Maintaining compliance

IPMC® provides code requirements for building maintenance

by Mark S. Graham

The International Code Council®'s International Property Maintenance Code® establishes minimum requirements for the maintenance of existing buildings, including their roof systems, through model code regulations. IPMC 2024 has several roofing-related requirements and can be used as a basis for roofing contractors performing periodic roof system maintenance.

IPMC 2024

The IPMC originated in 1996 when a committee consisting of representatives of the three legacy code organizations (Building Officials and Code Administrators International, International Conference of Building Officials and Southern Building Code Congress International) drafted comprehensive guidelines for existing buildings based on the legacy codes' requirements for existing buildings.

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

IPMC 2024 has eight chapters and two appendixes (see figure). The appendixes are not mandatory unless specifically referenced in

a jurisdiction's adoption ordinance.

The code applies to all existing residential and nonresidential structures and is intended to establish minimum requirements to provide a reasonable level of health, safety, property protection and general welfare insofar as they are affected by a building's continued occupancy. Existing buildings that do not comply with the code's provisions are required to be altered or repaired to provide a reasonable minimum level of health, safety and general welfare as required by the code.

Section 102.3-Applicaton of Other Codes indicates any repairs, additions or alterations must be done in accordance with the jurisdiction's other applicable codes, most commonly the International Existing Building Code,® International Building Code® and International Residential Code.®

Section 102.7-Historic Buildings states the code's provisions are not mandatory for existing historical buildings where the building is judged by the code official to be safe and in the public interest of health, safety and welfare.

Building owners are required to maintain their structures and exterior property in compliance with IPMC 2024 and the code under which the building was constructed except as otherwise provided in the IPMC.

Roofing considerations

A majority of IPMC 2020's provisions specific to roof systems are provided in

IPMC 2024

Chapter 1:	Scope and Administration
Chapter 2:	Definitions
Chapter 3:	General Requirements
Chapter 4:	Light, Ventilation and Occupancy Limitations
Chapter 5:	Plumbing Facilities and Fixture Requirements
Chapter 6:	Mechanical and Electrical Requirements
Chapter 7:	Fire Safety Requirements
Chapter 8:	Referenced Standards
Appendix A:	Boarding Standard
Appendix B:	Board of Appeals

IPMC 2024's chapter and appendix format

Section 304-Exterior Structure. Section 304.1.1-Potentially Unsafe Conditions provides a list of conditions that should be assessed and, if necessary, addressed according to IEBC, IBC or IRC as applicable. Item 2 on the list includes anchorage of roofs to walls or columns and stipulates there should not be distress that appears to reduce load-carrying capacity.

Item 7 on the list includes roofing materials and components that have defects that admit rain, roof surfaces with inadequate drainage, or any portion of the roof framing with signs of deterioration or fatigue.

Section 304.7-Roofs and Drainage indicates roofs and flashings must be sound, tight and not have defects that admit rain. Roof drainage is required to be adequate to prevent dampness and deterioration at walls and in the interior portion of a roof structure. Roof drains, gutters and downspouts are required to be free of obstructions and in good repair. Roof drainage cannot be discharged in a manner creating a public nuisance.

In Chapter 5-Plumbing Facilities and Fixture Requirements, Section 507.1 also indicates roof drainage is not permitted to be discharged in a manner creating a public nuisance.

Chapter 7-Fire Safety Requirements, Section 703-Fire-resistance Ratings and Section 703.1-Maintenance requires the fire-resistance rating of fire-resistance-rated construction must be maintained. Such elements are required to be visually inspected annually by the building owner and be repaired, restored or replaced if damaged, altered, breached or penetrated. Records of inspections and repairs must be maintained.

Roofing contractors' roles

Roofing contractors who perform roof asset management and maintenance and repair services can assist building owners in complying with IPMC 2024's roofing-related requirements. Specific roofing-related items required by IPMC 2024 (repairing roof system leaks; clearing roof drains, gutters and downspouts of debris; and noting any ponding water conditions) typically are included in roofing contractors' routine roof system service and maintenance programs.

