$\dot{Q}_{Floor\ on\ grade} = U_{grade\ p\ Floor}\ (T_{indoor} - T_{outdoor})$

23/10/19

Task 1: question and scheme of week 3.

	wood	insulation
outside air	0,03	0,03
wood bevel	0,14	0,14
urethane rigid foam	/	$(0,98/25)\times 90 = 3,53$
plywood	0,11	0,11
gypsum board	0,079	0,079
inside surface	0,12	0,12
wood studs	0,63	/

$R'_{wood} = 0,03 + 0,14 + 0,11 + 0,079 + 0,12 + 0,63 = 1,11\ \frac{m^2 \cdot °C}{W}$

$R'_{insulation} = 0,03 + 0,14 + 3,53 + 0,11 + 0,079 + 0,12 = 4,01\ \frac{m^2 \cdot °C}{W}$

$U_{tot} = U_{ins} \cdot \frac{A_{ins}}{A_{tot}} + U_{wood} \cdot \frac{A_{wood}}{A_{tot}}$

$U_{tot} = U_{ins} \cdot 0,75 + U_{wood} \cdot 0,25$

$U_{ins} = \frac{1}{R'_{ins}} = \frac{1}{4,01} = 0,2494\ \frac{W}{m^2 °C}$

$U_{wood} = \frac{1}{R'_{wood}} = \frac{1}{1.11} = 0,9009\ \frac{W}{m^2 °C}$

$U_{tot} = 0,2494 \cdot 0,75 + 0,9009 \cdot 0,25 = 0,18705 + 0,225225 = 0,412275\ \frac{W}{m^2 °C}$

$A_{tot} = 50 \cdot 2,5 \cdot 0,8 = 100\ m^2$

$\Delta T = 22 - (-2) = 24°C \rightsquigarrow \dot{Q}_{TOT} = U_{TOT} \cdot A_{TOT} \cdot \Delta T = 989,46 W$

Assignment 4- Aiuti Francesca

30/10/19

Task 1: complete the modified example of simplified wall calculations that you went through in the assignment of week 3 and find the total heat transfer thrugh wall.

Task 2: write a summary of 2 pages about radiation and radiative heat transfer.

Task 2: Radiation is the emission of energy as electromagnetic waves or as moving subatomic particles, especially high-energy particles, which cause ionization.
In terms of reality, radiation happens when an object in a vacuum chamber eventually cools down, reaching thermal equilibrium with its surroundings.
Radiation is different from conduction and convection since it does not require the presence of a medium material to take place.
Radiation occurs in solids, liquids and gases.
Electromagnetic waves transport energy, as said before, and they are characterized by their frequency ν or wavelenght λ. Their relation is: $\lambda = \frac{c}{\nu}$, where $c = c_0/n$.

The electromagnetic radiation, which is pertinent to heat transfer, is the thermal radiation, that increases with the increase of temperature. Thermal energy is emitted in all the space where the temperature is above 0.
Black body radiation is defined as a perfect emitter and absorber of radiation. The radiation energy emitted by a blackbody is $E_b(T) = \sigma T^4\ (W/m^2)$.
Light is the visible portion of the electromagnetic spectrum that lies between 0,40 and 0,76 μm.