

CONCRETE QUARTERLY

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EXCLUSIVE AND RECLUSIVE

Exposed concrete brings simplicity and style to luxury retreats in the wilds of India and Australia

FOSTER IN ARGENTINA

Can the architect persuade fashionable Buenos Aires of the beauty of fair-faced finishes?

AND ON THE SEVENTH DAY ...

How Adrian James built an award-winning home from precast concrete panels in less than a week



HOMeward BOUND



This issue celebrates “concrete living”, with a selection of exemplar housing projects from home and abroad. They showcase the many visual effects that exposed concrete can create in the domestic arena, from refined to rough and robust.

The Aleph in Buenos Aires sees Foster + Partners translate a common strategy for office buildings – exposed concrete soffits to maximise surface area and the benefit of thermal mass – to give an enhanced floor-to-ceiling height, as well as a striking aesthetic to the underside of the balconies.

In the very different climate of Oxford, Hill Top House is a rare example of a private dwelling that uses both a precast crosswall solution and a largely exposed concrete internal finish, again to address long-term energy considerations. Meanwhile, Stamp House in the Australian rainforest manages to reflect the philatelic interests of its client in a residence that is also cyclone-proof with major energy and water-storage capacity.

In each case, aesthetic ideals may have driven the material's selection, but its physical properties make it a solid choice in any finish. All are cool, whatever the climate.

Guy Thompson

Head of architecture and housing
The Concrete Centre
www.concretecentre.com/cq

IN THIS ISSUE



On the cover: The Khopoli House in Maharashtra, India, designed by SPASM Design Architects. Photo: Sebastian Zachariah

4 AIRES FRESHENER

Norman Foster breezes in to the Argentinian capital with a stunning apartment block that breaks with local custom by exploiting fair-faced finishes to the full

8 KING OF THE HILL

How Adrian James Architects inserted an award-winning modern house into an Edwardian terrace in just six days

9 COLLECTOR'S ITEM

Is it a cyclone shelter? Or a military compound? Or just a stamp dealer's holiday home? All is revealed ...

10 THE HOUSE OF LIQUID STONE

A luxury retreat beneath the mountains of Maharashtra explores concrete's quiet, contemplative side



The Concrete Centre is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries.
www.mineralproducts.org

New Part L to serve up simple low-carbon 'recipe'

Changes to Part L of the Building Regulations should provide a straightforward way for housebuilders to understand and meet targets on carbon emissions and fabric energy efficiency, according to The Concrete Centre.

The revisions, due to come into force in April 2014, are the latest in a series of sequential improvements aimed at delivering zero-carbon homes by 2016. Under Part L 2013, the carbon emissions of new homes will have to be reduced by 6% compared with Part L 2010.

It also introduces an “elemental recipe” approach to compliance, which is used to set the targets. This should provide clarity for developers, says Tom de Saulles, building physicist with The Concrete Centre.

“By simply following the standard recipe of U-values, Psi-values, air permeability etc, you are sure to

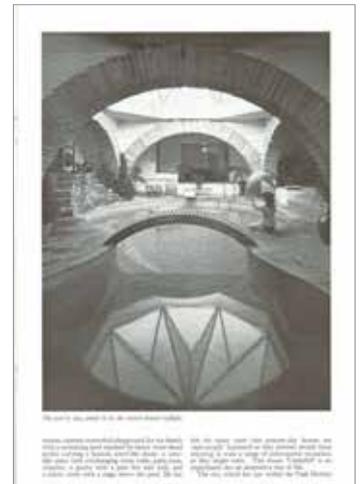
comply with Part L,” he says. “But the great thing is that this is not prescriptive, so other fabric and services options that deliver the required performance can also be used if they are thought to be more cost-effective or better suited to a particular project.

“Whether it is implemented as it stands or is tweaked slightly, the standard recipe provides a good starting point for housebuilders, and is simple to work with.”

The Concrete Centre will be releasing an update to its existing guide, Thermal Performance: Part L1A, early next year. The update for concrete and masonry housing will cover compliance requirements and offer practical guidance on meeting the new energy efficiency standard using a range of fabric specifications.

