Eckersley O'Callaghan

Specialist Heritage Engineering

Breathing new life into historic buildings

Contents

For almost 20 years, Eckersley O'Callaghan has been at the cutting edge of advanced engineering design with a strong focus on revitalising heritage buildings

The Queen's College, University of Oxford, UK
MICA Architects
Eckersley O'Callaghan designed the structural scheme for a basement extension to the Grade I listed library and archive, stretching 800m² beneath the provost's garden

Eckersley O'Callaghan collaborates with visionary clients on projects that push the boundaries of what is possible.

Since forming in 2004, our team has grown to more than 120 across offices in London, Manchester, New York, San Francisco, Los Angeles, Paris, Hong Kong, Shanghai, Delhi and Sydney.

We have established an international reputation for our creative, yet rigorous, approach to engineering structures and designing facades. We work on a range of extraordinary building projects across the world, from complex structures of timber, steel or concrete, through to bespoke glass designs and specialist heritage projects.

Our innovative work has received some of the highest accolades in the industry, and we are synonymous with pioneering new advances in design and engineering. Our engagement with architecture and industry underpins our pioneering use of materials to realise projects of exceptional quality, efficiency, and elegance.

Sustainable thinking informs all our projects, beginning at the earliest conceptual stages and continuing right the way through to completion.

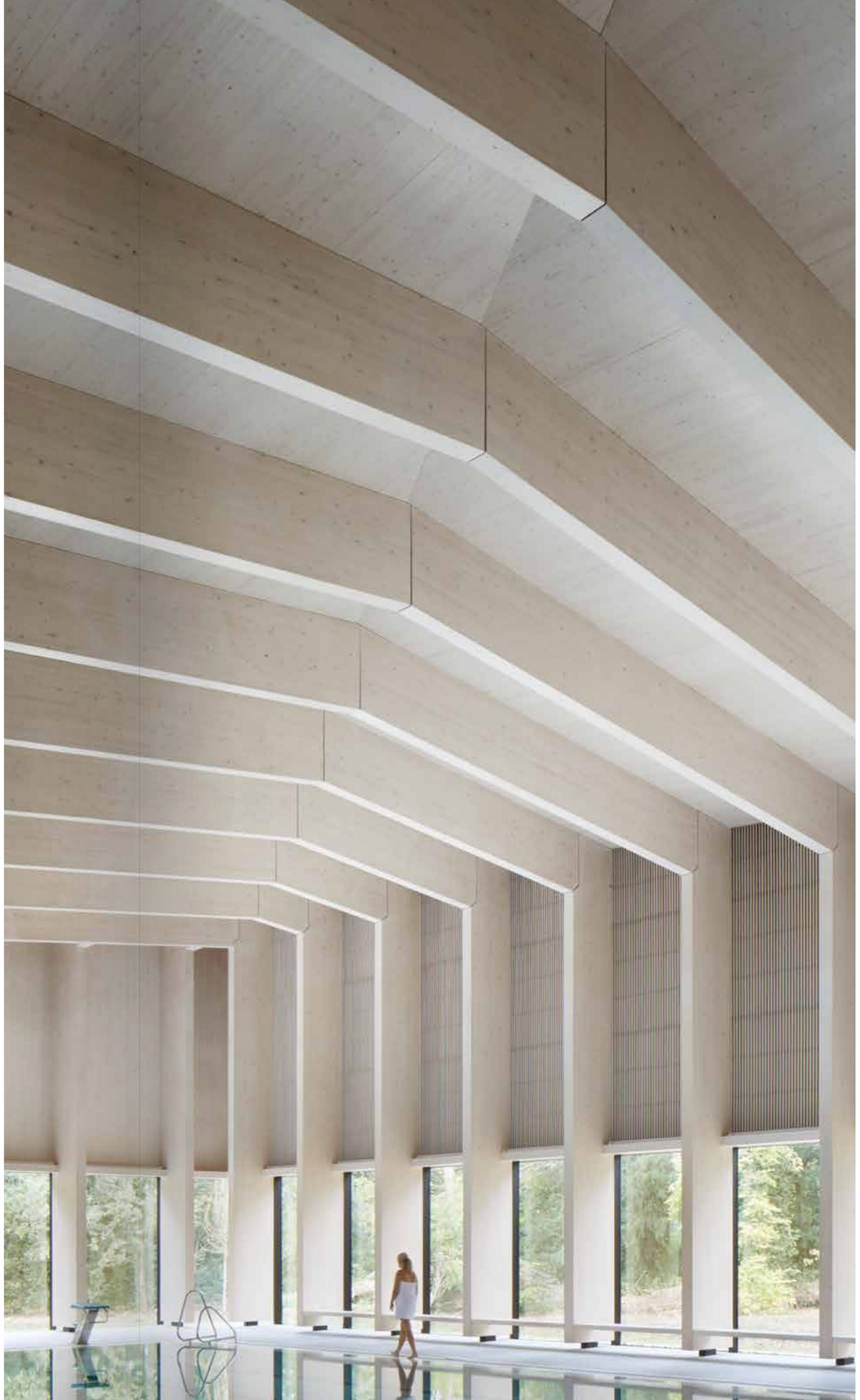
2021 Holcim Award for Sustainable Construction
Atlassian Central - special commendation

2021 IStructE Award for Structural Transformation
Ashworth Centre and Library Extension, Lincoln's Inn

2019 IStructE Award for Sustainability
La Référence de Ganthier

2019 Construction Consultancy of the Year
Construction News Awards

2018 Structural Timber Award
City of London Freemen's School Swimming Pool



01 **Collaboration**
Eckersley O'Callaghan team at work

02 **City of London Freemen's School Swimming Pool Ashtead, UK Hawkins\Brown**
Multi award-winning swimming pool with an offsite manufactured structure of engineered timber

03 **Atlassian Central Sydney, Australia SHoP | BVN**
Eckersley O'Callaghan provided structural and facade design for the world's tallest hybrid timber tower, which achieves a reduction of 50% in embodied carbon compared with conventional buildings

Our experience with heritage buildings

1

2

1 **V&A Museum**
Fashion Gallery
London, UK
6a Architects
We performed several structural upgrades in this space, enabling the installation of three, 9.5m diameter light rings, each weighing two tonnes and hanging off the original 1906 roof

2 **78 St James's Street**
London, UK
Squire and Partners
Refurbishment of a Grade II* listed Victorian building for office use, including new glazed elements

Building conservation is a highly specialised field of engineering. Our engineers have the diverse expertise to tackle the specific challenges presented by heritage buildings.

400
year span of historic projects

We bring a wealth of knowledge and experience from our varied portfolio of projects, ranging from historic townhouses and prestigious galleries to country manors and education establishments.

Successful heritage projects require both a passion for revitalising these historic structures and collaboration across distinct specialisms. We have established close relationships with heritage architects, planning and conservation consultants, as well as contractors who understand the specific requirements of historic buildings.

Collaborating with contractors, we develop key details quickly and efficiently, utilising phone reporting apps to allow quick and efficient reporting on-site. We also provide appropriate site monitoring across a range of works, including complex basement and foundation works, and extensive structural interventions to limit damage to the existing building.

We have expertise working with a wide range of materials, including timber, masonry, and historic metals. Our industry-leading knowledge of structural glass means we are highly skilled when it comes to replacing historic structures with new glazing, providing everything from advanced dew point analysis to detailed energy performance assessments.

In addition to upgrading buildings, our engineers are skilled in developing adaptive re-use schemes that ensure heritage buildings last long into the future.

At a time when sustainability is vital, conservation has become more important than ever. Finding new uses for our existing buildings forms a key - and growing - part of sustainable construction. Eckersley O'Callaghan has the skills to rise to this challenge.

