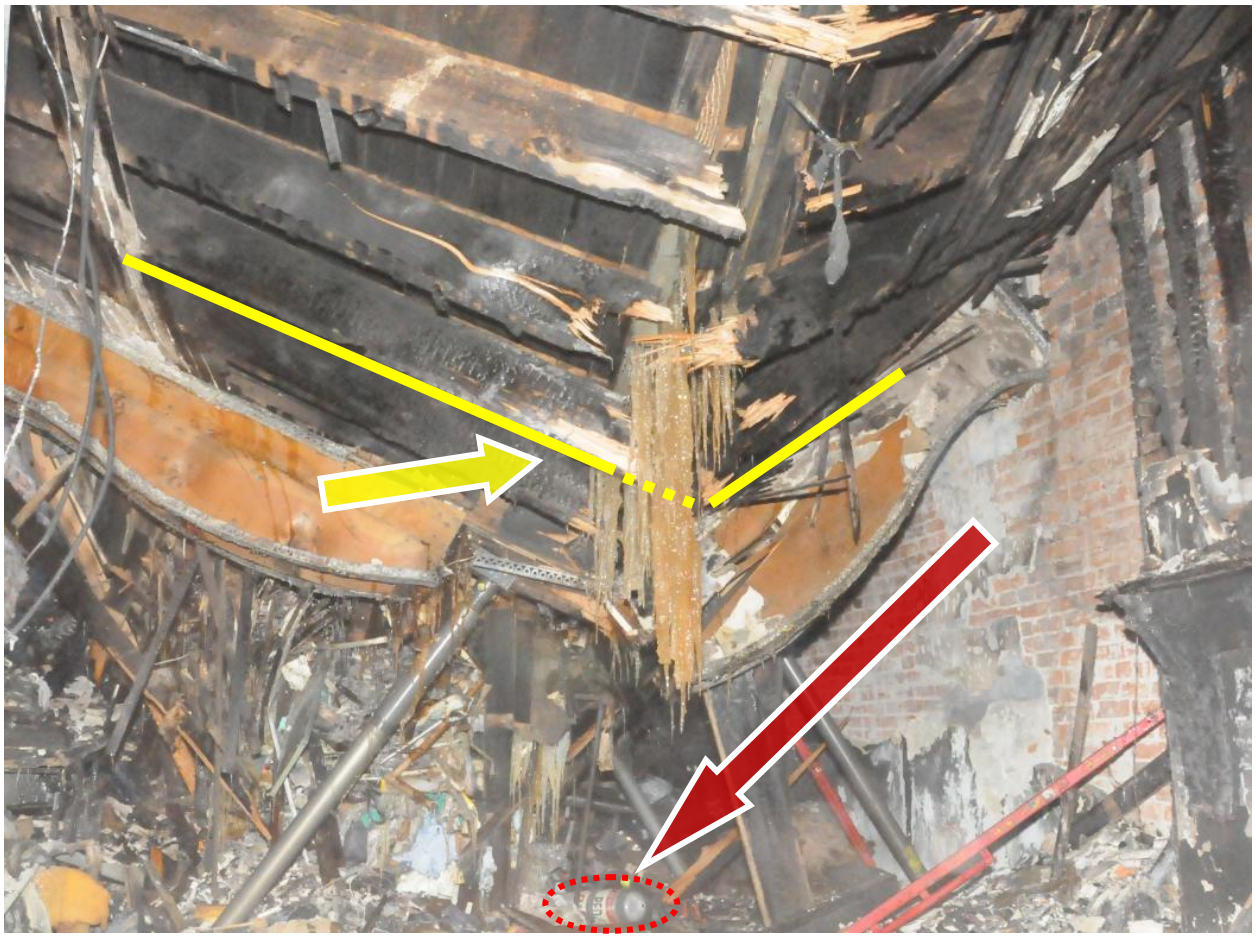
**Photograph #1**
Front of fire dwelling (Alpha Division). The Bravo exposure is to the left (green house with white door) and the Delta exposure is to the right (red house with red/white window awnings).



**Photograph #2**
The red circle indicates the approximate location where Lt. LeTourneau was located. The yellow circle shows Lt. LeTourneau's SCBA. This picture was taken from approximately the middle of the living space, along the Delta side wall looking towards the Bravo side of the dwelling.

**Photograph #3**
This picture is taken from near the Alpha wall looking towards the Charlie wall. Lt. LeTourneau was located under the debris approximately where the arrow points. The steps to the second floor are to the far left of the picture.

**Photograph #4**
This picture is taken from near the Alpha/Delta corner looking towards the Charlie wall. Lt. LeTourneau's SCBA is circled in the picture where the arrow points.



**Photograph #5**
"V" shaped collapse looking from near the Alpha/Bravo corner towards the Charlie wall. The "V" shape is highlighted below a floor joist by the yellow lines where the yellow arrow points. Lt. LeTourneau's SCBA is circled in the picture where the red arrow points.

**Photograph #6**
The circle indicates where the pipe was located on the top of the second-floor joist. The arrow indicates an area where the floor joists were notched to allow for the pipe. The picture was taken from the sidewalk in the Alpha Division on the exterior of the dwelling looking up toward the second floor.

**Photograph #7**
This picture is taken from near the Alpha wall looking towards the Charlie wall. Lt. LeTourneau was located under the debris approximately where the arrow points. The steps to the second floor are to the far left of the picture.

**Photograph #8**
This picture is taken from near the middle of the living space looking towards the Charlie wall. The arrow and circle indicate the approximate location where Ladder 12's PAK Firefighter landed when he fell from the second floor. Ladder 12's PAK Firefighters boot was located by the Investigative Team under debris at this approximate location.

**Photograph #9**
This picture is taken from near the Alpha wall looking towards the Charlie wall. Lt. LeTourneau was located approximately where the circle and arrow indicate.

**Photograph #10**
View of the roof looking from near the Alpha wall towards the Charlie wall.

**Photograph #11**
View of the rear of the dwelling. Ladder 12's PAK Firefighter was located by firefighters operating in the Charlie Division just inside the doorway after he self-rescued.

## Contributing Factors

It is the opinion of the AAR Team that no single factor can be attributed to the Line of Duty Death of Lt. LeTourneau; but rather, the critical merging of multiple factors. The AAR Team has identified the following contributing factors:

- Time discipline
- Delayed expansion of the Incident Command System
- Excessive clutter conditions of the dwelling
- Deteriorated structural integrity of the dwelling
- Extreme Weather for the Philadelphia Region
- Water Supply
- Crew integrity
- Situational Awareness
- Communications

**********

*For more than half a year, the AAR Team reviewed hours of video evidence with the ability to pause, rewind and slow down critical moments of the operation. The AAR Team analyzed audio and video footage, industry publications, made multiple visits to the scene and sought expert opinion to determine the conclusions this section documents. This After-Action Review was written in the comforts of a climate-controlled office, conditions that are contrary to those on the fire ground on January 06, 2018. As such, the members of the AAR Team sympathize with the fact that these luxuries were not the same as those afforded to the Incident Commanders and other key decision makers during this incident.*

## TIME DISCIPLINE

The relationship between critical factors discovered during size up and the negative effects imposed by time and sustained fire growth must be understood, especially while engaged in interior operations. Incident Commanders must not just rely on the individual principles of training, education or experience to conduct a successful operation; rather, they should be willing and capable to connect the relationship of those principles to critical factors of the incident and be able to scrutinize them against accepted industry standards.

A foundation for appropriate situational awareness and a cornerstone principle for tactical decision making in the fire service is monitoring operational time. It must be understood that as operational time increases, and conditions deteriorate, the expected survivability for an unprotected occupant diminishes. When fire conditions evolve to a point not compatible with life, and tactical operations exceed approximately 20 minutes[58] in a dwelling of ordinary construction, the safety of firefighters must become paramount to fire extinguishment.

During this incident, the Incident Commander changed tactics from an interior to exterior attack and withdrew all personnel from the dwelling at an elapsed time of 16 minutes and 14 seconds. However, when Engine 45 reestablishes a water supply, Command transitions back to an interior attack at an elapsed time of 22 minutes and 50 seconds. The interior collapse occurred approximately 19 minutes after reentry with an approximate elapsed time of 42 minutes.

[58] This is referred to by industry standard as the "20-minute rule". The 20-minute rule was referenced by Emmanuel Fried (1972, p.19) in his book Fireground Tactics. When deciding to "give up the fight inside", Fried says "factors you must consider are the occupancies, floor loads, absorbency of stored materials, age and maintenance of the building. A good general rule is this: When the fire has substantially involved more than one floor and is out of control after 20 minutes of inside operation, back all companies out and resort to the use of exterior streams". **NOTE:** In the modern fire environment: to include building design, material and furnishing (the opposite of legacy building construction and materials), the 20 minute time frame should likely be decreased.

The AAR Team believes the decision of the Incident Commander to withdraw to the exterior of the dwelling was appropriate due to fire conditions and the lack of a sustained water supply. However, a critical moment of the operation was the decision to resume interior operations. The AAR Team and the Technical Review Committee believe this decision is contrary to the recommendations in NFPA[59] 1500: The Standard on Fire Department Occupational Safety and Health. NFPA 1500 (2013, p.25) Paragraph 8.3.2, Sections 1 & 2 states:

- "The concept of risk management shall be utilized on the basis of the following principles:
    - (1) Activities that present a significant risk to the safety of members shall be limited to situations where there is a potential to save endangered lives.
    - (2) Activities that are routinely employed to protect property shall be recognized as inherent risks to the safety of members, and actions shall be taken to reduce or avoid these risks".

The AAR Team acknowledges that firefighting is an inherently hazardous profession which often requires dangerous and life risking actions. However, the AAR Team supports, as recommended in NFPA 1500 (2013, p.25), Paragraph 8.3.2, Section 3 that "no risk to the safety of members shall be acceptable when there is no possibility to save lives or property". It is paramount that the safety of civilians and firefighters supersede all other concerns during firefighting operations.

[59] The National Fire Protection Association (NFPA) is a "global nonprofit organization, established in 1896, devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards". "NFPA membership totals more than 50,000 individuals around the world" and "delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy". (NFPA, 2018)

Prior to reentry, a risk assessment should be performed to consider the occupant survivability profile and to reassess incident priorities. Jakubowski (2009, p.12) stated "Our focus cannot be blinded by our past successes or our relentless desire to win". (as cited in Marsar, 2009, p.16). The tactical decision to recommit firefighters to an interior fire attack is a possible consequence of the culture in the PFD that frequently prioritizes speed and extinguishment over the health and safety of its firefighters. Nevertheless, as Gasaway (2013, p.99) writes:

> "At a structure fire there is a finite amount of time in which responders can safely get the job done via interior operations. At some point, a building on fire will deteriorate to a condition that makes it no longer safe for firefighters to be inside, or the smoke and fire conditions will become so intense that the interior environment is no longer compatible with life".

Recognizing the importance of time during emergency incidents, in 2014, the PFD published a Chief Staff Note (CSN) [60] which established parameters for the notification of elapsed time. CSN #14-36 states "on Tactical Boxes, Boxes, Hazmat incidents, and River Observation Team incidents, the FCC will notify the Incident Commander, through the aide (Communications), of the elapsed time of the incident". Unfortunately, as discovered during AAR Team interviews with personnel from the FCC, several dispatchers stated they were never educated to understand the importance of this notification. Moreover, when an elapsed time notification *is* reported to Communications from the FCC, the information is not always transmitted to the Incident Commander. During this incident, the elapsed time was relayed to

[60] A Chief Staff Note is a temporary, written instruction from the PFD Executive Team involving a range of subjects intended to be incorporated into a Directive or Operational Procedure and institutionalized at the next revision.

Communications from FCC only once, at the 20-minute mark. However, Communications never notified the Incident Commander over the fire ground tactical channel.

For the reasons mentioned, the importance of understanding the elapsed time and its notification must be recognized and embraced by the PFD at all levels to combat possible instances of time compression (known as temporal distortion[61]).

[61] Temporal distortion "simply means time gets away from you. Five minutes may pass like 20, or an hour may pass and it seems like you've barely been on the scene for half that time". (Gasaway, 2013, p. 307).

## DELAYED EXPANSION OF THE INCIDENT COMMAND SYSTEM

The Philadelphia Fire Department uses the Incident Command System (ICS) for all incidents. In most cases during a Box assignment, the PFD assigns the first due Battalion Chief as Incident Commander until the fire is placed under control or the Battalion Chief is relieved by a higher-ranking officer. PFD Operational Procedure 19 (2007, p.6): Incident Command System, states the Incident Commander must consider "the safety and accountability of all members" which might require "a significant number of dedicated safety resources". Operational Procedure 19 (2007, p.9) also speaks to the need to "maintain a reasonable span of control" which could require the implementation of Branches, Divisions or Groups.

The AAR Team believes that throughout this expanding and dynamic incident, the initial Incident Commander[62] maintained his command presence. This AAR documents that the initial Incident Commander maintained composure while communicating strategy and tactics, addressed the Maydays in a timely manner and adjusted tactical operations based on continued fire ground challenges.

According to the Federal Emergency Management Agency's (FEMA) publication Incident Command System (ICS) (1998, p.1-8), "as incidents grow in size or become more complex, the responsible jurisdiction or agency may assign a more highly qualified Incident Commander". At 09:07:56 Hrs., based on the progress report that "All Hands" were in service, an automatic dispatch of additional resources occurred which included: an additional special operations (SOC) unit, the Incident Safety Officer (SO-1), Deputy Chief of EMS (ES.1) and the Deputy Chief for fire operations (Deputy 2). Deputy 2 arrived on the fire ground at 10:02:42, 54

[62] For this discussion, Battalion Chief 8 is being referred to as the initial Incident Commander. However, Lt. LeTourneau informally has Command of the fire ground for one minute and one second before Battalion Chief 8 assumes Command.

minutes and 58 seconds after dispatch, leaving the initial Incident Commander in Command for approximately 1 hour and 10 minutes.

One tenet of the ICS is maintaining a manageable span of control, which is "key to effective and efficient incident management" (FEMA, 1998, p. 10). ICS recommends an individual only be responsible for three to seven subordinates to maintain appropriate oversight. At the approximate time of collapse, in addition to the essential responsibilities of the Incident Commander, Bn. 8 was directly responsible for one Command Staff Function (Incident Safety Officer)[63], two Divisions (Charlie and EMS) and eight single resources (Engines 45, 50, 59, 29; Ladders 14 and 3; Rescue 1 and Squad 72). The AAR Team believes the span of control for the initial Incident Commander was too great and this expanding and dynamic incident would have benefited from another layer of organizational command.

The initial Incident Commander, Battalion 08, recognized the need for assistance and did request the necessary resources in a reasonable time. After assuming Command, Deputy 2 expanded the Incident Command System and established a secondary RIT and Safety Officer in the rear of the dwelling. However, the delayed response of Deputy 2 deferred a timely transfer of Command which impacted overall command and control.

| Command Sequence | | | |
|---|---|---|---|
| Unit in Command | Assumed Command | Transferred Command | Time in Command |
| Lt. LeTourneau (E.45) | 08:55:05 | 08:56:06 | 1:01 |
| Battalion 08 | 08:56:06 | 10:06:04 | 1:09:58 |
| Deputy 02 | 10:06:04 | 10:27:01 | 20:57 |
| Car 05 | 10:27:01 | 10:48:39 | 21:38 |

[63] On April 21, 2017, the PFD implemented a new position at the rank of Deputy Chief, the Field Incident Safety Officer (SO.1) who responds city wide on various incidents including "All Hands" fires. Shortly before the dispatch to 2240 N. Colorado Street, SO.1 had become available from a separate fire assignment in the western part of the City. SO.1's location at the time of dispatch increased his response time to 2240 N. Colorado Street. Because of this, a dedicated Safety Officer was not in an operational location prior to the collapse (video from the fire ground shows SO.1 arriving in front of the fire dwelling post collapse).

## EXCESSIVE CLUTTER CONDITIONS OF THE FIRE DWELLING

There were several radio communications from multiple units throughout the operation describing debris on the interior of the fire dwelling. During interviews conducted by the AAR Team, members discussed the excessive clutter and the impact it had on their operations. The clutter in the fire dwelling increased the fire load, affected the efficient advancing of hoselines and delayed PFD units in locating the stairs to the second floor; this led to both extended interior operational times and fire growth.

In addition to contributing to increased reaction times and delayed fire extinguishment, the excessive clutter in the fire dwelling in conjunction with water discharge from fire hose streams, continually added a live load[64] to the structure. During interviews conducted by the AAR Team, several members believed it was uncharacteristically odd that the first floor was not excessively wet and there were not areas of pooled water inside the dwelling during operations. It is believed the building's contents absorbed and trapped water from fire hose streams[65] preventing it from draining to lower floors or to the outside of the dwelling; which, in turn, increased the live load on the structure and contributed to the collapse.

In the Executive Summary of his report, Insights on Building Fire Performance During Fire Operations, Naum (2018, p.6) states:

> "a significant degree of clutter was present throughout the rooms and floors of the structure that imposed critical operations impediments and highly suggest; affected the structure during the early development stages of the fire within the room compartments and within concealed and exposed area

[64] Live load is defined by Smith (2012, p.244) as "the weight of the material in a building that is not permanent. This load can constantly change".
[65] Water weighs approximately 8.3 lbs per gallon (Firefighter Math, n.d.). With that said, when 200 gpm's are discharged from a hoseline, approximately 1,600 lbs of weight is added from water, every minute.

> of the building structural components, systems, assemblies and materials. These hoarding, heavy content and clutter conditions also had significant contributions towards building compromise, collapse and concurrent and subsequent Fire Department fire suppression operations, mitigation efforts and resulting fire service personnel extrication and rescue effort resulting from the structural floor collapse."

The AAR Team recognizes that although units reported that there was a lot of trash and debris inside, the description may not have a painted a clear and accurate picture for the Incident Commander of the true excessive clutter conditions on the interior.

## DETERIORATED STRUCTURAL INTEGRITY OF THE FIRE DWELLING

In addition to the previously documented condition of the home (see section, The Fire Dwelling: 2240 North Colorado Street) it was also discovered during post fire investigations that the top of several joists for the second floor were notched approximately 1" by 1" in the center of the dwelling to allow a channel for a pipe (see Post Fire Photograph #6). Some post fire photographs show the "V" shaped collapse occurred along the line where that pipe was situated (see Post Fire Photograph #5).

In the Executive Summary of his report, Insights on Building Fire Performance During Fire Operations, Naum (2018, p.10) states:

> "Generally, when operating companies are confronted with intense fire conditions within a building of Type III construction with similar vintage, occupancy use and tenant space configuration; and those fire conditions have either impinged or propagated within or along concealed spaces, voids or compartment(s) for an extended period of time prior to arrival or during fireground operations, it is highly probable and predictable that the structural integrity of the various assembly, supports and structural floor joists and wall systems will be compromised and subject to varying degrees of degradation."

The AAR Team acknowledges that the deteriorated condition of the dwelling was not readily apparent from outside the structure where PFD members were operating. Additionally, the condition of the interior structural components would be difficult to assess under fire and smoke conditions with zero visibility as described during interviews.

## EXTREME WEATHER (FOR THE PHILADELPHIA REGION)

Extreme weather conditions negatively impacted fire ground operations. The Philadelphia region experienced low temperatures, subzero wind chills and a snow event with accumulation in the days leading up to January 06, 2018. At the time of dispatch, the temperature was approximately 9°F with a wind chill of -10°F (NOAA, 2018); streets and pavements in the area were snow and ice covered.

When discussing cold temperatures, PFD Training Manual Supplement 901[66]: Size-up (2000, p.6), states:

> "extreme weather conditions, both hot and cold, must be addressed. These conditions can cause delays in both response time and fire ground operations. During cold weather, hydrants may be frozen or have low water pressure. Snow and ice will hinder ladder operations. Generally, smoke will appear white, in temperatures below 10°, and this may make it difficult to identify the material that is burning".

It was noted during video review that the color and buoyancy of smoke conditions exiting the dwelling changed significantly throughout the operation. At times, the smoke did appear white in color and stratified to a horizontal direction at or about the roof line of the fire dwelling. Due to the width of the street (approximately 30 feet from the front of the fire dwelling to the dwelling across the street) the Incident Commander was positioned relatively close to the dwelling which potentially narrowed his field of view.

It is believed the cold weather created smoke conditions which may have presented a more optimistic view of the interior fire development and effectiveness of the fire attack. For

[66] The PFD Training Manual Supplements are guides used by the PFD to expand on nationally recognized best practices.

this, and many other reasons, it is imperative that all firefighters operating on a fire ground effectively communicate true fire conditions to the Incident Commander so that appropriate decisions are made, and tactics deployed.

## WATER SUPPLY

The transcript of the South Tac 2 radio channel alludes to the difficulty in obtaining a consistent water supply; this played a significant role in the tactical considerations of the initial Incident Commander. Recognizing there was a major struggle to obtain a sustained water supply, engine company Driver/Operators adapted and worked together to combat the adverse conditions and prioritized the need to establish water to the fire ground (by working to ensure Engine 45's apparatus had a consistent water supply) rather than to their individual companies. However, not having reliable water supply led to both an increased time for interior operations as well as unrestricted fire growth.

