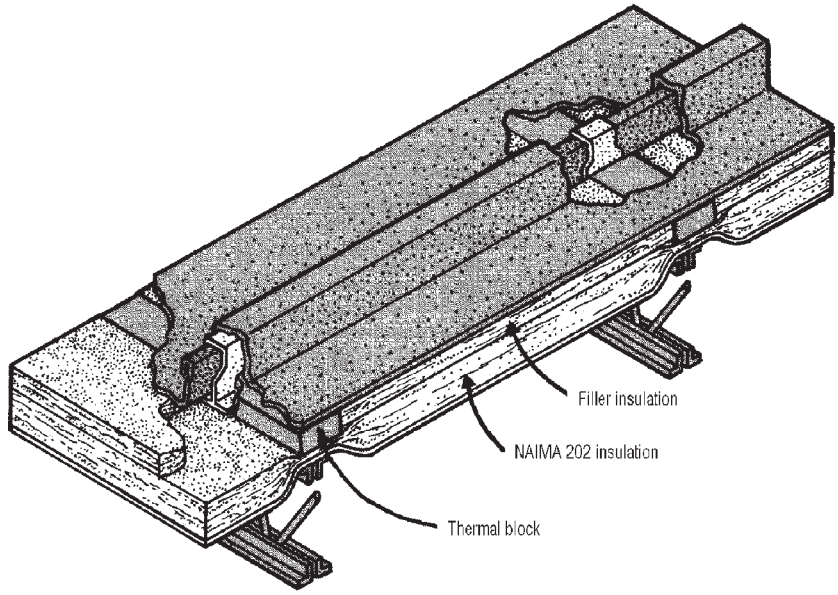

FIGURE 8.7 NAIMA system 3—use of thermal blocks. (*Courtesy of NAIMA Metal Building Committee.*)

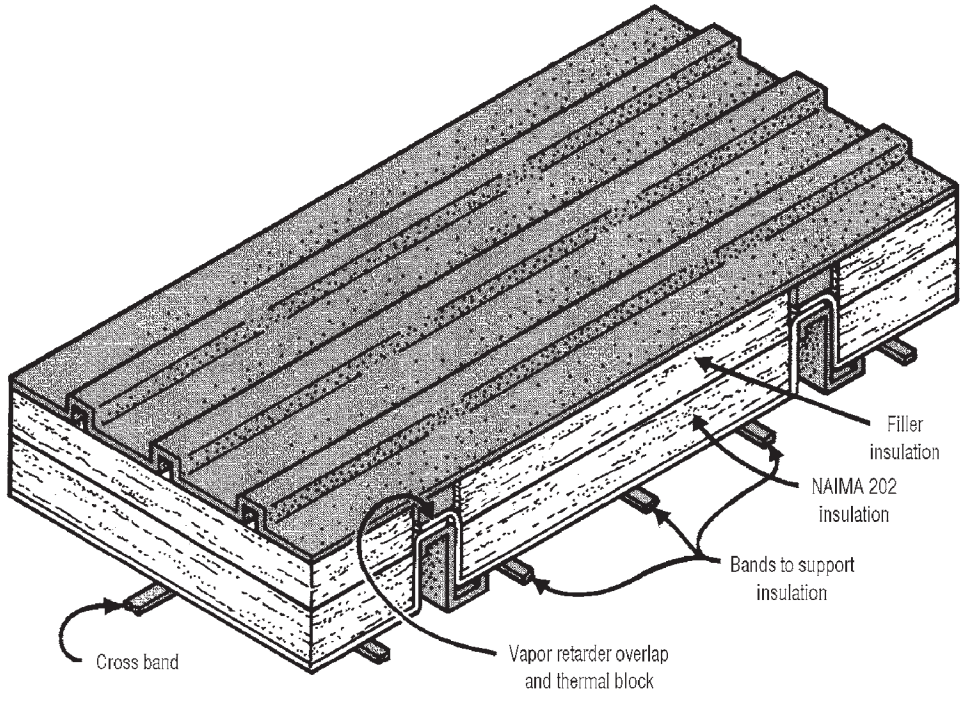

FIGURE 8.8 NAIMA system 4—use of thermal blocks in combination with blankets between purlins. (*Courtesy of NAIMA Metal Building Committee.*)

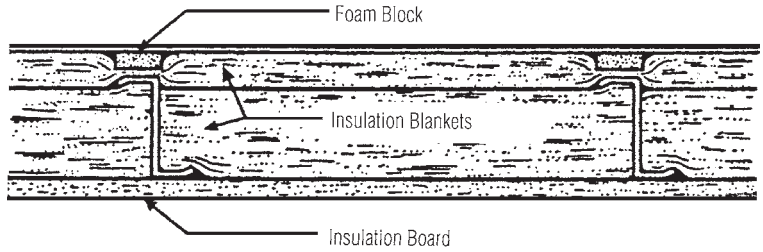

FIGURE 8.9 A premium system with insulated ceiling board. (*Courtesy of NAIMA Metal Building Committee.*)

a series of straps attached to the underside of the framing. Above the liner, insulation is installed similar to the fourth system.

Another proprietary product is the "Sky-Web System" by Butler Manufacturing Co., an open-web polyester scrim mesh with openings of about 1/2 in designed to visually blend with white-colored vapor retarders. In addition to insulation support, the mesh is intended to protect workers from falls and to catch falling objects.

Yet another proprietary insulation system, Finished R, by Owens Corning, consists of 1-in fiberglass blanket with a laminated vapor retarder that is supported by a grid of plastic extrusions suspended from the metal building structure.

Any insulation system that relies on materials being attached to the underside or between purlins should be reviewed for interference with purlin bracing described in Chap. 5.

8.6 U_o VALUES OF VARIOUS WALL SYSTEMS

Determination of the overall conductance values U_o for roof assemblies is relatively straightforward, given the fact that metal roofing and fiberglass blanket insulation are used almost exclusively and that the ASHRAE ratings are available. Our previous discussions have dealt with various fiberglass installation methods that will, more than anything else, make a difference in the thermal performance.

The walls, however, are another matter. A variety of both metal and "hard" (masonry or concrete) materials, coupled with either fiberglass or rigid insulation, are available. Tables 8.1 and 8.2 are included to facilitate comparison between overall conductance values of the most common wall systems.

The R values for the tables were taken from ASHRAE *Handbook of Fundamentals*[23] and Ref. 24. To simplify comparison, the following R values have been assumed for all systems: outside air film in a 15-mi/h wind = 0.17; inside air film = 0.68; an air space 3/4 to 4 in deep = 0.97. To compute the overall conductance value U_o one needs to add up all the R values of the components and take a reciprocal function of the sum as illustrated in the following example. R values for selected materials are indicated in Table 8.1.

U_o is the number of Btu that will flow through 1 ft^2 of the wall in 1 h when the temperature differential between the two sides is 1°F.

Example Compute U_o value for brick veneer over CMU insulated assembly:

Component	R value
Outside air film	0.17
4-in brick veneer	0.44
2-in air space	0.97
2-in polystyrene insulation	10.8