HOSE COMPANY 2 - WESTBURY FIRE DEPT.

TRAINING EXERCISE

Roof Operations

When do we cut a Roof:

- top floor fires

- when the roof is safe
  *not truss construction
  *not gypsum
  *the roof can support us on it !

Why do we cut a Roof:

- slow the horizontal spread of fire by channeling it to the air from the hole we cut.
- allows the smoke and heat to lift & makes the interior environment more tolerable, (for us and possible victims)
- allows easier advancement of teams
- prevents backdrafts.

Roof Team's - Tools:

- Roof teams should make sure the follow tools make it to the roof with them:

* Set of Irons (axe/halligan)
* Saw for the job
* Roof Hook - 8' ideal
* Hand lights
* Ropes (life saving & utility)
* Portable Radio(s)

Gaining Access to the Roof:

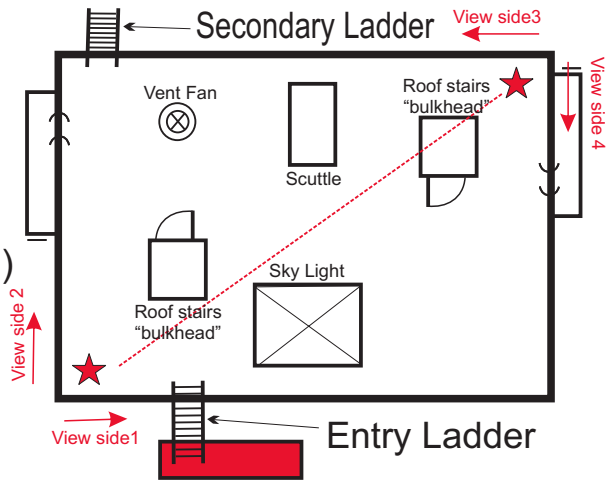
- Portable Ladder
- Aerial Device
- Adjoining building

Have of second means of egress
- one of above that you didn't used to gain your access
- fire escape ladder

(*should know it before entering a roof*)

You've determine Roof's Safe, You have 2nd means of Egress, You enter the roof, - Now What?

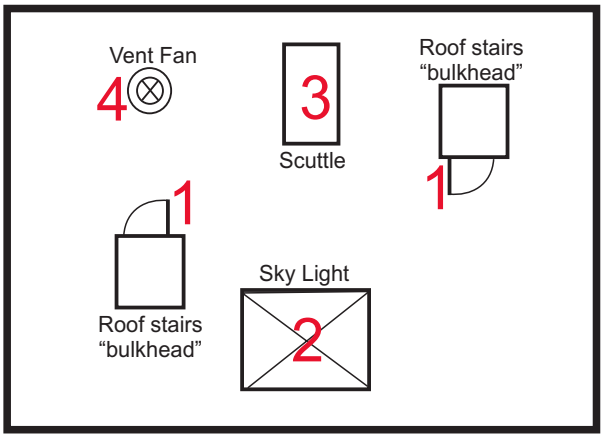
- 1 Member of team, **Do a 360*** over all sides and report findings to the IC as you partner opens the bulkhead(s).
  (*looking over the side, **of diagonal corners,*** ★ *will enable you to see over all 4 sides of building*)
  * looking for victims out windows
  * closest point of the fire
  (*the roof has the quickest access to all 4 sides and will be able to let IC know: size, fire walls...*)



Once you've sized up your needed & reported to IC:

- open all natural openings:

1 - bulkheads - once open
check immediately inside for victims
2 - Sky lights - checking the returns for fire
3 - Roof Scuttles (even if tarred over)
4 - Roof vents
These are quickly opened and will provide immediate results, possibly saving lives.



If we've determined the roof needs to be cut, we need to:

- determine the wind direction, we want to cut with the wind at our back, so the smoke we release doesn't hinder our cutting.

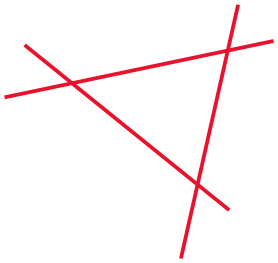
- the area we cut should be as close as possible to above the main body of fire, while still operating over a safe roof.

