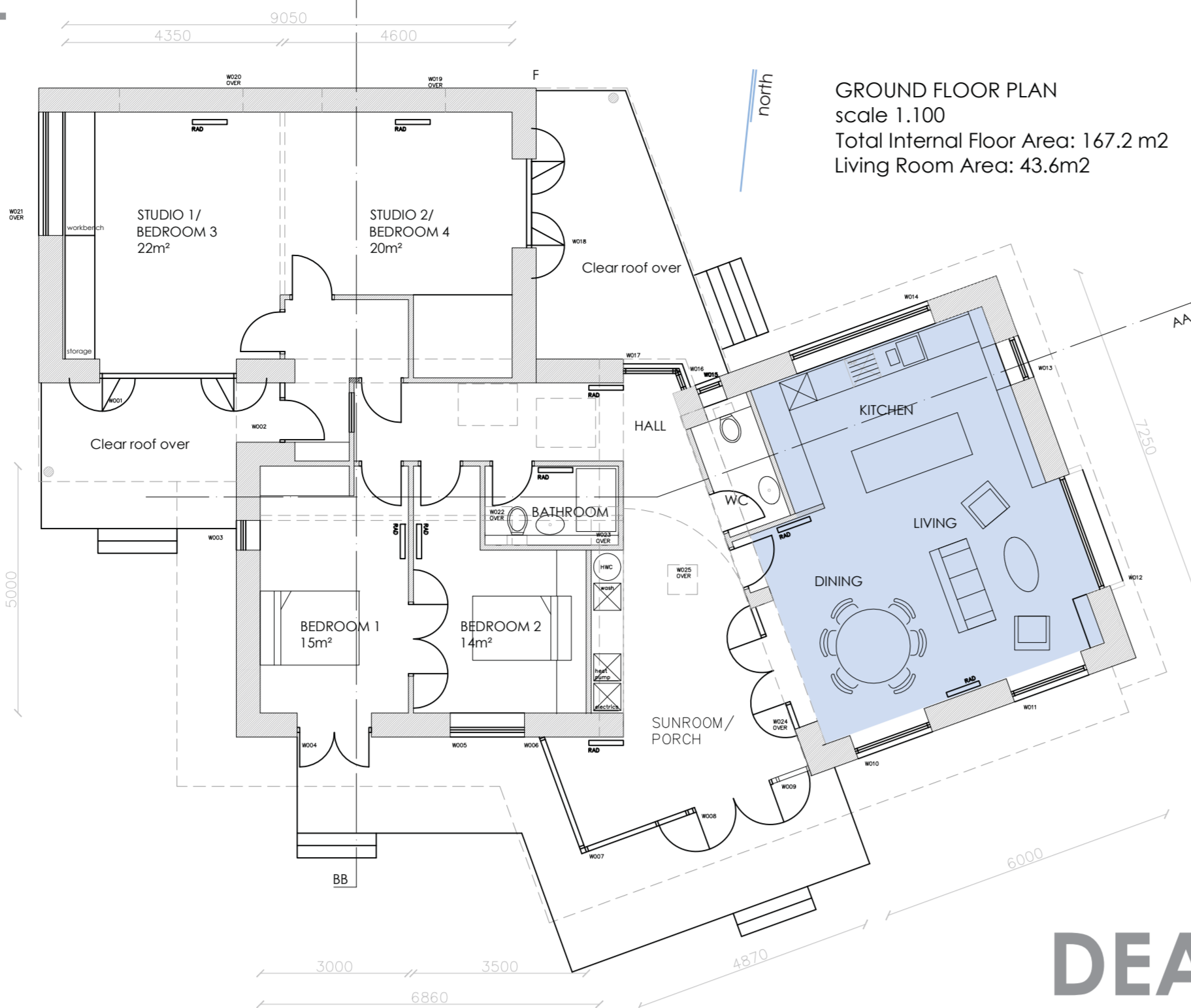


DESIGN + CONTEXT

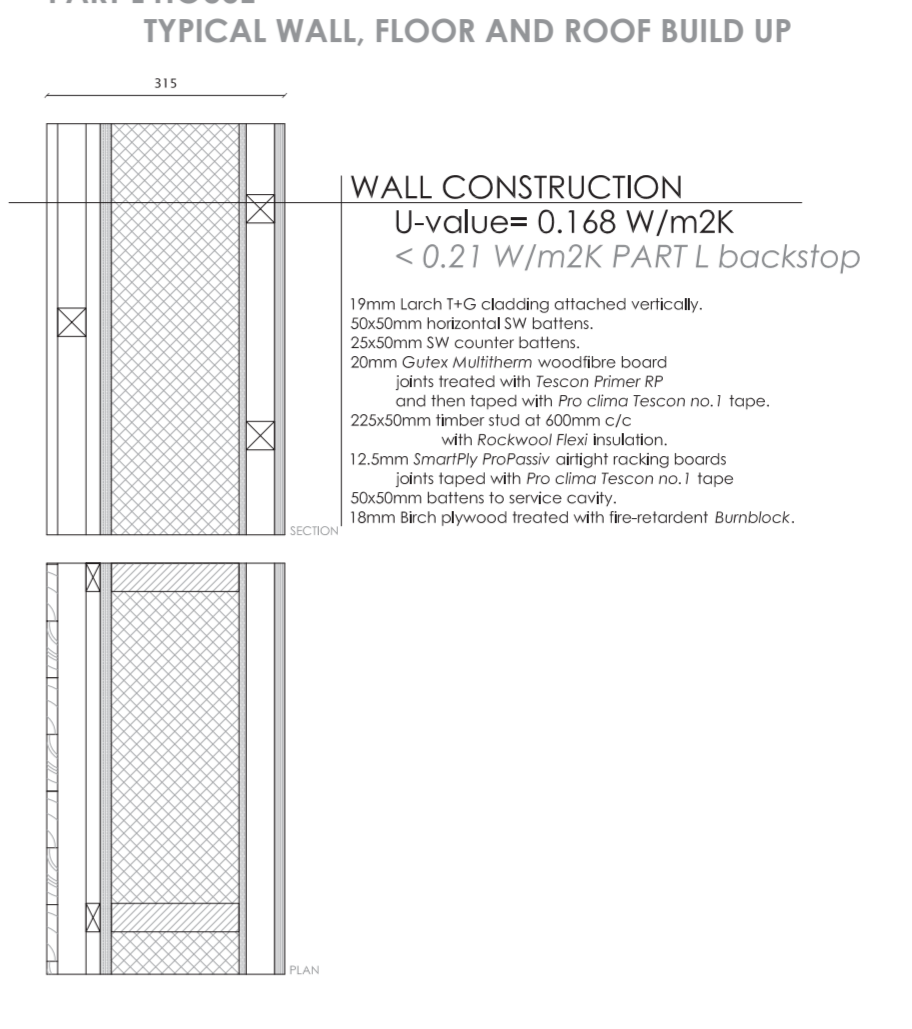


GROUND FLOOR PLAN
Scale: 1:100
Total Internal Floor Area: 147.2 m²
Living Room Area: 43.6m²



The site is located County Clare, on the edge of Special Area of Conservation in the heart of the Burren. The land was purchased back in the early 90's in order to protect it from bulldozing and a full farm was planted. The site for the house is nestled between mature covered Burren limestone and limestone fields and an ancient oak-wooded valley steeped in history with Galway Bay in the distance. The house design is intended to have as little impact on the site as possible. The use of materials are to be of a natural color which will minimize the visual effect of the house. It is the intention that the clients will build it and that the finishing trade will be as free of VOCs as possible. The clients are planning to set up two studios within the house, one for weaving and one for painting, the most important demands were to maximize the potential of the view and of natural daylighting.

