San Francisco Fire Department

Division of Training

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Tactics for Fires in Void Spaces

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TACTICS FOR FIRES IN VOID SPACES

INTRODUCTION

The type and age of construction in San Francisco buildings leads to frequent fires in Attics, Joist/Stud Bays and Lightwells. These types of fires are similar in the following ways:

- Non-Sprinklered areas
- Commonly oxygen starved due to modern construction and remodeling features: double paned windows, Tyvek wrap, sealed siding, fire rated doors, weatherstripping
- Difficult access (doubled up plywood sheathing for storage in attics)
- Labor intensive
- Requires Coordination

The ability of a Truck Company to expose hidden areas of fire is a critical function that greatly affects the amount of fire damage suffered. The public relies on the Fire Department to fully extinguish all fires and to remain on scene until this is accomplished. Taking ownership of a fire at all stages is essential. While the majority of fire is extinguished in early stages, searching for fire extension can be arduous and take considerable time. Diligent overhaul must be conducted at every fire incident.

The strategy at these fires is to "get ahead" of the fire and stop vertical or horizontal extension. This will require opening walls and ceiling adjacent or above areas of known fire in order to extinguish fire in downward or horizontal manner.

It is critical that Truck companies at these fires bring the proper tools and ladders and work in a coordinated fashion with Engine companies operating hose lines. Should this coordination fail, these fires can travel and cause increased damage.

In the SFFD we use OUR ladders. They are inspected by our members and trained with by our members. The use of house ladders is dangerous. They may be deteriorated, old or failing.

WALLS AND CEILINGS SHALL NOT BE OPENED UNTIL A CHARGED HOSELINE IS IN PLACE. Doing so will only introduce oxygen to the fire and cause it to increase in intensity and travel. While the TIC can assist searching for fire extension, it cannot be solely relied upon. Nothing can replace the visual certainty of physically opening a wall cavity and inspecting.

Pulling ceilings and opening walls are actions that should not be taken indiscriminately. The supervisor must clearly state the tactical objective and ensure members have the discipline to perform the desired functions as planned. For example, when pulling ceilings into an attic space the goal is not to open the ceiling and find fire, it is to pull ceilings ahead of the fire and extinguish horizontally to prevent spread. In addition, opening walls adjacent to a lightwell below the fire without a hose line in place above the fire can be disastrous as the fire is then oxygenated and can move vertically uncontrolled into the attic space.

Truck officers should have a clear understanding of building construction and use this knowledge to identify where fire is likely to travel. The direction of floor joists will generally dictate the path of fire travel in floor and ceiling spaces. The size of an attic as determined from the exterior will guide the truck officer on laddering, tools and strategy. In platform construction, fire will move up stud walls and hit top plates where it will spread into joist bays. In balloon frame construction, fire will potentially move vertically the height of the building to the attic space.

In Type 3 buildings there are multiple ways that fire can extend vertically into the attic space. These include light wells, garbage chutes, interior stair wells, utility chases, flues, elevator shafts, and top floor fires. Fire in

any of these locations requires immediate resource deployment to the top floor and roof to prevent extension to the attic. Remember, a basement fire in a Type 3 building may only present with smoke showing off the roofline on arrival due to the vertical paths of travel listed above.

Reading smoke location and movement will afford a Truck company the opportunity to get ahead of these fires. On size-up, the first arriving officer should identify the smoke location, color, and pressure. A lightwell fire will present with a column of black or grey smoke pushing vertically from the center of the roofline. An attic fire will present with grey smoke puffing from the eaves or hanging at the roofline. An exterior wall fire will present with grey smoke puffing from wall vents.

