

**Eckersley  
O'Callaghan**  
Engineers

**Education**





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# Practice Profile

Eckersley O’Callaghan is a multi award-winning structural and facade engineering design practice.

Since forming in 2004, we have grown to over 120 strong with with offices in London, Manchester, New York, San Francisco, Los Angeles, Paris, Hong Kong, Shanghai, and Sydney. We work on a diverse range of extraordinary building projects worldwide, ranging from structures in timber, steel and concrete, through facades and bespoke glass structures to specialist marine design.

We have established an international reputation for our creative, yet rigorous, approach to 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 work; as an organisation, we recognise that urgent behavioural changes are needed to combat climate change.

We are well known for collaborating with Apple on all of their flagship projects. Our innovative use of glass and carbon fibre reinforced polymers, as well as sensitive adaptations of historic buildings, have become signature features of the brand.

- Awards:**
- IStructE Award for Sustainability 2019**
  - Construction Consultancy of the Year, Construction News Awards 2019**
  - Queen’s Award for Enterprise 2018: International Trade**
  - Engineering Consultant of the Year, Building Awards 2016**
  - Construction Consultancy of the Year, Construction News Awards 2015**
  - IStructE Supreme Award for Structural Engineering Excellence 2014**
  - Queen’s Award for Enterprise 2010: Innovation**



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**10**  
offices  
worldwide

**145**  
project and  
company  
awards

**67%**  
of work from  
repeat clients

Our expertise spans a broad range of services specialising in the following areas:

- Structural and Civil Engineering
- Facade Engineering
- Glass Engineering

Our commitment to technical excellence, innovation through R&D, and application of the latest digital tools places us at the forefront of the industry.

An extensive experience of projects in many different parts of the world means that we are adept at dealing with International Codes and Building Regulations, and with diverse local and cultural requirements.

Our services are engaged in a variety of ways, whether that’s through the end-user client, as a sub-consultant to an architect or by the contractor responsible for constructing a project.

Our involvement may be to provide creative conceptual design, more detailed work for bidding and tender, or for full input through the construction of a project.

The practice has broad experience in the following sectors:

- Residential
- Retail
- Commercial
- Education
- Culture
- Leisure
- Infrastructure
- Marine



04

**“Hawkins\Brown has worked with Eckersley O’Callaghan on a number of award winning projects. They frequently challenge preconceived structural conceptions, consistently deliver solutions that exceed expectations and are always a delight to work with”**

**Adam Cossey**  
Partner | Civic, Community and Culture Lead  
Hawkins Brown

- 01 Design review meeting
- 02 Site visit to Coal Drops Yard, London
- 03 Company trip to Investcorp Building, Oxford, UK
- 04 City of London Freeman’s School Swimming Pool, Ashted, UK



## Engineering Education

We have been involved in education projects at every level, from primary schools through to universities.

We are interested in helping to design good buildings and think that the quality of our work, on projects with a wide range of briefs and budgets, helps to improve teaching environments and the experiences of students and staff.

We have worked on projects in the public sector funded by bodies such as the Education Funding Agency, as well as on projects for private schools and colleges. Much of our work comes from repeat clients, with several long term relationships that have yielded multiple buildings. Our staff value the relationships we have built with academics, teachers, estate staff, governors, board members and school advisors. We enjoy contributing to the improvement of education for the next generation.

Our conceptual design skills are well suited to the early stages of a project, but our interest is in following on to deliver these designs through construction. We have a track record of delivering our work to the term-

based design and construction programmes unique to education projects. We are equally comfortable working for the client using a range of procurement routes, including traditional procurement, as well as providing design services to contractors engaged on a Design & Build basis. This experience means we are well placed to make pragmatic design decisions, to be economic in elements such as foundations where required, producing structures that are well detailed and crafted.

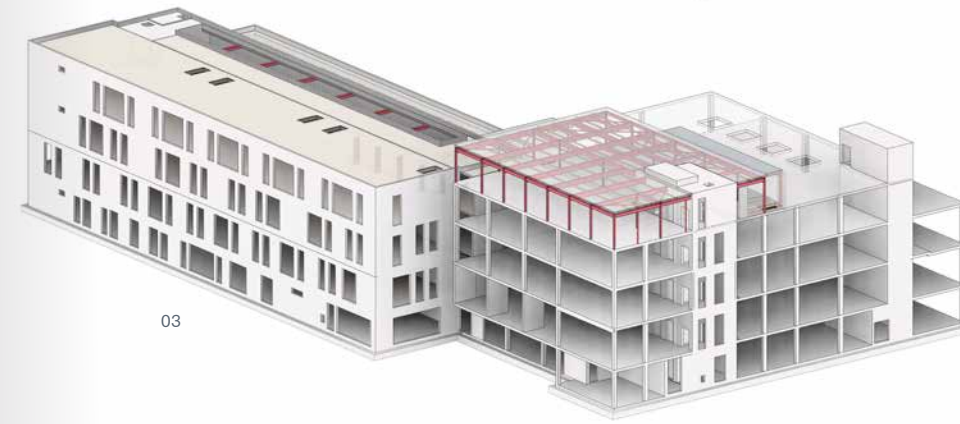
We actively pursue holistic designs where our structures and facades can contribute to the environmental performance of the building. Many of our projects use exposed structural materials, bringing properties such as warmth, honesty and robustness to the interiors, while our facades enhance the exteriors and improve the performance of the spaces within.



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**80+**  
education  
projects



04



05



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07



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01  
**Sevenoaks School Science and Technology & Sixth Form Centre**  
Traditional contract design services  
With a bill of quantities for the Sevenoaks Foundation.

05  
**St Paul's School**  
Client side traditional contract  
Facade design from scheme to completion for Design & Build contractor.

08  
**London School of Economics**  
Client side construction services  
Provided to LSE under a Design & Build contract.

02  
**Ark Soane Academy**  
Facade Consultant design coordination/supervision  
Facade role for Design & Build contractor.

06  
**Tiger Free School**  
Contractor design services  
Structural design provided for Willmott Dixon.

03 04  
**Mountview Academy of Theatre Arts**  
Pre and post novation services  
Structural Design & Build contract for the client and then the contractor Gilbert Ash.

07  
**St Antony's College**  
Client side monitoring role  
Facade engineering under Design & Build contract.





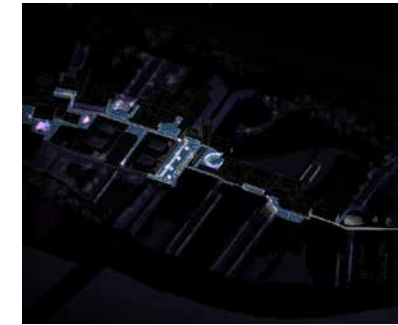
St Paul's School,  
London

We can provide useful input at a range of scales, from site wide to building specific, to meet all your educational building needs



#### Masterplanning

We are helping to create a masterplan for **City of London School** by looking at the feasibility of extending the existing buildings.



#### Site wide projects

Our work has extended across the **Lancaster University** campus to provide improved circulation.



#### Large scale buildings - new build

At **Keble College**, Oxford we have engineered a whole new quad housing spaces for research, teaching, accommodation and social uses.



#### Small scale buildings - new build

We designed a single design and technology classroom space as an extension to **St James School**. It includes plant, storage room, and office space.



#### Detailed Scope

We analysed and rationalised various facade elements and provided facade sequencing strategies for construction of the **Tinbergen Building's** new teaching laboratories.



We have provided complex envelope design with bespoke interfaces and steel structure for **Wadham College**.



#### Refurbishments

At **Southbank University**, we are renovating the existing structure and facade of the campus' London Road Building.



Awards

**RIBA Award 2021** - Zayed Centre for Research into Rare Disease in Children

**AJ Retrofit Awards 2021, Listed Building £10m and over** - Honourable Society of Lincoln's Inn Fields

**USA Property Awards, Best Architecture Single Residence USA 2020** - Tuscaloosa

**British Homes Awards, Small House of the Year 2020** – Island Rest

**British Homes Awards, Large House of the Year 2020** – Folding House

**AIA New York’s 2020 Design Awards - Architecture Merit 2020** - Manhattan West

**AEI Excellence Award in Architectural Engineering Integration 2020** - Manhattan West

**AIA Architecture Award 2020** – Floral Court

**American Architecture Award 2020** – Apple Carnegie Library

**IStructE Award for Sustainability 2019** – La Reference

**Concrete Society Award 2019** – Sevenoaks School STC

**World Special Prize Exterior Award, Shops & Stores Category 2019** – Apple Piazza Liberty

**World Prix Versailles Award, Shopping Malls category 2019** – Coals Drop Yard

**Construction Consultancy of the Year, Construction News Awards 2019**

**Civic Trust Award 2019** - White Lion House

**RIBA South Award 2019** - Beecroft Building

**RIBA South Building of the Year Award 2019** – Beecroft Building

**RIBA South East Award 2019** – Sevenoaks STC

**RIBA South East Client of the Year Award 2019** – Sevenoaks STC

**RIBA London Award 2019** – Alleyn’s School Lower | South London Gallery | Coals Drops Yard

**Queen’s Award for Enterprise: International Trade 2018**

**IStructE Award for Structural Artistry - Steve Jobs Theater 2018**

**RIBA National Award 2018** - Freeman’s School Swimming Pool

**Structural Timber Awards, Education Project of the Year 2018** – Freeman’s School Swimming Pool

**RIBA South East Sustainability Award 2018** - Freeman’s School Swimming Pool

**RIBA South Award 2018** - Hubert Perrodo Building, St Peter’s College | Canoe Lake Tennis Pavilion | The Queen’s College New Library

