

August 3, 2007

TO: All Members
Bureau of Emergency Services

FROM: M. D. Rueda, Deputy Chief
Bureau of Emergency Services

SUBJECT: **FIREFIGHTER INJURY REPORT - GREENSHEET
ADAMS STRUCTURE FIRE LESSONS LEARNED**

On July 24, 2007 at 2020 hours a commercial structure fire occurred at 5111 W. Adams Boulevard. During this incident an Apparatus Operator fell through the roof sustaining serious burns to his hands, arms and face. A review of this incident showed that there are significant lessons to be learned. This information was quickly compiled in a "Greensheet" preliminary report format to provide members with a review of these lessons learned. The information contained in the Greensheet report is preliminary and subject to change as additional information is obtained.

The purpose of the Green Sheet is to aid in accident prevention by quickly informing personnel of "What Happened". The report is to be used as a training tool and not to place blame.

All Officers shall review the attached Green Sheet with personnel under their command and discuss the lessons learned and how to apply them at future structure fires.

M. D. RUEDA, Deputy Chief
Bureau of Emergency Services

Attachment

Los Angeles Fire Department

GREENSHEET



FIREFIGHTER INJURY ADAMS STRUCTURE FIRE

JULY 24, 2007

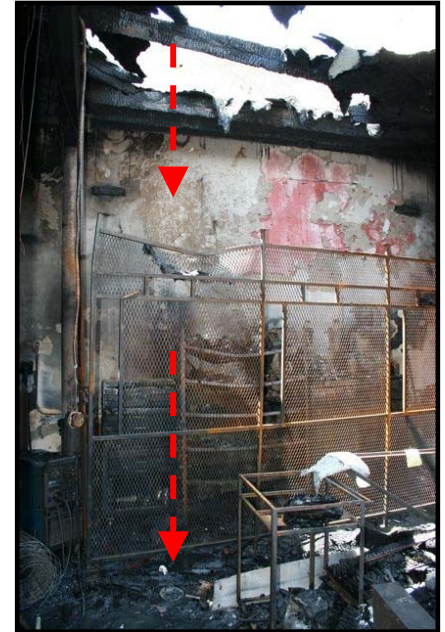
This report is intended as a safety and training tool, and aid to preventing future occurrences. Information contained herein is subject to revision as further investigation is conducted and additional information is developed.

ADAMS STRUCTURE FIRE FIREFIGHTER INJURY REPORT

SUMMARY

On July 24, 2007, at approximately 2033 hours, a Los Angeles Fire Department Apparatus Operator (AO) was injured while fighting a structure fire at 5111 W. Adams Boulevard, in Fire Station 68's first-in district.

The injured member assigned to Truck 26 stepped onto a portion of roof weakened by fire and fell approximately 5', 4" striking a metal room divider and continued to fall approximately 7', 10" to the floor of the structure. The room measured approximately 30' x 60'.



Rapid intervention procedures were initiated by on scene fire companies, which resulted in the missing member being found and rescued in approximately seven minutes by interior fire attack companies. The AO sustained significant burn injuries to his hands, arms, face, and scalp. He was transported to Cedars Sinai hospital for stabilization and then transferred to Torrance Memorial Burn Center.

The structure was two single story commercial occupancies combined together to total approximately 125' x 150' in size, the occupancy was divided into several work/storage areas. It was constructed of a wood frame with stucco exterior siding, conventional flat roof. The area involved in the fire was being used as a welding shop to create metal sculptures.



ADAMS STRUCTURE FIRE FIREFIGHTER INJURY REPORT

INCIDENT OVERVIEW



On July 24, 2007, at 2020 hours, a first alarm assignment consisting of Engine 68, Engine 34, Rescue 834, Task Force 26, Task Force 61, Rescue 61, EMS 18 and Battalion 18 were dispatched to a reported structure fire at 5111 W. Adams Boulevard. Rescue 68 and Rescue 868 were added to the incident after the initial dispatch.

