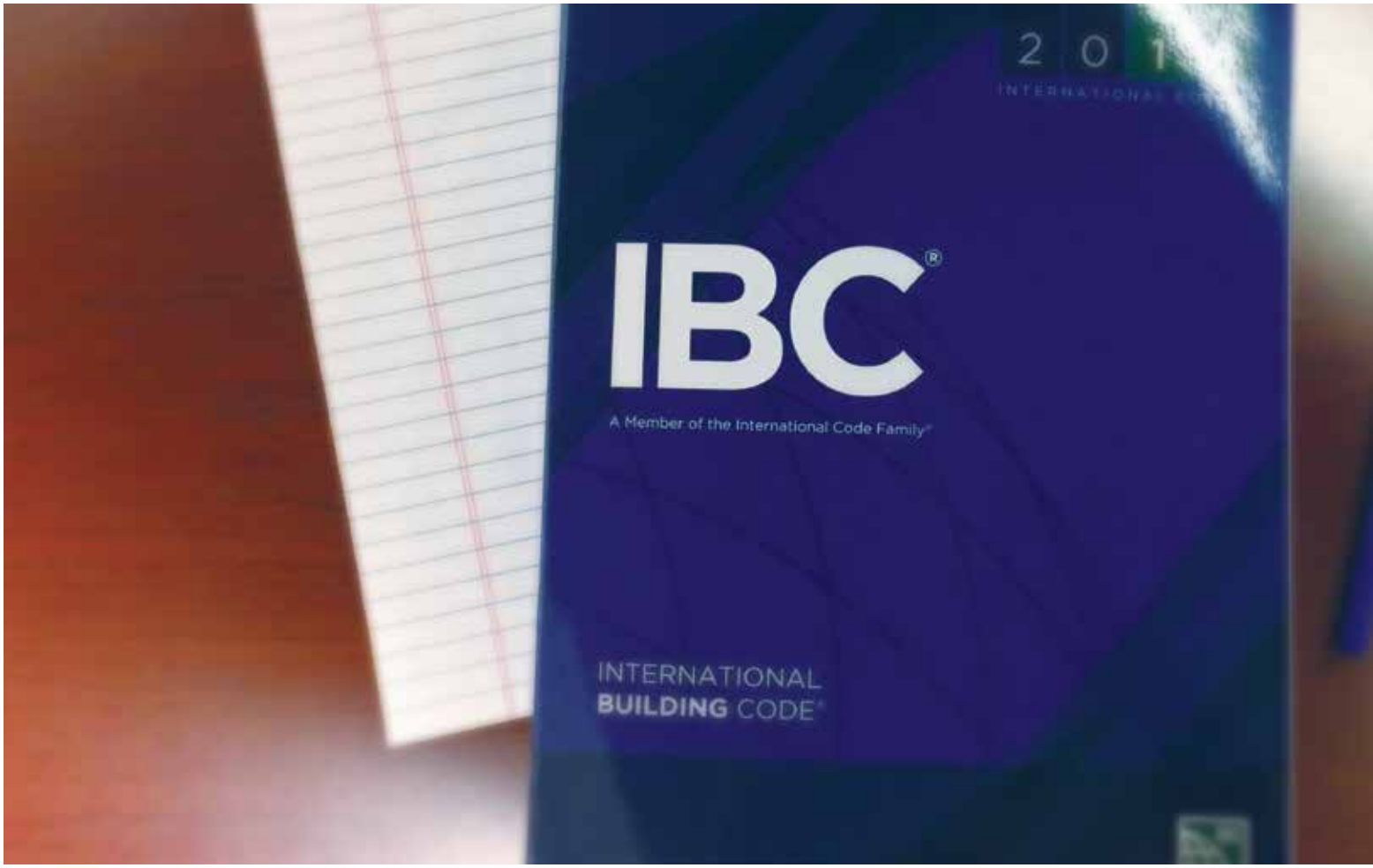

Standards you should know

SPRI standards provide guidance to designers and contractors

by Mark S. Graham

SPRI, which represents manufacturers of single-ply membrane roof system products and associated accessories, also is a standards-development organization. And because some of SPRI's standards are referenced in International Building Code,® 2018 Edition (IBC 2018) and can be used as design references, designers and roofing contractors should be aware of them.

ANSI process

SPRI is an American National Standards Institute- (ANSI-) accredited standards developer. ANSI facilitates the development of American National Standards by accrediting the procedures of standards developing organizations (SDOs), such as SPRI. Accreditation by ANSI signifies the standards development procedures used by an SDO meet ANSI's essential requirements for openness, balance, consensus and due process.

To read an article related to this topic, see "Complying with ES-1," July 2014 issue.

There are 237 SDOs accredited by ANSI and more than 11,500 ANSI standards.

Code references

References to three SPRI standards are contained in IBC 2018.

