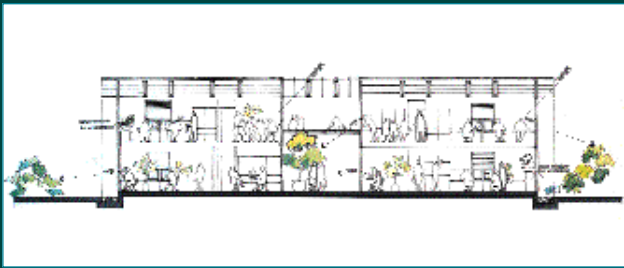


AN ENERGY EFFICIENT OFFICE BUILDING



IRISH ENERGY CENTRE

The Irish Energy Centre uses low energy and environmentally responsible design strategies to provide a high-quality, attractive workplace for its 28 staff. Proven energy-efficient technologies & techniques are used to satisfy heating, lighting and ventilation requirements placing minimal demand on non-renewable energy sources.



THE BUILDING

The building occupies the south side of a garden at the heart of the Forbairt campus in Glasnevin, Dublin. The main entrance is connected to the primary pedestrian route on the campus by a stone pathway with timber pergola above. Inside around the roof-lit, double height atrium, the four principal open-plan offices are grouped on two levels.

The atrium with its south-facing glazed roof is a place for interaction, an outside-inside social space which functions as both a link and separation between the two halves of the building. It traps sunlight and provides natural ventilation through the stack effect.

Cellular accommodation, vertical circulation and services are organised to the rear of the building, along a corridor attached to the open plan office areas. The flat-roofed, cellular services block, is designed to enable the open-plan, 3m-high offices to have windows on all four sides allowing optimum daylight and views for the occupants.

PASSIVE SOLAR DESIGN STRATEGIES

The energy design concept for the building was firstly to identify and reduce the most energy intensive components, which in the case of an office building are provision of heat and light, and secondly to use the building fabric as a 'climate modifier' to reduce heat losses, and minimise gains. This informed a strategy for optimal integration of energy-saving and passive solar heating technologies together with natural lighting strategies.

Thermal Mass

The envelope is constructed in materials of high thermal mass, concrete-block external walls, pre-cast concrete floors and an in-situ concrete flat roof (services block only). The undersides of the slabs are plastered and painted to enhance their usefulness as a thermal store.

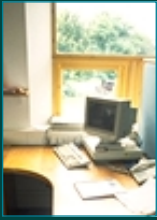
Daylight

The atrium is a 'light box' distributing daylight to other spaces. Light which enters the building through the atrium roof glazing is in turn borrowed by the adjoining offices and circulation corridor.

In the offices, evenly distributed openings maximise daylight availability, while white painted surfaces reflect the light. The design of the windows maximises high-level daylight penetration. The masonry window reveals are splayed to increase natural light and reduce glare.

Shading

Metallic venetian blinds provide protection against the immediate effects of sunlight and glare, while deciduous trees have been planted in the courtyards which will in future screen the sun in summer and filter light in winter in order to reduce glare and excessive heat gain.



MATERIALS AND CONSTRUCTION

In the Irish climate the primary energetic purpose of elements such as walls, floors and roof is to conserve and, where possible, store heat. In selection of materials and construction methods the life-cycle costs and the impact of the processes of their production on the environment were assessed in tandem with other more conventional selection criteria. Indigenous materials were given priority and natural materials were specified wherever possible.

External Walls

The composition of the cavity wall is as follows:

External leaf: 100mm fair-faced concrete block	Internal leaf: 215mm load bearing blockwork
Air gap: 40mm	Internal finish: 12mm gypsum plaster painted
Insulation: 60mm of rigid CFC-free thermal insulation	

ROOF

Irish softwood trusses are used for the pitched roof structure. These are exposed in the office space on the first floor. Roof finish is a sandwich of 150mm mineral fibre insulation packaged in a vapour barrier and breathing membrane with a rainproof cladding of mill finish aluminium above.

Timber

Timber is a classic ecologically-sound and recyclable material, and one much under-utilised in Ireland. It was specified throughout for its structural and aesthetic qualities.

Occupant control

A critical factor in the design was that the occupant of each workspace should be able to control his or her own environment: each has opening windows for ventilation and view, thermostatically controlled radiators, and task lighting. Movement detectors are provided throughout the building to control the electric lighting system in response to presence. Energy efficient lamps and luminaires are used throughout, and all fluorescent lights are high frequency. The Irish Energy Centre building embodies the best of information available on low-energy architecture. Energy-saving, passive and active solar heating technologies together with natural light strategies have been used to optimum effect. The result is a bright, natural and comfortable building that saves on both on bills and finite energy resources.



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THE IRISH ENERGY CENTRE IS A JOINT INITIATIVE OF THE DEPARTMENT OF TRANSPORT, ENERGY AND COMMUNICATIONS AND FORBAIRT. IT IS SUPPORTED BY THE EU THROUGH THE COMMUNITY SUPPORT FRAMEWORK THE IRISH ENERGY CENTRE BUILDING WAS PART FUNDED BY THE EUROPEAN REGIONAL DEVELOPMENT FUND. THE DEVELOPMENT OF THE BRIEF FOR THE BUILDING WAS SUPPORTED AS A EC DG XVII THERMIE 'B' ACTION.