During post incident observations and collaboration with the PWD, the AAR Team confirmed that five of the six hydrants,[67] which did not operate properly during the incident, were in fact in need of repair and/or replacement. Some of the repairs were as simple as replacing internal parts, while others required rebuilding or total replacement. This information highlights the need for the PFD membership to thoroughly conduct annual hydrant inspections[68] to ensure proper functionality of each hydrant in the City prior to an incident. The chart on the following page describes the hydrant location, type and issues with operation on January 06, 2018.

[67] The sixth malfunctioning hydrant was missing from the location when the AAR Team went to inspect it.
[68] Every year, each PFD fire company is responsible for conducting hydrant inspections in their local response area to verify the functionality of each hydrant and report any unsatisfactory conditions to the PWD for repair.

| Unit | Hydrant location | Hydrant | Disposition |
|---|---|---|---|
| **Engine 45** | N. Colorado/Dauphin Sts. | CCL[69] | Opened but wouldn't close |
| | Bouvier/Dauphin Sts. | CCL | Able to turn- but no water came out |
| | 17th/Dauphin Sts. | Standard[70] | Worked (Assisted by Engine 72's DPOP) |
| **Engine 50** | 17th St./Susquehanna Ave. | CCL | Wouldn't Turn |
| | N. Colorado St./Susquehanna Ave. | CCL | Wouldn't Turn |
| | 17th/French Sts. | CCL | Wouldn't Turn |
| | Chadwick/Susquehanna Ave. | CCL | Wouldn't Turn |
| | Susquehanna Ave./Bankroft St. | Standard | Worked (Assisted by Engine 29) |
| **Engine 13** | Bouvier/Dauphin Sts. | CCL | Wouldn't Turn |
| | *Provided water to Engine 45. Was supplied water by Engine 34 and then obtain a secondary water supply. | | |
| **Engine 34** | 18th/Dauphin Sts. | CCL | No issue |
| | Cleveland/Dauphin Sts. | CCL | No issue |
| | *Supplied water to Engine 13. Was assisted by Engine 34's DPOP in obtaining a secondary water supply. | | |

[69] A "CCL" ("Center Compression Lock") hydrant is one which is designed to prevent unauthorized use and requires that an adapter be placed on the hydrant prior to its operation.
[70] A "Standard" hydrant is one which does not require an adapter for operation.

## CREW INTEGRITY

According to the National Institute of Occupational Safety and Health's Line of Duty Death Report, F2014-25 (2017, p.28),

> "A critical element for fire fighter survival is crew integrity. Crew integrity means fire fighters stay together as a team of two or more. They must enter a structure together and remain together at all times while in the interior, and all members come out together".

As this incident evolved, crew integrity diminished; firefighters who typically operate as a team became separated. The primary cause of crew integrity issues appears to be that firefighters of the same unit had to change their SCBA cylinders at varying times which became low during operations. Of important note is that PFD Operational Procedure 37 (2004, p.6), permits a member who is low on air to exit an area alone so long as specific conditions are met. It is the belief of the AAR Team that all conditions were within the scope of Operational Procedure 37 which allowed members to leave the fire dwelling without the entire team having to exit.

The SCBA cylinders used by the PFD are 5500 psi, contain approximately 1800 liters of air and are rated to last for 45 minutes. The 45-minute rating is based on the SCBA wearer breathing 40 liters of air per minute (essentially, breathing at rest); however, during strenuous fire ground operations, the average firefighter can breathe approximately 100 liters of air per minute (meaning the cylinder may last for only 18 minutes). In the event the SCBA cylinder is not 100% full at the start of operations, the wearer should expect the time to cylinder depletion to be less. While breathing approximately 100 liters per minute, the wearer should expect the vibra-alert function to activate approximately 12 minutes into operations; giving the wearer an

additional 6 minutes until the cylinder is depleted of air. The vibra-alert function is a component of the SCBA which vibrates the wearer's face piece when their cylinder falls to 33% capacity.

Lt. LeTourneau places his SCBA Mask Mounted Regulator, the apparatus that connects to the face piece to deliver air to the wearer, into his face piece at approximately 08:58:00. Lt. LeTourneau's vibra-alert is not heard during his radio transmission at approximately 09:05:05 but is at approximately 09:05:17. Hence, Lt. LeTourneau's vibra-alert activated approximately 7 minutes and 17 seconds after he went on air[71], and about 10 minutes and 45 seconds after Engine 45's arrival on location.

A factor concerning SCBA cylinder pressure which must be understood is the correlation between temperature and pressure. When SCBA cylinders are quickly filled (known as hot filling), the temperature inside the cylinder is increased, (which raises the pressure) but does not fill the cylinders volume to capacity (1800 L). Over time, as the temperature inside the cylinder cools, the pressure decreases[72]. This is problematic because the initial rise in pressure can fool the firefighter filling the cylinder into believing the cylinder's volume is full; when in fact, it is not.

As part of the NIOSH LODD fatality investigation, the SCBA worn by Lt. LeTourneau was tested by Intertek, an independent research facility located in Cortland, NY. During one phase of the testing process, the research team simulated the temperature conditions from January 06, 2018 by placing a SCBA cylinder into an environmental cooler which was used to demonstrate temperature variations. After approximately one hour in these conditions, the cylinder lost approximately 25% of its capacity due to the rapid cooling process.

[71] During interviews, several members who were near Lt. LeTourneau during the operation were asked by NIOSH investigators if they heard air free flowing at any point during the operation. Members stated that they did not.
[72] The decrease in pressure from the initial hot fill, to the time the pressure equalizes, can be drastic.

The AAR Team believes it necessary to reiterate that the SCBA currently in use by the PFD is considered full at 5500psi. The AAR Team believes the comprehension of the information in this section regarding SCBAs is critical and necessitates the need for all firefighters to check their SCBA to ensure a full cylinder; allowing for the maximum work time and the possibility for more consistent crew integrity.

## COMMUNICATIONS

Paragraph 4.2.1 of PFD Directive 42 (2012, p.8): Fire Department Communications, addresses a unit's failure to respond in a reasonable timeframe. It states:

> "PFD Units will immediately verify all dispatches given them by the FCC. If units do not verify dispatches within one minute, the FCC will attempt to contact them via radio and phone line to ascertain receipt of alarm. Any delayed response will be reported to the appropriate chief officer".

During this incident, Deputy 2 failed to respond within one minute. The South Fire Band dispatcher attempted to contact Deputy 2 four times via radio and the dispatcher stated she attempted to contact him by phone to no avail. As the operation grew more complex, the dispatcher stated that she became immersed with additional radio traffic and failed to report Deputy 2's lack of response to a supervisor.

The AAR Team believes Directive 42 provides clear and decisive policy for actions when a unit fails to respond in a reasonable timeframe. However, the AAR Team believes the current CAD system and FCC protocols place a substantial strain on dispatchers due to lack of automation. This lack of automation reduces the efficiency and effectiveness of the overall communications process.

The Investigative Report released by the PFD (Philadelphia Fire Department, 2017, p.56) for FF. Joyce Craig, who died in the Line of Duty on December 09, 2014 while operating on the interior of a structure fire, included a recommendation that "…the FCC should have personnel dedicated to monitor [the] TAC channel/talk group to provide an optimum measure of safety to firefighters working at the scene of a fire and all other hazardous fire department responses". On January 27, 2017, the PFD transferred four newly promoted Battalion Chiefs to serve in the FCC

as Uniformed Communications Liaison Officers (UCLO) which was intended to provide the much-needed relief for the communications process. However, at the time of this incident, no formal dispatch training, job description, roles and responsibilities or organizational chart was developed for the new position. In addition, the PFD did not formally announce the position or inform its members of the purpose or function of it. Furthermore, after the integration of civilian dispatchers and supervisors with uniformed Battalion Chiefs, no guidance or training was provided to define appropriate authorities, chain of command or who was ultimately responsible for real time decision making.

Through interviews conducted by the AAR Team, it was discovered that in the absence of formal guidelines, the role of the UCLO evolved to primarily focus on administrative duties during emergency incidents rather than to monitor the tactical channel as was recommended in the Firefighter Craig Line of Duty Death Investigative Report. During escalating incidents, the UCLO is routinely tasked with ensuring notifications are made to PFD leadership. These administrative responsibilities preclude the UCLO from concentrating their full attention on monitoring the tactical channel.

During this incident, when the UCLO was made aware of a declared Mayday, he immediately and abruptly ended a phone conversation pertaining to an administrative inquiry from senior PFD leadership. The UCLO recognized the South Fire Band dispatcher was overburdened with work demand and therefore, he redirected all dispatches not related to this incident to a separate radio channel. Additionally, the UCLO ordered the stop of the repetitive broadcast of the emergency evacuation signal because, in his opinion, it was overriding pertinent and time sensitive communications during a critical time in the Mayday response. The AAR Team believes the decisions made by the UCLO at this juncture provided the proper level of

tactical support the position was intended to achieve and highlights the need for the UCLO's responsibilities to be clearly defined and understood.

## SITUATIONAL AWARENESS

It is well documented that situational overload can occur for an Incident Commander as the complexity of an incident grows. The merging of identified critical factors likely impacted the situational awareness of key decision makers and firefighters operating on the fire ground. Dr. Mica Endsley, a highly regarded researcher in the field of situational awareness, has defined situational awareness as "being aware of what is happening around you and understanding what that information means to you now and in the future" (as cited in Gasaway, 2013, p.68).

The AAR Team believes the initial Incident Commander adequately addressed many fire ground issues as they emerged. However, as a possible consequence of the extended time he was in Command, coupled with the dynamically changing environment and the need to continuously address tactical challenges, his overall situational awareness was likely impacted. According to Gasaway (2013, p.129), "the amount of information processed, the speed at which that information changes, and the complexity of the emergency scene can all contribute to the possibility of overload".

One way to assist firefighters and incident commanders in developing the appropriate situational awareness is through training. NFPA 1500 (2013, p.13), Chapter 5: Training, Education and Professional Development, Sections 5.1.1 and 5.1.2 states:

- "The fire department shall establish and maintain a training, education, and professional development program with a goal of preventing occupational deaths, injuries, and illnesses".
- "The fire department shall provide training, education, and professional development for all department members commensurate with the duties and functions that they are expected to perform".

Over the last decade or more, contrary to the recommendations of NFPA 1500, the PFD has provided only minimal education, training and professional development to its firefighters and officers. The absence of sustained training programs and professional development, especially during a period of relatively rapid retirement, promotions and hiring of new firefighters, has created challenges for the PFD.

One encouraging example of the effectiveness of training was never more apparent than it was during this incident. In December 2017, the PFD introduced a program to educate and train members in fire ground survival and Mayday operations. Several of the firefighters that became trapped while operating on the fire ground had just recently completed the training program to be instructors for this department-wide training initiative. During interviews with those members, it was stated that they used the skills recently learned to remain calm, address and recognize their situation, and work to rescue themselves. This training program was credited by several firefighters for having an immediate impact on their actions, decision making process and situational awareness during this incident.

## Recommendations

The AAR Team makes the following recommendations based on the fire ground events of January 06, 2018, the identified critical factors and lessons learned:

| **Problem** | **Concern and Reasoning** |
|---|---|
| The lack of a standardized training program in the PFD | • Inconsistent and irregular training contributes to inconsistent and unpredictable strategic and tactical decision making.<br>• After graduating from the Fire Academy, members are often left to their own merits to enroll in outside PFD training and education rather than being trained in PFD specific operations with all members learning from the same "playbook".<br>• A lack of standardized, PFD led training creates a culture of diminished personal and team accountability as well as varied strategic and tactical decision making. |
| **Recommendations** | |
| • The PFD should develop a sustainable Officer Development Program for each civil service promotional rank. This program should require members to complete job specific education and training immediately upon promotion to a new rank and prior to a field assignment.[73]<br>• The PFD should create a continuing education program for all Firefighters, Company Officers and Chief Officers focusing on all hazard responses with an emphasis on situational based critical thinking and risk management.[74]<br>• The PFD should develop a standardized training program for all current and future Aide's or Assistant's of Chief Officers.<br>• The PFD should develop a department wide training program to review SCBA operations and the proper use of breathing air compressors.<br>• The PFD should develop and deliver ICS Training for all fire and EMS Officers.<br>• The PFD should develop and deliver training for all fire suppression members on the detailed mechanical operations of fire hydrants and water supply operations.<br>• The PFD should develop a program to train and certify all members to the operations level of each technical rescue specialty. | |

[73] Similar to a recommendation from the PFD Investigative Report for the LODD of FF. Joyce Craig.
[74] Similar to a recommendation from the PFD Investigative Report for the LODD of FF. Joyce Craig.

| **Problem** | **Concern and Reasoning** |
|---|---|
| The need to increase on duty and staffed resources in the PFD | • The PFD provides emergency medical and fire suppression services to a population of approximately 1.6 million residents within an area of approximately 141 square miles.<br>• In FY19, the department responded to 324,185 incidents. Of these, 274,659 were EMS incidents and 49,526 were fire incidents. The department responded to 4,849 working structure fires, an average of 13 per day.<br>• Staffing the appropriate resources and having them available for response better ensures the PFD is able to safely and efficiently provide emergency services for the City of Philadelphia. |

**Recommendations**

- The PFD should increase the special operations resources to include, per Division: (1) Heavy Rescue and (1) Squad company.
- The PFD should increase the incident safety resources to include, per Division: (1) Assistant Incident Safety Officer, at the rank of Battalion Chief, to respond on all initial dispatches of tactical and box assignments.
- The PFD should increase the role and responsibility of the PFD Water Liaison Officer to include a 24 staffed unit which would respond to locations to perform maintenance of hydrants identified as not properly functioning, especially when identified during an active incident. Additionally, the unit would perform hydrant flow testing, as well as, coordinate with the PWD, when a hydrant fails to operate properly, to investigate the reason for the malfunction.
- The PFD should expand its Fire Code Unit to employ a 24 hour staffed licensed structural engineer who could provide guidance to on scene incident commanders operating at structural collapse incidents, as well as, to provide evaluation and analysis, post collapse, for incidents which result in significant injury or death.
- The PFD should increase staffing levels for all units during times of expected adverse weather conditions.
- The PFD should staff all specialized apparatus (including the collapse and air units) 24 hours a day to ensure when the unit is dispatched, qualified and trained personnel are immediately available to respond without delay.
- The PFD should elevate the rank of the UCLO to a Deputy Chief.

| **Problem** | **Concern and Reasoning** |
|---|---|
| The need to improve, update and standardize technology, equipment, and policies in the PFD so they are realistic and practical in the modern fire service. | • To continue the PFD's *vision* as the national leader in the Fire and EMS industry for health and safety.<br>• To improve upon the PFD's *mission* to serve the public by providing comprehensive all hazard prevention, risk reduction and emergency response and to ensure the health and safety of our members. |

**Recommendations**

- The PFD should update, modernize and place better emphasis on adherence to existing policies.
- The PFD should research and consider an upgrade to their dispatch technology and/or equipment to include the installation of an automated dispatch system in all fire stations.
- The PFD should consider upgrading all SCBA's to include pneumatic tracking information.
- The PFD should consider developing a new CAD printout for end users to easily identify critical information (i.e. address, detailed assignment information) and establish a system that prominently displays known and pertinent premise history (i.e. type of construction, heavy contents, building characteristics).
- The PFD should develop a database to identify dwellings with excessive clutter conditions, heavy contents or known building deficiencies; this information should be relayed to the Incident Commander by the UCLO on every assignment.
- The PFD should research and consider the implementation of a modernized, GPS based, fire fighter accountability system or program to be used during emergency scene operations.[75]
- The PFD should research and consider the implementation of a helmet cam program.
- The PFD should research and develop an extreme weather operations policy to guide strategic and operational decisions during weather events.
- The PFD should research and develop a new policy for the dispatch and utilization of special operations companies and equipment during fire ground and interior structural collapse operations to adequately maintain city wide special operations coverage and to ensure additional, trained resources are close to the incident scene if needed.
- The PFD should develop a new policy for the dispatch, training and utilization of all specialized apparatus (i.e. collapse and air units).
- The PFD should reintroduce and emphasize the importance of their existing policy that an elapsed time report be provided from FCC to Communications and ensure it is relayed to Command throughout all incidents.
- The PFD should institute a policy of mandatory, formalized AAR's for all incidents which meet defined criteria.[76]
- The PFD should develop a detailed policy and procedure for LODD investigations and AAR's. The policy should establish a task force of PFD members, with advanced training in conducting AAR's and investigations, who are immediately activated upon notification of a LODD or serious injury to a PFD member.[77]
- The PFD should consider increasing the number of SCBA cylinder refill stations.

[75] Similar to a recommendation from the PFD Investigative Report for the LODD of FF. Joyce Craig.
[76] Similar to a recommendation from the PFD Investigative Report for the LODD of FF. Joyce Craig.
[77] Similar to a recommendation from the PFD Investigative Report for the LODD of FF. Joyce Craig.

| **Problem** | **Concern and Reasoning** |
|---|---|
| The need to reallocate, redistribute and better define the roles, responsibilities and resources in the PFD to improve operational readiness and response. | • The PFD has recently increased its administrative and response capabilities.<br>• As the PFD continues to expand and improve, there becomes a greater need to define how the added resources will work in the already established system of response.<br>• Failure to clearly define roles and responsibilities for all resources leads to undesired or unanticipated performance. |

**Recommendations**

- The PFD should define the expected utilization and responsibility of the Uniformed Communications Liaison Officer (UCLO). The PFD should also improve and clarify the UCLO's roles and responsibilities to limit their administrative task level functions and focus their attention solely on operational monitoring and support.
- The PFD should increase the role of the Field Incident Safety Officer to include an expanded responsibility for platoon training and the initiation of an After-Action Review process based on defined triggering events.
- The PFD should strive to have a dedicated Field Incident Safety Officer on location as soon as possible after the first PFD units arrive on location.
- The PFD should require all Uniformed Communications Liaison Officer's (UCLO) to participate in training so they understand the technology, protocols and responsibilities of the position.
- The PFD should assign the administration of the "Hoarding Task Force" to the PFD Fire Prevention Unit and their responsibilities should include database management and training.

# Volume II: Addendums

## White Smoke Phenomenon

# Another "White Smoke" Phenomenon

**By: Dave Dodson** *[Author Note: This is an original article pulled from the author's research and educational seminars that have been derived from his other works: The Art of Reading Smoke DVD (Fire Engineering Books & Video) & Fire Department Incident Safety Officer (Jones & Bartlett Learning)].*

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In a simpler time, white smoke issuing from a building on fire was viewed as good news: the event is in early stages or the fire is being controlled by firefighters or a fire suppression system. Unfortunately, this over simplification can lead to some misunderstandings regarding fire spread and the threats to firefighters. The fact is, many influences can lead to the presence of "white smoke" leaving a building, including the white smoke phenomenon caused by outside, frigid air.

When outside air temperatures are well below freezing, hot dark smoke leaving the building turns white almost instantly. This phenomenon is the result of moisture or humidity condensing within the smoke. As a child, you may recall "blowing smoke" on frigid days using just the moisture in your breath when you forcefully exhaled. Smoke, in most cases, is quite moist (water vapor and other aerosols). As the smoke leaves the building and contacts the frigid air, the vapors condense and can form a white fog-like coating on all the hot particulates in smoke. The thicker the smoke, the more pronounced this white fog will appear. Obviously, the outside perimeter of the smoke plume has the most contact with frigid air, and therefore will be the most white-appearing to the firefighters outside.

Even in cases where the fire is burning hot and clean with little visible smoke, the thermal plume leaving the building can turn white as it contacts frigid air – it's just that the volume and density will be much less as there are fewer particulates to capture and emphasize the white color.

When fighting fires in sub-freezing weather, decision-makers should understand that smoke color can be misleading. Strategic and tactical decisions should be influenced more by the other three smoke attributes: volume, velocity, and density. Of these, velocity is perhaps the best indicator of heat. Violent, turbulent, or highly agitated smoke velocity is an indicator of severe heat (regardless of color) and should be treated as such to help locate the fire and direct attack options. In other words: **Velocity trumps Color** when it comes to judging heat.

**Building Performance During Fire Operations**

**City of Philadelphia (PA) Fire Department**
**Lt. Matthew LeTourneau Line-of-Duty Death**

# INSIGHTS ON BUILDING PERFORMANCE DURING FIRE OPERATIONS; Residential Row House Fire & Collapse

## 2240 North Colorado Street January 6, 2018

## Executive Summary

**Prepared by:**
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Syracuse, New York USA
**August 29, 2018**

***Dedicated to the Honor, Sacrifice and Memory of***
**Lt. Matthew LeTourneau**
***City of Philadelphia (PA) Fire Department***

**INSIGHTS ON BUILDING PERFORMANCE DURING FIRE OPERATIONS;**
**Residential Row House Fire & Collapse**
**2240 North Colorado Street - January 6, 2018**

***This is an Executive Summary and Synopsis of the findings and insights from the Comprehensive Report issued on August 30, 2018 Revision 03 to the Philadelphia Fire Department Health & Safety Office, Deputy Chief Vincent Mulray.***

***Refer to the full report for additional details, narrative and diagrams***

**INSIGHTS ON BUILDING PERFORMANCE DURING FIRE OPERATIONS;**
**Residential Row House Fire & Collapse**
**2240 North Colorado Street - January 6, 2018**

## Executive Summary

I. Scope of Insights
II. Executive Summary
III. Building Construction and Occupancy Profile
IV. Anatomy and Mechanism of Floor Compromise and Collapse V. References

## I. Scope

The purpose of this report was to provide insights on Building Performance during fire suppression operations derived from the inherent and as-found building conditions, occupancy risk and incident fire suppression operations conducted at the residential row house fire located at 2240 North Colorado Street, City of Philadelphia,
PA that occurred on January 6, 2018 that resulted in the Line-of-Duty Death (LODD) of Lt. Matthew LeTourneau, City of Philadelphia (PA) Fire Department. PFD Incident #18-0060250, FD Box #7743

Technical support was requested by the City of Philadelphia Fire Department's Health and Safety Office to support and supplement the scope and objectives of the Fire Department's After-Action Report for incident lessons, learning and insights.