We determine this area by:

* Soft spots, or tar that has bubbles
* Melting snow or ice
* On a wet roof, dry area or areas steaming
* Close proximity to hot to touch soil pipes or vents
* Radio transmissions from inside telling us where the fire is
* From our looking over the edge

Once we determined the area we want to cut - do and inspection cut(s) to verify: * plunge the blade of saw 3 time crossing cuts forming a triangle - assure all cuts overlap

crossing cuts



Inspection cut

*punch out triangle w/ roof hook and clear the ceiling below.

This inspection cut, outside of confirming the fire is below, will also allow you to size up the roofs construction: thickness, roofing material, roofs deck type and possibly the roof's beam type, preparing you for your larger cut.

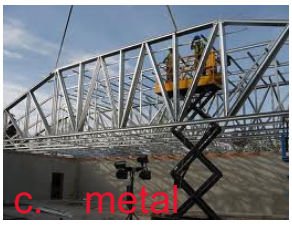
Besides Never Working on

Truss style roofs:

a. Bow Truss
b. Bar Truss
c. Light Weight Truss


a.


b.


c. metal

We also don't want to be operating on **Gypsum Roofs**.


c. wood

Most of the time, without pre-plan info, we'll be unsure of the roofs make up. We always want to caution to the side of a truss especially when dealing with buildings with large open floor plans such as retail stores, educational facilities, offices ...

This is why preforming an Inspection cut is so important.

When cutting a Gypsum roof, you'll get a white powdery smoke, letting you know your cutting gypsum. **This roof is UNSAFE, Roof operations are over!**

With the Truss' (outside of residential) the decking will normally be a metal decking called "Q- Decking". **This roof is UNSAFE, Roof operations are over!**

The minute you find a Truss, Q-Decking or Gypsum Roof,
- don't continue - reports such to IC and get off the Roof.

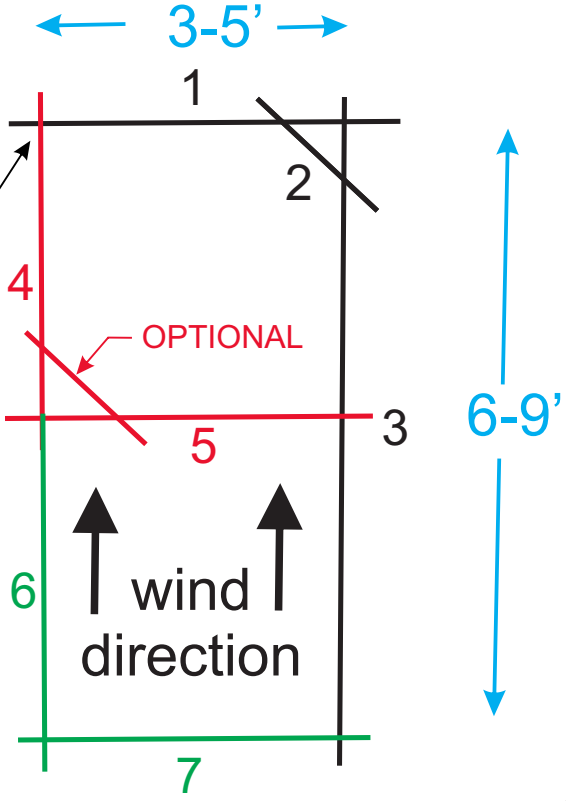
When conditions allow for cutting:

REMEMBER: **7 9 8**

* Cut 1, 2 & 3 Make up the 7
* Cut 4 & 5 make the 9
* Cut 6 & 7 make the 8

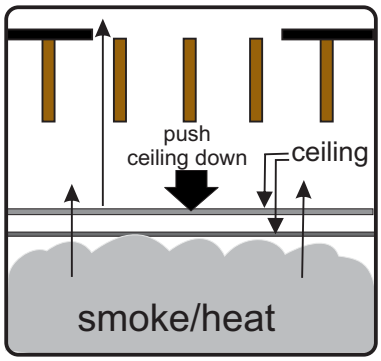
*make sure all your cuts **overlap***
this will save you time and pain later!

* Once the member on the saw is done with cut number 5 his/her partner should pry off the first section as the member cutting continues with cuts 6 & 7. Time is usually a factor with roof operations, the sooner we get off the roof the better!



Once we have our hole:

we want to make sure to clear the ceiling(s)
(*in older building there may be multiple layers, every renovation adding a new layer of ceiling*)



If you don't clear the ceilings, you're only releasing the smoke that has made it way above the ceiling.

