

in partnership with



Bahaa Alnassr Allah

Kinematics Social Hub

Oxford Brookes University

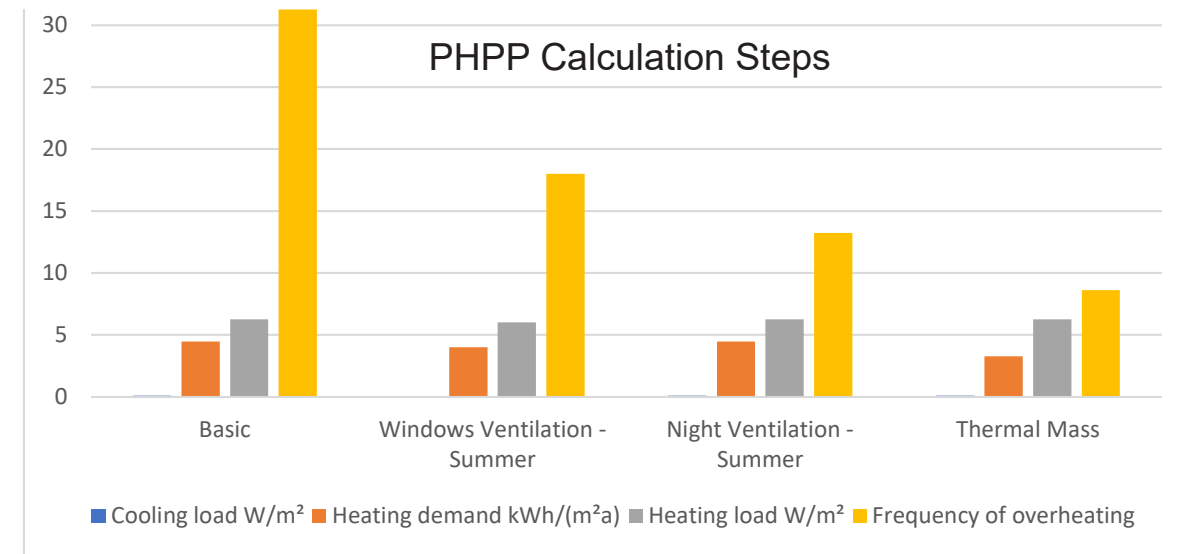
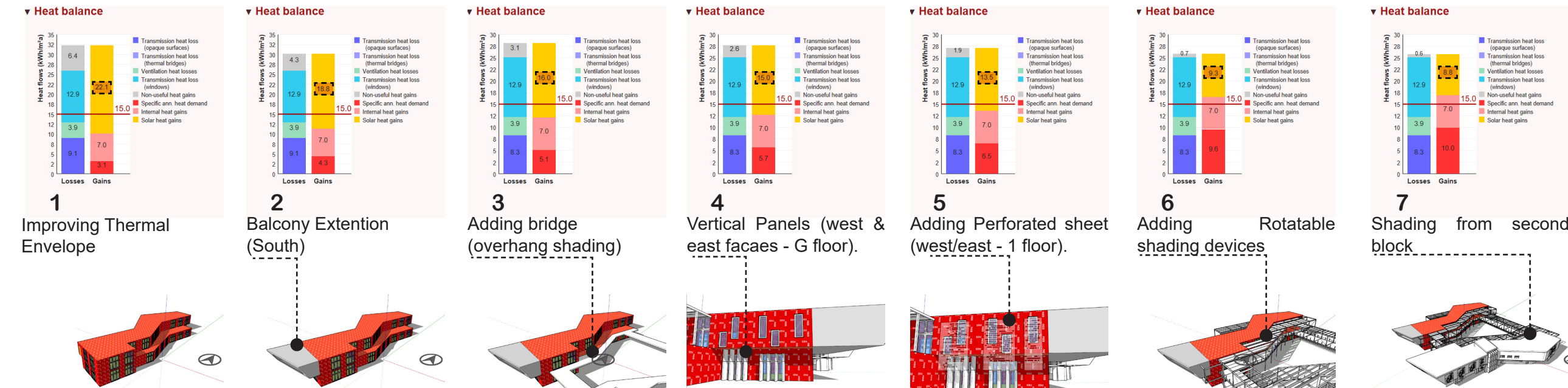
Design & development:

• Calculations started in SketchUp-PH plugin, U-values were improved to 0.145, 0.15, 0.25 and 0.7 W/m2K for walls, roof, floor, and windows respectively. Adding balconies to the south part of the building had a double effect on the ground floor (overhanging shading) and the first floor (buffer zone). After that, vertical panels and perforated sheets were added to external south and east facades to avoid low angle sun. finally, shading devices above terrace and shades from the second block have reduced solar heat gain to 8.8 (kWh/m2a).

