



INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS



TODAY'S MULTI-DWELLING: MID-RISE OPERATIONS

March 30, 2026





Sons of Irons llc.

January 22 at 7:26 PM · 🎵 Mad Mercer · 5133p · 🌐



• **COMING TO A DISTRICT NEAR YOU** •

Even if you think you work in a rural area, it is inevitable that a high occupancy multifamily is built in the near future. The question is are you ready for it? And do your tactics, equipment, and staffing reflect prioritization of the occupants?

We're gonna let you in on a little secret... they're not gonna tell you when they're building it... or ask you permission... one day you're gonna show up for work and it'll be under construction, and the next day people will be living in it... if your not studying these buildings because they're not in your district, your behind the expectations of community.

DON'T LET THESE BUILDINGS BE A SURPRISE! Start planning for it now cuz they're comin!

[#stayhard](#) [#staywet](#) [#staysalty](#) [#backstepforlife](#)

THE MID-RISE

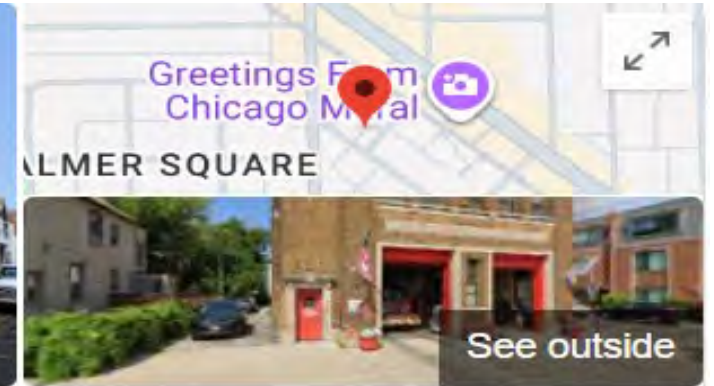
TODAY'S MULTI-DWELLING





- 31-year veteran - Chicago (IL) Fire Dept.
- Captain / Engine Co. 43 (Logan Square)
- Instructor high-rise & standpipe ops.
- Practitioner of tall buildings
- UL-FSRI Tech. Panel for Multi-Story Bldgs





Chicago Fire Department Engine 43/Ambulance 3

5.0 ★★★★★ 9 Google reviews

Fire station in Chicago, Illinois

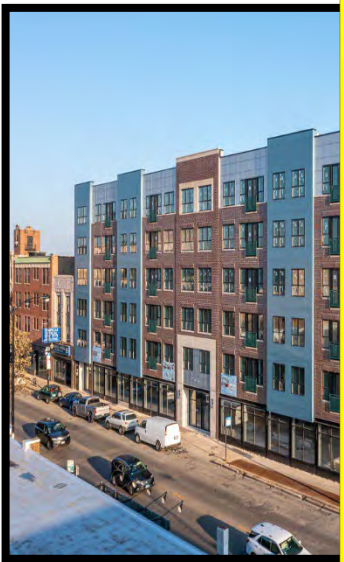
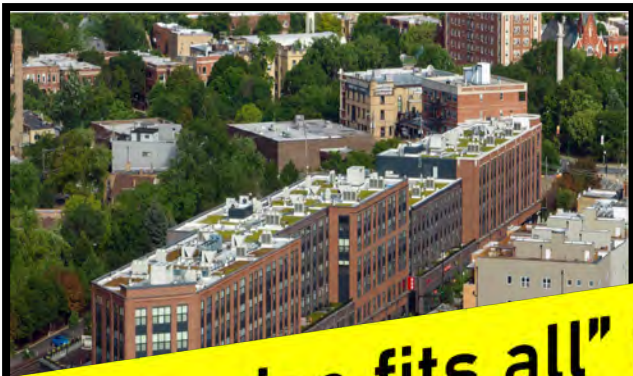


LOGAN SQUARE (CHICAGO)

- Diverse building stock
- 72,000 people in 3.2 sq. miles
- 9,000 runs annually
- Rent \$2,700 per mo. avg.
- \$678,000 median home price
- Landlocked – build upwards
- Mid-Rise Infestation



- The “one-size fits all” tactical approach doesn’t necessarily work
- Each mid-rise will require a customized tactical response plan
- The bigger they are, the bigger the problems





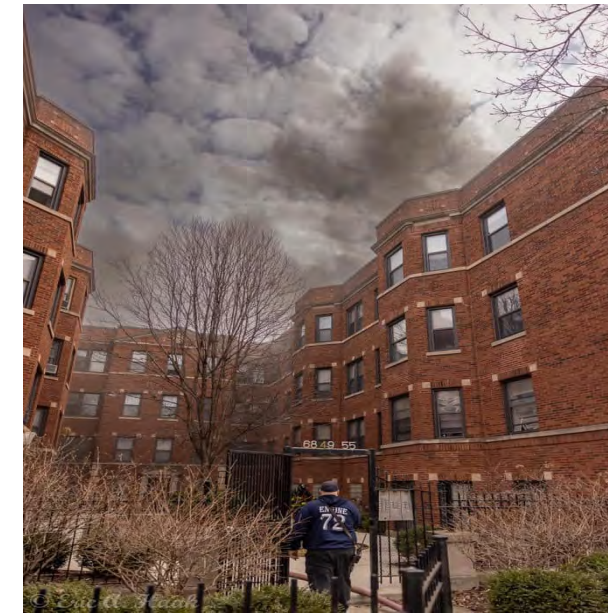
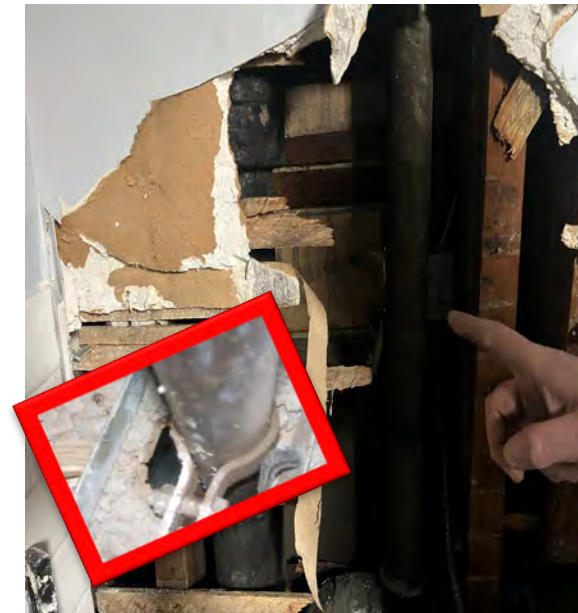
Type III, 3-over-1
(Legacy)

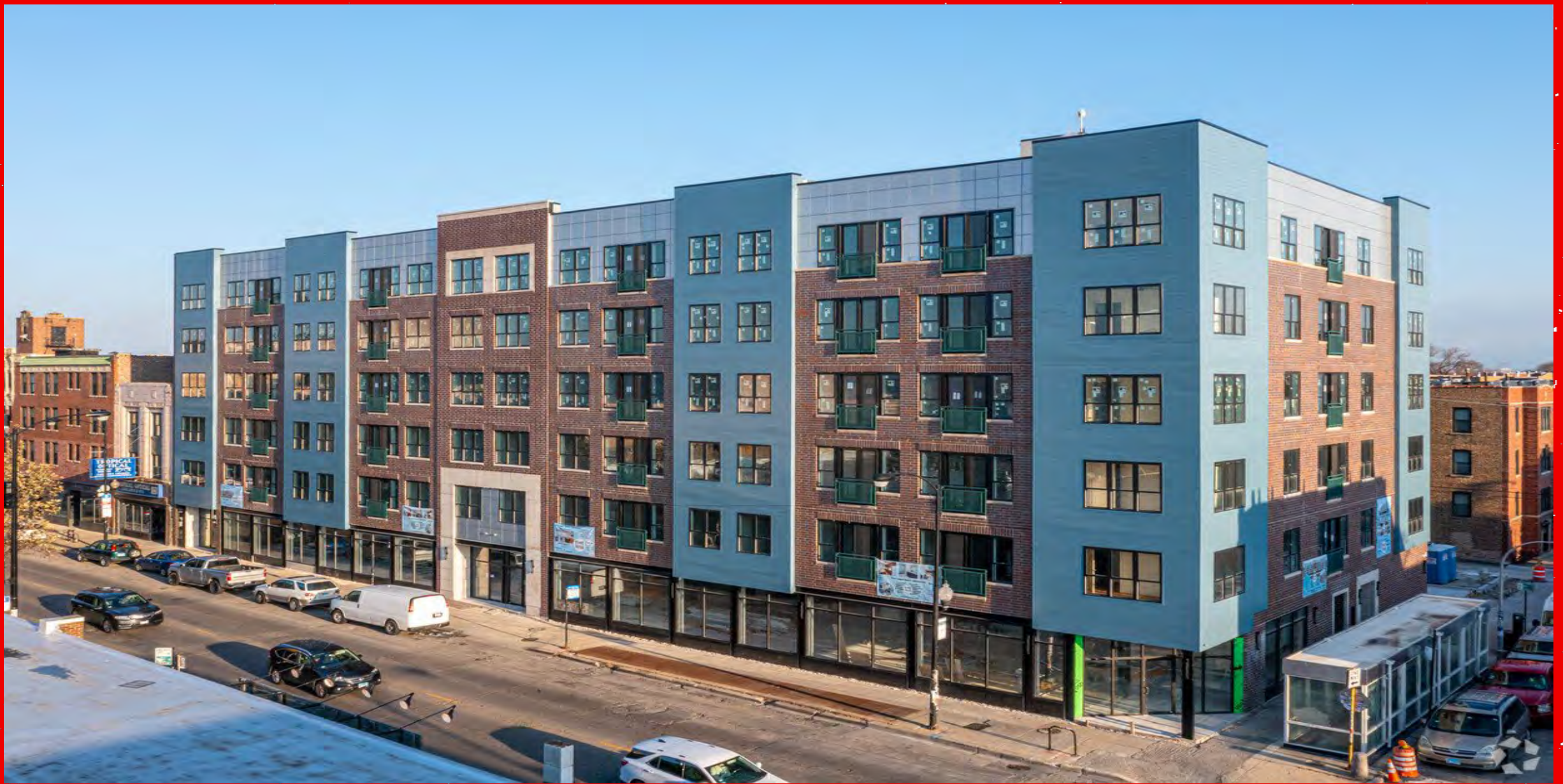


Type V, 3-over-1
(Modern)



- Heavy-duty Legacy Multi-Dwellings
 - Type III (ordinary)
 - Durable under fire conditions
 - 20-Minute Rule
- Straightforward & Predictable
- Requires adaptability





[Photo: Lt. Adam Krohn, San Diego FD]



- The built environment has changed
 - Legacy to modern
- *Inexperienced default mode [RPDM]*
 - Low frequency
- Too many *Operational Impediments*
- We may be grossly underprepared



- 4-7 stories
- [2] different buildings
- Wider than taller
- Wood-over-podium
- Type III and V construction
- Lightweight floor/roof assembly
- Medium/high-density life hazards
- NFPA 13R
- Standpipe (SP) equipped
- “Miniature High-Rise”
- Parking garage

Photo(s) from: Chris Naum



Toothpick Tower

Miniature High-Rise

**Podium, Pedestal,
Platform wood-frame
multiple dwellings**

Groundscrapers

Vertical lumber yard

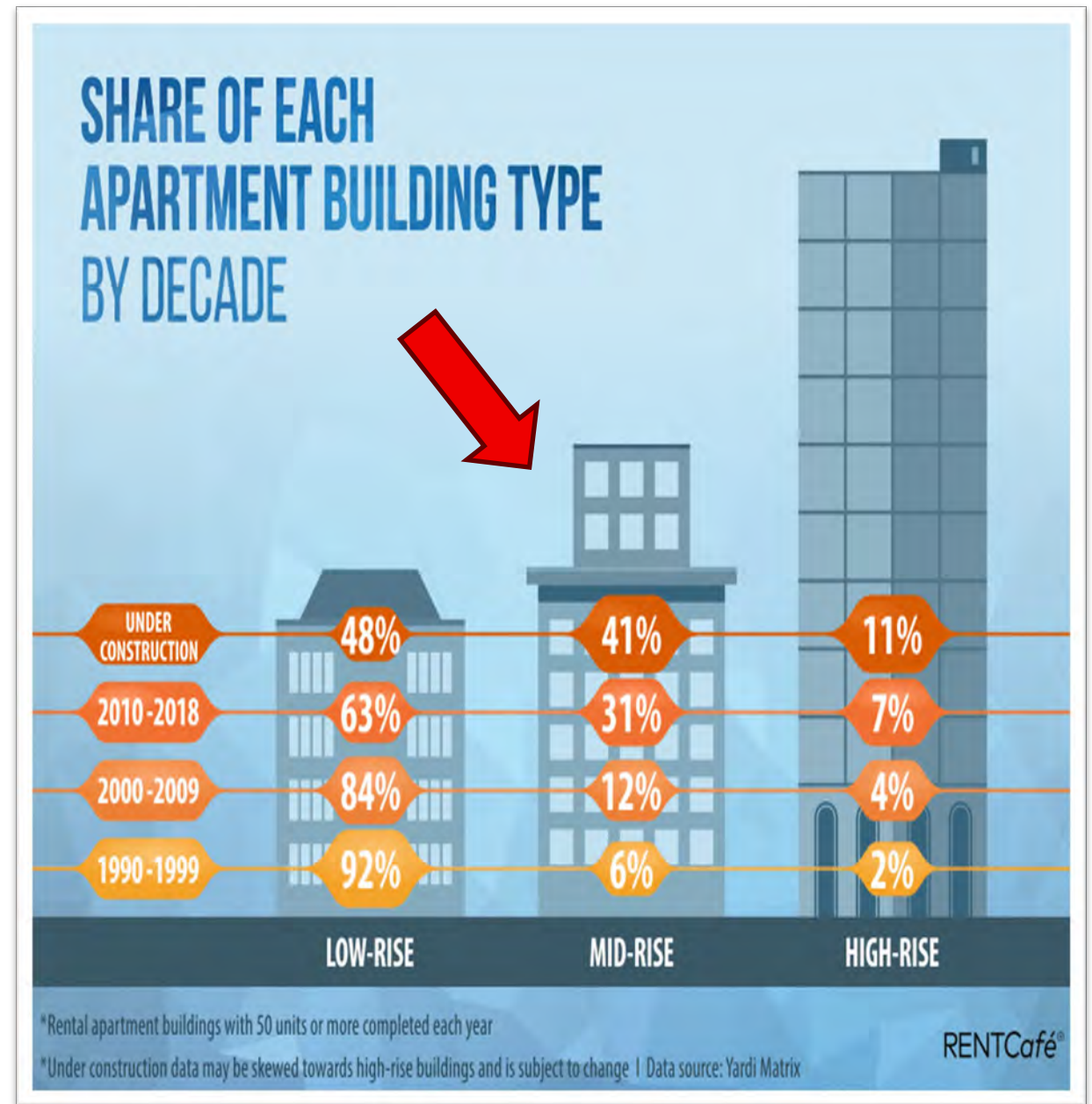


Why the popularity?



