



Off site volumetric prefabricated Micro Homes

zedPowerTM
zero fossil energy developments



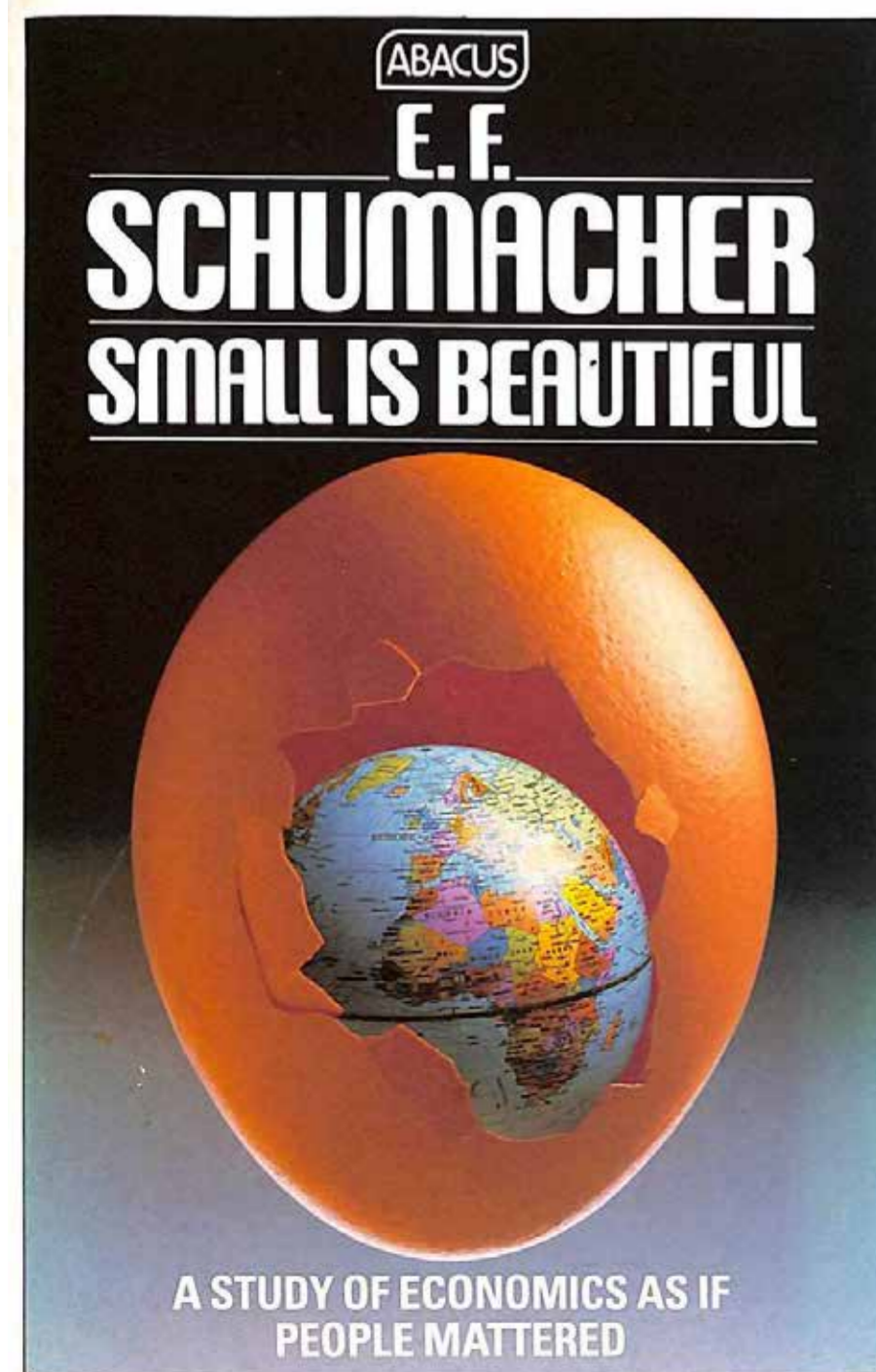
ZED Micro homes

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20 years of architecture and master planning designing out fossil fuels

We have spent the last two decades designing and building energy positive homes powered by building integrated photovoltaics. These projects are working well and have the potential for net zero annual energy bills as well as being climate neutral over the building's anticipated lifespan.

So the question is how do we make this specification affordable to everyone requiring housing ?



About us- From BedZED to ZED Micro Homes



ZED Micro homes



The ZED micro homes are designed with extensive glazed elevations and balcony decks that connect the interiors to the surrounding landscape without looking at neighbours.

This enables hamlets to be planned that look out over shared communal landscape, and not simply at each other, as is common in many park type developments.

The materials are always natural and designed to weather without requiring high maintenance – and without standing out in the host landscape.

Parking bays with electric vehicle charging points can provide residents with silent zero emissions personal transport – facilitating a low environmental impact lifestyle at a far lower cost than conventional development.

These homes are more energy efficient than almost any permanent building regs compliant housing, and have more integrated renewable energy systems and storage – providing a lower carbon footprint at a far lower capital cost than conventional housing.

They are delivered by trailer, jacked up to the correct height on site and the trailer is removed for re – use. Mini-piles resist wind uplift and provide permanent foundations on most sites.

A unique folding roof system enables the solar harvesting roofs to arrive flat for transport and tilt upwards on reaching the desired plot. The homes can be removed from the host landscape easily and leave no trace of their installation if required by the landowner or local authority.

If grid connected each home represents a 10.5 kw solar array, enabling 50 homes to become a 0.5 Megawatt solar farm, capable of providing surplus power and energy resilience to adjoining rural communities or infrastructure systems.

The low embodied CO2 of the initial construction plus the longevity of the materials plus the ability to displace the carbon content of conventional grid energy over a 60 year minimum life – results in a unique affordable climate neutral housing solution for both leisure / holidays and young people unable to purchase their own homes.

These Homes are designed by www.zed-power.com

Off site volumetric prefabricated Micro homes by ZEDpower

- Delivered by trailer, which is withdrawn for re- use
- Erected and commissioned in days
- Off grid capable, needing only fresh water supply, but with mains drainage and grid connect options
- Re-locateable with near zero waste
- Fully net zero, superinsulated and powered by renewable energy





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Structure:

- Class B surface spread of flame Flameproofed external structural grade birch ply laminations with class 3 glueline for humid conditions.
- All joints expressed and visible with torx head wirox galv steel screws
- No requirement for plasterboard – internal surface can be covered in waterbased diamond glaze laquer or wall paper or painted.
- Special kickers for floors and roof panels ensure accuracy and rigidity during dry assembly
- Internal floors have exposed coffer ceilings to increase room volume with integrated LED uplighting

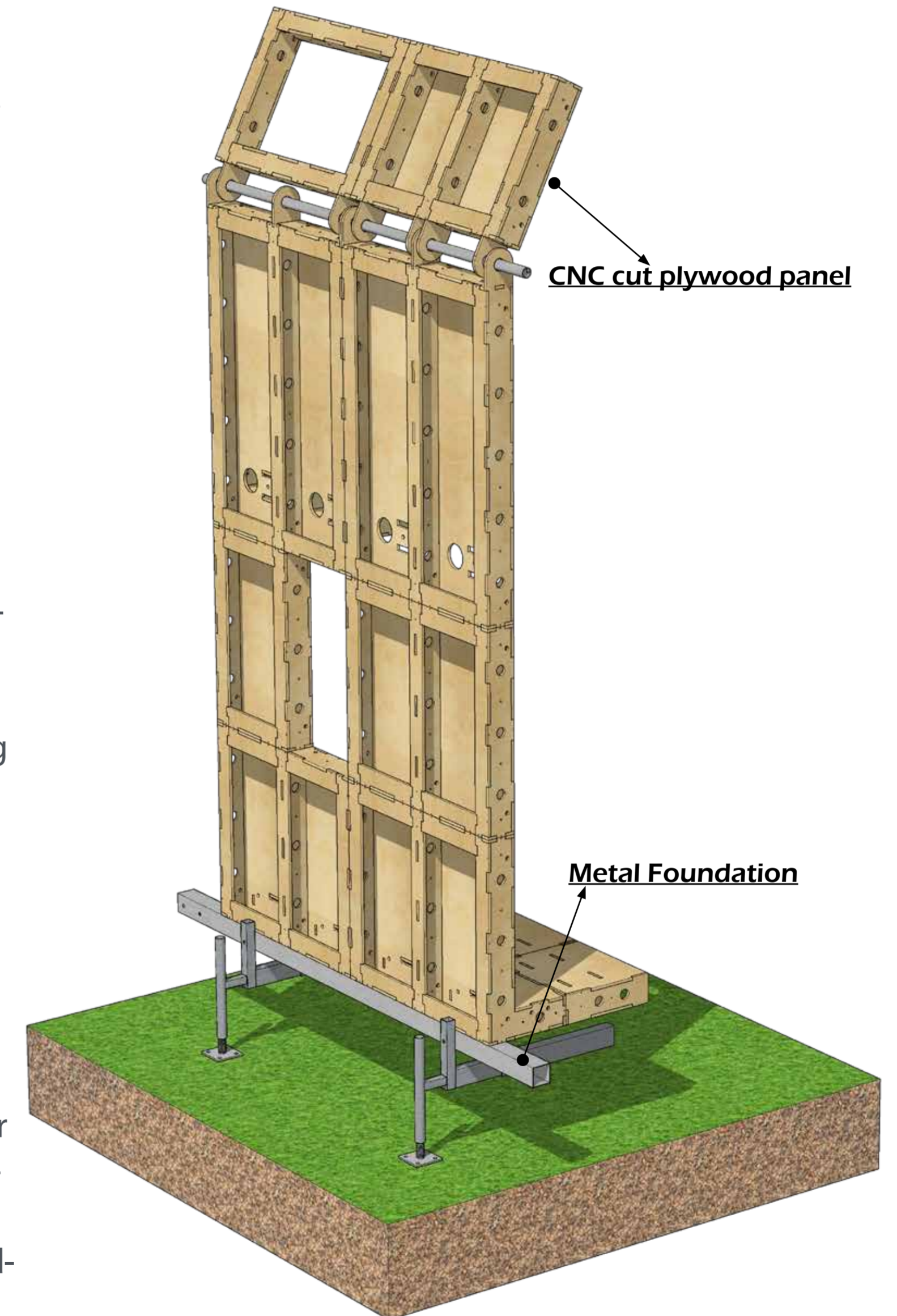
Insulation :

- 140 mm non combustible rockfibre incorporated into structural panels
- Covered with counterbattens and 70 mm high performance breathable multifoil airtightness line / water shedding breathable sarking felt
- Total build up equivalent to 275 mm of mineral fibre approx. with no toxic urethane foams used exceeding the building regulations thermal performance requirements and minimising thermal bridging without using any insulation materials that contributed to the Grenfell fire load.

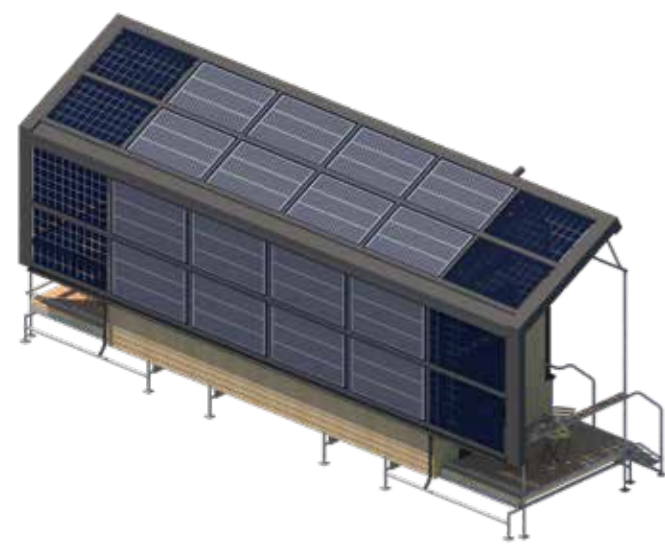
Solar Electric Cladding and Roofing :

- Around 10.5 kw peak of monocrystalline glass / glass laminate 455 watt peak opaque photovoltaic panels are mounted in black powder coated specially extruded aluminium frames that replaces the roof and vertical wall rainscreen cladding. A ventilated cavity behind the solar panels prevents summer overheating, and the vertical wall mounted panels provides better power outputs from low angle winter sunlight for off grid installations. The panels mounted over the external decks have
- translucent toughened laminated glass sandwiching the crystalline electric generating wafers – providing a dappled light and shade from a sunscreen canopy that also prevents summer overheating.

Building Structure- Roof&Wall&Floor



Structural Details_Plywood Panel



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Rainscreen Wall and roof cladding :

- Standing seam zinc roof and wall panels provide extreme longevity and resist water penetration in coastal areas with high wind speeds. Zinc covers all fascias.

Foundations :

- 300 mm dia dug by tractor mounted 1.5 m deep post hole auger sleeve embedded in concrete and individual galv steel scaffold pole supports at approx. 2m c/c with adjustable screw thread to allow for individual mini pile adjustment.
- No need for in situ concrete overslab or large volume pad or strip foundations, and no requirement for level ground as each support leg can be tailored to suit site conditions.
- Good for hillsides and sloping sites plus locations where it is important not to damage existing tree roots.
- The ability of the ground to absorb surface water run off is not affected by the new home, and on most sites grassland can run below the buildings.

Airtightness :

- Target 1.5 air changes / hour @ 50 pascals test pressure.

Glazing and doors : Glazing and doors :

- Triple glazed, low E, thermally broken, powder coated aluminium windows and doors with extremely long life and robust hinges are fitted throughout.

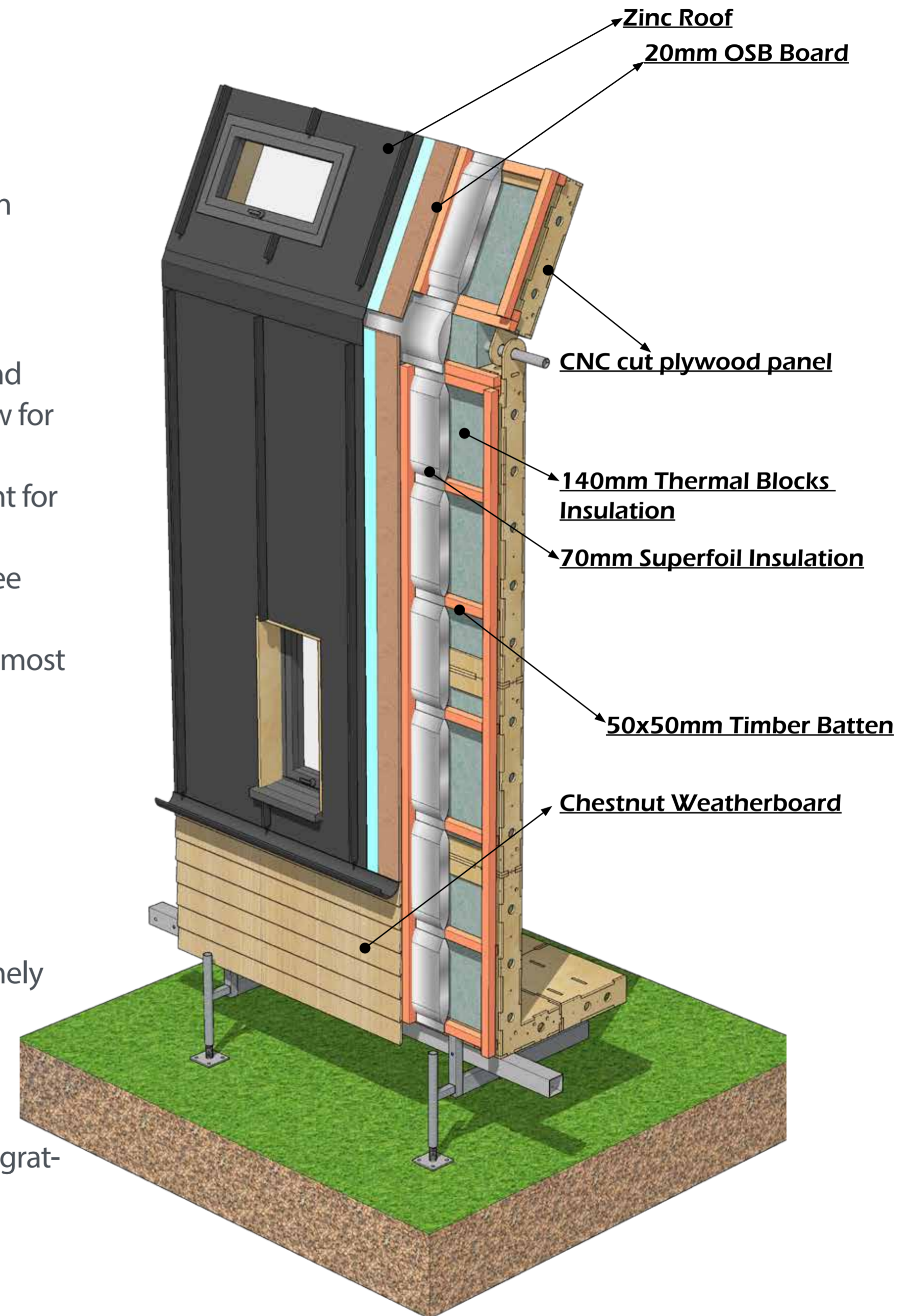
Floor :

- Hot dip galvanised chassis with vermin proofed galv steel sheet underside and jacking points integrated for final positioning on site and trailer withdrawal

Timber rainscreen vertical cladding :

- Locally sourced chestnut, cedar or larch cladding boards are specified fixed with torx head stainless steel screws to provide good durability.

Building Structure- Roof&Wall&Floor



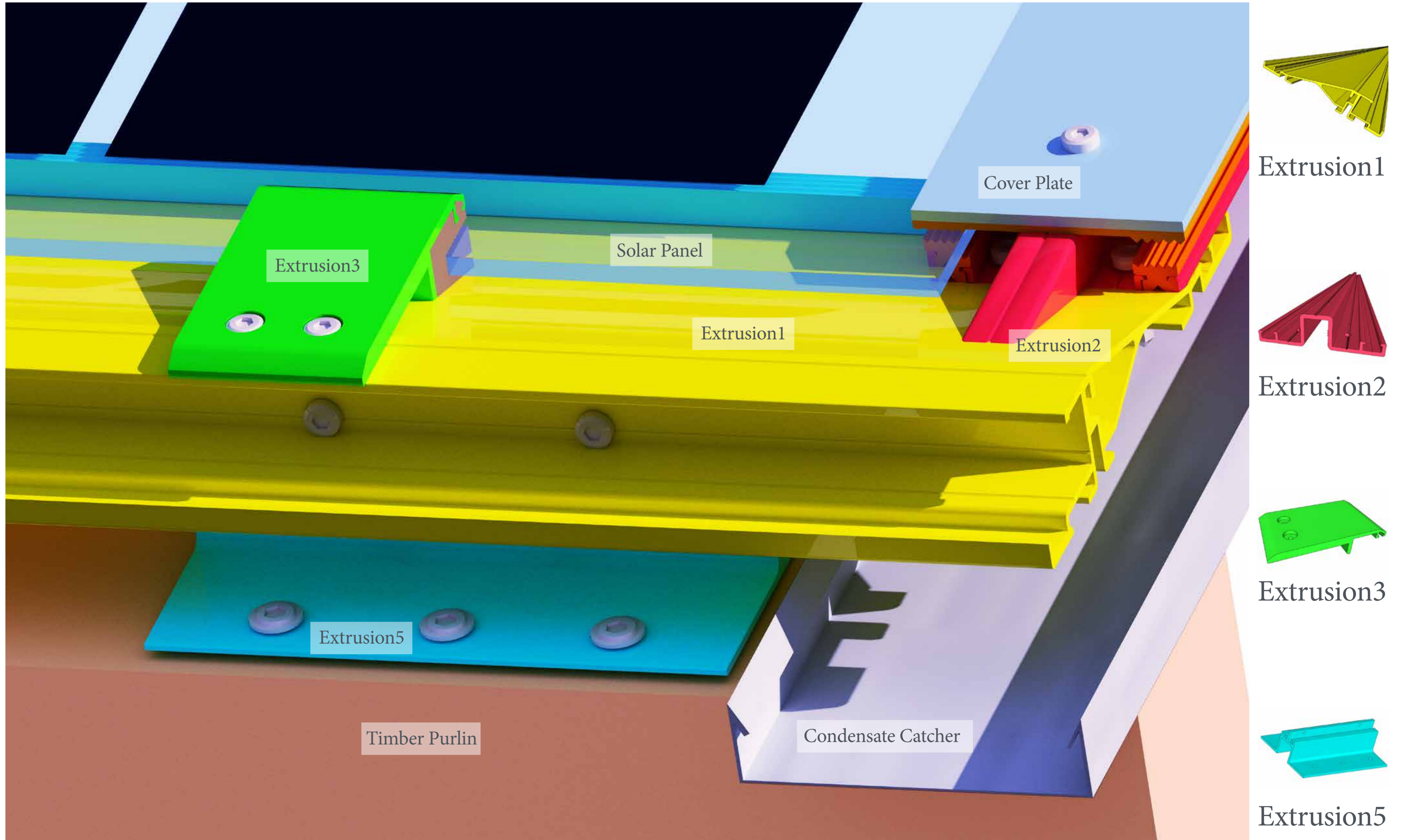
Structural Details_North View



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Building Structure- ZED Roof System

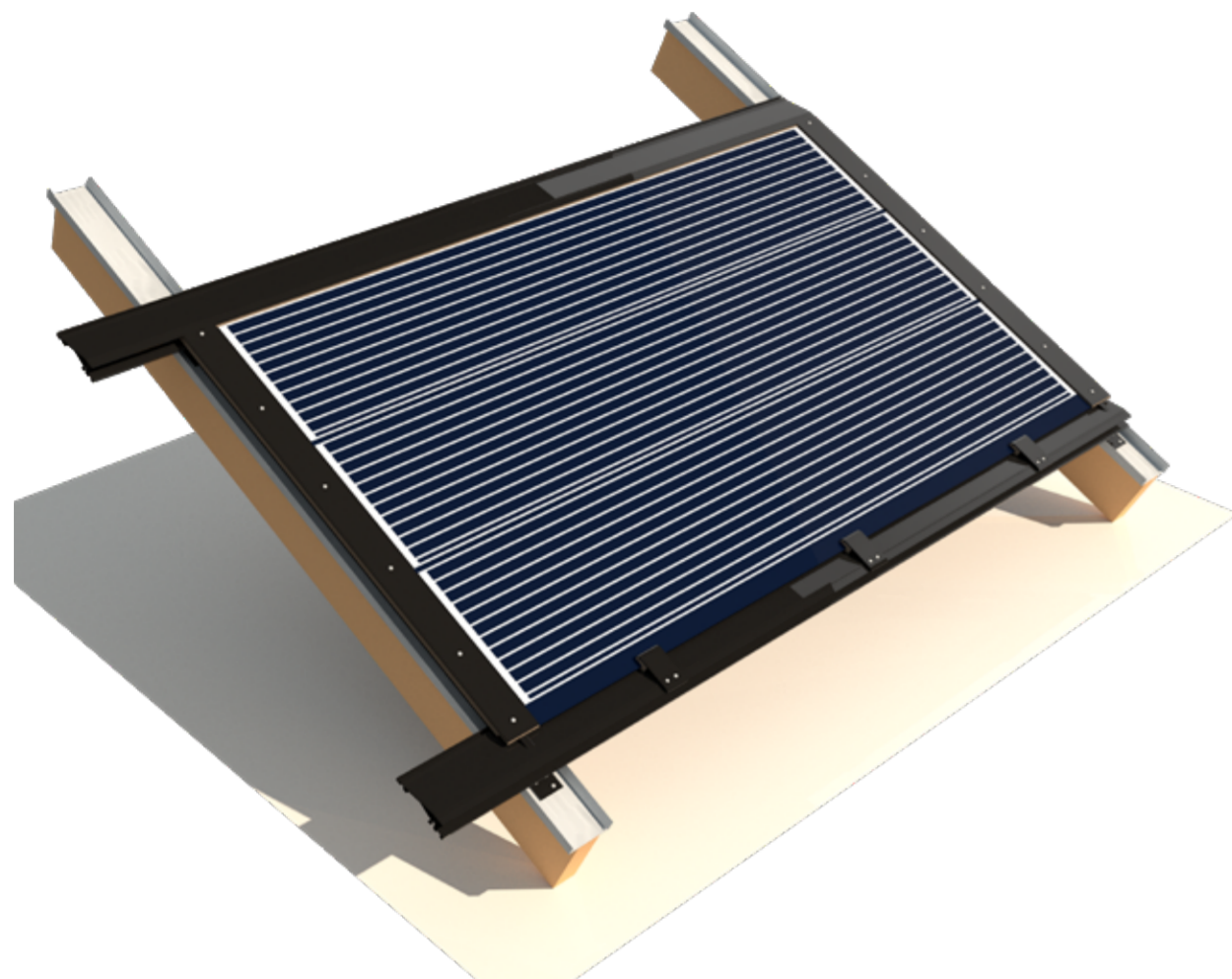




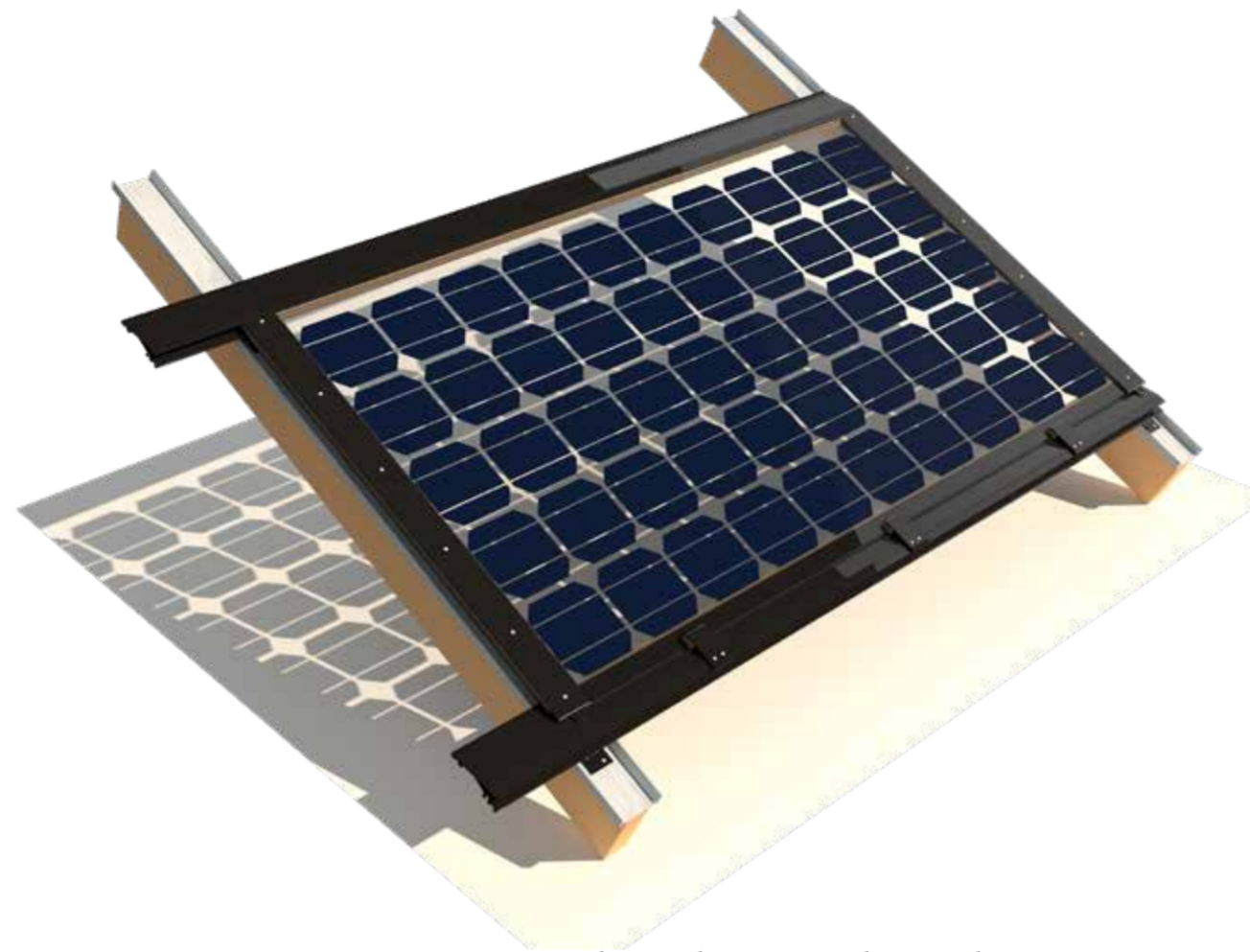
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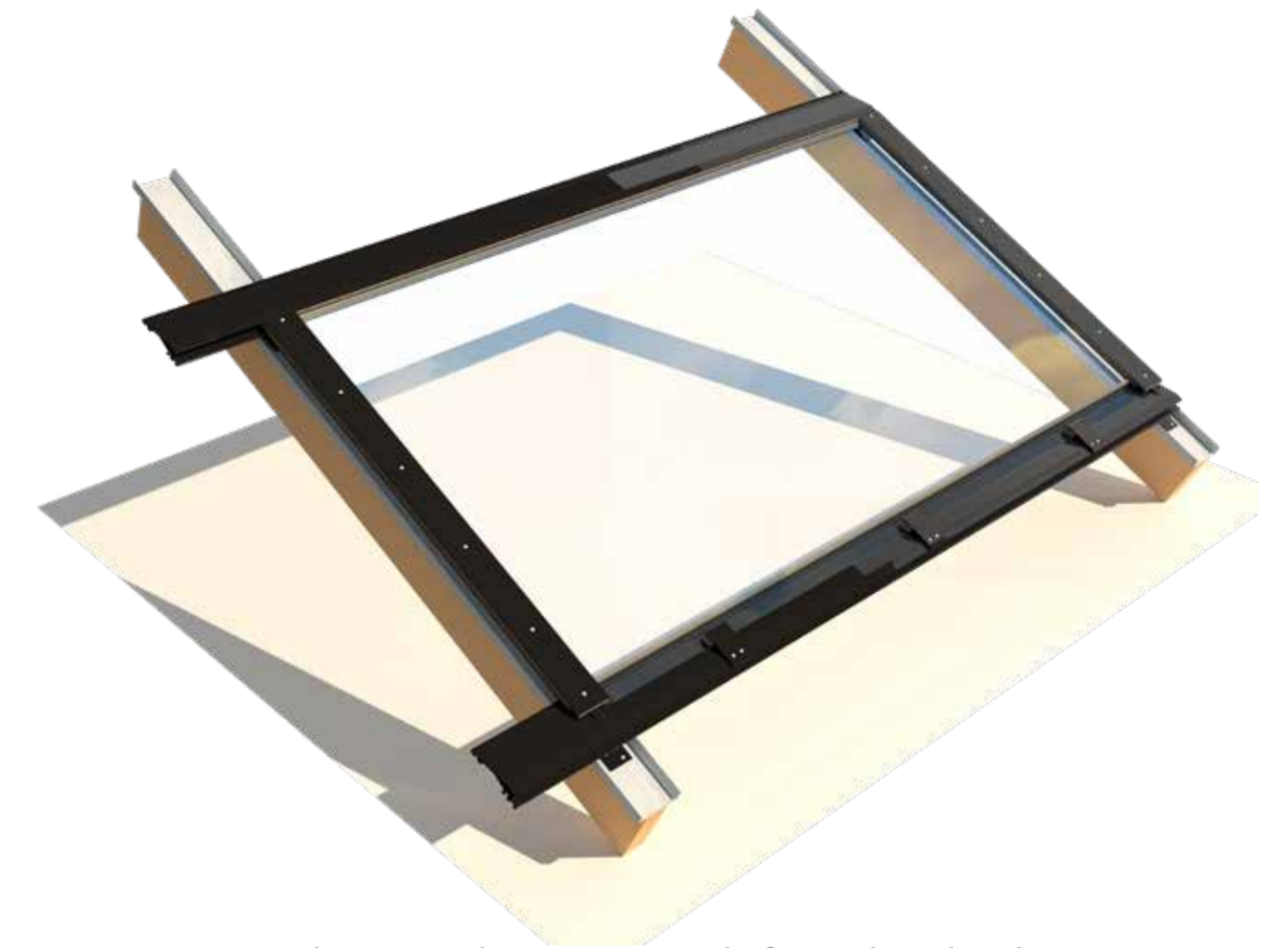
Building Structure- ZED Roof System



