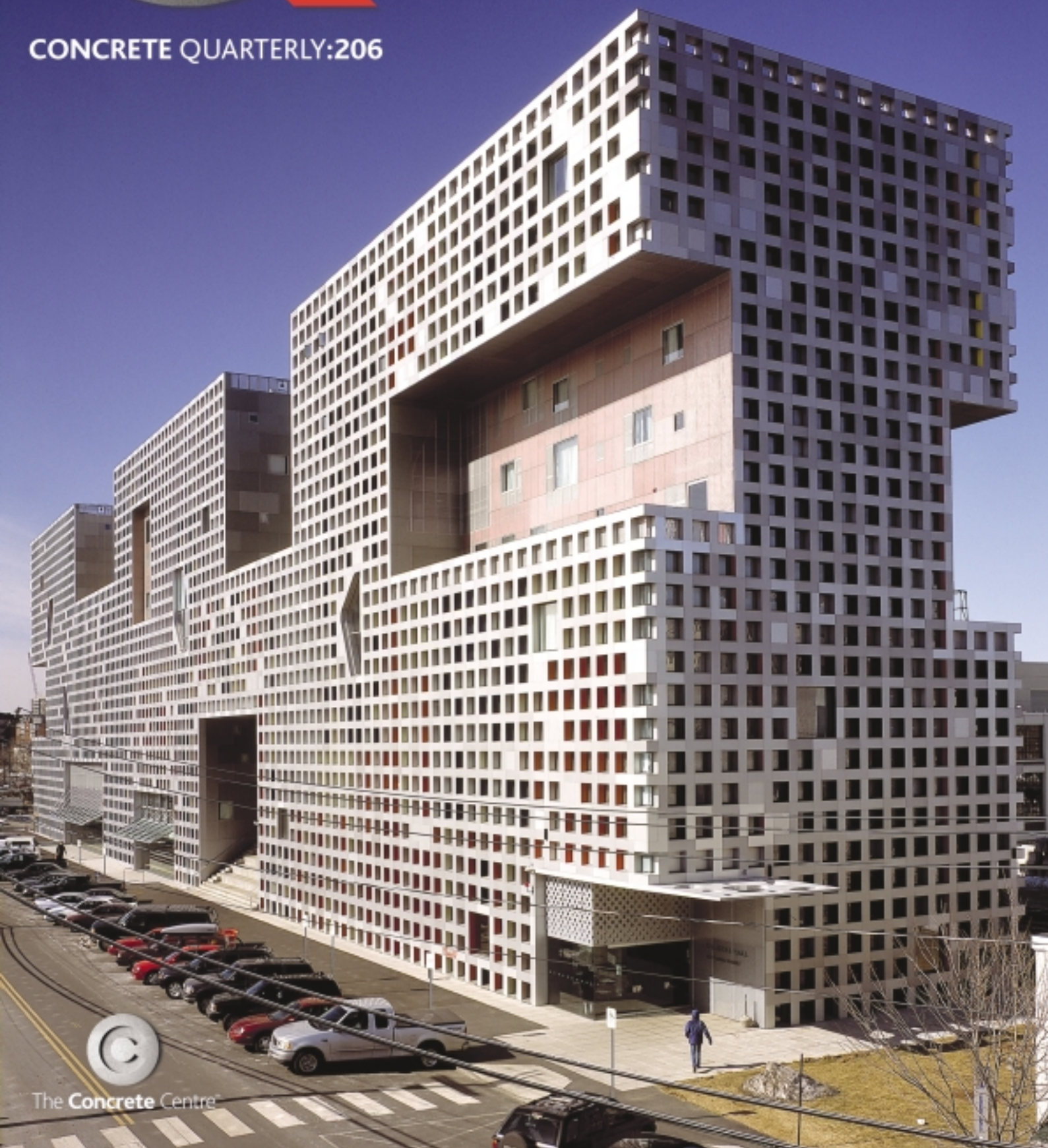




CONCRETE QUARTERLY:206



The Concrete Centre



At the recent British Construction Industry Awards, often described as the 'Oscars' of the construction industry, concrete had both starring

and supporting roles. It was celebrated not only for its design and structural innovation but also for its heavyweight performance.

This performance was appreciated during a summer that gave us a hot and sticky insight into the predicted future impact of global warming and provided a loud wake-up call that many offices, particularly those of lightweight construction, are unable to cope with high temperatures.

Concrete, with its inherent thermal efficiency, provides a thermal sink that stores and then later releases heat. In this way a building structure can be used to moderate internal temperatures and so reduce reliance on air conditioning systems. There is a growing number of commercial buildings where the fabric energy storage (FES) ability of concrete has been put to good use. Unwanted heat is absorbed by the building and then released as the building is cooled by night-time ventilation and subsidiary partial air conditioning when needed. In this way, the peak internal temperature of a building can be reduced by up to 20 per cent.

There is no additional cost associated with using exposed concrete. In fact doing so can often provide significant cost savings. Exposure of the concrete floor soffits removes the need to install suspended ceilings. Also, exposed concrete columns do not need additional fire protection cover. These savings can be considerable, up to 5 per cent of total construction. Not having to install suspended ceilings can reduce a building's height by 10-15 per cent.

All this combines to offer a performance of visual honesty and real structural meaning. A performance that was fully appreciated and applauded at this year's industry 'Oscars'.

**Ian Cox, director, The Concrete Centre**

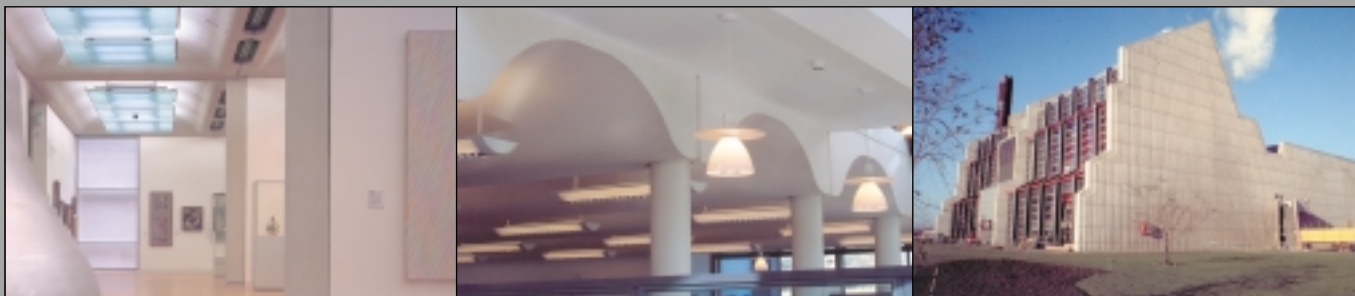
## ROUND-UP



JERI HAYGAN

### Room for learning

When Ellis Williams turned Gateshead's old Baltic flour mills into the Baltic Centre for Contemporary Art, it stripped out the working heart, the old silos. In Oslo, local architect HRTB has taken the opposite approach, preserving the geometry of a silo and finding a new use for it. A grain silo, constructed in 1953, was seen as a pioneer in the use of travelling formwork and therefore the decision was taken to keep it and convert it into student flats. The 50m-high structure is three 'tubes' deep, and access corridors run along the central tubes. At lower level there are single-room apartments, each occupying a tube and a bit, with bathrooms tucked into the interstices between the tubes. Higher up the building the central tube has been removed, making it possible to create larger, two bedroom apartments. In total there are 226 units on 18 levels. Construction involved casting more than 1,500 reinforced concrete floors and cutting about 1,000 window openings in the external walls. Rooms are more spacious than the standard student accommodation and there is specially designed built-in furniture that sits against the curved walls. Colour-coding of different floors should help residents remember which level they are on in what is, inescapably, a highly repetitive building.