Residential Mid-Rise Boom

- Renters market – Low supply of multi-family units
- (2022) 3.8 million units short
Source: Freddie Mac
- From 6% in the '90s to 41% today
- Goal: High-density yield to maximize value [ROI]



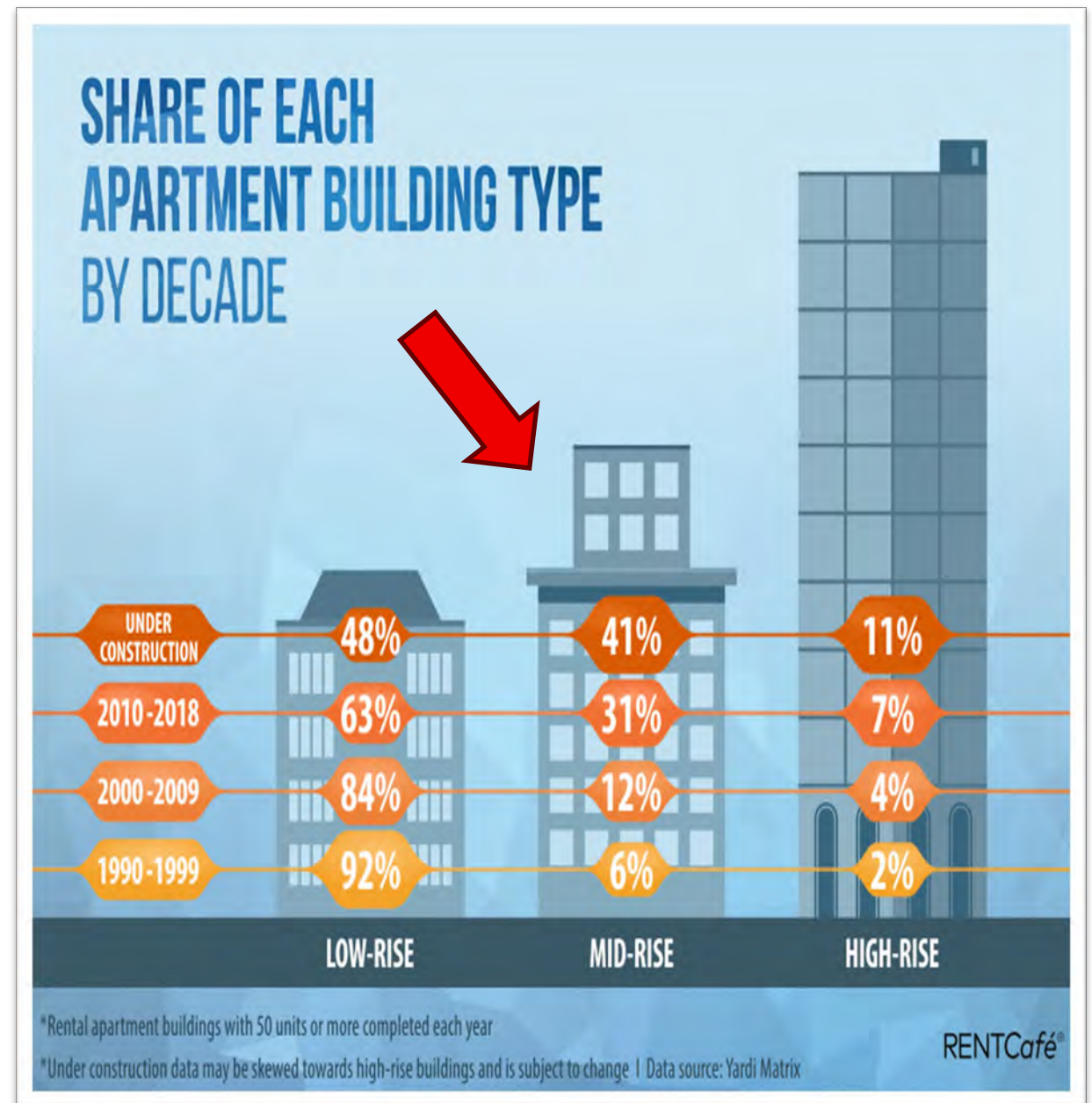
“Developments are constructed to *MAXIMIZE* the number of *UNITS* in each tract of land; any limitations reduce *PROFITABILITY* of development and may discourage development in certain areas.”

Source: Doug Ressler, Yardi Matrix



Residential Mid-Rise Boom

- **Cost-effective \$\$\$\$**
 - Wood-frame is 1/3 less the cost vs. steel/concrete & 50% less the cost in labor
 - Speed of construction
 - Cost of land vs. ROI



The Mid-Rise

- **Complicated**
- **Complex**
- **Confusing**
- **Challenging**



Has your department adapted your response protocol?

- Response Model?
- Policy or SOG?
- Manpower needs?
- Fire attack (modified)?
- Equipment needs or modifications?



The Mid-Rise



THE MID-RISE

WHAT IS A MID-RISE?

- 4-7 stories
 - < 75' ft.
 - Residential, Commercial, or mixed
- Wider than taller
- Type I, II, III, IV or V
- Urban / Groundscraper
- Hybrid construction



“Hybrids” are elements of light-weight construction or engineered materials that are mixed in with other types of construction; classify bldg. construction type least resistive to fire.



MID-RISE

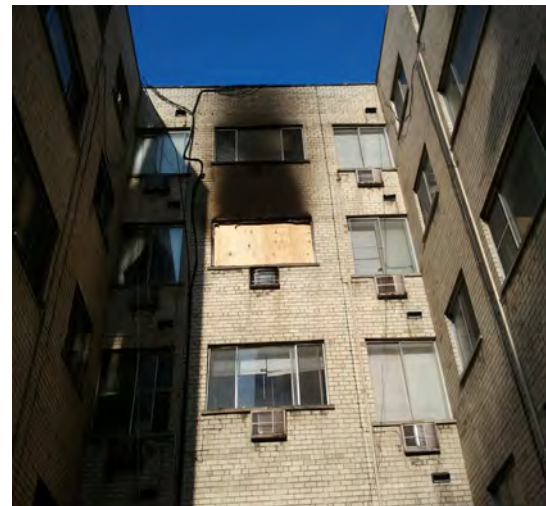
- **Type I, II, or III constructed**

- Flexicore/Pre-cast hollow core
- SBJ/metal “Q” decking
- Brick & Joist (ORD)



- **Type IV (loft units)**

- Heavy Timber
- Open floor plan/high-ceilings > 12 ft
- Lacks compartmentalization



MID-RISE

- **Overbuilds “Piggyback”**
 - Vertical expansion to existing building
 - Renovation rather than new construction

Monsters are created...



The Lucas Residences | Boston Luxury Condo Review



MID-RISE: TODAY'S MULTI-DWELLING

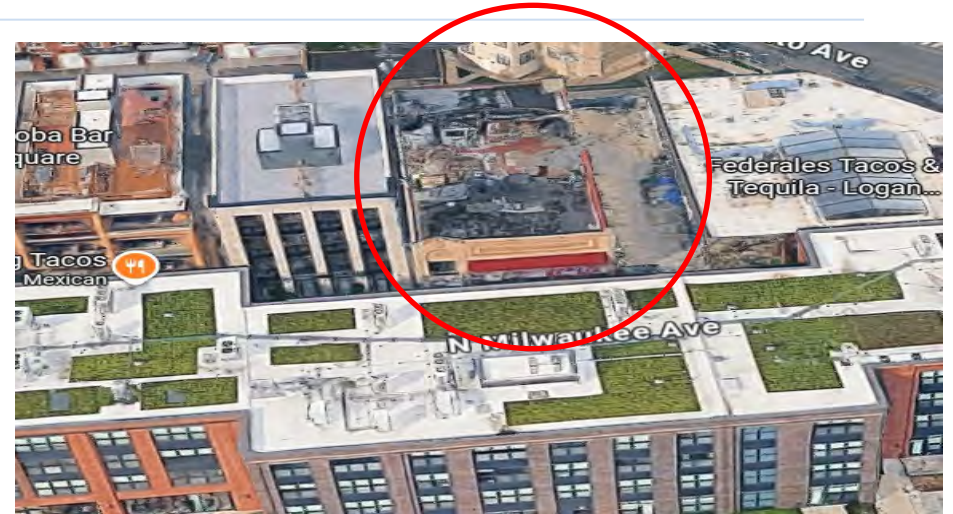
- Today's Apartment Building
 - ***Podium/Pedestal*** Mid-Rise
 - Built after 2000
 - Urban or Groundscraper
- Light-wood framing over a single- or multi-story podium base
- Truss: Floor and roof assemblies



MID-RISE: TODAY'S MULTI-DWELLING

- **Urban Infill Lots**

- Urban land scarce/expensive \$
- Built to a pre-existing plot
 - Smaller foot print
- Built between other existing buildings
- Low-to-medium density
 - 25-<100 units





5 over 1 - Midrise Podium (5:1)

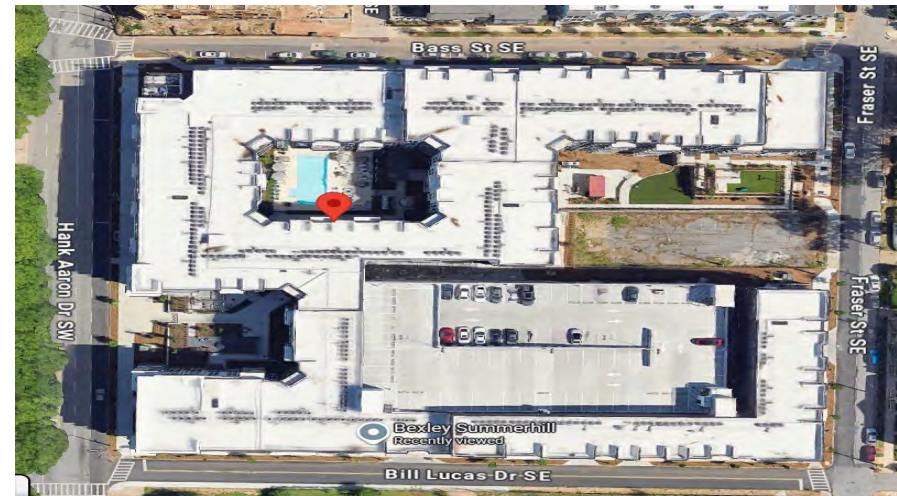
- Smaller urban INFILL lots
- Wide, but narrow
- Maximize density (units) on a small footprint
- 18-24 units



MID-RISE: TODAY'S MULTI-DWELLING

- **Groundscrapers**

- Greenfield development
- Untouched land to develop
 - Max. available acre(s) = density
- High-density multi-family housing
 - Several hundred units
 - 250-300' hallways not uncommon



MID-RISE: GROUNDSCRAPER

- A **groundscraper** is a large-scale building that extends significantly in a horizontal distance while remaining relatively low in height; can be as long as high-rises are tall.
- Problematic in many ways



MID-RISE: GROUNDSCRAPER



385 FEET = 38-story high-rise



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“While high-rises present a vertical challenge, groundscrapers present a horizontal challenge; both are subjected to significant HORIZONTAL REFLEX TIME.”



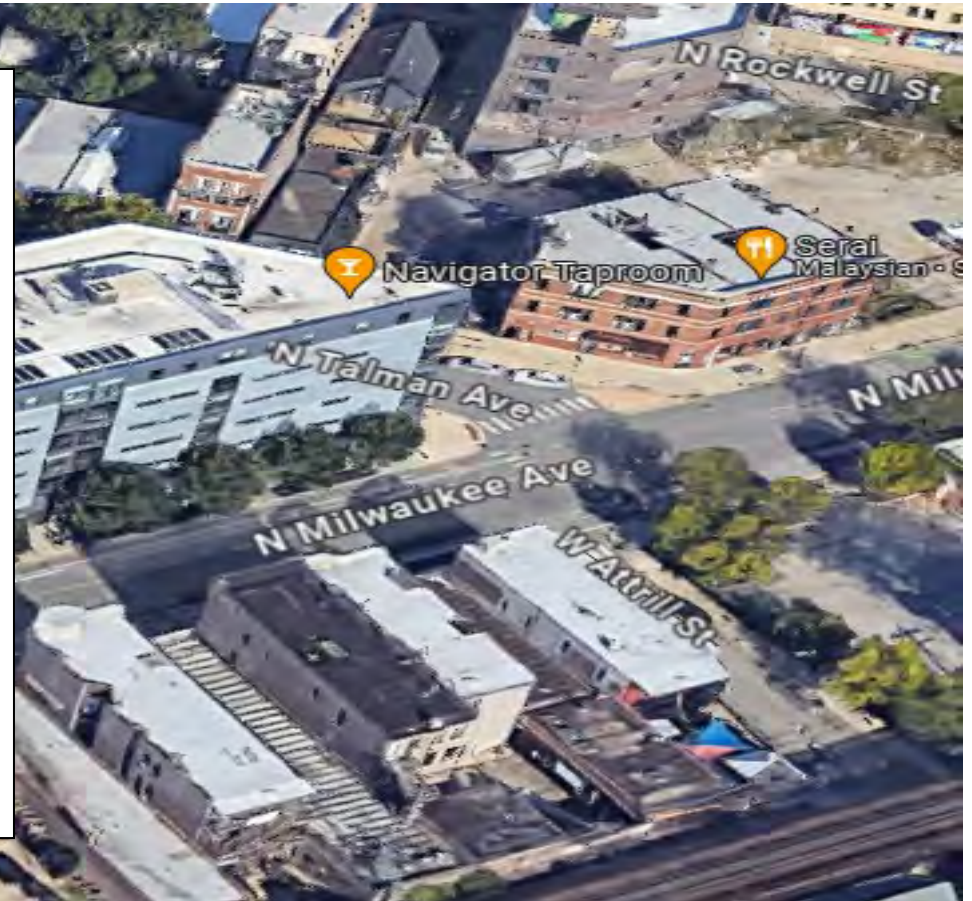
MID-RISE: GROUNDSCRAPER

- High-density thresholds
 - >120 (200 to 400 units)
- Operational complexity increases
- Demands are well beyond traditional multi-dwelling tactics
- ***Manpower magnet***



MID-RISE: GROUNDSCRAPER

In the event of a **FIRE** on an upper floor of this mid-rise building, what is the minimal fire service deployment configuration necessary to mitigate the event effectively and safely?





