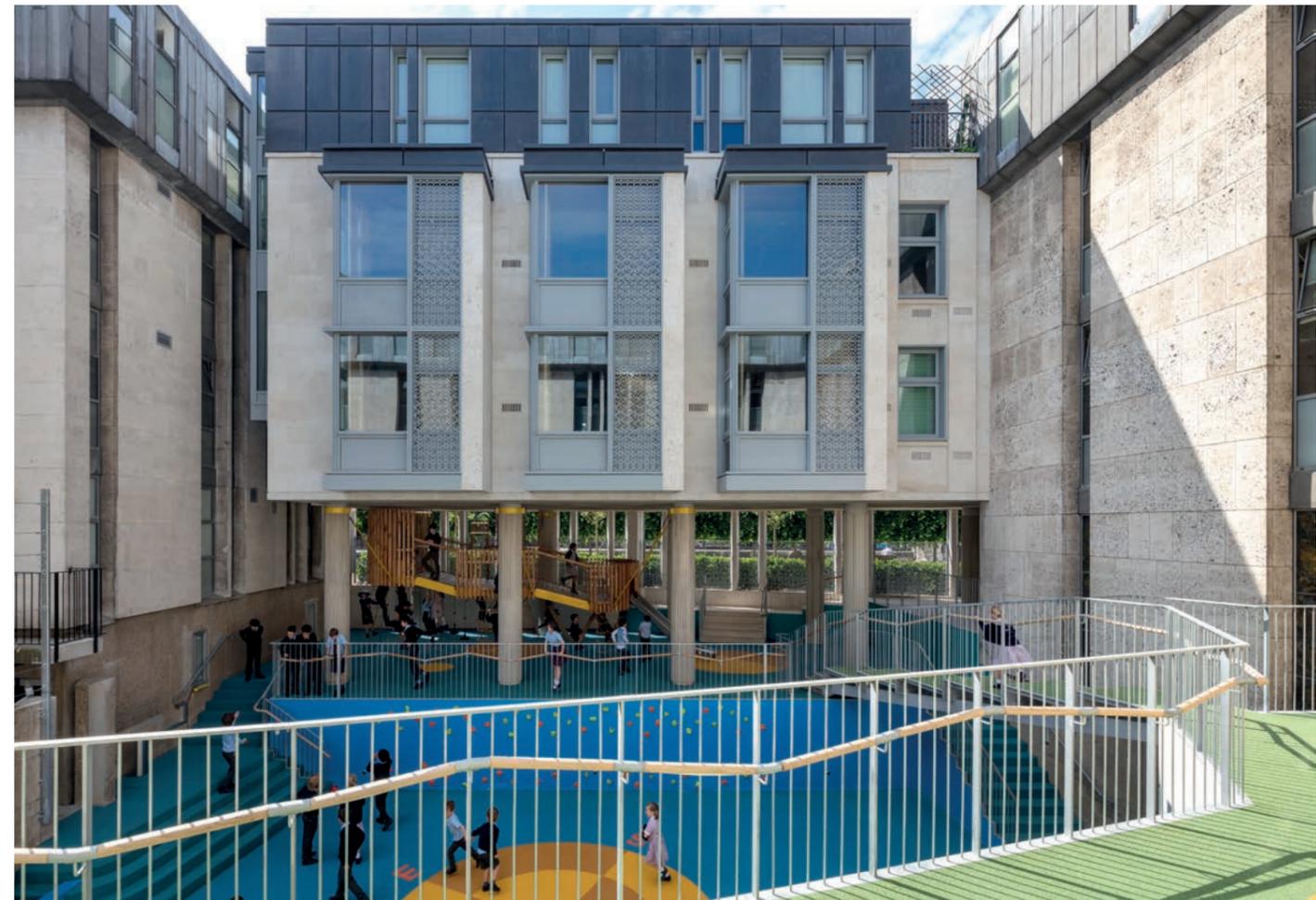


Buildingstudy

Hymns ancient and modern

Kilburn Nightingale Architects has extended St Paul's Cathedral School in central London with an artful renovation and addition linking the 1690s to the 1960s





