

SELF BUILD ON A SHOESTRING

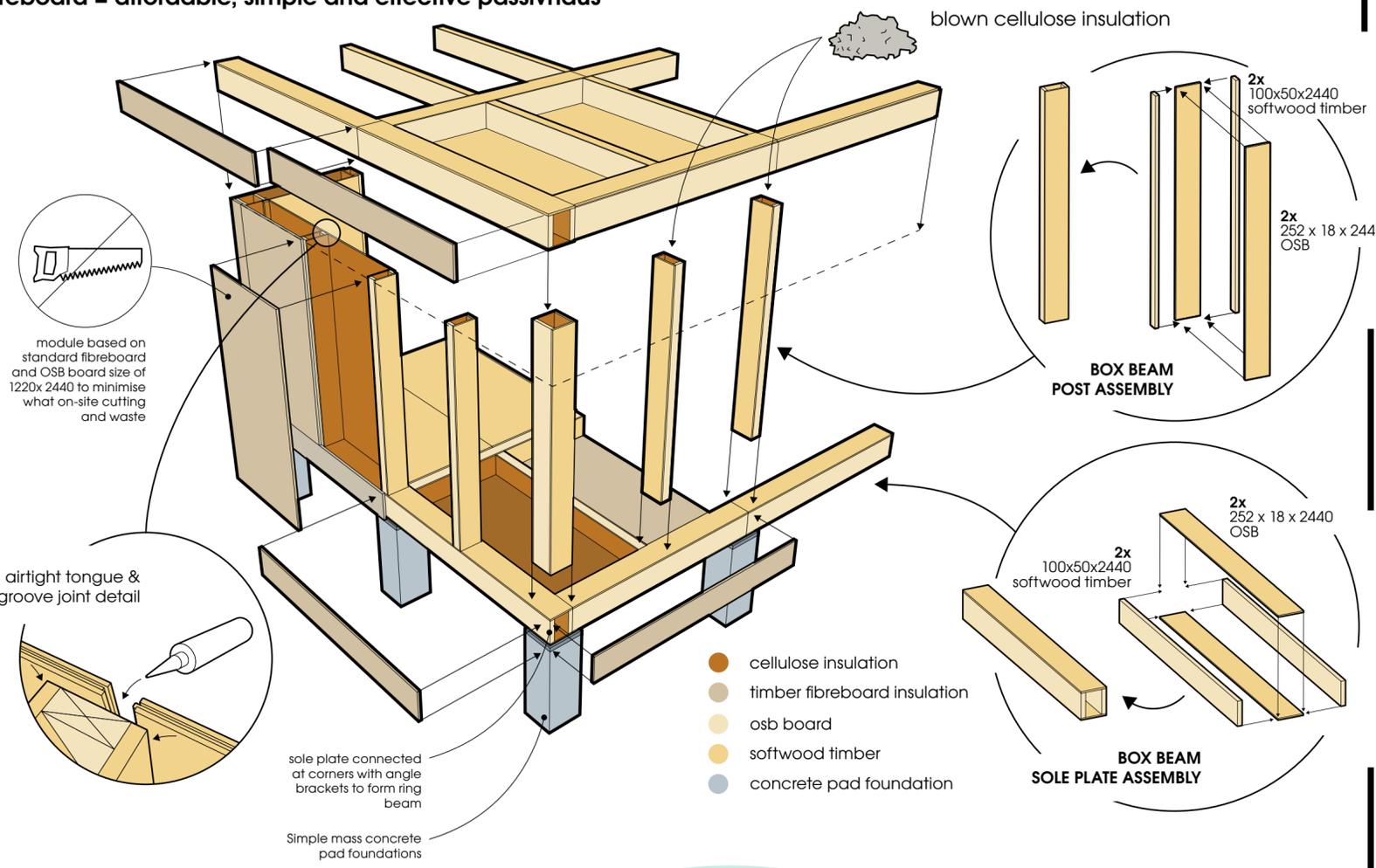
PASSIVHAUS MODULAR

box beam + osb + timber fibreboard = affordable, simple and effective passivhaus

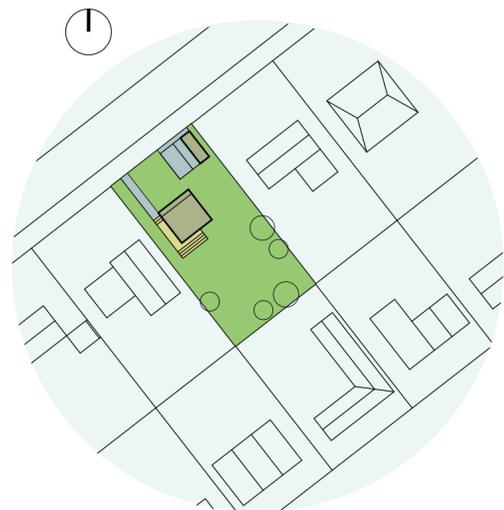
The key approach to cost reduction was to develop a system that could be fully self built using DIY modular components constructed from cheap, green and readily available materials. It was essential that this system could also achieve Passivhaus standard to save the occupants money over time in addition to reducing the carbon footprint. The proposed solution is a DIY insulated box beam. The grid has been designed to limit cutting and waste by sticking to standard board sizes. The key materials are:

- 100x50mm softwood timbers
- 2400x4800x18mm OSB tongue & groove with sanded finish