1 **Grimsthorpe Castle Lincolnshire, UK MUMA**
A new gallery will be added to the Grade I listed Grimsthorpe complex, which dates back to the 13th century

2 **Cast Courts, V&A Museum London, UK**
Structural and facade engineering services included the design of a new glazed roof envelope with solar control to replace the existing patent glazing system, supported on the original iron roof trusses

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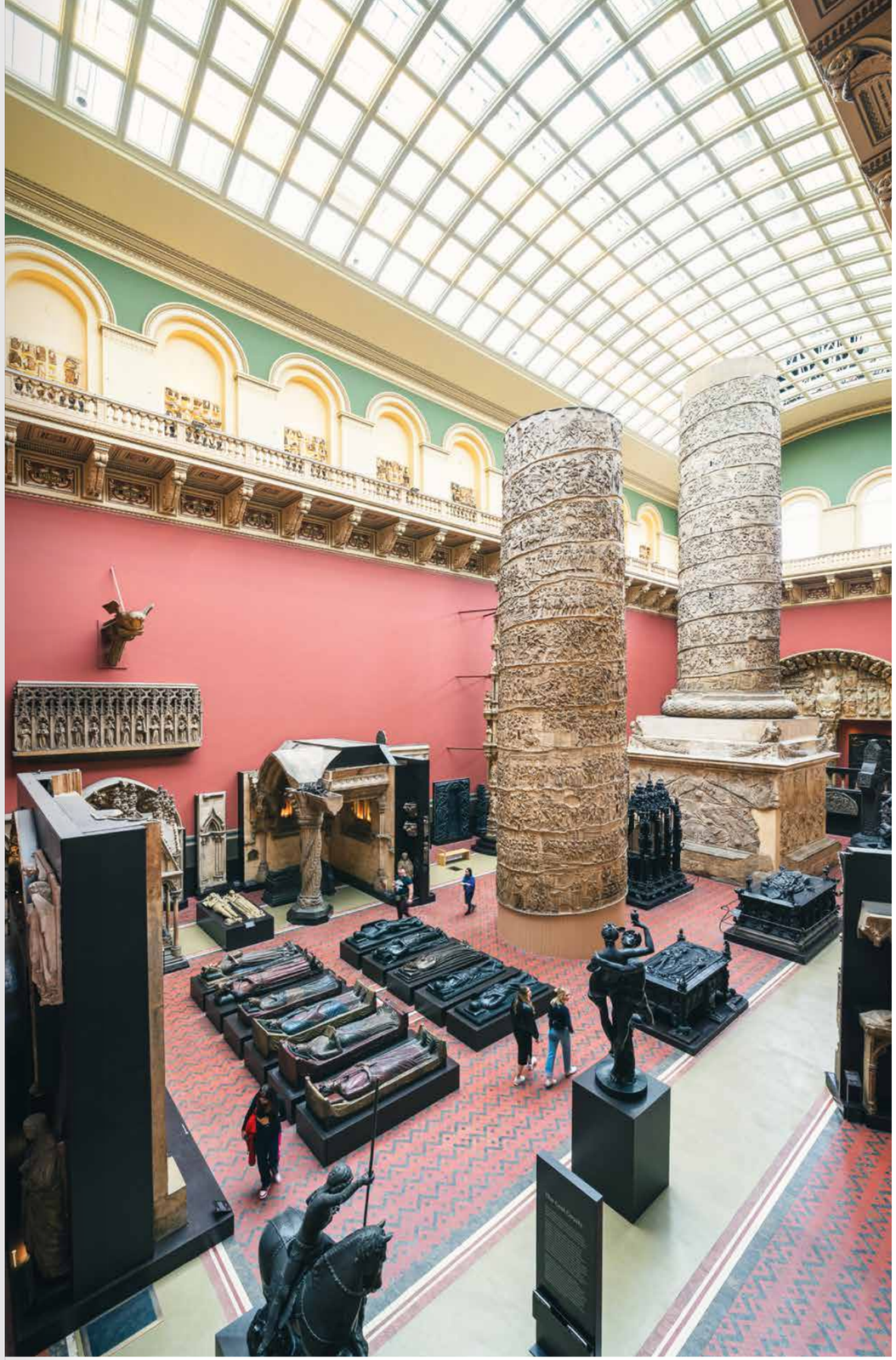

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20m
spanning trusses support the 150 year old roof

H B Allen Centre,
Keble College
University of Oxford, UK
MICA Architects
Temporary piles were required to support Acland House in order to create a new basement, part of a mixed-use academic development of the Grade II listed building

Through our experience, we have learnt that four factors are key to successfully tackling heritage projects: understanding, doing less, conserving and enhancing.

Understanding

Arguably the most important of these factors, understanding informs the whole design process. We want to learn everything there is to know about a building - how old it is, how it was used, who designed it, why they designed it that way, and what its historical significance is.

This initial step provides the foundation for a desk study. This is crucial for gaining a thorough understanding of the site and historic context. A building's past use is almost as important as its current use. Previous repairs help us understand what is required in the present.

Doing less

Once we've gained as much of an understanding as possible, it's time to decide what we might do to help conserve the building. A light touch approach, meaning we only do what is necessary, is often best. Sometimes, this might even mean doing nothing. However, when repairs are required, we always prefer to retain as much of what is already there where we can. Sometimes, a visible repair that is justified and necessary is better than attempting to hide an unnecessary or obtrusive repair. Better still, we like repairs that can be removed completely if the use of the building changes in the future.

Conserving

Conservation is about keeping what is already there. We understand the importance of a long-term strategy. We often see problems associated with inadequate heating and ventilation, rather than with the building itself, so we work closely with our clients to help them understand this. Ongoing monitoring and maintenance are almost as important as the repairs themselves. We have also learnt to trust repair work and construction methods that have stood the test of time.

Enhancing

In addition to conserving, we also have the skills to sensitively add to these projects by extending or changing their use and function. We do this by incorporating light renovation work, utilising the existing fabric of the building wherever possible in order to maximise the efficiency of the structure.

Finally, we recognise that our existing buildings need to be approached differently. It is through our close working relationships with heritage architects and contractors that we have managed to hone this approach.

1 **FRAC Île-de-France Paris, France Bona-Lemercier**
The envelope of the 400 year old chateau was retained and protected with a mirrored stainless steel facade

2 **Reinvented chateau**
The historic house has been completely transformed into a unique art gallery

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3 **Thorpe Lodge London, UK Atomik Architecture**
The Grade II listed school underwent a light-touch renovation, retaining as much of the existing 200 year old fabric as possible while creating new openings where required

Tackling heritage projects requires a unique combination of specialist skills and understanding

V&A Museum
London, UK
ZMMA | 6a Architects | Feilden Clegg Bradley Studios
We have been part of the museum's design team framework, redeveloping many galleries in the Grade I listed building

We have extensive expertise in dealing with issues surrounding materials such as timber, masonry, metalwork and glass. We also have the necessary skills and experience to undertake site assessments and surveys, carry out supporting site works, and introduce design interventions.

We are continuing to build on our wealth of experience in transforming the way heritage buildings are used, including extending their life through adaptive re-use measures.

Our skills include:

Structural survey and assessment
Supporting site works
Design interventions
Timber
Masonry
Metalwork
Facades
Adaptive re-use

Every heritage project begins with a thorough structural survey and assessment to establish the structure's condition.

The more information we have about the existing structures and materials, the greater the chance that we can conserve as much of the building as possible and minimise the need for interventions.

1 **The Opera Terrace London, UK**
Eric Parry Architects
Renovation of one of London's most famous historic sites required the replacement of the existing conservatory space in the east terrace and works to the adjacent wings

2 **Big survey for small space**
Just the terrace was adapted but we surveyed the condition of the whole four storey Grade II* listed Market Building to ensure minimal structural intervention whilst conserving the terrace's original stone and wrought iron structure

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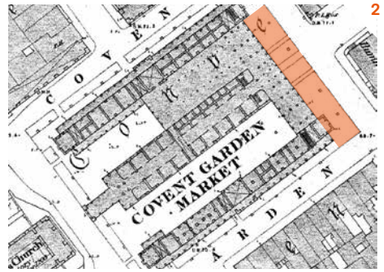

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Covent Garden Market

Location	London, UK
Client	Capco
Architect	N/A
Date	2018
Heritage status	Grade II*

For 140 years since its original build around 1880, the roof of Covent Garden Market Hall has been carrying its own weight - and the loads imposed on it - without any signs of structural distress or significant deterioration of the structural materials.

The scope of new works covers approximately 2430m^2 of roof over two market halls. In anticipation of the glazing being upgraded, our engineers analysed the historic metal roof over the market. The aim was to determine whether the structure could support the new loads, and identify any areas where strengthening might be required. This involved on-site condition surveys, intrusive surveys on columns, and analysis of the original framing with additional loading from the new glass roof. We also undertook research into iron types used during the period of original construction to determine an assumed strength.