This project rearranges a central London preparatory school to provide a new boarding house for its choristers, linking an existing 1960s Grade II-listed school building on one side and a Grade I-listed church tower on the other. Parts of the existing buildings have also been renovated to provide staff flats, three new classrooms, a refurbished and extended dining hall, and an IT room. The existing playground has been reconfigured and extended with a new play structure and an additional play area on the roof of the dining hall extension.*

Words Jay Merrick
Photography Nick Kane

Kilburn Nightingale Architects' (KNA) design of the new extension of St Paul's Cathedral School in the City of London has a Groundhog Day aspect which stretches back to the selection of the Architects Co-Partnership's 1967 scheme that produced the existing buildings on the site. One of these is connected to the Grade I-listed tower and spire of Wren's St Augustine's Church, whose nave was destroyed in a 1940s bombing raid.

KNA's original design for the extension was scrutinised by the City planners and by members of St Paul's Cathedral Fabric Committee. It was the latter, in particular, which shied away from the practice's

initial proposal for a somewhat busily finned south-facing elevation with a glazed loggia on the roof.

What goes around, comes around. The peculiarly mute forms of the school's original architecture – mostly designed by Alan Powers, neither Brutalist nor Modernist, and typologically obscure – presaged the Fabric Committee's reaction to KNA's initial ideas. In 1962, planners admired the 'appropriately quiet and collegiate nature of the [Architects Co-Partnership] scheme and the perception that the building will stand the

test of time'. The powers-that-be were more Olympian then: a competing design proposal for the school by Seely & Paget was, to quote Historic England 'discredited' by the Royal Fine Art Commission.

KNA's ability to resolve the extension project, led by Ben Kilburn, was based on a detailed understanding of the school's architecture through a number of their earlier, smaller interventions in the two original buildings, which sit between the eastern edge of St Paul's gardens and 1 New Change, Jean Nouvel's sleekly commercial basking shark. The Cathedral School was founded in the 12th century and its current site was originally identified in Charles Holden's and William Holford's post-war proposals for rebuilding the City of London.

The extension is lifted one storey above the play area, which sits in the angle of the L-shaped main block, and connects it with the standalone eastern building. The extension contains the school's two-level boarding house, with three six-bed dorms on each level, and the head of boarding's flat on the attic floor. This is the most substantial and transformative part of KNA's scheme, which has also delivered a new dining pavilion and a pleasingly limber metal staircase in the tower, which replaces a



grimly brutal concrete staircase that crudely concealed the stones of the tower's original 17th century base.

The project also required the removal or stripping-out of original structures and features, including the L-shaped dining pavilion and apartment on the ground floor, and the south-facing railings between the church tower and the separate eastern building. In that building, the lower ground floor is now an IT suite, and the first, second and third floors converted into accommodation for staff, nurses, and gap-year teaching students. This Jenga-like exercise has also increased the accommodation for chorister borders.

In deference to the buildability challenge on this tight, trial-pitted site, the three-storey structure has a CLT frame whose prefabricated sections were craned into position and erected in a few weeks. The cladding selection was aesthetically shrewd: it is mostly smooth Jordans Whitbed Portland stone, to generally match the facades of the church tower and St Paul's Cathedral, with more dramatically pitted Grove Whitbed to accentuate the sills and trims, and to refer to the haptic crunchiness of the existing buildings' stone.

The most imaginative and instantly satisfying aspect of the architecture is the skilfully composed and equipped play area volume in the undercroft, held above the racking, pin-balling choristers by fluted columns sitting on pile-caps that roughly follow the lines of St Augustine's ghostly nave. The columns are positioned to avoid underlying medieval and later remains, which include sacks of bones and 27 more or less complete skeletons. The playful asymmetry of the boldly sculpted coffering of the undercroft's concrete soffit is barely disturbed by carefully inset downlighters – a small but properly refined detail.

