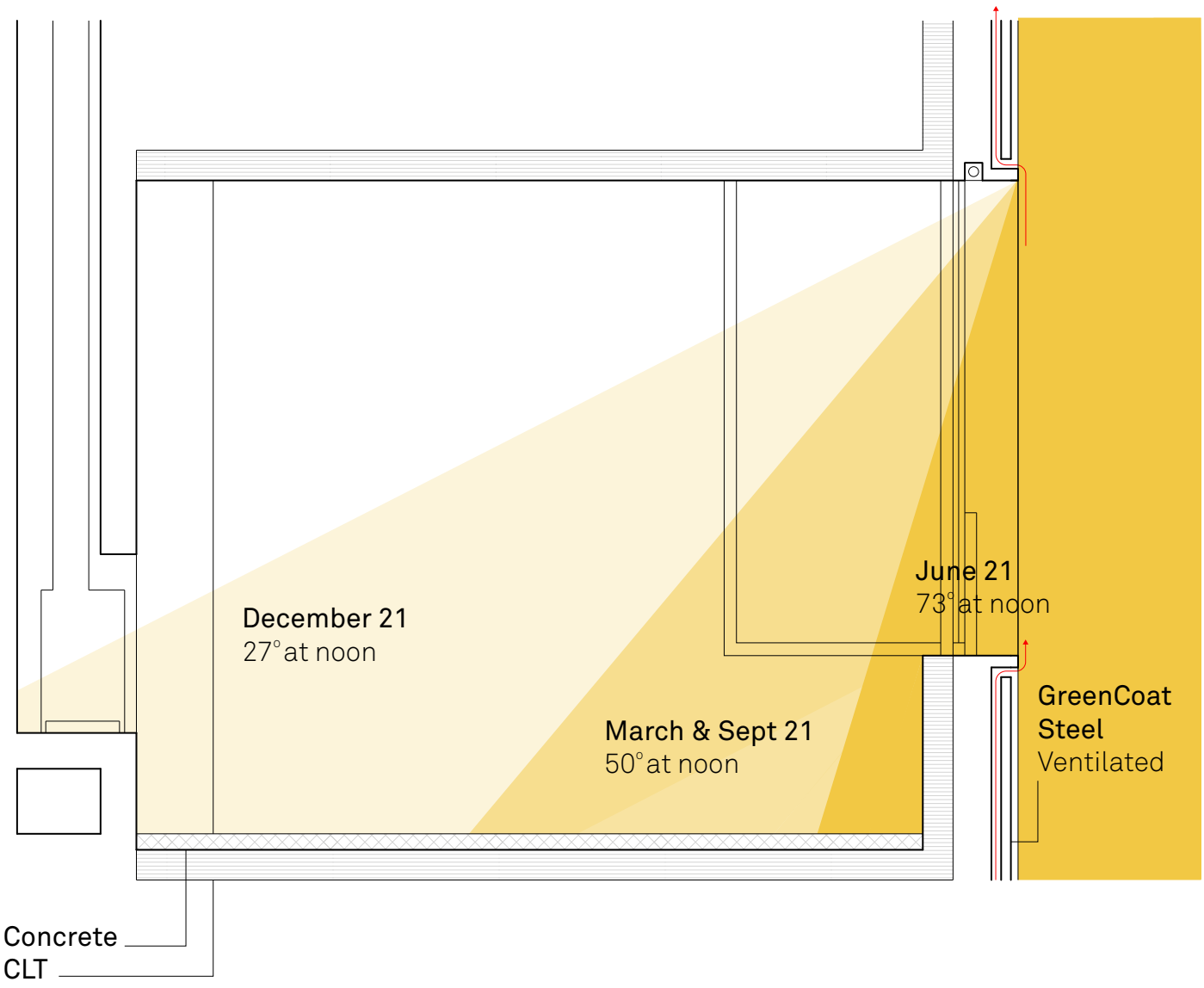
HENNING STUMMEL ARCHITECTS

SUSTAINABILITY STATEMENT & ENERGY HIERARCHY

152 Royal College Street, Camden

This energy statement follows the policies laid out in Camden Energy Efficiency and Adaption guide, along with the London planning policy for Overheating and Coolling. Sequence is set by document.