For more information, go to www.concretecentre.com

FROM THE ARCHIVE



JANUARY 1978: THE HOBBITS OF HOLME

“Tolkien's hobbit houses had much to commend them, lacking only the principle of rooflights,” opined CQ of architect Arthur Quarmby's family home, largely buried under a field in Holme on the edge of the Pennines. With sheep grazing on its turfed roof, the subterranean home was praised not only for being unobtrusive, but also for the high levels of insulation afforded by its reinforced concrete shell. And it was a step forward from Middle Earth too – a “jewel-like” rooflight let ample light into a cave-like living space complete with palm trees, creepers, swimming pool, and even a periscope overlooking the driveway.



Innovative floors lead the way to RIBA award for Slip House

The RIBA Manser Medal 2013 for the best new house in the UK has been awarded to Slip House, a bold new development in south London by owner/designer Carl Turner Architects, writes Elaine Toogood.

The Manser Medal is intended to encourage innovation in house design, and to provide exemplar projects to demonstrate to the wider industry how social and technological ambitions can be met through design.

Slip House is designed to Code for Sustainable Homes level 5, and concrete plays a fundamental role in its low-energy strategy. The floors are a hybrid system comprising thin slabs

of high-quality prefabricated concrete acting as permanent shuttering to 150mm cast in-situ concrete, which contains the underfloor heating system. This upper surface was placed and power-floated with a dry-shake topping to achieve a smooth finish.

"The precast system has been very successful and gives the house the 'found' warehouse style we were looking for," says architect Carl Turner.

"It also creates a very quiet, solid home and we have found the thermal mass of the concrete floors essential, helping to radiate a low level of heat at a constant temperature through cold periods."

PRP's Manchester estate renewal set to save over 80,000 tonnes of carbon

Three concrete-framed tower blocks on the Tamworth estate in Greater Manchester have been given a new lease of life, following a major refurbishment by architect PRP.

Trafford Housing Trust was seeking to improve the 261 flats to meet not only the Decent Homes standard but also modern targets on energy performance under Part L.

Pickford, Grafton and Clifton Courts were structurally sound but their exposed concrete frames allowed substantial cold bridging. The overhaul included overcladding of the external walls, the installation of double-glazing and the replacement of a gas-fired warm air system with centralised heating and solar panels, with heating plant positioned on the

roof to give the blocks a new identity.

The measures are estimated to save carbon emissions of 87,730 tonnes over the buildings' lifetime, and residents bills are expected to reduce by up to 50%.



Photo: PRP



Photo: Tom de Gaj/Avanti Architects

ST PAUL'S TRANSFORMED, AND GOLDFINGER SHINES AGAIN ...

Concrete Elegance's winter event took attendees back to school – to two schools, in fact, where concrete architecture new and old provides A*-grade teaching spaces.

At St Paul's School in Barnes, west London, Nicholas Hare Architects' Science Building is the first major addition to the school for 50 years. Project leader David Tompson explained the important structural, thermal and aesthetic role that concrete plays throughout the building, providing its frame and floor slabs, thermal mass to support the natural ventilation of its 18 laboratories, and also the pillars and roof vaults of an external colonnaded walkway.

Meanwhile, Avanti Architects' Fiona Lamb described a rather different challenge at another building dating from the 1960s. Grade II-listed Haggerston School in east London (pictured) was designed by Ernő Goldfinger and is considered one of the outstanding school buildings of the period. The aim of this refurbishment and reconfiguration project was to bring it up to the latest environmental and technological standards, and adapt it to more flexible styles of teaching without compromising its architectural value.

For more details on Concrete Elegance's 2014 events programme, and to watch presentations from previous events, go to www.concretecentre.com. You can also read CQ Autumn 2013's cover feature on St Paul's School Science Building at www.concretecentre.com/cq

THIS IS CONCRETE

This is Concrete blogger Nick Jones discovers that Britain's housing shortage is a constant theme throughout the CQ archive, "a reminder of how intractable the issue of housing supply has been in the postwar era, but also of how closely the concrete industry has been involved in trying to find an answer".

He finds that precast concrete systems have been seized upon repeatedly over the last 60 years, not least for the sense of permanence they offered in a fast-changing world. In 1952, the panels of Salisbury's Reema homes were delivered to site on "toast-rack trucks" and assembled in just four days: "Prefabricated in almost every detail ... these are permanent, feet-in-the-ground houses built to last," wrote CQ's reviewer at the time.