What is NFPA 1710?

The National Fire Protection Agency created NFPA 1710 as a standard for structure fire response.

It outlines the MINIMUM staffing levels for effective and safe operations for low, medium and high hazard structures.



Single Family Dwelling
Typical 2000 sq.ft, two story, single family dwelling with no basement and no exposures

17 Firefighters

According to NIST, a 4-person crew can complete critical fireground tasks 25% faster than a 3-person crew and 30% faster than 2-person crew.



High Hazard Occupancies
Schools, Nursing Homes, Public Assembly Buildings, other structures with a high life hazard or large fire potential

42 Firefighters
within 10 minutes



- Who can bring 27 FF with (4) FF companies in 8 minutes?
- What is your static response to alarms?
- Does your risk-to-response profile match?
- Critical task – getting water on fire!



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“Now, lets put a lot of people inside a multi-story combustible box and call it a “light or low-hazard” risk.”



MID-RISE: GROUNDSCRAPER

- **Groundscraper yields more units**
- **Units Per Acre:**
(1 acre = 200' x 200') [43,560 sq. ft.]
 - 4 sty = 100 units
 - 5 sty = 120 units
 - Mezzanine = add'l 20 units (% of roof)



[Photo: Christopher Naum]



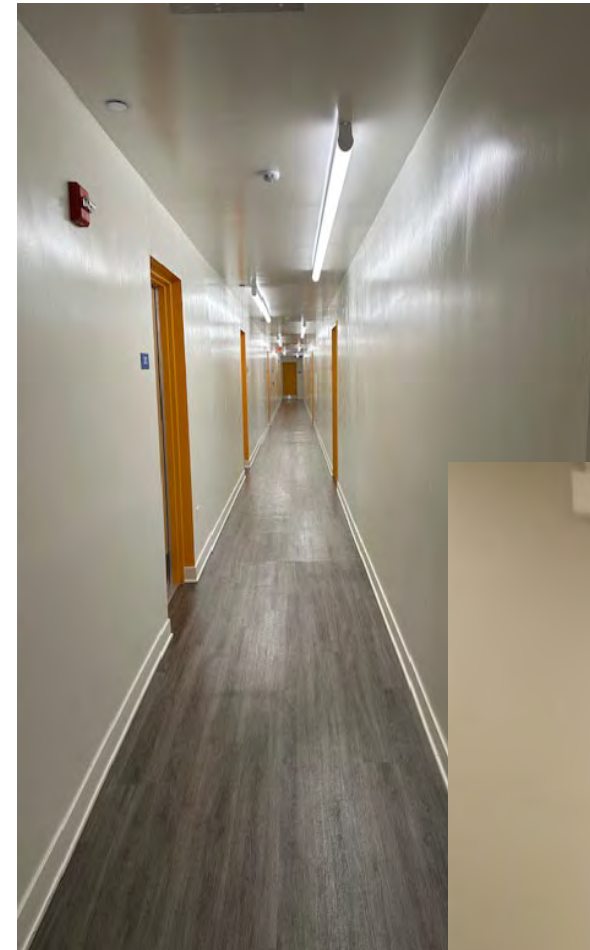
MID-RISE: TODAY'S MULTI-DWELLING

- Studio – 500 sq. ft.
- (1) bedroom – 800 sq. ft.
- (2) bedroom – 900 to 1250 sq. ft.
- A typical mid-rise unit is appx. 1,000 sq. ft.



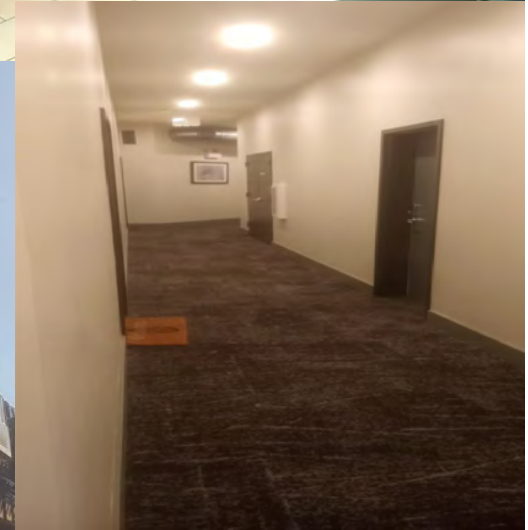
MID-RISE: COMPLEXITIES

- Limited views/lack of 360
- Accessibility – layers of security
- No stairwell continuity
- Long and “maze-like” hallways
- Multiple access points (stairwells)
- Confusing floor layouts
- No fire alarm panel
- Inadequate fire protection



MID-RISE: OPERATIONAL IMPEDIMENTS

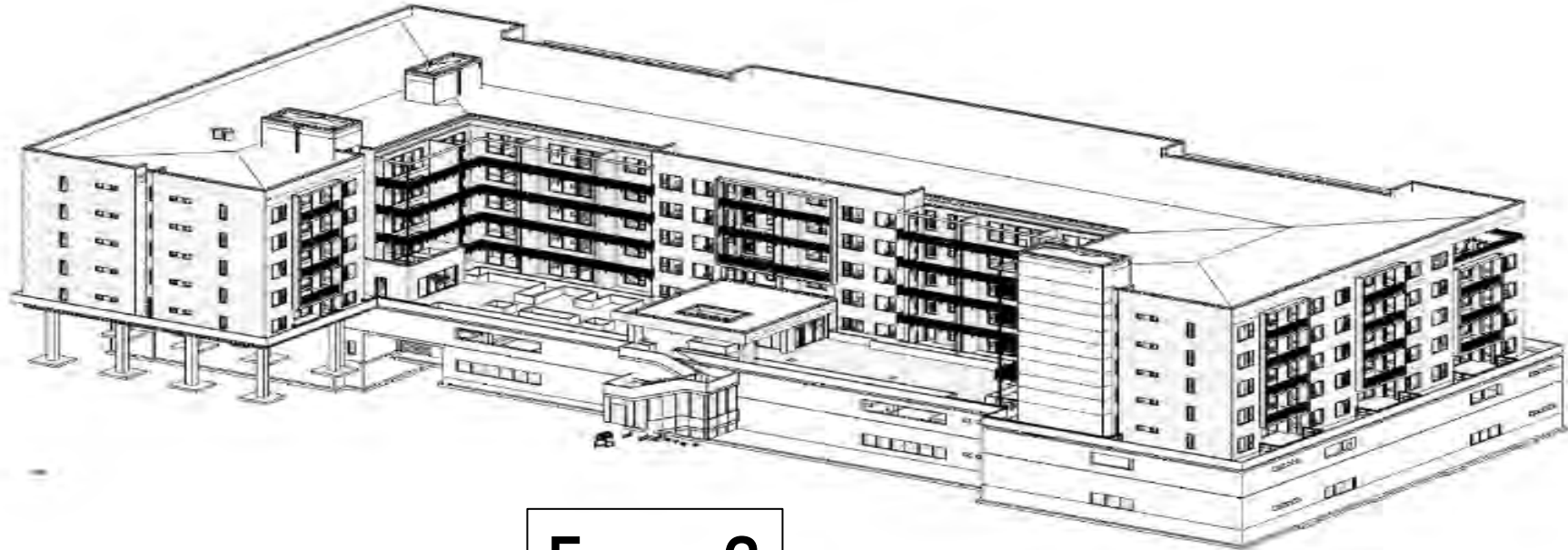
- Low response profile (mismatch)
- Accessibility & rig placement
- Difficulty locating the fire
- Assessing & directing fire attack options
- Combustible construction
- Large unprotected voids
- Subjected to Reflex Time



EVOLUTION:

TODAY'S MULTI-DWELLING

How did these buildings come about?



5 over 2

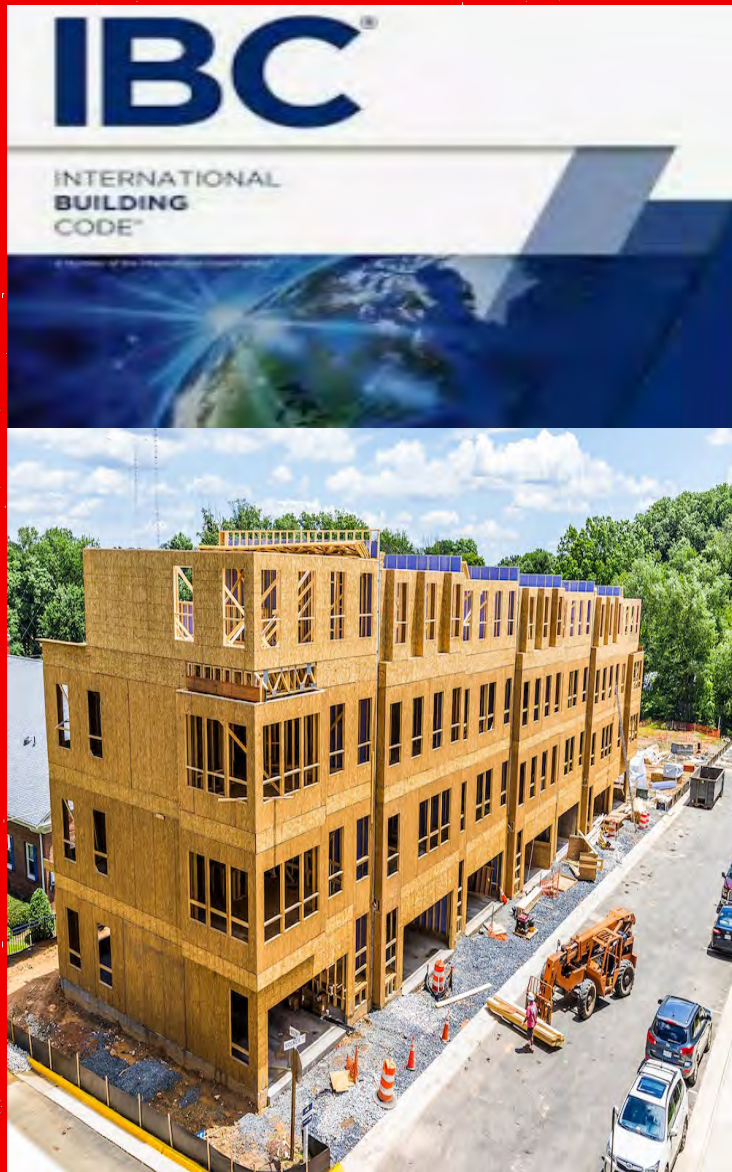




“It appears to be pretty clear that the design professional community have stretched the provisions of the applicable codes as far as possible with these new designs. I suspect that the committee who wrote the code provisions never imagined combustible buildings this tall and this large when the code provisions were being written.”

Larry Iseminger, FPE -Maryland State Fire Marshal





- International Building Code (IBC) [2000] – rise of the podium
- Replaced older codes (e.g., BOCA, NBC, UBC, etc.) [1997]
- Unified, standard approach to bldg. code(s) consistency
- Updates/revisions every 3 yrs [2024]
- AHJ can use IBC as a baseline, but can REQUIRE stringent codes



TODAYS MIDRISE: EVOLUTION

- Podium concept dates back to 1996 (Tim Smith)
- Type V multi-family was limited to 3-sty (UBC) [1996]
- “Loopholes” in the 1996 (UBC)
 - Building-on-building concept. [2 separate buildings]
 - “Fire-retardant-treated wood (FRTW)” can reclassify a Type V to Type III;
“Exterior walls of non-combustible construction.”



TODAYS MIDRISE: EVOLUTION

- “five-over-one” [5:1]
- Casa Heiwa (Los Angeles, CA)
- High-density yield – 100 units
- Concrete base podium topped by 5 stories of wood-framing and FRTW exterior



According to IBC, using a wood-frame exterior is equivalent to a Type III building with brick exterior walls?





- IBC 2021, 2024

- Type V – [wood-frame]



- Type V – B (unprotected) = 3 stories
- Type V – A (protected) = 4 stories



- IBC 2021, 2024

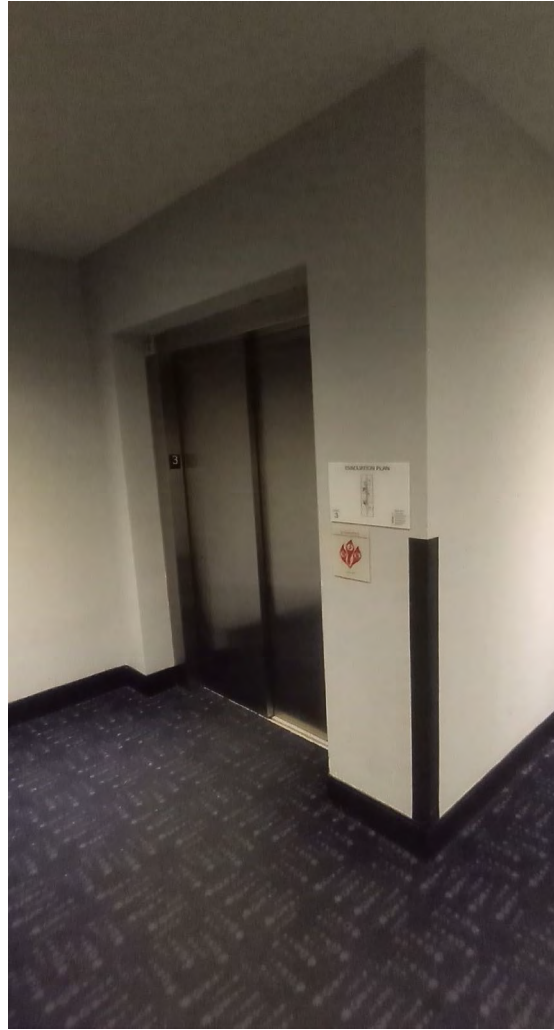
- Type III, Type V-A



- Up to 5 stories above podium
- Height doesn't include podium
- 5:2 mid-rise allowable (max)



What type of building is this?



