

# Transforming Buildings

Certified



Corporation



**Social Enterprise UK**  
Certified Member



EMPLOYEE  
OWNERSHIP  
ASSOCIATION

**INVESTORS IN PEOPLE**  
We invest in people Silver

Useful Simple  
Trust

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# Expedition Engineering

## Who we are

Expedition is a multi award-winning engineering consultancy.

Working across a range of built environment disciplines, we take pride in making a positive impact through a collaborative process.

We offer independent thinking and creative design skills to clients who want to maximise the value of their projects whether large or small.

We have designed bridges, skyscrapers, commercial and residential developments, cultural and educational buildings and airports. We have developed engineering solutions and infrastructure systems for significant masterplans around the world. Our team includes specialists in civil, structural, environmental and infrastructure engineering. Construction values range between £30,000 and £500m.

Expedition works with developers, architects, artists, government organisations, fabricators, contractors, environmental consultants, private clients and charities on a wide variety of projects. We deliver on scales large and small, in the UK and internationally, from inception, site selection and planning to completion and beyond.

Whilst our projects are diverse, what is common to all is our approach: we specialise in design, which we recognise as fundamentally successful if it is collaborative and interdisciplinary. To ensure valuable project outcomes, we believe that it is necessary to balance a considered mix of good engineering design, exploration and innovation.

### **Environmental, Social and Governance**

Our focused service is appreciated by our clients, many of whom have repeatedly commissioned us for our strategic insight, saving them time and cost whilst improving the quality and value of their projects and the surrounding environment for many years to come.



# Our Impact

## What's the problem being tackled?

Existing building stock is a valuable resource, and we must all make the most of it. Reuse, retrofit and refurbishment are all key to tackling the problem of underperforming developments. Solving this problem unlocks value on existing sites, reducing cost and programme for an equivalent new build, and can save thousands of tonnes of carbon.



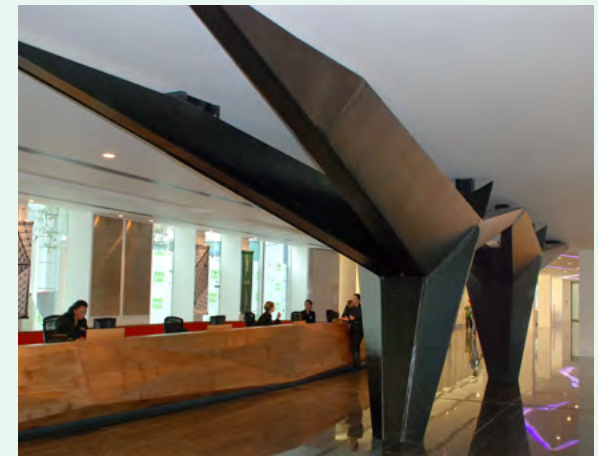
## What do we do to address it?

Our experienced engineers use their knowledge, investigative talents and innovative attitude to support our clients in unlocking radical possibilities within developments. We take a forensic approach to the problem in front of us and use our engineering expertise and collaborative cross discipline outlook to reach holistic solutions that create value for our clients and de-risk their projects.



## What does that achieve?

No surprises for our client, an excellent quality project that is significantly de-risked, and meeting the programme needs with greater cost certainty. Our early engineering involvement, with a consistent team working on the project through to completion, is often the key to successful redevelopment schemes. We go above and beyond, and we are able to collaborate and lead on problems that are outside of a traditional and constrained engineering scope.



# Our Impact

## How do we know that we're achieving?

We are always proactive, checking in with our clients and collaborators to ensure the team is on track and achieving the aims of the project. We have a number of award winning examples of reuse, retrofit and refurbishment projects, and delighted clients that work with us time and time again. As a B Corp, we report our impact annually and are pleased to improve on it year by year.



## How are we learning and improving?

Providing the best impact for our clients means that we constantly strive to supplement our experience with industry pushing initiatives, particularly in reducing carbon. This means that the latest approaches and technologies can be used for the benefit of our clients, in conjunction with our safe pair of hands to ensure a successful project. We are at the forefront of a number of industry low carbon design and material initiatives which is a key part of our learning in this field over the last 20 years.



