

# Foley House, Rothesay, Isle of Bute, Scotland



### The project

In the western isles of Scotland, 14 flats have been built in 2003-04. After a protracted feasibility stage, where numerous housing alternatives for the site were, this low-impact design for the site was chosen.

The project team, the client and local planning were keen for the natural environment and the long standing hardwood trees on the site to remain but for the site to have a useful purpose in providing homes in the local area.

The building, which is circular, is not contemporary to the area but has a key advantage. It has a low impact on the surrounding area as it has a small and compact plan area. It is also reminiscent of Brochs and medieval tower designs prevalent around Scotland. The building houses 14 flats with either two or three bedrooms. It has an open plan main area encompassing living, dining and kitchen areas which lead to a terrace.

The apartments are for rental, and the tenants were moved in during the summer of '04.

### Sustainable Objectives for the design

The sustainable targets set by the design team and the client will be met by:

- Protecting wildlife habitat and respecting the landscape and the distinctive identity of the proposed location.
- Provide and encourage genuinely participative forms of local democracy where citizens 'own' the ideas and the objectives and can work actively towards those objectives. We have adopted and promoted a holistic approach to the design, including the wider environmental and visual impact of the development on Rothesay, and have fully involved the Rothesay community in the process of design and planning.
- Strike the right balance between a reasonably high density of activity and dwellings necessary to support services and to provide green space and a feeling of well being.
- Make best use of the available technology and design to reduce energy use, waste and embodied energy in buildings to a minimum during construction and during occupation.
- Maximise accessibility paying particular attention to the importance of walking and cycling activities.

• Make a positive and quantifiable contribution to the reduction of greenhouse gases (CO<sub>2</sub> and others) by using,

- a). Triple glazing with super low-E and argon gas infill (Uvalue : 1.0 W/m<sup>2</sup>K)
- b). Max levels of insulation and airtight construction. (U value: 0.12 W/m<sup>2</sup>K)
- c). Heat recovering mechanical whole house system
- d). Elimination of the dedicated central heating system
- e). Additional insulation to Hot water tanks (100mm rather than 50mm)

• Use local resources (human and materials) to support the development

• Adopt best practice for sustainable development in the UK by DETR, 1999 through partnering etc.

• Contain the right ingredients to trigger and encourage a reduction in car dependency

• Finally, create an acceptable and successful design aesthetic and innovation.

### **Building Construction**

The floor construction consists of 215 mm concrete base, 150 mm extruded polystyrene and 200 mm macadam. The U-value is approx 0.12 W/m<sup>2</sup>·K.

The external walls consist of 300mm cavity with 275mm Fibreglass 'Dritherm' cavity insulation or equal with 25mm cavity . External walls are 100mm block with render, with 140mm dense concrete block internally. Brickwork externally to the stair areas. The internal surface is covered with foil-backed plaster board. The external wall has a U-value of 0.14 W/m<sup>2</sup>·K.

The roof is finished with 0.7mm preformed zinc roofing trays with standing seam joints at 600cts fixed with stainless steel clips on ventilated 25x100 pine sarking boards (untreated) on timber roof trusses to SE details at 600cts. 400mm insulation quilt and vapour barrier at ceiling level. Zinc lined internal gutters laid to falls with proprietary rainwater roof outlets and leaf guard. The U-value is 0.12 W/m<sup>2</sup>·K. On the terraces an Inverted roof comprising 50mm conc paving and gravel ballast verges on 150mm (roof) / 50mm (balcony) extruded polystyrene insulation on geotextile membrane on 20mm roofing asphalt, sheathing felt on screed. The U-value is 0.16 W/m<sup>2</sup>·K (roof terrace).

All windows to flats to be 'high performance triple glazed type timber casement window with external aluminium facings. Pre-stained finish. 25mm marine plywood box construction around window wrapped with vapour barrier. All joints sealed with tape. The U-value is 1.1 W/m<sup>2</sup>·K with the total amount of glazing approximately 15% of the floor area.

The flats main glazing is in the living area leading to the terrace, for passive solar gains. The balcony/terrace above each flat has an overhang allowing an element of shelter from the summer solar gains as will the site which has, predominantly, mature broad-leaf trees that will provide shelter from the sun during the summer. Alternatively, the overhang is such that the flats may gain solar benefits during the winter.

It was important for the flats to be airtight during construction. With this in mind the architect placed special emphasis during construction on this issue, especially on details around the windows and the balconies.

#### **Technical systems**

· Passivent AV continuously operating ventilation system is used in the building powered by continuously running roof mounted extract fans within Passivent louvred terminal comprising :

Extracts – Ceiling mounted extract fixed to a ductwork system linked to a continuously running central extract fan. Extracts provide continuous extraction dependent upon relative humidity response. Min extract 8m<sup>3</sup>/hr at 30% RH. Max 65m<sup>3</sup>/hr at 90% RH.

Inlets – window mounted humidity responsive inlets complete with external canopy grille sited in habitable rooms only.

Space heating is provided by electric Duplex dual control heaters connected to a separate reading meter from the common electrical mains.

Energy Performance  
Dunno

#### **Costs and benefits**

The passive systems in the building as well as the extra insulation aims to reduce space heating demand by 40% over a building meeting the current Scottish regulations.

#### **Financing**

Dunno

#### **Project team**

Client

Architect

QS

Engineer

Contractor

#### **Contact person**

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