Useful Simple Trust

Bridges

expedition
part of the Useful Simple Trust

Certified B Corporation

Social Enterprise UK
Certified Member

Proudly employee owned.

INVESTORS IN PEOPLE®
We invest in people Gold

Work with purpose

Who we are

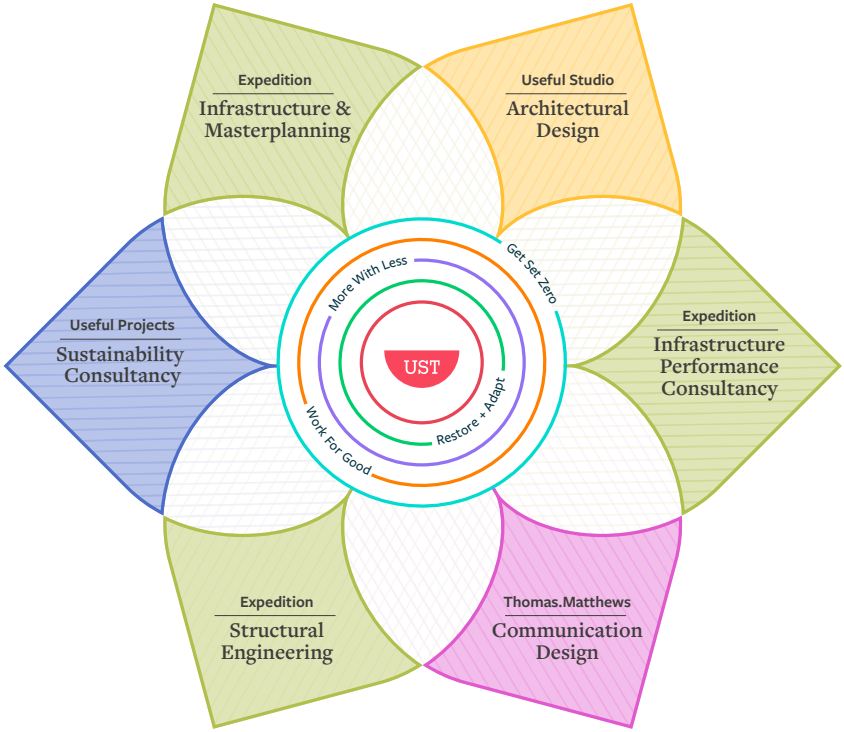
Established in 1999, Expedition is a multidisciplinary engineering consultancy providing a collaborative, interdisciplinary approach that puts engineering design and strategic problem solving first.

Working with Developers, Architects, Artists, Government Bodies, Infrastructure Clients, Fabricators, Contractors, Consultants, Charities, and other Private Clients across the UK and overseas, our projects are structured yet creative, embracing innovative ideas and techniques that can be relied on to reach the end goal successfully.

We take a progressive approach to our work as a practice, from our B Corp status to our sustainable goals and embedded values, and to our structure as part of a Social Enterprise and Employee Benefit Trust.

Our structure

Expedition is part of the Useful Simple Trust, a family of professional design practices driving change in the built environment consisting of Expedition Engineering, Useful Projects, Useful Studio, and Thomas.Matthews.



Our strands

WORK = FOR GOOD

We create affordable, inclusive, easy to navigate, and welcoming places to live and work as well as helping organisations to maximise social value where it's needed most through creative approaches.

MORE › WITH ‹ LESS

We create more value with less materials by designing out waste and inefficiency as part of wider productivity improvements. We respect existing buildings and components by looking for opportunities for reuse.

RESTORE + ADAPT

Our regenerative design approach seeks to restore habitats and ecological networks. We design new communities and infrastructure to be resilient in the face of high-emissions global warming scenarios.

GET / SET / ZERO

We have over a decade of experience in carbon baselining, target setting, verification, developing decarbonisation pathways, and action plans for organisations and projects.