Of course, the systems have come on a great deal, from the more flexible precast frames of the 1960s up to the present day and the award-winning Hill Top House (see page 8). This uses a system that could be seen as a descendant of the Reema prefabs, but as Jones points out, "Things have come a long way since the toast-rack trucks first rolled into Salisbury ..."

This is Concrete is a campaign to champion concrete projects, sustainability and innovation. Join the debate on twitter at [@thisisconcrete](https://twitter.com/thisisconcrete) and online at www.thisisconcrete.co.uk

"The combination of fast construction and 'feet in the ground' durability remains just as desirable now as it was 50 years ago"



AIRES FRESHENER

Foster + Partners brings something new to Buenos Aires, with an apartment block that uses fair-faced finishes to redefine the Argentinian capital's idea of luxury living. Tony Whitehead reports

Foster + Partners' first foray into South America is the Aleph – a nine-storey prestige apartment block near the banks of the River Plate in Buenos Aires. It is part of a redevelopment of the old harbourside neighbourhood of Puerto Madero and, like similar projects the world over, its challenge has been to combine a sense of place with modernity – and the kind of must-have desirability that ensures commercial success.

Fortunately, the Foster magic seems as potent here as on any other continent. The Aleph has already claimed an RIBA International Award, and even though prices started at around \$1m (£624,000), every one of its 50 apartments is now sold. So in a city with literally thousands of apartment blocks, how has Foster made this one special?

"Firstly it is a very popular place to live, in a great location with views out over the water," says Juan Frigerio, project architect. "But even so, the prices are high for Buenos Aires, so you are looking to attract people who want something a little bit unusual, and actually the Aleph is very different from anything around."

Certainly the basic construction of the Aleph is not what sets it apart: virtually every post-colonial building of any size in the city is similarly constructed. "It is true that in-situ concrete is the

standard construction material in Buenos Aires," concedes Frigerio. "But what's different about the Aleph is that we have exposed fair-faced concrete on the exterior and the interior. This is very unusual here, and an achievement we take pride in."

"The client [developer Faena Group] took some persuading, but we lobbied hard and were able to convince them that the purer architectural expression of the building structure was to leave the concrete visible. It is now one of the few buildings in the city that manages to express the beauty of concrete as struck."

From a distance though, it is not the concrete that immediately defines the building; rather it is the arrangement of generous balcony space and a system of high-quality bronzed aluminium louvred sun screens. On some of the larger, double-height apartments, these are electrically controlled, but for the most part they are simply pulled into position by hand. Reminiscent of Venetian or rattan blinds, casting slatted shadows into the interior, these reference a more traditional Argentinian lifestyle.

Such a reference is a trademark Foster approach, and one that also explains the apartments' concrete ceilings. Left as struck, these have a distinctive vaulted shape. Frigerio says they are partly inspired by a type of traditional Argentinian home: "We call them 'casa chorizo' because of their sausage-shaped vaulted ceilings made from brick." At the Aleph, the arched brickwork shape has been replaced by similarly vaulted ceilings in concrete, made by inserting curved timber formwork into the shuttering for the floor slabs.

As well as providing an unusual take on a traditional aesthetic, copying the shape of the "sausage houses" delivers a number of technical benefits: "The vaults rise 20cm into the 30cm

depth of the floor slab, so this gives an extra space and height to the living rooms and also reduces the amount of material used. And that reduces the overall weight of the floor slabs that the frame has to support."

