



The Role of Building and Fire Inspectors During Construction- The U.S. Perspective

October 14, 2020



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Baltimore City Fire Department- 23 years

Retired as Assistant Fire Chief - Administration

Deputy Chief - Fire Marshal

Maryland State Child Care Advisory Council,

Maryland State Fire Code Update Committee,

Steering Committee for the Mid-Atlantic Life Safety Conference.

NFPA Urban Fire Safety Task Force

City of Rockville, MD- Chief Building Official

Appointed to the MD State Building Rehabilitation Advisory Council by Governor

Prince George's County- Chief Building Inspector

American Wood Council- Manager of Fire Service Relations

Administrator - Construction Fire Safety Coalition

Fire Code Action Committee- International Code Council

NFPA 1 Fire Code Technical Committee

NFPA 5000 Fire Protection Features Technical Committee

NFPA 101 Fire Protection Features Technical Committee

NFPA 220 Building Construction Technical Committee

J.D. - University of Baltimore School of Law



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Posts

 **Construction Fire Safety Coalition** October 17 at 5:30 PM · 🌐

Let's keep these firefighters in our thoughts and prayers!



BALTIMORESUN.COM

Seven firefighters, two others injured in gas explosion, fire in Northeast Baltimore

Like Comment Share ...

 **Construction Fire Safety Coalition** October 17 at 10:33 AM · 🌐

Nearly 400 Texas fire marshals attended an October 14 presentation on fire protection during construction at the 20th Annual Texas Fire Marshal's Association annual conference in Austin.

Rob Neale, principal at Integra Code Consultants and Coalition for Construction Fire Safety partner, presented a two-hour seminar promoting the Coalition's message on construction site hazards and mitigation strategies.

Although only a handful of attendees indicated they currently enforce the fire prevention program requirements of the International Fire Code or NFPA 241, following the presentation several indicated they would redouble their efforts to do so.





Outline

- Nature of the Problem
 - “Responsibility Gap”
 - “Enforcement Gap”
 - Multi-Family Trending
 - IFC New Provisions
-



Nature of the Problem

U.S. fire departments report the following structure fire averages

- 3,840 under construction
- 2,580 during major renovations

Campbell, Richard, NFPA, *Fires in Structures Under Construction or Renovation*, February 2020



CAUSES OF NEW CONSTRUCTION FIRES



- Cooking Equipment - 22%
- Electrical- 16%
- Heating Equipment- 15%
- Intentionally Set- 11%
- Torch, burner or soldering iron- 7%
- Exposure Fires - 4%
- Smoking- 4%
- Spontaneous Combustion- 4%

Campbell, Richard, NFPA, *Fires in Structures Under Construction or Renovation*, February 2020



CAUSES OF NEW CONSTRUCTION FIRES

- Cooking equipment is the leading cause of fires, but they are usually minor.
- Electrical fires account for 16% of all construction fires but 42% of property damage
- Intentionally set fires make up 11% of construction fires but responsible for 32% of property damage

Campbell, Richard, NFPA, *Fires in Structures Under Construction or Renovation*, February 2020



TIMING OF NEW CONSTRUCTION FIRES

- Occur more frequently in colder months.
- Peak times are between 1600 hrs. and 2000 hrs.
- 12% occur between midnight and 0400 hrs.

Campbell, Richard, NFPA, *Fires in Structures Under Construction or Renovation*, February 2020



LEADING FACTORS CONTRIBUTING TO IGNITION



- Electrical failures or malfunctions
- Abandoned, discarded materials or products
- Heat source too close to combustibles

Campbell, Richard, NFPA, *Fires in Structures Under Construction or Renovation*, February 2020



FIRES OCCURRING DURING MAJOR RENOVATION



- Electrical- 23%
- Heating Equipment- 15%
- Intentionally Set Fires - 12%
- Cooking Equipment - 10%
- Torch, Burner, or Soldering Iron - 9%
- Smoking Materials - 3%
- Exposure Fires - 3%

Campbell, Richard, NFPA, *Fires in Structures Under Construction or Renovation*, February 2020





