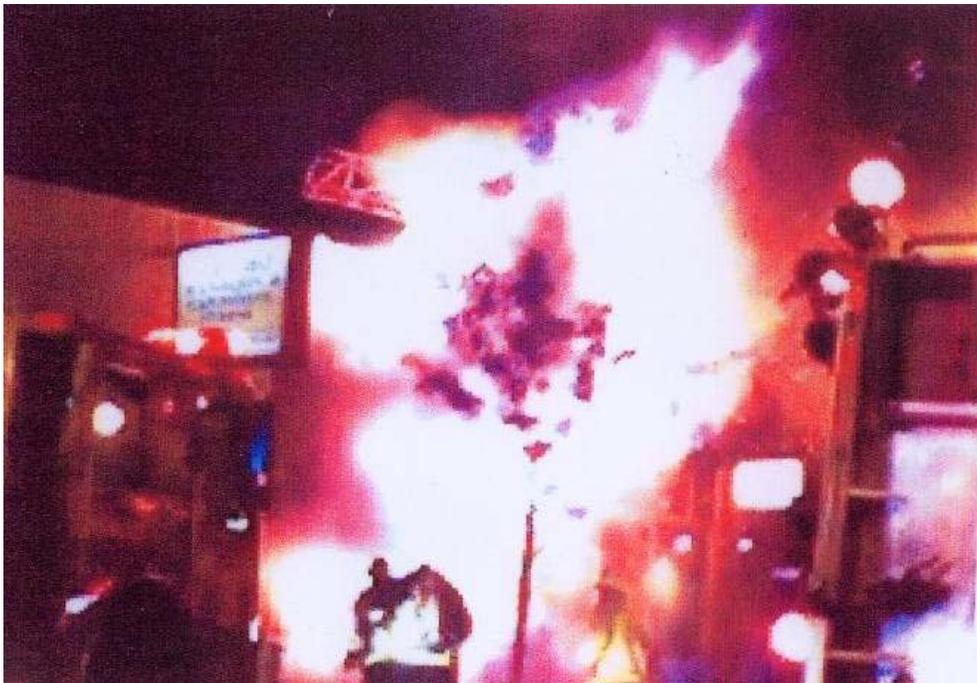


BOX 4-281

REPORT



AUGUST 29, 2007

Boston Fire Department

Board of Inquiry Report on fatal fire of August 29th, 2007

Date report issued: February 15, 2008

Report on: Box 4-281 Centre Street and Manthorne Road
Fatal Fire on August 29, 2007
Incident number # 47497
1727 Centre Street
West Roxbury
District 10
Division 2

Fire Commissioner Roderick J. Fraser Jr. appointed a Board of Inquiry on August 31, 2007 to investigate the circumstances surrounding the deaths of Firefighters Paul J. Cahill of Engine Company 30 group 4 and Warren J. Payne of Ladder Company 25 group 3 which occurred on August 29, 2007.

Board of Inquiry

Deputy Fire Chief	Stephen K. Dunbar	Division 1 group 4
Deputy Fire Chief	David R. Granara	Training Division
District Fire Chief	William J. Rice	Fire Investigation Unit
District Fire Chief	Michael G. Feely	Safety Division group 1
District Fire Chief	James R. Evans	District 7 group 4
District Fire Chief	George L. Wyman	District 11 group 1
Fire Lieutenant	Sean F. Kelly	Ladder Company 21 group 2
Fire Lieutenant	Neil A. Mullane Sr.	Engine Company 21 group 2
Fire Lieutenant	William M. Gillis	Engine Company 10 group 1
Fire Inspector	Christopher J. Sloane	Major Case Unit - Fire Investigation Unit

The Board of Inquiry would like to acknowledge additional members of the Boston Fire Department who contributed to the compilation of this report:

Fire Lieutenant Michael E. Tierney	Engine Company 24 group 2
Firefighter Darrin J. DeCoste	Ladder Company 23 group 3
Firefighter Michael N. Regan	Engine Company 24 group 2
Senior Operator Barbara E. McBurnie	Fire Alarm Office
Operator Christine M. Dowling	Fire Alarm Office
Principal Operator Peter J. Clifford	Fire Alarm Office
Radio Shop Supervisor Joseph F. Brooks	Fire Alarm Office
Plans Review Engineer Paul M. Donga	Fire Prevention Division
Department Chemist Joseph W. Murphy	Fire Prevention Division
Principal DP Systems Analyst John F. Perry	Management Information Systems
GIS Coordinator Crystal Schell	Management Information Systems
Senior Photographer Michael F. King	Fire Investigation Unit
Digital Photo Lab Specialist William F. Noonan	Fire Investigation Unit
Senior Administrative Assistant Debbie Burke	Fire Investigation Unit

The Board of Inquiry would also like to acknowledge other outside agencies and individuals contributing to this report:

Nelson Bryner	National Institute of Standards and Technology
Janell Jimenez	Photography credit
Brandon Donovan	Photography credit

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Scope of Report

The Board of Inquiry focused on examining all information and facts available during the time period in which the Board was convened. All of the Board of Inquiry's findings and recommendations are based on information gathered, reported and verified during the course of the Board's investigation.

In instances where facts could not be determined with certainty, due to conflicting information or differing perspectives, speculative conclusions have been omitted from this report.

Determination of allegations concerning alcohol or drug impairment as a contributive or causal factor at this fire was deemed outside the Board of Inquiry's level of expertise and jurisdiction. The Board of Inquiry is cooperating and sharing information with other agencies that are in the process of conducting open and ongoing investigations into these allegations.

Section 2

Opening Summary

Boston Fire Department
BOI Report on Box 4-281
1727 Centre Street
West Roxbury
District 10
Division 2
Incident number 47497

1st Alarm transmitted at 21:06 hours
2nd Alarm transmitted at 21:09 hours
3rd Alarm transmitted at 21:17 hours
4th Alarm transmitted at 21:25 hours
All out transmitted at 14:13 hours on September 07, 2007

On August 31, 2007 the Board of Inquiry initiated an investigation into the fireground fatalities on August 29, 2007 of Firefighter Paul J. Cahill Engine Company 30 and Firefighter Warren J. Payne Ladder Company 25.

On Wednesday, August 29, 2007, Box 281 was transmitted at 21:06 hours for a building fire at the Tai Ho restaurant located at 1727 Centre Street in Boston Fire District 10 of the West Roxbury section of Boston.

Engine Company 30 and Ladder Company 25 responded to the alarm of fire from quarters, arriving at the fire location at 21:08 hours. Ladder Company 25, the first company to arrive, reported fire showing from the roof. At 21:14 hours an emergency distress signal was received from Firefighter Payne's portable radio.

During the course of performing an initial aggressive interior firefighting operation, Firefighters Cahill and Payne were subjected to a flammable gas ignition and ensuing rapid fire progression resulting in a sudden intensification of fire and smoke conditions within the fire building.

Due to this event, both Firefighters Cahill and Payne sustained fatal injuries while operating inside the fire building.

Section 3

Objectives

The most important objective in every line of duty death investigation is to prevent the same situation from occurring in the future.

The objectives of this Board of Inquiry are as follows:

1] To determine the direct and indirect causal factors which resulted in a line-of-duty death, particularly those factors that could be used to prevent future occurrences of a similar nature, including:

- Identifying inadequacies involving apparatus, equipment, protective clothing, standard operating procedures, supervision, training, or performance.*
- Identifying situations that involve unacceptable risk.*
- Identifying previously unknown or unanticipated hazards.*

2] To ensure that the lessons learned and the recommendations from the investigation are effectively communicated to prevent future occurrences of a similar nature. [When appropriate, this should include dissemination of the information through fire service organization and professional publications.] *

*The above excerpts were taken from the International Association of Fire Chiefs “Guide for Investigation of a Line-of Duty Death”.

Section 4

Guidelines utilized in report preparations

- 1] Guide for Investigation of Line-of-Duty Death - IAFC Health and Safety Committee
- 2] Firefighter Line-of-Duty Death and Injury Investigation Manual - International Association of Firefighters
- 3] Boston Fire Department SOP# 62 Line of Duty Death
- 4] Boston Fire Department SOP# 2, 4, 5, 7, 10, 12, 13, 14, 18, 23, 24, 31, 32, 32A, 32B, 52, 58
- 5] Boston Fire Department Incident Command System
- 6] NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
- 7] NFPA 1500 Fire Department Occupational Safety and Health Program
- 8] NFPA 1971 Standard on Protective Ensemble for Structural Firefighting
- 9] NFPA 1981 Standard on Open-Circuit Self-Contained Breathing Apparatus
- 10] NFPA 1982 Standard on Personal Alert Safety Systems

Section 5

Investigation Methodology

It became evident at the Board of Inquiry's first formal meeting on September 11, 2007 that the range of functions needed to be performed during the investigation would require dividing the Board's investigation into manageable segments. Under each segment, responsibility was assigned for investigating and developing a report along with recommendations focusing on the assigned areas.

The following segments were assigned to members of the Board of Inquiry:

1] Fire Investigation Cause/Origin	District Fire Chief William J. Rice, FIU
2] Training	Deputy Fire Chief David R. Granara, Training Div.
3] Building information/codes	District Fire Chief George L. Wyman, Dist. 11
4] Personnel protective equipment	District Fire Chief Michael G. Feely, H-1
5] Fire Operations	District Fire Chief James R. Evans, District 7
6] Summary/findings/recommendations	All Board members

All relevant findings and recommendations from the above mentioned segments were then incorporated into the final report.

During the course of this investigation the following sources of information were reviewed by Board members:

- 1] Thirty four interviews of department members working at the scene of the fatal fire
- 2] Two interviews of off duty members who responded to the fire
- 3] Four interviews of civilians present in the fire building
- 4] Thirty six Boston Police interviews [7 department members, 5 on scene police officers, 1 member of Boston EMS, and 23 civilians]
- 5] Building plans
- 6] Building permits
- 7] City of Boston Building Code and Boston Fire Department Fire Prevention Regulations
- 8] Building construction texts and documents
- 9] Fire Alarm audio tapes of the incident
- 10] Radio transmissions between companies and units
- 11] Photographs of the fire building and adjacent buildings
- 12] Members' personal protective equipment
- 13] Mobile Computer Terminal [MCT] incident roster
- 14] Riding lists
- 15] Tour reports
- 16] Boston Fire Department Standard Operating Procedures [SOPs]
- 17] Boston Fire Department Incident Command System
- 18] Engineering reports of the fire building's cooking equipment hood duct exhaust ventilation system
- 19] Firefighting operations

- 20] Fire behavior within confined/concealed areas
- 21] Prefire plans of fire building
- 22] National Fire Incident Reporting System [NFIRS] fire report
- 23] Weather reports
- 24] National Institute of Occupational Safety and Health [NIOSH] Firefighter Fatality Reports
- 25] National Institute of Standards and Technology [NIST] fire modeling
- 26] NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- 27] Videos of incident

Following the examination and analysis of the above information, a timeline was established and utilized to reconstruct events leading up to the fireground fatalities of two firefighters at this incident.

Out of this process, the findings and recommendations of the Board of Inquiry were developed. It is the Board of Inquiry's opinion that it is of the utmost importance that the recommendations arising from this report be implemented in a timely manner to prevent a reoccurrence of this incident.

Section 6

Note: Refer to the Boston Fire Department Incident Command System or note on page 25 for an explanation of terms: exposure A, B, C, and D; or A side, B side, C side, and D side contained in the following information.

BUILDING HISTORY

Business Description

The fire building at 1727 Centre Street had been a Chinese restaurant since at least 1955, and most likely before that. In 1999, the name was changed from the China Gold to the Tai Ho. The Tai Ho had a maximum seating capacity of 80. The operating hours were Monday through Wednesday 11:30 a.m. - 10:30 p.m., Thursday 11:30 a.m. - 11:00 p.m., Friday and Saturday 11:30 a.m. - 12:00 a.m., and Sunday 12:30 p.m. - 10:30 p.m. The Tai Ho was open 365 days a year. The restaurant had a valid “Common Victualler 7 Day Wine and Malt Beverage” license and was open for business at the time of the fire. A total of four employees were working in the restaurant on the night of the fire. One of the employees discovered the fire, evacuated fellow co-workers, and called the fire into 911.

Common Hazards

HVAC System

The HVAC system was an old type roof model providing both heat and air conditioning to the restaurant. The HVAC unit was powered by natural gas and was electrically cooled. The unit had a 3 ton capacity and weighed approximately 400 pounds. The HVAC unit was on the roof approximately 40 feet from the front exterior wall [A side], 4 feet from the right side wall [D side], and mounted on roof curbing positioned directly over the partition wall between the kitchen and the dining room.

Electrical System

The electrical system was an underground supplied single phase 100 ampere with two meters into an 18 circuit capacity panel box with a 100 ampere circuit breaker. A two pole circuit breaker, 20 amperes [#6 and #8] and a single pole 20 ampere [#18] were found in the tripped position. The panel box circuit indexes were not adequately marked.

Near the center of the building in the cellar, a sub panel box [fed from the main panel box] was located with a 40 circuit capacity with no circuit breakers tripped.

Electricity was ruled out as a possible cause of the fire.

Special Hazards

Cooking equipment

The kitchen was located in the right rear of the Tai Ho restaurant and measured 16'6" by 18'6". In the middle of the kitchen was a metal prep table. This table created two aisles, 2 feet in width on either side. Cooking equipment was fueled by natural gas and was placed along the right D side demising wall between Tai Ho and Ferns. The equipment included five woks, two fryolaters, and an upright oven/broiler. [The fryolater was located directly next to the oven/broiler without any clearance between them as is required.] Along the partition wall separating the kitchen and dining area was a two burner gas stove. Kitchen exhaust hoods were located above the cooking equipment and ran along the partition wall and right D side demising wall, ending at the cellar stairs. A tag from J & B Cleaning was recovered indicating that the hoods and ducts were cleaned on what appears to be 5/18/07.

Fire Protection Systems

Ansul System

The cooking equipment was protected by an Ansul model R102 fire suppression system. This system consisted of two 3 gallon dual tanks with the extinguishing agent liquid Ansulex, designed to discharge in a spray form when activated. The system was last maintained in June 2007 by Gorham Fire Protection of Quincy, MA. In addition, on the premises was one class K six liter portable fire extinguisher [not operated] located in the kitchen to the left of the double swinging doors and one 10 pound ABC dry chemical portable extinguisher [not operated] in the rear of the kitchen. A dry chemical and one carbon dioxide portable extinguisher were in the cellar [not operated].

The Ansul fire suppression system in the hoods operated well after the fire started, probably due to grease dropping down from the hood in the flaming mode. The system was engineered to activate all of the caps simultaneously and empty the contents of the two 3 gallon tanks. A few of the heads did not activate as designed because the caps were grease bound. Although the Ansul system did deploy, it had no effect on the fire because the fire was above the hood in the duct, wall, and ceiling joists.

Fire Alarm System

The fire alarm system was a local system that was hard wired with a battery backup. The system consisted of heat and smoke detectors, pull stations, horns, and strobe lights. The battery was 12 years old and should have been replaced after 5 years. The fire alarm system operated on the night of the fire and can be heard on the Fire Alarm Office tapes.

Note: Because the fire was burning in the duct work, walls, and ceiling voids for an extended period of time, the fire alarm system did not operate immediately

Building Permits

The first mention in building records of a restaurant at 1727 Centre Street was a permit issued on November 19th, 1962. The permit was filed to lower the ceiling height to 9 feet.

On December 12, 1962, another permit was issued for a restaurant sign, “China Gold”.

On August 8, 1999, a short form permit was issued for restaurant renovation including ceiling tiles in the dining room, occupancy capacity decrease from 98 to 80 persons, and restaurant name change from China Gold to the Tai Ho.

No other permits were located for this building.

HVAC

There were no permits located for the HVAC unit of the Tai Ho restaurant.

Building Codes

1] In the City of Boston Building Code [1970] Section 1815.0 entitled Restaurant Cooking Equipment; reference is made to compliance with RS18-5. This reference standard is the 1969 edition of NFPA 96, Ventilation of Cooking Equipment with modifications as noted. Section 1815.0 requires that a hood fire suppression system be installed.

While access to the 1969 edition of NFPA 96 was not available, NFPA’s Inspection Manual, copyrighted in 1970, likely used the 1969 edition for reference and it states that “Seams and joints should have a liquid-tight external weld”.

The 1979 edition of the Boston Fire Prevention Code lists NFPA 96, 1976 edition, as a reference standard.

In 1975, the Commonwealth of Massachusetts adopted a state-wide building code. The first edition of the state building code references the 1973 edition of NFPA 96.

2] Prior to the 1970 edition of the Boston Building Code and the 1979 Boston Fire Prevention Code, there is no specific reference to NFPA 96 for the installation and protection of commercial cooking equipment. The Boston Building Code, 1963 edition, has requirements for Commercial Stoves and Ranges in section 2114. There is a requirement for the hood and duct work to be made of noncombustible material, but no specific requirement or recommendation as to seams and joints having to be liquid-tight or welded. Additionally, there is no requirement for a kitchen hood suppression system.

For reference purposes only, the 1969 edition of the NFPA Handbook refers to NFPA 96, 1964 edition and states “... [c] Substantial construction of duct systems [No. 18 gauge or heavier steel or No. 20 gauge stainless steel] with inside laps in the vertical ducts projecting in direction against air flow to reduce dripping of the burning grease from the duct joints in case of fire in the ducts...”

The earliest record found of 527 CMR having a requirement regarding NFPA 96, 1991 edition, is Section 10.03 [8] dated 12/4/92.

3] The following provides a timeline regarding occupancy changes of the building located at 1727 Centre Street:

- A] Building permit #741, issued on 3/24/1930- permit to build 2nd class building with four stores.
- B] Building permit #5715, issued on 11/19/1962- short form permit for restaurant renovation including dropping ceiling to a height of 9 feet.
- C] Building permit #6093, issued 12/12/1962- short form permit for restaurant sign “China Gold”.
- D] Building permit #1478, issued 4/12/1976- legalized occupancy for 2 stores [restaurant and laundry]. A letter from the Assessing Department states that the property has been taxed as such from 1955 to 1965.
- E] Building permit #2307, issued 3/8/1994- occupancy for store, pet grooming shop, restaurant, and laundry.
- F] Building permit #1512, issued 8/25/1999- short form permit for restaurant renovation including ceiling tiles in the dining room- occupant capacity decrease from 98 to 80 persons- restaurant changed name from China Gold to the Tai Ho.
- G] Building permit #4800, issued 11/19/2002- established occupancy as store, restaurant, laundry, pet grooming shop with kennel, and art gallery store.
- H] Building permit #4689, issued 9/8/2004- established occupancy as a restaurant, laundry, pet grooming shop with kennel, art gallery, and store.

4] There are no records of permits for the installation of the kitchen hood exhaust ducts and fans, hood fire suppression system, and the restaurant fire alarm system.

Section 7

Building History/Construction

TAXPAYERS

A Taxpayer is a term that appears to have originated as best can be determined in the 1920's. The term stems from the practice of real estate investors constructing buildings on a tract of land along a city street. These buildings were designed to pay the taxes on the land until a more desirable multistory apartment or office building could be built. The building once erected, was often divided into a row of stores to increase the rental income for the property owner.

Taxpayers generally have the following characteristics:

- They most often are of ordinary [Type III] construction, usually with brick bearing walls and wood joist roof members.
- They are commonly one story in height, although the two-story variety can be found in many jurisdictions with apartments on the second floor.
- Depending on the region, many taxpayers can have full or partial basements. Access to the basement is through metal sidewalk doors and stairs or interior "trap doors" in the stores themselves.
- They usually are limited to approximately 6 to 10 small stores [or other commercial establishments].
- They most often have common cocklofts*, attic spaces and common basements*.

* The fire building at 1727 Centre Street did not have a common cockloft or common basement.

The term Taxpayer has come to be accepted within the fire service as a description of any commercial structure built of ordinary construction with various occupancies in one subdivided building.

The Tai Ho restaurant was cut off from the other occupancies by demising walls extending from the floor to the bottom of the roof deck. These interior demising walls were constructed of wood and plaster with a layer of brick extending from the top of the demising walls to the bottom of the roof deck.

Building Information

The building was a one story taxpayer of ordinary construction consisting of a combination of brick, concrete block, and wood. The building was constructed in April 1930.

The building housed four separate occupancies. From left to right they were:

1729 Centre Street Continental Shoppe [exposure B-dog grooming and boarding business]

1727 Centre Street Tai Ho restaurant [fire building]
1725 Centre Street Ferns [exposure D-florist business]
1723 Centre Street L' Essence [exposure D1-art gallery]

The building's overall dimensions were approximately 90 feet [as measured along the sidewalk] by 60 feet [as measured front to rear]. Of the 90 foot length, the Continental Shoppe was approximately 27 feet in width, the Tai Ho was 32 feet in width, Ferns was 13 feet in width, and L'Essence was 17 feet in width. There was an additional one story addition in the rear of the Tai Ho restaurant that measured approximately 30 feet in length by 12 feet in width. This addition consisted of a walk-in freezer and storage room utilized exclusively by the Tai Ho restaurant. Permits for this addition could not be located, so it is unknown when it was built.

The fire originated above the broiler/oven in the kitchen of the Tai Ho restaurant. In addition to spreading through the ceiling of the Tai Ho, there was visible fire damage to a small area at the top of the wall that separates the Tai Ho from the Ferns [exposure D]. This includes charred wall studs and double top plates as well as damage to several roof joists adjoining Ferns.

EXTERIOR

The exterior door was a single entry door at street level opening outward. Inside was a small vestibule with a full partition wall containing a fixed window. Inside the vestibule there was another single outward opening door on the left to enter the dining room. The restaurant's maximum capacity was 80 patrons and seating consisted mainly of fixed booths with free standing tables and chairs in the middle of the dining area on the right side.

On the left side of the dining area there was an aisle with fixed booths and freestanding tables and chairs on both sides leading to the rear of the building. In the left rear there were restrooms and, beyond the restrooms, a rear exit.

DINING AREA

The dining area had a wood floor covered by carpet. The dining area walls were plaster over wood with 48 inch beaded wainscoting.

The ceiling in the dining area was a suspended ceiling approximately 9 feet from the floor. The suspended ceiling consisted of 12 inch square tiles stapled to strapping. The 12 inch tiles were made of a cellulosic/mineral fiber and were covered by a pliable covering which appeared to be paint. A test of the 12 inch tiles by the Department Chemist showed that when exposed to flame the cover material ignited immediately and sustained flame until it was consumed. Above the suspended ceiling there was a 17 inch void space and then the original sheet metal stamped ceiling attached to the ceiling joists. Above the original sheet metal stamped ceiling there was a 20 inch void space to the underside of the roof deck. Due to the slope of the roof, the void space between the sheet metal stamped ceiling and underside of the roof deck varied from 30 inches at the front of the building to 17 inches at the rear.

KITCHEN

The kitchen was in the right rear corner of the building separated from the dining room by a full partition wall with two swinging doors. The kitchen was approximately 18 feet 6 inches in length and 16 feet 6 inches in width. The interior walls of the kitchen were wood and plaster covered by metal veneer along two walls [the partition wall from the dining room and the wall that separated the Tai Ho from Ferns]. In the middle of the kitchen was a metal prep table bolted to the floor. The kitchen ceiling was the original sheet metal stamped ceiling which was attached to the ceiling joists creating a void space of 24 inches between the sheet metal stamped ceiling and the underside of the roof deck. At the rear of the kitchen was a door providing access to the one story addition containing a walk-in freezer and storage area. The kitchen floor was constructed of quarry tile over wood in the cooking area and ceramic tile over wood in the food prep area. In the right rear of the kitchen open wooden stairs led to the cellar. Due to cooking equipment, a center fixed food prep table, associated shelving and racks, along with supplies of cooking materials, the kitchen was highly congested and difficult to maneuver in.

CELLAR

The cellar in the tenant spaces were separated by walls formed of timber beams supported by steel posts spaced approximately 8 feet on center and infilled with terra cotta tiles.

ROOF

The roof of the building was a sloped [front to rear] flat roof with a 3 foot tall parapet at the building's front. The roof covering consisted of built up prepared rubber roofing over backer board which in turn was laid over an existing tar and gravel roof. The rooftop HVAC unit was mounted on a 14 inch roof curb above the kitchen area. The 3 ton capacity HVAC unit weighed approximately 400 pounds and was powered by natural gas and electrically cooled. Additionally, to the left of the rooftop HVAC unit, there was an atrium style skylight measuring 3 feet 8 inches by 3 feet 5 inches located over the kitchen area.

Reference Material: Brannigan's Building Construction For The Fire Service
Information on Taxpayers from: Fireground Size-Up by Michael A. Terpak

Engineering Report/Duct Ventilation System

Kitchen Exhaust Duct System

Field inspections were completed on August 29, August 30, September 4, and September 13, 2007. Additionally, an inspection was conducted on September 18, 2007 by representatives of the building's owner, the Tai Ho restaurant, Gorham Fire Protection Equipment, and PMD Mechanical. The mechanical engineers concluded in part the following:

- 1] Duct system was constructed of 26 and 24 gauge galvanized sheet metal.
- 2] Longitudinal seams are of "Pittsburgh Construction".
- 3] Transverse joints are slip joint and screwed [Pan Head].
- 4] A section of the exhaust system is 26 gauge snap lock round pipe with swivel gore 26 gauge adjustable 90 degrees.
- 5] Connections of vertical and horizontal sections were achieved by use of dove tail connections.
- 6] Kitchen exhaust hood is 22 gauge galvanized sheet metal with "Pittsburgh Corners".
- 7] Cooking equipment, hoods, ducts and fans were not cleaned of grease or maintained.
- 8] Proper clearances to combustible material were not maintained.
- 9] The hood seams and joints were not welded liquid tight, with appropriate clearances.
- 10] The entire exhaust system shall be inspected for grease build-up by a properly trained, qualified and certified company or person acceptable to the authority having jurisdiction. [NFPA 96]
- 11] The hood and duct system was totally contaminated with excessive grease and no maintenance label was found.
- 12] Fryers were adjacent to a broiler/oven and must have a clearance of 16".
- 13] The duct at the ceiling level was degraded with an opening approximately 1 inch wide by 12 inches long.

SUMMARY:

The hood, kitchen exhaust duct and roof curbing were of poor non-conforming construction and contaminated by grease, allowing the grease to escape to adjoining combustible areas, which directly led to fire and the products of combustion escaping from the containment area.

Industrial Standard

The industry construction standard for kitchen exhaust systems is 16 gauge black iron or stainless steel. All seams and transverse joints are to be welded and liquid tight, with appropriate cleanouts.

Reference:

SMACNA and 2004 Edition of NFPA 96.

CONCLUSION

As a result of the substandard materials being used over some period of time the duct above the hood degraded and a section of the duct became open approximately 1" x 12". This area showed signs of rust. Flame and products of combustion, including heat, carbon monoxide and other fire gases escaped from the duct. Combustible building materials over some period of time became coated with grease. The fire in the duct work above the hood escaped from containment and ignited combustible wall materials and extended vertically to the ceiling joists and ultimately the roof joists. The smoke and fire gases expanded and traveled horizontally filling both the top and bottom ceiling voids in the dining room as well as the 24" ceiling void in the kitchen.