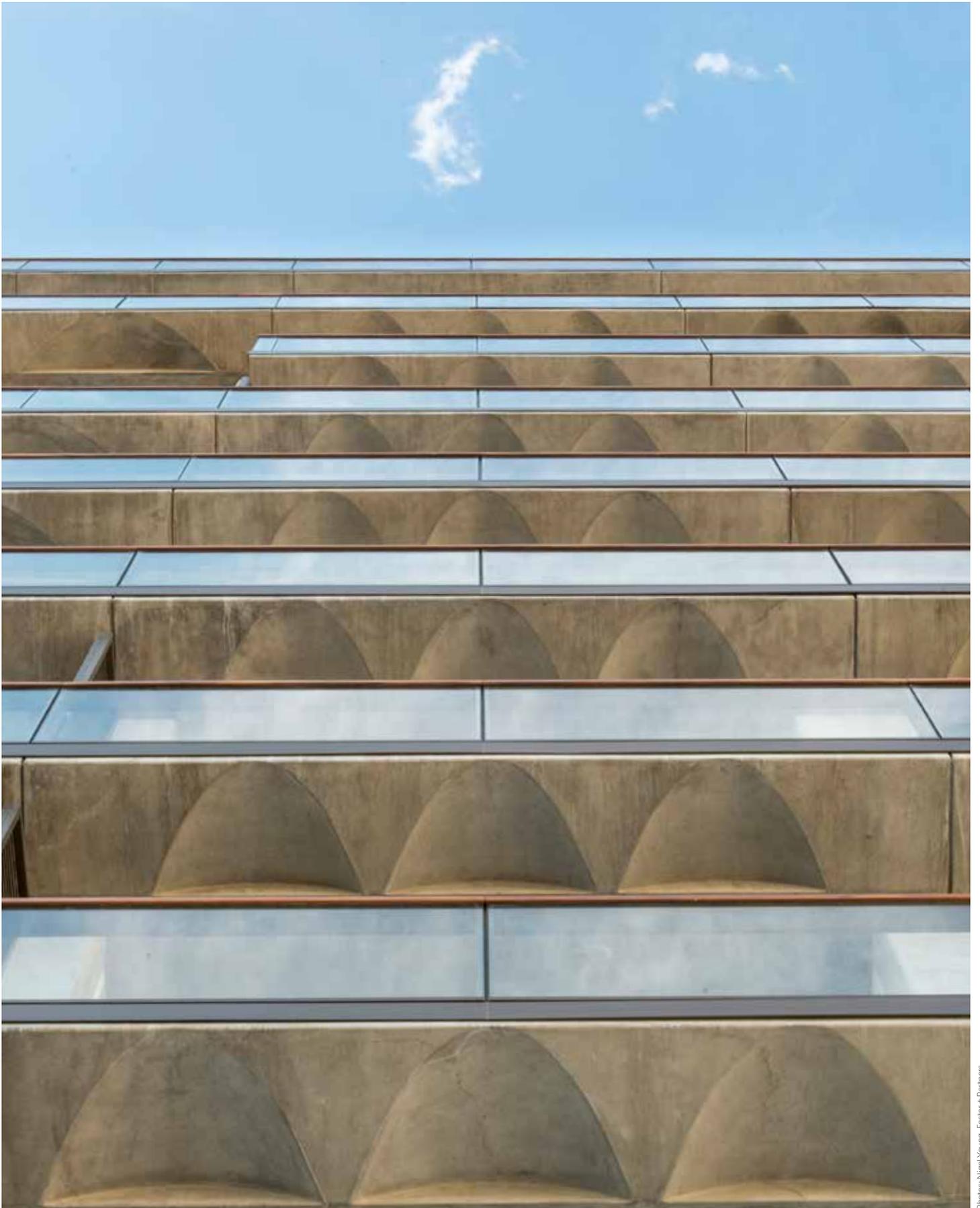
The bare concrete ceilings did mean that special consideration had to be given to the location of services – recesses and rebates were cast in the floor slabs to accommodate the drainage and pipework. With the electrics too, cabling and boxes were carefully coordinated at an early stage and then cast in. "The lighting, for example, comes directly from slightly recessed boxes cast into the ceiling, though this is common in Argentina," says Frigerio.

Unlike many projects that opt for an as-struck finish, the Aleph is constructed from ordinary structural concrete with the same colour cement and aggregate content throughout, a decision driven partly by economics. Great pains were taken, however, to achieve an attractive finish, including the use of three types of formwork (see "The formwork factor", overleaf). "Fair-face concrete is unusual here, so I think everybody had to up their game a little bit," says Frigerio. "But there is a well developed in-situ concrete industry, plenty of skill, and good quality, reliable materials. To be honest, it was easier to persuade the contractor to do what we wanted than it was to persuade the client that exposed concrete was not only acceptable, but actually hip and cool!"

As part of the persuasion process, the ceiling in one apartment was painted as a trial. "We tried five different colours, and in the end the client agreed it was best to leave it unpainted. That apartment was sanded down and is now like the others."