The most challenging aspect of the project was handling the materials. The existing structure incorporated the following:

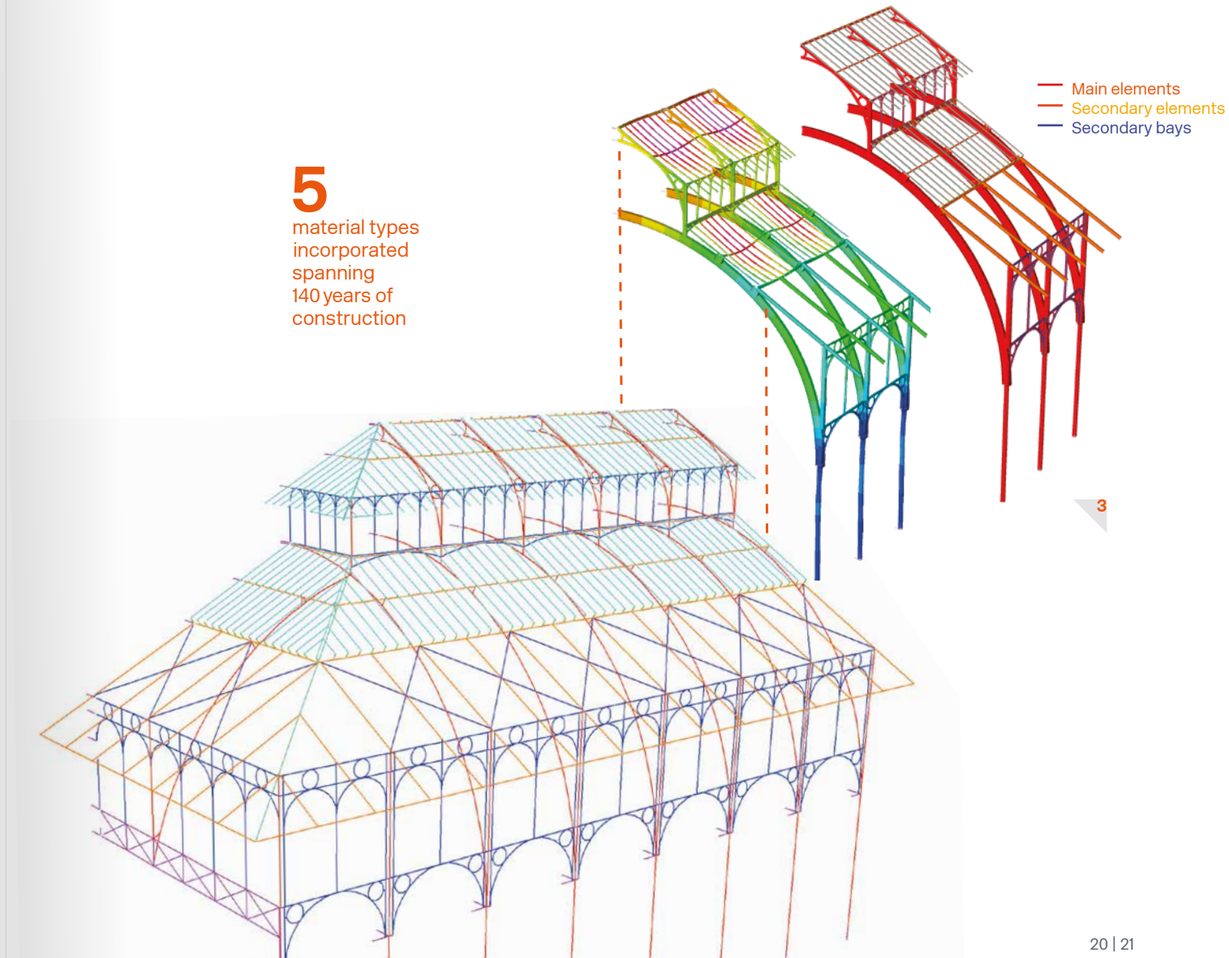
— Cast iron
— Wrought iron
— Historic mild steel
— Flitched beams with timber
— Georgian and chicken wire glass.

2

1 **Covent Garden Market building**
The north roof was built in 1879 and the south roof in 1889

2 **Covent Garden Market Roof**
Our engineers analysed the historic iron and glass roof over the market

3 **In-depth structural analysis**
Our finite element analysis model of the roof shows predicted displacements of the cast iron columns and wrought iron beams (left) and primary and secondary structural elements (right)



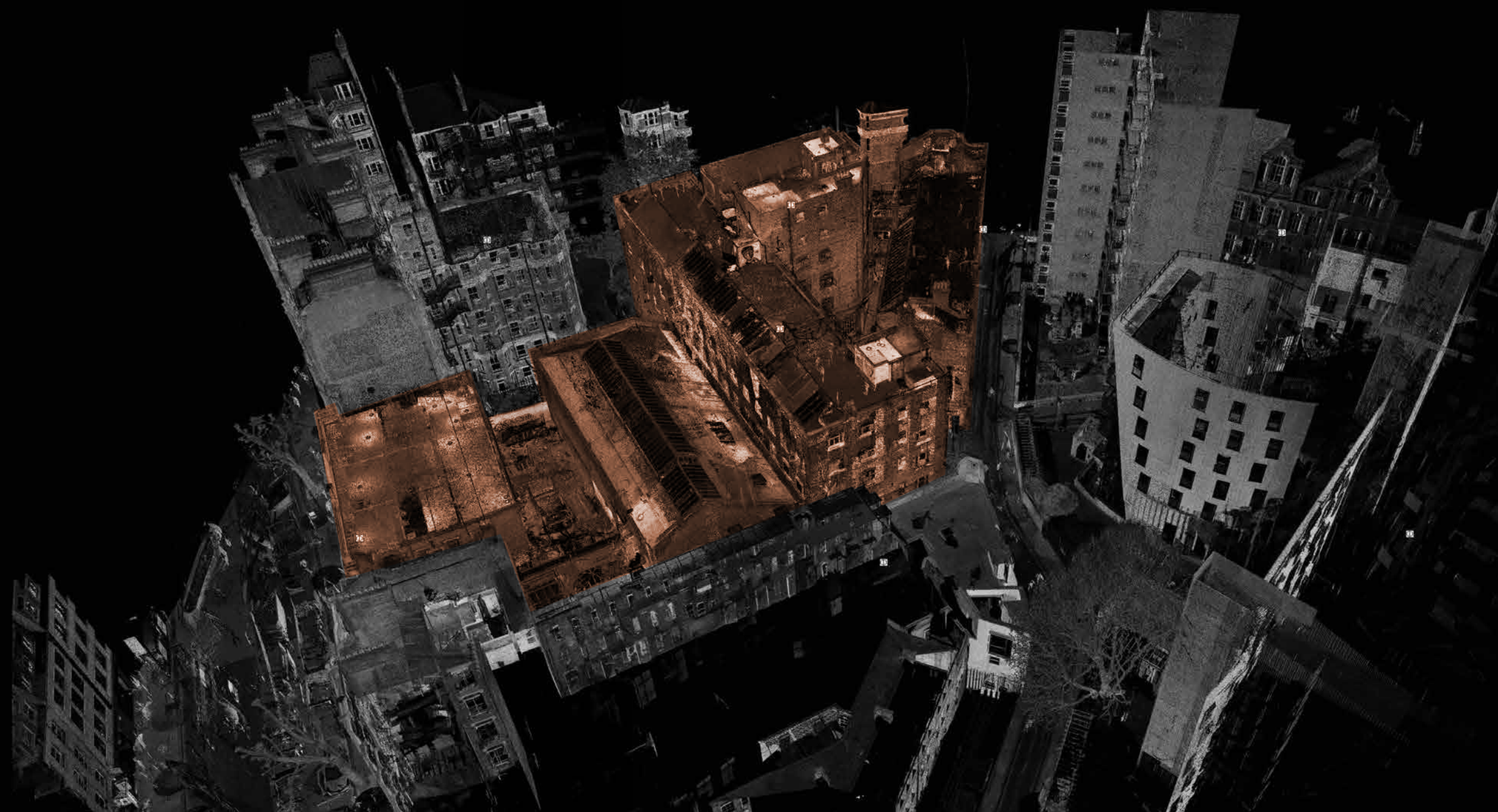
5
material types incorporated spanning 140 years of construction

3

There are many ways that our team helps in supporting site works. Our involvement continues right through to completion and beyond, checking that everything performs as it should.

Our work can include movement monitoring to establish key performance requirements, including site movement and long-term monitoring, with analysis of seasonal building movements undertaken to account for outliers.

We de-risk projects with as many site visits as possible during the early stages. We use site sketches to record information and show existing conditions to help reach agreements with contractors on site, allowing the team to adapt quickly to changing information. We also collect real time data using sophisticated remote techniques and make use of the latest digital technologies to record photos and notes, enabling us to issue reports onsite. This streamlines processes and reduces the risk of delays caused by waiting for information. Our services also include temporary works.



Panther House
London, UK
AHMM
From billions of dots we are able to create virtual 3D models of project sites such as this sensitive 1907 site (highlighted) and surrounding area. Engineers were able to make real-time surveys of the condition of the structure in order to minimize late changes from site discoveries.

V&A Museum Europe 1600-1815 Galleries

Location	London, UK
Client	V&A Museum
Architect	ZMMA
Date	2016
Heritage status	Grade I

We have closely worked with the V&A over many years, which is the largest museum dedicated to decorative art and design in the world. The challenge of adapting this Grade I listed building requires a range of engineering skills. Our structural engineers devised an ingenious method of construction and demolition using minimum vibration techniques for the removal of large sections of 1m thick loadbearing masonry walls. This incorporated the use of temporary works that were restricted to within the Europe Galleries and maintained existing load paths. These allowed the galleries above to remain open to the public throughout, with exhibits safely in place.

