



Preventing building fires

IFC® provides fire-prevention guidelines for building and structures

by Mark S. Graham

The International Code Council®'s International Fire Code® establishes minimum requirements that provide a reasonable level of life safety and property protection from the hazards of fire, explosions or dangerous conditions in new and existing buildings. It includes several roofing-related provisions.

IFC 2024

IFC first was published in 1997 and was written by a committee consisting of members of the three legacy model code organizations (Building Officials and Code Administrators International, International Conference of Building Officials and Southern Building Code Congress International). The committee's draft generally was consistent with the existing model fire codes at the time (*The BOCA National Fire Prevention Code, Uniform Fire Code and Standard Fire Prevention Code*).

In 2000, IFC's first edition was published using ICC's code development process. New editions have been published every three years since with the most current edition being IFC 2024.

IFC 2024 is divided into seven parts with 50 chapters and 15 appendices (see figure). The appendices are not mandatory unless



IFC 2024's Parts and Chapter Topics	
Part I—Chapters 1 and 2	Administration and definitions
Part II—Chapters 3 and 4	General safety provisions
Part III—Chapters 5 through 12 (Chapters 12 through 19 are reserved for future use)	Building and equipment design features
Part IV—Chapters 20-41 (Chapters 42 through 49, and 52 are reserved for future use)	Special occupancies and operations
Part V—Chapters 50, 51 and 53 through 67 (Chapters 68 through 79 are reserved for future use)	Hazardous materials
Part VI—Chapter 80	Referenced standards
Part VII—Appendices A through O	Adoptable and informational appendices

IFC 2024's arrangement and format

specifically referenced in a jurisdiction's adoption ordinance.

The code is intended to apply to buildings and conditions arising after the adoption of IFC; existing buildings; and conditions that, in the opinion of the

fire code official, constitute a distinct hazard to life or property.

IFC is intended to be used in concert with the *International Building Code*® and *International Residential Code*®. If there is a conflict between the provisions of IFC and IBC or IRC, IFC's Section 102.10-Conflicting Provisions indicates the most restrictive provision shall govern.

Roofing considerations

IFC 2024's roofing-specific provisions are spread throughout the code.

In Chapter 1-Scope and Administration, Section 105.5.25-Hot Work Operations indicates a hot work operational permit is required when applying roof coverings with an open-flame device. An example of an

open-flame device is an open-flame torch used to apply polymer-modified bitumen membrane and flashing products.

Chapter 3-General Requirements, Section 303-Asphalt Kettles provides specific provisions for transporting, job-site placement, fuel container placement, operators, fire extinguishers and construction of roofing kettles. For example, Section 303.2-Location indicates kettles must not be placed within 20 feet of any combustible material, combustible building surface or opening. Roofing kettles and kettle operations must not block a building's means of egress, roadways or building entrances. Kettles are not permitted to be used inside buildings or on rooftops.

Section 304-Combustible Waste Material provides requirements for handling combustible waste material, including roof tear-off materials. Section 304.1.2-Waste Material indicates accumulations of combustible or flammable waste or rubbish of any type are not permitted to remain on a roof.

Section 316.4-Obstructions on Roofs restricts rooftop obstructions that can hamper firefighter access. Wires, cables, ropes, antennas or other suspended rooftop obstructions on buildings with roof slopes of 7:12 or less must not create obstructions less than 7 feet high above a roof's surface.

An exception to this requirement permits lower height obstructions where the obstruction is encased in a white 2-inch minimum diameter plastic pipe or a fire code official-approved equivalent.

Section 317-Vegetative and Landscaped Roofs provides requirements for maintaining vegetative and landscaped roofs, including provisions for supplemental irrigation, removing dead foliage, establishing a maintenance plan and storage of fueled maintenance equipment. Section 317.3-Maintenance Plan authorizes fire code officials to require a maintenance plan when a fire hazard exists or a building is exposed to a fire hazard because of a lack of rooftop maintenance.

In Chapter 12-Energy Systems, Section 1205-Solar Photovoltaic Power Systems provides provisions for rooftop-mounted PV systems, including access pathways, smoke ventilation and labeling of rapid shutdown equipment. For example, Section 1205.3-Other than Group R-3 Buildings indicates a minimum 6-foot-wide access pathway must be maintained around rooftop-mounted PV at a roof's perimeter edges for firefighter access. An exception permits the access pathway to be reduced to 4 feet wide if the length or width of the building is 250 feet or less.

