Facade
Newsletter of the Architectural Cladding Association
Winter 2009

It's Bath time for Techrete

SouthGate in Bath is a new £360m retail-led, mixed-use development of unrivalled size and quality. In design, Chapman Taylor had to blend the scheme with the city's beautiful and charismatic Georgian character while remaining sensitive to its World Heritage status. Built in conjunction with a state of the art transport interchange, designed by Wilkinson Eyre, it offers 54,000m² net internal floor area over a site of five hectares.

The development consists of six buildings, with public spaces, including a large central square, designed to hold community, arts and entertainment events. This open streetscape will connect the 56 prime retail units anchored by a 125,000ft² Debenhams department store, 93 apartments and eight leisure areas. In addition, 860 underground parking spaces will be created.

In early 2007, Techrete was appointed to design, manufacture and install some 19,000m² of precast architectural cladding panels to the facades of all these buildings. In the main, natural Bath Stone has been cast onto precast units but some elevations are reconstructed stone specifically developed to give the colour of Bath Stone. Mined locally, the Bath Stone was manufactured for the project, a process managed from start to finish by Techrete.

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Twelve 'perhaps' equals one certainty

says Stephen Maddalena, chairman Architectural Cladding Association

Despite the recession that the building industry is going through because of the general state of the UK economy, there continues to be demand for the high-quality architectural precast cladding panels produced by ACA members from a wide and diverse range of building sectors that perhaps surprisingly includes post credit-crunch residential and retail developments.

So, what are the drivers for this situation?

Perhaps it's to do with comprehensive service that ACA members offer. *ACA members are long-established businesses specialising in the detail design, manufacture, delivery & installation of architectural precast concrete cladding panels.*

Perhaps it's the commitment of ACA members to the building industry. *ACA members have invested significantly not only in the plant and equipment of the specialist production facilities they operate, but also in the personal development and well-being of their employees.*

Perhaps it's to do with the choice of colours and textures, finishes and facings of the cladding panels that can be provided. *By careful choice of aggregate sources, precast concrete panels can be produced in a wide range of natural colours or, with the addition of cement pigment, almost any colour. The surfaces of panels can readily be lightly etched, polished or more coarsely textured by varying the production or finishing processes. And they can be textured by casting from a wide choice of patterned mould liners during casting. Precast panels may also include facings of natural limestones, sandstones, slates and granites. Incidentally, the off-site pre-assembly of such facings into large panels will significantly increase the rate at which a building can be clad relative to more traditional construction methods and typically dispenses with the need for an external scaffold.*

Perhaps it's because of the shapes that can be produced. *The inherent mouldability of concrete before it sets enables complex shapes and configurations to be achieved.*

Perhaps it's to do with the sizes that can be produced. *The economics of precast cladding construction generally favour the use of large panels, typically storey-height or grid-width units. Their size is usually limited only by road transport constraints or the lifting capacity of site cranage for off-loading and installation. The use of storey-height spanning between floor slabs or grid-width units spanning between structural columns eliminates the need for any secondary backings for intermediate support or restraint. The use of grid-width panels supported alongside columns eliminates the mid-span loading of the floor slabs.*

Perhaps it's down to the compatibility of precast cladding. *Precast concrete cladding is compatible with steel, in-situ concrete, precast concrete and hybrid structural frames. It can also be designed to harmonise with, or complement, other building materials*

Perhaps it's to do with quality control and proven British Standards. *Members operate audited quality management systems in compliance with BS EN ISO 9001:2000.*

Perhaps it's to do with sustainability. *As explained in depth in the ACA's recent publication "Sustainability and precast concrete cladding", precast concrete cladding is a resilient, energy-efficient, low-maintenance, attractive and durable construction material. Its manufacture takes place in low-energy, resource-efficient and low-waste production facilities, managed and staffed by a skilled workforce.*