Albedo Effect

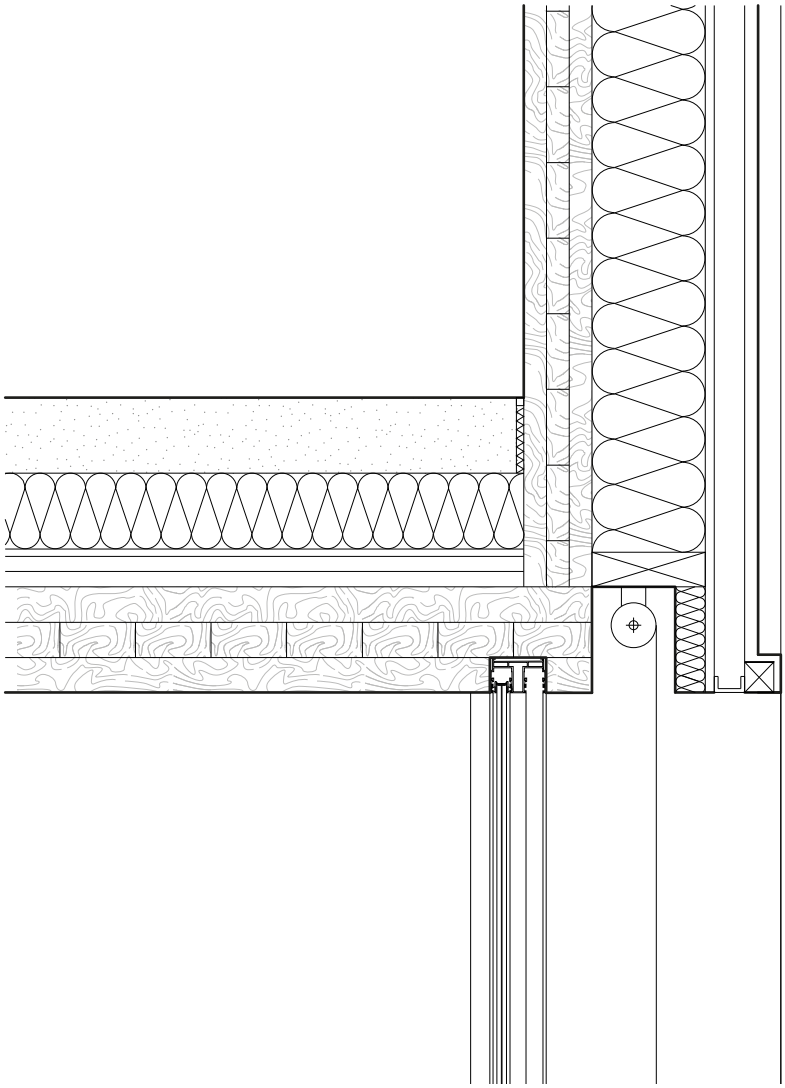


Our albedo effect is reduced through the lack of dark material in favour of light reflective finishes. The internal finish will be CLT with the floor constructed out of concrete. The facade of the building is made out of Greencoat steel which is highly resistant to UV radiation. To further cool the facade a ventilation gap will pass fresh air between the steel.

