

# OFF-GRID MICRO DWELLING

The off-grid micro dwelling presented in this case study is to form part of a community of huts or bothies at Cash Strip Wood in Falkland Estate. The full project proposes the construction of 15 off-grid micro dwellings and the creation of an attractive, well designed and accessible development.

The building analysed hereafter is the pilot and was constructed by Quercus in 2018, in order to provide a prototype for people interested in constructing their own.

**LOCATION** Cash Strip Wood, Falkland Estate, Scotland

**YEAR** 2018

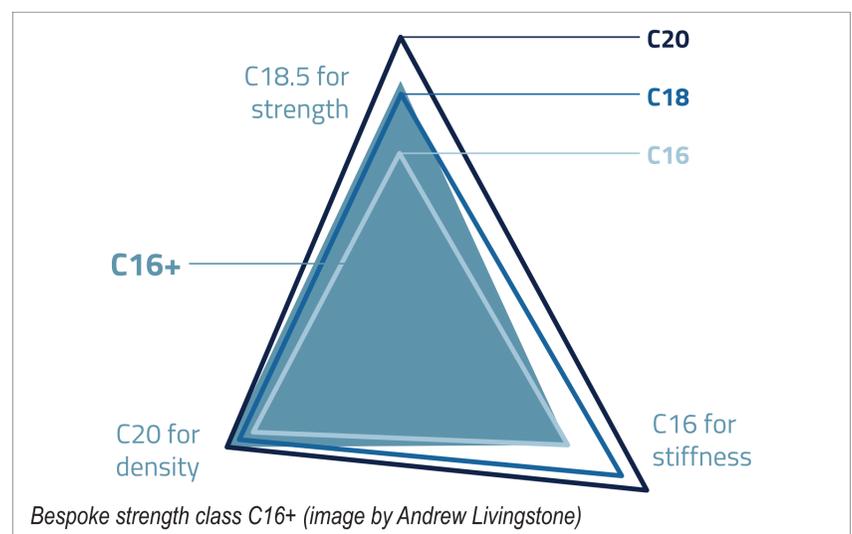
**PARTNERS** Centre for Stewardship, Studio Baird, Urban Animation, Quercus, Edinburgh Napier University (ENU)

The project is related to the 'Thousand Huts Campaign', which aims to revitalise the culture of hutting in Scotland



Momentarily set on an existing precast concrete paving slab located at the borders of the wood, the pilot has a floor area of 19.3 m<sup>2</sup> with a further 1.9 m<sup>2</sup> for the toilet, 3.4 m<sup>2</sup> in the sleeping loft and 14m<sup>2</sup> of deck area.

The main structure is formed from a larch timber frame system sourced entirely from the Estate and is insulated with natural materials.

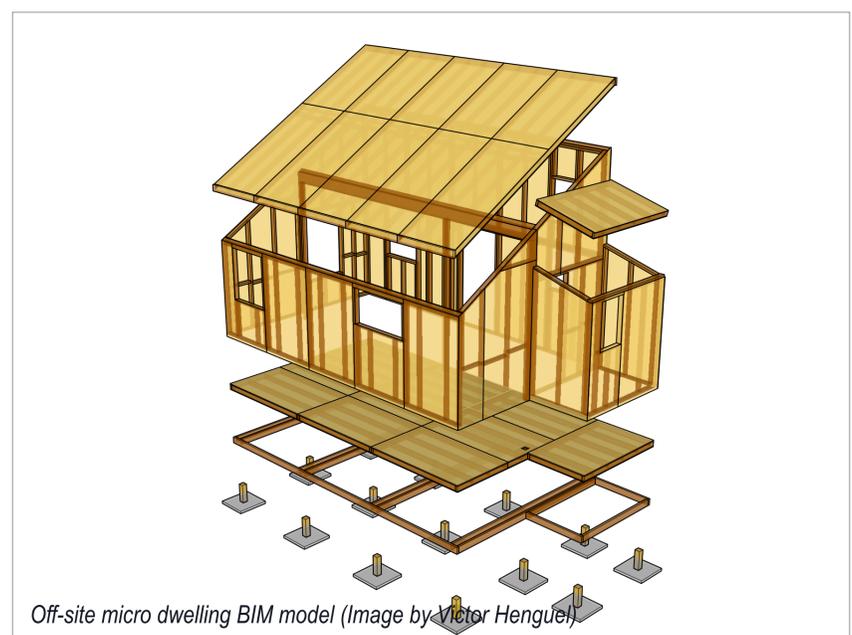


The structure was originally designed using C16 as a reference grade for the structural properties of larch. C16 is the grade classification assigned to the majority of structural timber available in the UK. ENU has however presented a bespoke class C16+ on the basis that it best fits UK-grown timber properties.

A comparative study between the originally designed configuration using standard grade C16 for the structural timber and an optimised configuration using bespoke strength class C16+ provides an insight into the potential savings and benefits of using homegrown timber belonging to this bespoke class.

For the study carried on the pilot off-grid micro dwelling, a digital Building Information Model was created and the structure was re-calculated using C16+ grade characteristics.

The structural utilisation of C16+ timber on average is a 10% uplift compared to standard C16, as a result of the enhanced characteristics of C16+ bespoke strength class.



A bespoke C16+ strength class developed by Edinburgh Napier researchers was introduced to best fit UK-grown timber properties and take into consideration its enhanced characteristics<sup>1</sup>

<sup>1</sup>Ridley-Ellis, D., Derivation of GoldenEye-702 grading machine settings for British Spruce. 2014, Report for CEN TC124/WG2/TG1: Edinburgh Napier University.