FABRIC + U-VALUES



ROOF CONSTRUCTION
U-value=0.159 W/m²K
< 0.160 W/m²K PART I backstop

FLOOR CONSTRUCTION
U-value=0.159 W/m²K
< 0.21 W/m²K PART I backstop

WALL CONSTRUCTION
U-value=0.168 W/m²K
< 0.21 W/m²K PART I backstop

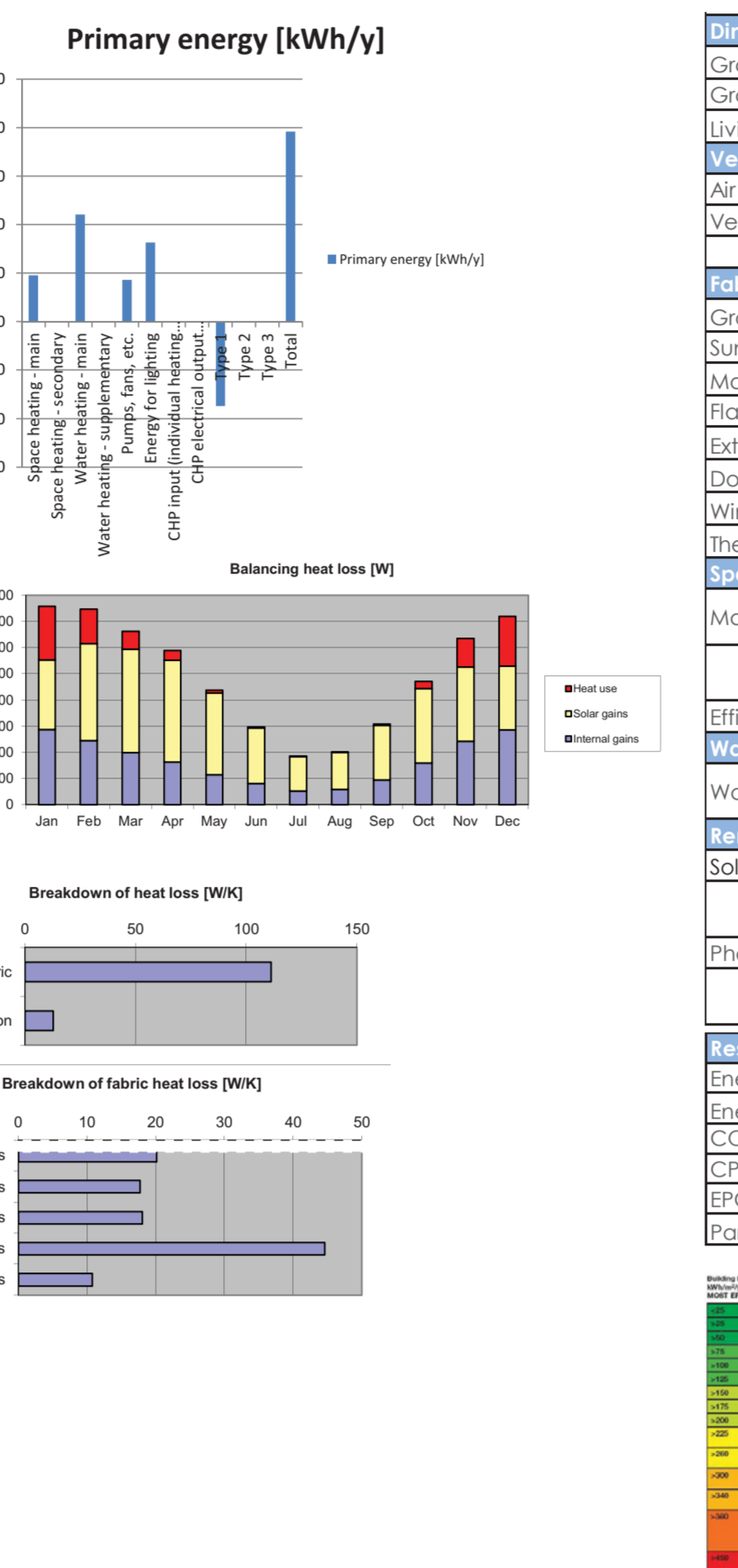
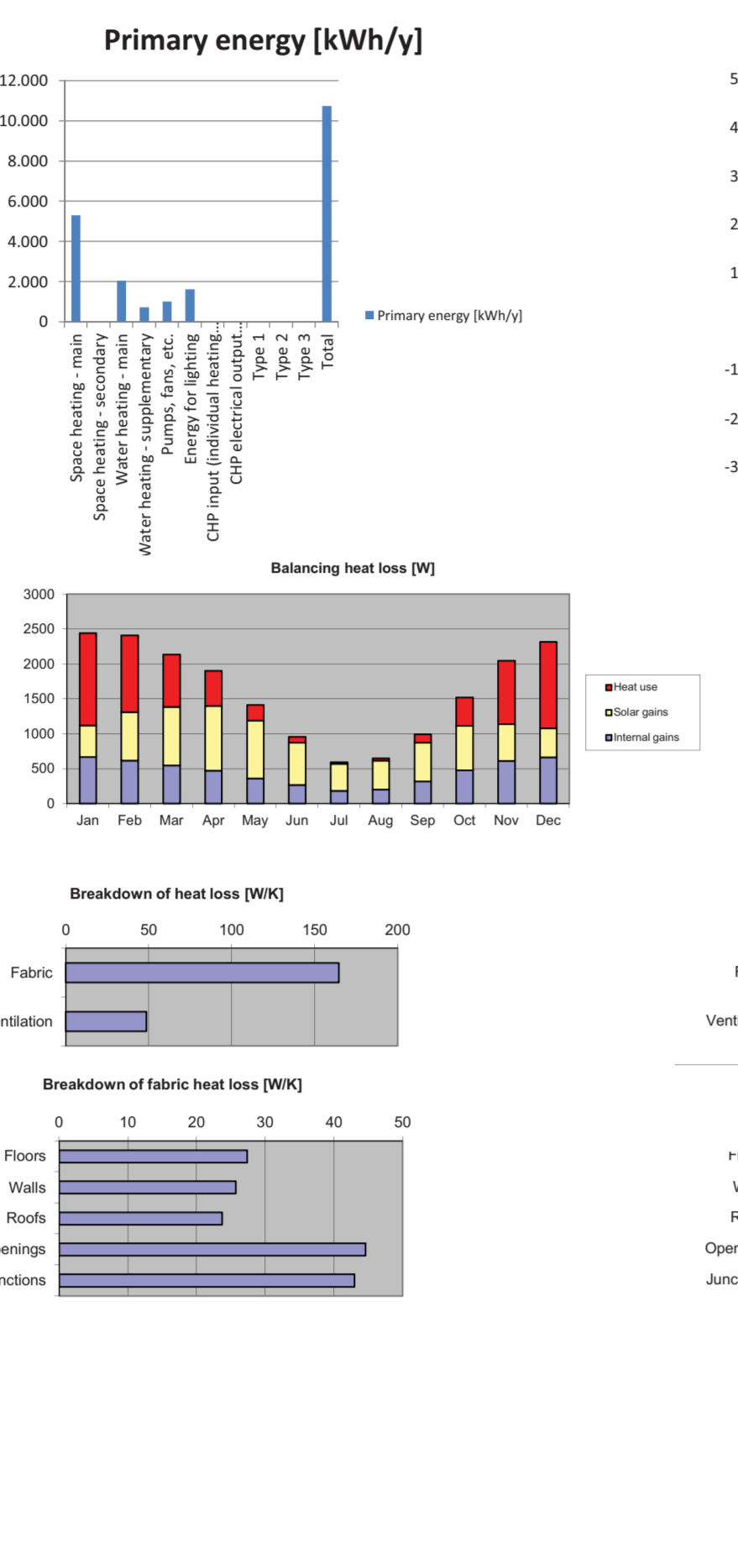
WALL CONSTRUCTION
U-value=0.114 W/m²K