**RIBA South Conservation Award 2018** - The Queen’s College New Library

**RIBA London Award 2018** - 70 Wilson Street

**Oxford Preservation Trust Awards' New Building 2018** - The Queen’s College New Library

**WAN Award, Regional Winner EMEA 2018** – Hubert Perrodo Building, St Peter’s College

**Engineering Consultant of the Year 2016, Building Awards**

**RIBA National Award 2016** - Investcorp Building

**WAF Awards, Higher Education and Research Building 2016** – The Investcorp Building

**RIBA North West 2016** – Library Walk

**Engineering Consultancy of the Year 2015, Construction News Awards**

**RIBA National Award 2015** – Levring House

**RIBA London Regional Award 2015** – Levring House

**Oxford Preservation Trust Awards' New Building 2015** – Investcorp Building

**IStructE Supreme Award for Structural Engineering Excellence 2014 - Apple Zorlu**

**British Glass Industry, Innovation Award 2014** – Eckersley O’Callaghan

**AIA SF Merit Award 2014** – Apple Stanford Mall

**WAN House of the Year Award 2013** – Gota Dam Residence

**New London Awards, House of the Year 2013** – Archway Studios

**Queen’s Award for Enterprise: Innovation 2011**

**Design Award, Tri-States Design Conference 2011** – Apple Covent Garden

**AIA SF, Merit Award 2011** – Apple IFC Shanghai

**IDSA Design of the Decade GOLD, Biggest Contribution to Brand Growth 2011** – Apple Retail Stores

**Honour Award for Excellence in Architecture, AIA San Francisco 2011** – Apple Upper West Side

**RIBA Award 2011** – Mill House

**Merit Award, New York Construction/McGraw-Hill 2011** – Apple Upper West Side

**Honor Award, AIA California Council 2011** – Apple Boylston Street

**RIBA Award 2009** – Stowe School

**Honour Award for Design Excellence, Boston Society of Architects/AIA 2009** – Apple Boylston Street, Boston

**Merit Award, AIA Seattle 2009** – Waipolu Gallery and Studio

Clients

Alleyn’s School  
Bedford Academy  
The Calhoun School  
City of London School  
Derwent  
Edmonton Public Library  
Forest Bridge School  
Freemen’s School  
Gainsborough’s House Museum  
Gildrege House Free School  
Great Ormond Street Hospital  
Haileybury  
Hinguar School  
Holland Park School  
Honourable Society of Lincoln’s Inn  
Imperial War Museum  
International Agency for Research on Cancer  
James Allen’s Girls’ School  
Kemble College  
Knauf  
Knight Dragon  
Lakeland Art  
Lambeth College  
Lancaster University  
London School of Economics  
Mansfield College  
Mountview Academy Theatre Arts  
Mulberry School  
National Science and Media Museum  
Norman Foster Foundation  
North Kent College  
Northumberland County Council  
Novartis  
Oxford Brookes University  
The Queen’s College  
Royal Institute of British Architects (RIBA)  
San Francisco Museum of Modern Art (SF MOMA)  
Science Museum  
Sevenoaks School  
Southbank University  
South London Gallery  
St Antony’s College  
St George  
St James School  
St Paul’s School  
St Peter’s College  
Stowe School  
Tiger Free School  
Univeristy of Oxford  
University of Reading  
University of Southampton  
V&A Museum  
Wadham College  
Willmott Dixon

Collaborators

AHMM  
Allies and Morrison  
Amanda Leveté Architects  
Architecture PLB  
Art & Build Architect  
Assael Architecture  
Atomik Architecture  
Ayre Chamberlain Gaunt  
BGS Architects  
BIG Architects  
Bond Bryan Architects  
Carl Turner Architects  
Casson Mann  
Design Engine  
Duggan Morris Architects  
Eric Parry Architects  
FJMT  
Foster + Partners  
Gardiner and Theobold  
Gensler  
Gilbert Ash  
Gollifer Langston Architects  
Grimshaw Architects  
Haverstock  
Hawkins\Brown  
Heatherwick Studio  
Herzog & de Meuron  
Hopkins Architects  
James Gorst Architects  
Kier Group  
KPF  
MICA Architects  
MUMA  
O’Donnell + Tuomey  
Rafael Viñoly Architects  
Rogers Stirk Harbour + Partners  
SimpsonHaugh Architects  
Snohetta  
SO-IL Architects  
Squire and Partners  
Stanton Williams  
Studio E Architect  
Studio Seilern Architects  
TDO Architecture  
Tim Ronalds Architects  
UN Studio  
Walters & Cohen  
Wates  
Waugh Thisleton  
WilkinsonEyre Architects  
Willmott Dixon  
Woods Bagot  
Zaha Hadid Architects  
ZMMA





Sevenoaks School,  
Kent



# Expertise



Structural & Civil Engineering



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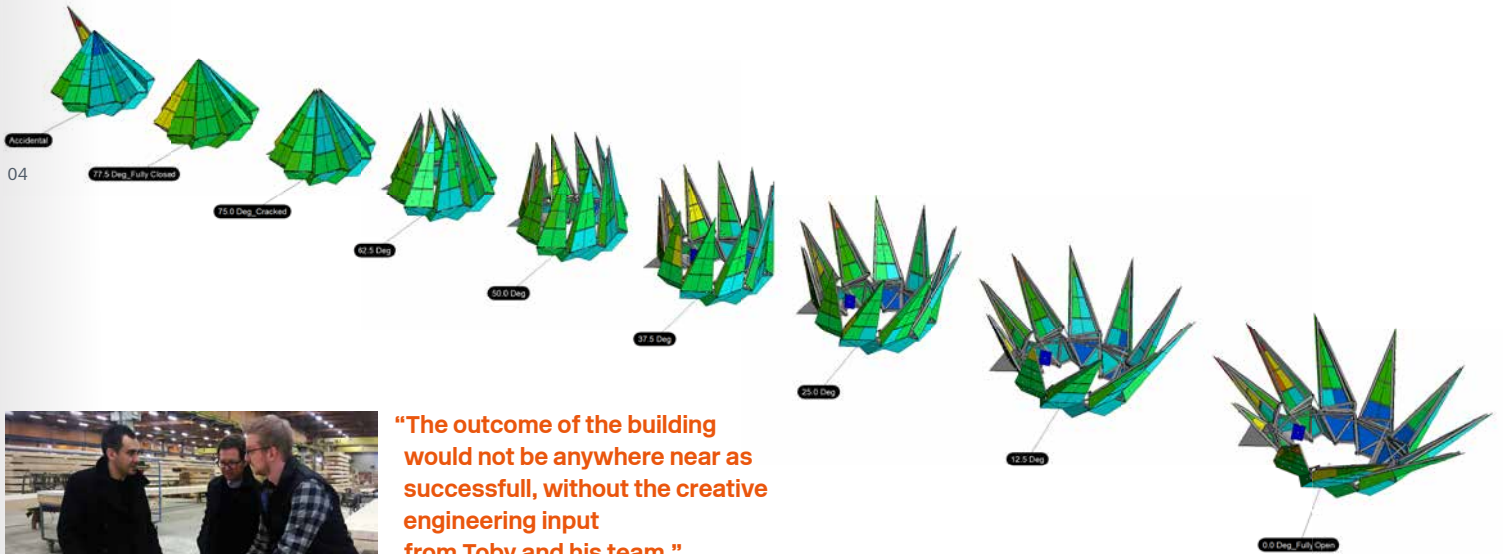
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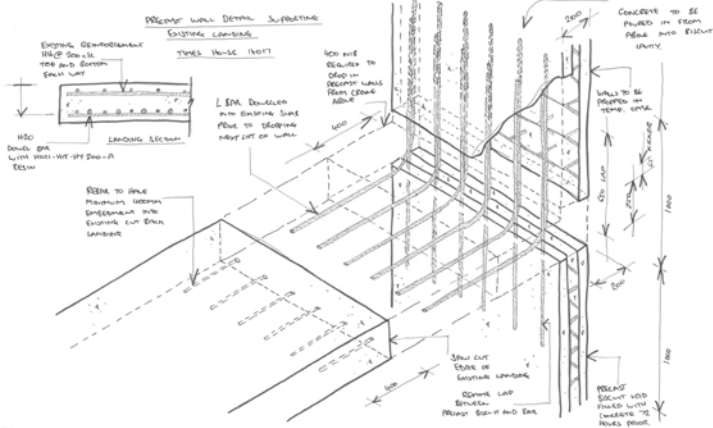


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“The outcome of the building would not be anywhere near as successful, without the creative engineering input from Toby and his team.”  
Darren Bray  
Technical Director  
PAD Studio



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We approach our work by fully interrogating all structural options to identify the most efficient, economic and elegant solutions.

Our work covers all structural materials, traditional and non-conventional, and all building types. We aim to provide clear options which address the parameters defined by the project and its architecture. Our team enjoys this collaborative approach, both within a design team and beyond with the contractors.

Our Structures team is a blend of both analytical and creative engineers, who can make pragmatic decisions as well as design refined details. A strong architecturally-influenced background is a common thread among all our team, which we believe is critical to the solutions we provide.

Projects might be in the context of new-build, or refurbishment and restoration of traditional and historic buildings. The extent of our involvement may be to provide creative conceptual design, more detailed work for bidding and tender, or for full input through construction of a project.

We engage with digital design tools and BIM, which are embedded in our workflow. These processes allow us to uncover efficiencies, improve decision making, fully integrate our structures, and enhance delivery. We believe that digital design tools are key to successfully realising intelligent engineering solutions for complex challenges.



Toby Ronalds  
Director of Structural Engineering  
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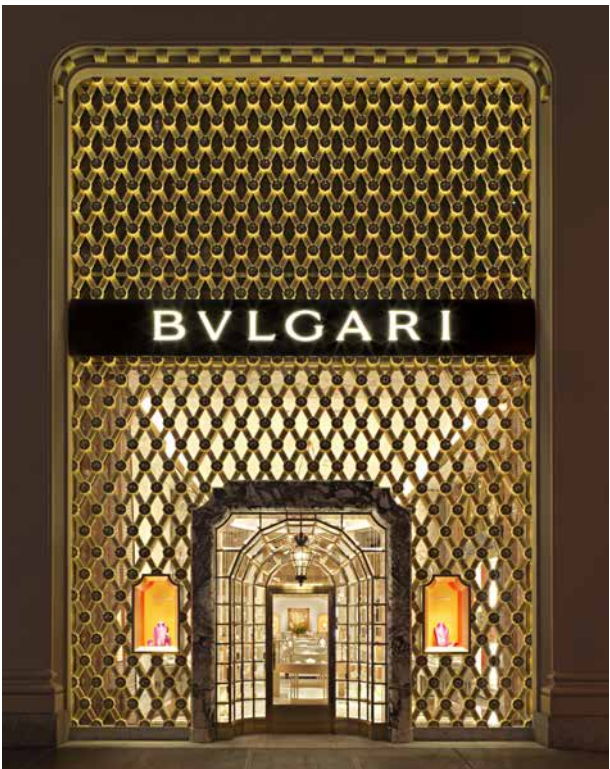
- 01 Perrodo Building, Oxford
- 02 El Gouna, Egypt
- 03 Irène Joliot Curie building, Paris
- 04 BIM model of Wooldbeding Gardens greenhouse
- 05 Visit to Weihag Factory to inspect CLT structural material
- 06 Tropicalia, Côte d'Opale
- 07 Vitsoe Headquarters, Warwickshire
- 08 Precast wall supporting existing landing