Perhaps it's the properties of concrete. *The dense high-quality concrete used provides an inherently robust and durable cladding material. Moreover, it is non-combustible and fire-resistant. Precast concrete panels can be designed to provide a high degree of energy efficiency for the buildings they enclose. The inherent thermal mass of concrete can serve to reduce peak heating and cooling loads. Precast cladding units can incorporate insulation as a backing or as the core within a sandwich panel to achieve required U-values. The inherent density of precast concrete provided efficient and economic sound control.*

Perhaps it's because of the benefits of just-in-time delivery. *Deliveries are made on a just-in-time basis to suit progress, thereby dispensing with the need for double-handling or temporary site storage.*

Perhaps it's thanks to safe methods of working. *Panels are installed by teams of experienced and qualified erectors in accordance with project-specific method statements and risk assessments.*

Perhaps it's to do with efficient fixing methods. *Where unobstructed access to panel fixing locations is available from the structural frame, safe methods of efficient fixing can be developed that dispense with the need for an external scaffold.*

In reality, it's probably a combination of all these factors that results in the direct and incidental benefits of precast cladding construction being recognised as providing optimum value for new commercial and civic offices, school and hospital projects, and retail, residential and leisure developments.

Trent is all white for Liverpool's first Hilton

Sparkling white reconstructed stone cladding from Trent Concrete, specially selected for its exceptional brilliance and clean aesthetics, ensured Liverpool's first Hilton Hotel will become a landmark building for the city. As part of dramatic £920m scheme on the historic Mersey waterfront, the 10-storey state-of-the-art hotel is one of the largest and most striking features of Grosvenor's massive Liverpool One mixed-use development.

Having worked with Trent on other high-profile projects, Aedas Architects approached the company to design the eye-catching concrete cladding to complement the Hilton's sleek, modern look. Under the £2.5m contract, Trent manufactured more than 6500m^2 of reconstructed white Portland Stone cladding, with a whiter-than-white Spanish Dolomite finish giving the building added sparkle. Main wall panels are in two-storey (7m) heights, with a mullion effect used vertically to visually stretch the building. Fascia beams cross the panels horizontally every second storey and an impressive white colonnade greets visitors approaching the hotel's luxurious lobby.

Components were delivered on a just-in-time basis and fixed to the structure directly from the trailer, avoiding the need for scaffolding and associated site preliminaries. On the gable ends of the hotel's side elevations, structural columns and beams from Trent give the building added stability, proving precast can offer much more than simply breathtaking aesthetics.

With a site time of only 21 weeks, Trent produced all the cladding for the project using its innovative off-site methods. The 216-room, crescent-shaped hotel, designed by Michael Squires and Aedas Architects, is in Canning Place, opposite the historic Albert Dock.

Said Trent's managing director David Walker "The Liverpool Hilton is a perfect demonstration of the efficiency and versatility that precast concrete can bring to landmark developments."

Decomo cladding takes the load

Decomo's work for contractor Heijmerink Bouw on the Berkenstede Apartment Tower in the Dutch town of Diemen is an outstanding example of the use of architectural concrete and how this can be combined with structural, logistical, economic and environmental considerations to provide a practicably constructed, high-performance and low-maintenance building.

The 13 storeys, on a 23 × 26m footprint, are clad on all four elevations with light beige grit-blasted panels. Some 150 matching precast balconies were also installed around the building and positioned to provide several diagonal relief features. The 'trafficked' horizontal surfaces of the balconies incorporate a profiled chequer pattern, created using rubber mould liners. As well as being a further aesthetic detail, this also provided an anti-slip finish.

The original design intent had anticipated that the architectural concrete panels would serve only as decorative, non-structural external cladding. Decomo's early involvement on the project allowed enough time for its expertise to be fully used and, accordingly, it soon became apparent that a far better and more efficient solution could be adopted.

With the exception of the ground floor, all levels were formed using an arrangement of stacked sandwich panels. An in-situ load-bearing wall was cast at ground-floor level and all loads from the panels above were transferred down to this bearing point. This in-situ wall was clad with 120mm-thick architectural concrete panels.