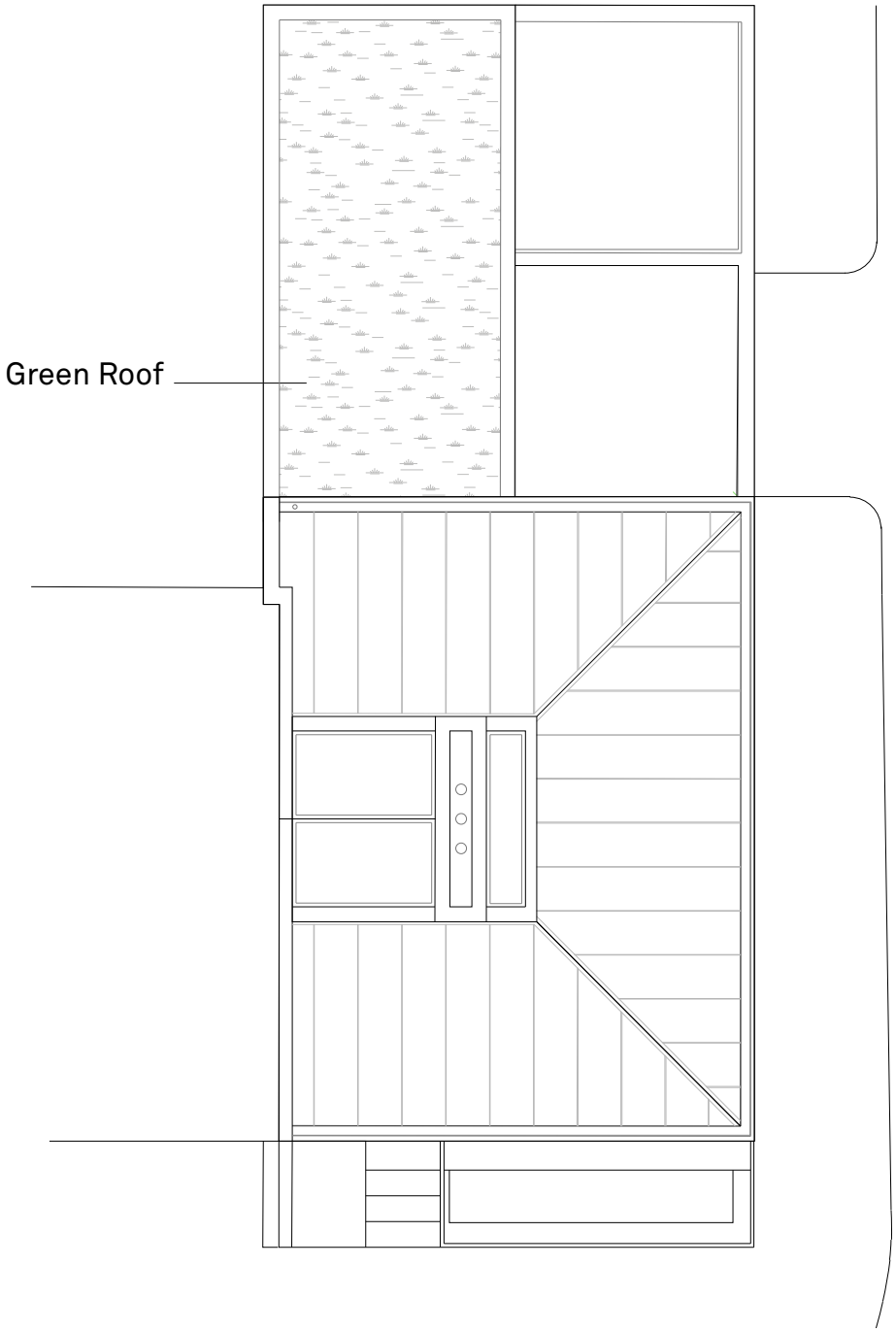
Two large windows cover the first floor facade facing south. To add protection to these spaces external pocket blinds will be fitted providing shading in the hot summer months.

Example from Blinds by Peter Meyer.