The insights, observations, assessment and opinions expressed directly or indirectly by this report are based on a review of general information, documents and visual media provided by designated and authorized representatives from the City of Philadelphia Fire Department and are postulated, formulated and articulated based on generally accepted fire protection engineering, fire and emergency services, fire incident management & operations and occupational safety & health principles, practices and methodologies.

This report and its observations shall not be construed to be a result of an in-depth technical analysis of the events or conditions leading to or resulting from the Philadelphia Fire Department incident #18-0060250 as referenced in this report. A review of media and documents provided by the Fire Department were used in the preparation of this report. The author assumes no liability for opinions expressed.

## II. Executive Summary

The structure fire, Philadelphia Fire Department Incident # 18-0060250, Alarm Box #7743 occurring on January 6, 2018 at the residential property located at 2240 North Colorado Street consisted of a single-family residential occupancy rowhouse was a structure fire that the Philadelphia Fire Department encounters with both regularity, consistency in building and fire performance and conditions that have led to the development of proficiencies, skills sets and protocols for the incident management and tactical mitigation of these incidents and the protection of life for the affected occupants that reside in these occupancies.

The rowhouse building type is synonymous and defined in the history of the City of Philadelphia as is the Fire Department's response, control and mitigation of fire incidents in these building and occupancy types. This single family residential occupancy rowhouse sustained a fire within the structure that communicated throughout the building, (causal factors of which are under investigation), culminating in a catastrophic second floor collapse of that area, which resulted in the line of duty death on-scene of Philadelphia Fire Lieutenant Matthew LeTourneau and other subsequent firefighter personnel injuries. The originating fire within this occupied structure resulted in the fatality of the single rowhouse occupant.

It is suggested and highly probable the second-floor collapse was triggered by;

- Overloading and excessive stress and loss of load transfer or carrying capacity of the existing structural wood floor joist assembly on the Second Floor from existing hoarding, heavy loads and clutter; The center bedroom area's floor area appears to have had significant live loading added based on occupant hording, heavy loads and clutter that placed additional stress and load transfer as fire extension or exposure from the first-floor fire resulting in probable building component and assembly compromise, deterioration and failure that lead to the V-shaped collapse along a vulnerable inherent condition.
- the ensuing compromising floor conditions lead to interior V-shaped floor collapse and the progressive succession of compromise of the floor diaphragm commencing from second floor bedroom inwards towards the second-floor center bedroom area.
- This resulted in a compromising floor condition at the front second floor bedroom, progressing towards the full collapse of the most susceptible second floor area within the center part of the second-floor resulting in a V-shaped collapse configuration bring both structural floor joists, flooring, partition and hoarding condition, heavy contents from the rooms above downward into the V-shaped collapse and onto the first floor.
- The central area of the second floor had a series of shorter floor joists that terminated at a framing joist that in turn framed the stairwell opening and did not extend to or were pocketed into the masonry bearing wall (Bravo Division)
- Wood floor joist #11 progressing from the front of the building inward was the last floor joist to full span from each bearing wall.
- The predominate compromising conditions that followed the legacy notch lines in the wood joists from building front- inward exhibited signs of load stress, failure and compromise; exhibited by the splitting and cracking of the wood joists. The line of structural compromise and failure followed the existing gas line and joist notching

coincided with an apparent structurally weak area and aligned with the axis of the subsequent V-shaped collapse (versus a more common single-sided lean-to collapse of the floor diagram and assembly.

- Fire severity (unquantifiable) and extension within the interior ceiling spaces; within the joist channels or possible direct impinged from room and contents fire conditions in the absence of some of the existing plaster and lath ceiling may have had a contributing effect on the wood joists due to fire exposure to increase susceptibility of floor joist compromise with diminishing load carrying capacity due to loss of wood mass (material charring and burn) coupled with the inherent characteristics of the aged wood.
- It is postulated and suggested that the addition of water introduced from the application of exterior hose streams into the upper interior from the street on the Alpha Division during a brief defensive tactical time period may have added additional live load (weight) that fall-out rates (non-evaporation) of water from the hose streams, would have soaked or saturated into porous or other soak-prone clutter and hoarding materials, thus increasing overall live loads that further exasperated floor structural stability, increased floor deflection and loss of load transfer and load carrying capacity that precipitated the compromise and resulting catastrophic collapse.
- The existing wood joist notches, creating a vulnerable condition on multiple adjacent floor joists, excessive hording and heavy clutter adding significant live load to an aged existing floor assembly and a varying degree of fire within the interior compartment and structural void space area suggest an apparent and highly probable series of conditions that aligned in such an manner at this rowhouse fire that provided the sequence of events and mechanism of collapse that had adverse consequences to operating companies within the structure.

**Uniqueness and Variances for this Rowhouse and Fire**

- The inherent legacy notching of the existing wood floor joists was a primary contributor to create an existing floor system that was highly susceptible and prone to be affected by an interior compartment or structural fire or affected by existing or in the addition of live or dead loads.
- Existing Hoarding, Heavy Contents and Clutter introduced to the rooms by the occupant significantly contributed towards the potential for floor instability and compromise.
- Deterioration and exposure of the interior rooms and occupancy to environmental exposure and elements and their suggested impacts on the building structural components, materials and systems may have had a contributing effect on structural stability and integrity of building components. Possible degraded load carrying capacity of the existing wood floor joists due to age, creep, the effects of loss of moisture content or cyclical exposure to environment elements**.**
- The small size of the rowhouse structure, when impacted by unstable or compromising structural stressors may not have the resiliency or resistance to recover from those conditions or allow for load transfers and still maintain its structural stability and integrity.

The alignment of seven separate conditions correlated in this rowhouse occupancy to create a variance an irregularity that made this incident and fire operation unique that contributed to the collapse conditions and outcome;

- The Existing Hoarding, Heavy Contents and Clutter
- The presence of the legacy notch lines in the wood joists from created an existing condition that made each of the floor joists highly susceptible and prone to the effects of fire, heat & failure.
- Inherent building support systems (Wood joist) degrade or affected material conditions & postulated diminished structural integrity
- Floor joist framing at the stairwell and floor area above that creates a susceptible and prone interior condition (to fire) that is inherent in all rowhouses of this layout type, floor plan and configuration (Workingman's Row House)
- The suggested impact of water introduced during fire suppression affecting hoarding and clutter conditions
- The location and extent of fire
- The transitional tactics from Offensive to Defensive to Offensive may not have considered structural integrity of critical internal building systems or components that may have been subject to varying degradation, damage or compromise and the compounded effects of imposed loads on the building from hoarding, heavy content and clutter.

The significance of interior compartment hoarding conditions, elapsed time of fire suppression operations and the varying degrees of fire involvement within the structure alone would highly suggest that the elevating risk probability for a structural compromise or collapse could be highly expected and possibly imminent.

Whenever operations transition from Offensive-interior to Defensive-exterior and then back to Offensive-interior, the overall building risk profile and assessment must be made by Incident Command and a determination made on probable building integrity and operational benefits expected by placing companies back into a structure and compartments that have been subject to increased fire exposure and degradation, impacted by the introduction of large or small caliber hose streams during defensive operations and the potential effect of the water introduction, absorption, steam conversion and fall-out rate and run-off or containment in rooms, floors, voids or materials.

## III. Building Construction and Occupancy Profile

**Overview**

The fire incident occurred within a densely populated neighborhood common to urban matrix of the City of Philadelphia (PA). The residential property located at 2240 North Colorado Street consisted of a single-family residential occupancy rowhouse that was located on a narrow street (North Colorado Street) comprised of thirty-four (34) attached rowhouse buildings that spanned the city block from a cross-street to the north (West Dauphin Street) and a cross-street to the south (West Susquehanna Ave.). Similar rowhouses were present across the street from the residence and were found to the rear of the structure (Charlie Division- geographic West) along the adjacent city street and block, separated by a slight backyard buffer zone.

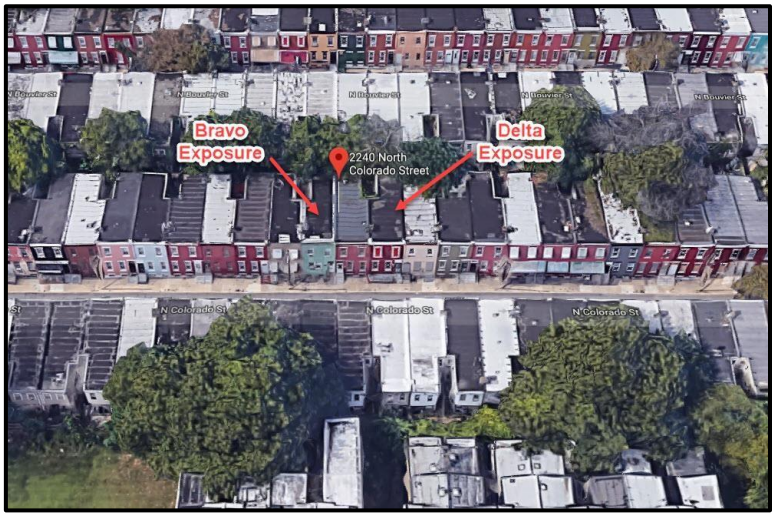
The residential rowhouse was built between 1880 and 1888 [1] under the adopted building and construction standards in effect at that time. The structures were of Type III- masonry brick and wood joist construction [2] in accordance with recognized standards in that era and consistent with NFPA 220 Standard [3].

The single-family residential occupancy rowhouse sustained a fire within the structure that communicated throughout the building, (causal factors of which are under investigation), culminating in a catastrophic second floor collapse of that area, which resulted in a firefighter fatality and other subsequent personnel injuries. The originating fire within the occupied structure resulted in the fatality of the rowhouse occupant.

Progressive fire extension and further structural collapse and compromise occurred throughout the interior occupancy of the building during fire suppression operations. There was some damage to the adjoining residential properties on both the Bravo Divisions (Geographic South) and the Delta Divisions (Geographic North). The single family residential occupancy rowhouse was the 15th unit inward along North Colorado Street from the intersection of West Dauphin Street.

The rowhouse was found to have evidence of physical, material and maintenance neglect and progressive physical building and structure deterioration. The building did not have an operable fixed heating system[1], had roofing and perimeter wall deterioration and had direct open areas to the environment with direct exposure and susceptibility to seasonal environmental cycles and conditions.

There was evidence that significant hoarding conditions of materials and a significant degree of clutter was present throughout the rooms and floors of the structure that imposed critical operations impediments and highly suggest it affected the structure during the early development stages of the fire within the room compartments and within concealed and exposed area of the building structural components, systems, assemblies and materials. These hoarding, heavy content and clutter conditions also had significant contributions towards building compromise, collapse and concurrent and subsequent Fire Department fire suppression operations, mitigation efforts and resulting fire service personnel extrication and rescue effort resulting from the structural floor collapse. [1, 17]




**Map 1 | Photo 1 Aerial View of 2240 North Colorado Street**
Photo: Analysis Diagram Courtesy of Buildingsonfire.com | C.J. Naum
Map Courtesy of Bing Maps | Photo Courtesy of Google Earth

**Layout and General Features**
The residential property located at 2240 North Colorado Street consisted of a single-family residential occupancy rowhouse. The rowhouse style structure or commonly referred to as the Philadelphia rowhouse, is typically a one to four-story residential house occupying a narrow street frontage and attached to adjacent houses on both sides. It evolved early in the city's history. [4]

By the nineteenth century, the term "Philadelphia row" not only became synonymous with the landscape of the city, but it also became a term used elsewhere to describe orderly rows of regularized houses. [4, 5, 6]

The single-family residential property located at 2240 North Colorado Street consisted of a two-story building located on a footprint of approximate 1,038 square feet. The building's style and design are commonly referred to a
Workingman's House [4] with defining characteristics that included;

- Masonry Brick bearing-party walls with masonry front facades
- Adjoining occupied buildings (rowhouses) on either side of the occupancy
- Wood Floor joists structural supports
- Plaster and lath over wood framing interiors
- Narrow Windows
- Single sloping roofs with modest ornate wood or brick cornice
- Front stoop (steps) accessing from street side,
- Entry vestibule,
- Two-floors of occupied space,
- Single run stairway,
- A basement with limited window(s)
- Indoor kitchen, plumbing, service and heating
- Small rear yards with partial court-yard area (adjoining to adjacent property)

These rowhouses can be found throughout the neighborhoods and sections of Philadelphia consisting of 1,000 –
1,600 sq. ft. on two-story homes. [4, 5, 6]

This rowhouse style, configuration and layout was highly predictable in terms of expected performance under fire conditions and in typical fireground incident operations. These types of buildings and occupancies have consistently provided the Philadelphia Fire Department (PFD) with extensive in-depth experience and operational insights from hundreds of thousands emergency incident responses, rowhouse building firefighting and fire incident management, tactical deployment and incident mitigation over the past 138 years. These buildings and occupancies have been fundamental in firefighting principles, practices and tactical methodologies in these residential occupancy types and occupancy risks.

**Building Construction and Occupancy**
The building was a masonry constructed residential occupancy built in between 1880 - 1888.[1] Constructed of Type III, ordinary construction, was two-stories in height and had a basement. The building had masonry party bearing walls located perpendicularly to the main street running east-west on the Bravo (South) and Delta (North) divisions, with in-fill non-bearing masonry walls on the west and east building face (Alpha and Charlie divisions respectively). Sited on a city block, the building was accessible on two of the four sides and had attached exposure structures of single use occupancy on the Bravo division and a building exposure across the alley on the Delta division. The residential property located at 2240 North Colorado Street consisted of a single-family residential occupancy rowhouse that was located on a narrow street (North Colorado Street) comprised of thirty-four (34) attached rowhouse buildings that spanned the city block from a cross-street to the north (West Dauphin Street) and a cross-street to the south (West Susquehanna Ave.).

Similar rowhouses were present across the street from the residence and were found to the rear of the structure (Charlie Division- geographic West) along the adjacent city street and block, separated by a slight backyard buffer zone. Type III, ordinary construction [2, 3] (also referred to as "Brick and Joist" construction) generally refers to a construction system that incorporates masonry perimeter wall construction with both fully supporting masonry bearing and non-bearing wall characteristics, fully dimensioned timber wood construction for structural supporting floor joists, roof rafters and assemblies and dimensioned wood framing for interior partitions. Interior wood framing is commonly present for wall and room partitions and compartmentation with plaster and lath construction for finish treatments.

There was evidence that significant hoarding conditions of materials by the occupant over time and a significant degree of clutter that was present and encountered by operating PFD companies throughout the rooms and floors of the structure that imposed critical operations impediments and highly suggest it affected the structure during the early development stages of the fire within the room compartments and within concealed and exposed area of the building structural components, systems, assemblies and materials. [1, 17]

These hoarding, heavy content and clutter conditions had significant influence and contributions towards subsequent building compromise, collapse and subsequent Fire Department fire

suppression operations, mitigation efforts and resulting fire service personnel extrication and rescue effort resulting from the structural floor collapse.

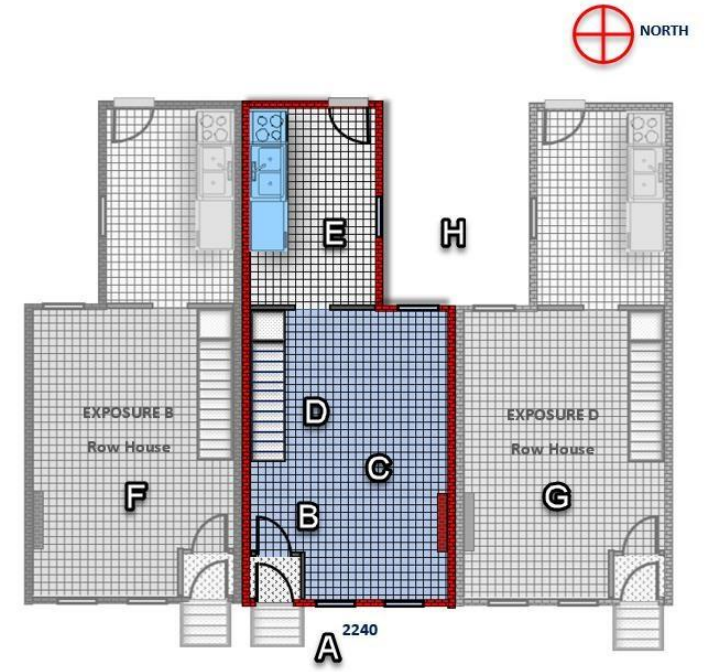



Diagram 1 First-Floor Plan
Graphic Courtesy of Buildingsonfire.com | C.J. Naum

**First-Floor Plan**: 15 ft. – 5 in. Front width x 37 ft. – 6 in. depth (10 ft. – 2 in. at rear width Kitchen) 1,038 Sq. Ft.
A: Front Sidewalk and stoop (stairs)
B: Entry Vestibule
C: Front Living Room
D: Straight Single-Run Stairs- UP to Second Floor
E: Rear Kitchen with access to Rear yard (Charlie Division)
F: Exposure-B Row house
G: Exposure-D Row house
H: Adjacent Adjoining Court Yard

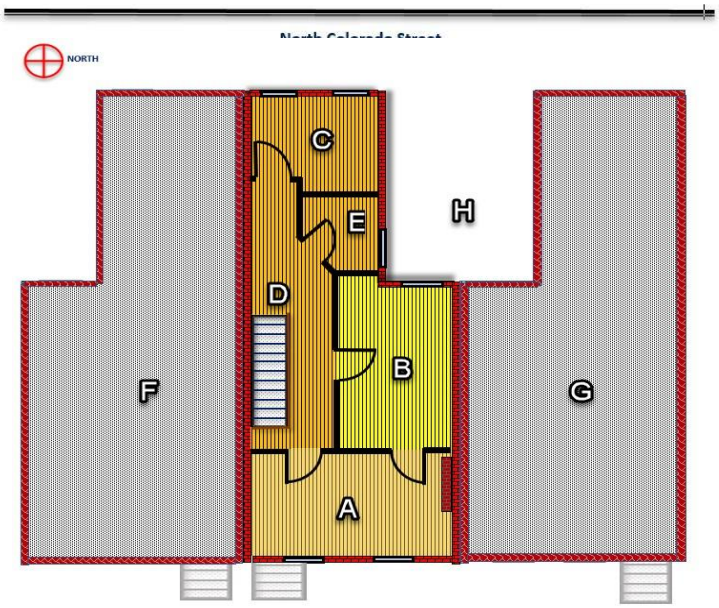



Diagram 2 Second Floor Plan (Adjacent Exposures shown)
Graphic Courtesy of Buildingsonfire.com | C.J Naum

**Second-Floor Plan**: 15 ft. – 5 in. Front width x 37 ft. – 6 in. depth (10 ft. – 2 in. width at rear Bedroom) 1,038 Sq. Ft.

A: Front Second Floor Bedroom (15'-2" x 12'-5")
B: Middle Second Floor Bedroom (10'-0" x 10'-5")
C: Rear Second Floor Bedroom (10'-2" x 9'-8")
D: Straight Single-Run Stairs DOWN to First Floor and Second Floor Landing and Corridor
E : Second Floor Bathroom
F : Exposure-B Row house
G: Exposure-D Row house
H: Adjacent Adjoining Court Yard

## Building Anatomy and Profile

- **Constructed:** circa 1880-1888 [1,16, 17]
- **Occupancy:** Single Family Residential

- **Condition:** Occupied and In-use; *Hoarding Conditions along with Degraded Building Conditions and evidence of interior occupiable spaces exposed to environmental elements.*[1,17,]
    - The rowhouse was found to have evidence of physical, material and maintenance neglect and progressive physical building and structure deterioration.
    - The building apparently did not have an operable fixed heating system, had roofing and perimeter wall deterioration and had direct open areas to the environment with direct exposure and susceptibility to seasonal environmental cycles and conditions.
    - There was evidence that significant hoarding conditions of materials and a significant degree of clutter was present throughout the rooms and floors of the structure that imposed critical operations impediments and highly suggest, affected the structure during the early development stages of the fire within the room compartments and within concealed and exposed area of the building structural components, systems, assemblies and materials.
    - These hoarding, heavy content and clutter conditions also had significant contributions towards building compromise, collapse and concurrent and subsequent Fire Department fire suppression operations, mitigation efforts and resulting fire service personnel extrication and rescue effort resulting from the structural floor collapse.

