

High-Rise Challenges:

Tips for Determining Floor Layout

by Captain Mike Gagliano, Seattle Fire Department

High-rise fires are intense. Everything about them presents a unique set of challenges to firefighters who are not strangers to being challenged. One aspect that gets lost at times is layout of fire floors and how different and confusing they can be; especially when you add in fire, smoke, urgency and challenging access.

Fortunately, there are a few things firefighters can do to lessen the impact of fire floor layout in high-rise fires. Some are done well before the fire starts, others during the operation. All are well within your ability to accomplish and would be a great addition to your toolbox and strategic/tactical planning.

Building Inspections

One of the best ways to start the floor layout knowledge base is during one of our least favorite activities. I find the dullness and drudgery of routine building inspections to be far more useful when done as more of a pre-fire than merely casting about for violations. It is very easy to start running through various scenarios with your crews, as you inspect a building, and that includes floorplans and layout. Many times we've done this type of inspection and noticed an oddity to the way the hallways are numbered or closed off sections that would be a real challenge in zero visibility. Anything that jumps out can then be talked out in terms of how we'd respond and then transferred over to the saved pre-fire for future use.

In a recent inspection we noticed an exterior access to one of the stairwells that would be far superior to trying to take our typical route through the lobby. We checked the floor layouts and they all followed a similar design and only varied in minor areas. A confirmed fire in units on this side of the building would lead us to use that exterior access as a primary attack stairwell. Without this knowledge we'd still get to the fire, but it would be much slower, require a lot more equipment and force us to use the optimal evacuation stairwell that most occupants are likely to use.

Pre-Fires

I realize the limitations of pre-fires as much as any of you. They are tough to keep updated, not the easiest thing to use when bouncing down the street to a fire and often sit in torn up binders or inaccessible databases. They can, however, be incredibly beneficial if used in the appropriate way and at the appropriate time.

The saved pre-fire, whether written or electronic, is a great table talk tool before the emergency and useful to chief officers who arrive later and have command boards and an environment to use them. The layout of floors is critical and can much more easily be verified if it has been written down prior to

all hell breaking loose. In one building we wrote up, the floor had a gradual slope in the hallway that ended in a few stairs and then continued on for another 100 feet. It was the same floor, seemingly, but now had a different numbering system that would lead you believe you'd changed floors. In the daylight, it was confusing. In the dark or smoke or heat, it could present a significant disorientation problem.

Floorplans/Maps

These diagrams are in most high-rise buildings and should be present in every one. They can be referred to during inspections and should be used when involved in actual emergencies. Among the insights that can be gained are locations of stairwells or other exits, elevator location in relation to other parts of the floor and oddities in floor layout. This may include rooms that are off the normal flow of the hallway or areas closed off by doors that may not be expected. You may also get some insight into the best stairwell to use as the firefighting option or where such things as air hookups are located if you have a Firefighter Air Replenishment System in the building. If not, you can plan on a long, labor intensive operation to get air supply to your firefighters. The variables are too many to list, but the idea is to get as much info as you can from the floorplan prior to getting into heavy smoke or heat. Locating things gets a bit tougher when you start to engage the problem. Give yourself a quick snapshot and you should be able to use that information to your benefit.

Building Manager/Engineer

There will not always be someone in charge at your high rise fire, but when that person is present, use them. They know the building better than you ever will and can provide valuable insight into the unique aspects of the structure. Some areas where the building manager can help us include communication system operation, hvac/fire pump specifics, problem areas in the building and access assistance. This would obviously include any floor layout concerns and may be as simple as getting the news that all floors are exactly the same. In particular, I have used the building manager to assist with utilizing the HVAC system to best assist in venting the structure without making it worse by moving smoke to other areas of the structure. The manager is also helpful in areas away from the fire in determining best "shelter in place" options and likely areas where occupants may congregate.

At one of our fires, the building manager notified us of peculiarity in the floor layout that had a living space a good distance away from everything else. It was off the dining area and could have easily been missed with the heavy smoke present. On this day, the manager was a huge help as we found a nice old lady safe and sound in her bedroom, with light smoke in the living room coming through the front door. Since her unit was off the main path, no one had notified her of the fire. It may have taken us quite a bit longer to get to her if we hadn't had good info from a the manager.

Uninvolved Floor Checks

During the fire, the best thing you can do is pause at floors below the fire and do a quick check of the floor layout and conditions. This is recommended in most fire tactics books and varies depending on the

author as to how frequently it should be performed. I have seen anywhere from every 3-7 floors recommended. It's good advice although, like every one of the options offered, has some limitations.

The primary problem with stopping the elevator or pausing in the stairwell is the time involved to do the check. Remember, you are working at a significant fire that is not getting smaller as time goes by. It will take a tremendous amount of discipline to actually take the time necessary to ascertain conditions and really take a good look at the floor layout which may have numerous twists and turns. I have found the time it takes to be well worth it and necessary.

On a fire in a residential building, with heavy smoke and fire on the top floor, I forced myself to stop the charge up the stairs and check conditions two floors below. To my surprise, we had heavy smoke on that floor and people calling for help. There were no indications, prior to opening the door, that those conditions existed. And while you can't see every detail of the floor layout, you can get a reasonable confirmation that it follows the basic idea you have in your mind based on all other options we've discussed above. That's typically the best you can hope for and then you must rely on your basic firefighting skills to take care of the rest.

Some is better than none

Getting the floor layout is not an exact science. That makes it pretty much like everything else about emergency scenes with lots of variables and the need to adapt quickly to unique aspects of the problem in front of you. These tips are meant to help fill out the picture, eliminate a variable or two and provide valuable information that will be tough to get as the fire burns. Before, during and after the fire it is incumbent on us to learn as much as we can to enhance our operations and make challenging fires a bit less daunting.

Mike Gagliano has 30 years of fire/crash/rescue experience with the Seattle Fire Department and the United States Air Force. He is the Captain of Ladder 5 and a member of the Seattle Fire Department's Strategic Planning Leadership Group. Captain Gagliano has written numerous fire service articles, is co-author of the bestselling book Air Management for the Fire Service and the SCBA chapter of the Handbook for Firefighter 1 & 2 from Pennwell. He is a member of the Fire Engineering/FDIC Advisory Board, a Director for the Firesmoke Coalition (firesmoke.org), on the advisory board of the UL-Firefighter Safety and Research Institute and teaches across the country on Air Management, Fireground Tactics, Leadership and Company Officer Development. Mike co-hosts the popular Fire Engineering radio webcast "The Mikey G and Mikey D Show" and partners with his wife Anne (firelife.com) to teach on strategies for developing and maintaining a strong marriage/family.