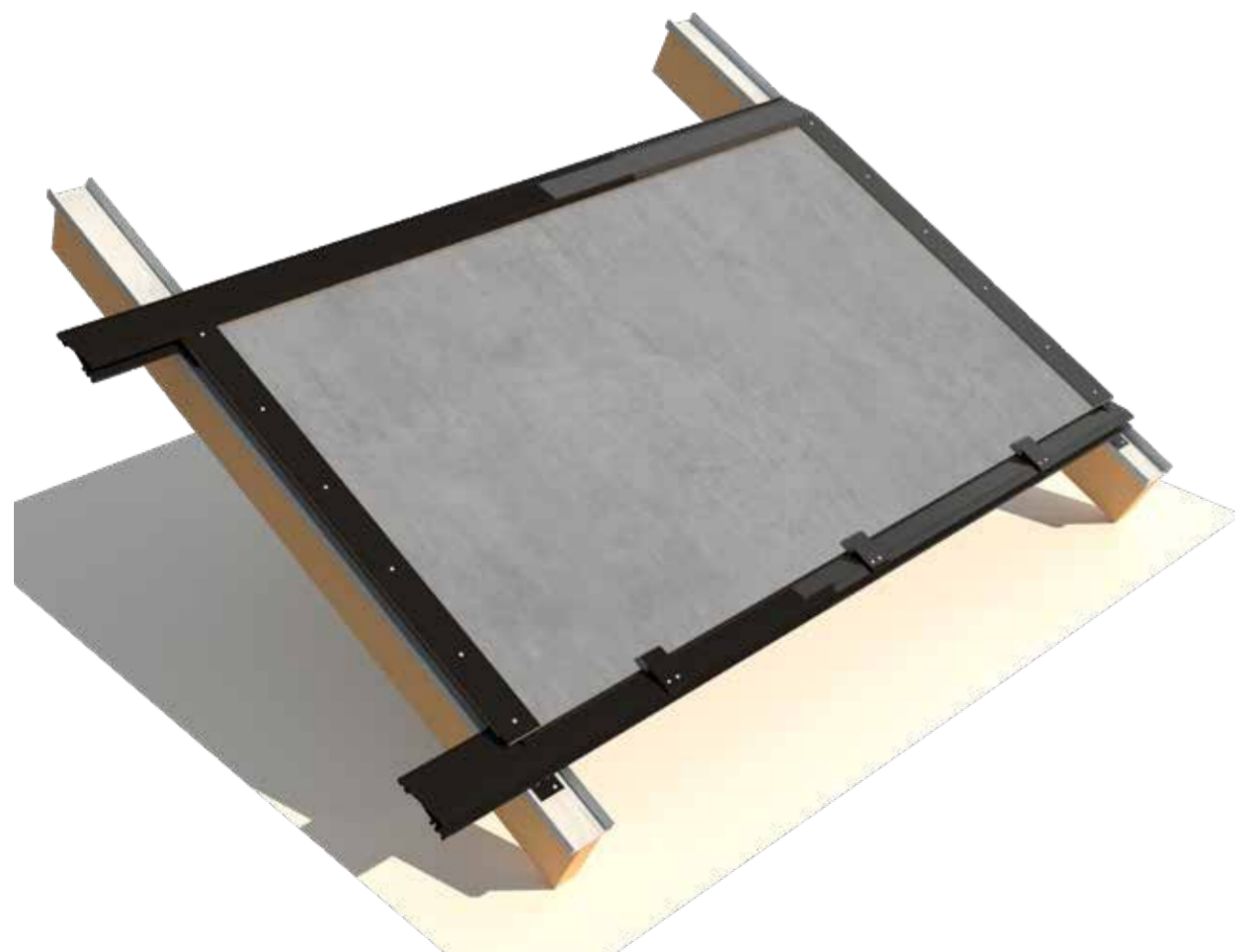
Mono PV with Black Interlayer so no daylight transmission for use over insulated surfaces



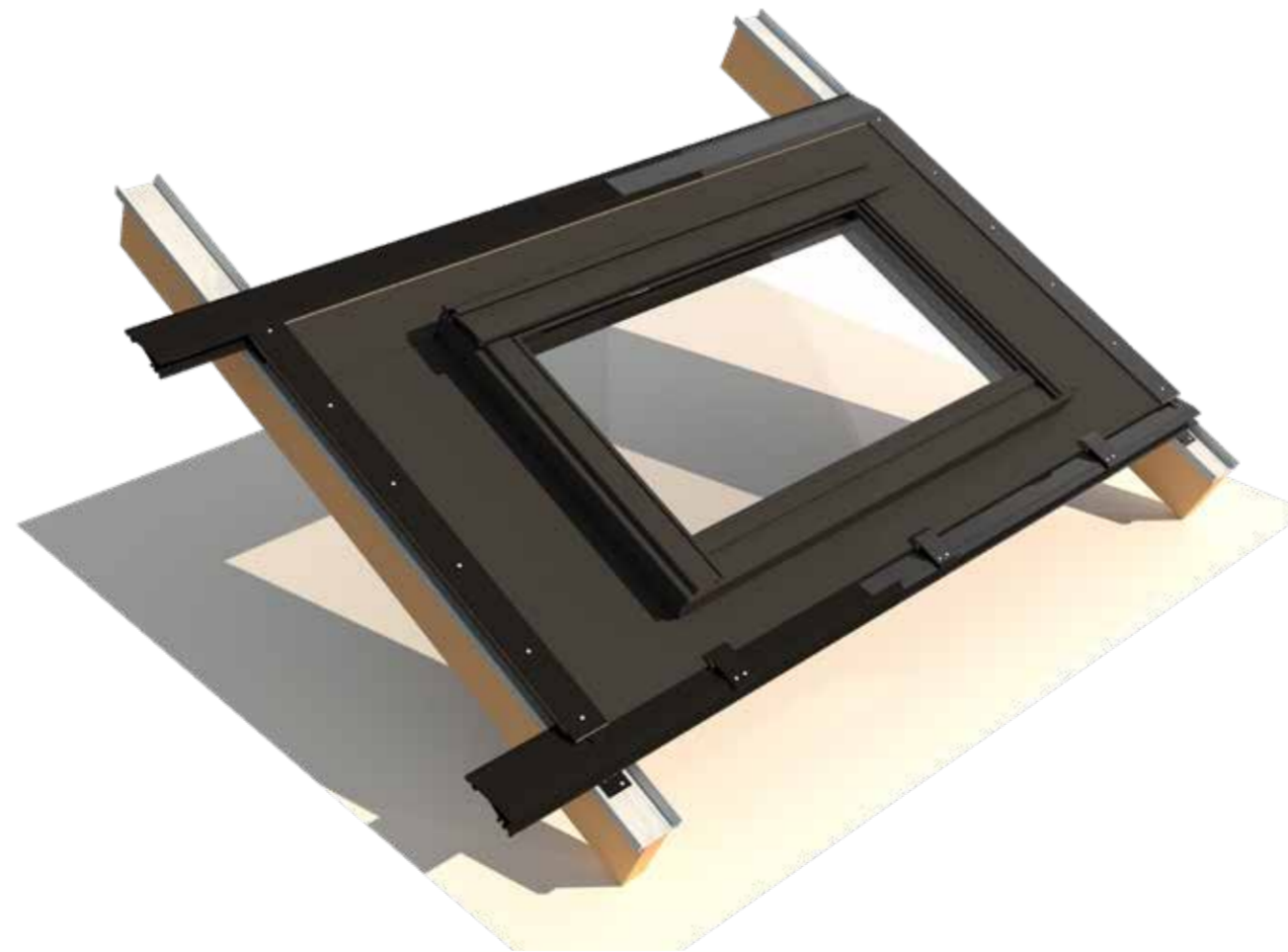
Mono PV with Clear Glass between cells for daylight



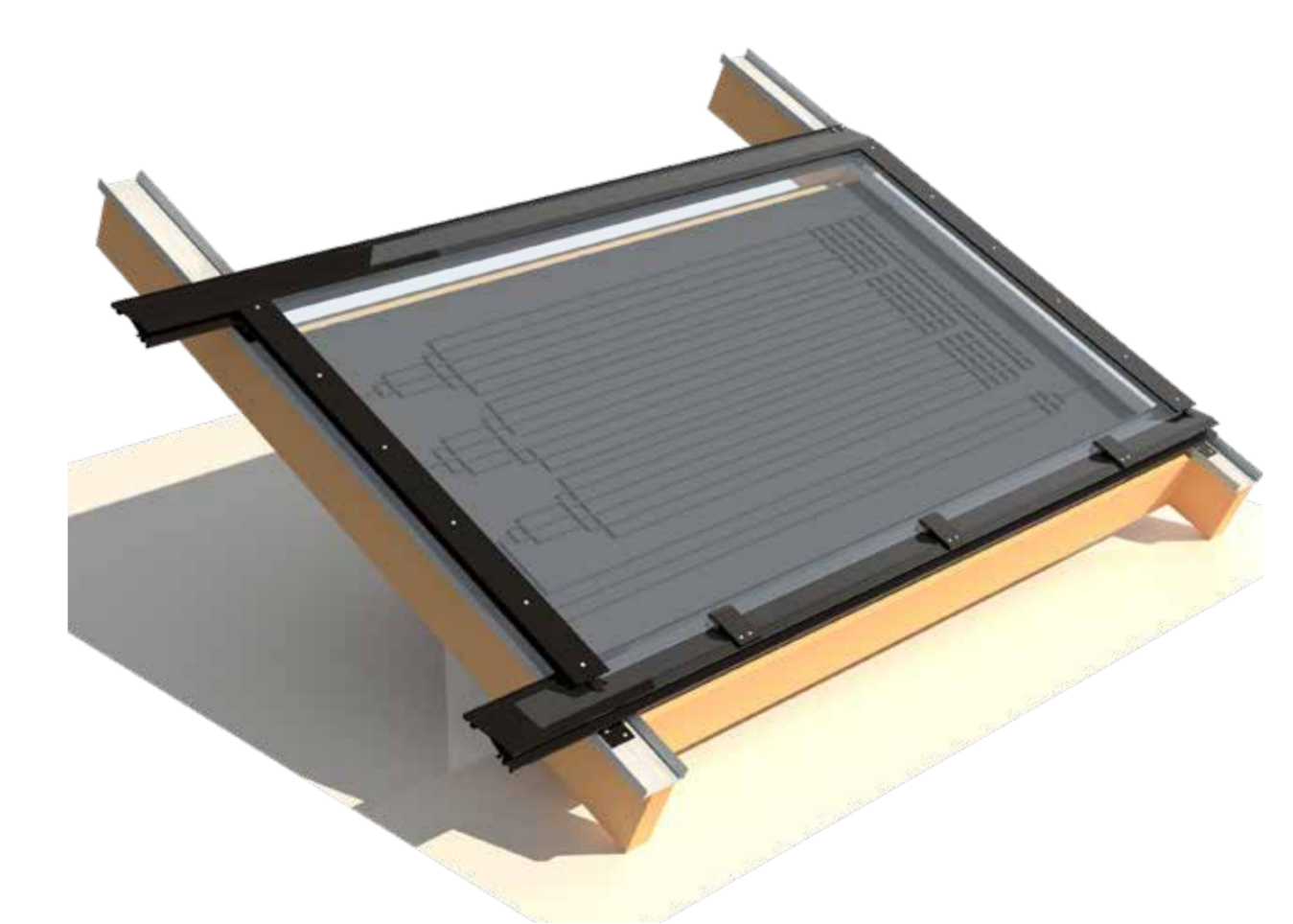
Clear Glass Panel for daylight



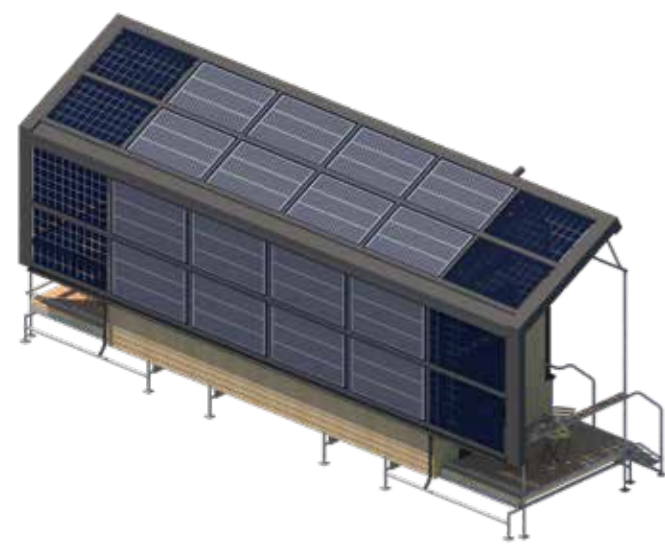
Solid Cembrit Slate Cement Board Panel for cladding



Double/Triple Glazed Velux Panel for ventilation



Evaporator Panel for hot water system



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Building Structure- ZED Roof System



ZED Wall



Triple Glazed Rationel Window Panel for ventilation_Type 1



Triple Glazed Rationel Window Panel for ventilation_Type 2



Triple Glazed Rationel Window Panel for ventilation_Type 3

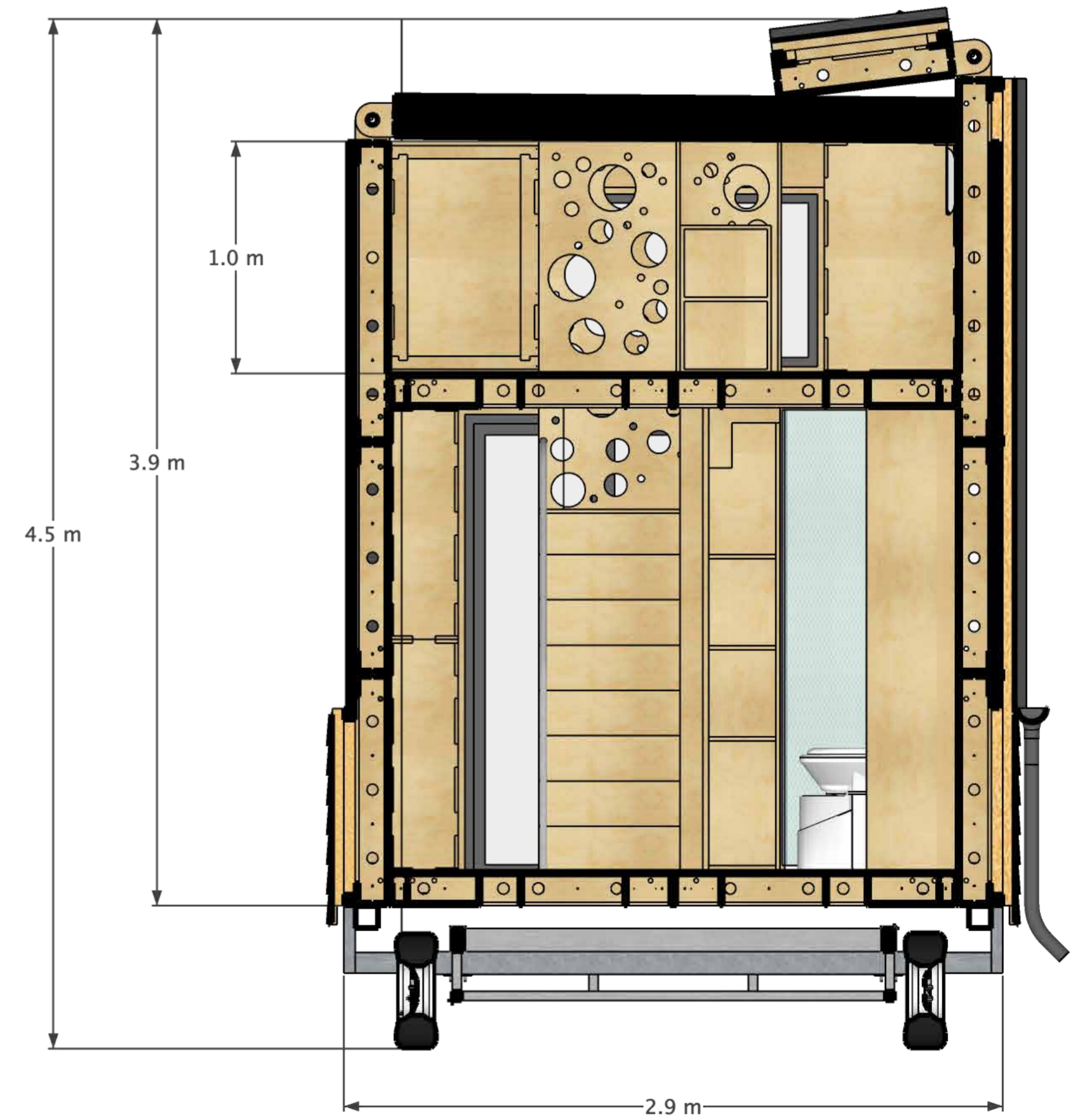
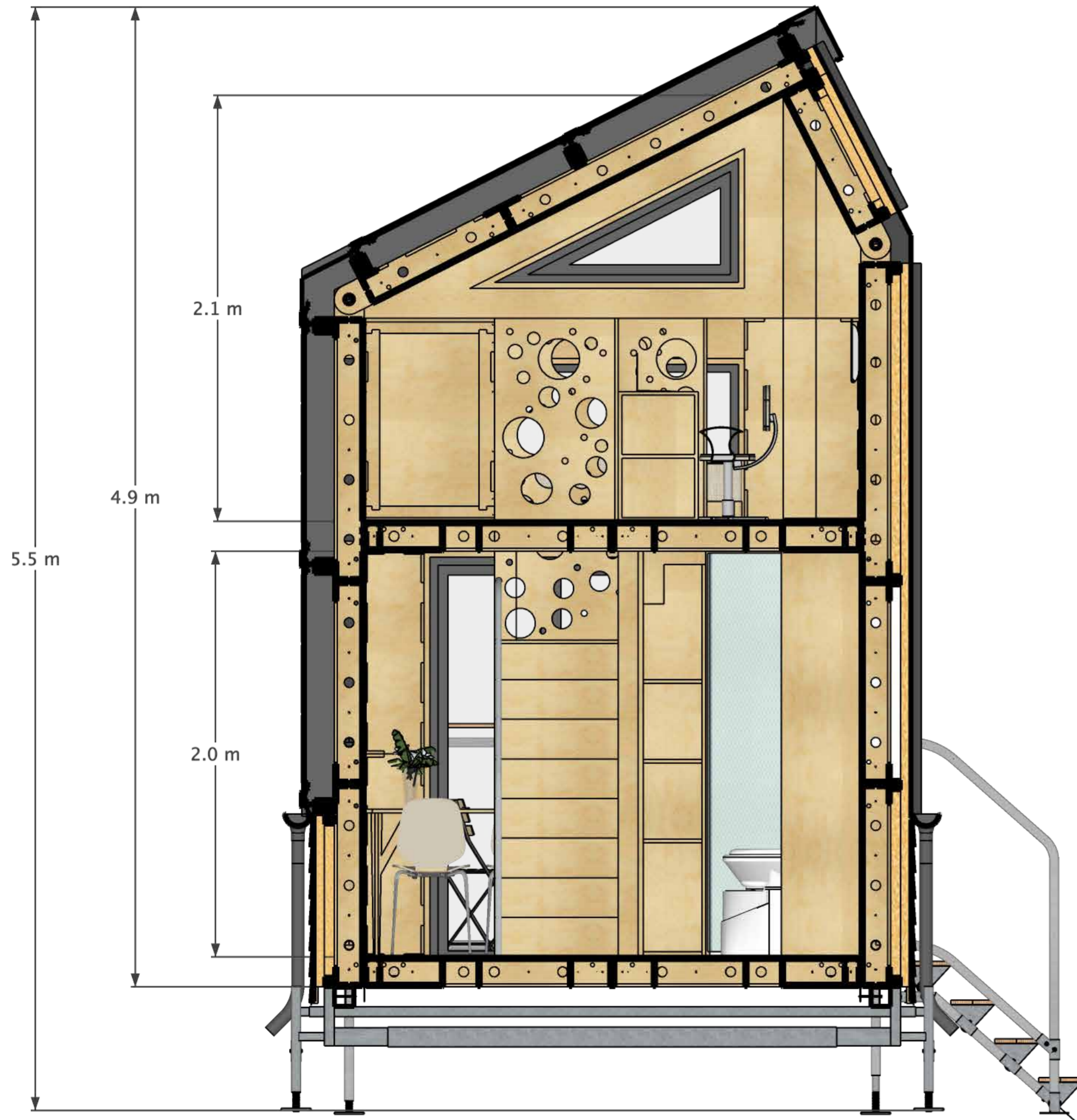


Triple Glazed Rationel Door Panel for ventilation



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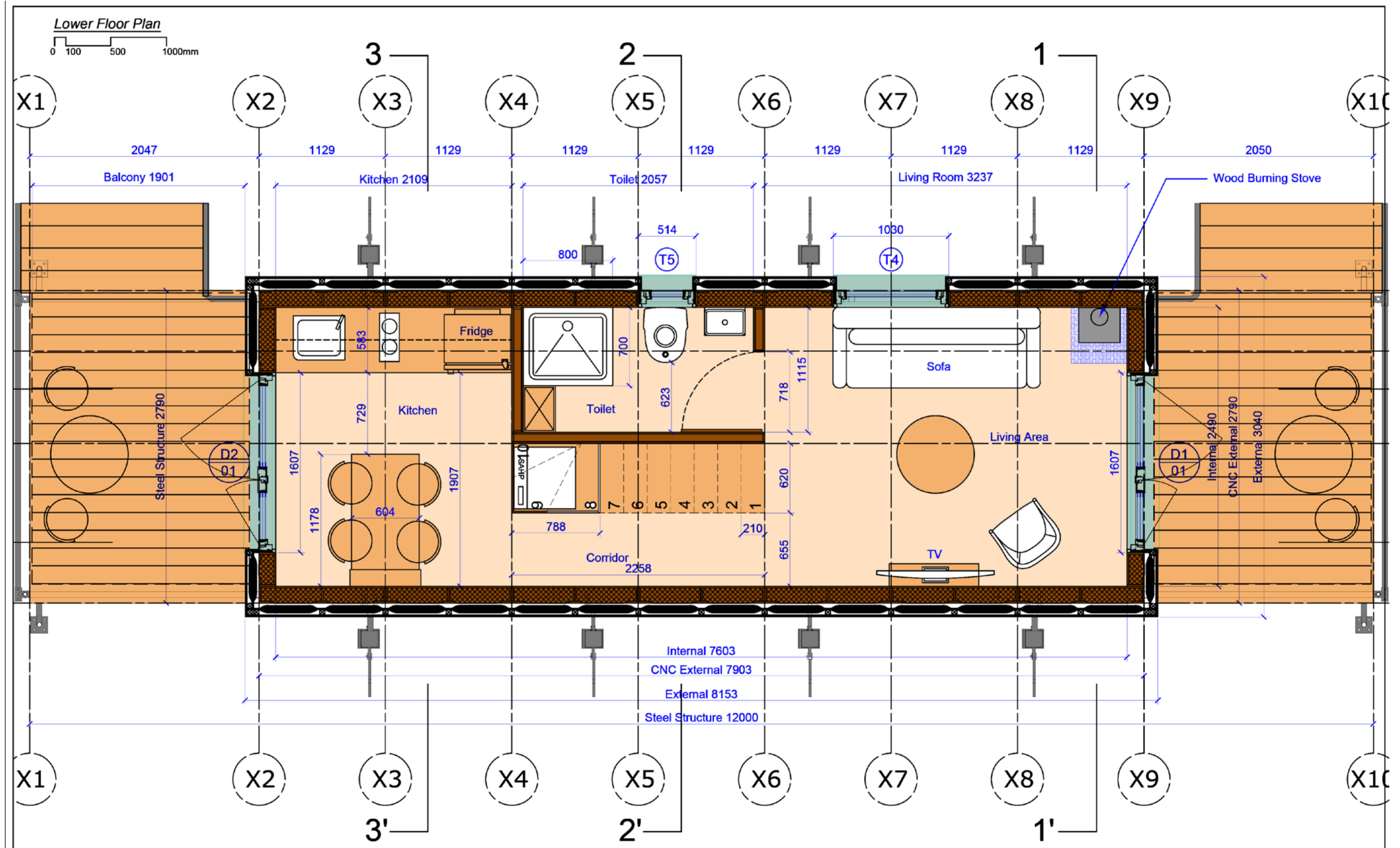
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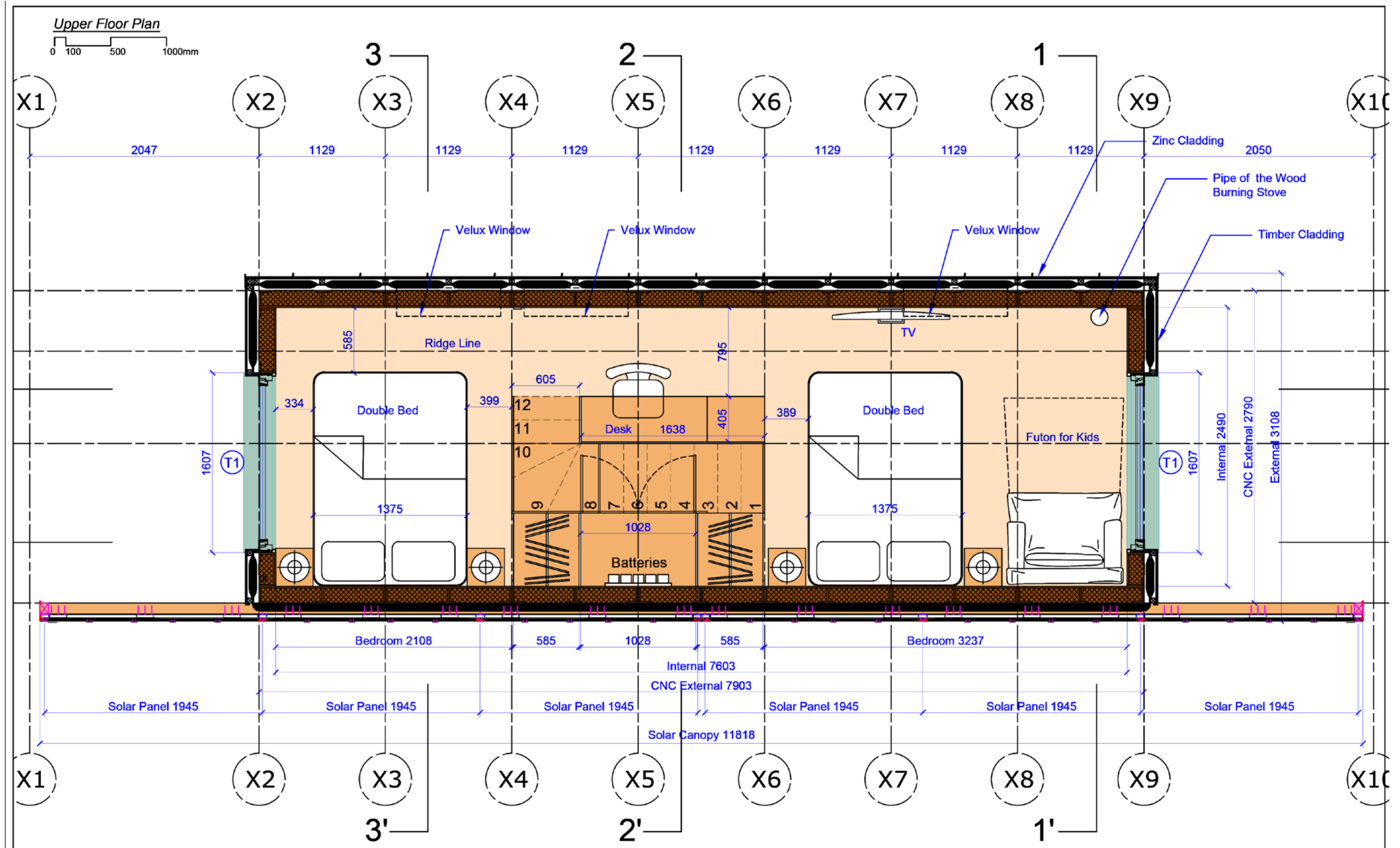