Shading

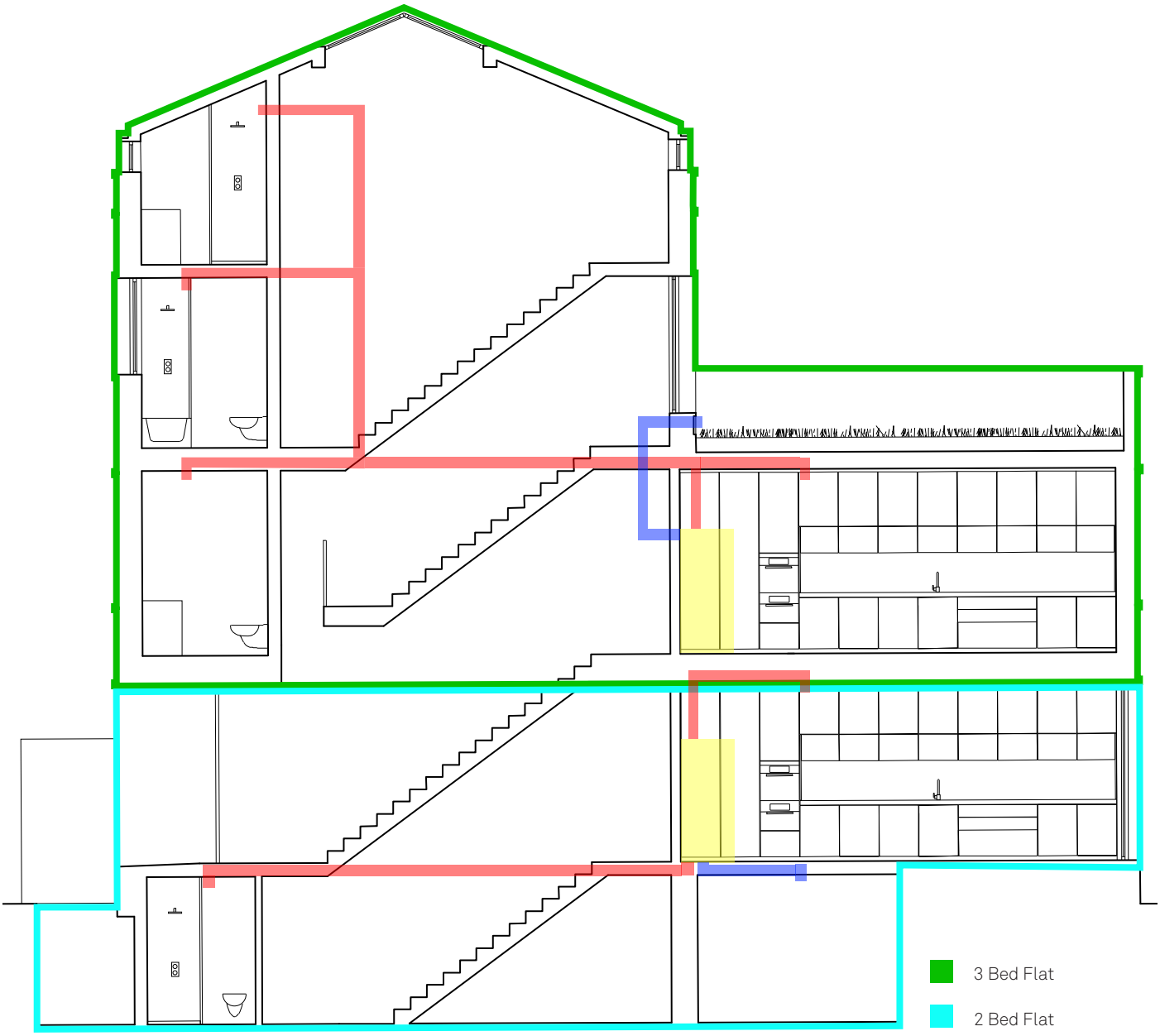


Green Roof



There is a green roof to the rear of the building. This will help mitigating the urban heat island, reduce water run-off, improve water quality, and help cool the membrane. The growing vegetation acts as an insulation layer, further shading the roof, and through evapotranspiration relieves the local drainage system.