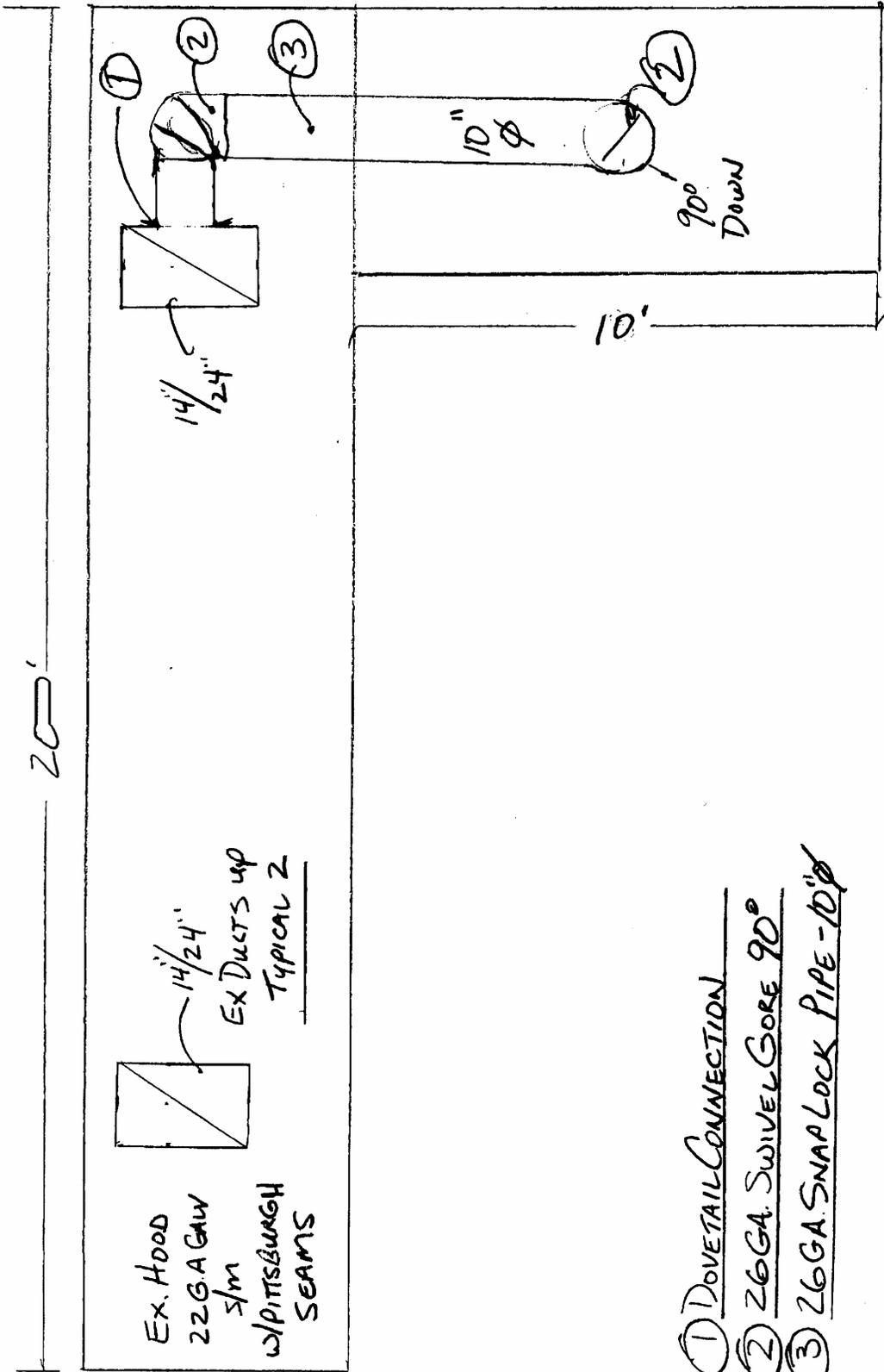
Reference Material:

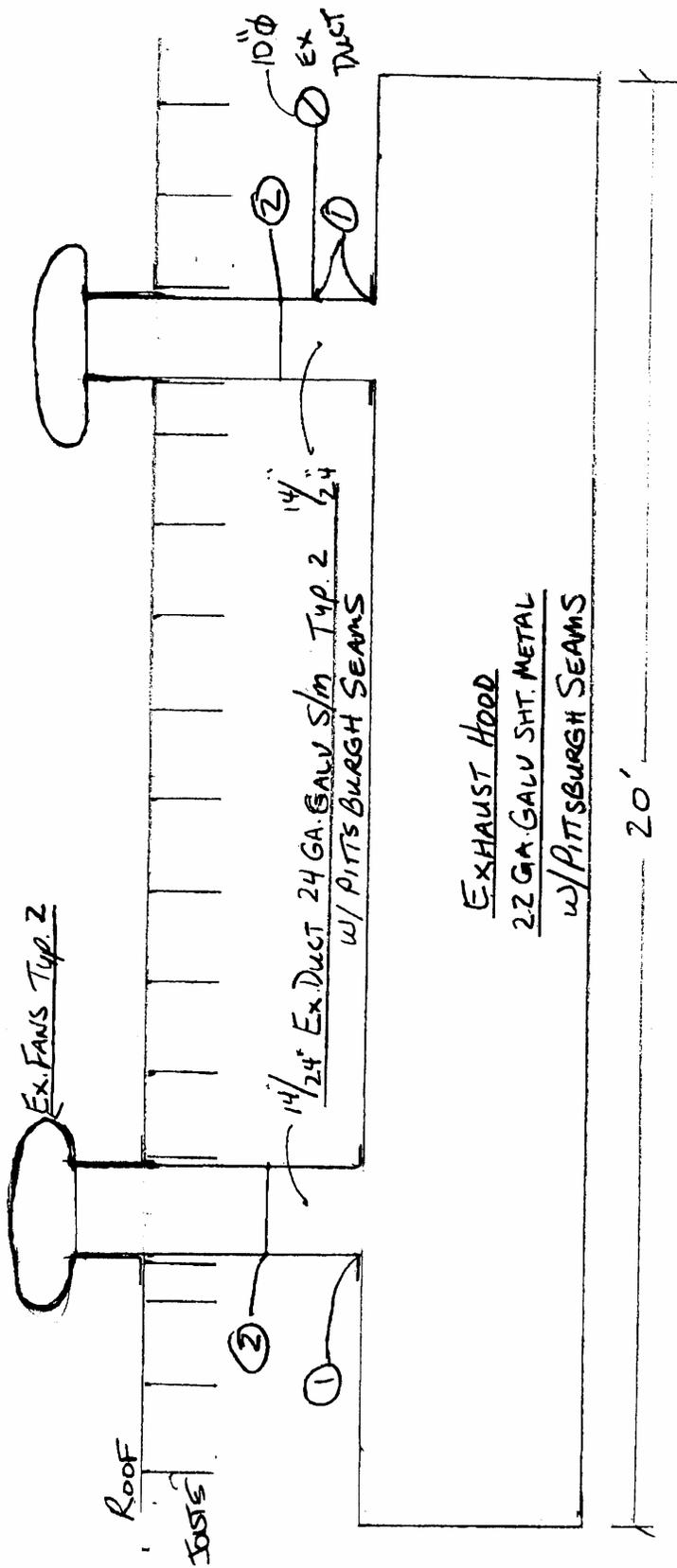
PMD Mechanical report dated September 18, 2007

Robert F. Gorham Jr. report dated November 16, 2007

NFPA 96 2004 Edition

PLAN VIEW 1/2" SCALE





- ① DOVETAIL CONNECTIONS
- ② S-SLIP CONNECTION w/ SCREWS

Floor SIDE VIEW 1/2" SCALE

Section 8

FIRE OPERATIONS

STRATEGIC CONSIDERATIONS

The strategy employed for the building fire at 1727 Centre Street consisted of a fast aggressive interior attack to locate, confine, and extinguish the fire. This strategy is utilized at most building fires the Boston Fire Department responds to.

LIFE SAFETY

INCIDENT STABILITY

PROPERTY CONSERVATION

- First, and always most important, is life safety.
- The fire building was searched and all patrons and employees were already found to be evacuated and removed from harm.
- The location of the fire in the roof area, presented the possibility of fire extension to adjacent exposures. This possibility required that occupancies on both sides of the fire building would necessitate search and evacuation along with investigation for fire extension.
- The initial Incident Commander was notified shortly after arrival that numerous animals, along with an attendant, were present in the basement of an adjoining exposure building which presented additional life safety concerns. Taking this information into account, a second alarm was quickly transmitted to obtain additional equipment and manpower.
- This formed the initial basis for strategy utilized in conducting an aggressive interior fire attack coupled with exterior ventilation aimed at quickly extinguishing the fire.

The strategy was quickly changed to search and rescue operations when firefighters were reported as unaccounted for.

The early transmission of a second alarm enabled the Incident Commander to utilize incoming fire companies for search and rescue operations and was pivotal in preventing further loss of life and additional injuries.

After rescue operations were completed and all members were accounted for the strategy utilized changed to a defensive mode.

The following series of events were reconstructed from interviews, examination of physical evidence, photographs, videos, and information obtained from the Fire Alarm Office audio recordings. Many of these events reflect firefighting actions that occurred simultaneously and thus are presented in a fashion depicting both the array of actions performed during the incident and the interactions between fire companies and units at the fire. Fireground activities such as investigation

[size up], primary search, ventilation, and extinguishment often occur simultaneously during various stages of a fire incident.

Note: Under the following sections the Boston Fire Department Incident Command System [BFD ICS] was utilized in the description of tactical operations.

Exposure “B” occupancy to the left of the fire building
Exposure “C” occupancy to the rear of the fire building
Exposure “D” occupancy to the right of the fire building

The front of the fire building is referred to under the BFD ICS as the A side.
The rear of the fire building is referred to under the BFD ICS as the C side.
The left side of the fire building is referred to under the BFD ICS as the B side.
The right side of the fire building is referred to under the BFD ICS as the D side.

TACTICAL OPERATIONS:

1727 Centre Street

Ladder Company 25’s Officer established Incident Command upon arrival and conducted an exterior size-up of the fire building. With fire showing from the roof and exposure concerns, Ladder Company 25’s Officer ordered a second alarm and went into a fast interior attack mode in an attempt to quickly extinguish the fire. Ladder Company 25 raised its aerial ladder to the left front A side of the fire building and the roof man ascended the aerial ladder and started roof ventilation operations. Ladder Company 25’s Officer, along with his open up and rake man, entered the fire building through the front door on Centre Street and conducted a primary search for building occupants. The primary search found the restaurant to be empty and it was later determined that four employees had self evacuated after discovering the fire in the kitchen.

Engine Company 30 ran 100 feet of four inch feeder line and connected to the hydrant located opposite 1725 Centre Street. Engine Company 30’s pump operator and hydrant man assisted each other with dressing the hydrant in preparation for supplying water. Engine Company 30’s Officer and pipe man advanced 200 feet of one and three quarter inch attack line into the front door of the fire building through the dining room and into the kitchen. Engine Company 30’s pump operator charged their hose line and the Officer along with his pipe man started playing water toward the fire located above the oven in the upper corner of the D side ceiling adjacent to the partition wall separating the kitchen from the dining room.

Ladder Company 16 arrived, raised its aerial ladder to the right A side of the fire building’s roof, and the roof man ascended the aerial ladder to assist with roof ventilation operations. Ladder Company 16’s Officer and open up man entered the fire building through the front door of the fire building and proceeded into the dining room where they observed fire located in the ceiling joists on the right rear corner of the dining room. Further investigation by Ladder Company 16 revealed that the fire had extended into the ceiling void and the underside of the roof assembly. Ladder Company 16’s officer then called District 10 and requested another hose line for the dining room.

While investigating for fire extension Ladder Company 16 also assisted in conducting a primary search of the premises for possible victims, none were found.

District 10 arrived, and after being briefed by Ladder Company 25's Officer, assumed Centre Street Command.

Engine Company 53 ran 200 feet of four inch feeder line with a hydrant assist valve [HAV] and connected to the hydrant located at 7 Greaton Road. They then advanced 250 feet of two and one half inch attack line into exposure B. District 10 then ordered Engine Company 53 to reposition their hose line into the dining room of the fire building. As they backed their line out of exposure B, while still outside, the "flammable gas ignition" event occurred within the fire building. Once repositioned, Engine Company 53 operated their hose stream on the fire from the front left side of the dining room. Engine Company 53 later assisted with the removal of Firefighter Payne through the right front window of the fire building.

Engine Company 55 ran 300 feet of four inch feeder line from the hydrant located at 1750 Centre Street. After the "flammable gas ignition" event, they advanced 250 feet of two and one half inch attack line to the right front A side window of the fire building and operated their hose stream through the window. Later they repositioned their line through the front window into the dining room and operated the line on the fire. After extinguishing visible fire, they assisted with the primary search.

District 10 immediately ordered a search and rescue operation within the fire building after being advised of the possibility of a missing firefighter.

Rescue Company 2 arrived and was ordered by District 12 to assist in the ongoing search and rescue operation for unaccounted firefighters. Rescue Company 2 entered the rear of the fire building and due to severe fire conditions encountered, were forced to conduct a search of the premises on their hands and knees. Rescue Company 2 conducted their search by proceeding through the rear storage room into the kitchen where they located Engine Company 30's pipe man, Firefighter Cahill, and removed him via the rear exit door off the storage room on the D side of the fire building. Once out of the fire building, CPR was immediately administered to Firefighter Cahill. Due to exposure from severe fire conditions during the search for and removal of Firefighter Cahill, two members of Rescue Company 2 were later transported to the hospital.

2nd Alarm

Ladder Company 10 raised its aerial ladder to the right corner of exposure D's roof and Ladder Company 10's roof man along, with the open up man, ascended their aerial ladder and assisted with roof ventilation operations. Once on the roof, Ladder Company 10's roof man notified the Fire Alarm Office that fire conditions on the roof had deteriorated and a HVAC unit on the roof was in danger of collapsing into the fire building. Ladder Company 10's Officer with his rake man entered exposure D and opened up a section of ceiling abutting the fire building. After the ceiling was opened up, a thermal imager was used and indicated fire had extended via the overlapping ceiling joists into exposure D.

Engine Company 28 ran 500 feet of four inch feeder line and connected with a hydrant assist valve [HAV] to the hydrant located at 1698 Centre Street. Engine Company 28 then advanced 200 feet of two and one half inch attack line to the front A side window of the fire building and operated their hose stream into the dining room area. Later, Engine Company 28 repositioned their hose line into the dining room and extinguished hot spots. Engine Company 28 also ran 100 feet of four inch feeder line into Ladder Company 16's ladder pipe.

Engine Company 48 ran 200 feet of one and three quarter inch attack line from Engine Company 53's pump to the exit door located in the rear of the fire building on the C side.

Engine Company 42 ran 300 feet of two and one half inch attack line to the rear D side of the fire building and operated the line onto the roof from a hill at the rear of the fire building.

Engine Company 52, initially assigned as a Rapid Intervention Team [RIT], was ordered to run 200 feet of one and three quarter inch line from Engine Company 30's pump. Engine Company 52 entered the fire building through the rear door on the D side of the fire building and advanced their line through the storage room into the kitchen where they provided protection for members of Rescue Company 2 as they searched for and removed Firefighter Cahill from the fire building.

Division 2 was briefed by District 10 upon arrival and assumed Centre Street Command. Upon being notified via a report from Ladder Company 10's roof man of unsafe conditions on the roof, he immediately ordered all firefighters off the roof. Additionally, after he was notified that a firefighter may have been unaccounted for, Division 2 ordered a third alarm. Shortly thereafter, upon confirmation that two firefighters were unaccounted for, he ordered a fourth alarm to obtain additional manpower for search and rescue operations.

Firefighter Payne was located in the D side of the dining room, approximately 20 feet in from the front wall of the fire building, by Ladder Company 16's open up man. Firefighter Payne's SCBA harness which was entangled with wires and the surrounding debris caused difficulty in his removal. With the assistance of several firefighters he was cleared from the debris and wires and removed through the A side front right window. Firefighter Payne received immediate medical attention by C13 [Department Medical Examiner]. Firefighters Payne and Cahill were removed from the scene and transported by Boston EMS to the hospital.

Upon reports that all firefighters were accounted for, Division 2 ordered an evacuation of the fire building and initiated a defensive fire attack mode. Division 2 then ordered a "Roll Call" and assigned District 12 [Net Chief] to confirm that all firefighters were accounted for.

Division 2 ordered all utilities shut off for the entire block of stores connected to the fire building.

Division 2 assigned incoming companies and continued a defensive fire attack mode on the fire until relieved by C2 [Chief of Department].

Ladder 28 assisted in fire operations at the rear of the fire building and was assigned as a Rapid Intervention Team [RIT].

Tower Ladder 17 was fed by a four inch feeder line from Engine Company 30's pump and operated their master stream over the entire roof of the fire building.

H-2 [Special Unit] set up portable lighting to illuminate the fire building.

TACOM unit operated the communications network from the parking lot of the White Hen Pantry across the street from the fire building and monitored all radio channels.

H-1 [Safety Chief] oversaw safety operations at the incident. After being notified that firefighters were unaccounted for, H-1 conferred with District 10 and conducted a search for missing firefighters. H-1 assisted Rescue Company 2 with the removal of Firefighter Cahill from the rear of the fire building and administered CPR until relieved by Boston EMS. While at the rear of the fire building, H-1 reported a strong odor of natural gas at that location. The natural gas odor source was later determined to be emanating from the rooftop HVAC unit which shifted during the course of the fire and snapped the unit's gas feed pipe at roof level.

District 8, originally assigned as the Rapid Intervention Team [RIT] Chief, was replaced by District 6. [District 8 not RIT trained]

District 12 [Net Chief] established sector command at the rear of the fire building and directed Rescue Company 2 in search and rescue operations at the rear of the building.

District 12 ordered Engine Company 52 to provide hose stream protection for the search operation being conducted in the rear of the fire building.

After members were removed, District 12 held a "Roll Call" at the TACOM unit and determined that all members were accounted for.

District 9 ordered to stand by.

District 6 was assigned as the Rapid Intervention Team [RIT] Chief and conducted a search of the dining room area within the fire building. After Firefighter Payne was located and removed from the fire building, District 6 was ordered out of the building by Division 2 when the defensive fire attack mode was implemented.

Ladder Company 29 RIT stood by.

W-12 [Air Supply Unit] supplied spare SCBA air cylinders.

W-25 [Rehab Unit] provided hydration to firefighters at the incident.

K-1 [Fire Marshal] and K-2 [Assistant Fire Marshal] responded to the incident.

K-3 [FIU] supervised the activities of the Fire Investigation Unit.

K-4 [FIU] interviewed employees and witnesses.

K-6 [FIU] conducted a preliminary cause and origin investigation.

K-7 [FIU] photographed and videotaped the incident and evidence.

3rd Alarm

K-5 assisted K-4 and K-6 with cause and origin determination and interviews.

Engine Company 24 ran 250 feet of two and one half inch attack line to exposure B and stood by.

Engine Company 37 ran 250 feet of two and one half inch attack line from Engine Company 42's pump to the rear of the fire building.

Ladder Company 26 assisted with search and rescue operations, and then conducted a complete and thorough secondary search of the fire building.

4th Alarm

Engine Company 22 ran their two and one half inch attack line to the front of the fire building and reported to Division 2.

Engine Company 21 connected to a hydrant opposite 8 Manthorne Road and Engine Company 21's crew reported to the Incident Commander.

C-1 [Fire Commissioner] arrived and was briefed on the incident by the Incident Commander.

C-2 [Chief of Department] arrived and assumed Incident Command after being briefed by Division 2.

C-2 requested C-26 [Department Chaplain] to respond.

C-3 [Chief of Operation Field Services] arrived and assumed command as the Operations Chief.

C-3 requested a crane be dispatched to the incident in order to mitigate a hazardous condition involving a rooftop HVAC unit in danger of falling into the fire building.

A-1 [Mayor] arrived and was briefed by the Fire Commissioner.

X-1 [Emergency Medical Services Liaison] arrived and coordinated EMS activities.

C-23 [Public Information Officer] arrived and coordinated public information activities.

S-1 [Superintendent of Fire Alarm] and S-5 [Radio Shop Supervisor] arrived and monitored radio traffic through the TACOM unit.

C-11 [Department Hospital Representative] arrived and was ordered to respond to area hospitals for updates on the conditions of injured firefighters.

CISD [Critical Incident Stress Debriefing] team arrived and conducted an on scene debriefing of firefighters at the incident in an office opposite 1727 Centre Street.

Engine Company 29 assigned to the fire detail from 2 am to 4 am.

Ladder Company 23 assigned to the fire detail from 2 am to 4 am.

Engine Company 16 assigned to the fire detail from 4 am to 6 am.

Engine Company 3 assigned to the fire detail from 4 am to 6 am.

Ladder Company 6 assigned to the fire detail from 4 am to 6 am.

Engine Company 14 assigned to the fire detail from 6 am to 8 am.

Ladder Company 1 assigned to the fire detail from 6 am to 8 am

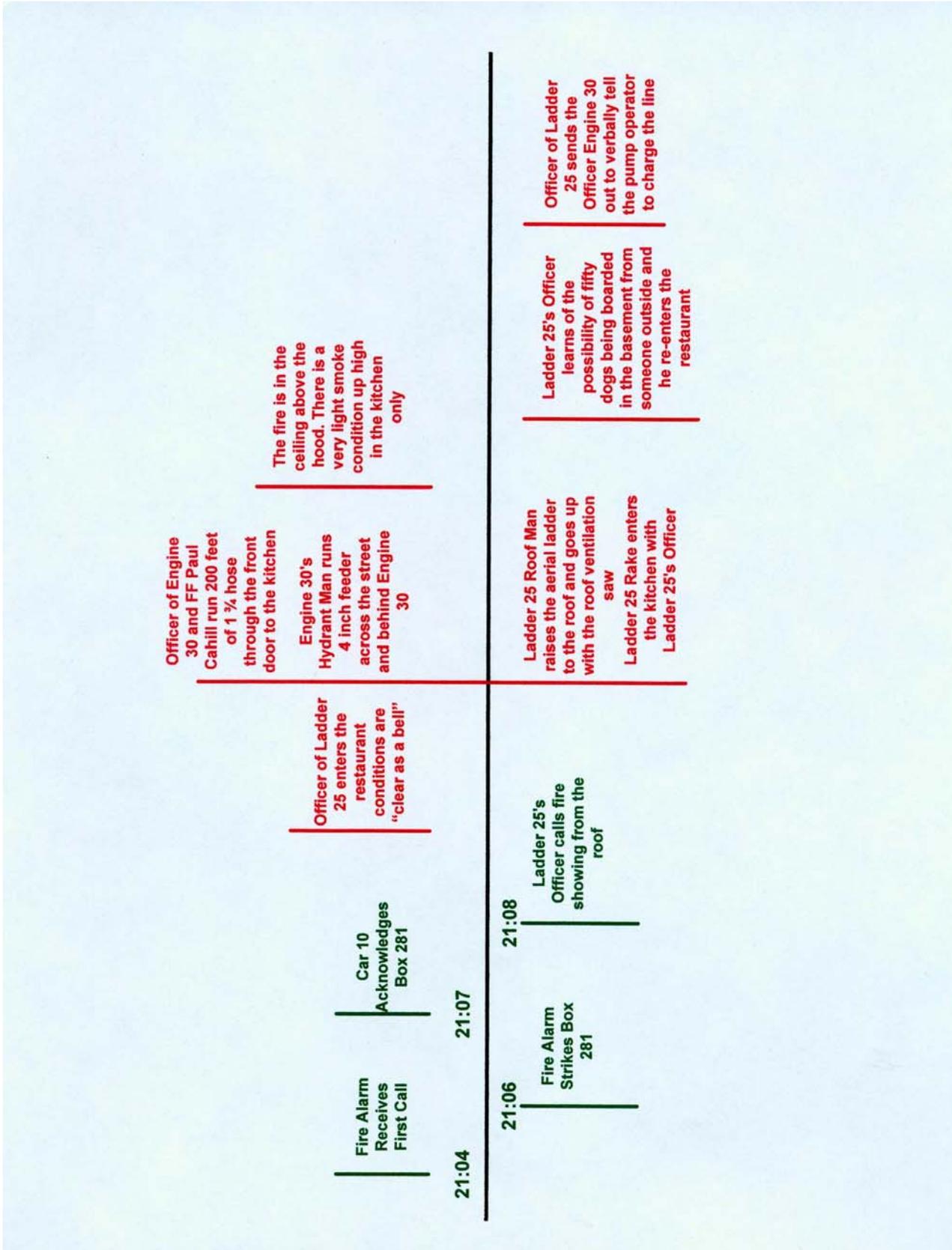
The fire detailed was terminated on September 06, 2007 at 09:24 hours.

Chain of custody was maintained by the use of detail companies until a search warrant was obtained on September 03, 2007. The search warrant ran for seven days and expired at 17:00 hours on September 10, 2007. The chain of custody ended upon the expiration of the search warrant and the fire building was returned to the owner. `

The All Out was transmitted on September 07, 2007 at 14:13 hours.

Section 9

Timeline



Ladder 25's Officer goes outside to verify that Engine got the message to charge the line, then re-enters and goes back to the kitchen

Officer of Ladder 25 orders second alarm

C7 acknowledges second alarm

21:10

Engine 30 repositions line on the other side of the center workstation for a better angle and smoke starts to bank down

Officer of Ladder 25 looks for another exit in the rear. Tells Ladder 25 Rake to stay with the line

Officer of Ladder 16 goes to the far right corner of the dining room and observes, through the missing ceiling panel, fire burning through the joists. FF Warren Payne is off to his right

Ladder 16's Officer calls Car 10 "we need another line in the first floor in the front"

21:12:14

21:09

Officer of L25 calls for Engine 30 pump to charge the line

Engine 30 plays the line on the fire

Ladder 16 arrives on scene. Officer and Open Up Man enter the front

Officer of Ladder 16 observes light smoke, dripping grease or plastic on fire from a failed ceiling panel in the far right corner

FFOP Ladder 16 is told to assist Engine 53 in running lines

Officer of Ladder 25 and Open Up Man of Ladder 16 remove the left side kitchen door

21:11:32

Car 10 is off on Centre St

Ladder 25's Roof Man makes one four foot cut through the roof near the A/C unit and the saw stalls

Engine 53 with a 2 1/2 inch line is directed into the dog grooming store by Car 10 (exposure B)

FFOP Ladder 16 is directed to the rear to open up any doors by Ladder 25 Roof Man

Within seconds Ladder 16's Officer is forced to the floor and describes hearing a loud "Whoosh" and a sound like a "freight train" It is "very dark and extremely hot"

Ladder 16's Officer feels steaming water which he believes is Engine 30's line hitting him and the whole room is "orange"

Car 10 calls Ladder 16

Officer of Ladder 16 because of the smoke moves towards Engine 30's line near the booths at the left side of the dining area waiting for a line

Ladder 10 arrives and enters exposure D, flower shop, with thermal imager and rake and start opening the ceiling

Open Up Man Ladder 16 leaves the restaurant and goes to exposure B dog grooming store

Conditions in the kitchen deteriorate rapidly. Engine 30 continues to operate their line

"Engine 53 charge the line"

Ladder 16 Roof Man brings roof ventilation saw to assist Ladder 25 in opening up the roof

21:12:37

21: 13

21:12

Ladder 25's Roof calls to Ladder 16 "Ladder 16 drop the aerial"

Off Duty FF Engine 30 breaks right front window with halligan bar, then moves to break left side window and also exposure B dog grooming window



1/16/06 21:00

21:12:55

Engine 53's Pumps radio is keyed



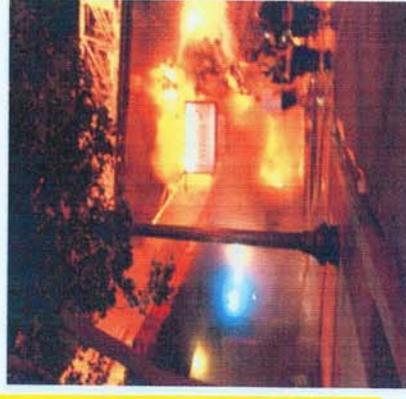
1/16/06 21:04 TAI HO

Event 21:13:06

Occurs

Car 10 calls Ladder 16

21:13:16



1/16/06 21:13 PM IMG-300

FF Cahill follows the hose line around the table heading to the rear where he is later found by Rescue 2 covered in debris

Car 10 repositions Engine 53 from the dog grooming store into the front door of the restaurant. Engine 53 operates their line from just inside the door

Ladder 25 and Engine 30's Officers exit the kitchen directly through the kitchens swinging doors into the dining area and lose contact with FF Cahill

Ladder 25's Open Up Man portable radio emergency signal is received by Fire Alarm

Fire Alarm calls Ladder 25 Open Up Man 3 times

Officer of Ladder 25 and Officer of Engine 30 exit the building through the front door realizing that FF Cahill was not with them and reported this to Car 10

Two members of Ladder 10 go to the roof with their roof ventilation saw and encounter heavy heat and smoke and describe the roof as "like walking on a mattress"

21:14

Officer Ladder 16 leaves the restaurant through the front door and meets Ladder 16's Open Up Man in the front of the building

Officer of Ladder 25 returns from looking for a rear exit and finds that the smoke and heat has banked down to the floor. He follows the line to find the Officer of Engine 30 and FF Cahill and tells them to get out

Engine 30's Hydrant Man enters the restaurant and follows Engine 30's hose line to the kitchen and meets Ladder 25's Rake Man. He continues to follow the line and comes to a stop when his path is obstructed by the center workstation. He then turns around and follows the line back to the dining area

Engine 55 moves their hose line to the right front window and begins to operate their hose

21:15

Fire Alarm calls Car 10. Car 10 responds. "They are in the building we are trying to get them"



11/11/08 9:11 PM



11/11/08 9:11 PM

1/4



Car 12 observes no fire in the dining area but sees smoke and that the ceiling tiles have been blown down

Fire Alarm calls Ladder 25 Open Up Man

Fire Alarm is calling Ladder 25 Open Up Man

Fire Alarm is calling Ladder 25 Open Up Man

Fire Alarms informs C7 that they received Ladder 25's emergency signal and tried to reach him on all four channels and could not reach him

H1 (Safety Chief) has arrived and assisted by a member from Ladder 26 enters the building following Engine 30's line in attempt to locate missing member. They hear a Pass device and follow this sound which leads them to a left rear door

Car 12 calls Car 10 on channel 2

21:16

21:17:

21:17:35

21:17:06

21:17:34

21:17:36

Car 12 (Net Chief) reports to Car 10. Car 10 informs Car 12 that there are two missing members and Car 12 goes to the rear of the building