EMS 18 arrived first on scene at 2022 hours and made the initial size up of a single story commercial with heavy smoke and fire through the roof. Engine 68, second to arrive on scene, established a supply line and performed forcible entry through a chainlink gate, wood door and scissors gate on the "D" side of the structure. Engine 68 along with Rescue 868 personnel then initiated fire attack operations utilizing a 1 3/4" hose line.

Battalion 18 arrived on scene and placed companies as follows:

Rescue 61 - Assist Engine 68 with forcible entry.
Engine 34 - Backup fire attack.
Light Force 26 – Roof Operations/Ventilation
Engine 26 - Backup fire attack.
Task Force 61 - West exposures.
Rescue 834 – Attached to Engine 34 to assist with fire attack.
Rescue 68 – Medical Group
EMS 18 – Medical Group

Battalion 18 provided a secondary size up, stating they had a "one story commercial, 75' X 100' with a little bit of fire coming through the roof". The incident was named Adams IC with Staging established at La Brea and Adams. The Command Post was located at Mansfield and Adams. Battalion 18 requested two additional task forces, three Battalion Chiefs, one paramedic rescue ambulance and one EMS Captain to standby at staging.

Light Force 26 arrived on scene. Engine 226 spotted and hooked up to a hydrant. The Truck Captain ordered ground ladders to the involved structure. The AO spotted and raised the aerial ladder to the "A-B" side of the structure. The Tiller and Top¹ Firefighter raised a 24-foot straight ladder to the "A-D" side of the structure.

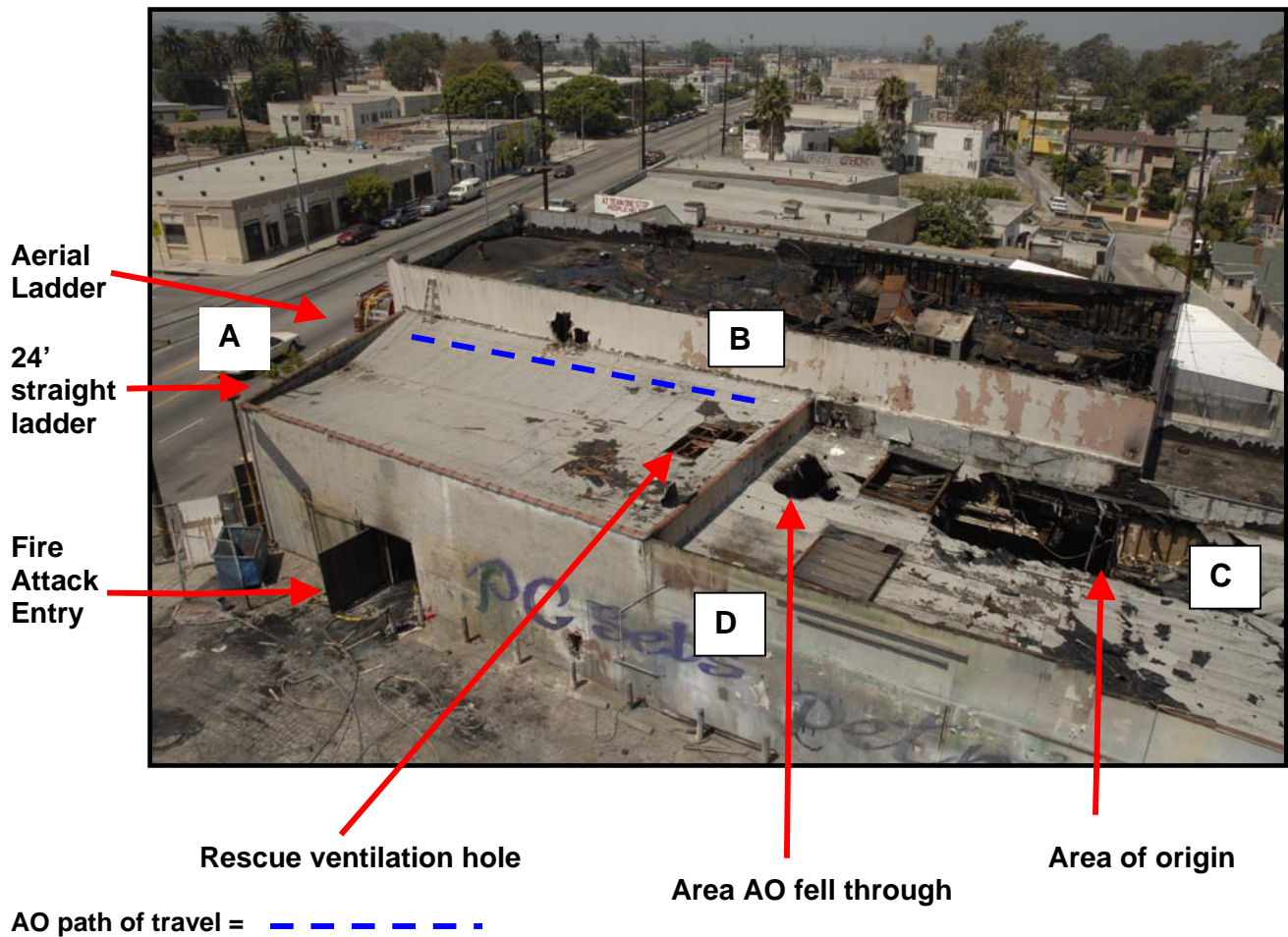
¹ The Top Firefighter was a first house probationary firefighter. This was his first shift on Truck 26.