FLOOR CONSTRUCTION
U-value=0.116 W/m²K

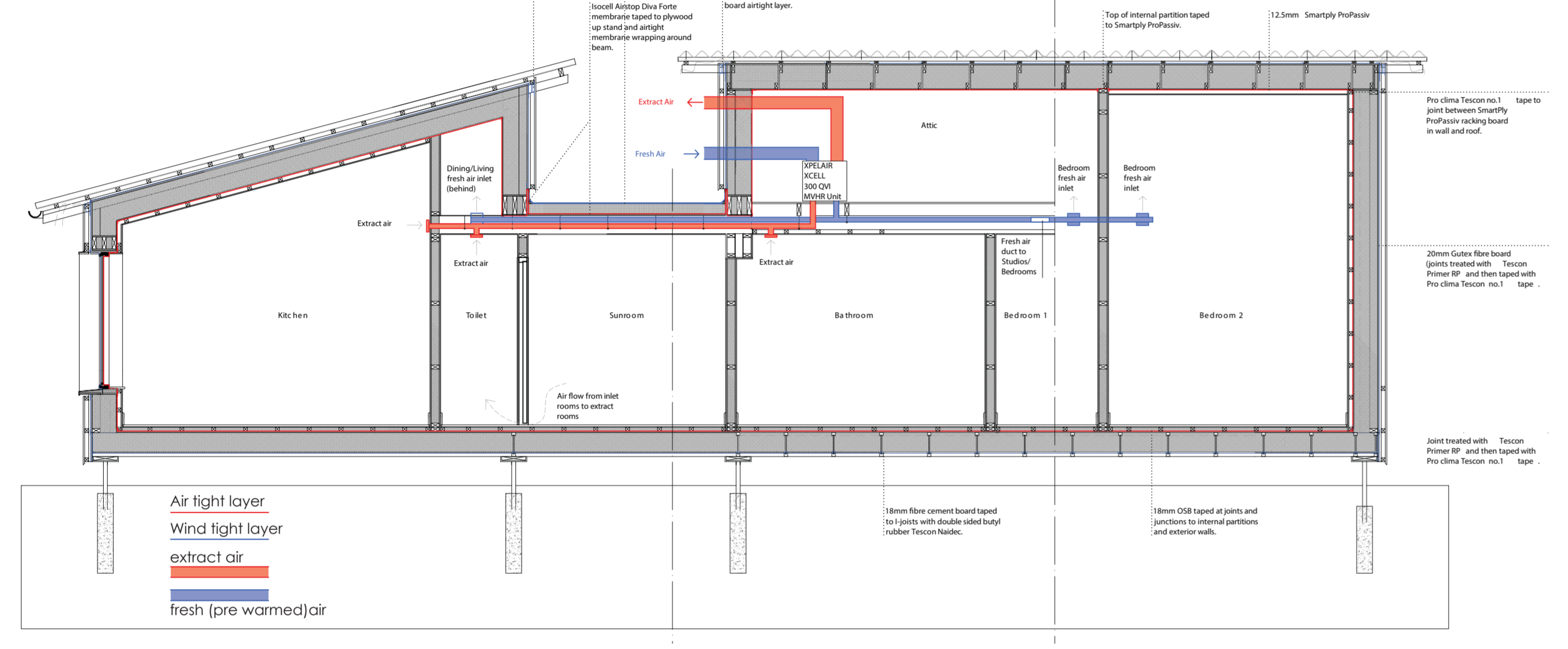
ROOF CONSTRUCTION
U-value=0.116 W/m²K

PART I HOUSE

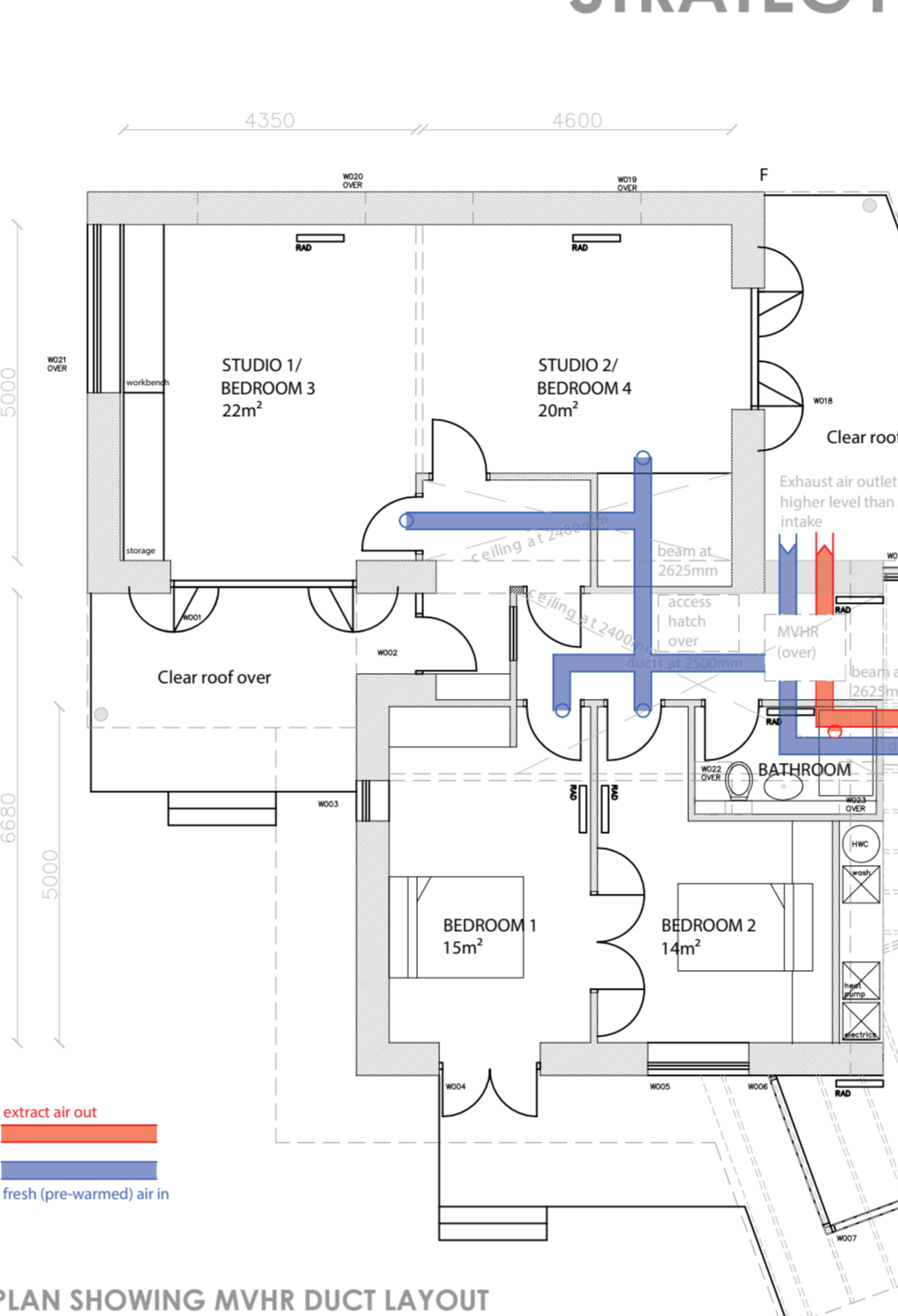
Summary table for Part I House performance metrics including energy ratings, U-values, and renewable energy contributions.