Sandwich panels were 490mm thick, consisting of a 100mm architectural/non-structural concrete outer 'leaf', 140mm of PUR Rigid Board insulation and a 250mm inner structural concrete 'leaf'. They incorporated cast-in electrical conduits and light/socket boxes along with water discharge pipes positioned in the insulation zone between the inner and outer 'leaves'.

In-situ concrete floors were poured over an 'Omnia' type permanent formwork decking system. The decking rests within pockets formed in the structural inner 'leaf' of the sandwich panels and the in-situ concrete was 'stitched' into these pockets using a combination of loose and cast-in reinforcement and couplers. At each level, the sandwich panels were erected first, after which the decking was placed and, finally, the in-situ concrete floor poured. Total installation time per level was just two weeks. With this construction method, an independent structural frame to support the cladding and floors was not needed and no external scaffold was required, as the preceding floor slab provided an ideal working platform for installing the next level of panels, with many of the services already incorporated into the panels. A further benefit was the facility for 'just in time' delivery of the panels.

Among the many myths relating to the use of concrete and concrete products, particularly at present, are those surrounding its environmental credentials. The reality is that precast concrete cladding is durable and robust and will typically exceed the expectations of a 60+ year design life with only minimal maintenance requirements. It provides excellent thermal, acoustic and fire resistance properties. At the end of its service life it can be deconstructed and is wholly recyclable. Decomo produces its panels in a purpose-built facility that provides a wealth of employment opportunities for the local community, and the company is committed to ongoing investment to improve efficiency and reduce waste. Recent measures and innovations have included the installation of water recycling plants, collection chambers to allow the re-use of grit in the finishing process, the use of self-compacting concrete to reduce the need for mechanical vibration, the use of recycled aggregates and steel and low-emission delivery vehicles.

For more information, refer to the Architectural Cladding Association's publication ***'Sustainability and precast concrete cladding'***.

Temple Quay Central, Bristol

Two office projects but very different designs

The Rolfe Judd Architects' designed office development at 8–13 Lime Street is a nine-storey building at the heart of the City of London. Being within the Leadenhall Market conservation area, there was a requirement for it to be predominantly constructed using natural Portland Stone. However, in practice, site location and programme constraints could not accommodate it being built traditionally with handset stonework. With no opportunities for compromise, a suitable alternative method of construction needed to be selected.

8-13 Lime Street, London

For the main Lime Street and Lloyd's Building elevations, this was achieved using stone-faced precast concrete units consisting of 50mm-thick natural Portland stone, quarried and dimensioned by The Stone Firms at Portland, with a 150mm backing of reinforced concrete. For the Beehive Passage elevation, Rolfe Judd's design showed brickwork that was similarly developed into brick-faced precast concrete units to facilitate construction. The detail design of the stone-faced and brick-faced panels was then further developed to enable window apertures within the typically storey-height panels to be framed and glazed before despatch from The Marble Mosaic Company's precasting facility at Weston-super-Mare.

Because of the site's restricted location, cladding panels were delivered on a just-in-time basis for direct off-loading and hoisting to their final locations. They were then fixed without the need for an external scaffold. By effectively pre-assembling the stonework and brickwork requirement of some 1400m^2 into 300 panels, the building was able to be clad in 12 weeks with shared use of the main contractor's tower crane.

By contrast, Temple Quarter around Temple Meads station in Bristol is a 115-acre regeneration project that is becoming the new heart of this city's business centre as it continues to attract major financial, legal and government organisations. The latest phase is Temple Quay Central which includes new offices for Burges Salmon who provide legal advice to national and international clients. The 29,000m^2 ND3 building designed by Stride Treglown Architects is being constructed by Balfour Beatty. Like Lime Street, and for many of the same reasons including high-quality appearance with inherent robustness and durability, architectural precast cladding panels also feature in its construction. Totalling some 3000m^2 in 400 typically storey-height units, its precast cladding panels have however been produced with a reconstructed stone finish instead of natural stone or brick facings. Cast by The Marble Mosaic Company using a grade 45 concrete mix of Polar White Dolomite aggregate and white cement, the exposed surfaces have a lightly textured surface to produce a sparkling white appearance. While it is typical for precast cladding panels to be individually supported by a building's structural frame, the detail design of the precast cladding panels for ND3 was developed to enable them to be stacked up to seven storeys high to facilitate fixing to stair core walls.

