



Attachment advice

Understanding proper steel roof deck attachment

by Mark S. Graham

Proper attachment of a steel roof deck to a building's underlying structural framing is an important consideration for proper roof assembly design. Unfortunately, there appears to be a lack of clear guidance between steel roof deck installers and the roofing industry regarding proper steel roof deck attachment.

Existing guidelines

The Steel Deck Institute and FM Global provide two generally recognized but somewhat different approaches to steel roof deck attachment.

ANSI/SDI RD-2010, "Standard for Steel Roof Deck," is a code-recognized standard for the materials, design and erection of steel roof deck panels. This document specifies connections be designed in accordance with the American Iron and Steel Institute's specification AISI S100, "North American Specification for the Design of Cold-Formed Steel Structural Members."

ANSI/SDI RD-2010 requires steel roof decks be designed to resist required net uplift forces but not less than 45 pounds per square foot at eave overhangs and 30 psf for all other roof areas.

ANSI/SDI RD-2010's guidance does not specifically address increased design wind loads at roof area perimeters and corners or



nonuniform uplift loading conditions, such as those created with seam-fastened mechanically attached single-ply membrane roof systems. SDI's design guidelines are based on uniform loading, such as those provided by an adhered membrane roof system.

FM Global's Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-Deck Roof Components," issued February 2020, provides guidelines for steel roof deck attachment for FM-insured buildings.

FM 1-29's Section 2.2.3.4 indicates one of two approaches—a performance-based approach or a pre-

scriptive enhancement approach—can be used.

Using FM 1-29's performance-based approach, a specific RoofNav assembly should be selected based on the higher wind-resistance classification needed for Zone 2 (perimeter) and Zone 3 (corners). Individual RoofNav assemblies for roof systems on steel roof decks have RoofNav number-specific guidance for steel roof decks and roof deck attachment.

FM 1-29's prescriptive enhancement approach provides for the specific RoofNav assembly to be based on the wind-resistance classification needed for Zone 1 (field) and enhancing steel roof deck securement for the perimeter and corners as follows:

- Zone 2: Increase the roof deck attachment by a minimum of 50% (1.5 times)

greater than that required by the RoofNav assembly in Zone 1.

- Zone 3: Increase the roof deck attachment by a minimum of 100% (2 times) greater than that required by the RoofNav assembly in Zone 1.

In many instances, because of steel deck flange, rib and flute spacing, it is impractical to increase Zone 2 attachment 50%. In these situations, increasing Zone 2 and Zone 3 attachment by a minimum of two times greater than that required for Zone 1 is appropriate.

FM 1-29's Tables 2 and 3 provide several attachment options for 6- and 8-inch-wide rib spacing for steel decks, respectively. For example, if the RoofNav listing requires FM-approved deck fasteners at a 12-inch spacing for Zone 1, FM-approved deck fasteners at a 6-inch spacing with minimum 1/2-inch-diameter integral washers or 3/4-inch-diameter washers are permitted for Zone 2 and Zone 3 attachment.

Closing thoughts

Field experience shows many steel roof decks encountered in new construction and reroofing situations may not be attached according to SDI or FM guidelines. As a result, the wind-uplift resistances of these roof assemblies could be a concern.

Steel roof deck and roof system installers need better guidance from designers regarding the type and spacing of steel roof deck attachment and any perimeter and corner enhancements for specific buildings. This is not a decision that should be left to steel deck installers or roofing contractors.

In new construction situations, this determination is best made by the building designer in consultation with the building's structural engineer. In reroofing situations, roof system designers should evaluate the existing steel roof deck attachment and clearly specify

“Steel roof deck and roof system installers need better guidance from designers”

whether any specific type and spacing of supplemental steel roof deck attachment is necessary. In many instances, supplemental deck attachment likely will be necessary because design wind loads have increased and

the methods of addressing roof area perimeters and corners have changed with recent editions of the codes.

If, in a reroofing situation, the designer cannot properly assess the adequacy of an existing steel roof deck's attachment, supplemental attachment methods should be specified and can be implemented as needed on a unit-cost basis.