As seen from Festival Gardens, the public area to the south, the elevation is chaste and deferential: the essential verticality of the stone façade, which angles in at its halfway mark to meet the tower, recalls those of the school's original buildings, but is much more elegantly expressed, without the Brut-lite asymmetries of Powers' verticals. And, in an intelligently convivial dissolution of boundaries, there is a more or less clear view into the undercroft from the pavement through metal screens patterned to match the baroque figuring of the balustrade around Hawksmoor's spire – the latter slightly altered by Paul Paget in 1966.

The extension's inward, north-facing elevation overlooks the lower play area and the rebuilt and enlarged single-storey dining pavilion opposite, which has a clean-lined, late modern Scandinavian look. A narrow, gently arched bridge, with a no-nonsense double-rail

The columns are positioned to avoid medieval remains, which include sacks of bones and 27 more or less complete skeletons



structure, adroitly resolved by Price & Myers, connects the undercroft to an extension of the play area on the roof of the dining pavilion.

The projecting two-storey bays that overlook this scene have decorative 'Hawksmoor' metal screens externally and internal wooden shutters that mediate views into and out of the dormitory rooms. Above them, lead sheeting has been unfussily laid and seamed on the slightly projecting attic storey. This adds a dash of Modernist tailoring to the elevation and avoids any repeat of the frumpy-looking girdles that crown the earlier buildings.

The internal design of the two boarding floors is impressive. The common rooms

and corridors outside the dormitories are timber-boarded and painted in unusual matt shades of soft green and blue.

In the rather spacious dorms, the walls, cupboards and double-bunks are oak-faced and simply and crisply detailed. The effect, standing in the doorway and looking towards the window screens and shutters might be described as calmly stylish.

A much trickier challenge, according to project architect Elliott Sully, was to create doorways connecting the common rooms at the western ends of the dorm floors with the tower. Here, scrutinised on site by archaeologists from the Museum of London, the tower's rubble



and mortar walls were carefully cut out, a concrete lintel inserted behind existing cornices, and doors then fitted to the portal's inner steel frame.

The corridors on the dorm floors are unusually pleasurable, both spatially and atmospherically. They reach a width of 2.6m outside the dorms, which creates generous milling space – and something more engrossing. The south light passing through the windows' shutters and decorative screens casts richly figured patterns on the floor. Quite unexpectedly, and combined with the soothing green or blue paintwork, this triggers a distinct and surreal sense of having ambled onto a sub-tropical verandah: phenomenology in action.

As English Heritage said of the original school buildings, the context around them is 'humbling'. The architecture of Kilburn Nightingale's scheme is nominally humble and certainly functionally effective. But in this hugger-mugger of existing structures, their real success is in the way they have artfully leavened and re-energised the bunker-like inscrutability of the Cathedral School's original tableau.

Jay Merrick is an architecture critic and author

Project data

Start on site July 2019

Completion February 2021

Gross internal floor area 420m² (new boarding house), 95m² (dining hall extension), 1,260m² (refurbished areas)

Construction cost £8.2 million
Construction cost per m²
Not available

Architect Kilburn Nightingale Architects

Client St Paul's Cathedral School

Structural engineer

Price & Myers
M&E consultant

CBG Consultants

Quantity surveyor Peter W

Gittins & Associates

Principal designer

Kilburn Nightingale Architects

Approved building inspector

Quadrant Building Control

Approved Inspectors

CDM adviser Apex CM

Catering design A&E Catering

Acoustic consultant Gillieron

Scott Acoustic Design

Planning consultant

Beacon Planning

Archaeology advice Museum

of London Archaeology and John

Schofield (St Paul's Cathedral

Archaeologist)

Access consultant Macemark

Play equipment specialist

PlayEquip

Stonework specialist

Szerelmey

Main contractor

Borras Construction

Annual CO₂ emissions

28.7kgCO₂/m² (estimate)

CAD software used Vectorworks

Performance data

Percentage of floor area with daylight factor

>2% 87.49% (predicted from computer model)

Percentage of floor area with daylight factor

>5% 8% (predicted from computer model)

On-site energy generation Nil

Heating and hot water load

100.15 kWh/m²/yr (predicted from computer model)