### Hopkins takes the prize

Michael Hopkins and Partners was the overall winner in the Concrete Society's 2003 Awards, with its Manchester Art Gallery (*above left*) which joins two existing buildings together into a seamless whole. The judges said: 'The new galleries exhibit exposed precast column and roof soffits with an outstanding quality of finish. The vaulted roofs are exquisite in shape and detail and the colour of the concrete chosen to achieve the necessary light level has worked very successfully. The quality and finish of all the concrete is exceptionally good.'

The SAS Institute in Upper Wittington, Bucks (*centre*), designed by Brocklehurst Architects, won the buildings category. Judges praised the concrete finish of the atrium and the exposed ceiling.

The mature structures category was won by the Carlsberg-Tetley Brewery in Northampton (*right*), designed by Danish architect Knud Munk and opened in 1971. The building, which has already exceeded its design life of 30 years, won praise for its quality and finish. 'The walls appear as fresh as when constructed,' the judges said, noting that 'minimal maintenance has been required and regular cleaning, using low-pressure water, has preserved the appearance of the structure.'

### Student design

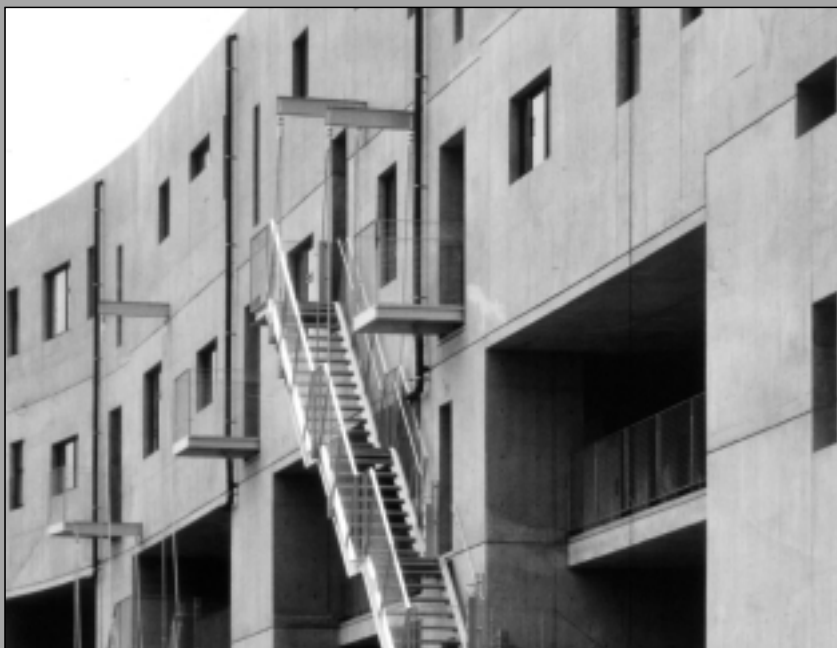
A new international concrete design competition for students of architecture and design in eight European countries has been launched by The Concrete Centre in association with the British Cement Association.

Under the theme of 'Robustness', the competition is open to all registered students of schools of art, design, architecture and landscape. Participating countries are Belgium, Portugal, the Netherlands, Ireland, Germany, Spain, France and the UK. Students are invited to make project proposals that investigate the

innovative use of concrete in architecture and design embracing the theme of robustness.

The competition is in two stages, a national and then an international competition open to the national winners. All national winners will be invited to a five-day international design workshop to be held in the Netherlands, with all costs met by The Concrete Centre.

For further details call Rosemary Tobutt on 0 700 4 822 822, email [rtobutt@concretecentre.com](mailto:rtobutt@concretecentre.com) or visit the competition website at [www.concretedesigncompetition.com](http://www.concretedesigncompetition.com)



### All about Holl

Steven Holl's Simmons Hall (see page 4 of this Concrete Quarterly), appears on the cover of a new collection of his work, published by Thames & Hudson. Apparently the only book available to show Holl's work from the very start of his career to the present day, it is a handsome and affordable collection of his projects, both built and unbuilt. Concrete enthusiasts can admire work such as the Fukuoka Housing in Japan and the chapel of Saint Ignatius at Seattle University. The description of the latter includes some interesting information on how the concrete panels were assembled.

Unfortunately, this is the exception. Too much of the text seems to have come directly from Holl's website, without the intervention of anyone concerned with such basic skills as grammar and good English. But with good photography and drawings, the book is still worth having.

*Steven Holl, edited and with an introduction by Francesco Garofalo. Thames & Hudson. £15.95*

# Holl picks holes in masonry tradition

Steven Holl's Simmons Hall dormitory at MIT marks a return to Boston's masonry tradition, but with a radical approach that both celebrates and denies the material properties of the concrete

By William Menking. Photographs by Paul Warchol

There is no city in the United States that has as many distinguished concrete buildings as the Boston suburb of Cambridge: Jose Luis Sert's Peabody Terrace students' dormitory, John Andrews' Gund Hall, James Stirling's Fogg Museum extension, not to mention Le Corbusier's Carpenter Center for the Visual Arts and scores of lesser structures by Sert, Cambridge Associates, Walter Gropius and The Architects Collaborative.

In fact, Boston is a masonry city. While the majority of the region's housing stock is wood construction, its most significant commercial and industrial buildings are red brick and, increasingly in the 20th century, concrete. A masonry tour would begin at its extraordinary waterfront granite wharf buildings and nearby Faneuil Hall and Quincy Market, and proceed to Charles Bullfinch's Massachusetts State Capital and the nearby blocks of Beacon Hill brick homes. The industrial quarter of the city has scores of outstanding 19th-century Victorian red-brick warehouses and factories. It is also the home of H H Richardson's brownstone Trinity church and brick Sever Hall at Harvard, and Kallman and McKinnell's Brutalist concrete

megastructure, the Boston City Government Center.

Sadly, recent masonry construction in the region seems only to consist of scores of ersatz Post-Modern commercial towers in Boston's city centre, Cambridge's Kendall Square and the hi-tech research corridor known as Route 128. These buildings aim for instant respectability and, given Boston's masonry tradition, these mostly steel high rises are faced in brick and stone in order to appear as if they have been there forever. It has been many years since Cambridge has seen a significant contemporary masonry building. However, a new concrete structure has recently appeared in the city that intends to stand out from this depressing recent tradition. But how does it compare to other splendid masonry structures in Cambridge?