Summary table for NZEB House performance metrics, including energy ratings and U-values.



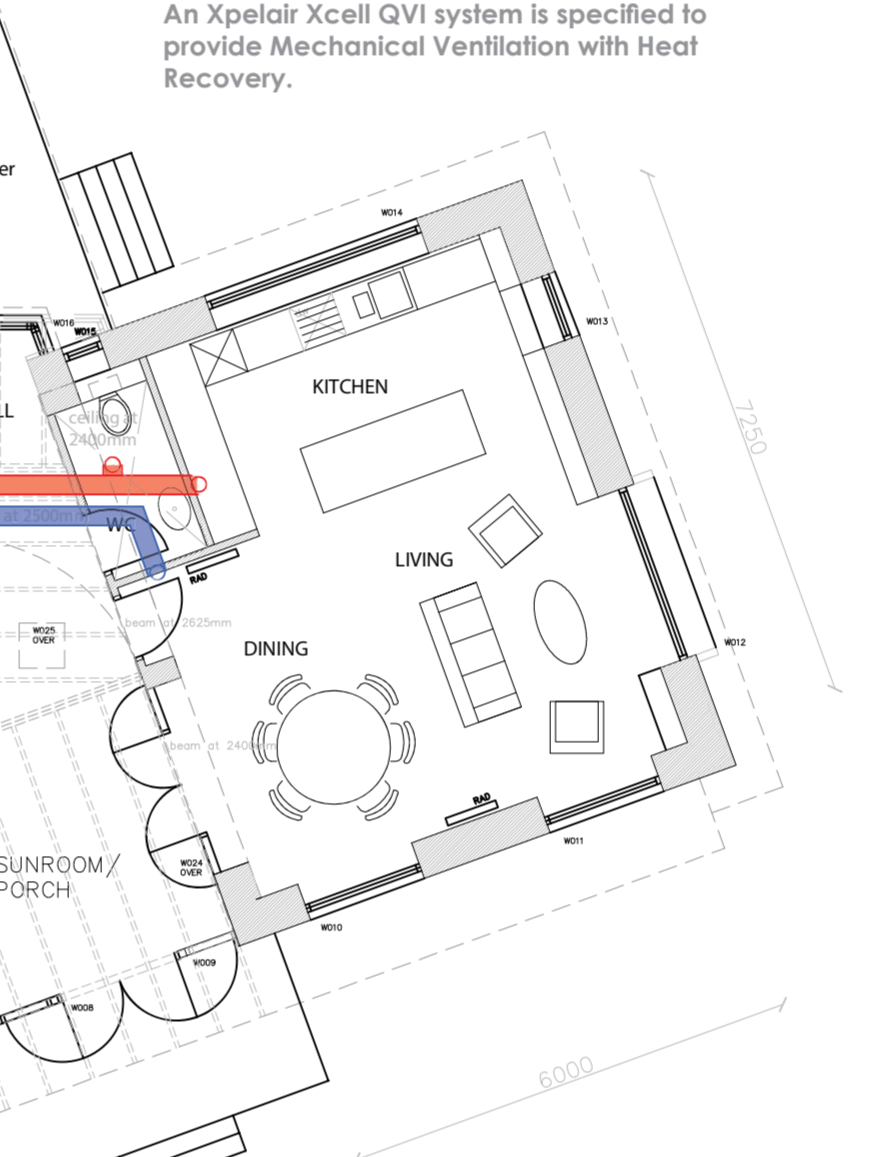
AIRTIGHTNESS + VENTILATION STRATEGY



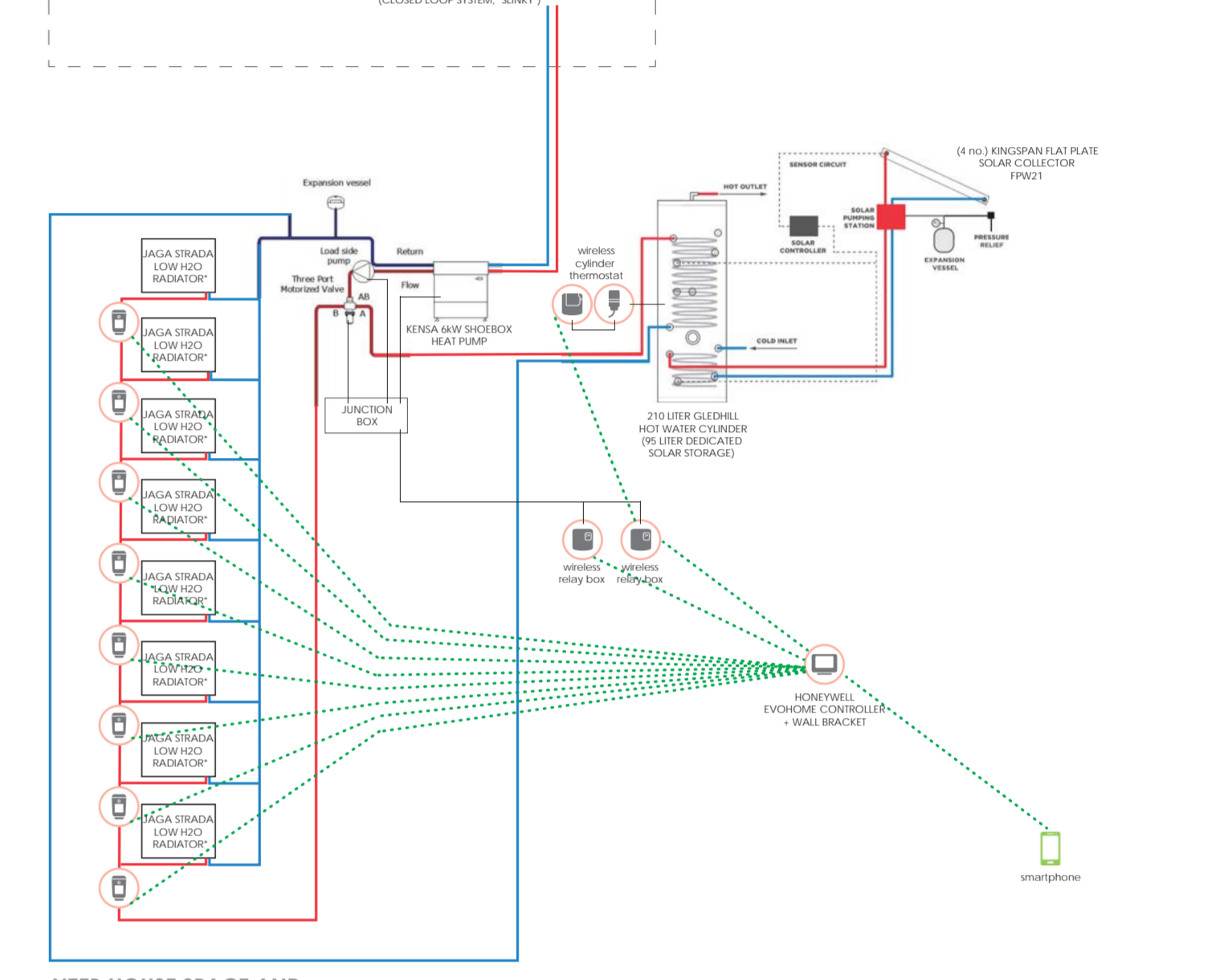
