

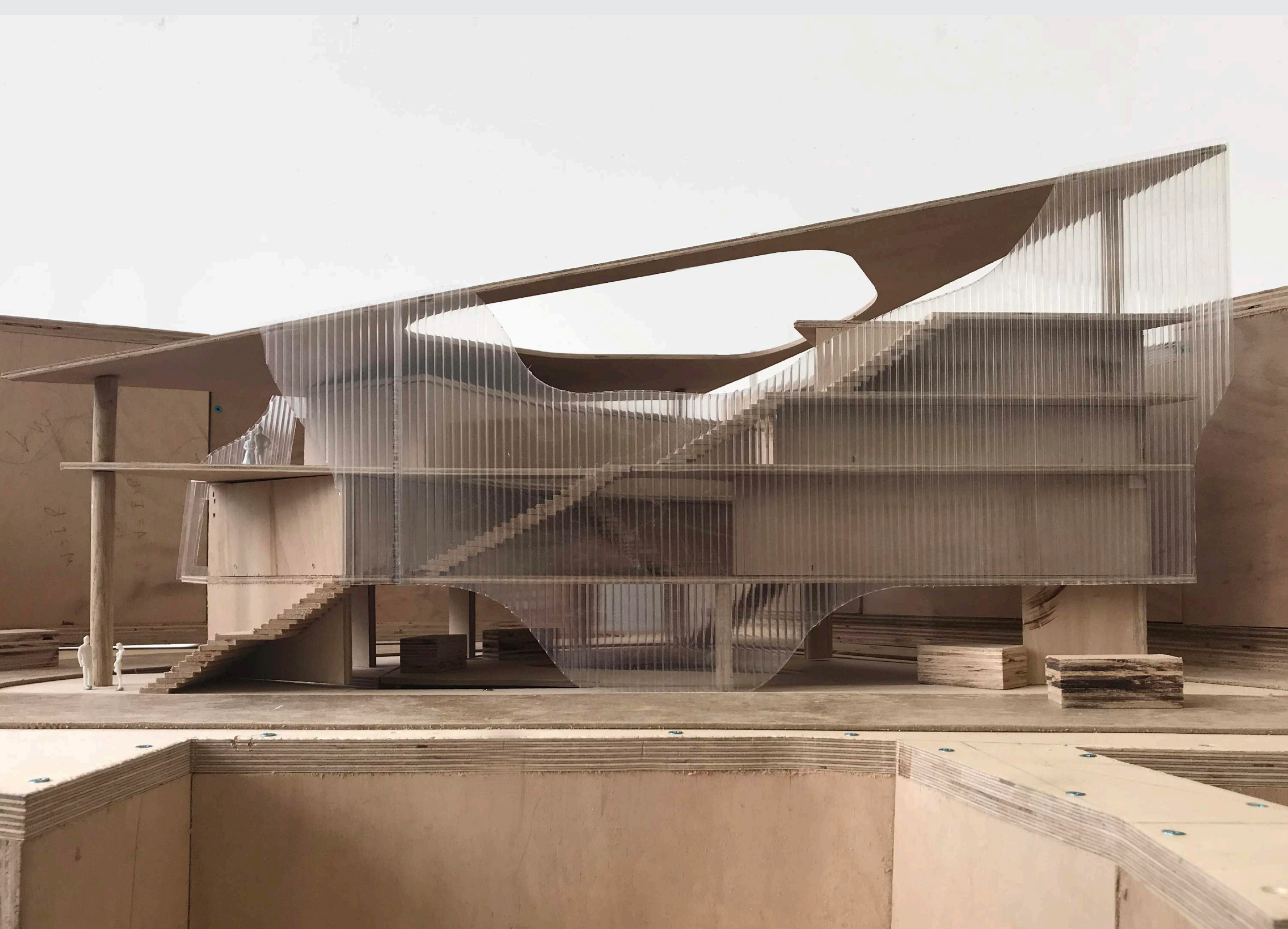


in partnership with



TIMOTHY HORNSBY

The Recharge Valletta Project



PROJECT FACTS

Residential
Building Use

Valletta
Location

750m²
TFA

PASSIVHAUS STRATEGY

The development is of mixed weight construction, consisting of post-tensioned concrete slabs and timber walls. OSB forms the main airtightness layer and this is continued to slab using adhesive tape. Service voids protect the OSB from puncture by future residents. Ventilation is centralised by zone using LG Ventech systems with 88% heat recovery efficiency. Shading is provided via a kinetic energy generating façade on the East and south elevations, and glazing is limited with louvres on the West. As the building is elevated, it cannot benefit from ground cooling: therefore, active cooling is necessary. However, cooling loads remain below PassivHaus requirements due to the provision of adequate cross ventilation and night purging.