- 30mm timber fibreboard insulation
- cellulose insulation

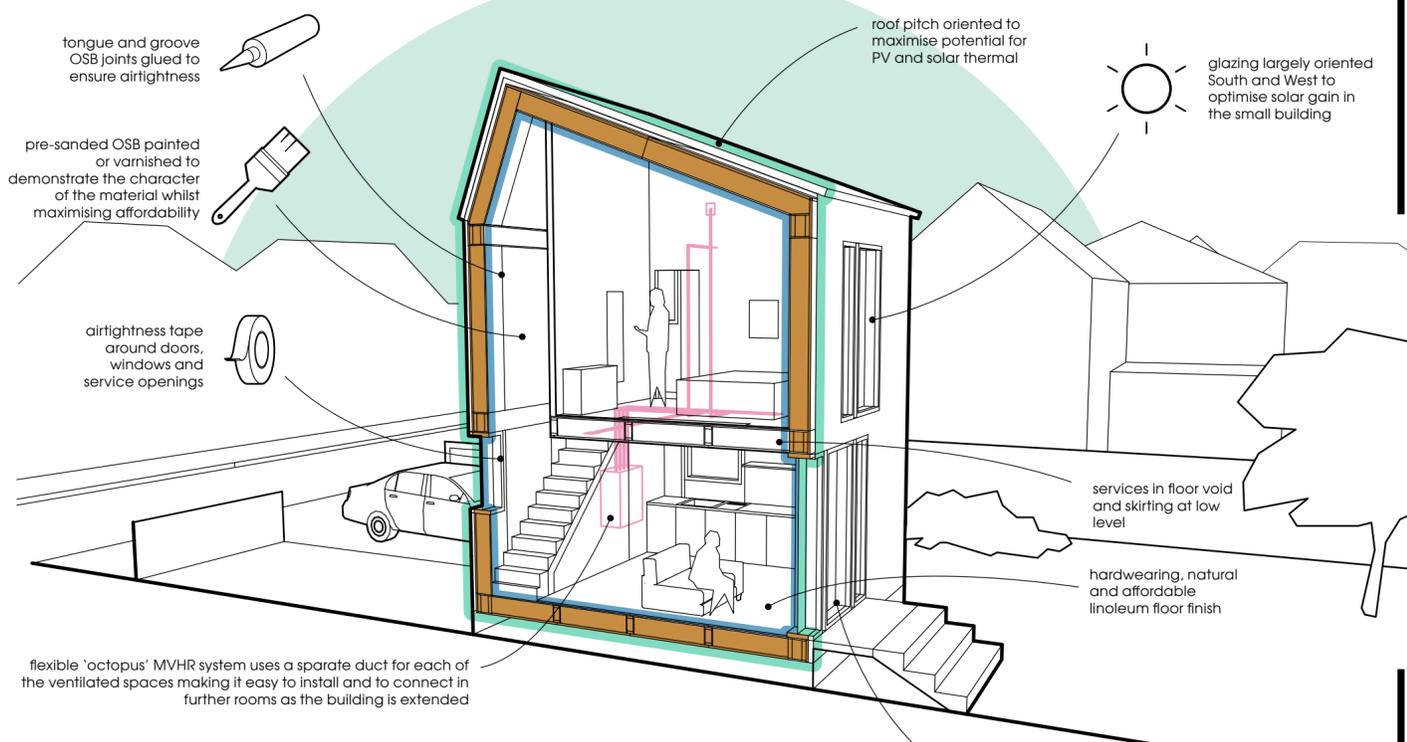
The standard dimension box beams create the depth required for the wall insulation which is very easy for the self builder to assemble on or off site. The OSB provides structural stability. The tongue and groove joints are glued to ensure airtightness. The pre-sanded finish is also quick and affordable. The timber fibre board creates a thermal bridge free outer layer. The cellulose can be easily blown into the the box beams and the cavity between the boards creating a u-value of 0.12 which exceeds the Passivhaus standard. All of the build up is breathable ensuring a healthy internal environment. This construction can also be used for the floors, walls and roof, making it simple, replicable and effective.