Total energy load

112.22 kWh/m²/yr (predicted from computer model)

Carbon emissions (all)

28.70 kgCO₂/m² (predicted from computer model)

Annual mains water consumption Unavailable

Airtightness at 50Pa

3 m³/hr/m² (estimated)

Overall thermal bridging heat transfer coefficient (Y-value)

0.046 W/m²K (predicted from computer model)

Overall area-weighted U-value

0.46 W/m²K (predicted from computer model)

Embodied/whole-life carbon Unavailable

Predicted design life 50+ years



Client's view

The brief for the new build part of the scheme was directed by the need to provide compliant boarding accommodation to reflect current regulations, and the desire to meet the expectations of families whose children are choristers at the school. In doing so, the new building is part of a strategy to secure the English choral tradition long into the future.

The accommodation, running over two floors, includes 36 beds configured in groups of six, common rooms currently configured as a games room and cinema room, bathrooms, plus ample quiet social spaces.

Materials are entirely sympathetic to the existing school which, designed in the 1960s is a modernist interpretation of St Paul's Cathedral. Features of the new accommodation include underfloor heating and air flow management, as well as sound-proofed window sets.

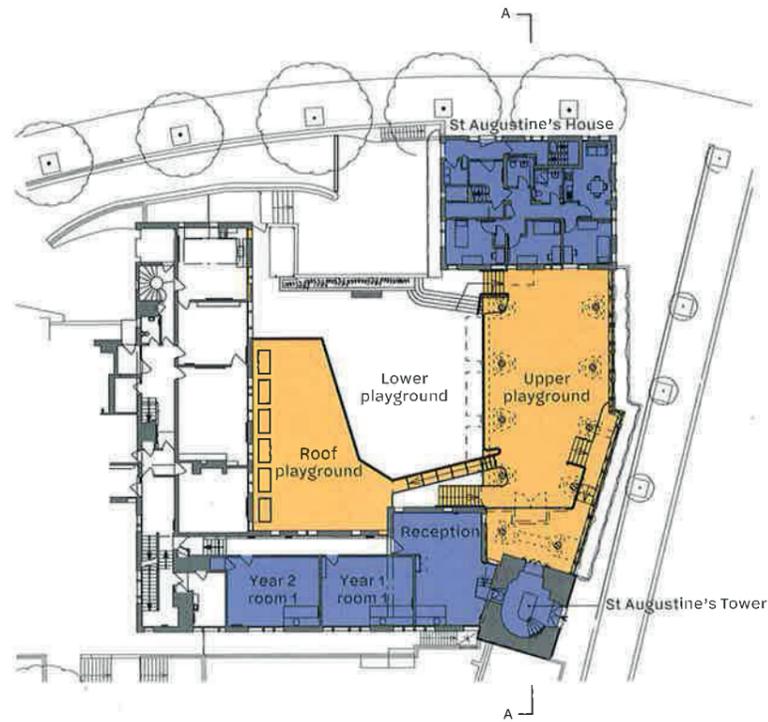
Maximising a constrained plot, the building is elevated on pillars, creating a covered play area, which has also been completely redesigned. The enlargement of

the play spaces, which are secure and fully contained, includes a green wall and other planting. These features have a positive environmental impact as well as being aesthetically pleasing.

The new boarding accommodation is the central element to a three-phase redevelopment of the school's estate. This includes substantially better residential staff accommodation, more classrooms, a discrete ICT suite, an enlarged and refitted dining hall and kitchen and bespoke play equipment. These elements combined have increased the school's capacity and are now meeting the needs of increasing numbers of London parents wishing to educate their children at St Paul's Cathedral School.

