



Something to think about

Installing solar and PV materials can present an opportunity, but you need expertise

by Glen Clapper, AIA, LEED AP

There is a movement within the building and construction industries to reduce carbon emissions and fossil fuel energy use in buildings. Renewable energy, which includes solar and photovoltaic roofing materials, can significantly contribute to that goal, and the roofing industry should be prepared to take advantage of this opportunity.

Considerations

Rooftop-mounted PV systems offer some advantages over ground-mounted PV systems by making use of otherwise underused rooftop space rather than valuable ground-level real estate. Rooftops also are relatively secure from passersby whereas ground-mounted systems typically need to be fenced off or otherwise secured to limit access. Additionally, some rooftop-mounted PV systems may not be visible to passersby.

Code requirements for rooftop building-integrated PV systems, including PV shingles, are included in the 2024 I-Codes and are complex. BIPV systems have dual functionality as roof

coverings and electricity-generating products. This dual functionality can lead to confusion and disputes about who should install and maintain such systems.

Various code requirements further complicate the issue. NRCA believes rooftop-mounted PV system installation always should involve a professional roofing contractor and licensed electrician. A licensed electrician may be necessary to make interconnection to the electrical grid and oversee the proper installation of a PV system's electrical components; most jurisdictions have requirements for licensed electricians to perform that function. Also, several states and local governments have enacted special licensing requirements for PV system installers.

In addition, rooftop-mounted PV system installations only should be undertaken with the involvement of a professional roofing contractor for several reasons, including his or her ability to assess the condition of roofs; knowledge of how to install new roof systems properly and safely to best accommodate rooftop-mounted PV systems; and awareness of roof system manufacturer's requirements of "solar ready" installations for warranties. A roofing contractor also understands how to properly secure equipment on rooftops and apply flashing materials as well as how attaching equipment to a roof system may affect its long-term watertightness.

Roofing contractors also are aware of local building code requirements related to wind resistance, fire resistance, structural loads and access requirements.

Codes

Currently, the I-Codes have few specific requirements for PV- or solar-ready roof systems. The International Energy Conservation Code® has two appendices that contain general requirements for

roof areas but apply only to new construction. The commercial appendix only applies to buildings five stories or less in height that are oriented between 110 and 270 degrees of true north or have low-slope roofs. The residential appendix requires a minimum of 150 square feet or 300 square feet of solar-ready roof area depending on the type and size of structure. Neither appendix speaks to the readiness of a roof assembly beyond roof loads.

The International Building Code,® Section 1505.9 "Rooftop mounted photovoltaic (PV) panel systems," states: "Rooftop mounted photovoltaic (PV) panel systems shall be tested, *listed* and identified with a fire classification in accordance with UL 2703."

It also states the fire classification of the system should be based on the type of building construction. Section 1604.5.2 "Photovoltaic (PV) panel systems," states: "Rooftop-mounted PV panel systems and elevated PV support structures installed on top of buildings shall be assigned to the same risk category as the risk category of the building on which they are mounted." This means the same PV system may not be installed on a warehouse and a hospital without modifications to meet a higher risk category.

PV quality

The quality of PV systems varies, so it is important to consider whether a roof system should have an expected service life equal to or greater than the PV system being installed on it. This helps minimize the need to dismantle or remove a PV system to provide for necessary repairs or completely remove a roof system to maintain building watertightness.

PV systems often are reported to have service lives up to 25 years. Roof

systems, on the other hand, have service lives that vary significantly depending on the specific roof system design, roofing materials used, installation workmanship and owners' maintenance. An industrywide roofing study conducted by the Roofing Alliance shows the average life expectancy of a low-slope roof system on a commercial building is 17.4 years. Based on this, NRCA has concluded above-average roof systems should be installed on buildings where rooftop-mounted PV systems are being installed or where rooftop-mounted PV system installation is anticipated.

