



HOSE CO.2 WESTBURY FIRE DEPT.

Strategies & Tactics of Basement Fires

Strategies and Tactical Considerations



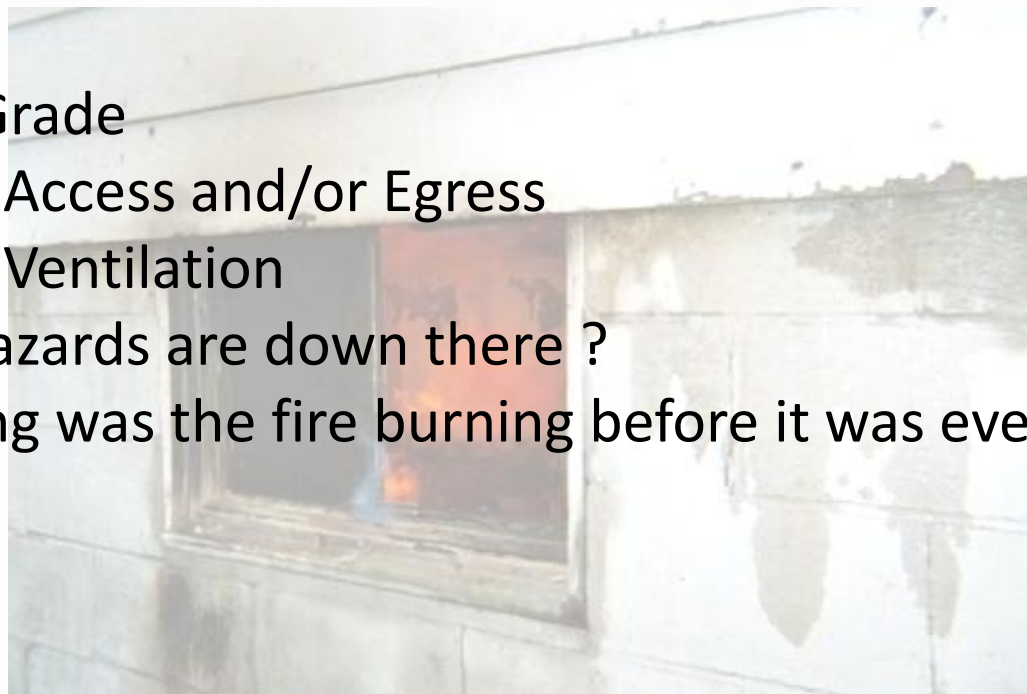


HOSE CO.2 WESTBURY FIRE DEPT.

Strategies & Tactics of Basement Fires

What makes a Basement Fire challenging for us?

1. Below Grade
2. Limited Access and/or Egress
3. Limited Ventilation
4. What hazards are down there ?
5. How long was the fire burning before it was even noticed ?





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Strategies & Tactics of Basement Fires

What makes a Basement fire more challenging for us?

Below Grade:

- Concrete walls - contains the heat and makes for a Hot Fire
- Have to go down to get it – as all the heat and gases going up, at you
- Have to go up, through hottest part of fire to get out, in an emergency
going in or out
(have to go through worst conditions before get to better conditions)

How many basements or below Grades Floors are there ?

Basement , Sub-Basements, or splits that have a ½ basement then a full one...



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Strategies & Tactics of Basement Fires

What makes a Basement fire more challenging for us?

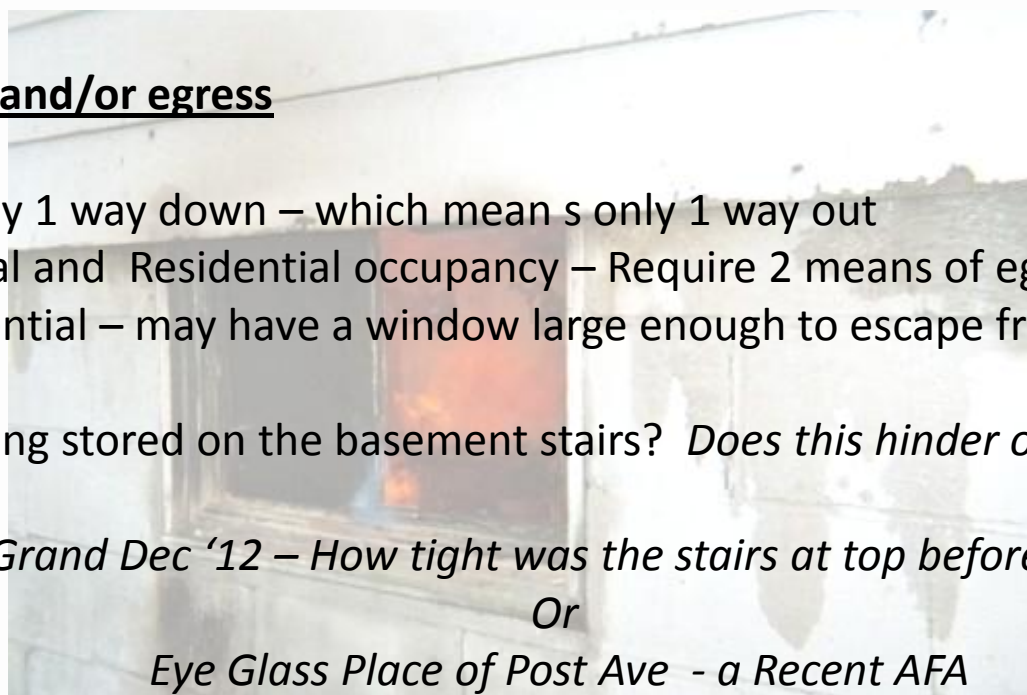
Limited entry and/or egress

- Maybe only 1 way down – which means only 1 way out
Commercial and Residential occupancy – Require 2 means of egress
For Residential – may have a window large enough to escape from - is acceptable
- What's being stored on the basement stairs? *Does this hinder or access/egress*

Fire on S. Grand Dec '12 – How tight was the stairs at top before it opened up?

Or

Eye Glass Place of Post Ave - a Recent AFA





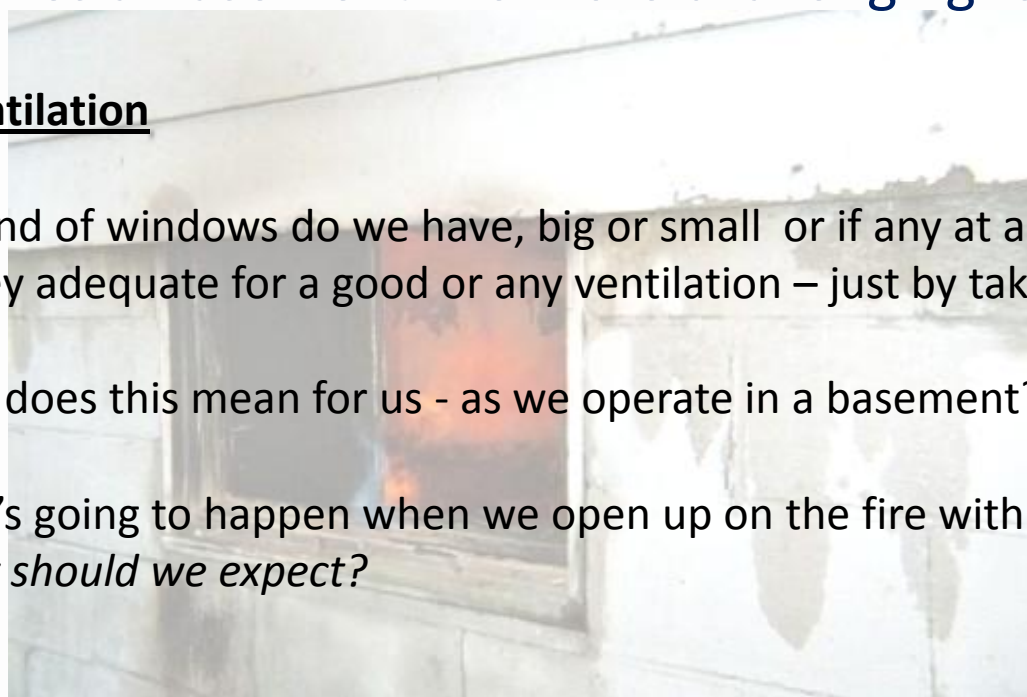
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Strategies & Tactics of Basement Fires

What makes a Basement fire more challenging for us?

Limited Ventilation

- What kind of windows do we have, big or small or if any at all?
Are they adequate for a good or any ventilation – just by taking them?
- What does this mean for us - as we operate in a basement?
- What's going to happen when we open up on the fire with the line ?
What should we expect?





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Strategies & Tactics of Basement Fires

What makes a Basement fire more challenging for us?

What hazards are down there?

Hazards in a basement are **unlimited** ... :

- What do people store down their basement? Everything !
Paints, cleaning supplies, junk, junk, junk ...
- What are conditions in a basement – Neat or Collyer mansion conditions?
- Can we expect living , sleeping quarters, or SRO's in a basement?
- Are ceiling joist exposed to fire or protected with sheetrock or ceiling tile?
- What's a common Basement Ceiling and Why? How may this effect us?
Refer to S. Grand Basement – What happened to ceiling when line hit it?
- Where are the buildings : Heating, Electrical Panel, Gas Meter, Water Meter?



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Strategies & Tactics of Basement Fires

What makes a Basement fire more challenging for us?

How long was the fire burning before it was noticed

- Do basement fires get noticed quickly , if not a widely used area?
How is this going to effect us – what type of conditions may we face?
- What are some thing we need to consider before entering a basement on fire?
 1. Occupancy
 2. Construction - Old (heavy timber) vs New (Engineered I beams or Truss)
 3. Fire Load and Fire Conditions -
What it has to burn, what stage of fire is it and resources available ...
should effect our initial tactics – Offence, Defense or Transitional
(little defense before playing offense ?)