In addition to safeguarding and allowing for flexibility in boarding for choristers, a further benefit is being able to host visiting choirs when the school is not in session. *Simon Larter-Evans, headmaster, and Martin Kiddle, bursar, St Paul's Cathedral School*

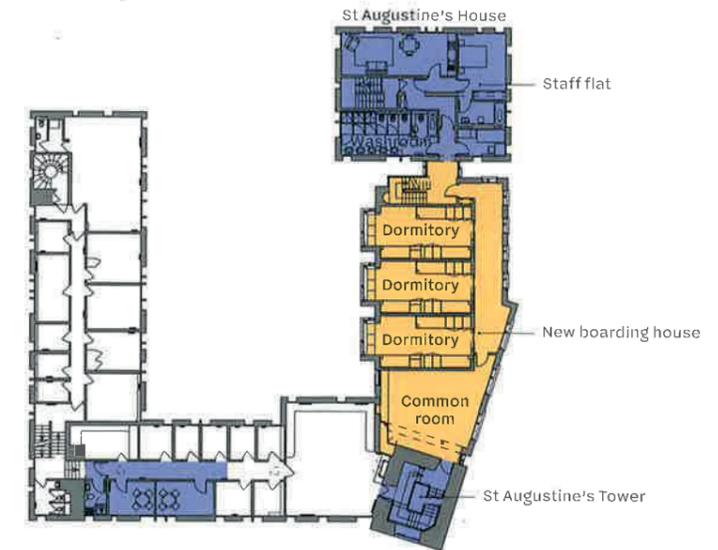
Ground floor plan



Third floor plan



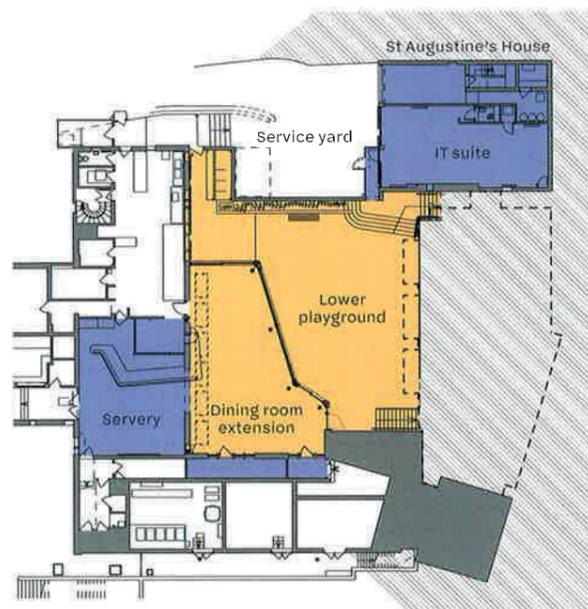
Second floor plan



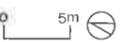
First floor plan

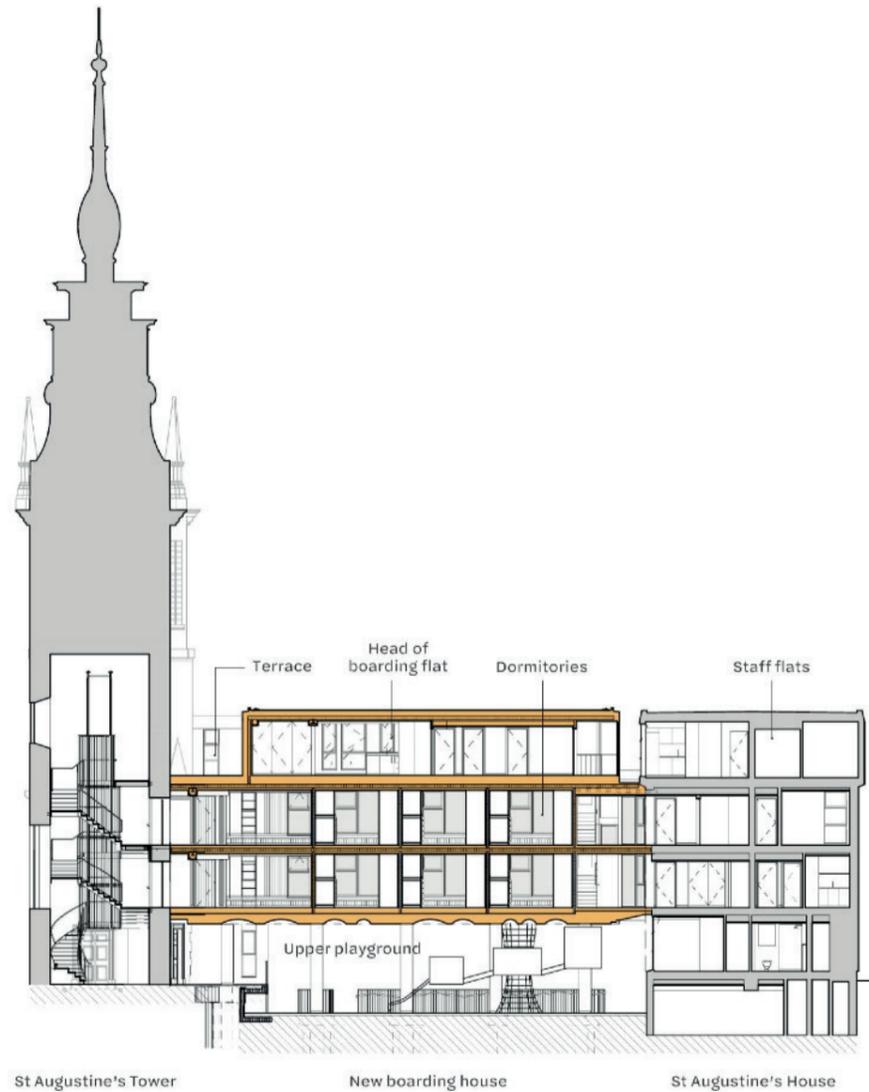


Lower ground floor plan



■ New works ■ Existing updated





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Architect's view

