

Building study

A university for school pupils

Walters & Cohen Architects has added a major new energy-efficient building to St Paul's School that supports the school's vision for learning, discussion and interaction to happen both inside and outside the classroom



The 10,000m² new General Teaching Building at St Paul's School provides a library, dining hall, offices, chapel, assembly hall and 56 classrooms. Breakout spaces are dispersed around the school to encourage teamwork and collaboration. A triple-height atrium is its social heart. Externally, the vertical emphasis of the elevation creates a non-rhythmic pattern and can be seen from afar. The building's L-shape design completes a ring of circulation on all levels and encloses the school's reinvigorated central courtyard.

Words Ellie Duffy
Photography Dennis Gilbert

A 2019 study of Britain's independent school system identified St Paul's School as one of nine schools in England whose pupils are 94 per cent more likely to join the elite – defined



as an entry in *Who's Who* – than any ordinary British-educated person. In 2016 the school hit the headlines when its headmaster admitted its fees were unaffordable, while announcing 'generous financial support' for families with an income under £120,000. Perhaps it shouldn't be a surprise that a quick glance at the school's alumni reveals there have been very few architects among them, George Dance the Younger (1741-1825) being a notable exception.

It could be said that the school hasn't had much luck with architecture. Its first building, next to St Paul's Cathedral, burnt down in the Great Fire of London. It was twice rebuilt in the City before moving in 1884 to a purpose-built Alfred Waterhouse building in Hammersmith (since outgrown and now demolished). In 1968 the school moved to its present site on the banks of the Thames in Barnes, a former filter bed with awkward ground conditions. Here Powell & Moya – perhaps not in their finest hour – designed a lightweight system-built CLASP school (Consortium of Local Authorities Special Programme, or 'Collection of Loosely Assembled Steel Parts' to its detractors). It was an asbestos-riddled building, though built with the best of post-war intentions. Nevertheless, despite these architectural setbacks, St Paul's School kept

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its end up at Barnes without the firm ballast of a continuum of built fabric.

Walters & Cohen's new L-shaped general teaching building completes a quadrangle originally posited for the school in a Patel Taylor masterplan, later developed and partially realised in Nicholas Hare Architects' 2013 four-storey Science Blocks, which present muscularly expressive concrete colonnades to what is now the inner sanctum – Founder's Court. Diverging from the marching step of Hare's peristyle, Walters & Cohen's building is a taut-skinned contradistinction of glass transparency and dark-grey aluminium panelling. It completes a great loop of teaching space at the heart of the school site in befitting proportions that harbour unexpectedly deep plans.

Walters & Cohen won the project in an invited competition in 2012, beating Hawkins Brown, Eric Parry, Ian Ritchie and Stanton Williams to the commission. 'We developed the brief from the inside out,' says practice co-founder Michal Cohen, who worked with the school over a six-month period to scope its current and future needs. Her starting point was observation, undertaken in the school's previous teaching buildings, and she describes watching pupils running 'like sand' through its spaces at a rhythm of 40-minute intervals, marked by the sound of a tannoy bell





and causing the whole building to shake. 'It was easy to see where the pinch-points were, and there was no natural light nor views from the circulation spaces,' she recalls.

Cohen assessed that the school had a vision of learning, discussion and interaction happening everywhere, but it wasn't sure what this looked like. An important move was to persuade the client to incorporate breakout spaces, both big and small, into corridor areas, expressing the pedagogical ethos spatially. These are carefully calibrated to reflect departmental needs – one-to-one spaces for maths, small-group spaces for languages, bigger ones for humanities. Naturally, the school also wanted a building that would stand the test of time in terms of robustness but also with respect to its long-term accommodation of shifting educational models and trends. Here Walters & Cohen has worked assiduously to integrate service runs and cores with circulation within a resilient structural grid. The school also expressed a desire for a 'non-masculine' building. 'When we drilled into that concept,' says Cohen, 'it turned out they didn't want the elevations to articulate a grid. So we developed a non-regular rhythm for the courtyard façades with three different sizes of glass-and-louvre module.'

Beyond the introspection of the quad, the building's most public face – glimpsed from across the Thames through trees and the frontages of auxiliary buildings – presents vertically corrugated battlements of irregularly spaced precast fins, interspersed

Architect's view

The General Teaching Building (GTB) at St Paul's is part of an ambitious masterplan for the school which, as a combined project, is aiming for a BREEAM score of Excellent.

As well as providing new general teaching facilities, a dining hall, library, secular hall and chapel, this phase of the development also includes a new energy centre that powers the entire campus, and has provided a new LTHW ring-main for existing and new buildings on site to plug into. The GTB is heated using low surface-temperature radiators that significantly reduce the amount of energy required to heat the required water. All of the boilers within the new energy centre have the ability to run at this reduced temperature so that, as the infrastructure is rolled out within subsequent and existing buildings, the energy consumption of the whole site can be further reduced.

