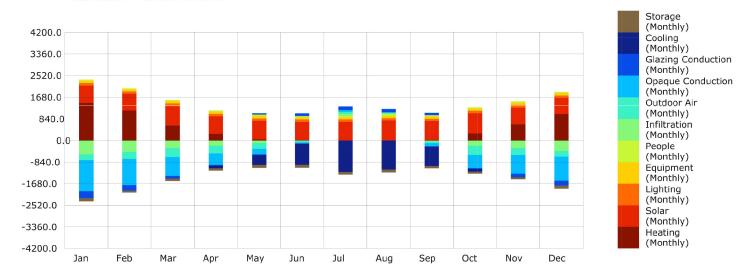
No changes

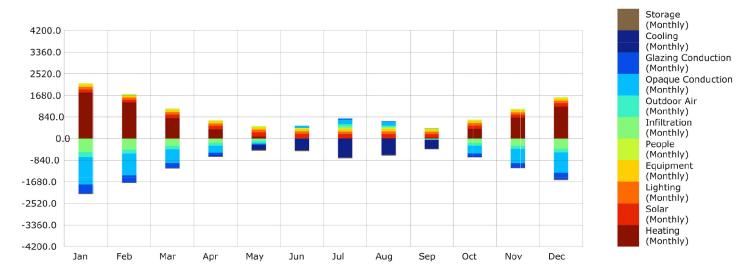
Cooling Load: 153.75 kWh/m2 Heating Load: 184.06 kWh/m2 Total Load: 337.81 kWh/m2



Blinds

adding blinds on window openings

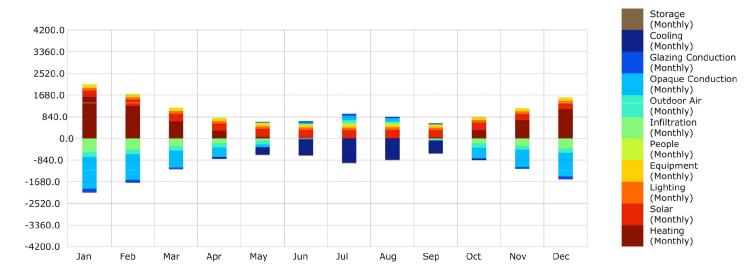
Cooling Load: 80.89 kWh/m2 Heating Load: 231.97 kWh/m2 Total Load: 312.86 kWh/m2



Wall to Window Ration

decrease the window ratio on the facades that facing the sun: East, South, West, from 0.3 to 0.1

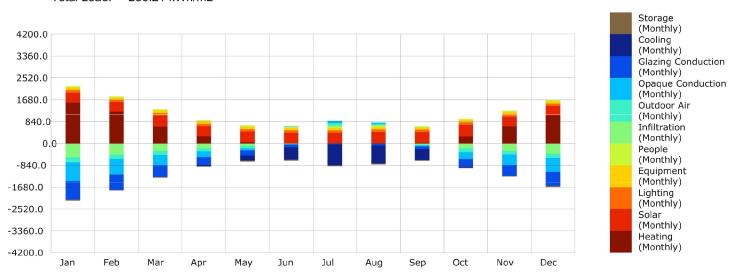
Cooling Load: 108.50 kWh/m2 Heating Load: 205.17 kWh/m2 Total Load: 313.68 kWh/m2



Construction

changing materials of exterior wall, window, roof, use materials and assemblies with higher R-values

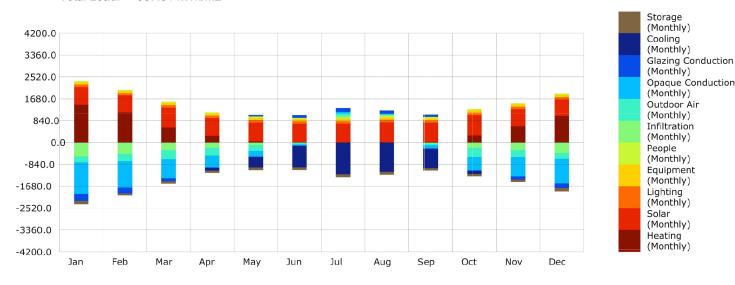
Cooling Load: 89.84 kWh/m2 Heating Load: 196.36 kWh/m2 Total Load: 286.21 kWh/m2



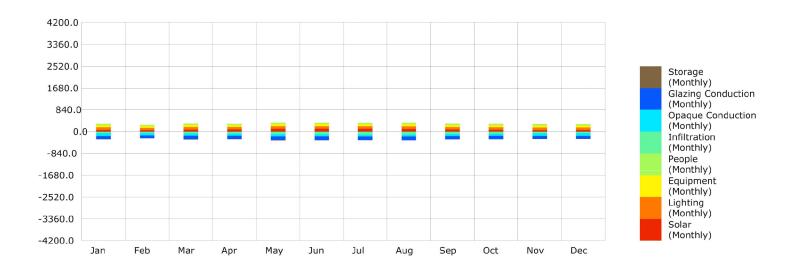
Thermal Mass

adding 8" concrete thermal mass

Cooling Load: 153.75 kWh/m2 Heating Load: 184.06 kWh/m2 Total Load: 337.81 kWh/m2

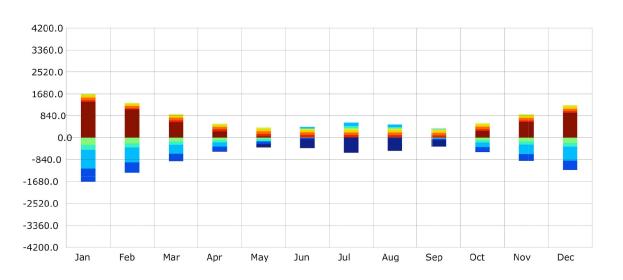


Combination without system



Combination combine the 4 parameters

Cooling Load: 60.18 kWh/m2 Heating Load: 174.46 kWh/m2 Total Load: 234.64 kWh/m2



Temperature without system

Storage (Monthly)

(Monthly)

(Monthly)

(Monthly)

Outdoor Air (Monthly)

Infiltration (Monthly) People (Monthly)

Equipment (Monthly)

Lighting (Monthly)

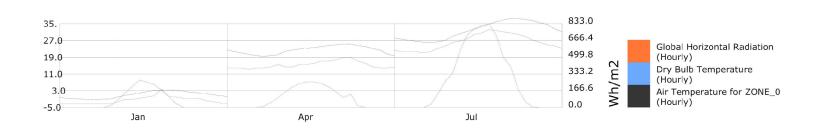
Solar (Monthly)

Heating

Glazing Conduction

Opaque Conduction

Cooling



- 1. From the results of the 4 parameters, the most effective is construction, to use materials and assemblies with higher R-Values.
- 2. Without any system running in the room, the temperature range in winter is 0-4 °C, in summer is 25-40 °C.