Partly new build (the boarding house) and partly renovation of 1960s buildings (and a 17th century church tower), this scheme is the culmination of many years of work, the initial proposals being developed in 2013. Given the location and the listing of the buildings, the site is highly sensitive with respect to planning and archaeology, with very little space for enlargement.

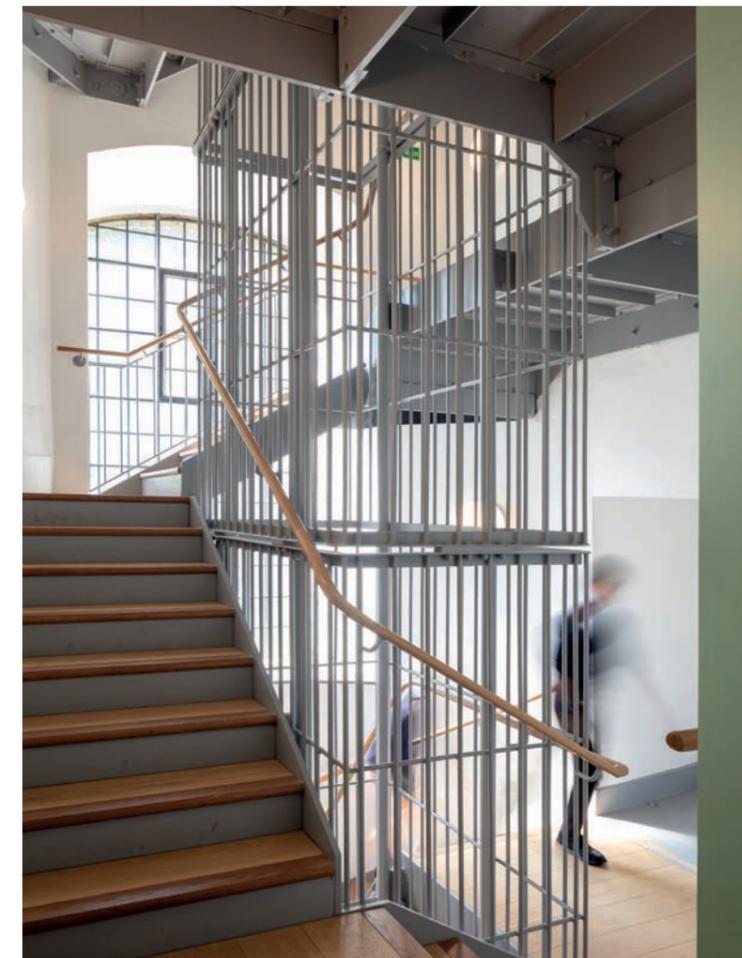
The project's designs were developed in dialogue with the school, parents, children and governors, the City of London Planning Department and the Cathedral Dean and Chapter. The boarding house design was refined to reduce excavation and disruption of the site and to minimise the on-site programme.

