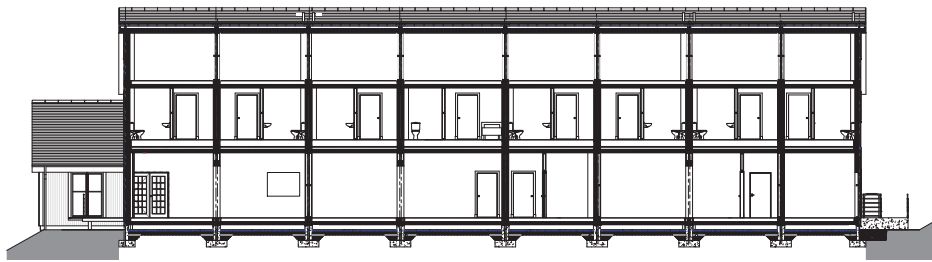
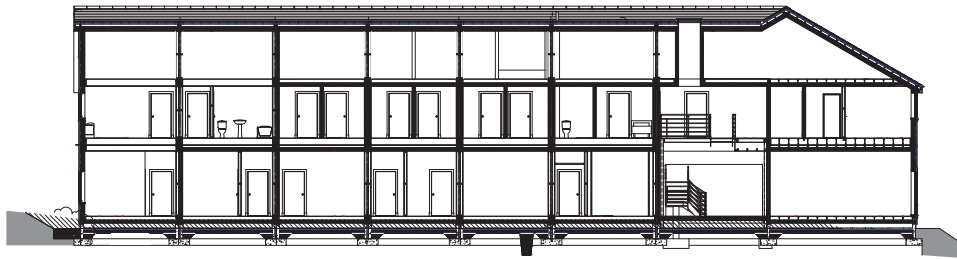


MATERIAL  
CONSIDERATIONS  
**A NATURAL FACTORY**

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**CASE STUDY**  
**FAIR ISLE BIRD OBSERVATORY**









With thanks to Alan Guthrie, The Fair Isle Bird Observatory and Synergie Scotland for photography.

### Timber technologies

The design incorporates a high degree of air tightness and insulation levels to minimise heat loss. The timber framing uses i-joists, a strong, sustainable product made locally.

The building is 'T' shaped in form, with triple-ply timber panel wall construction which has been treated to leave the natural timber colour exposed. The building has a shallow 15 degree roof pitch with stained fascias and soffits made of spruce and Siberian larch. Cladding on the roof comprises a high performance metal tile.

The roof incorporates a 5 kW capacity photovoltaic panel which is designed to be unobtrusive, but provide an additional input into micro-renewables. The exterior is made from timber cladding panels and high quality timber windows sourced from certified sustainable forests in Europe.



### Special timber-related features

The contractor had previously developed a four-pods-to-a-house method (two upper and two ground) using pre-insulated closed panels which had been successfully used in an affordable housing project in Orkney. This design was developed significantly to suit the layout of the observatory so that the standard pod contained two rooms with a central corridor. The upper floor panels also included the roof structure. The pods came fully fitted with insulation, decoration, windows, doors, electrics and plumbing, and are specially designed to withstand the Fair Isle's severe weather conditions.

The building uses a heat recovery system and innovative dynamic breathing building insulation to reduce external heat loss to a minimum. The system is based on the 'Energyflo' wall insulation system, where warm air is circulated in the cavity and recovered using a heat pump. It is hoped that additional renewable energy devices will be connected to the building in the future.

Draught lobbies were also installed at entrances to separate the service/wet areas from the main building in order to reduce heat loss through uncontrolled ventilation. The dining room and lounge 'pods' project out from the main building, and have full-height glazing to take advantage of daylight and views.

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# CASE STUDY

## FAIR ISLE BIRD OBSERVATORY

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### Name of building

Fair Isle Bird Observatory

### Date completed

2010

### Building type

Public

### Location

Fair Isle, Shetland

### Lead Designer

Synergie Scotland

### Architect

Colin Armstrong Associates

### Client

Fair Isle Bird Observatory Trust

### Main contractor / timber supplier

Rubislaw Associates

CDMM

AHW Building Solutions

### Anticipated lifespan of building

45 years +

### Background to building

Established in 1948, the Fair Isle Bird Observatory Trust operated originally from huts near the harbour at North Haven in the Shetland Isles. The new observatory replaces the earlier, now unsuitable, timber structure built in 1968, and is located within the footprint of the original structure to avoid disturbing any of the environmentally important surrounding area. The building offers spectacular views out to sea, and uses as much natural light as possible whilst still forming a shelter from the frequent severe winds.

The observatory is the lynchpin of Fair Isle's fragile economy, providing accommodation and a research base for scientists, visitors, support staff and students studying its migratory and precious resident seabirds.

The building has 24 bedrooms (including one for disabled use), lounge and dining facilities, a shop, offices and separate accommodation for the warden and his family, who are the only people who occupy the observatory all year round.

The building was prefabricated offsite using a modular timber system so that it could be constructed quickly and easily during the potentially short building seasons on the remote island, where restrictions are posed by weather and ferry timetables. The observatory was therefore only closed for one season during construction.

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### Material Considerations

A Natural Factory

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