The building – Simmons Hall by the New York architect Steven Holl – is a student dormitory at Massachusetts Institute of Technology (MIT), just a few blocks from masonry landmarks The Baker House Dorm by Alvar Aalto and Eero Saarinen's cylindrical chapel. It is a long narrow ocean liner of a building that seems moored between a major traffic corridor with small industrial buildings and railroad

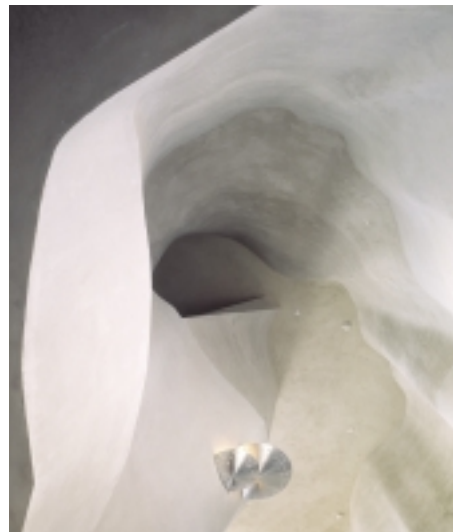
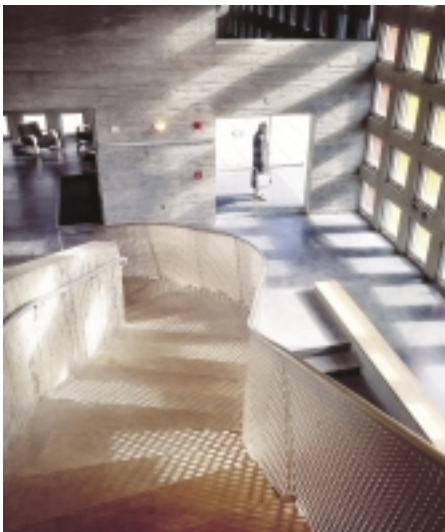
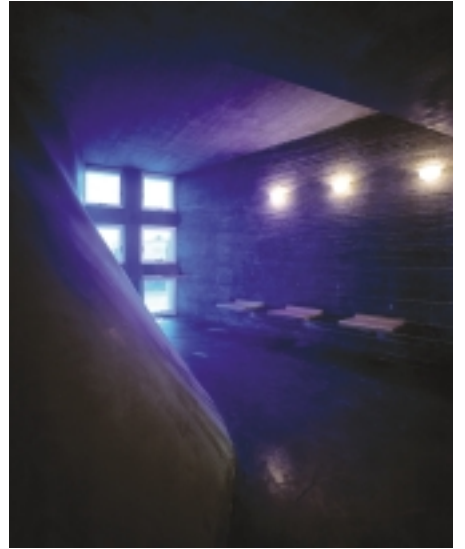
tracks. In fact, the location is a rapidly gentrifying industrial area and Holl's building is meant to address the area's future as a district of residential towers.

The dormitory's massing resembles two *Pac-Man* figures set head to head, or irregular Lego or puzzle pieces. Its cut-out shape relieves the 116m length of the structure, allows it to have a series of open terraces and creates inserts for its major public sections like the entrance and street-side cafeteria. This shape, according to Holl, is 'porous and permeable' and primarily meant to offer view corridors through the structure to the buildings behind it and to the distant Boston skyline and Charles River. However, this sounds like hyperbole to justify and support its unorthodox urban profile. It is still, after all, a large building, so it is unclear how residents behind the structure will be able to see through its form to the distant skyline and river. But porosity and permeability and allusions to biology seem to be Holl's preferred intellectual rationale for the dorm and he strives for it at every design turn.

The exterior of Simmons Hall resembles a concrete honeycomb or, as I was told by an MIT student, a 'computer punch card'

Top row, left to right: holes on holes; large and small openings break up the facade; meditation space in the basement. Middle row, left to right: looking down into the foyer; study bedroom with restricted views out; looking up into one of the voids. Bottom row, left to right: colours on the facade follow stress lines; sculptural forms intrude in a corridor; the dining hall

(this building seems to lend itself to unending metaphors and similes) with 5,538 square cut-outs that function less as windows than as light openings on its perimeter walls. These 58cm square cut-outs make the building, if viewed from a distance, appear 30 floors in height. However, each floor has three cut-outs from floor to ceiling and the building is only 10 storeys in height. It is scaleless in the manner of Aldo Rossi's brilliant red mausoleum in Modena that rises like a skyscraper from a distance, but has only four storeys. Like the Modena toy tower, Simmons' wall is thick masonry with deep incised cut-outs that function as light portals. In Rossi's structure, the openings are not glazed but open portals, and are meant to make the mausoleum appear tall and bring light into a contemplative volume. But Simmons is a residence and in its public gathering spaces the glazed openings provide a sense of protection and a dramatic wall of regularly patterned light. But looking out of the portals seems unnatural and requires one to walk up to them purposefully to peer out. The small student dormitory rooms each have six portals, ie three cut-outs high and three across. Perhaps MIT stu-



dents are too engrossed in their studies to peer out of a window, but I cannot imagine that these openings are popular with those who inhabit the building.

The strength of Simmons Hall as architecture is the manner in which the concrete allows it to become a carved irregular structure with tactile rough-walled interior spaces. However, Holl seems unwilling to allow the concrete to carry the day and constantly tones down the material to soften its rough and direct surfaces.

The exterior wall, for example, is an innovative precast exoskeleton of concrete panels, but is clad in soft-tone sanded aluminum. Many of the square cut-outs have yellow, red and blue paint applied to their jambs, and this creates waves of primary colours spread across the facade if viewed from an oblique angle on the street. This patterning is taken directly from structural engineer Guy Nordenson's stress drawings for Simmons, which Holl simply applies to the building. It is a clever idea to show the structural stresses, but it is also another way in which the building's concrete is tempered – or even covered up – with another material.

The tradition of fearing concrete's hard-edged directness goes back to at least 1902 and Auguste Perret's rue Franklin apartments, which are faced with terracotta. Le Corbusier also often added colour to his concrete structures. Simmons succeeds when Holl allows the material to be pure masonry construction. Its entranceway, reception space, undulating staircase and central ground-floor passageway all have walls of beautifully exposed concrete, with textured surfaces left by the concrete's wooden forms. It is inexplicable that, with all the fine concrete structures in the area, Holl nevertheless seems to have thought that concrete is too harsh a material.

The MIT building's attempts to mediate concrete's materiality have much in common with Modern Scandinavian architecture's attempt to humanise the style of the 'Neue Sachlichkeit'. The suspended ceilings in the building, for example, are panels of birch plywood with Holl's obligatory small punctured 'porous' holes.

Furthermore, the most successful spaces are those that could only happen with concrete as a

which look for all the world like gaps in Swiss cheese. They are the building's most dramatic spaces and give what would be a fairly standard dormitory a bit of fashionable 'blob' architectural drama and irregular spatial form.