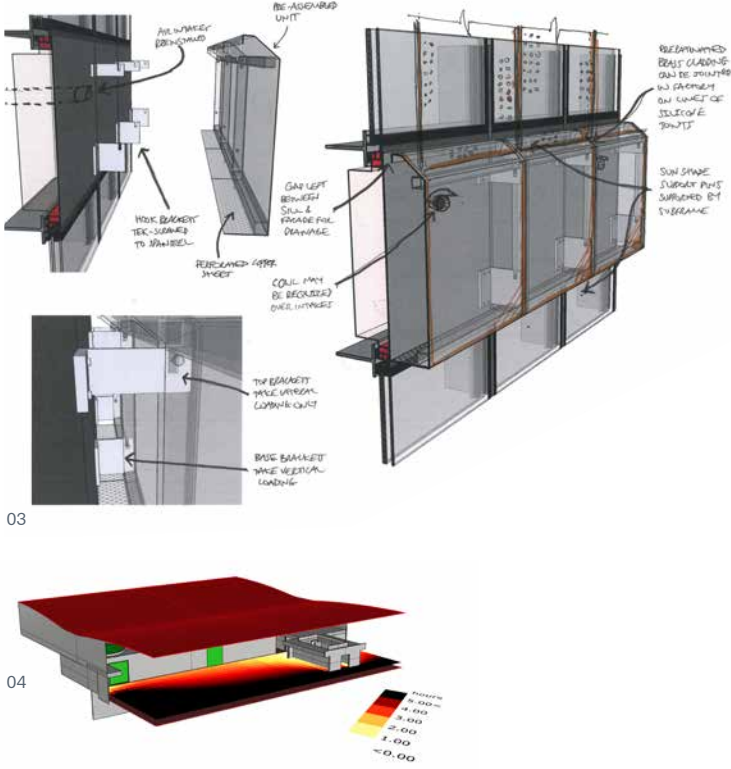
Facade Engineering



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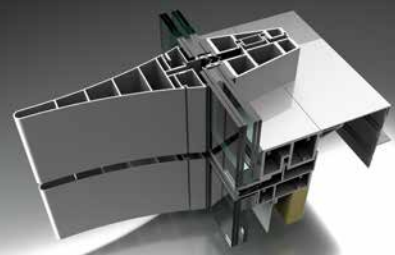
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We are working with EOC under a framework agreement, and as a trusted expert partner, they give us the confidence to provide best value solutions, while mitigating risk.

Mark Tant  
Managing Director  
Wates Group



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09

Eckersley O'Callaghan includes one of the largest facade engineering groups in the UK, offering a full-service approach to facade design.

As building envelope design becomes more complex due to increasingly stringent energy requirements and material and technological advances, Facade Engineers have assumed a central role in architectural and engineering design teams in recent years.

We offer a full service approach to facades in all material types, using standard or bespoke systems, delivered either as performance-specified or fully detailed design. In addition to structural design and system detailing, we have the tools to assess the facade energy performance and ensure compliance with efficiency targets. Additionally, we maintain a close relationship with industry suppliers to ensure we are aware of the latest technology in materials, manufacture and performance.

As a practice, we take a very sustainable approach to design and at the core of this is the re-use of existing buildings. We therefore offer a comprehensive service of existing facade condition survey and reporting, in which condition and remedial works required can be identified and specified. Beyond that, entirely new facade systems can be designed and specified that can be compatible with the existing building structure, giving the building a new sustainable lease of life.

The breadth of our expertise across the discipline includes detailed environmental analysis. This supports our ability to engineer building envelopes that fully, and efficiently, meet all performance criteria.



**Damian Rogan**  
Director of Facade Engineering  
damian@eocengineers.com  
+44 20 7354 5402

- |   |   |
|---|---|
| 01<br>Wadham College,<br>Oxford         | 06<br>Render of facade<br>mullion         |
| 02<br>Bulgari 5th Avenue,<br>New York   | 07<br>The Williamsburg<br>Hotel, New York |
| 03<br>70 Wilson Street<br>facade design | 08<br>Sberbank,<br>Moscow                 |
| 04<br>Building solar analysis           | 09<br>The Waterman,<br>London             |
| 05<br>SF MOMA,<br>San Francisco         |   |





# Projects

**“A highly professional firm  
which has provided creative  
but practical solutions on  
projects both large and small.  
Highly recommended”**

**Roger Boden**  
Bursar, Keble College,  
Oxford University

H B Allen Centre, Keble College,  
Oxford

LANNER  
20 8900 929  
1925 81439



Mountview Academy of Theatre Arts



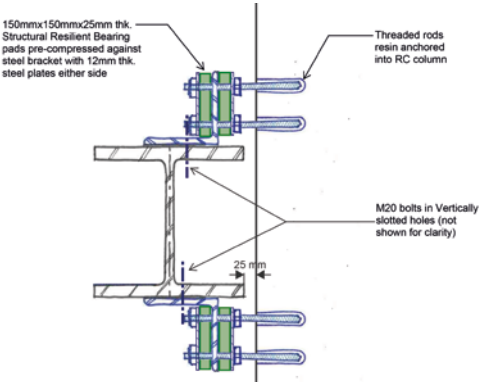
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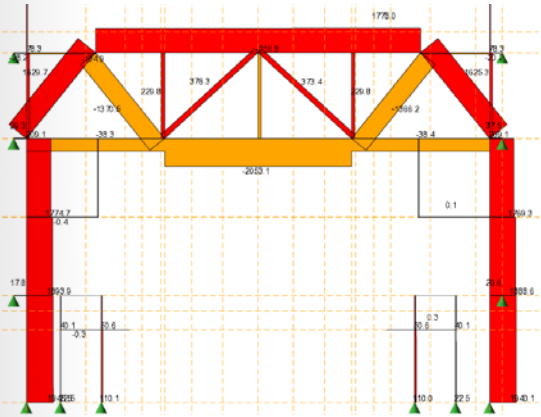
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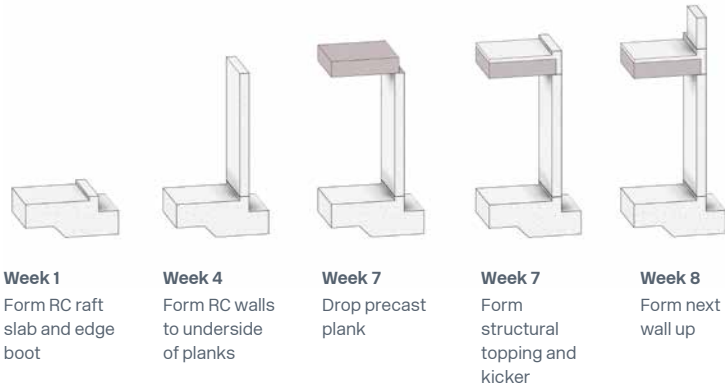
03



04



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- Week 1**  
Form RC raft slab and edge boot
- Week 4**  
Form RC walls to underside of planks
- Week 7**  
Drop precast plank
- Week 7**  
Form structural topping and kicker
- Week 8**  
Form next wall up

06

**Location:** London, UK  
**Client:** Mountview Academy  
**Architect:** Carl Turner Architects  
**Date:** Completed 2018  
**Value:** £18m  
**Services Provided:** Structural Engineering

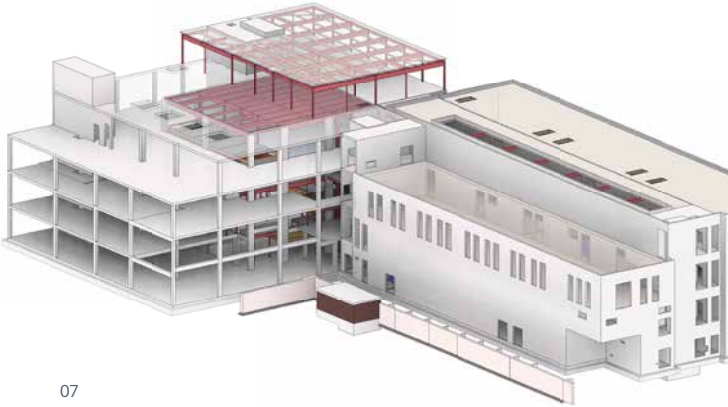
This new facility for the Mountview Academy of Theatre Arts is set in the heart of Peckham. The building comprises two distinct blocks; one for studio and the other for theatre. The studio block includes acting and dancing studios, TV black boxes and cafés, located over four floors. The theatre block includes a 200-seat theatre space, a lettable space, and an additional rooftop café.

Eckersley O’Callaghan has engineered the structure of the academy, which is primarily a concrete frame, utilising a precast lattice slab construction to achieve the longer spans across the dance studios. This has been designed with floor vibration sensitivity in mind. This flooring system meets the natural frequency requirements in these spaces and gives an architecturally expressed concrete finish. A reinforced concrete frame encloses the theatre auditorium, which itself is formed in structural steel to accommodate the complex geometries. Acoustically resilient restraint brackets are used to separate the building from the surrounding concrete frame while providing lateral restraint.

Supported by lightweight timber frames, the sawtooth shape of the roof has large openings to maximise north light into the main acting and dance spaces. The exterior character of each block is distinguished with different cladding materials; corten steel for the theatre block and brickwork for the studio block.

The client initiated the project with an aim to keep costs significantly lower than the benchmark of £3500/m² for similar-use academies. By drawing an costing structural options, and building with different specification levels of finishes, we have been able to work with the client team to match expectations to the delivered building. The final structure provides robust but economic finishes and gives the academy the flexibility and the potential to develop the building further in the future.

**£1800**  
per sqm construction  
cost for this  
10,000sqm building



07

- 01 Mountview Theatre Academy
- 02 Theatre
- 03 Studio block
- 04 Detail of acoustic separation between steel and concrete columns
- 05 Analysis of full storey trusses spanning 16m over theatre block
- 06 Construction of studio block
- 07 3D structural model



East Range  
Mansfield College



01

**Location:** Oxford, UK  
**Architect:** Rick Mather Architects  
**Client:** Mansfield College  
**Date:** Completed 2014  
**Value:** Undisclosed  
**Services Provided:** Structural Engineering

Founded in 1886, Mansfield College is one of the University of Oxford's smallest constituent colleges. An increase in student numbers has required a corresponding increase in catering, bar and dining facilities. To meet these requirements, the college's Grade II\* listed East Range buildings have undergone extensive internal and external refurbishment, with a new build extension, requiring careful consideration of any impacts on the historic building fabric.