Industry influence

Engaging with the wider industry is key to advancing our knowledge and skills base. Our teams play a crucial role in professional bodies and design panels, including but not limited to:

IStructE

Climate Panel

Homes England

Technical Advisor

Royal Academy of Engineering

Fellows of the Royal Acadamy of Engineering

ice
Institution of Civil Engineers

Policy and Public Affairs Panel

Water Panel

Past ICE President

Fellows of ICE

NATIONAL INFRASTRUCTURE COMMISSION

Design Group

Net Zero Bridges Group

UK GBC

Carbon Measurement and Reporting Task Force

Circular Economy Strategy

Clients

We work with both private and public clients, developers, local authorities, and infrastructure bodies. Here is a sample of our existing clients:

Our Services

We are proud of our award-winning bridge portfolio, and often work as Lead Designers on such projects, where our exceptional structural and architectural eyes result in exceptional projects.

Our experienced team works across existing and new bridges, with always the same focus: creating positive impact on the environment and the communities.

Our ambition is supported by our technical excellence, engagement with stakeholders, collaboration with architects, fabricators, and contractors throughout a project's lifecycle.

Our services are:

- Feasibility Studies
- Assessment of Existing Bridges
- Repairs, Strengthening & Durability Improvements
- Design of New Bridges
- Consultancy & Expertise
- Innovation, Research & Development

1 — Feasibility Studies

Our early input enables key masterplanning assumptions to be validated, maximising the benefits of a new or repurposed crossing. It also enables quicker design development, fully integrated with the objectives of each site.

Our services include:

- **Alignment studies**: Setting-out, span and ramp arrangements & support locations
- **Flood Risk Assessments:** Climate change impacts, resilience requirements & under-deck clearances
- **Stakeholder engagement:** Environmental Agency, Network Rail, TFL & Highways Authority
- **Integration with Masterplanning Strategies:** Sustainability, active travel & access for all
- **Technical compliance with key parameters** e.g. minimum width, gradients or parapets heights
- **Structural typologies & material opportunities**
- **Social Value Impact & Circular Economy opportunities**
- **Construction sequence & site accesses**
- **Approval & adoption process advice**
- **Survey specifications**

2 — Assessment of Existing Bridges

We are experts in the rapid assessment of existing short- to medium-span bridges to inform clients about likely short, medium and long-term prospects. A key benefit of our approach is holistic vision: from specifying local repair works to advising on repurposing of bridges.

Our services include:

- **In-situ visual inspection:** Non-destructive tests e.g. ultra-sonic tests to check plate thicknesses
- **Analysis of damage, cracks & corrosion**: Diagnosing potential causes & proposing mitigation measures
- **Durability Assessments**
- **Numerical Load Assessments**
- **Next step advice: repair vs replace**
- **Reusing & repurposing opportunities**
- **Specifications for in-situ load testing**

3 — Repairs, Strengthening & Durability Improvements

We take a whole life approach to cost and carbon in our design work. This idea is embedded in our principles of lean material use, prioritising local repairs wherever possible, as well as the development and adaptation of new technologies leading to a better way forward.

Our services include:

- **Structural & non-structural repairs**
- **Durability & lifespan extension improvements**
- **Concept designs for Tender**
- **Detailed design on behalf of Contractors**
- **Site support**
- **Principal Designer & H&S Risk Management**
- **Approval In Principle submissions to Local Technical Authorities**
- **Operation & Maintenance Manuals**

4 — Design of New Bridges

We are passionate about elegant and sustainable design that has a positive impact on local communities. Thanks to our collaborative approach to resolve architectural and engineering details, our bridges are successful pieces of public space. We offer independent thinking and creative design skills to maximise the value of our projects – large or small.

Our services include:

- **Concept to detailed design & construction phases**
- **Alignment Studies**: Incl. setting-out, span and ramp arrangements & support locations
- **Geometric definition**: In compliance with regulations e.g. minimum width, gradients or parapets heights
- **Structural Engineering**: Typology, stability, element sizing, material specifications
- **Civil Engineering:** River works, abutments, embankments, road build-ups & drainage
- **Expertise in dynamics, robustness & resilience to climate change**
- **Social Value Impact & Circular Economy opportunities**
- **Approval In Principle Submissions to Local Technical Authorities**
- **Operation & Maintenance Manuals**

5 — Consultancy & Expertise

Our engineering-led advice is informed by a passion for pioneering innovation and productivity improvements. We provide strategic, independent, and specialist support from concept through to construction and sustainable asset management. Our approach is always focused on achieving the best results, working alongside our clients to understand their objectives. Our advice is always entirely independent.