ROLES & RESPONSIBILITIES

...that pertain to safety precautions during construction



“THE RESPONSIBILITY GAP”

Traditional Role of the Building Inspector:

- Examine the approved building plans
- Ensure that construction “as built” matches the approved plans
- Inspect the construction while applying building and trade codes
- **“We don’t inspect for fire safety, that’s the fire inspector!”**



“THE RESPONSIBILITY GAP”

Traditional Role of the Fire Inspector:

- Inspects completed buildings
- Examines fire protection systems & means of egress
- Applies fire code, which is a “maintenance code”
- **“We don’t inspect construction sites, that’s the building inspector!”**



“THE RESPONSIBILITY GAP”

Between traditional roles of Building vs. Fire Inspectors lies:

- Unsafe construction practices
- Violation of construction fire safety codes
- Ignition sources in the vicinity of fuel sources



“THE ENFORCEMENT GAP”

Local government’s budgets are tight

1. Building Department – are understaffed
2. Fire Prevention Bureau – staffed to conduct permit inspections
3. Fire Suppression Division – are being reduced, scope has increased



CASE STUDY: FAIRFAX COUNTY, VA



Date: February 8, 2020

Time: Approximately 8am

Location: 2800 block of Poag Street, Penn Daw, Fairfax County, VA

Response: 5 Alarms- Firefighters from Alexandria, Arlington, Fort Belvoir and Prince George's County assisted Fairfax County.

Injuries: One firefighter and one civilian (passerby) were taken for minor injuries

