Hanover Quay Dublin

by Susan Dawson

The former docklands on the banks of the River Liffey, Dublin, is being re-generated. Much of the new development is apartment blocks; Dublin has a huge shortage of old housing stock and this, combined with an economic boom and lack of a skilled workforce, has driven house prices to a point where they are higher than those in London. To solve the labour shortage problem, many of these new apartment blocks are built with factory-made, precast concrete components. The cellular and repetitive nature of apartment block design is ideally suited to precast construction; sound reduction at party walls is easy to achieve and the solidity of precast concrete cladding recalls traditional concepts of enclosure.

Hanover Quay, designed by O'Mahony Pike Architects (OMP), is one of the largest docklands developments. Once a gasworks, the site stretches back from the Liffey quayside to the banks of the Grand Canal dock. It is a mixed development, of 13 blocks, 4 to 8 storeys high and accommodating 292 one to three-bedroom apartments (including affordable apartments) with basement car parks, a creche, retail units, a pub and restaurant. The buildings looking directly onto the river contain two lower floors of office/retail units and upper floors of apartments with large balconies, some of which are 'winter gardens' with glazed sliding screens.

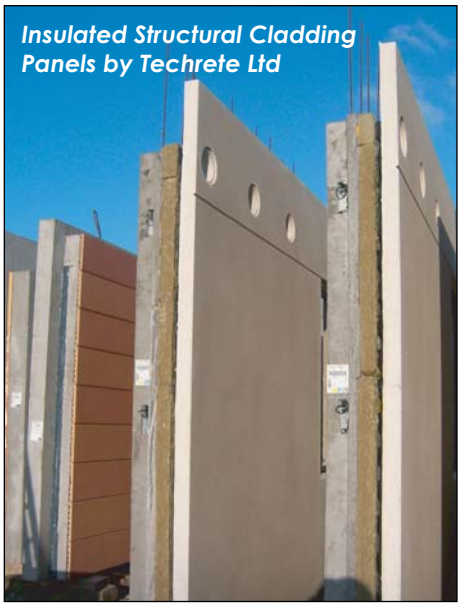
The apartment blocks are a composite structure of load-bearing precast concrete external wall panels, precast concrete internal wall panels and precast concrete floor slabs. The external structural cladding panels were supplied by Techrete while the internal structural elements, including load bearing

Precast crosswalls, balconies and wideslab and hollowcore floor units were supplied by the Concast Precast Group. In addition, Concast provided a transfer beam system at ground and first floor levels to maximise clear spans for open plan retail units.

'This must be the sixth or seventh job where we have used precast concrete panels' explains the architect. 'In Dublin where labour is scarce and time is a premium, it's definitely the way to go'.

This is the first time that OMP has used precast concrete insulated sandwich panels produced by Techrete, a manufacturer based in Ireland and the UK, with a head office at Howth, just outside Dublin. The Techrete insulated sandwich panels comprise an outer leaf, a layer of insulation and a backing leaf of plain grey concrete. They are cast as one and the insulation, being installed under controlled factory conditions, is well protected by the concrete. They also have a range of options: the outer leaf of precast concrete is available with a wide choice of stone-like finishes or facings such as stone, brick or terracotta; the panels can be integrated into the building fabric as a load-bearing structure to support either precast or cast in-situ floor slabs.

Insulated Structural Cladding Panels by Techrete Ltd



Insulated Structural Cladding Panels by Techrete Ltd

The sandwich panels have a 150mm load-bearing structural inner leaf connected to a 75mm outer leaf with stainless steel wind/shear tie connectors, with cavity former, 75mm mineral fibre insulation and vapour barrier between. The outer leaf is separated from the inner leaf by the connectors; it is free to expand and contract and is not intended to support any load.