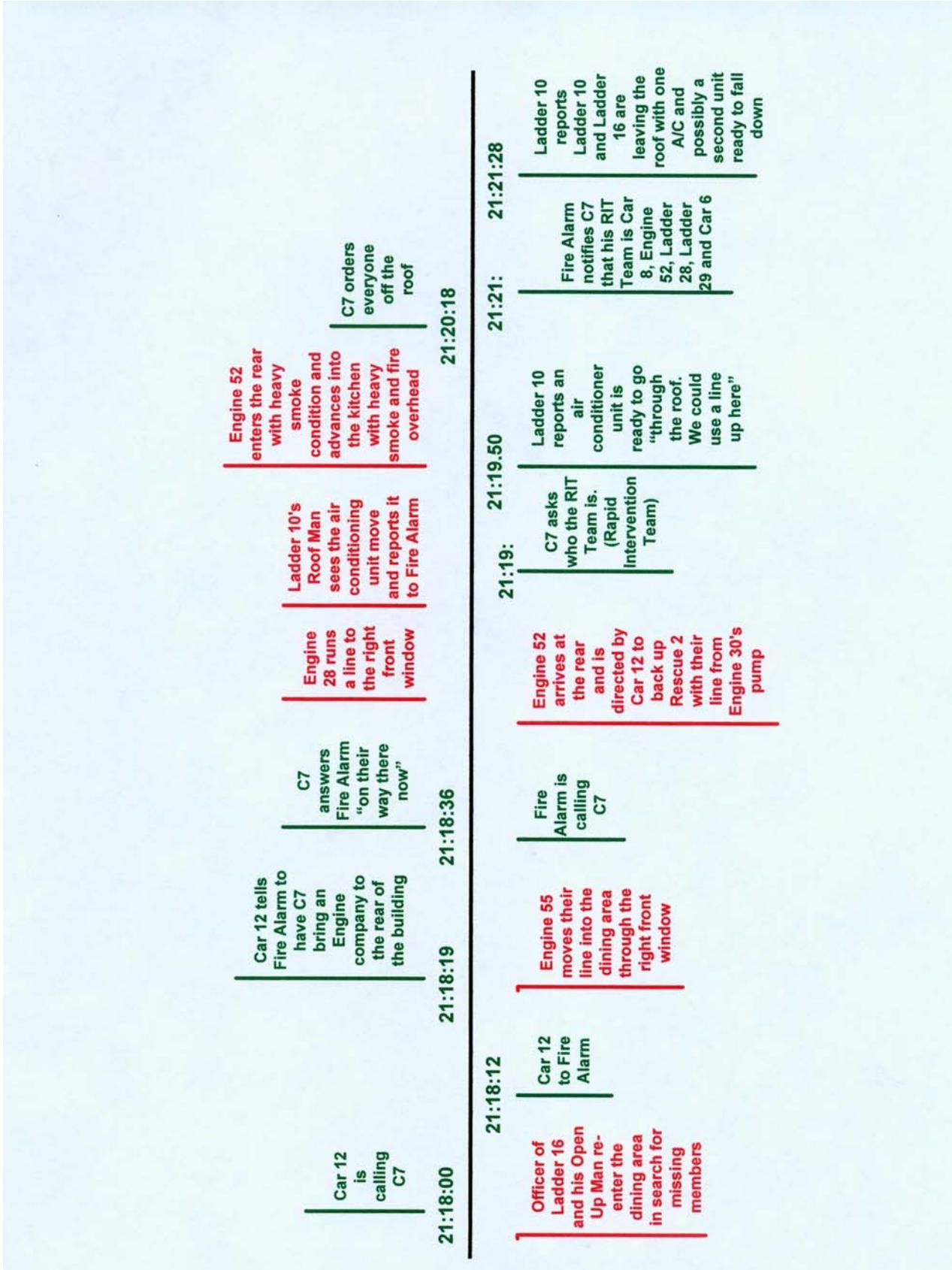
Car 12 arrives at the rear door. Finds that the door is in the open position and as he enters encounters heavy smoke banked down to within 6 inches of the floor and fire in the ceiling of the kitchen area

C7 arrives and calls off as Centre St Command

Car 12 calling C7

C7 orders a third alarm

Rescue 2 arrives and is directed by Car 12 to the rear of the building to search for missing members



21:18:00
Car 12 is calling C7

21:18:19
Car 12 tells Fire Alarm to have C7 bring an Engine company to the rear of the building

21:18:36
C7 answers Fire Alarm "on their way there now"

21:18:50
Ladder 10's Roof Man sees the air conditioning unit move and reports it to Fire Alarm

21:19:00
Engine 28 runs a line to the right front window

21:19:05
Engine 52 enters the rear with heavy smoke condition and advances into the kitchen with heavy smoke and fire overhead

21:18:12
Car 12 to Fire Alarm

21:18:19
Officer of Ladder 16 and his Open Up Man re-enter the dining area in search for missing members

21:19:12
Fire Alarm is calling C7

21:19:19
Engine 55 moves their line into the dining area through the right front window

21:19:19:

C7 asks who the RIT Team is. (Rapid Intervention Team)

21:19:21:

Fire Alarm notifies C7 that his RIT Team is Car 8, Engine 52, Ladder 28, Ladder 29 and Car 6

21:19:28:

Ladder 10 reports Ladder 10 and Ladder 16 are leaving the roof with one A/C and possibly a second unit ready to fall down

21:19:50:

Ladder 10 reports an air conditioner unit is "through the roof. We could use a line up here"

21:20:18:

Engine 52 arrives at the rear and is directed by Car 12 to back up Rescue 2 with their line from Engine 30's pump

21:21:28:

Ladder 10 reports Ladder 10 and Ladder 16 are leaving the roof with one A/C and possibly a second unit ready to fall down

Rescue 2 is searching the kitchen finding FF Cahill face down, covered in debris, Pass device operating and face piece off

Rescue 2 has a hard time removing FF Cahill due to him being caught in debris

Ladder 16's Open Up Man finds FF Payne in the right side of the dining area approximately 20 feet in from the front. Payne is in a sitting position, facing the rear, with his back against an overturned table and his facepiece on. He removes FF Payne's facepiece and tries to drag him out. He then removes his own facepiece and yells for help, to assist him with removing FF Payne.

A member from Rescue 2 and the members of Engine 55 hear Ladder 16's Open Up Man calling for help and move in to assist him. They have trouble moving FF Payne because he appears to be entangled in debris

FF Payne is removed from the building through the right front window by several members and is immediately attended to by Fire Department Doctor who performed CPR

Car 12

21:24:05

FF from Rescue 2 detailed to Engine 28 along with Rescue 2's Driver are ordered by Car 10 to enter the building through the front door to search for missing members

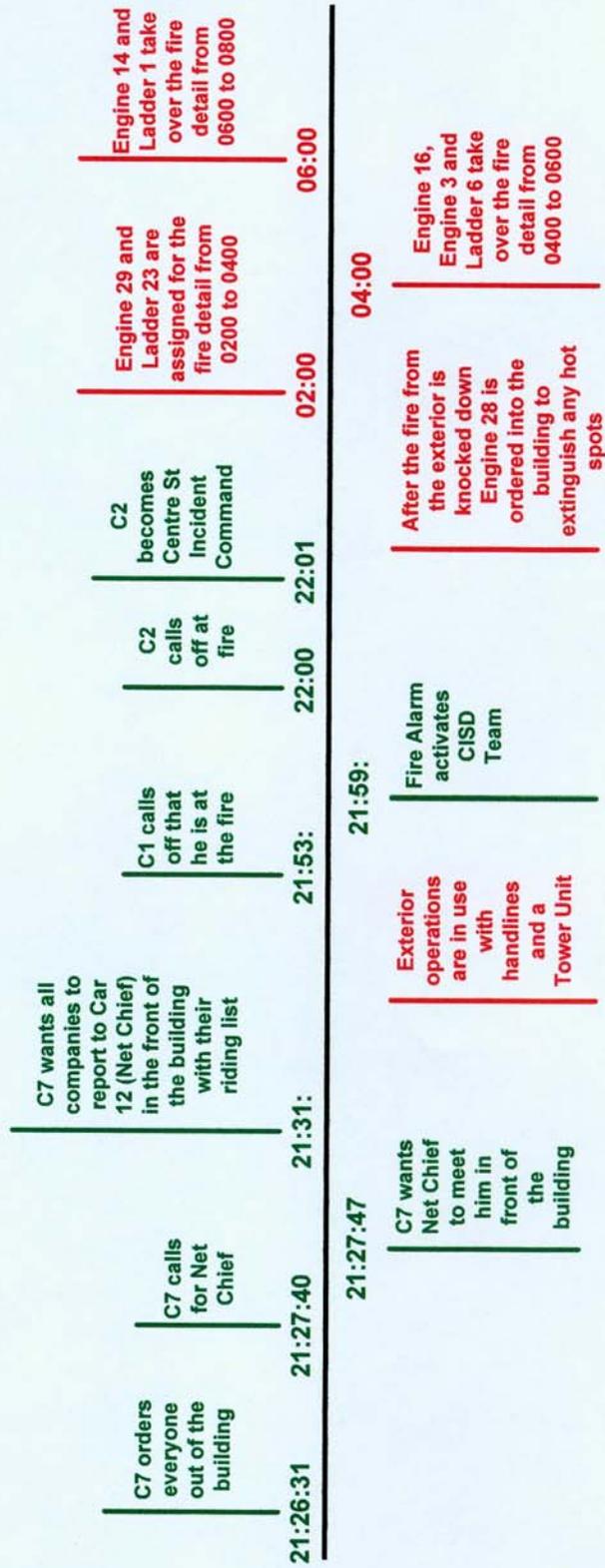
After entering the building they find Engine 30's Hydrant Man who is trying to exit the building and they assist him out to the front

Officer of Engine 30 and Officer of Ladder 25 re-enter the restaurant heading towards the kitchen to look for missing members

Car 12 witnesses FF Cahill being brought out the rear door by Rescue 2 and other members

21:25:12
C7 orders Fourth Alarm

FF Cahill is moved from the rear of the building to the street while H1 performs CPR



Section 10

TIMELINE NARRATIVE

On Wednesday, August 29, 2007 at 2104 hours, the Fire Alarm Office received its first of several calls for a building fire at the Tai Ho restaurant located at 1727 Centre Street in West Roxbury. The first of these calls originated from an employee within the restaurant reporting a fire inside the restaurant. While this caller was on the phone the fire alarm was heard sounding in the background.

The Fire Alarm Office, after receiving this call, transmitted Box 281 at 2106 hours. In accordance with standard response procedures, the following companies and units were dispatched from quarters and responded to the fire location:

- Engine Company 30
- Engine Company 53
- Engine Company 55
- Ladder Company 25
- Ladder Company 16
- Rescue Company 2
- District 10

At 2107 hours District 10 acknowledged that Box 281 had been transmitted.

At 2108 hours, the Officer of Ladder Company 25, upon arrival, reported fire showing from the roof.

The Officer of Ladder Company 25 entered the restaurant and observed no visible signs of employees or patrons within the dining room. He also observed that conditions in the dining room were clear. Continuing his search to the rear of the building, the Officer of Ladder Company 25 entered the kitchen area and observed a light smoke condition with fire in the front right corner of the ceiling above the oven and hood.

Engine Company 30 connected to a hydrant opposite the fire building with 100 feet of four inch feeder line with a hydrant assist valve and secured their water supply. The Officer of Engine Company 30 and the pipe man, Firefighter Paul J. Cahill, entered through the front door of the fire building and advanced 200 feet of one and three quarter inch attack line through the dining room into the kitchen area.

Simultaneously, Ladder Company 25's driver raised the aerial ladder to the roof over the left front A side of the fire building and ascended to the roof via the aerial ladder carrying a power roof saw. Once on the roof, he observed fire coming through a vent located approximately 40 feet to the right side rear of the building. This vent was later determined to be directly over the kitchen area. Ladder Company 25's driver started to make saw cuts through the tar and gravel/rubber roof and was forced to make four saw passes to cut through the roof. After he completed one straight four foot cut, the saw stalled, and he observed fire coming through the cut.

Engine Company 30's Officer exited the restaurant and ordered his pump operator to charge the line.

At 2109 hours Ladder Company 25's Officer ordered a second alarm due to information reported to him by a bystander concerning the possibility of fifty dogs and an attendant's presence within the basement of exposure B.

Ladder Company 25's Officer ordered via radio for Engine Company 30 to "Charge that line".

At 2110 hours C-7 acknowledged the second alarm.

Engine Company 30 began to put water on the fire from across the room in the kitchen.

Ladder Company 16 arrived on scene and the Officer and open up man entered the fire building via the front door and observed light smoke in the dining room along with dripping grease or plastic from the corner of the right rear D side ceiling of the room. Ladder Company 16's driver raised the aerial ladder to the roof and is advised by a radio message from Ladder Company 25's driver to "drop the aerial".

Ladder Company 25's Officer and Ladder Company 16's open up man removed the left side door from a pair of swinging doors between the kitchen and dining room.

At 2111 hours District 10 called off on Centre Street as Centre Street Command.

Engine Company 30 repositioned their line to the other side of the kitchen center work station to improve the angle of fire attack. Smoke started to bank down in the kitchen.

Engine Company 53 ran a four inch feeder line with a hydrant assist valve to the hydrant at 7 Greeton Road. They then advanced a two and one half inch attack line to the front of the fire building and were ordered by District 10 to advance their attack line into exposure B.

At 2112 hours Engine Company 53, now inside exposure B, called for their line to be charged.

The Officer of Ladder Company 16 along with his open up man and Firefighter Payne [Ladder Company 25's open up man] were within the dining room at this point. The Officer of Ladder Company 16 observed a missing ceiling panel in the far right D side corner of the dining room adjacent to the floor to ceiling partition wall separating the dining room from the kitchen. He further observed fire burning through the wood joists above the missing ceiling panel. As the Officer of Ladder Company 16 moved toward the kitchen doors, his open up man exited the fire building and entered exposure B to investigate for fire extension. At the same time Firefighter Payne moved to the right D side center of the dining room. Ladder Company 16's Officer called District 10 via radio with the message, "We need another line on the first floor front". Simultaneously, Ladder Company 16's Firefighter on Probation, assigned as rake man, who had been ordered by Ladder Company 16's Officer to assist Engine Company 53, was directed by Ladder Company 25's roof man to check and open any rear doors. Ladder Company 16's roof man

then proceeded to the roof with his power roof saw to assist Ladder Company 25's driver with roof ventilation.

An off duty Firefighter assigned to Engine Company 30 broke the right A/D side front window of the fire building with a halligan bar after receiving permission from District 10. He then moved to the left A/B side front window of the fire building and broke that window out.

Ladder Company 10 arrived, and Ladder Company 10's Officer and rake man brought their thermal imager into exposure D. They opened the ceiling area abutting the demising wall to check for fire extension. Ladder Company 10's roof man and open up man raised their aerial ladder to the right front A/D side of exposure D and ascended via the aerial with their power roof saw. Ladder Company 10's roof man described roof conditions as "like walking on a mattress". He also stated that heavy black smoke along with heat emanating from the roof caused him to use his SCBA/face piece intermittently.

Ladder Company 16's Officer moved toward Engine Company 30's line to a position near the fixed seating booths on the left side of the dining area adjacent to the half wall to await Engine Company 53 and direct them to the far right corner of the dining room.

District 10 ordered Engine Company 53 to back out their charged two and one half inch attack line from exposure B and to reposition their line through the front door of the fire building.

While waiting for Engine Company 53's line, Ladder Company 16's officer was forced to the floor in a matter of seconds by what he described as a loud "whoosh". He also described a sound "like a freight train". During this time, Ladder Company 16's Officer stated that conditions within the fire building became very dark and extremely hot seconds before the room turned completely orange. Due to heavy smoke and extreme heat conditions, he was driven to his knees and then to the floor. While lying on the floor he felt scalding water coming down on him from the ceiling, the result of Engine Company 30's line being operated on the fire by Firefighter Cahill. It was later determined that the majority of the dining room's ceiling tiles had been blown down which indicated that a pressure release had occurred.

At 2113 hours District 10 called Ladder Company 16 twice via radio and received no response.

Ladder Company 16's Officer exited the fire building's front door on his hands and knees.

Ladder Company 25's Officer told his rake man to remain with Engine Company 30's line while he attempted to locate a rear exit. Due to heavy smoke conditions within the fire building, he was unsuccessful in locating a rear exit. Ladder Company 25's Officer returned to the kitchen area where fire conditions had markedly deteriorated and experienced extremely elevated heat levels accompanied by zero visibility in this area. Ladder Company 25's Officer then followed the sound of water being discharged from Engine Company 30's line and located Engine Company 30's officer positioned behind his pipe man, Firefighter Cahill, backing him up as they discharged water on the fire. Upon locating Engine Company 30's Officer and pipe man, Ladder Company 25's Officer yelled to them "get out", "get out". Firefighter Cahill shut down the line that had been pulled over a center counter work station and attempted to follow his hose line to exit the front of

the fire building. The excess hose line that had been advanced into the kitchen during the repositioning of Engine Company 30's line caused Firefighter Cahill to move further into the kitchen toward the rear of the building. Firefighter Cahill was later located, covered with debris in the kitchen, with Engine Company 30's line and removed from the fire building.

The Officers of Ladder Company 25 and Engine Company 30 exited the fire building through the kitchen and dining room without following the hose line back.

At 2114 hours Firefighter Warren J. Payne's portable radio emergency distress signal was received by the Fire Alarm Office.

Engine Company 30's hydrant man entered through the front door of the fire building following Engine Company 30's hose line and encountered heavy smoke conditions within the kitchen. On his hands and knees, he located Ladder Company 25's rake man in the kitchen and asked him for the location of Engine Company 30. Ladder Company 25's rake man was unaware of Engine Company 30's location, so he continued to follow the line until he reached a center counter work station and couldn't proceed further. Engine Company 30's hydrant man then reversed his direction and followed the line out through the front door of the fire building.

Fire Alarm Office called Ladder Company 25's open up man several times and received no response.

Engine Company 55 operated their two and one half inch attack line through the A side front right window of the fire building on fire within the dining room's rear partition wall and ceiling.

Engine Company 53 operated their two and one half inch attack line from the fire building's front door entryway on fire in the ceiling on the right D side of the dining room.

At 2115 hours the Fire Alarm Office called District 10 and informed him that they received Ladder Company 25's open up man's emergency distress signal. District 10 answered the Fire Alarm Office and stated "they are in the building; we are trying to get them". The Fire Alarm Office continued trying to contact Ladder Company 25's open up man.

District 12 [Net Chief] reported to District 10 in front of the fire building. District 10 informed District 12 that there were two firefighters unaccounted for. District 12 informed District 10 of his intention to investigate conditions at the rear of the fire building. As District 12 proceeded past the front of the fire building toward the rear, he observed ceiling tiles that had been blown down and the presence of a heavy smoke condition within the dining room.

At 2116 hours the Fire Alarm Office continued to call Ladder Company 25's open up man and did not receive a response. District 12 arrived at the rear door D side of the fire building and observed that the door was open. District 12 then entered the fire building and proceeded through the storage room into the kitchen and encountered a heavy floor to ceiling smoke condition and observed fire in the ceiling area.

Rescue Company 2's Officer, with two of Rescue Company 2's members, arrived at the rear door on the D side of the fire building and were ordered by District 12 to enter the fire building from that location and conduct a search for unaccounted firefighters.

At 2117 hours Division 2 arrived and assumed Centre Street Command. The Fire Alarm Office informed Division 2 that they received Ladder Company 25's emergency distress signal and attempted to contact him on all four channels and had not received any response from Ladder Company 25's open up man.

H-1 [Safety Chief] with a member from Ladder Company 26 entered the fire building to search for missing firefighters following Engine Company 30's hose line into the kitchen. During his search, H-1 heard a PASS device sounding and his attempts to locate the source led him to the left B side rear where he and the member from Ladder Company 26 exited the C side rear of the fire building.

At 2117 hours Division 2 ordered a third alarm transmitted.

Ladder Company 16's Officer with his open up man re-entered the dining area of the fire building to search for missing firefighters.

Engine Company 55 repositioned their attack line into the dining room through the side A front right window of the fire building and advanced toward the fire.

At 2118 hours District 12 requested the Fire Alarm Office to send an engine company to the rear of the fire building.

At 2118 hours Division 2 notified the Fire Alarm Office that the line just requested "is on the way there now".

Engine Company 52 arrived at the rear of the fire building and was ordered by District 12 to operate their one and three quarter inch attack line to protect members of Rescue Company 2 engaged in conducting a search for unaccounted members.

Engine Company 28 advanced an attack line to the A side front right window of the fire building and provided protection and back up to Engine Company 55.

At 2119 hours Ladder Company 10's roof man reported to the Fire Alarm Office that a HVAC unit located on the fire building's roof was moving and stated "we could use a line up here".

At 2120 hours Division 2 ordered everyone off the roof.

At 2121 hours Ladder Company 10's roof man reported that Ladder Company 10 and Ladder Company 16 were leaving the roof. He also reported that one, and possibly a second, HVAC unit were in danger of going through the roof.

A Rescue Company 2 member, detailed to Engine Company 28, and Rescue Company 2's driver were ordered by District 10 to enter the front door of the fire building and conduct a search for

missing firefighters. While searching in the dining room they came across Engine Company 30's hydrant man and assisted him in exiting the building.

Rescue Company 2's Officer and two members of Rescue Company 2 searching in the rear of the fire building located Firefighter Cahill. He was found face down covered with debris in the kitchen with Engine Company 30's line. Firefighter Cahill's face piece was off and his PASS device was operating when he was located. Difficulty was encountered in removing Firefighter Cahill due to his entanglement in debris. After several attempts he was freed from the debris and removed to the rear alley where H-1 administered CPR. Firefighter Cahill was quickly moved to the front of the fire building and was treated and transported by Boston EMS to the Faulkner hospital.

Note: It was observed that Firefighter Cahill, after his removal from the fire building, had a laceration to the forehead at the hairline. Later, Firefighter Cahill's fire helmet was recovered with blood on the helmet liner.

At 2125 hours Division 2 ordered fourth alarm.

Ladder Company 16's open up man, while searching, located Firefighter Payne on the right D side of the dining room, approximately twenty feet from the front wall of the fire building. Firefighter Payne was found in a sitting position with his back up against an overturned table with his face piece on. Ladder Company 16's open up man shouted for help upon his discovery of Firefighter Payne and unsuccessfully attempted to move him. As other members arrived, Firefighter Payne's SCBA harness, entangled with wires, and face piece were taken off in attempt to free him from the debris. He was then removed through the A side front right window of the fire building and received immediate medical attention by the Boston Fire Department Medical Examiner and Boston EMS. Firefighter Payne was then transported by Boston EMS to the Brigham and Women's hospital.

At 2126 hours Division 2 ordered the fire building evacuated.

At 2127 hours Division 2 ordered the Net Chief to the front of the fire building.

At 2131 hours Division 2 ordered all companies at the incident to report to the Net Chief in front of the fire building with riding lists for roll call.

At 2153 The Fire Commissioner arrived at the fire.

At 2200 hours the Chief of Department arrived at the fire.

Section 11

Fire Cause and Determination

NARRATIVE STATUS

FIRE INVESTIGATION UNIT

INCIDENT: 07/47497 DATE: 08/29/2007 ADDRESS: 1727 Centre Street

At 2109 hours, upon receipt of 2nd alarm Box 281, the Fire Investigation Unit responded to 1727 Centre Street, the Tai Ho Restaurant and reported to the Incident Commander, Acting Deputy Fire Chief Paul O'Brien. Weather conditions at the time of the incident were clear and cool with temperatures in the upper 60's. The main body of fire was confined to the Tai Ho Restaurant with minimal horizontal extension in the wall studs, double top plates and several roof joists in the area that separates Tai Ho and Fern's, the occupancy on the right (exposure D). The Tai Ho is a one (1) story 32' 4" X 60' structure of ordinary construction, brick facing and a sloped, flat rubber roof. At the time of the Squads' arrival, a 4th alarm had been transmitted and all members were ordered off the roof due to an HVAC unit in peril of falling through the roof to the floor below. Shortly thereafter all department personnel were ordered to evacuate the building because of the obvious hazardous conditions. The following morning two (2) cranes from Shaughnessy Construction removed the HVAC unit from the roof. The HVAC unit was a three (3) ton capacity unit weighing approximately 398 lbs.

After discussing the situation with the Incident Commander and lengthy interviews with members of the 1st arriving suppression units, the Squad carefully began conducting an origin and cause by using the fire investigation prescribed method of following the path of least to most damage. The fire originated in the kitchen which was at the rear right of the restaurant and approximately 18' 6" X 16' 6" in dimension. The 11' high sheet metal stamped ceiling was suspended approximately 2' below the roof deck. The area of origin was at the far right front of the kitchen area at ceiling level above the hood, over a two (2) tier oven. Directly adjacent to the oven on the left was a two (2) basket fryolater used for frying foods. Above the fryolater was a hood vent. The Squad removed the classified baffle filter and were able to see the ceiling area above the oven. We were able to make note of a considerable grease build-up and a separation in the duct work that was made obvious by the observance of rust and severe degradation of the duct to hood connection in the plenum chamber. This separation in the duct was approximately 12" long and 1" wide. The grease contributed significantly to the heat and products of combustion allowing the partition wall between the kitchen and dining room to also be compromised. The products of combustion including: heat and flame, smoke, carbon monoxide, and other fire gases caused the fire to extend vertically and horizontally with the compromising of the partition wall and ignition of the ceiling joists with extension to the bottom of the roof deck leading to a rapid loss of integrity to the roof's structural members. The weakening of the roof at this point led to a 2' to 3' drop downward of the HVAC unit. This snapped the black iron gas feed with instant ignition of the leaking natural gas at that point. Carbon Monoxide (CO) and smoke filled the dining room ceiling area which consisted of a 17" void between the cellulosic/mineral fiber ceiling tiles and the underside of the sheet metal

stamped ceiling and a 20” void between the sheet metal stamped ceiling and the roof deck. The result was a “flammable gas ignition”.

The Squad spoke with the Officer of Ladder Company 25, who reported that on arrival there was fire showing from the roof of the restaurant. Members of Engine Company # 30 ran an 1 3/4” line into the front entrance, through the dining room area to the rear of the building and into the kitchen. At that time the dining room appeared to be clear of any smoke and fire with the fire appearing to be confined to the ceiling area above the oven in the kitchen. The Officer of Ladder Company 25 stated that Engine Company # 30 had initiated suppression activity and that in a short period smoke banked down causing conditions in the kitchen to deteriorate very rapidly, necessitating an immediate evacuation by members. Upon exiting the kitchen, it became apparent that the dining room and the entire restaurant was now untenable.

It became clear that two firefighters did not get outside. Firefighter Paul Cahill was found in the kitchen by members of Rescue 2 and was removed out to the rear of the building in full cardiac arrest. The Safety Chief [H-1] immediately started CPR with the victim subsequently being removed to the hospital by Boston EMS. Firefighter Warren Payne was found at the right side of the dining room, approximately 20’ in from the front of the building and removed to the street in the front through a large window at the right side of the structure. The Fire Department Medical Examiner, who was on scene, began administering CPR to Firefighter Payne before removal to the hospital by Boston EMS.

A Boston Police Lieutenant Detective, assigned to the FIU, coordinated the investigation with the Boston Police Homicide Unit with all the necessary measurements and photos, both still and video. This incident is a cause given fire, a failure to clean with the severe grease build up and the separation in the duct work contributing to the rapid spread of fire. District 10 Fire Chief assessed damage at \$800,000.00. Digital photos and video were taken by FIU photographer.

Respectfully submitted,

FIU in Charge
Fire Investigation Unit/Arson Squad
HS/db
Centre st 1727

Section 12

PERSONAL PROTECTIVE EQUIPMENT

Equipment

The Boston Fire Department provides and issues personal protective equipment (PPE) to all of its members. Personal protective clothing for structural firefighting is provided in the form of bunker coat, bunker pants, bunker boots, safety gloves, fire helmet, flashlight, and personal PASS device.

Bunker Gear

On August 3, 2000 the Boston Fire Department implemented a bunker gear ensemble options program* (see appendix). This bunker gear policy allowed firefighters a choice in the PPE they could wear during structural firefighting. Since initial adoption of the bunker gear options policy, and the fire at the TAI HO restaurant, the bunker gear policy has been modified several times. The bunker gear policy in effect on August 29, 2007 can be found in Special Order No. 31 dated June 27, 2005* (see appendix). This most recent policy was amended on June 28, 2006 to allow the wearing of fire retardant shorts. Both Firefighter Cahill and Firefighter Payne were wearing bunker gear ensemble option # 2 on the night of the fire.

The bunker gear worn by Firefighters Cahill and Payne was manufactured by BRISTOL Fire Apparel Inc. and issued in April 1995. This bunker gear has an outer shell of NOMEX DELTA T. This blend is comprised of 75% Nomex, 23% Kevlar, and 2% carbon fiber rip stop. The garment contains a breathable moisture barrier and an inner thermal liner. This PPE is certified as meeting the requirements of the National Fire Protection Association (NFPA) 1971 *Standard on Protective Ensemble for Structural Firefighting* (1991 edition).

PPE

All members are issued structural firefighting gloves and bunker boots. This PPE is certified as compliant with NFPA 1971 *Standard on Protective Ensemble for Structural Firefighting* meeting the requirements of successive editions of the standard depending on the date they were placed in service. Every firefighter is issued a Cairns leather fire helmet, model N5A, and a personal Survivor flashlight.

SCBA

The Boston Fire Department respiratory protection program provides every on duty member an individual Self Contained Breathing Apparatus (SCBA). The equipment provided is a SCOTT AIR-PACK Fifty model 4.5 pressure demand SCBA. When equipped with the standard department air cylinder, this SCBA is certified by NIOSH as a 30-minute rated SCBA. In addition to meeting the requirements of NIOSH, the departments SCBA are certified as meeting the requirements of NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus* (2002 edition). Six

hundred twenty five new SCBA were placed in service during July 2004. Every member of the department is provided with a personal issue full face piece for attachment to the SCBA breathing regulator.

PASS

All members of the department are provided with two Personal Alert Safety System (PASS) devices. Each member is issued a Grace Industries super PASS, an individual, stand alone (PASS) that they are required to affix to their bunker coat. In addition, all Department SCBA are equipped with an integrated, automatically activated SCOTT pak-alert SE PASS device. The integrated PASS is certified as compliant with NFPA 1982 *Standard on Personal Alert Safety Systems* (1998 edition).

Radio System

The Boston Fire Department is responsible for the receipt and dispatch of all fire related emergency calls throughout the city. These calls are received and the apparatus dispatched by the Fire Alarm Office (FAO). The Boston Fire Department operates a conventional analog radio system manufactured by Motorola. The system is licensed by the Federal Communications Commission (FCC) as a Public Safety Radio System. The system utilizes 15 channels. The frequencies listed are for the portables and mobiles.