*“We plan the successful, sustainable buildings of tomorrow by taking a holistic and tailored approach that considers the whole life of every construction. In the face of issues like the climate emergency and biodiversity loss, we believe that solutions can be engineered that allow us to coexist with nature. Thoughtful, considered and regenerative design can help communities, as well as the planet, thrive.”*

### **George Oates**

Director and Lead for Redevelopment of Existing Buildings, Expedition Engineering



1 / *Case Studies*



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# 55 Baker Street

55 Baker Street represents the radical £150m reinvention of a 1950s office building that transforms the site into an important new urban centre to include living, leisure and retail spaces along with an abundance of high-spec open plan office units. This was the largest commercial development in West London at the time, covering 1m sqft.

**Collaborators:** Make Architects  
London & Regional



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## Key challenge and outcome

Unlike all other pre-development bid teams, Expedition and L+R showed that the building could be reused, with targeted demolition.

This retained over 70% of the floor plate, resulting in an overall increase of 130% of the original area. The reuse of the frame saved 18 months on programme, allowing the development to be let significantly earlier.

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## Carbon

As over 35,000 tonnes of concrete frame and foundations were reused and saved from demolition, the embodied carbon in the redevelopment was significantly lower than a new build.

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## Client Value

The development went to market 18 months early with a significantly larger floor area. There was significantly less opposition to the development due to the minimal demolition.



Baker Street

# Clifton House, Euston Road

Clifton House was an existing seven-storey 1930's warehouse in an area of rising property values. To maximise the value of the building, an additional three storeys of grade A office space were added. This was achieved by building a lightweight structure on top whilst enabling 'business as usual' for the retail on the ground floor.



**Collaborators:** Robin Partington Associates

## Key challenge and outcome

Expedition's ingenious solution was to extend and hence increase the capacity of the existing foundations without undermining them, saving both time and money.

The structure and foundations were analysed in detail to check they could carry the increased vertical and lateral loads, resulting in minimal costly strengthening works. The new, enhanced stability structure was positioned outside of the original building footprint to enable beneficial retail use. The top storey was demolished and four storeys were rebuilt, maximising the value of the building.

## Carbon

By following Circular Economy principles, we saved our client money, time and resources by providing an engineering solution that significantly reduced the amount of new construction works. Refurbishment is often the most sustainable approach for existing buildings.

## Client Value

The works increased the building area by over 50% to around 13,000m<sup>2</sup>. The design approach enabled the ground floor retail area to remain operational throughout the construction period. Construction phasing assessments were carried out which saved months on the original programme.





Clifton House, Euston Road

# Snowdon Aviary, London Zoo

Expedition was appointed by ZSL as Structural and Civil Engineers to work on the restoration of Cedric Price and Frank Newby's Grade II\* listed Snowdon Aviary at London Zoo. The inherent beauty and brilliance of the sixty-year-old former bird house required a deep understanding of the existing ground breaking structure to ensure it would be fit for purpose for another 60 years.

**Collaborators:** CBRE  
Pfeifer  
Foster + Partners



## Key challenge and outcome

Getting to grips with the UK's only tensegrity structure – and designed prior to computational support – was a complex engineering study, involving physical models, thoughtful analysis, and pragmatic on-site proof load testing (rubble bags with deflection monitoring). With our highly developed model to show existing behaviour we were able to advise on which structural elements required replacement and which could be reused with repairs, as well as supporting the cable renewal strategy and new mesh design, and providing the Client with an assessment to justify the next 60 years of design life.

## Client Value

It is hoped that the sensitive restoration and repurposing of this jewel-like structure into a walk-through monkey house, will support increasing numbers of people to visit the world's oldest scientific Zoo and to appreciate both the rich architectural heritage and the precious biodiversity on display there.



Snowdon Aviary, London Zoo

# Selfridges, London

Engineering intervention made possible a major £300m transformation of Selfridges department store in London's Oxford Street over a 5 year period adding 10% more retail space. The iconic department store is made up of a number of distinct buildings and significant adaptations over its long history. The work unified varying floor plates and increased shop frontage on Duke Street, maximising the retail opportunities whilst keeping the store open throughout.

**Collaborators:** Gensler (phase I)  
David Chipperfield Architects (phase II)  
Stanhope



## Key challenge and outcome

Expedition designed a phased sequence of structural interventions that resulted in the removal of the exit delivery ramp that emerged in the centre of the Duke Street frontage. This work connected the retail spaces on either side of the ramp, creating additional valuable retail space and significantly improving Duke Street frontage. The careful sequencing enabled 'business as usual' in all the adjacent retail spaces, including above and below the major construction works.