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The Tiller Firefighter then brought up a 16-foot straight ladder onto the roof at the direction of the AO. The Captain II proceeded up the 24-foot straight ladder onto the roof and sounded with his axe along the "D" side of the structure up to the Division wall dividing the "B" and "D" side of the structure. The Truck Captain provided a size up to the Incident Commander (IC) describing the structure and extent of fire involvement.

The AO climbed the aerial ladder with a chainsaw. He did not have a rubbish hook or pike pole with him. As the AO climbed the aerial ladder The Inside Firefighter yelled out to him that the Captain II had climbed the 24' straight ladder and was going to the right ("D") side of the structure.

Top and Inside truck positions climbed the aerial ladder after the AO, bringing the second chainsaw and roof kit with them. The Inside Firefighter took the roof kit apart at the parapet, left one rubbish hook at the aerial ladder and the Inside and Top Firefighters proceeded along the parapet wall on the "D" side of the structure, with the Inside Firefighter sounding their path of travel.



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The AO did not wait for the ventilation team and was seen traveling rapidly on the "B" side with no sounding tool(s). On the roof the Inside firefighter shouted for the AO to stop and come back the other way, but the AO did not stop or acknowledge the shouting. The AO was seen looking at the area of the roof involved with fire prior to falling through the roof.

The Captain II on the roof stated that he momentarily looked towards the "B" side of the structure and saw the AO going over the division wall and then immediately disappearing. This was followed by a large amount of fire erupting from the area the AO went through. The distance from the upper roof to the lower roof of the fire building is 3'. A second witness stated that immediately after the AO went over the division wall he saw the AO supported on the involved roof for approximately 1-2 seconds before falling through.

The Captain II assigned to Truck 26 on the roof broadcast emergency traffic over the tactical channel and then leaned over the parapet of the involved structure and yelled to Engine 26 personnel below that his AO had fallen through the roof. At approximately 2033 hours, Battalion 18 heard panicked, indiscernible radio traffic on the tactical channel. It was clear to Battalion 18 that there was a possible life-threatening emergency. Battalion 18 asked the companies on the roof if they were declaring an emergency traffic. Battalion 18 did not hear confirmation regarding whether or not an emergency traffic situation existed. The Battalion Commander instructed his Staff Assistant to notify OCD of "Emergency Traffic, Firefighter through the Roof".