Additional resources

PV modules are susceptible to damage resulting from hail. ASTM E1038, "Standard Test Method for Determining Resistance of Photovoltaic Modules to Hail by Impact with Propelled Ice Balls," and FM 4478, "Roof-Mounted Rigid Photovoltaic Module Systems," address the ability of PV modules to withstand the impact forces of hailstones.

Accumulated dirt, debris and atmospheric fallout can reduce PV systems' efficiency. Cleaning solutions sometimes used to clean PV systems may be detrimental to roof coverings, such as those with strong alkali content. Verification with the PV and roof covering manufacturers should occur before cleaning a PV system.

There are many facets to installing and maintaining PV or solar materials on roof systems. Based on the current direction of energy codes and standards, roofing contractors may want to familiarize themselves with the potential added benefit of providing these services. 🌱🔧

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Report shows improvements in MSD prevention

Multiple workplace programs aimed at preventing musculoskeletal disorders have achieved the highest rating within the National Safety Council's MSD Solutions Index, according to a recent report from NSC.

The council's second annual MSD Solutions Index Pledge Community Report explores areas in which organizations that have signed its MSD Pledge are strongest and what opportunities for improvement exist.

The report is based on survey responses from 44 MSD Pledge members from various industries who addressed questions from three pledge commitment subsections: risk reduction, safety culture, innovation and collaboration. The respondents received an overall index result, as well as the results of each subsection. Each corresponded to one of five MSD prevention maturity levels: novice, reactive, advancing, proactive and innovating.

According to the report, most respondents scored in the proactive (44.2%) or advancing (37.2%) categories; 11.6% of respondents were "innovating" in their MSD prevention efforts.

Findings from the report include:

- Eighty-eight percent of respondents have some form of MSD prevention or ergonomics program in place—up from 83% in the previous report.
- Seventy-six percent of the organizations share successful MSD prevention solutions at conferences or through external communications.
- At 50%, awkward postures/excessive bending or twists was the most common MSD risk factor reported, followed by lifting or carrying (43.2%), prolonged sitting/standing (31.8%) and computer-related repetitive activities (31.8%).
- The body parts most affected by MSDs are: lower back (77.3%), shoulder/upper arm (61.4%) and wrist (50%).

To access the National Safety Council's MSD Solutions Index, go to professionalroofing.net

"This year's report reflects the dedication of the MSD Pledge community to building safer workplaces and protecting workers' health," says Katherine Mendoza, senior director of workplace safety programs at NSC. "With the insights from the MSD Solutions Index, we see organiza-

tions are making significant strides and identifying critical areas for improvement, proving the MSD Pledge can drive real change in the safety and well-being of workers worldwide."



Researchers to create construction safety toolkit

A collaborative research effort is underway to build a toolkit to help construction managers, supervisors and workers identify and address safety and health challenges unique to the industry, according to *Safety+Health* magazine.

The Collaborative Leadership for Safety and Health in Construction project is being led by researchers from the Colorado School of Public Health, Aurora, and the Center for Promotion of Health in the New England Workplace, Lowell, Mass. It is supported by CPWR—The Center for Construction Research and Training, the Centers for Disease Control and Prevention, and the National Institute for Occupational Safety and Health.

The five-year project is focused on the critical safety and mental health challenges in construction. Researchers expect the toolkit to foster a comprehensive, sustainable culture of safety and health by emphasizing collaboration between various levels of the workforce and, in turn, contribute to reduced injury rates and enhanced worker health and well-being.

Eight contractors will implement and use the toolkit as researchers evaluate the process. After the evaluation process, the toolkit will be disseminated via the Occupational Safety and Health Administration, along with labor unions, contractor associations, professional safety and health associations, and workers' compensation insurers.

"The secret of our approach is the focus on both leadership commitment and workforce engagement," Natalie Schwatka, project leader and assistant professor at the Centers for Health, Work & Environment at the Colorado School of Public Health, said in a press release. "This project is about creating a framework that gives both managers/supervisors and workers a more active role in the safety and well-being initiatives at their workplaces."