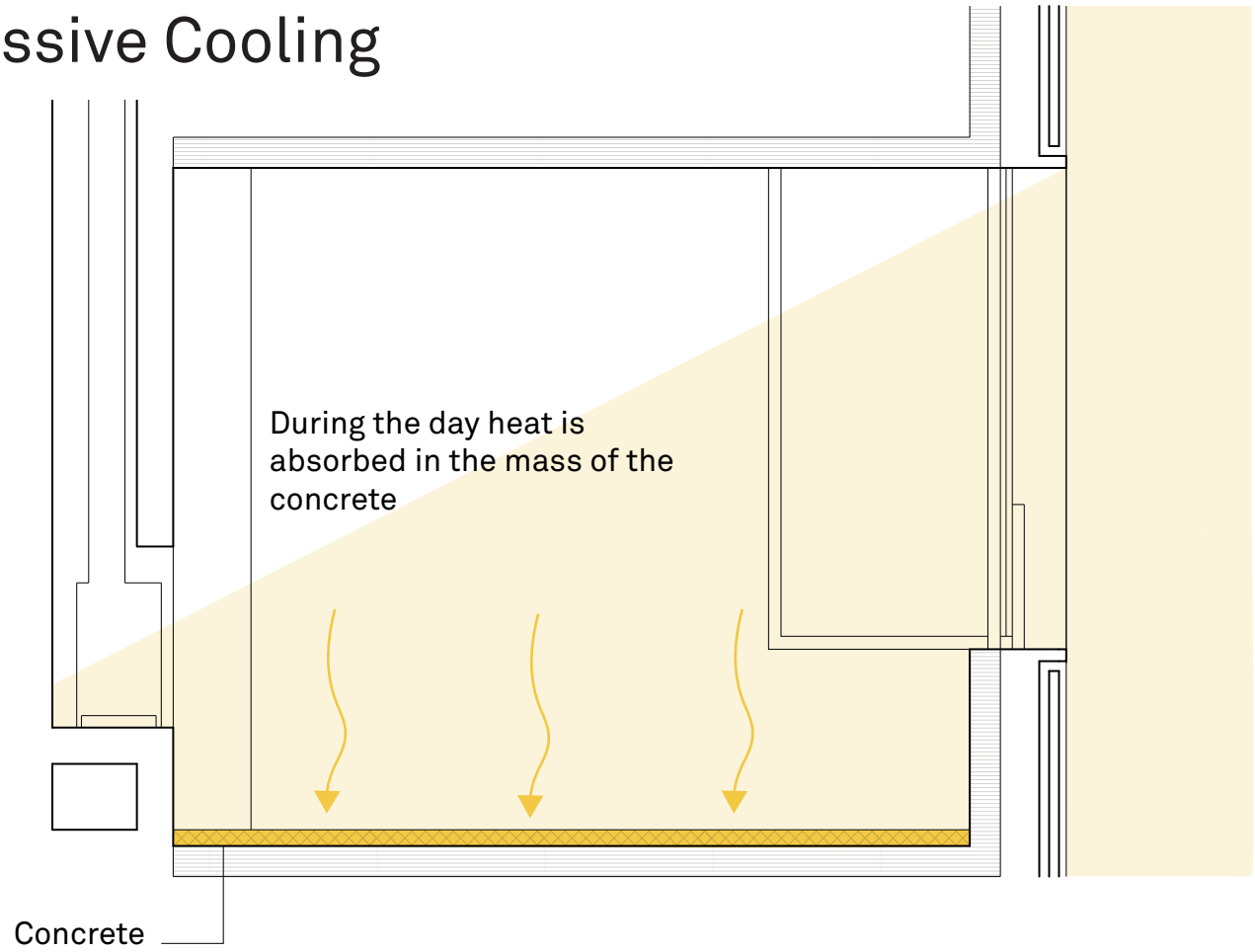
Mechanical Ventilation

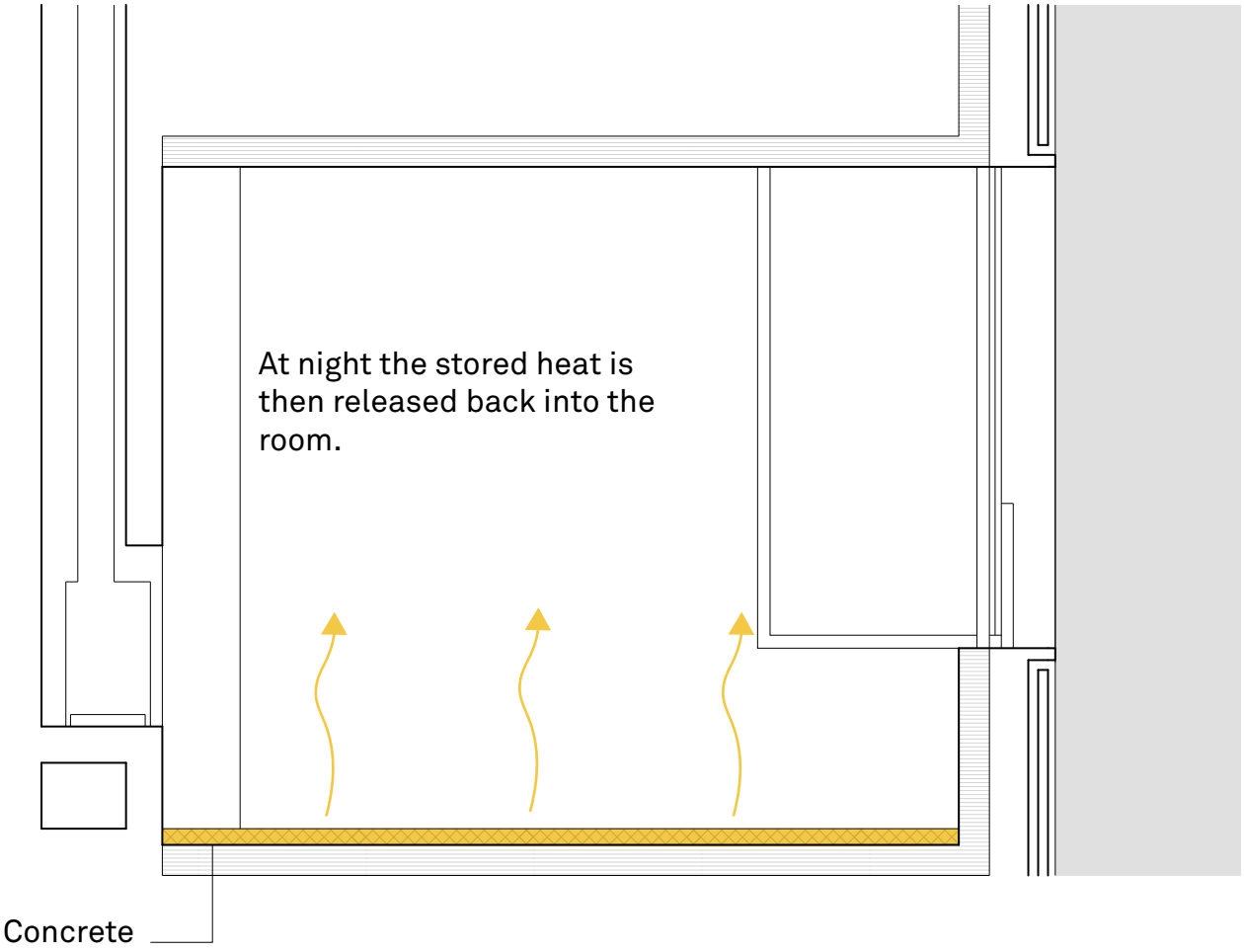


Each flat will have a heat recovery ventilation system, exhaust air will be extracted from the kitchen and bathrooms with the heat extracted recycled throughout the living spaces. This will help retain heat within the building. This process also helps reduce the buildings need to rely on centralised energy sources.

