



Where North Meets South

A photograph of a modern house with a grey roof and white walls. The house features a large glass extension and a courtyard with a pond and trees. The sky is blue with white clouds.

A Modern Home near Edinburgh blends
Local Character with Australian Eco-Consciousness

West – cantilevered canopy, deck, window cassettes and stainless steel gutters modify the traditional vocabulary of white walls and slate roof



This understated modern family home is located in Cramond, a village on the northern outskirts of Edinburgh. The village has a strong traditional architectural character, featuring stone houses complete with clipped eaves, steep slate roofs and white render or 'harling' (a roughcast). Across the Forth River lies Fife with its wonderful traditional fishing villages, such as the heritage-listed Culross (pronounced locally "Kooruss").

The site of this house – which was occupied by a 1950s bungalow – is on the edge of Edinburgh's urban footprint, right against the 'green belt', with expansive views to the north over open fields to the Forth Estuary. The garden is entered through an older (heritage-listed) stone arched gateway, which is connected to a small gate lodge in which the clients lived while their new house was being built. Early on in the design process, it was decided to remove the existing bungalow, as it failed to take best advantage of the site and views, and had proven too small to meet the needs of the clients, who had lived in it for over 20 years. Although demolishing a perfectly good house could be considered as not environmentally responsible (as one throws away the valuable embodied energy that was used to built it), the clients countered this argument by designing an experimental home that would adopt key strategies to minimise environmental impact and reduce energy consumption.

The clients' brother-in-law is the Irish architect Lindsay Johnston, who emigrated to Australia in 1986 and has won several awards for his environmentally responsive buildings. He had frequently stayed in the original house and his relatives approached him to design a new house for their site. Lindsay Johnston had studied architecture just up the Scottish coast in Dundee and was very excited by the prospect of taking on the challenge to design a house that would be a modern interpretation of the traditional vernacular language of the region – something that Charles Rennie Mackintosh explored 100 years ago, for example in his Hill House in Helensburgh, which is now open to the public. However, Johnston also teaches Master Classes with one of Australia's foremost architects Glenn Murcutt. In this design Lindsay Johnston therefore set himself the task to explore innovative Australian considerations regarding environmental strategies and technologies, for example using the sun's energy.

The first challenge was to address the difficulty that the best views are to the north while the sun is in the south. Although the new house has been located almost exactly on the footprint of the existing house, the major 'move' was to raise the ground floor slightly to avail of the fine views and to increase the floor area by introducing a part basement and an upper floor. The major energy 'move' was to put the main living room and bedroom at the north



Top left:
Entrance hallway and formal dining area – light from west, east and above

Top right:
Upper level landing with skylight and dormer window views to east and the sea

Above left:
Integral photovoltaic cells in roof and bedroom balconies in double volume conservatory

Above right:
North – main living room deck and master bedroom balcony views to Forth Estuary

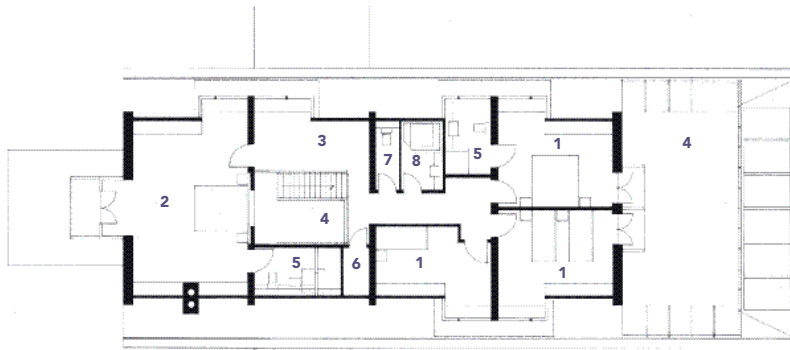
end of the house and introduce a solar conservatory on the south end to capture passive solar gain. This solar gain can then be transferred to the north end and provide a warm covered 'interstitial' space (between inside and outside) within the conservatory beside the family kitchen.

The traditional local architectural 'language' of rendered white walls and 45° natural slate roofs has been transformed into a modern 'dialect' with finely detailed glass to corner windows, dormers, balconies, canopies and decks. Professor Brian Edwards, former Head of the Edinburgh School of Architecture and author of the book *Green Architecture Pays*, remarked on this design that he could see "cultural transmigration from Australia" in some of the ideas.

The house is built using the highly insulated SIPS system by BPAC with the walls and roof built like a big box of 167mm rigid light-weight insulated panels, consisting of 150mm polystyrene sandwiched between two layers of particle board. The concrete walls and roof slates are therefore a weathering 'overcoat'. The special window and balcony details are powder-coated aluminium cassettes, which slide over the SIPS panels, and hardwood timber windows and doors were selected for thermal and aesthetic reasons – all double glazed.

