

Top-Level Priority: Rethinking Roofing for Resilience

By Dan Hounsell, Senior Editor

Ensuring the resilience of institutional and commercial facilities does more than enable organizations to prepare for, respond to and return to operations after natural disasters and other crises. It also can deliver a range of important benefits that are appealing to building owners.

Why has resilience become a top priority in recent years? The effects of climate change have resulted in more frequent and destructive natural disasters affecting facilities, which is prompting building owners of both new and existing facilities to embrace the role of resilience — including resilient roofs — in protecting their organizations' in-place assets.

By understanding challenges and options, building owners can make smarter decisions that protect organizations' in-place assets

“I see more building owners and building managers pay more critical attention to roofs,” says Juan Kuriyama, senior vice president and director of architecture with Hoffmann Architects. “It’s hard sometimes when you’re dealing with an existing building because there are restrictions that are imposed on you by the physical limitations of your building that don’t allow you to do some things. For new buildings, the biggest thing is planning. This is where some building designs fall short and building management fall short.”

By exploring the characteristics and benefits of new-generation resilient roofing, building owners can be better equipped to



identify actions they can take to deliver these benefits to their organizations.

Systems and benefits

For building owners aiming to increase the resilience of their facilities, there is no better component to focus on than the roof.

“The roof is your first line of defense that protects the building from the elements,” Kuriyama says. “It has to be able to withstand water infiltration but also wind uplift and impact resistance, and it must address energy. Most of the energy a building loses is through the roof, so it’s very important how the

system,” she says. “There could be energy cost savings related to your resilient roof. If you have a cool reflective roof surface, it could reduce your cooling demand and improve the comfort of your occupants.”

Resilient roofing also can put facilities in line to take advantage of financial incentives.

“Some cities and states offer incentives to owners to do more energy efficiency upgrades, which could offset the project costs because resilient roofing tends to be more expensive than standard roofing systems,” Varner says. “You also can expect a longer service life for your resilient roof system. You can expect less maintenance and then obviously a longer life cycle, so less replacements over the life of your building.”

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roof performs energy-wise. There are a lot of hats that the roof has to wear.”

For owners accustomed to thinking of roofs largely in terms of materials and components, resilient roofing requires a broader perspective.

“Resilient roofing is less about a single material and more about system performance overall under different hazards that your facility might see and its lifespan,” says Serena Varner, vice president with FEA, a facilities management consulting firm. “They’re characterized by the ability to withstand extreme weather conditions, and they utilize certain advanced materials and construction techniques to enhance its strength and durability.

“Some of these key characteristics include robust attachment to withstand wind resistance. You want to ensure that your roof covering, your insulation and your cover board are all attached to your deck and structure in a certain way so wind uplift loads transfer safely into your building frame.”

Roofing system manufacturers have revisited and upgraded their product offerings to meet the growing interest in and demand for resilient roofing, including greater emphasis on assembly testing and performance ratings.

“I think that’s certainly a way to get the point across that these roofs are more resilient when you have clearer testing numbers and standards that you can show people,” Varner says. “Show (owners) more robust perimeter and corner detailing because that’s where a lot of failures occur. I think that can get across to facility managers and owners — the numbers that they can see for the improved systems.”

For building owners who buy into the critical role of roofing in facility resilience, a range of financial benefits can become available to their organizations.

“It can pay you back in various ways, such as avoided loss,” Varner says. “If there’s a storm, you can expect less storm damage, so then less repairs that need to be performed to your roof because it can withstand additional pressures and wind loads.”

Varner says that the financial benefits do not stop there.

“There might be like insurance advantages, a lower premium because of the more robust construction of your roof

Putting it all together

While developing and implementing a comprehensive roof maintenance plan is a critical element in ensuring the system’s performance and resilience, it is just one of several important decisions owners must make in ensuring resilient roofing for their facilities. First, Varner emphasizes the role of proper design.

“Whether it’s a new construction or roof replacement, match your design to the hazards and exposures of your area, whether it’s the wind speed that’s expected, hail risk, climate or sun exposure,” she says. “Make sure that you’re specifying a tested roof system that has all of those enhancements at the perimeters and edges and enhanced performance specifications.

“Demand robust water management. Make sure that there’s positive drainage, enough slope, whether it’s in your structure, in the deck or in your insulation system. Maintain your drains over the life of the roof system. Make sure that your drains aren’t clogged and that there’s secondary overflow drainage so there’s no ponding or blockage that could become a leak.”

Perhaps most importantly during the design phase, pay attention to the details.

“Make sure all your details are correct,” Varner says. “This results from quality assurance during installation, having somebody inspect it during construction. Do all the field verifications to make sure everything is being installed properly at edges, perimeters and penetrations. Get your routine maintenance completed, especially after any type of storm event.”

Next, owners need to ensure that the organization protects the roofing system’s warranty by implementing an effective inspection and maintenance program.

“The caveat with roof warranties you’re going to read is that if (the roof is) properly maintained,” Kuriyama says. “That’s key for the building owners and building managers. One thing is designing your roof, but the other part is that you need to maintain it. It’s not just install it and forget about it. Regular inspection is part of it.”

Effective maintenance is more than just a short-term method for preventing leaks. It also has long-term implications.

“Replacing your roof is going to be costly no matter when you do it, especially if it’s a flat roof,” he says. “But if you’re a commercial building in a high-density city and you have all your equipment on the roof, replacing your roof is going to be a major expense. You need to maintain it, do inspections, do repairs promptly and monitor it. It is a big expense.

“You need to maintain it because life expectancy — 25 or 30 years — is just your common roof. But if you maintain it, you might extend its life. Your roof can last for 50 years if it’s well maintained.”

Even the best-maintained roof systems do not last forever, and planning for its end also is a crucial, early step.

“If you’re putting mechanical equipment, chillers, antennas, telecommunication and solar panels over that, when the time comes to replace the roof, you have a burden to remove that,” Kuriyama says. “That should be also part of the resilient roofing thoughts. You need to remember it’s not a permanent solution. You’re going to have to replace it, and you need to design based on that.”

Perhaps the most important idea for owners to remember is that ensuring resilient roofing requires that they rethink much of what they know about roofing.

“A resilient roofing system isn’t one thing in particular,” Varner says. “It’s not one-size-fits-all. It’s going to vary based on your location and the utilization of your facility. There are lots of ways to improve your roofing system to make it more resilient regardless of your circumstances — things that could be implemented, a new construction or existing to help extend the lifespan of your roof and make your facility overall more efficient.”

Given its complexity and critical role in protecting facilities, resilient roofing also needs to be among the first considerations for owners.



For building owners looking to increase the resilience of their facilities portfolios, there is no better component to focus on than the roof.

“Resilient roofing is something that goes above and beyond what the industry standard or the code mandates,” Kuriyama says. “Resilient roofing should be considered for any type of building, especially for institutional and commercial buildings. It should not be an

option. It should be something they consider from the get-go.” ■

Dan Hounsell is senior editor for the facilities market. He has more than 30 years of experience writing about facilities maintenance, engineering and management.

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