Channel	Frequency	Use
BFD 1	483.1625	Call-In, General Communications
BFD 2	483.1875	Fireground Communications
BFD 3	483.2125	Haz-Mat Communications
BFD 4	483.2375	Evacuation Operations, Command Channel
BFD 5	453.6500	Station Alerting
BFD 6	483.1500	Tactical / Academy
BFD 7	483.1750	Tactical / Academy
BFD 8	483.2000	Tactical / Academy
BFD 9	483.2250	Tactical / Academy
BFD 10	483.2500	Tactical / Fire Alarm Construction
BFD 11	486.1500	Tactical / Special Operations Command
BFD 12	486.1750	Tactical
BFD 13	486.2000	Tactical
BFD 14	486.2250	Tactical
BFD 15	486.2500	Tactical

Channels BFD 1 through BFD 4 operate in half-duplex mode. This allows the Fire Alarm Office (FAO) to receive and transmit at the same time while the mobile and portable units can either receive or transmit. The Fire Alarm Office has sole responsibility for the control of radio traffic. Channel BFD 1 has been designated as the Call-In channel. All department radio users are required

to make initial contact on this channel. The use of all others channels is restricted. Fire Alarm assigns radio channels to incidents or units as needed.

During periods of multiple alarms or other high activity levels, the Fire Alarm Office will designate which channels are to be used for which purpose. This includes the assignment of channels for use at a particular incident.

Normally BFD 2 will be assigned for all alarms of fire if not already in use. Subsequent fires will be assigned to BFD 3 or BFD 4. The units operating at the Tai Ho fire were assigned to radio channel BFD 2 by the Fire Alarm Office.

Every piece of fire apparatus has a mobile radio in the cab. All command vehicles are equipped with a mobile radio. The Motorola XTS5000 portable radio is now the standard portable for all firefighting personnel. The department currently has 488 portable radios in service and every on duty firefighter is assigned a radio. The transmit power of the XTS5000 portable is 5 watts. All mobile and portable radios are equipped with a unique user identification call sign. This call sign is recorded and time stamped by the FAO console every time the radio transmits. In addition every radio voice transmission is also recorded, with time stamp, on a separate digital radio voice recorder.

All portable radios have two orange buttons that have been programmed to send an emergency signal to the FAO radio consoles. The emergency signal includes the call sign. This signal is intended to alert the Fire Alarm Operators that there is a Mayday/Urgent message or that the firefighter is in distress. FAO will then call that radio to determine the nature of the emergency.

Equipment Examination

An investigation of the personal protective equipment (PPE) used by the victims was conducted to determine if the intended level of protection was provided. This investigation consisted of examining both the protective clothing worn and the protective equipment used by the victims. The PPE was also examined to determine if it functioned as designed. Initial inspection and testing of the PPE was conducted at 13:30 hours on September 8, 2007 at the quarters of the Fire Investigation Unit (FIU). The equipment examined was removed from storage in the FIU evidence room of the Boston Fire Department. Present at the inspection on this date were:

Deputy Fire Chief Stephen K. Dunbar	Division 1 group 4
District Fire Chief Michael G. Feely	Safety Division group 1
District Fire Chief William J. Rice	Fire Investigation Unit
FF John P. Bergamo	Training Division, SCBA technician
FF James P. MacDonald	Training Division, SCBA technician
FF Kenneth W. Rheddick	Fire Investigation Unit, photographer
Radio Shop Supervisor Joseph F. Brooks	Fire Alarm Division

Equipment belonging to FF Paul Cahill

SCBA marked # 356 and also E30

This SCBA was identified as belonging to FF Cahill. This SCBA is a SCOTT air-pack 4.5/Fifty with integrated SCOTT pak-alert SE PASS device. Coupled to this SCBA was a SCOTT 30 minute air cylinder (serial # ALT 639-43578).

The SCBA is certified as compliant with NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus* (2002 edition).

The PASS is certified as compliant with NFPA 1982 *Standard on Personal Alert Safety System*. PASS (1998 edition).

The initial examination noted the following conditions of the SCBA.

The purge valve on the regulator was in the fully open position. The air gauge on the control console indicated empty. There were water drops on the inside of the gauge lens. The air cylinder valve was in the fully open position and the cylinder gauge indicated 0 [zero] pressure. The PASS was tested and functioned properly. There was no facepiece on the regulator.

In order to test the functionality of certain SCBA components, the pressure coupling was disconnected from the empty cylinder and a full air cylinder was connected to the SCBA. The replacement cylinder was opened and the Heads Up Display (HUD), PASS, and vibralert functioned as designed when initially charged. The regulator, air saver switch, and purge valve were tested and functioned correctly. The remote gauge indicated a full cylinder.

The cylinder valve was closed and the air pressure in the SCBA was bled to zero gauge pressure using the purge valve. The HUD and vibralert functioned correctly at the corresponding design pressures.

Visual examination of the SCBA showed a straight 3/4" cut in the outer covering of the low pressure hose. This small slice in the hose exposed the HUD wiring. This cut did not appear to affect the operation of the HUD. There was no air leakage from this cut.

During a second inspection, while preparing the SCBA for a flow test, it was discovered that the regulator had a small air leak when rotated around the purge body valve. This leak occurred intermittently. This air leak did not occur during the initial testing of the HUD, PASS, vibralert, or purge valve. The Boston Fire Department manufacturer certified repair technicians examined the air leak and determined that the seals and gaskets on the purge body were worn and needed replacement. The technicians explained that this was a common repair and accounted for 10% – 15% of all SCBA repairs. Both repair technicians stated that the soiled condition of the SCBA was about average when compared to other SCBA that come in for repair or maintenance. There were noticeable water drops on the inside of the SCBA pressure gauge.

On September 9, 2007, this SCBA was tested for air flow performance as specified in section 7.1 of NFPA 1981 (2002 edition). The SCBA was placed on the Biosystems Posichek 3 and flow tested. This SCBA passed all functional and breathing resistance tests. The activation of the SCBA end of service time indicators (EOSTI) were observed as specified in section 6.2 of NFPA 1981. The activation of the HUD was observed as specified in section 6.3 of NFPA 1981. The last annual flow test on this SCBA was performed by the department technicians on March 13, 2007 and passed all functional and breathing resistance tests.

To determine if the air leakage from the purge body may have contributed in any significant way to an accelerated loss of breathing air the following test was performed. The air cylinder was removed and replaced with a full cylinder. The batteries were removed from the PASS sensing module and marked. These batteries were removed to prevent operation of the PASS alarm during the purge leak test. The batteries were replaced upon completion of the test. The battery compartment was clean and dry and had no signs of corrosion.

The replacement air cylinder was fully opened. The HUD and remote pressure gauge both indicated a full air cylinder. The regulator was rotated into a position that was able to obtain the maximum air leakage from the purge body. The regulator was secured in this position for the length of the test. The leak from the regulator purge body continued at a constant flow and the following was observed.

- Air flowing for 16 minutes and 30 seconds the HUD first indicated 3/4 full air pressure.
- Air flowing for 49 minutes and 20 seconds the HUD indicated 1/2 air pressure.
- Air flowing for 86 minutes and 12 seconds the HUD indicated 1/4 air pressure.

The vibralert activated at this time and the test was stopped. These are total elapsed times. The original cylinder and batteries were reinstalled in the SCBA.

These test results are the basis for the BOI's conclusion that the air leak from the purge body did not significantly contribute to an accelerated loss of air pressure.

Facepiece

The facepiece tagged FF Cahill was a SCOTT-O-VISTA model AV 2000. There was a small 1/4" stress fracture in the lens at the top left adjustment strap connection. The interior surface of the facepiece lens was coated with a large amount of soot. FF Cahill's name was faintly visible on the top adjustment strap of the head harness. The facepiece was not on the regulator. With the facepiece flat on a table, regulator hole facing the bottom and nose cup on the inside, the adjustment straps were in the following positions.

Top left strap pulled tight to the webbing
Top right strap pulled within 1" of the webbing
Lower left strap not pulled
Lower right strap pulled approximately 3 – 3.5 "

PASS

The SCBA integrated PASS was tested by operating the emergency alarm and reset buttons and functioned properly. The red and green LEDs on the control console functioned correctly. The PASS emergency alarm was again activated and reset. During this test the PASS remained in the sensing mode for 19 seconds before sounding the pre alert signal. The PASS sounded in the pre alert mode for 12 seconds before moving into alarm mode. The functional mode times are within NFPA 1982 design parameters of a properly functioning PASS device. During previous SCBA testing with the replacement air cylinder the PASS activated as designed. The pre alert and alarm signal strength appeared consistent with a properly functioning PASS.

Bunker coat

The interior label identified the manufacturer as Bristol Fire apparel. The label on the coat listed a manufacture date of 4/95 and garment # 000238. There was no noticeable thermal exposure or insult to the outer shell. The interior lining of the bunker coat was in fair condition. There was a small (penny size) burn on one of the reflective stripes.

FR (Fire Resistive) station pants

FF Cahill was wearing department issue FR station workpants and black safety shoes. The pants showed no apparent defects or damage.

Gloves

A pair of department issue NFPA compliant structural firefighting gloves were examined and found in good condition.

Flashlight

A survivor flashlight tagged as FF Cahill was tested and functioned properly.

Fire Helmet

A Cairns and Bros. helmet, model N5A, tagged as belonging to FF Cahill was examined and found to be in good condition with normal wear and tear.

Personal PASS Device

There was no individual issued PASS device found.

Portable radio

FF Cahill did not have a portable radio in his possession. A portable radio, identified as “Engine 30 pipe”, was accounted for at Engine Company 30’s quarters on the morning of August 30, 2007.

Equipment belonging to FF Warren Payne

SCBA # 359

A second SCBA was recovered marked with the BFD in house inventory # 359. There were no other distinguishable markings. This SCBA is a SCOTT air-pack 4.5/Fifty with integrated SCOTT pak-alert SE. Within this SCBA was a SCOTT 30 minute air cylinder. The SCBA is certified as compliant with NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus* (2002 edition). The PASS is certified as compliant with NFPA 1982 *Standard on Personal Alert Safety System PASS* (1998 edition).

This SCBA had been subjected to an extreme thermal exposure. All surfaces were blackened. All plastic components were melted and distorted. Much of the cloth portions of the SCBA shoulder straps were burnt away or charred and brittle. The control console was melted and the air gauge unreadable. The alarm and reset buttons on the PASS control console appeared to function correctly, however, the PASS did not operate. The purge valve on the regulator was melted and distorted but appeared to be 2/3 in the fully opened position. The regulator was melted with a portion of the facepiece melted onto the regulator body.

The air cylinder had a blue paint band on the neck of the cylinder indicating it had been hydro tested in 2004. The hydro test label was charred and unreadable. The cylinder pressure gauge lens was melted and unreadable. The air cylinder was empty and in the fully closed position. The nipple O-ring in the cylinder coupling appeared to be in good condition and did not show any signs of exposure to the extreme heat.

There were multiple wires wrapped around the low pressure hose and the body of the SCBA that were not components of the SCBA. Examination of the fire scene revealed that the lower suspended ceiling was supported with similar wires. Photographs of the fire scene document wires hanging from the ceiling in the area where FF Payne was found. The Board of Inquiry believes that the wire fell from the ceiling onto FF Payne’s SCBA and became tangled in the unit.

In an attempt to look for damage or thermal distortion, the nipple O-ring from the pressure coupling was removed and tagged for examination. The same O-ring was also removed and tagged from FF Cahill's SCBA. The O-rings were delivered to the SCBA repair shop for examination under the magnifying light with a certified SCBA repair technician. The examiner looked for signs of damage, particularly damage caused by heat. There was no indication of damage or distortion due to heat. Both removed O-rings were then compared to a new O-ring. All three O-rings looked similar. There was a slightly darker appearance in color on the exposed side of the O-rings that came from the victims SCBA. The repair technician noted that they looked no worse than the other O-rings that come in from the field. The O-rings were reinstalled on the proper SCBA.

The interior of the pressure coupling and the exterior of the cylinder threads were examined and showed no signs of the discoloration from heat exposure that the rest of the SCBA exhibited. This evidence combined with the examination of the O-ring leads the BOI to believe that the cylinder and coupling were connected during the fire.

Because of the damage to the SCBA, specifically the regulator, it could not be flow tested. This SCBA was flow tested at the Department repair facility on May 08, 2007. During this test, the SCBA passed all functional and breathing resistance tests.

Facepiece

Also examined was a facepiece tagged as belonging to FF Payne. Photos indicate that this facepiece was located in the area where FF Payne was found. The facepiece lens was severely melted and fragmented. The head harness webbing appeared to be mostly intact and showed no signs of thermal degradation.

PASS

The fire department investigators that collected Firefighter Payne's SCBA at the fire scene reported that the PASS alarm sounded intermittently. While the SCBA was in the evidence room at the Fire Investigation Unit, members reported that the alarm sounded intermittently for at least eighteen hours after the incident and then stopped sounding. Video made by the department photographer the day after the fire captured the intermittent sounding of the PASS alarm.

During the initial testing of the integrated PASS on September 08, 2007, it did not function. In an effort to determine the functional status of the PASS prior to the incident, the following test was conducted.

The sensing module of the PASS was removed from the SCBA back frame. The battery compartment was opened. The battery cover had minor soiling from soot and a small amount of debris on the inside gasket. The compartment cover was dry. The compartment itself was dry and free of corrosion. The batteries were removed from the sensing module and marked.

Two new and previously marked 9 volt batteries (marked test) were placed in the PASS battery compartment. The battery cover was replaced and the sensing module was locked into position on the back frame. The emergency alarm button was operated and the PASS went into alarm mode.

The PASS alarm was silenced by operation of the reset button. The PASS was then shut off by operation of the reset button. This test was repeated two additional times with the same results. The PASS was placed in alarm mode and then reset into the sensing mode by operation of the reset button. The PASS was allowed to cycle through its sensing mode. The PASS transitioned from the sensing mode into the pre alert mode at 20 seconds. After operation in the pre alert mode for 11 seconds the PASS transferred into alarm mode. This test was repeated with the same results. These times meet the requirements of section 6.3 and section 6.4 of NFPA 1982.

All sound levels appeared consistent with a properly functioning PASS. The red and green LED's on the control console functioned correctly. The PASS was not tested for automatic activation due to damage to the regulator.

The individual issue stand alone PASS by Grace Industries was also examined. This PASS was burned, blackened, and melted. The PASS was tested by operation of the emergency button and did not function.

Portable radio

This radio is a Motorola model XTS 5000 with BFD inventory # 8611. The radio was tagged as belonging to FF Payne.

The face of this radio was partially covered by burned bunker coat fabric fused to the body. The LCD display was unreadable due to a charred and blackened lens. The channel selector was in the #1 position. The push to talk button on the radio was deformed. The spiral cord from the radio body, to the lapel mounted, remote speaker microphone (RSM) was deformed and burned. This cord contains fourteen wire conductors. A portion of the insulation on the cord was melted away and exposed the wiring. The controls on the remote speaker microphone were all melted and inoperative.

The radio was turned on and emitted the power up tones. Over the course of five minutes the radio emitted many different error tones. Some were steady tones, some were intermittent tones. The radio picked up messages between FAO and Ladder 6. The push to talk button on the radio was deformed, inoperative, and unable to transmit. The emergency button on the radio was pushed repeatedly and FAO did not receive the emergency signal. The radio emitted the low battery tone. The battery was replaced and the emergency button was again activated. FAO received the emergency signal along with the radio ID for Ladder 25 open up. The soot was scraped away from the display and it functioned properly. All normal radio functionality remained on the body with the exception of the push to talk switch.

The emergency button on the remote microphone was pushed. FAO did not receive the signal and the radio failed to emit the emergency tone. The radio again made intermittent error tones. The remote speaker microphone was replaced with a new remote, and the emergency button on the new remote was activated. This time the FAO did receive the emergency signal along with the Ladder 25 open up ID. The radio was tested with FAO on channel #1 using the new remote microphone. This radio message was received by the FAO, and the radio now received an acknowledgement message from FAO.

The damaged RSM was reconnected to the radio. The damaged cord was then manipulated causing the radio to intermittently trigger and transmit the emergency alert signal. The BOI believes this deformed cord is the likely source of the emergency alert alarm.

Bunker coat

The exterior Nomex shell of the bunker coat was missing approximately 50% of its fabric. The remaining coat shell was tattered and loosely connected. These remaining fragments were extremely burned and brittle. Portions of the sleeves were missing. The vapor barrier and outer surface of the thermal liner were exposed and in a similar condition as the shell. A majority of the inner surface of the thermal liner was intact with no sign of damage. The coat had the NFPA required label and was identified as manufactured by Bristol Fire apparel with a manufacture date of 3/95 and garment # 000057

FR station Pants

There was only a small portion of the pants remaining. This consisted of the waist area of the pants. The remainder of the pants was burned away. An attached label identified them as manufactured by Topps safety apparel 8/02 1153.

Gloves

The gloves were discolored and showed signs of fire exposure. The gloves appeared to be the type issued by the department and were labeled Shelby manufacturing and marked with the safety equipment institute logo and lot # 140412

Shoes

A pair of black leather safety shoes was examined. They were intact, discolored, and showed signs of fire exposure. Small portions of the leather were burned away.

Fire Helmet

A Cairns and Bros. helmet, model N5A, was examined. The helmet showed signs of fire exposure. Portions of leather, the paint, reflective trim and company shield were burned and melted. The eye shield was almost entirely melted away.

Personal PASS Device

The individual issue stand alone PASS by Grace Industries was also examined. This PASS was burnt, and melted. The PASS was tested by operation of the emergency button and did not function.

Flashlight

A survivor flashlight was examined. The portions not covered by the bunker coat retaining strap were blackened and melted. The bezel was missing. The on/off switch was melted and did not operate.

Fire Hose

Flow tests were conducted on the four lengths of 1 3/4" hose used by Engine Co. 30 as the initial attack line. These tests were conducted to try and determine if the hose functioned properly and produced the required flow. The actual nozzle used by Engine Co. 30 at the Tai Ho fire was unavailable for testing. The tests were conducted using the standard issue Elkhart Chief low pressure nozzle (model # 4000-22). The nozzles used by the BFD are designed to flow 185 gpm at 75 psi while affixed to the 1 3/4" attack line.

On November 2, 2007 a fire hose test was conducted at the Boston Fire Department Moon Island Training Academy. Testing was performed on 200' of 1 3/4" attack line assigned to Engine 30. This hose test was performed using Engine Co. 29's pump (E-one 2007). This pump is equipped with electronic pressure and flow gauges on its discharge outlets. This allows for accurate flow measurements.

TEST 1

Test consisted of running 200' of 1 3/4" line (Engine 30) from gate #1
Using training academy nozzle (# 1)

The discharge pressure	150 psi
The gallons per minute	180 gpm

1 3/4" line (Engine 29) from gate #2
Using Engine 29 nozzle (#2)

The discharge pressure	150 psi
Gallons per minute	190 gpm

This test was conducted for 10 minutes.

TEST 2

200' of 1 3/4" (Engine 29) from gate #1
Using Engine 29 nozzle (#2)

The discharge pressure	150 psi
Gallons per minute	200 gpm

200' of 1 3/4" (Engine 30) from gate #2
Using training academy nozzle (#1)

The discharge pressure 150 psi
Gallons per minute 170 gpm
This test was conducted for 10 minutes.

With a friction loss of 25 psi for every 100' of 1 3/4" hose, up to 10 psi loss for nozzle and fittings, and a pump pressure of 150 psi, we would expect a nozzle pressure of 90 psi. The test of Engine Co 30's hose from discharge gate # 1 produced a flow of 5 gpm below design flow. The test of Engine Co. 30's hose from discharge gate #2 produced a flow of 15 gpm below design flow.

These test results, combined with reports from the Officer of Engine Co. 30 stating they had adequate water volume and pressure, leads the BOI to conclude that the reduced flow rate did not negatively impact initial hose line operations.



Portable Radio

Remote Speaker
Microphone





Radio Cord Wiring



Radio Cord Wiring





SCBA with control console

Bunker Coat – FF Payne



Section 13

TRAINING

Firefighters Cahill and Payne were assigned to fire companies that were not trained in any special disciplines such as Haz-Mat, Decon, or Technical Rescue. Therefore, their annual training consisted of Back to Basics, EMS First Responder, the Maze drill, and Rapid Intervention Team [RIT] training.

Back to Basics is a drill that consists of fire companies practicing running hose lines and raising ground ladders during live burning fire exercises conducted at the Boston Fire Department's Fire Academy burn building at Moon Island. The operation and placement of aerial ladders is also an evolution practiced during this drill.

The burn building was condemned as being unsafe to conduct live burns several years ago causing the suspension of the Back to Basics drill training program.

Recent training history:

Firefighter Cahill

2007

Maze Drill

EMS Refresher Course

Cardiac Care Response Update [CPR] Autism 101

CPR/AED

2006

EMS Responder

CPR/AED

Patient Assessment

Carbon Monoxide

C-Spine

Scene Size Up

2005

First Responder

Weapons of Mass Destruction

AED Transition

2004

Nerve Agent [Atropine]

EMS Responder

2003

Emergency Rescue

Smallpox Training

Firefighter Payne

2007

Maze Drill

EMS Refresher Course

Cardiac Care Response Update

2006

EMS Responder

CPR/AED

Packaging of Patients

Patient Assessment

EMS Refresher Course

2005

Gaining Access and Rescue Operations

First Responder

Weapons of Mass Destruction

AED Transition

NIMS ICS 100

NIMS ICS 700

2004

Chemical Protective Clothing

Ice Rescue Program

Cardiac Emergency Update

EMS Responder

2003

Smallpox Training

Basic Life Support [Defib]

Protective Breathing Search and Rescue

Ice Rescue Program

Rapid Intervention Team [RIT] was started by the Department in July of 2007. At the time of the fire, neither Engine Company 30 [Firefighter Cahill] nor Ladder Company 25 [Firefighter Payne] had been assigned to this training.

Bunker Gear

Firefighter Warren J. Payne was appointed to the Boston Fire Department on January 27, 1988. Firefighter Paul J. Cahill was appointed on May 12, 1993. Both Firefighters were issued bunker gear at the time of their appointments. During the early part of 2006, the Department began to replace the bunker gear of any firefighter who was appointed prior to the year 2000. The new gear was to be issued while fire companies were attending EMS training at Headquarters. Firefighter Payne was issued new bunker gear on April 18, 2006. Apparently, Firefighter Cahill was not with his company on the day Engine Company 30 attended EMS training. His new gear was never picked up.

SCBA

The Boston Fire Department annually inspects and flow tests all breathing apparatus. These inspections are conducted by certified SCBA repair technicians. Firefighter Payne's SCBA was inspected on May 08, 2007 and passed all functional tests and breathing resistance tests. Firefighter Cahill's SCBA annual inspection was performed on March 13, 2007 and passed all functional tests and breathing resistance tests. Firefighter Cahill's SCBA was inspected again on September 11, 2007 and passed all functional tests and breathing resistance tests. Firefighter Payne's SCBA was unable to be tested.

State requirements

For many years the Boston Fire Department trained its recruits according to a curriculum established by the Department. This curriculum mirrored accepted standards in firefighting. The recruit class of July 2007 was the first class to be certified using the State of Massachusetts Fire Academy standards. This certification will be required for all future classes.

ICS Training

In 2006, most of the Department's company officers and chiefs received instruction in an ICS 200 course that was provided by the Office of Homeland Security. In 2007, most of the Department's chiefs received instruction in ICS 300.

Spare apparatus

On the night of the fire, Ladder Company 25 and Engine Company 30 were using spare apparatus. The use of spare apparatus had no adverse effects on fireground operations.



SCOTT PosiChek3

5/8/2007 10:25:54 AM

Visual / Functional Test Results

Manufacturer : Scott Boston Fire Department
 Model : Air-Pak 4.5 115 Southampton
 ID : 359 Boston, Ma

Location : Ladder25
 Other ID :

Auxiliary IDs

Facepiece / Head Harness
 Regulator 0406002014AG
 Reducer 0406009457AA
 Low Pressure Alarm
 Cylinder
 Airline Attachment
 Harness

Visual Inspection

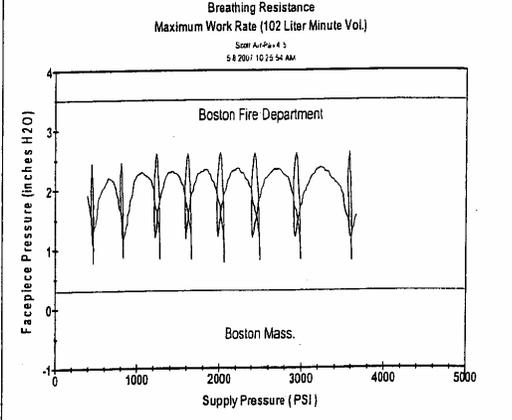
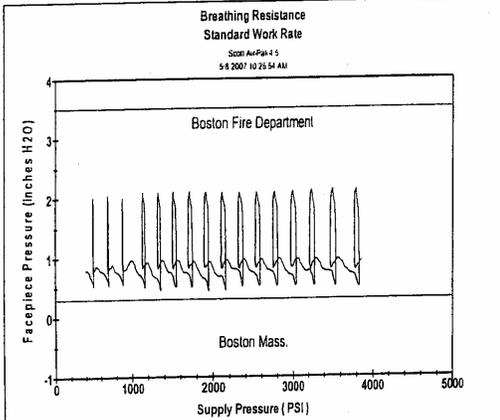
Facepiece / Head Harness : N/A
 Backframe/Harness : Pass
 Cylinder : Pass
 Alarms : N/A
 Hoses : Pass

Functional Tests

Facepiece Leak Test : Pass 0.1 in. H2O
 Exhalation Pressure : Pass 1.9 in. H2O
 Remote Gauge Test : Pass

	1000 PSI	2000 PSI	3000 PSI
Pass	1219	2111	3074

Alarm(s) Activation : Pass 1097 PSI
 Air Saver Switch : Pass -3.7 in. H2O
 Static Facepiece Pressure : Pass 0.8 in. H2O
 Primary Reducer Lockup : Pass 86 PSI
 Primary Creep : Pass -5 PSI
 Low Cylinder Transfer Pr : Pass 1097 PSI
 Secondary Reducer Lockup : Pass 159 PSI
 Secondary Reducer Creep : Pass -8 PSI
 Purge Flow Test : Pass 134 L/min
 High Pressure Leakage : Pass 4 PSI
 Secondary Pr. at High Cyl. Pass



Minimum	Maximum		Breathing Results	Minimum	Maximum	
0.4 in. H2O	2.1 in. H2O	Pass	Facepiece Pressure	0.8 in. H2O	2.6 in. H2O	Pass

Tested by : Jack McGrath
 Service Center : Boston Fire Department

Signature

359
ST

LADZS

ISSUE	RED#	REG#
7/3/04	0406009457AA	0406002014AG
11-11-06	Replaced check Valve FLU-TEST OK	
1-26-07	Replaced ALL BATTERIES Heads up Display	
5-8-07	ALL BATTERIES, FLU-TEST OK.	