The garden in the quad between the buildings has been discretely dropped to form a terrace adjacent to a new café, which is housed within the existing envelope. The cafe extends outside through two historical, stone-framed windows, sensitively converted into glass doors. Extensive temporary works were required to support the existing masonry structure, including rubble filled ashlar stone walls, while new structure



02



03

was inserted to open up the existing spaces. An existing Victorian kitchen was replaced, and existing back-of-house areas remodelled by clearing partitions.

A new building with a reinforced concrete frame creates a foyer and circulation spaces, and improves disabled access, while providing new college kitchens. This building is built against the historic chapel and the East Range buildings but is structurally separate from both so that differential movements can be accommodated. Extensive structural glass insertions were also made, including a large rooflight over the foyer, supported on a lightweight stainless steel frame. This cantilevers out from the new building without taking any support off the gable wall of the East Range, to allow building movements to occur.

- 01  
East Range new  
dropped terrace
- 02  
New feature stair
- 03  
Temporary works to  
enable removal of the  
wall below

The Hands Building  
Mansfield College



01



02



03

**Location:** Oxford, UK  
**Client:** Mansfield College  
**Architect:** MICA  
**Date:** Completed 2017  
**Value:** £14m  
**Services Provided:** Structural Engineering

Structural Timber Awards 2018 - Shortlisted

Eckersley O'Callaghan designed the original structural scheme for this student accommodation building, which gained planning permission in 2008. Since then, a double-height basement has been added to house the Bonavero Institute of Human Rights, including an auditorium, a 200-seat lecture theatre and seminar rooms.

The Hands Building comprises 78 en-suite student bedrooms, together with a common room and staff offices. The building has been constructed from an arrangement of cross-laminated timber (CLT) walls and floors, a prefabricated form of construction that reduces build time, the number of deliveries required to the site, and therefore disruption to the surrounding

campus. It also reduces environmental impact, due to timber's sustainable attributes. The exterior facade is clad in stone with prominent use of structural glass.

The two-storey basement is a reinforced concrete box, sitting deep in a high water table. A limited number of internal supports allow for the large spaces required in the brief. The base of the concrete box forms a raft slab foundation that supports the structures above, with a dual system of a cavity drain and waterproof concrete providing waterproofing protection. Temporary props and dewatering facilitated the construction adjacent to several important existing buildings.

- 01  
3D structural model
- 02  
Installation of  
CLT walls
- 03  
200-seat lecture  
theatre



Science & Technology and Sixth Form Centres  
Sevenoaks School



**Location:** Kent, UK  
**Client:** Sevenoaks Schools  
**Architect:** Tim Ronalds Architects  
**Date:** Completed 2018  
**Value:** £23m  
**Services Provided:** Structural & Civil Engineering

**BREEAM Excellent**  
**RIBA National Award 2019**  
**RIBA South East Award 2019**  
**Schueco Excellence Award - Steel Project 2019**  
**RICS South East Design Through Innovation Award 2019**

- 01

Atrium
- 02

Coordinated services BIM model
- 03

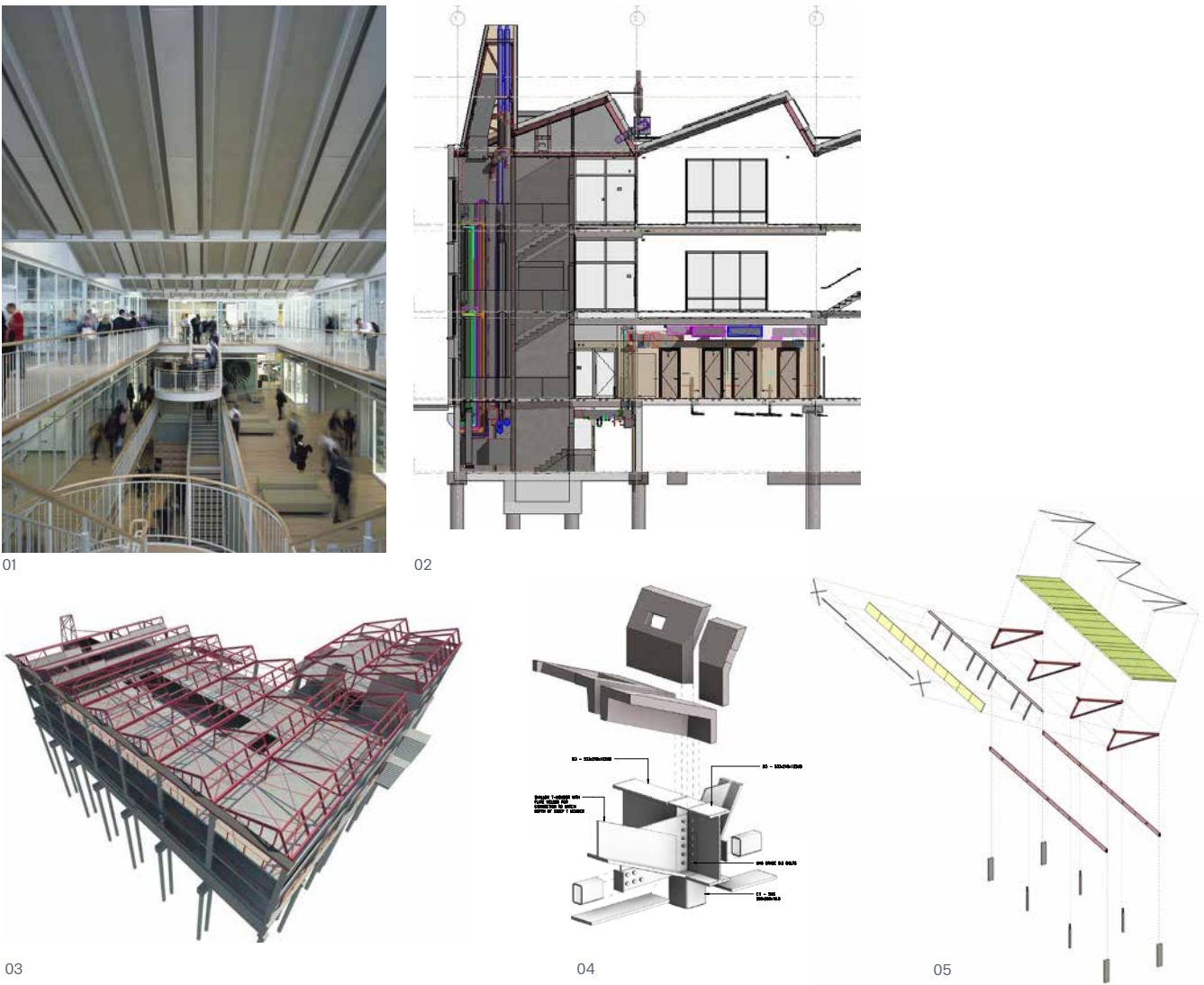
3D Revit model of building
- 04

Detailed model of roof connections
- 05

Exploded 3d view of roof structure: steel framing with precast concrete panels

This project is the latest in a masterplan for the long-term development of Sevenoaks School, a leading independent co-educational school. It provides a new science centre with 22 laboratories, technology workshops, offices, a sixth form centre, café and large multi-purpose space that can be used for exams.

Concrete played a vital role in the building's architectural and engineering conception. A precast ribbed roof structure is the project's standout feature, facilitating 7m-wide pitched spans with a slender appearance, while maintaining the concrete aesthetic, integrating services and providing thermal mass to the upper floor. A series of north lights brings diffused natural light into the laboratories and the dramatic central atrium. Steelwork framing elevates the precast panels into these skylights. Extensive detailing and coordination, carried out through BIM and the building's Revit model, fine-tuned the setting out of the ribs, the relationships with the steel framing and the services strategy.



In situ concrete is used in a variety of ways throughout the project and is integral to the function, aesthetics and performance of the building.

Precast concrete stair flights are used in the building with similar exposed finishes. The imposing mass of the exposed concrete is offset by elegantly detailed features in several areas of the building, including glazed steel canopies, glass display vitrines and light steel framed balustrades. Two freestanding atrium stairs were fabricated in steelwork offsite and delivered and lifted into position through the partially completed roof structure as completed elements.

The building is embedded into a sloping site and an additional reinforced concrete basement level contains storage and plant spaces. The SUDS drainage design includes areas of permeable landscaping and soakaways.

**217**  
precast roof panels,  
22 unique geometries,  
made from 4 master  
plank moulds



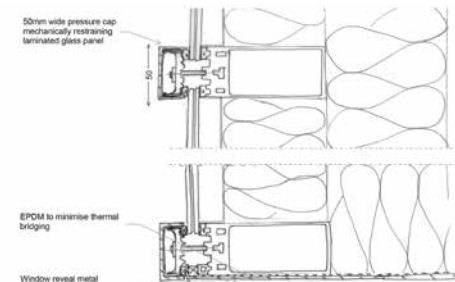
2019 IstructE Award Sustainability  
2019 Construction News Awards  
International Project of the Year - Shortlisted  
2019 IStructE Award Structure in Extreme  
Conditions - Shortlisted

La Référence de Ganthier  
Ganthier, Haiti  
Studio PHH

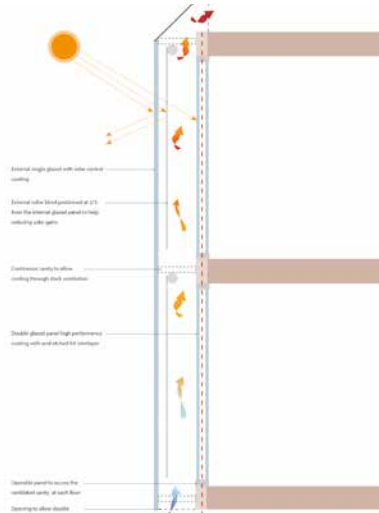




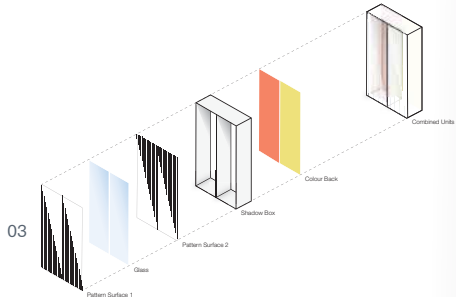
Wadham College



02



01



03

**Location:** Oxford, UK  
**Client:** Wadham College  
**Architect:** AL\_A  
**Date:** Completed 2021  
**Value:** Undisclosed  
**Services Provided:** Facade Engineering

Eckersley O'Callaghan provided facade engineering services for two new buildings on Wadham College's historic Oxford University site. The William Doo Undergraduate Centre contains a range of social spaces which has enhanced and improved the interactions of the Wadham student community. The Dr Lee Shau Kee Building creates a welcome centre for prospective students visiting one of the college's inspiration days or summer schools.