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Strategies & Tactics of Basement Fires

**Now we know why Basement Fires are more challenging,
what Strategies or Tactics can we deploy to overcome them?**

- **Size up** – a major and key component of all fires, it is even more important in a basement fire, due to these added challenges.
- **A full 360 degree size up needs to be done**, not just what we see in the front.
 - what we see in the front may be far different then what is present in the back
Smoke out a basement window is best indication from outside – have basement fire
 - entries/egress, conditions observed, *need to be noted*
is there fire out the window and vented, may not be in front, but is in the back
is there a means of egress to the outside, - if needed
is there a means of getting ventilation – with commercial, may not be ?
how big of an area is the building, footprint, front to back and side to side –
if interior stairs are in back of building – how much hose do you needed to get to the front?
 - what does it say above the front door - Dr's office, Hardware Store, Deli ...
Will give you a good idea what we'll be dealing with in the basement!



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Strategies & Tactics of Basement Fires

Now we know why **Basement Fires** are more challenging,
what **Strategies or Tactics** can we deploy to overcome them?

WATER - WATER - WATER

As with most fires - Put water on the fire , the fire goes out, our Problem Solved.

BUT - What Size Line and type Nozzle?

1.75" : + Maneuverability, + Swift Advancement, + tight quarters, - limited GMPs

2.5" : + GMP, - maneuverability, - slower to advance, - bad in tight quarters

Smooth Bore Nozzle: + penetration, + throw distance + cooling , - Venting

Fog Nozzle : - penetration, - distance, - cooling , - smaller particles = Steam + Venting

SOG: 1.75 – Smooth Bore – Residential, & 2.5" – Smooth Bore – Commercial



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Strategies & Tactics of Basement Fires

The Line & Nozzle should ultimately be determined by: The **Size Up** doing that walk around the entire structure & Noting:

- **Occupancy** – Residential vs Commercial - Occupied vs Unoccupied
- **Where in basement is fire** – ½ basement (Split) or a sub basement ...
- **Fire load** - determined by visualized Fire, Smoke, Preplan if available and any past experiences at the location, what it says over front door ...
What is actually burning & what has the potential to burn...
What stage/phase is the fire - Free burning - flashed already/back draft ...
- **Egress** – type (window / stairs) , there condition, maneuverability , where they are located and how many of them are there.
- **Means of Ventilating** – Window(s), Bilco door, outside stairs , or any at all ...

All these factors should determine line size and/ or nozzle type of all lines utilized – could the second line differ from the 1st ?



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Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

With size up – How old the Structure is should also be considered:

- Legacy Construction



- Modern Construction



MASS = FIRE RESISTIVE



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Strategies & Tactics of Basement Fires

Legacy Floor Construction

- Legacy basements usually **2"x8" or 2"x10" floor Joists**
16" or 24" on center
- The decking (first floor) is typically constructed of 1 bys (1 X 4s or 1 X 6s) or plywood

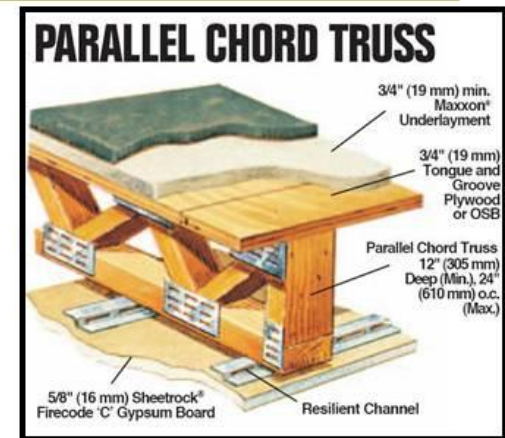
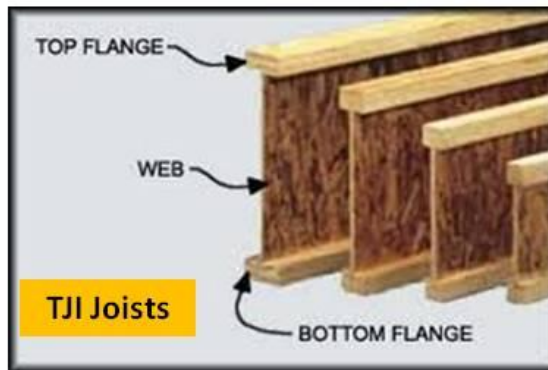




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Modern Floor Construction





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Protecting Lightweight Components

Slide courtesy of ISFSI Modern Construction Considerations for Company Officers



Floor Assembly Type	Failure Times		Difference
	Without Drywall	With Drywall	
2 x 10 Joist	18:45	44:45	+ 26:00
12" I-Joist	6:03	26:45	+ 20:03
14" Finger Joint Truss	13:06	26:45	+ 13:39
14" Metal Gusset Truss	13:20	29:15	+ 15:55

UL's findings regarding drywall protection

A 200% average increase in failure time

How long did it take us to get that line to top of stairs – from Time fire was NOTICED?



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How long did it take us to get that line to top of stairs – from Time fire was NOTICED?

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Possibly already failed prior arrival

- 4 Min – Fire to get Noticed
- 3 Min – Called in and toned out
- 3 Min - Members – HQ
- 3 Min – to Scene
- 3 Min – Line to get to top of Stairs

16 Mins. +- being generous ?

Will you run out of air before that Floor Fails?



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How long did it take us to get that line to top of stairs – from Time fire was NOTICED?

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- 1 Min – Fire to get Noticed by AFA
- 2 Min - Alarm Co – Fire Comm
- 2 Min - Fire Comm – Westbury FD
- 3 Min – Call Back - Fails
- 1 Min – Toned out Alarm
- 5 Min - No Members – Sig 32
- 3 Min - Enough Members to roll
- 3 Min – to Scene
- 3 Min – Line to get to top of Stairs

23 Mins. +- being generous ?

Will you be in basement when Floor Fails?



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Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

Getting that Line in place becomes our next step

- Legacy Construction

Usually located in kitchen area



Tri-level usually have stairs just inside front door.



Residential

Typically
only
1
set of stairs
going down

- Modern Construction



Usually located under the upper stairs



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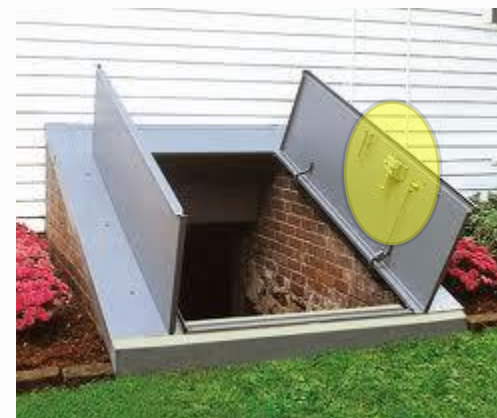
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For Commercial or Residential with basement occupancy :

In order to get permit to have basement living space – requires 2nd means egress

- typically 2 sets of stairs – 1 inside the structure and 1 leads to outside
old style taxpayers – inside *at back door* and outside front sidewalk , for example
residential – outside Bilco door in Rear is very common as 2nd set of stairs.
(note these outside entries are usually fortified & hard to force – **especially if in rear**





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For Residential basement with occupancy :

Large windows that a person can escape from is also an acceptable 2nd means of egress for that basement with living space .





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These **outside entries** to a basement are typically **NOT** the point of entry to attack a basement fire, although in some cases will be the easiest and most direct means to the fire - *for a bunch of reasons*:

- attacking the fire from an outside point will just push the fire up the interior staircase, if unprotected. If done, multiple lines need to be put in place simultaneously - (Inside and Out) which requires more immediate manpower.
- attacking the fire from the outside stairs also limits our ventilation. These outside stairs make great ventilation points, ahead of the fire, with their exposure being the outside, opposed to 1st floor of the structure with the interior stairs.



