The solar radiation energy, Q_s, was expressed by the incident solar heat load which is proportional to the roof's area and material. The indirect solar radiation was neglected.

$$Q_s = Q_{op}A_t$$

$$Q_{op} = \alpha R I_g + Ut$$

$$U = 1/[(1/h_e)+(1/K)]$$

$$R = U/h_e$$

Where:

K = coefficient of global heat transmission, ($W/m^{2o}C$)

A_t = area of roof exposed to incident radiation, (m^2)

I_g = global radiation intensity, (W/m^2)

Q_s = total solar heat, (W)

Q_{op} = quantity of radiant heat for opaque materials, (W/m^2)

t = temperature gradient, (°C)

The total heat gain or loss by conduction was given by Koeningsberger et al. (1977) as: