Additional considerations for steel roof decks

by Mark S. Graham

Steel roof decks are common substrates for low-slope membrane roof systems. Recent changes to recognized guidelines may affect the design and installation of roof assemblies that include steel roof decks.

FM 1-29

In January, FM Global updated its Property Loss Prevention Data Sheet 1-29, "Roof deck securement and above-deck roof components," and several changes affect steel roof decks.

FM Global requires steel roof decks approved by FM Approvals be used for all insulated steel roof decks. In addition, deck spans, which are measured center to center, should not be greater than a deck's specific approval issued by FM Approvals. In some instances, roof decks' allowable deck spans according to FM Approvals are less than manufacturers' regularly published spans.

Most conventional steel roof decks are fabricated from steel with a minimum yield strength (F_y) of 33 ksi. For new construction projects that require roof systems have an FM Approvals' rating greater than 1-90 or when a membrane's fastener row spacings (for a mechanically attached single-ply membrane) exceed 6 feet, FM Global requires a steel roof deck to be fabricated with wide ribs from minimum 22-gauge, high-yield strength, Grade 80 steel (F_y = 80 ksi) and have a maximum span of 6 feet.

If a roof system's required FM Approvals' field rating is greater than 1-135, FM Global requires its steel roof deck be fabricated with wide ribs from high-yield strength, Grade 80 steel. In corner regions, FM Global recommends using shorter deck spans or heavier gauge steel.

Also, for new construction, FM Global now requires steel roof decks to be designed for wind-uplift pressure resistance in addition to gravity (downward) loads. Table 11 in FM 1-29 provides allowable uniform uplift pressures for common steel roof deck types fabricated from Grade 33 (F_y = 33 ksi) steel. Multipliers provided in the table's footnotes allow for using steel with higher yield strengths.

FM 1-29 also contains extensive changes regarding attachment of steel roof decks to framing members. In many instances, FM Global requirements exceed what is common in the industry.

FM 1-29 is available in the data sheets section of FM Approvals' RoofNav application, which is accessible at www.roofnav.com.

SDI position statement

In August 2006, the Steel Deck Institute (SDI) published a position statement, "Steel deck products in contact with pressure treated lumber," that provides SDI's recommendations for addressing current-generation pressure-treated lumber that can contact steel roof decks.

SDI warns of the potential for corrosion of prime-painted and galvanized steel roof decks that contact current-generation pressure-treated lumber.

SDI recommends a layer of a self-adhering polymer-modified bitumen membrane sheet be used as a barrier between steel roof decks and pressure-treated lumber.

SDI's position statement is available in the publications section of SDI's Web site, www.sdi.org.

NRCA's position

If you design, manufacture or install roof systems over steel roof decks, you need to be aware of FM Global's revised guidelines for steel roof decks and SDI's new recommendation.

In most instances, determining a steel roof deck's compliance with FM Global's guidelines clearly is outside the scope of most roofing contractors' work and beyond the expertise of many roofing professionals. If you encounter a roofing project insured by FM Global or where FM Approvals' guidelines are specified, I encourage you to seek verification from the building owner, project designer and/or general contractor, as appropriate, to determine whether the steel roof deck complies with FM Global guidelines.

Regarding SDI's position statement, NRCA does not support SDI's position. Although the use of a suitable barrier may be prudent for prime-painted steel roof decks, based on NRCA's longstanding concern for steel deck corrosion, NRCA recommends only G-90 galvanized steel be used for steel roof decks. For G-90 galvanized steel roof decks, the use of a separate barrier layer appears unnecessary because the construction industry currently recognizes heavily coated galvanized steel fasteners and accessories are appropriate for direct contact with pressure-treated lumber.

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