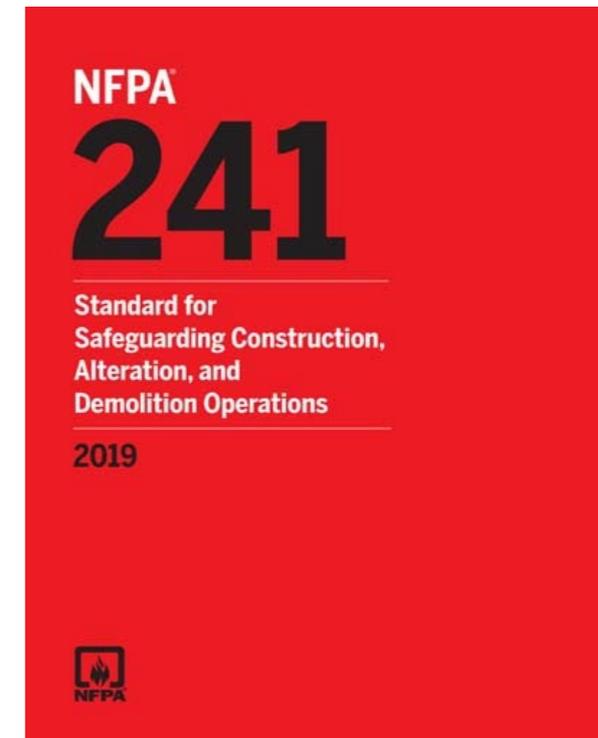


NFPA 241- GARBAGE CHUTES

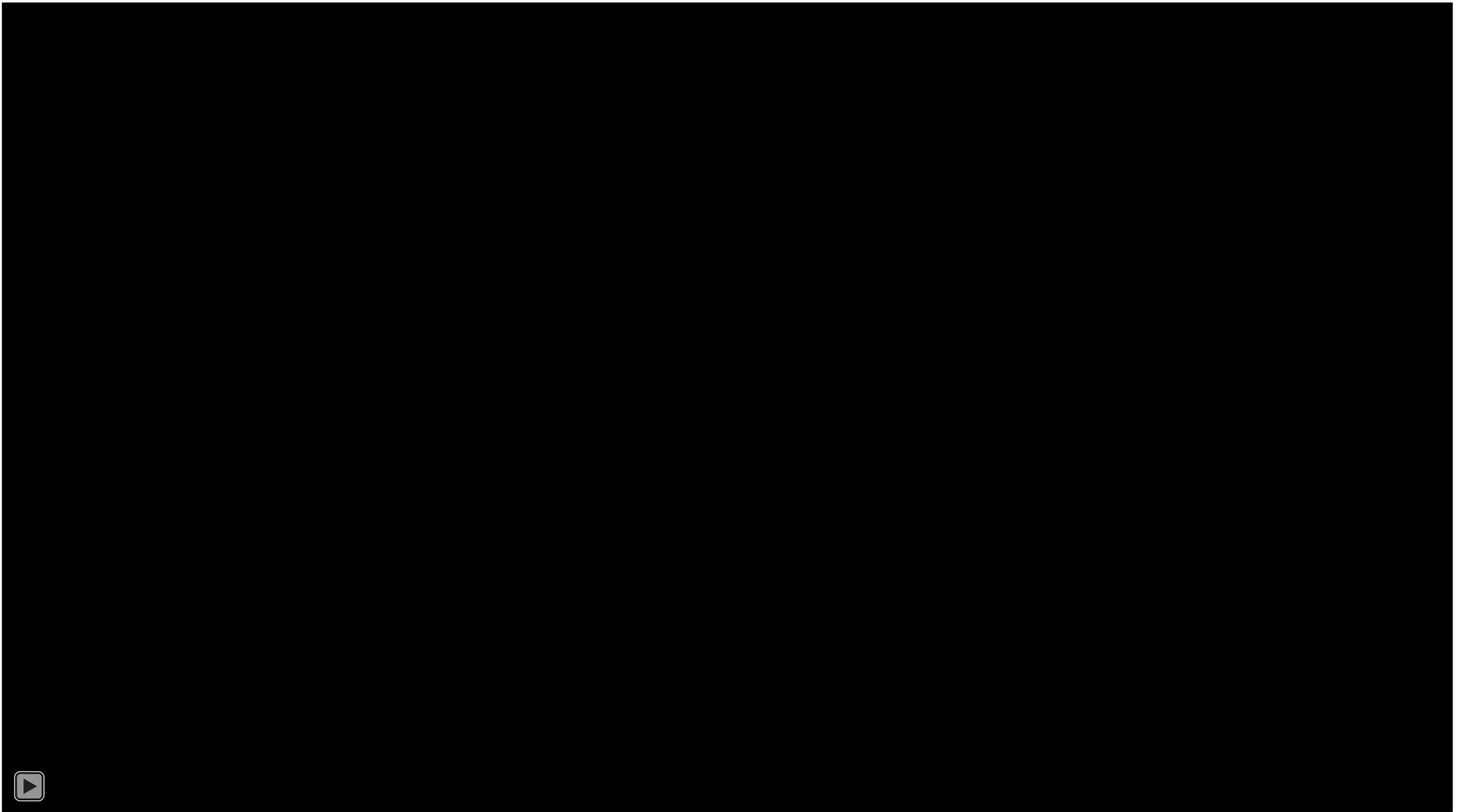
5.4.4.3* The interior of combustible trash chutes shall be provided with not less than one temporary automatic sprinkler within a recess near the top of the chute.

5.4.4.4 The temporary sprinkler required by 5.4.4.3 shall be protected by the recess as well as a listed sprinkler guard.

5.4.4.5 The temporary sprinkler required by 5.4.4.3 shall be connected to any available water supply with a listed fire hose, or a flexible, commercial rubber hose, with a diameter of not less than 19 mm ($\frac{3}{4}$ in.) and a listed flexible connector.



FIRST ARRIVING UNIT



MULTI-FAMILY STRUCTURE FIRE ARE TRENDING UP

Construction fires (Multi-family Structures) in the U.S.

- 2017- 13 fires
- 2018- 14 fires
- 2019- 24 fires
- **2020- 28 fires as of September 1st**



SITE SECURITY

- Guard service shall be provided when required by the AHJ
- Security fences shall be provided where required by the AHJ
- Entrances to the structure under construction must be secured
- The guard service must be trained in the following
 - Notification procedure
 - Function & operation of fire protection equipment
 - Familiarization of fire hazards
 - Use of construction elevator



SITE SECURITY

- Site security plan, based on security assessment, should include:
 - Personal observations
 - Log books
 - Video technology
 - Scheduled patrol routes
 - Proper notification procedures



SITE SECURITY

THEY ALWAYS PUT UP FENCES AFTER THE FIRE!