PRECAST CONCRETE GABLE WALLS

The construction sequence of a typical gable wall:
• a row of 3m-high precast concrete insulated sandwich panels was installed by crane. (At ground floor level the load-bearing inner leaf of each panel rests on a cast in-situ concrete boot beam);
• a series of precast floor slabs (2.4m or 1,200mm wide and 8-10m span) was craned in, with edges bearing on the 150mm load-bearing inner leaf of the insulated sandwich panels. The 8mm-diameter reinforcing bars projecting from the tops of the precast panels were bent over and covered with structural screed topping to stitch the panel to the floor slab;
• a firestop and dpc were fixed in the cavity and the dpc was dressed down;
• the upper precast concrete insulated sandwich panels were craned in so each 150mm inner leaf would rest on the screed, exactly above the inner leaf. The pre-fixed, threaded bolts projecting from the inner leaf of the panel below were fixed into shoes cast in the inner leaf of the panel above; this formed the panel-to-panel connection; and
• the sequence was repeated.

Because the precast elements could be craned in, the erection sequence was speedy and an early weatherproof enclosure was created to let following trades install plasterboard wall finishes, the underfloor heating pipes in the screed and the composite timber/aluminium windows.

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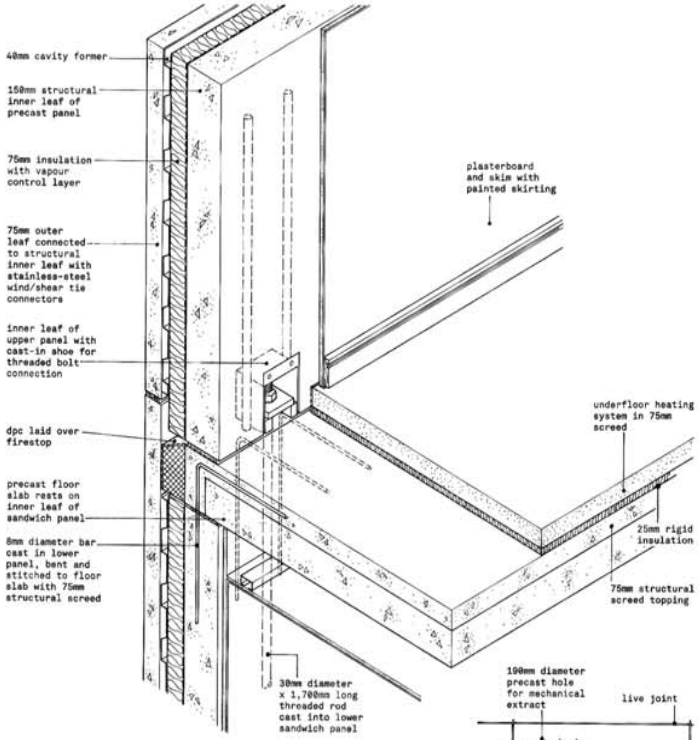
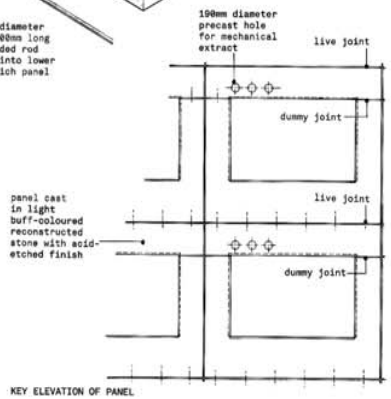
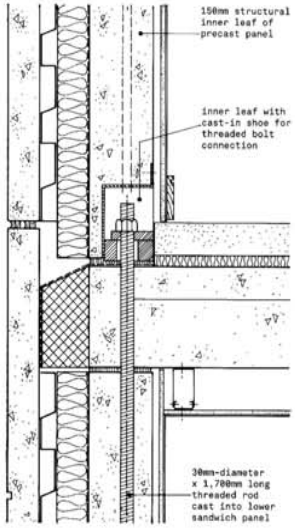