- #1 Question
- Treat it like a high-rise?
- Similar, but not the same
 - Many will default to a standpipe operation
 - Belief that a standpipe stretch is faster method
 - Standpipes are different

“This is a High-Rise,
NOT a Mid-Rise”





What's the difference?



[Residential] Mid-Rise buildings are similar to high-rise:

Automatic sprinklers

Large footprint

Standpipe

Floor plans, layout & hallways

Elevators/electrical rooms/trash chutes

Life hazards: (medium-to-high density)

Type 1 stairwell enclosures

Area of Refuge

Above or below-grade enclosed parking

- But lacking....."The Mid-Rise."
 - No 1-way PA system to communicate
 - Fire Command Center (FCC)
 - Lacks a formal lobby
 - Type 1 fire-resistive construction
 - Lacks adequate compartmentalization
 - NFPA 13
 - Not required to provide bldg. intelligence
 - Departmental response policy (e.g. mid-rise SOP)



ANATOMY



**It's important to know
when the building was
built and which IBC code
did it fall under.**



Peak into the Podium

(1) structure, but considered.....

*(2) separate (different) structures
by code [IBC]*



ANATOMY – THE PODIUM

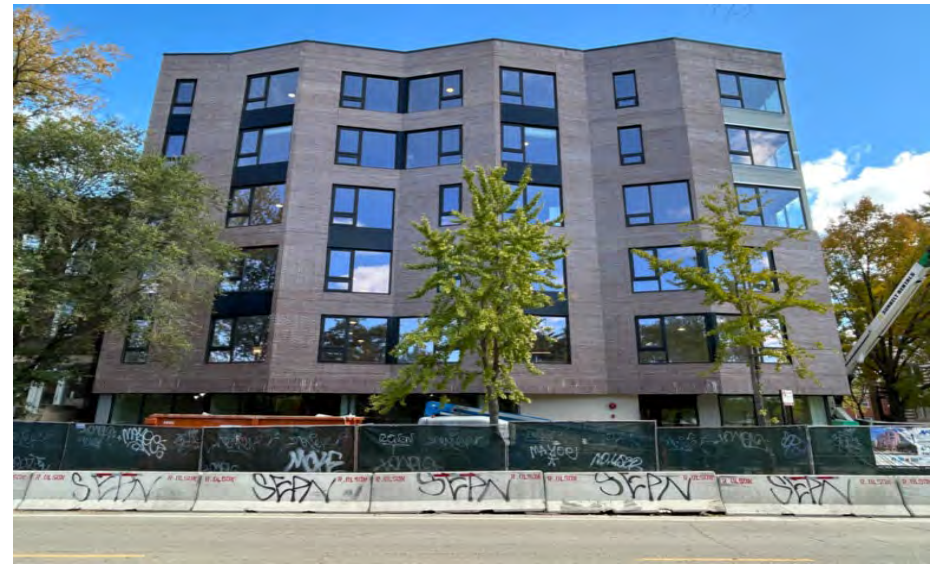
- Transfer slab (base) for the upper floors (platform, or pedestal)
- Concrete or steel podium
- Requires: 3 hr. fire-rated horizontal separation (Fire Wall)





Base – Transfer Slab



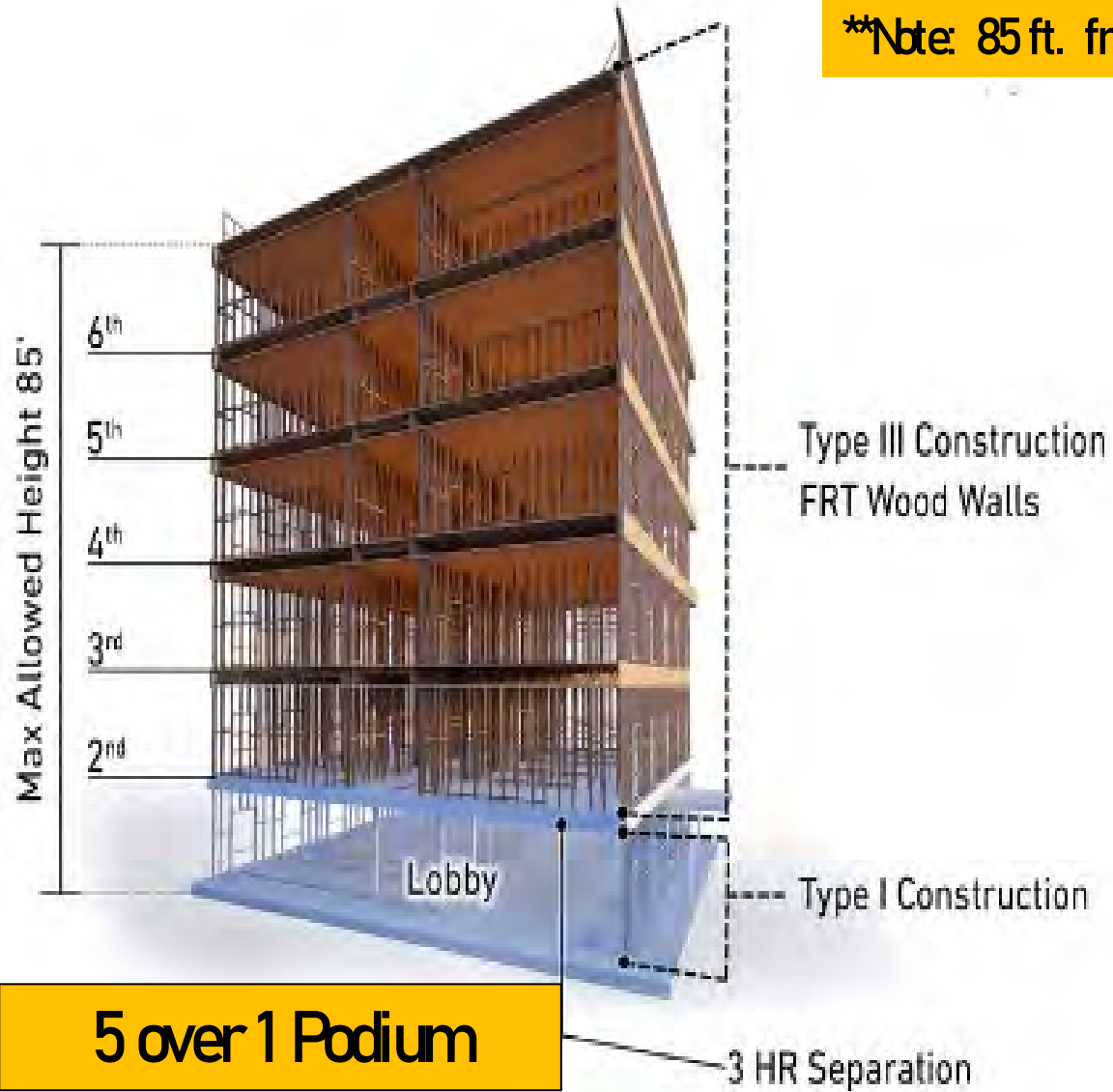


ANATOMY – THE PODIUM

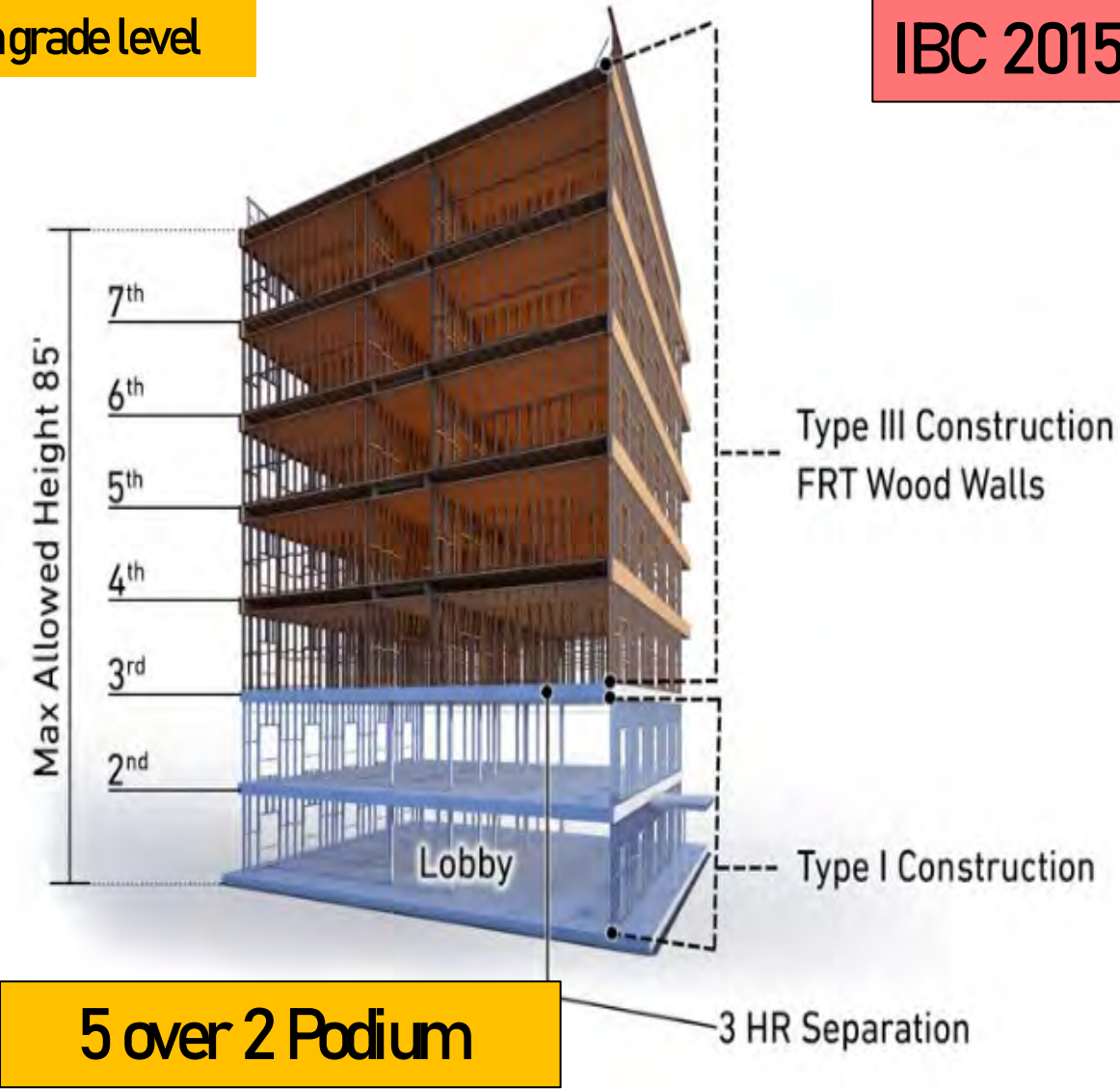
- Steel I-Beams/Q-decking & poured reinforced lightweight concrete over decking (> 4”)
- Sprayed applied fireproofing
 - 1-inch = 1 hour
 - Cementitious or fiber
 - Raises fire rating to a Type I
- @ 1,000 F, 100 ft. steel I-beam can expand 9 inches



**Note: 85 ft. from grade level



5 over 1 Podium



5 over 2 Podium



ANATOMY – THE PODIUM

- IBC 2015 – (2) Story Podium
- NFPA 13 (hard-piped)
- Uses
 - Parking garage (grade or below grade)
 - Retail, commercial or mixed-use
 - Anchor tenant \$\$



ANATOMY – THE PODIUM

- The podium isn't the problem
 - Auto fire
 - Trash chute fire
 - NFPA 13 (hard-piped)
- The podium is a separate building (Type I)
- Podium oddities
 - Full NFPA 13 system



ANATOMY – THE PODIUM

- Trash Chutes
 - Pneumatic
 - No handle/push button
 - Bleed-off air in compressor to open
 - Separate enclosure in the podium.



ANATOMY – UPPER FLOORS

- Vertical shafts that penetrate the podium's horizontal separation require a 2-hour rating
- Stairwells & Elevators
- Trash chutes & HVAC liners
- Plumbing



Vertical Shaft Penetrations



Elevator



Stairwell



Trash Chute



HVAC



ANATOMY – UPPER FLOORS



[Photo by Paul T. Dansbach]



ANATOMY – UPPER FLOORS

“A bunch of combustible wood-frame single-family boxes stacked on top of each other”

“Human storage bins” – Chief Anthony Avillo

“Lightweight Apartment Building Fires with Heavyweight Realities.”

– BC Dan Miller, Omaha (NE) FD.



ANATOMY – UPPER FLOORS

- Residential units
- 4-5 stories above podium
- Combustible (wood-frame)
- Exposed & Unprotected truss-loft
- NFPA 13R



ANATOMY – UPPER FLOORS

- Occupants live in a combustible box
- Wood-frame (Type V) interior
- Exterior sheathing (Type III)
- [Open-Web] parallel chord-truss





“While we no longer have vertical balloon construction, we certainly have horizontal balloon construction.”

— CAPTAIN BILL GUSTIN (MDFR)



ANATOMY – UPPER FLOORS

- Combustible Roof Assembly
- 10 ft. ceilings
- Combustible Balconies & roof decks
- Combustible exterior using EIFS





“Today’s apartment building will not perform well under advanced fire conditions, or prolonged (nonintervention) burn time.”



PRE-PLAN



Concept: BC Chief Gerry Tracy (FDNY)



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“Your level of effectiveness is measured in the effectiveness of your preparation & pre-planning.”