ESS FF UNIT



SCOTT PosiChek3

3/13/2007 9:50:33 AM

Visual / Functional Test Results

Manufacturer : Scott Boston Fire Department
 Model : Air-Pak 4.5 115 Southampton
 ID : 356 Boston, Ma

Location : Engine30
 Other ID :

Auxiliary IDs

Facepiece / Head Harness
 Regulator 0406001881AG
 Reducer 0406009337AA
 Low Pressure Alarm
 Cylinder
 Airline Attachment
 Harness

Visual Inspection

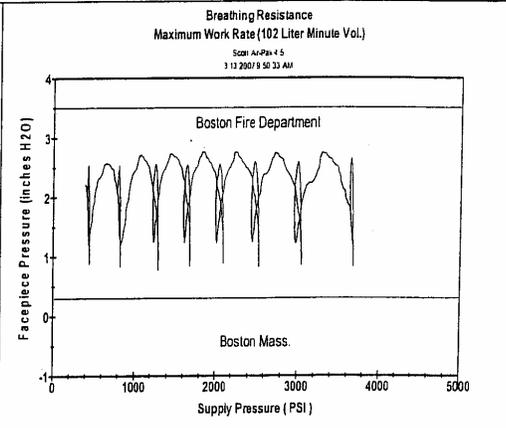
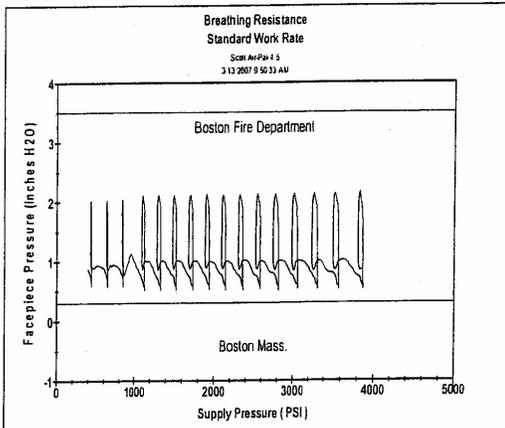
Facepiece / Head Harness : N/A
 Backframe/Harness : Pass
 Cylinder : Pass
 Alarms : N/A
 Hoses : Pass

Functional Tests

Facepiece Leak Test : Pass 0.3 in. H2O
 Exhalation Pressure : Pass 2.0 in. H2O
 Remote Gauge Test : Pass

1000 PSI		2000 PSI		3000 PSI	
Pass	1061	Pass	1946	Pass	3016

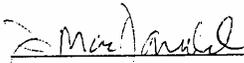
Alarm(s) Activation : Pass 1077 PSI
 Air Saver Switch : Pass -3.1 in. H2O
 Static Facepiece Pressure : Pass 0.8 in. H2O
 Primary Reducer Lockup : Pass 86 PSI
 Primary Creep : Pass -8 PSI
 Low Cylinder Transfer Pr : Pass 1077 PSI
 Secondary Reducer Lockup : Pass 162 PSI
 Secondary Reducer Creep : Pass -1 PSI
 Purge Flow Test : Pass 141 L/min
 High Pressure Leakage : Pass 10 PSI
 Secondary Pr. at High Cyl. Pass



Minimum	Maximum		Breathing Results	Minimum	Maximum	
0.5 in. H2O	2.2 in. H2O	Pass	Facepiece Pressure	0.8 in. H2O	2.8 in. H2O	Pass

3/13/2007 10:03:22 AM Jack McGrath : Replaced Check Valve

Tested by : Jack McGrath
 Service Center : Boston Fire Department

Signature 
 Page 1 of 1 Version 3.07



SCOTT PosiChek3

9/11/2007 12:15:28 PM

Visual / Functional Test Results

Manufacturer : Scott Boston Fire Department
 Model : Air-Pak 4.5 115 Southampton
 ID : 356 Boston, Ma

Location : Engine30
 Other ID :

Auxiliary IDs

Facepiece / Head Harness
 Regulator 0406001881AG
 Reducer 0406009337AA
 Low Pressure Alarm
 Cylinder
 Airline Attachment
 Harness

Visual Inspection

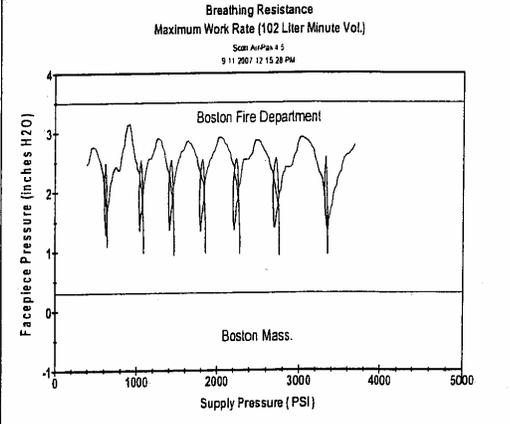
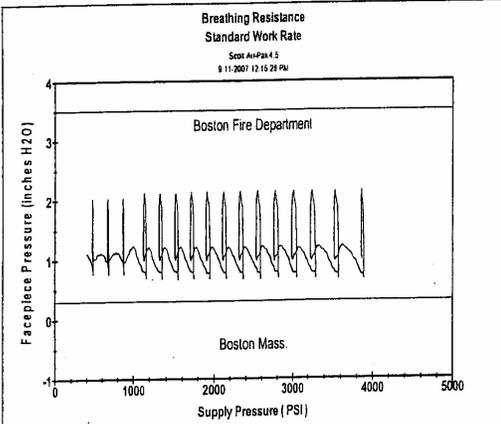
Facepiece / Head Harness : N/A
 Backframe/Harness : Pass
 Cylinder : N/A
 Alarms : Pass
 Hoses : Pass

Functional Tests

Facepiece Leak Test : Pass 0.1 in. H2O
 Exhalation Pressure : Pass 2.0 in. H2O
 Remote Gauge Test : Pass

1000 PSI		2000 PSI		3000 PSI	
Pass	1086	Pass	1900	Pass	2999

Alarm(s) Activation : Pass 1077 PSI
 Air Saver Switch : Pass -3.8 in. H2O
 Static Facepiece Pressure : Pass 0.9 in. H2O
 Primary Reducer Lockup : Pass 90 PSI
 Primary Creep : Pass -3 PSI
 Low Cylinder Transfer Pr : Pass 1077 PSI
 Secondary Reducer Lockup : Pass 161 PSI
 Secondary Reducer Creep : Pass -1 PSI
 Purge Flow Test : Pass 129 L/min
 High Pressure Leakage : Pass 11 PSI
 Secondary Pr. at High Cyl. Pass



Minimum	Maximum		Breathing Results	Minimum	Maximum	
0.7 in. H2O	2.1 in. H2O	Pass	Facepiece Pressure	0.9 in. H2O	3.2 in. H2O	Pass

Tested by : Jack McGrath
 Service Center : Boston Fire Department

Signature

Jim McDonald

Page 1 of 1

Version 3.07

356

ENG. 30

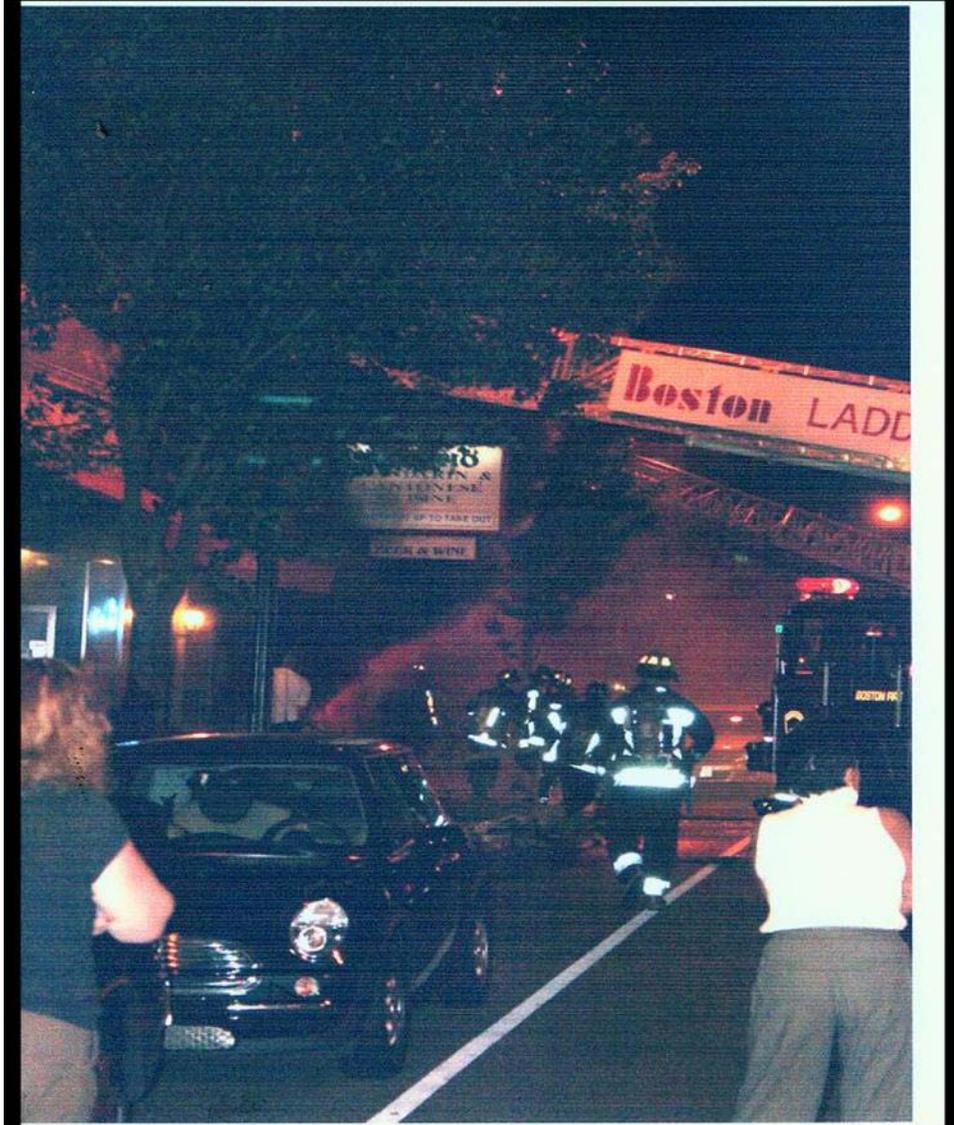
ISSUE	REG#	REG#
7/3/04	0406009337AA	0406001881AA
10-18-05	Replaced BATTERIES III	PAK-ALERT
01-10-06	Replaced BATTERIES III	PAK-ALERT
01-17-04	" "	" - HEADS UP
11-01-06	FLO TEST	OK.
03-13-07	Replaced check valves FLO TEST - OK	Replaced all batteries

Section 14

Photographs



1727 Centre Street
Fire Building



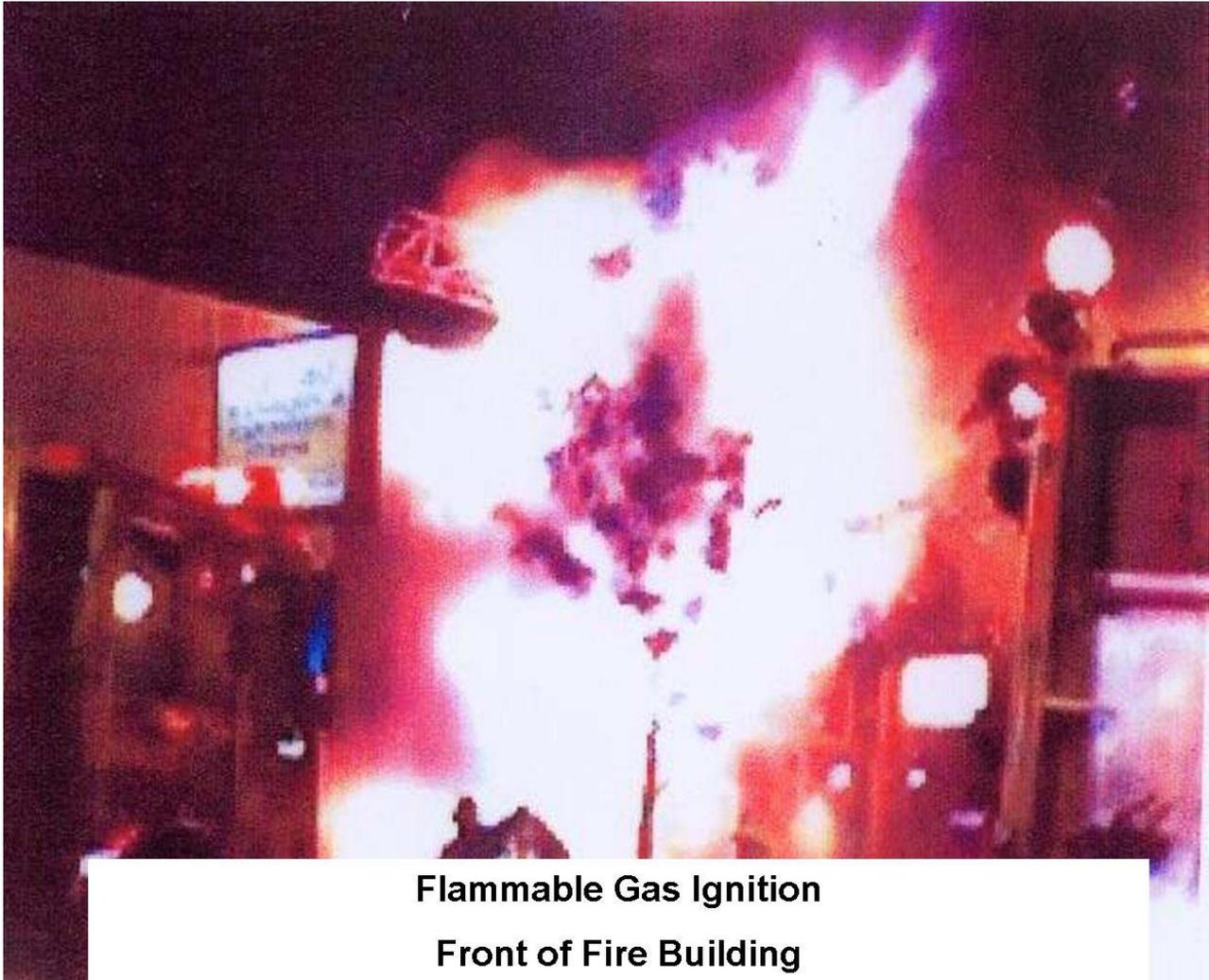
21:12 Hours



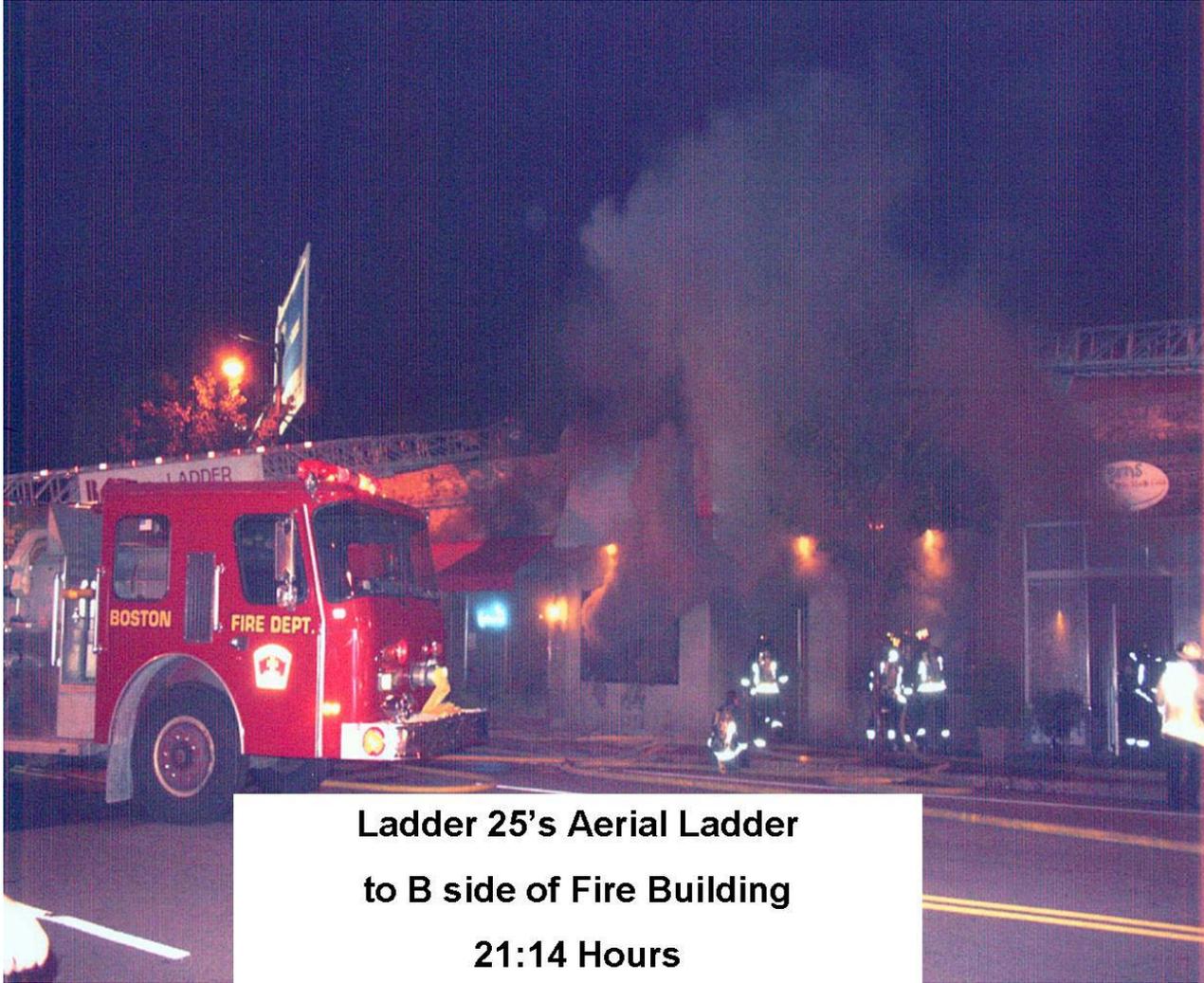
21:13 Hours



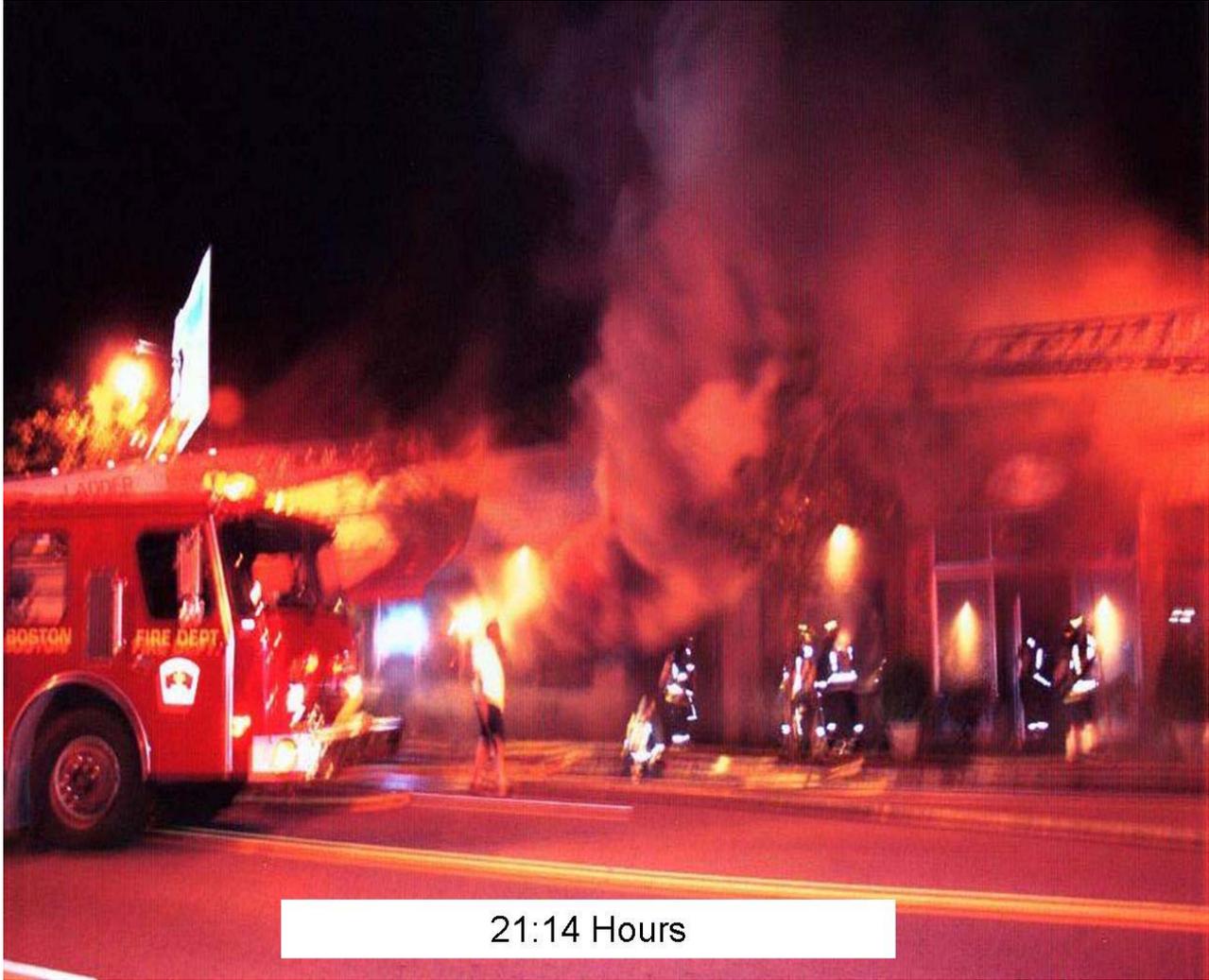
21:13 Hours



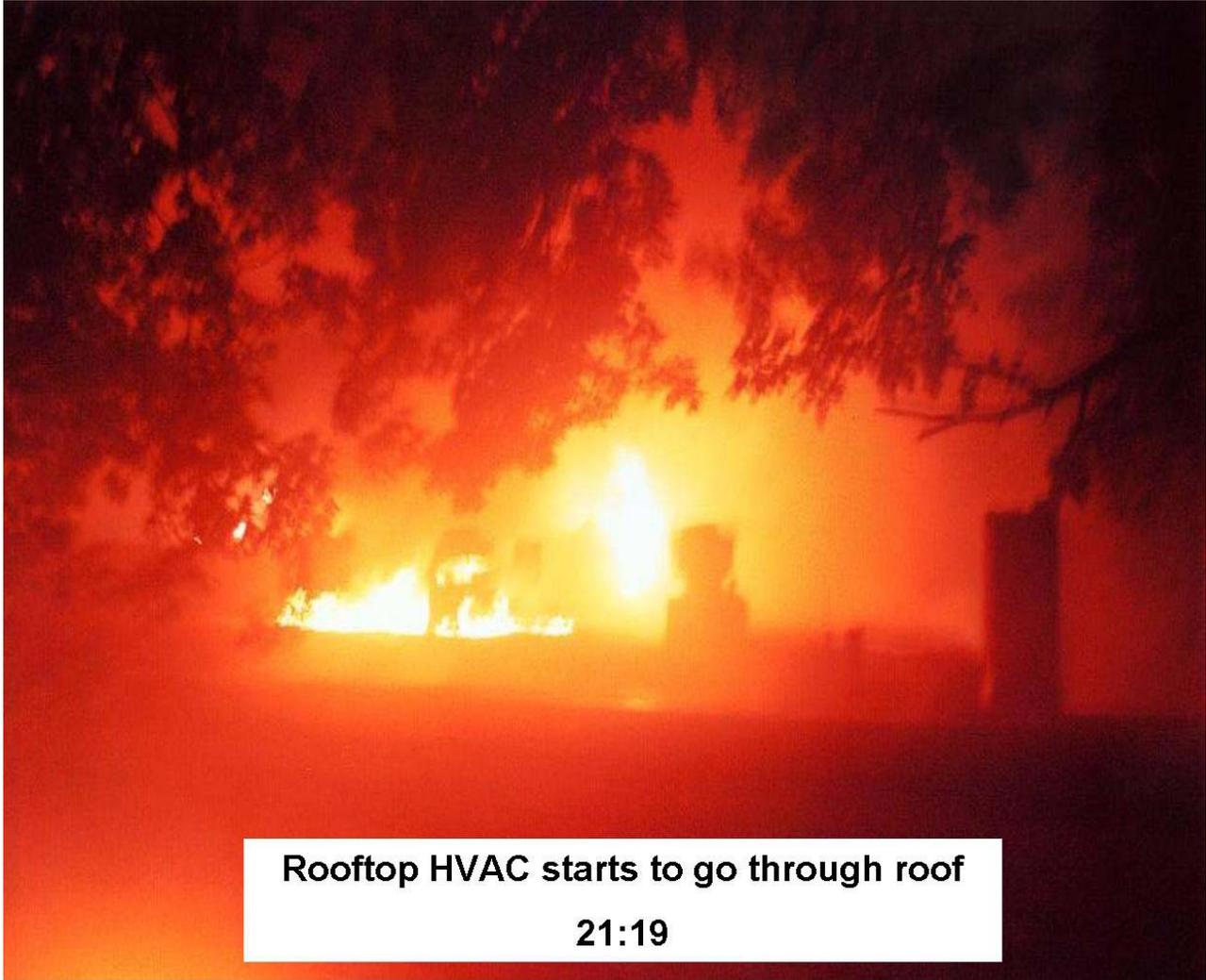
**Flammable Gas Ignition
Front of Fire Building**