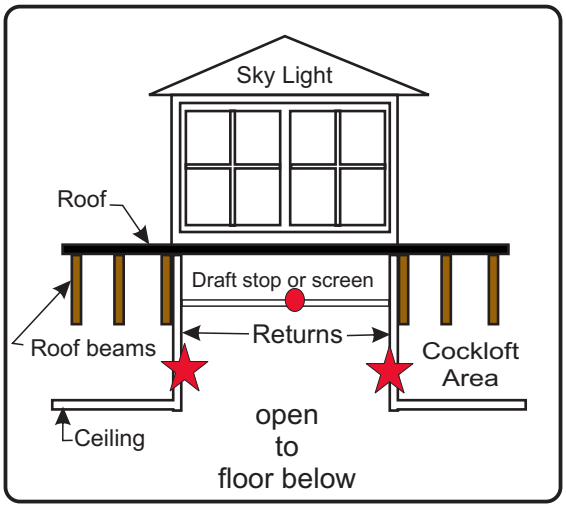
We want to release the smoke and heat from the fire area, bringing the fire up and outward instead of extending horizontally.

This is achieved by using a 8' hook, pushing the ceiling downwards, forcing it inwards. Use caution there should be an immediate burst of heat and smoke that comes out the cut hole. The area around this hole will soon become unstable, so when the ceiling is cleared move on or get off the roof if you're done with roof operations.

Report to IC the roof is open, the inside teams should already know by feeling temperatures drop, but if they didn't feel relief, the radio report will let everyone know conditions should be getting better.

Sky Lights:

When we take sky light, it may be easier to pry the entire unit off, then to break?

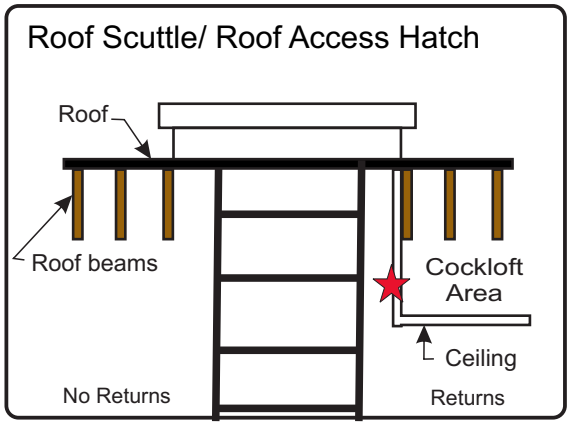


If you're going to break the glass, break a single pane or small area of glass first, then wait a few moments before taking the entire thing, this alerts members below to take cover.

Once all glass is taken or the sky light is removed, check for a draft stop ● (additional piece of glass to stop wind/weather drafts) or a screen, they will need to be cleared for the smoke/heat to escape.

Open the Returns ★ with a hook, this will allow you to check if the fire has extended past the ceiling and into the cockloft. Report your findings to the IC, since a fire in the cockloft may change IC's tactics.

Roof Scuttles/Roof Access Hatch:



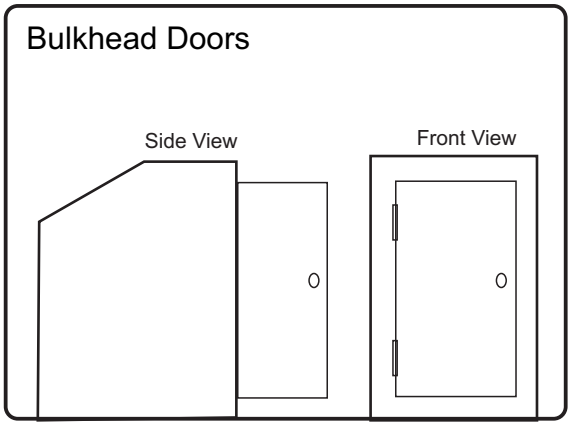
Roof Scuttles are most typically pried open, even when they are tarred over.

When opened, there may or may not have Returns like with the sky light. Typically these scuttles are in "employee only"areas and these areas are unfinished having exposed roof beams. If there are Returns, ★ open them, exposing the cockloft like you would with a sky light and report your findings to the IC.

(*" roof to command - roofs open, cockloft is clear at this time"*)

Under NO Circumstance should you descend a scuttles ladder!

Bulkhead Doors:



Bulkhead doors are doors at the top of the building stairs, giving roof access.