The building's formal entranceway is one of Simmons' most dramatic and certainly welcoming spaces. A wide opening covers dramatic yet gentle steps from the sidewalk through to the concrete lobby and then to a

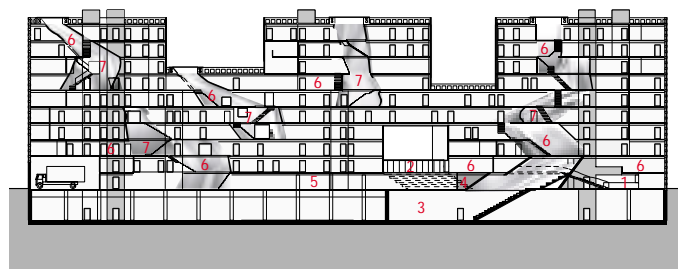
building of great architectural ambition and intention but failed thought and planning.

The beautiful wood patterns left by the forms are, I was told, something that did not come easily for the company that constructed the building. Despite Boston's masonry and Modernist concrete tradition, the company could not find enough experts in concrete formwork to complete the structure. It had to bring older form makers out of retirement to work on the structure, but also, one hopes, to train another generation of builders.

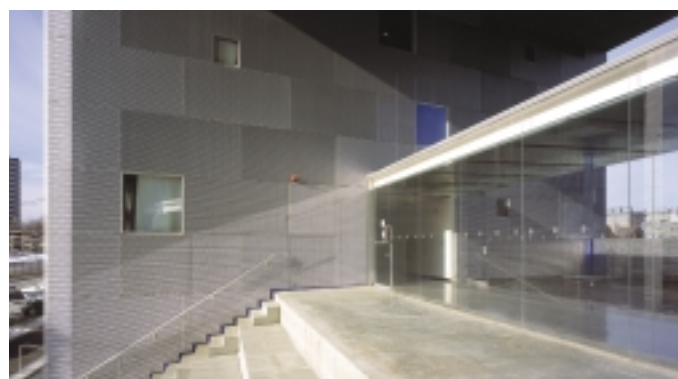
The building, it should be noted, is advertised as being 'naturally' air conditioned because its heavy concrete walls act as a brise-soleil. However, I visited in August and, while it was not unbearably hot, the brise-soleil did little to dampen New England's legendary humidity. Fortunately, there are few students in the building in summer when heat and humidity envelop the city.

Simmons Hall is a serious piece of architecture that is refreshing in the somewhat stuffy atmosphere of recent academic buildings and the blocks of Post-Modern dreck that scar all American cities.

Furthermore, the building's unstated but obvious references to Corb's Unités mean that Holl consciously attempts to give the structure all the requirements of a small city. Students whose lives are defined by lack of time and money can find all manner of urban amenities within the building: compelling communal space, public art, seductive common spaces, a sidewalk cafeteria, a meditation room and real architecture. But in the end, the building tries a little too hard to be serious architecture. One wishes Simmons Hall would be more straightforward and give us fewer biological allusions and unusable light portals. People want windows!



KEY		
1 lobby	5 dining hall	9 terrace
2 glazed passage	6 study	10 visiting scholar
3 multiuse/auditorium	7 group lounge	
4 meditation	8 graduate resident	



Gentle steps lead to a splendid but rarely used entrance

material. The most impressive are the six multi-storey group lounges that slice up, across and through, the standard residential floors. These flowing spaces, made of thin poured concrete, suggest Bilbao crossed with la Tourette and cut diagonally through the building's walls and floors, often spilling into the hallways. They are expressed on the facade as large irregular openings that Holl labels 'amoebic', but

glazed terrace, with a fantastic Dan Graham reflective glass pavilion Yin Yang. Unfortunately, this is not really the true entrance (which is on the building's corner), and is used only for formal occasions and the steps for lounging on warm days. It suggests a serious lack of planning and thought on Holl's part if the major entrance is used only as seating in the spring. It is perhaps the most apt metaphor for this

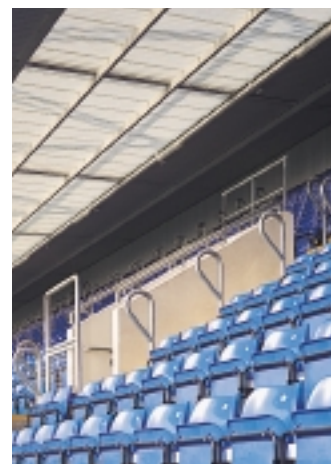


Form-makers were brought out of retirement to achieve the concrete finishes

# Ipswich Town on the ball with new stand

Precast concrete was chosen as the only material that could realise the design for a new football stand to a very tight timescale and within the physical constraints of a difficult site

By Susan Dawson. Photographs by Nick Hufton



Ipswich Town Football Club's new North Stand at its Portman Road ground seats more than 7,000 fans – 4,000 more than its predecessor – with vastly improved facilities including a club superstore, bar, WCs, lifts and staircases to provide easy access for all, including wheelchair users.

Since the publication of the Taylor Report on ground safety following the Hillsborough tragedy, many new football stands have been built, mostly with steel structural frames. Ipswich's North Stand is different. The lower tier and main frame are of precast concrete; the frame supports the upper tiers, concourse and roof in a truly hybrid concrete structure. Precast concrete was chosen as the only material that could realise the design within the physical constraints of the site and the very short construction time available.

The site was a critical factor: like many football grounds set in built-up areas, it is hemmed in by an existing infrastructure of roads and buildings – there was absolutely no space to extend. A basement was not an option – the site is on low-lying ground with a high water table.

The football season was another factor. 'We started detail

design at the end of January [2001],' explains Mike Crook of architect HOK Sport, 'and we had to move on to site at the end of May so that the lower tier would be ready early in the next season.' (The club was in the Premiership at the time and the stand needed to be filled to capacity for every game).

## Change of tactics

To achieve this, it was clear that the team would have to re-assess design and procurement procedures radically. Precast concrete offered the advantages of shorter erection time, as the number of components is minimised; use of off-site fabrication; use of applied finishes; inherent structural fire resistance; and ease of erection.

The new stand comprises two tiers sheltered by a projecting steel roof structure and 'book-ended' at each side by a three-storey tower of bar and ancillary accommodation.

Instead of the more usual tier structure – a steel frame supporting interlocking concrete terrace units – the lower tier is formed of a series of structural stepped precast concrete 'staircase' units – like a series of staircases set side by side. They combine the functions of the conventional steel frame/precast terrace unit to

form a slim concrete slab without downstand beams, with self-finished and fire-resisting precast soffits. This approach maximised a critical dimension: the floor-to-ceiling height of the lower concourse, which ran below the tier (the position of the ground-floor slab was predetermined – it had to lie above notional flood level).

The lower precast concrete tier units rise to rest at their ends on beams spanning between a series of 14 massive precast-concrete shear walls at the rear of the stand. The shear walls – a dominant element on the rear facade where the main entrance is located – were the solution to the problem of how to increase seating capacity within the confines of the existing road layout.

Each shear wall is 3m wide, more than 11m high and is generally spaced at 7.6m centres. The shear walls support the upper concourse – a steel and hollow-core precast floor plank structure – which extends beyond them on both sides, including a 3.6m cantilever over the adjacent road. Above the upper concourse, the shear walls are sloped at the tops to support the steel raker beams of the upper tier; they also provide stiffness to the upper tier against overturning

forces, allowing it to cantilever nearly 4m out over the road at its highest point.