The new building comprises a concrete 'table' on columns raising it above the playground, with a three-storey CLT structure above housing choristers and a staff flat. CLT was chosen for its low embodied carbon and speed of

erection. The building is highly insulated to enhance energy efficiency and designed to maximise airtightness, with all habitable rooms served by MVHR units with air filters. These can be switched off in the warmer months with ventilation provided by open windows. When necessary, heat is provided by underfloor heating, suitable for adaptation to future air source heat pumps. As a result of these measures, the heating requirement is very low and energy usage is minimised, thereby reducing the whole life carbon footprint.

Improvements have been made to enhance energy performance in the existing buildings. Lighting has been changed to low-energy and boilers enhanced. Further improvements will be made to the building fabric, particularly to the roofing.

Ben Kilburn, director, Kilburn Nightingale Architects



Engineer's view

The site's rich and complex history poses significant limitations on opportunities for development of any kind. Roman archaeology 4-5m below ground level is overlain by the remains of the medieval church of St Augustine, first mentioned in records dating from 1148. Rebuilt in 1630, the church was then destroyed in the Great Fire and rebuilt by Wren in 1695 with a spire attributed to Hawksmoor. Destroyed again in the Blitz of 1941— along with almost everything in the vicinity, with the exception of the cathedral - the spire alone was repaired in 1954 and then incorporated into the 1967 Choir School by Architects Co-Partnership.

The challenge was to provide additional accommodation, touching down on the historic site but in a very limited and controlled way, while not reducing the limited area of playground space, and bridging between existing staircases in the listed spire and boarding houses. The result is a

structural solution using a raised table in exposed in-situ concrete.

Drawing records and historic film from the early 1960s enabled us to map the locations of the 'table legs' onto the buried church. By adjusting the geometry carefully, we were able to have reasonable confidence that the discrete triangular pile cap foundations would miss the historic walls. Several archaeological investigations — including the exhumation of over 20 skeletons and some adjustment of the pile cap alignments — gave certainty about where piles could be installed.

The cellular spaces of the new boarding house are supported off the top of the table and use cross-laminated timber construction, which allowed rapid progress of the structure on a difficult-to-access site while other areas of the school remained in use.

Andy Toohey, partner, Price & Myers





Working detail

This detail shows the south façade of the new boarding house. It consists of 50 to 75mm-thick Portland stone slabs fixed back to a cross-laminated timber structure using stainless steel ties and brackets. A layer of rigid insulation sits in the cavity between the stone and the CLT. Below this is a concrete slab at first floor level, with the playground beneath.

Two types of Portland stone were used: Jordans Whitbed and Grove Whitbed. The Jordans is the smoother of the two and is used on the main vertical areas of the façade. The Grove is much more figured, with its higher fossil content, which usually manifests as pits in the stone. This is more visually energetic and as such is used sparingly in areas such as window reveals, sills or copings. The two stones also help the new boarding house relate to its neighbours, the smoother stone resembling the surfaces of St Augustine's Tower – as well as the Cathedral itself – and the Grove more like the existing part of the school's external walls.

CLT was chosen for three main reasons: firstly, for its low embodied carbon; secondly, because it could be prefabricated away from the constricted site and rapidly assembled once delivered; and thirdly for its adaptability – provision for a future platform lift is made with demarcated knock-out panels in the floor slabs which can simply be cut out when the need arises.

The building's appearance is primarily concerned with 'fitting in' and visually (as well as physically) linking two very different existing buildings. However, the means of achieving this involves the use of contemporary, sustainable timber technology, hidden under the surface.

*Elliott Sully, project architect,
 Kilburn Nightingale Architects*

South façade detail section

