$$U = \frac{1}{0.17 + 0.44 + 1.16 + 0.91 + 0.42 + 0.61} = \frac{1}{3.71} = 0.27$$

When 2 in. of bat insulation is added in the air space in the wall, an air space will still be left since it was originally 3⅝ in. wide. Then,

$$U = \frac{1}{3.71 + \frac{2}{0.27}} = \frac{1}{11.11} = 0.090$$

This coefficient (0.090) applies only to the wall where no studding or framing is present and is assumed to constitute 85 per cent of the whole wall. Then for 1 sq ft of wall the heat transfer through the insulated portion is 0.85 × 0.090 or 0.0765 Btu.

In the portion of wall where framing is present, the air space will be replaced with an equivalent thickness of wood framing. Then,

$$U \text{ (through framing)} = \frac{1}{\frac{1}{6.0} + \frac{1}{2.27} + \frac{1}{0.86} + \frac{3.625}{0.80} + \frac{1}{2.4} + \frac{1}{1.65}}$$

$$U = 0.136$$

Then for 1 sq ft of wall the heat transfer through the framing is 15 per cent of 0.136 or 0.0204 Btu. The total heat transfer through 1 sq ft of wall (with 3⅝ in. framing covering 15 per cent of area) equals

$$U \text{ (corrected)} = 0.0765 + 0.0204 = 0.097 \text{ Btu}$$

This is the value shown for No. 49-B in Table 6, which is included to eliminate the need for the calculation of framing corrections when insulation is used in frame construction.

In making the calculations for values of U shown in Tables 5 to 18, the following conditions have been assumed:

Equilibrium or steady-state heat transfer, eliminating effects of heat capacity.
Surrounding surfaces at ambient air temperatures.
Exterior wind velocity of 15 mph.
Surface emissivity of ordinary building materials = 0.83.
No correction for position or direction of heat flow. (Average coefficients used).
Air spaces are ¾ in. or more in width.
Variation of conductivity with mean temperature neglected.
Corrections for framing made on basis of parallel heat flow through 2 × 4 in. (nominal) studs, 16 in. on centers, the framing covering 15 per cent of wall area.
Actual thicknesses of lumber assumed to be as follows:

Nominal	*Actual*
1 in. (S-2-S)	25/32 in.
1½ in. (S-2-S)	1 5/16 in.
2 in. (S-2-S)	1⅝ in.
2½ in. (S-2-S)	2⅛ in.
3 in. (S-2-S)	2⅝ in.
4 in. (S-2-S)	3⅝ in.
Finish flooring, (maple or oak)	13/16 in.

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

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): Plain Walls—No Interior Finish	Plaster (½ in.) on Walls	Metal Lath and Plaster[f] 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[g] Plastered Plus 1 in. Blanket Insulation—Furred[a]	Wall Number
		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	0.36	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	0.28	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 ¾ in.
[g] Thickness of plaster assumed ½ in.
[h] Based on 2 in. furring strips; one air space.