The road layout was so critical that the shear walls had to be notched back from ground to first-floor level to stand at the edge of the public pavement. Precast-concrete access staircases are set between pairs of shear walls, rising to give access to the upper concourse and to both lower and upper tiers.

## 'Open-book' success

For HOK Sport and structural engineer Jan Bobrowski and Partners, quality of manufacture and tolerance control were critical to achieving the fast construction programme. It was decided that supply and erection of the entire structure should form one contractor package. This was ultimately awarded to ABC Structures, with Trent Concrete as the precast-concrete supplier. The package was negotiated on an 'open-book' basis to allow the earliest possible specialist input into the design process. This gave great flexibility – client and architect could select concrete types and finishes while the price was being negotiated.

The result: every precast unit fitted on site perfectly and the lower tier was completed in time for all the big matches.



#### LEARNING FROM THE IPSWICH EXPERIENCE

The North Stand at Ipswich Town Football Club was selected as a project in the series of Knowledge Capture workshops on the basis that it represented an interesting case study in terms of both process and product, *writes Dr Jacqueline Glass*, lecturer in architectural engineering at the Department of Civil and Building Engineering, Loughborough University.

A few specific findings from this workshop are worth repeating, with a view to drawing out lessons for best

practice guidance:

- Compression of the design phase – an intensive period of activity (just a few weeks) on detailed design effectively defined what the structure would look like.

- The use of a lead frame contractor (LFC) as a good method to procure hybrid concrete/steel components, rather than relying on the main contractor.

- Trust – a closely integrated team that trusted in the expertise and experience of its various members.

- The use of 'open-book' negotiation, rather than competitive tendering to achieve the best value for the club.

- A 'one-stop' client, combined with unambiguous instructions from the architects, facilitated quick, high-quality decision making.

The building was also used as a case study for a Partners in Innovation project, managed by The Concrete Centre, entitled 'Best Practice Guidance for Hybrid Concrete Construction'.

#### CREDITS

##### ARCHITECT

HOK Sport + Venue + Event: Rod Sheard, Mike Crook, Bill Augustyn, Christopher Lee, Belinda Draper

##### STRUCTURAL ENGINEER

Jan Bobrowski and Partners: John Cutlack

##### QUANTITY SURVEYOR

Gill Associates

##### MAIN CONTRACTOR

Jackson Building

##### SUPERSTRUCTURE SUBCONTRACTOR

Aren Building Concepts (ABC Structures)

##### PRECAST CONCRETE

Trent Concrete, Tarmac Topfloor

##### SERVICES

Hannan Associates

##### PLANNING SUPERVISOR

MLM

##### ASSOCIATE ARCHITECT

Hoopers

## A stand with precast units and shear walls

The lower tier of the new stand is formed of a series of structural stepped precast 'staircase' units. The units and the walls of the vomitories that give access to them were cast with a mix of white concrete incorporating Derbyshire spar aggregate.

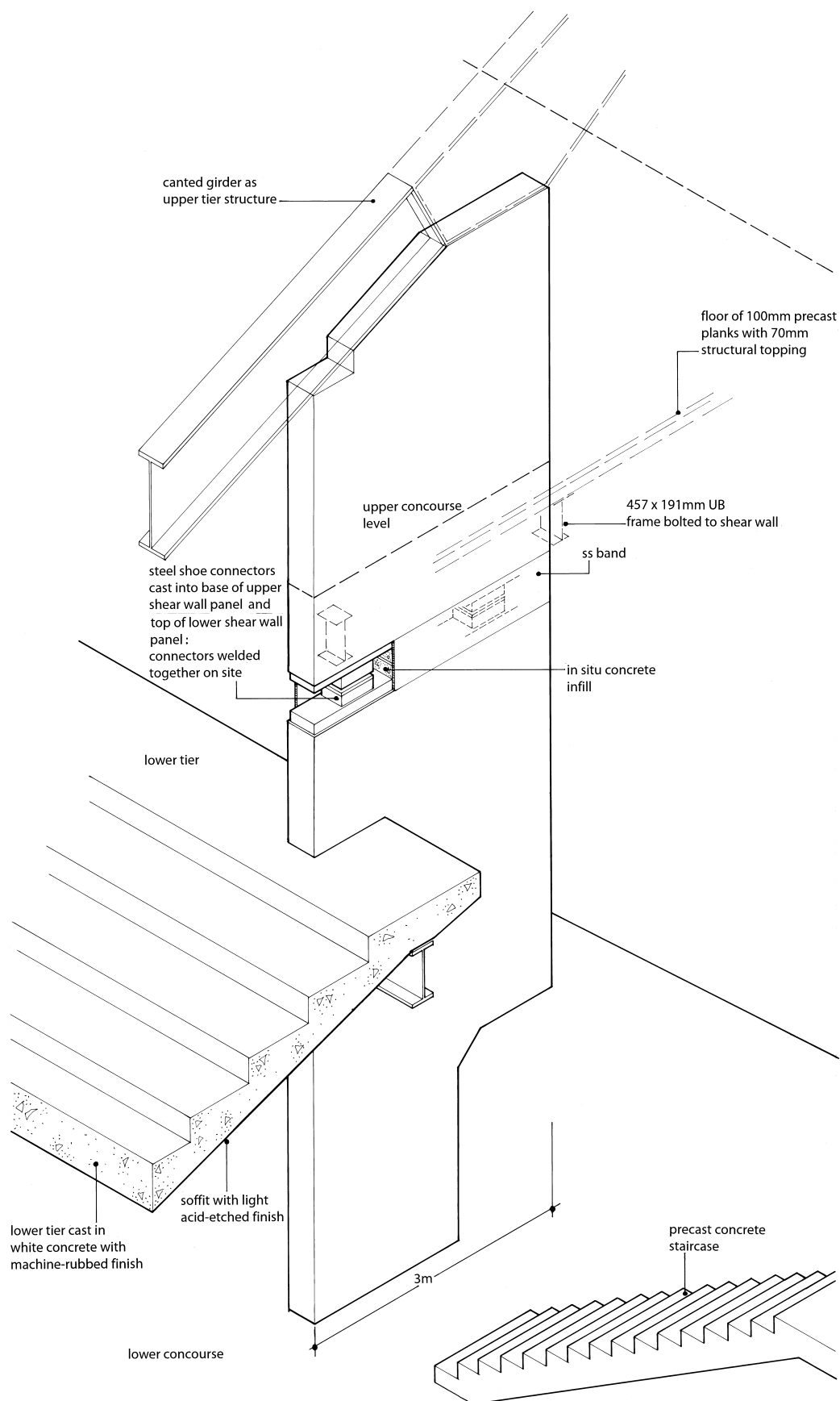
The backs of the lower tier units rest on beams spanning between a series of 14 precast concrete shear walls which stand at the rear of the stand. Each shear wall is 3m wide and more than 11m high; they are generally spaced at 7.6m centres. To maintain accuracy of fit and alignment, each shear wall was match-cast in two paired units with steel shoe connectors; these were then welded together on site. The shear walls were cast using Spanish Dolomite coarse and fine aggregate, which introduces a sparkle into the surface of the concrete.