The intent of the Dr Lee Shau Kee Building was to be light and uplifting. The facade is composed of opaque areas which are clad in glass panels with contrasting vertical metal fins between them. Windows are inset. The opaque modules are formed between the

framework of metal fins and are in essence a series of shadow boxes. Each box has a metal backing at the rear and a glass panel at the face.

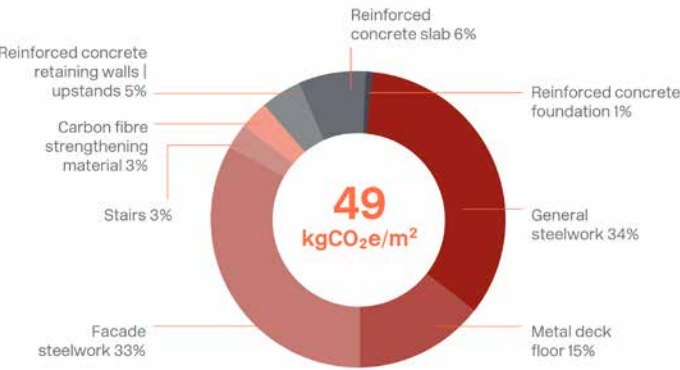
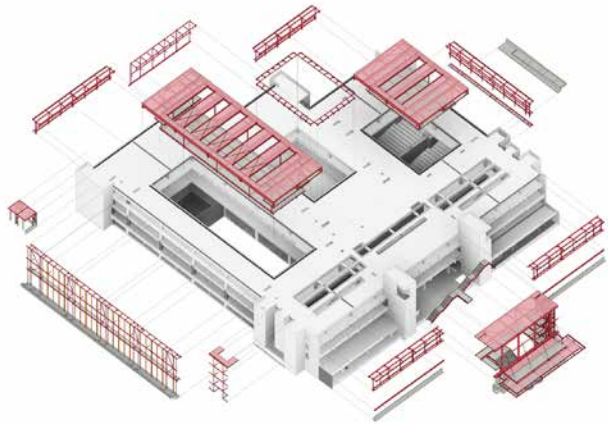
The facade of the Undergraduate Centre plays with a similar idea of varying degrees of transparency, but in a distinct way that reflects its own identity and function. The Undergraduate Centre is an expression of horizontally, which is visible through the pattern applied to the glass facade. The facade of the Undergraduate Centre is composed of panels of clear and opaque glazing with a printed polyvinyl butyral (PVB) interlayer which makes reference to the subtle range of colours of the college hall's stained-glass windows, creating texture on the facade at a finer scale.

- 01  
Early facade design strategy for the William Doo Undergraduate Centre
- 02  
Opaque facade shadowbox detail at window reveals showing vertical anodised aluminium expressed capping profiles
- 03  
Opaque facade buildup option of Dr Lee Shau Kee building

London South Bank University



01



02

**Location:** London, UK  
**Client:** London South Bank University  
**Architect:** Wilkinson Eyre  
**Date:** Completion due 2021  
**Value:** £60m  
**Services Provided:** Structural & Civil | Facade Engineering

Eckersley O'Callaghan are providing structural and facade engineering services including below ground drainage on the redevelopment of the existing four-storey 1970s London Road Building with an overall internal area of 20,000 sqm. The building is currently used as teaching and office space, with an extremely cellular layout unfit for modern use. The new design will become the campus' Student Hub and will include lecture theatres, library, sports facilities and catering areas.

Retaining the original concrete frame, the works include infilling of the current lightwells with new floors, while the existing roof is lifted up to create new dramatic double-height spaces. An additional 1,000sqm of accommodation has been created. The building

entrance is also being remodelled, with full-height glazing and a sweeping new canopy.

The existing facade will be removed and replaced and the structure re-clad with a combination of brickwork, glazing and GRC. Carbon studies have shown that GRC backed unitised facade modules have lower embodied carbon than traditional brickwork.

By refurbishing and going the extra mile to save as much as possible, the Embodied Carbon for the building is just 49kgCO<sub>2</sub>e/m<sup>2</sup> – three and a half times less than the 179kgCO<sub>2</sub>e/m<sup>2</sup> 2020 Leti education target and just under half that of the 105 kgCO<sub>2</sub>e/m<sup>2</sup> 2030 target.

- 01  
Structural interventions include recladding of facade and structural infill to atrium and courtyards
- 02  
Carbon calculation for building



The Beecroft Building



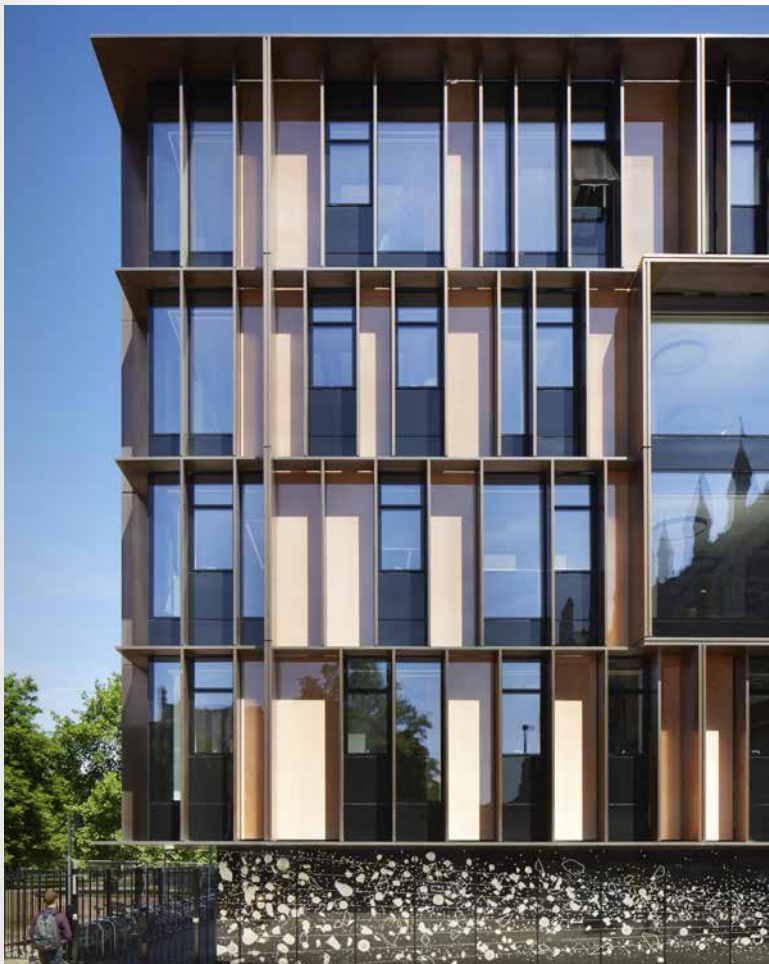
01



02

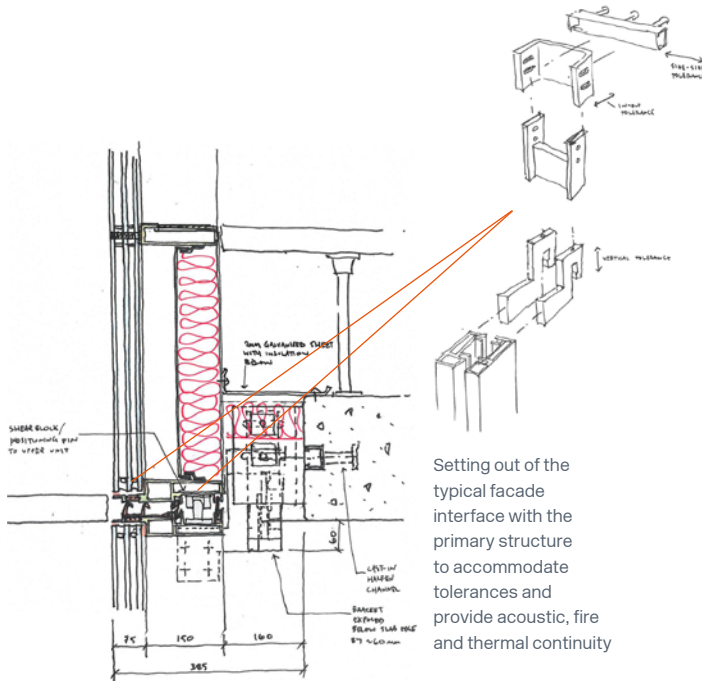


03



04

2km+  
of prefabricated fins  
incorporating over  
2000sqm of folded  
copper sheet



05

**Location:** Oxford, UK  
**Client:** Oxford University  
**Architect:** Hawkins\Brown  
**Date:** Completed 2017  
**Value:** £50m  
**Services Provided:** Facade Engineering

**BREEAM Excellent achieved**  
**RIBA National Award 2019**  
**RIBA South Award 2019**  
**RIBA South Building of the Year Award 2019**  
**Oxford Preservation Award 2019**

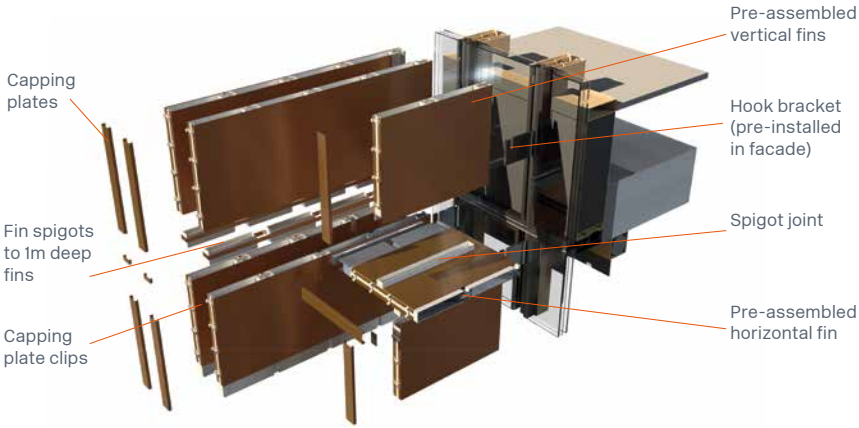
The Beecroft Building is a landmark research and teaching facility for the University of Oxford Physics Department. Eckersley O'Callaghan provided facade engineering services and the design and detailing of the complex curtain walling systems, incorporating a variety of innovative materials including over 2km of copper & bronze shading fins.

Demanding performance targets drove the adoption of a unitised curtain walling system in the main facade. Choosing this system at an early stage meant it could be tested while the 16m deep basement was constructed. A key challenge then became the design and installation sequencing of the 700mm deep, cantilevering copper fins which were supported back to the unitised system.