Building Construction

A basic understanding of Building Construction is essential for firefighters. The ability of a truck company to open and expose wall and ceiling cavities requires a knowledge of how buildings are constructed in San Francisco. When a wall, ceiling, or void space needs to be opened, it must be determined which type of finish covering is installed. There are several common wall and ceiling coverings in San Francisco. When ordered to check for extension, particularly above known areas of fire, companies must be thorough in their extension assessment. The use of a TIC does not replace the senses of members visualizing and feeling for extension of fire. A fire may be running the stud bays and not presenting with a heat signature in a room. There will, however, be telltale signs of fire travel such as soot on the baseboards or crown molding, discoloring/ bubbling of wall paint, smoke from heating vents or electrical fixtures. When on the top floor, an investigation must be made to ascertain whether fire has extended through the walls to the attic. This involves opening walls and pulling ceilings once a charged hose line is in place. Not only are we trying to find hidden fire, but the primary objective is also to stop vertical extension of fire into the attic and prevent a large-scale incident.

Ceilings

The purpose of pulling ceilings is to expose hidden fire, stop vertical/ horizontal spread, and contain the fire. Anytime a fire potentially has extended from the contents to the structure, the walls and ceiling must be opened as soon as possible with a charged line in place. Fire normally travels from wall spaces to ceilings. Therefore, if a hole is initiated in the middle of a room, it is important to pull until you reach a wall where extension is possible. Small holes in the ceiling do little good as companies cannot get into the attic space as needed. Expanding one large hole in multiple directions is much more efficient. If there is any question, continue to pull until there is no doubt.

Safety Considerations for Ceiling Overhaul

1. When pulling lathe and plaster ceilings it is important for the officer to evaluate the task and ensure that the proper tools and sufficient personnel are on site to complete the task.

2. Live electrical wires up to 220v are run in wall and ceiling cavities. For this reason, the ceiling hook should penetrate no further into the space than necessary. Consider de-energizing power to the building or unit prior to pulling ceilings. Knob and tube wiring is still prevalent in many San Francisco buildings. This type of wiring configuration presents an electrocution hazard due to minimal insulation and possibility of exposed wires.

3. If solar panels are present, be aware that high voltage wires may be running in the walls/ceilings to the inverter box.

4. Pulling ceilings in a smoky environment can lead to inadvertent dropping of chandeliers or decorative plaster fixture surrounds (rosettes) which can injure firefighters. For this reason, the ceiling hook should be held at an angle to ensure items dislodged fall to the floor ahead of the firefighter and not directly on top of them.

5. Be aware that, particularly when wet, large sections of material can fall and present a hazard to firefighters operating below.

6. Do NOT stand on top of a bed, chair or couch and pull ceilings. Safety requires the firefighter to be on stable ground. Bring the proper ladder and utilize it if necessary.

A Truck Company may encounter the following types of ceilings. Each type has its own challenges and most effective tactics.

1. Lathe and Plaster
    a. Four-foot-long strips of wood lathe, typically 1-inch wide, nailed directly to the open wall studs or joists. When pulling lath and plaster ceilings first determine the way the joists are running. Typical joist orientation in San Francisco is parallel to the street. The lath will run across the joists at an angle, usually at a 90 or 45 degree.

    b. The correct tool for pulling ceiling with this type of covering is the San Francisco Ceiling Hook. The steel, 6 foot long, rubber-wrapped hook should be the primary tool for this task. A ceiling hook extension must be at the ready in case high ceilings are encountered. An attic extension, baby extension, or A-Frame ladder may be needed to completely open the ceiling at elevated areas.

    c. It is important to use proper technique when pulling ceilings in order to conserve energy and expose the joists. This entails punching the hook parallel with the lath in order to penetrate the finished ceiling and then turning the tool 90 degrees in order to "hook" the lath. A pulling motion towards the floor will then remove a section of lathe and attached plaster. Once the initial penetration is made, a firefighter can continue to use that opening to pull additional lath and plaster. The most difficult part of pulling ceilings, particularly in high ceilings, is to make the initial hole. Plaster is a hard finish applied in 3 coats. Due to this, the goal should be to penetrate the ceiling as few times as possible and use the initial hole to pull significant areas in multiple directions as needed. If you feel resistance when initially penetrating the ceiling, the hook has most likely hit a joist or a cross piece. Pull the hook out and move a few inches either direction and you should find the void space.

    d. Two ceiling hooks used in unison can simultaneously pull both ends of a 4-foot piece of lathe and remove large areas in a speedy fashion. When difficult or high ceilings are encountered, it may be beneficial for two firefighters to work together using one hook to make the initial hole.