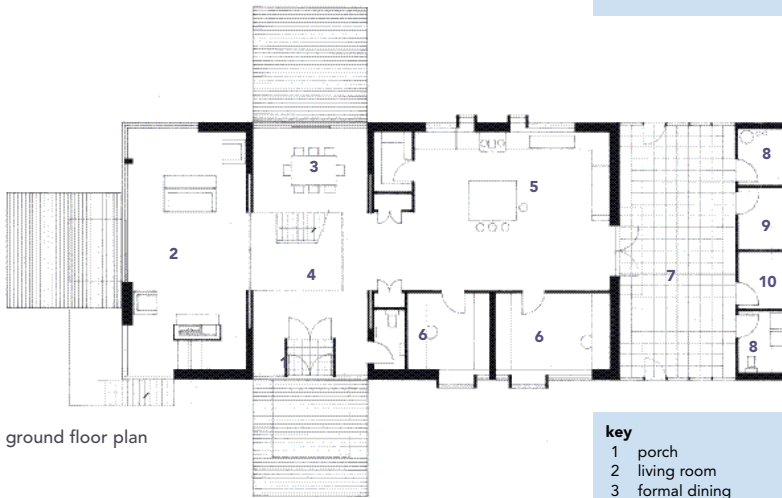
The truly innovative environmental and energy systems are somewhat understated in the architecture. The passive solar conservatory to the south also contains a large active solar system with 20 X 63 polycrystalline photovoltaic cells integrated into the roof glass, manufactured by Schuco in Germany, plus six standard photovoltaic modules located over the south facing roofs of the end stores. This set-up is projected to produce 3120kWh per annum saving 1.67 tonnes CO². The system is connected to the grid and the electricity produced powers a Swedish IVT geothermal ground source heat pump that feeds a hydronic underfloor heating system cast into the concrete ground floor. Rainwater is harvested off the roof into large 250mm diameter stainless steel gutters (definitely an Australian feature) and is stored in underground tanks and used for flushing toilets and irrigation.

The result of the design, planning and technical systems in this house is a very comfortable eco-friendly living environment, where views, solar access and functions are harmonised – drawing on the best design influences from the Northern and Southern hemisphere. The interior spaces are filled with light and views and, no matter what the season, the owners can find sunny corners – both inside and outside the house, which allow them to enjoy the delightful surrounding landscape.



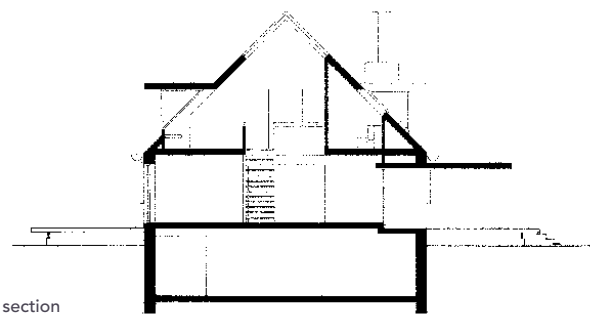
first floor plan

- key**
- 1 bedroom
 - 2 master bedroom
 - 3 gallery
 - 4 void
 - 5 en suite
 - 6 linen
 - 7 wc
 - 8 bathroom



ground floor plan

- key**
- 1 porch
 - 2 living room
 - 3 formal dining
 - 4 void over
 - 5 kitchen / dining
 - 6 study
 - 7 conservatory
 - 8 store
 - 9 potting shed
 - 10 utility



section

South – solar conservatory and photovoltaic panels on store roofs



Architect:
Lindsay Johnston

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Lindsay Johnston was born in Belfast and studied architecture in Dundee, Scotland. He worked for Alex Gordon in London before returning to Ireland in 1967 to join An Foras Forbartha. He was an associate with Denis Anderson in Diamond Redfern before establishing his own practice in Bray and Dublin. He emigrated to Australia in 1986, where he became Dean of Architecture at the University of Newcastle. His innovative sustainable buildings have received both RIAI and RAIA awards and have been published internationally. He is Convener of the Architecture Foundation Australia, which runs the annual Glenn Murcutt International Architecture Master Class and is a visiting professor at the Universities of Newcastle and Sydney. He lives and works on the Hawkesbury River north of Sydney.

Project Facts

Project size:

House size: 280m²

Solar conservatory: 40m²

Ground floor stores: 20m²

Basement storage / studio: 80m²

Project Team

Scottish Partner Architect:

Scott Wardlaw, Edinburgh

Structural Engineers:

Philip Thomson and Partners, Edinburgh and SIPS Industries, Dalgety Bay, Fife

SIPS wall and roof panel system:

SIPS Industries, Scotland www.sipsindustries.com

Windows and doors joinery:

Holyrood Joinery, www.holyroodjoinery.co.uk

Solar conservatory and photovoltaics:

Northern Tectonics and Schuco Ltd

www.northerntectonics.co.uk, www.schuco.co.uk

IVT Geothermal Heat Pump: Ice Energy Ltd.

www.iceenergyscotland.co.uk

Solar energy: Solar Technologies UK Ltd.

www.solartechnologies.co.uk

Underfloor heating: Rehau Ltd. www.rehau.co.uk

Ventilation system: Nuair, www.nuair.co.uk

Internal wall linings:

Fermacell www.fermacell.co.uk

Smart Home system: Ezone Interactive, Scotland

Conservatory floor: Caithness Slate

Rainwater tanks: Freerain, www.freerain.co.uk

Fireplace: Jetmaster

Window/balcony cladding:

Newbyres Engineering, Edinburgh

Flat roofs: Sarnafil