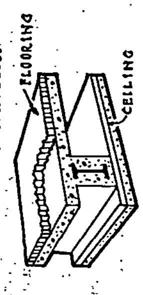
TABLE 9. COEFFICIENTS OF TRANSMISSION (U) OF CONCRETE CONSTRUCTION FLOORS AND CEILINGS[a]

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 still air (no wind) conditions on both sides.

TYPICAL CONSTRUCTION



Type of Ceiling	Thickness of Concrete (Inches)	No.	No Flooring (Concrete Bare)[b] A	Yellow Pine Flooring[c] on Wood Sleepers Embedded in Concrete[d] B	Maple or Oak Flooring[e] on Yellow Pine Sub-Flooring[c] on Wood Sleepers Embedded in Concrete C	Tile or Terrazzo[f] Flooring on Concrete D	1/4 in. Battleship Linoleum Directly on Concrete E
No Ceiling	4	1	0.65	0.40	0.31	0.61	0.44
	6	2	0.59	0.37	0.30	0.56	0.41
	8	3	0.53	0.35	0.28	0.51	0.38
	10	4	0.49	0.33	0.27	0.47	0.36
1/2 in. Plaster Applied Directly to Underside of Concrete	4	5	0.59	0.38	0.30	0.56	0.41
	6	6	0.54	0.35	0.28	0.52	0.38
	8	7	0.50	0.33	0.27	0.47	0.36
	10	8	0.45	0.32	0.26	0.44	0.34
Suspended or Furred Metal Lath and Plaster (3/4 in.) Ceiling	4	9	0.37	0.28	0.23	0.36	0.29
	6	10	0.35	0.26	0.22	0.34	0.28
	8	11	0.33	0.25	0.21	0.32	0.27
	10	12	0.32	0.24	0.21	0.31	0.25
Suspended or Furred Ceiling of Plasterboard (3/8 in.) and Plaster (1/2 in.)	4	13	0.35	0.26	0.22	0.34	0.28
	6	14	0.33	0.25	0.21	0.32	0.26
	8	15	0.31	0.24	0.21	0.30	0.25
	10	16	0.30	0.23	0.20	0.29	0.24
Suspended or Furred Ceiling of Rigid Insulation (1/2 in.) and Plaster (1/2 in.)	4	17	0.24	0.20	0.17	0.24	0.21
	6	18	0.23	0.19	0.17	0.23	0.20
	8	19	0.22	0.18	0.16	0.22	0.19
	10	20	0.22	0.18	0.16	0.21	0.19
Plaster (1/2 in.) on Corkboard (1 1/2 in.) Set in Cement Mortar (1/2 in.) on Concrete	4	21	0.15	0.13	0.12	0.14	0.14
	6	22	0.14	0.13	0.12	0.14	0.13
	8	23	0.14	0.12	0.11	0.14	0.13
	10	24	0.14	0.12	0.11	0.14	0.13

[a]Computed from factors marked by * in Table 2.
[b]The figures in COLUMN A may be used with sufficient accuracy for concrete floors covered with carpet.
[c]Thickness of yellow pine flooring assumed to be 25/32 in.
[d]The figures in COLUMN B may be used with sufficient accuracy for maple or oak flooring[e] applied directly over the concrete on wood sleepers.
[e]Thickness of maple or oak flooring assumed to be 13/16 in.
[f]Thickness of tile or terrazzo assumed 1 in.

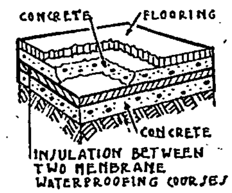
that the under surface of the roof and the upper surface of the ceiling are more nearly equivalent to the boundary surfaces of an internal air space than they are to the external surfaces of a wall. It would be more nearly correct to use a value of 2.2 rather than the usual value of 1.65 as coefficients 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

TABLE 10. COEFFICIENTS OF TRANSMISSION (U) OF CONCRETE FLOORS ON GROUND WITH VARIOUS TYPES OF FINISH FLOORING[a]

Coefficients are expressed in Btu per hour per square foot per degree Fahrenheit difference in temperature between the ground and the air over the floor, and are based on still air (no wind) conditions.

TYPICAL CONSTRUCTION



Thickness of Concrete (Inches)	No Flooring (Concrete Bare) A	Wood Flooring on Sleepers on Concrete B	Tile or Terrazzo on Concrete C	1/4 in. Battleship Linoleum on Concrete D
2	0.10	0.10	0.10	0.10
4	0.10	0.10	0.10	0.10
6	0.10	0.10	0.10	0.10
8	0.10	0.10	0.10	0.10
10	0.10	0.10	0.10	0.10

[a]Until more complete data are available, based on tests now in progress, it is recommended that a coefficient of 0.10 be used for all types of concrete floors on the ground, with or without insulation. For basement walls below grade, use the same average coefficient (0.10). A lower ground temperature should however be used for walls than floors as explained in Chapter 6. For further data see A.S.H.V.E. Research Paper—Heat Loss Through Basement Walls and Floors, by F. C. Houghten, S. I. Taimuty, Carl Gutberlet and C. J. Brown (A.S.H.V.E. JOURNAL SECTION, *Heating, Piping and Air Conditioning*, January 1942, p. 69).

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 115.