SITE SECURITY

- Convincing corporate leadership of the critical importance of site (physical) security during daytime operation and night time trespass prevention is a challenge.
 - An effective security perimeter interferes with site logistics, can be limiting to placement of construction stock
 - Most contractors aren't sufficiently sophisticated to understand how fences really affect site logistics.
 - Fences need not be a barrier to site logistics, a common challenge among urban builders.



SITE SECURITY

- Thoughts on Site Security
 - Video/artificial intelligence fence line monitoring.
 - "Real fence" surrounding the site - secured into the ground/pavement/sidewalk. No "weighted base" temp fencing.
 - Signs – "video security" and "no expectation of privacy"





NEW CONSTRUCTION SAFETY CODE PROVISIONS IFC 2021 EDITION

New Tools to Aid the Fire Service Enforcement of Construction
Safety Codes



NEW CONSTRUCTION SAFETY CODE PROVISIONS IFC 2021 EDITION

- **Daily Fire Safety Inspections**
- **Fire Watch Requirements**
- **Cooking Separation Requirement**
- **Site Safety Plan Requirement**
- **Site Safety Director Responsibilities**



DAILY FIRE SAFETY INSPECTIONS

The most impactful change regarding construction fire safety is requiring the construction “Site Safety Director” to conduct daily fire safety inspections at the project site.



DAILY FIRE SAFETY INSPECTIONS

Site Safety Director must conduct daily fire safety inspections at the project site.

These daily inspections must include the exterior and interior of the buildings under construction everyday until the certificate of occupancy is issued.

The daily inspections must be documented and available immediately upon request of the fire official. Failure to conduct and/or document the daily inspections can result in a violation being issued.

3rd offense the fire official can issue a “stop work” order until the fire code official receives “satisfactory assurances” of future compliance.



REQUIREMENTS OF THE DAILY INSPECTIONS

- ✓ Inspect hot work areas
- ✓ Inspect all temporary heating equipment
- ✓ Ensure combustible trash and debris is removed from the non-work areas daily
- ✓ Ensure temporary wiring does not have exposed conductors
- ✓ Flammable liquids and hazardous materials are being stored properly in approved locations



REQUIREMENTS OF THE DAILY INSPECTIONS

- ✓ Fire hydrants are unobstructed and “clearly visible”
- ✓ Inspect fire access to confirm free of obstructions
- ✓ Ensure standpipes are in service and go up with the building within one floor of the highest construction
- ✓ Portable fire extinguishers are in service and properly spaced



FIRE WATCH REQUIREMENTS

Fire watch mandatory for buildings above 40 feet in height or with an aggregate area exceeding 50,000 square feet.

It was felt that “these buildings are large enough to create a significant loss to the community, endanger firefighters, and consume resources...if the building burns.”



FIRE WATCH REQUIREMENTS

Allows fire watch personnel to also serve as security.

The fire watch personnel must be trained in the use of portable fire extinguishers and fire reporting.

The fire watch must have at least one means to notify the fire department.

Fire watch personnel must keep a record of all time periods of duty, including a log of all patrols and times and locations that buildings were entered and inspected.



