

Norphosis 1.0

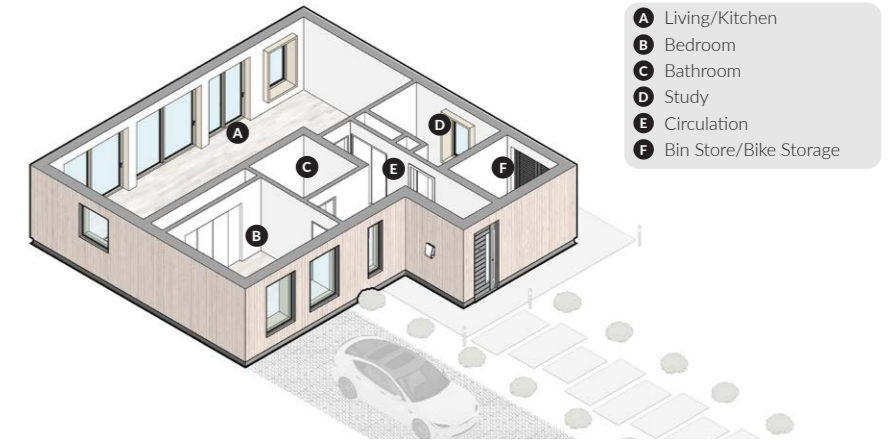
Our response to a changing environment.
NORBORD OFF GRID 2030



① Concept

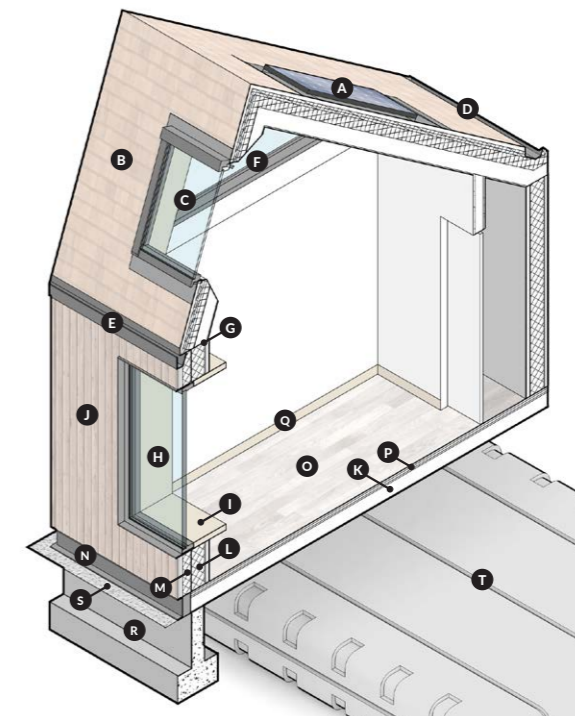
With a vision of sustainable adaptability, the design is a modular panel-build house that enables occupants to enlarge and reconfigure their houses to accommodate evolving needs. Designed using the Norbord Stirling OSB Zero Board as part of a wood-fibre insulated panel structure for walls, floors & roof, the scheme aims to have a low embodied carbon construction throughout. Each panel can be sewn together

to create whole room units that can be reconfigured together as larger modules. Likewise, the roof can be orientated by homeowners to best utilise the natural lighting & ventilation in each given site. With a totally dry construction including the modular groundworks. The building can be easily de-constructed, relocated with minimal impact on the site and reducing construction waste.

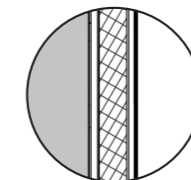


- A Living/Kitchen
- B Bedroom
- C Bathroom
- D Study
- E Circulation
- F Bin Store/Bike Storage

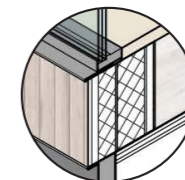
② Section & Wall Type Details



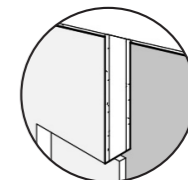
- A Photovoltaic panels.
- B Roof panel with timber shingles outer cladding.
- C Roof light- Composite frame triple glazed low e-inner pane.
- D Valley gutter.
- E Concealed perimeter gutter.
- F Aluminium framed glazed gable end panel with ventilation louver.
- G Bolted connection roof to wall panel.
- H Composite frame triple glazed low e-inner pane window.
- I Timber window frame to surround to form seat.
- J Timber strip cladding on timber battens.
- K Norbord OSB Sterling Zero to structural facings and noggins to SIPS panels.
- L Internal service zone to all perimeter wall panels.
- M Highly insulated panels.
- N Aluminium base skirting
- O Suspended floor panel with engineered timber flooring spanning on to ground beams.
- P Under floor heating.
- Q Timber skirting.
- R Precast T ground beam
- S Shingle back fill to strip trench
- T Rainwater harvesting belly tank in floor void.