PVs cover all the available roof, providing the school with an ongoing source of renewable energy. They have been raised above the roof surface to allow a wildflower roof to grow around and beneath them and increase the site's overall biodiversity.

Where possible, the new building is naturally ventilated, using the high thermal mass of the in-situ concrete frame to regulate the building's temperature throughout the day and further reduce the amount of additional heating and cooling required.

Tim Rowley, Hannah Anderson, Michal Cohen

with long glazing drops. This vertical language, present on both outer elevations, is integral to an environmental strategy that provides a high proportion of natural ventilation, as well as providing solar shading and noise attenuation.

A related external manoeuvre was to effectively pedestrianise an existing service route between the new building and the River Thames, prioritising this space for the benefit of pupils for the first time. The Founder's Court is landscaped in a similar urban-realm language, with trees, and plinths (soon to be populated with statues) – the idea being to ensure the area is inhabited and not just gazed at in the keep-off-the-grass tradition.

The building's environmental strategies are closely fused with an acoustic plan to dampen internal sound reverberation and mitigate against noise from the nearby A4 and Heathrow flight path. Much of the in-situ frame and 80 per cent of its concrete ceiling soffits are left exposed internally. Fresh air is supplied through manually operated apertures and louvres integrated into cladding modules. Air is conveyed through high-level corridor side-vents to grilles in roof lanterns above the circulation voids. Below ground, an audacious and surprisingly low-tech solution from structural engineer AKT II used dynamic compaction to stabilise conditions to enable a thermally useful 600mm-deep raft foundation, averting the need for the deep piles used in the earlier Science Blocks. Walters & Cohen's addition is a simple volume that works cleverly to

punch light and a hierarchy of sculpted spaces into a deep plan. Belying the pragmatic basis of its prescribed footprint, just about every corner of the building works to subvert its own rhythm by presenting 'wormholes' of luminescence and volume. The regular beat of the double-loaded corridor plan – even-handedly delivering 56 classrooms in two sizes over three levels – is broken up by a series of spatial crescendi. Cohen refers to these as 'jewels', and they include the school's triple-height atrium; a multipurpose secular hall neatly integrated with a chapel annexe; a ground-floor ceremonial room; and the lofty volume of a north-facing library overlooking the tree-lined Thames banks.

In the library, and across the school's network of circulation voids, fair-faced concrete finished to a tactile smoothness is juxtaposed with the delicate staccato rhythm of splay-legged balustrading, providing a language against which carefully selected gilt-framed portraits, rare books and artefacts are displayed like icons. An outstanding aspect of the project is its proportional play of volumes, ranging from crescendo spaces down to the scale of individual classrooms.

'Staff felt the new classrooms were bigger than the old ones, but they weren't,' says Cohen. 'It was just that they were in the right proportion, with windows down to the floor.'

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Perhaps what the school meant when it called for a 'non-masculine' architecture was a building without pomp. And, indeed, the design intelligence represented is of the kind sometimes undersung: the ability to think across time while working co-operatively with existing and future context, getting the sensory qualities right – the sound, the fall of light, the experience of spatial proportion. On the day of my visit the school is pupil-less, but a sense of the building's potential to be animated by human activity is palpable. Hopefully the building will be occupied again as soon as the Covid-19 lockdown eases.

We live in interesting times and, at a point when levels of socio-economic inequality have scaled new heights (or depths) in the UK, St Paul's School has made some interesting decisions in commissioning new architecture. It has steered a prudent course in addressing the serious business of elite education while judiciously passing under the radar of an embarrassment of riches. In turn, Walters & Cohen has delivered a quietly erudite building that handles some of the less tangible but fundamentally important aspects of architecture – time, sound, light, volume – with sensibility and considerable architectural skill.

Ellie Duffy is a writer on architecture and the built environment



Performance data

On-site energy generation 30 per cent of regulated energy
Heating and hot water load 30.56 kWh/m²/yr (from Part L Model)
Total energy load 42.9 kWh/m²/yr regulated, 67.86 kWh/m²/yr regulated and unregulated (from Part L Model and excluding energy generation)
Airtightness at 50Pa 4.24 m³/hr/m² (measured)
Overall area-weighted U-value 0.46 W/m²k (for whole envelope)
Predicted design life 60 years

Project data

Start on site March 2016
Completion February 2020
Gross internal floor area 9,714m²
Construction cost £43 million
Construction cost per m² £4,427
Architect Walters & Cohen Architects
Client St Paul's School
Structural engineer AKT II
M&E consultant Max Fordham
Quantity surveyor and cost consultant Arcadis
Project manager Metis Projects
CDM co-ordinator Robinson Low Francis

Approved building inspector Butler & Young Approved Inspectors
Main contractor Osborne
CAD software used Vectorworks
Landscape architect Bradley-Hole Schoenach Landscape
Acoustic engineer Max Fordham
Façade consultant Eckersley O'Callaghan
Signage design Walters & Cohen
Planning consultant Lichfields
Annual CO₂ emissions 5 kgCO₂/m²