Stringent thermal performance requirements meant that secondary structure and thermal penetrations had to be minimised while avoiding large cantilever loads on the curtain walling system and thermal bridging.

The facade contributed significantly to the building achieving a BREEAM Excellent rating, through a fabric-first passive approach with extremely low U-values, passive solar control, and a mixed mode ventilation strategy. The shading fins on the optimised grid allowed the use of highly transparent glass, permitting ample diffuse daylight to reduce artificial lighting demands. All these steps allowed the use of an extremely efficient M&E system in the upper floors, freeing up valuable plant space for the cutting-edge M&E systems required in the basement labs.

The fin support strategy also meant that they were not subject to wind induced vibrations transferred back to the primary structure, which was a key driver for the highly sensitive equipment in the laboratories. The laboratories have subsequently been recognised as some of the ' stillest ' places on the planet.

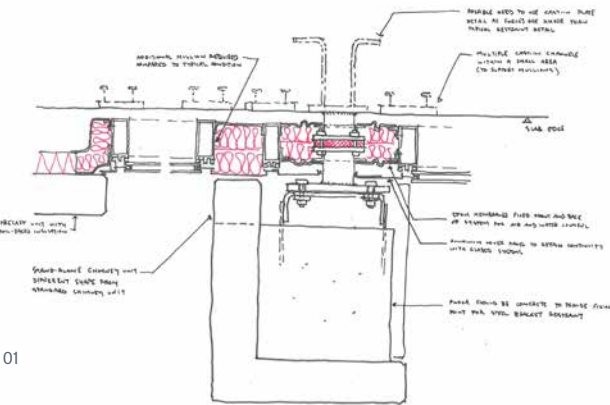


06

01 Beecroft Physics Building	04 Facade
02 Reception lobby	05 Slab edge fixing detail
03 Facade and walkway detail	06 Exploded view of on-site fin assembly



St Paul's School



Location: London, UK  
Client: St Paul's School  
Architect: Walters & Cohen Architects  
Date: Completed 2018  
Value: Undisclosed  
Services Provided: Facade Engineering

Founded in 1509, St Paul's School is one of the top independent schools in the UK. A group of 1960s facilities buildings has been transformed into a new 9,000 square-metre teaching block comprising classrooms, a library, dining hall, offices, chapel, and social spaces including a large atrium.

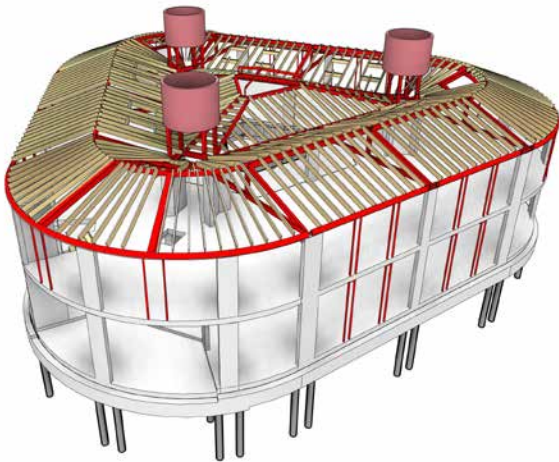
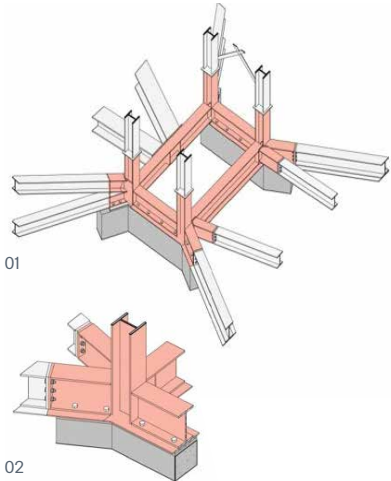
Eckersley O'Callaghan has engineered the facade for the new L-shaped structure. The building features two different facade compositions. The elevations facing onto the central green courtyard, Founder's Court, consist of a silicone-glazed aluminium stick system with aluminium spandrel panels and vents.

The external facade is formed by an aluminium stick system combined with solid precast concrete elements. The precast elements include L-shaped vertical chimneys that provide natural ventilation to the classrooms. The ventilation units have a twofold function. Lower panels ensure natural ventilation rates are achieved, a bottom hung outward opening top light is actuated and linked to the building management system.

The facade forms an integral part of the building's energy efficiency, providing natural ventilation, solar shading and noise attenuation.

01  
Precast connection  
detail to chimney

Alleyn's School Lower School



Location: London, UK  
Client: Alleyn's School  
Architect: Tim Ronalds Architects  
Date: Completed 2018  
Value: £4m  
Services Provided: Structural Engineering

Alleyn's School required a new building to replace the existing Lower School building, which was in poor condition and too small for the school's needs. Increasing the number of classrooms from 8 to 12, the new Lower School also includes an assembly room and amenity space, and contributes additional play space and bicycle storage for it's 240 pupils.

The building uses an exposed frame of in situ reinforced concrete up to the first floor, which provides thermal mass to the building, while the roof is formed from steelwork and Douglas fir timber rafters – both carefully detailed and exposed on the soffits at first floor level. Brickwork is used for internal and

external walls, giving a robust, hard-wearing finish. A Sustainable Drainage System is used beneath the playground for attenuated rainwater storage.

Eckersley O'Callaghan has engineered the structural design of the new Lower School and a separate extension to the school's science building. In addition to this we have also engineered a new drama centre, multi-purpose studio space, and sixth form centre. The works are part of the planned redevelopment of the School's western end, which will, in time, also include new spaces for dining.

01  
Chimney area  
structure

02  
Chimney area  
connection detail



2016 RIBA National Award  
2016 RIBA South Award  
2015 Oxford Preservation Trust New  
Building Award  
2015 Lux Award

Investcorp Building  
St Antony's College,  
Oxford, UK  
Zaha Hadid Architects





Novartis Institute for Biomedical Research



Location: Massachusetts, US  
Client: Novartis  
Architects: Maya Lin | Toshiko Mori Architects  
Date: Completed 2015  
Value: Undisclosed  
Services Provided: Facade Engineering

Multinational pharmaceutical company Novartis chose architects Maya Lin and Toshiko Mori to design two interconnected buildings in an extension of its campus in Cambridge, Massachusetts, which acts as the centrepiece of its worldwide research operations. Eckersley O’Callaghan played a significant role in the facade design of both buildings.

The Maya Lin facade comprises 290,000 square feet of a distinctive, randomly perforated natural stone screen, hung from a unitised aluminium curtain wall system. We were instrumental in resolving the stone design and a supporting stainless steel structure, which assembles the individual stone panels into mega-panels that are fixed to the curtain wall behind and then fixed to the primary structure using conventional brackets. This innovative approach allowed the cladding contractor to save considerable assembly time on site.

Our initial engagement with Toshiko Mori for the facade design of Building 613 was brought about by disappointment in the visual mock-up of terracotta louvers. We carried out a materiality study to present several alternatives, finally settling on a unique system comprising weaved bronze fabric encapsulated within laminated glass blades. We also designed an elegant louver carrier system that could be applied to the custom unitised curtain wall without compromising either aesthetics or thermal performance. Silicone bonding was used to avoid mechanical fasteners within the glass elements.

We were able to work within strict budgetary constraints by researching suitable vendors for the specialist glass and bronze weave louvers, which ultimately enhanced both the building’s appearance and shading performance.

01  
Unitised facade  
section showing the  
integrated hung stone  
screen

Honourable Society of Lincoln’s Inn Fields



Location: London, UK  
Client: The Honourable Society of Lincoln’s Inn  
Architect: MICA  
Date: Completed 2018  
Value: £16m  
Services Provided: Structural Engineering

BREEAM Very Good  
AJ Retrofit Awards 2021  
New London Architecture - Conservation 2020  
Civic Trust Awards 2021 - Regional Finalist  
IStructE Award for Structural Transformation 2021 - Shortlist

The Honourable Society of Lincoln’s Inn Fields is the largest of the four Inns of courts, comprising several beautiful buildings. The most renowned building is the Grade II\*-listed Great Hall and Library. The Great Hall was first completed in 1845 and the library was added in the 1870s by Architect, Philip Hardwick.

Our team provided Structural and Civil engineering services for a major refurbishment, including an extension to the existing library building, and the addition of two cavernous basement spaces, a total of 1,860m<sup>2</sup>, linked directly to the historic building via new subterranean apertures. This sprawling project presented challenges across a range of materials and scale, with safeguarding the historic building at the forefront of our minds. Numerous junctions with the existing buildings were carefully detailed to allow the two to freely articulate without visual disruption.

The Great Hall features a 185m<sup>2</sup> one-of-a-kind fresco painted onto fresh plaster, and highly sensitive to building movement. Its value was such that the art consultant refused to provide any specification for its

temporary protection during the construction works. Our weekly ‘Movement Monitoring report’ was studied with fervour and compared with our pre-construction predictions. The southern ceremonial staircase was carefully suspended on a series of micro-piled stilts for 12 months while the double basement auditorium and advocacy space was excavated below.

A freestanding glass link containing an ultra-slim bridge structure allowed the new library foundations to ‘bed in’ to the London clay without the large glass panels attracting any load. Each pane carefully chased into the historic brickwork to allow vertical freedom of movement while resisting lateral wind forces.

In re-connecting the new library space to the historic turret, the existing spiral stone stairs had to be rotated by 180 degrees. This operation had to be carried out with surgical precision and was achieved without the need to replace any of the original treads. The result is testament to the team maintaining such a keenly focused attention to detail throughout.







## Bedford Academy



**Location:** Bedford, UK  
**Client:** Bedford Academy  
**Architect:** Bond Bryan Architects  
**Date:** Completed 2013  
**Value:** £25m  
**Services Provided:** Structural & Civil Engineering

Bedford Academy is a co-educational comprehensive academy with a science and technology specialism and 1440 students.

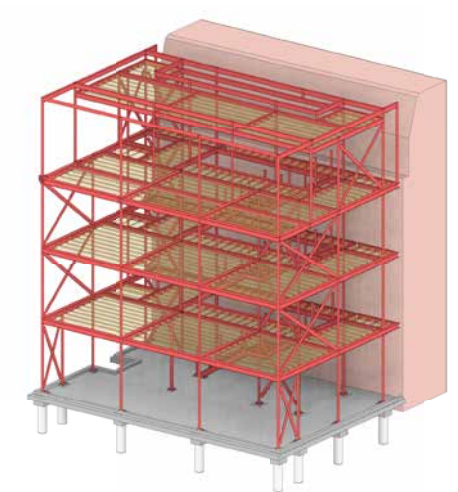
Eckersley O'Callaghan provided structural engineering services for the new 12,000m<sup>2</sup> building. The academy was constructed on part of the playing fields of the existing John Bunyan School, which continued to operate before re-opening as Bedford Academy when the first phase of the development was completed in October 2012.