Our services include:

- **Independent Cat 2 & Cat 3 checking**
- **Scheme design efficiency reviews**: Highlighting cost, carbon savings & buildability improvements
- **Site Productivity Improvement Analysis** e.g. process review, time & motion analysis
- **Asset management advice** e.g. supporting portfolio maintenance strategy with risk analysis & deterioration predictions

6 — Innovation, Research & Development

We help our clients conceive and design front-end concepts and innovations, embedding new techniques and materials into construction. Our combination of engineering expertise and innovation know-how ensures efficient delivery of projects.

Our services include:

- **Industry sponsored innovation projects**
- **Internal research projects:** Focusing on low carbon materials, industrialising construction elements & considering impacts on biodiversity, environment & local communities
- **Participation with industry knowledge-sharing groups & conferences**
- **Article, guidance & book publications**
- **Innovation delivery:** Working alongside existing supply chains to implement step-by-step changes
- **Innovation management:** Supporting Clients in their Net Zero goals & wider sustainability objectives

Case Studies

The Phoenix

Services: Civil Engineering | Sustainability Masterplanning | Structural Engineering
Location: East Sussex, UK
Client: Human Nature Places
Architect: Periscope (Masterplanning)
Status: Planning Approved

Human Nature has taken a widely acclaimed approach to creating a sustainable mixed-use neighbourhood on the former industrial estate in Lewes, East Sussex. The redevelopment of the 7.9-hectare site includes retaining and reusing the existing industrial estate buildings and opening access to the riverfront following the catastrophic flooding in October 2000.

Tasked with designing new flood defences and sustainable drainage system, as well as developing the circular water and earthworks strategies, we have also advised on the new footbridge across the River Ouse. Providing much improved active travel connectivity to recreational areas to the north of the site and new riverside walk, the proposed design is inspired by Lewes' historic industrial legacy.

Developing the flood defence, drainage, and earthworks strategy, our team considered connectivity into the wider masterplan, flood resilience, and potential low carbon technologies.

The Phoenix

Bridgewater Triangle

Services: Civil Engineering | Sustainability Masterplanning
Location: London, UK
Client: LLDC
Architect: Mikhail Riches | William Matthews Associates
Status: Planning Approved

We were appointed as Principal Designer and Project Lead for the detailed design of the new road bridge as part of the Bridgewater masterplan. To open access to the highly sustainable new residential development, we have focused on improvements to the river wall, provision of landscaped embankments, and a new publicly accessible towpath.

Working closely with the architect, we navigated the challenge of delivering a bridge with a clear architectural intent which also meets the necessary structural and operational requirements.

Detailed design of the adjacent landscape included a range of civil engineering structures and new river walls which incorporate sustainable embankments to create a biodiverse and resilient waterfront.

Managing multiple stakeholder engagement at the interfaces between the structure and its setting, including the Environment Agency and the Canal & River Trust, our expertise allowed us to take ownership of the technical interfaces and develop solutions that satisfied all stakeholders, significantly reducing the risk for our client.

Bridgewater Triangle

Image © Filippo Bolognese

Onllwyn Road Bridge

Services: Civil Engineering | Sustainability Masterplanning | Structural Engineering
Location: Onllwyn, South Wales
Client: Global Centre of Rail Excellence
Architect: 5th Studio
Status: In Planning

We were commissioned to assess the reuse of the dilapidated 20m-span Onllwyn Road Bridge to design a new cost-effective and carbon efficient alternative. As the first public-facing component of the wider GCRE operations to be delivered, this project plays a significant role in setting the scene for the future development.

Our studies confirmed that the most efficient way of addressing the structure's physical constraints and futureproofing was to replace the existing bridge while reusing the current bridge as a pedestrian bridge elsewhere on site. The proposed design keeps the same alignment as the existing crossing.

The frame arrangement is designed such that future maintenance and road closures are limited. The low-carbon, cost-efficient design includes precast concrete beams with an integral connection to the abutment wall. The proposal combines a series of precast pre-tensioned concrete beams with an in-situ slab, cast on a thin precast slab acting as permanent formwork.