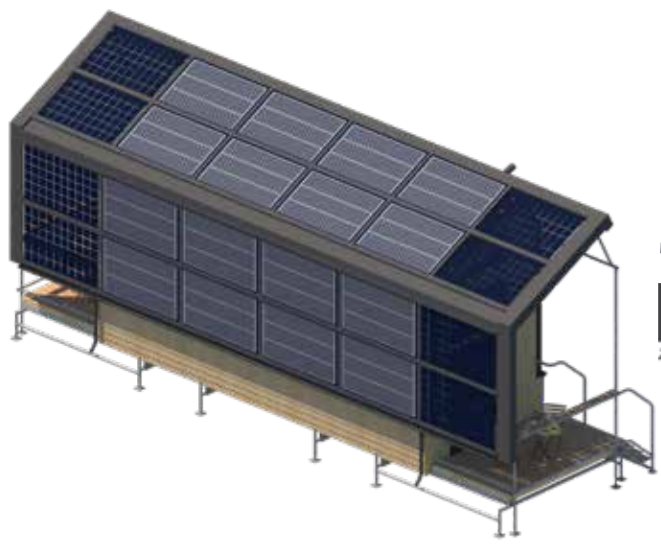
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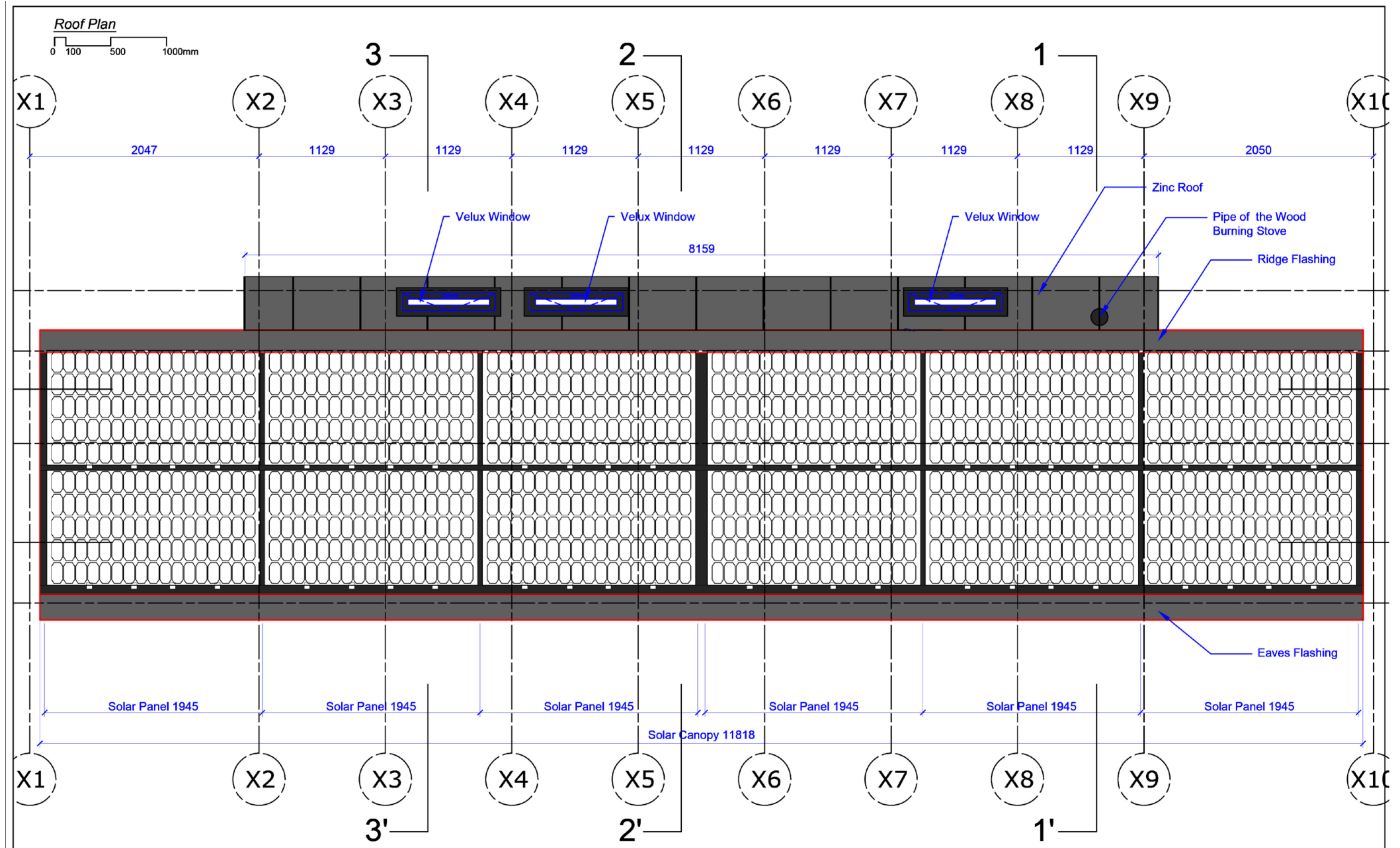


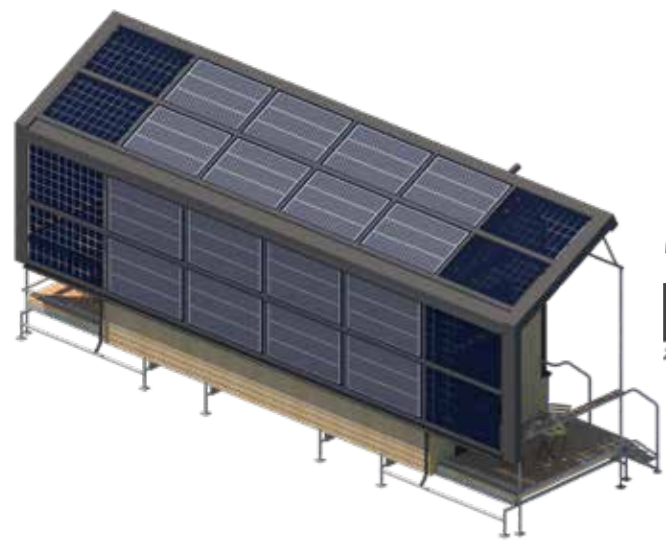
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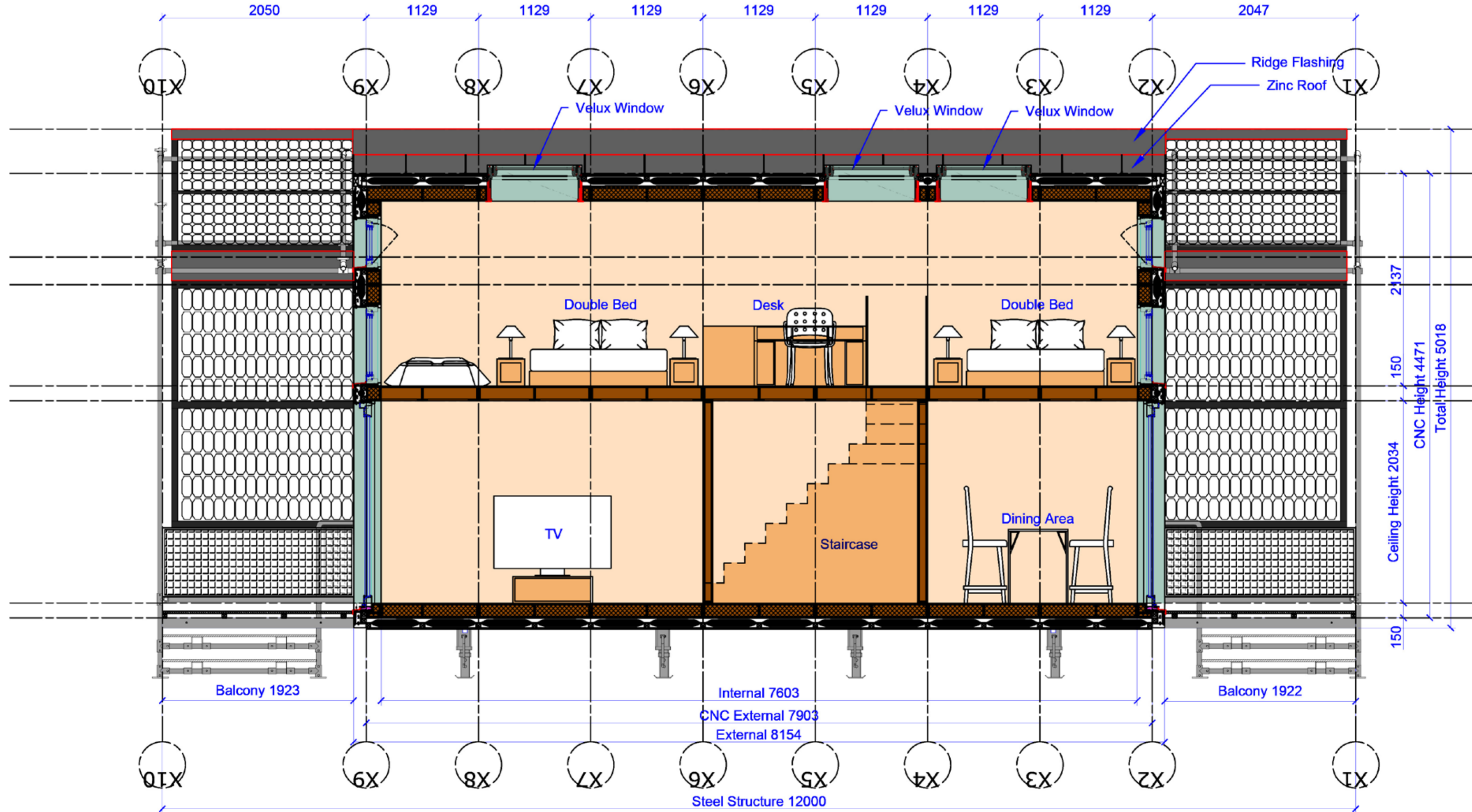


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Long Section AA'

0 100 500 1000mm

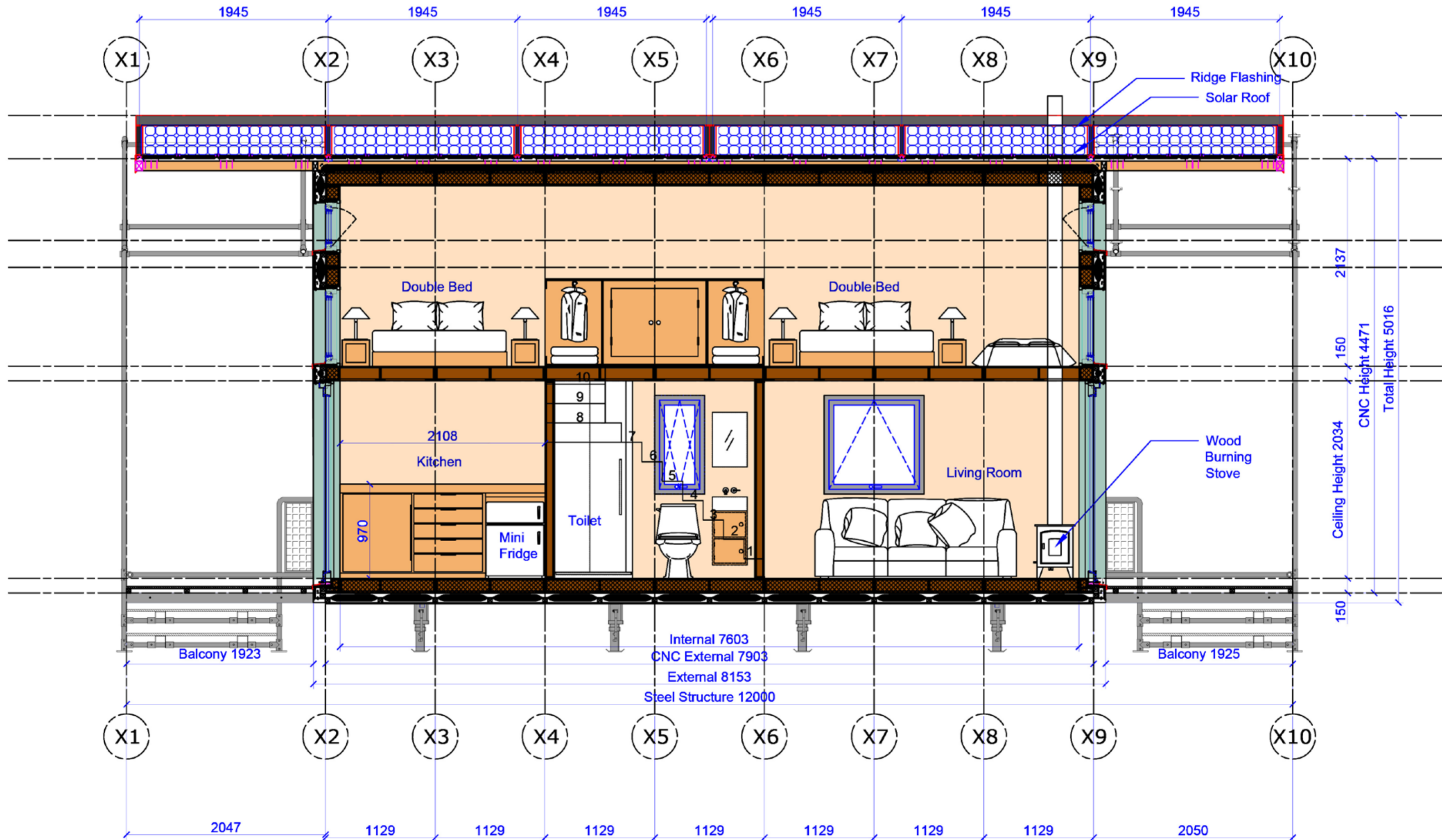




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Long Section BB'
0 100 500 1000mm

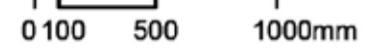




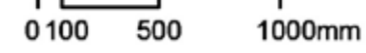
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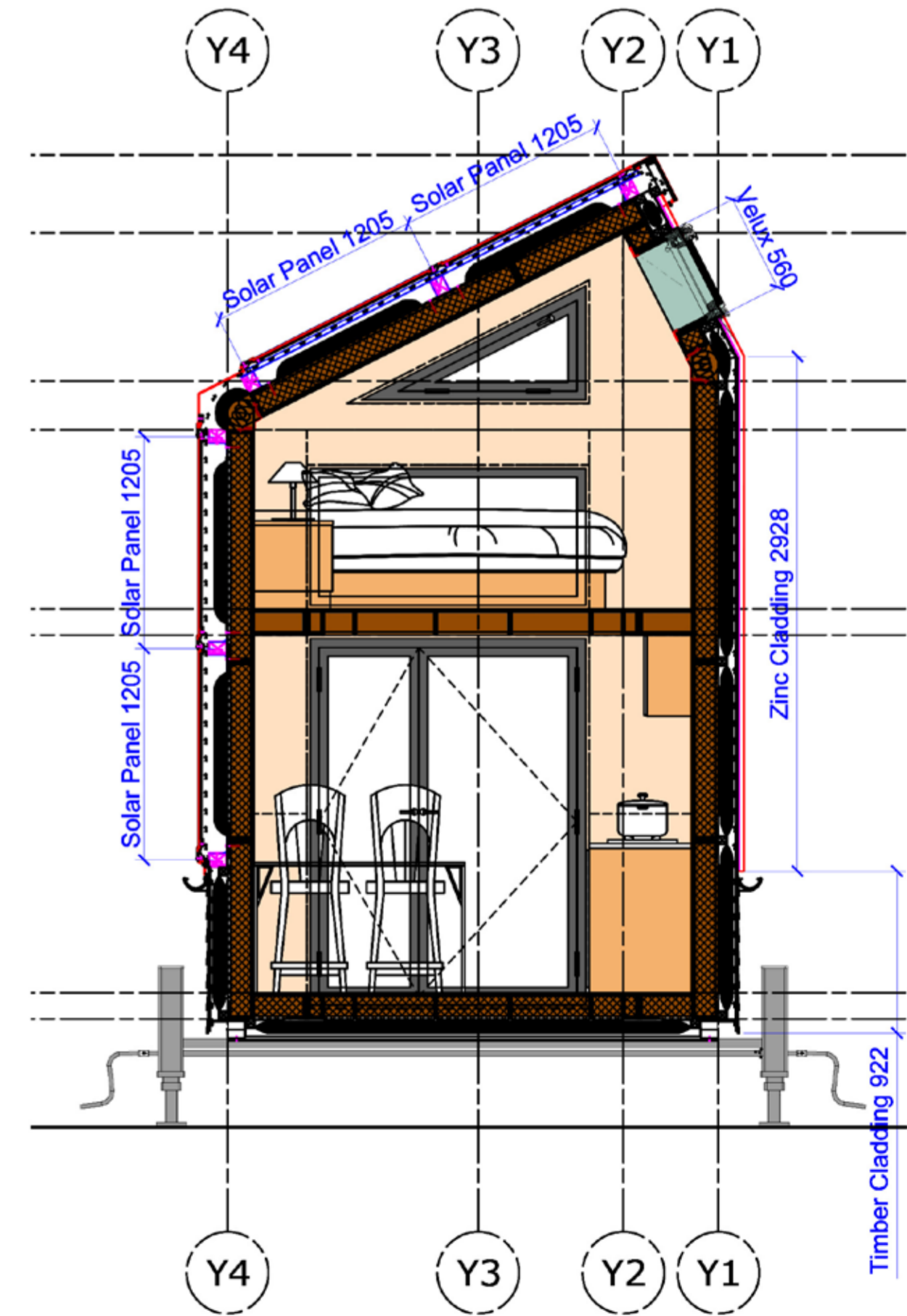
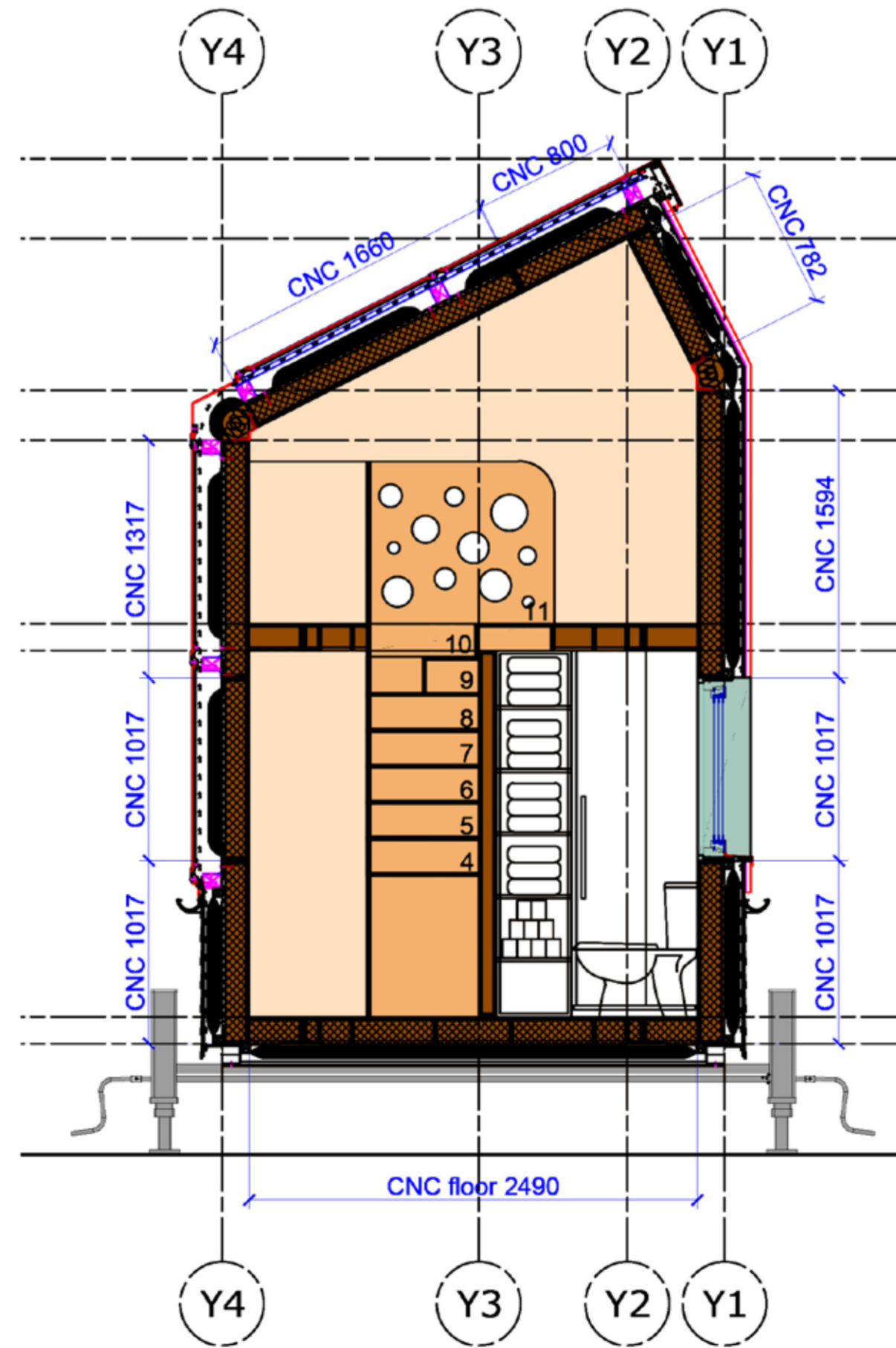
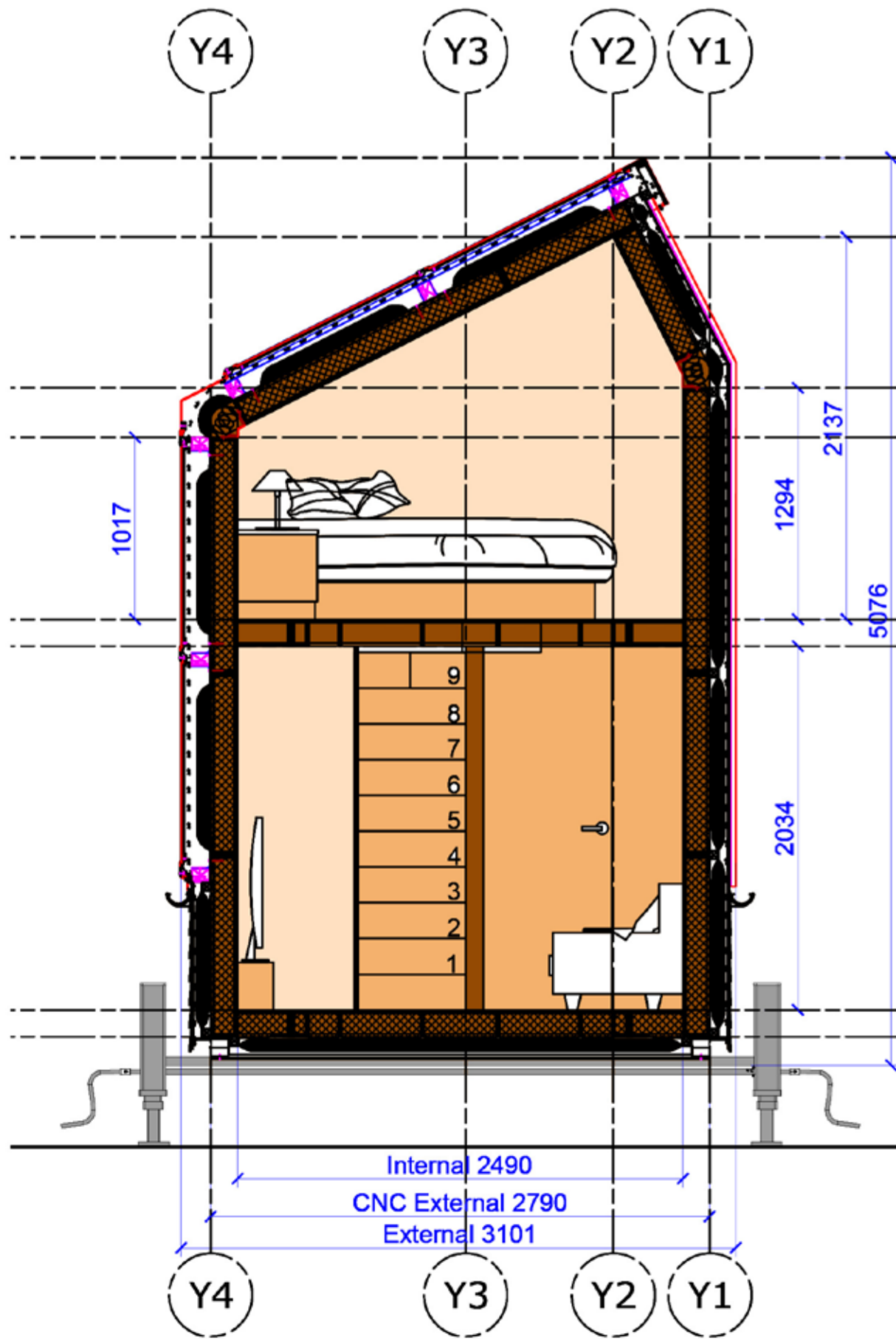
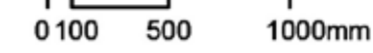
Short Section 11'



Short Section 22'



Short Section 33'

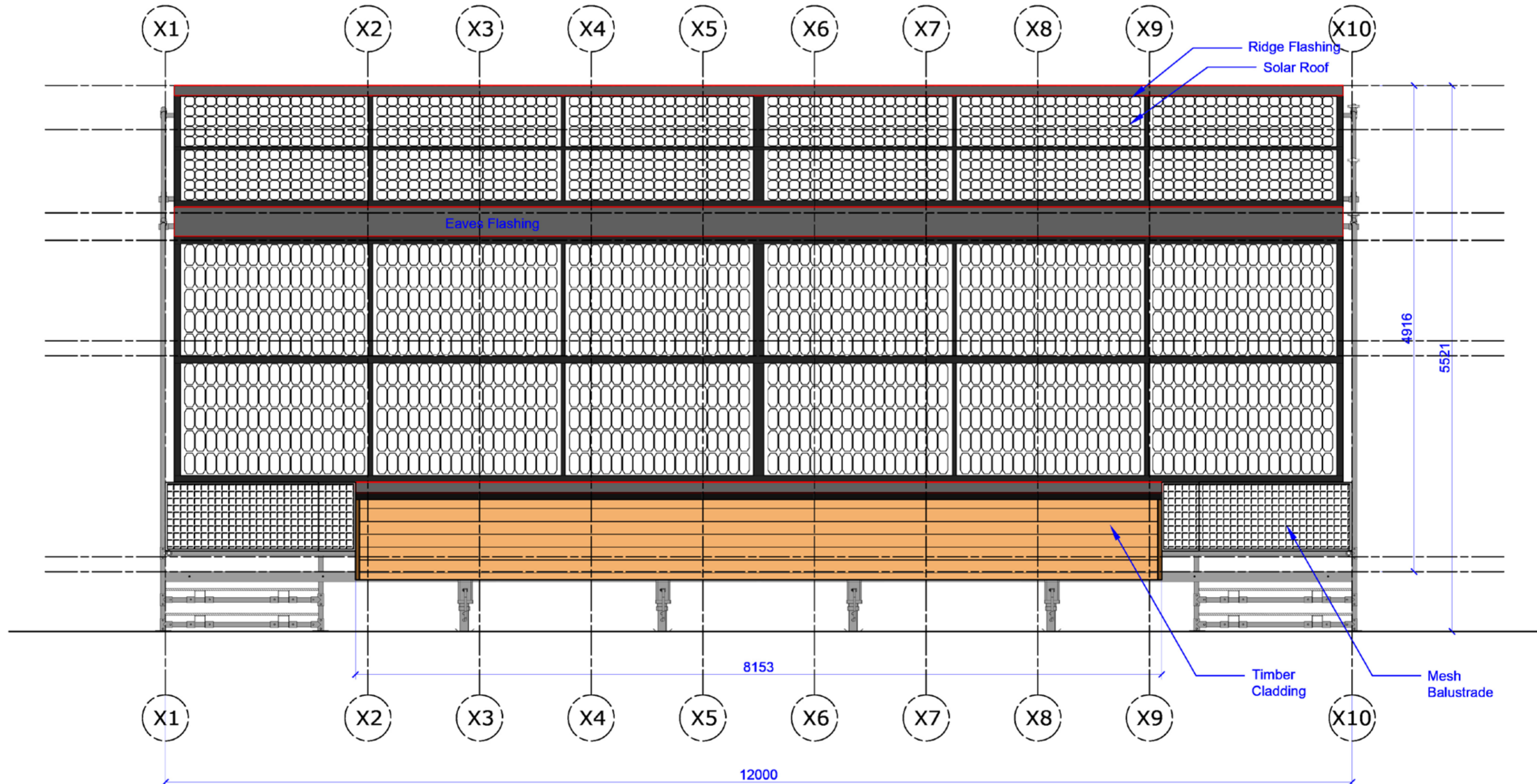




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South Elevation
0 100 500 1000mm