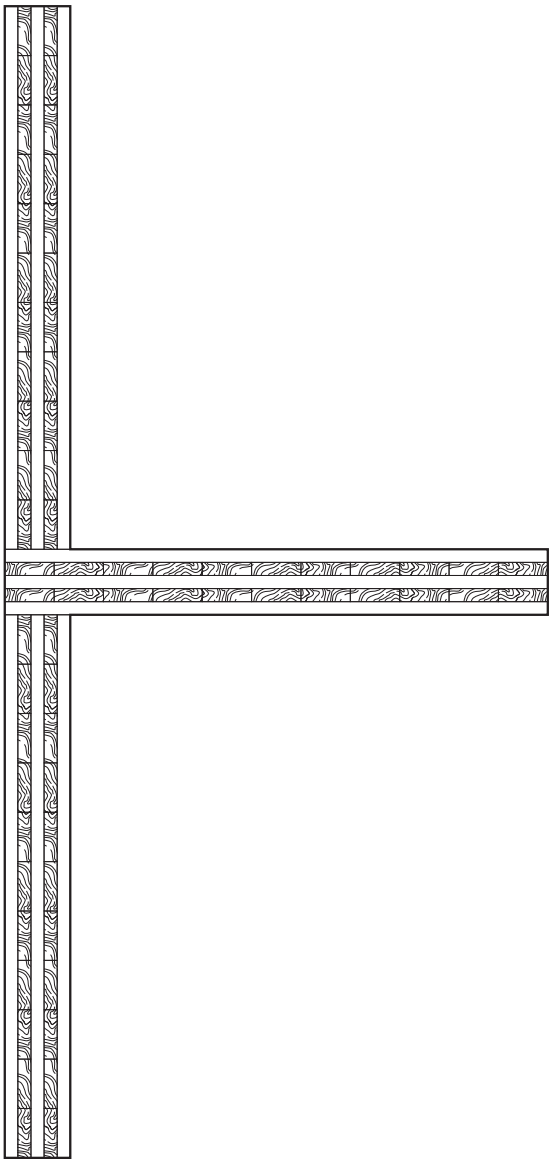
Passive heating and cooling can be attributed to thermal mass. During winter months the suns energy will be stored in the concrete, at night it will then be released back into the room. In Summer the mass should be protected allowing it to release any energy stored.