It is important to get the bulkheads open as soon as possible. This will clear the stairway of smoke, giving victims trying to escape and firefighter entering a more tolerable environment. If the door to these stairways, are open on the fire floor, all the floors above the fire floor will contain smoke, getting worst as you go up. Getting the bulkhead open will relieve this smoke.

When you open the bulkhead, chock the door open, so the wind doesn't close it requiring you to force it again. Check immediately inside the door for victims, who may have become overcome by the smoke, as the attempted to get to the roof to escape the fire.

At no time should you consider these stairs a second means of egress or should you descend down them unless there is a immediate rescue of a victim **on the stairs**.

Horizontal Ventilation:

After the completion of opening all the natural openings and making your roof cut(s) if the roof condition still allows, the roof team can assist with horizontal ventilation.

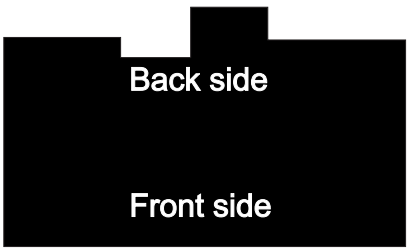
This can be achieved by reaching over the sides with a 8' hook and taking the top floor windows.

You can also use a halligan tied to the utility rope being dropping.
- first measure the distance lowering the tool to the center of window
- pull tool up, the drop down, this should stop the tool at that distance of the window, crashing the tool into the window.

As with all horizontal ventilation, this needs to be coordinated with the hose line, knowing there is water on the fire.

Horizontal ventilation from a roof is only done if the roof conditions allow, we don't want to be spending more time on the roof then is necessary, if we can do horizontal ventilation from a ladder below, this is what should be done!

Additional Safety Considerations:



* When walking a roof, try to stay to the front side, they tend to me more even, where the back distances tend to vary from store to store.

* If you can't see your feet, you shouldn't be walking but down on a knees and with a tool sounding the roof

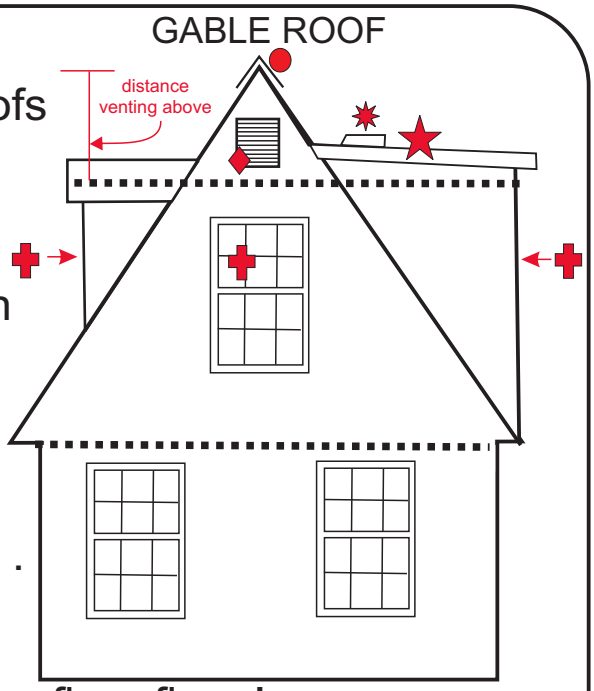
* We don't want to be on Truss or Gypsum roofs (*white powder or Q -Decking*)

* Have a second means of egress (portable Ladder, aerial ladder, adjoining building or a fire escape gooseneck in an emergency)

* Don't want to be cutting between yourself and your exit.

* Cut with wind at our back - (facing the top cut of 7, wind should at our back)

Residential Roof Operations:



In most case when we talk residential roofs we are dealing with a pitched wood frame roof.

Venting a pitched roof has little to no gain in most of the newer platform framed (post WWII) style homes. In older Balloon frame style homes (pre WWII) where fire easily extends to the attic, there may be a need to open these roofs .

Remember, we only vent a roof if it's a top floor fires !

In the diagram, the back flat dormer area ★ way provide us an area above the fire and should be opened, but only after pulling the natural roof vent ✸ and pushing in the ceiling, providing some relief.