**Ladder 25's Aerial Ladder
to B side of Fire Building
21:14 Hours**

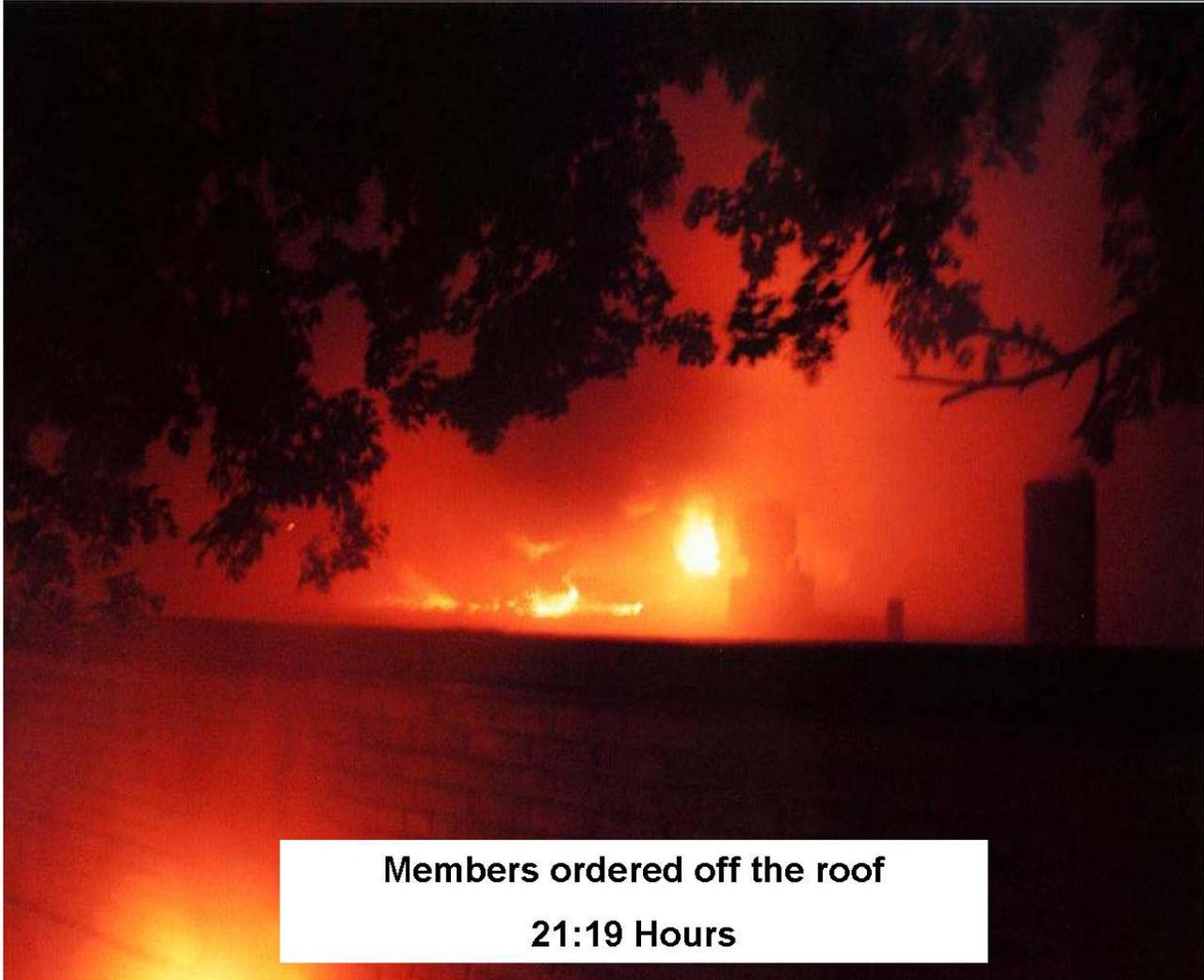


21:14 Hours



Rooftop HVAC starts to go through roof

21:19

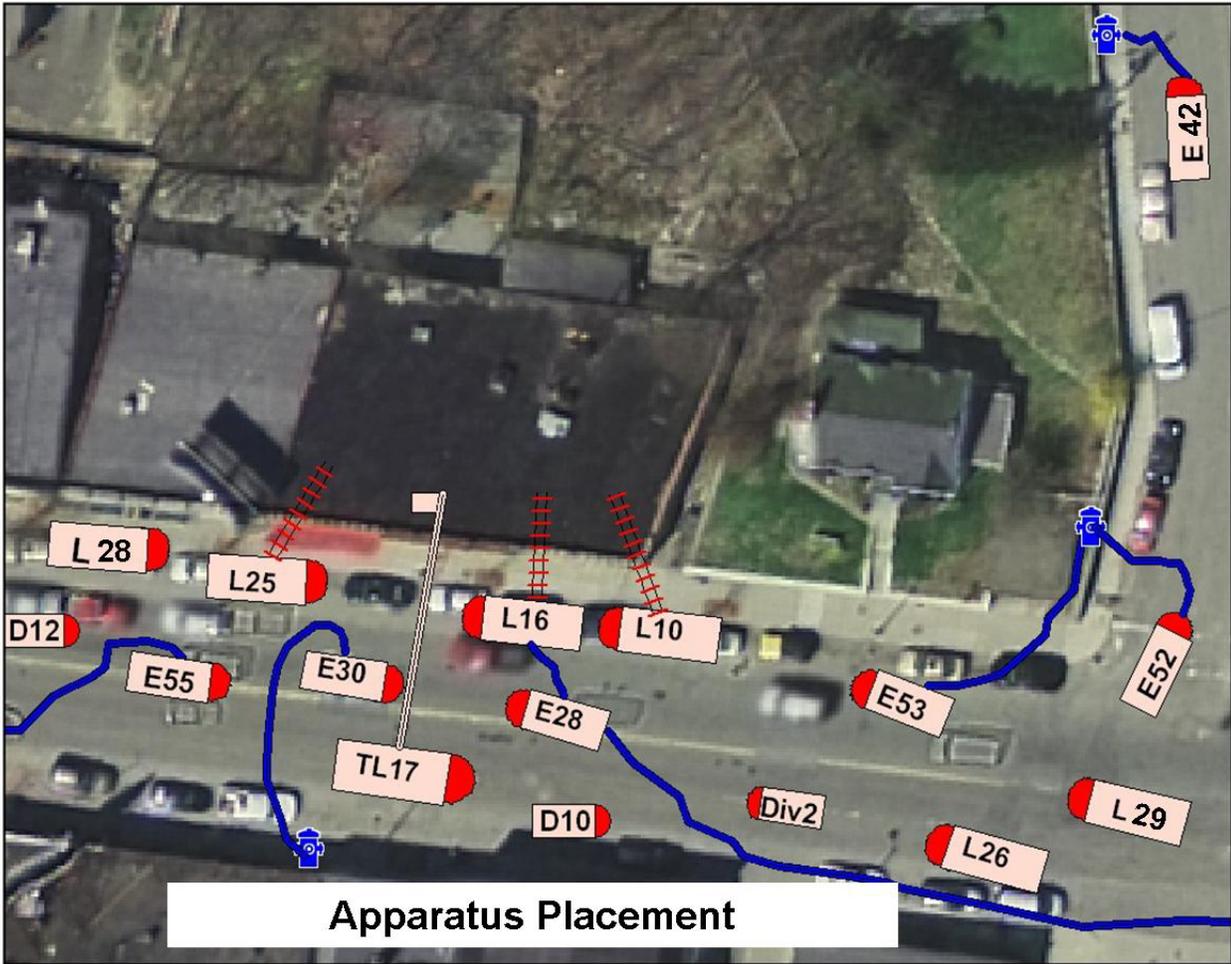


Members ordered off the roof

21:19 Hours



Fire Conditions on the roof
21:19 Hours

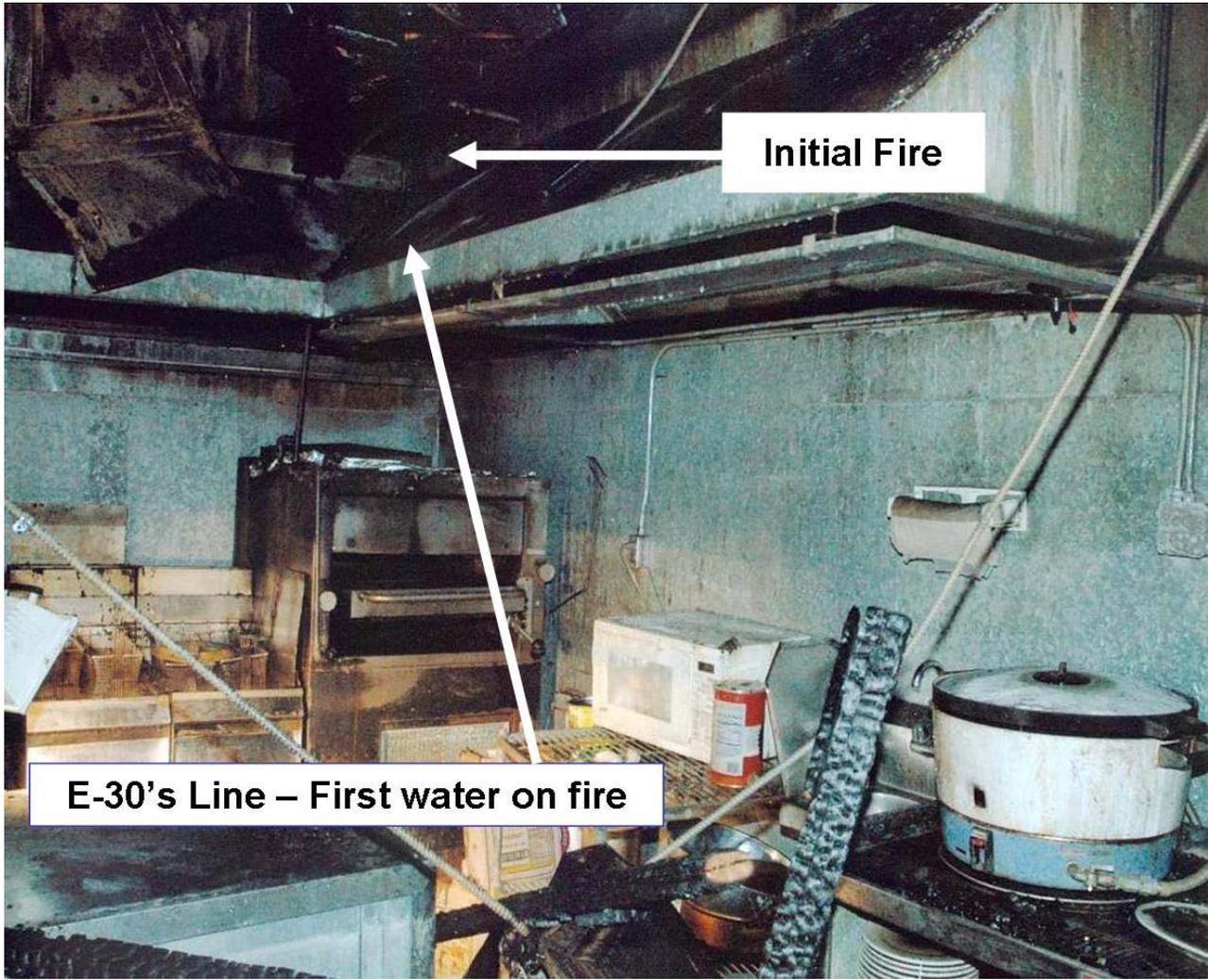




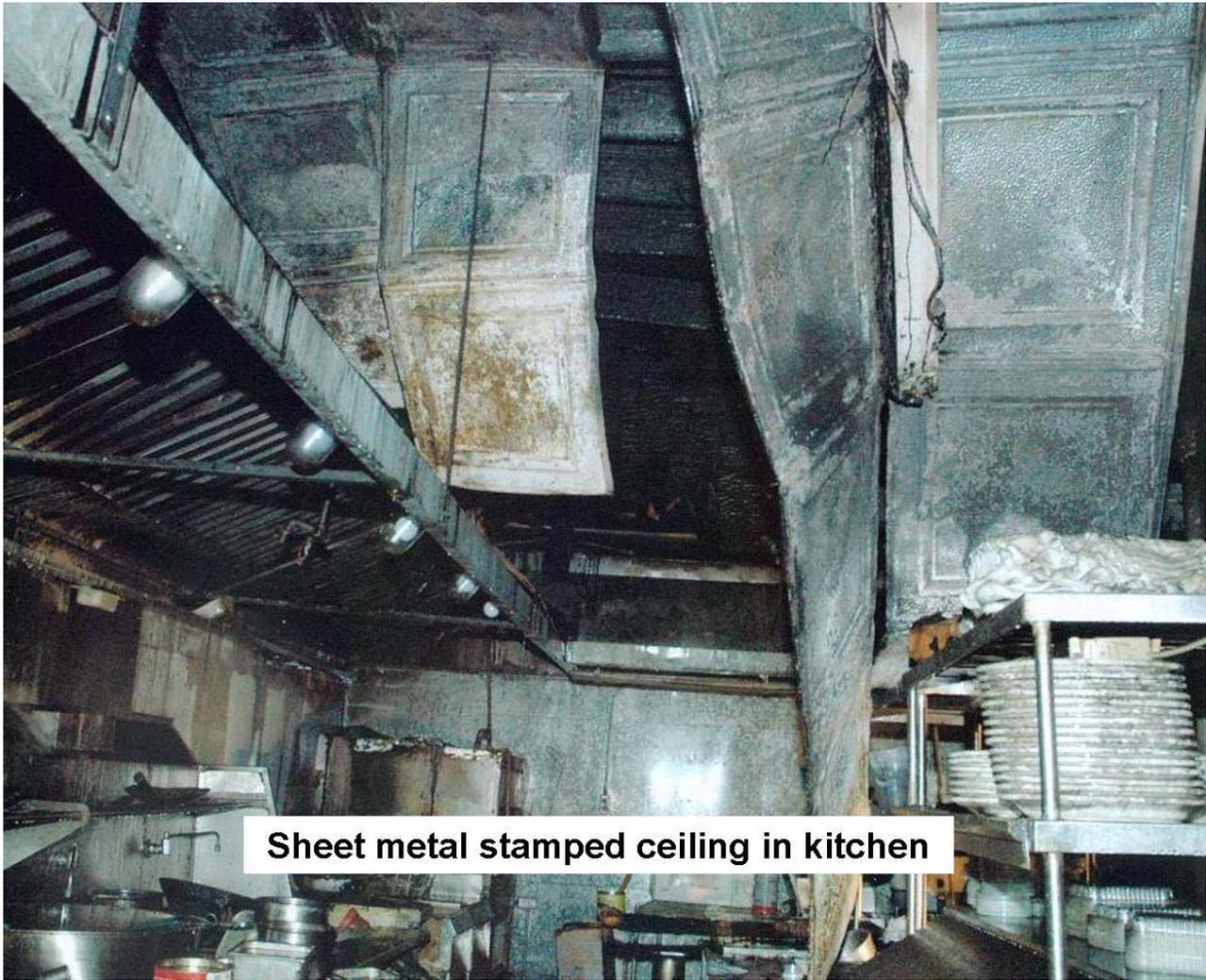
E-30's 1 3/4" line through the dining room



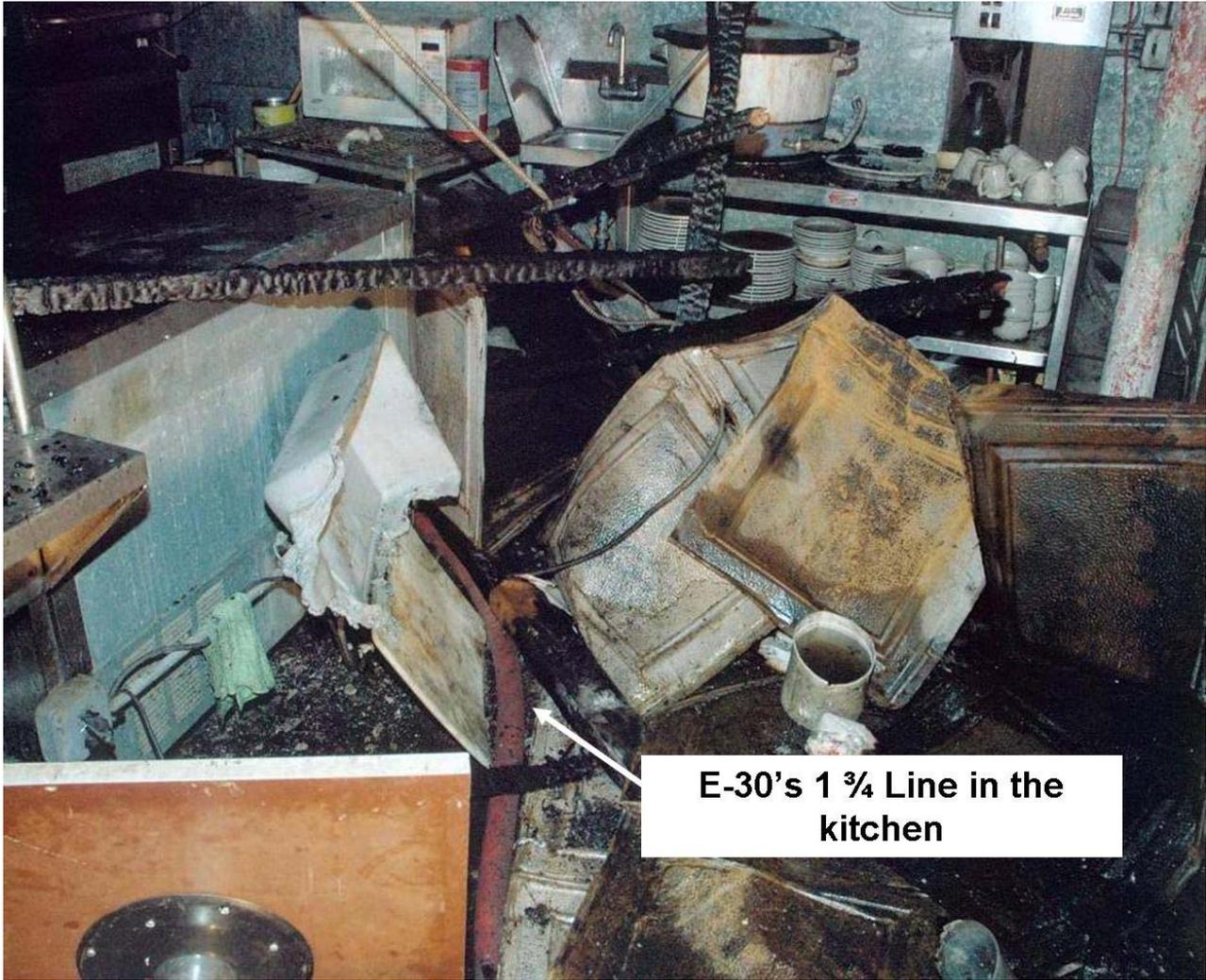








Sheet metal stamped ceiling in kitchen

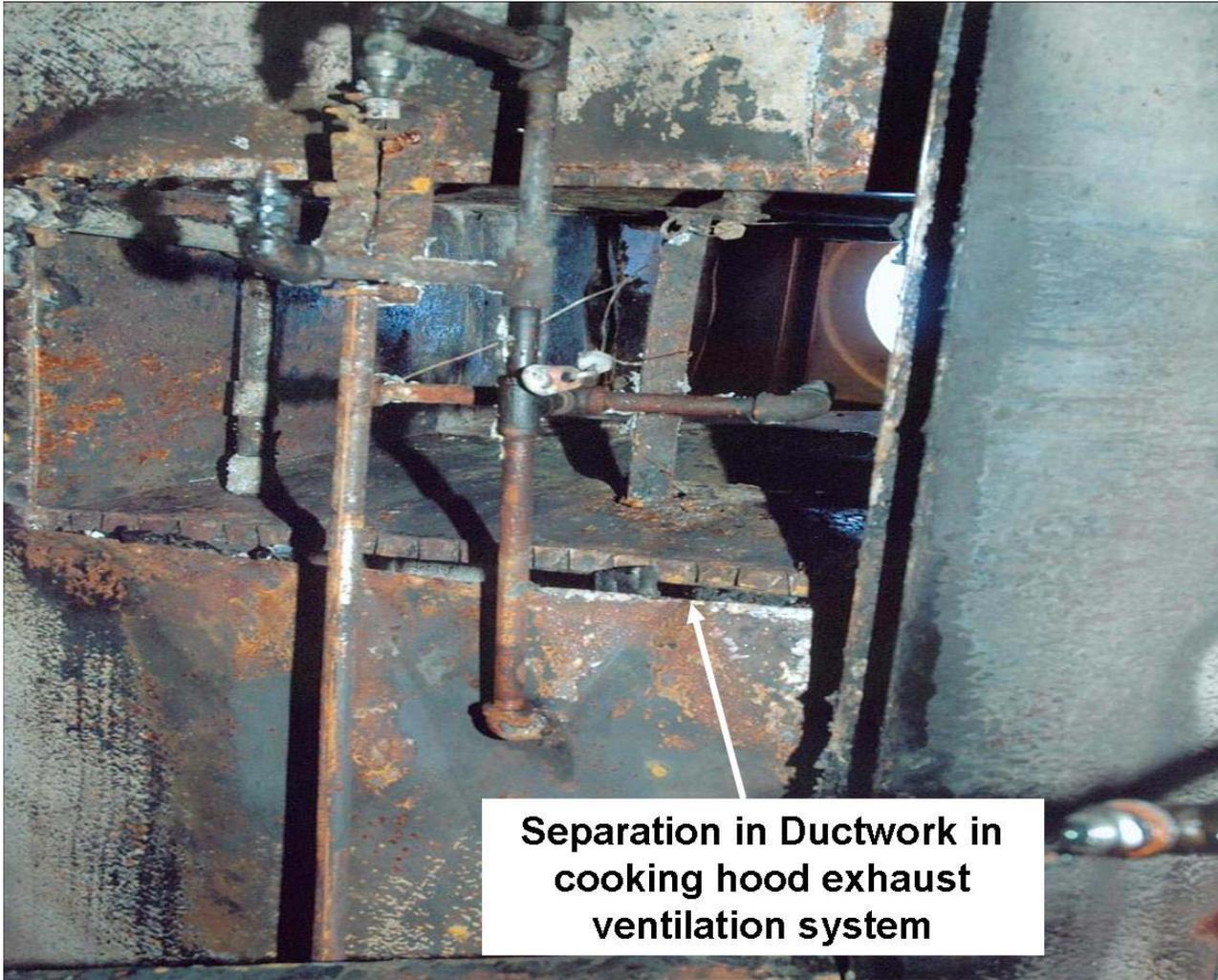


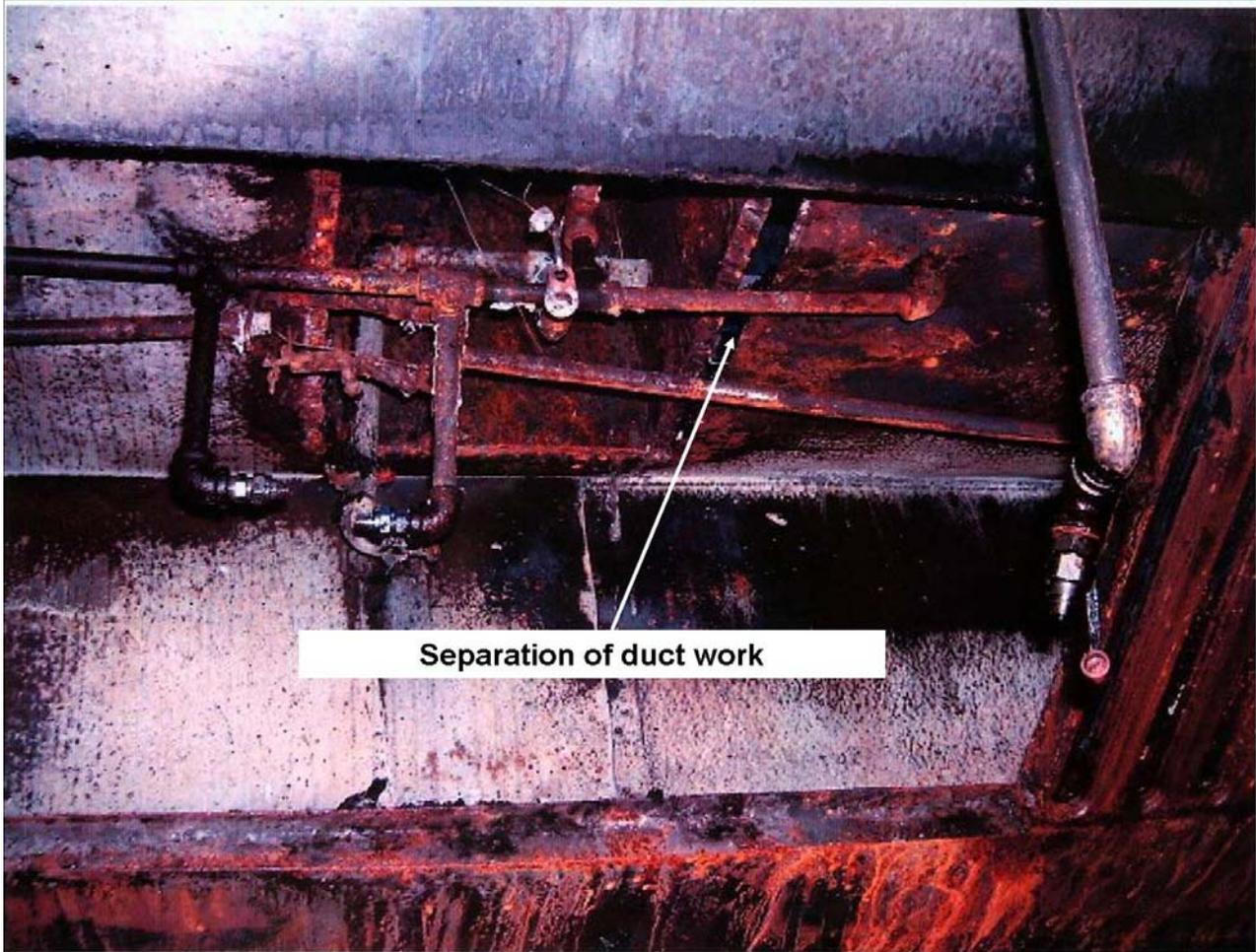


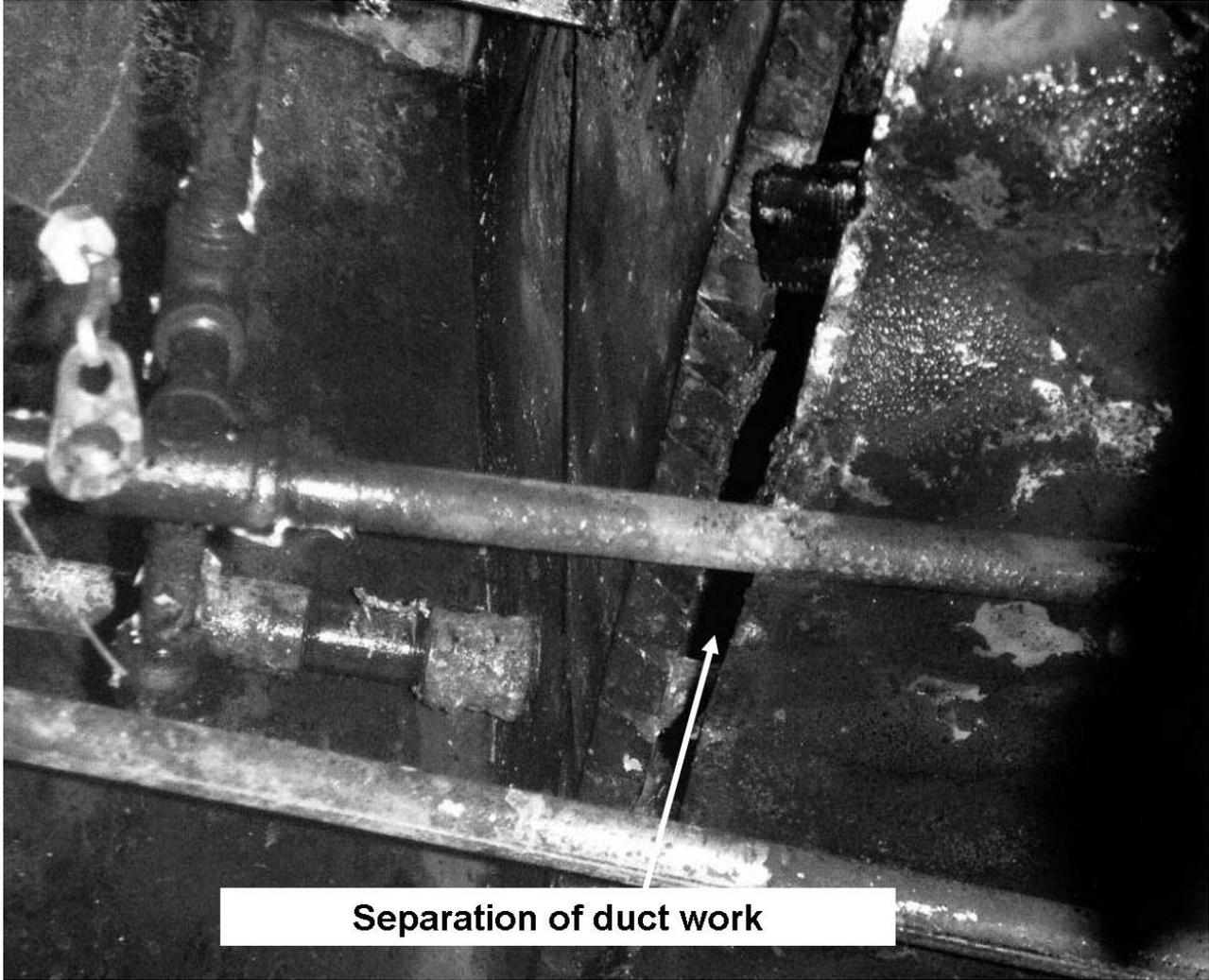
E-30's 1 3/4 Line

**FF Cahill found in
kitchen**





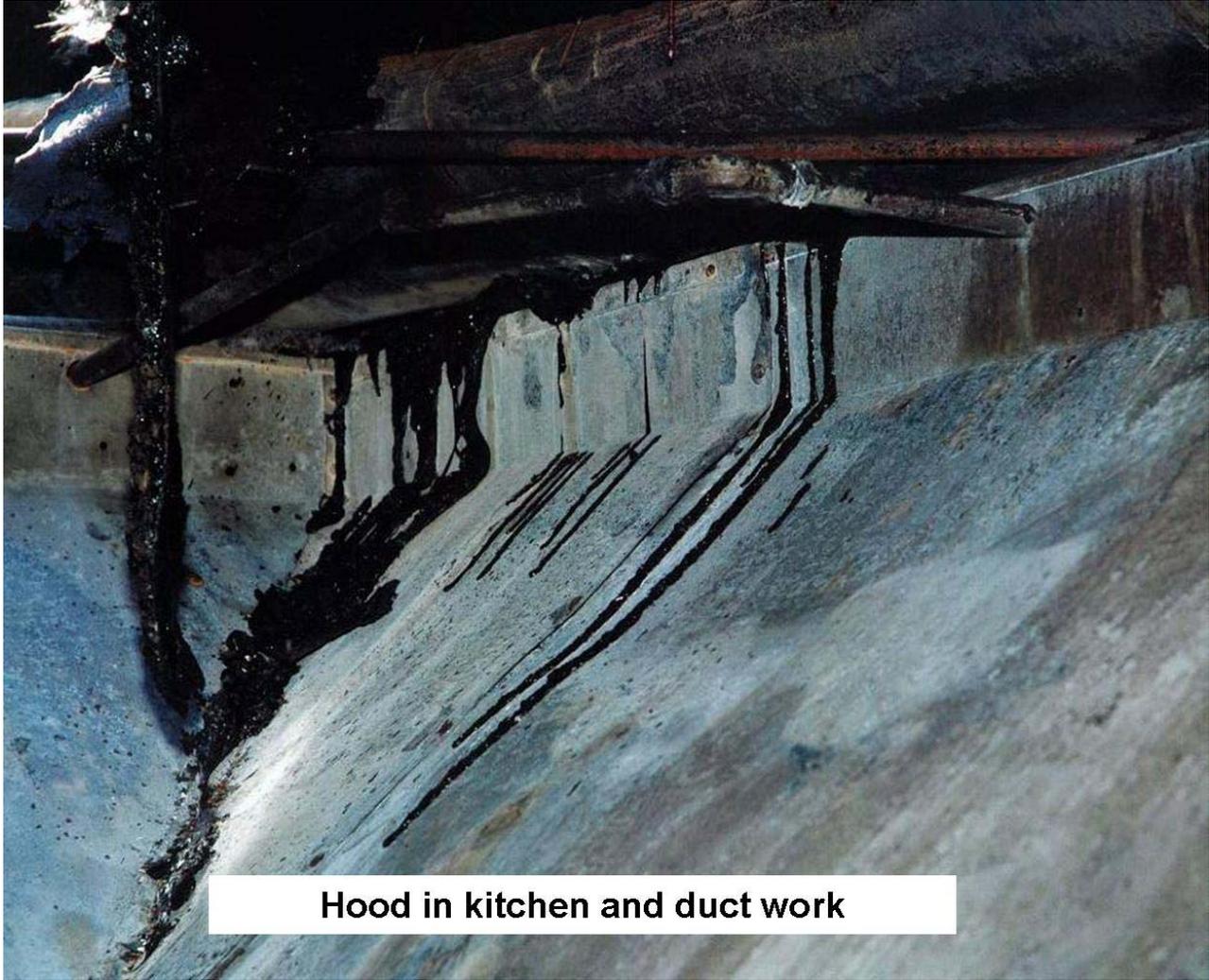




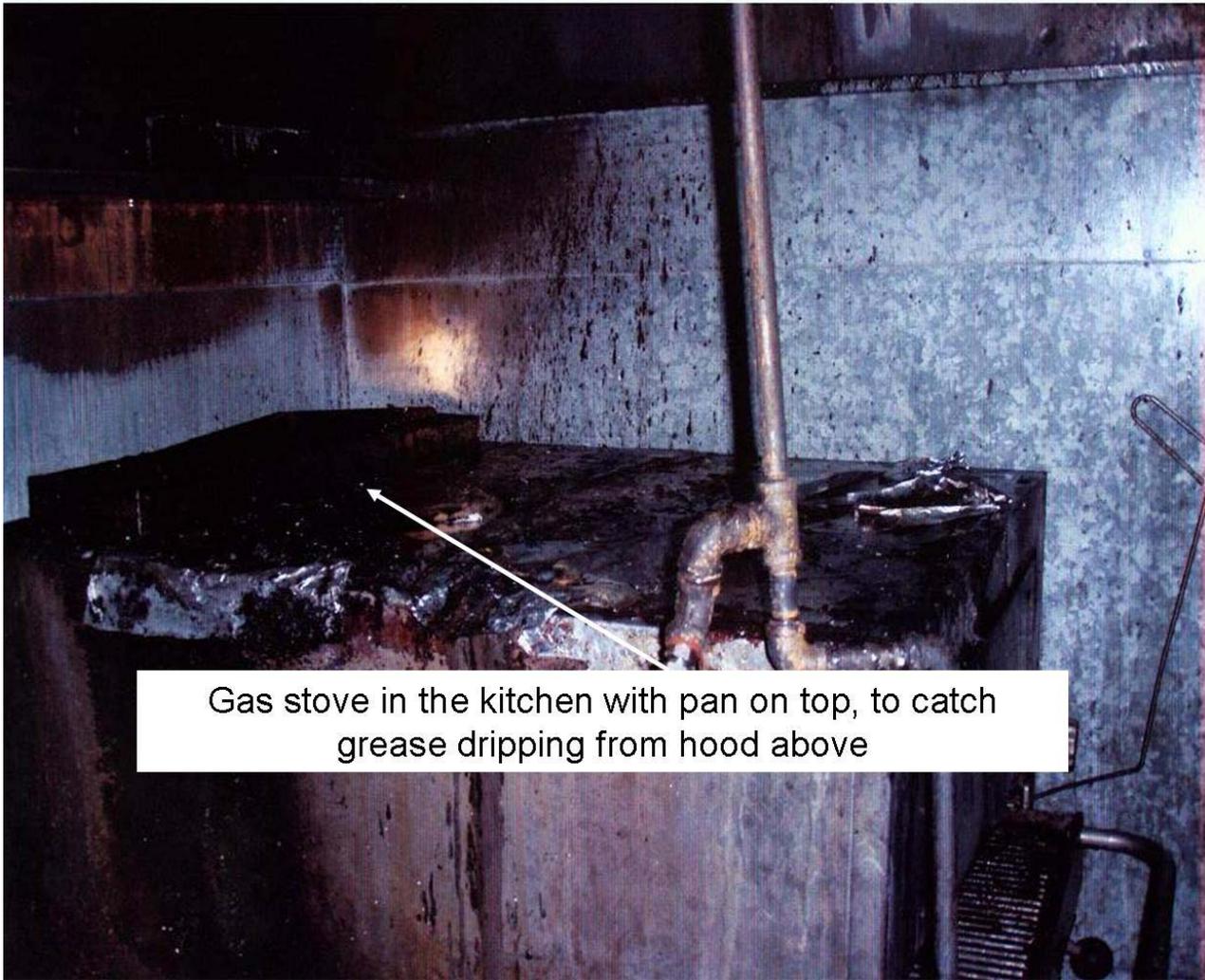
Separation of duct work



Grease buildup in second duct in kitchen



Hood in kitchen and duct work





Oven top with grease buildup



Rear kitchen doorway to storage room



Rear storage room exit to back alley



Front right window



Fire vented out the right front window



**Location of HVAC Unit
after removal by crane**





False Mansard style roof overhang



Rooftop over kitchen

Section 15

Findings: Summary

The fire at the Tai Ho restaurant on August 29, 2007, which resulted in the fatalities of Firefighters Cahill and Payne, was borne out of a series of events that can be characterized by the timeframe between the arrival of the first due fire companies [Engine Company 30 and Ladder Company 25] and the occurrence of a “flammable gas ignition” within six minutes after their arrival at the fire location.