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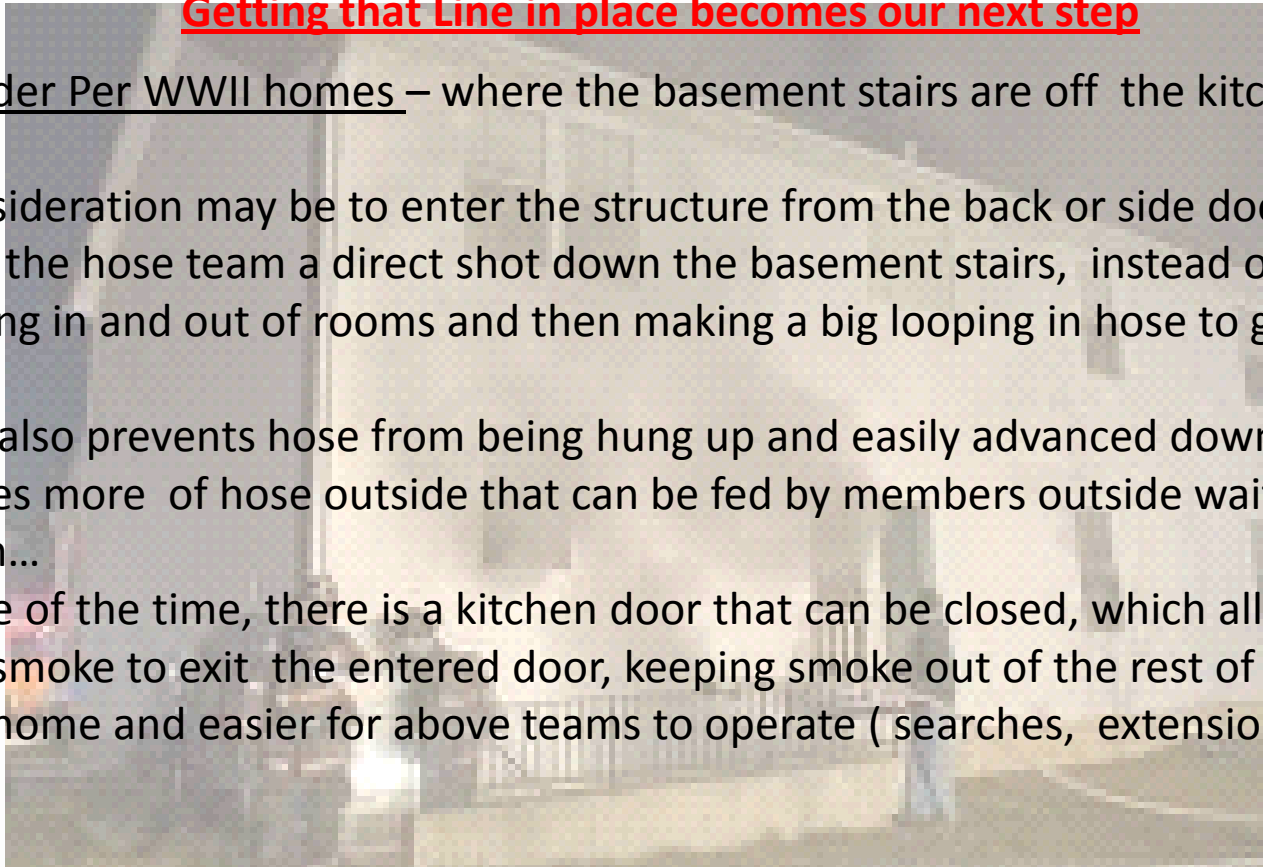
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For older Per WWII homes – where the basement stairs are off the kitchen: *Rear*

A consideration may be to enter the structure from the back or side door, giving the hose team a direct shot down the basement stairs, instead of weaving in and out of rooms and then making a big looping in hose to go down.

- This also prevents hose from being hung up and easily advanced down stairs.
- makes more of hose outside that can be fed by members outside waiting to go in...
- some of the time, there is a kitchen door that can be closed, which allow the smoke to exit the entered door, keeping smoke out of the rest of the home and easier for above teams to operate (searches, extension checks...)





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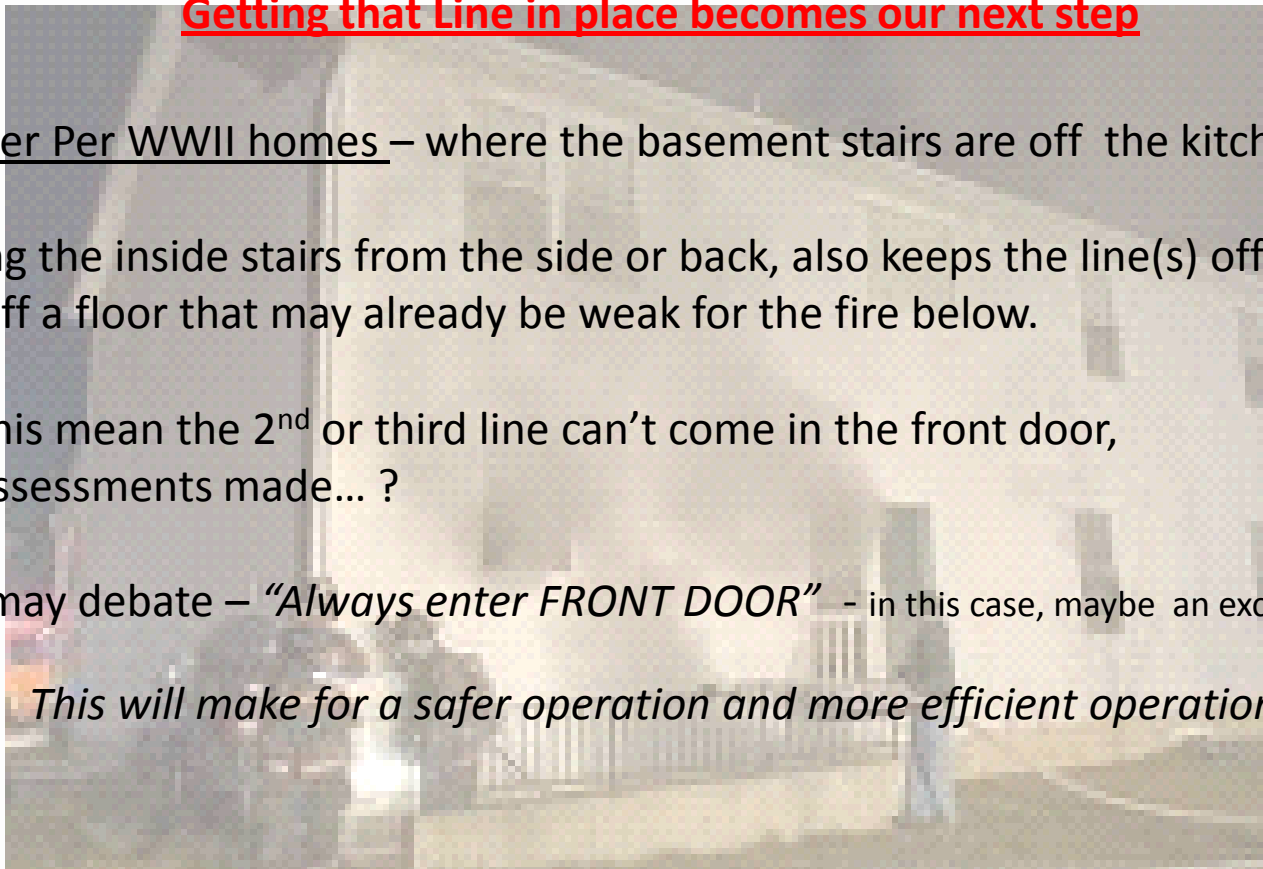
For older Per WWII homes – where the basement stairs are off the kitchen: *Rear*

Entering the inside stairs from the side or back, also keeps the line(s) off the first floor, off a floor that may already be weak for the fire below.

Does this mean the 2nd or third line can't come in the front door, after assessments made... ?

Some may debate – “*Always enter FRONT DOOR*” - in this case, maybe an exception?

This will make for a safer operation and more efficient operations.



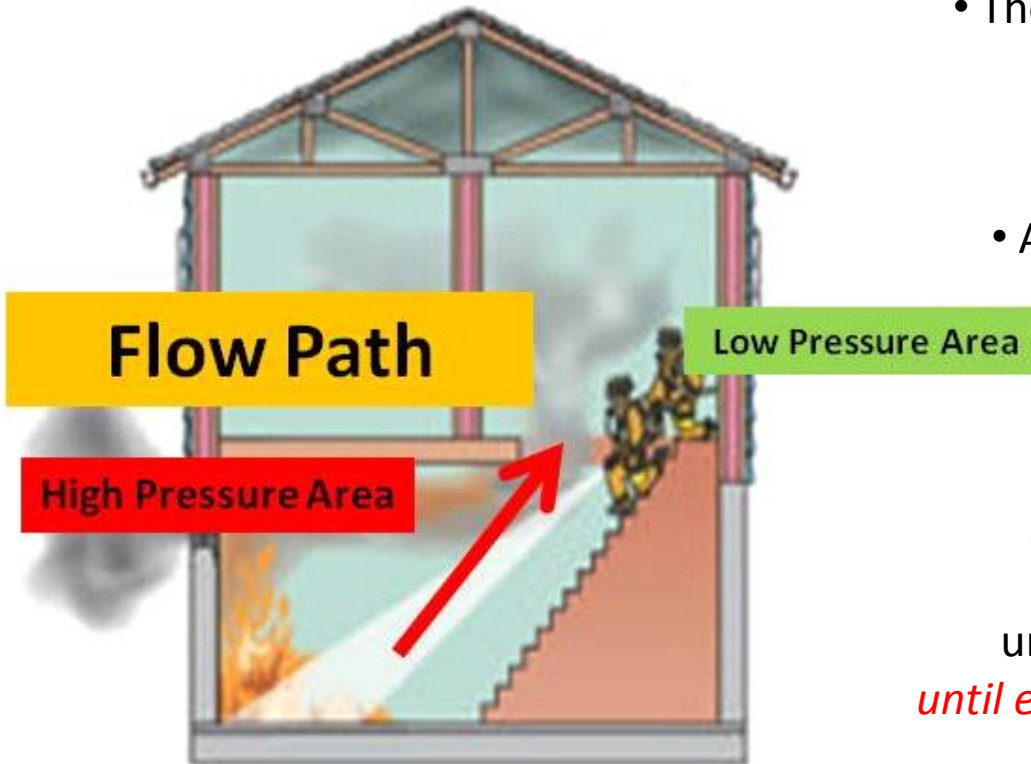


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- The top of the stairs is hottest point of a basement fire. (*“Top of the Chimney”*)

- All the heat and gases are going up the stairs under pressure

- As you go **down** the stairs conditions (Heat/Smoke) should get better, the further you go down, until you hit the basement floor.

until experienced – tough to comprehend

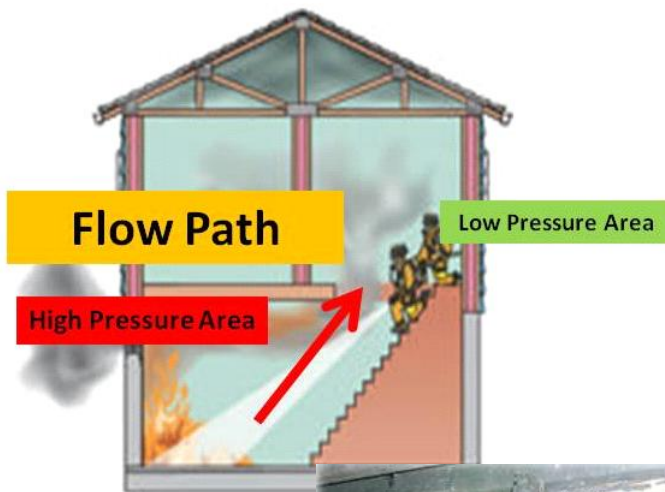


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If conditions at top of stairs are so bad you “can’t make the stairs”

Consider:

Hitting fire from top the stairs before *quickly* advancing down.