The OCD floor captain was monitoring the tactical channel and shortly before being notified by the IC of the emergency, broadcast an emergency traffic notification, "Firefighter through the roof" on the OCD dispatch channel (Channel 7) and the incident Tactical Channel (Channel 13).

The Captain II directed the Top Firefighter to drop bag a 1 ¾" hose line to the roof and directed him to knockdown the large amount of fire coming from the area where the Apparatus Operator went through the roof. The Firefighters from Truck 26 assigned to the Inside and Tiller positions immediately began ventilation operations to open the roof, south of the division wall to assist with rescue operations.

The IC asked for a report on the firefighter down and assigned Engine 94 as a Rapid Intervention Company as Engine 94 was arriving on scene. The Captain II from Truck 26 told the IC that his "AO was down into heavy fire in the very rear; no other person went down, just AO (last name) in the fire right now."

The IC assigned Task Force 58 and Engine 61 along with Engine 94 Rapid Intervention. The Truck 26 Captain II notified the IC that unless he heard different, he was going to put a line right into the fire from the roof.

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During post incident interviews, the Captain II from Truck 26 stated when the AO fell through the roof; heavy fire came through the hole and the hoseline was used to knockdown the heavy fire during the rescue operation.

Engine companies 68, 34, and 26 were assigned interior fire attack and upon hearing the announcement of the AO through the roof initiated a search of the structure finding and rescuing the missing AO. Engine 26 used two thermal imaging cameras during the search. The AO was carried out of the structure by various personnel, assessed and treated by Rescue 68 personnel. The AO was semi-conscious and able to talk². Witnesses stated that during the rescue, heavy interior smoke was present with near zero visibility. The ceiling and roof members sustained heavy fire damage.

Thermal imaging cameras were instrumental in locating the missing AO.



View of structure from "D" fire attack entry

² Due to his medical condition the AO involved in this incident was not interviewed for this report.

ADAMS STRUCTURE FIRE FIREFIGHTER INJURY REPORT

CONTRIBUTING FACTORS

Three significant issues have been identified as factors relative to this incident. They are as follows:

1. The AO did not determine roof integrity through sounding procedures.
2. Independent action by the AO compromised ventilation team unity and prevented a coordinated ventilation and safety plan.
3. The AO did not accurately evaluate the extent of fire involvement and roof integrity.

SAFETY ISSUES FOR REVIEW

- **During ventilation operations, prior to leaving a ladder, the roof shall be sounded. The first member of the ventilation team should be sounding ahead of the team. Members must sound anytime they are stepping onto a different roof area or path of travel.**

The Captain II of Light Force 26 ordered ground ladders to the involved structure. He proceeded up the 24-foot straight ladder onto the roof at the "A-D" corner and sounded with his axe along the "D" side of the structure up to the division wall. The AO spotted and raised the aerial ladder to the "A-B" side of the structure and climbed the aerial ladder with a chain saw.

The AO did not wait for the remainder of the ventilation team and was seen traveling rapidly on the "B" side without any sounding tool(s). The AO acted independently and did not communicate his actions with the other members of the ventilation team.

The inside and top firefighters followed the path of the Captain II along the "D" side sounding with a rubbish hook.

The Officer or member in charge of roof operations shall ensure all ventilation team members are briefed on proposed roof ventilation operations, level of risk appropriate for the potential benefits, and other specific safety issues.

Ventilation teams must ensure company unity on the roof.