In reroofing situations on occupied buildings, NRCA prefers designers specify mechanical fasteners rather than power-actuated fasteners or spot welding for any required supplemental attachment. For occupant safety, NRCA suggests spot-weld attachment and power-actuated fasteners be avoided on occupied buildings.

Additional information about steel roof deck and roof deck attachment is provided in Chapter 2—Roof Decks of *The NRCA Roofing Manual: Membrane Roof Systems—2019*. 🌟🌟

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

 @MarkGrahamNRCA

Construction sites adopt new technology amid COVID-19 crisis

The COVID-19 pandemic has forced the U.S. construction industry to adopt new technologies to monitor job sites remotely and help workers practice social distancing, according to www.constructiondive.com.

Many office workers have been working from home, making the connection between a job site and office more crucial than before. Scott Crozier, general manager of civil engineering and construction for Sunnyvale, Calif.-based software company Trimble Inc., says shared data and digital connectivity is becoming the norm. Crozier notes inspectors are beginning to allow the use of technology for virtual inspections, which can speed up the process because no one needs to physically visit a job site.

Crozier also says the lower cost of labor has delayed technology adoption in the U.S. construction industry for years; cheaper

labor, despite a lack of skilled workers, means less demand for technology. In Europe and Australia, the higher cost of labor means contractors need to innovate rapidly, which often attracts young Americans with construction and technology backgrounds.

As construction was deemed essential and allowed to continue in nearly all 50 states, technology firms and safety app developers introduced or expanded various applications that some construction leaders say will become the norm. Such applications include using image data or wearables to track workers, ensure they maintain social distancing and reduce social density on job sites; providing questionnaires for workers to complete before allowing them on-site to reduce the risk of COVID-19 spreading; and allowing for virtual walkthroughs so stakeholders can have up-to-date imagery of work in progress without visiting job sites.

During a recent webinar, Anita Woolley Nelson, chief strategy officer of Skanska USA Building Inc., Parsippany, N.J., said she

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doesn't believe the status quo will return when the pandemic ends, but new applications will help maintain productivity.

"People always say you can't take a job site home with you," she said, "[but] maybe you can."

Cyberattacks increase as more people work remotely

As more people work remotely amid the COVID-19 pandemic, explicit COVID-19-related cyberattacks emerge daily, increasing the volume of threats, according to www.constructiondive.com.

In January, Santa Clara, Calif.-based computer security software company McAfee began detecting pieces of mobile malware disguised as apps for body temperature checks or other COVID-19 prevention functions. The cyber-threats began to broaden, and Raj Samani, chief scientist at McAfee, says "it's like we've kicked over a hornet's nest."

Other cyberattacks exploit the circumstances related to the outbreak, such as people logging on from unsecure devices.

Samani says though most security software will stop most of the attacks, many attacks are "hiding in plain sight" in fragmented threats indirectly related to COVID-19.

Employers with a remote workforce must increase their awareness regarding traditionally consumer-targeted threats. Many people are tempted to click on corrupt links about COVID-19 because people are anxious and want information. Employees might be fooled by attacks on their internet service providers, streaming services or websites disguised as aids for small-business loans.

Between January and March, internet-exposed Remote Desktop Protocol ports have increased from 3 million to 4.5 million, with many belonging to the U.S. Access to an RDP box grants an attacker scope of an entire network from which he or she can engage in many forms of cyberattacks. The most vulnerable systems reportedly are running Windows Servers.

COVID-19 cyberattacks put construction companies and other organizations on high alert. Distribution of malicious software or viruses via web domains is spiking. Key words

associated with COVID-19 are mixed in with phony sites and phishing campaigns. Campaigns with luring mechanisms are delivering malware, including keyloggers, banking Trojans and remote administration tools.

"There's nothing that I would say, 'We've not seen that before,'" Samani says. The problem is "just the sheer volume of just everything under the sun."

To view the Federal Communications Commission's 10 cybersecurity tips for small businesses and other cybersecurity resources, go to www.professionalroofing.net.




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