Finely tuned steel frames were engineered to create circulation access. The design enabled a low impact installation method – an adapted version of the Pynford underpinning approach. The construction sequence ensured a controlled transfer of load from the existing brickwork to the temporary works, and then finally into the frames.

The remaining brickwork could then be demolished safely, avoiding further movements of the building due to bending deflection of the new steel beams after demolition, and so preventing damage to the listed building.

Predicted deflections of the steel frames from our analytical models were compared to on site movements from monitoring points and used to control the jacking process. These correlated closely and so validated the calculations, and subsequently the jacks were closed off. During demolition, maximum accelerations were carefully controlled to prevent undue vibrations in the walls above, and only minimal vibration cutting was allowed.

In total, seven large openings were created up to 15m in length, and 300 tonnes of brickwork were removed from the basement of the museum.

1 **Europe 1600-1815 Galleries**
Remodelled and enlarged exhibition galleries, created by repurposing underused back of house areas

2 **Extended gallery space**
Demolition of brickwork wall opens up exhibition room

3 **Adapted Pynford underpinning method**
Insertion of steel pins provide temporary support and allowed construction of steel frames with minimal vertical movement

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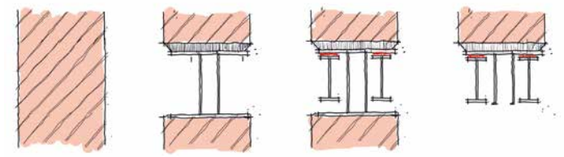
15m
long openings created

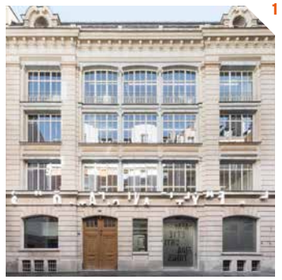
300 tonnes
of brickwork were removed

2

3 **Adapted Pynford jacking method**



Original wall | Install stools | Perform jacking (red) | Remove base stool



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1 **Lafayette Anticipations**
Paris, France
OMA
Refurbished 1891 industrial building with insertion of unique moving exhibition tower

2 **Mobile tower**
Exhibition spaces with adjustable floor heights were created by the insertion of a steel frame rising 18m high within the 19th century fabric

3 **Modern meets historic**
The insertion of the new, steel-framed tower has reimagined the five storey atrium

4 **Intelligent solutions**
Our structural design of the tower offers 49 possible spatial and programmatic configurations

2

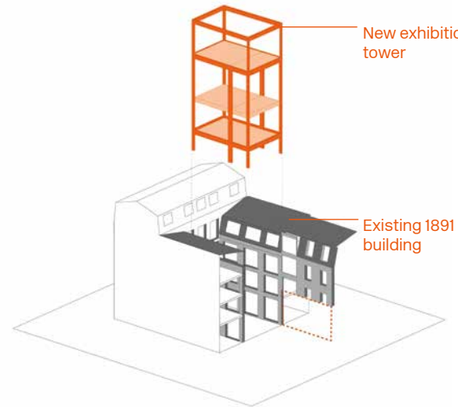
Our team can make design interventions, from new staircases and roofs through to the addition of new building storeys by vertical extension.

While sometimes a project calls for an addition that subtly blends with the existing fabric, other instances may be better served by a modern installation artfully juxtaposed with the structures already in place.

Glass can naturally complement heritage projects as a design intervention by fitting in seamlessly without overpowering a structure or distracting from its key features.

We have developed a reputation for our innovations with glass and facades, working with Apple as glass engineer for more than 300 projects. We are also listed on more than 20 design glass patents. Working intensively with any material produces a close working relationship between the designer, engineer and fabricator – one that allows us to really get to know its intricacies and associated challenges.

Our expertise in this field has been called upon in several of our heritage projects, where we have adapted, updated and replaced historic glazing.



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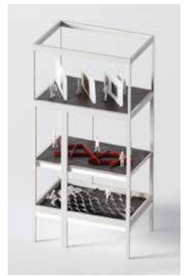

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Apple Covent Garden

Case study | Design interventions

Location	London, UK
Client	Apple
Architect	Bohlin Cywinski Jackson
Date	2010
Heritage status	Grade II
Awards	2011 Westminster Society Biennial Award 2011 AIA Tri-State Design Award 2011 AIA CC Merit Award

1

1 **Apple Covent Garden London, UK**
When completed, the store was the largest ever Apple outlet

2 **Big Apple**
A spectacular new skylight was inserted over the restored internal courtyard

3 **Adapting columns**
Complex work to cut and lengthen historic metal columns enabled the insertion of a new mezzanine floor

4 **Remodelling strategy**
Concept showing column cutting and lengthening strategy

5 **Glass meets brick**
A glass staircase connects customers to three storeys of the store

Our work with Apple on their retail stores often involves the careful insertion of new structures into old buildings. This project for the Grade II listed 1870s building in Covent Garden was a careful restoration of the existing fabric together with some radical work to make the building suitable to house three floors of retail space, back of house basement, and three floors of offices above. The building previously housed a nightclub and restaurant. At 25,000sq ft this was Apple's largest store opening.

Previous alterations to the building had been insensitively designed, with very obtrusive structural interventions. Much work was required to remove these and replace them with more carefully considered elements of structure. These were discretely integrated into the historic fabric whilst at the same time opening up the spaces and strengthening where necessary.

Cast iron columns were cut down in some areas, with base details re-fabricated and re-attached to alter floor levels and improve ceiling heights.

A spectacular new skylight 13.5x13m 8.5m tall was designed over the restored internal courtyard to form the hub of the whole building. The roof required a lightweight construction to justify its load onto the original structure, so the thickness of the steel was optimised and post tensioned steel ties were specified to reduce weight and take out thrusting forces onto the walls.

Two new glass staircases were designed, one a spiral and one a straight stair which sits in a newly enclosed lightwell, seamlessly hitting the brickwork walls around it.

13m
skylight inserted into 1870s masonry fabric

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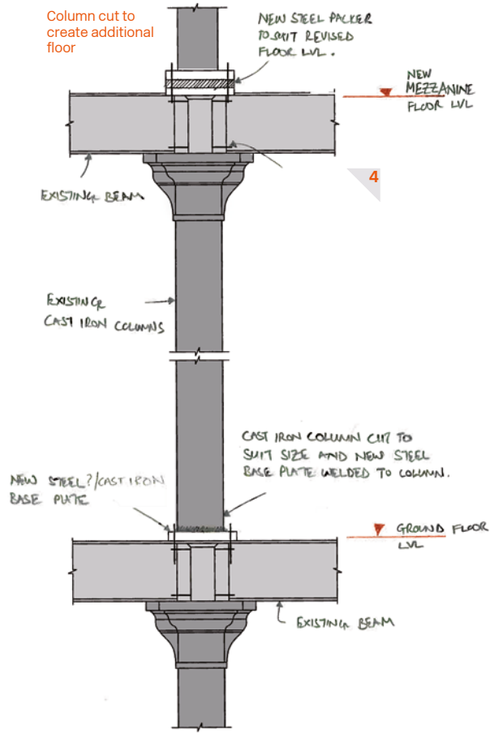

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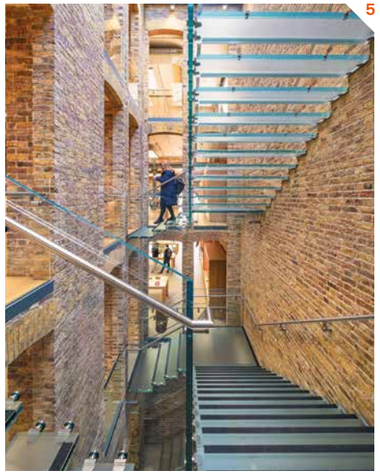


The Rose Inn
Wokingham, UK
Gollifer Langston Architects
This project required sensitive timber repair and restoration for a building dating back to the 1700s

We have specialist knowledge of working with timber, both in terms of modern applications of engineered timber and in the repair and restoration of timber in heritage buildings.

Our engineers are skilled in the identification of different wood species as well as dealing with dry rot, insect infestation, repair of defective timber joints, and the reinstatement of original timber structures.

We are able to employ a variety of repair methods. These include epoxy resin-based repair, new steelwork and ironmongery and new timber bolted to the existing structure and plywood strengthening.

Importantly, we have established relationships with timber surveyors who we work closely with to ensure better project outcomes.