Or better

Hitting fire from outside

Defensive before

Going down on **Offense**

(*no life hazard*)

with another line

as that 1st line protects interior stair’s integrity & Keeping fire from the 1st floor.





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If conditions at top of stairs are so bad you *"can't make the stairs"*

Consider:

Another consideration is Cellar Distributor

Cut a hole in floor – vicinity above fire
Drop line down with a distributor
Darken down fire
then advance line down

The attack line, should be protecting Interior stairs as distributor operates, if possible.



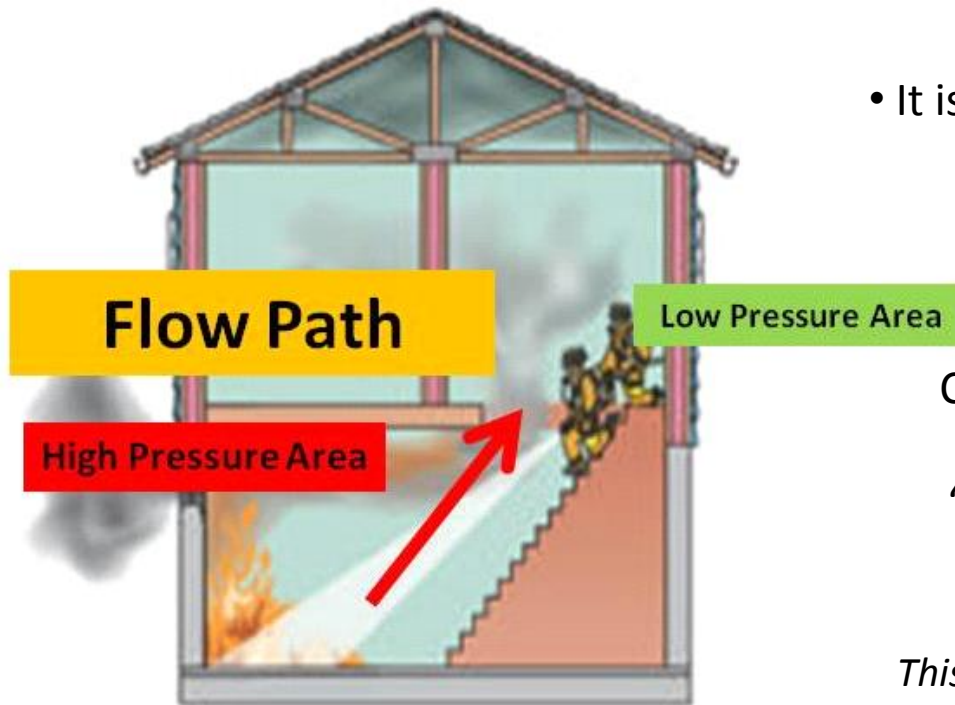


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Getting that Line in place becomes our next step



- It is **imperative** before making the push Down a basement stairs, That you have enough line set to make it to the bottom!

Coming up short will hang you up on the stairs,
“ in the middle of that chimney”,
Maybe for some time,
as more line is fed to you.

This can have serious effects to your body!



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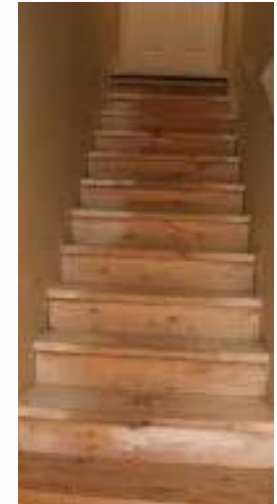
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- Try to access the stairs type & condition
Before you go down.



- Concrete
- Open or Closed Risers
- What's on stairs – a *cluttered stairs usually means a cluttered basement*
- Condition of the stairs - Good or Poor
 - Platform type (changes direction)
 - side walls to stairs



All will have an effect on operations
HOW?

*If stairs are real poor conditions – now what?
What does it say about basements integrity?*





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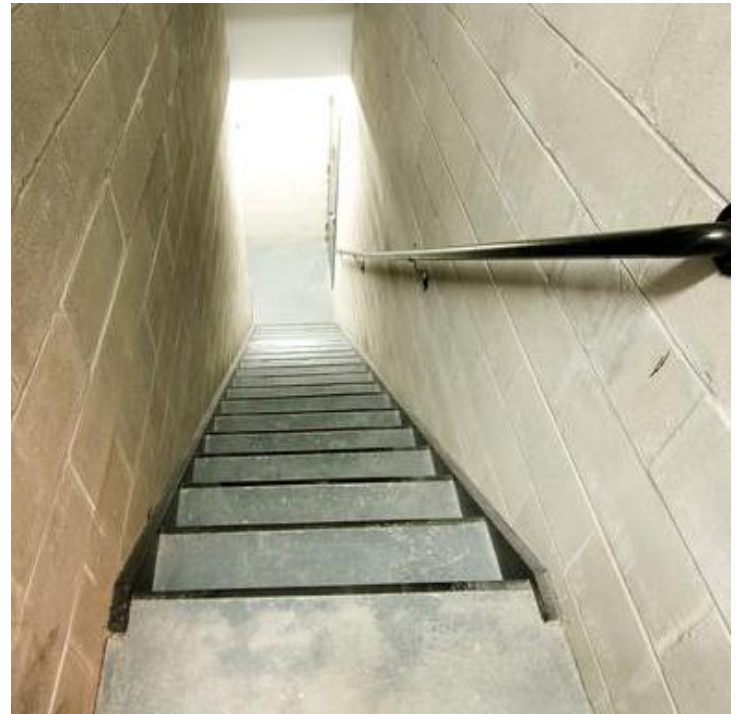
If you see smoke coming from a Basement window(s),
You get to the basement stairs and are met with little or no smoke:

What could this be telling you?

- fire is in a close room in basement
- door at the bottom of the stairs

In essence,

What may you need with you?





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Strategies & Tactics of Basement Fires

Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

Finding the fire in a Basement

With Ventilation being an issue with basement fires, finding the fire may not always be an easy task, especially without a TI Camera.

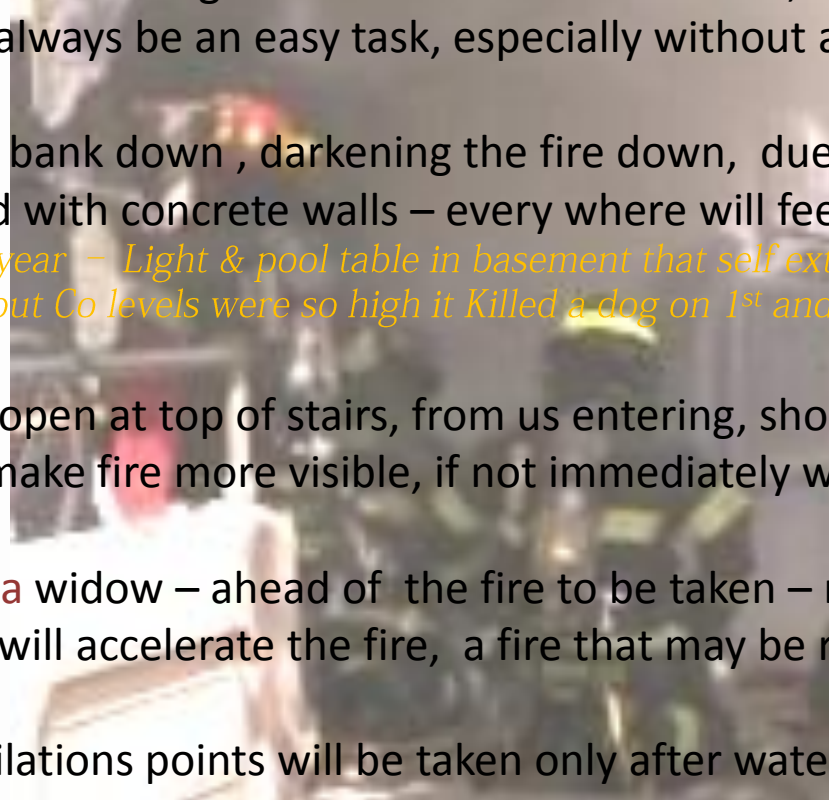
Smoke will bank down , darkening the fire down, due to lack of air.
And with concrete walls – every where will feel hot.

Note: the fire last year – Light & pool table in basement that self extinguished due to lack of O₂, but Co levels were so high it Killed a dog on 1st and 2nd floors.

The door now open at top of stairs, from us entering, should lift the smoke and make fire more visible, if not immediately will soon.

Calling for a widow – ahead of the fire to be taken – may also help
Just note, this will accelerate the fire, a fire that may be right next to you !

All ventilations points will be taken only after water is on fire.





