

MATERIAL
CONSIDERATIONS
A LIBRARY OF SUSTAINABLE
BUILDING MATERIALS

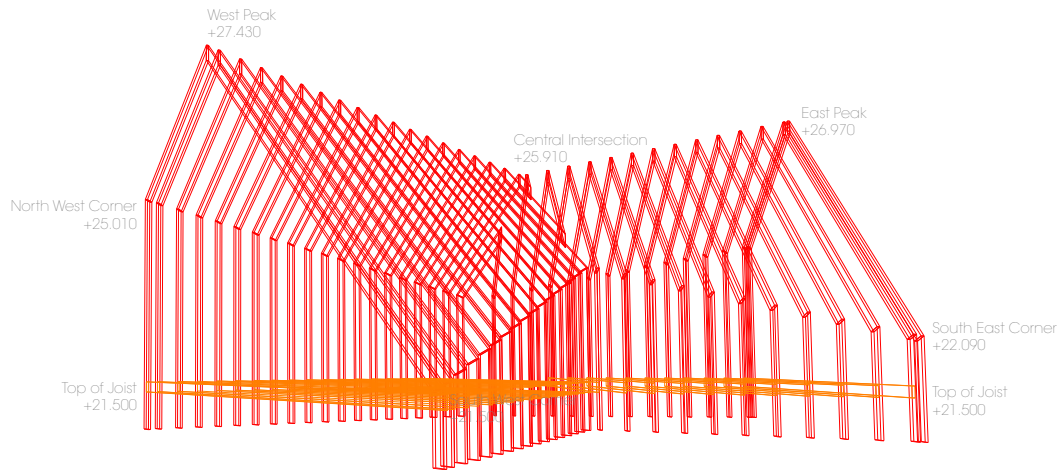
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CASE STUDY
CAMUSDARACH SANDS



Architecture &
Design Scotland
Ailtearachd is Dealbhadh na h-Alba





Photography by David Barbour, with thanks to Raw Architecture Workshop for 3D diagram.

Timber Technologies

The timber superstructure is a series of deep ribs at 450mm centres with v-shaped plywood gussets fixed either side, connecting opposing rafters and studs within a specific zone, to ensure no internal structural bracing is visible. This also allowed for significant spans, improved air tightness levels and the ability to insulate well. The roof and wall construction sections are almost identical.

The Cedar cladding has been detailed to allow for expansion, contraction and the movement of surface water during these altered states. Surface water is channelled into 25mm cladding grooves. Should any water run underneath the roof cladding a profiled metal sheet beneath the timber lapped over a concealed rubber edge detail simultaneously directs water away from the building and protects the cavity to the rear of the vertical cladding. The 25mm shadow gap from which any stray surface water is expelled is formed by angled cuts to all cladding boards. This 25mm dimension appears across the building in several timber interface, door, window, and shadow gap details.

Timber Related Features

Construction was carried out by a local house and boat building firm. The architect worked with them to develop specific construction details that are common to boat building providing the contractor with a cutting list for each stud and rafter [which were all different] which allowed him to construct the frame to accurately reflect the proportions of the concept models and drawings. The inclusion of boat building techniques, gusset construction enabled the timber roof finish helping the project team realise and reinforce the original concept – the building should appear simply as another partly submerged rugged form, surrounded by wild grass.

By maintaining total control of the site and others in the area, the contractor has been able to offer apprenticeships to local school leavers. This building was particularly popular with the apprentices as it is unorthodox relative to others in the area, and considered 'experimental' by the entire workforce. There was significant opportunity for alternative methods of construction and finishing which the architect and contractor developed together resulting in the contractor's team taking real interest and total ownership of the building. Whilst the form is not traditional, the method of construction reflects local expertise, knowledge and endeavour.

CASE STUDY

HOUSE AT CAMUSDARACH SANDS

Name of Building

House at Camusdarach Sands

Date Completed

November 2013

Building Type

Private House

Location

Morar, Inverness-shire

Architect

Raw Architecture Workshop

Main contractor/ Timber Supplier

Knoydart Construction

External cladding – Knoydart Construction

Internal finishes – Travis Perkins

Awards

Shortlisted for the RIAS Best Use of Timber Award
2014

Background to the Building

This part subterranean new build house is located on steeply sloping former rough grazing land. The clients, already living in this isolated location, were keen that proposals captured the spectacular sunrise over the mountains and sunset behind the islands. Construction carried out by a local house and boat-building firm was low tech, consisting of an exposed concrete base sitting beneath the timber frame superstructure.

There is a clear distinction in internal arrangement of space and function across three levels denoted by changes in light levels, scale of spaces, ceiling heights and materials. The entrance is at the lower level into a darker, utilitarian concrete bunker. Progressing up through the building, via the birch ply staircase, spaces enlarge, daylight levels and ceiling heights soar, and materials have a lighter finish. The external colour was debated, with black chosen to reflect the characteristics of peat, gorse and stormy skies.

The exposed location, storm battered climate and very low performance of the client's previous dwelling determined the environmental brief. The building had to be extremely sturdy, very warm and renewable energy systems were very appropriate for this isolated location. The ability for the occupants to quickly and easily control space heating and fresh air was imperative as the weather coming off the north Atlantic changes extremely quickly. Environmental considerations vary from building position and orientation, local labour, skills and materials, to the inclusion of an air source heat pump and super insulation which provides a U-Value of 0.15 [W/m²k] to walls and roof.