IBC 2018's Section 1504.4-Ballasted Low-slope Roof Systems references ANSI/SPRI RP-4-2013 (RP-4), "Wind Design Standard For Ballasted Single-ply Roofing Systems," as the basis for designing aggregate and paver-ballasted single-ply membrane roof systems. RP-4 is based on ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," and limits the use of RP-4-compliant ballasted roofs to buildings 150 feet high or lower.

IBC 2018's Section 1504.8-Surfacing and Ballast Materials in Hurricane-prone Regions and Table 1504.8 Maximum Allowable Mean Roof Height Permitted for Buildings with Aggregate on the Roof in Areas Outside a Hurricane-prone Region further limit aggregate usage based on a building's mean roof height, nominal design wind speed (V_{asd}) and exposure category. IBC 2018 uses ACE 7-16.

IBC 2018's Section 1504.5-Edge Securement for Low-slope Roofs references ANSI/SPRI/FM 4435/ES-1-2011 (ES-1), "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems," as a method for testing the wind resistances of edge metal flashings (except gutters) for built-up, polymer-modified bitumen and single-ply membrane roof systems.

The code specifically references ES-1's RE-1, RE-2 and RE-3 resistance test methods and not ES-1's other requirements. Tested resistances need to exceed design wind loads determined using the code's Chapter 16-Structural Design.

IBC Section 1505.10-Roof Gardens and Landscaped Roofs references ANSI/SPRI VF-1-2010 (VF-1), "External Fire Design Standard for Vegetative Roofs," as a method for design of vegetative roof systems for external fire resistance.

The code includes additional requirements for vegetative roof systems in Section 1505.10-Roof Gardens and Landscaped Roofs, Section 1507.16-Vegeative Roofs, Roof Gardens and Landscaped Roofs and in the International Fire Code's Section 317-Rooftop Gardens and Landscaped Roofs.

Other design references

In addition to the SPRI standards referenced in the code, other SPRI standards can be used as design references. These include:

- ANSI/SPRI/RCI NT-1-2017, "Detection and Location of Latent Moisture in Building Roofing Systems by Nuclear Radioisotopic Thermalization"
- ANSI/SPRI FX-2016, "Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners"
- ANSI/SPRI GT-1-2016, "Test Standard for Gutter Systems"
- ANSI/SPRI IA-2015, "Standard Field Test Procedure for Determining the Uplift Resistance of Insulation and Insulation Adhesives over Various Substrates"
- ANSI/SPRI RD-1-2014, "Performance Standard for Retrofit Drains"
- ANSI/SPRI WD-1-2014, "Wind Design Standard Practice for Roofing Assemblies"
- ANSI/SPRI RP-14-2016, "Wind Design Standard for Vegetative Roofing Systems"
- ANSI/GRHC/SPRI VR-11-2001, "Procedure for Investigating Resistance to Root Penetration on Vegetative Roofs"

Accessing SPRI's standards

SPRI's standards are available at no cost and are accessible at www.spri.org/standards.

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ICC welcomes new vice president

Zakreski

The International Code Council (ICC) has named Judy Zakreski vice president of global services. Zakreski has extensive experience in operations management, business development and government relations.

In her new position, Zakreski will coordinate ICC's global programs that facilitate the adoption of the International Codes, provide accreditation and evaluation services, and promote trade and new technologies. She previously served as president and CEO of China Trade Strategies, a boutique firm focused on U.S.-China market entry and export finance, and she speaks Mandarin Chinese.

"The ICC Family of Companies is active in many countries around the world, promoting safe, sustainable, affordable and resilient structures and communities through a variety of products and services," says Dominic Sims, ICC's CEO. "Judy brings a wealth of international knowledge and expertise to her role at the Code Council, and she will work closely with the senior management team to elevate and expand our global footprint."

Wireless technology helps keep workers safe

As workers and managers grow increasingly comfortable using smartphones and tablets, technology companies are producing wireless devices that can help keep workers safe on job sites, according to Bloomberg BNA.

These new devices often are small enough to fit inside a hard hat or pocket, but they can complete an array of helpful tasks, including detecting whether a worker is connected to a fall-protection lanyard, tracking a worker's body temperature and heart rate, and detecting how close workers are to moving heavy equipment.

Among the construction companies implementing the new technology is general contractor Skansa USA, New York City. The company is working with suppliers to incorporate wearable, wireless technology into safety gear that would notify an employer when a worker attaches a fall-protection harness to a lanyard; use cameras to help detect workers lacking the correct tools or gear and notify workers and supervisors; and use motion sensors to detect changes to how a worker walks to help prevent the start of an overuse injury.

Construction companies can look to other industries for ways to use wearable technology to solve ergonomic problems. A beer distribution company in the Pacific Northwest outfitted its employees with sensors that recorded workers' movements to measure when workers were straining, lifting or bending too much. Some employees wore exoskeletons designed to help with lifting while other employees did not. The company was surprised to discover the workers wearing the exoskeletons were more likely to overexert themselves. It also found constantly moving beer cases poses a larger risk for workers than infrequent lifting of heavy kegs. Based on the information from the wearable sensors, the company is looking for ways to improve how workers fill and unload delivery trucks to cut back on how often beer cases must be moved.