- **All members of the roof ventilation team are required to wear the required appropriate PPE prior to initiating ventilation operations. The roof of a burning building is part of the Immediate Danger to Life and Health (IDLH) area. The Officer or member in charge of a ventilation team shall ensure that everyone on their team is wearing the appropriate PPE.**

ADAMS STRUCTURE FIRE FIREFIGHTER INJURY REPORT

The AO of Light Force 26 was not wearing either firefighting or work gloves at the time of the incident. He was wearing a turnout coat, turnout pants, rubber turnout boots, helmet and SCBA. It is unknown if he was wearing a firefighting hood. When the injured AO was rescued, the members' SCBA facepiece and radio were both secure in their pouches. Witnesses stated the AO's Personal Alert Safety System (PASS) was not sounding when he was found. The investigation team was unable to determine whether or not the SCBA bottle had been turned on. The radio sustained damage to the display and knobs and was inoperable upon examination. All PPE worn by the AO was examined and determined to have performed as required. None of the PPE worn contributed to the injuries. Failure to wear firefighting gloves contributed to the severity of burns on the hands of the AO.

- **Officer's assigned new members (probationary and non-probationary) shall ensure that the member is provided with an operational safety expectation for all emergency incidents.**

The day of the incident was the AO's first shift in a newly promoted position. On the morning of the same day, the Captain II of Light Force 26 provided training for the company members on roof ventilation standard operating procedures. The training included actual roof cutting on a one story single family dwelling and practicing roof ventilation operations on a center hallway apartment building.

Company Officers must adopt standard operating guidelines and procedures and communicate these to all members of their crew. It is all members' responsibility to strictly adhere to those guidelines and procedures to ensure their own safety and the safety of others.

- **All members assigned to an incident must be made aware of the strategy being declared by the incident commander, and hence the level of risk that members will be permitted to take.**

EMS 18 arrived on scene of the incident and made the initial size up of a single story commercial with heavy smoke and fire through the roof.

Battalion 18 provided a secondary size up and assigned companies consistent with an offensive attack, although it was never declared offensive. The Department protects both life and property. Some risk is appropriate for a closed commercial building with little likelihood of life loss; however, risk vs. gain must always be a primary consideration.

The Captain II of Light Force 26 had evaluated the conditions on the roof and was prepared to trade distance for safety and write off the portion of the roof that had self-vented. He had planned to initiate ventilation operations on the uninvolved portion of the building.

August 2, 2007

TO: All Members
Bureau of Emergency Services

FROM: M. D. Rueda, Deputy Chief
Bureau of Emergency Services

SUBJECT: **ROOF CUTTING OPERATIONS AND FIREFIGHTER SAFETY**

On July 24, 2007 an Apparatus Operator fell through the roof at a commercial structure fire sustaining serious burns to his hands, arms and face. A review of the incident showed that there are significant lessons to be learned, reviewed and reinforced.

Statistically, roof-cutting operations rank as one of the most dangerous fire ground activities. The widespread use of lightweight roof construction and ever-changing building standards combined with a reduction in fires and experience of our members increase the potential danger to firefighters.

It must be clearly understood, and accepted by all members that roof-cutting operations lacking adherence to standard safety procedures and appropriate oversight are inherently unsafe, often ineffective and can lead to serious injury or death.

The following policy on roof-cutting operations shall be followed at all structure fire incidents. These directives have been previously published:

- All personnel must recognize the roof of a structure as part of the Immediate Danger to Life and Health (IDLH) area.
- Prior to ventilation operations, a clear ventilation plan should be communicated and understood by all members on the roof.
- Ventilation teams must insure company unity on the roof of structures.