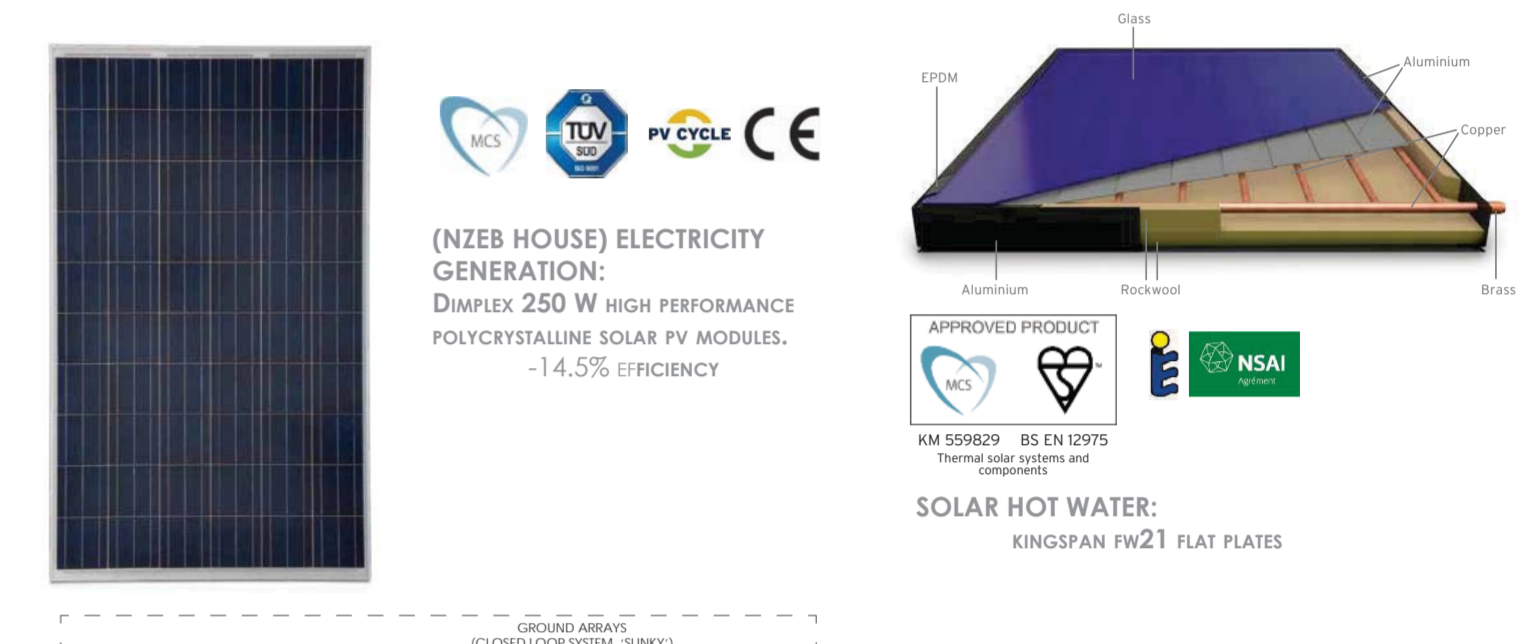
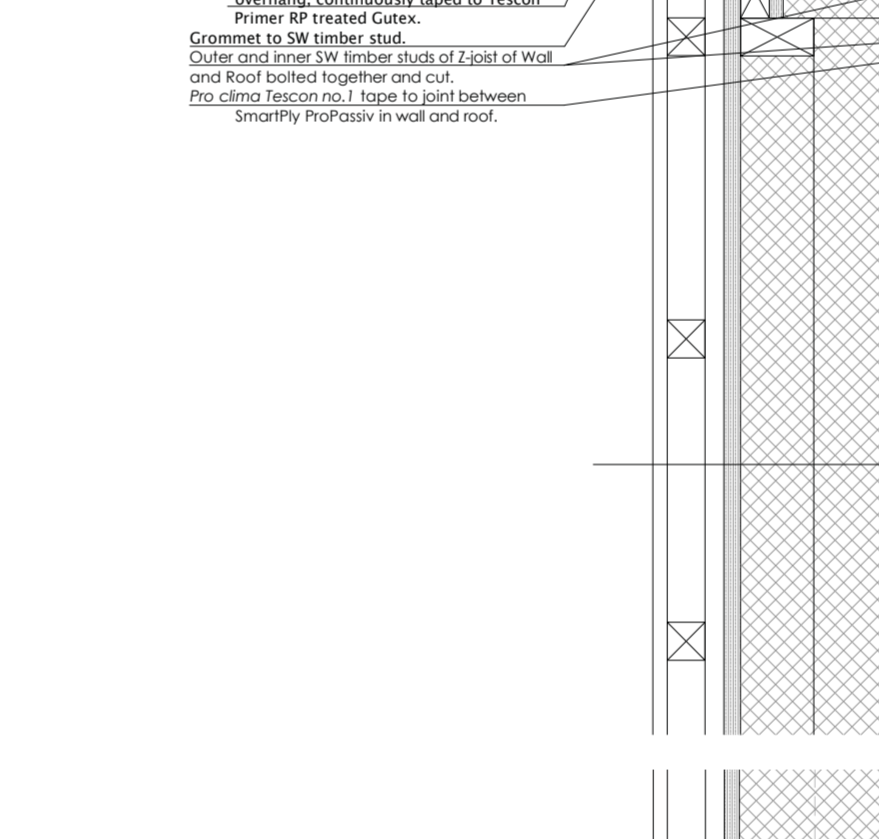
Alltightness target is 0.05 Air Changes per Hour or a G10 value of 1m³/m²/m measured @ 50pa