Kitchens and living space all have the Foster

WE LOBBIED HARD TO CONVINCING THE CLIENT THAT THE PURER ARCHITECTURAL EXPRESSION OF THE STRUCTURE WAS TO LEAVE THE CONCRETE VISIBLE



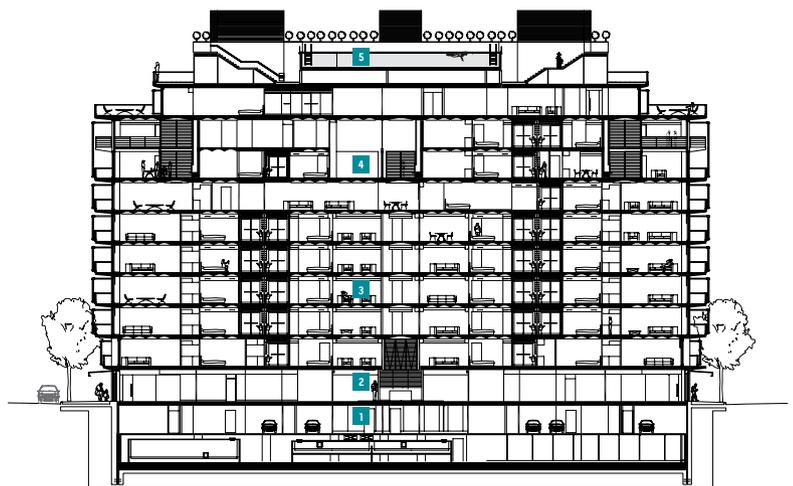


Structure: From piling to rooftop pool

The Aleph's position overlooking the harbour at the mouth of the River Plate meant that the groundworks required special consideration. "This harbour was created by British engineers in the 1880s," says Foster + Partners project architect Juan Frigerio. "But the ground is wet and poor quality so the buildings here effectively float like rafts."

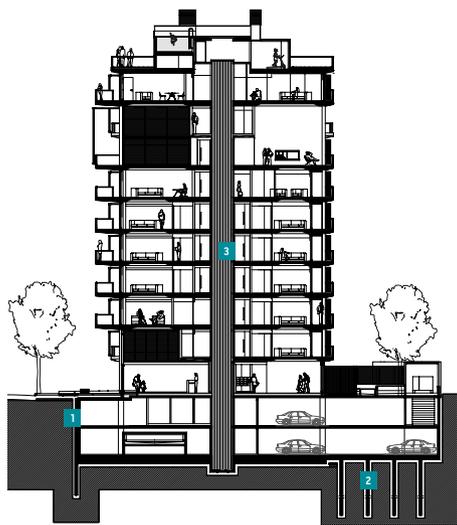
To define the 18,500m² site, contiguous piling was sunk around the perimeter, which allowed the basement to be excavated without the soft ground collapsing inwards. Pumps removed water while the 12m-deep concrete piles were sunk. A reinforced-concrete wall was then constructed immediately inside the contiguous piling, which became the outline of the basement car park. "Water pressure from below was potentially a problem, so the concrete ground slab is thicker than normal," says Frigerio. "There are also sumps and pumps which collect and remove water on a permanent basis."

At one stage, the Aleph's luxury swimming pool was to be located in the basement, but it was relocated to the roof, partly because of the pressing need for parking. "It is also much nicer up there, with a heated infinity pool and great views," says Frigerio. "The pool is 1.1m deep and constructed of concrete. In fact there is a double slab at the top with a 1.5m gap below the pool for plant and maintenance access. All that water and concrete is quite heavy so obviously we had to ensure the frame is robust enough to take the weight."



The Aleph: Long Section

- 1 Basement car park
- 2 Entrance level
- 3 Apartments
- 4 Duplex apartments
- 5 Rooftop pool



- 1 Reinforced-concrete perimeter wall
- 2 12m-deep piles
- 3 Circulation core

touch of elegant simplicity – a minimal palette of limestone flooring and plain plastered walls contrasts with the texture of exposed concrete ceilings and columns. The apartments range from 90-300m², but all have wide, glazed doors and walls offering panoramic views out to sea, or over the spectacular urban vista offered by one of the world's largest cities.

"It's not that the materials we have used are ridiculously expensive," says Frigerio, "but the ivory floors, white walls and exposed concrete combine to give a very bright luminous feel – very comfortable, elegant and refined."

