Coefficients for frame construction are corrected for the effect of framing where such correction would increase the coefficients, but not where the correction would decrease the coefficients.[7]

It should be noted that the effects of poor workmanship in construction and installation have an increasingly greater percentage effect on heat transmission as the coefficient becomes numerically smaller. Failure to meet design estimates may be caused by lack of proper attention to exact compliance with specifications, and a factor of safety may be employed as a precaution when it is judged desirable.

Roof Coefficients

Computations for wood shingle roofs applied over wood stripping are based on 1 by 4 in. wood strips, spaced 2 in. apart. Values for roofs containing Spanish and French clay roofing tile are assumed the same as for slate roofs. Values for pitched roofs in Table 16 apply where the roof is over a heated attic or top floor so that the heat passes directly through the roof structure, including any interior finish material.

Combined Ceiling and Roof Coefficients

If the attic space between the ceiling and roof is unheated, the combined coefficient from room air below the ceiling to exterior air can be calculated from the following formula:

$$R_T = \frac{1}{U_{ce}} + \frac{1}{nU_r} \tag{4}$$

and

$$U = \frac{1}{R_T} \tag{5}$$

where

U = combined coefficient to be used with ceiling area.
R_T = total resistance of ceiling and roof.
U_{ce} = coefficient of transmission of ceiling.
U_r = coefficient of transmission of roof.
n = ratio of roof area to ceiling area.

It should be noted that the overall coefficient U should be multiplied by the ceiling area to determine heat loss and not by the roof area. Values of U_r and U_{ce} should be calculated using a value of 2.2 (the reciprocal of one-half the air space resistance) rather than 1.65 for the conductances of surfaces facing the attic, since the attic is equivalent to an air space.

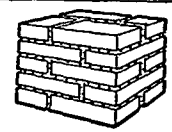
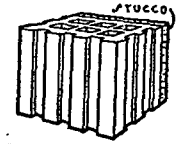
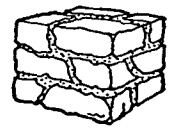
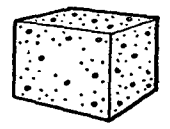
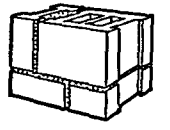
If the attic contains windows, dormers and vertical wall spaces, and if their area is small compared to that of the roof, they may be considered part of the roof area. For accuracy, the sum of the coefficients of each individual section, multiplied by its percentage of the total area, should be used as U_r. Where attic wall areas are large, it is preferable to estimate the attic temperature as illustrated in Chapter 11, and calculate the heat loss through the ceiling by multiplying the value of U_{ce} for the ceiling by the difference in temperature above and below the ceiling.

Basement Floor, Basement Wall and Concrete Slab Floor Coefficients

The heat transfer through basement walls and floors to the ground is dependent on the temperature difference between the air within and that

TABLE 7. COEFFICIENTS OF TRANSMISSION (U) OF MASONRY WALLS

Coefficients are expressed in Btu per (hour) (square foot) (Fahrenheit degree difference in temperature between the air on the two sides), and are based on an outside wind velocity of 15 mph.

TYPE OF MASONRY		THICKNESS OF MASONRY INCHES	INTERIOR FINISH (PLUS INSULATION WHERE INDICATED)									WALL NUMBER
			Plain Walls—No Interior Finish	Plaster (½ in.) on Walls	Metal Lath and Plaster Furred[a]	Gypsum Board (⅜ in.) Decorated—Furred[a]	Gypsum Lath (⅜ in.) Plastered—Furred[a]	Insulating Board (½ in.) Plain or Decorated—Furred[a]	Insulating Board Lath (½ in.) Plastered—Furred[a]	Insulating Board Lath (1 in.) Plastered—Furred[a]	Gypsum Lath Plastered Plus 1 In. Blanket Insulation—Furred[a]	
			A	B	C	D	E	F	G	H	I	
Solid[b] Brick		8	0.50	0.46	0.32	0.31	0.30	0.22	0.22	0.16	0.14	87
		12	0.36	0.34	0.25	0.25	0.24	0.19	0.19	0.14	0.13	88
		16	0.28	0.27	0.21	0.21	0.20	0.17	0.16	0.13	0.12	89
Hollow[b] Tile (Stucco Exterior Finish)		8	0.40	0.37	0.27	0.27	0.26	0.20	0.20	0.15	0.13	70
		10	0.39	0.37	0.27	0.27	0.26	0.20	0.19	0.15	0.13	71
		12	0.30	0.28	0.22	0.22	0.21	0.17	0.17	0.13	0.12	72
		16	0.24	0.24	0.19	0.19	0.18	0.15	0.15	0.12	0.11	73
Stone[c]		8	0.70	0.64	0.39	0.38	0.36	0.26	0.25	0.18	0.16	74
		12	0.57	0.53	0.35	0.34	0.33	0.24	0.23	0.17	0.15	75
		16	0.49	0.45	0.31	0.31	0.29	0.22	0.22	0.16	0.14	76
		24	0.37	0.35	0.26	0.26	0.25	0.19	0.19	0.15	0.13	77
Poured Concrete[d]		6	0.79	0.71	0.42	0.41	0.39	0.27	0.26	0.19	0.16	78
		8	0.70	0.64	0.39	0.38	0.36	0.26	0.25	0.18	0.16	79
		10	0.63	0.58	0.37	0.36	0.34	0.25	0.24	0.18	0.15	80
		12	0.57	0.53	0.35	0.34	0.33	0.24	0.23	0.17	0.15	81
Hollow Concrete Blocks												
		Gravel Aggregate										
		8	0.56	0.52	0.34	0.34	0.32	0.24	0.23	0.17	0.15	82
		12	0.49	0.46	0.32	0.31	0.30	0.22	0.22	0.16	0.14	83
		Cinder Aggregate										
		8	0.41	0.39	0.28	0.28	0.27	0.21	0.20	0.15	0.13	84
		12	0.38	0.36	0.26	0.26	0.25	0.20	0.19	0.15	0.13	85
		Light Weight Aggregate[e]										
		8	0.36	0.34	0.26	0.25	0.24	0.19	0.19	0.15	0.13	86
		12	0.34	0.33	0.25	0.24	0.24	0.19	0.18	0.14	0.13	87

[a] Based on 4 in. hard brick and remainder common brick.

[b] The 8 in. and 10 in. tile figures are based on two cells in the direction of heat flow. The 12 in. tile is based on three cells in the direction of heat flow. The 16 in. tile consists of one 10 in. and one 6 in. tile each having two cells in the direction of heat flow.

[c] Limestone or sandstone.

[d] These figures may be used with sufficient accuracy for concrete walls with stucco exterior finish.

[e] Expanded slag, burned clay or pumice.

[f] Thickness of plaster assumed ½ in.

[g] Thickness of plaster assumed ¾ in.

[h] Based on 2 in. furring strips; one air space.