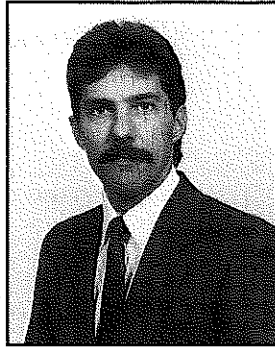


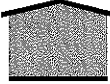
# Asking the Impossible

## Merging Wood Decks & FM Approved Assemblies are Sometimes Impossible

by Philip Dregger, president, Technical Roof Services, Inc.

(Editor's Note: Philip D. Dregger, president of Technical Roof Services, is a registered engineer and registered roof consultant. He has served as a director for the Roof Consultants Institute and as treasurer for the Roofing Industry Committee on Wind Issues. Dregger has lectured and published extensively, sharing lessons learned from numerous roof investigations. Questions to Dregger can be submitted in writing to Technical Roof Services, 395 Civic Drive, Suite C, Pleasant Hill, Calif., 94523).



 ROOF SPECIFICATIONS often call for hot applied, built-up roofs (BUR) to be installed over base sheets that are mechanically attached to  $\frac{1}{2}$ " plywood or oriented strand board (OSB). A common method of mechanical attachment is to install ring shanked nails with 1" heads, 9" o.c., along side laps and in two staggered rows, 18" o.c., between side laps. To resist damage from wind uplift, architects/specifiers often



INSTALLATION of ring shank nails, with one inch heads, to secure a base sheet to a OSB deck.

require that the installed roof be Factory Mutual (FM) approved, Class 1-60 or 1-90. FM literature, however, clearly states that approved wood decks must be at least  $\frac{3}{4}$ " thick and be fire treated. Acceptance by FM can be achieved in such cases, only if automatic fire sprinklers are provided.

If a building has a  $\frac{1}{2}$ " plywood deck (and does not have automatic fire sprinklers) and the roof specifications call for an "FM approved," mechanically attached BUR; this requirement cannot strictly be complied with. If the property insurance company is not underwritten by a Factory Mutual Company, a brief letter clarifying the situation, can reduce potential contractor liabilities by requesting architect/specifier and owner direction before proceeding with the project as if the substrate was "approved." Factory Mutual should not be contacted in those cases as it is not their jurisdiction.

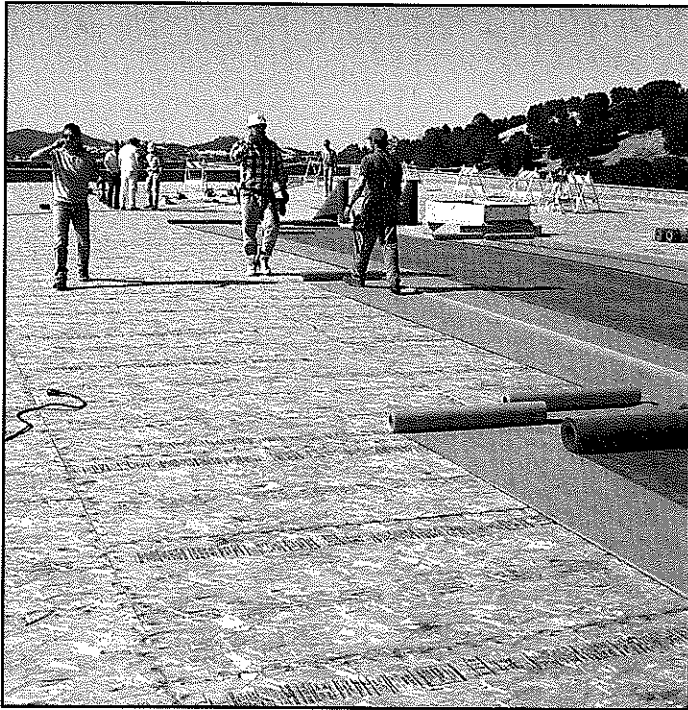
Unfortunately, the method for complying with FM requirements or recommendations for an uninsulated BUR is not always clear to everyone, even if an "approved substrate" is provided.

The Factory Mutual Approval Guide describes basic attachment requirements for numerous roof systems and decks, including treated wood decks. However, the tables for treated wood decks are for insulated roof assemblies. The only listings in the FM Approval Guide for approved constructions that describe required spacings of base sheet fasteners for BUR membranes, are those for lightweight insulating concrete decks. No listings can be found in the Approval Guide that address the question of

required nailing patterns for mechanically attaching base sheets to "approved" wood decks, let alone 1/2" wood decks.

For non-approved "combinations" (e.g., decks), Table 2, 3, and 4 in FM Data Sheet 1-48 "Design and Repair Procedures for Wood and Cementitious Decks," can be used by specifiers to determine base sheet fastener spacings and the appropriate information included in the specifications. It should be noted, however, that heads larger than 1" are required if individual fastener pull-out loads are greater than 45 lbs.

References to FM 1-60 or FM 1-90 "approval" cannot strictly be met if the roof assembly is not Class 1 approved. The "1" in the rating refers to the fire classifica-



ROSIN sized paper is often installed between the wood deck and base sheet.

tion and defines limited combustibility of the above deck components. The 60 or 90 rating refers to the wind rating of the assembly (i.e. laboratory test pressure in pounds per square foot). "Approval" means that the assembly has passed all applicable FM lab tests (e.g. fire, wind, hail).

FM has recently begun to provide "specification tested" ratings pertaining just to one test such as wind uplift, rather than the battery of tests that must be addressed as part of a Class I assembly "approval" rating. Consequently, specifiers can require that non-insulated roofs over 1/2" wood decks meet the requirements of a FM Class 60 or Class 90 wind securement.

In conclusion, when wood decks less than 3/4" thick are involved, specifiers should specifically describe the desired base sheet fastening patterns rather than rely on inapplicable references to FM requirements. It must be remembered that wind uplift forces are greatest along building edges and at corners, and base sheet fasteners should be increased in these locations. Further guidance is contained in Factory Mutual Data Sheets 1-28S and 1-48. ■