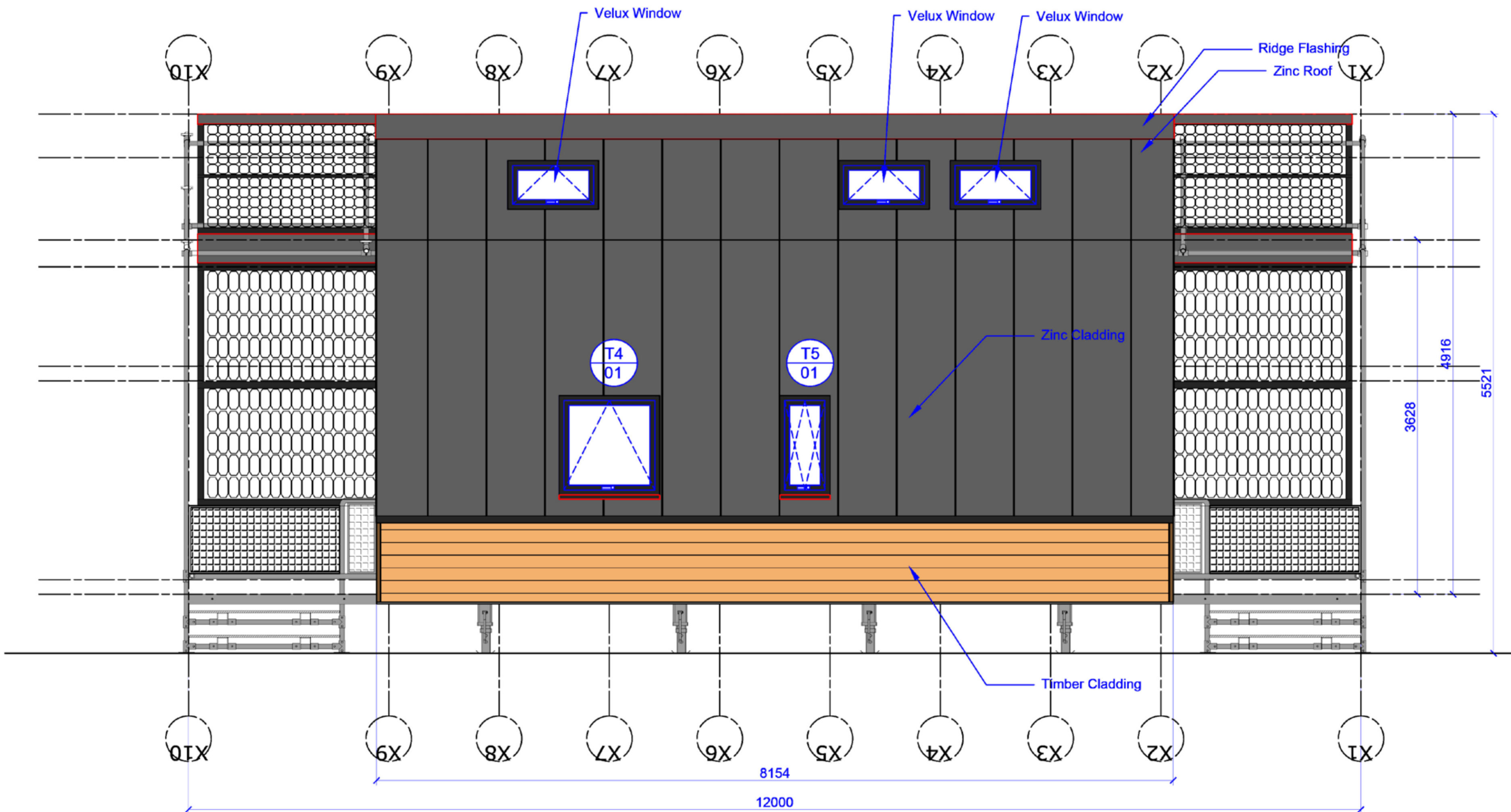


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North Elevation

0 100 500 1000mm





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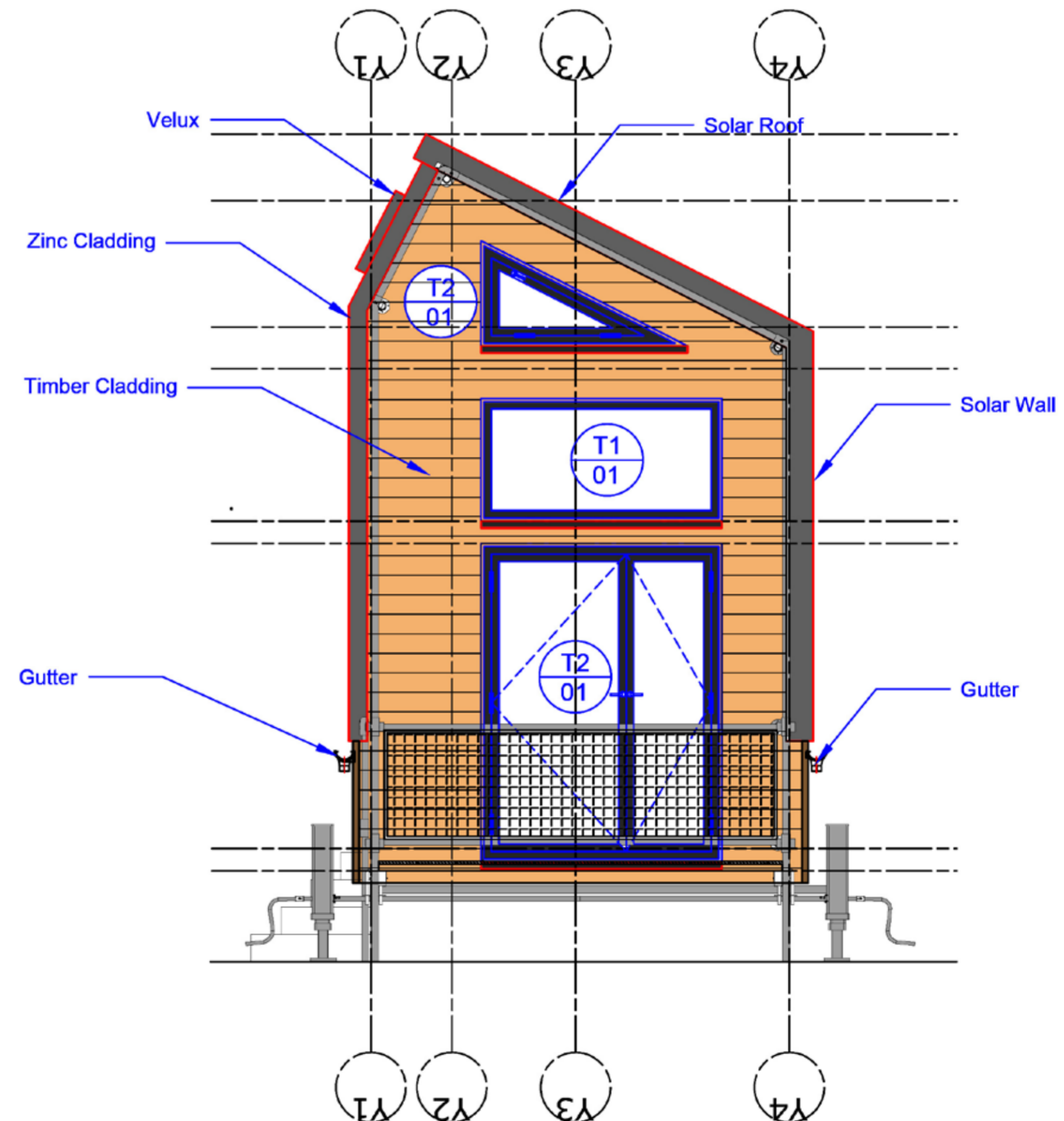
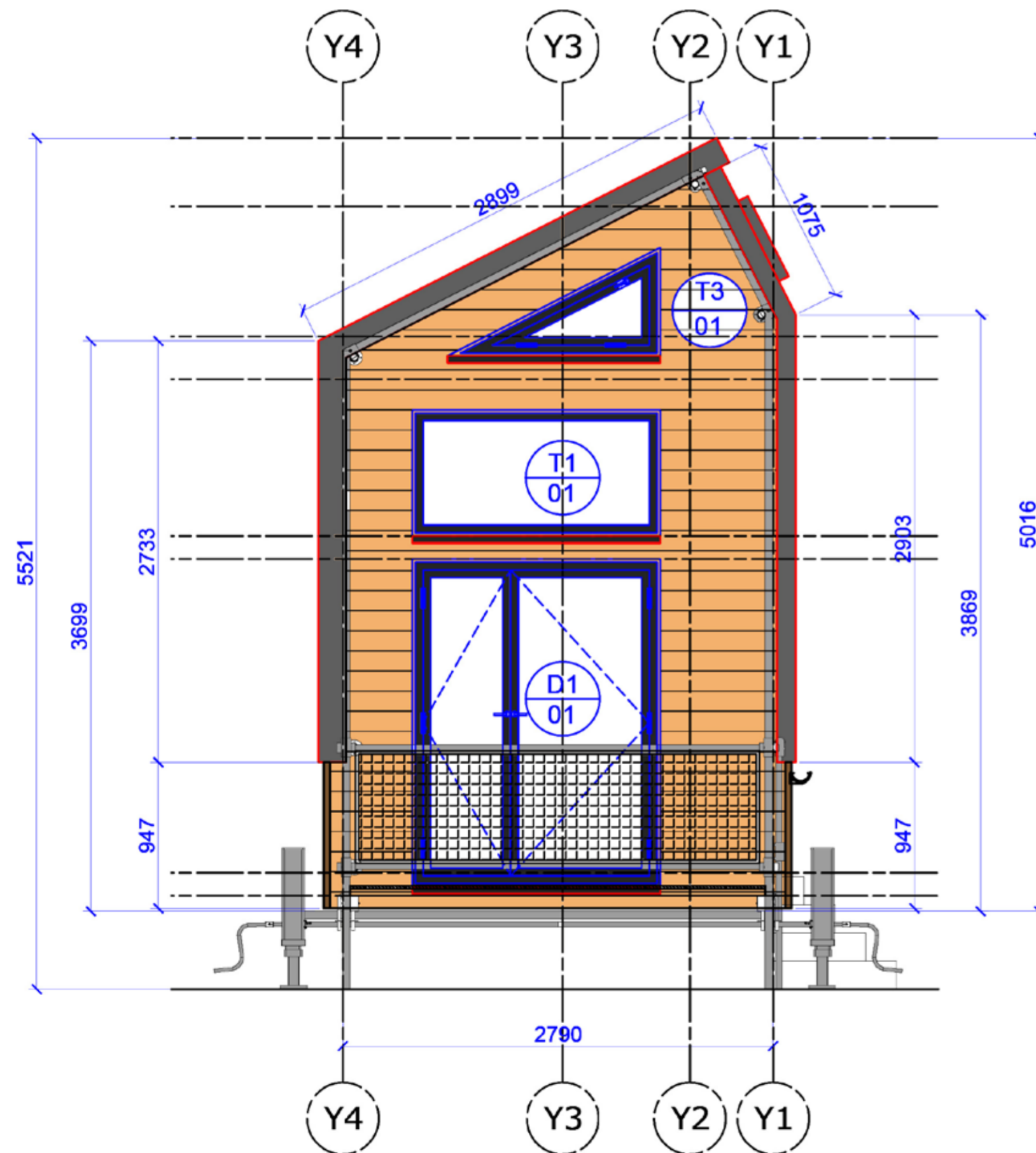
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East Elevation

0 100 500 1000mm

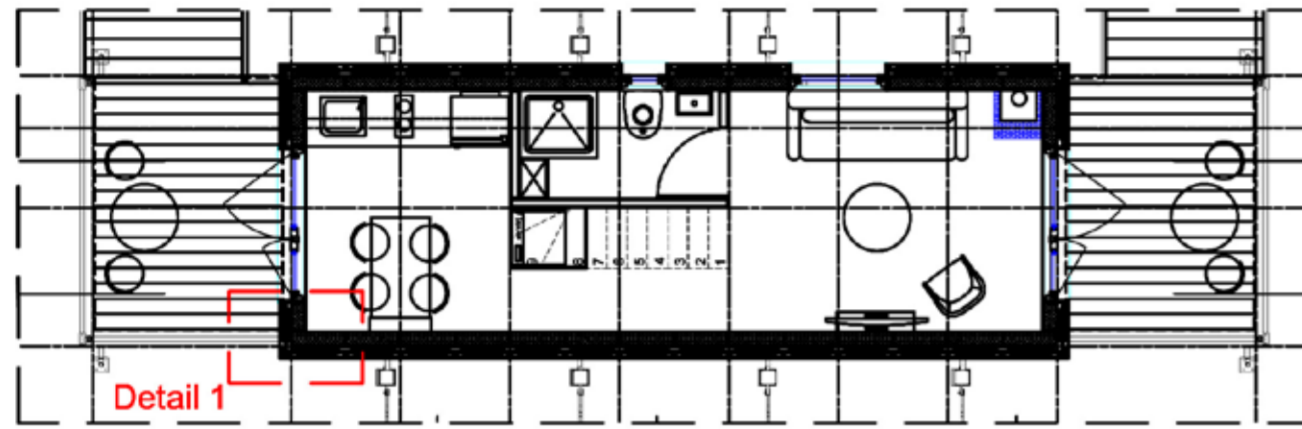
West Elevation

0 100 500 1000mm

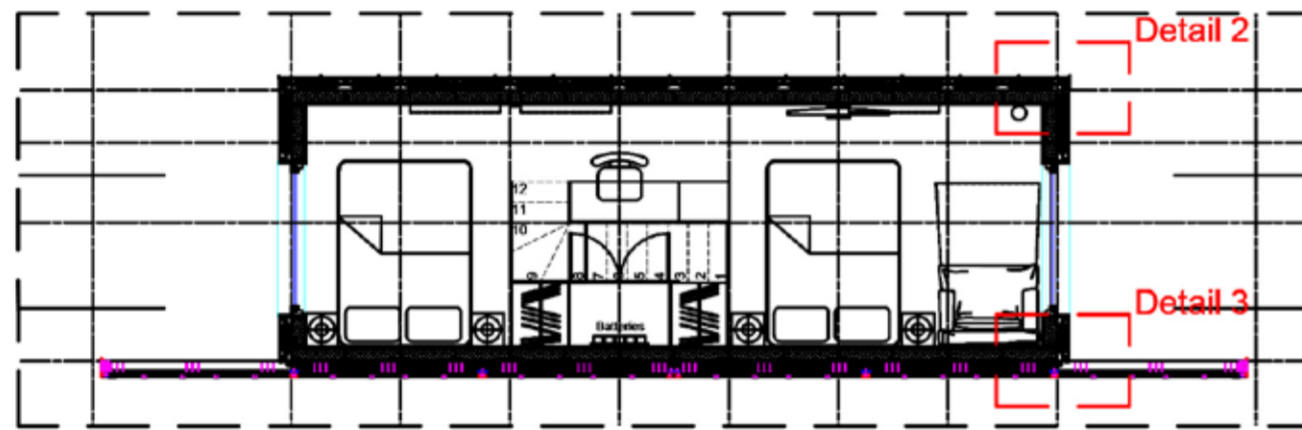




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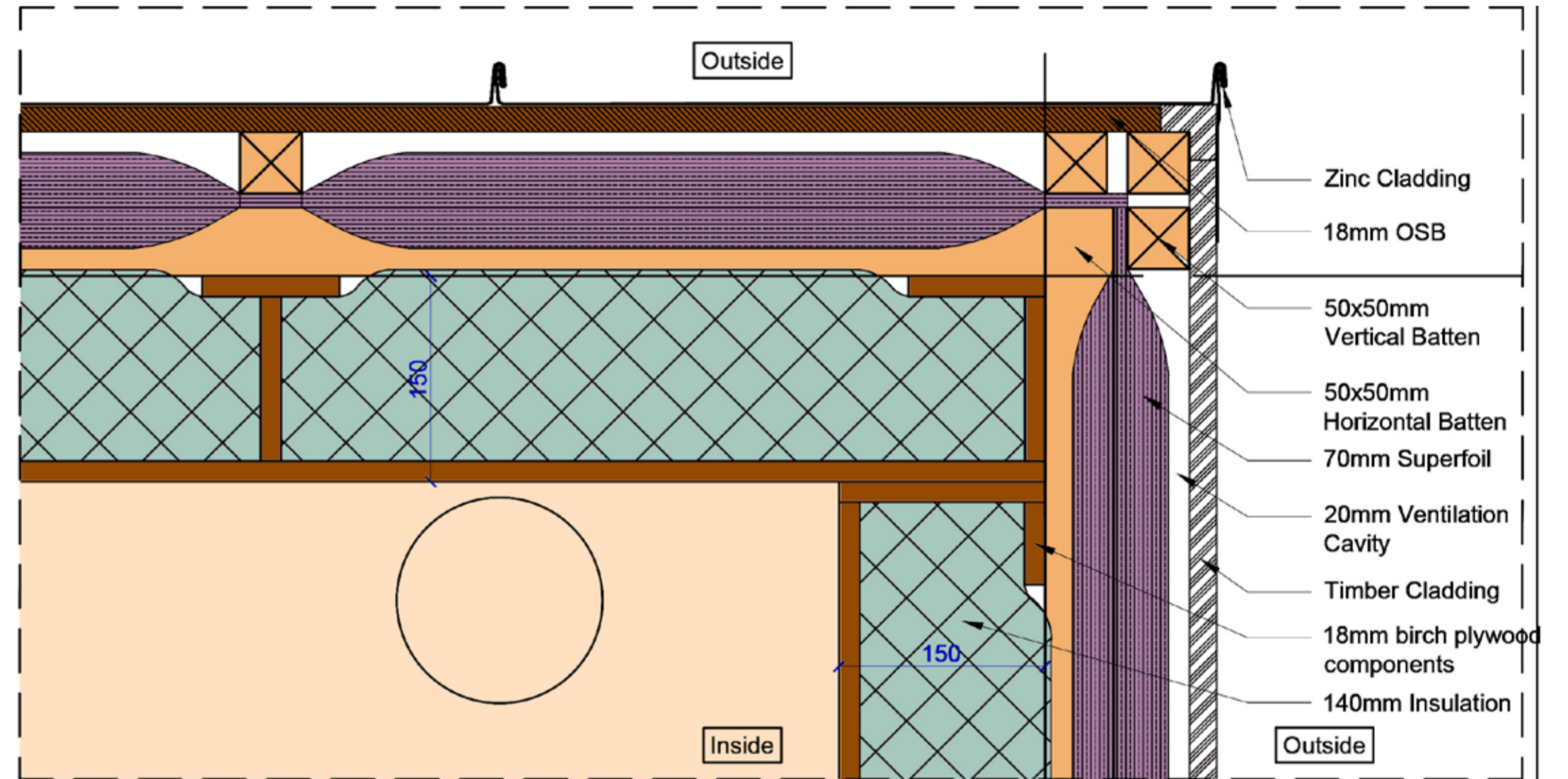
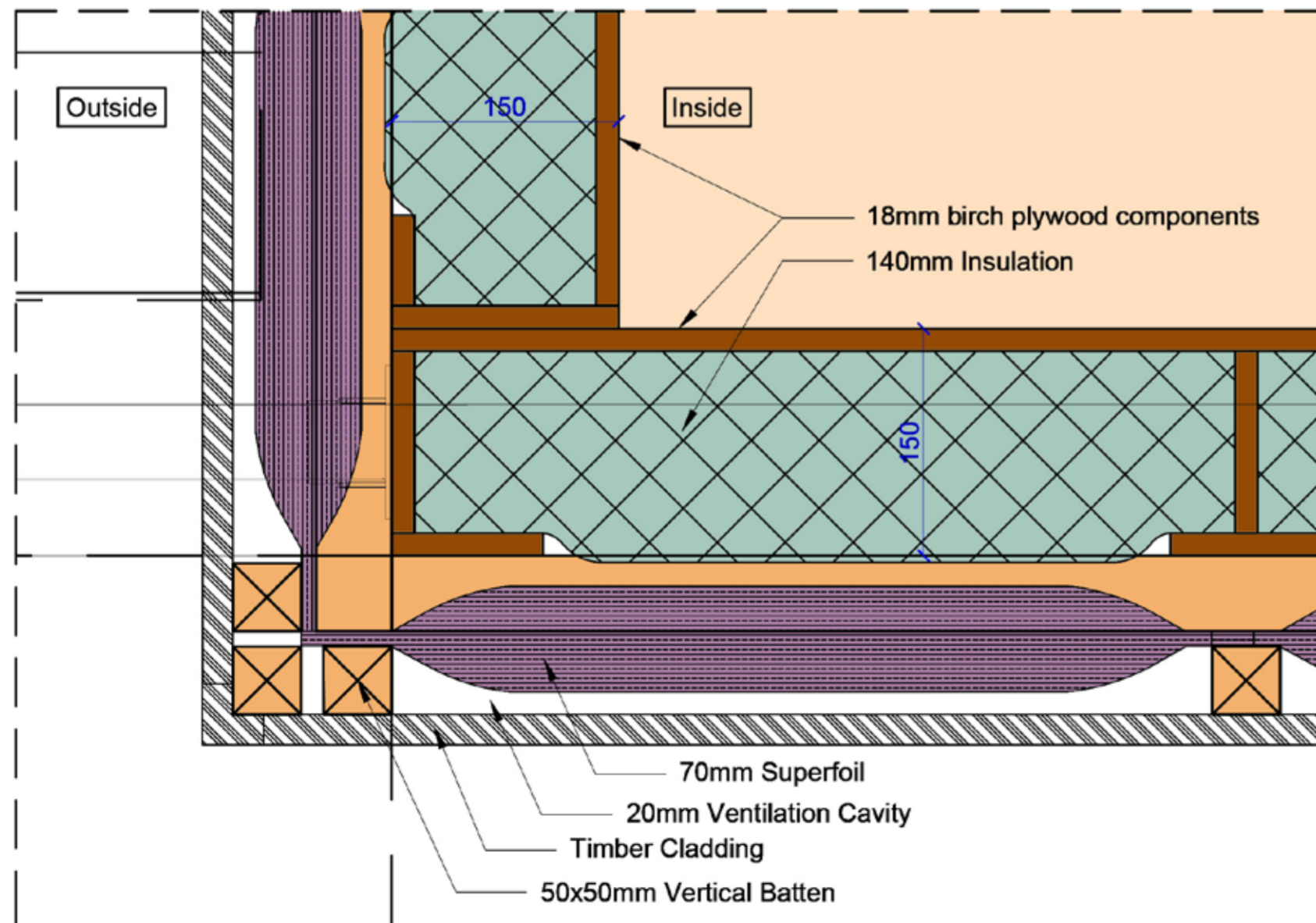


above: Lower Floor Plan 1:100@A3



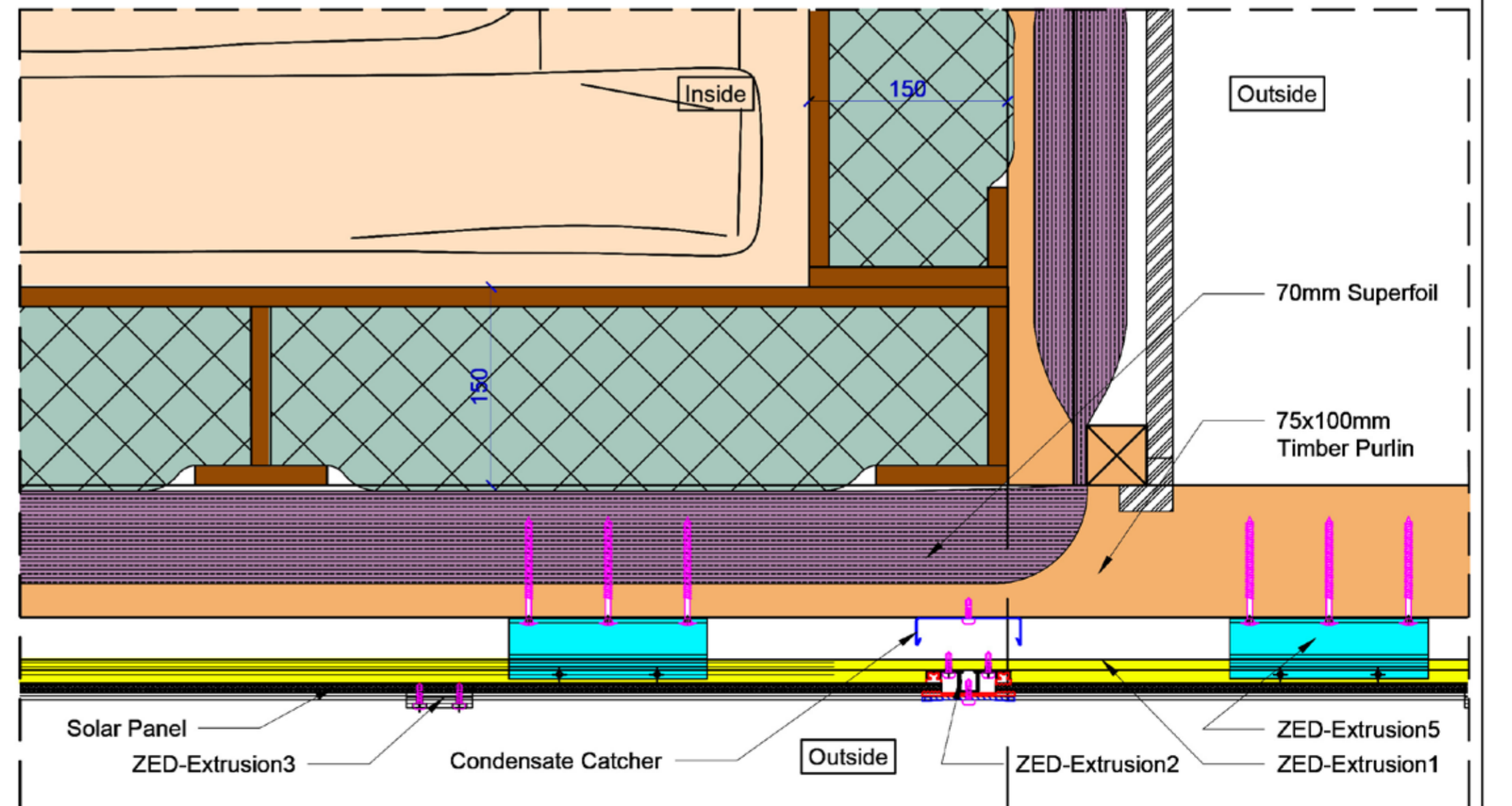
above: Upper Floor Plan 1:100@A3

below: Details 1 Timber Cladding & Corner (1:5@A3)



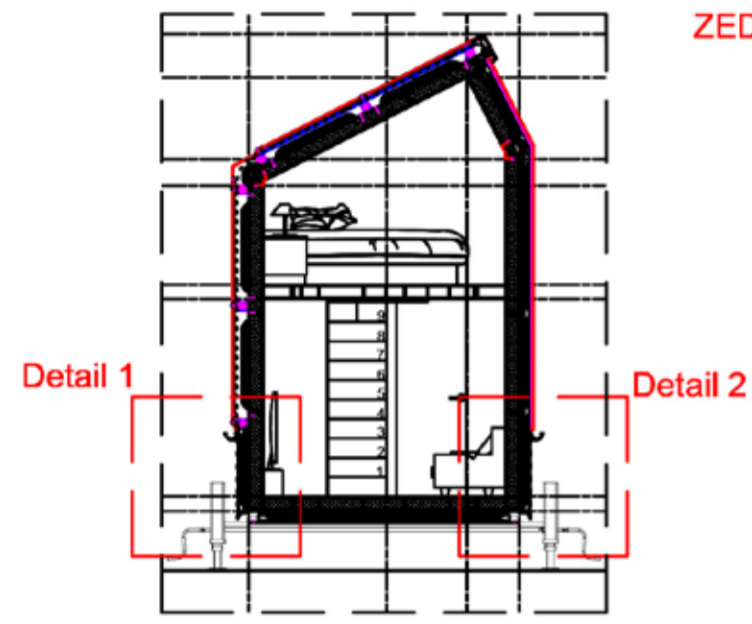
above: Details 2 Timber Cladding & Zinc Cladding (1:5@A3)

below: Details 3 Timber Cladding & ZED Wall (1:5@A3)