- **Construction System:** Type III Ordinary Construction (based on National Building Code, circa 1900-1915 ed.)
    - **Floor Joists:** Full dimensioned 3 in. x 7.5 in. Floor joists were pocketed into the masonry bearing walls. There were no internal joint strap anchors or tie-backs to the masonry bearing or non-bearing walls. (no external spreader plates were used on the building facade) Bridging would not have been expected to be present between floor joists based on the short spans.
    - **Wood Joist: Eastern Hemlock (Tsuga canadensis)**[9,10] 3 in. x 7.25 in
      The wood is moderately lightweight, (about 28 pounds per cubic foot at 12- percent moisture content), moderately weak in bending strength, moderately strong in end compression, low in splitting resistance, and average in nail-holding capacity, moderately low in strength, moderately stiff, and moderately low in shock resistance.[9]
    - **Hemlock** is similar to spruce in appearance, though much inferior as a building material. The wood is very brittle, splits easily, and is very liable to be shaky. Its grain is coarse and uneven, and though it holds nails much more firmly than does pine, the wood is generally soft and not durable. Hemlock is used almost exclusively as a cheap, rough-framing timber. [8]
    - **NOTE:** A sample taken from the building by the PFD was identified to have a moisture content of **3.6%**[1,17]
    - **Unique Feature of Note:** Within the Joist Void consisting of the 2nd Floor wood floor system; Commencing proximal to the first wood joist an approx. 1-inch x 1-inch notch was cut into the upper top portion of the wood joist to accommodate the installation of a pipe run into the occupancy for gas service to the residence in the late 1800's. These cut notches and legacy gas pipe run continues in each wood floor joist inward from the Alpha side wall area interior along an almost floor span center-line approx. 20 ft. or more.
    - **Stairwell Area:** The Single-run stairway and stairwell was located directly adjacent to the interior Bravo Division wall and was accessible immediately upon entry through the front door and vestibule. The wood floor joists span fully wall to wall in all interior area except at the stairwell. An alternate method of assembly and structural system is present at this location

  - **Flooring:** 3-inch x 1-inch wood plank flooring is common for this building type and vintage consisting of a rough under floor planking attached to the wood floor joist, a finished upper flooring treatment was not apparent
  - Refer to Diagram for Typical Structural Floor System and Masonry Perimeter Wall and Floor Joist Orientation and Column Support Plan
- **Size:** Two Stories, with a full basement
  - Height: Curb line to Cornice- approx. 20 feet
- **Floor Area:** 37 feet approx. x 15 feet approx. [519 square feet per floor]
  - Total Floor Area: 1,038 Square feet est.
  - Closed- Compartmented Floor Plan
- **Interior Compartments:** Two (2) occupant spaces-rooms on the 1st Floor. Four (4) occupant spaces rooms on the 2st Floor. Full basement; open space.
  - Compartment framing, wood timber construction, original plaster and lath wall treatment (fully, partial or removed)
  - As-found evidence of physical, material and maintenance neglect and progressive physical building and structure deterioration
  - Recommended practices and code ordinances at the time of the building's construction (1880-1888)
- **Roof:** Timber Rafters with Wood Deck and covering
  - The cornice had been modified and altered, with plywood panels partially installed to protect the roof cockloft void. Original brick and/or covering materials were absent at the time of the fire.
- **Masonry Perimeter Walls:** Masonry Brick Wall Construction Party Bearing Walls (Bravo and Delta Divisions; Brick walls and wood frame backing on Alpha and Charlie Divisions
  - Evidence of masonry brick wall deterioration of mortar joints, brick facing and wall integrity; Exposed rear walls and court-yard shape, Charlie Division.
  - The Front façade did not appear to have an observable deteriorated or compromising conditions.
  - Window Treatments: Conventional window treatment and sizing for residential occupancy spaces (Basement, 1st and 2nd floors).

## IV. Anatomy and Mechanism of Floor Compromise and Collapse

Generally, when operating companies are confronted with intense fire conditions within a building of Type III construction with similar vintage, occupancy use and tenant space configuration; and those fire conditions have either impinged or propagated within or along concealed spaces, voids or compartment(s) for an extended period of time prior to arrival or during fireground operations, it is highly probable and predictable that the structural integrity of the various assembly, supports and structural floor joists and wall systems will be compromised and subject to varying degrees of degradation.[28]

Rapid or prolonged fire extension or exposure will result in probable building component and assembly compromise, deterioration, failure and collapse.[29,30] This will directly affect structural integrity that will lead to a limited compromised assembly(ies), isolated or catastrophic collapse of critical building anatomy elements that may impact firefighting operations based on proximity, exposure and operational phases. This must be anticipated by safety officers, company officers and commanders and considered in tactical plans and task assignments both within the interior and exterior of the structure. The potential and probability of an isolated or catastrophic structural collapse of a masonry perimeter wall or facade, degraded bearing or party walls, degrade interior compartment or ceiling or floor diaphragm would be considered a predominate building performance consideration and predictability variable for operations, if identified by command or company officers and assimilated as such into the initial on-scene size-up and incident risk assessment process during tactical plan development.[24,29]

- Type III buildings have a distinctive predictability of performance under fireground operations based on inherent building anatomy, design, compartment fire dynamics in the building and the correlation of firefighting, intervention, effectiveness and time. They are prone to both interior floor collapse and perimeter wall collapse within short operational periods based on influencing fireground factors and variables.
- In situations when suspected or actual degraded building, component or structural conditions are observed or suspected; or when heavy content clutter, hoarding conditions are experienced or when observations indicate significant additional live or dead loads, staging or placement of materials, products, debris or other are present that may have an adverse effect on structural loading, integrity or structural stability, strength or weight carrying capacity or transfer; THEN immediate actions appropriate to the tactical stage(s) of incident operations should be initiated at the company or incident command level forthwith and with considerations to the promptness, severity and growth of the proceeding anticipated or preceding conditions.

The on-going operations and concurrent tactical demands associated with incident priorities in complex and evolving incidents that involve escalating fire severity, undefined or invalidated fire location, extent or location(s) and concurrent demanding civilian life safety strategies, create a situation of decreasing managed defenses, high probability for error-likely conditions and operations proceeding into a high-risk environment.

The need for a pronounced understanding of Type III building construction, features and risk profiling in reading a building integrated with fluid operational monitoring and assessment is crucial to firefighting operations in these building types and associated occupancy risks. This is applicable to rowhouse occupancies and fire incidents with prolonged fire suppression activities and when structural stability conditions may be subject to adverse influence from identified or suspected conditions. The challenge for today's incident commanders and operating companies on the modern fireground is to clearly recognize Type III building performance factors in both conventional Type III buildings and in applicable rowhouse occupancies and inherent ordinary construction characteristics fundamental to the manner in which a building's anatomy (and fire conditions) presents itself at an evolving incident and to ascertain and distinguish how it will subsequently perform during fire duress and the continuum of elapsed incident time.[18,20,22,23]

Although the size, footprint and design of rowhouses have lesser fireground complexities than typically encountered with larger sized and more complex Type III building and occupancies, nonetheless company and command level sensitivity of potential compromising and catastrophic structural conditions that may evolve with fire incidents that do not have clearly identified operational benchmarks or prompt declarations of fire conditions under control or extinguished must have diligent and timely monitoring and decision-making. This is especially true for fireground operations involving transitions from offensive interior operations to defensive operational tactics and the transition back again to offensive interior or proximal building tactical engagements. These operational periods tend to lead to increasing risk severities and highly probable adverse conditions or events to occur that will impact the safety of fire companies and personnel.

*Predicting a potential structural collapse is one of the most challenging tasks facing an incident commander at a fire scene. Usually the lack of information on the construction of the building, fire size, fire location, fire burn time, condition of the building, fuel load, etc., makes the task nearly impossible.*

The incident parameters confronted by operating companies at 2240 North Colorado provided a clear indication of demanding operational priorities and task assignments, concurrent operational assignments and challenges with determination of fire location, propagation and extent and the effects of time compression on the operational period from arrival time at 08:51 hrs., to the time in which adverse building performance due to fire exposure precipitated the building collapse at 09:33:15 - :30 hrs.

The presence of observed or suspected heavy contents, hoarding and or clutter are clear signs that highly suggest deliberate actions and tactical assignments that maintain or enhance company integrity and firefighter safety during the evolving incident.

**Mechanism of Floor Compromise & Collapse**

## Operational Perspective

Each building material and component is affected differently (over time) based on their material characteristics and fire resistance or vulnerability. This includes such factors as: applied structural load intensity, member/component type, member dimensions and boundary type, incident heat flux from the fire on the member or assembly, type of construction and effects of temperature rise within the structural member on the relevant properties of the member. Live loads introduced into the room compartments will also have an influence on fire propagation, severity and exposure on structural systems.

The mechanism and sequence of collapse of the second floor along the approx. centerline of the rowhouse and concentrated within the center of the building suggests with high probability the floor collapse was precipitated and triggered by the compromise of the interior supporting wood floor joist assemblies and the subsequent concurrent succession of collapse of the second floor area between the stairwell (Bravo side), the second floor central bedroom area and floor leading to the Delta side wall due to the inherent legacy condition of the upper notching of each floor joist, the additional live load imposed on the floor system from heavy content and clutter found in the second floor bedrooms, a degree of fire degradation of supporting systems from possible flame impingement and exposure and the probable addition of water loading from the application of exterior hose streams into the upper interior during a brief defensive tactical time period that precipitated the compromise and collapse.

It is suggested and highly probable the second-floor collapse was triggered by;

- Overloading and excessive stress and loss of load transfer and carrying capacity of the existing structural wood floor joist assembly on the Second Floor from existing hoarding, heavy loads and clutter; The center bedroom area's floor area appears to have had significant live loading added based on occupant hoarding, heavy loads and clutter that placed additional stress and load transfer as fire extension or exposure from the first-floor fire resulting in probable building component and assembly compromise, deterioration and failure that lead to the V-shaped collapse along a vulnerable inherent condition.
- the ensuing compromising floor conditions lead to interior V-shaped floor collapse and the progressive succession of compromise of the floor diaphragm commencing from the from second floor bedroom inwards towards the second-floor center bedroom area.
- This resulted in a compromising floor condition at the front second floor bedroom, progressing towards the full collapse of the most susceptible second floor area within the center part of the second-floor resulting in a V-shaped collapse configuration bring both structural floor joists, flooring, partition and hoarding condition, heavy contents from the rooms above downward into the V-shaped collapse and onto the first floor.
- The central area of the second floor had a series of shorter floor joists that terminated at a framing joist that in turn framed the stairwell opening and did not extend to or were pocketed into the masonry bearing wall (Bravo Division)

- Wood floor joist #11 progressing from the front of the building inward was the last floor joist to full span from each bearing wall.
- The predominate compromising conditions that followed the legacy notch lines in the wood joists from building front- inward exhibited signs of load stress, failure and compromise; exhibited by the splitting and cracking of the wood joists. The line of structural compromise and failure followed the existing gas line and joist notching coincided with an apparent structurally weak area and aligned with the axis of the subsequent V-shaped collapse (versus a more common single-sided lean-to collapse of the floor diagram and assembly.
- Fire severity (unquantifiable) and extension within the interior ceiling spaces; within the joist channels or possible direct impinged from room and contents fire conditions in the absence of some of the existing plaster and lath ceiling may have had a contributing effect on the wood joists due to fire exposure to increase susceptibility of floor joist compromise with diminishing load transfer and load carrying capacity due to loss of wood mass (material charring and burn) coupled with the inherent characteristics of the aged wood.
- It is postulated and suggested that the addition of water introduced from the application of exterior hose streams into the upper interior from the street on the Alpha Division during a brief defensive tactical time period may have added additional live load (weight) that fall-out rates (non-evaporation) of water from the hose streams, would have soaked or saturated into porous or other soak-prone clutter and hoarding materials, thus increasing overall live loads that further exasperated floor structural stability, increased floor deflection and loss of load transfer and load carrying capacity that precipitated the compromise and resulting catastrophic collapse.
- The existing wood joist notches, creating a vulnerable condition on multiple adjacent floor joists, excessive hoarding and heavy clutter adding significant live load to an aged existing floor assembly and a varying degree of fire within the interior compartment and structural void space area suggest an apparent and highly probable series of conditions that aligned in such an manner at this rowhouse fire that provided the sequence of events and mechanism of collapse that had adverse consequences to operating companies within the structure.

**Uniqueness and Variances for this Rowhouse and Fire**

- The inherent legacy notching of the existing wood floor joists was a primary contributor to create an existing floor system that was highly susceptible and prone to be affected by an interior compartment or structural fire or affected by existing or in the addition of live or dead loads.
- Existing Hoarding, Heavy Contents and Clutter introduced to the rooms by the occupant significantly contributed towards the potential for floor instability and compromise.
- Deterioration and exposure of the interior rooms and occupancy to environmental exposure and elements and their suggested impacts on the building structural components, materials and systems may have had a contributing effect on structural stability and integrity of building components. Possible degraded load transfer and load capacity of the existing wood floor joists due to age, creep, the effects of loss of moisture content or cyclical exposure to environment elements**.**

- The small size of the rowhouse structure, when impacted by unstable or compromising structural stressors may not have the resiliency or resistance to recover from those conditions or allow for load transfers and still maintain its structural stability and integrity.

The alignment of seven separate conditions correlated in this rowhouse occupancy to create a variance an irregularity that made this incident and fire operation unique that contributed to the collapse conditions and outcome;

- The Existing Hoarding, Heavy Contents and Clutter
- The presence of the legacy notch lines in the wood joists from building front inward created an existing condition that made each of the floor joists highly susceptible and prone to the effects of fire, heat and failure.
- Inherent building support systems (Wood joist) degrade or affected material conditions & postulated diminished structural integrity
- Floor joist framing at the stairwell and floor area above that creates a susceptible and prone interior condition (to fire) that is inherent in all rowhouses of this layout type, floor plan and configuration (Workingman's Row House)
- The suggested impact of water introduced during fire suppression affecting hoarding and clutter conditions
- The location and extent of fire
- The transitional tactics from Offensive to Defensive to Offensive may not have considered structural integrity of critical internal building systems or components that may have been subject to varying degradation, damage or compromise and the compounded effects of imposed loads on the building from hoarding, heavy content and clutter.

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## Approximate Timeline of the Interior Collapse (in photographs)

*(Source: Screen shots taken from police body cameras.)*


09:33:15


09:33:18


09:33:19


09:33:20


09:33:21


09:33:22


09:33:23


09:33:24


09:33:25

## Weather

| Date | Time | Temperature | Wind-chill | Relative Humidity | Wind Speed (mph) | Wind Gust (mph) |
|---|---|---|---|---|---|---|
| 1/1/2018 | 8:54 | 10°F | negative 2°F | 53% | 8 | N/A |
| | 9:54 | 13°F | 1° | 49% | 9 | N/A |
| | 10:54 | 15°F | 2° | 42% | 11 | N/A |
| 1/2/2018 | 8:54 | 16°F | 3° | 49% | 11 | N/A |
| | 9:54 | 19°F | 6° | 45% | 13 | N/A |
| | 10:54 | 20°F | 7° | 45% | 13 | 23 |
| 1/3/2018 | 8:54 | 19°F | N/A | 39% | 0 | N/A |
| | 9:54 | 22°F | N/A | 36% | 0 | N/A |
| | 10:54 | 25°F | N/A | 37% | 0 | N/A |
| 1/4/2018 | 8:54 | 24°F | 8° | 84% | 25 | 33 |
| | 9:54 | 23°F | 6° | 85% | 26 | 37 |
| | 10:54 | 23°F | 8° | 85% | 21 | N/A |
| 1/5/2018 | 8:54 | 12°F | negative 5°F | 48% | 16 | 37 |
| | 9:54 | 14°F | negative 5°F | 44% | 25 | 30 |
| | 10:54 | 15°F | negative 3°F | 42% | 21 | 39 |
| 1/6/2018 | 8:54 | 9°F | negative 10°F | 48% | 20 | N/A |
| | 9:54 | 11°F | negative 6°F | 44% | 17 | 34 |
| | 10:54 | 12°F | negative 6°F | 42% | 20 | 33 |

(Source: National Weather Service- National Oceanic and Atmospheric Administration)

## Water Supply Timeline

| Approximate Timeline of Engine Company Water Supply (Pre-collapse) | | | | |
|---|---|---|---|---|
| | Engine 45 | Engine 50 | Engine 13 | Engine 34 |
| 8:51 to 8:53 | Pre-arrival | | | |
| :54 | ON SCENE | | | |
| :55 | | | | |
| :56 | | | | |
| :57 | Alpha Div. | ON SCENE | | |
| :58 | | | ON SCENE | |
| :59 | | | | ON SCENE |
| 9:00 | | | | |
| :01 | | | | |
| :02 | | | | |
| :03 | | | | |
| :04 | No engine companies have water | | | |
| :05 | | Alpha Div. | | |
| :06 | | | | |
| :07 | | | | Alpha Div. |
| :08 | | | | |
| :09 | | | | |
| :10 | | | | |
| :11 | | | | Lose pressure |
| :12 | | | | Alpha Div. |
| :13 | Alpha Div. | | | |
| :14 | | | | |
| :15 | | | | |
| :16 | | | | Move from Alpha Div. to Charlie Div. |
| :17 | | | | |
| :18 | | | Charlie Div. | |
| :19 | | | | Charlie Div. |
| :20 | | | | |
| :21 | | | | |
| :22 | | | | |
| :23 | | | | |
| :24 | | | **A coupling disconnects on Colorado St. sending water flowing into the street and not to the tip** | |
| :25 | | | | |
| :26 | | | | |
| :27 | | | | |
| :28 | | | | |
| :29 | | Alpha Div. | | |
| :30 | | | | |
| :31 | | | Charlie Div. | |
| :32 | | | | |
| :33 | | | | |

## Unit Response Data

| Information Sources: | CAD | NFIRS | S. TAC 2 | S Fire |
|---|---|---|---|---|

| | | Dispatch | En Route | On Scene | Available |
|---|---|---|---|---|---|
| First Alarm | E 45 | 8:51:43 | 8:52:48 | 8:54:32 | 11:10:47 |
| | E 13 | 8:51:43 | 8:52:51 | 8:58:55 | 12:31:00 |
| | E 34 | 8:51:43 | 8:53:52 | 8:59:24 | 14:17:48 |
| | E 59 | 8:51:43 | 8:52:27 | 8:54:17 | 8:56:05 |
| | E 50 | 8:54:09 | 8:54:35 | 8:57 | 12:16 |
| | L 14 | 8:51:43 | 8:52:44 | 8:55:05 | 11:10 |
| | L 12 | 8:51:43 | 8:52:34 | 8:55:42 | 12:16 |
| | Bn 8 | 8:51:43 | 8:52:31 | 8:55:47 | 13:35:59 |
| | Bn 3 | 8:51:43 | 8:52:27 | 8:54:27 | 12:21:36 |
| | M 25 | 8:51:43 | 8:53:56 | unknown | 13:01 |
| | | Dispatch | En Route | On Scene | Available |
| 2 and 2 | L 3 | 8:56:21 | 8:59:15 | 9:04:19 | 13:01 |
| | M 31 | 8:56:21 | 8:57:35 | 9:05:48 | 13:13 |
| | ES 9 | 8:56:21 | 8:58:14 | 9:06:34 | 13:09:57 |
| | SQ 72 (1st) | 8:56:21 | 8:58:19 | Recalled | 9:02:24 |
| | R 1 | 9:02:06 | 9:02:31 | 9:16:45 | 11:39:33 |
| | | Dispatch | En Route | On Scene | Available |
| All Hands | SQ 72 (2nd) | 9:07:44 | 9:08:40 | unknown | 11:42:52 |
| | D 2 | 9:07:44 | 9:43:14 | 10:02:42 | 12:32:03 |
| | SO 1 | 9:07:56 | 9:09:05 | 9:31:18 | 11:16:22 |
| | ES 1 | 9:07:44 | 9:10:12 | 9:23:08 | 13:04:36 |
| | ES 3 | 9:08:06 | 9:10:34 | 9:29:56 | 12:56:38 |

| Information Sources: | | CAD | NFIRS | S. TAC 2 | S Fire |
|---|---|---|---|---|---|
| | | **Dispatch** | **En Route** | **On Scene** | **Available** |
| | **FM 13** | 9:14:09 | 9:14:09 | 9:48:00 | 16:34:41 |
| | **FM 15** | 9:00:22 | 9:00:22 | 9:00:22 | 16:34:41 |
| | **M 36** | 9:13:06 | 9:14:36 | 9:20:36 | 16:34:25 |
| | | **Dispatch** | **En Route** | **On Scene** | **Available** |
| **Special Call** | **E 59** | 9:14:49 | 9:15:27 | 9:18 | 12:15:31 |
| | **E 29** | 9:14:48 | 9:15:56 | 9:18:30 | 11:38:00 |
| | | **Dispatch** | **En Route** | **On Scene** | **Available** |
| | **M 34** | 9:16:30 | 9:17:02 | 9:29:24 | 11:24:58 |
| | **M 44** | 9:16:30 | 9:17:46 | 9:30:02 | 13:13:41 |
| | **SA 10** | 9:27:15 | 9:27:15 | 9:33:57 | 16:34:41 |
| | **VC 1** | 9:33:09 | 9:33:30 | 9:47:16 | unknown |
| | | **Dispatch** | **En Route** | **On Scene** | **Available** |
| **Mayday Response** | **Bn 4** | 9:36:22 | 9:36:39 | 9:43:57 | 11:23:58 |
| | **E 55** | 9:36:22 | 9:37:12 | 9:40:17 | 11:47:42 |
| | **L 8** | 9:36:22 | 9:40:33 | 9:50:01 | 11:47:23 |
| | **M 13** | 9:36:22 | 9:37:41 | 9:43:50 | 12:46:03 |
| | **M 15** | 9:36:22 | 9:38:56 | 9:45:56 | 15:29:21 |
| | **E 43** | 9:37:02 | 9:41:59 | 10:00:00 | 11:15:56 |
| | **AU 1** | 9:37:02 | 9:42:02 | 10:00:00 | 11:50:33 |
| | | **Dispatch** | **En Route** | **On Scene** | **Available** |
| | **Car 1** | 9:42:13 | 9:42:13 | 9:47:44 | 16:34:41 |
| | **PN 10** | 9:49:09 | 9:49:09 | 10:15:09 | 11:10:13 |
| | | **Dispatch** | **En Route** | **On Scene** | **Available** |
| **Second Alarm** | **E 20** | 9:52:09 | 9:52:49 | 9:52:50 | 11:22:33 |
| | **E 9** | 9:52:09 | 9:52:20 | 10:02:51 | 11:12:56 |
| | **E 35** | 9:52:09 | 9:53:27 | 9:58:22 | 11:09:10 |
| | **E 25** | 9:52:09 | 9:54:00 | 10:00:41 | 11:08:50 |
| | **E 28** | 9:52:09 | 9:53:32 | 10:01:31 | 10:12:35 |
| | **Bn 9** | 9:52:09 | 9:52:50 | 10:08:45 | 11:12:02 |
| | **Bn 11** | 9:52:09 | 9:55:00 | 10:10:00 | 11:07:15 |
| | **Bn 1** | 9:52:09 | 9:52:15 | 10:06:04 | 11:07:57 |
| | **L 10** | 9:52:24 | 9:53:26 | 9:59:03 | 11:20:38 |
| | **L 18** | 9:52:37 | 9:54:41 | 9:58:42 | 11:12:57 |
| | **Bn 10** | 9:52:37 | 9:52:42 | 10:02:37 | 14:38:54 |

