Conduction

It’s the transfer of heat internal energy by movement of electrons within a body, the heat transfers from the warmer to the cooler body until they’re of the same temperature. Heat conduction is a sustainable method used in buildings to raise the temperature of the space without needing any air conditioners or heaters. It’s achieved by choosing certain materials with high heat conductivity and of certain thickness.

Heat transfers through the wall as steady and one-dimensional so the rate of heat transfer is constant.

Fourier’s Law:

Rate of heat transfer is proportional with the average temperature and inversely proportional with the wall thickness.

Heat transfer depends also on the conduction resistance of the wall and it’s defined according to the geometry and thermal properties of the medium.

Heat transfer resembles the electric current flow as the rate of heat transfer resembles the electric current and the thermal resistance is the electric resistance.

Example 1

A= 20 m2 L= 0.4m k= 0.78 W/m ΔT= 25 °C

Solution 1:

Solution 2:

Rwall =