MID-RISE: PRE-PLAN



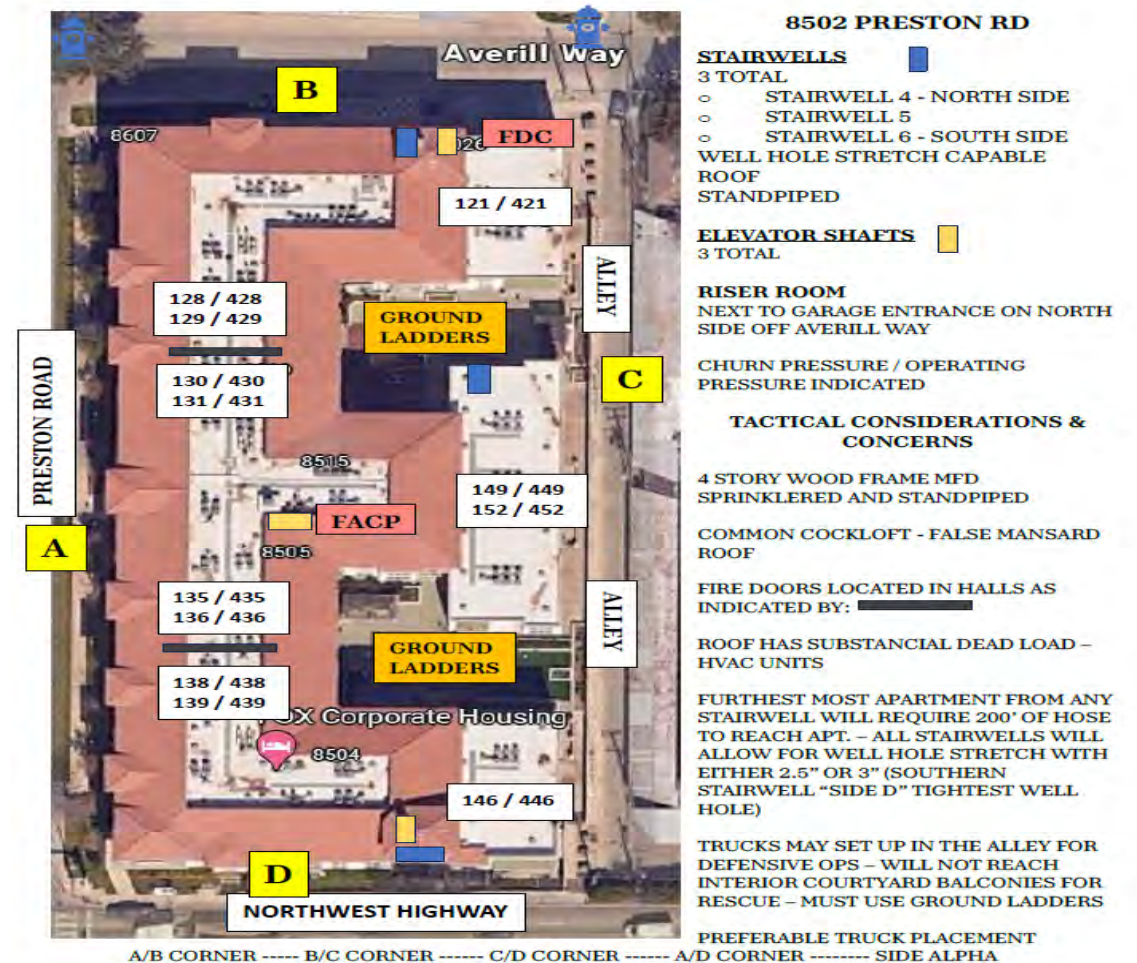
MID-RISE: PRE-PLAN

- **Pre-plan before the fire**
 - Your responsibility
 - During construction
 - Post-Construction
- **Battle Plan**
 - Gathering Building Intelligence (BI)
 - SOPs lack intimate details of bldg.



MID-RISE: PRE-PLAN

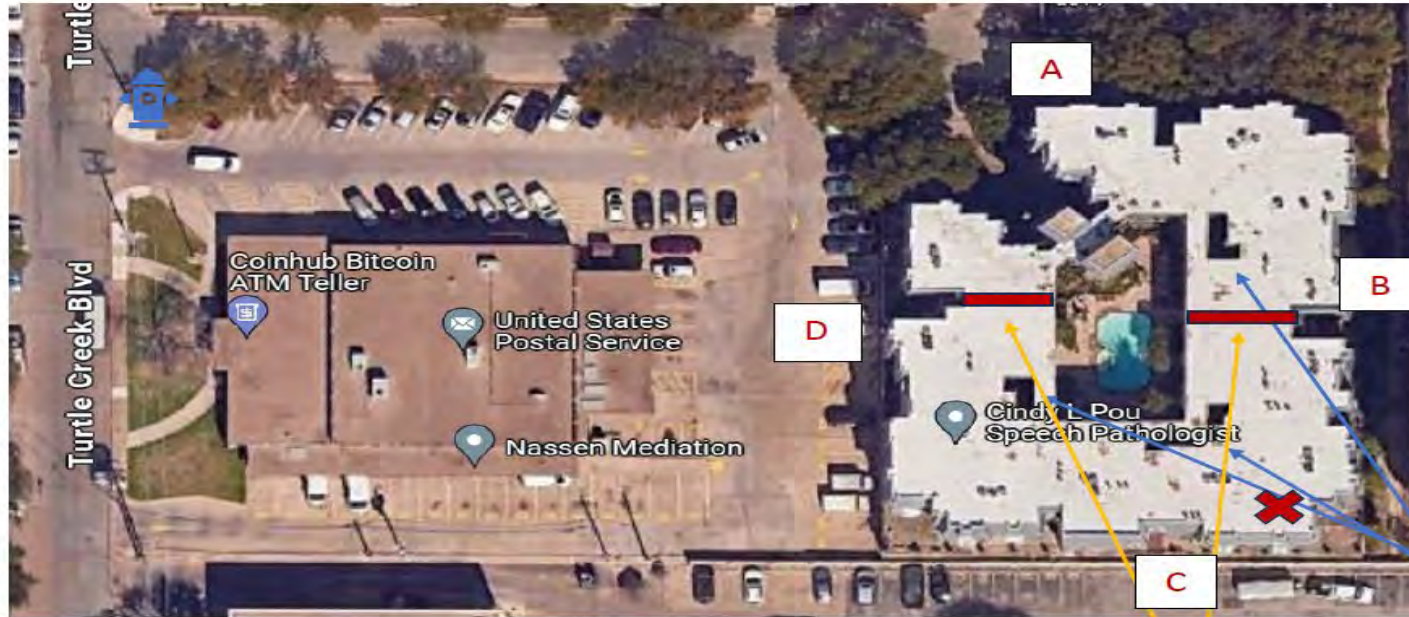
- Well-designed “Battle Plan.”
- Addresses pertinent details
- Helps develop a custom, specific pre-incident strategy for a given building



[Courtesy Lt. Mike Bernard, Dallas (TX) FD]



MID-RISE: PRE-PLAN



8610 TURTLE CREEK BLVD

3 STORY RESIDENTIAL OVER PARKING GARAGE

1 MAIN STAIRWELL AT FRONT ENTRANCE BEHIND ELEVATOR SHAFT

STAIRWELL CAPABLE OF "WELL HOLE" STRETCH

ELEVATOR ROOM IN PARKING GARAGE BEHIND STAIRWELL

RISER ROOM NEXT TO ELEVATOR ROOM

UNPROTECTED ROOF OPENINGS

TACTICAL CONSIDERATIONS / CONCERNS

[Courtesy Lt. Mike Bernard, Dallas (TX) FD]

- COMMON ATTIC AREA THROUGHOUT (CONSIDER TRENCH CUT IF NEEDED)
- ONLY ONE STAIRWELL ACCESSIBLE FOR INITIAL FIRE ATTACK (LOCATED AT MAIN ENTRANCE)
- 250' (2.5" OR 3" WITH GATED WYE) PLUS RAPID ATTACK PACK OR WICHITA BUNDLE WILL REACH THE FURTHEST MOST APARTMENT ON 4TH FLOOR WITH 75' OF HOSE FOR FIRE ATTACK (MARKED WITH RED "X")
- BEST PLACEMENT FOR AERIALS (BRAVO / CHARLIE CORNER, CHARLIE / DELTA CORNER, AND DELTA SIDE) FOR MAXIMUM SCRUB AREA
- CONSIDER 2ND ALARM IMMEDIATELY UPON CONFIRMATION (VIA VISIBLE SMOKE COLUMN / MULTIPLE CALLERS ETC)
- AFTER HOURS WILL BE LOCKED GATE AT USPS FACILITY – ACCESS WILL HAVE TO BE MADE TO SET UP AERIAL ON SIDE DELTA



MID-RISE: PRE-PLAN

WHERE'S MY SPOT AND WHAT'S MY SCRUB?

[Courtesy Chris Tierney Streamwood (IL) FD]



ALL TWO BEDROOM UNITS ON THIS SIDE OF BUILDING

	01 UNITS	03 UNITS	05 UNITS	07 UNITS	09 UNITS	
5	BR LR LR	BR BR LR	LR BR BR	LR BR BR	LR LR BR	5
4	BR LR LR	BR BR LR	LR BR BR	LR BR BR	LR LR BR	4
3	BR LR LR	BR BR LR	LR BR BR	LR BR BR	LR LR BR	3
2	BR LR LR	BR BR LR	LR BR BR	LR BR BR	LR LR BR	2
1	BR LR LR	BR BR LR	LR BR BR	LR BR BR	LR LR BR	1

105' AERIAL ONLY
 INACCESSIBLE
 GROUND LADDERS
 GROUND LADDERS OR 100' AERIAL



MID-RISE: PRE-PLAN

- **Ground ladders**
 - Limited accessibility for trucks
 - Urban mid-rises – limited access
 - Poor scrub areas
 - 35' max. length
 - Consider 40'-50' ground ladders
 - Address ladder rescue concerns
 - Courtyards
 - Inaccessible sides or sectors



50' Bangor Ladder / 4 FF



MID-RISE: PRE-PLAN

- Texas Doughnut (Wrap)
- Fire/smoke may not be visible from courtyard
- 50% of the building can not be laddered in courtyards
 - Ladder Rescue?
 - Water (e.g. exterior fires)



MID-RISE: PRE-PLAN

- **For the Engine Co:**

- Where are the stairwell exits located?
- Can I take a well-hole stretch?
- Hallway length from well-hole to middle of the building?
- Is there a fire pump?

“If Plan A doesn’t work, you better have a Plan B then...”



[Lt. Steve Robertson, Columbus (OH) FD]

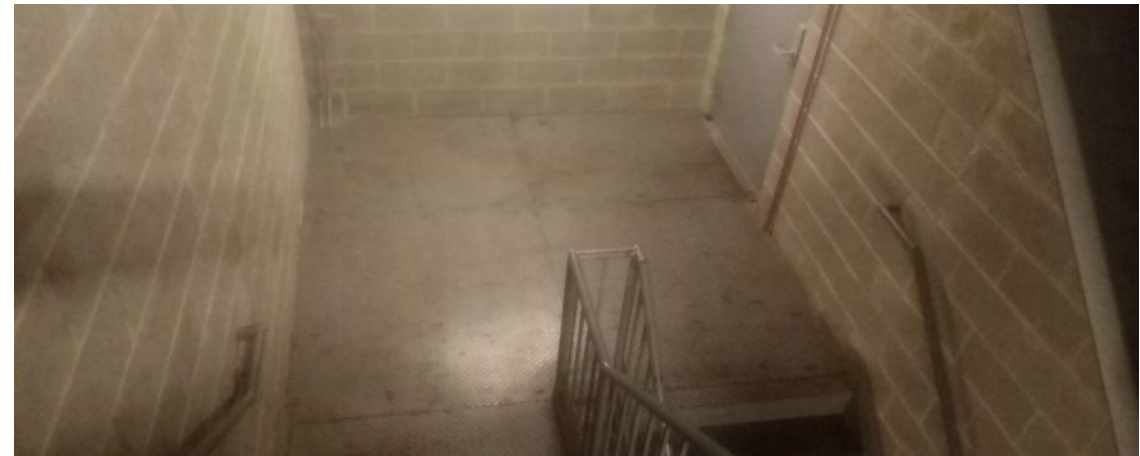
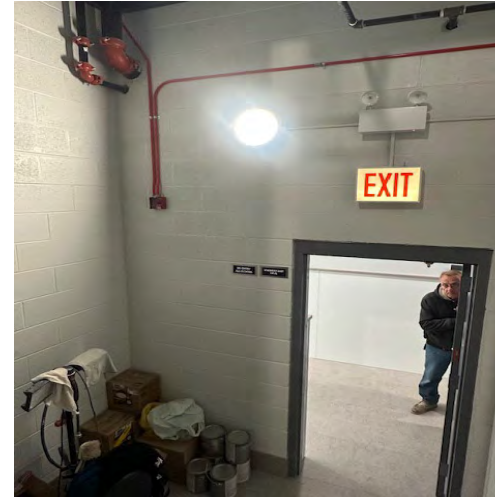




MID-RISE: PRE-PLAN

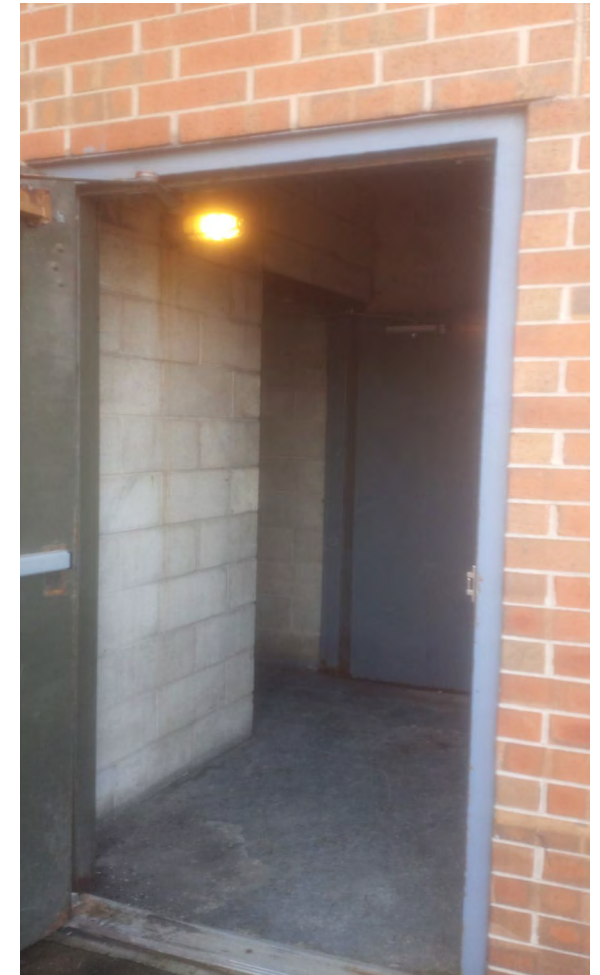
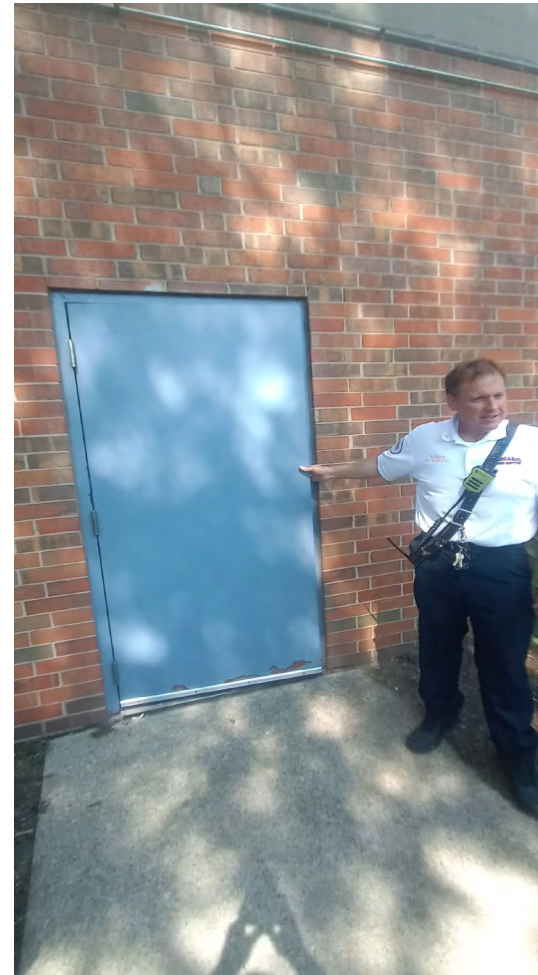
- **Stairwells**
 - 2-hour (Type I) enclosure
 - Primary launch point for fire attack/safest spot in bldg.
 - Area of refuge