Galux Multitherm and Galux Multitop form for a large part of the windtight layer. As the pitch is 15 degrees only all joints to be taped. Smartify Proffisiv forms for a large part, the airtight layer and is to be taped at all junctions, joints and penetrations. Windows/doors taped to OSB and Smartify Proffisiv. Service cavity to prevent penetration of airtight layer. All pipework and ducting to be sealed with tapes/grommets.

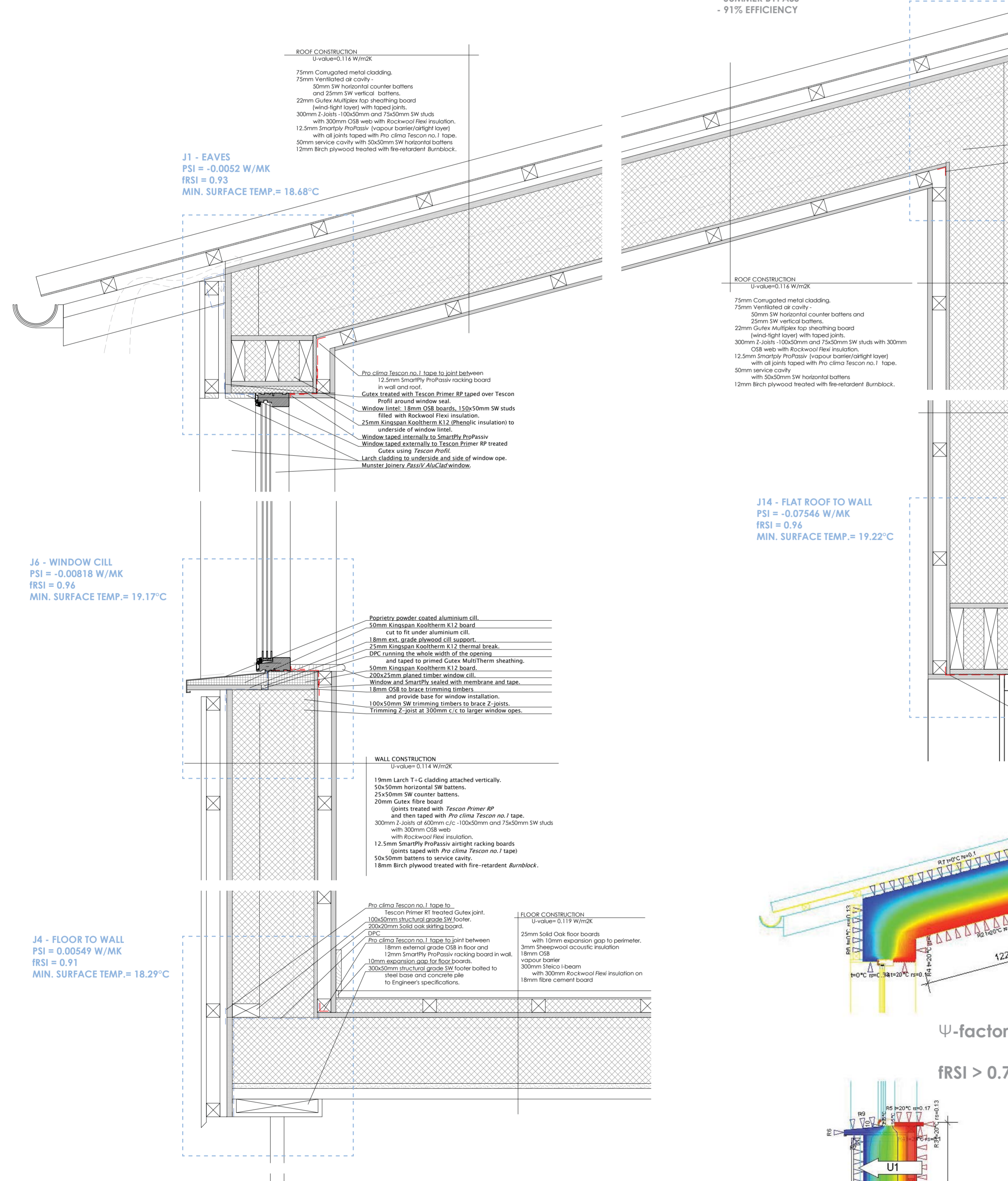
An Xpelair Xcell QVI system is specified to provide Mechanical Ventilation with Heat Recovery.



