The Whole Life House

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The Whole Life House

A built work won through open competition. It formed part of Scotland’s Housing Expo in 2010 that featured a series of exemplar buildings looking at contemporary ideas for sustainable housing and urbanism. The building looks beyond technological understandings of environmental design towards addressing social and economic sustainability through adaptation strategies over the life of the building. The Whole Life House won the House of the Year prize at the Scottish Housing Awards 2011. (Image : Nigel Rigden)
The Whole Life House

An architectural design, exhibition piece and permanent built work. Its originality lies in a contemporary interpretation of rural and suburban housing form. The project addresses the research question of how to make private sector housing more resilient and sustainable through adaptation. This is a field with little applied research and the context of this live project allowed latitude for experimentation and speculation. However, at its heart, the building is a realised outcome of a theoretical research proposition, that in use succeeds in its intentions. The project introduces the concept of soft flexibility as design generator, making explicit linkages to social and economic sustainability design strategies. The output's significance lies in the built realisation and validation of a theoretical proposition. It introduces for the first time adaptive strategies to the UK private housing sector. It was a key exhibit at Scotland's Housing Expo, an event showcasing contemporary and innovating housing design that attracted in excess of 30,000 visitors. The output's rigour is demonstrated through peer review in the open design competition for Expo inclusion. Additionally its innovation was recognised in winning the House of the Year Prize at the Scottish Design Awards in 2011. The work was featured in both the general and specialist press.

The design addresses the challenges of making resilient and sustainable communities in suburban and rural conditions. It responds to the fact that over 40% of household relocations in Scotland are because of the unsuitability of housing stock1. It tests how spatial organisation can produce dwellings that anticipate change through the application of "soft flexibility". The house is divided into two – a core dwelling with living, kitchen and some sleeping accommodation along with an annexe block that allows varying degrees of interdependence with the main building. The functions of the annexe are deliberately not clearly defined. It can be entered directly from the lobby of the building and has services provided for kitchen and bathroom facilities. The building responds to vernacular form, colour and symmetry with a conscious attempt to root the building in an episodic and sometimes chaotic exhibition environment. This was recognised in respect of the whole life house being illustrated as an example of best practice in the Scottish Government PAN 83 policy document on masterplanning. The building includes a carefully considered environmental strategy that includes passive solar glazing, high thermal mass floors, night shuttering and sunspaces as part of the design.

In terms of impact, the Whole Life house was a key exhibit at Scotland's Housing Expo in 2010 attracting 30,000 visitors. The building was featured in a series of on site and online lecture and workshop sessions. The WholeLife House intended to address challenges in the private sector. This was recognised in the award of House of the Year at the Scottish Homes Awards 2011. The work is a vehicle for further research into rural and sustainable housing. The building process is investigated by the author in a book chapter within the recently published Aesthetics of Sustainable Architecture. The building was published and reviewed in Building Design and The Observer. It forms a part of the Scottish Government Publication Scotland's Housing Expo.

The Whole Life house was undertaken as practice based research with Brennan and Wilson Architects. John Brennan was responsible for the initial and detail design of the work until building tender stage including all drawings. Following this he was jointly collaborated with Julie Wilson for post tender design adjustments and on-site construction. All drawings and photographs unless credited otherwise by John Brennan

Peer recognition and review:

Author references.
Benedict, James. “Scottlands Housing Expo." Building Design, London, August 13, 2010. The work was also featured in the following newspapers: The Scotsman and The Observer.

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colour photographs: Nigel Rigden
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The proposal features a single storey flexible use wing to the garden. It is able to adapt easily to suit changing family circumstances including potential sub letting. The design reflects the rapidly changing ways in which households now evolve.

The scheme also features attic trusses to the main wing for loft storage and a homeworking base within the garden.

Investing in construction has a potential to sustain communities at both a local and regional scale. The proposal is based around a timber frame with established manufacturers in Northern Scotland. Cladding, floor finishes, furniture can all be sourced in the Highlands.

Critically the timber frame is easily built by local contracting organisations. Specialist trades and structure is kept to a minimum. Hybrid prefabrication techniques allows rapid erection of the shell with better finishing trades co-ordination.