Making sense of the information coming from various sensors used at job sites can pose a challenge for companies. As a result, many technology companies offer advice regarding how to set up systems and analyze the data to ensure employers can use collected safety data to identify trends and leading indicators, helping move safety staff from reacting to accidents to preventing them.

Department of Energy awards $105 million for solar research

On April 17, the Department of Energy (DOE) announced it will award $105.5 million for about 70 research projects, according to Bloomberg BNA. Early-stage research for solar photovoltaic (PV) and concentrating thermal power will receive funding in an effort to improve the affordability, flexibility and performance of solar technologies.

Forty-six million dollars will be awarded for research to integrate solar power into the electric grid; $27 million will be awarded for research to reduce costs and increase performance of PV solar power; $24 million will be awarded for research and development involving concentrating solar power; and $8.5 million will be awarded to "prepare the solar industry for a digital future" and increase the number of veterans working in the industry. Funding for integrated solar, concentrating solar power and PV solar will require a 20 percent cost-share by the recipient.

Most U.S. solar farms use PV panels. Solar-thermal power plants concentrate sunlight on a central point to heat water or molten salt, which generates steam and can turn an electric turbine at any time; thermal energy can be used to produce electricity when the sun is not shining and can be integrated into other applications.

According to Charlie Gay, director of DOE's Solar Energy Technologies office, the value of PV and solar-thermal power is "like having bite-sized chunks of energy ready to go whenever you need it, wherever you need it."

Past federal research funding has led to a decrease in solar costs; DOE anticipates the new funding will continue the trend.

"Investing in all of our abundant energy sources, including solar technologies, will help to drive down costs and ensure the nation leads the world in energy production and innovation," U.S. Secretary of Energy Rick Perry said in a statement.

University of Michigan lab will test autonomous drones

The University of Michigan College of Engineering has opened M-Air, a 9,600-square-foot, four-story open-air lab for testing autonomous aerial vehicles, including some that could be used for roofing purposes, according to www.constructiondive.com.

Project engineers are developing unmanned drones for multiple uses at the lab. As a netted, outdoor facility, M-Air enables project engineers to conduct test flights in real-world conditions while avoiding the risks and restrictions of operating drones outside.

A statement by the university indicates some of the drones developed may be used to inspect roofs for damage and "ferry and eventually position and install shingles with a pneumatic nailer." Drones already are considered a promising technology among roofing contractors, and the Replaced by Robots blog predicts the job of applying roof shingles has a 90 percent chance of eventually being automated by robotic technologies such as autonomous drones. Drones also can be used during pre-construction processes to capture aerial views of roof systems and help designers create 3-D models and maps of buildings.

To view a video of the University of Michigan's new M-Air lab, go to www.professionalroofing.net.

Regulations currently restrict the widespread adoption of drones in the construction industry, according to Mike Danielak of Portland, Ore.-based drone network service provider Skyward. Safety and privacy concerns often are cited as primary reasons for the restrictions. However, the White House is working toward easing legislation to allow for more drone deployment nationwide.

And there have been real-world situations during which the Federal Aviation Administration (FAA) has been forthcoming in permitting drone use. After Hurricane Harvey, the FAA authorized the use of drones to inspect roadways and power lines for damage. Proponents are hopeful the FAA's approval of drone use at that time may pave the way for increased allowances for drone use to assist with construction tasks such as building inspections and job-site surveys in the future.

ASTM International test method supports KEE roof membranes

ASTM International's Committee D08 on Roofing and Waterproofing has developed a new standard to support the growing use of roof membranes that contain ketone ethylene ester (KEE) polymer blends.

Roof membranes containing KEE polymer blends are said to be more flexible and chemical-resistant than other roof membranes, making them less susceptible to some types of damage. In the early 2000s, Committee D08 developed ASTM D6754, "Standard Specification for Ketone Ethylene Ester Based Sheet Roofing," a specification requiring the polymer content (by weight) of a new kind of roof membrane to be at least 50 percent KEE. Committee D08's new standard, ASTM D8154-17, "Standard Test Methods for 1H-NMR Determination of Ketone-Ethylene-Ester and Polyvinyl Chloride Contents in KEE-PVC Roofing Fabrics," is a test method that provides consultants, building owners and specifiers a way to test KEE roof membranes to precisely determine what percentage of the polymer content is KEE and not polyvinyl chloride. The test method uses Nuclear Magnetic Resonance (NMR) to accurately determine KEE content in roof membranes, according to ASTM International member Jerry Beall, product and technical specialist for FiberTite Roofing Systems Seaman Corp., Wooster, Ohio. Interested parties are invited to participate in future development of ASTM D8154, including research for reproducibility among a series of laboratories.

Additional information about Committee D08's standard development is available at www.astm.org/committee/D08.htm.