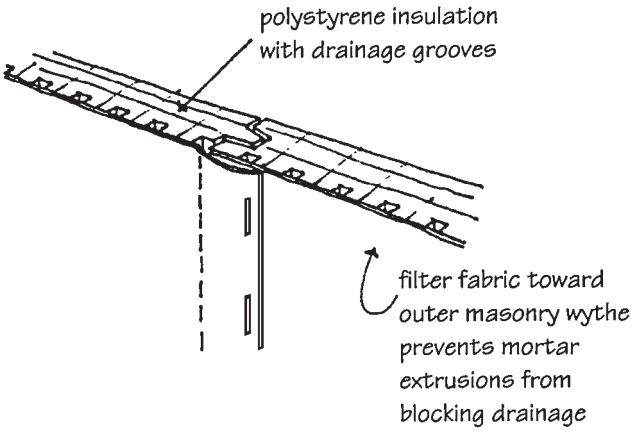
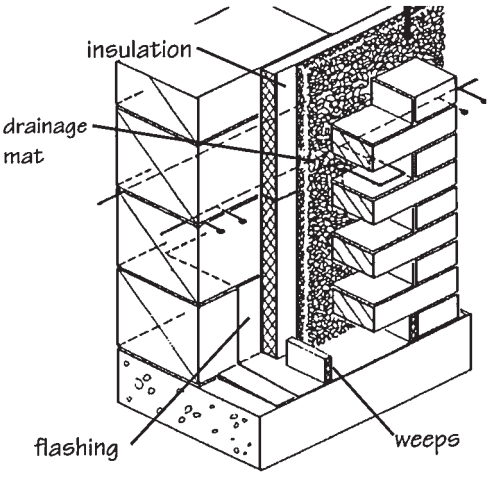
Some proprietary insulation products have drainage mats or drainage grooves designed to prevent mortar extrusions from obstructing the flow of moisture to weep holes (*see Fig. 8-35*). Air circulation behind the insulation will reduce effectiveness, so rigid insulation should be well adhered or fastened tightly to the backing wall. Gaps between boards will also reduce effectiveness.

Generally, rigid insulation is installed against the cavity face of the backing wall. A minimum of 2 in. should be left between the cavity face of the exterior wythe and the insulation board to facilitate construction and allow for drainage of the cavity. Mechanical and/or adhesive attachment as recommended by the manufacturer is used to hold the insulation in place.

Some concrete block manufacturers produce units with rigid insulation inserts installed at the plant prior to shipment. These inserts may be of polystyrene or polyurethane, and vary in shape and design for different proprietary products (*see Fig. 8-36*). Hollow unit cores can also be filled with foamed-in-place insulation, but the foam will prevent free drainage of moisture



POLYSTYRENE INSULATION WITH DRAINAGE GROOVES



WOVEN FILAMENT DRAINAGE MAT
ADHERED TO POLYSTYRENE INSULATION

Figure 8-35 Proprietary rigid insulation designed to maintain moisture drainage from masonry wall cavity.

to the weeps in a single-wythe wall. Foamed-in-place, loose fill and most insulation inserts leave thermal bridges at the unit webs because the insulation is not continuous. Thermal bridging in single-wythe walls not only affects heat transfer and energy use, but may cause condensation as well. Lightweight CMU has higher thermal resistance than units made with heavy aggregate, so the effect of thermal bridging is somewhat modified, and the benefits of added insulation somewhat greater (*see Fig. 8-37*).

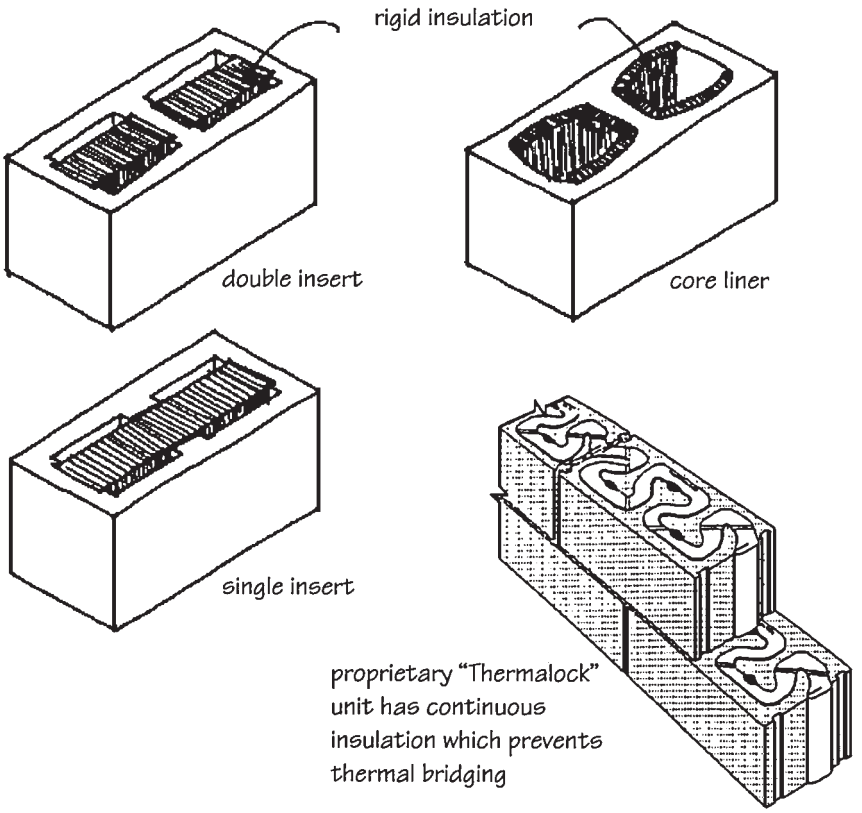


Figure 8-36 Rigid insulation inserts for hollow CMUs.

R-Value of Insulated and Uninsulated Single-Wythe CMU Walls

Nominal Wall Thickness (in.)	Unit Cores	Concrete Unit Weight				
		60 pcf	80 pcf	100 pcf	120 pcf	140 pcf
4	insulated	3.36	2.79	2.33	1.92	1.14
	uninsulated	2.07	1.68	1.40	1.17	0.77
6	insulated	5.59	4.59	3.72	2.95	1.59
	uninsulated	2.25	1.83	1.53	1.29	0.86
8	insulated	7.46	6.06	4.85	3.79	1.98
	uninsulated	2.30	2.12	1.75	1.46	0.98
10	insulated	9.35	7.45	5.92	4.59	2.35
	uninsulated	3.00	2.40	1.97	1.63	1.08
12	insulated	10.98	8.70	6.80	5.18	2.59
	uninsulated	3.29	2.62	2.14	1.81	1.16

Figure 8-37 Aggregate weight affects thermal resistance of concrete masonry. (*From National Concrete Masonry Association,* TEK Bulletin 38A, *NCMA, Herndon, VA.*)