The main staircases at the rear of the stand were cast with coloured concrete, using Cree Town coarse aggregate with Lee Moor fines. The mix contrasts with the Spanish Dolomite and gives a durable non-slip surface to the main escape routes.

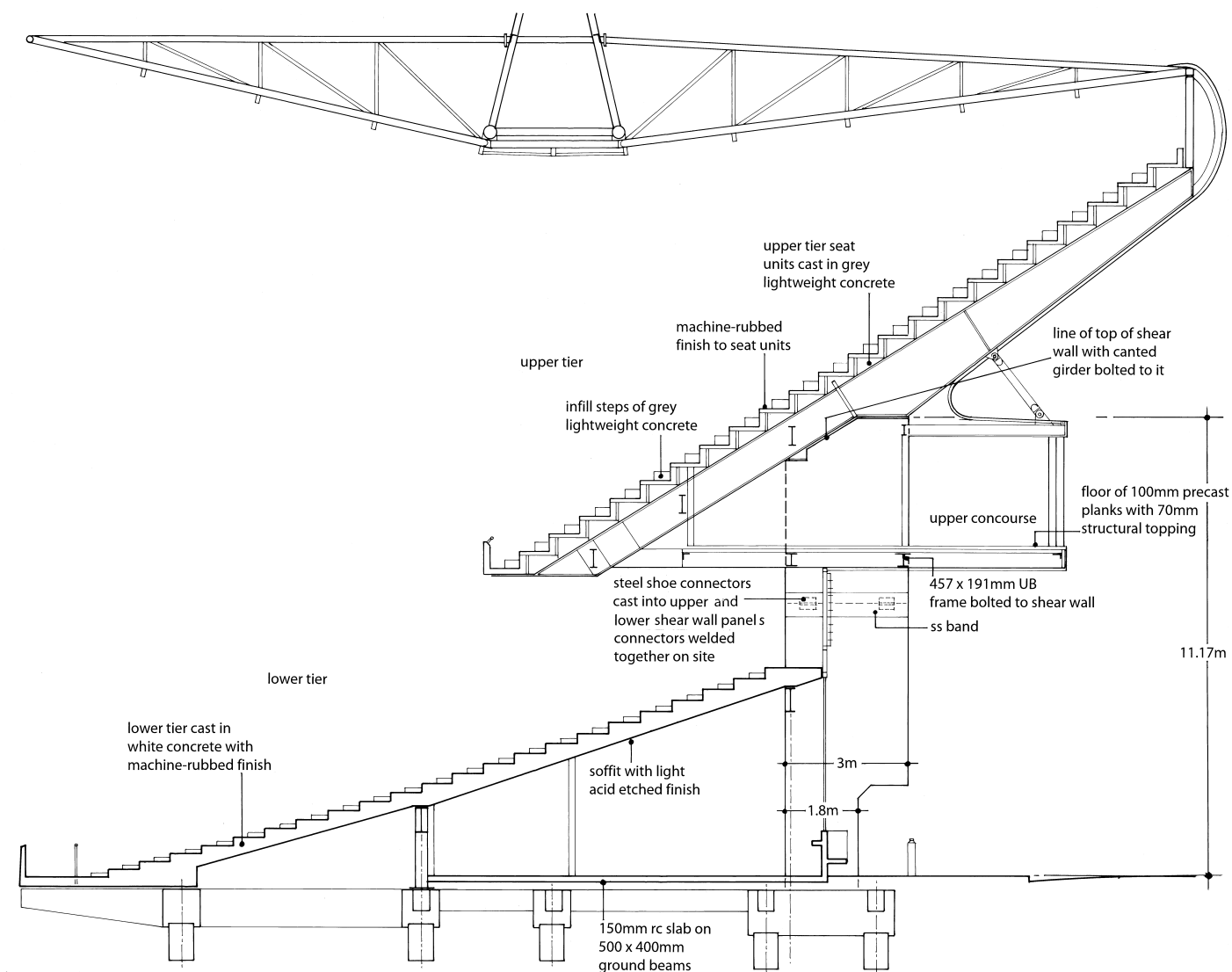
Lightweight grey concrete was used for the upper terrace units to reduce dead load. The overall weight saving is greater than pro-rata as the depth required to produce the same level of fire resistance is less for lightweight concrete.

The use of precast units solved a serious problem – having a restricted site yet with a water table that would not permit the development of a basement. In addition, the use of precast speeded up the construction process; installation was simpler and there was no need to use wet trades – the soffits of the units are exposed to form the ceiling.

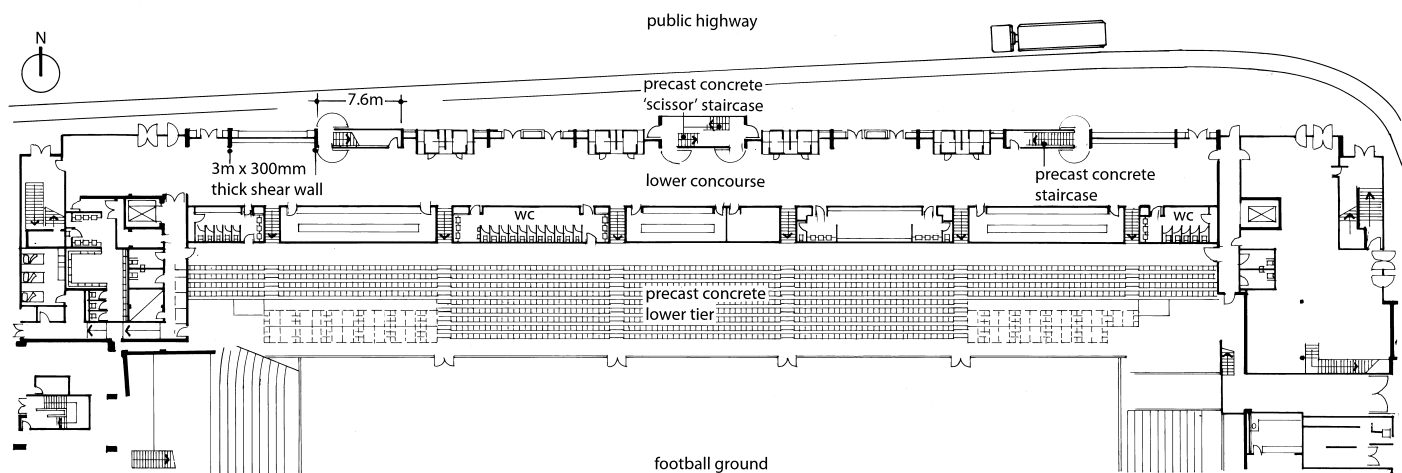
**Susan Dawson**



ISOMETRIC OF PRECAST CONCRETE SHEAR WALL



SECTION THROUGH NORTH STAND AND TIERS



PLAN AT LOWER CONCOURSE LEVEL

# Domestic bliss on a solid foundation

Despite its rise to the dizzy heights of being both fashionable, affordable and, now, multi-award-winning, many architects are still failing to see or explore the potential for in situ concrete in domestic interiors

By Fiona McWilliam

Award-winning in situ concrete interiors of 2003 (from left): Herzog & de Meuron's Laban dance centre, Deptford; de Rijke Marsh Morgan's No 1 Centaur Street, Waterloo; Azman Owen Architects' courtyard house, Islington; Jamie Fobert Architects' Anderson House, central London



DENNIS GILBERT/VIEW

The aesthetic possibilities of in situ concrete have long been recognised by the architects of churches and other public buildings, but the use of in situ concrete in domestic interiors was, for many years, confined to a handful of individually designed private dwellings.