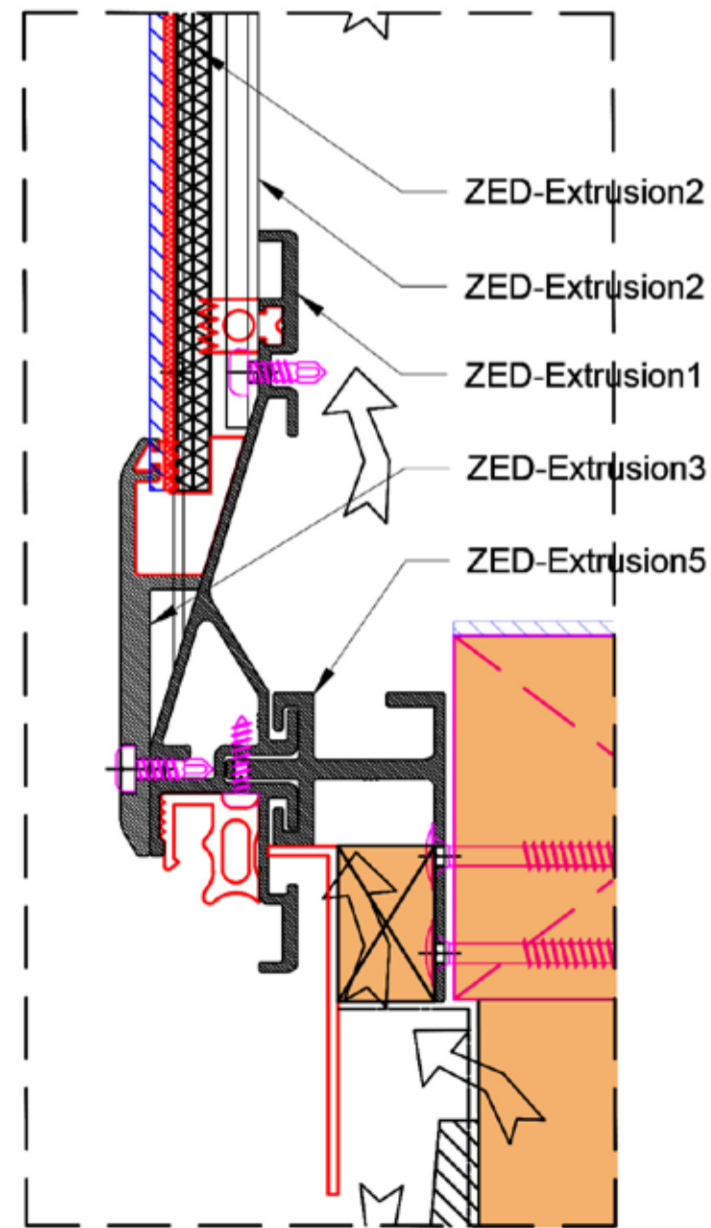




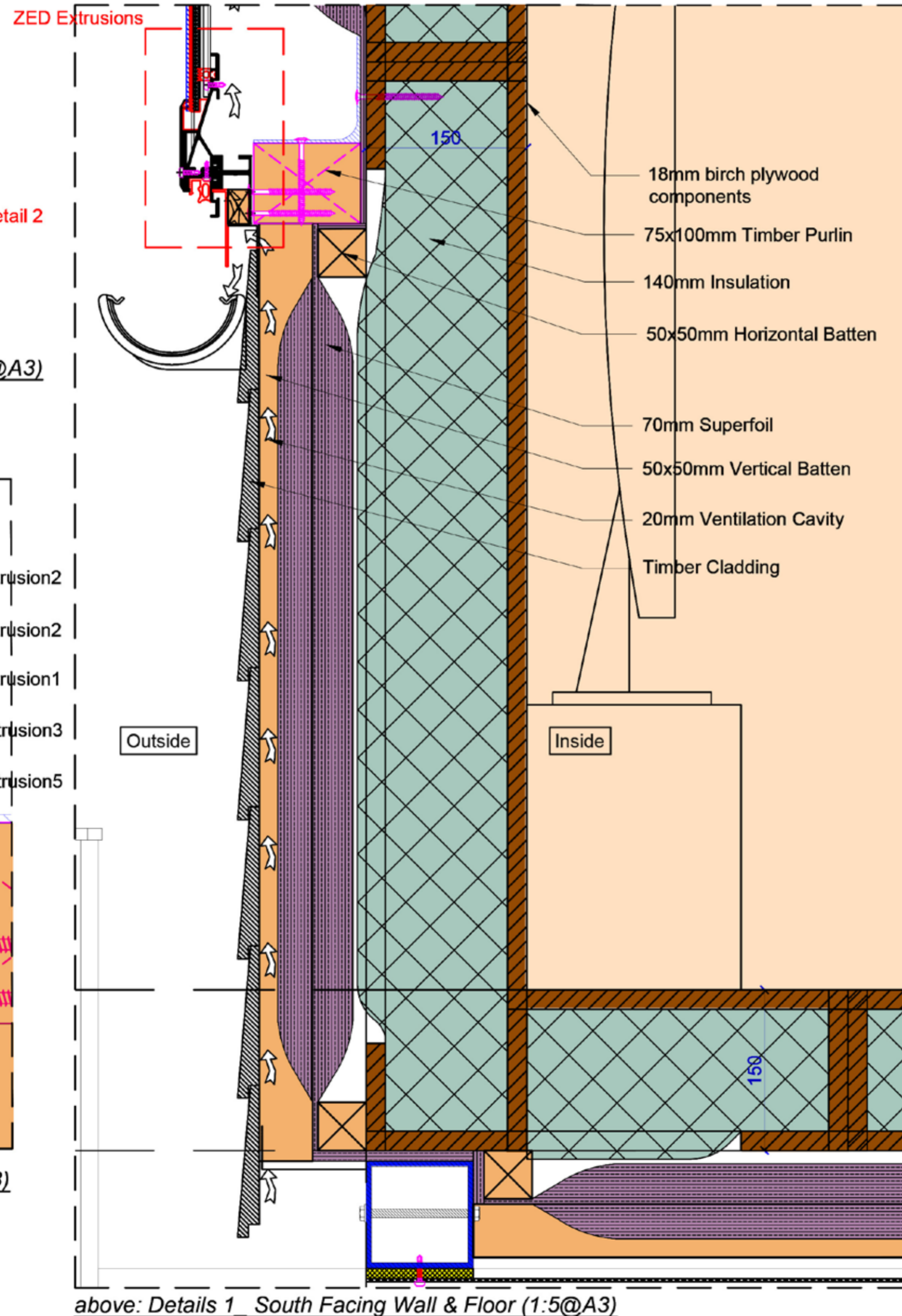
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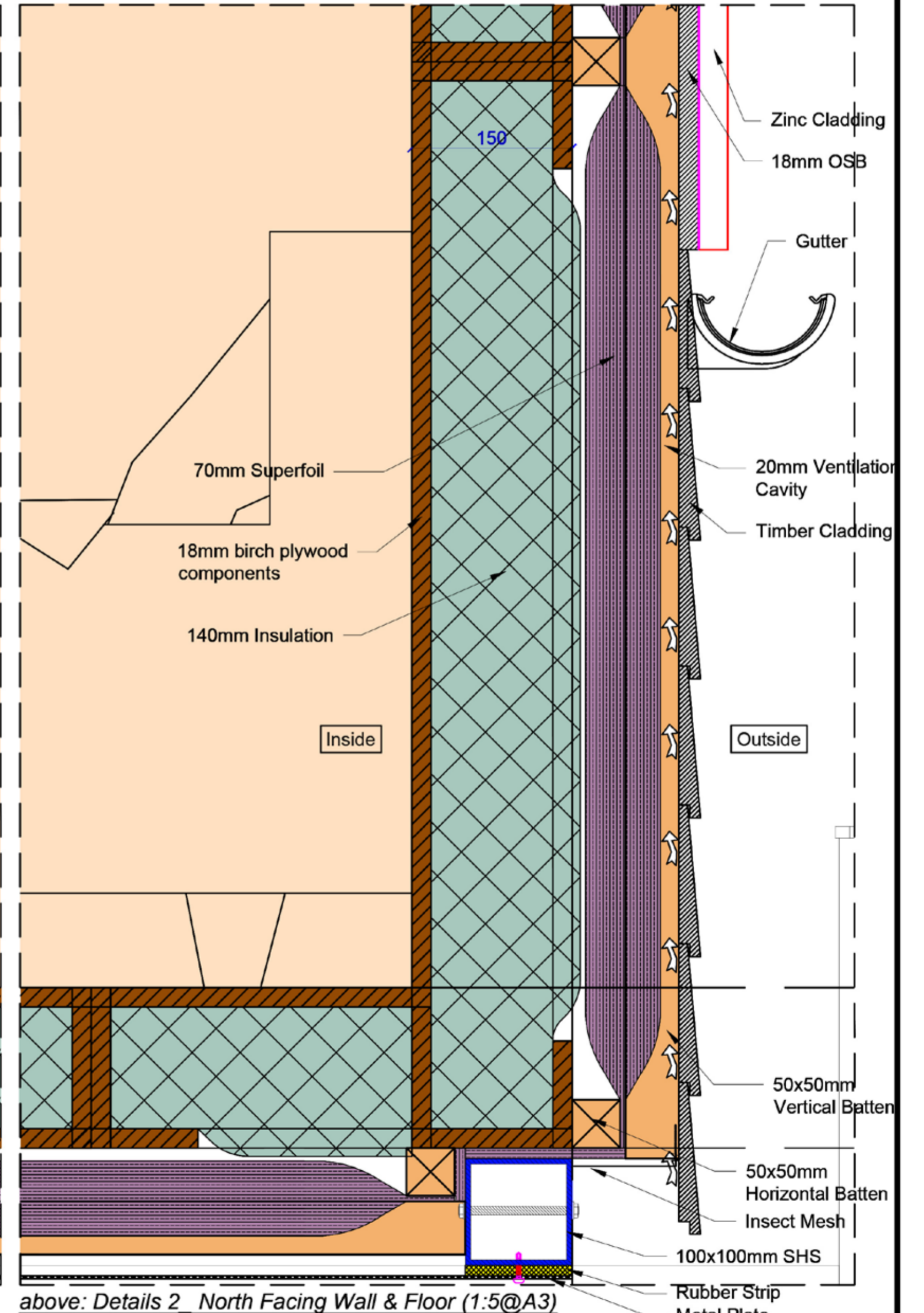
above: Short Section 11' (1:100@A3)



above: ZED Extrusions (1:2@A3)



above: Details 1 South Facing Wall & Floor (1:5@A3)

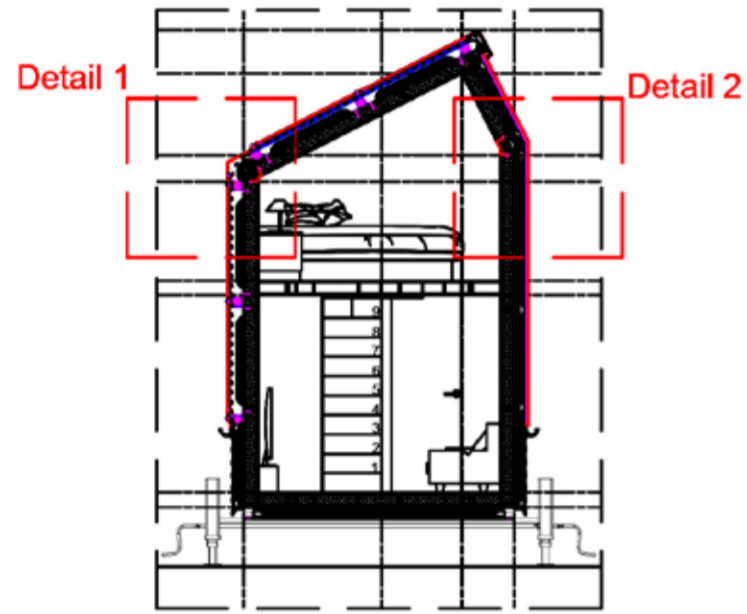


above: Details 2 North Facing Wall & Floor (1:5@A3)

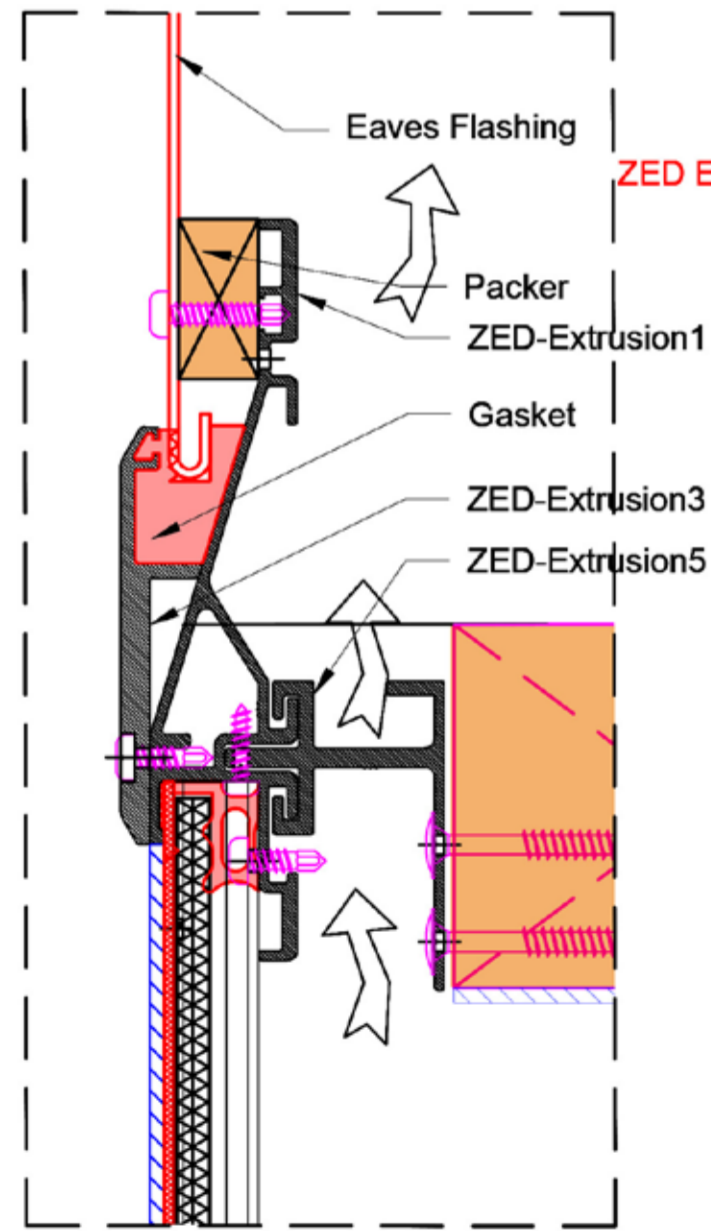


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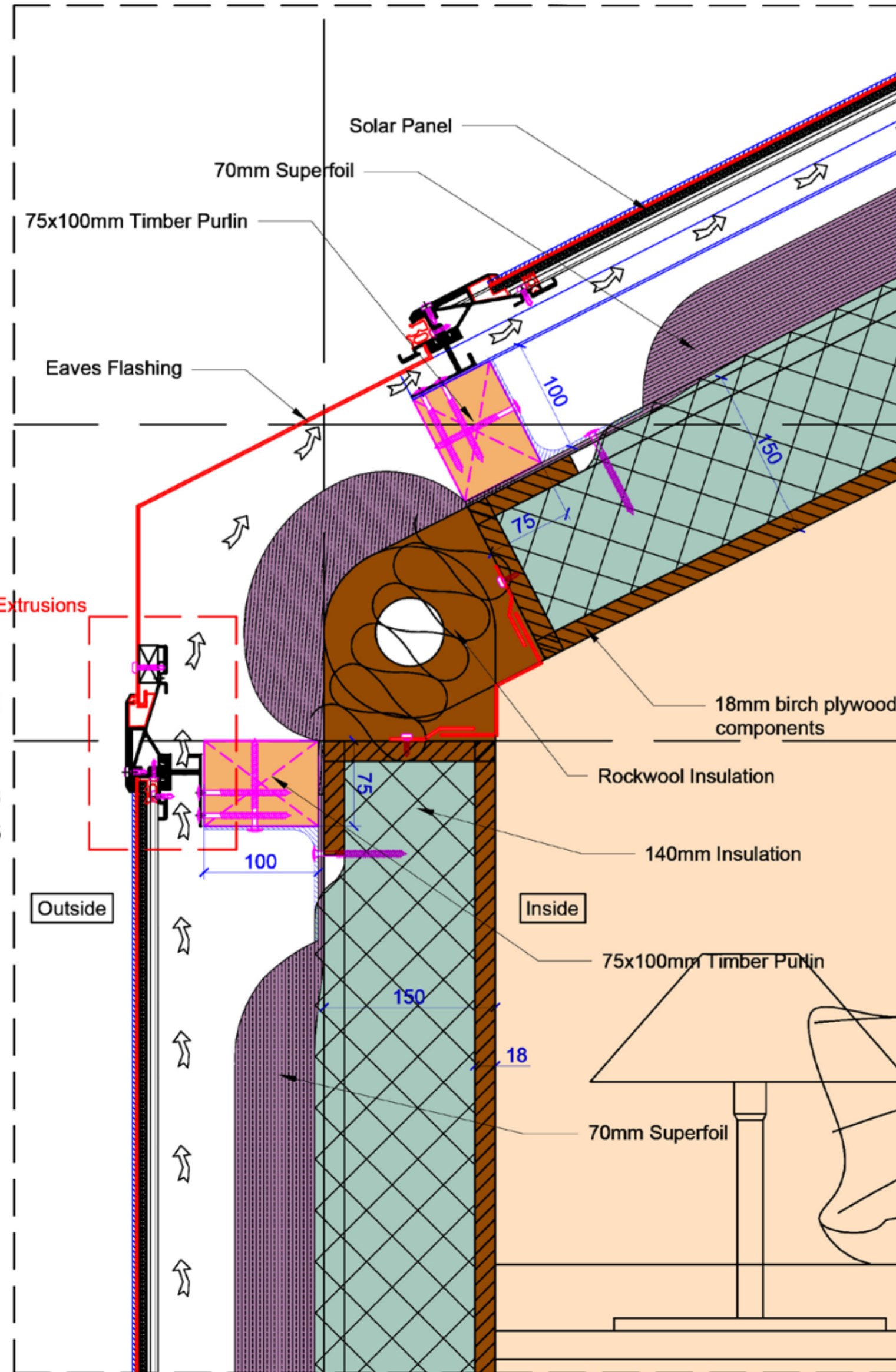
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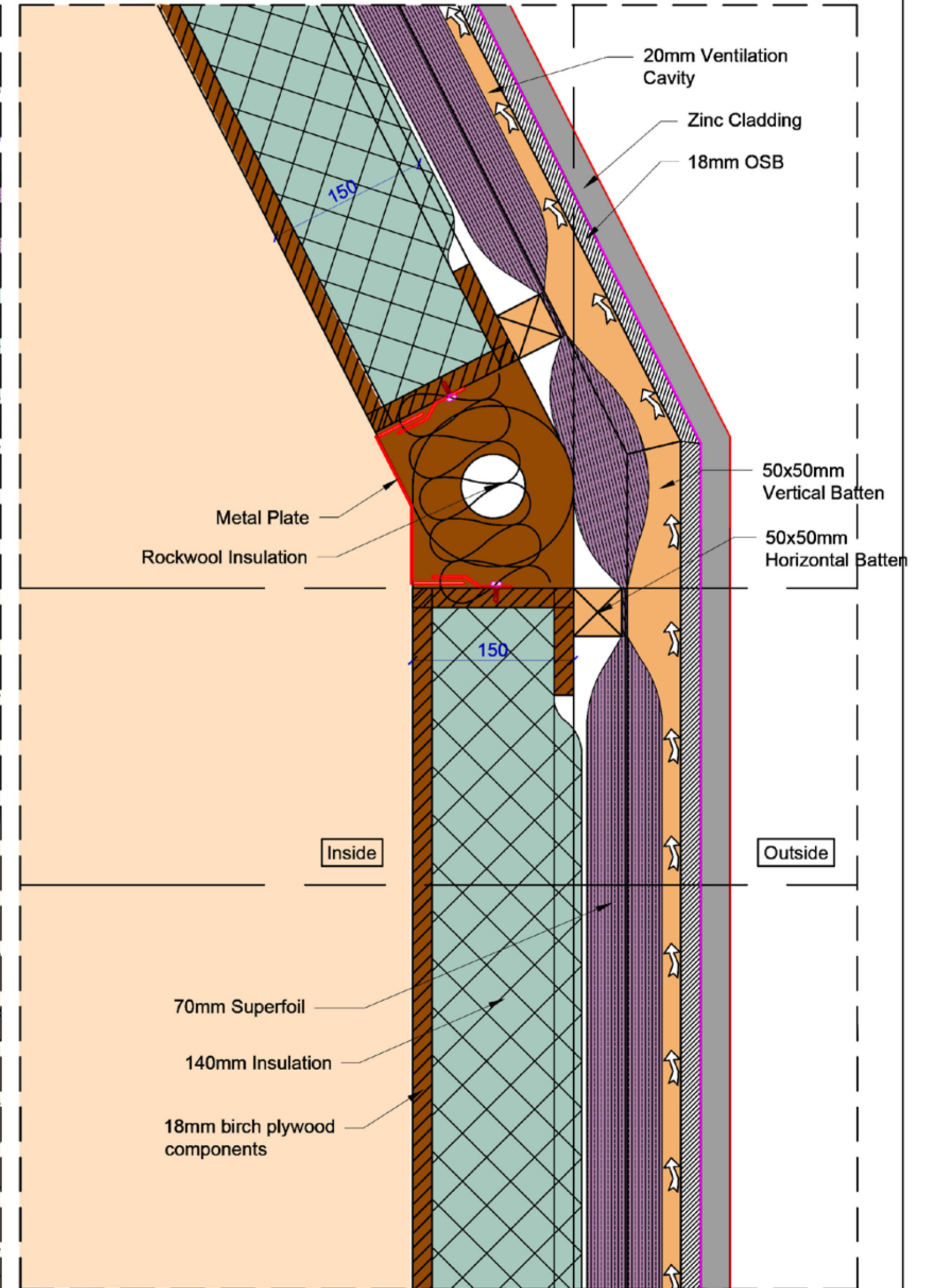
above: Short Section11' (1:100@A3)



above: ZED Extrusions (1:2@A3)



above: Details 1 South Facing Wall & Tilting Corner (1:5@A3)

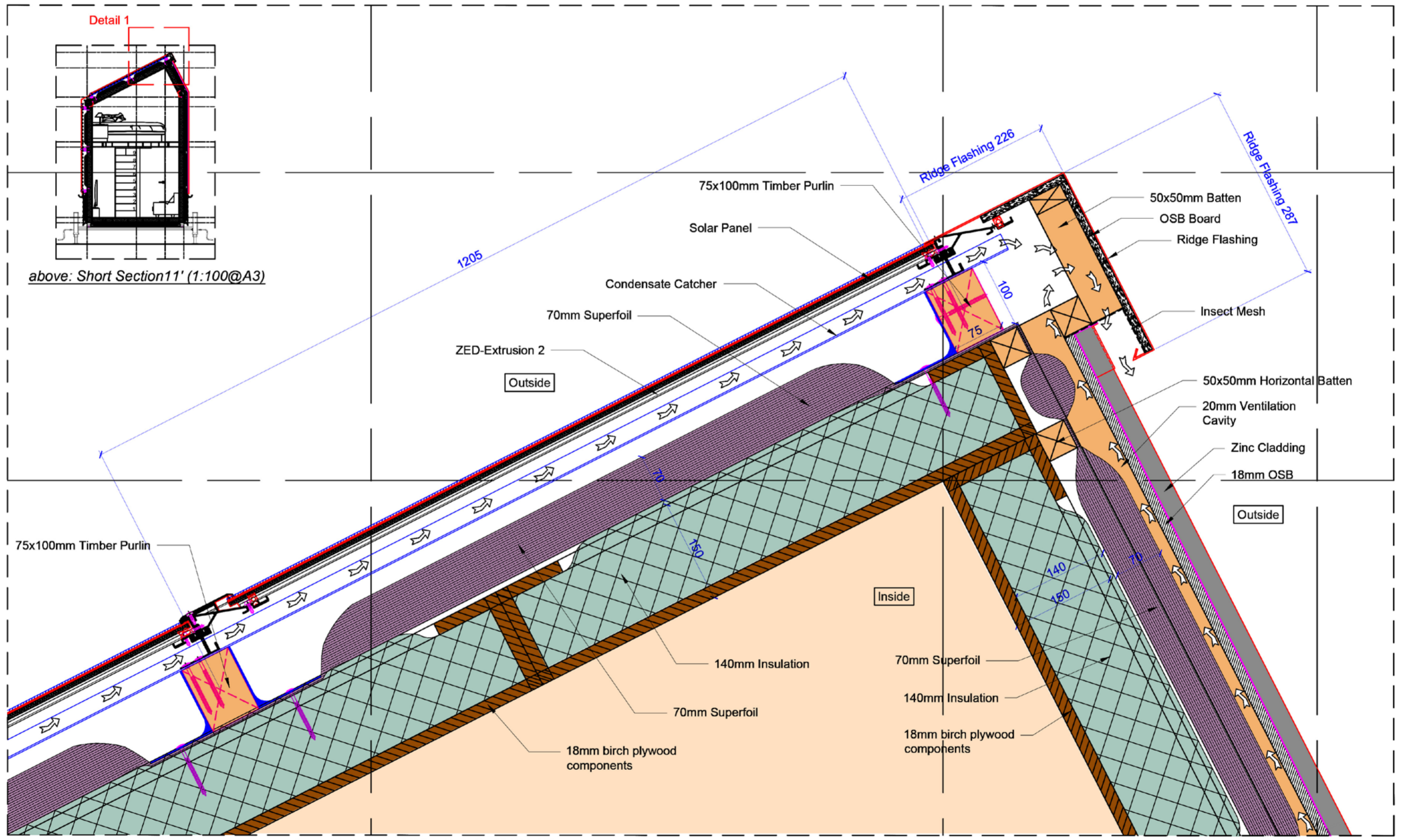


above: Details 2 North Facing Wall & Tilting Corner (1:5@A3)



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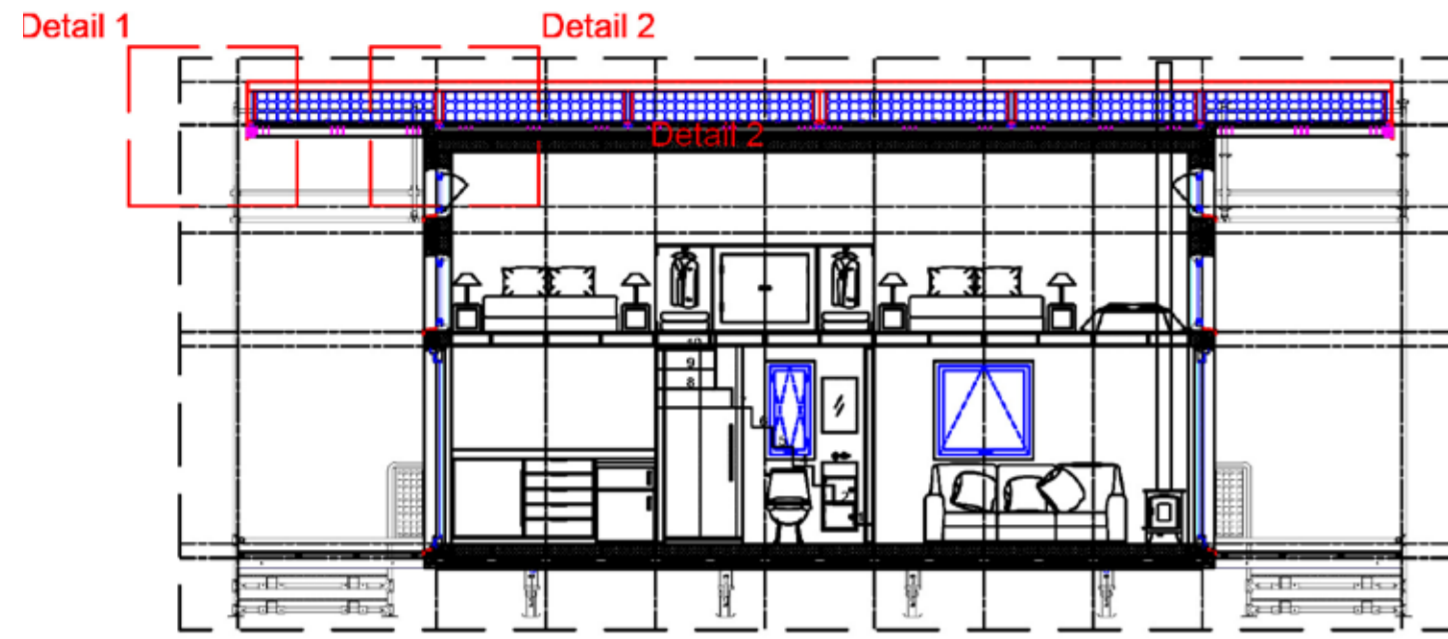


above: Details 1 Ridge Details (1:5@A3)