Certainly head height is a luxurious 2.9m, rising to 3.1m in the vaulted concrete ceilings. The living room walls are of sliding glass, allowing the spacious concrete balconies to easily become part of the living area. As the building is located in the southern hemisphere, sunscreens are on all but the south face, providing privacy as well as shelter from the strong sun of the summer months. Apartments also receive additional shading from the width of the balconies above.

"The idea is for the doors to the balconies to remain open for much of the time," says Frigerio. "Buenos Aires has a temperate climate, so heating is only needed for a few weeks every year. Cooling is more of an issue, but the thermal mass of the concrete helps to absorb the heat of hotter days, and residents can just leave the doors open and allow the sea breezes to keep the apartments cool in summer."

Frigerio says the combination of concrete frame, sunscreens and balcony living allows active air-conditioning to be kept to a minimum and helps to reduce the energy consumption of the block.

With its rooftop pool and designer good looks, it is small wonder that the fashionable crowd have taken to the Aleph – and it seems likely that its popularity could change the perspective of local designers. Concrete might be the city's default structural material, but Foster has shown how it can also be used as a defining and distinctive design feature.

PROJECT TEAM

Client Faena Group

Architect Foster + Partners

Collaborating architect Berdichevsky-Cherny Arquitectos

Contractor/concrete contractor Caputo SA

Structural engineers Jose Norberto Galay, Buro Happold

CLOCKWISE FROM TOP LEFT

The concrete balconies are shaded with bronzed aluminium louvred screens; the exposed vaulted ceilings rise 20cm into the 30cm

floor slab; all apartments have wide glazed doors offering panoramic views; cross-section showing basement structure; front section showing layout



The formwork factor

Three types of formwork were used during the construction of the Aleph: timber, glass-reinforced plastic (GRP) and steel.

"We used steel for the columns, mainly because you can get a very good finish," says Foster + Partners project architect Juan Frigerio. Although steel moulds are relatively expensive, they can be re-used many times, which meant that only a small number were required. "Also, since the steel forms are placed vertically to create columns, their weight is not as much of an issue as it would be using steel for spans."

The beamless floor slabs were poured into timber formwork supported by scaffolding and props. To create the curving vaulted ceilings, laminated ply was used to make forms roughly like cylinders split lengthways. "We used 6mm laminate, which allows the timber to be bent into the curved shape and then nailed down, with the nails covered in resin to avoid nail marks."

These forms were placed on top of the timber deck before pouring and, after a 21-day curing process, the formwork and props were taken away to reveal the vaulted ceilings. "The shadow lines between vaults are very neat, which we achieved by using removable metal inserts along the straight edges of the curved forms."

The most complex moulds, however, were the GRP forms needed to create the elliptical shapes "hollowed out" of the underside of the Aleph's many balconies. These shapes also create striking patterns when viewed from the immediate exterior of the building.

"We used GRP because the geometry of the balconies was more exact and demanding," says Frigerio. "The shapes curve in two dimensions, rather than one like the vaults of the interior. The balconies also taper – they are thinner at the edges to allow residents to view more sky and to accentuate the sense of light and space."

The balconies were designed using Microstation 3D software, and the information was sent to specialist GRP form makers. "Obviously GRP is a more expensive option than timber, even though we have re-used forms as much as possible," says Frigerio. "So to keep costs down, the formwork for the corner balconies, which do not have the ellipse details, was constructed from timber like the slabs."



Photos: David Fisher Photography

KING OF THE HILL

A modern house with Japanese-style exposed interiors has been seamlessly inserted into an Oxford terrace, writes Elaine Toogood

Exposed concrete finishes and a sustainable low-energy solution were essential parts of the brief for this new family home from the outset.

Hill Top House, which was awarded Overall Winner at the Concrete Society Awards 2013, is sandwiched into an Edwardian terrace in Oxford, a streetscape not untypical of many in the UK. More unusual is that inside the property most of the surfaces are exposed concrete, an aesthetic and structural honesty inspired by the works of Japanese architect Tadao Ando.

A system of precast concrete walls, floors, roof and stairs called crosswall was chosen during the design process. This is a well-established solution for fast-track construction, most commonly used in the UK for hotels and student accommodation. Factory-finished concrete panels are delivered to site, lifted in place straight from the delivery truck and structurally tied together using stainless steel loops and rods. Each joint is then grouted in place to produce an effectively monolithic structure. At Hill Top House, the whole process took just six days.