## Chronological Fire Department Operations

| Source | Time of Day | Message |
|---|---|---|
| | | **8:51:00** |
| SFIRE | 8:51:43 | Radio: Box 7743 18TH & Dauphin Sts. fire reported 2220 N. Colorado St. Dwelling operate SF, ST2, E45, E13, E34, E59, L14, L12, B8, B3 M25. (2x) |
| | | **8:52:00** |
| CAD | 8:52:27 | E.59 & Bn.3 Enroute |
| CAD | 8:52:31 | Bn.8 Enroute |
| CAD | 8:52:34 | L.12 Enroute |
| CAD | 8:52:44 | L.14 Enroute |
| CAD | 8:52:48 | Engine 45 Enroute |
| SFIRE | 8:52:49 | B8: responding 2200 N. Colorado St. |
| CAD | 8:52:51 | Engine 13 Enroute |
| SFIRE | 8:52:57 | Radio: 2220 N. Colorado St, affirmative. |
| | | **8:53:00** |
| CAD | 8:53:03 | MISC: Also got 2240 N. Colorado -- Report of people inside |
| SFIRE | 8:53:06 | E45: E45, L14 responding 2220 N. Colorado St. |
| SFIRE | 8:53:15 | Radio: affirmative. |
| CAD | 8:53:20 | Engine 34 Enroute |
| CAD | 8:53:24 | MISC: OP122 (Police) states people are In the process of coming out- unknown where. |
| SFIRE | 8:53:41 | Radio: B8 report of people inside unknown location. |
| SFIRE | 8:53:47 | B8: affirmative. |
| SFIRE | 8:53:50 | E50: available from medic band put me on the Box. |
| SFIRE | 8:53:53 | Radio: E45 did you copy? |
| CAD | 8:53:56 | M.25 Enroute |
| SFIRE | 8:53:57 | E45: acknowledge report. |
| | | **8:54:00** |
| SFIRE | 8:54:00 | Radio: L14 did you copy? |
| SFIRE | 8:54:06 | L14: we got it. |
| CAD | 8:54:09 | Asst Engine 50 |
| SFIRE | 8:54:17 | Radio: E59 recall. (2x) E50 is available responding second in on Box 7743 18th/ Dauphin Sts. Fire reported 2220 N. Colorado St. operate SF Stac2. (2x) |
| CAD | 8:54:32 | Engine 45 On scene |
| CAD | 8:54:35 | Engine 50 Enroute |

| | | |
|---|---|---|
| **8:55:00** | | |
| SFIRE | 8:55:05 | E45: E45, L14 on location 2240 N. Colorado St, 2 story, 15 x 35 middle of the row dwelling, fire showing first floor Bravo / Delta same size and dimensions all occupied in service 2N2. |
| SFIRE | 8:55:37 | Radio: attention companies responding 2220 N. Colorado St. with the exception of E13 E34 proceed in go into service operate SF Stac2. (2x) |
| CAD | 8:55:42 | L.12 On scene |
| CAD | 8:55:47 | Bn.8 On scene |
| **8:56:00** | | |
| CAD | 8:56:05 | E.59 Available on Radio |
| STAC2 | 8:56:06 | Command raises L14-Officer, advises him that there is a report of someone inside. B8 then raises L12-Officer to no answer. |
| CAD | 8:56:21 | Assist L.3, M.31, ES9, SQ.72 |
| SFIRE | 8:56:29 | Radio: attention L3 respond as Rapid Intervention Team (R.I.T), M31, ES9, SQ72 on Box 7743 18th/ Dauphin Sts. Fire located 2220 N. Colorado St. operate SF Stac2. (2x) |
| STAC2 | 8:56:40 | Command raises Communications, Communications answers but transmission is interrupted by E45 -Pack instructing E45-DPOP to send the water. |
| STAC2 | 8:56:54 | Command reports to Communications, correct address of 2240 N Colorado St, heavy fire conditions on the first floor, placing 3n2 in service. Command then Raises E34-Officer. |
| **8:57:00** | | |
| STAC2 | 8:57:20 | E34-Officer answers Command. Command tells E34-Officer, when they arrive on location they are being put into service, bring inch & 3/4, take the D exposure. E34-Officer acknowledges. |
| CAD | 8:57:35 | M.31 Enroute |
| STAC2 | 8:57:38 | Command raises E13-Officer and asks his position. He responds, 3rd in. |
| SFIRE | 8:57:58 | M31: responding. |
| STAC2 | 8:57:59 | Command raises P50. P50-Officer responds and Command confirms that he is second in, P50 confirms he is second in and that they are positioning themselves. Command tells P50 that they are to stretch inch & 3/4, they are going to back-up E45 going into the front door. P50 acknowledges their orders |
| **8:58:00** | | |
| SFIRE | 8:58:11 | SQ72: responding. |
| CAD | 8:58:14 | ES9 Enroute |
| CAD | 8:58:19 | SQ.72 Enroute |
| SFIRE | 8:58:22 | B8 Aide: 3N2 in service, 2 story middle of the row occupied dwelling 15 x 35 heavy fire first floor, Bravo/ Delta same size and dimensions. |
| SFIRE | 8:58:42 | Radio: heavy fire first floor 3N2 in service, affirmative. Any report on occupants? |
| SFIRE | 8:58:48 | B8 Aide: negative. |

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| STAC2 | 8:58:49 | Command raises L12-Officer and tells him to go to the B exposure, do a search, and ventilate. L12-Officer acknowledges and reports, "in the rear *bad audio* smoke first and second floor. Command tells them to also get in the rear of the original fire dwelling and make sure it is ventilated and *unreadable*. L12-Officer states, they are back there *unreadable*. |
| SFIRE | 8:58:53 | SO1: available. |
| CAD | 8:58:55 | Engine 13 On scene |
| SFIRE | 8:58:59 | Radio: E13 3rd in, go into service. |
| **8:59:00** | | |
| SFIRE | 8:59:12 | L3: responding 2220 Colorado as R.I.T. |
| CAD | 8:59:15 | L.3 Enroute |
| CAD | 8:59:24 | Engine 34 On scene |
| STAC2 | 8:59:29 | L12 raises Command and tells him the original fire dwelling has smoke in the first and second floors and that they are in the B now. Command acknowledges. |
| **9:00:00** | | |
| STAC2 | 9:00:00 | Command raises E45-Officer. E45-Officer responds and states he is "going to bring out a". Command interrupts and tell E45-Officer to stand-by, then instructs Communications to have a medic unit report to the front of the fire building immediately with a stretcher. Communications acknowledges. |
| STAC2 | 9:00:22 | B3 raises command to report that he has fire extended in the breezeway, in the rear and he will need a line. Command acknowledges. |
| CAD | 9:00:22 | Assist FM.15 |
| SFIRE | 9:00:29 | B8 Aide: Medic report to front with equipment immediately. |
| STAC2 | 9:00:42 | Command raises Communications and asks for a rundown of the box and which medic unit is on location, which Communications provides. Command states that they need the medic unit "up here immediately". M25 acknowledges Command's message and states they are walking down now. |
| SFIRE | 9:00:45 | Radio: M25. |
| SFIRE | 9:00:51 | Radio: M31 I cannot raise M25 report to front of building. |
| **9:01:00** | | |
| SFIRE | 9:01:03 | M31: affirmative. |
| SFIRE | 9:01:08 | Radio: ES9 responding? |
| STAC2 | 9:01:24 | Command raises L14-Officer. No response from L14-Officer |
| STAC2 | 9:01:39 | E45-DPOP raises E45-Officer, Command says "standby" and then raises L14-Officer and requests a primary as soon as they can. Command then raises L12-Officer. |
| SFIRE | 9:01:55 | R1. |
| STAC2 | 9:01:58 | L12-Officer responds to Command. L14-Officer states a primary is on the way. Command then raises E45-Officer and requests a progress report on the interior. |
| **9:02:00** | | |
| SFIRE | 9:02:06 | R1: available responding 18th/ Dauphin Sts. |

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| CAD | 9:02:13 | Assist R.1 |
| SFIRE | 9:02:14 | Radio: SQ72 recall. |
| CAD | 9:02:24 | SQ.72 Available on Radio |
| SFIRE | 9:02:24 | SQ72: available. |
| STAC2 | 9:02:26 | E45-Officer reports, we have the first floor *unreadable*, *unreadable* second floor. Command states that he does have fire extension to the second floor. |
| SFIRE | 9:02:29 | Radio: M25. |
| CAD | 9:02:31 | R.1 Enroute |
| SFIRE | 9:02:49 | Radio: attention SQ72 recall (2x), R1 is available now responding on Box 7743 18th/ Dauphin Sts. fire located 2220 N. Colorado St. operate SF Stac2. |
| STAC2 | 9:02:51 | 50-Driver "*unreadable*". Command asks E45-Officer if he has extension to the second floor. E45 gives a short inaudible response that is cut-off. Command then advises E45-Officer that E50 is coming in the first floor behind him. |
| **9:03:00** | | |
| SFIRE | 9:03:05 | B8 Aide: request run down on Box. |
| SFIRE | 9:03:10 | Radio: affirmative. E34 Pack radio activated emergency button can we check them? |
| SFIRE | 9:03:19 | B8 Aide: affirmative. |
| STAC2 | 9:03:24 | E45-DPOP raises E45-Officer. E45-Pack raises E45-DPOP. E45-DPOP states he has a new hydrant, water is coming now. |
| SFIRE | 9:03:29 | Radio: B8 Aide ready to copy companies? |
| SFIRE | 9:03:34 | B8 Aide: affirmative. |
| SFIRE | 9:03:36 | Radio: okay, E45, E50, E13, E34, L14, L12, L3 R.I.T, yourself (B8), B3, M25, M31, ES9, R1 now available responding, SQ72 recalled. Affirmative? |
| STAC2 | 9:03:52 | From unknown source, "you have water coming right now". |
| STAC2 | 9:03:57 | Command raises E34-Officer and tells him he has an emergency activation and asks if he is declaring an emergency? |
| **9:04:00** | | |
| SFIRE | 9:04:07 | B8 Aide: affirmative, medic responding report to front of building. |
| SFIRE | 9:04:12 | Radio: affirmative. Gave M31 message, unable to raise M25. |
| STAC2 | 9:04:16 | E45-Pack raises E45-DPOP. Unknown source tells E50-Driver to send the water; E50-Driver responds that it's coming. From unknown source, "45-Officer, you have the water?" |
| CAD | 9:04:19 | L.3 On scene |
| SFIRE | 9:04:24 | B8 Aide: affirmative a squad pulled up. |
| STAC2 | 9:04:44 | Command raises E34-Officer. E34-Officer responds, negative to the emergency activation and that they reset. Command asks E34-Officer their location. E34-Officer responds, coming down *unreadable*, setup on D. |
| **9:05:00** | | |

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| STAC2 | 9:05:06 | Command raises E45-Officer and tells him that he has fire conditions on the second floor, he has E50 coming in behind them on the first floor and that he needs them to try to make the second floor. E45-Officer acknowledges and advises command that they are having trouble making the stairs around the debris inside. |
| STAC2 | 9:05:31 | E13 raises Command and states they are *unreadable* down the rear, if he wants them to reposition in the front. Command responds, negative he can use them in the rear. |
| SFIRE | 9:05:44 | B8 Aide: E34 Pack Radio accidental activation resetting. |
| STAC2 | 9:05:47 | Command raises C Division and informs him that he has E13 stretching a line down the rear. C Division informs command that if E13 could go into the C exposure first floor and come out the back, it would be better. Command responds, "affirmative, we can do that." |
| SFIRE | 9:05:48 | Radio: affirmative, E34 Pack Radio was accidental and resetting. |
| CAD | 9:05:48 | M.31 On scene |
| **9:06:00** | | |
| SFIRE | 9:06:08 | M31: on scene 17th/ Susquehanna. |
| STAC2 | 9:06:09 | E45-Officer raises E45-DPOP. |
| STAC2 | 9:06:20 | E34-Officer tells E34-DPOP to send the water. |
| SFIRE | 9:06:23 | Radio: affirmative. Chief wants you to respond to front of building. |
| STAC2 | 9:06:28 | Command raises E13-Officer. |
| SFIRE | 9:06:31 | M31: affirmative. |
| SFIRE | 9:06:33 | Radio: okay. |
| CAD | 9:06:34 | ES.9 on scene |
| STAC2 | 9:06:37 | E50-driver tells E50-Officer that he has a bad hydrant. |
| STAC2 | 9:06:47 | ES9 announces he is on location. |
| SFIRE | 9:06:56 | B8 Aide: progress report, All Hands in service, Heavy fire first & second floors. |
| STAC2 | 9:06:58 | Command raises E45-Officer. |
| **9:07:00** | | |
| SFIRE | 9:07:12 | Radio: can you confirm address of fire. |
| STAC2 | 9:07:15 | *unreadable* |
| SFIRE | 9:07:19 | B8 Aide: make address of fire 2240 N. Colorado St. |
| STAC2 | 9:07:23 | Command raises E45-Officer. |
| SFIRE | 9:07:23 | Radio: be advised police are giving us information that someone inside of 2242 N. Colorado St cannot get out of the property. |
| SFIRE | 9:07:34 | B8 Aide: affirmative checking. |
| STAC2 | 9:07:37 | Communications raises Command and tells him that FCC is reporting someone can't get out the house at 2242. Command acknowledges and states he will send someone right now. |
| SFIRE | 9:07:40 | SQ72: responding. |
| CAD | 9:07:44 | Assist SQ.72, D.2, SO.1, ES.1 |

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| SFIRE | 9:07:56 | Radio: attention SQ72, D2, SO1, ES1, ES3 respond on Box 7743 18th/ Dauphin Sts. fire located 2240 N. Colorado St. operate SF Stac2. (2x) |
| STAC2 | 9:07:57 | Command announces "Command to all companies operating on Colorado St I need you to exit the building we are going switch to a defensive attack, all companies operating on Colorado exit the building we are switching to a defensive attack. |
| **9:08:00** | | |
| CAD | 9:08:06 | Assist ES.3 |
| STAC2 | 9:08:21 | Command raises C Division and tells him to "pull everybody out of the building and get a PAR, we're going to re-group and we'll go back inside, affirmative." |
| STAC2 | 9:08:38 | C Division acknowledges and state he can give Command PAR now, "I have L12 here in the rear with me, they evacuated the building. I'm still waiting for that hoseline to come to the rear." |
| CAD | 9:08:40 | SQ.72 Enroute |
| SFIRE | 9:08:47 | B8 Aide: exterior attack, doing Personnel Accountability Report (PAR). |
| STAC2 | 9:08:52 | Command announces, "Command to E45-Officer I need you to exit the building, bring all your members outside, standby for a PAR. Command to E50-Officer I need you to back your line out, standby for a PAR." |
| **9:09:00** | | |
| SFIRE | 9:09:02 | SO1. |
| SFIRE | 9:09:04 | Radio: B8 Aide, repeat the last part of message, doing exterior attack and what else? |
| STAC2 | 9:09:05 | *Unknown Company* acknowledges Command with an "affirmative". |
| CAD | 9:09:05 | SO.1 Enroute |
| STAC2 | 9:09:08 | Command announces, "Command to E34-Officer make sure you back your company out, standby for a PAR." |
| SFIRE | 9:09:19 | B8 Aide: switching to exterior attack, doing PAR. |
| STAC2 | 9:09:21 | E50-Driver raises E50-Officer and tells him he has a second bad hydrant. Then *unreadable* |
| STAC2 | 9:09:42 | Command Raises E45-Officer. E45-Officer informs Command they have PAR outside of the structure. |
| STAC2 | 9:09:52 | Command raises E50-Officer and asks if he has PAR. E50-Officer responds, "making my way out front now Chief." Command asks E50 to repeat. |
| **9:10:00** | | |
| SFIRE | 9:10:10 | ES1: responding 18th/ Dauphin. |
| STAC2 | 9:10:11 | Command raises E13-Officer and asks if he has PAR. E13-Officer responds, "13, we have PAR." Command raises L14-Officer and asks, "all members accounted for." |
| CAD | 9:10:12 | ES.1 Enroute |
| SFIRE | 9:10:16 | Radio: affirmative, attempts to raise ES3 and Deputy 2. |
| SFIRE | 9:10:26 | ES3: responding 18th/ Dauphin. |

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| STAC2 | 9:10:29 | L14-Officer announces to all members of L14 that he "needs them to check-in face to face out front." |
| CAD | 9:10:34 | ES.3 Enroute |
| SFIRE | 9:10:37 | SO1. |
| STAC2 | 9:10:39 | E34-Officer tells E34-Pump that they lost pressure. |
| STAC2 | 9:10:45 | Command raises L12-Officer and asks if he has all members accounted for. L12-Officer responds, affirmative *unreadable*, Command acknowledges. |
| SFIRE | 9:10:46 | SO1: responding 2240 N. Colorado St. |
| STAC2 | 9:10:54 | Command raises Communications and gives the report of, "be advised we have transitioned to a defensive attack, all companies are out of the building, all members are accounted for." Communications acknowledges the report. |
| SFIRE | 9:10:58 | Radio: affirmative. |
| **9:11:00** | | |
| SFIRE | 9:11:04 | VC1: on scene. |
| SFIRE | 9:11:11 | Radio: okay. |
| STAC2 | 9:11:23 | L14-Roof raises L14-Officer and gives an *unreadable* report. L14-Officer asks L14-Roof, "do you have both your guys up there yes or no." L14-Roof responds, "both accounted for." L14-Officer acknowledges. |
| SFIRE | 9:11:36 | B8 Aide: All Hands, exterior attack, all members accounted for. |
| STAC2 | 9:11:50 | L14-Officer raises B8 and to inform him that L14 has PAR, Command acknowledges. |
| SFIRE | 9:11:51 | Radio: affirmative all members accounted for. Be advised elapsed time is 20 minutes. |
| **9:12:00** | | |
| STAC2 | 9:12:03 | Command raises L12-Officer and tells him that, "I have to make sure we get into D exposure to make sure there is no fire extension and to make sure you get a primary in there." |
| STAC2 | 9:12:35 | SQ72-Driver raises E50-Driver |
| STAC2 | 9:12:52 | L14-Roof raises L14-Officer advises him that the fire is *unreadable* directly on the wires in the rear. L14-officer acknowledges. |
| SFIRE | 9:12:56 | B8 Aide: dispatch another medic unit ALS or BLS in addition to M25 & M31. |
| **9:13:00** | | |
| SFIRE | 9:13:06 | Radio: affirmative. M36 will be dispatched. Deputy 2. |
| CAD | 9:13:06 | Assist M.36 |
| STAC2 | 9:13:19 | Command raises C Division and asks for nature and conditions. C Division reports he is in the rear with E13 and L12, they are still waiting on water, fire extending to D on the exposure right now, he needs an emergency response from PECO - he has arcing wires. Command acknowledges. |
| SFIRE | 9:13:20 | Radio: attention M36 respond on Box 7743 18th/ Dauphin Sts. Fire located 2240 N. Colorado St operate SF Stac2. (2x) |
| SFIRE | 9:13:49 | FM13: responding 2224 N. Colorado St. |