• In PHPP, an overheating of 31% was detected. few strategies were applied in order to mitigate that; allowing summer window ventilation, night ventilation, and applying heavy construction thermal mass to spaces that are exposed to direct sun. Finally, the Passivhaus standard has been achieved with 9% overheating, 6 W/m2 heating load, and no cooling load.



3D Views within context

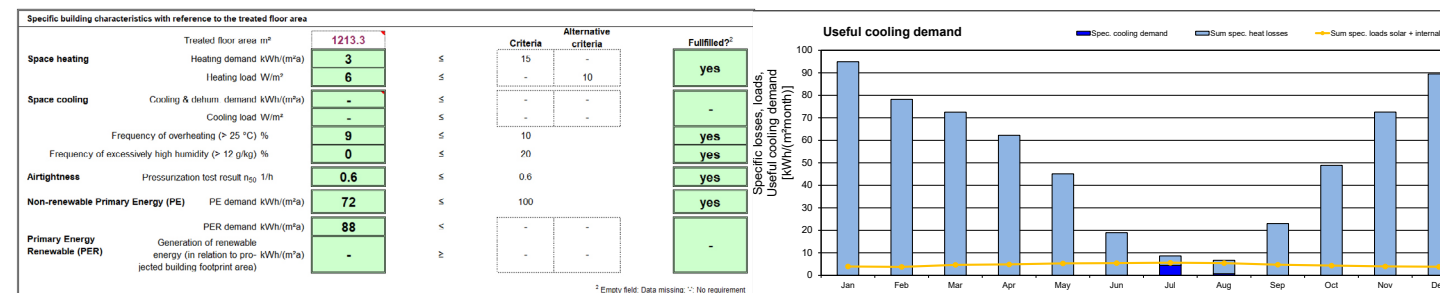
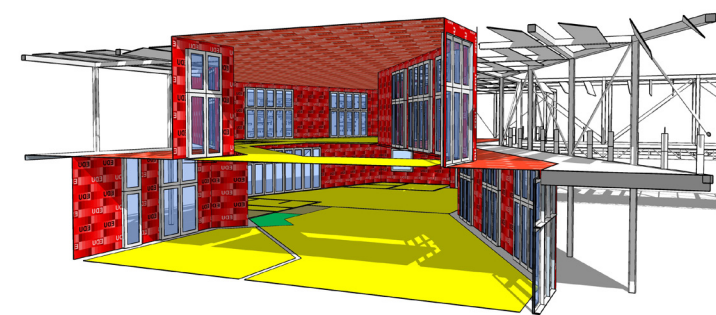
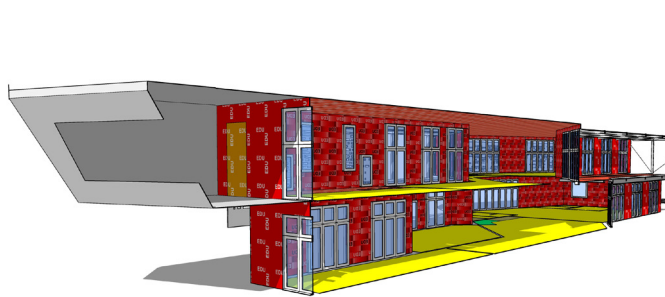


Specific building characteristics with reference to the treated floor area			
Space heating	Treated floor area m ²	1213.3	
	Heating demand kWh/(m ² a)	4	
	Heating load W/m ²	6	
Space cooling	Cooling & dehum. demand kWh/(m ² a)	-	
	Cooling load W/m ²	-	
	Frequency of overheating (> 25 °C) %	31	
	Frequency of excessively high humidity (> 12 g/kg) %	8	
Airtightness	Pressurization test result n ₅₀ 1/h	0.6	
Non-renewable Primary Energy (PE)	PE demand kWh/(m ² a)	74	
Primary Energy Renewable (PER)	PER demand kWh/(m ² a)	90	

1 Basic Imported Model With Window Vent

2 With Night Vent

3 With Thermal Mass



PHPP Final Result