PASSIVHAUS
Student Competition

Bahaa Alnassr Allah

Kinematics Social Hub

in partnership with

TARMAC
A CRH COMPANY

PROJECT FACTS

Mixed-use	Granada	1210 m²
Building Use	Location	TFA

PASSIVHAUS STRATEGY

- Airtightness & ventilation strategy: castconcrete provides the required airtightness with all joints sealed by tapes, it also provides thermal mass that helps to absorb the heat during the day and release it at night. Cross and stack ventilation helps to purge and cold down the building at night in Summer.
- Heating strategy: Using low U-value walls and windows helps to reduce heat loss during winter and MVHR provides the extra heating needed to keep the building warm.
- Shading strategy: Rotatable shading panels are installed over the terrace and can be adjusted to provide the desired amount of sun. this also affects the interior space solar heat gain. Balconies to the south and the 1st-floor extension to the west and east block summer sun and allow it in winter. Additional vertical panels and perforated sheets are installed.
- Summer comfort: the building is designed to grab wind during summer, trees and water surfaces were designed to control wind speed and reduce its temperature.

DESIGN PHILOSOPHY

The site in Granada, Spain is surrounded by different land usage, including universities, residential, and a train station creating a diverse community. The main aim of the project is to connect this community in one place (students, tourists, residents) through food, music, and culture which are mutual areas of interest in all human beings. The spaces created will be flexible in order to allow people to rent them and to create social gatherings that promote sharing and exploring the unique qualities that make us humans. The design style was inspired by the industrial style of the site (train and tram stations). Although Passivhaus is well-known for its thick envelope, this project still provides a strong connection between inside and outside; building creates an easy-to-control microclimate which in turn helps the building to achieve the Passivhaus standard.

PREDICTED PERFORMANCE

Walls	0.145
Floor	0.25
Roof	0.15
Windows	0.7

U-Values

6 w/m² Heating Load

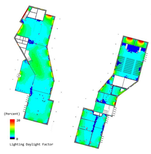
1.79 Form Factor

ics with reference to the treated floor area				
Treated floor area m²	1213.3		Criteria	Alternative criteria
Heating demand kWh/(m²a)	3	≤	15	-
Heating load W/m²	6	≤	-	10
Cooling & dehum. demand kWh/(m²a)	-	≤	-	-
Cooling load W/m²	-	≤	-	-
ency of overheating (> 25 °C) %	9	≤	10	
ely high humidity (> 12 g/kg) %	0	≤	20	
Pressurization test result n_{50} 1/h	0.6	≤	0.6	
ergy (PE) PE demand kWh/(m²a)	72	≤	100	
PER demand kWh/(m²a)	88	≤	-	-
Generation of renewable energy (in relation to pro- kWh/(m²a) jected building footprint area)	-	≥	-	-

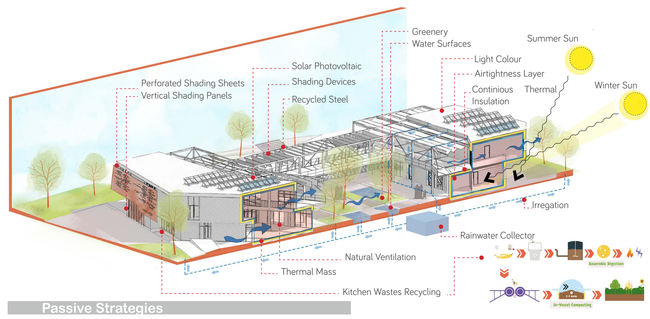
* Empty field

MATERIALS

Steel structure: recycled steel was used from the site itself (old train station).
Fly Ash concrete: a waste product of the combustion of coal (low embodied energy).
Kalwall: a highly insulating and offers unrivaled Solar Heat Gain Control.
Timber Cladding: a natural and local material and has low embodied energy.
Corten Steel: no maintenance required and the surface develops to a stable rust-like appearance forming a protective coating that slows the rate of future corrosion.



Building form, windows, and shading devices help to avoid overheating and also allow to receive an adequate amount of daylight at an average of 6% daylight factor.



Acknowledgements

Course name: Building Simulation and Design in Context
Principle Tutor: Hossein Sadeghi-Movahed
Supported by: Charlotte Khatso and Neil Kiernan

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designPH

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