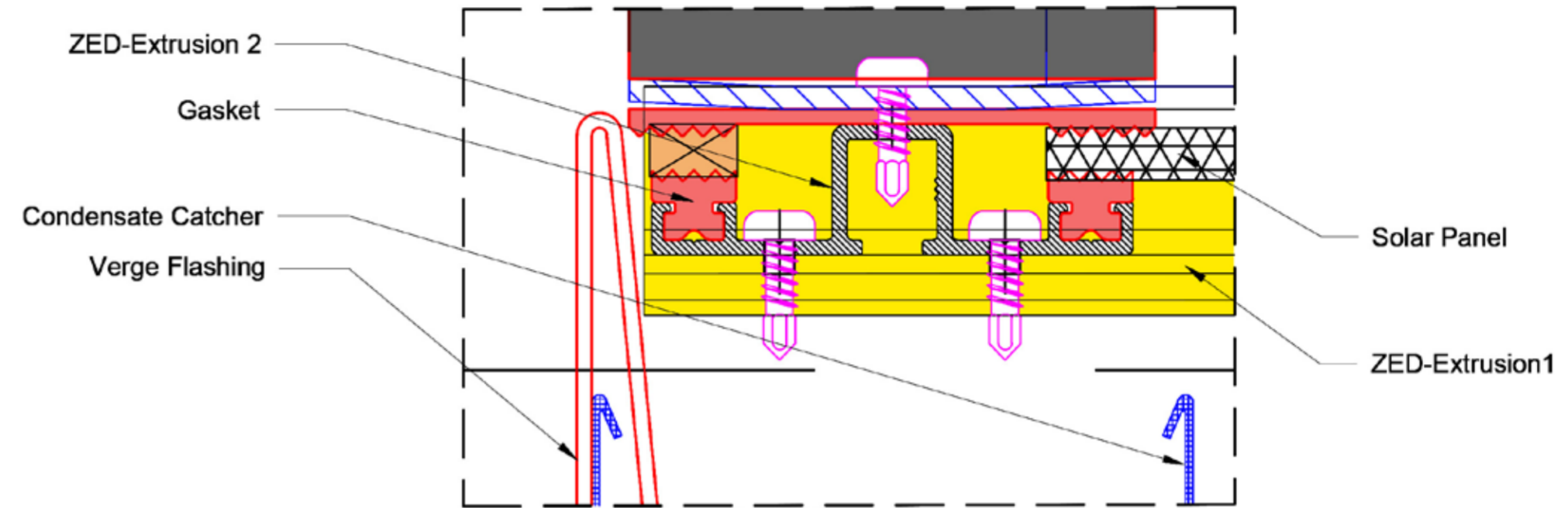


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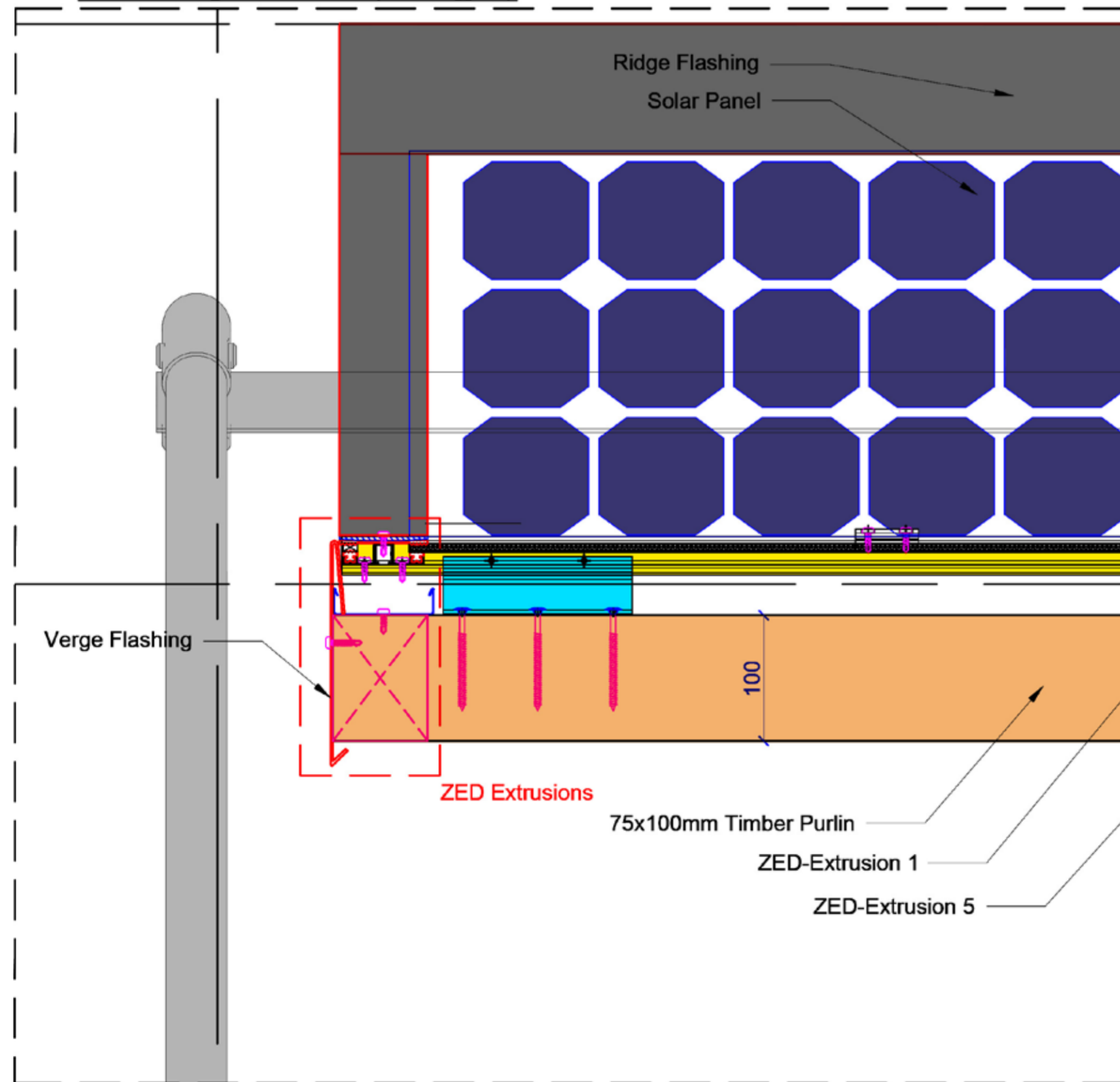
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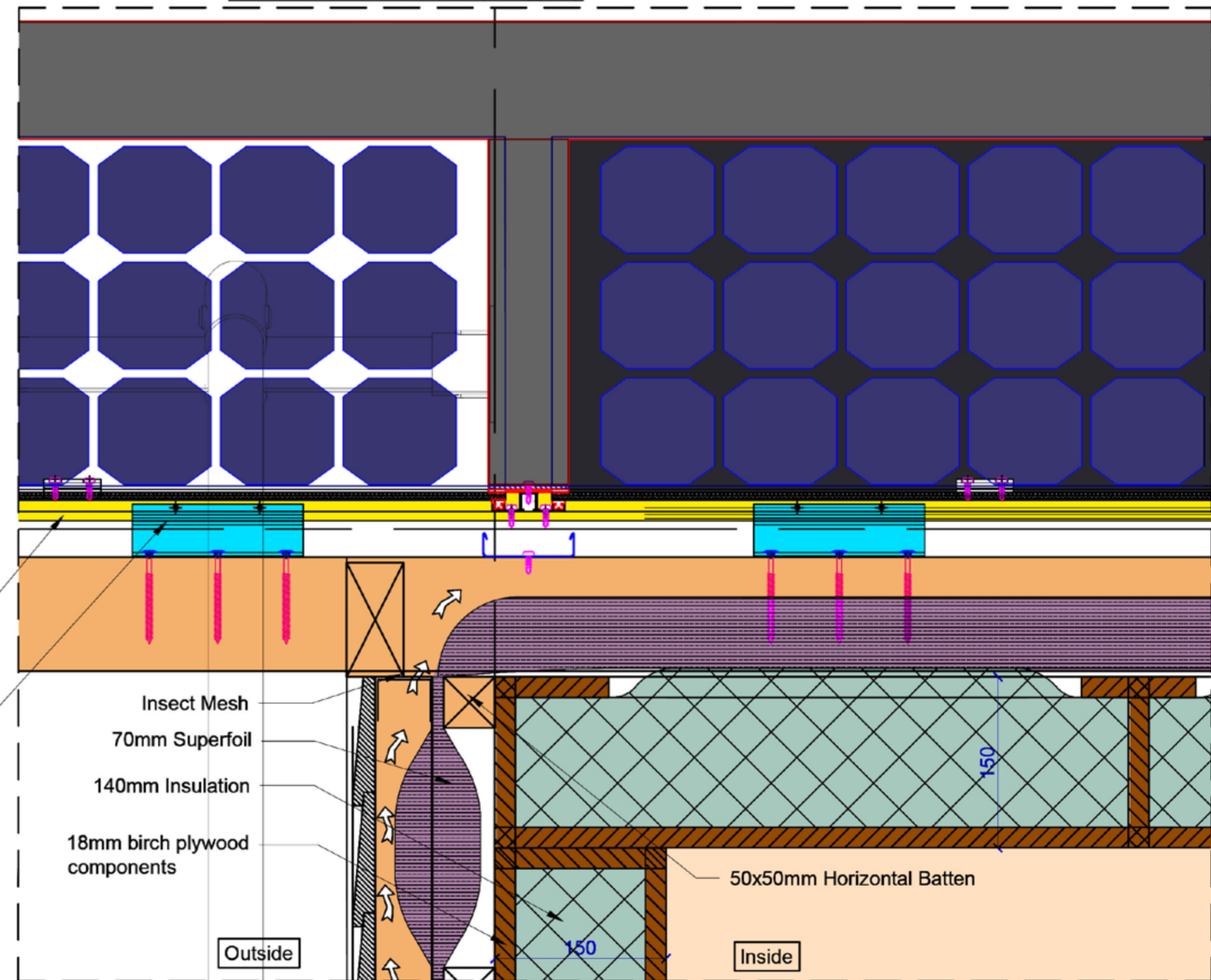
above: Long Section BB' (1:100@A3)



above: ZED Extrusions (1:1@A3)



above: Details 1 South Roof Verge Details (1:5@A3)

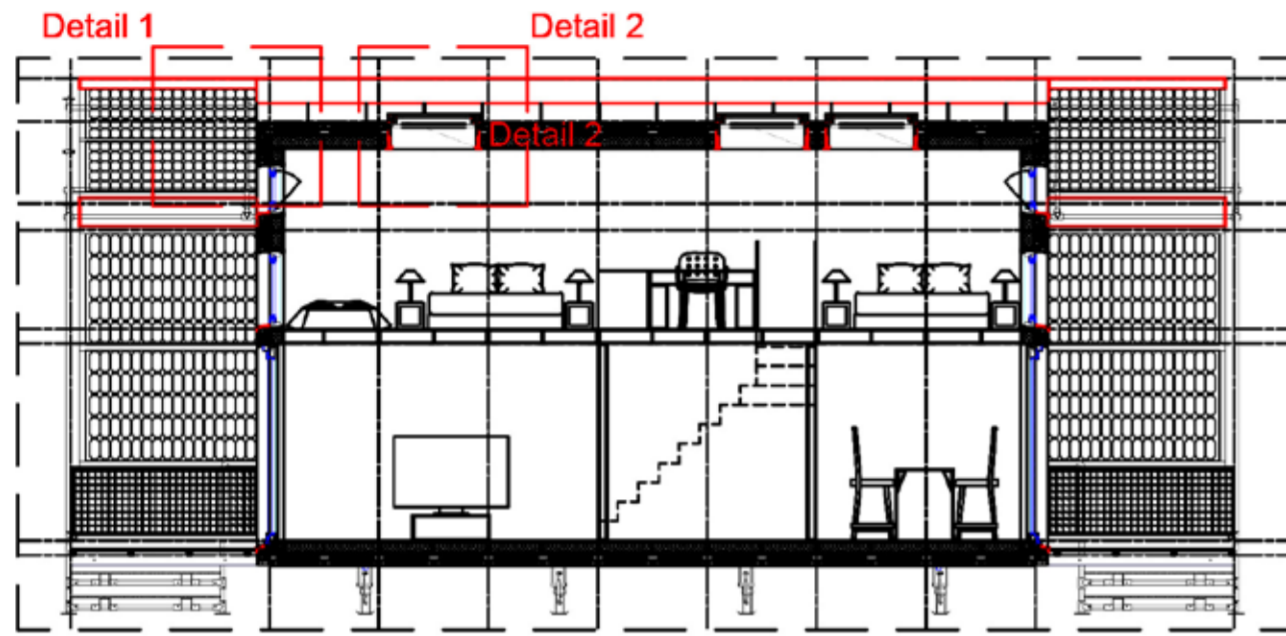


above: Details 2 South Roof & Wall (1:5@A3)

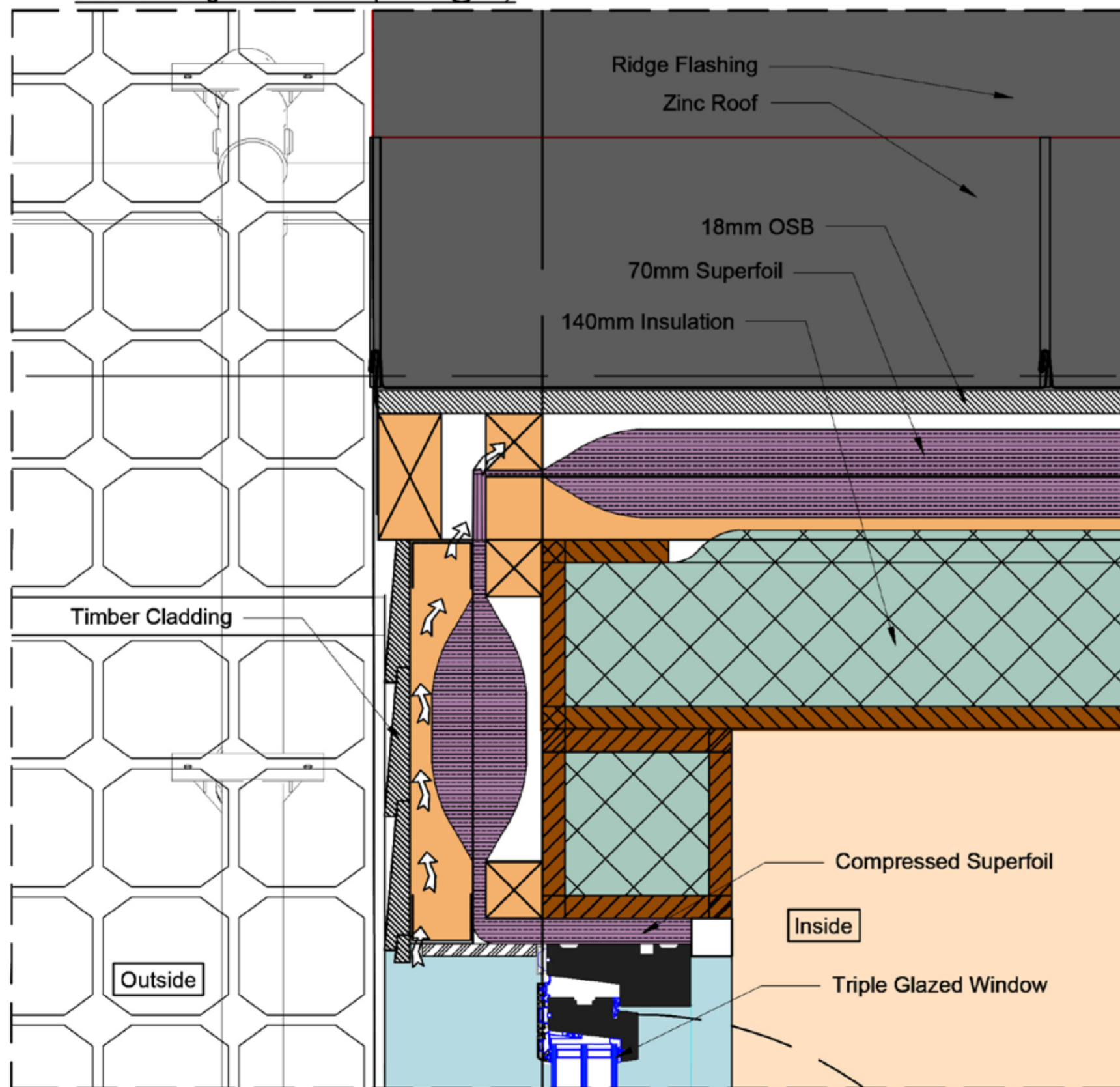


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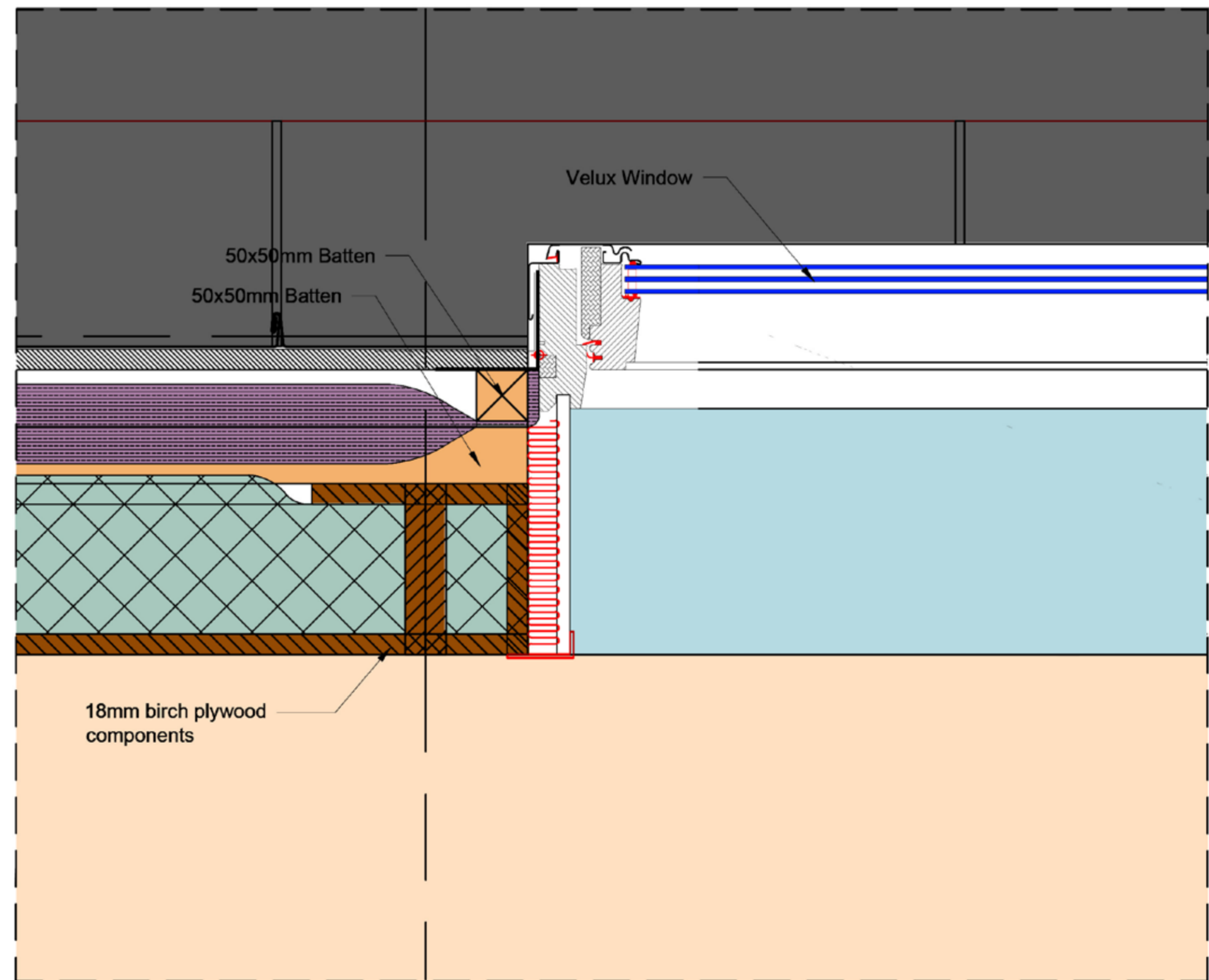
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above: Long Section AA' (1:100@A3)



above: Details 1 North Roof Verge Details (1:5@A3)

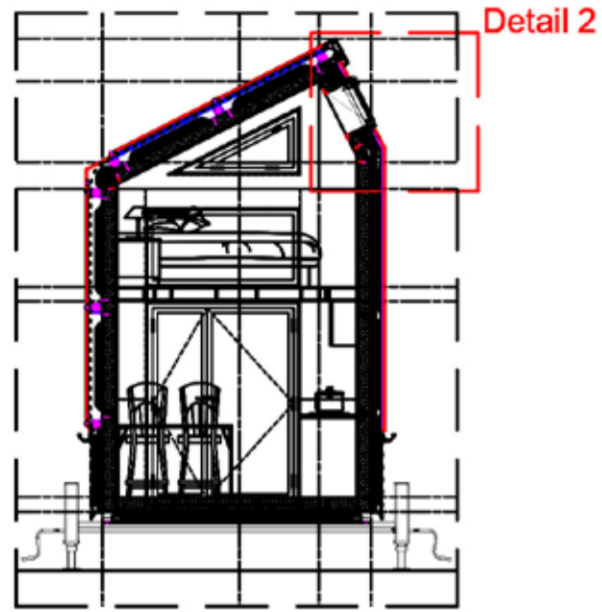


above: Details 2 North Roof & Velux Window (1:5@A3)

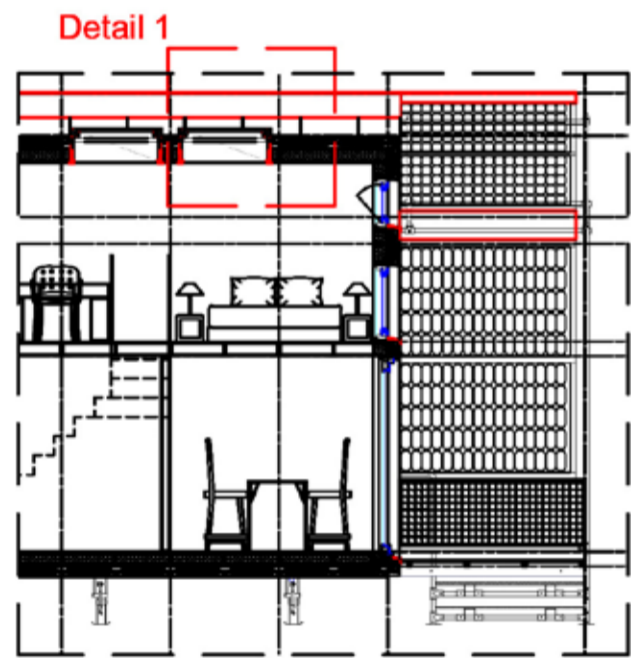


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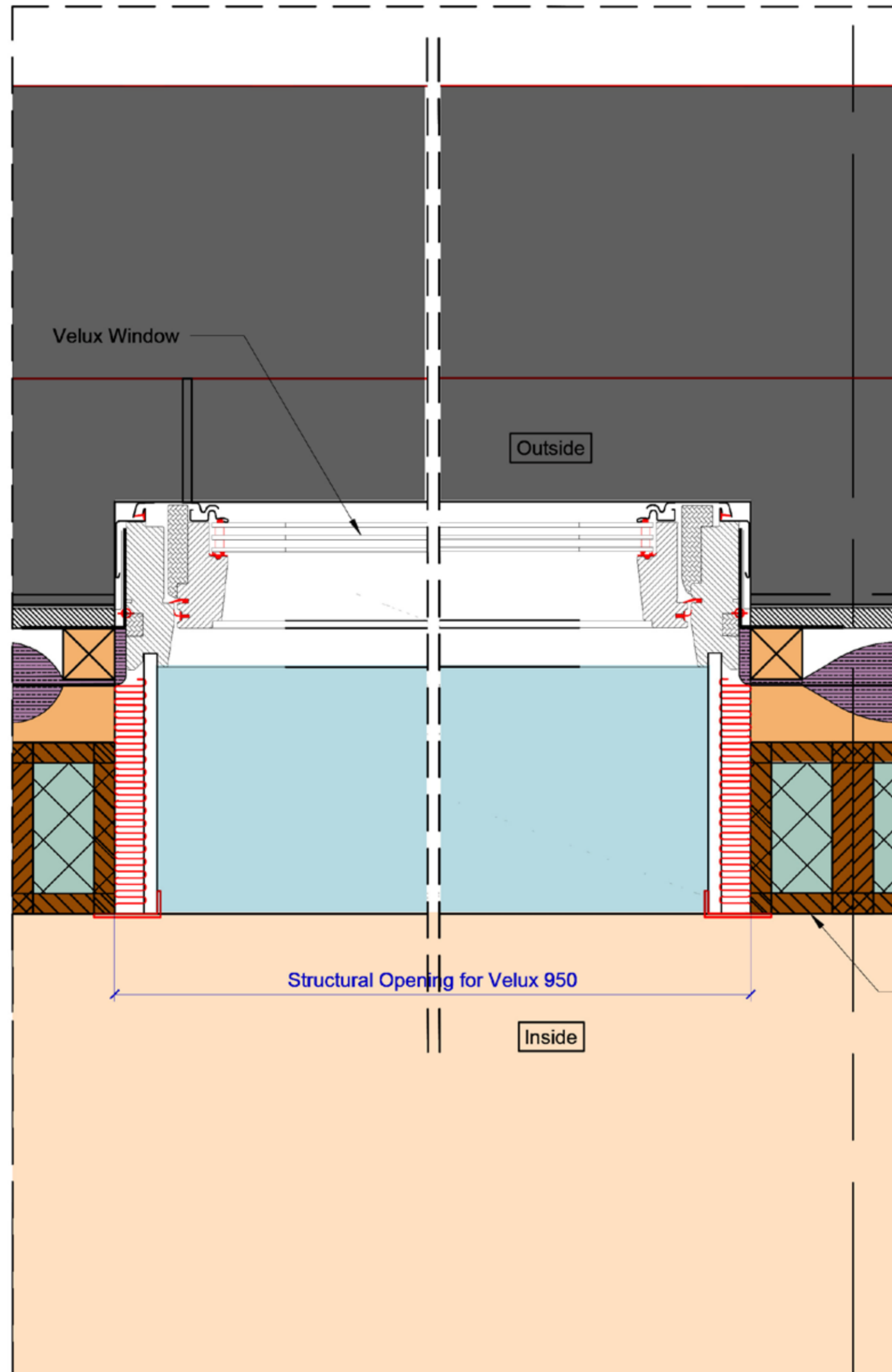
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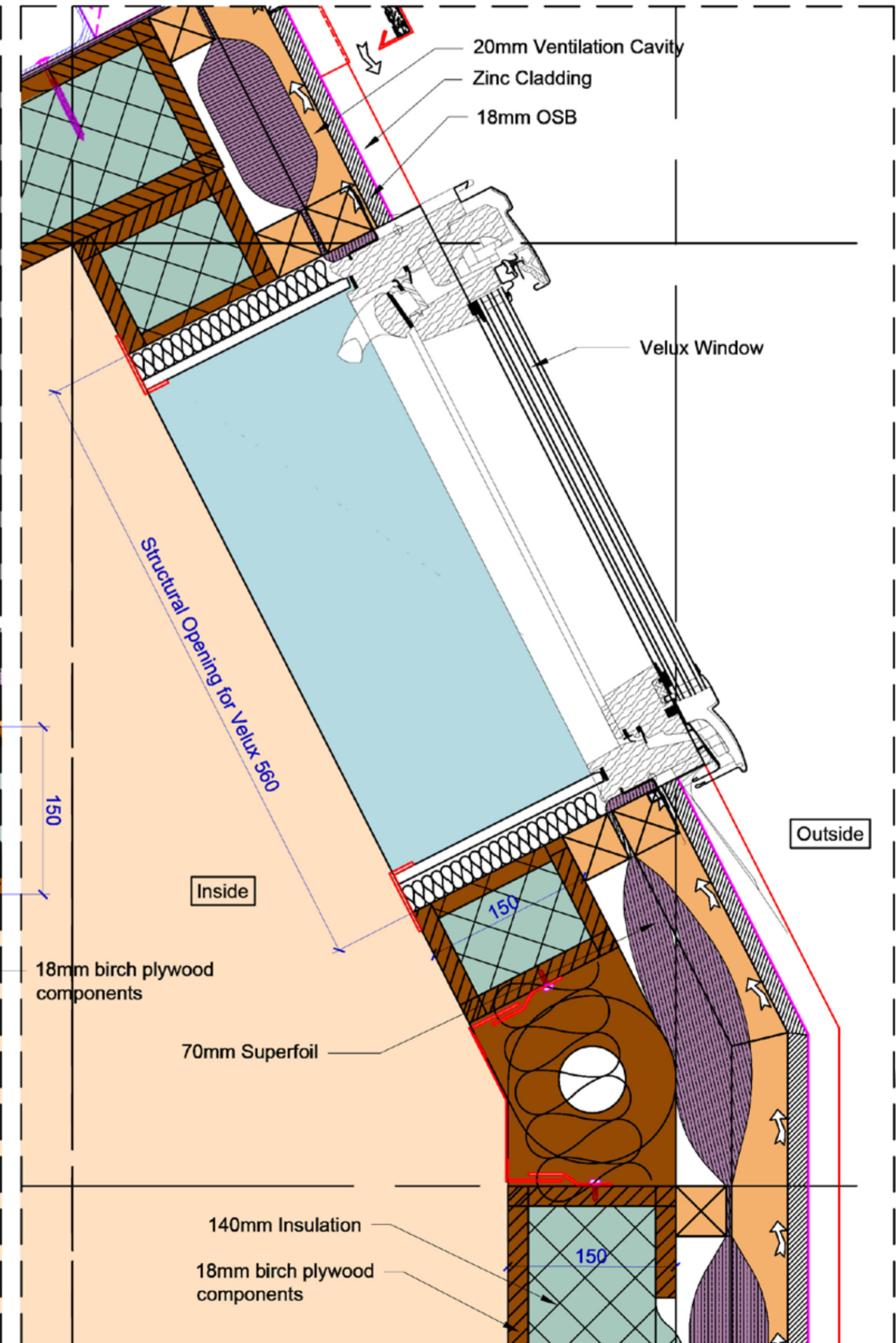
above: Short Section 33' (1:100@A3)



above: Long Section AA' (1:100@A3)