DESIGN PHILOSOPHY

The Recharge Valletta Project is a staged development programme intended to reduce congestion, improve air quality and increase resident and tourist mobility throughout the city. The scheme will provide an autonomous electric taxi service within the city walls, in addition to installing an electric vehicle charging station in an effort to decarbonise the historical city. The operation centre is a multi-storey complex, consisting of taxi storage and charging below ground, EV charging station at ground level, and offices and residential on the floor above, which have been designed to PassivHaus standards. Renewable energy harvesting has been a primary concern during the design, and the project has been designed to take full advantage of the climatic conditions of the site. 380m² of Photovoltaic panels span the structure, forming a solar canopy, whilst an innovative kinetic façade on the east elevation shades the building whilst generating electricity from the steady gentle wind speeds using piezoelectric technology.

PREDICTED PERFORMANCE

Walls 0.129
Floor 0.146
Roof 0.090
Windows 0.800

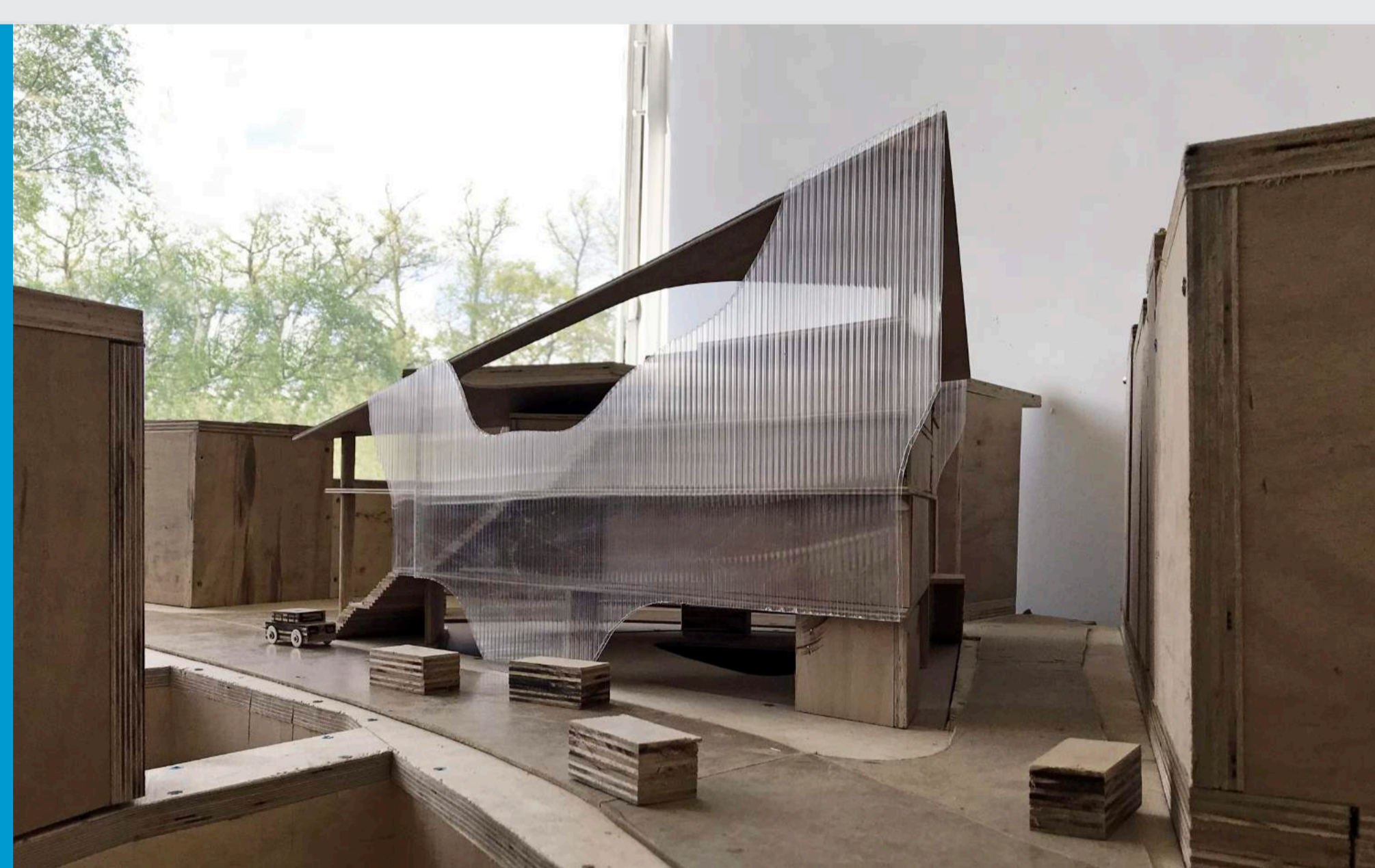
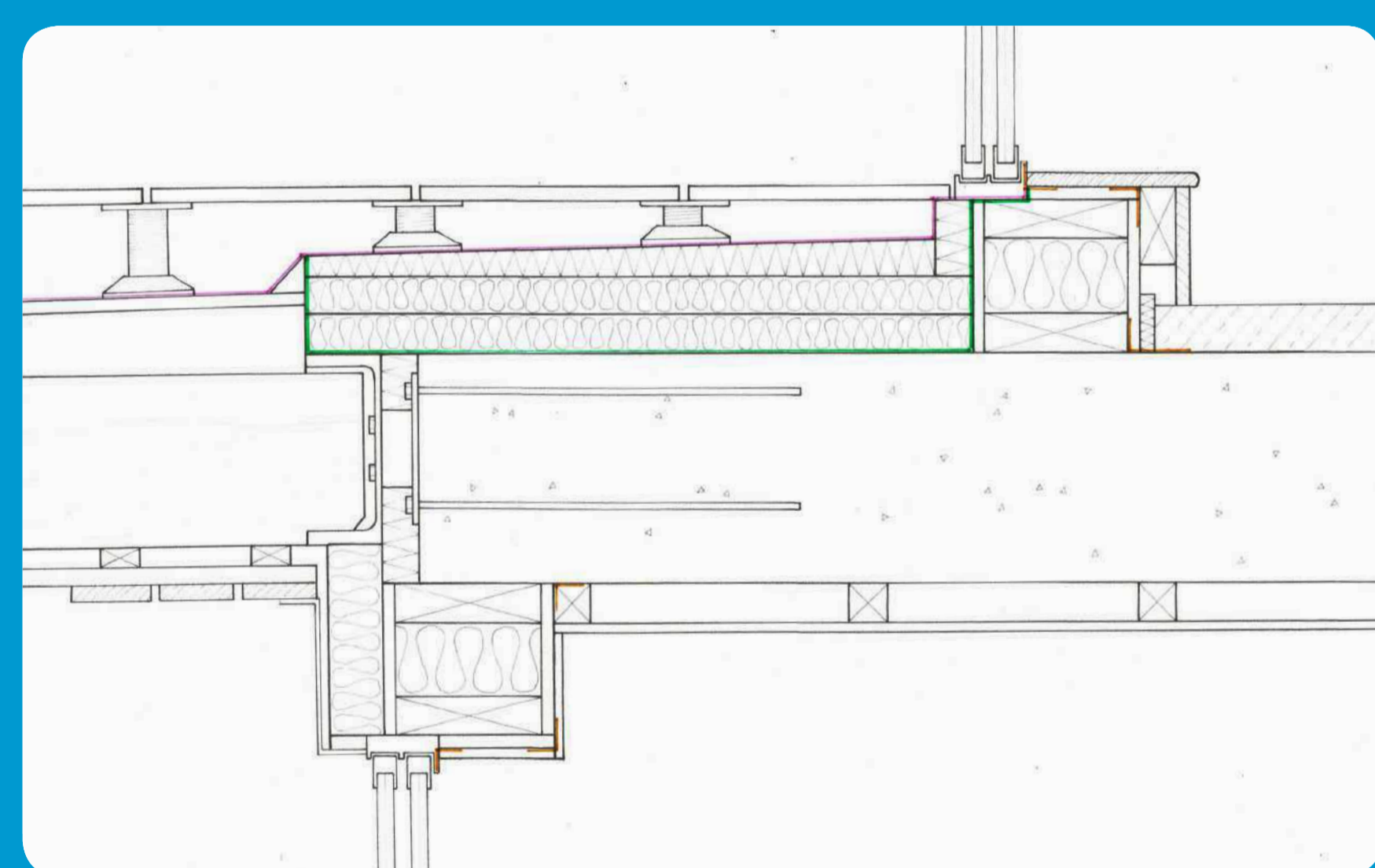
U-Values