Architect Adrian James is keen to highlight the appropriateness of crosswall for smaller scale, one-off housing projects. Although the manufacture of the panels and their details are systemised, the size of each panel is bespoke – albeit within maximum dimensions dictated by machinery size and delivery – and can therefore be defined to suit each site and design. Furthermore, the speed of installation significantly lessens the impact of construction on neighbours, in this instance reducing the programme by a quarter.

The house is essentially an open-ended self-supporting box, slotted into place and insulated externally on all sides. Floors and roof plates span between structural boundary walls, creating the potential for open-plan spaces with no downstand beams. This means the end facades are free to use a language appropriate to local site conditions.

The benefits of solid concrete boundary walls include robustness and low maintenance costs, but most significant for urban and suburban residential development is the creation of excellent acoustic and fire barriers. The exposed structure is also fundamental to the low-energy strategy. The well-insulated thermal mass stabilises internal temperatures, reducing energy demand in the winter; with night-time ventilation, it helps to keep the building cool in summer. Since airtightness

LEFT TO RIGHT

Both facades include large areas of glazing; a central rooflight bathes the exposed surfaces in natural daylight; panel joints were carefully aligned both horizontally and vertically

PROJECT TEAM

Architect Adrian James Architects

Structural engineer Price & Myers

Main contractor Carter Construction

Concrete system supplier Cornish Concrete Products

Concrete floors Lazenby

of 3m³/h/m² was achieved, the house has a mechanical ventilation system which, along with all other services, was skilfully ordered into a central zone with dropped ceilings, to avoid casting or chasing them into the precast concrete.

The client was particularly keen to express the structure internally, which required closer attention to the finish and joint detailing. A concrete mix was chosen with a high proportion of recycled aggregates and naturally whiter through the use of sands sourced locally to the manufacturer in Cornwall. It has a smooth as-struck finish, with the odd blow hole filled and a clear sealant applied on site to aid maintenance. During design, care was taken to locate and align joints between panels both horizontally and vertically, occasionally using dummy joints to optimise manufacture and delivery efficiencies. The positions of most lifting bolts were hidden or carefully grouted on site.

A year after moving in, the owners remain very happy in their tailor-made concrete home. Adrian James Architects, meanwhile, was so impressed with the opportunities offered by the crosswall system that its next commission has been conceived as precast concrete from the outset. **Adrian James will be presenting Hill Top House at the Surface Design Show Interior Concrete seminar on Wednesday 5 February 2014**



Photos: Patrick Bingham Hall

COLLECTOR'S ITEM

This cyclone-proof holiday home deep in the Queensland jungle pays unlikely homage to its owner's passion for stamps

With the Stamp House in Far North Queensland, Charles Wright Architects has found a third way between luxury holiday and survival weekend – the kind of place where a Bond villain or Vladimir Putin might choose to unwind.

On the one hand, the holiday house has all of the sophistication one would expect of an exclusive getaway. At the heart of the building is an open courtyard with a pool. From here, six cantilevered wings radiate out, housing en-suite bedrooms and outdoor lounges. The finishes are minimalist and of the highest quality, with polished concrete floors, marble bathrooms and all services embedded seamlessly into the slab and walls (some of these elements were precast and some cast in situ).

On the other hand, the structure also has the strength and self-sufficiency of a high-grade military bunker. The Stamp House is situated in the middle of Queensland's rainforest, an area prone to extreme weather in the wet season. In response, Wright has effectively designed a deluxe cyclone shelter – which came in handy when the category 5 Cyclone Yasi struck midway through construction. "By the time Yasi came around, we had already



poured the upper-level slab, so we could hide a lot of the equipment in the undercroft," says Wright.

From the walls of the 14m cantilevers to the irregular star-shaped "waffle" ceiling above the central area, the reinforced-concrete structure is immense. "The walls to each wing are actually the structural beams that support the entire building, so they're incredibly thick – an average of 650-700mm," says Wright. In order to support such a heavy structure, more than 30 piles had to be driven 12m down into the swampy site.

Because of the remoteness of the house, it also has to be capable of sustaining itself if cut off by bad weather. The roof is covered in solar panels, which have a two-month storage capacity, eliminating the need for a backup fossil-fuel generator. And there's a vast concrete tank beneath the pool that can harvest and collect up to 250,000 litres of rainwater – enough to fill 1,000 bathtubs.