2. Metal Lathe and Plaster
    a. This is a difficult and challenging operation. The metal lathe is applied in 3x8 sheets nailed or stapled every 6-8 inches. While standard pulling using a ceiling hook will accomplish the task, it will take significantly more time and energy. The existence of a covering of this type must be relayed to the IC so that they understand that the process will be slower and more arduous.

A properly pulled ceiling. Are the joists running parallel or perpendicular to the street? On a corner building they will run the shortest distance of the property.

b. The process for pulling this type of ceiling is slightly different from wood lathe material. In these types of ceilings, it is necessary to find the corners of the metal lathe sheets. These are typically located where the wall meets the ceiling. Once that is determined, a ceiling hook can be used to pull along the joist at the outside of each sheet to remove the nails. In other words, pulling around the perimeter of the sheets will slowly but surely release the lathe and plaster. In these types of ceilings, the most arduous task is actually pulling down on the material to release the nails. For this reason, an alternative is available. A properly placed ridge ladder can be used with the hooks placed inside the lathe and downward pressure placed on a lower rung will release the metal lathe in large sections. Wire cutters may be necessary to cut free hanging sections of metal lathe.

c. Safety considerations: The weight and size falling sections can be dangerous to firefighters operating below. In addition, the metal lathe when pulled is extremely sharp and can cause injury.

3. Sheetrock/Drywall
    a. Typically, 4x8 sheets 1/2 or 5/8 inch thick is screwed or nailed to the joists. It is frequently attached over the existing lathe and plaster ceilings or lathe. Sheets are present in 4x8, 4x10 or 4x12 sections, and nailed or screwed to the joists every 4-6 inches.

    b. The San Francisco Ceiling Hook is the best tool for removal.

    c. Best practice is to "zipper" cut creating small penetrations directly next to a joist. Once a significant line of exposed opening has been accomplished, two hooks can be used to pull and fold a flap of sheetrock open. 5/8" sheetrock is heavy, particularly when wet and can come down in large pieces. This poses a hazard to firefighters. Therefore, the company officer must ensure the area is clear and anticipate falling sheets.

    d. If practical, application of water can assist in removing larger sections of this material.

    e. Be aware that in a residential over commercial building there will commonly be soundproofing, or double sheetrock, installed on the ground floor commercial unit's ceiling. This will make the task labor intensive.

4. Tongue and Groove or Box Beam Wood Ceiling
    a. In some instances, property owners have used wood to cover ceilings for decorative purposes. In these cases, a clear challenge has been presented to firefighters. A chain saw is the best tool to create holes in this material. This comes with obvious delays and challenges. Cutting two inches away from a nail pattern will ensure a joist is not cut while opening. Due to the delays and challenges of this, the IC must be notified immediately of this type of finish construction.

5. Drop Ceilings
    a. Multiple types of ceiling coverings may be used together with a void space in between. For example, a 12-foot lathe and plaster ceiling may be dropped, and a ceiling of sheetrock may be constructed to facilitate the installation of sprinklers in the void space. This condition

must be relayed to the IC and the roof team. The roof team will identify this by the lack of ventilation after breaking through the first layer of ceiling from the roof.