- Prior to proceeding from the laddering point(s) on a roof, sounding with a rubbish hook shall be completed. The member sounding the roof with a rubbish hook is the first member walking ahead of the ventilation team. Members must sound anytime they are stepping onto a different roof area or path of travel.
- No roof-cutting operation should ever be performed without the presence of a dedicated “safety member.” One person from the roof cutting team must have the sole responsibility of the “safety member” and shall not be involved in the cutting or pulling operation. The designated safety member must have the knowledge, experience and ability to effectively perform this function.
- The minimum number of personnel required for roof-cutting operations shall be two members – one for cutting and one as the safety member. These members may choose to switch roles midway through their operation, but one member must always be the designated safety member. Large structures will require more than two members to operate safely.
- The safety member shall not become involved in the actual roof ventilation operation. The safety member shall place themselves in a position on the roof within visual and audible range of the members actively involved in the cutting operation. The safety member’s minimum responsibilities will include but are not limited to continually evaluating factors concerning safety of all members on the roof and effectively communicating with the IC and interior fire attack teams.
- The number of members required for a roof-cutting operation remains incident driven. This is dependent upon many factors: size of the structure, building construction, volume of fire, resource availability, etc. Whenever multiple companies are assigned to the roof, the IC shall designate one member in charge as “Roof Division.”
- Members must be aware of potential warning signs that indicate potential structural collapse.
- Lightweight Roofs – Burn tests on lightweight roof materials have demonstrated that these roofs can fail and collapse in as little as 16 minutes measured from the beginning of the fire, not from time of our arrival. When operating on lightweight roofs, or suspected lightweight roofs, if at all possible members shall follow the policy of approaching the roof from the uninvolved areas and cutting “indicator holes” along their access/escape routes. **Members shall never conduct ventilation operations directly over a working fire on a lightweight roof.** Members should employ the practice of trading space for time so that they may complete their roof-cutting operation prior to the fire impinging on their ventilation hole.

- All members operating on a roof shall identify and communicate travel and escape routes and ensure that they remain safe throughout the operation. Second-in truck companies should always consider extending their aerial to the roof and throwing additional ground ladders.
- The AO, Captain or Safety Member in charge of the roof operation shall communicate pertinent information and hazards to the IC, fire attack teams, interior divisions, etc.
- The AO or Captain in charge of the roof operation shall coordinate ventilation operations with other companies that are assigned to the roof.
- The AO or Captain in charge of the roof operation should monitor appropriate tactical radio frequencies to determine exact fire location. Two way Communication with interior divisions/companies and companies on the roof concerning fire location and conditions on the roof must be conducted.
- All members must constantly evaluate the roof ventilation operation, the effectiveness of the operation and weigh RISK vs. GAIN to allow for a timely and safe exit from the roof. Primary responsibility for this task is assigned to the AO or Captain in charge of the roof operation.
- The collapsible ladder carried on truck companies should be utilized on parapets, walls or when needed to transition from one roof to another.
- All members shall ensure their SCBA has been turned on prior to exiting a ladder during all above ground operations. This will ensure the PASS device will automatically activate should a member become disoriented or in some way incapacitated.
- All roof ventilation team members shall wear the required appropriate PPE prior to initiating ventilation operations. The Officer or Apparatus Operator in charge of a ventilation team shall ensure that everyone on their team is wearing the appropriate PPE.
- During structure fire incidents, the Officer or AO in charge of roof operations shall ensure all ventilation team members are briefed on proposed roof ventilation operations and are briefed on safety issues and ventilation strategy and tactics.

- All members must be knowledgeable and have a clear understanding of Department Training Bulletin 76 (Company Operations) and Book 101 (Rapid Intervention Procedures) to ensure firefighter incident safety, accountability, company operations and Emergency Traffic procedures. Realistic and practical scenarios and drills related to firefighter safety and self-survival must be practiced with all members.
- Company Officers shall train all members on self-rescue/survival procedures in the event a member falls through a roof during ventilation operations.
- Company Officers shall train all members under their command on Rapid Intervention Procedures for a member(s) who have fallen through a roof during ventilation operations and how they can assist their own rescue.
- Company officers must adopt Standard Operating Guidelines and procedures for ventilation operations and communicate these to all members of their crew.
- Officer's assigned a new AO (probationary and non-probationary) shall insure that the member is provided with an operational safety expectation briefing for all roof operations.

M. D. RUEDA, Deputy Chief
Bureau of Emergency Services