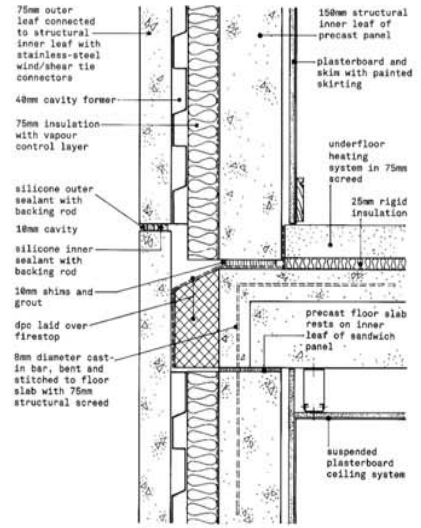
CUT-AWAY ISOMETRIC OF PANEL CONNECTIONS



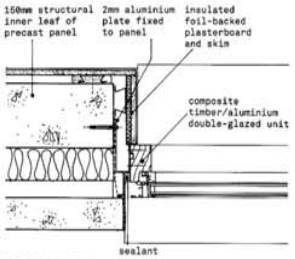
KEY ELEVATION OF PANEL



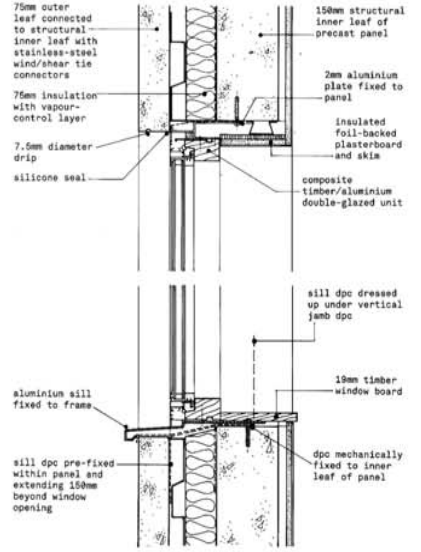
DETAIL OF PANEL-TO-PANEL CONNECTION



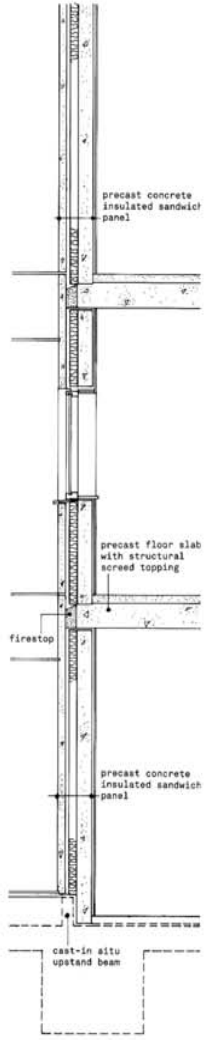
DETAIL OF PANEL-TO-FLOOR SLAB CONNECTION



DETAIL AT WINDOW JAMB



DETAIL AT WINDOW HEAD AND SILL



KEY PART-SECTION AT GABLE

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possible. Hanover Quay shows how a fully integrated structure and skin sandwich panel system, where load-bearing wall panels provide both structural support and external finish, speeds up construction and minimises on-site labour costs.

CREDITS

Developers
The Project was developed by Hanover Quay Partnership which is a joint venture between Park Developments and John Sisk & Son Ltd.