Workshops throughout the design and construction process ensured the project did not deviate from the agreed brief and cost plan. This involved regular feedback from the contractor's supply chain.

The structure comprises a three-storey steel frame, with precast concrete floor slabs acting compositely with the steel support beams. The central circulation hub features a dramatic single flight stair running up through it. The uppermost classroom block is glazed to take advantage of views across the playing fields. It overhangs the lower part of the block, supported on raking columns.

The final phase of construction, completed in spring 2013, involved demolition of the old school buildings, and new landscaping, car parking and sports facilities.

## Hubert Perrodo Building St Peter's College



**Location:** Oxford, UK  
**Client:** St Peter's College  
**Architect:** Design Engine Architects  
**Date:** Completed 2018  
**Value:** £2m  
**Services Provided:** Structural & Civil Engineering

Eckersley O'Callaghan has provided structural and civil engineering services for a scheme to improve the facilities for the academic community at St Peter's College, Oxford. We have been involved in the construction of a new four-storey accommodation building, the reconfiguring of surrounding existing buildings, and the remodelled landscaping of two of the college's quads.

The new accommodation building is on a confined site and there were requirements that the surrounding buildings would remain operational during construction. We used a steel frame construction to ensure that the structure could be erected in such a tight space. Vertical circulation has been provided

**RIBA South Award 2018**  
**WAN Award 2018 - Regional Winner EMEA**

by a steel-framed lift enclosure and steel-framed staircase, which was designed with flights between floors spanning approximately 7.5m unsupported.

Teaching spaces within the existing Chavasse Building have been revamped, with 5m steel 'picture frames' allowing the provision of large folding doors between spaces, creating greater flexibility of use. Meanwhile, we implemented several strategies, including porous paving and a soakaway, to improve the drainage of the Chavasse and Hannington Quads. A new access ramp, steps, planters, and circular tree pit have also been provided.



BREEAM Very Good  
38% reduction in CO2 omissions  
2013 Green Apple Award  
2013 Southend Borough Council Annual  
Design Awards – Commendation  
2013 RIBA East Regional Award - Shortlisted  
2014 Civic Trust Awards - Regional Finalist



Hinguar School,  
Essex UK,  
Spacecraft Architects



## Irène Joliot Curie Residence



**Location:** ZAC Rungis, Paris

**Client:** Espacil Habitat

**Architect:** Hauvette & Associés

**Date:** Completed 2012

**Value:** £11m

**Services Provided:** Structural | Facade Engineering

Eckersley O'Callaghan has engineered the structure and facade for the first building to be completed on the ZAC of Rungis, the first eco-friendly district in Paris.

The new structure provides 183 flats for students and research scientists (90 student flats and 93 flats for scientists) with 500m<sup>2</sup> commercial space at the ground level. The building has a simple polygonal shape and is built around a planted courtyard.

There are first commercial and collective elements on which is placed two additional 3 storey high segments, each forming a juxtaposed and superposed block.

The concrete facade is insulated by the exterior, the floors are supported by shear walls perpendicular to the facade. There are at least two high windows per

room. The frames and openings are completely masked by an exterior golden anodized aluminium skin which accentuates the cleanliness of the perforations of the facade.

Thermal insulation has reduced energy consumption to about 30 % below the current thermal regulation requirements. The installation of 160m<sup>2</sup> of solar thermal panels on the roof contributes to domestic hot water production.

Rain water is recovered from the roof and is stored in a cistern for sanitary use and to water the private garden. The residence is certified BBC (Building with Low Energy Consumption) and has a H&E A- profile label.

## IARC Headquarters



**Location:** Lyon, France

**Client:** IARC & Lyon métropole

**Architect:** Art & Build

**Date:** Completion due 2022

**Value:** Undisclosed

**Services Provided:** Facade Engineering

Part of the World Health Organization, which is itself governed by the United Nations, the IARC is an intergovernmental research agency, which investigates the causes of cancer. Based in Lyon, the organisation will be moving to a new headquarters building, designed by Art & Build Architects.

Eckersley O'Callaghan is engineering the project's technologically-advanced facade. Cutting-edge innovations featured in the envelope include shape memory materials, reminiscent of flower petals, that will provide passive solar protection, and thermochromic glazing, which will react to sunlight,

becoming partially opaque to reveal organic motifs that minimise heat gain. Activated by the sun's energy, these systems require little human intervention and reduce energy consumption and maintenance costs.

We have conducted detailed research into the environmental effects of thermochromics to ensure benefits are maximised for this new building.

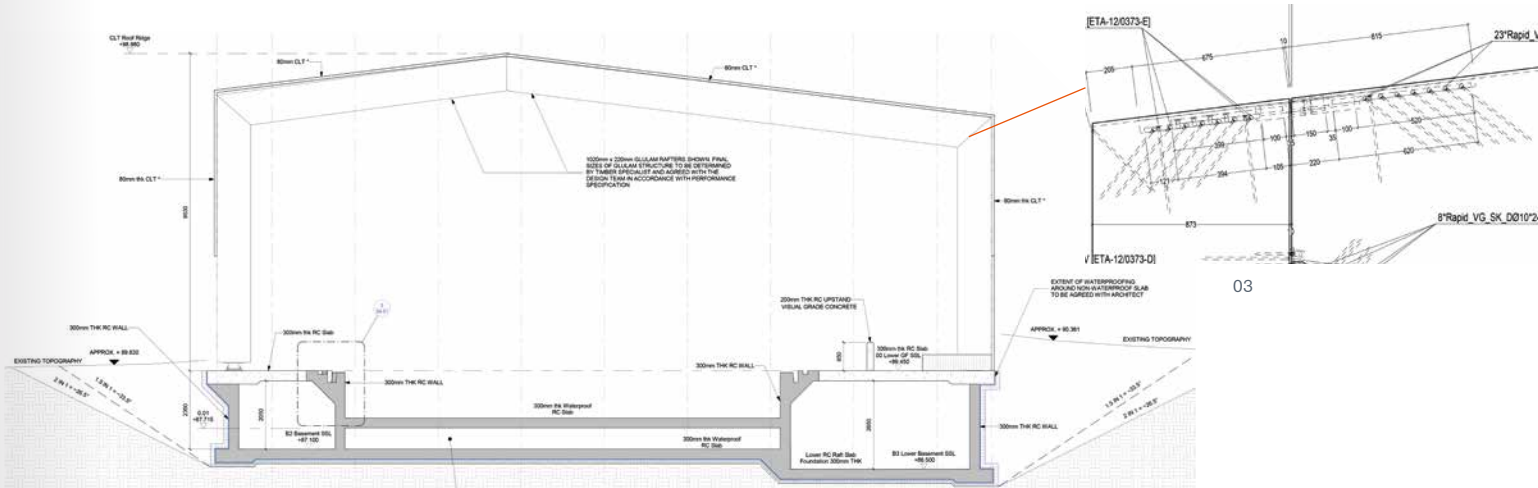
The project brief also specified a requirement for high weatherproof and acoustic performance.



Swimming Pool



01



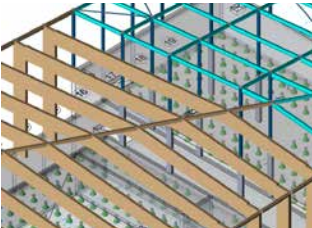
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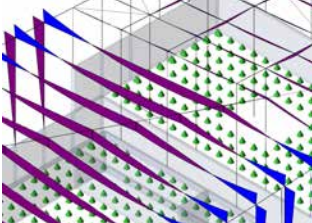
04



05



06



07

**Location:** Ashstead, UK  
**Client:** City of London Freeman's School  
**Architect:** Hawkins\Brown Architects  
**Date:** Completed 2017  
**Value:** £8m  
**Services Provided:** Structural Engineering

**RIBA National Award 2018**  
**RIBA South East Award 2018**  
**RIBA South East Client of the Year Award 2018**  
**RIBA South East Sustainability Award 2018**  
**Structural Timber Awards 2018**

Eckersley O'Callaghan provided structural engineering services for a new swimming pool for City of London Freeman's School, replacing the original pool, which was destroyed by a fire in 2014. This new six-lane, 25-metre competition pool is surrounded by woods and parkland and the school's Grade II\*-listed Main House. The scheme also includes changing facilities, an annex, and energy centre.

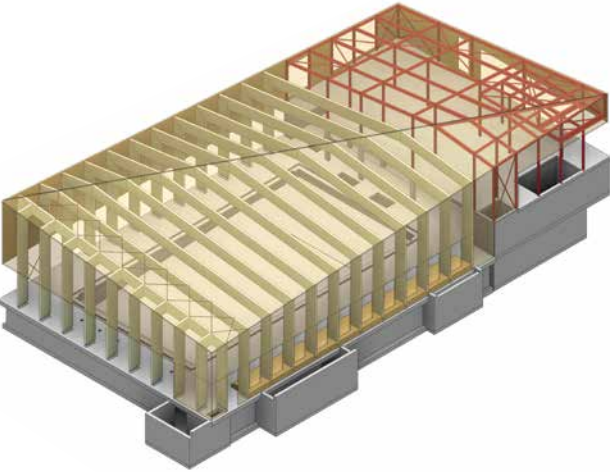
The design involved the development of an envelope of cross-laminated timber, with minimal structural steel inserts, supported by long-spanning portal frames in glulam timber, which are gradually skewed along the length of the building.

The project utilises the very latest in energy-efficient ventilation systems hidden below the pool structure to service the building. Finished to a very high standard, the engineered wood has been left exposed internally and treated with a white stain, leaving the grain visible. This natural finish allows the building to complement its natural setting, and provides thermal insulation and corrosion resistance.

The site is located in an area of chalk, which is liable to corrosion over time – we engineered a foundation solution to minimise this risk while carrying the weight of the superstructure. We were also responsible for the detailed design of all reinforced concrete and steel elements.

A complex geometrical layout demanded that we employ the latest 3D BIM tools to model these forms throughout the close coordination process with the design team. This BIM model was later used by the contractors for developing construction information. Prefabricated off-site, the structure was assembled on-site in just over three weeks. From detailed design to completion, the project took only one year.

