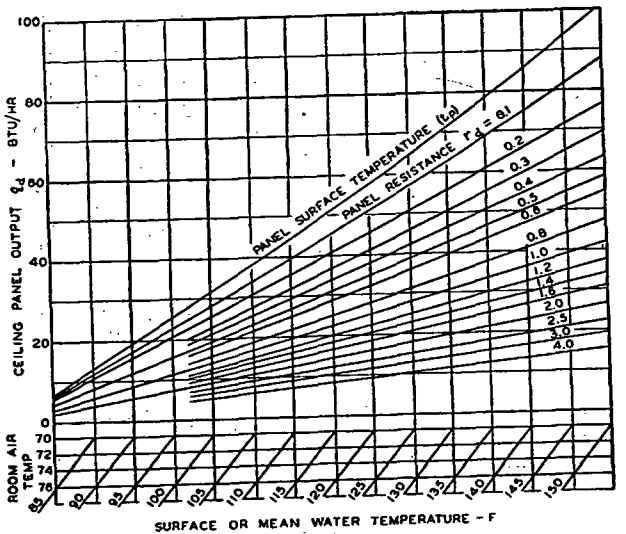


FIG. 15. CEILING PANEL DESIGN GRAPH SHOWING PANEL SURFACE TEMPERATURE AND MEAN WATER TEMPERATURE *vs.* OUTPUT DOWNWARD

calculating AUST, the surface temperature of *inside* walls is assumed to be the same as the inside air temperature. The surface temperatures of *outside* walls and exposed floors or ceilings can be obtained from Figs. 13 for a 70 F room air temperature. Corrections for other temperatures may be obtained from Fig. 14.

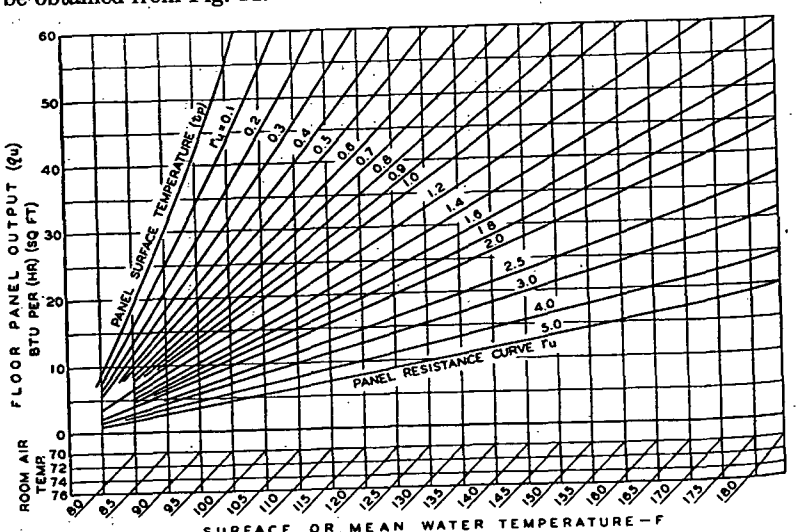


FIG. 16. FLOOR PANEL DESIGN GRAPH SHOWING PANEL SURFACE TEMPERATURE AND MEAN WATER TEMPERATURE *vs.* OUTPUT UPWARD

The combined heat transfer for ceiling panels and floor panels in rooms in which the air temperature is 70 to 76 F can be read directly from Figs. 15 and 16, respectively. These two diagrams apply to rooms in which the AUST does not differ greatly from room air temperatures. Tests[6, 7] showed that the two temperatures are normally nearly equal.

Panel Heat Losses

Heat transferred from the upper surface of ceiling panels, the back surface of wall panels, the underside of floor panels, or the edges of any panel

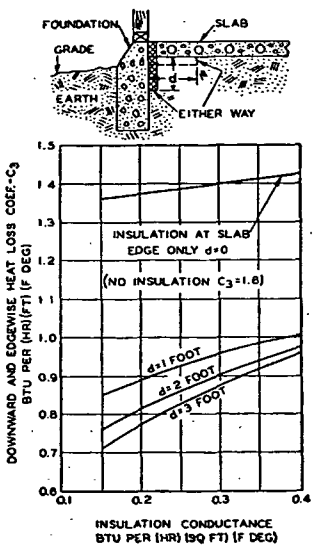


FIG. 17. DOWNWARD AND EDGEWISE HEAT LOSS COEFFICENT FOR CONCRETE FLOOR SLABS ON GRADE

is considered a panel heat loss. Panel heat losses are part of the building heat loss if the heat is transferred outside of the building. If the heat is transferred to another heated space, the panel loss is a source of heat for the space and is not a part of the building heat loss. In either case, the magnitude of the panel loss should be determined.

Panel heat loss to the outside should be kept to a reasonable amount by insulation. Panel heat loss to heated spaces may require reduction by insulation if the amount of heat transferred is excessive or if objectionable temperatures will be developed. For example, a floor panel may overheat the basement below and a ceiling panel may cause the temperature of a floor surface above it to be too high for comfort.

The heat loss from most panels can be calculated by using the coefficients given in Chapter 9 Heat Transmission Coefficients of Building Materials. These coefficients should not be used to determine the downward heat loss from panels built on grade because the heat flow from them is not uniform.[10, 11, 12] The heat loss from panels built on grade can be estimated from Fig. 17.