## Carbon

Our dedicated stewardship of the structure at Selfridges resulted in maximum reuse of the building. By assessing the existing structure, we were able to enable another 100-years of design life and avoid large-scale demolition.

## Client Value

Using phased engineering intervention to unlock potential in the store resulting in increased retail space and significantly improved access. Our insight and approach to manage structural risks enabled the client to undertake strategic interventions in limited areas and avoid larger disruption... And created the world's largest accessory hall!



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# Bewlay House, Camden

The original building at 32 Jamestown Road Camden, was built as a pharmaceutical laboratory in the late 1980's. To maximise the value of the site, the client wanted to add an additional two storeys and reconfigure the space to create a light filled central atrium to this building creating a new mixed use development.

**Collaborators:** Ben Adams Architects  
London & Regional



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## Key challenge and outcome

To demonstrate that two storeys could be added without the need for significant temporary works or expensive strengthening works to the foundations or existing reinforced concrete frame, Expedition undertook a detailed structural analysis of the complete building. The outcome was that the additional storeys were designed as a lightweight steel frame using composite floor construction.

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## Carbon

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## Client Value

This vertical extension enabled the existing foundations to be used without any additional strengthening works, avoiding key risks of party wall and riverside works. The structural work to support repositioning of the lightwell and rework the main core unlocked a more flexible floor plate and making a more market friendly development.

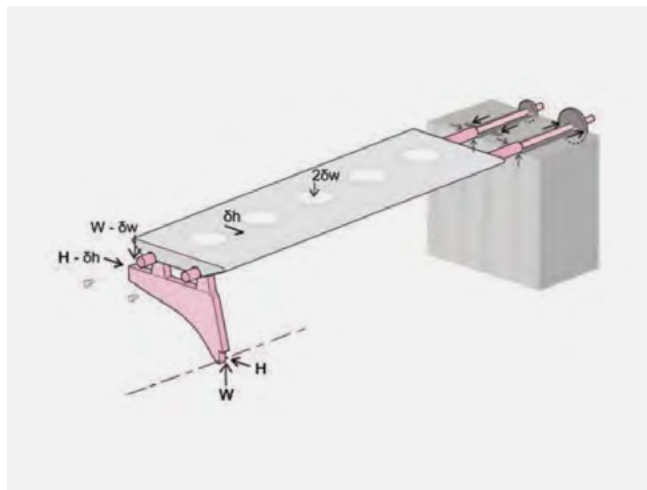


Bewlay House, Camden

# IStructE Headquarters

The Institution of Structural Engineers appointed Expedition to develop the recently purchased 1960's steel frame building on Bastwick Street, London to form their new HQ. The project included the refurbishment of the four storey building into high-quality offices, meeting spaces, library, a reading room and an auditorium.

**Collaborators:** Hugh Broughton Architects



## Key challenge and outcome

To maximise the value of the existing building Expedition enabled targeted structural modifications to open up and repurpose the building for the modern day. The centrepiece of the redevelopment is a new double-height entrance area with an exposed concrete feature wall supporting a finely detailed horizontal cantilever staircase in pre-cast concrete and steel, and a complementary bridge at first floor.

## Carbon

Our proposals achieved a 93% reduction in carbon when compared to demolition and rebuild. This allowed the client to strategically spend carbon where it really mattered. In particular, justification of the existing floor plates to remain insitu under the various new use loadings was a complex and unseen piece of analysis underpinning this re-use project.

## Client Value

The remodelling of building provided much needed facilities for the institution that in its existing format would not have been possible.





IStructE

# 64 Old Church Street, Chelsea

This modernist Grade II\* listed private home in Chelsea had previously received extensions, including a Norman Foster conservatory added in the 1990s. The client wanted to add an additional extension to the property in line with planning restrictions. As the building is such a rare example of modernist architecture in the area, the project was granted planning permission that expires after a specified period requiring the work to be completed in curtailed time period.

**Collaborators:** Apt  
Weber Industries



## Key challenge and outcome

To complete the project on such a constrained programme, Expedition's solution was to create a modular design that was fully movable. The three steel 'pods' could be craned in to sit on a chassis spanning over the existing garage minimising the onsite period. The modular nature also means it can be easily removed at the end of the granted planning period. Our work meant that disruption to the client and the local neighbourhood was reduced as far as possible.