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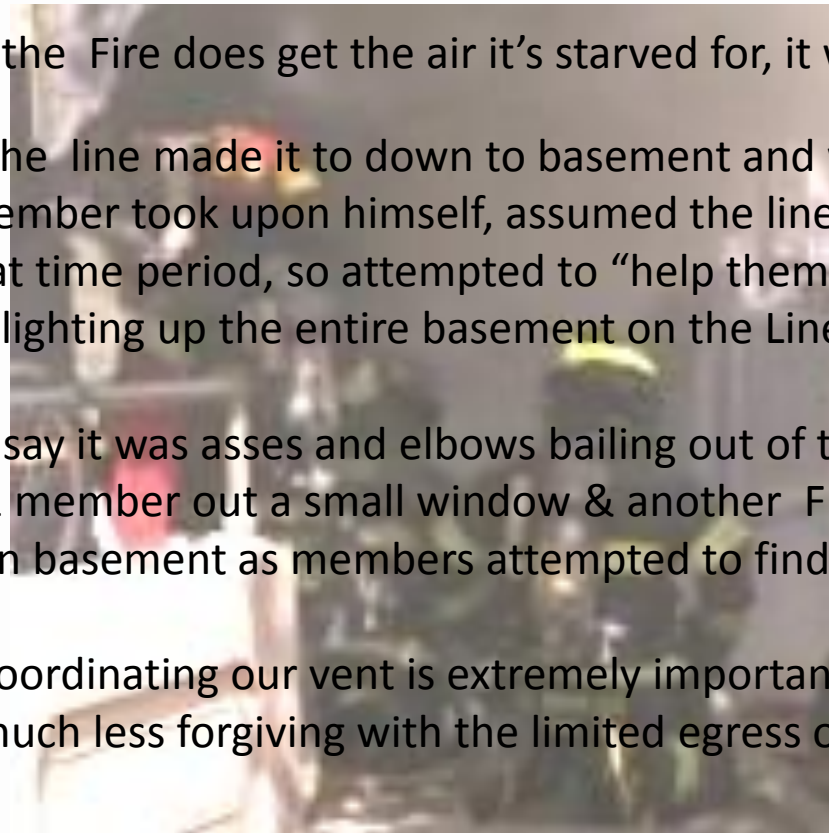
Finding the fire in a Basement

Also Know – once the Fire does get the air it's starved for, it will flash! (NHP 2010)

At this event – the line made it to down to basement and while attempting to locate fire, a member took upon himself, assumed the line made it to the fire during that time period, so attempted to “help them” and took All the windows, lighting up the entire basement on the Line crew & Truck Co.

Needless to say it was asses and elbows bailing out of the basement
Trapping 1 member out a small window & another FF ran out of
air in basement as members attempted to find him.

Coordinating our vent is extremely important –
A mistake is much less forgiving with the limited egress of a basement !





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Finding the fire in a Basement

Having a free burning fire isn't necessarily a bad thing unless it lights up the entire area.

Coordination of the vent is imperative to prevent this – *ahead of fire **before** behind line, before going down is typically better than after down , but after fire hit is best!*

If the fire is hit, without the vent ahead of it, it may roll over lines crew's head. As with any fire – cool the ceiling, before hitting main body of fire.

Control the water flow until you get the vent
Aimlessly flowing water in extreme heat –
your just steaming the crews operating in basement.
(*Where is that HOT water going – or better yet staying*)

If you can get the nozzle out a window to forcefully vent areas, do so immediately after hitting the fire, then assess what you have and what water is still needed.



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Finding the fire in a Basement

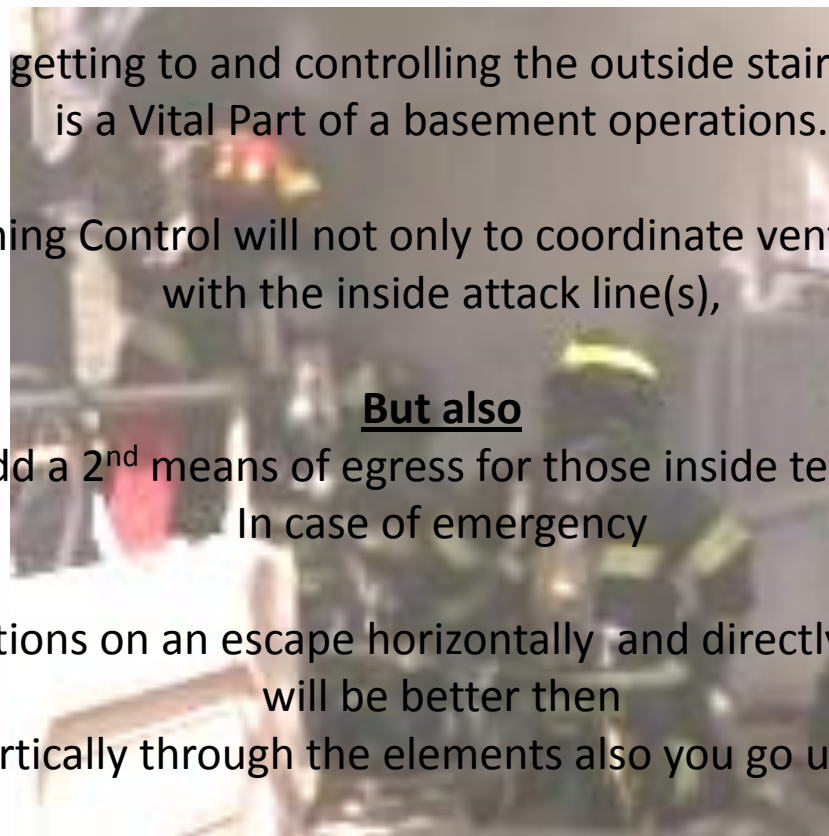
Immediately getting to and controlling the outside stairs/egress, if any, is a Vital Part of a basement operations.

Gaining Control will not only to coordinate ventilation with the inside attack line(s),

But also

add a 2nd means of egress for those inside teams, In case of emergency

Conditions on an escape horizontally and directly outside will be better then going vertically through the elements also you go up, then out.





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Back Up Line(s)

When that 1st line make the basement stair, It is important to have the 2nd line ready at the top of the stairs:

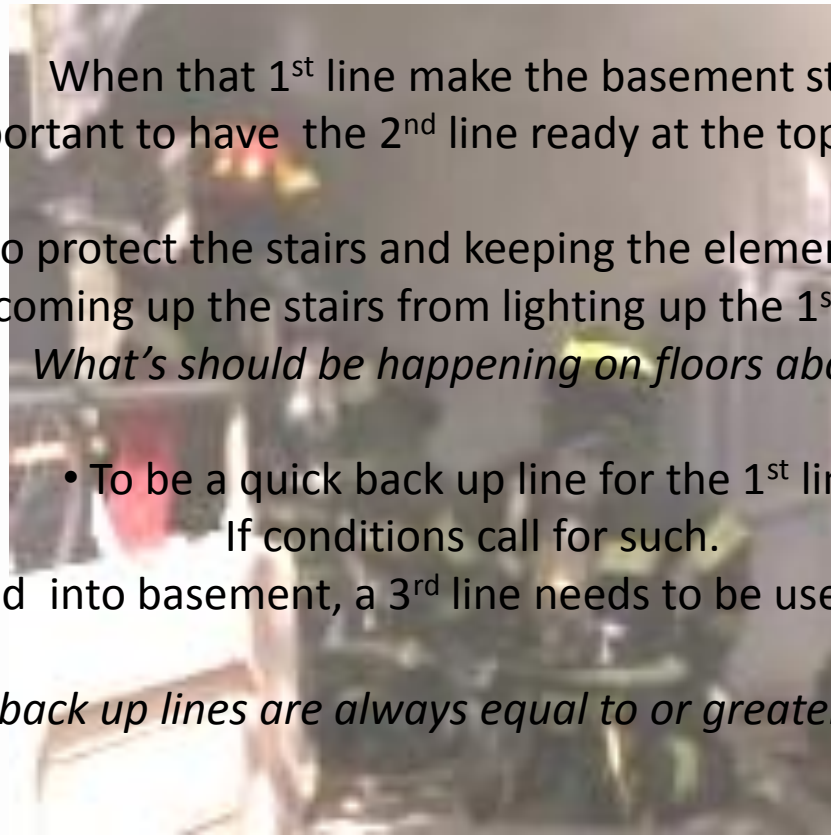
- to protect the stairs and keeping the elements from coming up the stairs from lighting up the 1st floor.

What's should be happening on floors above?

- To be a quick back up line for the 1st line, If conditions call for such.

If 2nd line is called into basement, a 3rd line needs to be used to protect the stairs

Remember back up lines are always equal to or greater then the 1st line.





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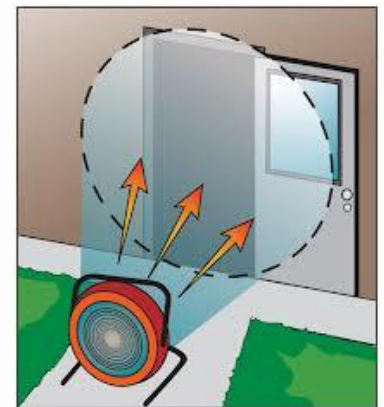
Overcoming Ventilation issues

Since basements are below grade and with limited windows Getting ventilation to make conditions tolerable, is a challenge but can be achieved by:



Utilizing a nozzle out a window
Fog pattern – or smooth bore clockwise circle

Fans – Negative or positive pressure
Negative - out a window or door
Positive - in front door or top of stairs



Once the fire has been knocked down.

Positive ventilation work very well, in conditions with limited ventilation points and works best when such conditions exist.