4 w/m²

Heating Load

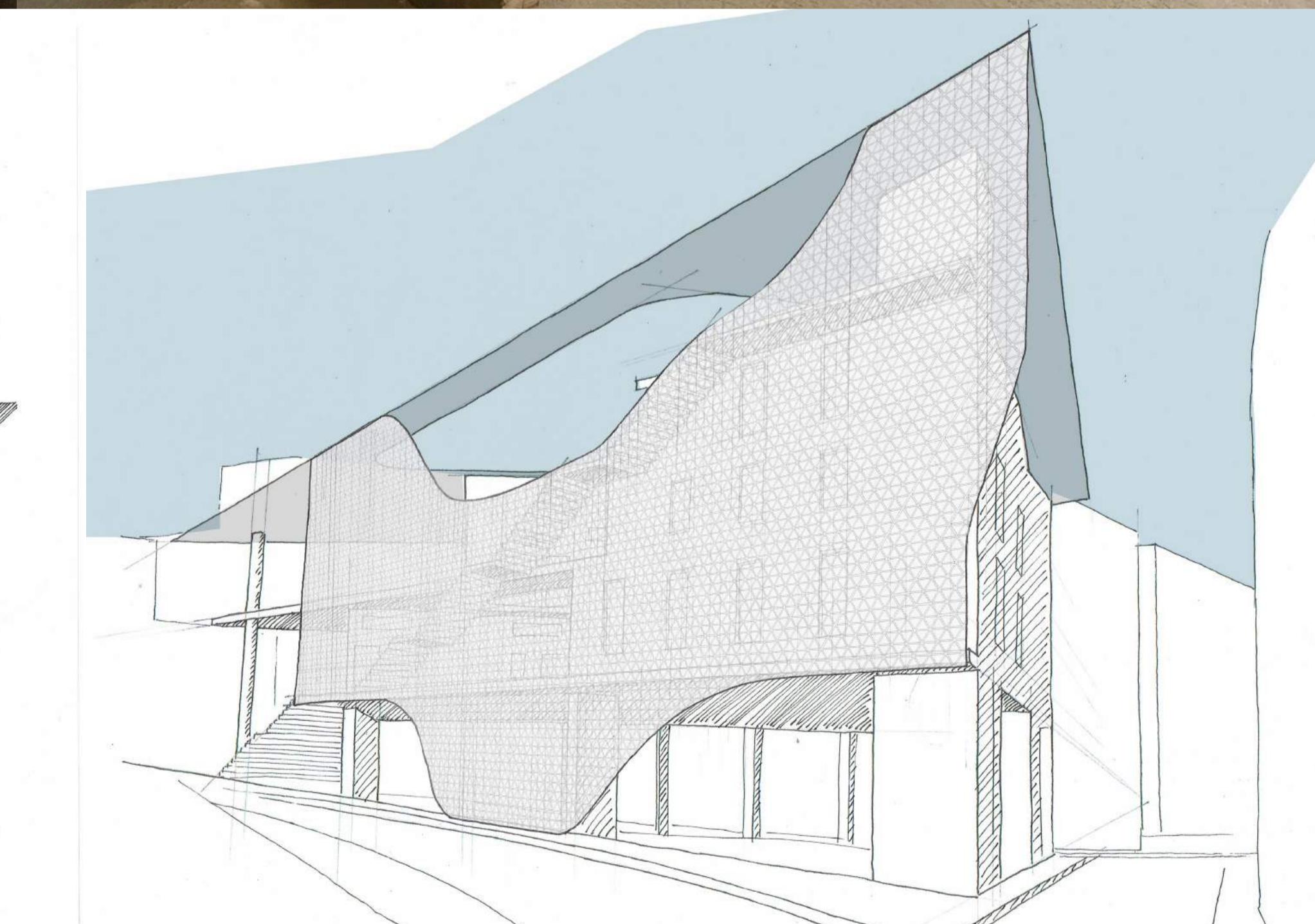
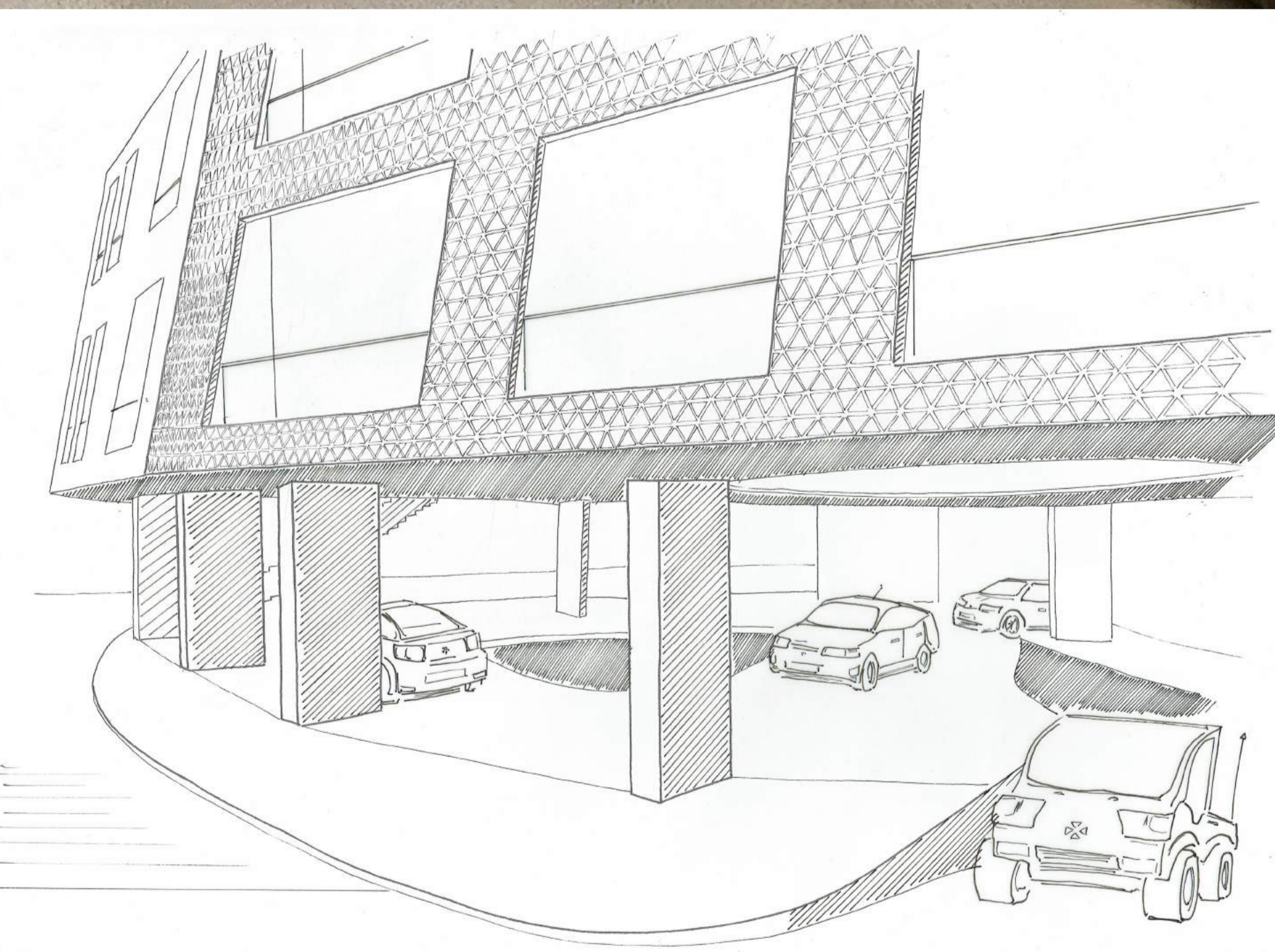
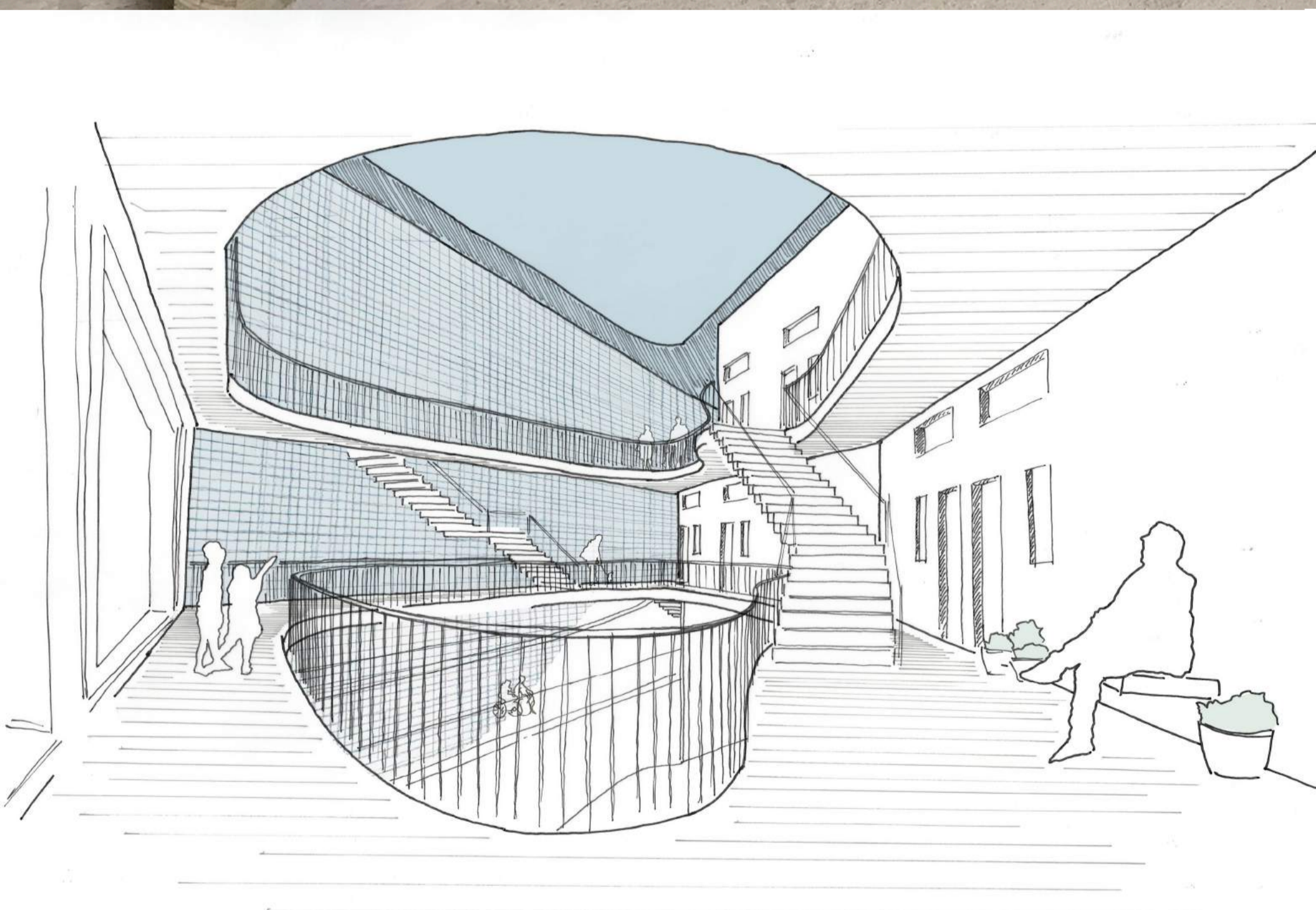
2.96

Form Factor



MATERIALS

Materials have been selected according to their proximity to site. Malta has next to no natural resources, and as such building materials are imported from distant countries. The main structure is reinforced concrete. This is spanned with rolled steel walkways, and exteriors are clad with red cedar. Italy is Malta's main supplier of Cedar and Cement. Rolled Steel is imported primarily from Spain. Aggregate is available on the island.



Acknowledgements

Sustainable Building: Performance and Design
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OXFORD
BROOKES
UNIVERSITY

UK PASSIVHAUS STUDENT COMPETITION