## Carbon

Our engineering enabled a sensitive, pared-down solution with refined design that used the least possible material, minimising waste and carbon. The offsite construction and manufacture of our modular design means the extension can ultimately be removed for use elsewhere when planning permission expires.

## Client Value

A cost effective expedient design solution that was sympathetic to the original iconic design. Modular nature minimised on site construction period which was critical to realising the project.

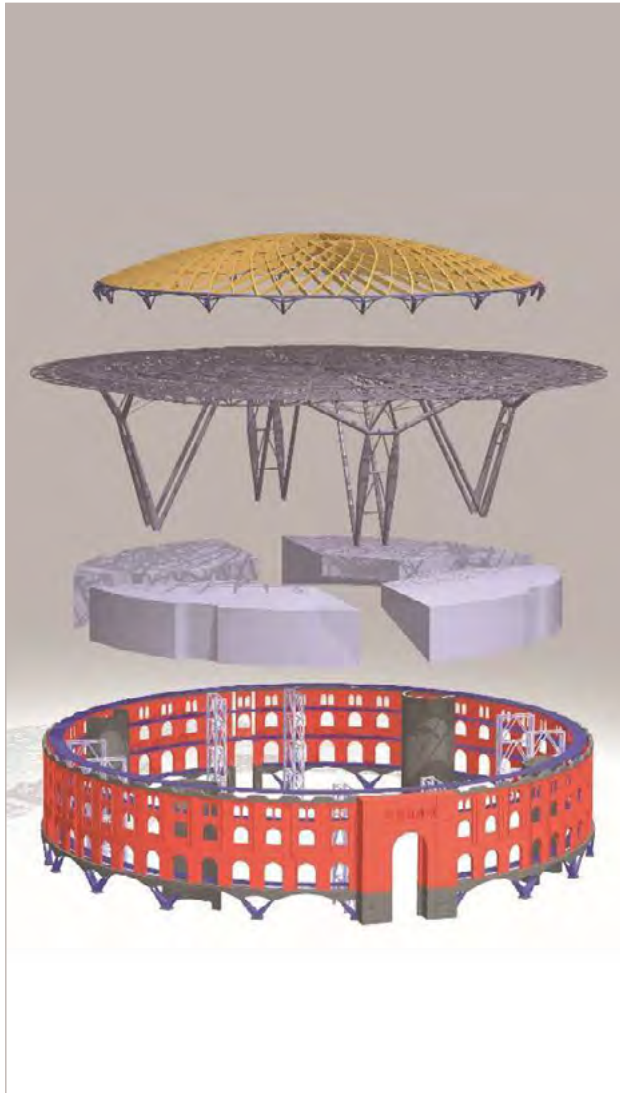


64 Old Church Street, Chelsea

# Las Arenas

Working with Rogers Stirk Harbour + Partners, Expedition enabled the conversion of Barcelona's Las Arenas bullring into a mixed use leisure and office complex. Located on one of Barcelona's busiest streets, the bullring had lain derelict for decades, defying repeated attempts to transform the site whilst retaining the historic structure.

**Collaborators:** Roger Stirk Harbours + Partners  
BOMA



## Key challenge and outcome

Expedition's simple engineering idea enabled the lowering of the entrance level of the former arena to match the surrounding street and provided the key to unlocking the development, enabling seamless movement into and across the development. It required considerable engineering expertise to preserve the decaying and dangerously listing 100-year-old circular masonry wall and perch it 5m above the new ground level, while another five storeys of basement were excavated directly beneath, and a new timber gridshell roof installed on top.

## Carbon

Demonstrating the reuse of such a complex and high profile building shows the power of adopting circular economy principles even in the most challenging situations. Different materials have been used sensitively to act in their most efficient form. Timber was selected for the roof, reducing the embodied carbon of the building whilst providing a dramatic visual effect and fire performance achieved through sacrificing charring layers.

## Client Value

Using engineering ideas to radically open up the possibilities for the building resulting in a highly popular, commercially successful, award winning mixed use development.



Las Arenas



Useful Simple  
Trust

Purpose-driven design for  
our changing environment

The Useful Simple Trust is a family of professional design practices driving change. Our experienced and committed engineers, architects, designers and strategists work side-by-side, and with our clients and users, to deliver valuable outcomes with positive impact. Our structure creates real value for our clients, beneficiaries and wider society.

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