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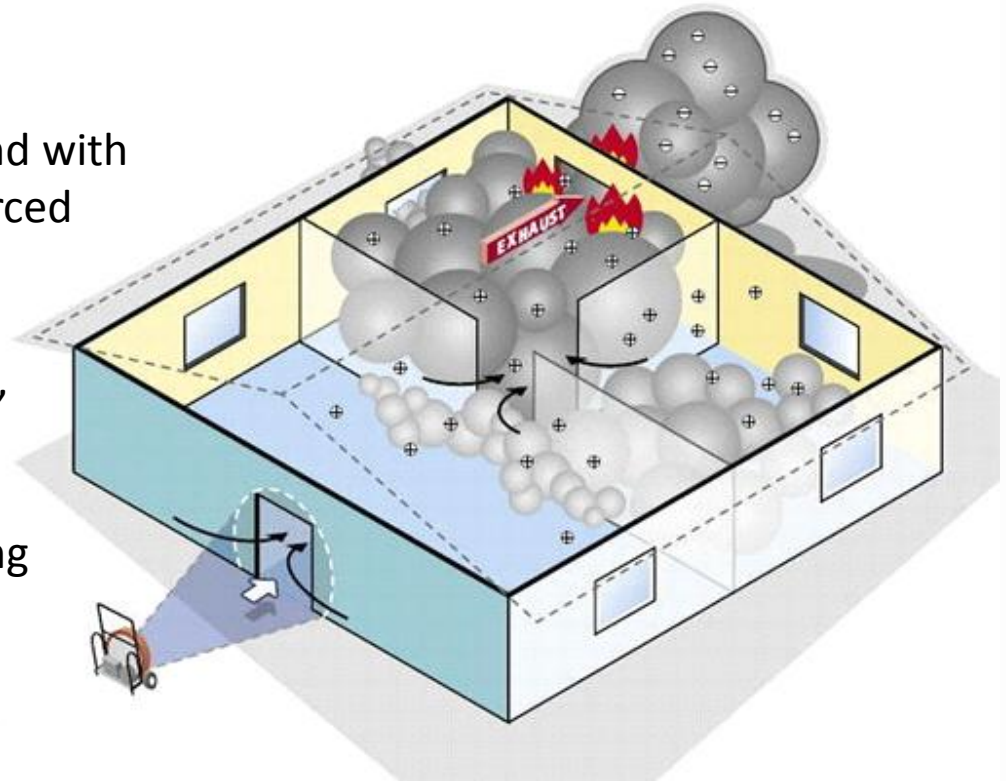
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Overcoming Ventilation issues

Positive Pressure Ventilation:

The less openings, the better and with more force the smoke will be forced out of the structure.

Assure there is no fire extension, prior to implementing, since it will accelerate any none extinguished fire, possibly making things worst and not better!





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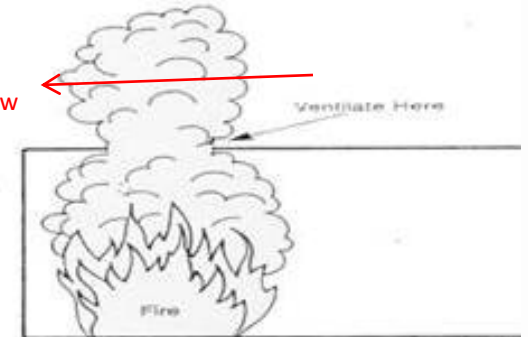
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Overcoming Ventilation issues

If there is no windows or exterior stairway:

Front picture window
Large showcase window



There may be a need to cut a hole in the 1st floor floor to allowing gasses to lift.

- this hole(s) shall be placed in locations where escaping heat & gases can be controlled and immediately be taken to the outside and not to locations that will just extend the fire.
- these holes need to be protected by a hose line, to prevent fire extension and possibly used to force the contaminates out of the structure (Fog Nozzle)
- these holes also need to be continually monitored for structural integrity *of the floor* and also to prevent a fall hazards of members unaware of such hole.



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Overcoming Hazards in Basement Fires

One of the biggest obstacles we face in a basement fire is housekeeping:





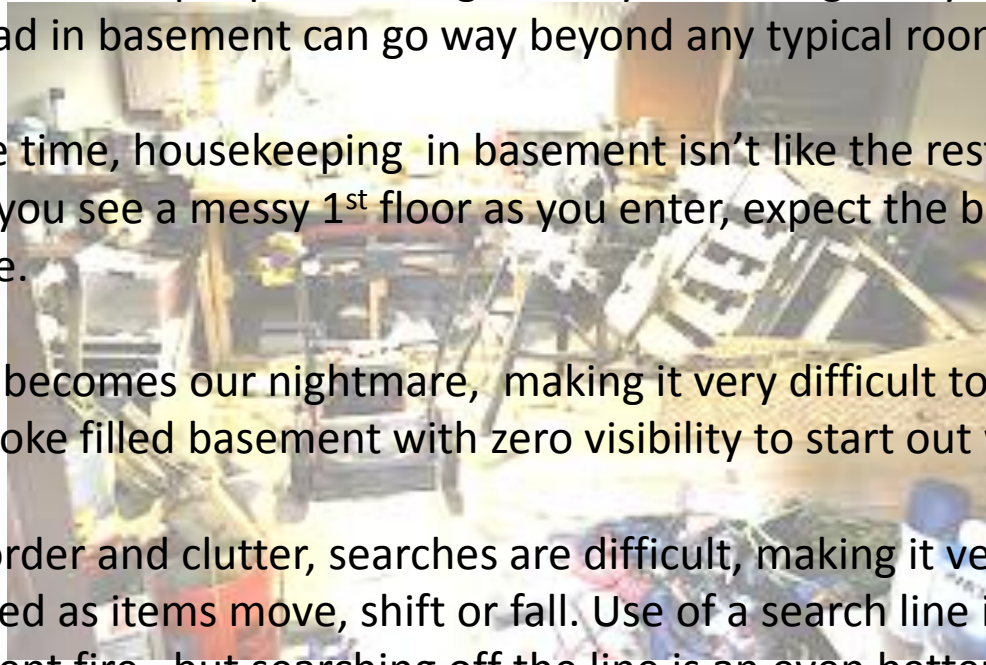
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Strategies & Tactics of Basement Fires

Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

One of the biggest obstacles we face at a basement fire is Housekeeping:

- Basements become peoples “storage facility” - storing everything!
The Fire load in basement can go way beyond any typical room and content fire.
- Most of the time, housekeeping in basement isn't like the rest of the premise **so note:** if you see a messy 1st floor as you enter, expect the basement to be worse.
- this clutter becomes our nightmare, making it very difficult to maneuver down a smoke filled basement with zero visibility to start out with.
- with little order and clutter, searches are difficult, making it very easy to get disorientated as items move, shift or fall. Use of a search line is an great tactic in a basement fire, but searching off the line is an even better tactic.





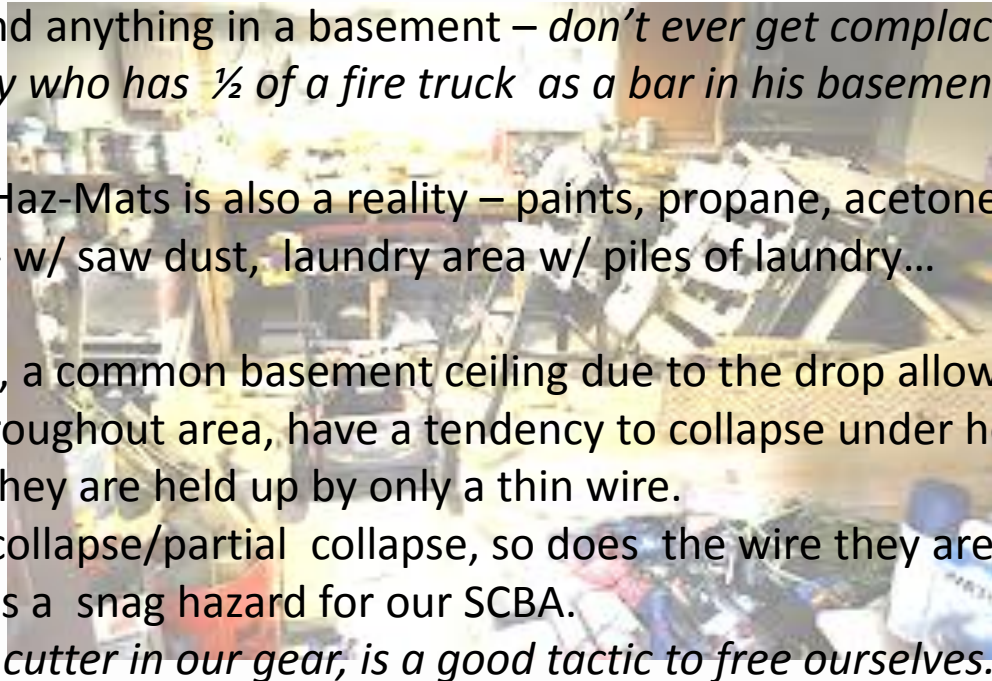
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One of the biggest obstacles we face at a basement fire is Housekeeping:

- Expect to find anything in a basement – *don't ever get complacent. I know a guy who has ½ of a fire truck as a bar in his basement*
- Storage of Haz-Mats is also a reality – paints, propane, acetones...
- work shops- w/ saw dust, laundry area w/ piles of laundry...
- Drop ceiling, a common basement ceiling due to the drop allowing wiring to throughout area, have a tendency to collapse under heavy heat, since they are held up by only a thin wire. When they collapse/partial collapse, so does the wire they are holding up and becomes a snag hazard for our SCBA. *Having wire cutter in our gear, is a good tactic to free ourselves.*