Walls

Walls provide a natural cavity for vertical fire travel. A fire in a lower area of a wall can be assumed to travel to the upper portion of the wall/ ceiling within the stud bay. Additionally, in balloon framed buildings, stud bays often lack fire stops. This can lead to rapid, vertical extension. For this reason, an entire wall stud bay must be exposed when fire is suspected in that area. As always, be cautious of the presence of utilities within the wall space prior to opening. When searching for fire extension in walls, the natural areas of fire spread must be checked. Electrical wires or water supply pipes running vertically requires removing or cutting holes in fire blocks. Checking around and above electrical outlets and plugs should be a priority. In addition, vent, water supply and drainpipes which run above plumbing fixtures create a chase opening for fire to travel. Opening walls above toilets and sinks will commonly find fire extension in that wall area. Finally, flue pipes are required to run to the roof. Any heating units or vents should have the areas around and above checked for fire. Pinpointing the areas where fire naturally travels will ensure a quick discovery of fire extension, minimize property damage and loss, and save crews from additional, tedious work.

1. Determining the material to be removed dictates the best tool to be used. For lathe and plaster, a San Francisco Ceiling Hook works best at high wall levels. A pick head axe works best at reachable areas and below. Sheetrock walls can be opened by finding the area between the studs and taking blows with a sideways pick head axe, punching through the sheetrock. The adze end of the Halligan is also effective at punching through Sheetrock. Once the location of a stud has been determined, the adze or fork end of the Halligan can be used to pry sections of sheetrock from the wall using the stud as a fulcrum. One tip to determine the material covering the studs is to check for corner cracks at the ceiling level. If cracks are present in this area, the material is clearly lathe and plaster. Conversely, if a straight nail or screw pattern is made visible from heat in the walls, then the wall is sheet rocked.

2. In lathe and plaster walls, prior to opening a wall to check for fire extension, door and window casings and baseboard should be removed. This will make it far easier to remove the lathe since it is held down by these trim pieces.

3. Many homes in San Francisco have installed wainscotting or board and batten trim to protect walls and for decoration. These can be removed with hand tools by simply reversing the way that it was built. Pry off any caps, baseboard, beads or other finish trim and expose the base wood material. Then pry off the base using a stud as a fulcrum. A pick head axe or a Halligan tool is best for this.

4. Some walls are covered in plywood under the sheetrock. This is an indication that the wall is a shear wall. This can affect exterior and interior walls. It is important to know that a shear wall is a load-bearing wall, and the cutting of studs should not occur. Compromising this type of wall could have negative impacts on the structural integrity of the building. When directed to open a wall of this type, it is advised to first remove the sheetrock to expose the nails, these nails can be used as a guide to make a chainsaw cut along the studs to expose the wall cavity.

Notice bottom right wall furnace. The flue will run all the way through the attic and vent above the roof. This presents a path of travel for fire in the walls.

Old, inactive kitchen flue provides a space for fire to travel.

Where did fire travel in these stud bays and why?

Interior Shear wall with Simpson hold downs. Identify the shear and do not cut near the hold downs. Also notice the nail plates to protect the Romex.

Common plumbing for bathroom shower and vanity. Notice the 2x4 blocks either penetrated through or removed (over the shower) for drain vents. This is where fire will travel.

Every effort should be made to open a wall through the easiest material. For example, it is more efficient and less destructive to open from the sheet rocked or plastered side rather than the tiled or metal clad side of the wall. There are times when walls must be accessed from the exterior to search for fire extension. When this must be done it will require the cutting of siding or breaking of stucco. A chain saw is the best tool for cutting wood siding. The operator must be cognizant of the possible hazards.

1. Conventional chainsaws are designed to cut wood material only. The presence of sparks when cutting indicates that the chain is contacting metal. Often this will immediately dull the cutting teeth and make the saw ineffective. This metal could be a number of things including nails, pipes, conduit, metal fasteners, metal lathe, or sheet metal. This presents a clear danger to all firefighters in the area as the chain could fail and come off the guard and severely injure those in the area. In all cases, the operator must stop cutting when this is encountered and determine next steps. It's possible that the cut location can be changed to avoid metal. Sometimes, however, hand tools must be used to expose the area prior to completing the cut with the chainsaw.