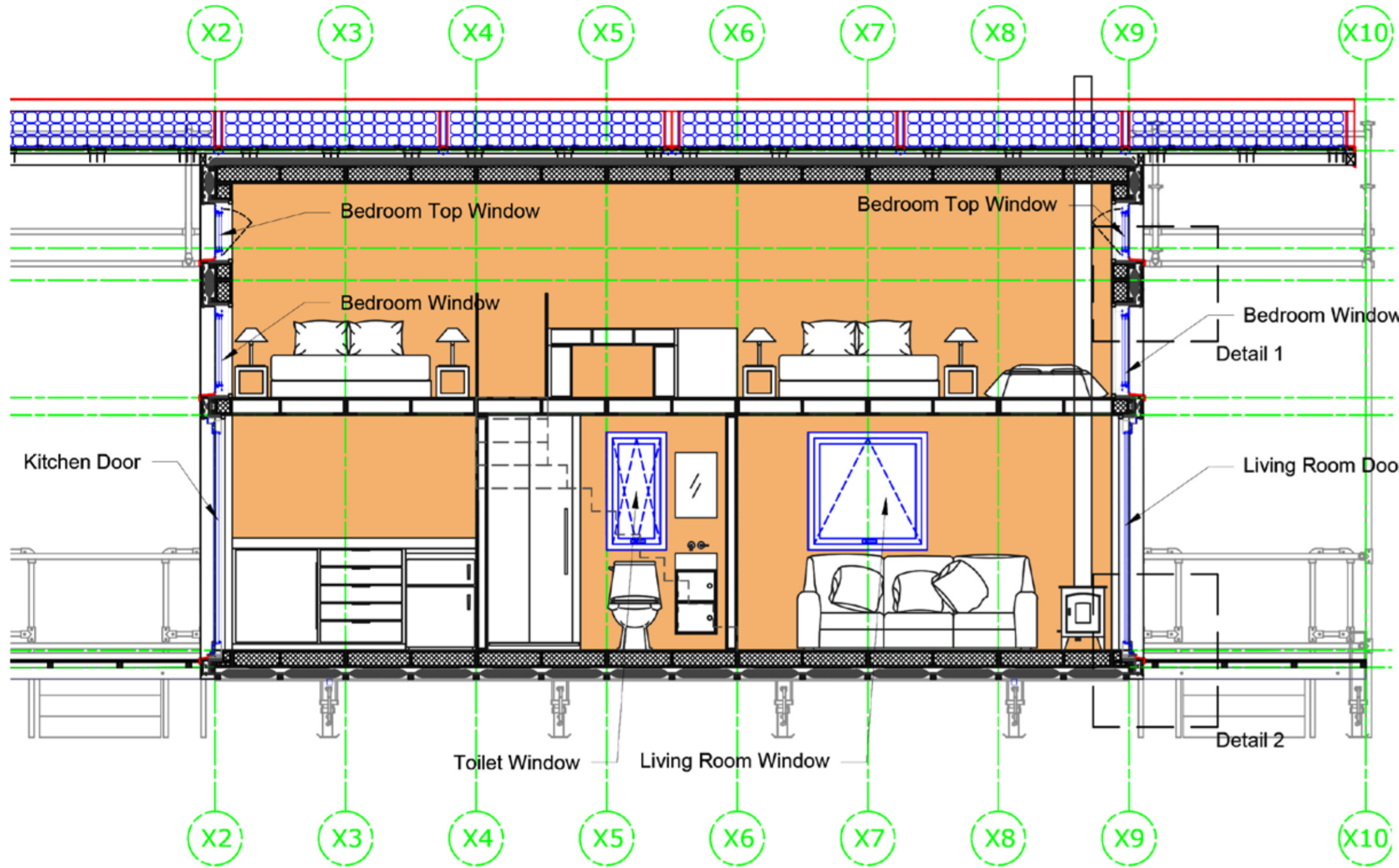
above: Details 1 Long Section Velux Detail (1:5@A3)



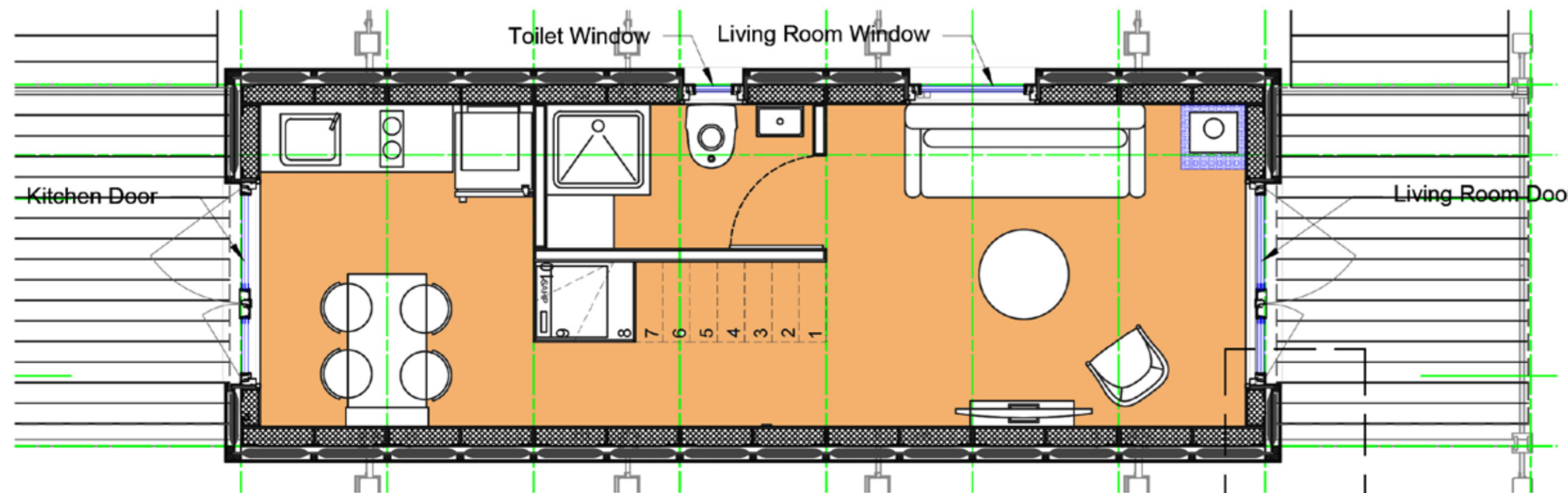
above: Details 2 Short Section Velux Detail (1:5@A3)



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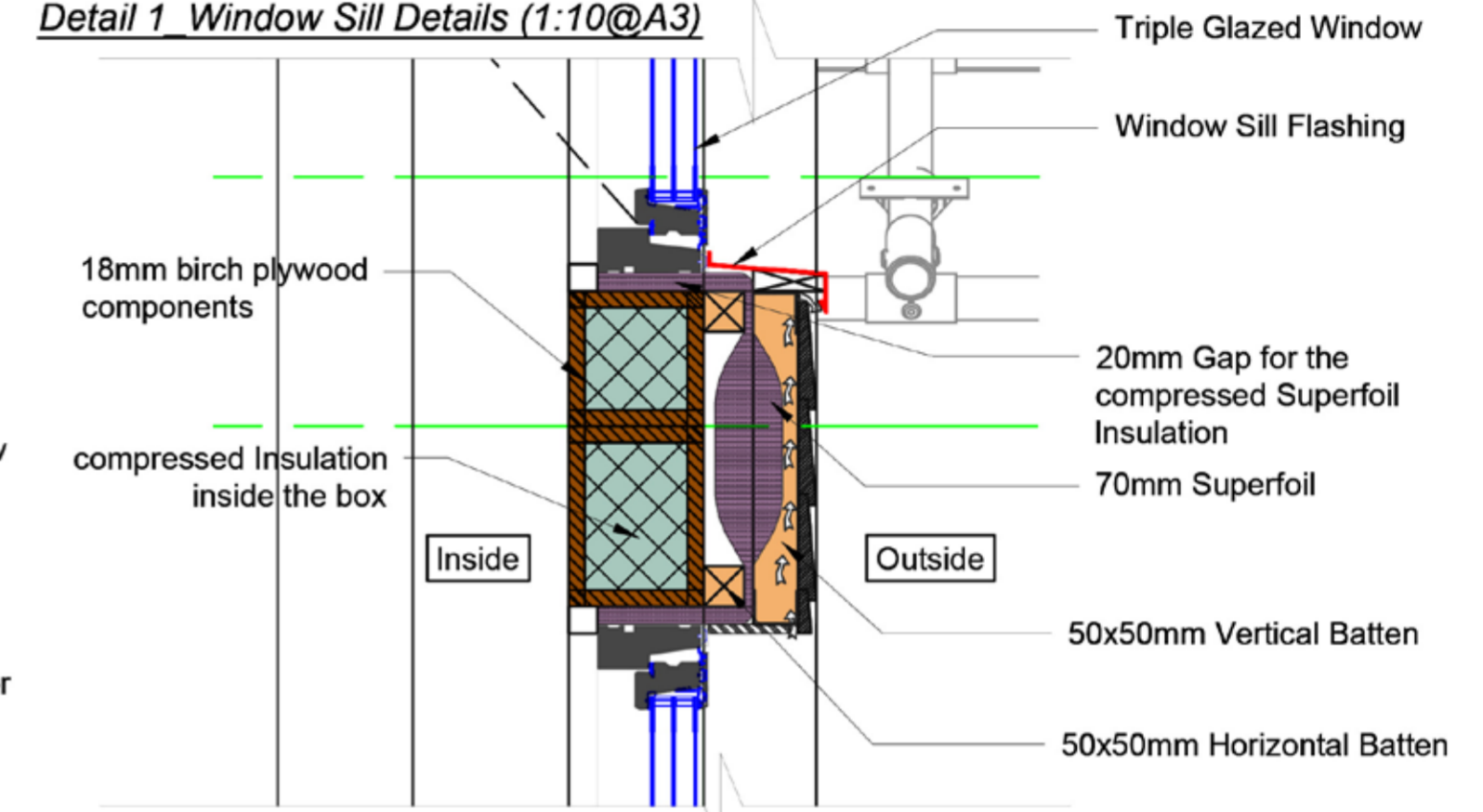


above: Long Section AA' 1:50@A3 0 500 1000mm

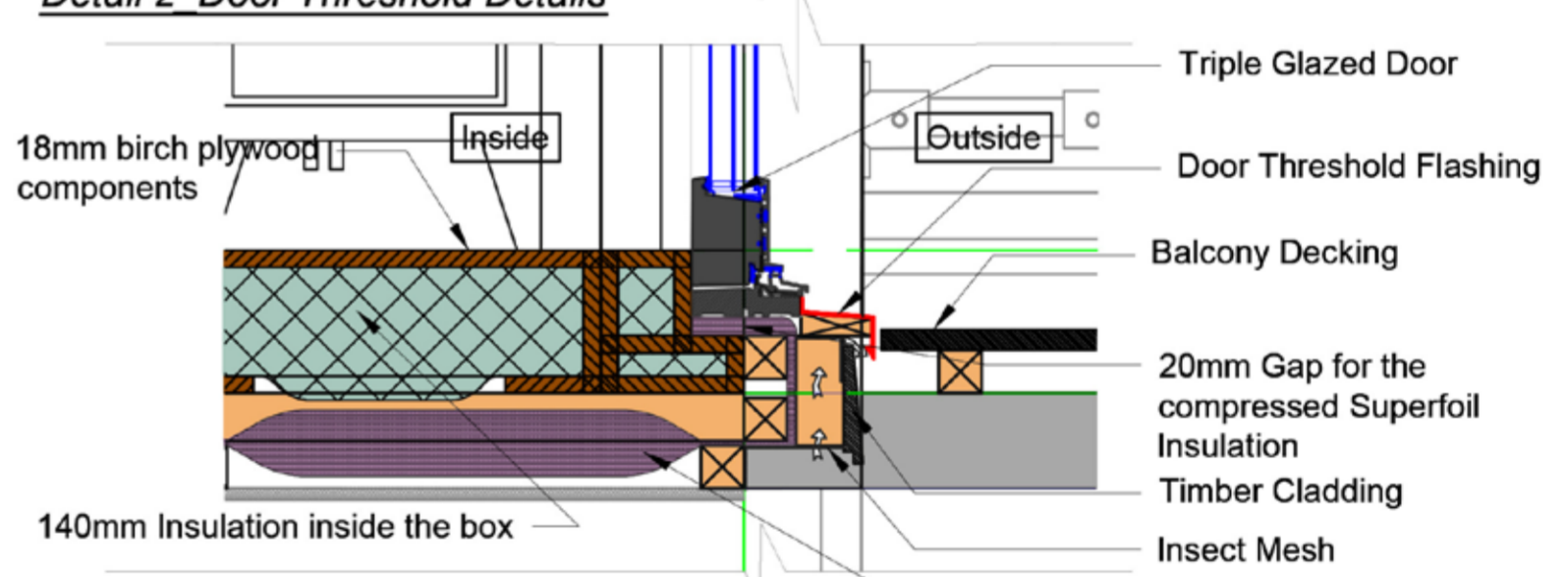


above: Ground floor plan 1:50@A3 0 500 1000mm

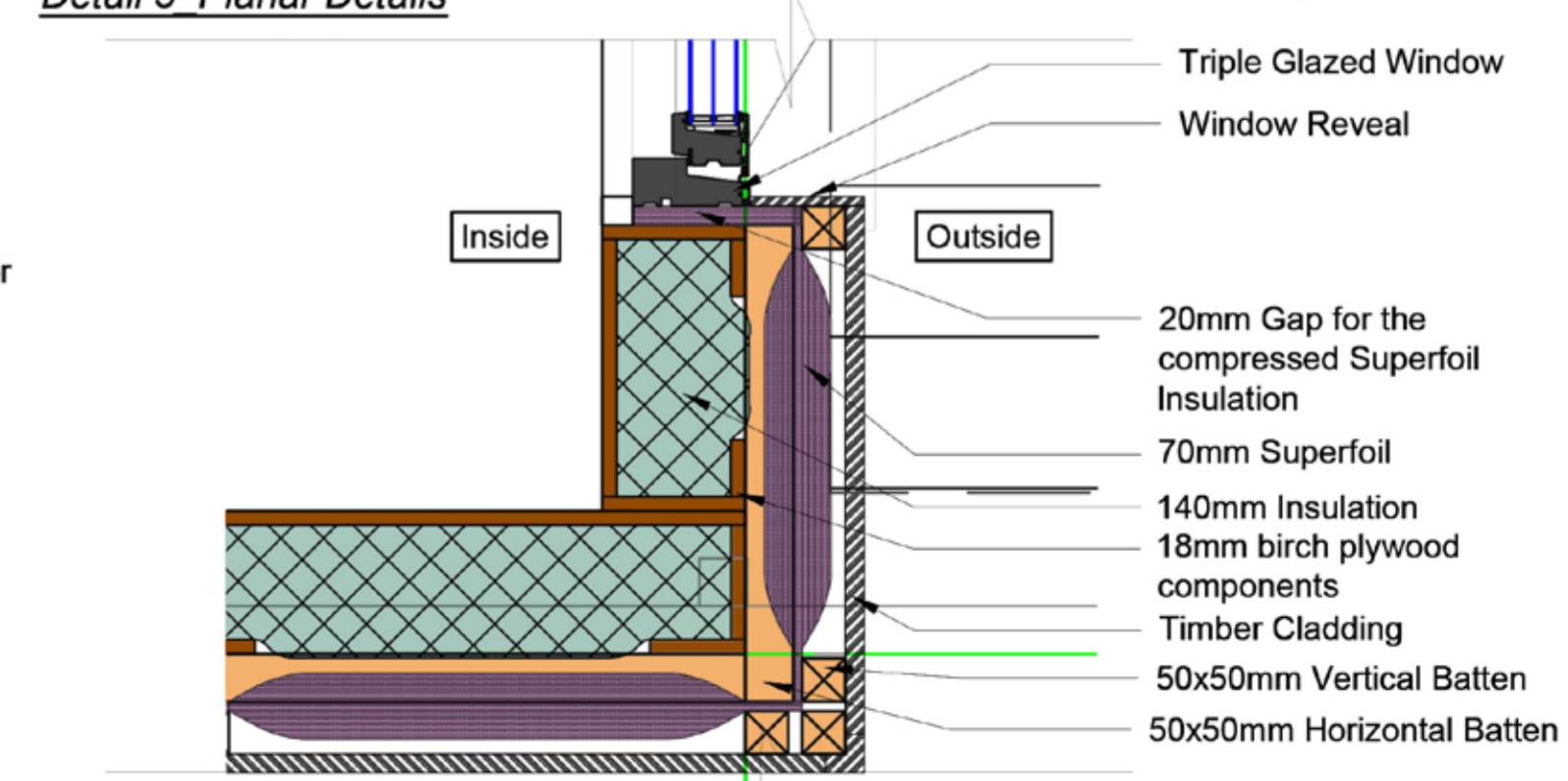
Detail 1 Window Sill Details (1:10@A3)



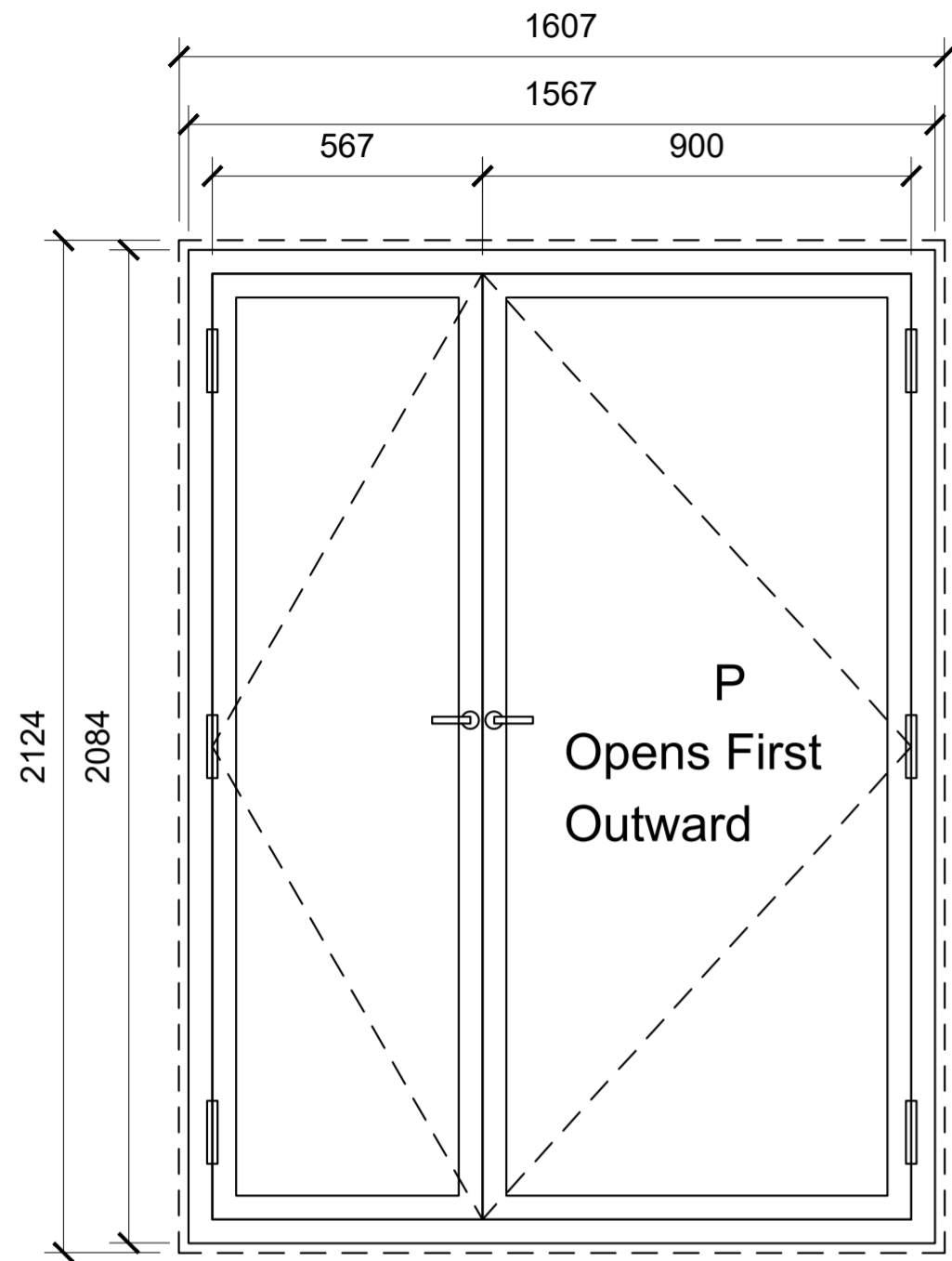
Detail 2 Door Threshold Details



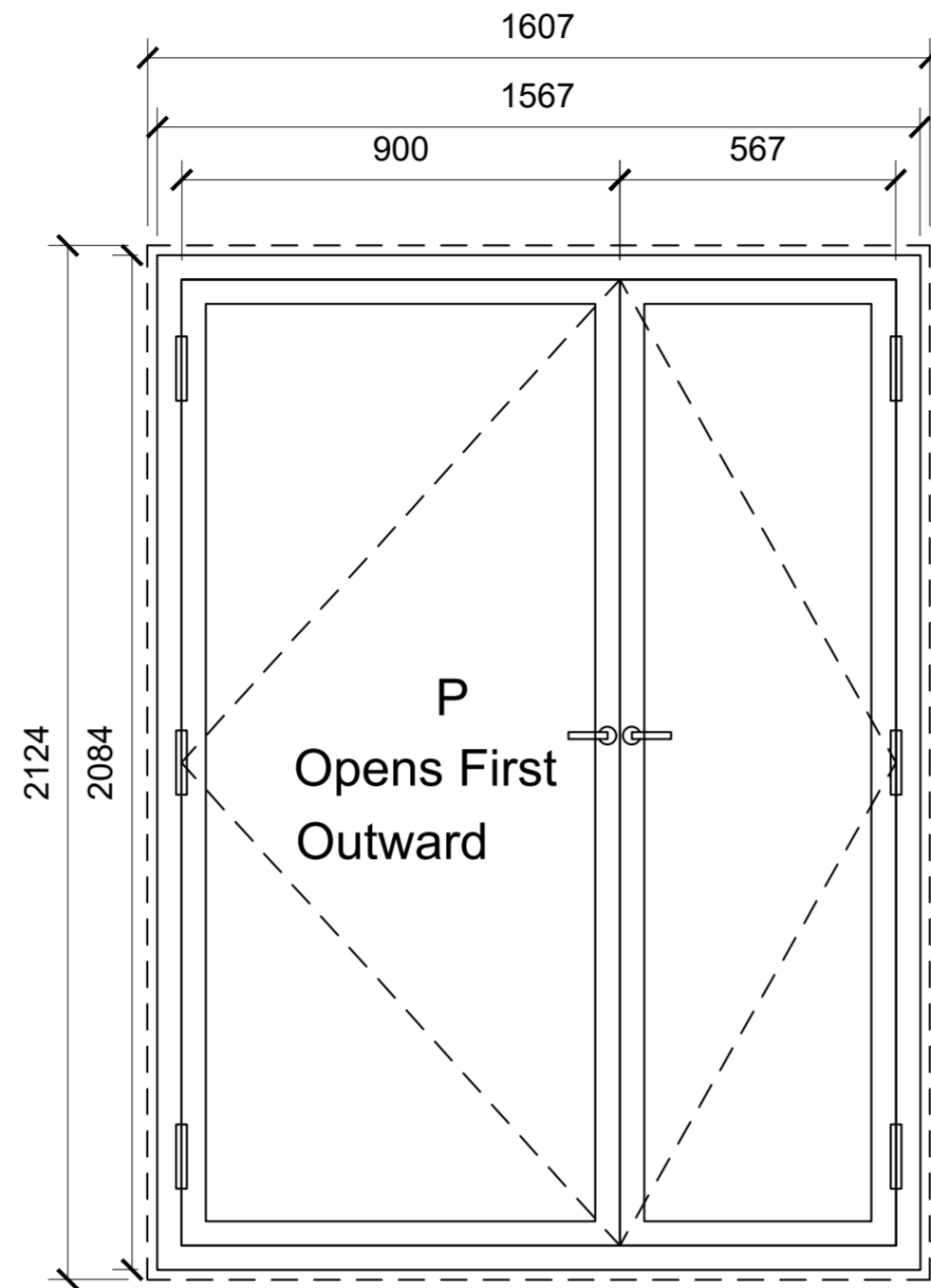
Detail 3 Planar Details



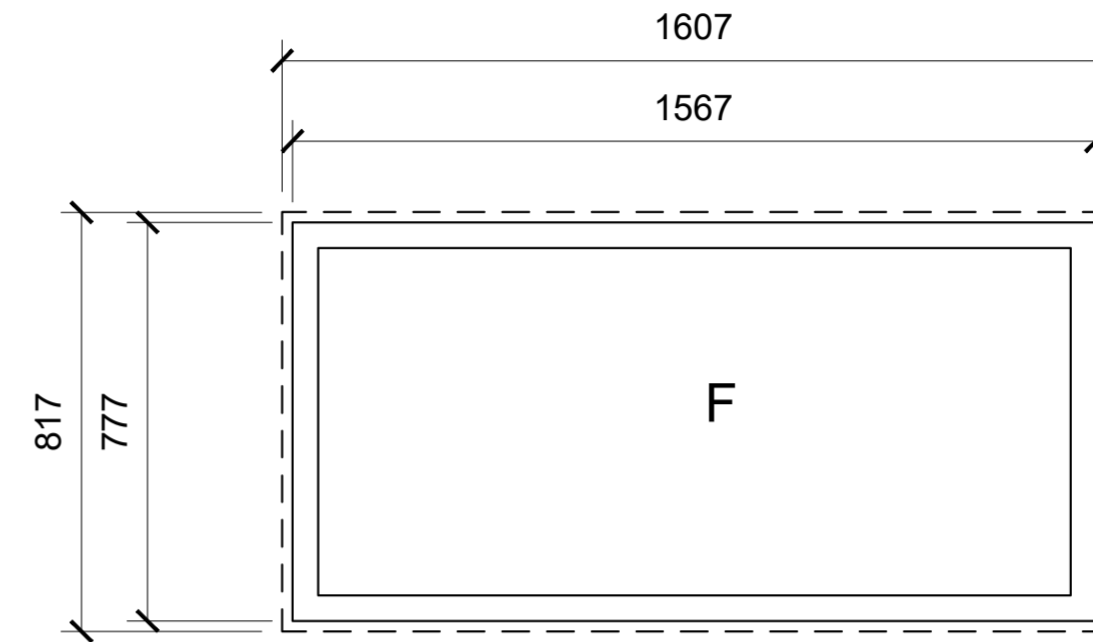
D 1 Living Room Door:
(S/O:1607x2124mm) (Size: 1567x2084mm)



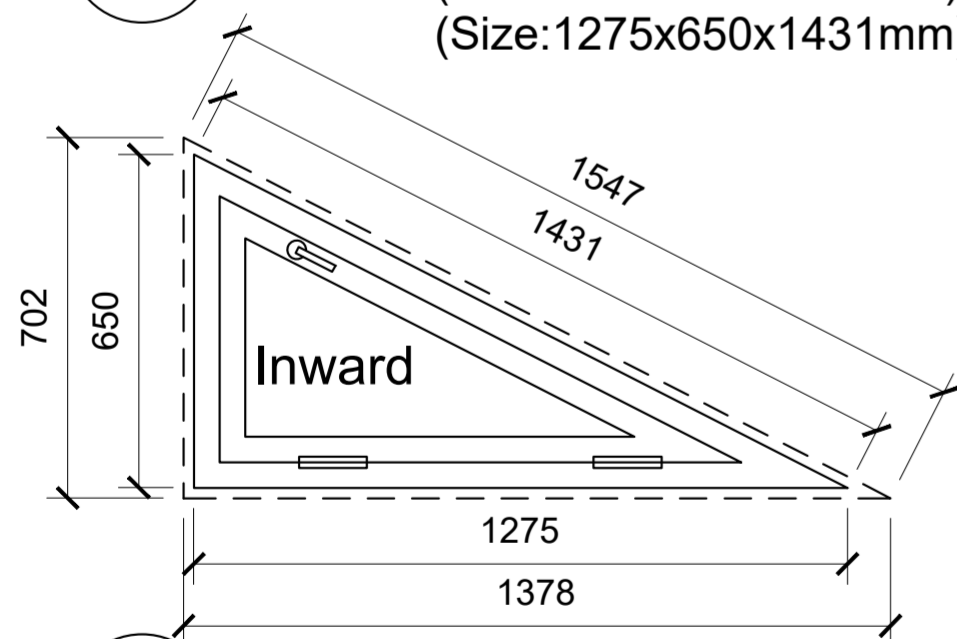
D 2 Kitchen Door:
(S/O:1607x2124mm) (Size: 1567x2084mm)



