P.J. Carroll's Factory, Dundalk, Co. Louth, Ireland

Project Description

Please provide a description setting out client's brief, the planning constraints, materials and method of construction, summary of time-table, programme and budget constraints in the space below:

Client's brief

Dundalk Institute of Technology's brief for the refurbishment consisted of a 10,000 sq.m. teaching and administrative facility for the departments of Informatics and Creative Arts.
The brief included classrooms, PC laboratories, lecture theatres, radio studios, sound studios, film studio, art studio, screening room, dark rooms, a diverse range of music practice and performance spaces and associated student and staff facilities.

Planning constraints & design principles

As the building is a protected structure, all modifications had to sensitively address the first principles of conservation and their impact on the buildings fabric required assessment and planning approval.

The over-riding design objective for the refurbishment was to establish an architectural discipline that was in keeping with the 1970's original design. The original concept for the building was of a repetitive free-standing structural bay, supported at each corner, and capable of expansion in any direction. The first strategic decision was to organise the significant number of offices around three atria. Three bays (each 20m x 20m clear spanning roof trusses) were jacked up by 1m in order to create the two storey accommodation. Due to the original cruciform column design, this was achieved without interfering with the adjoining bays. The next principle was to align the circulation routes with the structural gridlines of the building; this gave the overall internal space planning a strong discipline. Due to the deep plan nature of the building, a social space and wintergarden were created. These spaces brought light and air into the heart of the building. Light also entered the building at the corridor intersection points.

Extensive conservation works were carried out including analysis of the brickwork and steelwork in order to establish best practice. Modifications to the envelope consisted of removing only brick panels adjacent to the cruciform column and replacing them with glazing. This generated a typical bay elevational composition of 4no. brick faced panels framed on both sides with glazing and above by clerestorey glazing. This composition clearly expresses the fact that each bay is a free standing structural entity. Its is also worth noting that the subdivision of the glazed units match the existing, as all the façade components in the original design had a mathematical relationship with the overall form of the building.

Materials

A limited palette of new materials were used and the conservation principle that all new works should be reversible was adhered to. Externally aluminium curtain walling with a bespoke capping system was designed. Internally the walls to the ground floor offices were built with lightweight blockwork and a steel frame supported timber joisted floors. All new walls were plasterboard partitions with 45mm deflection head details, acoustic insulation and linings were applied as required for the function of each space.

Programme and budget constraints

In 2001 the architects were appointed but due to capital funding delays the project was not lodged for planning until December 2006.

The existing condition of the 40 year old tobacco processing areas gave rise to two significant issues, asbestos in the ductwork and tobacco dust. In order to reduce the financial risks associated with these items, a separate enabling and strip out contract was undertaken. The main contract works started on site in October 2008 and finished in March 2010. Due to the tight budget, extensive value engineering exercises was undertaken at key stages, this gave good value to the client and the project was delivered within budget.

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Inclusive Design Statement

Please provide 200 words describing the ways in which the building meets the principles of inclusive design, i.e. in providing environments that are safe, convenient and enjoyable to use by people regardless of disability, age or gender:

The first objective was to ensure that the building was accessible to the Campus; this was achieved by providing a new footpath from the bridge to the entrance.

The ground levels at the entrance were adjusted to facilitate access and a ramp was incorporated into the hard landscaping. The new perimeter path was set at a level to ensure level access to all doors and the main entrance door's automatic opening device facilitates ease of use.

Designated disabled parking has also been located close to the entrance.

Internally ramps have been provided to accommodate all changes in level and all second floors are accessible via 3no. platform lifts. All staircases have optimum risers and going.

The typical corridors are unusually wide, (3.2 m) which allows for comfortable circulation. The main social space and wintergarden are located in the heart of the building which aids cross circulation. and the bespoke way finding system facilitates good orientation.

Disabled toilets are included in the toilet spine area.

Regarding detail, the typical doorset is a leaf and a half door, which exceeds minimum user requirements.

In the common areas and classrooms all lighting, heating & cooling systems are automated. All mechanical and electrical controls are set out at a convenient height for all users.

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RIBA awards programme Process Sustainability Statement

The RIBA is committed to meeting the challenge of climate change and raising the understanding of sustainability within the profession. This document is to provide where possible quantitative and qualitative data on the sustainability credentials of buildings submitted for awards. There may be buildings where it is not possible to produce quantifiable data either because of their size, or because they do not provide climatic enclosure, in which case only the written statement needs to be included.

Gross floor Area	10,000m²	Treated floor area (eg where energy use can be measured)	10,000m²
Annual energy/CO_2 consumption for space and water heating (excluding any contributions from onsite renewables which should be noted below)		40kWhrs	x 0.19 kgCO_2/kWhr 76kgCO_2/m²
Annual energy/CO_2 consumption for electrical usage (excluding any contributions from onsite renewables which should be noted below)		84kWhrs	x 0.43 kgCO_2/kWhr 36.12kgCO_2/m²
CO_2 emissions/m² treated floor area			43.72kgCO_2/ m²

Give the basis of calculations/software / measured data used to achieve the above data.

Data above has been generated by the iSBEM software during the process of generating a BER rating for the building.

Give details of any benchmarking evaluation system that has been completed for the building(e.g. BREEAM for Offices/BREEAM for Schools/Eco Homes Rating/SAP/SBEM).

The building has been evaluated under the BER rating scheme (equivalent to the UK EPC scheme) using the SBEM method. For the purposes of comparison the building was evaluated using pre-refurbishment and post-refurbishment details.

The original building achieved a G rating taking into account its industrial use and the poor insulation values. The refurbished building, with its change of use and improved building envelope and M&E installation achieved a B1 rating.

We have also used the SBEM figures and our own energy use estimates to calculate energy use in comparison with the CIBSE TM46 good practice figures for energy consumption in university buildings.

Where appropriate provide the name of the engineer who has validated the above figures.

The above BER ratings were carried out by Barry O'Sullivan, BDP, who is a qualified Non-Domestic Energy Assessor registered with SEAI since 2008.

Give details of any renewable energy systems incorporated into the building.

The building incorporates the use of ice banks for free cooling. The ice is generated by the excess energy generated 850MW wind turbine adjacent to the building that serves the DKIT campus.

Use the remainder of this sheet to give a short statement about the approach that has been taken towards addressing issues of sustainability in the design of the project.

- The overall design for the building brought natural light and air into the building where possible.

- The insulation and air sealing techniques used are an important demonstration of what can be achieve with the fabric of existing buildings. Large, existing buildings rarely have their air leakage levels improved due to the complexity of applying constraints to an unknown structure, and the difficulty in enforcing a standard on the contractor.
- The use of an ice bank as an energy store for an on-site wind turbine is an innovative concept.