2. Stucco must be either broken out or cut using a combination of power tools (Multi-Purpose Saw with Concrete Blade) and hand tools. If stucco is encountered, every effort must be made to open the wall from the inside as this presents an arduous effort. But if the only option is to open from the exterior, once the stucco is removed with a saw, maul or other blunt breaking tool, the chicken wire must be cut out. Only then can a chain saw be used to cut the plywood backing. Remember that this cut is a "blind" cut into an exterior wall. Members must be aware that utilities are likely present.

Attic Fires

Identifying the presence and size of an attic is an important evaluation that must be identified and relayed to the Incident Commander. In general, the greater the size of the attic, the larger the potential problem when fire enters the space.

In type 5 buildings with peaked roofs, the attic may be the entire A frame roof structure from the ceiling of the top floor to the peak. Some buildings with steep pitched roofs may have additional void spaces created by the construction of knee walls. These walls would be built between the top floor joists and the roof rafters on the lower edge of the roof closer to the eave for additional support. The presence of a dormer window will indicate that the attic has been developed and most likely will have a much smaller confined attic space. When the attic has been developed it is highly likely that sheetrock has been installed which provides fire protection into the undeveloped attic.

Upon arrival, companies must make an assessment to determine the likelihood of fire entering the attic. Balloon frame construction will allow fire to travel vertically unblocked from the foundation to the roof. Determining balloon frame construction on size-up is generally a function of construction type, date of build and whether modifications have been made to the framing after the initial construction. These buildings were constructed from the early 19th century until World War II (1940s). In San Francisco, a Victorian style building should be considered to have balloon frame construction. In this type of construction, the floors are essentially suspended from the walls and attached using a ledger. After the 1940's platform construction became the common type of construction. Here, each floor is independently constructed with fire stops to prevent fire from vertically extending.

Exterior Walls opened due to presence of shear wall (1/2” plywood) on the interior. Notice Black pipe (gas) and Romex (electrical) as possible hazards.

A critical element of determining construction type is the ability to read smoke. Should a fire appear to be isolated on the ground floor, however smoke is emitting from the roof eaves or from the siding on upper floors, balloon frame construction should be suspected, and immediate action taken.
Should the possibility of Balloon frame construction be present, tactical objectives must be altered to prevent fire from vertical travel. Hose lines to the top floor in conjunction with the opening of walls and ceilings must be a top priority.

The presence of platform construction DOES NOT mean that vertical extension in the stud bays will not occur. Chase walls where plumbing, electrical and HVAC piping are installed will serve as extension corridors for fire. An evaluation of smoke movement still needs to be made to determine if the fire is extending vertically towards the attic.

An evaluation of the building from the exterior may yield results in determining ceiling heights. Long windows usually mean high ceilings. Victorian buildings often have 12 feet or higher ceilings and will require the use of a ceiling hook with extension. A smart way to combat this is to bring the 12' attic or 18' baby extension ladder(s) which may have a ceiling hook and an extension attached to the ladder. This ladder will likely be used to access the attic space for inspection and horizontal use of a hose line. Any truck company ordered to the top floor of a fire building should consider bringing an attic extension.
In type 3 buildings, the size of an attic can be determined from the exterior by measuring the distance between the top of the top floor windows and the parapet wall. The roof drain scupper will be the roof level and the seismic bolts will be at the top floor ceiling level. The distance between will be the vertical measurement of the attic space.

Attic Fire Tactics
Preventing Fire from entering the attic space is a primary tactical objective. However, in certain instances the fire will have advanced into the attic prior to Fire Department arrival. Should this be the case, the goal is to isolate the fire and prevent it from advancing uncontrolled into the entire attic. A fire that has entered the attic requires communication and coordination between the companies operating on the top floor and the roof team. As is normal, the ventilation hole must be cut directly over the fire. Prior to removing the roof decking, the roof ventilation team must ensure that an operating hose line is in place and in the correct position to stop fire spread in the attic.

