Cork House

by Matthew Barnett Howland with Dido Milne and Oliver Wilton

Client Matthew Barnett Howland and Dido Milne

Figure 1.1 Cork House photograph (Jones, 2019)

Figure 1.2 Cork House Materials- Roof (De Rijke, 2019)

Overview

Cork House is a house almost entirely made from cork and timber which gives it an exceptionally low whole life carbon, being carbon negative at point of completion and *"618kgCO2e/m2 over a 60 year lifespan, the lowest whole life carbon for any building they have assessed" (RIBA, 2019).* It is one of the first houses that fits the concept of Circular economy within Architecture, with solid cork blocks being fixed together through dry-joins and gravity in a way that means all parts are reusable and can be dismantled. Despite this, the structure conforms with all necessary living requirements and it waterproof, with cork also being a good insulator. The cork material itself is created from the by-products of cork forestry's and cork stopper production (RIBA, 2019). Harvesting of the bark to make the cork does not harm the tree and can be re-harvested every nine years making it sustainable (Barnett Howland, 2019).

The house is designed so that it can be assembled and dismantled by hand. It is the first of its type and may inspire many other buildings like it as a result of its success, winning 3 RIBA awards in 2019 (RIBA, 2019).

Figure 1.3 Cork House Elevation (Barnett Howland, 2019)

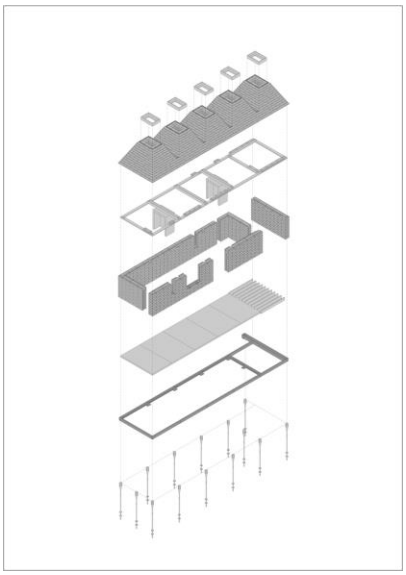

Figure 1.4 Cork House Axo (Barnett Howland, 2019)

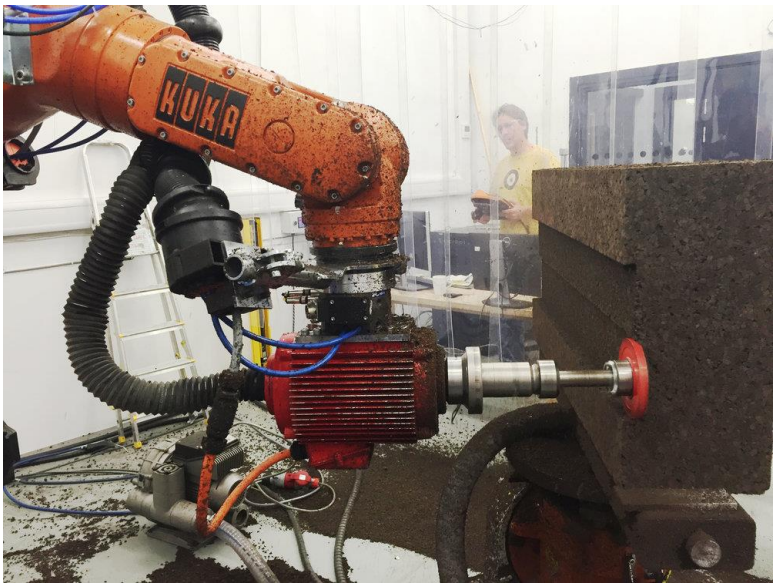

Figure 1.5 Robotic Cork Milling (Barnett Howland, 2021)

Cork Research

A robot was used to shape the blocks of cork so they would interlock perfectly so they were watertight and secure. This image shows the shaping of a prototype roof block. This shaping was done so that dry joins could be used in order to make cork reusable.

Research on building with cork commenced in 2014 with funding and materials provided by companies Innovate UK and Amorim (Barnett Howland, 2019). This then developed into Expanded cork block research. Researched focused on structural performance and rain and fire resistance.

Below are prototype roof pieces made out of expanded cork. Many different sized prototype models were made, including a small cabin which was used to test air pressure throughout seasons (Barnett Howland, 2019).

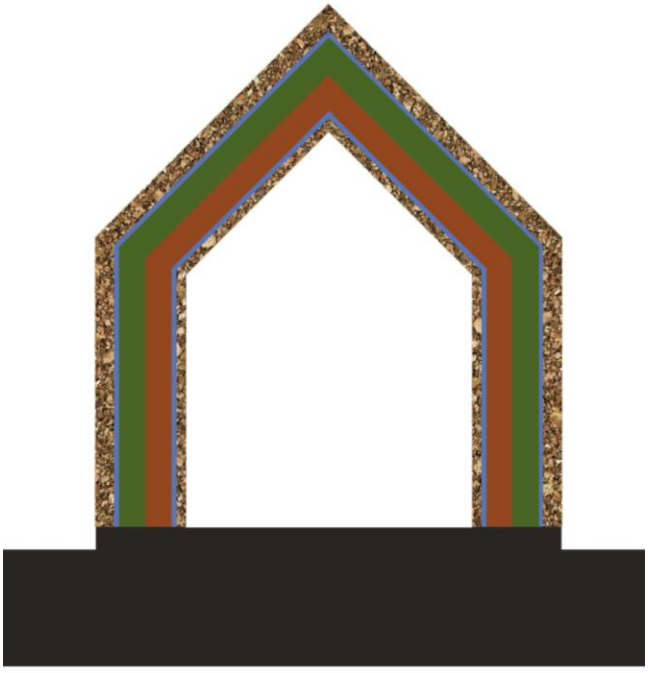

Figure 1.6 Solid Cork Concept (Barnett Howland, 2021)

Figure 1.7 Roof prototypes (Barnett Howland, 2021)

Solid Cork Concept

On the Matthew Barnett Howland's website he briefly shows a diagrammatic video of this solid cork concept in which solid shells of materials are slotted together to create a house structure. This is obviously in the early stages of development but may also be a successful way of using cork as a building material. This structure however has more limitations as its solid nature limits the ability to change shapes.

Summary

Positives of using cork as a material - it is a by-product of other industries so reduces waste and should be cheaper. It can create carbon negative housing. It is easy to assemble and dismantle meaning it is accessible to more people. It uses dry-joins so it is reusable. Materials are local to the UK. It is an innovative material that does not sacrifice the quality of living.

Drawbacks of using cork as a material - Despite it working in this climate, it may not be as easily sourced or functional in other climates. There may be a limit to the scale and shape of houses created with cork. This is the first of its kind and we cannot know for sure how successful it will be in the long run as it is still a new material to build with.

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Image References

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1.2 De Rijke, A., 2019. *Cork House Materials- Roof* [Digital Image] RIBA Architecture. Available at: https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-regional-awards/riba-south-award-winners/2019/cork-house [Accessed 17th October 2021]
1.3 Barnett Howland, M., 2019. *Cork House Elevation [*Digital Image] RIBA Architecture. Available at: https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-regional-awards/riba-south-award-winners/2019/cork-house [Accessed 17th October 2021]
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1.6 Barnett Howland, M., 2021. *Solid cork concept* [Digital Image] Matthew Barnett Howland. Available at: https://www.matthewbarnetthowland.com/solid-cork-concept [Accessed 17th October 2021]
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