One slightly quirky feature is the decoration on the facade. The client is a stamp dealer and, to reflect this, the exterior has been given perforations – hence the house's name. This effect was simply achieved, says Wright. "We screw-fixed the PVC caps from some piping to the formwork. It was quite crude but it yielded the result we wanted."

If the philately theme slightly undermines the super-cool Bond villain vibe, Wright says the facade will soon gain a suitable air of mystery. "In the tropics, concrete develops a dark stain, or patina. This will become part of the house's character – the idea is that it will grow into the jungle."

PROJECT TEAM

Architect Charles Wright Architects

Structural engineer G&A Consultants

Civil engineer McPherson MacLean Wargon Chapman

Contractor PD Builders

TOP

The 14m cantilevers keep the living areas above the flood line at all times

ABOVE LEFT

An irregular roof structure adds drama to the central area



THE HOUSE OF LIQUID STONE

Contemporary concrete design is in harmony with nature at the serene Khopoli House in the hills of Maharashtra

A two-hour drive from the teeming, congested city of Mumbai brings you to Khopoli, a small town at the base of the Sahyadri mountains in the dramatic western ghats (highlands) of the state of Maharashtra. Here is a holiday home that at once defies and embraces its location.

Designed by Mumbai-based SPASM Design Architects, the 638m² house combines rustic simplicity and contemporary elegance. With its sharp, rectangular forms, it appears to have been formed from the rocky outcrop on which it sits – indeed, its architect has dubbed it “the house cast in liquid stone”.

The house is divided into two wings, with the living and dining areas in the central space, closed off with blinds when necessary. It is entered under a cantilevered concrete overhang that provides sheltered outdoor space. The entrance hall and

internal passages create a feeling of being in an almost cave-like refuge, which is reinforced by a guest bedroom and bathroom buried in the rocky hillside and accessed by a stone-lined staircase.

This is very much a house for relaxation and leisure, emphasised by the many outdoor spaces and seating areas, and the spa-like bathrooms and main staircase that are open to the sky. It is also a house built for quiet contemplation, with the horizontal planes and vertical lines of the rectangular structure framing panoramic vistas of the ghats.

The exposed concrete structure, which was cast in situ, is made from a cement mix containing granular basalt, a black rock found in the surrounding mountains. The basalt granules give the concrete a dark grey, subdued tonal quality which in some contexts might be forbidding, but here the raw darkness of the concrete enhances the sense of calmness that the building exudes, and the sense that it has not been constructed within its environment but evolved there.

The structure works with the landscape in more elementary ways too: there is a hole in the entrance





Photos: Sebastian Zacherle



PROJECT TEAM

Architect SPASM Design Architects

Structural engineer

Rajeev Shah & Associates

Contractor IMPEX Engineers

CLOCKWISE FROM TOP LEFT

The use of exposed concrete means the living spaces require little maintenance; the basalt cement mix gives the exterior a subdued tone; the spa-like bathrooms are open to the sky; even the sofa makes use of the concrete structure ...

roof to accommodate a mango tree, while another tree grows from the terrace leading to the infinity pool.

The use of exposed concrete also has practical performance benefits. The Maharashtra region has a hot climate that includes a monsoon season from March to July. The thick concrete walls of the house provide a sanctuary against the heat of the summer sun and protection against the driving rain of the monsoon. And given the exposed location of the house and its function as a holiday home rather than permanent residence, the concrete structure has a further benefit: minimum maintenance.

The Khopoli House is one of a number of recent projects that celebrate the visual honesty of concrete – an increasingly appealing consideration for designers seeking to express a building as a cohesive solid whole and not as a collection of elements and finishes. In many respects, concrete is a blank canvas that can take on a very defined character with the introduction of coloured pigments or carefully chosen aggregates. In the case of the Khopoli House, that character is one of calmness and serenity.



FINAL FRAME: ULAPPATORI TOWER

Ulappatori residential tower, designed by architects Petri Rouhiainen and Annamária Móricz-Rouhiainen, overlooks the Finnish Gulf in Espoo, Finland's second largest city. The importance of the sea to the local people was the inspiration for its decorative concrete facade, an artwork of underwater creatures and giant waves by Aimo Katajamäki. The patterns were rendered by Graphic Concrete using surface retardants to expose areas of aggregate.