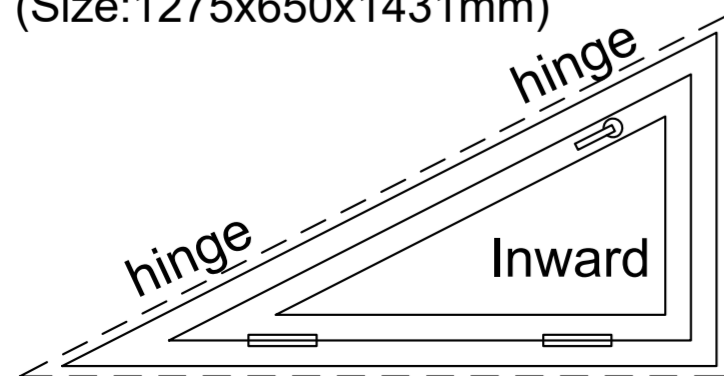
T 1 Bedroom Window:
(S/O:1607x817mm) (Size: 1567x777mm)



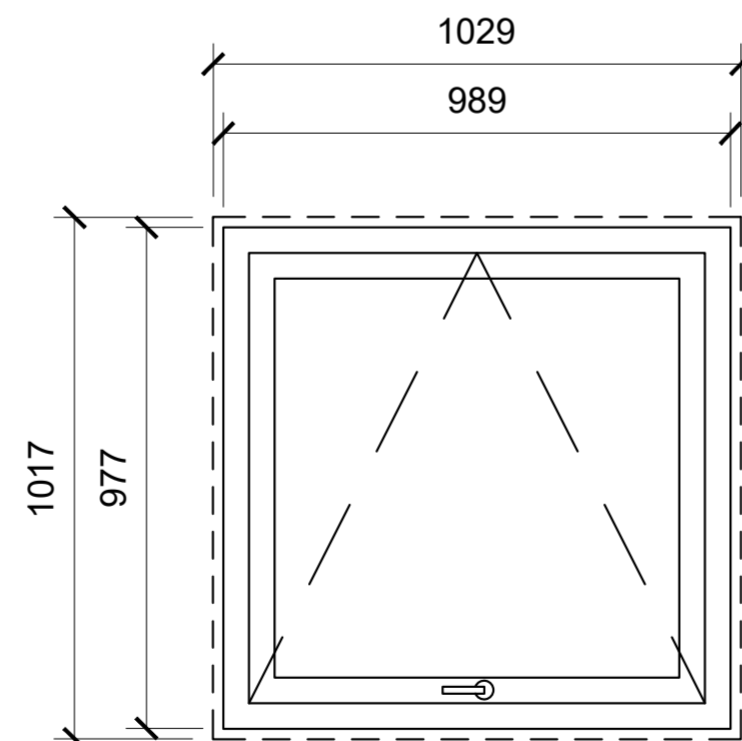
T 2 Bedroom Top Window
(S/O:1378x702x1547mm)
(Size:1275x650x1431mm)



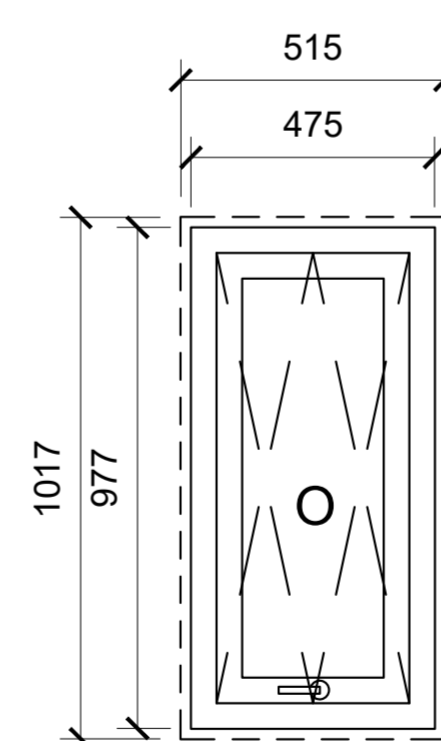
T 3 Bedroom Top Window
(S/O:1378x702x1547mm)
(Size:1275x650x1431mm)



T 4 Living Room Window
(S/O:1029x1017mm)
(Size:989x977mm)



T 5 Toilet Window
(S/O:515x1017mm)
(Size:475x977mm)



Windows / Doors Quantity Summary

ZED MOBILE		
	Door Types	
	D1	D2
FF	1	1
SF	0	0

ZED MOBILE					
	Window Types				
	T1	T2	T3	T4	T5
FF	0	0	0	1	1
SF	2	1	1	0	0

NOTE:

- ALL DIMENSIONS SHOWN ARE STRUCTURAL OPENING.
- 10MM TOLERANCE FOR DOORS AND WINDOWS
- 20 MM THRESHOLD
- 150MM SILL
- ALL WINDOWS ARE DOUBLE GLAZED IF NOT SPECIFIED
- NO TRICKLE VENTS
- Frame/sash Colour(both inside&out):
- RAL 7001 Silver Grey

Revisions Table

Rev	Date	Amendments
A	03/10/2022	door's width changed
B	07/10/2022	tolerance expanded to 20mm on each side
C	08/10/2022	hinge position updated

KEY:

D 1 Door type

T 1 Window type

T Toughened / Laminated safety glass

P Primary leaf (double doors only)

O Opaque glass

EI Fire resistant Glass: Integrity and Insulation

Fixed window/pane

Topswing window

Topguided window

Centre Pivot window

Client:

Project:

TINY HOUSE_Tilting Roof

Drawing Title:

Windows/Doors Schedule

Issued for:	Drawn by:	Checked by:
Construction	TD	BD

Drawing Number: Rev. C

Created: 29.09.2022 Scale: 1:10 @ A1 & 1:20 @ A3

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Do not scale, use figured dimensions only. Unless stated otherwise, these drawings represent design intent only and approved assembly drawings will be required from the Trade Contractor prior to any work and/or procurement being undertaken.

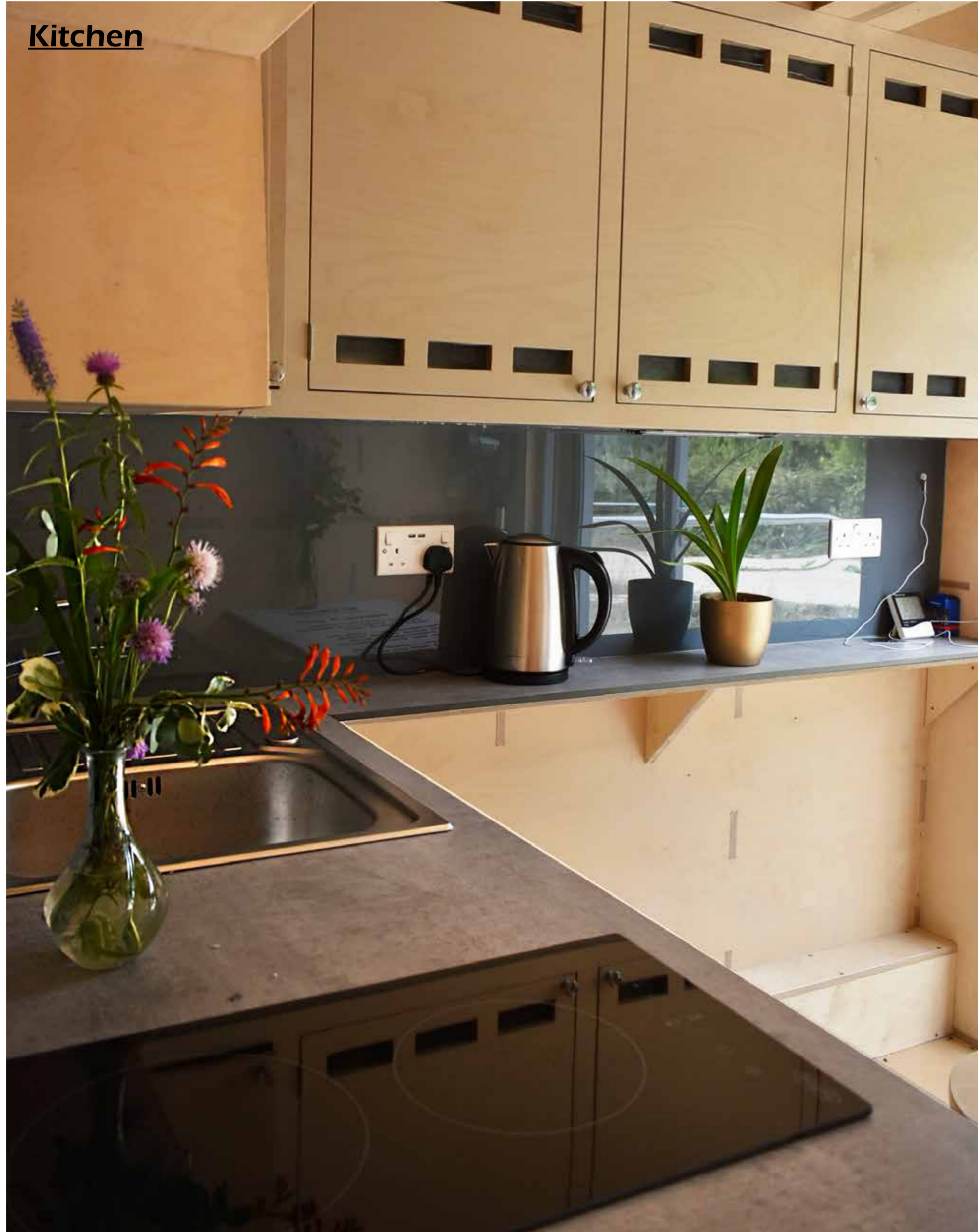


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Living Space- Kitchen&Dining Room

Kitchen

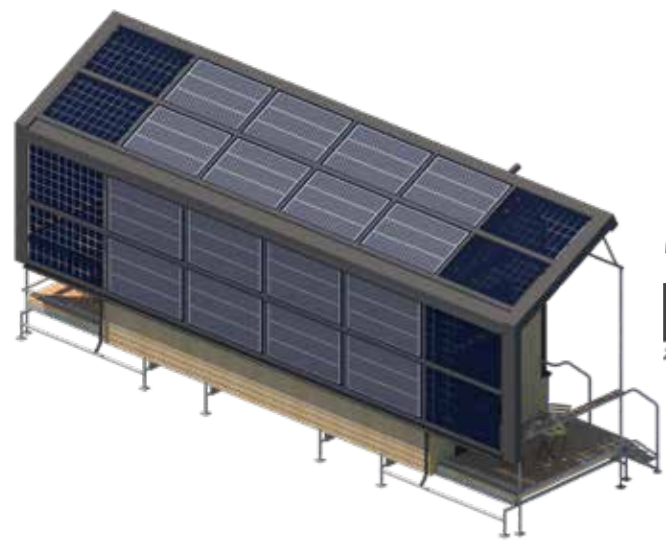


Kitchen :

- A CNC cut lacquered plywood kitchen with solid laminate worktop and induction hob is specified as standard. A micro wave oven, plus A plus under counter fridge and recirculating charcoal extractor fan can be specified.
- The kitchen is designed for longevity and robustness, and avoids the use of mdf and chipboard. A thro' coloured acrylic splashback and a stainless steel recessed sink plus drainer is specified with a monobloc Hansgrohe kitchen tap for long life.
- A grease filter is fitted below the waste pipe to prevent clogging of drainage systems on off grid installations with micro reed beds.



Dining Area



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Living Space- Living Room

Balcony

Living Room

Staircase





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Living Space- Balcony&Storage

External balcony deck :

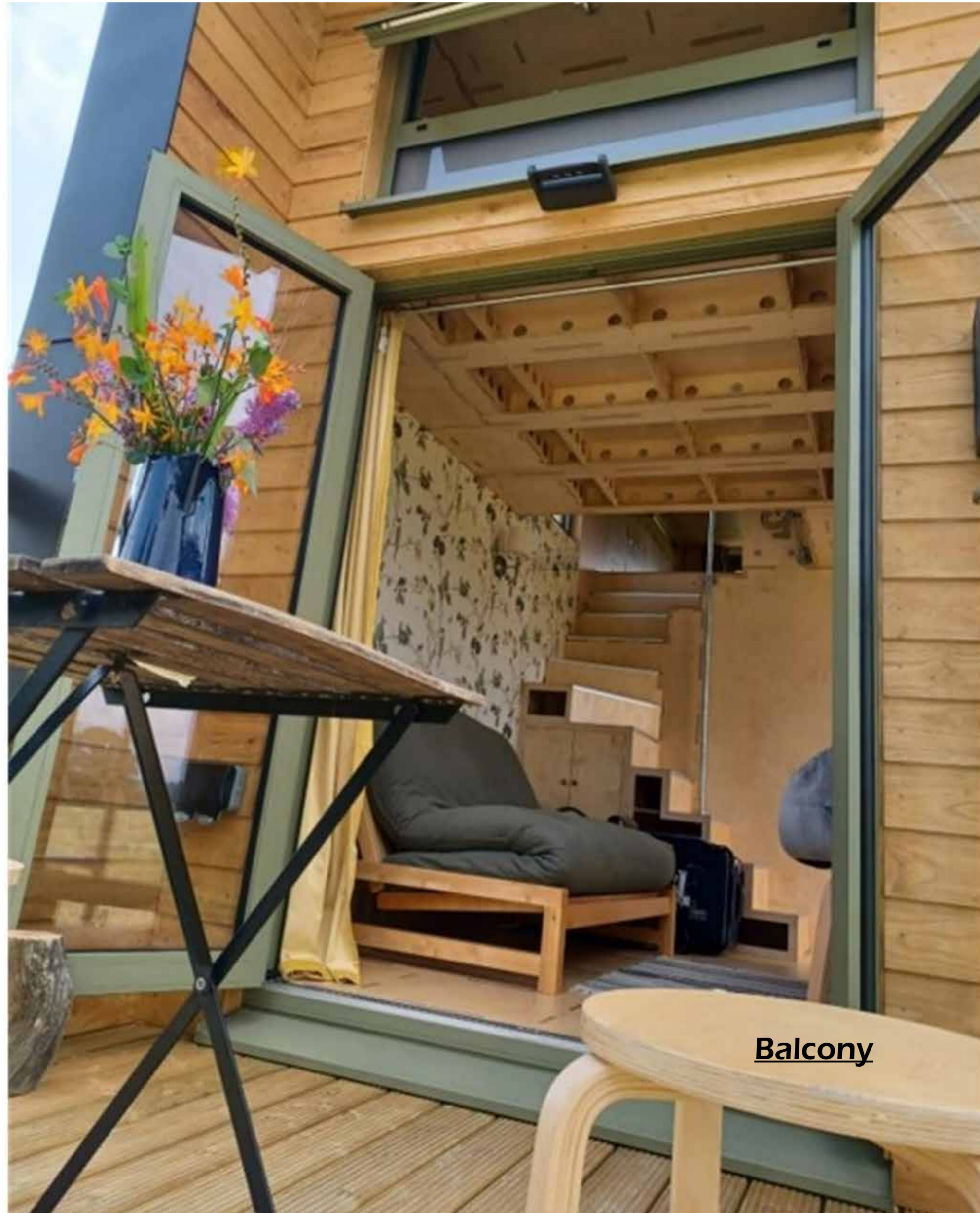
- Both living room and kitchen open out onto generous timber clad balcony decks accessed by large glazed patio doors allowing outdoor extensions to the internal living space.

Clothes storage :

- Each bedroom has a clothes rail and store with the option of more storage under each bed. The bathroom has extensive shelves beside the shower for linen. There is further households storage under the staircase.

Cleaning :

- A wall mounted cordless vacuum cleaner can be provided in each home A wall mounted cordless vacuum cleaner can be provided in each home.





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Living Space- Bathroom

Bathroom :

- A ceramic shower tray with coloured acrylic backing sheet, and sliding toughened glass shower screen plus low flow shower head and mixer tap is specified with wall mounted ceramic sink and Hansgrohe taps.
- An advanced ceramic composting WC with urine separating bowl and micro flush facility is fitted on off grid units.
- A low powered fan mounted inside the external composting chamber sucks room air through the toilet bowl continuously and extracts stale air at roof level eliminating any chance of odour on off grid units.
- The bathroom floor is sealed cork tiles. A heated towel rail is fitted connected to the radiator system.



Shower Room under the Staircase





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Services- Water

Rainwater storage and collection :

- Plastic micro gutters can harvest rainwater for storage and re use if required

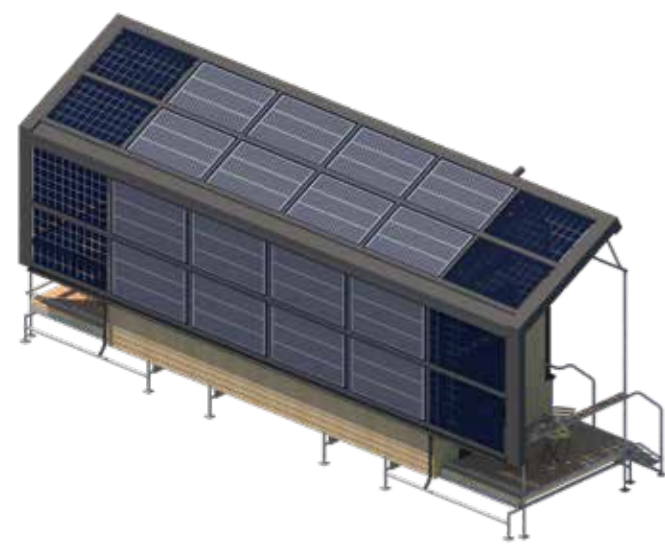
Fresh water connection :

- A blue polyethylene drinking water pipe is normally buried under soil and connected to the mains water supply

Drainage Connection :

- If flushing toilets are fitted a piped drainage connection to the municipal sewer is required, either pumped by a commercial grade twin pump saniflow unit with small bore poly pipe connection to the mains drainage, or under unit external composting chamber on off grid units.
- The dried waste from the composting unit needs emptying every three to six months depending on occupancy.
- Please note an external micro reed bed is required for urine and dirty water treatment from sinks and showers fed by gravity drainage pipe buried below ground. The reedbed is normally installed around 20 m from the home.

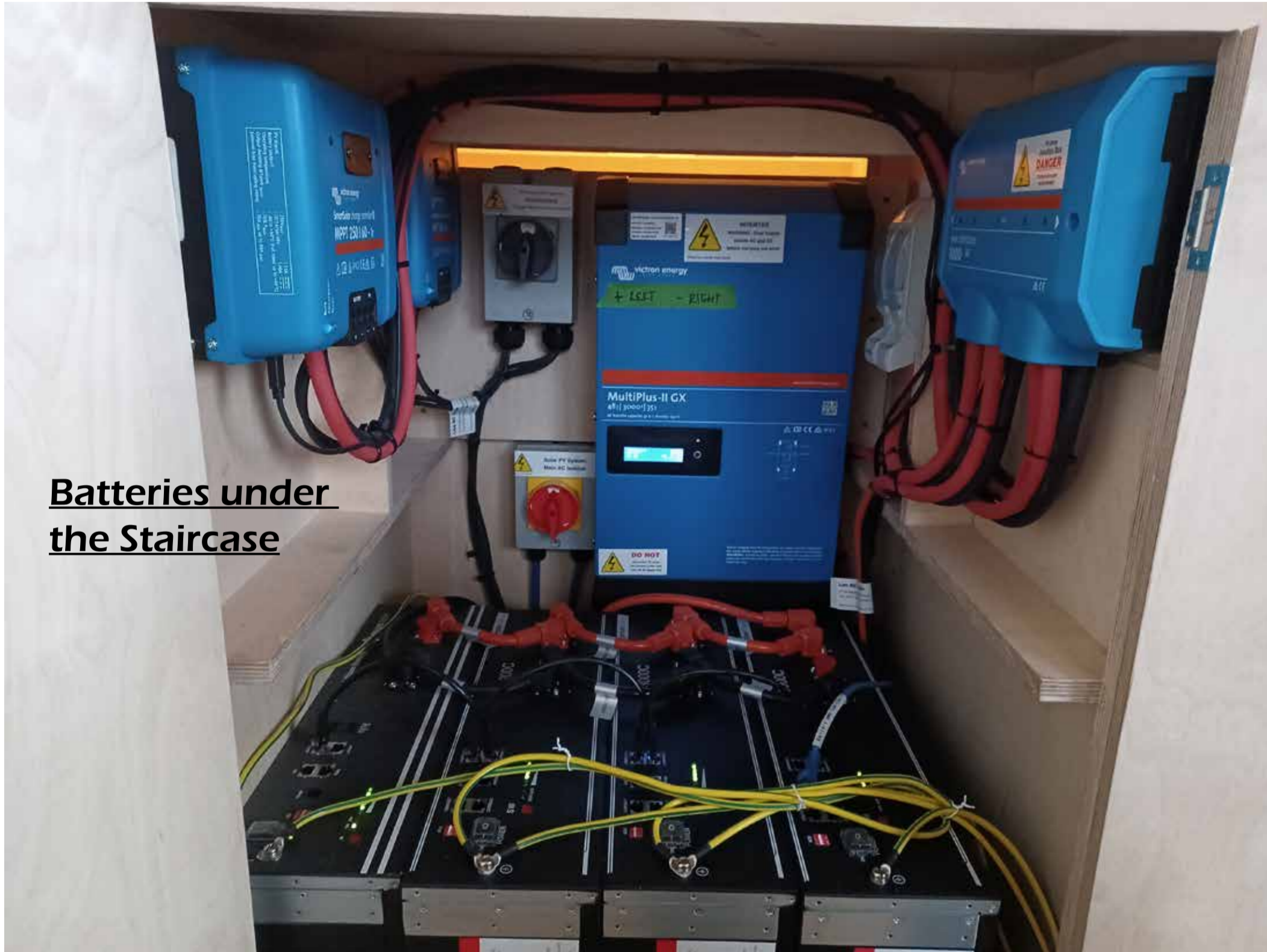




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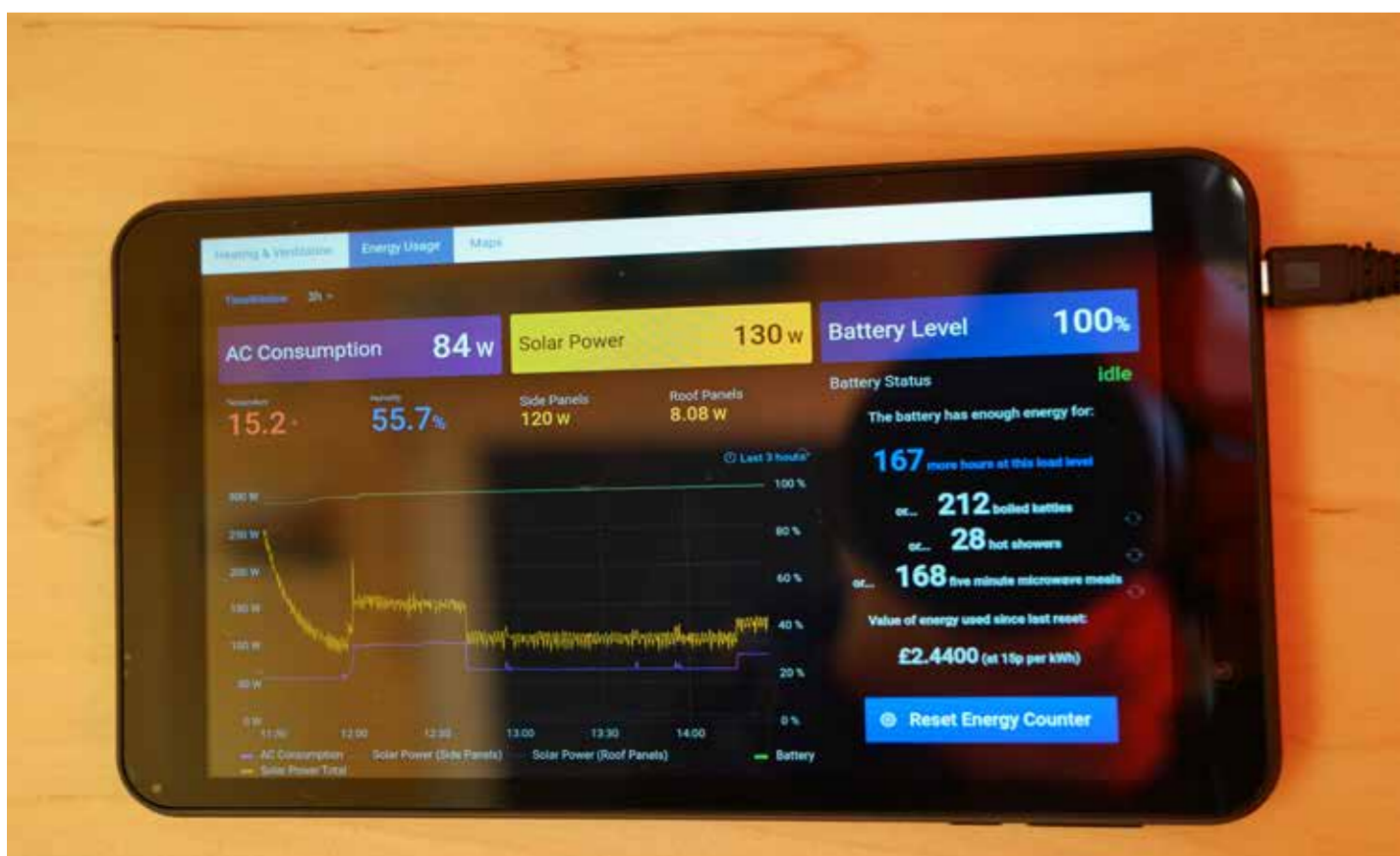
Services- Electricity



Batteries under the Staircase

Battery storage and inverter with MPPT solar charge controller:

- Approx 10.5 kwh of LiFePo4 or LiTo batteries are integrated into off grid installations to store solar electricity from the day to power the homes at night. Each home has 240 volt electrical circuit with a max current take off of 3 kw.
- An inverter with grid connect import / export capability allows export of surplus electricity to the grid or other buildings if required. Exchangeable LTo batteries can also be fitted that power electric bikes and small motorcycles and mopeds, enabling low cost personal electric transport in rural areas.





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Services- Heat&Ventilation

Heat recovery ventilation :

- A ducted mini unit with adjustable DC motor fan with min current draw of 15 watts and max 40 extracts from the kitchen and supplies warmed fresh air to the living room

Evaporator plate heat pump system :

- An evaporator plate is mounted behind the solar panels absorbing re - radiation from the building integrated solar installation. Solar generated electricity transforms low grade heat into hot water stored at around 55 deg C for use both as domestic hot water and radiative heating through micro radiators in the kitchen and living room.
- There is no need for an external fan for the heat pump. The maximum current draw for the Heat pump is approx. 455 watts and the thermal out put is approx. 1500 watts for most of the year.

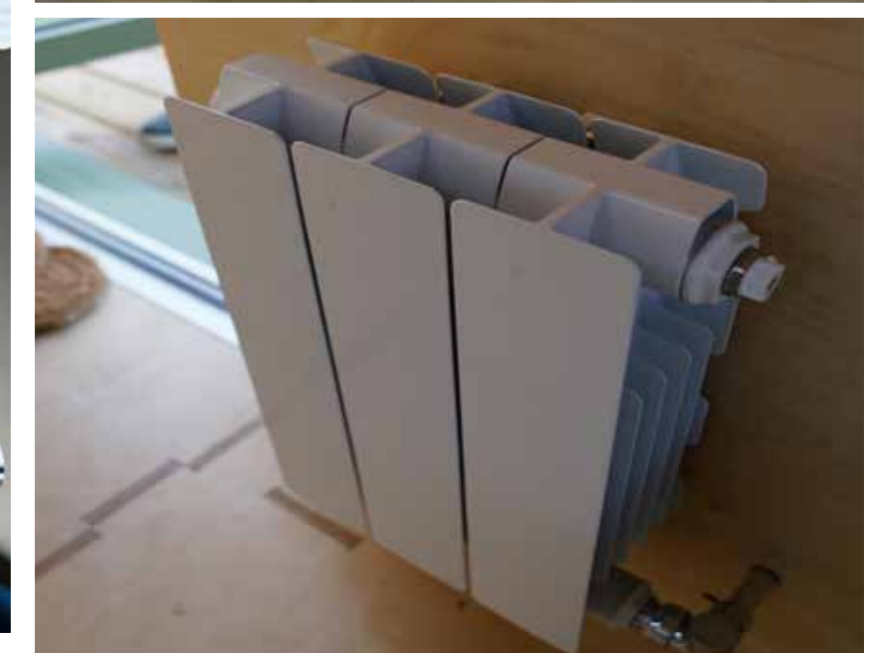


SAHP Hot Water System

Evaporator Plate



Mini Unit with adjustable DC Motor Fan





Off site volumetric prefabricated Micro Homes

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