Chiswick Park Footbridge

Services: Structural Engineering
Location: London, UK
Client: Blackstone | Stanhope
Architect: Useful Studio
Status: Complete

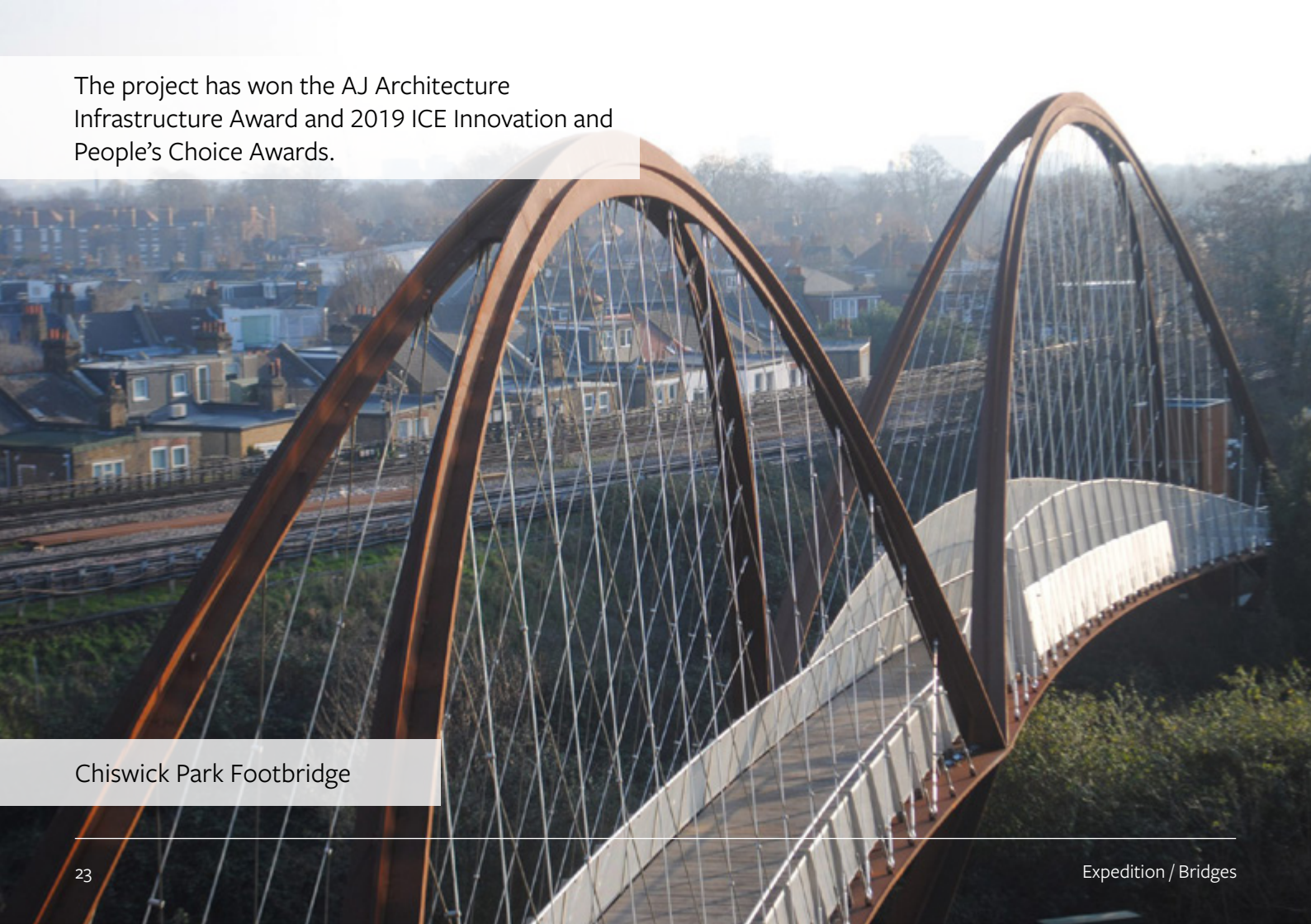
As Lead Designers, one of the key criteria for this 150m-long, multi-span pedestrian bridge was to minimise future maintenance requirements.