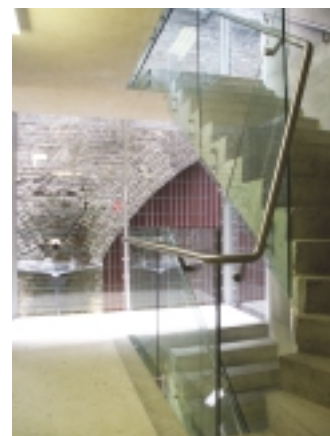
Now, however, thanks largely to the efforts of award-winning architects such as Azman Owens and Jamie Fobert, in situ concrete as an interior finish is perceived by a wider public as being not only über-fashionable, but also achievable and affordable.

Yet many architects, according to architectural concrete consultant David Bennett, fail to understand what they can achieve with in situ concrete. Even with the practically limitless

range of bespoke colour combinations and finishes, says Bennett, they remain reluctant to incorporate the material in their designs. This is despite the fact that it could potentially offer considerable cost savings over, for example, terrazzo tiles when it comes to providing large areas of attractive and extremely durable flooring.

While quick to describe the technical challenges of casting such a floor, Bennett is even quicker to dismiss the need for specialist concrete contractors. He says contractors only have to be aware of the need to avoid excessive surface tamping (which brings sand, cement and water to the surface), and the importance of surfaces being absolutely true to enable effective cutting and polishing. Laying a terrazzo floor in situ, he maintains, requires little more than 'a competent contractor with the right equipment'.

What is important when working with in situ concrete, whether on floors, walls or other surfaces, is how contractors are instructed. 'Architects need to give information directly to the people who are actually doing the work,' Bennett insists. Contractors have not been challenged enough in this area, he adds, nor have they been given enough



MICHAEL MACK

help and guidance to extend their abilities beyond carcass-grade in situ concrete.

The reason? People turned their back on concrete, Bennett says, 'after the Modernists and Brutalists did it to excess, and developers exploited it badly for cheapness'. Consequently, in situ concrete is both misunderstood and underused.

He laments the UK's 'poor craft skills', asserting that a good joiner is the secret of good in situ concrete work. This, and the quality of wood – or indeed other materials – used for formwork. He urges architects to think of formwork as furniture; it is, after all, reusable and that justifies its often high cost.

Despite the UK skills shortages, Herzog & de Meuron is

pleased with the quality of in situ concrete it has managed to achieve at the Laban dance centre in Deptford. The Swiss-based firm is a prolific user of in situ concrete, having pioneered a number of finishes and applications.

It was, says associate Michael Casey, the first practice to incorporate glass in concrete as well being a pioneer of screen printing concrete. 'We use concrete in a way that's responsive to the contractor,' he explains, 'and while we can produce very beautiful concrete in Japan, it's easier here to work with lesser tolerances'.

A growing number of architects in the UK are beguiled by the unpredictability of in situ concrete, says Bennett. They regard it as the closest thing to a natural, manufactured product.

The scatter of stones in an in situ cast terrazzo floor has, he says, 'the randomness of pebbles on a beach'. And it is this randomness, he adds, which gives in situ concrete its unique form, beauty and character. But here, too, there is another stumbling block: 'The fact that it is monolithic – one solid slab with no joints – means the only sample you can do is the entire thing.' And without samples, architects are reluctant to specify in situ concrete.

Bennett describes how he was brought in as a 'concrete doctor' halfway through a recently completed contract to build RIBA's London Building of the Year 2003, a four-unit apartment at No 1 Centaur Street, close to the Eurostar viaduct at Waterloo Station.

In addition to prescribing the successful grit blasting of honey-combed in situ concrete walls, he provided a 'simple-to-follow recipe' for the terrazzo flooring specified by architect de Rijke Marsh Morgan (dRMM) for the building's communal circulation

areas. A local building firm laid this floor successfully, Bennett claims, by adhering closely to his instructions.

Michael Spooner, an associate with dRMM, admits that this project was 'a steep learning curve', and that he learned a great deal in terms of controlling the concrete process on site, including strategies for constructing formwork. 'We realised that we had to be hands-on and work very closely with the chippie.'

Bennett praises the 'excellent' joinery skills of London-based



KEITH COLLIE

contractor Varbud, and its positive contribution to Azman Owens' RIBA Award-winning concrete house in Aberdeen Lane, Islington. A general building contractor, Varbud had worked with Owens on a number of projects before this one, but none that required such large amounts of in situ concrete. Joyce Owens says that she decided to employ David Bennett as concrete consultant early on in the project, 'because it included the casting in situ of load-bearing walls'.

Bennett sent the contractors on a training course and showed them how to use a special poker to remove air bubbles. The combined expertise and close working relationship of the various parties involved in this

project resulted in a stunning testament to the beauty and versatility of in situ concrete. The silky internal walls were poured behind birch-faced formwork panels that had been lightly oiled with a high-performance chemical release agent. Everything was screw-fixed from the back of the panels, says Bennett, ensuring that the contact face was free of potential blemishes or splits.

While Owens admits the clients on this project were initially suspicious of in situ concrete, fearing that it might appear cold, they were happy to proceed once they had seen some other buildings with concrete interiors. And the finished house is very warm in appearance, she says, 'thanks to the unbelievable contrast between the rich reddish timber and the concrete'.

Owens insists that what she likes most about in situ concrete is its unpredictability – 'the fact that you never know quite what you're going to get'. And unlike the uniform finish of pre-cast, she adds, 'it's so organic'.

'I like the fact that concrete is fluid, as oppose to all other materials, which are unit-based,' says Jamie Fobert, of Jamie Fobert Architects, whose quirky and spatially sensitive Anderson House, an entirely concrete building with no exterior walls, clinched this year's 2003 Award for Building in an Historic Context.

The client approached Fobert after seeing his concrete-dominated interior for Cargo, a restaurant/club in Shoreditch, and the concrete furniture his firm has created for several Aveda cosmetics shops.

According to Fobert, the client liked the polished effect his team had achieved on in situ concrete walls at Cargo by using polythene sheeting inside the formwork. 'We developed this further,' Fobert explains, 'acknowledging

that a domestic scheme needs to be at a more human scale.' Fobert used neither concrete consultants, nor specialist contractors on this project. 'What we were not looking for was something monolithically flat.'

He explains how the idea of lining formwork with plastic came about by accident when, on a job in south London, plastic sheet-lined foundations were inadvertently left protruding from the ground, and he realised that polythene can imbue poured concrete with a glassy, reflective quality.



DAVID GRANDDORGE

Fobert's free-form, experimental approach certainly paid dividends with the Anderson House, and his practice seems well and truly hooked on the further use of in situ concrete, for domestic and commercial interiors. His advice to nervous architects considering the same is to find a brave client. 'You can't force concrete on someone who doesn't want it,' he insists.