South London Gallery

1 **Timber floor repair detail**
New wood is spliced to existing timber to repair the joist

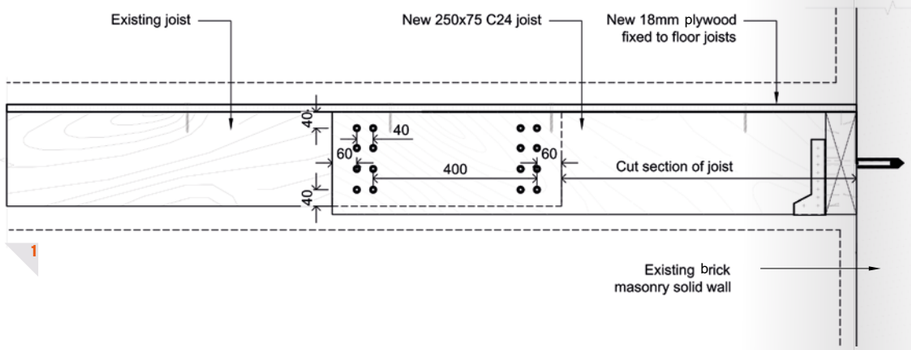
2 **New meets old**
Both old and new floors, as well as original brickwork, are visible

3 **Hazardous damage**
Dangerous dry rot and mould

4 **Water ingress**
Timber floors had become brittle from water damage

5 **Repaired floor**
Timber following repairs

Location	London, UK
Client	South London Gallery
Architect	6a Architects
Date	2018
Heritage status	Grade II*
Award	2019 RIBA National Award 2019 RIBA London Award



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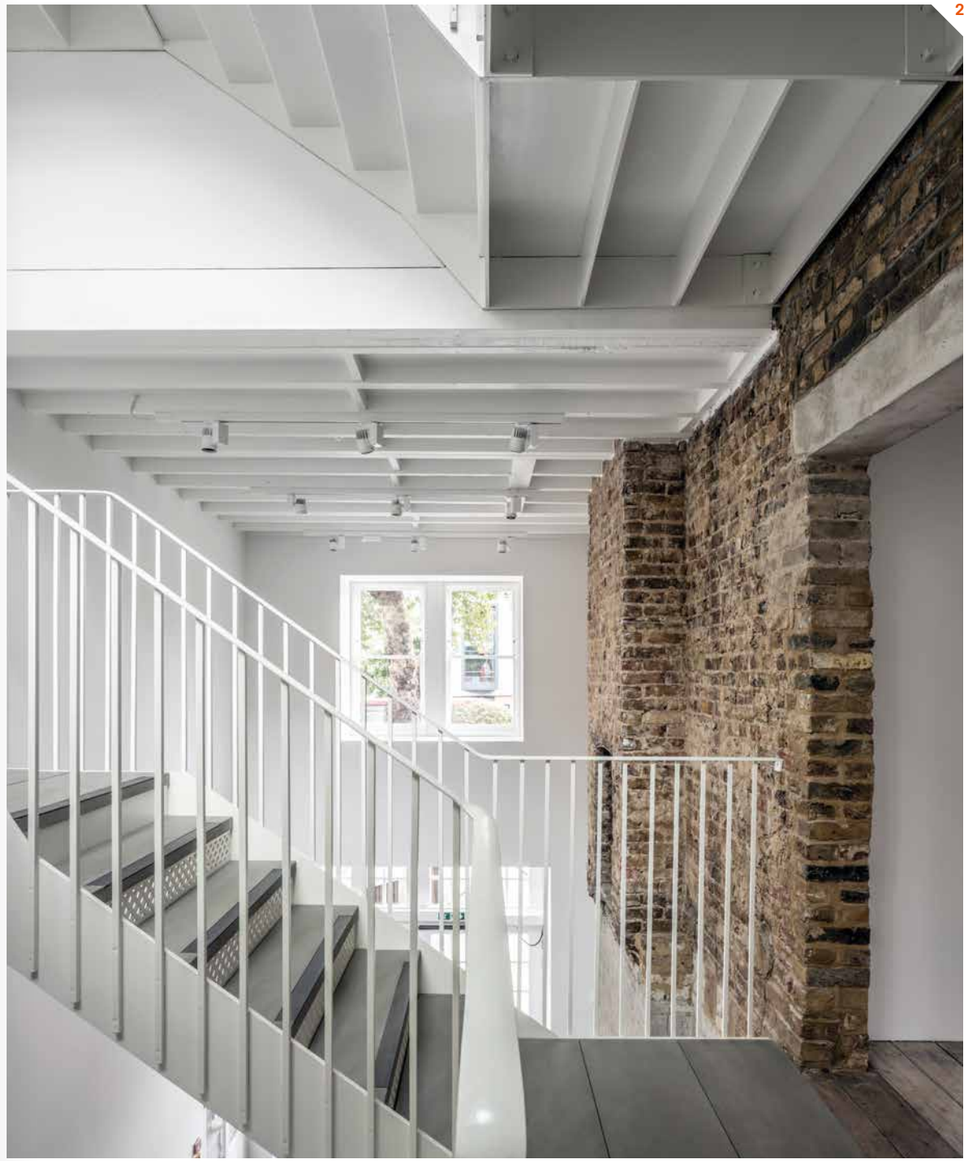
While restoring and converting this 1876 fire station into a new gallery, our engineers discovered extensive damage to the original timber floors and roof.

The design brief was to retain and express as much of the existing Victorian structure as possible, and to increase the capacity of the floors to meet the demands of new gallery space. An initial assessment of the timber floors and roof identified many damaged areas, particularly those where water ingress was most significant, including joists, bearings in external walls, embedded timber plates and roof valleys. Significant decay and active dry rot was identified.

These findings led to a full survey of each timber element, followed by strengthening or repairing as needed. This was carried out after strip-out, in the early construction stages. Meticulous local repairs were favoured rather than replacements of entire joists or beams, and required special detailing. Rotten parts of timber elements were dried out, cut back to sound wood, and replaced with appropriate splicing detail. The remaining original timber was treated with preservative to prevent spread of decay in the future.



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97%
of the original timbers were retained through our strengthening and repair work

3

4

5

Our engineers have experience of working with different types of lime mortars, historic brickwork, masonry townhouses and brick structures.

When dealing with historic masonry, the skills required are as wide-ranging as they are specialised. Our repair methods encompass local replacement, steel ties through the building, masonry stitching, masonry restraint through floors, brick vault strengthening and repointing. We are also experienced in the specifications of brickwork and thermal upgrades.

South London Gallery
London, UK
6a Architects
Repairs were carried out to the Victorian masonry, which had movement cracks and holes in the walls

East Range
Mansfield College

Case study | Masonry

Location	Oxford, UK
Client	Mansfield College, University of Oxford
Architect	MICA
Date	2014
Heritage status	Grade II*

The refurbishment of the East Range provided new catering, dining and bar facilities and formed the first phase of Mansfield College's wider estates strategy. This required an extensive redesign of the Grade II* listed buildings, involving many structural interventions to the sensitive historic fabric.

Temporary works were carried out to support the existing masonry structure of rubble-filled ashlar stone walls whilst the new structure was inserted. The accompanying masonry repairs were complex and intricate, and required knowledge of a broad spectrum of methods and materials.

New openings in the existing gable wall and into the chapel required new pieces of exposed stonework, some requiring hidden steel lintel strengthening to maintain the gothic detailing.

Where cuts were made into the internal stone rubble wall and the exposed faces adjacent to the areas of lowered ground floor, we carefully created new edges in cut stone. This required the expertise of a suitable stonemason to assist with the design of the proposed modifications.

Elsewhere internally, the works revealed a number of areas of cracked stonework. These repairs required a range of stone stitching details using angled steel ties.

Glazing was used to create harmonious interfaces between the new elements of the project and the heritage buildings. These interventions are sensitively set within cut grooves in the stonework to enable seamless transitions between stone and glass.

1 **Refurbishment and extension**
As well as restoring the Victorian buildings, the project included a glass extension and the lowering of the ground floor to create a new terrace cafe

2 **Masonry interventions**
Stone has been cut away in order to lower the floor and new stone has been added

3 **Respectful additions**
New structure is sensitively set within grooves cut into the stonework

4 **Improved connectivity**
Hidden steel lintel strengthening enabled the creation of a new opening in the stone wall, providing a link into the chapel

1

Area where floor is lowered

2

10
new openings in the existing stone fabric

3

4

The repair and restoration of historic metalwork requires a detailed knowledge of metallurgy and the potential brittleness of historic metals.

Existing metalwork often requires improved corrosion protection or an assessment of its existing load capacity. Whether we're working with cast iron, wrought iron or steel, we are able to quickly identify any issues with the metalwork and propose effective solutions. We carefully consider the condition, capacity and age of metalwork and will undertake surveys to determine its relationship to current building codes.