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| STAC2 | 9:13:50 | Command raises Communications. Communications acknowledges the request for PECO. |
| STAC2 | 9:13:58 | Command requests 2 additional engines from Communications. |
| **9:14:00** | | |
| STAC2 | 9:14:05 | SQ72-Driver raises E50-Driver and asks if they are using the hydrant at 17th & Dauphin, if not they are going to take it for E45. E50-Driver asks, "what hydrant?" |
| CAD | 9:14:09 | Assist FM.13 |
| SFIRE | 9:14:11 | B8 Aide: dispatch 2 additional engines and PECO for arcing wires in the rear. |
| SFIRE | 9:14:23 | Radio: confirming special call for 2 engines affirmative. |
| STAC2 | 9:14:25 | ES9 raises M31. |
| STAC2 | 9:14:33 | Command raises C Division and advises him that he has E34 back on the first floor, 2 additional engine companies on the way and that they are having water problems in the front as well. |
| SFIRE | 9:14:34 | M36: responding 18th/ Dauphin. |
| CAD | 9:14:36 | M.36 Enroute |
| CAD | 9:14:48 | Assist E.59, E.29 |
| STAC2 | 9:14:54 | C Division acknowledges and tells Command he can help him out as soon as he can get water. |
| **9:15:00** | | |
| STAC2 | 9:15:02 | L12-Pack raises Command |
| SFIRE | 9:15:02 | Radio: attention E59 E29 respond special call on Box 7743 18th/ Dauphin Sts. Fire located 2240 N. Colorado St operate SF Stac2. (2x) |
| STAC2 | 9:15:11 | E50-Officer raises E50-Driver and tells him that he needs water. E50-Driver responds that he's still working on getting a hydrant that works. He has two down and is trying a third one. |
| STAC2 | 9:15:25 | E13-Officer raises E13-DPOP and tells him to send the water. |
| CAD | 9:15:27 | E.59 Enroute |
| SFIRE | 9:15:39 | Radio: attempts to raise Deputy 2. (2x) |
| STAC2 | 9:15:40 | Command raises Communications and tells him that when the additional engines get on location, he will need the first in company to assist E50 with securing the water supply. |
| CAD | 9:15:56 | E.29 Enroute |
| STAC2 | 9:15:58 | E13-TIP Firefighter |
| **9:16:00** | | |
| STAC2 | 9:16:02 | L14-Roof raises L14-Officer |
| STAC2 | 9:16:06 | Communications acknowledges Command's orders and tells him that E59 and E29 were dispatched. |
| STAC2 | 9:16:11 | M25 |
| SFIRE | 9:16:11 | ES9: unable to get through on Tac channel, requesting EMS tac channel and 2 additional medic units. |
| STAC2 | 9:16:15 | E13-TIP Firefighter, we're ready for the water, "leaving shortly". |
| STAC2 | 9:16:25 | L13-Roof, go ahead with your message. |

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| CAD | 9:16:30 | Assist M.34, M.44 |
| STAC2 | 9:16:31 | E45-DPOP raises *unreadable* DPOP and tells him to send the water. |
| STAC2 | 9:16:37 | *unreadable* |
| SFIRE | 9:16:37 | B8 Aide: Orders for E59 are to assist E50 with water supply. |
| CAD | 9:16:45 | R.1 On scene |
| STAC2 | 9:16:49 | Command raises C Division and tells him that he has E34 is coming through the D exposure with a charged hoseline to the rear, and he has E45 operating in the front with a hoseline. C division acknowledges and says he will wait for E34 to come through the D |
| SFIRE | 9:16:56 | Radio: E59 to assist E50 affirmative. Informing M34, M44 requesting per ES9. Affirmative? |
| **9:17:00** | | |
| CAD | 9:17:02 | M.34 Enroute |
| SFIRE | 9:17:09 | B8 Aide: M34 M44 affirmative. |
| SFIRE | 9:17:12 | Radio: affirmative ES9 requesting 2 additional medic units. |
| SFIRE | 9:17:17 | Radio: attention M34 M44 respond on Box 7743 18th/ Dauphin Sts. Fire located 2220 N. Colorado St operate SF Stac2. (2x) |
| STAC2 | 9:17:20 | R1 raises Command and tells him they are on the fire ground and can they help. Command tells them to report to the front with their tools and members. |
| STAC2 | 9:17:43 | E45-DPOP raises E45-Command and tells him that he has "good water", E45-Officer acknowledges. |
| CAD | 9:17:46 | M.44 Enroute |
| STAC2 | 9:17:57 | M25 raises Communications and requests an ES Officer, they are parked at 18th & Dauphin Sts. |
| SFIRE | 9:17:59 | Radio: attention E55 cover E45, E20 cover E50, L8 cover L14, L10 cover L3. (2x) |
| **9:18:00** | | |
| STAC2 | 9:18:12 | Communications raises ES9 |
| STAC2 | 9:18:20 | E13-Officer raises E13-TIP Firefighter |
| STAC2 | 9:18:26 | 13-Pump |
| STAC2 | 9:18:30 | 13-Pump, I got the water. "Affirmative." |
| STAC2 | 9:18:35 | E13-Officer raises E13-TIP Firefighter. E13-Pump answers. E13-Officer raises E13-TIP Firefighter and tells him the water is coming. |
| SFIRE | 9:18:50 | M44: responding 2220 N. Colorado St. |
| STAC2 | 9:18:57 | L12 raises Command |
| SFIRE | 9:18:58 | Radio: affirmative. |
| STAC2 | 9:18:59 | *unreadable* |
| **9:19:00** | | |
| SFIRE | 9:19:02 | M34: responding 2220 N. Colorado St. |
| STAC2 | 9:19:03 | Command acknowledges L12. L12 reports that the primary in D is negative and there doesn't appear to be any fire extension *unreadable*, Command acknowledges. |
| SFIRE | 9:19:14 | Radio: E59 Orders are to assist E50 with water supply. |

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| STAC2 | 9:19:23 | Command raises E50-Officer and asks how the first floor looks. E50-Officer reports that they have a lot of trash inside *unreadable*. Command acknowledges. |
| STAC2 | 9:19:43 | Command asks E50-Officer, what the fire conditions of the first floor are. |
| STAC2 | 9:19:53 | Communications raises M25 and tells him to switch over to South-Tac3, which will be the EMS Tac Channel for the assignment. |
| **9:20:00** | | |
| STAC2 | 9:20:10 | Command raises C Division |
| STAC2 | 9:20:22 | *Unreadable* first floor rear, shut your line down. |
| SFIRE | 9:20:22 | B8 Aide: ES9 utilizing Stac3 as EMS channel. |
| STAC2 | 9:20:30 | Command raises C Division and asks how they look in the rear. C division says, "We're looking pretty good right now, I have E13 and E34 here now and we've knocked down the fire impinging in the D and working on the first floor now." Command acknowledges and says he has E50 on the first floor. |
| SFIRE | 9:20:36 | Radio: M34, M44 utilize Stac3 talk to ES9. |
| SFIRE | 9:20:48 | M34: switching to Stac3. |
| SFIRE | 9:20:58 | E20: en route to cover E50. |
| **9:21:00** | | |
| STAC2 | 9:21:11 | L14-Roof raises L14-Officer and tells him there is still fire showing in the breezeway, second floor. L14-Officer asks if it's extending. L14-Roof says it's hard to tell, that it is in the common space between the two units. |
| SFIRE | 9:21:29 | Radio: Attentions Q9 cover E34. (2x) |
| STAC2 | 9:21:55 | E50 raises E45-Officer and delivers an *unreadable* message. E45-Officer responds, "need more line?" |
| **9:22:00** | | |
| STAC2 | 9:22:21 | Command raises C Division and tells asks him if he has two line in the rear? C Division tells him, "affirmative", and that he has a "serious electrical problem back here". Command acknowledges. |
| SFIRE | 9:22:28 | Radio: attempts to raise Deputy 2. (2x) |
| STAC2 | 9:22:43 | E13-Officer raises E13-Pump |
| STAC2 | 9:22:58 | E13 raises E13-DPOP and tells him to increase the pressure. E13-DPOP acknowledges. |
| **9:23:00** | | |
| SFIRE | 9:23:00 | ES1: on the fire ground. |
| CAD | 9:23:08 | ES.1 On scene |
| SFIRE | 9:23:09 | VC1. |
| SFIRE | 9:23:39 | B8 Aide: (2ND request) PECO emergency response arcing wires in the rear. |
| SFIRE | 9:23:50 | Radio: okay. B8 Aide be advised police have female in distress at 2246 N. Colorado St. |
| STAC2 | 9:23:58 | L14-Officer raises B3 and asks "is possible the companies in the rear can hit that fire blowing out the second floor rear, it's going to be extended soon?" |
| **9:24:00** | | |

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| SFIRE | 9:24:06 | B8 Aide: okay. |
| SFIRE | 9:24:15 | Radio: E55. |
| STAC2 | 9:24:20 | B3 responds, "E34 is in the process of knocking that down right now." |
| STAC2 | 9:24:26 | Communications raises and informs Command that FCC is reporting at 2246 that police have a female in distress and asks if Command wants EMS notified on South-Tac3. |
| SFIRE | 9:24:43 | Radio: Attentions E55 cover E45. (2x) |
| STAC2 | 9:24:54 | Command raises ES9 and asks he can check on it. |
| **9:25:00** | | |
| STAC2 | 9:25:07 | Command raises ES9. |
| STAC2 | 9:25:12 | Communications informs Command that he'll raise them on South-Tac3 because they're Tac3 using it as their own band. Command asks Communications if he can communicate with them on the band. Communication acknowledges, "affirmative". |
| STAC2 | 9:25:27 | Command raises E50-Officer and asks how he's making out on the first floor. E50-Officer tells him that E45 has the line right now and that he's on his way to change his cylinders and that E45 has the line and positive water supply. Command acknowledges. |
| SFIRE | 9:25:52 | Radio: E55, E9. |
| STAC2 | 9:25:56 | Command raises E45-Officer and asks for a progress report on the first floor. |
| **9:26:00** | | |
| SFIRE | 9:26:22 | L10: available as L10 - 3. |
| STAC2 | 9:26:23 | E50-Driver raises E50-Officer |
| STAC2 | 9:26:30 | E45-Officer raises Command and gives an unreadable report. Command asks him to repeat it because it was unreadable. |
| SFIRE | 9:26:44 | Radio: affirmative. |
| STAC2 | 9:26:55 | E45 reports, "we have our lines on the first floor, a lot of debris inside the dwelling, making an attempt to make the second floor." |
| **9:27:00** | | |
| STAC2 | 9:27:07 | Command asks E45-Officer if he's attempting to make the second floor. E45 responds, "*unreadable* attempting to make the second floor now." Command acknowledges. |
| SFIRE | 9:27:09 | SA10: responding 18th/ Dauphin. |
| CAD | 9:27:15 | Assist SA10 |
| SFIRE | 9:27:17 | Radio: affirmative. |
| STAC2 | 9:27:24 | Command raises C Division. |
| STAC2 | 9:27:41 | Command raises C Division and tells him to get one of his lines that are operating in the rear to go into the first floor to back E45 while they make the second. |
| **9:28:00** | | |

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| STAC2 | 9:28:00 | C Division informs Command that he's not going to be able to do that because E13 doesn't have water and that E34 is the only company he has water in rear and there's a serious impingement on the exposure. Command acknowledges. |
| STAC2 | 9:28:17 | E13 raises E13-Pack and asks his location. E13-Pack responds, "*unreadable* we're putting it back together now." |
| STAC2 | 9:28:43 | L14-Officer asks L14-Roof how it is looking now. L14-Roof reports that the fire has been knocked down and the vent holes are doing its job. L14-Officer acknowledges. |
| **9:29:00** | | |
| STAC2 | 9:29:09 | Command raises E50-Officer and advises him that they are charging a line right now and that he should be good to go. |
| CAD | 9:29:24 | M.34 On scene |
| STAC2 | 9:29:27 | Command raises E45-Officer and advises him that E50 has water and are coming in behind him. E45-Officer acknowledges. |
| SFIRE | 9:29:50 | ES3: on the fire ground. |
| SFIRE | 9:29:55 | Radio: affirmative. |
| CAD | 9:29:56 | ES.3 On scene |
| **9:30:00** | | |
| CAD | 9:30:02 | M.44 On scene |
| STAC2 | 9:30:12 | E50-Driver tells E50-Officer that he has water. E50-Officer acknowledges. |
| STAC2 | 9:30:27 | Rescue-Roof raises Rescue-Search |
| STAC2 | 9:30:33 | Command raises C Division and tells him, "that company that you having water problems in the rear, I got a 3inch *unreadable* in the front, they make their way through the front *unreadable* dwelling, they can connect out here." C Division acknowledges and tells him it will be E13. |
| STAC2 | 9:30:57 | E13-Officer raises E13-Pack. E13-Pack tells E13-Officer, "13-Pack, it's ready to come now." E13-Officer tells him they have a charged 3 inch in the front of the fire dwelling if he needs it. E13-Pack responds that they're ready. E13-Officer acknowledges. |
| **9:31:00** | | |
| SFIRE | 9:31:18 | SO1: on the fire ground. |
| STAC2 | 9:31:24 | Command raises E45-Officer |
| SFIRE | 9:31:24 | Radio: okay. |
| STAC2 | 9:31:31 | Rescue-Roof raises Rescue-Search. Rescue-Officer responds. Rescue-Roof asks if "*unreadable* second floor yet?" Rescue-Officer answers that E50 is headed up now. Rescue-Roof acknowledges. |
| STAC2 | 9:31:49 | Command raises E45-Officer and tells him that he needs him to hold the first floor, he has E50 *unreadable* the second. |
| **9:32:00** | | |
| STAC2 | 9:32:10 | *Unreadable* transmission |

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| STAC2 | 9:32:18 | Rescue-1 raises Command and tells him they are going to need a line in the second floor front bedroom. Command asks if that's the B. Rescue-1 acknowledges that it's B second floor front bedroom. |
| STAC2 | 9:32:36 | Command raises E13-Officer and tells him that he has a water *unreadable* on the A division and he needs him to take his line to the B exposure. E13-Officer acknowledges. |
| **9:33:00** | | |
| SFIRE | 9:33:09 | VC1. |
| STAC2 | 9:33:16 | E13 raises E13-Pack and says, "Hey Will, shut us down at the gate so we can move over to the B. |
| SFIRE | 9:33:16 | Radio: VC1. |
| SFIRE | 9:33:27 | Radio: VC1 proceed. |
| SFIRE | 9:33:30 | VC1: responding 2220 N. Colorado St. |
| STAC2 | 9:33:33 | Command announces, "Command to all companies exit the building. Command to all companies operating on Colorado St exit the building, were going to defensive attack." |
| SFIRE | 9:33:34 | Radio: okay. |
| SFIRE | 9:33:42 | E2: available as E2 - 10. |
| STAC2 | 9:33:47 | Command announces, "Command to all companies exit the building, we're switching to a defensive attack. Standby for a PAR." |
| CAD | 9:33:49 | Assist VC1 |
| SFIRE | 9:33:54 | Radio: affirmative. |
| STAC2 | 9:33:55 | E13 to *message cut-off*" |
| SFIRE | 9:33:57 | SA10: on fire ground setup Gratz/ Dauphin Sts. |
| **9:34:00** | | |
| STAC2 | 9:34:00 | From an unknown company, "Timmy! Timmy get down here now!" |
| SFIRE | 9:34:06 | Radio: Gratz/ Dauphin Sts. Affirmative. |
| SFIRE | 9:34:08 | Radio: B8 Aide E50 Officer activated emergency button Stac2, are they declaring an emergency? |
| STAC2 | 9:34:10 | Unreadable transmission. |
| STAC2 | 9:34:13 | Unreadable transmission. |
| STAC2 | 9:34:20 | From an unknown company, "*unreadable name*, Timmy, get down here!" |
| STAC2 | 9:34:24 | Command raises Communications and tells him, "Have FCC sound the emergency evacuation signal." Communications acknowledges. |
| SFIRE | 9:34:24 | B8 Aide: affirmative. |
| STAC2 | 9:34:33 | Communications informs Command that there is an emergency activation signal coming from E50-Pack on South-Tac2. |
| STAC2 | 9:34:41 | Command Raises E50-Officer. |
| SFIRE | 9:34:45 | B8 Aide: Orders of B8 sound emergency evacuation. |
| STAC2 | 9:34:46 | MAYDAY, MAYDAY, MAYDAY, E50-Officer! I got a, I can't find L12-Pack, we're on the second floor! |

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| STAC2 | 9:34:56 | Command says, "alright repeat your uh, who's calling a MAYDAY, where you at?" |
| **9:35:00** | | |
| SFIRE | 9:35:00 | Radio: E50 officer. |
| STAC2 | 9:35:05 | MAYDAY, MAYDAY, MAYDAY, E50-Officer I'm stuck on the stairwell, I do not have a location of L12-Pack! |
| SFIRE | 9:35:05 | B8 Aide: affirmative pulling him out now. |
| SFIRE | 9:35:07 | Radio: By Orders of Incident Commander, attention companies operating on Box 7743 18th/ Dauphin Sts. By Orders of B8 there's an Emergency Evacuation. Repeating By Orders of Incident Commander B8 there's an Emergency Evacuation on Box 7743 18th/ Dauphin Sts. |
| STAC2 | 9:35:16 | Command asks E50-Officer, "E50-Officer, you're declaring a MAYDAY, what is your location?" E50-Officer responds with a cut-off message, "MAYDAY" |
| STAC2 | 9:35:24 | L12-Pack announces, "L12-Pack I'm out in the rear, I made it out." |
| STAC2 | 9:35:34 | Command raises E50-Officer. E50-Officer responds, "I'm resetting." |
| STAC2 | 9:35:43 | C Division raises command and tells him that he has accountability for E50-Pack and that he's being taken to the front. |
| **9:36:00** | | |
| STAC2 | 9:36:08 | Command announces, "All companies on Colorado, standby for a PAR." |
| STAC2 | 9:36:17 | Communications raises Command and asks if they pulled "our guy out"? Command tells him, "affirmative, we're conducting a PAR right now but preliminarily, we have all our guys accounted for." |
| CAD | 9:36:22 | Assist Bn.4, E.55, L.8, M.13, M.15 |
| SFIRE | 9:36:34 | Emergency Evacuation tone sounded. |
| CAD | 9:36:39 | B.4 Enroute |
| STAC2 | 9:36:44 | Command raises E45-Officer |
| SFIRE | 9:36:44 | Radio: attention E55, L8, M13, M15, B4, Q43 to E13 pickup AU1 respond on Mayday on Box 7743 18th/ Dauphin Sts. Fire located 2240 N. Colorado St. (2x) |
| STAC2 | 9:36:54 | 72 to [E72 Firefighter]. |
| STAC2 | 9:36:58 | Go for [E72 Firefighter] - "Where you at, Buddy?" - "Myself and *unreadable* are on the roof accounted for, everybody is clear up here." "Affirmative." |
| **9:37:00** | | |
| CAD | 9:37:02 | Assist Q.43, AU.1 |
| STAC2 | 9:37:10 | Command announces, "Command to all companies standby unless you have a priority." |
| STAC2 | 9:37:14 | Command raises E45-Officer |
| STAC2 | 9:37:28 | Command raises E45-Officer |
| CAD | 9:37:41 | M.13 Enroute |
| SFIRE | 9:37:47 | M15. |
| SFIRE | 9:37:52 | Radio: B8 Aide, dispatched Mayday response, inquiring do you need emergency activation button sounded again? |

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| STAC2 | 9:37:53 | Communications raises Command and asks about PAR. Command tells him to standby, they are still looking for E45-Officer. |
| **9:38:00** | | |
| STAC2 | 9:38:09 | Command raises E45-Officer |
| SFIRE | 9:38:11 | B8 Aide: affirmative still doing PAR. |
| SFIRE | 9:38:16 | Radio: okay still doing PAR. |
| STAC2 | 9:38:17 | C Division raises Command and tells him he has PAR in the rear with E34 and E13. Command acknowledges. |
| SFIRE | 9:38:22 | L8 - 14. |
| SFIRE | 9:38:32 | B8 Aide. |
| SFIRE | 9:38:32 | Radio: attention all companies operating on Box 7743 18th/ Dauphin Sts. By Orders of Incident Commander Urgent Emergency Evacuation. (2x) |
| CAD | 9:38:56 | M.15 Enroute |
| **9:39:00** | | |
| SFIRE | 9:39:13 | Command: Communications. |
| SFIRE | 9:39:15 | Communications. |
| SFIRE | 9:39:18 | Command: standby. |
| STAC2 | 9:39:24 | E13-Command raises E13-Pump |
| STAC2 | 9:39:29 | Command raises C Division |
| STAC2 | 9:39:43 | Command raises E50-Officer |
| SFIRE | 9:39:43 | B8 Aide: E50's member out. |
| SFIRE | 9:39:51 | Radio: B8 Aide, do you want to continue emergency evacuation signal to be sure? |
| STAC2 | 9:39:55 | Command raises E50-Officer and asks if he has all his members accounted for. E50s Officer states E50 is accounted for. |
| **9:40:00** | | |
| SFIRE | 9:40:00 | B8 Aide: standby. |
| STAC2 | 9:40:08 | Command raises L12-Officer and asks if he has all his members accounted for. He states that he has PAR. |
| SFIRE | 9:40:09 | Radio: E55 responding? |
| SFIRE | 9:40:17 | E55: on scene 23rd/ Gratz Sts. In the rear of Second Alarmers. |
| STAC2 | 9:40:21 | Command raises L14-Officer. |
| SFIRE | 9:40:26 | Radio: okay, in the rear of Second Alarmers, have you. |
| SFIRE | 9:40:30 | Radio: L8. |
| SFIRE | 9:40:33 | L8: responding, at Front/ Dauphin Sts. |
| SFIRE | 9:40:35 | Radio: M13, M15. |
| STAC2 | 9:40:36 | Command raises L14-Officer and asks if he has all his personnel accounted for. He responds that he has all his personnel accounted for. |
| CAD | 9:40:41 | L.8 Enroute |
| SFIRE | 9:40:43 | M13: responding 2200 N. Colorado St. |
| SFIRE | 9:40:47 | Radio: operate on Stac3 with ES9. M15. |