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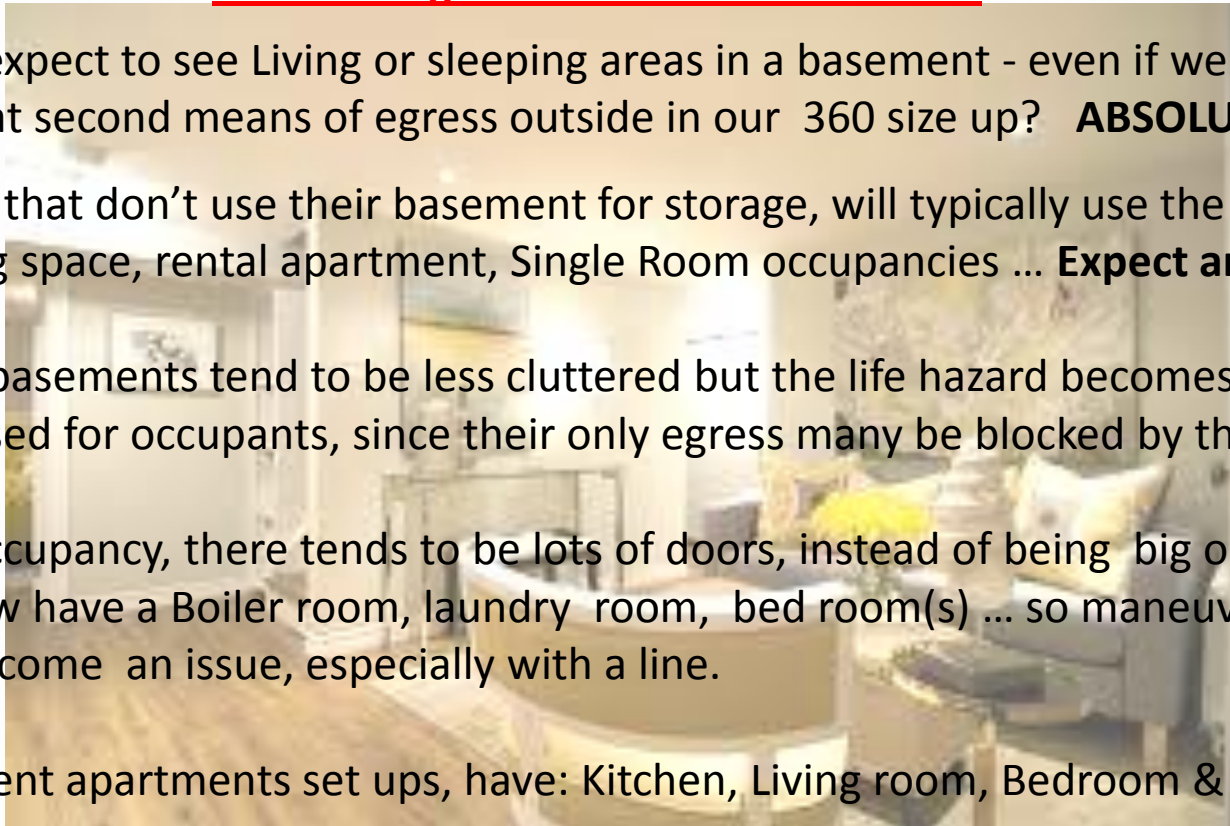
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Can we expect to see Living or sleeping areas in a basement - even if we don't find that second means of egress outside in our 360 size up? **ABSOLUTELY**

- People that don't use their basement for storage, will typically use the space as living space, rental apartment, Single Room occupancies ... **Expect anything!**
- These basements tend to be less cluttered but the life hazard becomes greatly increased for occupants, since their only egress may be blocked by the fire.
- with occupancy, there tends to be lots of doors, instead of being big open areas, you now have a Boiler room, laundry room, bed room(s) ... so maneuverability may become an issue, especially with a line.
- Basement apartments set ups, have: Kitchen, Living room, Bedroom & Bath ...





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Strategies & Tactics of Basement Fires

Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

Overcoming Hazards in Basement Fires

- Split levels – common home in Salisbury & North of Northern State Parkway





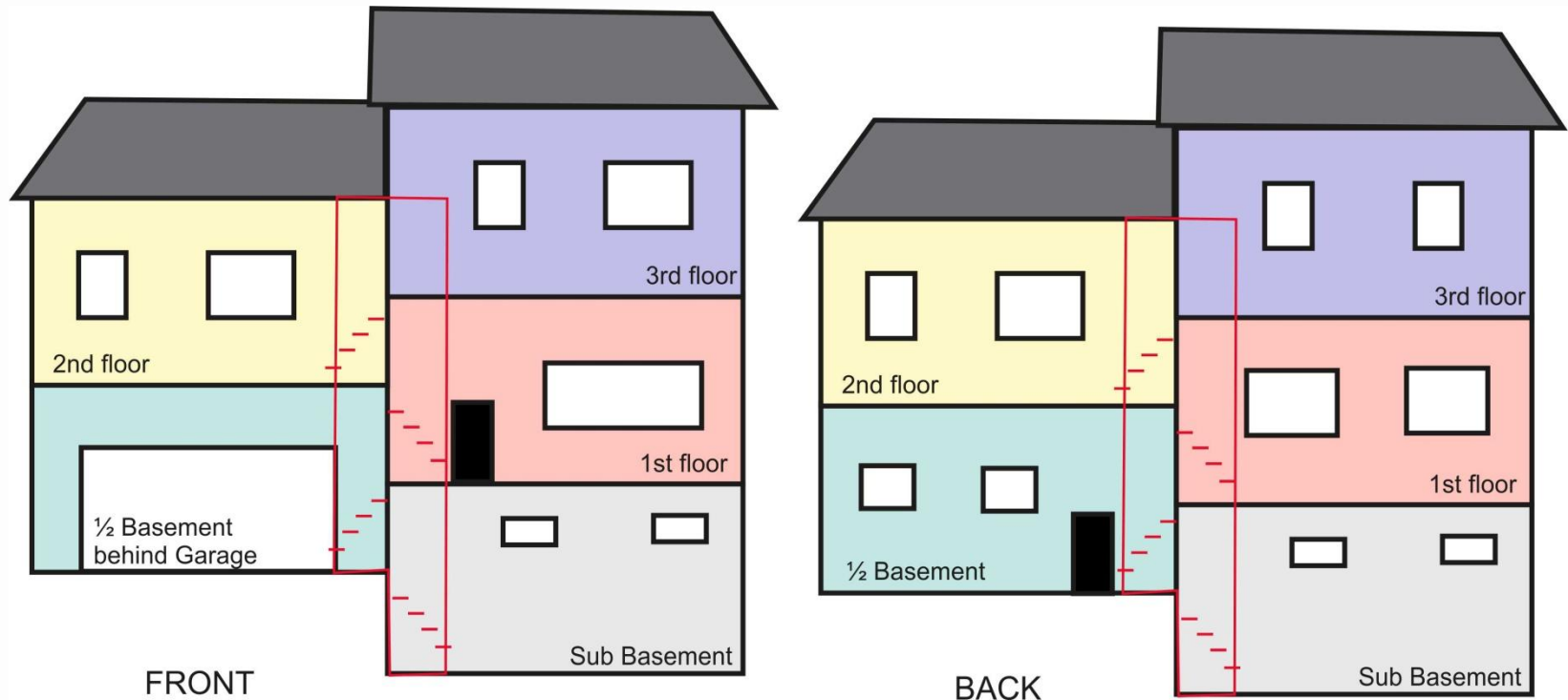
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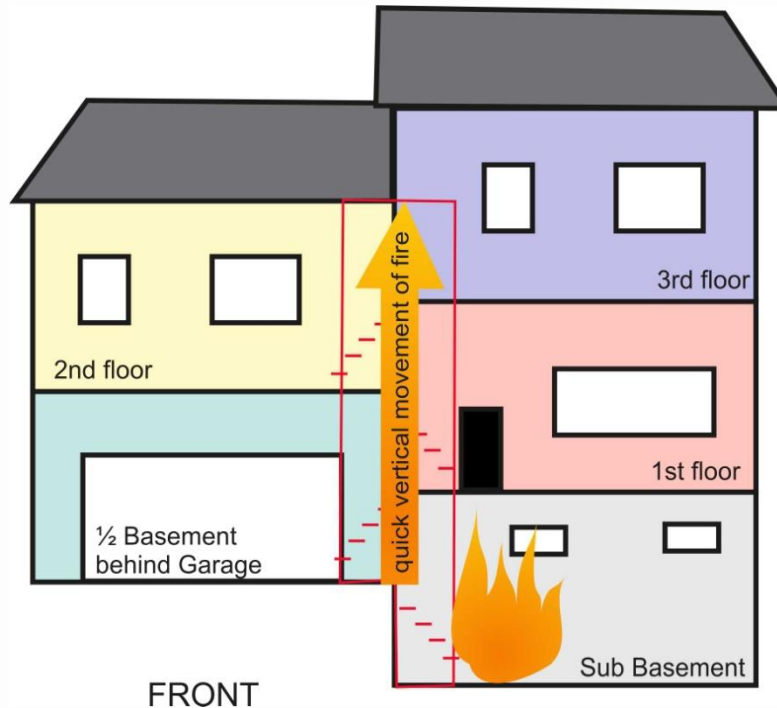
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Overcoming Hazards in Basement Fires

- Split levels – common home Salisbury & North of Northern State Parkway



With these splits:

- quick vertical movement of fire up center interior stair case can easily trap victims on all floors.
- protecting the stairs becomes a top priority
 - protect potential victims
 - protects operating members