Covent Garden Market
London, UK
The 140 year old roof of Covent Garden market, which required detailed metalwork analysis

Freemen's School Main House

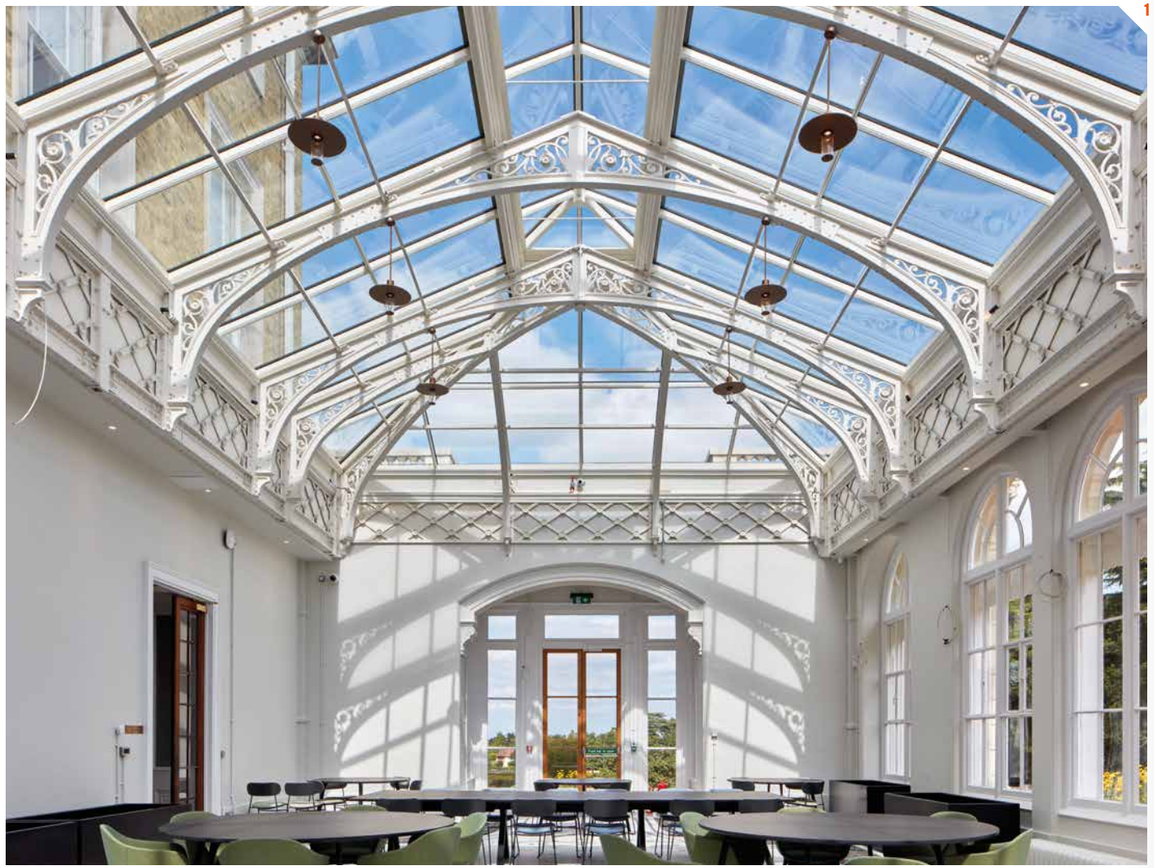
Location	Surrey, UK
Client	City of London Freemen's School
Architect	Hawkins\Brown
Date	2022
Heritage status	Grade II*

1 **The Orangery**
The sympathetically restored and opened up Orangery space

2 **Original metal revealed**
Paintwork was sandblasted to reveal the original wrought and cast iron and new epoxy paint applied

3 **Freemen's School Main House**
The Orangery is adjoined to Freemen's School's Main House building, a Grade II* listed property

4 **3D scheme model**
A BIM model was developed using sophisticated survey techniques, enabling the Orangery roof to be analysed in remarkable detail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Eckersley O'Callaghan provided structural and civil engineering services for the refurbishment of Freemen's School's Main House building, a Grade II* listed property built in the late eighteenth century. This involved several key structural interventions.

The existing 20x9x2m Orangery space has been opened up to allow it to function as a study area and wedding venue in the summer months. To ensure a sympathetic refurbishment to the Orangery, which is of significant historic interest, no notable structural alterations were undertaken. The Orangery's structural frame is formed of wrought iron truss members spanning the width of the space, with ornate, cast iron additions added later.

Through careful structural analysis, the existing trusses were verified for the additional loadings and a finite element model was made for the roof to check the stress increase. As the increase was found to be permissible and within suitable limits for the cast iron members, the new glazing could be installed. A sophisticated point cloud survey was also used to allow the modelling of the existing members in a finite element analysis model, and an accompanying BIM model was produced. This helped enormously in analysing the existing cast iron truss elements.

The refurbishment necessitated new corrosion protection for the steelwork. The paintwork was sandblasted to reveal the original wrought and cast iron. New epoxy paint was specified to protect the masonry and new protection was applied to the framing to secure its future use.

9m
cast and wrought iron trusses salvaged from existing 18th century structure


2


3


4

Minerva House
London, UK
Morris + Company
New windows will be installed within the retained facade of this Grade II listed building. The project has a strong focus on embodied carbon evaluation and circular economy principals

Careful restoration of existing facades can dramatically improve building performance in addition to retaining historically significant features.

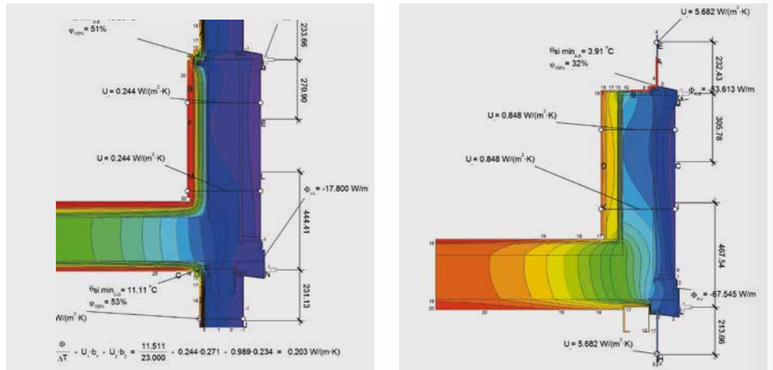
The ability to repair and improve the performance of a heritage facade requires detailed knowledge of historic materials, the skills to determine the facade's current condition, an understanding of its current performance, and the ability to deliver future performance requirements without compromising the existing facade.

We assess the facade by undertaking the appropriate surveys, and by testing the fabric at the right stage of the design. During construction works we carefully safeguard these historic structures against damage.

In our designs we also look at methods to improve the thermal performance of the facade by undertaking feasibility studies and optioneering.

Location	London, UK
Client	Tishman Speyer
Architect	DSDHA
Date	2018
Heritage status	Grade II*

Smithson Plaza



1

The first stage of renovations at the former home of The Economist magazine has been completed. Originally designed by Alison and Peter Smithson and renamed in their honour, Smithson Plaza consists of three towers rising five, eight and 15 storeys in height, and linked by a raised plaza. First completed in 1964, the complex is Grade II* listed and represents a significant example of 1960s brutalism.

Supported by both Historic England and the Twentieth Century Society, the staged refurbishment brings the cluster of buildings in line with modern standards. In doing so, it delivers sustainable and flexible new workspaces with minor extensions to the towers' rooflines, as well as creating space for new shops. New skylights in the plaza allow light into a new subterranean art gallery. The first phase of the project includes the addition of a new café facing onto the plaza, and the refurbishment of six storeys of the tallest tower, with further refurbishment phases taking place while the buildings remain occupied.

Eckersley O'Callaghan has provided engineering services on the retained facade including the replacement of glazing systems, a refurbished lobby facade and a new extension to the building realized in a glazed curtain wall system. We also developed construction methods that could be undertaken in a phased sequence to support the project's overall strategy.

The constraints of refurbishing listed buildings necessitated careful studies of the existing fabric, with detailing to the support structure of the facade designed to maintain its existing appearance while achieving an improvement in the facade's thermal performance.

1 **Thermal assessment**
Our thermal assessment of the plaza facade before (left) and after our refurbishment

2 **Lobby facade**
An initial conceptual design was provided for the lobby

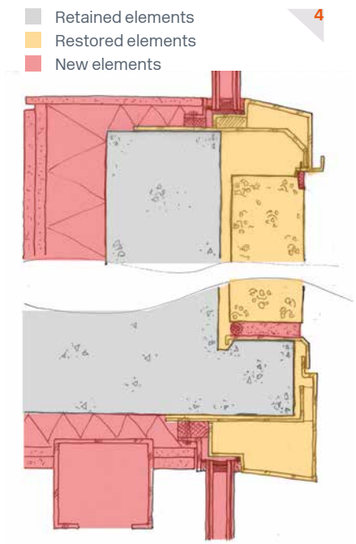
3 **Renewed tower facade**
Windows have been refurbished in the top four floors of the tallest tower

4 **Improved design**
Sketch showing new, retained and restored elements of the plaza facade

2

80%
improvement in facade thermal performance following our works

3

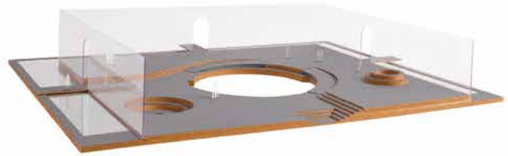


4

We are well versed in adaptive re-use of existing structures to extend a building's life whilst retaining its inherent embodied carbon.