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| STAC2 | 9:40:51 | Command raises SQ72-Officer |
| SFIRE | 9:40:53 | M15: responding. |
| SFIRE | 9:40:59 | Radio: affirmative, operate Stac3. |
| **9:41:00** | | |
| STAC2 | 9:41:08 | E55 raises Command and tells him they have arrived on the fire ground and set-up in the rear of the Second Alarmers at Dauphin & Gratz. Command tell him he needs him at front of the fire dwelling with his personnel. E55 acknowledges. |
| STAC2 | 9:41:35 | From unknown company, "E13-Pump send that water back." E13-DPOP responds and is told again to send the water back. |
| STAC2 | 9:41:47 | C raises Command and asks if they have confirmation on E45's Officer. Command tells him to, "stand by, we're working on it." |
| SFIRE | 9:41:59 | Q43: en route E13 pickup AU1. |
| **9:42:00** | | |
| CAD | 9:42:02 | Q.43, AU.1 Enroute |
| SFIRE | 9:42:03 | Radio: affirmative. |
| SFIRE | 9:42:10 | Car1: responding. |
| SFIRE | 9:42:12 | Radio: Car1 affirmative. |
| CAD | 9:42:13 | Assist CAR.1 |
| SFIRE | 9:42:13 | Radio: stand by all officers and members for the following message, attention all companies, fire companies that normally operate on the South Fire Band will switch to and operate on the North Fire Band with the exception of fire companies operating on Box 7743 18th/ Dauphin Sts. who will remain and operate on the South Fire Band. (2x) |
| **9:43:00** | | |
| SFIRE | 9:43:09 | SQ72: to companies operate in the rear. |
| CAD | 9:43:14 | D.2 Enroute |
| STAC2 | 9:43:15 | From an unknown company, "Go Mike." |
| STAC2 | 9:43:31 | Command raises E55-Officer |
| CAD | 9:43:50 | M.13 On scene |
| CAD | 9:43:57 | Bn.4 On scene |
| **9:44:00** | | |
| STAC2 | 9:44:04 | E59. |
| STAC2 | 9:44:13 | E59-Officer raises E59-Driver |
| STAC2 | 9:44:24 | E59-Officer raises E59-TIP Firefighter. E59-TIP Firefighter responds. |
| SFIRE | 9:44:24 | Radio: B7 Aide Orders of PN1 recall PN10 have them respond to 2240 N. Colorado St. |
| STAC2 | 9:44:36 | From an unknown company, "*unreadable* shut it down *unreadable*." |
| SFIRE | 9:44:36 | B7 Aide: affirmative. |
| STAC2 | 9:44:45 | Command raises C Division and asks him if they can place the line in the rear to the second floor from his location? C Division tells Command, "that's negative, the original fire building, the rear kitchen floor is very unstable and have a partial collapse and extension in the rear". |

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| SFIRE | 9:44:45 | Radio: emergency activation button for L3 Driver on Stac2. |
| SFIRE | 9:44:51 | B7 Aide: affirmative. |
| **9:45:00** | | |
| STAC2 | 9:45:17 | Communications raises Command and tells him, "emergency evac from L3-Driver". Command acknowledges. |
| STAC2 | 9:45:38 | L3-Driver states he is resetting. |
| STAC2 | 9:45:45 | Command raises Communications and tells him L3-Driver is accidental and resetting, Communications acknowledges. |
| SFIRE | 9:45:51 | Radio: E71 cover E13, E9 cover E34. (2x) |
| STAC2 | 9:45:53 | E59-Pump raises E59-Officer. |
| **9:46:00** | | |
| STAC2 | 9:46:06 | Command raises E55-Officer and tells him that he needs his line in the front of the fire building. |
| SFIRE | 9:46:08 | B8 Aide: L3 Driver accidental activation of emergency button, resetting. |
| SFIRE | 9:46:22 | B7 Aide: PN10 notified and responding. |
| SFIRE | 9:46:28 | Radio: affirmative making them available putting them on other assignment. |
| STAC2 | 9:46:32 | Command raise E55-Officer and asks if he read the message and says, "I need you in the front of the fire building immediately with a line". E55-Officer acknowledges |
| SFIRE | 9:46:35 | M36: en route Hahnemann Hospital C3 with 1 patient not involved in fire dwelling. |
| SFIRE | 9:46:48 | Radio: okay C3 Hahnemann Hospital with patient not involved in fire dwelling. Affirmative, call in with patient information. |
| CAD | 9:46:58 | M.36 Enroute to Hahn, Class 3 with a patient not involved in the fire dwelling |
| STAC2 | 9:46:58 | E59-Officer raises E59-TIP Firefighter. |
| **9:47:00** | | |
| STAC2 | 9:47:04 | SQ72-Roof raises Command and reports, "we have a partial roof collapse in the rear, if you have anybody in there pull them out." Command acknowledges. |
| SFIRE | 9:47:14 | E41: affirmative. |
| SFIRE | 9:47:16 | VC1: on the fire ground. |
| STAC2 | 9:47:24 | E59-Pump |
| SFIRE | 9:47:26 | Radio: okay. |
| STAC2 | 9:47:27 | *open mic* |
| SFIRE | 9:47:29 | Car1: on the fire ground, have OEM dispatch CP1. |
| STAC2 | 9:47:35 | L14-Officer raises L14-Roof and says, "get off the roof now, get off the roof now." L14-Roof acknowledges. |
| CAD | 9:47:44 | CAR.1 on scene |
| SFIRE | 9:47:45 | Radio: affirmative Car1 OEM notified. |
| STAC2 | 9:47:48 | Command raises Communications and reports, "alright we have right now all companies out of the building, we do have one member unaccounted for, uh need the second alarm and also start the collapse unit". Communications acknowledges. |

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| **9:48:00** | | |
| SFIRE | 9:48:17 | Radio: B8 Aide progress report from IC. |
| SFIRE | 9:48:25 | B8 Aide: Orders of IC Strike out second Alarm, 1 member unaccounted for and send Collapse Unit (CO1). |
| STAC2 | 9:48:37 | D2 raises Command and asks for "situation and resource status?" Command reports, "alright we have, we switch to defensive mode, we do have one member unaccounted for in the building, we have R1 trying to remove that member, we do have a second alarm and." D2 acknowledges and asks who's the second-in Battalion Chief on the second alarm. |
| SFIRE | 9:48:40 | Radio: affirmative, confirming for second Alarm and Collapse Unit (CO1). |
| SFIRE | 9:48:45 | B8 Aide: affirmative. |
| SFIRE | 9:48:58 | PN10: available from 63rd St, en route to other Box can you give me address? |
| **9:49:00** | | |
| CAD | 9:49:09 | Assist PN.10 |
| SFIRE | 9:49:12 | Radio: affirmative 2240 N. Colorado St. |
| STAC2 | 9:49:21 | Unreadable transmission from an unknown source |
| STAC2 | 9:49:28 | D2 standby. |
| STAC2 | 9:49:42 | Command raises D2 and tells him they're striking the second alarm right now. D2 asks him to repeat the message. |
| **9:50:00** | | |
| STAC2 | 9:50:10 | D2 raises Command and asks if all members present and accounted for? Command tells him all members are accounted for with the exception of the Officer of E45. D2 if there is a MAYDAY in progress? Command tells D2, "yes we do. We have R1 and I do have a Chief assigned to the MAYDAY. We have the member located." D2 tells him to maintain command that he's about five minutes out. |
| SFIRE | 9:50:15 | B8 Aide: Strike out second Alarm immediately. |
| SFIRE | 9:50:22 | Radio: affirmative, coming. |
| SFIRE | 9:50:27 | Radio: second Alarm on Box 7743 18th & Dauphin Sts fire located 2240 N. Colorado St. SF STAC2, attention E20, Q9, E35, E25, E28 w/ CO1, L10, B9, B11, B1, B10. (2x) |
| **9:51:00** | | |
| STAC2 | 9:51:42 | Communications raises Command. |
| STAC2 | 9:51:46 | Rescue-Driver raises Rescue Search-1 |
| **9:52:00** | | |
| STAC2 | 9:52:00 | Command tells company trying to raise him to proceed with their message. Communications tell Command that the Chiefs on the second alarm are B9, B11, B1 and B10. Command acknowledges and provides a progress report of, "we're still in a defensive mode of operations, we have one member that we are trying to remove from the building". |
| CAD | 9:52:09 | Dispatch E.20, Bn.9, B.11, Bn.1, Q.9, E.35, E.25, E.28 |
| CAD | 9:52:15 | Bn.1 Enroute |

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| CAD | 9:52:20 | Q.9 Enroute |
| CAD | 9:52:24 | Assist L.10 |
| STAC2 | 9:52:30 | Rescue-Driver raises Rescue-Command. |
| CAD | 9:52:37 | Assist L.18, Bn.10 |
| SFIRE | 9:52:38 | B8 Aide: progress report, All Hands, defensive mode of operation, in process of pulling 1 member from building. |
| CAD | 9:52:42 | Bn.10 Enroute |
| CAD | 9:52:49 | E.20 Enroute |
| CAD | 9:52:50 | Bn.9 Enroute; E.20 On scene |
| STAC2 | 9:52:58 | Rescue-Driver raises Rescue-Officer and tells him to switch over to analog. Rescue-Officer acknowledges and tells him to give him one minute. |
| SFIRE | 9:52:59 | Radio: affirmative. |
| **9:53:00** | | |
| SFIRE | 9:53:03 | Car5: en route to Colorado St. |
| CAD | 9:53:07 | Assist Car.5 |
| SFIRE | 9:53:10 | Radio: affirmative. |
| SFIRE | 9:53:18 | L10 - 3: responding on second Alarm on Colorado St, you sending someone else to 17th St correct? |
| NFIRE | 9:53:22 | E28: Enroute to E29 station to pick up collapse unit. |
| CAD | 9:53:26 | L.10 Enroute |
| CAD | 9:53:27 | E.35 Enroute |
| SFIRE | 9:53:30 | Radio: south medic will handle. |
| CAD | 9:53:32 | E.28 Enroute |
| CAD | 9:53:38 | Assist CO.1 |
| NFIRE | 9:53:39 | B9: Responding on the Box switching to S. Tac 2 |
| SFIRE | 9:53:54 | E35: responding on second Alarm, staging area? |
| NFIRE | 9:53:56 | L18: L18 |
| **9:54:00** | | |
| CAD | 9:54:00 | E.25 Enroute |
| SFIRE | 9:54:03 | Radio: E35 you are second in, E20. |
| STAC2 | 9:54:06 | RIT-Group raises Command and tells him, "If we can minimize the water on the second floor that would be a help. I think any water down here will further compromise what we got." Command acknowledges. |
| SFIRE | 9:54:13 | E20: responding first in. |
| SFIRE | 9:54:16 | Radio: affirmative, Logistics, E35 you are going to be 3rd in, affirmative? |
| SFIRE | 9:54:24 | E35: affirmative 3rd in. |
| SFIRE | 9:54:34 | L18: responding on second Alarm. |
| SFIRE | 9:54:40 | Radio: affirmative. |
| CAD | 9:54:41 | L.18 Enroute |
| NFIRE | 9:54:56 | B11 Aide: responding on the second Alarm second in Chief. |
| **9:55:00** | | |

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| CAD | 9:55:00 | Bn.11 Enroute |
| SFIRE | 9:55:00 | B8 Aide: staging area 19th/ Dauphin Sts. |
| SFIRE | 9:55:10 | Radio: staging area 19th/ Dauphin Sts for incoming companies, affirmative. |
| SFIRE | 9:55:34 | B8 Aide: second Alarm ladders are L10 and L18? |
| SFIRE | 9:55:41 | Radio: affirmative. |
| STAC2 | 9:55:52 | RIT-Group raises Command and tells him, "We shut the lines down, we need it quiet in here." Command acknowledges and announces, "Command to all companies on Colorado St shut your lines down." |
| **9:56:00** | | |
| SFIRE | 9:56:00 | Radio: B9. |
| SFIRE | 9:56:10 | Radio: B9. |
| SFIRE | 9:56:17 | Radio: B9, E28. |
| SFIRE | 9:56:23 | E28: en route E29 pickup collapse unit. |
| NFIRE | 9:56:24 | B9: Logistics 1 |
| SFIRE | 9:56:27 | Radio: affirmative. |
| STAC2 | 9:56:30 | Command raises Communications and requests PGW. Communications acknowledges. |
| SFIRE | 9:56:35 | E25: confirming 4th in on second Alarm. |
| SFIRE | 9:56:43 | Radio: affirmative E25. |
| SFIRE | 9:56:50 | B8 Aide: PGW requested. |
| SFIRE | 9:56:57 | Radio: affirmative. |
| **9:57:00** | | |
| **9:58:00** | | |
| CAD | 9:58:22 | E.35 On scene |
| SFIRE | 9:58:33 | L18: on the fire ground staged at 19th/ Dauphin Sts. |
| STAC2 | 9:58:42 | RIT-Group raises Command and tells him they are going to start fogging out the first floor. Command acknowledges. |
| CAD | 9:58:42 | L.18 On scene |
| SFIRE | 9:58:42 | Radio: affirmative. Attention companies responding to second Alarm on Box 7743 18th/ Dauphin Sts. Staging area is 19th/ Dauphin Sts. (2x) |
| **9:59:00** | | |
| CAD | 9:59:03 | L.10 On scene |
| SFIRE | 9:59:10 | L10 - 3: at 19th/ Dauphin Sts in staging. |
| SFIRE | 9:59:18 | Radio: okay. B10. |
| SFIRE | 9:59:26 | B10: responding as Safety Officer. |
| SFIRE | 9:59:28 | Radio: affirmative, confirming responding as Safety Officer. |
| SFIRE | 9:59:36 | SOC1: responding 18th/ Dauphin Sts. |
| SFIRE | 9:59:43 | Radio: affirmative. |
| **10:00:00** | | |
| SFIRE | 10:00:20 | PI1: responding 2200 N. Colorado St. |
| CAD | 10:00:24 | Assist PI.1 |

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| SFIRE | 10:00:26 | Radio: affirmative. |
| SFIRE | 10:00:36 | Radio: PN10. |
| CAD | 10:00:41 | E.25 On scene |
| SFIRE | 10:00:46 | Radio: PN10. |
| SFIRE | 10:00:59 | M44: transporting member to Temple Hospital. |
| **10:01:00** | | |
| STAC2 | 10:01:12 | Command raises Communications and asks about the collapse unit request. Communications tells him that E28 is on their way to pick it up. |
| SFIRE | 10:01:16 | Radio: okay, call with patient information. |
| CAD | 10:01:19 | M.44 Enroute to Temple ER with 1 member |
| CAD | 10:01:31 | CO.1 Enroute |
| SFIRE | 10:01:38 | SA5: available leaving fire ground, responding 18th/ Dauphin Sts. |
| CAD | 10:01:48 | Assist SA.5 |
| SFIRE | 10:01:49 | Radio: okay. |
| STAC2 | 10:01:58 | E20 raises Communications and asks if they had orders from FCC? Communications tells him to check with FCC. |
| **10:02:00** | | |
| NFIRE | 10:02:19 | D2: on the fire ground |
| SFIRE | 10:02:37 | E20: Logistics on second Alarm, did you want us to pickup an apparatus? |
| CAD | 10:02:37 | Bn.10 On scene |
| CAD | 10:02:42 | D.2 On scene |
| NFIRE | 10:02:44 | Q9: on the fire ground |
| STAC2 | 10:02:45 | D2 raises Command and asks for a progress report. Command reports, "We have evacuated this building of all members. All members are accounted for with the exception of one member of E45. Currently have R1 and SQ72 trying to remove the member, we do have eyes on the member." |
| CAD | 10:02:51 | Q.9 On scene |
| **10:03:00** | | |
| STAC2 | 10:03:18 | RIT-Group raises Command and asks, "can we get some fans blowing air into the front window to try to clear this first floor out a little bit?" Command acknowledges and orders L12-Officer to get fans from L12 and L14 for ventilation. |
| SFIRE | 10:03:21 | Radio: have E28 pick up the collapse unit. E43 is picking up air unit 1. |
| SFIRE | 10:03:33 | E20: affirmative. |
| SFIRE | 10:03:45 | B10 Aide: B10 on the fire ground. |
| SFIRE | 10:03:55 | Radio: affirmative. |
| **10:04:00** | | |
| SFIRE | 10:04:02 | B8 Aide: progress report, All members accounted for except 1 member of E45, eyes on member, R1 and SQ72 inside dwelling, all other members on exterior. |
| SFIRE | 10:04:23 | Radio: okay. |
| CAD | 10:04:32 | M.44 Trauma Transport to Temple ER; member 32M fall on fire first to second Vitals Stable ETA 5 |
| SFIRE | 10:04:55 | Car4: responding to Colorado St. |

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| **10:05:00** | | |
| CAD | 10:05:04 | Assist Car.4 |
| SFIRE | 10:05:04 | Radio: affirmative Car4. |
| SFIRE | 10:05:27 | Radio: Attention E24 cover E43, L20 cover L14. (2x) |
| **10:06:00** | | |
| SFIRE | 10:06:02 | B1 Aide: B1 on location. |
| CAD | 10:06:04 | Bn.1 On scene |
| STAC2 | 10:06:04 | D2 raises Communications and informs him that B3 is C Division, B8 is now Operations and D2 is taking Command. Communications acknowledges. |
| SFIRE | 10:06:16 | Radio: affirmative. B8 Aide. |
| CAD | 10:06:29 | Assist TS.2 |
| STAC2 | 10:06:31 | Command raises Operations and tells him to communicate to all members on the fire ground to direct radio communications through Operations. Operations acknowledges. |
| SFIRE | 10:06:34 | Radio: B8 Aide B9 Logistics Officer, B11, B1, B10 Safety Officer, B1 and B10 on location. |
| SFIRE | 10:06:54 | B8 Aide: affirmative repeat. |
| **10:07:00** | | |
| SFIRE | 10:07:01 | Radio: B9 Logistics Officer, B11, B1, B10 Safety Officer, B1 and B10 on location. |
| STAC2 | 10:07:09 | Command raises Communications and requests two SEPTA buses on location for R&R. Communications acknowledges. |
| SFIRE | 10:07:22 | Radio: Attentions L2 cover L18. (2x) |
| STAC2 | 10:07:34 | Command raises Operations and tells him to standby then announces, "Command to all members operating on the fire ground on Colorado St, direct your radio communications through Operations, direct your radio communications through Operations." |
| SFIRE | 10:07:44 | B8 Aide: D2 Command, B8 Operations, B3 C-Division, request 2 SEPTA buses R & R for members. |
| **10:08:00** | | |
| SFIRE | 10:08:05 | Radio: okay. |
| SFIRE | 10:08:43 | B9: on scene as Logistics 1, confirming E20 Logistics Company, E43 picking up air unit, location of staging? |
| CAD | 10:08:45 | Bn.9 On scene |
| STAC2 | 10:08:48 | Command raises Operations and asks for a progress report from the RIT Supervisor. |
| **10:09:00** | | |
| SFIRE | 10:09:01 | Radio: staging area B8 gave as 19th/ Dauphin Sts, E20 is Logistics Company, E43 en route E13 picking up air unit, E28 responding with collapse unit. |
| STAC2 | 10:09:19 | Q43-Officer raises Operations and tells him that he is on the fire ground with AU1, setup at 16th & Susquehanna. Operations acknowledges and tells him to standby. |
| SFIRE | 10:09:25 | B9: affirmative. |

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| **10:10:00** | | |
| STAC2 | 10:10:11 | Communications |
| STAC2 | 10:10:17 | Operations asks Communications if he is trying to raise him. Communications says, negative. |
| SFIRE | 10:10:30 | E24: on radio to cover E43. |
| STAC2 | 10:10:36 | Operations raises Command and provides an update from RIT-Group Supervisor, "We had an interior collapse parts of the building are unstable, so we are currently conducting shoring operations". Command acknowledges and asks Communications if he copied the progress report. Communications says negative. |
| **10:11:00** | | |
| STAC2 | 10:11:22 | Command raises Communications and reports, "we're currently in service with all members from the BOX Alarm, RIT-Group 1 Supervisor is still trying to ascertain rescue, there has been an interior collapse, Rescue-1 is trying to sure up the first floor so they can proceed with rescue". Communications acknowledges. |
| STAC2 | 10:11:52 | Operations raises Communications and asks if E29 is on the assignment. Communications tells him, yes and that they were on the Special Call. Operations tells Communications that he wants E29 to link up with the Collapse Unit. Communications passes on these orders to E29. E29 acknowledges the orders. |
| **10:12:00** | | |
| SFIRE | 10:12:29 | E28: on location. |
| STAC2 | 10:12:30 | Command raises the Safety Officer |
| CAD | 10:12:35 | E.28, CO.1 On scene |
| SFIRE | 10:12:37 | Radio: okay. |
| STAC2 | 10:12:40 | Command raises Operations and tells him that he has B10 fourth in on the second alarm and will be putting him in the rear with C Division. Operations acknowledges. |
| SFIRE | 10:12:58 | B8 Aide: progress report, All Hands in service initial Box, R.I.T 1, R.I.T Roof and CO1 inside. M44 once they are done with the member at the hospital return to fire ground. |
| **10:13:00** | | |
| STAC2 | 10:13:04 | C-1 raises Operations and tells him if they can direct the Collapse Unit in off of 17th St, they can bring it up Susquehanna and in closer. Command acknowledges and raises Communications and asks what companies are in Staging? Communications tells him the second alarm - E20, E9, E35, E25, L10, and L18. Command acknowledges and tells him he wants E20 and L10 as the RIT in the rear and have them report to C Division. Communications acknowledges and passes on the orders. E20 and L10 acknowledge. |
| SFIRE | 10:13:29 | Radio: okay. |
| SFIRE | 10:13:33 | Radio: E28. |
| SFIRE | 10:13:46 | E28: at 19th/ Dauphin Sts. with CO1. |
| **10:14:00** | | |
| SFIRE | 10:14:03 | Radio: okay standby at staging area. |