- **No stairwell continuity**
 - Lobby may offer (1) stairwell
 - This stairwell is locked from the lobby for security



MID-RISE: PRE-PLAN

- **Stairwells**
 - Multiple stairwells above
 - Many will serve as an EXIT discharge to the exterior at remote locations away from the lobby
 - Exit discharge stairwells are locked from the outside and can only be accessed from the exterior



- Stairwells should be labeled with floor number and geo-identifier (e.g. 2-West, 4-South)
- Identify which stairwell allows roof access – that should be labeled
- Exterior doors need to be labeled for identification

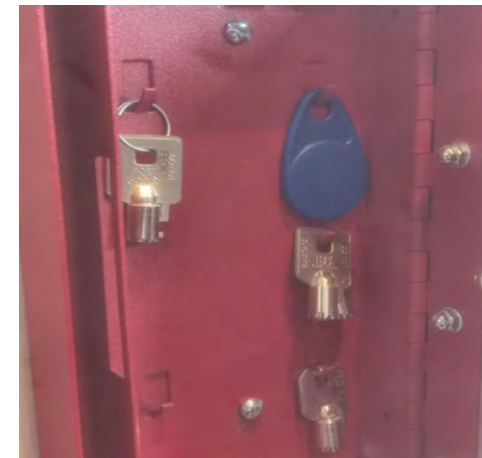
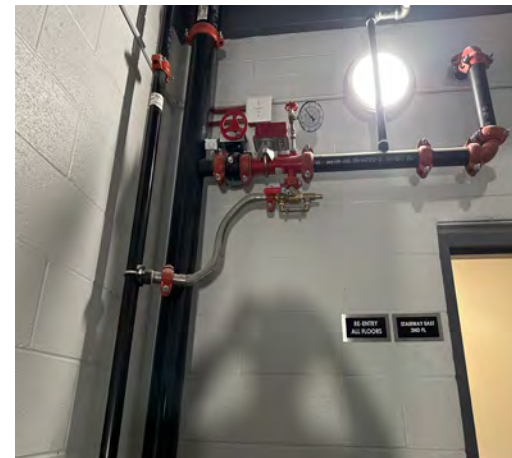


“Though not explicitly required by the IBC, exterior door labeling is a critical best practice for improving tactical efficiency and reducing confusion on the fireground—especially in mid-rise buildings with decentralized layouts.”



MID-RISE: PRE-PLAN

- **Determine the following:**
 - Where are the keys?
 - Sprinkler coverage?
 - Sprinkler isolation control valves?
 - Pump room?
 - Fire alarm panel?
 - Stairwell locations & Roof access?
 - Type of Standpipe & FDC?
 - Hydrant(s)?



MID-RISE: PRE-PLAN

- **Keys – Getting In?**
 - Gaining access difficult
 - Entry codes
 - Fobs, swipe cards, or mechanical keys
 - Doors are locked
 - Master Keys
 - Trash chute
 - Pump room
 - Utility closet



[Photo Chris DeBello]



MID-RISE: PRE-PLAN

- **Mechanical Key**

- When the master key doesn't work
- Master key fob

Resident Entry – 6 o'clock

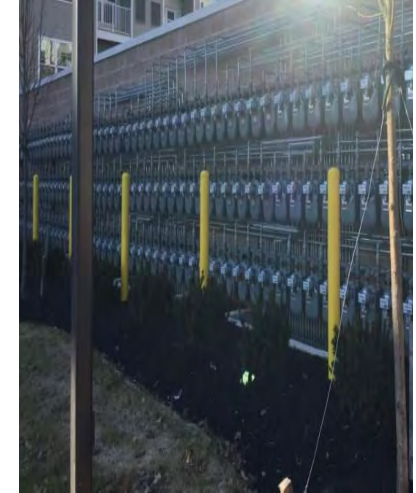
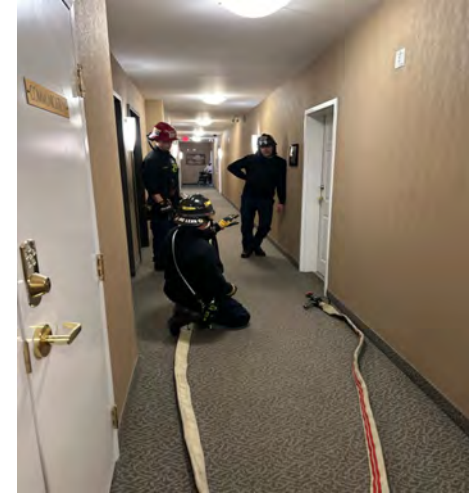


Master Key Setting – 12 o'clock



MID-RISE: PRE-PLAN

- **Gathering building intelligence**
 - CAD, Fire Prevention, and BICs
 - Saves time & eliminates guesswork
 - Building information is not required by code



WHAT'S THE PLAN?

MID-RISE: HAVING A PLAN

If you don't have a plan, this what happens..

- Complete disorganization
 - Saturated with manpower
 - No one is available for critical tasks
 - Equipment unavailable
 - No hose is carried up (Reflex Time) or rope bag
 - Completely caught off-guard
 - Consciously disoriented
 - No one remembers stairwell
 - No one remembers where and how far the rig



- Fire Suppression **CAN NOT** take place if you don't know where you're going
- Challenges of accessibility and locating the fire
- Requires **RECON** before prematurely committing to a specific stairwell for fire attack
- Consider fires beyond the pre-connect
- Requires creative methods for expedient water delivery
- Time is imposed on every aspect of a Mid-Rise Operation



MID-RISE: HAVING A PLAN

First-Due Arrival - Conditions

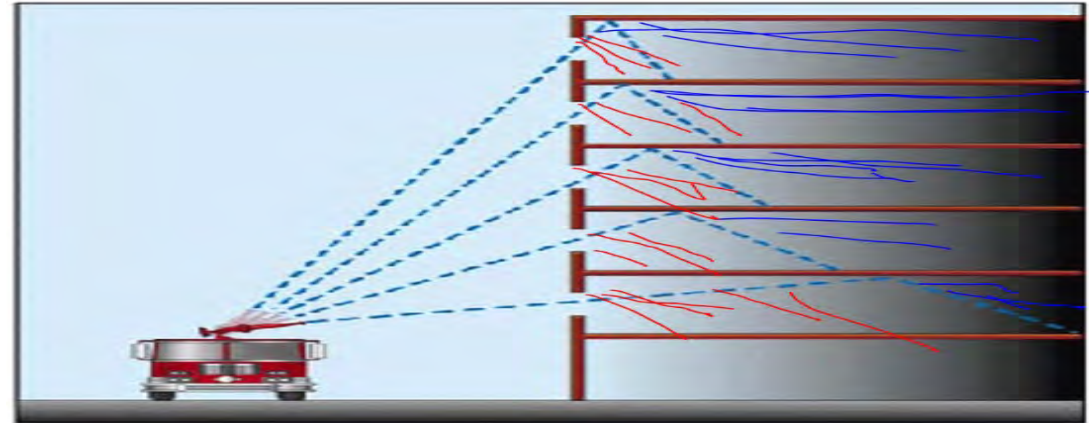
- “Nothing Showing”
 - Limited field of view
 - Requires Recon.
 - Advise what sides viewed
- Fire or smoke showing on arrival
 - Consider a first strike option
 - Exterior Hit (e.g. RAM, deck gun)



MID-RISE: HAVING A PLAN

Blitz Attack

- Offensive weapon (Deck Gun)
 - Rapid exterior water
 - Lintel hits or high-angle static entry
- Velocity & Reach
 - 8.3 gal. per second
 - 10-15 second hit (< 30 seconds)



MID-RISE: HAVING A PLAN

- **SOP/SOGs – Mid-Rise Policy**
 - [default mode] of pre-described actions to direct the first-due units
 - Provides a consistent model of response
 - Ensures critical tasks are initiated
 - Not rigid, but flexible for real-time decisions



MID-RISE: HAVING A PLAN

A “Mid-Rise” policy needs to address:

- Who is the Fire Investigation Team?
- What are the first-due companies doing?
Second-due?
- Requires discipline



MID-RISE: FIRE INVESTIGATION TEAM

- **Location & extent of fire?**
 - Fire in-or-out of box?
 - Report hallway conditions
- **Best way to access the fire?**
 - Recon. floor below
 - Closest stairwell
 - or drop from unit closest to stairwell



[Photo: Phil Montgomery]



MID-RISE: FIRE INVESTIGATION TEAM

- **Hose deployment considerations**

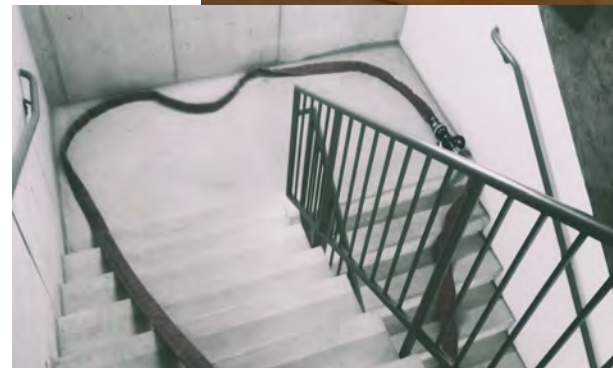
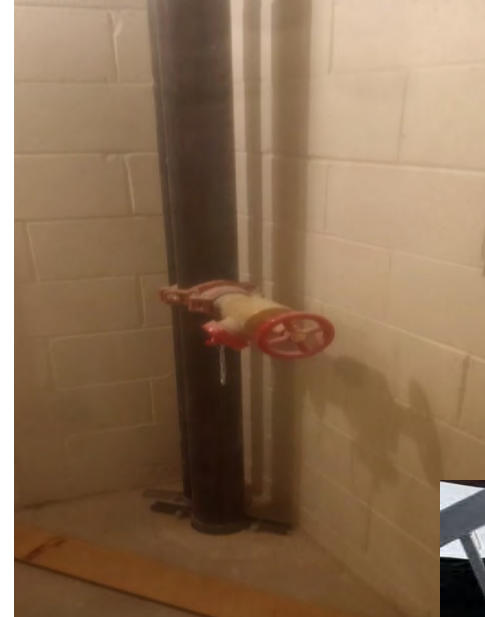
- The stretch is predicated on hallway conditions
 - Clean vs. dirty hallway
- How and where is the stretch coming
 - Shortest distance stretch (SDS)?
- What's the stretch? (lengths)



MID-RISE: FIRE INVESTIGATION TEAM

Hose deployment considerations

1. Hose in stairwells
2. Well-stretch
3. Rope drop or coupling drop
4. Using the standpipe?



MID-RISE: FIRE INVESTIGATION TEAM

- Keep your bearings
- Doors locked
- Closest stairwell – usable?
- Direct traffic
- Orchestrate the stretch
- Second due – Help with the stretch
- Smoke management (how)?

- **Do not rush or skip when there is a fire**
- **Results in critical mistakes**
- **The fire is the ultimate distractor; the pressure to make a decision forces us to make bad decisions**



IBC code provisions may allow a travel distance of 250 ft. From leaving the unit, traveling via a “protected corridor” to a “protected” stairwell. If fire attack is initiated remotely from the fire, the stretch will be short.

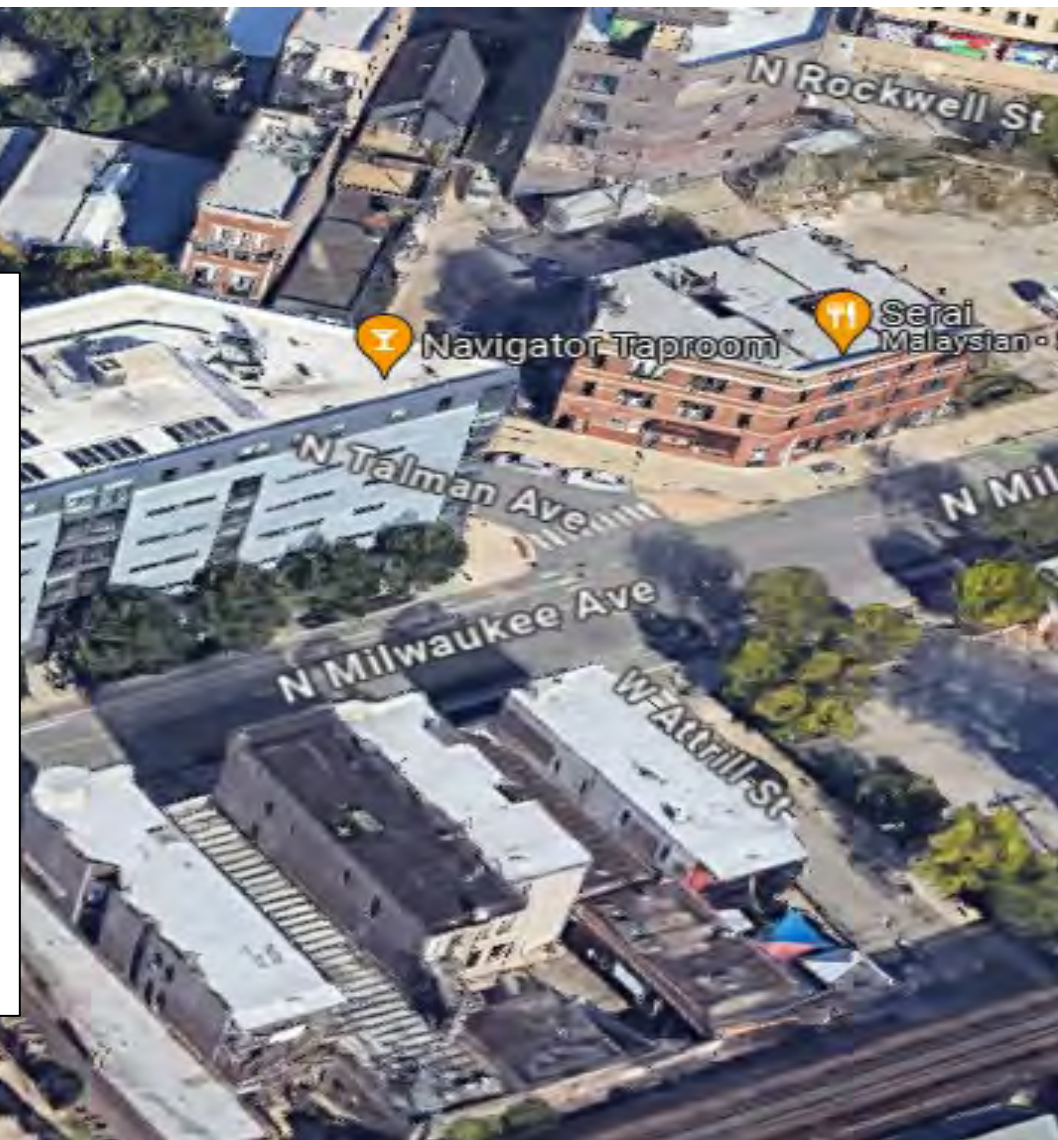


Figure 1. Typical mid-rise wood frame

By code, multifamily residential use must be fire-sprinklered, which reduces the potential fire risk of using wood construction in this type of building.

“Don’t worry, the building is sprinklered”

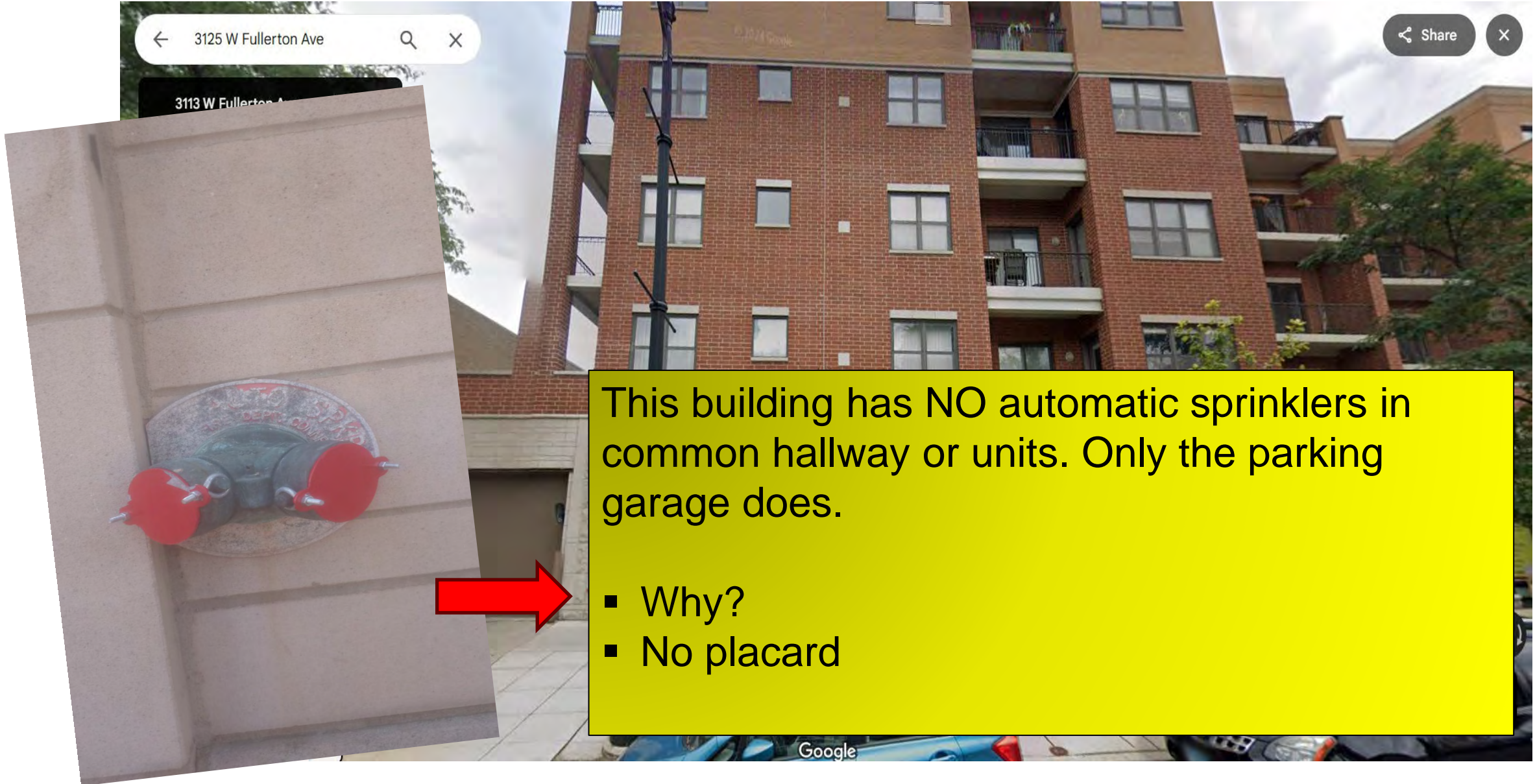


NFPA 13R

**NFPA 13R, Standard for the
Installation of Sprinkler
Systems in Low-Rise
Residential Occupancies**







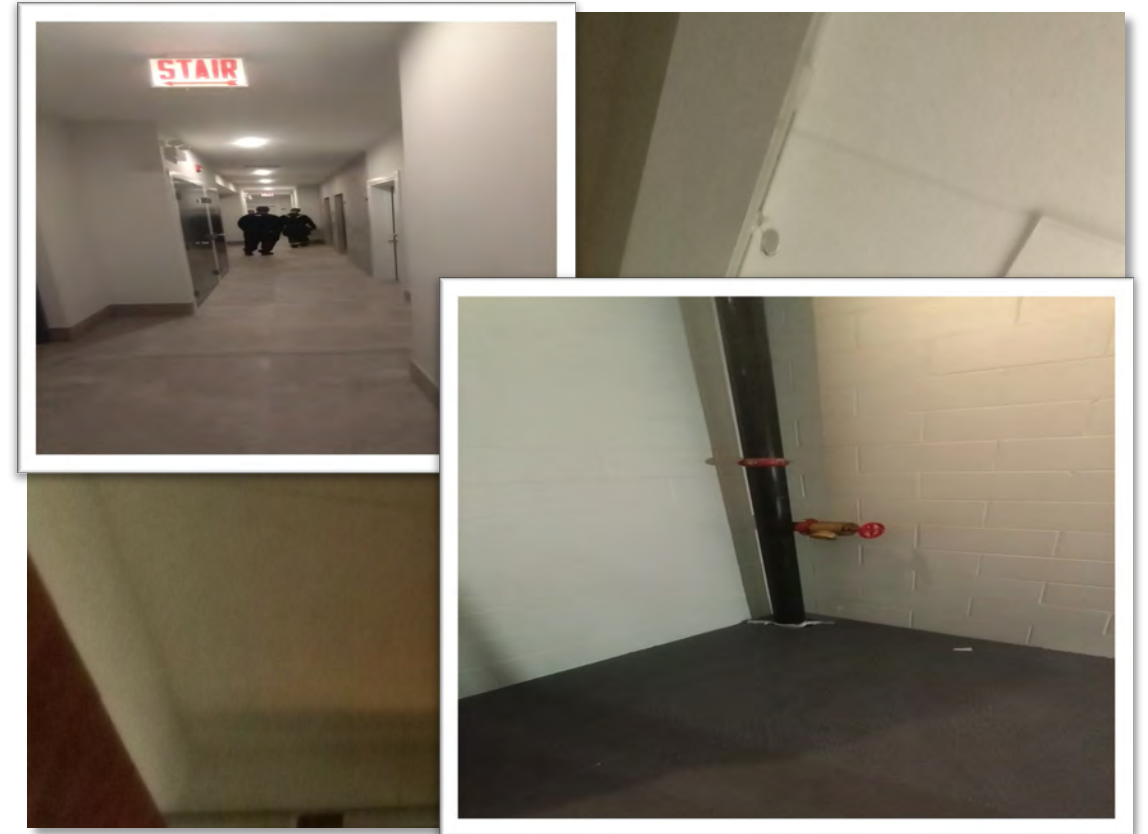
This building has NO automatic sprinklers in common hallway or units. Only the parking garage does.

- Why?
- No placard



NFPA 13R

- **Exemptions – “Trade Offs”**
 - Type I
 - Type II
- **Don’t assume**
 - FDC – what and where?



NFPA 13R

- Required by code
 - Type III, Type V
- Designed for “light hazard” applications
- Directed towards “life-safety” for egress
- Omission of sprinkler heads in concealed spaces & voids
- NFPA 13R delivers $\frac{1}{2}$ the discharge (gpm) density per sq. ft.



- 1 lb. of polymer plastics = 22,000 BTUs
- NFPA 13R is 4-6X cheaper than a NFPA 13 System
- “Blazemaster” CPVC is used for “light-hazard applications.”
- OMISSION of void spaces, closets and bathrooms





During a UL test, as shown in the picture above, a fire plume between 370°C (698°F) and 483°C (901.4°F) came in direct contact with BlazeMaster CPVC piping for 10 minutes.

This example shows that when exposed to a fire, CPVC piping forms a charring layer on the pipe's exterior, which then functions as a thermal barrier to reduce heat conduction. Water flowing through the pipe also cools the inside, further reducing the burning rate.





In the event of a fire, a BlazeMaster fire protection system reacts quickly to suppress and extinguish the flames without soaking unaffected rooms of the house. Homeowners can rest assured knowing their families and valuables are safeguarded by the most trusted nonmetallic fire protection system in the world.



NFPA 13R

- **Void spaces**
 - Account for 25% or more of the bldg. by volume (space)
- **Common voids**
 - Truss-loft
 - Horizontal highway
 - Pipe chases
 - Soffits



//

“One needs to ask, why is a full NFPA 13 sprinkler better protecting the vehicles below the platform and not life-safety in the "Toothpick" construction levels above? The 13R is not effective in the multitude of open void spaces.” – Jack Murphy



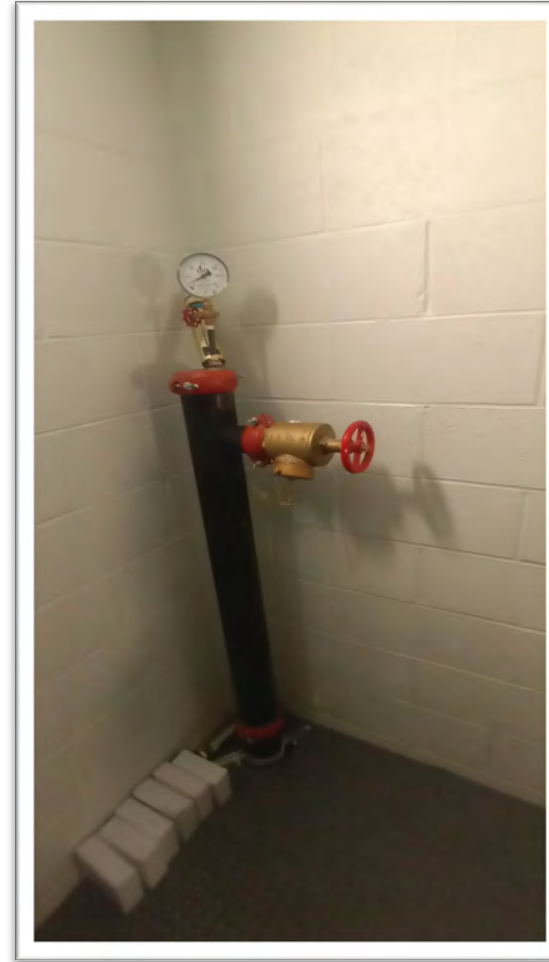
IBC 2021 905.3.1 standpipe requirements: Class I standpipe for bldgs. with floors more than 30 feet high if sprinklered, Class III for non-sprinklered.

- This is NOT a high-rise standpipe
- A standpipe (SP) doesn't mean it's an obligation to commit to a SP operation
- Sprinkler and standpipes are completed different in a mid-rise



Manual Wet Standpipe Systems

NFPA 14. Always wet, but NO adequate WATER PRESSURE (domestic water pressure) to produce a good hand[line]



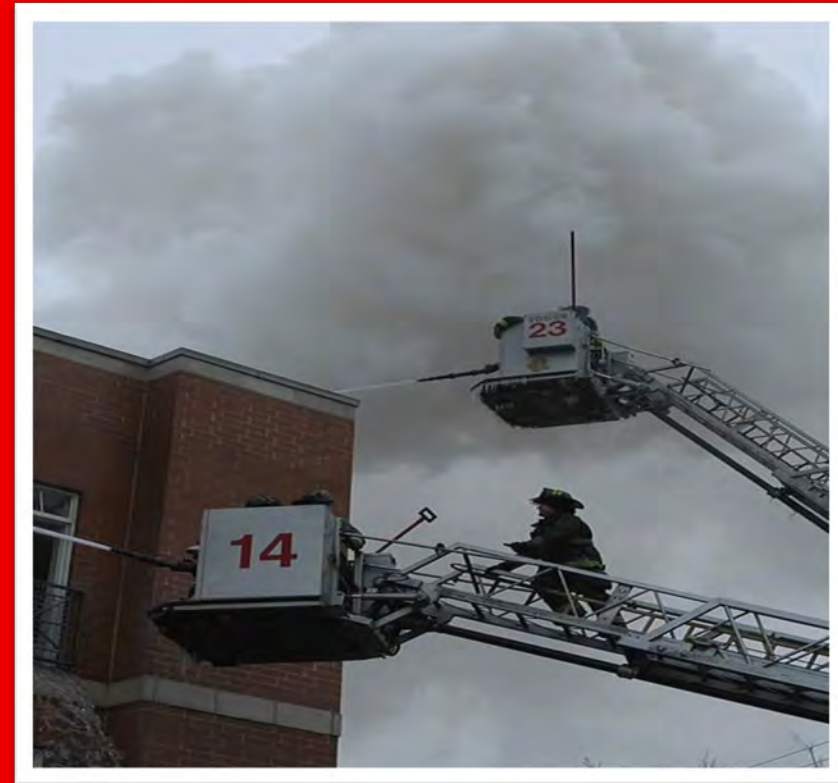
Manual Wet Standpipe Systems

- Using the SP will rob the sprinkler system
- FD to pump the FDC to supply system demand –150 #
- Allowable for Mid-Rise under 75 ft.
- IBC doesn't set a square footage requirement for a fire pump
- FDC should have a placard [NFPA 14, IBC] that indicates “wet or dry.”