One of the most effective ways to give a building a new lease of life is repurposing the existing structure so that it has a new or improved function. This might involve facade retention, construction of a new basement or roof, or upgrading the existing structure by strengthening foundations and timber floors so that it can support increased loading.

1



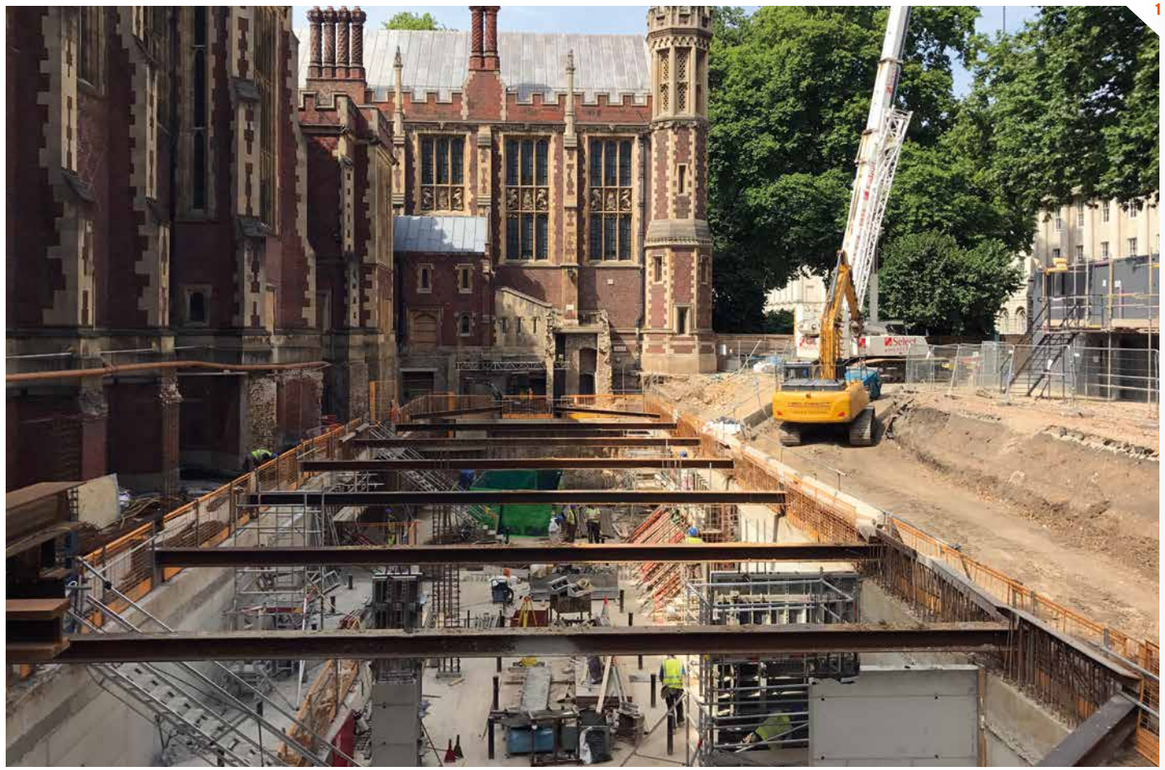
1 **Clermont Ferrand Metropolitan Area Library Clermont-Ferrand, France Stanton Williams**
Deconstructed model showing the transformation of the 17th century structure. This includes a timber lattice roof crowning a contemporary light box inserted into the heart of the historic building

2 **Original building**
The former hospital is a well-known landmark in the town

3 **The transformation**
The double height extension will house café, community and reception areas, bathed in natural light

2

3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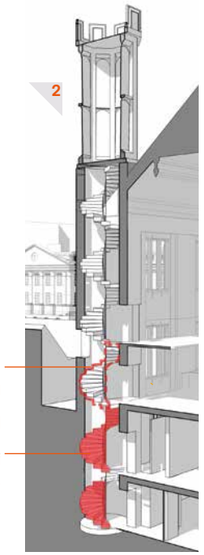
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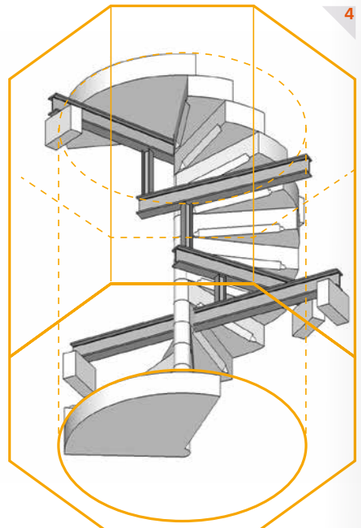
Section of existing spiral stair altered

Section of existing spiral stair removed


3

180°
rotation of historic limestone staircase with treads weighing 300kg each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Honourable Society of Lincoln's Inn

Location	London, UK
Client	The Honourable Society of Lincoln's Inn
Architect	MICA
Date	2020
Heritage status	Grade II*
Award	2021 IStructE Structural Transformation Award 2021 AJ Retrofit Award 2020 New London Architecture - Conservation


5


6

1 **Subterranean development**
A new, two storey basement creates an extension to the existing library

2 **Turret staircase**
The historic staircase was restructured and rotated in situ

3 **Old and new interface**
Supporting the existing granite entrance staircase during the construction of the new basement

4 **Surgical precision**
Reciprocal temporary works enabled the complex 180° rotation of the staircase

5 **Harmonious re-use**
The basement features a floor length skylight with no detrimental impact on the Grade II* listed building

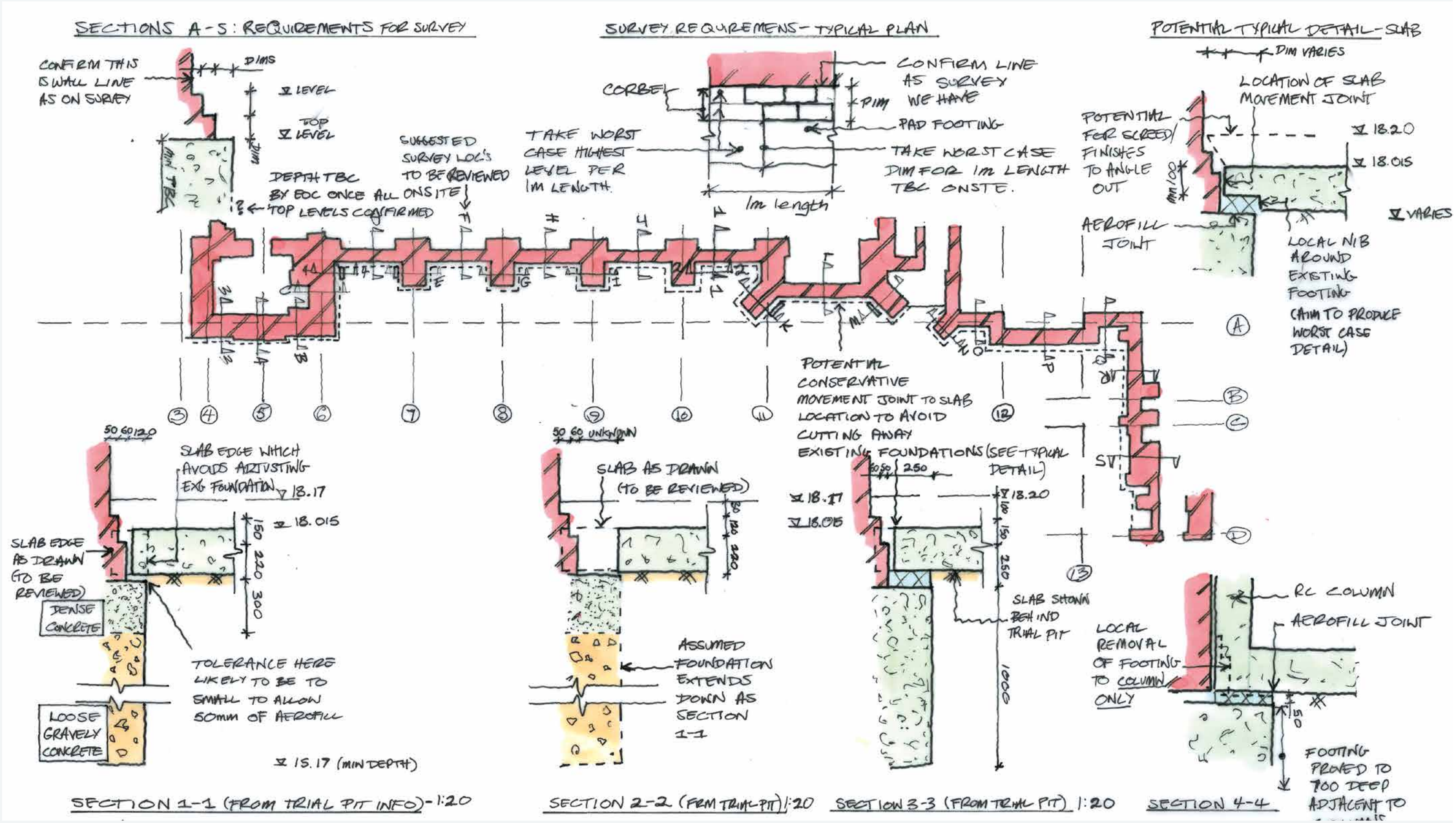
5 **Royal Opening**
Brian Eckersley explains the basement underpinning to the Queen who officially opened the completed project