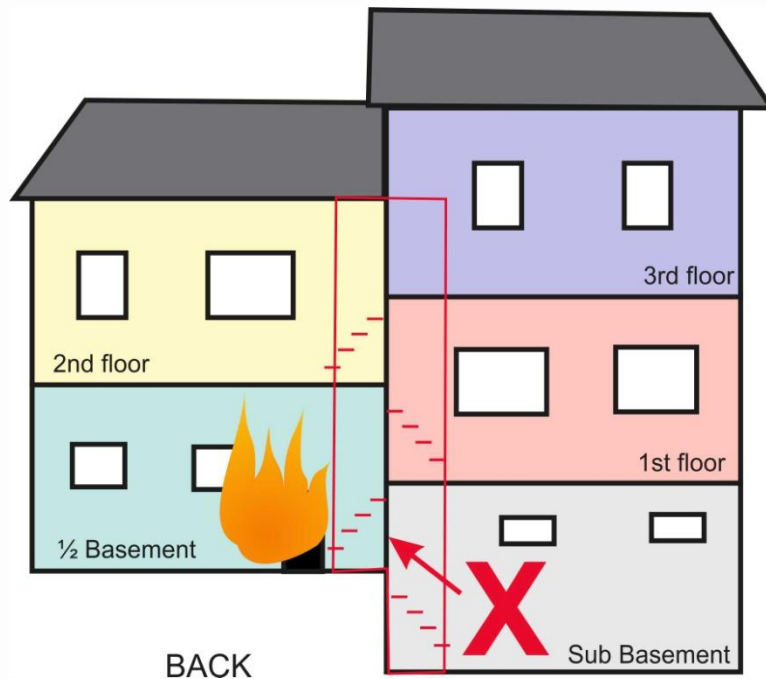
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Overcoming Hazards in Basement Fires

- Split levels – common home Salisbury & North of Northern State Parkway



With these splits:

- Fires in the ½ Basement
Garage or area behind the garage
(a common place for a laundry room)
WILL trap any victims in the sub basement, if access to the back door (if one) is cut off by the fire.
- getting that back door open ASAP will make the Sub Basement more tolerable for any victims since its below the fire level.



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Overcoming Hazards in Basement Fires

- **Balloon Construction** – Houses in the Village – Pre WWII Homes – Large Victorians ...

Distinctive feature – Stacked windows



Note: a basement fires in these type Houses:
the fire also being in the attic or at least the
walls needs to be of real concern.

Fire has unrestricted vertical movement
from basement to attic – via the walls,
since studs run basement to attic.

Just because you knocked down the small drier
fire in the basement, don't assume your
problems are over!



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Overcoming Hazards in Basement Fires

- **Commercial Basement Fires:**

The type of commercial structure will play vital part in the tactics we utilize-



Are we going to handle a basement fire in a:

Liquor store

Bootery

Beauty Salon

Dentist office

Pizzeria

Hardware Store

Pool Store

Deli

all the same way? Why or why not?

What it says above the front door will greatly effect the tactics we deploy.



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Strategies & Tactics of Basement Fires

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Overcoming Hazards in Basement Fires

- **Commercial Basement Fires:**

- Most stores on Post Ave – have a basement.



They'll be interior stairs and also exterior stairs in either the front sidewalk, but more common in rear.

These basements are typically used for storage of stock items that business sells or provides.



A good number of the stores will have some sort of “office area” in the basement.

The fire load on these basements could be Extremely Large – “again *what does it says above the front door*”



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- Commercial Basement Fires:



- Most of these **stores**, the basement will have unprotected – beams.
Good news is most will be legacy construction so a true 2x8, 2x10 ...



Newer building – Old Country Rd - Merrick Ave
be guided by Preplan information.
May not have a basement since on a slab,
which is typical in today's “strip mall “ stores.



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Overcoming Hazards in Basement Fires

• Commercial Basement Fires:

• What about commercial “office” buildings?



• How many basements are in this type building?

• Are we going to have ventilation issues?

• What about attached parking garages - subgrade

• What about the fire load

- what can we find down these basements?

• Do these type of building have sprinklers?

- if so, what problems do they present us?

• Do these building have stand pipes?

- if so what problems does it present?

• How many set of stairs are there?

- how many are we going to utilize – which one?





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Strategies & Tactics of Basement Fires

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Overcoming Hazards in Basement Fires

• Commercial Basement Fires:



In general:

- Commercial Basements fire have potentially **HEAVY Fire Loads** = Big Water
- Little to no ventilation in Offices , Outside the stair case we entered down.
- Large area + Smokey conditions =
- difficult finding the fire
- difficult maneuverability
- 1st crew may not even get to seat of fire before running out of air
- use Search line – extremely important
- very labor intensive operations



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Strategies & Tactics of Basement Fires

Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

Always Take into consideration – HOW LONG WAS THE FIRE BURNING ?

Basement fire can go un-noticed for quite some time.

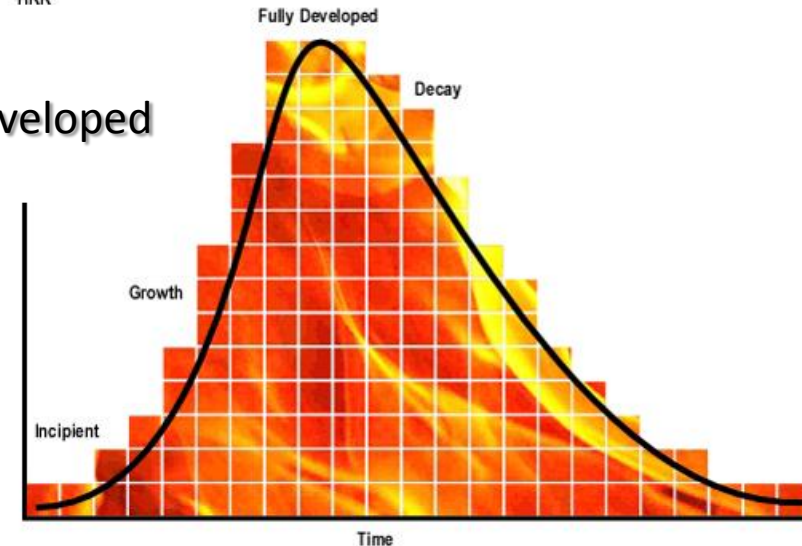
This presents issues for us:

- what stage of fire will we be dealing with?
if caught early we may have: growth - full developed

now take into account – time to call FD
Time for members to respond to HQ
Time for rigs to get to location
Time to get line in place ...

We will be dealing with a fully developed fire
But more then likely one that is in Decay – and starving for air!

HRR Heat Release Rate (HRR) and Fire Development





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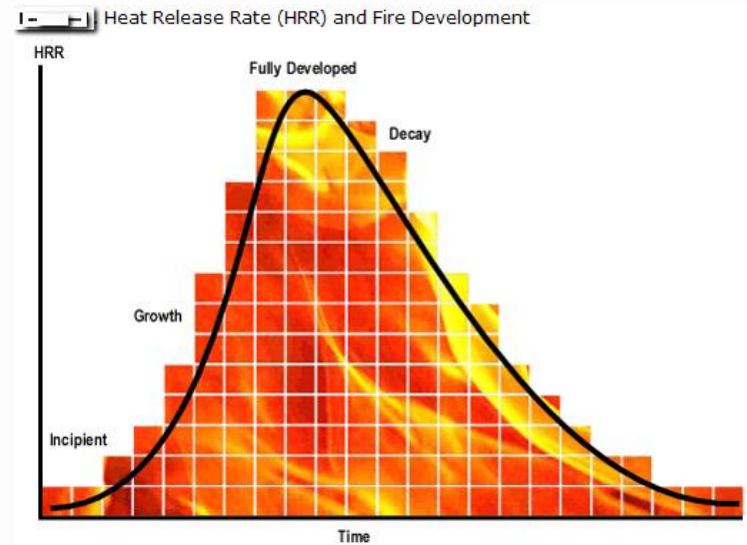
Now we're Ready to head down the Basement Stairs:

- what are we doing to that fire by opening the basement door?
- what has the fire done to the structure in the mean time?

Especially if free burning

remember the previous slide :

*how long does an unprotected 12" engineered I beam last ? **6 Minutes!***





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Strategies & Tactics of Basement Fires

Now we know why Basement Fires are more challenging, what Strategies or Tactics can we deploy to overcome them?

Always Take into consideration – HOW LONG WAS THE FIRE BURNING ?

The last thing we want to do is go down

The stairs of Death For Nothing :

- to save no one
- to save junk being stored down there

Especially if

conditions are questionable at best

Risk a lot to save a lot / Risk Little to save Little

If this is the case:

These fires should be Transitional events:

Defense – line in a window, Cellar Distributor... while protecting stairs

Then

Offense – Go down under control if conditions allow for such .





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Strategies & Tactics of Basement Fires

In Closing

Proper **SIZE-UP** , SIZE –UP, SIZE – UP **can't stress enough**
QUICK WATER on FIRE ... as with most fires , **are the keys to success!**

Basement Fire are Hot, Poor Conditions ...

HAVE a FAST STAGED and READY

HAVE Back Ups for all positions – ready to go to IMMEDIATE work

Never have too many lines, staged ready!

Ventilation – Negative pressure if fire not controlled

Positive pressure if fire is controlled -

get conditions in basement more tolerable **as soon as possible**

Be aware of all the hazards you may face , before you're put into that situation,
TRAINING - TRAINING - TRAINING, more you experience, the better you'll react!



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Strategies & Tactics of Basement Fires

In Closing

Questions ?

Concerns ?

Comments ?

Be Safe Out There!