

Monocoque Cabin

CASE STUDY

Monocoque Cabin is designed as a holiday home nestled in the woodlands adjacent to the Shropshire Union Canal.

“By expanding upon our architectural ethos, we emphasise the principles of critical regionalism, prefabrication, and the creation of ‘design objects’ that people desire to inhabit and possess.”

- Marcos Design Workshop



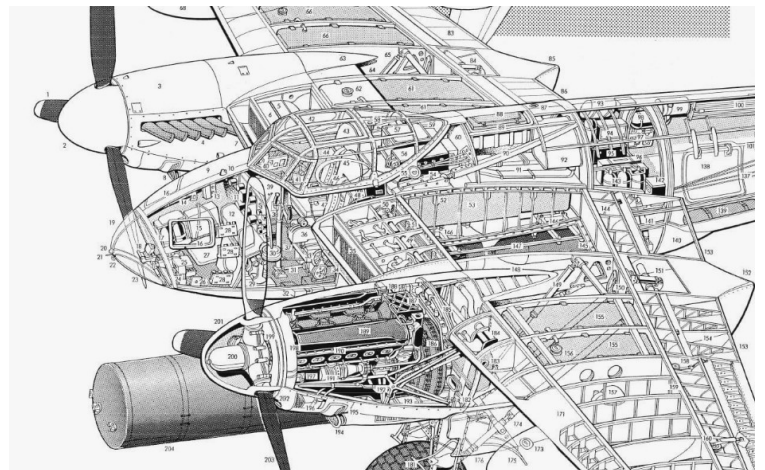
The Project Concept

Monocoque Cabin draws inspiration from the de Havilland Mosquito of WWII RAF fame. Although monocoques often utilised in aerospace and automotive design are rarely used in building design due to the required geometric innovations for extending the spanning distance of the structural shell, they offer a 22% higher strength-to-weight ratio than traditional truss-type construction.

The structural system supports loads through the object's external skin, forming a strong yet lightweight structure akin to an eggshell. In addition to the enhanced strength-to-weight ratio, monocoques promise material efficiency, precise construction, cost savings, and a rapid manufacturing process.

As a result, Monocoque Cabin's lightweight modular system boasts a fluid form devoid of sharp edges, seamlessly integrating with the surrounding landscape. The monocoque shell demonstrates a balance of rigidity and strength while exuding elegance.

The push for greater farming diversification at Peatswood Farm has resulted in a collaboration with the Workshop, leading to the installation of a Monocoque Cabin.



Product Specification

Hanson Plywood strongly advocate that construction/architectural specifications should be satisfied with products that are fit-for-purpose after considering the actual application and the particular performance criteria required.

The product specified for the Monocoque Cabin was 18mm grade B/B Birch Plywood. Birch Plywood is a very high quality panel comprising of birch veneers throughout which produces the most versatile of products, suitable for a wide variety of applications and projects.



Planning & Construction



The main birch-ply and OSB structure was fabricated off-site at BlokBuild's factory in Hull.

The off-site manufacturing provided precision and was conducted through a simple 3-Axis CNC machining. Such a process added the manufacturing process to be both time and cost efficient.

The construction process also involved integrating DfMA techniques to streamline the monocoque ribbed system's fabrication and communication processes.

By merging these materials and structural principles with geometric advancements, the architects and project leaders involved managed to successfully reduce material use, shorten fabrication time, and achieve the targeted curvilinear-spanning structure.





The End Result

“We are very happy with the results and how well the Monocoque Cabin is blending within the surrounding landscape”

- Peter Markos (Marcos Design Workshop)

At first sight, the Monocoque Cabin sits poetically in the landscape. Its undulating and ribbed structure creates a highly sculptural form rationalised internally and contextually.

The floor plans are crisp and logical, with furniture integrated within the plywood monocoque structure itself. Internal materials have been carefully considered to convey a sense of warmth and belonging. The curves of the structure create cohesive and fluid spaces inside, where walls become ceilings, and window openings are directed outwards framing desired views.



Collaborators

Engineer: Price & Myers

Fabricator: BlokBuild Ltd

Client: Unique Cabin Stays Ltd

Interior Visual: Rachel Glenn

Exterior Visual: Maciej Adaszewski

Joint Model: Rebecca Miller

Location: Peatswood Farm