It is evident from the Board of Inquiry’s investigation that the fire had ignited and burned for an extended period of time prior to fire companies being dispatched and arriving on scene. This undetected extended burn time allowed the fire to “feed” and increase in size within the restaurant’s exhaust hood and ducts and ceiling areas directly in and over the cooking area located at the rear of the building.

Accumulations of grease along with the ceiling support framing and roof structure were ignited, while the oxygen content within the ceiling and roof void spaces was being consumed by the burning process.

As the oxygen levels dropped within these concealed areas, carbon monoxide levels dramatically increased, causing the fire to decrease in intensity. The fire at this stage was oxygen starved, and in effect, “looking for more oxygen”.

Upon arrival of Ladder Company 25, the Officer reported fire showing from the roof duct vent of the building. Due to the viewing point at street level, the officer could not determine the extent or magnitude of the fire from his vantage point and entered the fire building to further investigate fire conditions.

The first due companies [Engine Company 30 and Ladder Company 25] simultaneously upon arrival initiated standard firefighting operating procedures of search and rescue, determining the fire location within the building, and performing roof ventilation.

Upon entering the fire building, first due companies observed no smoke or elevated heat levels within the dining room or kitchen.

The absence of smoke conditions and heat upon arrival of the first due companies were verified during interviews by the Board of Inquiry. While Engine Company 30 connected to a hydrant across the street, Ladder Company 25 raised its aerial ladder to the fire building. Ladder Company 25’s driver then ascended the aerial ladder to the roof to ventilate the building. Once on the roof, Ladder Company’s driver encountered difficulty in using his saw while attempting to cut a ventilation hole through the built up prepared roof covering.

Further investigation by Ladder Company 25 led to the discovery of the fire’s location in the ceiling area of the kitchen at the rear of the building. At this point Engine Company 30 advanced a hose line through the dining room and into the kitchen area and began wetting down the visible fire. The

fire at this time was burning in the front right corner of the kitchen, high up within the hood and duct and ceiling area.

In an attempt to gain better fire stream penetration, Engine Company 30 repositioned their hose line further into the kitchen weaving their hose around and over tables and cooking equipment to obtain a better angle of fire attack.

After repositioning their hose line, Engine Company 30 began playing their hose stream up into the duct and ceiling causing ceiling tiles in the kitchen and dining room to become dislodged by the force of the fire stream.

The Board of Inquiry believes oxygen entrained within the fire stream together with the infusion of oxygen from the air below the ceiling admitted a fresh supply of oxygen into the ceiling area directly above the kitchen's hood/exhaust duct and into the ceiling void space created by the dislodged ceiling tiles. This event in turn, caused the unburned flammable gas generated by the undetected extended burning fire at that location to ignite.

The ignition of the flammable gas mixture and rapid fire progression then almost simultaneously expanded into an intense fire ball out into the right side of the restaurant's dining room and out through the buildings front window.

It was noted by the Board of Inquiry that this "flammable gas ignition" was highly directional and intense, creating "blow torch" like effects for a duration of 20 to 30 seconds. Interviews, char evidence, and photographs reviewed by the Board of Inquiry corroborate that within one to two minutes after Engine Company 30 began playing their hose stream on the fire within the kitchen, conditions throughout the fire building rapidly and dramatically deteriorated.

During the Board of Inquiry's investigation it was determined that heavy smoke banked down from the ceiling to within inches of the floor throughout the building just seconds prior to the development of extremely high heat levels, also throughout the building.

It is the belief of the Board of Inquiry that the rapid development of heavy smoke conditions just seconds prior to the "flammable gas ignition" and the sudden intensification and extension of fire due to the "flammable gas ignition", caused department members operating within the fire building to become disoriented. The rapid deterioration of fire conditions within the building coupled with the interior layout of the restaurant's kitchen and dining room consisting of cooking and food preparation areas, fixed seating booths, and loose tables and chairs along with interior partitions hindered quick self evacuation at this fire.

Due to disorientation, fire and smoke conditions, debris, and the interior layout of the building, Firefighter Cahill was not able to evacuate the fire building and thus succumbed to injuries sustained at this incident. Firefighter Payne succumbed of smoke inhalation and thermal injuries in the dining room. Firefighter Cahill succumbed to smoke inhalation in the kitchen while attempting to follow Engine Company 30's hose line out of the fire building. In addition to the two firefighter fatalities, twelve additional firefighters suffered varying degrees of injuries during the course of this fire.

The Board of Inquiry noted:

- The initial size up conducted by first due companies from the exterior of the fire building revealed fire showing from the duct exhaust vent on the roof. The ensuing fire behavior at this incident was unusual in the respect that initial fire size up did not indicate the extent of fire conditions within the fire building. The Boston Fire Department responds to and extinguishes numerous exhaust hood/duct fires every year without incident.
- The condition of the degraded [hood/exhaust] ductwork was not visible to the first arriving companies. Heat and products of combustion escaped from the separation in the exhaust duct above the ceiling level allowing the fire to extend to the ceiling voids and the bottom of the roof deck. The products of combustion, as a result traveled from the kitchen ceiling void space through the partition wall separating the kitchen from the dining room and into the dining room ceiling void spaces. There was no evidence of heat or smoke within the dining room upon arrival.
- Fire behavior at this incident was difficult to anticipate given the elapsed time of only six minutes between the first due companies' arrival and the "rapid fire progression/flammable gas ignition", resulting in the fatalities of two firefighters.
- The roof/ceiling configuration and construction in the Tai Ho restaurant consisted of a sloped flat roof covered by rubber roofing with backer board over an existing tar and gravel roof. The ceiling inside the restaurant was a sheet metal stamped ceiling supported by wooden framing members attached to the roof framing. A second suspended ceiling within the dining room was supported by wires and fasteners from the ceiling above. Wooden roof decking and framing assemblies created a ceiling void varying in height between the roof boards and the support framing of the sheet metal stamped ceiling. This void, varying in height between 30 inches at the front of the building and tapering to 17 inches at the building's rear wall, existed over the entire restaurant. In the dining room and adjacent area a second dropped ceiling existed below the sheet metal stamped ceiling. This second void space, 17 inches in height, was supported by wire hangers screwed into the sheet metal stamped ceiling. This suspended ceiling was finished off with twelve inch acoustical tile squares stapled to 1 inch by 3 inch wooden strapping.
- The results of this particular construction design feature produced two large adjacent ceiling void spaces containing combustible roof decking and framing members that were filled with a flammable gas mixture as the fire progressed. The Board of Inquiry believes the upper ceiling void space ignited first with resultant rapid flame propagation occurring within the void. Sudden ignition of the flammable gas mixture in the upper ceiling void space measurably increased the temperature and pressure causing failure of the sheet metal stamped ceiling in the kitchen which rapidly propagated to and caused the failure of the lower ceiling void in the dining room. Upon ignition of the flammable gas mixture, high levels of carbon monoxide and heavy smoke conditions were generated, which in turn, promptly ignited into an intense fireball.

- The prolonged period that the fire burned prior to fire department notification and arrival was instrumental in creating conditions leading to the fatalities of Firefighters Cahill and Payne.
- The substandard construction, installation and maintenance of the kitchen hood, duct and exhaust system, along with the degradation of the duct work were the underlying factors involved in this fatal fire incident.

Section 16

Board of Inquiry Recommendations

1] Legislation required to govern the installation/maintenance/cleaning/inspection of commercial cooking ducts/hoods/vent systems and affiliated equipment by licensed and insured contractors. [Adopt NFPA Standard 96 and tie permit to ISD]

Training

The following training recommendations encompass items not definitively established by the Board as causal factors contributing to the fatalities of Firefighters Cahill and Payne, but areas the Department should consider for improvement involving safety and efficiency at future emergency response incidents.

2] The Department must develop and implement an ongoing officer training program. This professional development training should be provided on an annual basis, and place emphasis on the realistic duties and responsibilities of those in all supervisory positions. The training must encompass all supervisory levels. Additionally, Chief Officers and acting Chief Officers should receive advanced Incident Command training. The department should consider hiring outside fire service professionals to assist in program development and implementation.

3] To insure that all firefighting personnel receive the necessary training and maintain proficiency in required firefighting skills, the Department must develop and implement a computerized record system for tracking all members training and certification levels.

Annual training must be provided in basic and advanced firefighting skills. Due to continuing changes in construction techniques and materials, technology, and equipment, programs must be monitored and updated to keep pace with advancements in these areas.

In addition to the above mentioned training programs, the Board's investigation concludes the following training programs are necessary:

4] A standardized and comprehensive Rapid Intervention Team [RIT] annual training program. This program must include all department members assigned to firefighting operations and should encompass various search techniques and equipment, fighter survivor skills, and MAYDAY procedures.

5] RIT group training for all Chief Officers and acting Chief Officers.

6] Self contained breathing apparatus [SCBA] training including basic operation, proper use, and limitations of respiratory protection. Emergency removal procedures and a maze escape drill should be components of this training.

7] Personal Alert Safety System [PASS] refresher training.

8] Mobile and portable radio training that includes basic and emergency radio functions along with proper radio usage.

9] Thermal imager camera training for all firefighting personnel.

10] Training in roof operations that includes identifying roof features, hazards, ventilation procedures, roof power saw operation, and reporting of roof conditions.

11] Training in apparatus operation and proper placement at emergency incidents.

12] The Department must develop and enforce a policy that disciplines members for absences from mandatory training programs.

* The importance of maintaining on going training programs in the designated areas identified by the Board during the course of its investigation is essential. To supplement the Training Academy's programs the continuation of monthly in-house company drills must be emphasized.

Standard Operating Procedures [SOPs]

During the investigation the Department's Standard Operating Procedures [SOPs] were reviewed. In the process the Board noted that many SOPs were no longer current and required extensive updating. In addition, the Board noted the need for newly developed SOPs. All SOP recommendations involve general Department guidelines utilized by firefighting companies and units on the night of the fire. The Board could find no instance where failure to follow the SOP's general guidelines caused or contributed to the fatalities of Firefighters Cahill and Payne. Based on the investigation of this fire, the Board recommends the following to improve the safety and efficiency of the Department responses to future emergency incidents.

13] The Department should establish a permanent SOP review committee. This committee should be a joint labor management committee consisting of members who possess expertise in firefighting operations. All Department Standard Operating Procedures [SOPs] shall be reviewed with updates issued annually by this committee.

14] Develop and implement a new SOP on RIT operations.

15] Develop and implement a new Roof operations and Ventilation SOP.

16] Develop and implement a new SOP for taxpayer fire incidents.

17] Develop and implement a new SOP on Thermal imager cameras.

18] Develop a new SOP on radio communication procedures and usage.

19] Update SOP 4 [Search and Rescue] including standardized procedures for conducting roll calls during emergency incidents and incorporated into training programs.

20] Update SOP 5 [Firefighter Assist and Search Team]

21] Update SOP 2 [Communications Network] SOPs 7, 10, 13, 14, & 52.

22] Update SOP 7 [Radio Procedures]

23] Update SOP 10 [Operating Saws]

24] Update SOP 13 [Response to Fires and Other Emergencies]

25] Update SOP 14 [Fire Duty and Emergency Operations]

26] Update SOPs 32, 32A, 32B [Instructions for Care Maintenance and Emergency Operation of Respiratory Protective Equipment]

- 27] Update SOP 52 [Ladder Companies]
- 28] Update SOP 58 [Personal Protective Clothing]
- 29] Update SOP 62 [Line of Duty Death]

Fire Department Equipment and Policies

During the investigation the Board became aware of the need for new and updated department policies and equipment to enhance the personal safety of firefighters during fireground operations. Advancements in personal protective equipment occur on a regular basis. The department must keep pace with these changes to insure the best protection for its members. The Board of Inquiry recommends the following:

- 30] The Departments conducts research and test the latest bunker gear for a suitable replacement of outdated bunker gear.
- 31] Research and procure new technology for tracking and locating members down or unaccounted for at incidents, i.e. lighted rescue ropes.
- 32] Appoint a Research and Technology Officer to research and recommend new equipment and technologies.
- 33] Purchase thermal imaging cameras for all firefighting companies.
- 34] Purchase and install fireground recorders in all firefighting Chief's vehicles and the TACOM Unit to record radio activity at incidents.
- 35] Install portable radio chargers in all firefighting vehicles.
- 36] The Fire Alarm Office shall conduct tests to determine the existence of dead radio spots throughout the city of Boston.
- 37] The Fire Alarm Office procures the necessary enhancements, upgraded capacity, and equipment to bring the NICE digital radio recording system up to operational requirements.
- 38] Procure software that allows company/unit rosters on the CAD system to be updated through the desktop computers in fire stations.
- 39] Develop a new riding list policy for greater personnel accountability at incidents.
- 40] All Senior Firefighters, Acting Officers, Company Officers, and Chief Officers shall be held strictly accountable for members under their command.
- 41] District Fire Chiefs shall make rounds [visit fire stations] on day and night tours to conduct roll call, inspect PPE, and sign house journal.
- 42] Develop a new check list, signed by the Company Officer, to ensure all Department members check their PPE and SCBA prior to the beginning of each tour of duty.
- 43] Elimination of the Bunker Gear option policy. Bunker gear and all PPE use is mandatory and shall be worn and used at all incidents where an Immediate Danger to Life and Health [IDLH] atmosphere exists or has the potential to exist.
- 44] Thermal imaging cameras shall be utilized initially to scan for hidden fire at all incidents where the potential for hidden fire exists.
- 45] Personal PASS devices shall be worn and utilized at all incidents.
- 46] Portable radios shall be carried and utilized at all incidents.

- 47] Procedure for keeping a firefighter at the turntable whenever members are operating on roofs shall be reviewed and updated.
- 48] Incident Command vests shall be worn at multiple alarms, hazmats, high rise, tunnel and other high profile or large scale incidents.
- 49] Firefighters on Probation [FFOP] shall not enter fire buildings without being accompanied by an Officer. [Paint FFOP top half of helmet orange]
- 50] Department members who respond to emergency incidents while off duty shall remain behind fire lines and be directed by the Incident Commanders.
- 51] Maintain Rescue Companies manning at 1 officer and 4 firefighters and utilize them as an immediate RIT team.
- 52] The Department should appoint an Officer and assign personnel to manage and update the Prefire Program.
- 53] Prefire plans shall include double ceilings, ceiling voids, or hidden confined spaces such as cocklofts where fire may be located and burn undetected.
- 54] Change the designation of the Net Chief to Accountability Chief and develop and implement a standardized roll call procedure for emergency incidents.
- 55] The Fire Alarm Office shall make an announcement for all members to activate their personal PASS device when the fireground channel is assigned.
- 56] Radio communications and procedures - members shall notify Incident Commander when completing or not completing assigned tasks at incidents. Each member shall be issued a personal radio to be carried at all times when on duty.
- 57] Establish a permanent Board of Inquiry with alternates [appoint/train/develop procedures/checklists - review/update/modify SOP 62]. Utilize this board for serious or multiple firefighter injuries as well as fatal incidents.
- 58] Maintain control of fire building where a fatality or serious injury has occurred to a department member. [Appoint permanent BOI/establish set procedures to follow for conducting investigations/review/update/modify/enforce SOP 62].
- 59] The Board of Inquiry strongly recommends the City and Local 718 take the necessary steps to immediately implement a drug testing program.
- 60] Substance abuse training - provide all supervisory levels within the Department training in the current substance abuse policy, supervisory training, employee education, employee assistance, and alcohol/drug testing.

Note: The Boston Fire Department's Employees Assistance Program, created in 1983, was voluntarily adopted by the Department in 1989. Under current Boston Fire Department drug testing policy, there is a pre-employment hair test screening, a breathalyzer and urinalysis test conducted during recruit training at the Fire Academy, along with a final screening test prior to the completion of one year of employment.

Individuals mandated into the Employees Assistance Program through the Department's "for cause testing" policy are subject to random alcohol/drug testing twice a month for period of one year.

With regard to the recommendation concerning substance abuse training, as stated earlier in the Scope of Report Section, determination of alcohol/drug impairment in relation to fitness for duty is a complex issue, an issue the Board of Inquiry viewed as outside its level of expertise and jurisdiction. Despite these limitations, the Board of Inquiry felt that the importance of the alcohol/drug impairment issue in this investigation required examination for signs indicating impairment in the actions of members during fireground operations at this fire incident.

What constitutes alcohol/drug impairment and the levels or degrees of impairment that adversely affect a person's ability to perform assigned tasks varies among individuals. Review of currently available relevant information concerning this subject suggests that even expert opinion varies on this matter. In other words, does a positive alcohol/drug test indicate conclusively an individual's impairment? This was one of the issues the Board of Inquiry was confronted with during the course of its investigation in attempting to determine factual information involved at this fatal fire incident.

With this in mind, the Board of Inquiry did not intend to ignore or evade the issue of alcohol/drug impairment during the course of its investigation, but sought to seek factual indications that supported impairment as one of the causal factors in the fatalities of these two Firefighters.

The Board of Inquiry could find no factual indications supporting that alcohol/drug impairment contributed to or caused these two firefighters to become disoriented or inhibited their ability to perform the firefighting duties assigned to them at the fatal fire incident.

Nevertheless, the Board of Inquiry believes it is of paramount importance that any questions concerning fitness for duty or alcohol/drug impairment issues arising from this incident must be immediately and decisively addressed.

It was noted by the Board of Inquiry that a sizeable number of recommendations generated by the investigation of this fire were linked to training. Many of these training recommendations are associated with basic firefighting activities while others involve implementing new fire training programs, procedures, and procuring updated equipment, technology, and training facilities.

In an effort to further refine the recommendations involving training recommendations generated by the investigation, the Board of Inquiry contacted several comparably sized fire departments in an attempt to determine how these departments handle issues listed in the recommendations section of this report. The Board of Inquiry received information from these fire departments mainly outlining training budgets, instructor qualifications, size of training staff, and training facilities. Without exception, all contacted departments had significantly larger training budgets with more instructors along with updated or modern training facilities.

Since training is a vital aspect in maintaining firefighter safety on the fireground, the Board of Inquiry urges more attention, time, and resources be directed to the items contained in the recommendations section of this report.

Section 17

Members Bio/Death Certificates

Firefighter Paul J. Cahill age 55 Date of Birth October 13, 1951

Appointed to the Boston Fire Department on May 12, 1993.

Assigned to Engine Company 37 on June 19, 1993.

Transferred to Ladder Company 26 on June 01, 1999.

Transferred to Engine Company 37 on March 01, 2001.

Transferred to Engine Company 20 on April 01, 2001.

Transferred to Engine Company 30 on April 01, 2003.

Firefighter Warren J. Payne age 52 Date of Birth April 17, 1954

Appointed to the Boston Fire Department on January 27, 1988.

Assigned to Ladder Company 25 on January 27, 1988.

*Official autopsy and toxicology reports are not available to the Board of Inquiry.



REGISTRY DIVISION OF THE CITY OF BOSTON

COUNTY OF SUFFOLK, COMMONWEALTH OF MASSACHUSETTS, UNITED STATES OF AMERICA

Certificate **R** No 82114

I, the undersigned, hereby certify that I hold the office of
City Registrar of the City of Boston and I certify the following facts appear on the
records of Births, Marriages and Deaths kept in said City as required by law.

The Commonwealth of Massachusetts MEDICAL EXAMINER'S CERTIFICATE OF DEATH REGISTRY OF VITAL RECORDS AND STATISTICS		2007-18911	004795	STATE USE ONLY
1 DECEASED - NAME FIRST MIDDLE LAST Paul J Cahill		2 SEX M	3 DATE OF DEATH (Mo., Day, Yr.) August 29, 2007	
4a PLACE OF DEATH (City/Town) Boston		4b COUNTY OF DEATH Suffolk		4c HOSPITAL OR OTHER INSTITUTION - Name (if not in index, give street and number) Faulkner Hospital
5 PLACE OF DEATH (Check only one) Hospital <input checked="" type="checkbox"/> Outpatient <input type="checkbox"/> ODA <input type="checkbox"/> Other <input type="checkbox"/> (Specify Home, Chiropractor, etc.)		6 SOCIAL SECURITY NUMBER [REDACTED]		7 WAS WAR VETERAN Specify War Vietnam
8a WAS DECEASED OF HISPANIC ORIGIN? (If yes, specify) No		8b RACE (Specify) White		8c DECEASED'S EDUCATION (Highest grade completed) 12
9a AGE - Last Birthday (Yr.) 55		9b UNDER 1 YEAR MO. DAY YR. MO. DAY YR.		10a DATE OF BIRTH (Mo., Day, Yr.) October 13, 1951
10b BIRTH PLACE (City and State or Foreign Country) Boston, Massachusetts		11 MARRIED, NEVER MARRIED, WIDOWED OR DIVORCED Married		11a LAST SPOUSE (Full name at birth or adoption) [REDACTED]
12 MARRIED, NEVER MARRIED, WIDOWED OR DIVORCED Married		13 LAST SPOUSE (Full name at birth or adoption) [REDACTED]		14a USUAL OCCUPATION (Prior, if retired) Firefighter
14b TYPE OF BUSINESS/INDUSTRY Boston Fire Dept.		15a RESIDENCE - No. and Street, City/Town, County, State/Country [REDACTED]		15b Zip Code [REDACTED]
16 FATHER - Full name at birth or adoption [REDACTED]		17 STATE OF BIRTH (If not in U.S., name country) Mass.		18 MOTHER - Full name at birth or adoption [REDACTED]
19 STATE OF BIRTH (If not in U.S., name country) Mass.		20 FATHER - Full name at birth or adoption [REDACTED]		21 STATE OF BIRTH (If not in U.S., name country) Mass.
22 INFORMANT'S NAME [REDACTED]		23 MAILING ADDRESS [REDACTED]		24 RELATIONSHIP Wife
25 METHOD OF ANATOMICAL DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Entombment <input type="checkbox"/> Donation <input type="checkbox"/> Other		26 FUNERAL SERVICE LICENSEE OR OTHER DESIGNATE Brian T. Fitzgerald		27 LICENSE # 6449
28a PLACE OF DISPOSITION (Name of cemetery, crematory, or other) Forest Hills Crematory		28b LOCATION (City/Town/State) Boston, Massachusetts		
29 DATE OF DISPOSITION (Mo., Day, Yr.) September 6, 2007		29a NAME AND ADDRESS OF FACILITY OR OTHER DESIGNEE Dockray & Thomas 455 Washington St. Canton, MA 02021		
30 PART I - CAUSE OF DEATH - SEQUENTIALLY LIST IMMEDIATE CAUSE THEN ANTECEDENT CAUSES THEN UNDERLYING CAUSE				APPROX INTERVAL
a. Immediate Cause SMOKE INHALATION				MINUTES
b. Due to				
c. Due to				
d. Due to				
30 PART II - OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH				31 AUTOPSY? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
32 MANNER OF DEATH <input type="checkbox"/> Natural <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Homicide <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		33a DATE OF INJURY Aug 29, 2007		33b TIME OF INJURY 09:06 PM AM PM
34 DESCRIBE HOW INJURY OCCURRED FIGHTING RESTAURANT FIRE		35a PLACE OF INJURY (Type) RESTAURANT		36 INJURY AT WORK? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
35b LOCATION/STREET OF INJURY 1727 CENTER ST. BOSTON, MA. 02118		37a APPROX TIME OF DEATH 10:12 PM		37b DATE PRONOUNCED August 29, 2007
38 MEDICAL EXAMINER CERTIFICATION KIMBERLEY M. SPRINGER, M.D. 720 ALBANY ST. BOSTON, MA. 02118		38a LICENSE # 227119		38b TIME PRONOUNCED 10:12 PM AM PM
39 On the basis of an inspection and/or investigation in my office death occurred at the time, date, and place and due to the cause(s) stated. (Signature) <i>[Signature]</i>		39a DATE SIGNED August 30, 2007		
40a DID I/P/AM PRONOUNCEMENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		40b IF YES, TIME AM PM		40c NAME OF PRONOUNCER TITLE: D RN O PA DNP
41 DATE BURIAL PERMITTED Sept. 1, 2007, 5571		42 RECEIVED IN CITY/TOWN OF BOSTON		43 DATE OF DEATH SEP 03 2007
44 SIGNATURE Bridget Igbokwe		45 SIGNATURE Judith A. McCarthy		



REGISTRY DIVISION OF THE CITY OF BOSTON

COUNTY OF SUFFOLK, COMMONWEALTH OF MASSACHUSETTS, UNITED STATES OF AMERICA

Certificate **R** No 82113

I, the undersigned, hereby certify that I hold the office of
City Registrar of the City of Boston and I certify the following facts appear on the records of Births, Marriages and Deaths kept in said City as required by law.

The Commonwealth of Massachusetts MEDICAL EXAMINER'S CERTIFICATE OF DEATH REGISTRY OF VITAL RECORDS AND STATISTICS		2007-18915	004807	STATE USE ONLY	
1 DECEASED - NAME FIRST Warren		LAST Payne		2 SEX M.	3 DATE OF DEATH (Mo., Day, Yr.) August 29, 2007
4a PLACE OF DEATH (City/Town) Boston		4b COUNTY OF DEATH Suffolk		4c HOSPITAL OR OTHER INSTITUTION - Name (if not in other, give street and number) Brigham & Womens Hospital	
5 PLACE OF DEATH (Check only one) <input type="checkbox"/> Hospital <input type="checkbox"/> Dispensary <input type="checkbox"/> Outpatient <input type="checkbox"/> CDDA <input type="checkbox"/> Other (Specify Home, Hospice, Other (Specify))		6 SOCIAL SECURITY NUMBER		7 US MAR/VETERAN Specify (Mo., Yr.)	
8a WAS DECEASED OF HISPANIC ORIGIN? (If yes, specify)		8b RACE (Specify) Black		8 DECEASED'S EDUCATION (Highest grade completed) 12 College (1-4, Sr)	
9a AGE - Last Birthday (Mo., Day, Yr.) 53	9b UNDER 1 YEAR MO. DATE YRS. WEEKS	10 DATE OF BIRTH (Mo., Day, Yr.) April 17, 1954		11 BIRTH PLACE (City and State or Foreign Country) Boston, MA	
12 MARRIED, NEVER MARRIED, WIDOWED OR DIVORCED Divorced		13 LAST SPOUSE (Full name of spouse or adopter)		14 USUAL OCCUPATION (Mo., if retired) Firefighter	
15 TYPE OF BUSINESS/ESTABLISHMENT City of Boston		16 STATE OF BIRTH (If not in U.S., name country) VA		17 STATE OF DEATH (If not in U.S., name country) VA	
18 DECEASED'S NAME		19 MARITAL ADDRESS		20 RELATIONSHIP Mother	
21 METHOD OF IMMEDIATE DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Entombment <input type="checkbox"/> Cremation <input type="checkbox"/> Other		22 FUNERAL, SERVICE LICENSEE OR OTHER DESIGNEE Richard D. MacKinnon Jr.		23 LICENSE # 6956	
24 PLACE OF DISPOSITION (Name of cemetery, crematory, or other) Forest Hills Cemetery		25 LOCATION (City/Town/State) Boston, MA		26 DATE OF DISPOSITION (Mo., Day, Yr.) September 7, 2007	
27 NAME AND ADDRESS OF FACILITY OR OTHER DESIGNEE Leighton-MacKinnon 4 West Washington St., Hanson, MA 02341		28 PART I - CAUSE OF DEATH - SEQUENTIALLY LIST IMMEDIATE CAUSE THEN ANTECEDENT CAUSES THEN UNDERLYING CAUSE			
a. Immediate Cause SMOKE INHALATION AND THERMAL BURNS		APPROX. INTERVAL		MINUTES	
b. Cause					
c. Cause					
d. Cause					
29 PART II - OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH				30 AUTOPSY <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
31 MANNER OF DEATH <input type="checkbox"/> Natural <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Homicide <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		32a DATE OF INJURY Aug 29, 2007		32b TIME OF INJURY UNKNOWN AM PM	
33a DESCRIBE HOW INJURY OCCURRED FIGHTING RESTAURANT FIRE		33b PLACE OF INJURY (Type) RESTAURANT		33c LOCATION/ADDRESS OF INJURY 1727 CENTRE STREET, BOSTON, MA	
34 MEDICAL EXAMINER CERTIFICATION		35a TIME OF DEATH 10:05 PM		35b DATE PRONOUNCED August 29, 2007	
36a (Name and Address) KIMBERLEY M. SPRINGER, MD, 720 ALBANY ST., BOSTON, MA 02118		36b LICENSE # 227119		36c TIME PRONOUNCED 10:05 PM AM PM	
37a On the basis of examination and/or investigation, in my opinion death occurred at the time, date, and place and due to the cause(s) stated (Specimens)		37b DATE SIGNED August 30, 2007		37c TIME SIGNED AM PM	
38a PRO/PAIN/PROLONGEMENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		38b IF YES, DATE		38c IF YES, TIME AM PM	
39 NAME OF PRONOUNCER		40a NAME OF PRONOUNCER		40b TITLE: <input type="checkbox"/> MD <input type="checkbox"/> PA <input type="checkbox"/> NP	
41 DATE BURIAL/ENTOMBMENT September 3, 2007		42 RECEIVED IN CITY/TOWN OF BOSTON		43 DATE OF RECORD SEP 05 2007	
BURIAL/ENTOMBMENT SIGNATURE Bridget Igboke		DECEASED'S SIGNATURE Judith A. McElarty			

Further hereby certify that by annex...