Site layout & overview

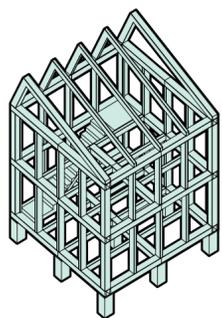


The core module unit is positioned in line with the neighbouring detached houses with sufficient space around to ensure possibility of future expansion.

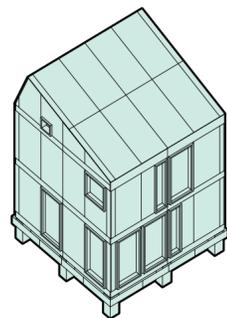


Core module composition

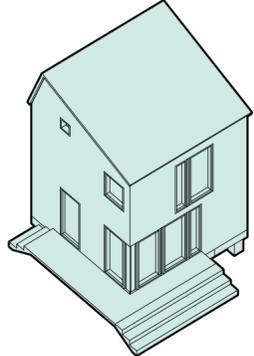
PRIMARY STRUCTURE



AIRTIGHT ENVELOPE



WEATHERPROOF CLADDING



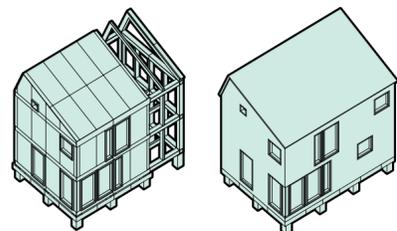
- airtightness value lower than 0.6ac/hr@50pa
- continuous thermal bridge free envelope 0.12 U-value
- rainscreen cladding - various options available

high quality triple glazed Passivhaus windows 0.8 U-value

Extendability

Simple modular construction allows for easy disassembly to enable extension and adaptation of the core module. Materials taken out can be reused in the new structure.

1 Couple + single child



GROUND FLOOR

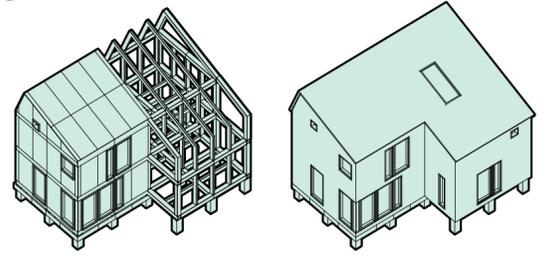


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FIRST FLOOR



2 Small family/intergenerational



GROUND FLOOR

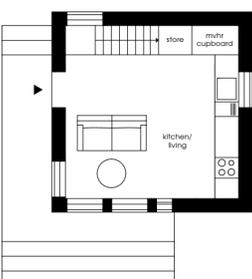


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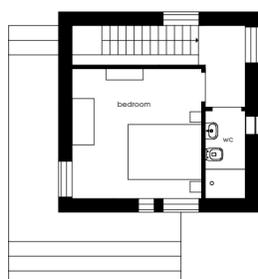
FIRST FLOOR



GROUND FLOOR



FIRST FLOOR



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