ARCHITECT
O'Mahony Pike Architects

CONTRACTOR
John Sisk and Son

CONSULTING ENGINEERS
Burke Jenkins

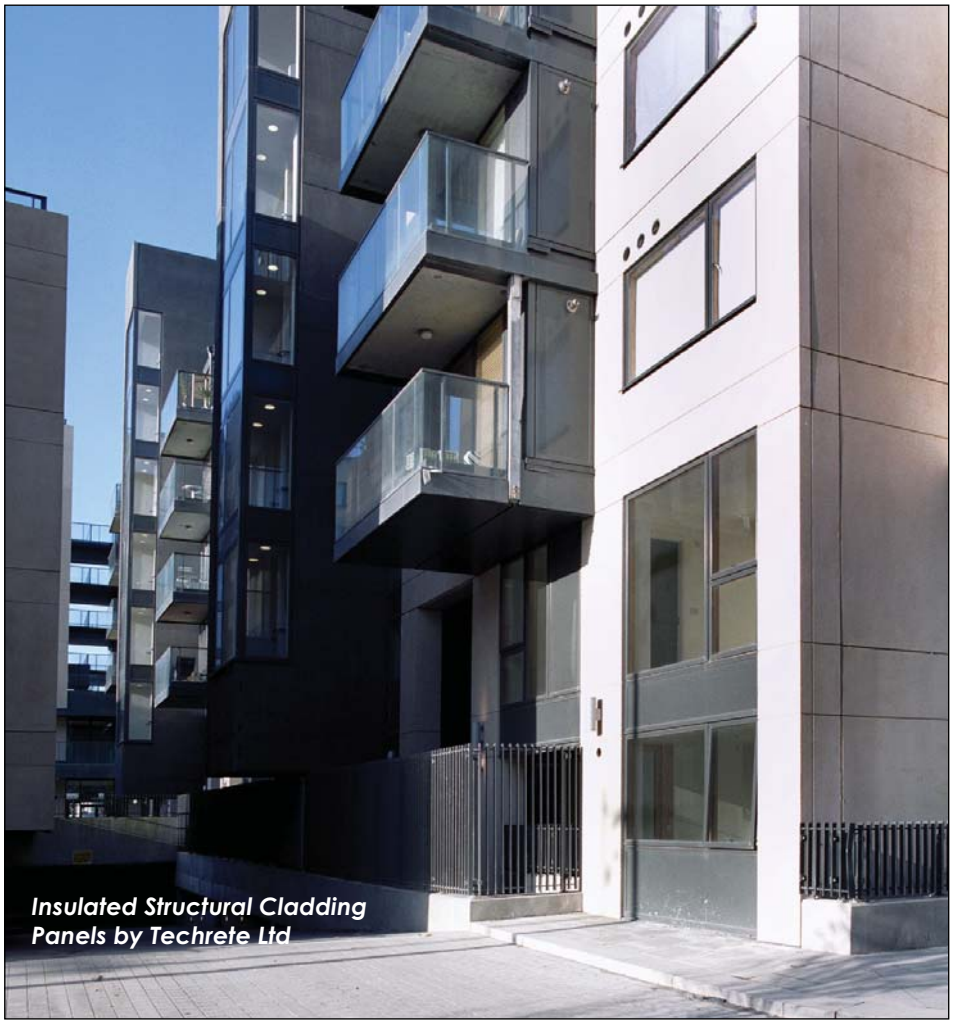
PRECAST CONCRETE
Precast concrete crosswall structural frame/floors/stairs - Concast Precast Group
Precast concrete cladding and sandwich panels – Techrete

The main cladding panels produced by Techrete are a light buff reconstructed stone with an acid-etched finish, stair core and balcony edge panels are a dark charcoal grey reconstructed stone with an acid-etched finish. The panels incorporate window openings and circular apertures to extract mechanical and electrical ventilation from the apartments. Dpc's around window openings were pre-fixed to the panel at the Techrete factory.

The outer leaf of each sandwich panel extends at the top above the floor junction to co-ordinate the live joints at the external face with finished floor level. The outer leaf is watertight, with double seals at joints. There is a vapour control layer behind the insulation. Calculations were carried out to establish that the dew point could not occur within the cavity. Each panel has a horizontal dummy joint aligning with the window head to reduce the scale of the panelled facade.

One of the architect's design requirements was to eliminate downstand beams and other visible supports on the glazed elevations. This was achieved by the use of cantilevered self-supporting balconies manufactured by Concast.

Precast Concrete Panels offer many advantages; they provide a strong, durable, energy-efficient, fire-resistant cladding system and all aspects of the production process are carried out in a factory environment, ensuring the highest quality



Insulated Structural Cladding Panels by Techrete Ltd