Passive Cooling



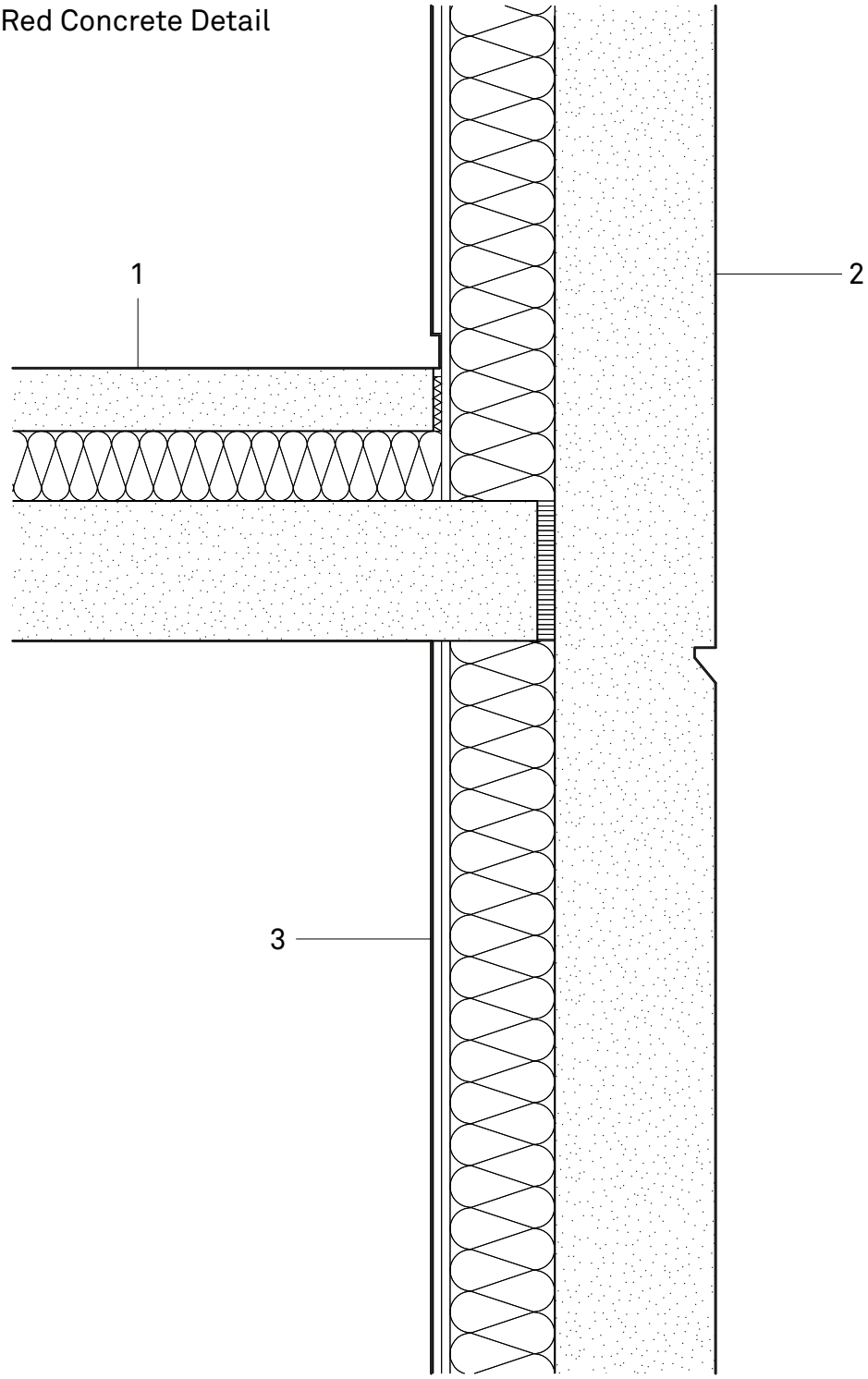


CLT over Concrete



We have changed our building material from concrete to CLT (Cross Laminated Timber) this is for a host of reason. The construction time for the main structure has reduced considerably from a year to 2 - 3 weeks, as CLT panels can be lifted 18 times a day. No need for wet trades or brick and block work means the amount of noise created along with dust has been removed for site. Sequestered carbon in the timber further lower the embodied carbon footprint.

Previous Proposal Red Concrete Detail
1:10



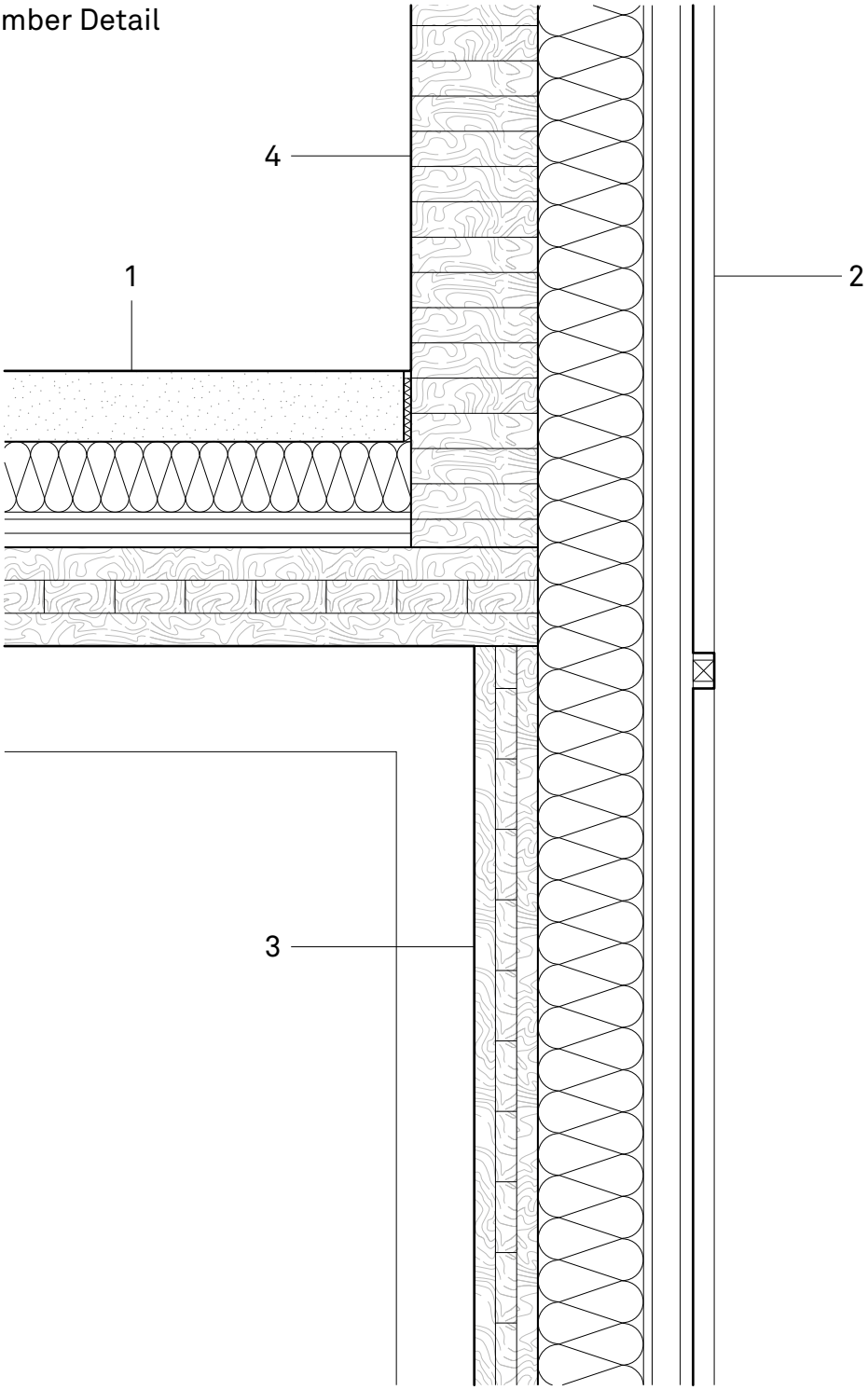
1 100mm Power Floated Polished Concrete
100mm Rigid Insulation
200mm Concrete Slab