Ground floor plan
First floor plan
Section through conservatory
Section through main stair

The building proposes simple, robust sustainable techniques. Masonry construction to the southern elevations and solid ground floors provide thermal inertia to regulate excessive solar gain, taking into account climate change over the design life of the building. The use of a heat recovery ventilation unit allow exhaust air to the conservatory to be utilised elsewhere in addition to more traditional bathroom/kitchen extract configurations. A small wood burning stove to the ground floor provides heat to the living area.

THEWHOLELIFEHOUSE RESEARCH
HIGHLAND HOUSING FAIR
PLOT 18

1. Winning competition entry: The original competition asked for proposals for each site in the expo village. At this early stage an emphasis on adaptability as a means of interrogating different pathways to sustainable design was investigated.

2. View of original proposal showing separate home office, which remained unbuilt.

3. Expo masterplan (image Cadell2 Architects) The masterplan was based on the concept of a Highland township or Lochan, oriented around a town square.

4. Site plan showing location of whole life house

5. Scotland’s Housing Expo August 2010. The exhibition attracted 30,000 visitors and was supported through a series of lectures, seminars and presentations.
1. Adaptability precedent: Our practice has worked for a number of years on flexible live-work housing types in rural locations. Although different in form the the whole life house - this scheme in Perthshire, designed in 2007 looks at shared preoccupations with entrance and connection/separation of the workplace.

2. Adaptability precedent: Woodbank Housing for New Lives New Landscapes with flexible live work and hybrid prefabrication. This scheme was completed by our practice in 1998 where we were specifically asked to look at live-work accommodation in low density rural sites and how these might be integrated in building.

3. Adaptable Annexe to Whole Life house - options showing different configurations. This shows how the annexe can address the complex household configurations we now see. It is formulated in response to government data on household size and characteristics.

4. Part plan view show main disposition of planning elements. This shows as a schematic the key breakdown of the house into fixed and adaptable parts.

- young family: The annexe is used as a guest bedroom with a family room attached. If desired, the dividing partition can be removed to make a single space for a larger family room or home office.
- large family: With three or more children, space can be at a premium. In this case the annexe wing can be utilised for two additional bedrooms, to provide a four bedroom home with a ground floor bathroom close by.
- young adult at home: With mobility reduced by high rental and house purchase costs, more and more young adults are staying at home. In this case, the annexe wing can be made into a small self contained flat with galley kitchen and separate bedroom.
- elderly relative: In this configuration, the annexe is converted into a large single room to enhance mobility. The shared entrance and galley kitchen encourage independence and privacy when it’s wanted.
1. View down stairs to kitchen. Although built for private sector development, the house uses double height space and top lighting to animate key circulation spaces.

2. Integral sunspace to living room and master bedroom. The sunspace is sparing in its use of glazing to avoid too wide temperature swings and also to ensure the room is useable over longer periods in the winter months. Simple internal openings allow passive solar gain to percolate the main rooms.

3. Relationship between stair lobby and kitchen. This shows the shared entrance but separate access to annexe and main house.

4. Environmental response of building showing key low carbon strategies. These are current good sustainable practice - including underfloor heating, heating/thermal mass combined with lightweight highly insulated timber frame. (based on visualisation by Nick Sharp)

**solar hot water panels to roof**
The Whole Life house features solar hot water panels to preheat how water for use in basins, baths and showers. It is hoped that the panels will supply around half the energy required.

**floor construction**
The building is heated with underfloor heating pipes laid in an insulated concrete slab. To reduce temperature swings and overheating from passive solar gain, the floor is tiled to the concrete to give mass and thermal inertia to the home.

**wall construction**
The building is timber frame construction with locally sourced cladding. Insulation is placed between the timber studs. An additional services cavity is formed to the building interior. This allows the main structure to be sealed effectively to reduce air leakage from the building. The services cavity is also infilled with insulation. By placing the fixing battens horizontally, thermal bridging is reduced.

**the sunspace**
The house is oriented with most windows to the south, with the north face of the building less heavily glazed. The whole life house features a sunspace with roof glazing to admit passive solar gain. At night, it can be closed off from the heated core of the building.
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