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| STAC2 | 10:14:24 | Command raises Operations |
| SFIRE | 10:14:28 | Radio: B8 Aide 2 SEPTA buses at 22nd/ Diamond Sts. waiting for escort. E28 on location in staging area with collapse unit. |
| STAC2 | 10:14:37 | Command raises Operations and tells him he putting another RIT Group in the rear with C Division. Operations acknowledges. |
| SFIRE | 10:14:48 | B8 Aide: E28 report to front of building. |
| SFIRE | 10:14:53 | Radio: E28 B8 report to front of building. |
| **10:15:00** | | |
| STAC2 | 10:15:04 | C raises Operations and tells him he has L18 and that he can use him as the RIT. Operations says he need L18 to set up some fans for ventilation. |
| STAC2 | 10:15:16 | Communications raises L10 and tells him he will be part of the RIT Group in the rear with E20. L10 acknowledges. |
| SFIRE | 10:15:23 | E28: affirmative. |
| **10:16:00** | | |
| STAC2 | 10:16:03 | Communications raises Command to inform him that there are two SEPTA buses on location, trying to get them to Second& Diamond. They will have police escort them in. Command acknowledges. |
| STAC2 | 10:16:31 | E45-DPOP *unreadable transmission* |
| **10:17:00** | | |
| SFIRE | 10:17:27 | E28: on scene on Dauphin St at Gratz St with collapse unit with vehicles in street blocking access. |
| **10:18:00** | | |
| STAC2 | 10:18:09 | Logistics-1 raises E20-Officer and tells him to meet him at the command post. |
| SFIRE | 10:18:12 | Radio: PN10. |
| STAC2 | 10:18:28 | From unknown company, "Command *unreadable* in service in the rear *unreadable* second RIT Group." |
| STAC2 | 10:18:44 | Communications raises Command |
| CAD | 10:18:49 | M.34 En route to hospital |
| STAC2 | 10:18:53 | Communications raises Command and informs him that the Collapse Unit is on location with E28 but is having a problem getting down the street because of multiple units vehicles in the middle of the street. Command acknowledges. |
| **10:19:00** | | |
| STAC2 | 10:19:09 | RIT Group raises Operations and tells him to have the Collapse Unit standby. |
| STAC2 | 10:19:22 | RIT Group raises Operations |
| STAC2 | 10:19:28 | Operations raises RIT Group Supervisor. RIT Group Supervisor tells Operations if they get the fans running in the rear pulling the smoke out, they'll be better. Operations acknowledges. |
| STAC2 | 10:19:43 | Operations raise C division and asks if he read the message from the RIT Group Supervisor and says,"*unreadable* L18 setting up the fans in the rear trying to suck some of that smoke in the first floor out." |

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| STAC2 | 10:19:55 | C Division tells Operations that he has one fan from L14 in service and that L18 is in the process of setting up their other fan in the doorway. Operations acknowledges and raises RIT Group Supervisor. RIT Group Supervisor acknowledges. |
| **10:20:00** | | |
| STAC2 | 10:20:11 | Operations advises that the Collapse Unit is on the fire ground. RIT Group Supervisor acknowledges. |
| STAC2 | 10:20:25 | Logistics-1 raises E43-Officer |
| STAC2 | 10:20:33 | Operations raises Communications and asks the location of the Collapse Unit. |
| STAC2 | 10:20:47 | Communications. |
| STAC2 | 10:20:53 | Operations asks for the location of the Collapse Unit. |
| **10:21:00** | | |
| STAC2 | 10:21:01 | Communications raises CO-1. CO-1 gives the location of Dauphin & Cleveland Sts. |
| STAC2 | 10:21:12 | Operations says, "Let them know if they…standby." |
| STAC2 | 10:21:24 | Operations advises that they can use Susquehanna to get closer to the fire ground. |
| STAC2 | 10:21:39 | Logistics-1 raises E43-Officer. |
| **10:22:00** | | |
| STAC2 | 10:22:01 | B1 raises E29-Officer to make sure Susquehanna Ave is clear for the Collapse Unit. |
| STAC2 | 10:22:13 | Command raises Communications to provide a progress report, "We have shored up the collapse on the first floor, we have located the down firefighter, we're in the process of extricating him to the exterior of the building, we're still in service with the first alarm companies, affirmative?" Communications acknowledges. |
| SFIRE | 10:22:13 | SA5: on fire ground at Colorado/ Susquehanna Sts. |
| CAD | 10:22:24 | SA.5 On location |
| SFIRE | 10:22:25 | Radio: affirmative. |
| SFIRE | 10:22:45 | SOC1: on the fire ground. |
| STAC2 | 10:22:48 | E29-Officer raises CO-1. |
| STAC2 | 10:22:54 | Command raises B4. |
| **10:23:00** | | |
| SFIRE | 10:23:02 | B8 Aide: Progress report from Incident Command, first Alarm companies in service, first floor shored up, down fire fighter located attempting to extricate. |
| STAC2 | 10:23:21 | B1 raises Operations and tells him to direct the Collapse Unit southbound on 17th St and a right on Susquehanna Ave. |
| SFIRE | 10:23:21 | Radio: okay. |
| STAC2 | 10:23:55 | Operations raises Communications. |
| **10:24:00** | | |
| STAC2 | 10:24:46 | Command raises Communications. Communications answers. |
| STAC2 | 10:24:59 | Operations raises Communications and asks if he received the instructions to get the Collapse Unit closer to the fire ground. Communications tells him they did and acknowledged over the Tac Band. |
| **10:25:00** | | |

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| STAC2 | 10:25:39 | SOC-1 raises Command |
| STAC2 | 10:25:52 | SOC-1 raises Operations |
| **10:26:00** | | |
| STAC2 | 10:26:00 | Command raises C Division and asks for a progress report from the rear. C Division reports, "Right now we have all fire extinguished in the rear area, I'm standing by with E13, E34, and I have RIT Group-10 and I have B10 in the rear." Command tells him B10 is his Safety Officer in the rear. C Division acknowledges. |
| SFIRE | 10:26:35 | Radio: B8 Aide Deputy 2 Portable radio activated the emergency button on Stac2, are they declaring an emergency? |
| STAC2 | 10:26:43 | CAR5 raises Communications |
| STAC2 | 10:26:50 | Operations raises E45-Pump Operator and tells him to, "charge the 3 inch." E45-Pump Operator acknowledges, "doing it now." |
| SFIRE | 10:26:51 | B8 Aide: Deputy 2? |
| SFIRE | 10:26:54 | Radio: affirmative Deputy 2 Portable. |
| SFIRE | 10:26:57 | B8 Aide: affirmative. |
| **10:27:00** | | |
| STAC2 | 10:27:01 | CAR5 raises Communications and tells him, "CAR5 is assuming command, D2 is now Operations." CAR5 then announces to the fire ground, "All companies on the fire ground CAR5 is assuming command, D2 is now Operations." Communications acknowledges. |
| NFIRE | 10:27:03 | FM1: accidental reset en route to the fire ground 2200 N. Colorado St. |
| CAD | 10:27:26 | Assist FM.1 |
| CAD | 10:27:28 | FM.1 Enroute |
| STAC2 | 10:27:30 | Communications raises D2 and tells him there's an emergency activation from his radio and asks if he's OK. D2 says, "That's affirmative, reset." Communications acknowledges. |
| **10:28:00** | | |
| SFIRE | 10:28:05 | PN10: on the fire ground Colorado St. |
| STAC2 | 10:28:06 | Command raises C and asks, "How's it look back there?" C Division reports, "It looks pretty good here in the rear, we have just one small hotspot in the rear of the kitchen taking care of right now, and L18 has a smoke ejector in the rear window." Command acknowledges. |
| SFIRE | 10:28:14 | Radio: PN10 tried to raise you, on Orders of PN1 wants you to respond to SW Philly assignment. |
| SFIRE | 10:28:22 | B8 Aide: Deputy 2 portable was accidental activation of emergency button resetting; Car5 is Command, Deputy 2 Operations. |
| SFIRE | 10:28:36 | Radio: okay. |
| CAD | 10:28:44 | MISC Bn.8, D.2 Accidental Emergency Activation; Car 2 has Command |
| STAC2 | 10:28:51 | From unknown company, "Stop whatever they're doing in the rear." |
| SFIRE | 10:28:54 | Radio: PN10 did you copy? |
| SFIRE | 10:28:59 | PN10: affirmative on Orders of PN1 returning to SW Philly assignment. |
| **10:29:00** | | |

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| SFIRE | 10:29:47 | Radio: Attentions E70 cover E50. (2x) |
| **10:30:00** | | |
| STAC2 | 10:30:05 | Command raises Communications and advises him that SEPTA buses are set up at 18th St & Susquehanna Ave. |
| STAC2 | 10:30:41 | Operations raises D2-Aide |
| **10:31:00** | | |
| STAC2 | 10:31:14 | C raises Operations and tells him he has some fire lighting up on the D roof and that he may want to get a line up there. |
| STAC2 | 10:31:38 | Operations tells C Division, there's an engine company in the rear affirmative |
| STAC2 | 10:31:56 | Operations tells C Division to keep an eye on exterior structure of the building to identify any cues of possible collapse |
| SFIRE | 10:31:58 | Radio: B8 Aide. |
| **10:32:00** | | |
| SFIRE | 10:32:19 | Radio: B8 Aide SEPTA buses at 18th/ Susquehanna. |
| STAC2 | 10:32:22 | C raises operations and tell him," We have some fire right above where they are working inside, we want to take a quick shot at to knock it down if that's ok" |
| SFIRE | 10:32:34 | B8 Aide: affirmative. |
| STAC2 | 10:32:42 | Operations confirms if they can knock it down from the c and C Division confirms they can hit it from the outside, and operations lets him know if no members are in danger they can go ahead and do it. |
| **10:33:00** | | |
| STAC2 | 10:33:04 | E28 raises command |
| SFIRE | 10:33:32 | E28: at 17th/ Dauphin Sts. with collapse unit unable to pass due to fire department & PGW vehicles blocking access. |
| SFIRE | 10:33:57 | Radio: B8 Aide E28 on location at 17th/ Dauphin Sts. with collapse unit unable to pass due to fire department & PGW vehicles blocking access. |
| **10:34:00** | | |
| SFIRE | 10:34:14 | B8 Aide: affirmative. |
| STAC2 | 10:34:18 | Communications tries to raise Command, Operations raises Command to tell him Communication is trying to raise him. |
| **10:35:00** | | |
| STAC2 | 10:35:00 | Communications tells Command the collapse unit is at 17th & Dauphin trying to make their way and there is PFD vehicles in their way. Command asks if they can standby at that location. |
| STAC2 | 10:35:20 | Communication raises CO1, CO1 Acknowledged and responses standing by |
| STAC2 | 10:35:34 | from unknown company "Get the troops ready to receive, we're coming out the door" |
| STAC2 | 10:35:42 | Operations raises Command, Command acknowledged Operations |
| STAC2 | 10:35:49 | Operations tells Command "We extricated the Firefighter we are on our way out". Command acknowledged and let operations know the CO1 is standing by at 17th & Dauphin |
| NFIRE | 10:35:51 | FM2: responding on the fire ground 2200 N. Colorado St. |

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| **10:36:00** | | |
| CAD | 10:36:23 | Assist FM.2 |
| CAD | 10:36:25 | FM.2 Enroute |
| STAC2 | 10:36:25 | From unknown company "we're coming out the window" |
| STAC2 | 10:36:53 | Command raises communication and tells him that SOC1 is now rescue branch and repeats it. Communications acknowledge. |
| **10:37:00** | | |
| STAC2 | 10:37:21 | Command to all companies operating the fire ground, company officers conduct a PAR, command to all officers operating on the fire ground company offices conduct a PAR and report back to operations. |
| STAC2 | 10:37:50 | L18 Officer raises L18 Tiller |
| **10:38:00** | | |
| STAC2 | 10:38:34 | C raises Operations |
| STAC2 | 10:38:52 | Command raises Operation |
| **10:39:00** | | |
| STAC2 | 10:39:01 | Operations |
| CAD | 10:39:01 | M.34 Arrival at Hospital |
| STAC2 | 10:39:08 | Command asks Operations “how you making out with that PAR from all units" Operations responses " I'm giving them time to report back chief standby" |
| STAC2 | 10:39:13 | E55 raises Operation |
| STAC2 | 10:39:22 | C raises Operations and reports" He has PAR in the rear with E13, E34, L18, Rit group 10, B10 Safety. Operations acknowledges and raises D2-Aide to see if he copies. |
| **10:40:00** | | |
| STAC2 | 10:40:02 | E55 raises Operations "PAR is complete we have all our members" Operations acknowledge |
| STAC2 | 10:40:19 | Communications raises Command to see if there was a message for him, Commands responds negative |
| STAC2 | 10:40:38 | SQ72 raises FF *unreadable* |
| STAC2 | 10:40:46 | Command raises Communication and tells him " all members have exited the building and are accounted for", Communications acknowledged |
| SFIRE | 10:40:54 | Radio: Attentions L16 cover L2. (2x) |
| **10:41:00** | | |
| STAC2 | 10:41:00 | E59 Officer raises Operations to report "all members accounted for" |
| STAC2 | 10:41:16 | Command raises R1 officer , R1 Officer responds |
| SFIRE | 10:41:19 | Radio: stand by all officers and members for the following message, attention all companies, fire companies that normally operate on the South Fire Band will switch to and operate on the North Fire Band with the exception of fire companies operating on Box 7743 18th/ Dauphin Sts. who will remain and operate on the South Fire Band. (2x) |
| **10:42:00** | | |
| STAC2 | 10:42:29 | Operations raises R1 officer for progress on PAR R1 Responds "Chief R1 has PAR" |

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| STAC2 | 10:42:43 | Command Raises EMS Group Supervisor |
| STAC2 | 10:42:58 | EMS Group Supervisor Command asks "progress report from all EMS personnel" |
| **10:43:00** | | |
| STAC2 | 10:43:19 | C raises Operation |
| STAC2 | 10:43:28 | Operation raises SQ72 officer |
| SFIRE | 10:43:35 | Radio: Attentions E44 cover E45. (2x) |
| STAC2 | 10:43:43 | SQ72 Officer Operations asks "progress report on PAR" SQ72 reported all members accounted for |
| **10:44:00** | | |
| STAC2 | 10:44:01 | C tells Operation " I have some hot spots lighten up that I can take care from the exterior is it ok to continue extinguishment", Operation " that's affirmative if you need additional resources let me know" C lets Operation know he is fine with the companies he has in the rear. |
| CAD | 10:44:06 | M.25 Enroute to the Hospital |
| STAC2 | 10:44:36 | C Repeats to operation he has enough resources in the rear. |
| STAC2 | 10:44:48 | Operations raises B8 to find out his location, B8 responds 18th & Dauphin |
| **10:45:00** | | |
| STAC2 | 10:45:41 | Alpha raises C to notified him he is going to have E55 hit the second floor from the ladder of the exterior front, so he can watch out for the water coming out on his end, C Division acknowledges |
| **10:46:00** | | |
| STAC2 | 10:46:08 | Operations raises D2-Aide to bring the status board D2-Aide acknowledges |
| STAC2 | 10:46:24 | Unknown Company raises Operation |
| STAC2 | 10:46:28 | Operations acknowledge *unreadable* |
| NFIRE | 10:46:42 | FM1: on the fire ground. |
| CAD | 10:46:50 | FM.1 On scene |
| STAC2 | 10:46:58 | L3 to Command, Repeats |
| **10:47:00** | | |
| STAC2 | 10:47:17 | Command to Operations, Command asks Operations about PAR, Operations report all members are present and accounted for. |
| STAC2 | 10:47:33 | Command asks Operations how he feel about putting it under control and Operations respond "I concur" |
| STAC2 | 10:47:40 | Command raises Communication |
| STAC2 | 10:47:43 | Communication |
| STAC2 | 10:47:46 | Command tells Communication standby |
| STAC2 | 10:47:53 | Command raises C |
| **10:48:00** | | |
| STAC2 | 10:48:00 | Command asks C how they feel about putting it under, C respond "I feel good with that, we got everything taking care of here in the rear. Just a couple little tiny hot spots " |
| STAC2 | 10:48:17 | Command raises Communications |

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| STAC2 | 10:48:19 | Communications |
| STAC2 | 10:48:21 | Command tells Communication "Orders of CAR5 place the Fire under control, transitioning command back to D2" |
| STAC2 | 10:48:31 | unknown medic raises ES9 |
| SFIRE | 10:48:39 | B8 Aide: Orders of Car5 FIRE UNDER CONTROL, Deputy 2 has Command. |
| STAC2 | 10:48:49 | unknown medic raises ES6 |
| SFIRE | 10:48:57 | Radio: affirmative. |
| CAD | 10:48:58 | Fire Under Control by orders of Car.5 |
| **10:49:00** | | |
| SFIRE | 10:49:07 | Radio: FIRE UNDER CONTROL on second Alarm on Box 7743 18th/ Dauphin Sts. (2x |
| **10:50:00** | | |
| **10:51:00** | | |
| CAD | 10:51:31 | M.25 Enroute to Temple Hospital; 45M-CA-ALS in Prog-ETA 1 |
| **10:52:00** | | |

## SCBA Test Results

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# NIOSH DIVISION OF SAFETY RESEARCH TEST REPORT

**SCOPE OF WORK**
Performance Testing of Field Worn SCBA
to NFPA 1981: Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services, 2013 Edition, Section 8.1 — Airflow Performance Test, and Section 8.13 — EOSTI Independent Activation Test

**REPORT NUMBER**
103495252CRT-001

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TEST REPORT FOR NIOSH DIVISION OF SAFETY RESEARCH
Report No.: 103495252CRT-001
Date Issued: May 07, 2018

## REPORT PREPARED FOR

NIOSH Division of Safety Research
1095 Willowdale Road
Morgantown, WV 26505
USA

## TEST STANDARD

NFPA 1981: Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services, 2013 Edition, Section 8.1 — Airflow Performance Test, and Section 8.13 — EOSTI Independent Activation Test

## AUTHORIZATION

| | |
|---|---|
| **Quote Number:** | Qu-00878306 |
| **Signed Quote Date:** | April 24, 2018 |

## PRODUCT DESCRIPTION

| | |
|---|---|
| **Sample Name:** | Field Worn SCBA |

## SAMPLE INFORMATION

| | |
|---|---|
| **Dates Samples Received:** | May 03, 2018 |
| **Dates of Testing:** | May 03, 2018 |

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TEST REPORT FOR NIOSH DIVISION OF SAFETY RESEARCH
Report No.: 103495252CRT-001
Date Issued: May 07, 2018

## SECTION 1
## CONCLUSION

This test report completes the testing covered by proposal number Qu-00878306.

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

Please note: this Test Report does not represent authorization for the use of any Intertek certification marks.

| | | | |
|---|---|---|---|
| **Project Owner:** | Trevor O'Gorman | **Project Reviewer:** | Rob Simmonds |
| **Title:** | Technician | **Title:** | Engineer, Team Leader |
| **Signature:** |  | **Signature** |  |
| **Date** | 07-May-2018 | **Date:** | 07-May-2018 |

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## SECTION 2
## NFPA 1981-2013 TEST DATA SHEETS

**SECTIONS 8.1**
**AIRFLOW PERFORMANCE TEST**

| TEST CONDITION | PEAK INHALATION (in. water column) | PEAK EXHALATION (in. water column) |
|---|---|---|
| Initial on Breathing Machine @40 L/M | 0.86 | 2.10 |

| TEST CONDITION | PEAK INHALATION (in. water column) | PEAK EXHALATION (in. water column) |
|---|---|---|
| Initial on Breathing Machine @100 L/M | 1.01 | 2.46 |

| ACTIVATION OF ALL EOSTI: | Yes |
|---|---|

**SECTION 8.13**
**EOSTI INDEPENDENT ACTIVATION TEST**

**40 L/M:**

| EOSTI(S) Blocked: Vibe Alert | |
|---|---|
| Pressure at EOSTI Activation (psi) | 1900 |

| EOSTI Activated: HUD | |
|---|---|
| Pressure EOSTI Stops (psi) | 0 |

| EOSTI(S) Blocked: HUD | |
|---|---|
| Pressure at EOSTI Activation (psi) | 2015 |

| EOSTI Activated: Vibe Alert | |
|---|---|
| Pressure EOSTI Stops (psi) | 134 |

**100 L/M**

| EOSTI(S) Blocked: Vibe Alert | |
|---|---|
| Pressure at EOSTI Activation (psi) | 1833 |

| EOSTI Activated: HUD | |
|---|---|
| Pressure EOSTI Stops (psi) | 0 |

| EOSTI(S) Blocked: HUD | |
|---|---|
| Pressure at EOSTI Activation (psi) | 2033 |

| EOSTI Activated: Vibe Alert | |
|---|---|
| Pressure EOSTI Stops (psi) | 124 |

## SECTION 4
## PHOTOGRAPHS

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