IBC 2021 CODE CHANGES- MASS TIMBER

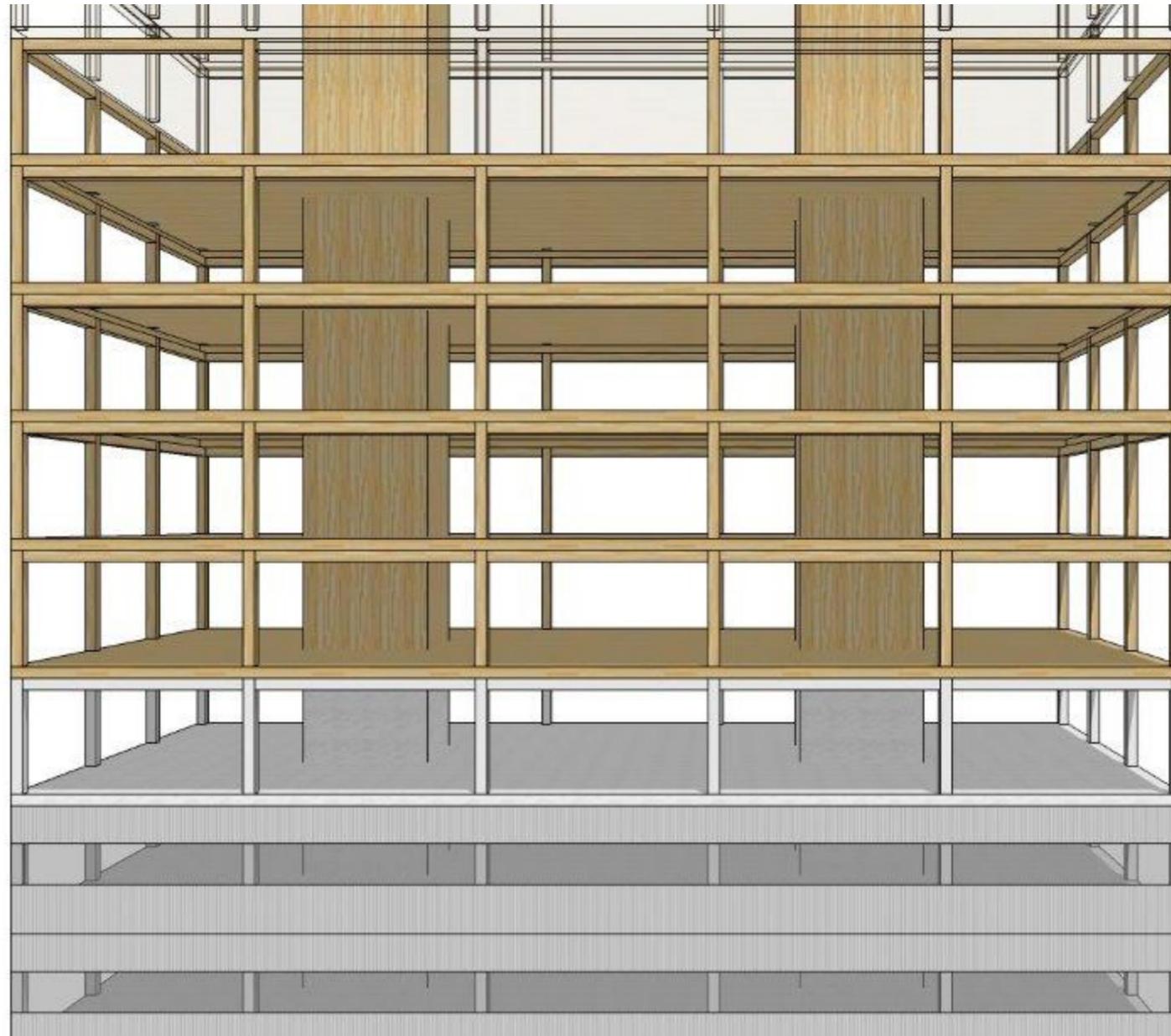
IFC 3314.7 Fire safety requirements for buildings of Types IVA, IVB, and IVC construction. Buildings of Types IVA, IVB, and IVC construction designed to be greater than six stories ABOVE GRADE PLANE shall meet the following requirements during construction unless otherwise approved by the *fire code official*.

1. Standpipes shall be provided during construction in accordance with Section 3311.
2. A water supply for fire department operations, as approved by the fire chief.
3. Where building construction exceeds six stories ABOVE GRADE PLANE, at least one layer of the noncombustible protection required by Section 602.4 shall be installed on all building elements more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor levels.
4. Where building construction exceeds six stories ABOVE GRADE PLANE required exterior wall coverings shall be installed on all floor levels more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor level.