Joyce Owens, on the other hand, has successfully proved that sceptics can be made to appreciate the virtues of in situ concrete. Her unequivocal advice to architects is to get in an expert: 'Someone like David Bennett – he gave us a seminar and made us understand the possibilities and pitfalls of working with in situ concrete.'



## FAVOURITE BUILDING ALEX DE RIJKE TALKS TO CRISTINA ESPOSITO ABOUT OWEN WILLIAMS' BOOTS D10 FACTORY

Alex de Rijke's first impression of the Owen Williams-designed Boots D10 factory in Nottingham was of a 'fantastically confident and ambitious building'. De Rijke admits he was struck by the effect as a whole – the impressive scale, the 'very direct and large frame and curtain walling' and the 'wonderful transparency' of the glazed facade.

Widely regarded as the most significant icon of British Modernism, the Boots factory is an unpretentious, no-nonsense construction, typical of the North American factory genre within which its origins lie – in Williams' own words, it is merely 'the shell surrounding a process'.

While de Rijke observes that D10 'has no rhetoric, [it is] built as a system which facilitates cer-

tain requirements', he finds the use of concrete inspiring. His favourite element, the loading bay, he deems elegant in its huge scale but 'without brutality'. The enormous cantilevers and huge columns are 'daring' and de Rijke compares the haunches, which support the roof canopy, to a pair of 'enormous concrete hands'.

For de Rijke, the building is vast without being intimidating or arrogant. 'We live in a routinely over-built culture,' he says dryly. 'D10 hovered right on the edge and got it right. Williams had the confidence to take calculated risks.'

Boots' decision to undertake a refurbishment of the Grade I-listed D10 building in 1989 was a contentious one. For commercial reasons, the building needed to

be brought in line with EC performance standards, while still maintaining the integrity of Williams' original design. De Rijke finds the result a disappointment – 'it detracts from the transparency, which is one of the whole points of the building'. And, in spite of the care taken to match the original curtain walling, de Rijke observes that the depth of the glazing is very different, 'a facade which once revealed the interior now reflects the sky'.

De Rijke would like to do more with concrete. Having won awards for No 1 Centaur Street, the prototype housing project in south London acclaimed as a 'mini-masterpiece', de Rijke says he has learnt a lot and would like to try something more 'structurally ambitious'. A large-span

The Boots D10 factory in Nottingham, widely regarded as the most significant icon of British Modernism



## LETTER FROM NEW YORK

exhibition space or car park would be 'ideal', a stadium would be 'wonderful'. With a wry laugh he admits that a small bridge 'would certainly do'.

As Centaur Street demonstrates, good buildings don't have to be about 'big' and, for de Rijke, the interpretation of materials is key. He uses Schindler's slab tilt as an example of how concrete is 'fantastically variable, even on a small scale'. In Schindler's own cooperative residence/studio on King's Road in LA, concrete was poured into flat trays to produce walls as an easier alternative to vertical shuttering. In de Rijke's opinion, this produced a very 'simple but elegantly done' single-storey building.

The manipulation of concrete forms has always interested him. His interest in the material began while working in Amsterdam, and he especially admires the work of concrete shell expert Felix Candela. In Britain, however, Williams is his favourite concrete pioneer – 'the man made a concrete church, even a concrete boat! He knew the material inside out and loved it.' In common with elements of the Boots factory such as the concrete purlins, Centaur Street's interior is of in situ mould-cast concrete. The experience allowed de Rijke, a self-confessed prefab junkie, to experiment with shuttering to achieve contrasting textures and more fluid, sculpted construction. De Rijke aspires to an ideal of joint-free construction, or 'less-joint' construction as he calls it.

So what does he say to Centaur Street's detractors? 'With that project I wanted to achieve material and space continuity. I got told off for the lack of obvious joints, which was never the point anyway. One material was made into a flowing, expressive, warm environment without brutality. It is rough but intimate.'



DENNIS GILBERT/VIEW

Small incidents sometimes put big matters into sharp focus, writes Frank Duffy. Having lived in New York now for three years, admittedly in the somewhat melancholy aftermath of 11 September, I find myself frequently wrestling with the question of how such an energetic and inventive nation as the United States can tolerate so many conservative buildings and interiors – especially in my field of office design.

Recently Tony Hunt, the British structural engineer, presented in his diffident, slightly quirky and entirely idiosyncratic way, an array of very un-conservative and inventive engineering design projects. The context was the lunchtime colloquium on the relationship between architecture and engineering that I am currently helping to run for first-year graduate students at the School of Architecture at MIT. Hunt's projects spanned 30 years – from a tiny shelter for Team Four to the Willis Faber building in Ipswich, past the Sainsbury Centre in Norwich, via Waterloo Station to the Eden project – each more elegant and daring than the last. The first question was: 'Why can't we have the same open-ended and innovative collaboration between engineers and architects in the US?'

Don't misunderstand me. The studios and corridors of the architecture school at MIT are humming, not only with computers but also with intellectual power. Architecture students are exploring the wildest frontiers of computational design. Fundamental questions are being asked about using the computer to skip directly from imagination to fabrication, thus eliminating the deadweight of outmoded professional structures and constructional processes. So it isn't shortage of talent or skill or daring that is the problem. Nevertheless, there does seem to be an enormous distance between the liveliness of the

MIT design studios and the heaviness of so much conventional construction in Boston and New York.

So what is the answer? Is the contemporary British love of elegant, Minimalist engineering that is integrated so closely with architecture simply a consequence of the particular personalities of Ove Arup and Felix Samuely, the two great founders of the modern structural-engineering tradition in the UK? Or is it something to do with the legacy of the Victorian aesthetic, of the arts and crafts movement, or even of the Festival of Britain? Tony Hunt advanced historically based theories such as these at the colloquium.

In fact, it is much easier to understand why the generality of American engineering and architecture is heavy handed, formulaic and divisive than it is to explain why the very best of British current structural design is so inventive and integrated. It is not just that New York is a hard, aggressive and competitive place where professional collaboration is never to be taken for granted. Much more fundamental factors are the sheer size of the US economy, its history of rapid growth and its overwhelming success. Within such a vast economy the overriding imperatives of variety reduction and of divide-and-rule have had so far the unfortunate result of making the clumsiness of much construction and engineering inevitable.

Tony Hunt's wonderful structures impressed MIT deeply. However, are they not a little too close to reviving another age? May there not be more hope in discovering, somewhere down those long MIT corridors, a post-Taylorist aesthetic for a post-Taylorist economy, based on computer processes that integrate, not divide, architectural and engineering skills? Frank Duffy is a partner in the international design consultancy DEGW



## PUBLICATIONS

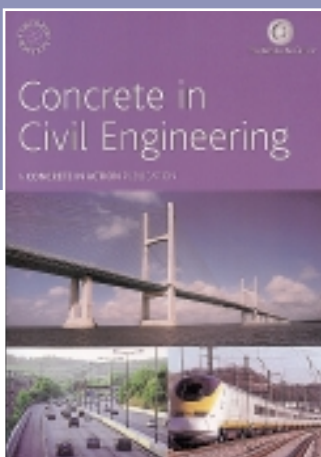
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