Type 1 | Internal Standard SIPS with service zone both sides.



Type 1a | External Standard SIPS + cladding+ service zone inside.

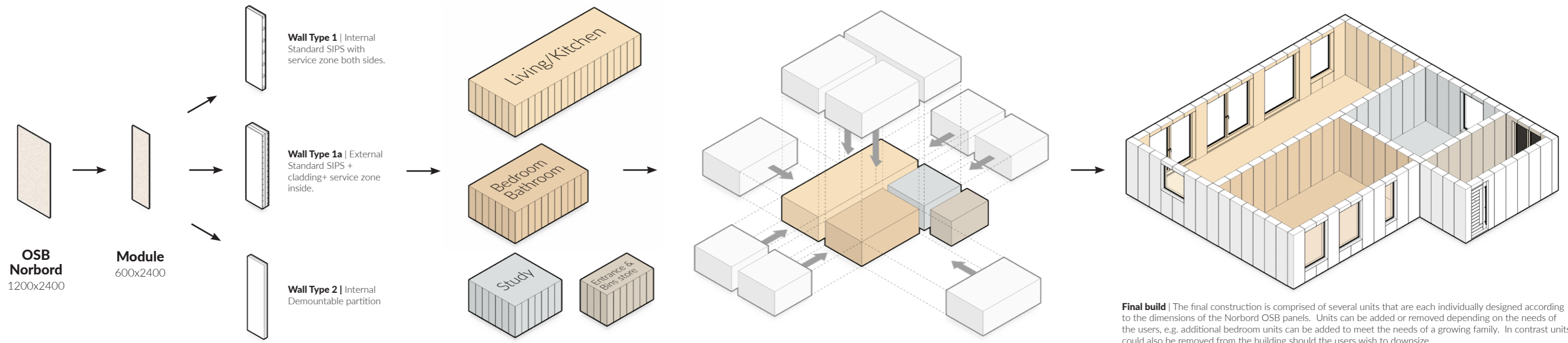


Type 2 | Internal Demountable partition

“touch the earth lightly.”
The goal is to leave the earth without a trace of our presence, or *minimal impact.*



③ Assembly



Final build | The final construction is comprised of several units that are each individually designed according to the dimensions of the Norbord OSB panels. Units can be added or removed depending on the needs of the users, e.g. additional bedroom units can be added to meet the needs of a growing family. In contrast units could also be removed from the building should the users wish to downsize.

④ Key Features

- Able to adapt, grow and reduce in size as family requirements change
- Modular off-site construction of lightweight panels designed to standard sizes with a repeating module to reduce waste
- Compact form factor for a low energy design (1.7-2.5)
- Simple bolted construction with gasket seals for easy assembly/disassembly, supporting a circular economy of re-use/recycling
- A+ rated materials with low embodied carbon
- Groundworks to be simple precast T ground beam for modules or Micropiling with adjustable cap reducing excavation and construction waste.
- Natural lighting supported through roof structure
- External storage for bikes and bins
- Super insulated thermal bridge free construction meeting LETI performance values
- Triple glazed windows with low-e solar control glazing providing cross-ventilation. External solar control blinds to balance daylight/solar gain
- MVHR with underfloor heating, air conditioning, heat pumps and cooker hoods.
- PVs with energy cell storage for residential and EV charging with energy monitoring systems.
- Rainwater harvesting for greywater use with storage tanks in suspended floor void
- Energy monitoring to allow for user awareness and improve future design solutions
- Total primary energy use for all appliances, hot water, space heating and cooling (with low energy appliances)
- Longevity of systems specifications by minimising additional coatings to allow for reuse
- Maximising the use of self-finishing internal surfaces and proposing the use of VOC (volatile organic compound) free materials.
- Material efficiency - designed to standard building sizes or for a repeating module reducing waste.
- Proposing the use of products for furniture based on EPD data, recycled material and avoidance of harmful chemicals like formaldehydes and VOCs for building occupiers.

⑤ Interior Finishes



⑥ Meeting LETI Performance Targets

Fabric U-values (W/m2 .K)

Walls 0.13 - 0.15 Floor 0.08 - 0.10 Roof 0.10 - 0.12 Exposed ceilings/floors 0.13 - 0.18 Windows 0.80 (triple glazing) Doors 1.00

Efficiency measures Air tightness

Air tightness <1 (m3/h. m3@50pa)

Thermal bridging 0.04 (y-value)

G-value of glazing 0.6-0.5

MVHR 90% (efficiency) less than 2m duct length from external wall.

Reducing energy consumption to 35 kWh/m2.yr

Reducing space heating demand to 15 kWh/m2.yr

Reduce embodied carbon by 40% to < 500 kgCO2/m