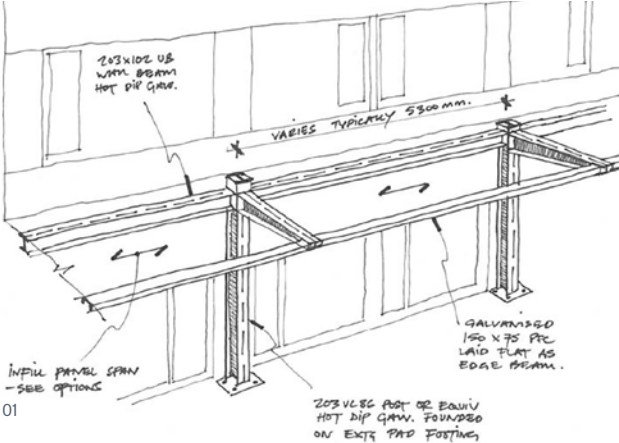
**90t**  
CO2 sequestered  
from 675m<sup>3</sup>  
timber used



- |   |  |
|---|--|
| 01<br>Freeman's School<br>Swimming Pool | 05<br>Long span portal<br>frames in glulam<br>timber |
| 02<br>Structural plan                   | 06<br>3D analysis model                              |
| 03<br>Hidden eaves<br>connection detail | 07<br>Portal frame-bending<br>movements              |
| 04<br>CLT structure<br>assembly         |  |



Lancaster University Spine



**Location:** Lancaster, UK  
**Client:** Lancaster University  
**Architect:** MICA  
**Date:** Completed 2018  
**Value:** £13m  
**Services Provided:** Structural & Civil Engineering

Lancaster university's central circulation route - the 'Spine' is a kilometre pedestrian walkway that runs through the centre of the university campus. Eckersley O'Callaghan has provided a structural design which re-imagines the existing canopy structures that connect to over 20 different buildings, to enhance natural light, improve lighting and way-finding generally, and redefine a series of squares outside key buildings. With green roofs, wetlands and improved drainage, the design also adds a sustainable focus to the university. Our scope also covered the extensive landscaping works.

We worked closely with the architect, landscape designers and services consultants to develop the designs. Our work focused on the canopy structures and a series of pop-up pavilions that link the university's central square to the bus station below. Prefabrication was used as a means of enabling the university to remain operational while the work was carried out, with phased delivery of works to support this.

01  
3D schematic of the typical walkway cantilevering canopy

Gildredge House School



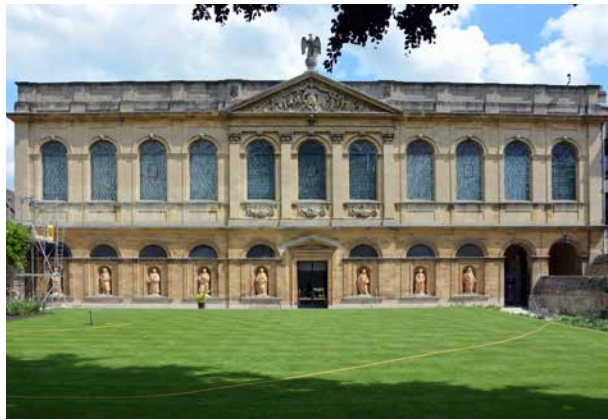
**Location:** Eastbourne, UK  
**Client:** Willmott Dixon  
**Architect:** Lee Evans Partnership  
**Date:** Completed 2014  
**Value:** £13m  
**Services Provided:** Structural Engineering

Gildredge House is a new school catering for approximately 1200 pupils, combining existing Victorian buildings with a modern extension. Our services included the demolition of single storey buildings, design of a three court sports hall, a new performance space and a three storey extension to the existing computer building. The steel frame and flat roof is supported by 120m<sup>2</sup> of curtain wall and houses a staircase 10 metres wide.

Newly landscaped play spaces and a large multi-use games area have also been provided. Other refurbishments were carried out in the complex, ranging from inserting new steel work to replace load bearing walls, to the creation of new door openings. The project was completed under the SCAPE framework, with Eckersley O'Callaghan working closely with the Willmott Dixon design and construction teams.



## New Library and Archive The Queen's College



**Location:** Oxford, UK  
**Client:** The Queen's College  
**Architect:** Rick Mather Architects | MICA  
**Date:** Completed 2017  
**Value:** £7m  
**Services Provided:** Structural Engineering

**RIBA South Award 2018**  
**RIBA South Conservation Award 2018**  
**Oxford Preservation Trust New Building Award 2018**  
**Civic Trust Awards 2019** - Regional Finalist

Founded in 1341, The Queen's College is one of the University of Oxford's constituent colleges. Its spectacular Grade I-listed library dates from 1692 and is one of the largest of any Oxford college, with a lending collection of 50,000 volumes and nearly 150,000 volumes in the historical collection. Requiring more room, and with surrounding space being limited, the only feasible place to accommodate an extension to the library was beneath the provost's garden.

Eckersley O'Callaghan designed the structural scheme for this new basement. The basement sits in particularly sensitive surroundings, immediately adjacent to and below the existing library, with fragile historic walls on either side. We used a secant piled perimeter wall, propped during excavation to retain the surrounding ground and to minimise movements of the

adjacent foundations. Movement monitoring helped to control the process. The connection to the existing library was particularly complex, requiring careful underpinning to the old wall.

Key to the design was ensuring that the library's valuable collection was protected, while at the same time accommodating the needs of its users. A rooflight running from north to south introduces natural light to the reading room, with the historic collection stored away from this light. Our structural glazing experience allowed us to provide key advice for the walk-on rooflight, and also for a glazed lift shaft. The basement roof supports new planting to reinstate the existing provost's garden, meaning the rooflight and access stairs are the only evidence of the basement.

## Stowe School Boarding Houses



**Location:** Buckinghamshire, UK  
**Client:** Stowe School  
**Architect:** Rick Mather Architects  
**Date:** Completed 2009  
**Value:** £10m  
**Services Provided:** Structural & Civil Engineering

**RIBA Award 2009**

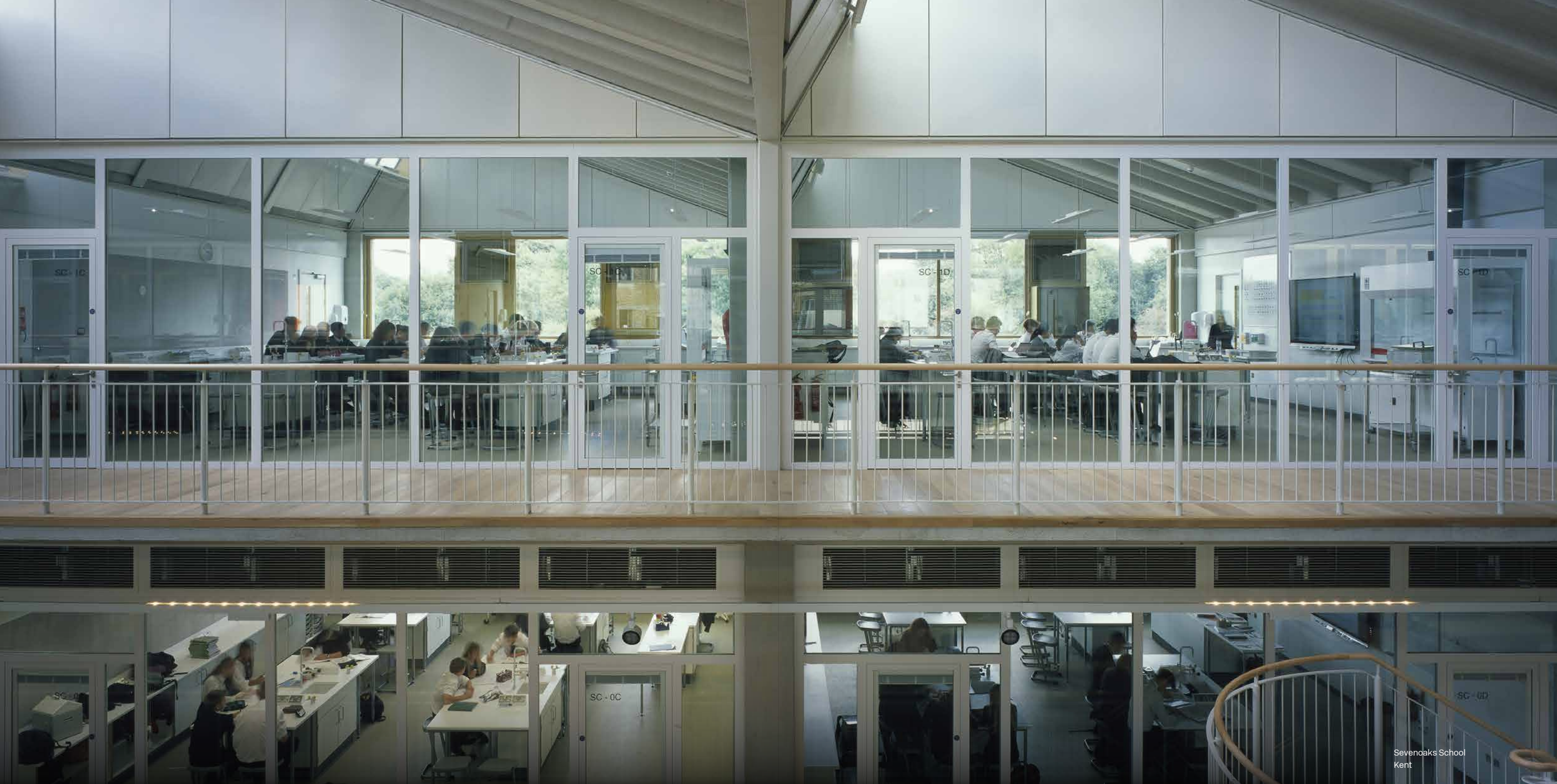
Stowe School is one of the most prestigious schools in the world. Based at Stowe House, formerly the country seat of the Dukes of Buckingham and Chandos, it forms the highest concentration of Grade I-listed buildings in England, set within beautiful landscaped grounds.

Eckersley O'Callaghan provided structural engineering services for the new Boarding House. The scheme is split into two buildings, with 72 rooms accommodated in each. The four- and five-storey blocks contain en-suite study bedrooms, with staff dwellings on the upper levels.

The structure uses a concrete column and flat slab construction and non-loadbearing partition walls to provide an economic and flexible layout that can be adapted over time by moving the partitions within the structural frame. The dramatic cantilevering eaves of the roof were formed from timber supported by a lightweight steel frame.

The building is founded on poor soil so a piled foundation design was developed to control the building's settlement. Bath stone, zinc and render were used for the facade to match the Main House and compliment the historic setting.





Sevenoaks School  
Kent

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