MID-RISE FIRES



MID-RISE: FIRES

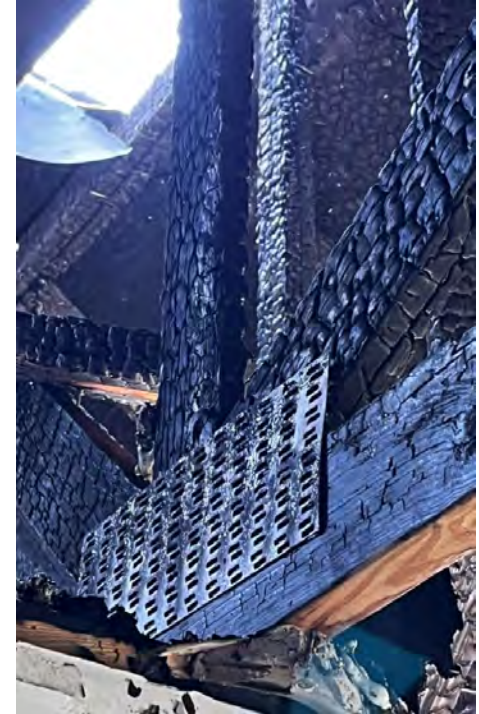
“When we have a fire in a lightweight constructed building, we can expect structural collapse within 5-10 minutes once structural members (floor or roof) have been exposed to fire. NOT 5-10 minutes after our arrival”



Chicago FD Training Bulletin – Feb. 2002



[Photo Chief DJ Stone]



[Photo by Justin Weinmann]

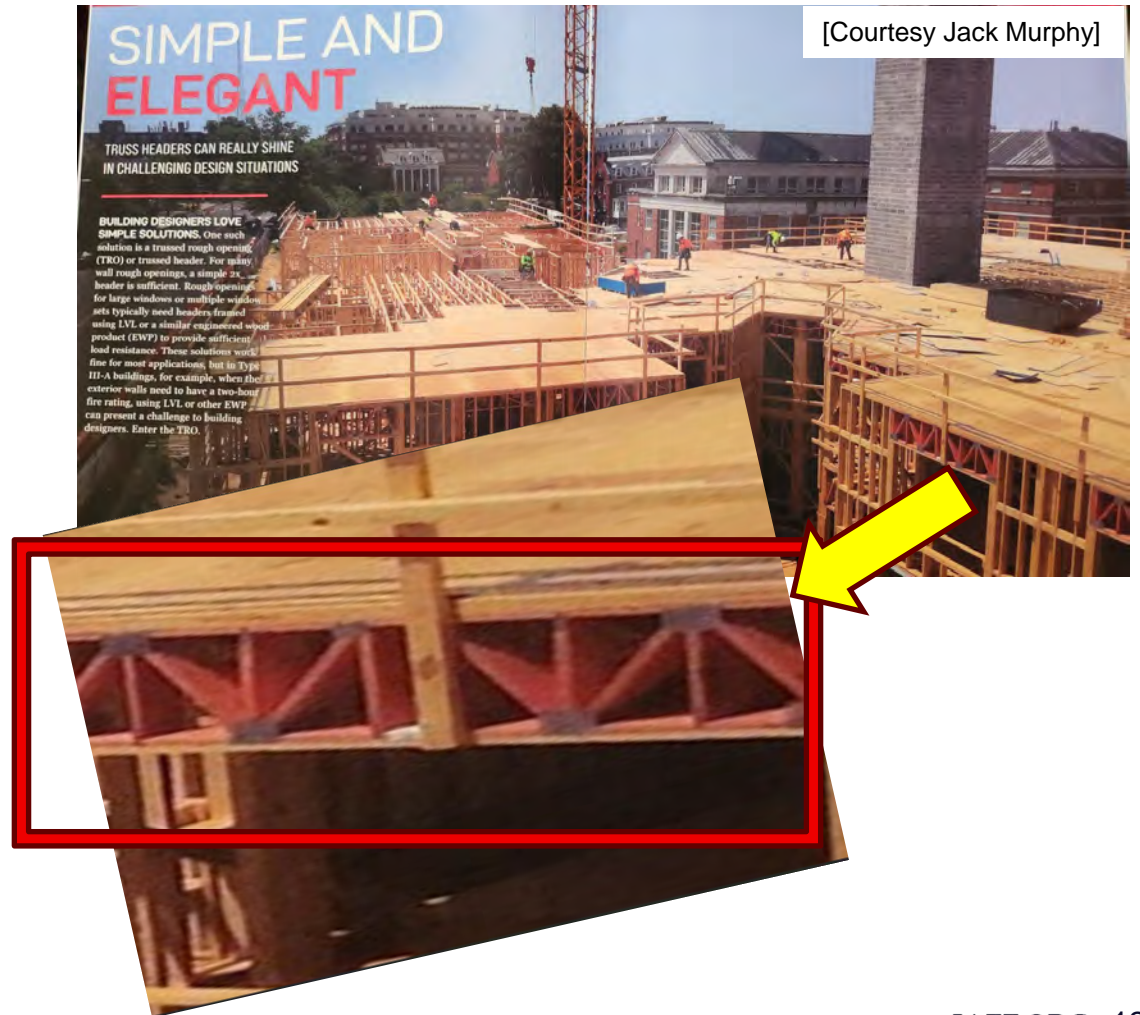


INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS

MID-RISE: FIRES

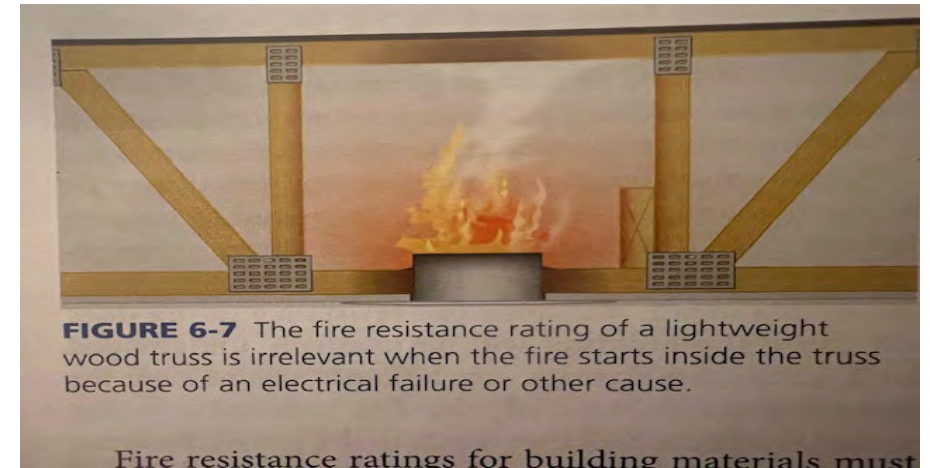
- **Fires in lightweight construction**
 - Contents or structure?
 - Advise of lightweight construction
 - Tactical channel
 - “Hyper-Vigilant”
 - Monitor exterior conditions – smoke at rim joist or window head (TRO)

- **Burn time**  **to water-on-fire?**



MID-RISE: FIRES

- **Transition into a structure fire**
 - Top Hats (can-lights) are easily defeated.
 - Housing/plastic baffle(s) melt-away
 - Smoke pushing from ceiling light fixtures is a good indicator of fire in void space
- **Type X and Type C Gypsum are not the same**



MID-RISE: FIRES

Fire Extension:

- Small non-protected penetrations can spread fire into the void
 - As little as a $\frac{1}{2}$ " is large enough
 - There are 1000s of penetrations
 - Wood shrinkage can open up joints
 - Wood shrinkage of $\frac{1}{4}$ " can occur over time
 - 5:1 mid-rise will shrink 1-inch in one year



MID-RISE: FIRES

Fire Extension:

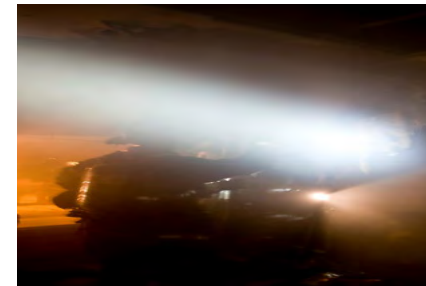
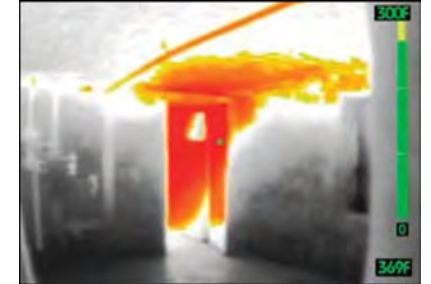
- Top floor fires
 - Attic space largest void (gable/hips)
 - Multi-directional fire spread
 - Common space
 - Fire walls/Fire Partition Walls
 - Dynamic Dead Loads above
 - Extensive operation (defensive)
 - Beyond your tactical reach
 - Risk increase when committed



MID-RISE: FIRES

Interior fire attack

- Use reach of stream @ entry
- TIC limitations, but use it!
- Open ceiling & inspect trusses
- “3-Pull Method of opening up”
 - Upon entry (doorway)
 - Mid-point area
 - Room of origin
- Smoke not clearing – open & inspect
- Return of fire
 - Get to the outside walls quick!



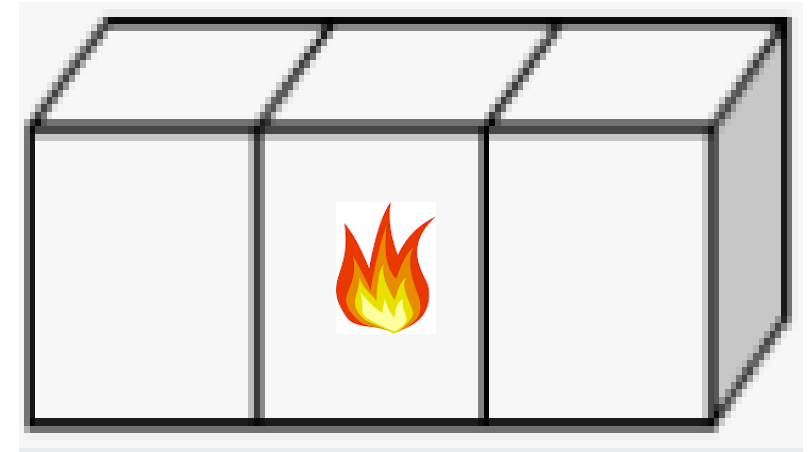
[Photos: Alan Jacobs, Andrew Starnes, Capt. Gustin]



MID-RISE: FIRES

Structure fire involving LW trusses

- Interior attack / reach of stream
- Multiple hand[lines] required
 - Simultaneous or sequential
- Pulling ceiling – inspect trusses
 - Box it out from remote units
- Determine size/scope of involvement
 - Get ahead of it, above it, around it, and below it!



MID-RISE: FIRES

Structure fire involving LW trusses

- Stay ahead, open ceiling(s) early!
- Fire in the truss-loft DOES NOT mean abandon the building
 - An interior attack might save the structure
- When the trusses are extensively involved in fire, where interior attack isn't feasible, use a defensive strategy.



Points to Remember

- Remember:
 - NFPA 13R “inadequate fire protection”
 - Assume the building is entirely combustible
 - Including roofs and balconies
 - Assume that a well-developed fire has extended into concealed voids
 - Voids require protection **(FIRE)** unit-to-unit
 - Draftstopping (smoke) may be ineffective
 - True firewalls may or may not be present





THANK YOU!
ANY QUESTIONS?

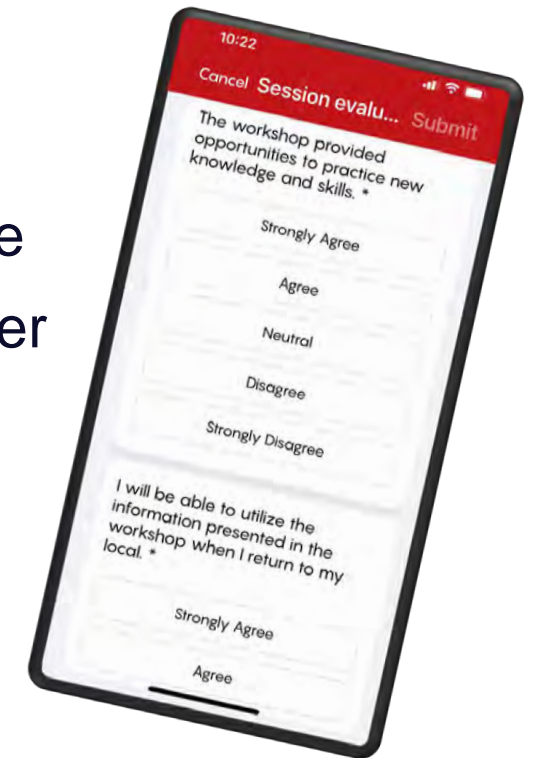


JIMMY DAVIS

Captain | jwdprb5969@att.net

EVALUATION AND WIN AN IPAD!

- **Submit your workshop and overall evaluations to be automatically entered in two drawings for a new iPad!**
- **Complete your evaluations using the IAFF app:**
 1. Download the IAFF app and sign in with your iaff.org username
 2. Tap the 2026 Strive for Excellence Summit event image to enter the event's dashboard
 3. Tap "Sessions" and tap on the workshops you attended
 4. Tap "Evaluation" and complete the evaluation
 5. Tap "Submit"



For the event's overall evaluation, follow steps 1 and 2, then tap "Event Evaluation" located in the event's Dashboard.