Setting a standard for its combination of form and function through collaborative design, the striking landmark provides a direct link from the business park to the tube station, previously only accessible by a circuitous route, by opening a connection across the railway line that divides them.

Working closely with Useful Studio, we pared the design down to just three materials - weathering steel, hardwood timber, and stainless steel – exploiting the structural form so that no dampers were necessary, and eliminating extraneous details where debris might gather.

The selection of a network arch was the logical engineering response to the challenge of creating a lightweight footbridge which did not vibrate excessively under its expected density of footfall. The disruption of the railway was minimised by prefabricating the whole arch and lifting it in place in a single operation.

The project has won the AJ Architecture Infrastructure Award and 2019 ICE Innovation and People's Choice Awards.



Chiswick Park Footbridge

Stockton Footbridge

Services: Structural Engineering
Location: Stockton-on-Tees, UK
Client: English Partnership | Stockton Borough Council
Status: Complete

As a landmark over the River Tees, this 180m-long pedestrian crossing showcases design at its most efficient, creating a lean, elegant, and slender structure that is built to last for 120 years. The footbridge's asymmetric form was the perfect solution to the site's constraints, where river traffic prevented a central support.

We were part of the competition-winning team appointed to meet the client's brief for a dramatic structure representing value for money; striking the right balance between slenderness and rigidity, while keeping within budget.

The two tied arches are linked in the middle by a curved, inverted 'saddle', making the bridge less prone to wobble while maintaining the curvaceous aesthetics of its shape.

The deck was designed and built with precast concrete units with integrated drainage channels, overflow spouts and supports for handrails fittings. A perfect example of what we would now call DfMA.

The project has won the IStructE Structural Awards: Supreme Award for Structural Engineering Excellence 2009 and Structural Steel Design Award 2010.

Stockton Footbridge

AVA Footbridge & Lift System

Services: Infrastructure Performance Consulting | Structural Engineering
Location: UK
Client: Network Rail | Innovate UK
The AVA Consortium: Expedition | Hawkins\ Brown | Walker Construction | McNealy Brown | KSG | Network Rail
Status: Prototype Complete

The award-winning AVA Footbridge addresses the challenges of enhancing productivity in delivering footbridges across the network; meeting NR's goals to reduce capital expenditure (CAPEX), installation time, and carbon footprint, alongside its 'Access for All' program.

Featuring a distinctive modular design, an integrated lighting system, and an exposed bead-blasted stainless steel finish, AVA is a high-quality architectural piece suitable for any station environment. Its layout is configurable, allowing for various bridge and lift arrangements to meet specific site requirements, and its span and height are flexible, with customisation options including a roof.

The use of stainless-steel for both structure and cladding extends the design life of the footbridge to 120 years. This significantly reduces early-stage degradation, minimises disruption to passengers, lowers whole-life carbon footprint, and cuts down overall lifecycle costs.

AVA's modular system, with pre-installed cladding, glazing and services, simplifies assembly and speeds up delivery. Its bolted connections and streamlined design reduce approval times compared to standard practices.

AVA Footbridge

Image © The AVA Consortium

Maximising Social Value from Infrastructure Projects

The ICE Research and Development Enabling Fund and Useful Projects have co-funded this important piece of research to investigate the current approach to social value across the sector, implementation gaps, and to identify practical recommendation to close the gap and help the sector deliver impactful social value.

The research was conducted in 2019. A mixed methods research approach was adopted which involved collecting, analysing and interrogating qualitative and quantitative data, as shown in the adjacent figure.

The focus of the research has been on major infrastructure projects in the transport, energy and water sectors.

The methodology was purposely aligned with the Social Enterprise UK's research methodology for their publication 'Front and Centre – Putting Social Value at the Heart of Inclusive Growth' which focused on the current approach to social value by local councils and central Government.

Maximising Social Value from Infrastructure Projects

The team

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- **The Phoenix**, Human Nature
- **Onllwyn Road Bridge**, GCRE

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We are on a journey to create purpose-driven design for our changing environment.

Contact our team if you'd like to be involved.

Expedition Engineering

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