In Chapter 33-Fire Safety During Construction and Demolition, Section 3305.10-Safeguarding Roofing Operations provides provisions for roofing operations, including placement and use for roofing kettles, and fire extinguishers for roofing operations. The provisions for roofing kettles refer to Section 303. Section 3305.10-Fire Extinguishers for Roofing Operations requires at least one 3-A 40-B:C-rated fire extinguisher be on the roof during any roofing operations.

Closing thoughts

Building owners and operators, roof system designers and roofing contractors should be aware of the fire code and specific edition that applies to the buildings they work on.

IFC reportedly has been adopted by 31 states. To see a state list of IFC adoptions, go

to iccsafe.org and enter “adoptions” in the search feature. Another fire code, the National Fire Protection Association’s NFPA 1, “Fire Code,” applies in most other jurisdictions.

NRCA has submitted several code change proposals during ICC’s 2024 Group A code development cycle intended to clarify IFC’s roofing-related requirements. If approved, the changes will be incorporated into IFC 2027.

IFC 2024 and its previous editions are accessible at codes.iccsafe.org. 🌐🔍📖

MARK S. GRAHAM is NRCA’s vice president of technical services.

MIT develops AI-involved training for robots

A recent study by Massachusetts Institute of Technology researchers shows a new training method for robots may bring them closer to performing complex tasks on job sites with more efficient results, according to Construction Dive.

MIT’s Improbable AI Lab, a group within its Computer Science and Artificial Intelligence Laboratory, combined three types of instruction—language-, visual- and action-based—to teach robots how to perform multistep tasks with higher success rates than comparable training methods.

The training framework, known as Compositional Foundation Models for Hierarchical Planning, reportedly can help robots have an effect in construction, manufacturing and household chores.

The training involved robots approaching a larger objective by completing many smaller steps first. Each step is improved on by the next through a process that allows the training framework to reason about its ideas and take in feedback at each stage to generate a more practical outline.



To view examples of MIT’s AI training, go to professionalroofing.net.

Anurag Ajay, a Ph.D. student at MIT and a Computer Science and Artificial Intelligence Laboratory

affiliate, says robots currently are limited by their hardware but would be good at performing brute force work, such as picking up heavy objects and moving them.

SPRI to canvass RD-1 retrofit drain standard

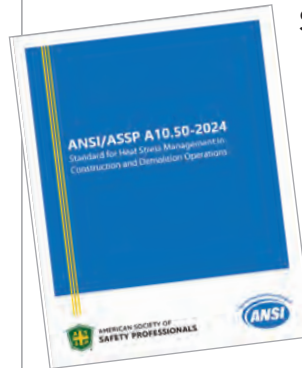


SPRI has announced it is revising ANSI/SPRI RD-1, “Performance Standard for Retrofit Drains,” and plans to canvass the document for reapproval as an American National Standard.

ANSI/SPRI RD-1 is a reference for individuals who design, specify or install retrofit roof drains designed for installation in existing drain plumbing on existing roofs. The standard does not include consideration of all roof stormwater drainage code requirements for specific building sites.

In 2004, SPRI developed the ANSI/SPRI RD-1 standard for use by architects, engineers, consultants, roofing contractors and owners of low-slope roof systems. It was last revised and reapproved as an ANSI standard in 2019.

Standard regarding heat stress in construction is published



The American Society of Safety Professionals has published the first national voluntary consensus standard addressing heat stress for workers in construction and demolition operations, according to the ASSP website.

ANSI/ASSP A10.50-2024, “Heat Stress Management in Construction and Demolition Operations,” offers guidance regarding protecting

workers, explains how to acclimate workers to high heat conditions, and provides requirements for training employees and supervisors. The standard includes checklists and flowcharts designed to help companies develop clear, effective heat stress management programs that bridge the regulatory gap.

“This new industry consensus standard is an important development because there is no federal regulation focused on heat stress,” says Jim Thornton, president of ASSP. “Employers need expert guidance on how to manage heat-related risks. They must have the tools and resources to identify and help prevent work hazards before an incident occurs.”

The A10.50 standard identifies engineering and administrative controls a company can implement to ensure workers get proper rest, water breaks and shade while still meeting business needs. Recommendations such as medical monitoring and using a buddy system can reduce risks and help prevent heat-related illnesses in many work environments.

The effects of heat stress can range from mild symptoms such as heat rash and heat cramps to severe conditions such as heat exhaustion and heat stroke, which can be fatal. The standard includes a detailed emergency response plan if a worker has a severe reaction to excessive heat.

NRCA was part of the A10.50 subcommittee that wrote the standard; the subcommittee consisted of 30 safety and health experts from businesses, trade unions, consulting firms, universities and government agencies.