Section 18

GLOSSARY

Aerial	Term used to describe a ladder truck. The hydraulically powered ladder permanently affixed to a ladder truck.
Apparatus	General fire service term for a motor vehicle truck. Includes Engine Co, Ladder Co, Rescue Co, Tower ladder Co, and others.
Attack line	Fire hose stored directly behind the driver and pulled into the burning building.
BOI	Board of Inquiry, the ten member body, appointed by the Fire Commissioner, responsible for investigating the fatal fire at the Tai Ho restaurant.
Bunker gear	Protective clothing worn by firefighters. This clothing is a three part system. The outer coat and pants shell are manufactured using Nomex, a fabric resistant to very high temperature. The clothing also contains a vapor barrier and thermal liner.
C-7	Radio call sign for the Deputy Fire Chief in charge of Division 2.
Car 10	Radio call sign for the District Fire Chief in charge of West Roxbury and portions of Hyde Park and Roslindale.
Cockloft	A void space between the roof and the ceiling. This space is often made of combustible material and may be continuous from one occupancy to another.
Cylinder	A high pressure air cylinder (4500 psi) that connects to the SCBA and provides approximately 15 - 20 minutes of breathing air.
Demising Wall	Wall that separates one tenant's space from that of another tenant.
Division 2	A geographic fire district which encompasses the south side of Massachusetts Avenue and all portions of the city south of this boundary.
Engine Co.	Fire apparatus that carries 750 gallons of water, 2000 feet of hose, 1000 gpm pump, equipment and personnel.
Engine man	Firefighter assigned to an Engine Company, includes Engine officer, pump operator, hydrant man, and pipe man.
Facepiece	The mask type attachment that fits over the head and connects to the SCBA air supply regulator.

FIU	Fire investigation unit, a section of the fire prevention division charged with investigating and determining the cause of all fires.
FR	Fire resistive. The term is used with the department issued station work pants. The pants provide some additional protection from thermal exposure above that provided by ordinary work pants.
HAV	Hydrant assist valve. Large valve connected to a hydrant that allows a second Engine company to increase volume and pressure to the supply [feeder] line.
HUD	Heads Up Display. A series of colored lights displayed to the firefighter while wearing his SCBA facepiece. These lights indicate the amount of air pressure remaining in the SCBA.
HVAC	Heating, ventilation, and air conditioning. The equipment that provides heating and cooling to an occupancy.
Hydrant man	Firefighter assigned to an Engine company who connects a supply line from a hydrant to the Engine upon arrival.
IC	Incident commander. The person who assumes overall command and control of all personnel and equipment at an emergency. This person will change as the incident escalates and higher ranking personnel arrive.
Jump seat	Single seats in the passenger compartment of fire apparatus, behind the driver, usually rear facing.
K-3,4,5,6,7	The radio call sign of members assigned to the Fire Investigation Unit.
Ladder Co.	Fire apparatus that carries a 110 foot aerial ladder, 6 extension ladders, power and hand tools, forcible entry and extrication tools, EMS equipment and personnel.
Maze Training	Maze like structure designed with moveable walls and obstacles. Used by firefighters for SCBA confidence and self rescue training.
NFPA	National Fire Protection Association: a standard making body that develops and publishes minimum equipment standards for the fire service.
Net Chief	District Fire Chief that functions as the communications unit leader and accountability officer. Responsible for overseeing the command and control board which tracks physical location and status of firefighting units.
NIOSH	National Institute of Occupational Safety and Health. Approves self-contained breathing apparatus [SCBA] for use by firefighters.

NIST	National Institute of Standards and Technology. Conducts research on the performance of firefighting equipment. Performs computer modeling to predict fire growth and smoke spread.
Officer	General term used to denote a firefighter that has been promoted to Lieutenant or Captain.
Open Up man	Firefighter assigned to a Ladder company that carries forcible entry tools. The firefighter is a member of the lead firefighting team and provides access for the hose team.
Ordinary Construction	A construction type where the exterior walls are of masonry and the interior walls, floors and roof are made of wood. Also known as Type III construction.
Parapet	A low wall at the edge of a roof that extends above the roofline.
Partition wall	An interior wall, one story or less in height, that separates two areas. May be bearing or nonbearing.
PASS	Personal Alert Safety System. This emergency equipment, worn by firefighters, combines a motion sensor with an emergency alarm. If the device does not detect any motion for more than 30 seconds, it emits a 95 decibel alarm.
Pipe man	A member of the hose team, this lead firefighter carries the nozzle, with hose attached, into the building. This firefighter operates the nozzle on the fire.
Pump Operator	Firefighter assigned to an Engine company responsible for connecting attack hose line to pump and then supplying and maintaining adequate water and pressure.
Rake man	Ladder company firefighter that uses a Boston version of a pike pole. Responsible for making holes in ceilings and walls looking for hidden fire.
RIT	Rapid Intervention Team. A team of firefighters whose sole function is to locate and rescue missing or trapped firefighters.
Roof man	Firefighter assigned to the roof upon arrival. This firefighter's function is to provide roof ventilation to release flammable and toxic gases for the interior crews. Usually places a hole in the roof, and opens vents and skylights.
SCBA	Self Contained Breathing Apparatus. The equipment the firefighter carries on his back to supply breathing air. This includes the air cylinder and face piece.
Size up	The initial situation evaluation of the emergency.

- Taxpayer Fire Department slang for a certain type of building. Originally used to describe a 2 or 3 story occupancy with commercial entities on the ground floor and residential units above. Is also widely used to describe a single story commercial building with multiple tenants.
- Truck man Firefighter assigned to a Ladder company. Includes Ladder company officer, roof man, open up man, or rake man.
- Vibralert A component of the SCBA that vibrates and alerts the wearer that air pressure is at or below $\frac{1}{4}$ capacity.

Section 19

Appendix

Weather conditions at the time of the fire incident

The weather conditions were obtained from weather bug.
The closest station was 2 miles away in Brookline.
The conditions reported were for 21:00 hrs.

Temp	72.2F
Humidity	60.431
Pressure	30.009 R
Wind speed	7.453
Wind Direction	199 south/southwest

Where 0/360 = North, 90 = East, 180 = South, 270 = West

281

CENTRE ST & MANTHORNE RD														
GRID:		12-04												
RESPOND TO FIRE						COVERING ASSIGNMENTS								
ENGINE	LADDER		SPECIAL	CHIEF	ENGINE	LADDER								
1st	30	53	55	25	16	R2	D10	28 - 30						
WF	28			10		TC H1 SU	Dv2	29 - 30	42 - 28	48 - 55	52 - 53	14 - 25 26 - 10	15 - 26 29 - 16	
2nd	28	48	42	52	10	28	TC H1 SU	Dv2	5 - 22 24 - 53	18 - 52 29 - 30	21 - 24 37 - 28	22 - 37 49 - 48	14 - 25 23 - 29	15 - 26 26 - 10
3rd	24	37			26				10 - 24	21 - 53	22 - 28	50 - 37	4 - 10 21 - TC	17 - 4 24 - 17
4th	21	22							3 - 14	5 - 24	10 - 53	14 - 28		
5th	14	18			23				16 - 52 Bk 1-28	33 - 42 Ca 2-33	51 - 29 Qu 4-18	7 - 29 Bk 2-14		Qu 5-7
6th	29	5							7 - 24 Ne 3-30	32 - 7 Nw 6-51	So 2-32			
7th	10	33			7				8 - 42 Ch 1-9	9 - 8 De 1-48	49 - 53 Wn 1-56	56 - 5	19 - 29 Ca 3-15	
8th	8	7							9 - 24 Bk 3-37	50 - 42 Ev 2-8	Mi 1-16			
9th	50	9							39 - 24 Ma 3-10	41 - 42 Rv 3-30	Wt 4-41	56-39		

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A		MM DD YYYY 08 29 2007	HQ	07-0047497	000	<input type="checkbox"/> Delete <input type="checkbox"/> Change <input type="checkbox"/> No Activity	NFIRS -1 Basic
25035 MA		08 29 2007		HQ	07-0047497	000	
FDID * State * Incident Date * Station Incident Number * Exposure *							
B Location*							
<input type="checkbox"/> Check this box to indicate that the address for this incident is provided on the Wildland Fire Module in Section B "Alternative Location Specification". Use only for Wildland fires. Census Tract _____							
<input checked="" type="checkbox"/> Street address 001727 CENTRE ST							
<input type="checkbox"/> Intersection Number/Milepost Prefix Street or Highway Street Type Suffix							
<input type="checkbox"/> In front of Boston MA 02132							
<input type="checkbox"/> Rear of City State Zip Code							
<input type="checkbox"/> Adjacent to							
<input type="checkbox"/> Directions							
Cross street or directions, as applicable							
C Incident Type *		E1 Date & Times			E2 Shift & Alarms		
111 Building fire		Month Day Year Hr Min Sec			Local Option		
Incident Type		Alarm * 08 29 2007 21:06:13			Shift or Alarms District Platoon		
D Aid Given or Received*		ARRIVAL required, unless canceled or did not arrive			Special Studies		
1 <input type="checkbox"/> Mutual aid received		Arrival * 08 29 2007 21:08:58			Local Option		
2 <input type="checkbox"/> Automatic aid recvd.		CONTROLLED (Optional), Except for wildland fires			Special Study ID# Special Study Value		
3 <input type="checkbox"/> Mutual aid given		<input type="checkbox"/> Controlled					
4 <input type="checkbox"/> Automatic aid given		LAST UNIT CLEARED, required except for wildland fires					
5 <input type="checkbox"/> Other aid given		Last Unit					
N <input checked="" type="checkbox"/> None		Cleared 09 10 2007 08:48:46					
F Actions Taken *		G1 Resources *		G2 Estimated Dollar Losses & Values			
11 Extinguishment by fire		<input checked="" type="checkbox"/> Check this box and skip this section if an Apparatus or Personnel form is used.		LOSSES: Required for all fires if known. Optional for non fires. None			
21 Search		Apparatus Personnel		Property \$ _____, 500, 000			
24 Recover body		Suppression 0060		Contents \$ _____, 300, 000			
		EMS _____		PRE-INCIDENT VALUE: Optional			
		Other _____		Property \$ _____, 000, 000			
		<input type="checkbox"/> Check box if resource counts include aid received resources.		Contents \$ _____, 000, 000			
Completed Modules		H1 *Casualties		H3 Hazardous Materials Release		I Mixed Use Property	
<input checked="" type="checkbox"/> Fire-2		Deaths Injuries		N <input type="checkbox"/> None		NN <input type="checkbox"/> Not Mixed	
<input checked="" type="checkbox"/> Structure-3		Fire Service 002		1 <input type="checkbox"/> Natural Gas: slow leak, no evacuation or Hazmat actions		10 <input type="checkbox"/> Assembly use	
<input type="checkbox"/> Civil Fire Cas.-4		Civilian		2 <input type="checkbox"/> Propane gas: <21 lb. tank (as in home BBQ grill)		20 <input type="checkbox"/> Education use	
<input checked="" type="checkbox"/> Fire Serv. Cas.-5		H2 Detector		3 <input type="checkbox"/> Gasoline: vehicle fuel tank or portable container		33 <input type="checkbox"/> Medical use	
<input type="checkbox"/> EMS-6		Required for Confined Fires.		4 <input type="checkbox"/> Kerosene: fuel burning equipment or portable storage		40 <input type="checkbox"/> Residential use	
<input type="checkbox"/> HazMat-7		1 <input type="checkbox"/> Detector alerted occupants		5 <input type="checkbox"/> Diesel fuel/fuel oil: vehicle fuel tank or portable		51 <input type="checkbox"/> Row of stores	
<input type="checkbox"/> Wildland Fire-8		2 <input checked="" type="checkbox"/> Detector did not alert them		6 <input type="checkbox"/> Household solvents: home/office spill, cleanup only		53 <input type="checkbox"/> Enclosed mall	
<input checked="" type="checkbox"/> Apparatus-9		U <input type="checkbox"/> Unknown		7 <input type="checkbox"/> Motor oil: from engine or portable container		58 <input type="checkbox"/> Bus. & Residential	
<input checked="" type="checkbox"/> Personnel-10				8 <input type="checkbox"/> Paint: from paint cans totaling < 55 gallons		59 <input type="checkbox"/> Office use	
<input type="checkbox"/> Arson-11				0 <input type="checkbox"/> Other: Special Hazmat actions required or spill > 55gal. Please complete the Hazmat form		60 <input type="checkbox"/> Industrial use	
J Property Use*		341 <input type="checkbox"/> Clinic, clinic type infirmary		539 <input type="checkbox"/> Household goods, sales, repairs		63 <input type="checkbox"/> Military use	
Structures		342 <input type="checkbox"/> Doctor/dentist office		579 <input type="checkbox"/> Motor vehicle/boat sales/repair		65 <input type="checkbox"/> Farm use	
131 <input type="checkbox"/> Church, place of worship		361 <input type="checkbox"/> Prison or jail, not juvenile		571 <input type="checkbox"/> Gas or service station		00 <input type="checkbox"/> Other mixed use	
161 <input checked="" type="checkbox"/> Restaurant or cafeteria		419 <input type="checkbox"/> 1-or 2-family dwelling		599 <input type="checkbox"/> Business office			
162 <input type="checkbox"/> Bar/Tavern or nightclub		429 <input type="checkbox"/> Multi-family dwelling		615 <input type="checkbox"/> Electric generating plant			
213 <input type="checkbox"/> Elementary school or kindergarten		439 <input type="checkbox"/> Rooming/boarded house		629 <input type="checkbox"/> Laboratory/science lab			
215 <input type="checkbox"/> High school or junior high		449 <input type="checkbox"/> Commercial hotel or motel		700 <input type="checkbox"/> Manufacturing plant			
241 <input type="checkbox"/> College, adult education		459 <input type="checkbox"/> Residential, board and care		819 <input type="checkbox"/> Livestock/poultry storage (barn)			
311 <input type="checkbox"/> Care facility for the aged		464 <input type="checkbox"/> Dormitory/barracks		882 <input type="checkbox"/> Non-residential parking garage			
331 <input type="checkbox"/> Hospital		519 <input type="checkbox"/> Food and beverage sales		891 <input type="checkbox"/> Warehouse			
Outside		936 <input type="checkbox"/> Vacant lot		981 <input type="checkbox"/> Construction site			
124 <input type="checkbox"/> Playground or park		938 <input type="checkbox"/> Graded/care for plot of land		984 <input type="checkbox"/> Industrial plant yard			
655 <input type="checkbox"/> Crops or orchard		946 <input type="checkbox"/> Lake, river, stream					
669 <input type="checkbox"/> Forest (timberland)		951 <input type="checkbox"/> Railroad right of way					
807 <input type="checkbox"/> Outdoor storage area		960 <input type="checkbox"/> Other street					
919 <input type="checkbox"/> Dump or sanitary landfill		961 <input type="checkbox"/> Highway/divided highway					
931 <input type="checkbox"/> Open land or field		962 <input type="checkbox"/> Residential street/driveway					
				Property Use 161		Restaurant or cafeteria	
						NFIRS-1 Revision 03/11/99	

25035	MA	MM	DD	YYYY	HQ	07-0047497	000	Complete Narrative
FDID *	State *	8	29	2007	Station	Incident Number *	Exposure *	

Narrative:

On arrival there was fire showing on the roof in the rear. Engine Co. 30's charged 1 3/4" line was already in the restaurant. Ladder Co. 25's aerial was raised to the roof. There was one Firefighter from Engine Co. 30 connecting the feeder line to the hydrant, the pump operator was connecting feeder line to the pump. The rest of the Firefighters were in the building with one on the roof. The second alarm was struck by the Captain of Ladder Co. 25 before my arrival. I assumed Centre Street command. I could not see into the restaurant due to heavy smoke. The first Firefighter out of the building was the Captain of Ladder Co. 25 who informed me that Firefighter Paul Cahill was missing. I notified the companies reporting to me to search for the missing member. Division 2 arrived, I told him at least one member was missing and the companies were inside searching. At this time Division 2 assumed Centre Street command. It was shortly after Division 2 arrived the Firefighter nearer the front of the restaurant was found and removed. A second Firefighter was found in the rear of the restaurant and removed to the street where CPR was immediately administered by District Fire Chief Gregory Mackin of the safety division. During the fire, the air conditioner penetrated the roof causing a hazard to the Firefighters below. Two cranes were ordered to the scene to remove the air conditioner from the roof.

Engine Co. 30 ran 200' of 1 3/4" to the kitchen and operated on the fire in the ceiling. Ladder Co. 25 put their aerial to the roof, attempted to open the roof with K-12 saw and axe. Firefighter Warren Payne went inside the building for search and rescue.

Engine Co. 53 ran 250' of 2 1/2" line into Tai Ho restaurant and operated on the fire.

Engine Co. 55 ran 250' of 2 1/2" line to the thru front window and operated on the fire.

Ladder Co. 16 aerial to the roof, other members went in the building.

Rescue Co. 2 the first RIT company was assigned to locate downed members. Rescue 2 made entry into the rear of the building. Members searched, located and removed downed Firefighter Paul Cahill from the kitchen area.

Engine Co. 28 ran 200' of 2 1/2" line to the front of the Tai Ho and operated line on the fire. Then acted as a RIT team with D08. Also fed Ladder Co. 16 ladder pipe.

Engine Co. 48 ran 200' of 1 3/4" line off Engine Co. 53 to the rear of the building and operated. Assisted Ladder Co. 28 with open up duties. Later ran a 1 3/4" line over a 20' ladder to flood the roof.

Ladder Co. 28 assisted companies in the rear of the building.

Engine Co. 42 ran 300' of 2 1/2" to the rear of the building and operated.

Engine Co. 52 was the second RIT team, reported to the Deputy and entered the building. Ran 200' 1 3/4" line to the rear of the building.

Ladder Co. 10 aerial to roof two members to the roof. Other members went inside, helping remove the downed Firefighter from the rear of the restaurant.

Tower Ladder 17 operated elevated platform fed by Engine Co. 30 on fog and straight stream on the roof.

Ladder Co. 29 was a RIT team with District 6. Entered the front of the building and searched.

Engine Co. 37 ran 250' of 2 1/2" line off Engine Co. 42 to the rear of the building. Reported to District Fire Chief John Howard.

Engine Co. 24 ran 250' of 2 1/2" line to the pet store, did not operate line.

Ladder Co. 26 ordered to search and rescue duties.

~~Engine Co. 22 Reported to Deputy with 2 1/2" line and stood by.~~

Engine Co. 21 Took a hydrant reported to Deputy and stood by.

Ladder Co. 23 Fire Detail 2AM to 4AM.

Engine Co. 29 Fire Detail 2AM to 4AM.

Engine Co. 16 Fire Detail 4AM to 6AM

Engine Co. 3 Fire Detail 4AM to 6AM.

Ladder Co. 6 Fire Detail 4AM to 6AM.

Engine Co. 14 Fire Detail 6AM to 8AM.

Ladder Co. 1 Fire Detail 6AM to 8AM.

There were two Firefighter casualties.

Firefighter Paul Cahill Engine Co. 30 FLK

Firefighter Warren Payne Ladder Co. 25 BWE

K1 Person/Entity Involved [857] - [928] - [2392]
Local Option Business name (if applicable) Area Code Phone Number

Check This Box if same address as incident location. Then skip the three duplicate address lines.

Mr./Ms./Mrs. First Name [Zou] MI [] Last Name [Zi] Suffix []
 Number [74] Prefix [] Street or Highway [Van Winkle] Street Type [ST] Suffix []
 Apt./Suite/Room [] City [DO]
 Post Office Box []
 State [MA] Zip Code [02124] - []

More people involved? Check this box and attach Supplemental Forms (NFIRS-1B) as necessary

K2 Owner Same as person involved? Then check this box and skip the rest of this section. [617] - [480] - [1383]
Local Option Business name (if applicable) Area Code Phone Number

Check this box if same address as incident location. Then skip the three duplicate address lines.

Mr./Ms./Mrs. First Name [Jie] MI [] Last Name [Li] Suffix []
 Number [74] Prefix [] Street or Highway [Van Winkle] Street Type [ST] Suffix []
 Apt./Suite/Room [] City [DO]
 Post Office Box []
 State [MA] Zip Code [02124] - []

L Remarks
Local Option

On arrival there was fire showing on the roof in the rear. Engine Co. 30's charged 1 3/4" line was already in the restaurant. Ladder Co. 25's aerial was raised to the roof. There was one Firefighter from Engine Co. 30 connecting the feeder line to the hydrant, the pump operator was connecting feeder line to the pump. The rest of the Firefighters were in the building with one on the roof. The second alarm was struck by the Captain of Ladder Co. 25 before my arrival. I assumed Centre Street command. I could not see into the restaurant due to heavy smoke. The first Firefighter out of the building was the Captain of Ladder Co. 25 who informed me that Firefighter Paul Cahill was missing. I notified the companies reporting to me to search for the missing member. Division 2 arrived, I told him at least one member was missing and the companies were inside searching. At this time Division 2 assumed Centre Street command. It was shortly after Division 2 arrived the Firefighter nearer the front of the restaurant was found and removed. A second Firefighter was found in the rear of the restaurant and removed to the street where CPR was immediately administered by District Fire Chief Gregory Mackin of the safety division. During the fire, the air conditioner penetrated the roof causing a hazard to the Firefighters below. Two cranes were ordered to the scene to remove the air conditioner from the roof.

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 Ladder Co. 16 aerial to the roof, other members went in the building.
 Rescue Co. 2 the first RIT company was assigned to locate downed members. Rescue 2 made entry into the rear of the building. Members searched, located and removed downed

L Authorization

[F871] [MacCurtain, Kevin P] [COD] [HD0] [09] [11] [2007]
Officer in charge ID Signature Position or rank Assignment Month Day Year

Check Box if same as Officer in charge. [F647] [Hession, Kevin P] [DIS] [D10] [09] [11] [2007]
Member making report ID Signature Position or rank Assignment Month Day Year

25035
FDID *

MA
State *

MM DD YYYY
8 29 2007
Incident Date *

HQ
Station

07-0047497
Incident Number *

000
Exposure *

Complete
Narrative

Narrative:

Firefighter Paul Cahill Engine Co. 30 FLK
Firefighter Warren Payne Ladder Co. 25 BWE

The following members were injured.

Firefighter Kenneth Gibson Engine Co. 55 BWE
Fire Lieutenant Donald Mullen Rescue 2 BWE
Firefighter Paul Stanley Rescue 2 BWE
Firefighter Ray Estremera Ladder Co. 16 BWE
Firefighter Edward Saniuk Ladder Co. 10 BID
Firefighter Charles Follett Engine Co. 30 BID
Fire Lieutenant Michael Palizzolo Engine Co. 30 BID
Fire Captain Stephen Keogh Ladder Co. 25 BID (assigned to Engine Co. 30)
Firefighter Bryan Dale Engine Co. 30 BID
Firefighter Michael Feeney Ladder Co. 25 BID
Firefighter Robert Hayes Ladder Co. 25 BID
Firefighter on Probation Arthur Brooks Ladder Co. 25 BID.

The potential code violations for this address are being investigated by the Fire Marshal's Office.

Bunker Gear

On August 3, 2000 the Boston Fire Department implemented a bunker gear ensemble options program (see appendix). This bunker gear policy allowed firefighters a choice in the PPE they could wear during structural firefighting. During the time frame of initial adoption and the fire, the bunker gear policy had been modified and reissued. The bunker gear policy in effect on August 29, 2007 can be found in Special Order No. 31 dated June 27, 2005 (see appendix). Firefighters Cahill and Payne were wearing bunker gear ensemble option # 2 (bunker coat, FR pant, approved safety work boot) the night of the fire.

The bunker gear issued to Firefighters Cahill and Payne was manufactured by BRISTOL Fire Apparel Inc. in April 1995. This bunker gear has an outer shell of NOMEX DELTA T comprised of 75% Nomex, 23% Kevlar, and 2% carbon fiber ripstop. This PPE meets the requirements of NFPA 1971 *Standard on Protective Ensemble for Structural Firefighting* (1991 edition).

APPENDIX

**SPECIAL ORDER
NO. 26**

AUGUST 3, 2000

From: Chief of Department
To: Deputy Fire Chiefs, All Divisions
Subject: **I. BUNKER GEAR**

Effective 1800 hours, August 3, 2000, the Boston Fire Department will implement the following trial policy relative to the use of Bunker Gear during the summer and fall periods of high humidity and high temperatures. Members may choose from the following fire fighting ensemble options:

1. Bunker Coat, Bunker Pant, Bunker Boot
2. Bunker Coat, FR Pant, Approved Safety Work Boot (steel shank/steel toe)
3. Bunker Coat, FR Pant, $\frac{3}{4}$ Fire Boot
4. Bunker Coat, FR Pant, Bunker Boot

The Boston Fire Department, as part of a continuing commitment to the health and safety of its fire fighters, and after much consideration and review of the use of the full Bunker Gear ensemble and related injuries, has determined that the use of such gear, while providing a high degree of protection against the effects of fire, may pose health and safety hazards to fire fighters. Fire fighters who have experienced discomfort in the form of high physical stress due to high body heat and difficulty of motion while using the full Bunker Gear ensemble may choose from the above options.

The Boston Fire Department is not abandoning Bunker Gear policy, but considers temporary implementation of these options as progressive until a full evaluation can be made of the potential long-term health problems associated with such usage. The department will continue its program of evaluating and researching all new developments in this area.

The department will monitor this program closely to determine if such policy is contributing to the health and safety of Boston Fire Fighters. The type, frequency and severity of injury will be studied.

All Form 5Ds submitted will specify which ensemble option number was being worn at the time of injury.

This policy change is possible because of the high caliber response capabilities of the Boston Fire Department, particularly in interior fire fighting. Namely, the rapid response of an adequate number of properly staffed and trained units, capable of rapid deployment, properly placed hose streams of sufficient volume and number, and prompt and thorough ventilation, in effect, taking measures that minimize the likelihood of backdraft or flashover.

This policy position is intended only for the Boston Fire Department and is not a recommendation to other fire service organizations.

Members are encouraged to make suggestions, comments, etc., on a Form 5A and send it to Deputy Chief William Hitchcock, Training Division.

Per Order:

Paul A. Christian
Chief of Department

APPENDIX

**SPECIAL ORDER
NO. 31**

JUNE 27, 2005

From: Chief of Operations
To: Deputy Fire Chiefs, All Divisions
Subject: **I. BUNKER GEAR POLICY REISSUED**

The Boston Fire Department implemented the following policy relative to the use of bunker gear during periods of high temperature and humidity. This policy is based on the recommendation of the joint BFD/Local 718 Safety Committee. Members may choose from the following fire fighting ensemble options:

1. Bunker Coat, Bunker Pant, Bunker Boot
2. Bunker Coat, FR Pant, Approved Safety Work Boot (steel shank/steel toe)
3. Bunker Coat, FR Pant, $\frac{3}{4}$ Fire Boot

The wearing of shorts is no longer allowed. Chief Officers and Company Officers shall be held strictly accountable for the compliance of the member's bunker gear ensemble options.

Members electing options 2 or 3 shall carry their bunker pants on apparatus during their tour of duty.

Incident Commanders may use their discretion to order full bunker gear ensembles at incidents.

The Boston Fire Department, as part of a continuing commitment to the health and safety of its fire fighters, and after much consideration and review of the use of the full bunker gear ensemble and related injuries, has determined that the use of such gear, while providing a high degree of protection against the effects of fire, may pose health and safety hazards to fire fighters. Fire fighters who have experienced discomfort in the form of high physical stress due to high body heat and difficulty of motion while using the full bunker gear ensemble may choose from the above options.

The Boston Fire Department is not abandoning bunker gear policy, but considers temporary implementation of these options as progressive until a full evaluation can be made of the potential long-term health problems associated with such usage. The department will continue its program of evaluating and researching all new developments in this area.

The department will monitor this program closely to determine if such policy is contributing to the health and safety of Boston Fire Fighters. The type, frequency and severity of injury will be studied.

All Form 5Ds submitted will specify which ensemble option number was being worn at the time of injury.

This policy change is possible because of the high caliber response capabilities of the Boston Fire Department, particularly in interior fire fighting. Namely, the rapid response of an adequate number of properly staffed and trained units, capable of rapid deployment, properly placed hose streams of sufficient volume and number, and prompt and thorough ventilation, in effect, taking measures that minimize the likelihood of backdraft or flashover.

This policy position is intended only for the Boston Fire Department and is not a recommendation to other fire service organizations.

Members are encouraged to make suggestions, comments, etc., on a Form 5A and send it to Deputy Fire Chief David Granara, Training Division.

Per Order:

William F. Hitchcock
Chief of Operations