New homes or recently modified homes may have a ridge vent easily identifiable by cap shingles on the roofs peaked that are raised ● . If you pull off these raise cap shingles, along with the nappy material under them, there will be a 3-4" cut that runs the entire length of either side of the ridge and is open to the area below. You'll vent this area without ever making a cut.

You can also pull the side gable end vents ♦ , usually located at the peaks of either sides of the house, this also allow you to vent above the 2nd floor ceiling and lets you know if there is fire above it.

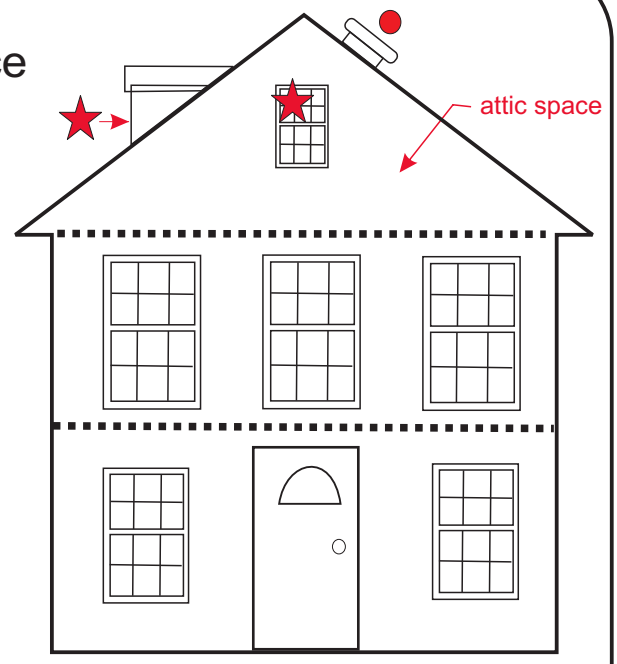
In most cases all we'll need to do to vent a residential house fire is to horizontally vent the fire floors windows. If the roof area isn't putting us over the fire, its not worth the time and effort.

Remember:

Risk a little to gain a little - Risk a lot to gain a lot

and here **-** *A lot of effort doesn't justify such little gain*

Residential Roof Operations:



In cases where there is a full attic space above the fire floor, the attic should be opened using extreme caution.

Like the commercial structures we are not going on the roof if it is a light weight truss construction, which is common in today's newer style homes, allowing for the demanded wide open floor plan and at a cheaper price.

Home that were built Pre WWII were built is a style called balloon frame construction, with allows for easy vertical spread of fire. The outside wall studs run from the basement sill plate to the attic, so a fire that started in the basement could quick be found in the attic before it noticed anywhere else. This style houses it is not uncommon to be alerted to an attic fire, but actually have a basement fire! For this reason, we may need to open the roof. Venting these roofs should only be done from a Aerial platform(Tower Ladder) , due to the possible instability, height and pitch of the roof. We first want to remove any natural opening such a attic window(s)★ or roof vents ● before we preforming any roof cutting operations. These natural vents will give us a good idea of what is happening in that attic space. If we are met with significant fire, upon taking them, there will be NO roof operations!

You should also use caution on the roofs of Pre WWII homes, due to the roof make up. Most of these roof are 1"x 3"or 4" nailing strips spaced about 6" apart that shingles are nailed to, leaving very little between us and the attic below especially under a fire condition. If there is fire in that attic it will be through the roof in a very short period of time. (Risk - vs- Reward) This is another reason we'll be venting from the platform of an aerial device.

MOST IMPORTANT - WITH ALL ROOF OPERATION -
SIZE UP, HAVE A PLAN & MONITOR WHAT GOING ON AROUND YOU !

Hands On Station 1

4x8 sheet of Plywood on wood crates:
Wood Blade - cut 7 , 9 , 8
review inspection cuts
Prying roof - 7 8 9 cut & use slats of crates to demo - roof material boards

Hands On Station 2

Using Metal Pipes
Review Changing blade Wood - Metal
Review Safety - Glass, emergency shut downs
Cut pipe w/ Metal blade
Review when may be using a metal saw:
Locks, roll gates, dumpsters...

Hands On Station 3

Using door Prop -
Review Prying - Outward opening door as if it was a bulkhead door
Review Chocking it
Review with a hook, checking inside

Hands On Station 4

Using aerial to A&P roof
Review carrying tools up an aerial ladder
On the roof, review roof hazards, natural openings, parapets, looking over side...
Review pulling tools up using utility rope