Although the locations and design requirements of the Lime Street and Temple Quay Central projects were very different – one a particularly restricted site surrounded by an established international business centre and the other a waterfront location that is being progressively regenerated – both exemplify the inherent versatility and practicality of architectural precast cladding construction.

New ACA sustainability publication outlines clear case for choosing precast cladding

With the idea of sustainability now embedded in the construction industry, designers and clients need access to the environmental credentials of the products they specify. A new publication from the Architectural Cladding Association (ACA) makes this sometimes difficult subject more understandable and accessible by explaining the sustainability benefits of precast concrete cladding.

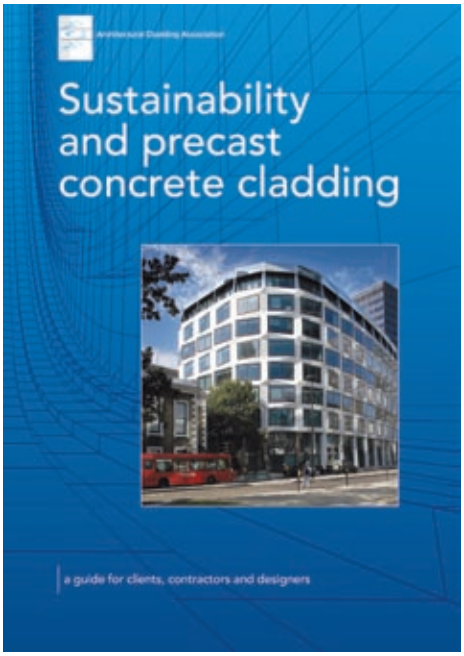
The guide ***Sustainability and precast concrete cladding,*** launched at the British Precast Conference in May 2009, has been welcomed throughout the industry. It sets out clearly and in detail the important benefits of precast cladding, with in-depth information on the precast manufacturing process and what ACA member companies are doing to improve the sustainability of their products even further.

The guide is divided into five main sections:

- Sustainable performance in use
- Planning for a sustainable project
- Designing responsibly
- Sustainable manufacture
- Safe, sustainable construction

Key issues such as energy efficiency, zero carbon construction and responsible sourcing are clarified, along with the ways that precast factories save energy, reduce water consumption and make the most of automated manufacturing processes to optimise the use of materials and prevent waste.

Equally important is that precast cladding is a long-lasting product whose thermal mass, acoustic properties and resilience continue to provide 'payback' to the client, and all within an architecturally attractive building. The guide ends by saying "Precast concrete cladding has significant sustainability benefits to offer" and the ACA looks forward to seeing more precast cladding being used now that all the facts are at the specifier's fingertips.



You can download a copy of the ACA's publication from www.architectural-cladding-association.org.uk or email aca@britishprecast.org for a paper copy.

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The company worked in close association with main contractor Sir Robert McAlpine and architect Chapman Taylor to ensure every detail was co-ordinated and properly interpreted – no mean achievement since the whole development involves some 1850 precast panels. The whole aim was to produce a development with a traditional solid look and feel about it: for example, window reveal and building corner details, which often betray panelised construction because of visible seams, were carefully designed to give the impression of solid stone. To disguise panel seams on the facades, neo-classical devices such as string courses, columns and pilasters are used so that the panels are not evident.

The units for the Bath development were produced in Techrete's Brigg factory, installed under the guidance of in-house project management and the project is now due to open to the public in three phases – the first this autumn, the second in Spring 2010 and the third later that same year.

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