Located at Lincoln's Inn Fields, the Grade II* listed Victorian hall and library dates back to 1845. These buildings have undergone a modern transformation with the addition of a 2000m² education centre and extension.

On the East Terrace, the extension is a subterranean development comprising two basement levels and a feature rooflight extending the length of the terrace level. The library extension comprises two storeys of office space above ground and an underground double height auditorium for educational seminars.

The new double-storey basement was installed to allow future re-use without impacting negatively on the visual appearance of the existing Great Hall building. Underground interfaces between old and new structures required careful detailing to account for building movements. The nature of the original foundations was determined through extensive ground investigations. Underpinning was required in areas to create pathways between new and existing elements. A new secant wall was built, with the basement installed in a top-down fashion with support from plunge columns into piles.

The new basement extends under the existing entrance stair. To construct this, we devised an intricate set of temporary works to support the stair until it could be re-supported on the basement box. This involved micro-piling a series of piles from the existing one storey basement level, then installing a steel frame to support the stair to replace the previous supporting walls.



Understanding Lincoln's Inn
Detailed sketch produced to understand the complexities of the structural foundations, and to inform the interface of new and old


1

2

Case study |
Adaptive re-use facades

Olympia

Location	London, UK
Client	Yoo Capital
Architect	Heatherwick Studio | SPPARC
Date	2023
Heritage status	Grade II and Grade II*

11
storey office building extension to Olympia Central

The famous Olympia show halls are to be transformed into a destination for events, culture and heritage. The 14 acre west London site dates from 1887 and includes the Grade II* Grand Hall, National Hall, Olympic Central and Olympia West.

Eckersley O'Callaghan is providing facade design services for seven buildings in the masterplan, which combines restaurants, hotels, theatres offices and music venues. These buildings are a combination of new build and adaptive re-use.

Olympic Central will be transformed with the addition of a new 11 storey office building. This will retain a Grade II listed facade that will act as the main entrance. We are carrying out glare, illuminance and sun radiation analysis to optimise the glass design and the appearance of the building.

At Olympia West, the concert hall will be extended to create an additional third and fourth floor with a prefabricated acoustic wall, aluminium cladding and a glass box entrance.

A Grade II listed car park will be transformed into a co-working office and hotel with both new and retained facades. Another hotel – the National Hotel - will be built above an existing Grade II listed building.

A new, arched glass canopy will span 24m over public realm to enable access through to the heart of the site. G-Gate Theatre will be a new performing arts centre clad in precast concrete with a fully-glazed curtain wall elevation onto Hammersmith Road. The Grade II* listed Pillar Hall will have its windows replaced and upgraded following our thermal performance assessments.

7
buildings transformed

West Concert Hall, situated at the rear of the site

MSCP Car Park
Grade II listed


3

G-Gate Theatre

Olympia Central
Grade II listed

National Hotel
Grade II listed

24m glass canopy

Pillar Hall
Grade II* listed


4


5

1 **Arched glass canopy**
Creates covered access from the front entrance all the way to Olympia Central at the rear

2 **G-Gate Theatre and Olympia Central**
New theatre situated next to Olympia Central

3 **An icon transformed**
Seven buildings in the 14 acre complex will be transformed

4 **Show halls site**
The famous showground pre-transformation

5 **National Hotel**
New build development will supplement an existing Grade II listed building

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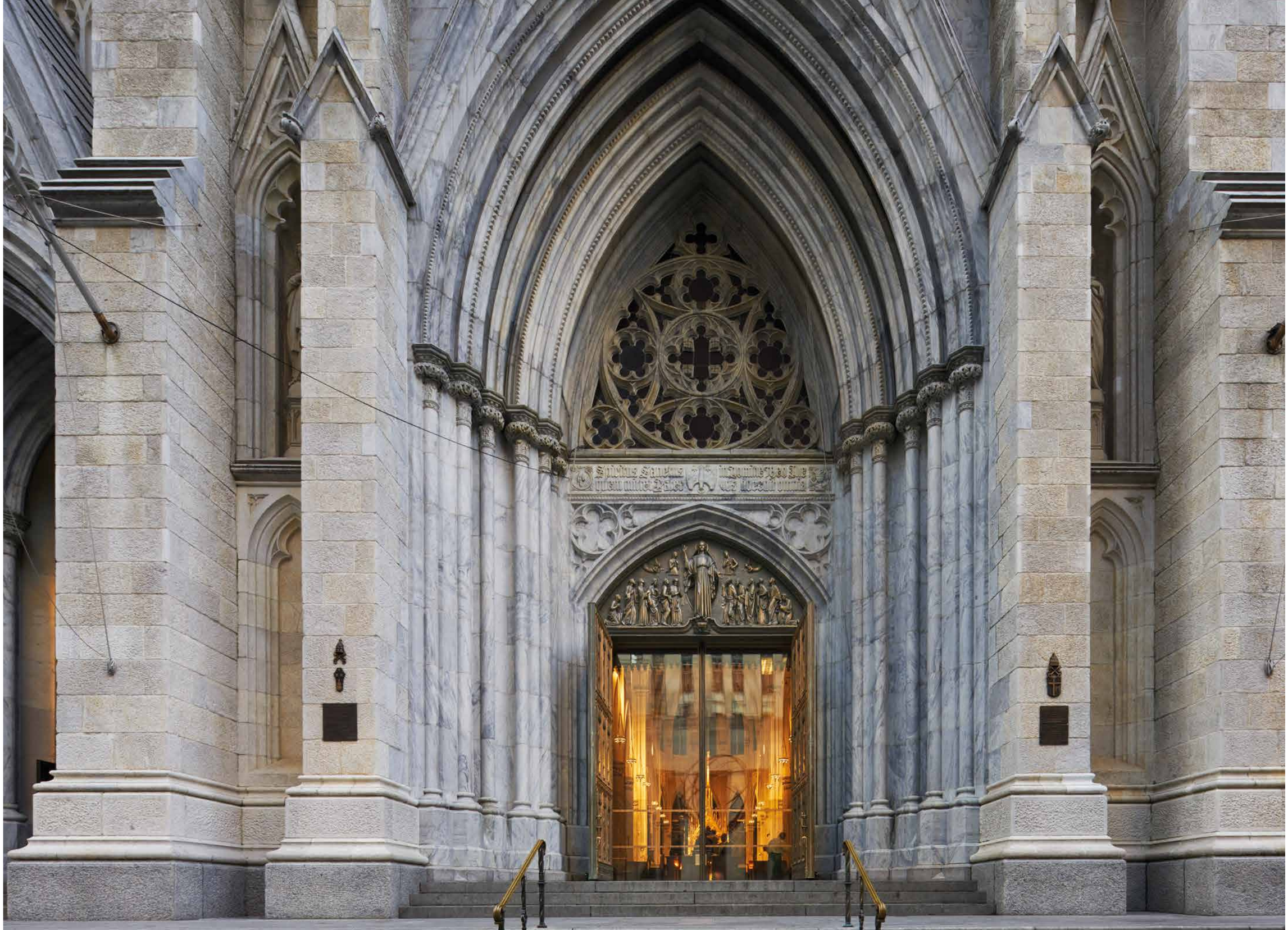

St. Patrick's Cathedral
New York, USA
Murphy Burnham & Buttrick Architects
The Cathedral is one of New York's most visited landmarks. We inserted these new glass sliding doors behind the original swing ones to improve acoustics

Cover image
We inserted a 14x7m glass wall into the 1878 fabric

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