2 200mm Red Concrete

3 3mm Plaster
12mm Plywood sheet x 2
150mm Insulation

U Value of 0.13W/m^2K

Cross Laminated Timber Detail
1:10



1 100mm Power Floated Polished Concrete
100mm Rigid Insulation
10mm Fermacell, 20mm Fermacell x 2
140mm Structural Cross Laminated Timber

2 Red oxidised Green Coat Steel
18mm Plywood sheet
40mm Timber battens (cavity)
12mm Plywood Sheet
150mm Insulation

3 90mm Structural Cross Laminated Timber

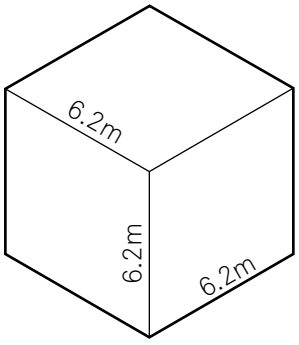
4 Glue Laminated Timber Beam

U Value of 0.12W/m^{2}K **A 10% improvement with new mraterial.**

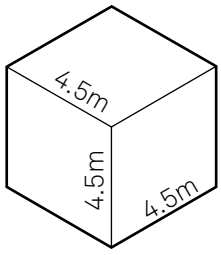
Emissions Table

	Concrete Construction	CLT Construction
m^3	243.3 m^3	Concrete - 94.2 m^3 CLT - 74m^3
CO_2 e	525.528 tonnes of CO_2 e	Concrete - 226 CO_2 e CLT - 51.8 CO_2 e
Carbon Sequestered		CLT - 85.4 CO_2 Stored
Alternative Reductions		There is a 15% reduction in carbon emission without plaster.

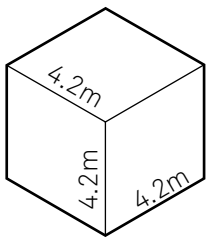
The previous proposal used an estimated 243.3m^3 of concrete with incredibly high emission rate of 525.2 tonnes of CO_2e. The switch to timber has drastically reduced our emissions. The basement has to remain in concrete at 94.2m^3 with emissions of 226 tonnes of CO_2e. Above ground CLT has replaced the previous concrete structure with 74m^3 of timber. Every cubic meter of wood used in replacement of concrete reduces CO_2 emission on average by 1.1 tonnes. This added with the 0.9 tonnes of CO_2 stored in a cubic meter is a saving of 2 tonnes per m^3. Around 148 tonnes of CO_2e will be saved a through the change of material.



Concrete - 243.3 m^3



Concrete - 94.2 m^3



CLT - 74m^3

Summary

The previous proposal received an EPC rating of A. The new specification has further improved the buildings effiency and enviromental impact. The switch to cross laminated timber is main contributer with construction time and the amount of embodied energy drastically reduced.