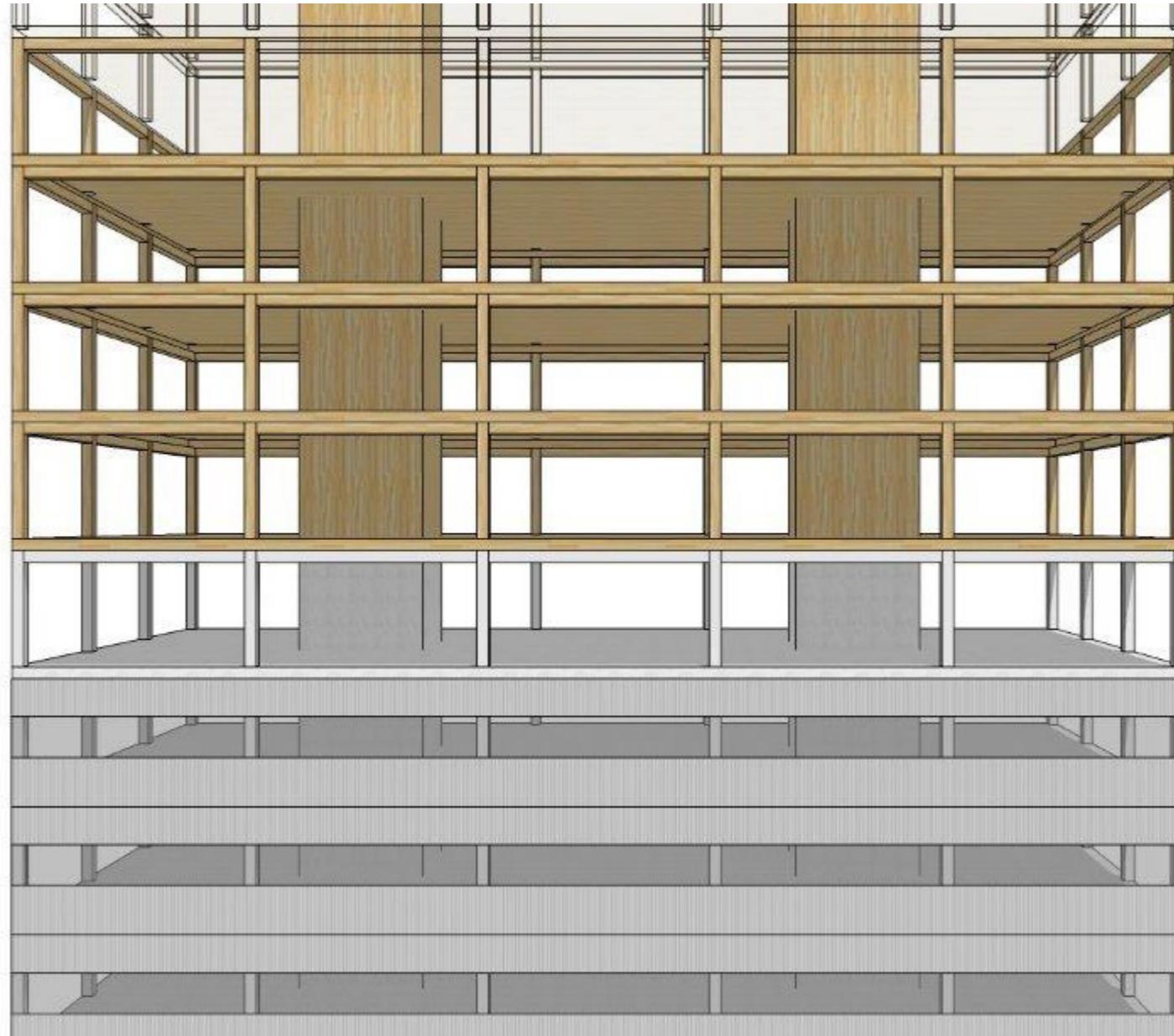
Exception: Shafts and vertical exit enclosures.



FIRE SAFETY DURING CONSTRUCTION



FIRE SAFETY DURING CONSTRUCTION





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