How is gypsum board used as a roofing material? —via e-mail

Q

Obviously (one hopes), gypsum board is not suitable for use in situations where it is exposed to excessive heat or moisture, lest it lose its structural integrity at the molecular level. In other words, if it gets too wet, it tends to sag and eventually becomes pasty; and if it gets too hot for prolonged periods, it loses its water content and becomes powdery. However, in the proper setting that second property can prove beneficial. One of gypsum board’s favorable qualities is that when subjected to fire, the water molecules in the gypsum turn to steam, which will slow down the progress of the fire. For this reason, the building codes allow its use as a roof sheathing underlayment in certain applications.

The Gypsum Association has a publication, Gypsum Board Roof Underlayment for Multi-Family Construction, (GA 276-97). It explains how 5/8-inch thick type-X gypsum board is used as an underlayment for combustible roofs in multifamily construction. When installed according to any one of the three suggested methods (provided the local code provisions are in agreement), the use of type-X gypsum board underlayment beneath the roof sheathing permits the builder to forego the construction of parapets otherwise required between dwelling units.

The three methods mentioned above include the “Full Roof Underlayment” method, the “Partial Roof Underlayment” method and the “Ledger Strip” method. The full roof method looks to be the simplest, in that one installs a complete layer of gypsum board over the entire roof area before attaching the roof sheathing. The partial roof method allows the installer to use the minimum amount of gypsum board on either side of the fire/party wall—usually 4 feet, but check the prevailing code—as underlayment beneath the sheathing. Using this method, however, requires altering the roof framing so that the sheathing remains level where it covers the underlayment and where there is no underlayment. The third method involves placing 2-by-2 ledger strips on either side of the rafters so that the type-X gypsum board may be placed between the rafters, which allows the sheathing to be attached directly to the framing. So if you’re looking for a way out of installing parapets on your next condo project, look into type-X gypsum roof sheathing underlayment.

Several reports lately suggest that spray-applied fire-resistive materials have adhesion problems. Is this correct? —via e-mail

Q

I have heard several proponents of sprinklers and even fire marshals question the performance of SFRM, asserting that it is easily removed from its intended substrate. I find it curious that those who give very high marks to sprinklers “when properly designed, installed and maintained,” do not feel the need to include that very same qualifier when describing the performance of SFRM. The fact is that SFRM products advertise a minimal cohesion/adhesion of 150 lbs. per square foot, with high-traffic products offering adhesion exceeding 10,000 lbs. per square foot. However, SFRM must be applied over a sound substrate, with attention paid to the temperature and the drying conditions to perform as intended. According the SFRM manufacturers’ technical services people, SFRM failures occur over improperly prepared substrates or where substrates that have been primed with something having marginal adhesion, or the SFRM is interfered with before it’s been given proper drying time. When a substrate is questionable, metal lath should be put up prior to applying the SFRM. The minimum surface and air temperature for most products is 40 degrees Fahrenheit within the first 24 hours of application, and typically a minimum of four complete air exchanges per hour are recommended until the material is dry.

About the Author
Lee G. Jones is AWCI’s director of technical services. Send your questions to him in care of AWCI’s Construction Dimensions, or send your e-mail question to jones@awci.org.