IPMC 2024's requirement for annual visual inspection and maintaining fire-resistance ratings is rather nonspecific and broad in the context of roof systems. Examples of visible surface conditions that may affect a roof system's fire classification include scour of aggregate surfacings, loss of mineral-granule surfacing, and roof coating erosion or flaking. If these conditions exist, they should be noted and reported to building owners.

Other than the annual visual inspection and maintenance of fire-resistance ratings, IPMC 2024 does not specify inspection and maintenance frequency. NRCA maintains its long-standing recommendation that roof systems should be inspected and any necessary repairs be made twice a year. Additional inspections and maintenance may be necessary after severe weather is experienced.

For a link to IPMC 2024, visit professionalroofing.net.

NRCA has published inspection and maintenance documents addressing built-up and polymer-modified bitumen membrane, single-ply membrane, architectural metal panel and structural metal panel roof systems

that can be used for conducting periodic roof inspections and maintenance. Each document includes checklists that can be used for documenting inspections and noting any necessary repairs to building owners.

Additional information about repairs for membrane roof systems is provided in *NRCA's Repair Manual for Low-slope Membrane Roof Systems, 2nd Edition*. Repair guidance for asphalt shingle roof systems is provided in *The NRCA Repair Manual for Asphalt Shingle Roof Systems*.

These NRCA repair manuals can be purchased from shop.nrca.net.

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

Article analyzes effectiveness of membrane roll sizes

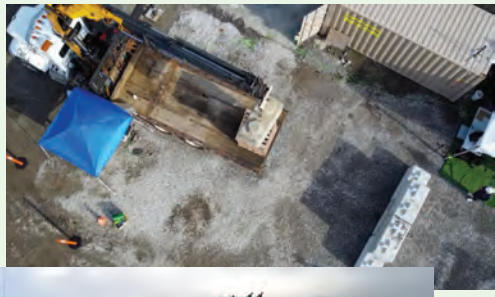
Interface Magazine has published "All Thermoplastic Rolls Are Not Equal" by Colin Murphy, principal of Trinity | ERD, Seattle. The article investigates claims it is quicker and more cost-effective to use wide-width rolls in mechanically attached systems by analyzing side-lap attachment spacing and seam-welding lengths and comparing use of wide-width rolls with traditional, narrower rolls.

Trinity | ERD researchers used variables affecting installation speed of a mechanically attached roof covering such as number of fasteners installed into a side lap, roll maneuverability and total lineal footage of welds. Findings revealed for single-ply mechanically attached systems, standard 72- and 81-inch wide rolls are faster to install when compared with wider rolls with 6 inches on center side-lap spacing.

For more information about the research, contact IB Roof Systems, Grapevine, Texas, at ibroof.com/contact-us.

Robots work on experimental job site

A team of researchers at the University of British Columbia, Vancouver, demonstrated how its collection of robots could work autonomously on a job site on Mitchell Island in Richmond, British Columbia, according to Construction Dive.



Camera-bearing aerial drones captured details that were used to create digital twins of the job site. Using "as-built" information, AI-equipped cranes and forklifts moved construction materials around the actual site and navigated around obstacles without a human operator.

Tony Yang, a UBC professor, says the impetus for the technology's development stemmed from labor shortages across the U.S. and Canada. Although the robot technology was usable and job-site ready, it is not yet commercially available.

"Our goal is to ensure workers actually become managers instead of doing the physical hard work," Yang says. "They are controlling a machine or giving instructions to machines to do the job."

An autonomous system also can detect whether workers enter an unsafe area. Yang says the software did more than 1,024 checks per second.

In addition, Yang and his team are working with Rogers Communications Inc., a Canadian communications and media company, on a product that would enable contractors to wrap the broader spectrum of digital construction management under the umbrella of a single tech product. The team is also developing a fully autonomous excavator, which will use drawings to dig out the foundation of buildings without human aid.

To view a video demonstrating the UBC team's artificial intelligence-driven robots, go to professionalroofing.net.

Yang says the goal of his research is not to take jobs away from workers, though similar claims have been met with skepticism from experts.