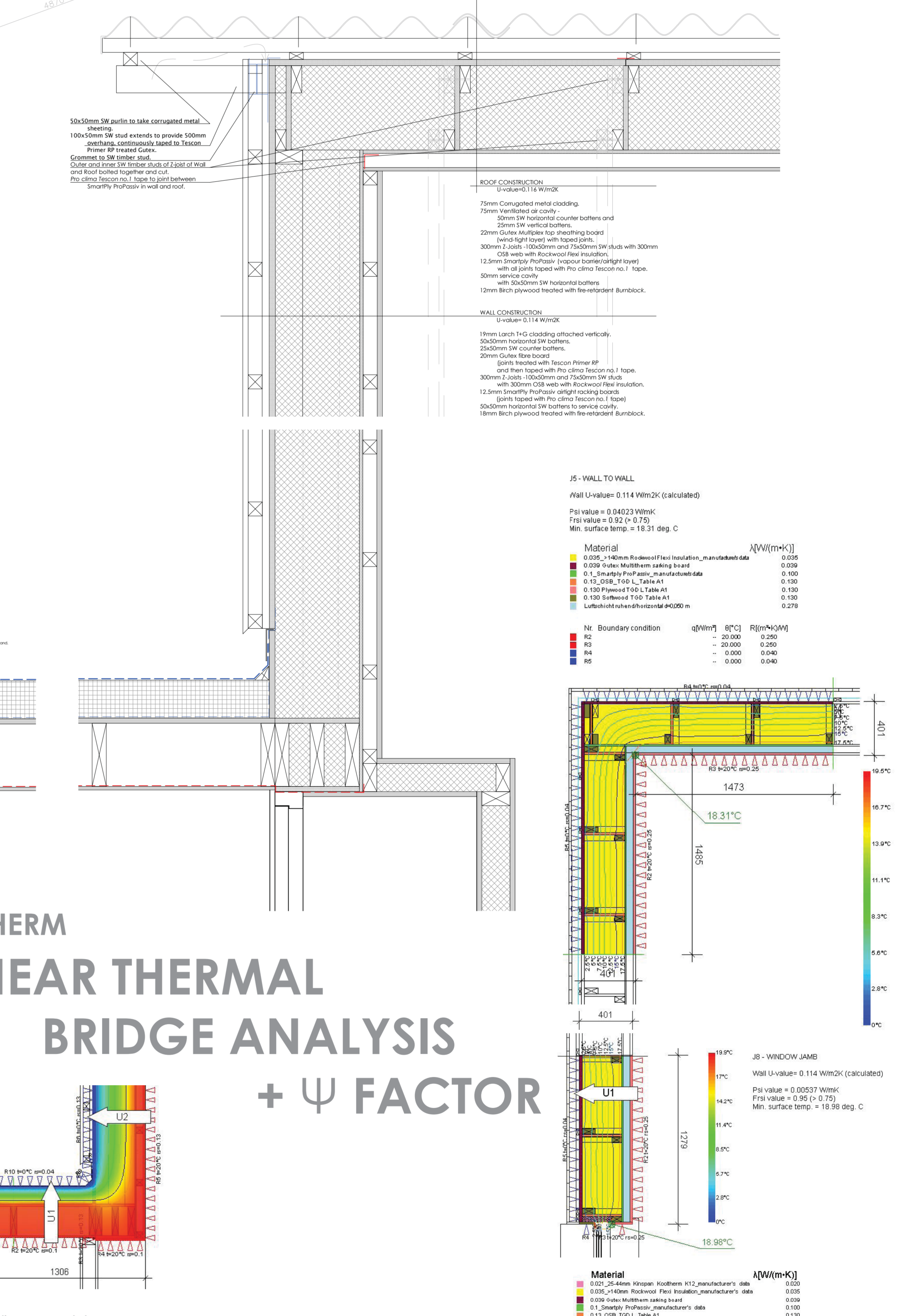
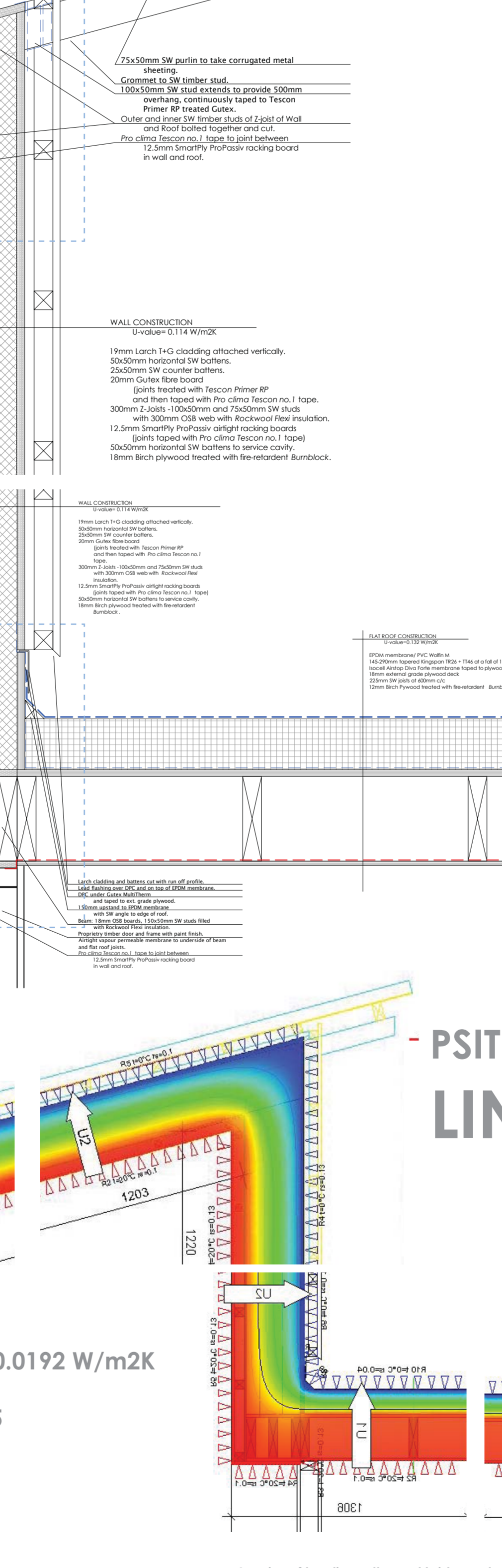
SYSTEMS + RENEWABLES
SPACE HEATING + HOT WATER + ELECTRICITY



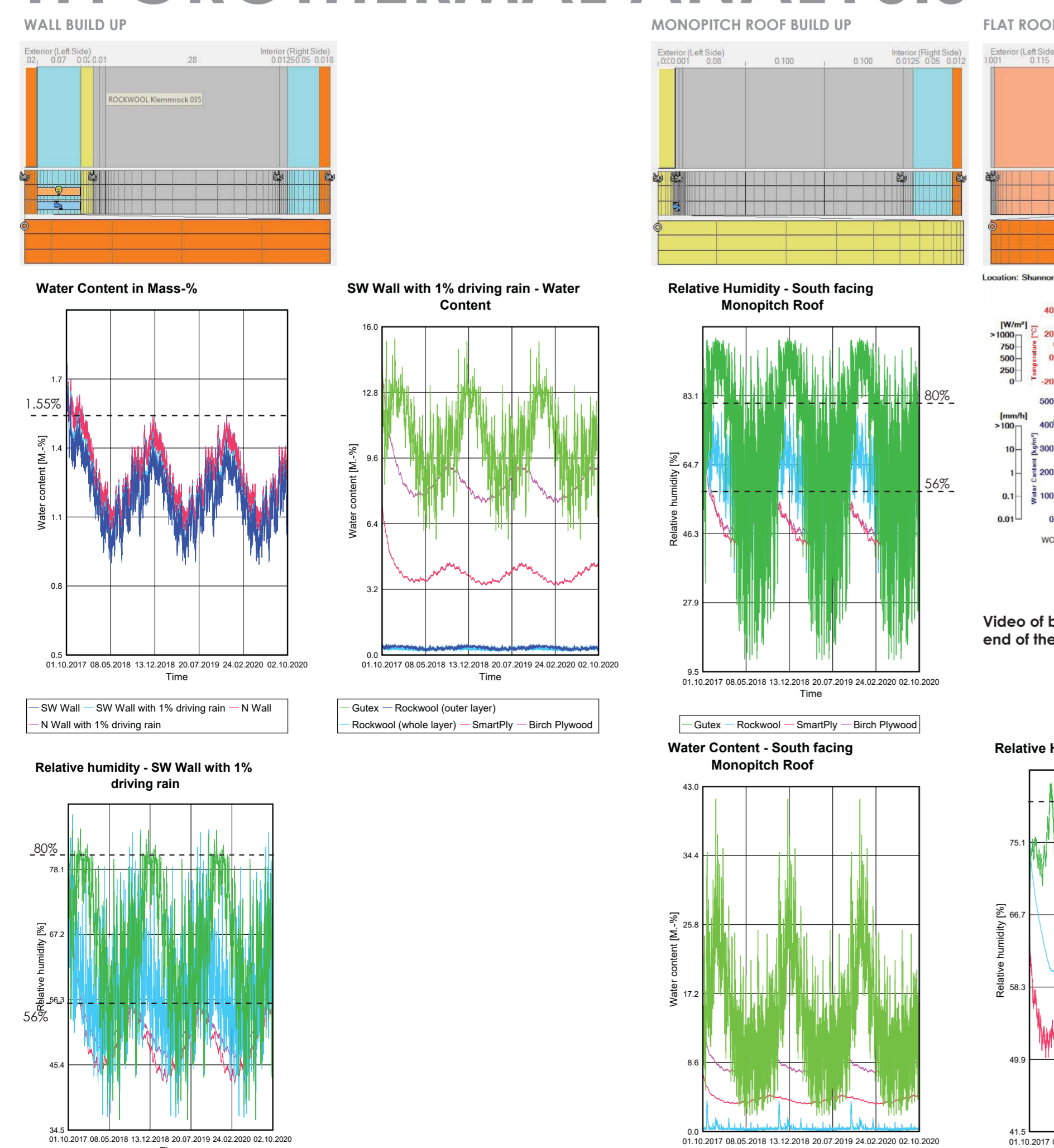
TESCON NO.1 TAPE + TESCON PROFIL TAPE APPLICATION GUIDE FOR SEALING BETWEEN BOARDS, AT JUNCTIONS AND AROUND DOOR AND WINDOW OPES.



