

1. Conductive Heat Transfer:

Heat transfer takes place as conduction within a wall if there is a temperature difference.

$$Q_{\text{cond. wall}} = kA \cdot (T_1 - T_2) / L = (T_1 - T_2) / R_{\text{wall}}$$

$$R_{\text{wall}} = L / (kA)$$

2. $L = 0.4 \text{ m}$, $A = 20 \text{ m}^2$, $\Delta T = 25$, and $k = 0.78 \text{ W/m K}$

$$\text{➤ } Q_{\text{cond. wall}} = kA \cdot (T_1 - T_2) / L = 0.78 \cdot 20 \cdot 25 / 0.4 = 975 \text{ W}$$

$$\text{➤ } R_{\text{wall}} = L / kA = 0.4 / (0.78 \cdot 20) \approx 0.02564 \text{ }^\circ\text{C/W}$$

$$Q_{\text{cond. wall}} = (T_1 - T_2) / R_{\text{wall}} = 25 / 0.02564 \approx 975 \text{ W}$$