A common mistake in attic fires is to pull ceilings and apply water where fire is found. Once water is applied vertically into the attic, the fire may spread in all directions. Again, the goal is to contain the fire in a designated area. When fire is suspected in the attic space, inspection holes should be made in the ceiling moving from the involved area to the unburned. Once an inspection hole reveals no active fire, then a large hole should be made in the ceiling (possibly removing ceiling joists) so that a firefighter on-air can use an attic/baby extension ladder to get up in the attic space with a charged hose-line and horizontally attack fire in open space in order to contain/extinguish the attic fire from the unburned to the burned. Joists or rafters are commonly spaced either 16 or 24 inches on center. In either case, access for a firefighter wearing an SCBA is difficult.

The hallway can be utilized to quickly make inspection holes every 10-15 feet as needed. Once the containment area has been identified, making a large hole in the hallway should be avoided if possible. Deploying an extension ladder in the hallway can block access and egress on the fire floor. Additionally, a large hole in the hallway could cause heat and smoke to bank down in the main egress area. Therefore, choose the best area or room on either side of the hallway to open up and place the attic extension ladder to effectively attack the fire. If air quality will allow, a small interior chainsaw can be used to quickly remove ceiling joists where the horizontal attack is going to be initiated in the attic. This allows adequate space for a firefighter with an SCBA to climb the ladder with a hose-line and enter the attic space to horizontally attack the fire. When placing the ladder in ceiling hole, the head of the ladder should face away from the main body of fire. This will prevent the nozzle reaction from pushing the firefighter off the ladder.

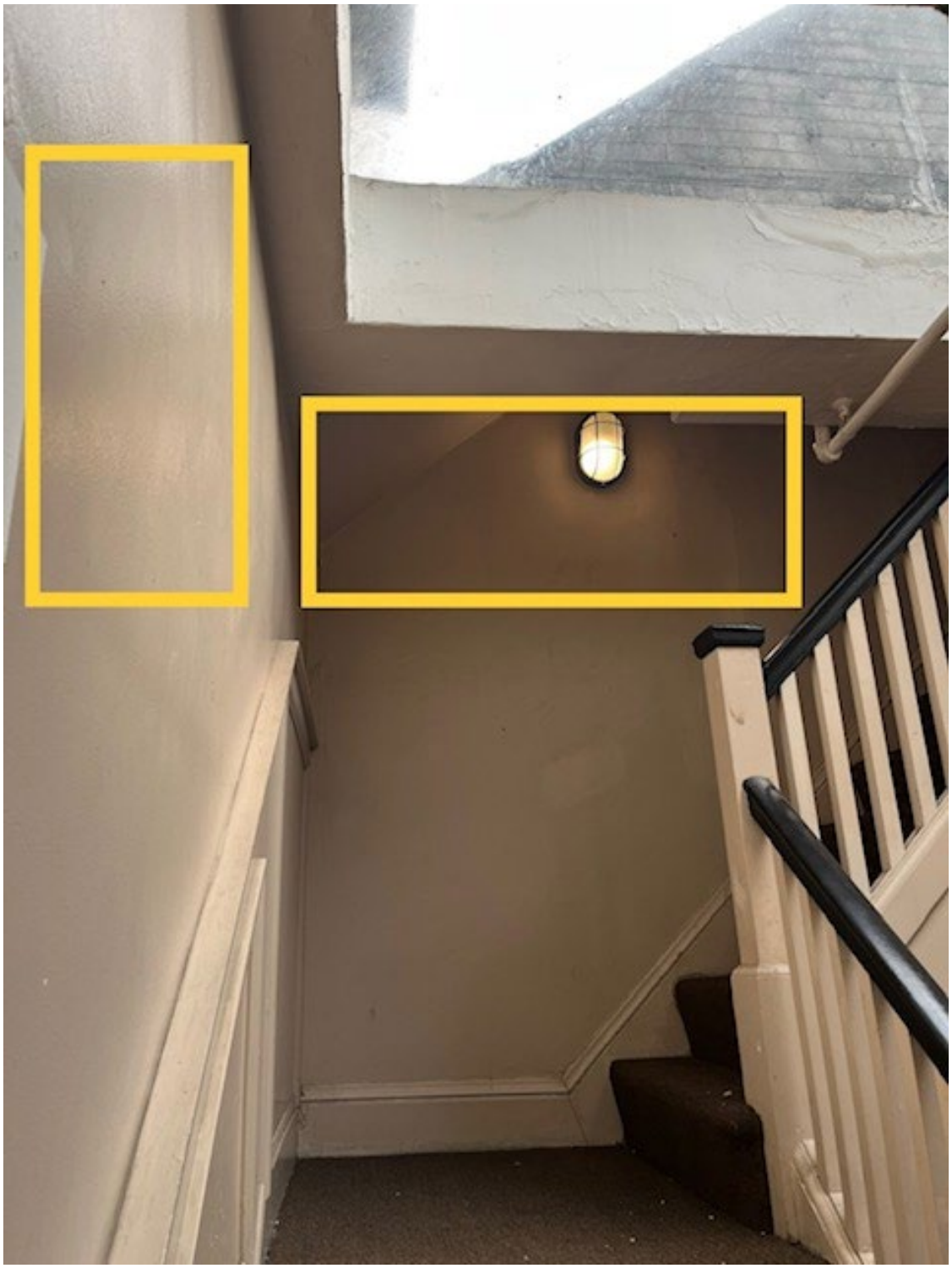
Alternative areas to extinguish fire in the attic should be considered. The sheetrock returns on skylights provide an area to horizontally extinguish fire. Additionally, the stairs leading to the penthouse often times have a wall that can be breached to enter the attic. Attacking an attic fire from this area has advantages such as:

1. The stairs provide a safe and stable area from which to attack the fire.
2. With the penthouse door open, smoke and heat can ventilate out the opened door making the operating area more tenable.

To be effective, this must be the best area from which to attack the fire. Incorrectly employed, this could be harmful and push the fire in an unwanted direction. Having a charged hose line in place is essential because these stairs provide a critical area of egress. Should fire and smoke impinge on this area, an important passageway for members and tools could be lost.

Example of a ladder placed correctly so the nozzle reaction does not push the firefighter off the ladder

The firefighter entering the attic should first position themselves securely into the attic with full PPE including SCBA. The firefighter should be then handed the hose line while the ladder is footed. Again, the firefighter must be inside the attic securely and the ladder footed prior to opening the nozzle. The nozzle reaction can cause the firefighter to fall off the ladder if these precautions are not taken. In addition, prior to operating a hose line in an attic, the power should be shut off to prevent electricity travelling from the hose stream to the firefighter.



Stairs to penthouse with highlighted wall areas that access the attic space.

Accessing the attic from a stairwell: This tactic successfully employed to limit fire spread

Note knob and tube wiring on the ceiling

Lightwell Fires

Small lightwell fires have the potential to rapidly become large scale incidents if not immediately identified and mitigated. This is due to the likelihood of rapid, vertical fire extension to the upper floors and attic. It is critical to get ahead of these fires in order to stop them.

It is important to recognize where lightwell windows are located on each floor. In the event that these windows are in a hallway, care must be taken not to advance past the window where egress can be cut off if fire is present in the lightwell.

Lightwell fires commonly require several hose lines operating on different floors. At minimum, a hose line is needed at the floor of lightwell termination, the next floor up, and the top floor. At each of these floors, truck members must be present to search for fire extension. This is a case where the Fire Attack Chief may order the Truck to split and send teams of 2 members to different floors.

Lightwells are also called airshafts because their presence allows for ventilation from windows on the interior of the building. Frequently, lightwells are present adjacent to kitchens and bathrooms. This presents a challenge as many bathrooms have tiled walls that take time to breach. A maul, ram bar chisel or other blunt breaking tool may be used to accomplish this. Lightwells also provide an area where plumbing can be run easily without entering walls. Lightwell bases are areas where discarded cigarette butts and other trash accumulates. Frequently the base of these lightwells becomes cluttered with trash and a single cigarette but can ignite a significant fire.