PSITHERM LINEAR THERMAL BRIDGE ANALYSIS + Ψ FACTOR



WUFI PRO HYGTROHERMAL ANALYSIS



PERIOD OF CALCULATION

Primary a period of 3 years is used as it is a light weight construction and as the results showed that equilibrium was reached after the 1st few months it is an appropriate length of calculation.

CLIMATE DATA:
The external climate is simulated using Shannon Airport weather data file as the house will be built in North Clare. The internal climate data is EN 15251 W16.63 with 'Medium Moisture Load' giving an internal RH of between 30-65%.

ORIENTATION:
South-West is seen as the direction of the prevailing wind in the climate file used. This will be subject to the most driving rain. The North facing wall is also tested as this will have the least amount of heat from the sun and therefore less drying out capacity.

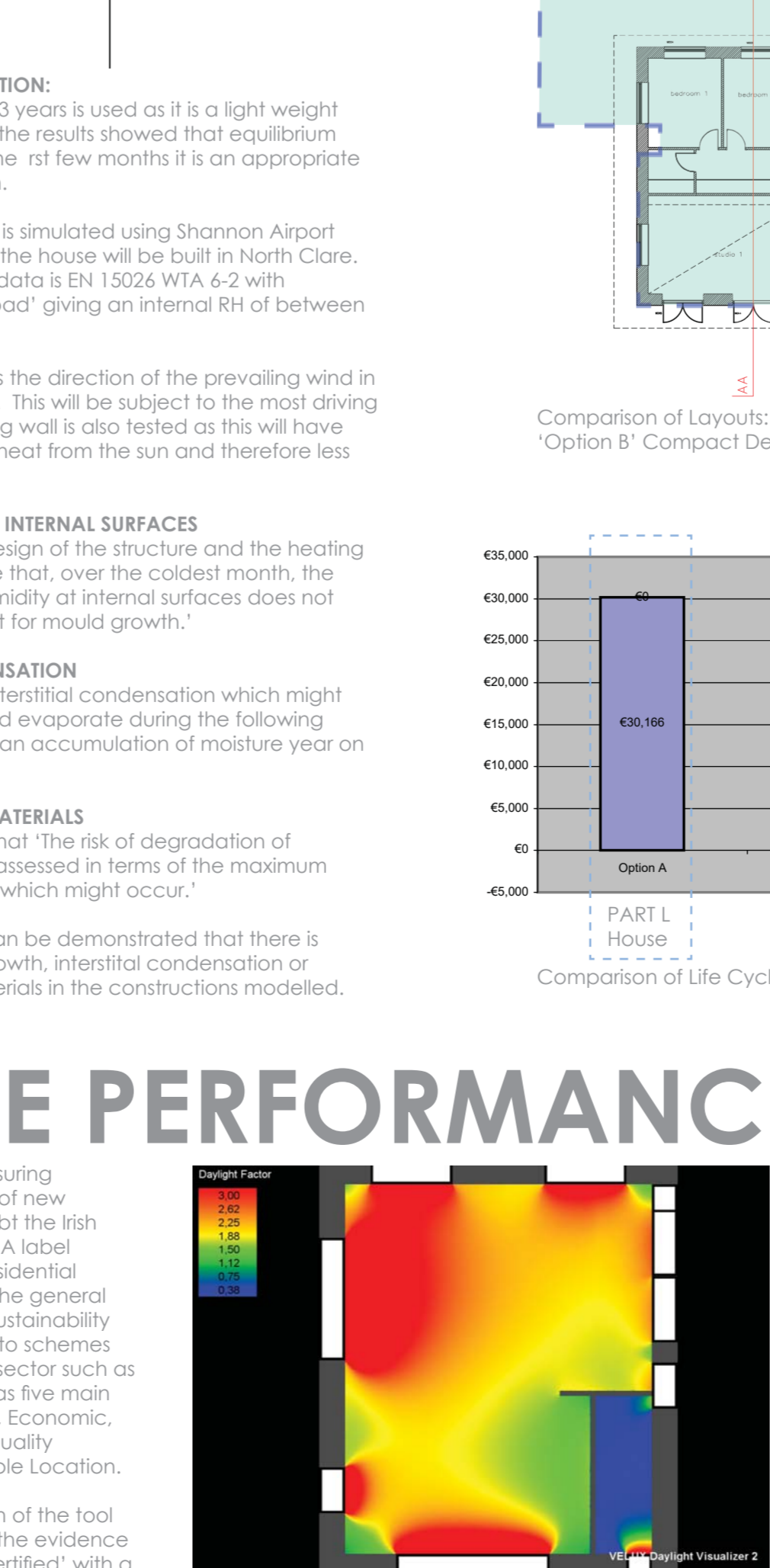
MOULD GROWTH ON INTERNAL SURFACES
BS 5250:2016 'The design of the structure and the heating system should ensure that, over the coldest month, the average relative humidity of internal surfaces does not exceed 80%, the limit for mould growth.'

INTERNAL CONDENSATION
BS 5250:2016 'Any interstitial condensation which might occur in winter should evaporate during the following summer, preventing an accumulation of moisture year on year.'

DEGRADATION OF MATERIALS
BS 5250:2016 states that 'the risk of degradation of materials should be assessed in terms of the maximum level of condensation which might occur.'

From the graphs it can be demonstrated that there is little risk of mould growth, interstitial condensation or degradation of materials in the construction modelled.

LIFE CYCLE COST ANALYSIS



HOME PERFORMANCE INDEX

