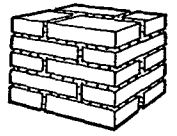
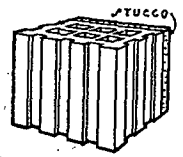
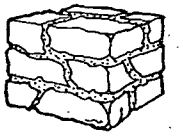
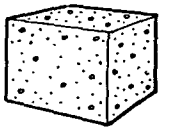
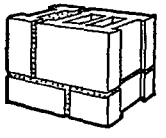
TABLE 6. COEFFICIENTS OF TRANSMISSION (U) OF MASONRY WALLS

Coefficients are expressed in Btu per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on a 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[f] Furred	Gypsum Board (⅜ in.) Decorated—Furred	Gypsum Lath (⅜ in.) Plastered—Furred	Insulating Board (½ in.) Plain or Decorated—Furred	Insulating Board Lath (½ in.) Plastered[g]—Furred	Insulating Board Lath (1 in.) Plastered[g]—Furred	Gypsum Lath Plastered Plus 1 in. Blanket Insulation—Furred[h]	
			A	B	C	D	E	F	G	H	I	
Solid[a] Brick		8	0.50	0.46	0.32	0.31	0.30	0.22	0.22	0.16	0.14	67
		12	0.35	0.34	0.25	0.25	0.24	0.19	0.19	0.14	0.13	68
		16	0.28	0.27	0.21	0.21	0.20	0.17	0.16	0.13	0.12	69
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	0.29	0.22	0.22	0.21	0.17	0.17	0.13	0.12	72
		16	0.25	0.24	0.19	0.19	0.19	0.16	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	0.32	0.31	0.30	0.22	0.22	0.16	0.14	76
		24	0.37	0.35	0.26	0.26	0.25	0.20	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	0.58	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	0.19	0.17	0.15	82
		12	0.50	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[e] Weight Aggregate									
		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 ⅝ in.
[g] Thickness of plaster assumed ½ in.
[h] Based on 2 in. furring strips; one air space. These figures may also be used for wood or metal lath.

where

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

In selecting the values to be used for U_r and U_{ce} it should be noted that the under surface of the roof and the upper surface of the ceiling are more nearly equivalent to the boundary surfaces of an internal air space than they are to the external surfaces of a wall. It would be more nearly correct to use a value of 2.2 rather than the usual value of 1.65 as coefficients for these surfaces. In most cases this would make only a minor change in U. It should be noted that the over-all coefficient should be multiplied by the ceiling and not the roof area.

If the unheated attic space between the roof and ceiling has no dormers, windows or vertical wall spaces the combined coefficient may be used for determining the heat loss through the roof construction, attic and top floor ceiling. If the unheated attic contains windows and vertical wall spaces these must be taken into consideration in calculating the roof area and also its coefficient U_r. In this case an approximate value of U_r may be obtained as the summation of the coefficient of each individual section such as the roof, vertical walls or windows times its percentage of total area. This coefficient may then be used with reasonable accuracy in Equation 4. If there are large vertical wall areas, the most accurate procedure is to estimate the attic temperature by means of Equation 4, Chapter 6 and to calculate the heat loss by using the ceiling coefficient only, and the attic temperature instead of the outside temperature. Information concerning basement floor and wall coefficients will be found on Page 110.

The values in Table 16 apply principally to hip and double hip roofs with unheated attics. In the case of gable and gambrel (Dutch Colonial) roofs having end wall surfaces, the values in Table 16 can be used with reasonable accuracy if the end wall area is considered as part of the roof area. Thus in arriving at the combined roof and ceiling coefficient for a pitched roof with insulating board applied to the under side of the rafters, the board must also be applied to the end wall surfaces in order for the values in Table 16 to be approximately applicable.

The coefficients in Table 16 are based on ⅓ pitch roofs for which the value of n, or the ratio of the roof area to the ceiling area, is 1.2. Since these combined roof and ceiling coefficients are based on the ceiling area, small variations in the pitch do not greatly alter the coefficient. An increase in pitch above the ⅓ used for calculating the values would increase the combined coefficient, and vice versa.

Basement Floor and Wall Coefficients

The dirt in contact with basement floors and walls below grade has an appreciable insulating value. The exact thickness or depth of the dirt which may contribute to the heat resistance of floors and walls in contact therewith is a variable and indeterminate quantity. Tests at