Lightwells are often lined with sheet metal/tin. Lightwells are designed in this manner to shed rainwater into drain at the base, therefore the sheet metal sections are overlapped from the bottom up. This creates an easy entry for fire to enter the walls behind the sheet metal at each seam from a fire that started at the base. In this case, there is potential for rapid, vertical fire extension. For this reason, each floor above the base of the lightwell must be checked for fire extension.

Tools

Initially the best tools to search for extension from a lightwell are our standard wall and ceiling opening tools. However, as the incident advances, it will be necessary to remove the sheet metal from the siding in the lightwell. This presents a challenge due to the tight area of a lightwell as well as the presence of active plumbing pipes. Sometimes a stud may need to be cut out at the base level of the lightwell to allow access for firefighters and material removal. A window can be made into a door with a few cuts; or a door created by removing a wall. Many tools on the Truck are effective for this task. These tools should be trained with and discussed as possible lightwell tools to remove sheet metal and expose wood siding and/or framing. They provide maneuverability which is essential in a tight space.

1. Cordless Sawzall with a metal cutting blade
2. Grinder with a diamond cutter
3. Air chisel
4. Crowbar/Slicebar/Clawbar
5. Halligan Hook for prying
6. Some downtown trucks have crafted their own specific lightwell tool. All members should be familiar with their location and use. Using a rope to lower the tool from above can be advantageous and prevent dropping the tool to the bottom of the lightwell.

Oftentimes, prior to removing the sheet metal, it is necessary to cut/remove the pipes in the lightwell. Learn to identify pipes and their use. Small diameter copper pipe or galvanized pipe is typically water pipe, cast iron is typically drainpipe and small diameter black pipe is typically gas pipe. Should a water or gas line be burst, a redwood plug may be used as a temporary fix while utilities are being shut off at the meter or street. Removing large diameter drain pipes should only occur when the sheet metal cannot be removed with the

drain pipes in place. This must be accomplished methodically and safely as drainpipes are cast iron and extremely heavy. When cutting or removing these pipes a rope should be attached from the roof to ensure safe lowering of the cut pipes. Cast iron pipes are either leaded together or connected with no-hub couplings. Either way they can be easily detached and fall on unsuspecting firefighters. For this reason, removal of lightwell components should be done methodically and in small sections.

Windows in hallway on the ground floor should be checked for fire and the termination floor of the lightwell verified

Discarded trash at the base and hung up on piping can be ignited by a discarded cigarette

Notice the piping and sheet metal in this lightwell. Also notice the creases in the sheet metal where fire can enter the wall

2nd arriving Truck Companies at a known fire of these types shall report to the command post with the following;

- 2 Ceiling Hooks (w extension if needed)
- Irons
- Attic or Baby Extension
- TIC
- Rope Bag

Greater Alarm Truck Companies shall report in with the above tools and consider bringing chain/bullet saws and additional forcible entry tools as needed.

Conclusion

One of the primary jobs of a truck company is to open walls and ceilings and expose hidden fire for the engine company to extinguish. To do this effectively, firefighters must work with a purpose, and in conjunction with other suppression efforts. It is incumbent on all companies operating at an incident to ensure all active fire areas are fully extinguished prior to terminating and leaving the incident. If this cannot be accomplished safely, then a vigilant fire watch should be assigned to the incident for a period long enough to deem the fire has been fully extinguished.

A working knowledge of building construction in San Francisco is required to be successful. This document lays out some fundamentals of how and why we do what we do, but it is only a foundation. Take every opportunity to learn about each building type you will encounter and build upon your own experiences during your career. Discuss what you learn and share it with your fellow firefighters so that our proven ways are not forgotten or lost.