Environmental Impact Assessment





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ARUP

Introduction

Urbanisation and economic growth must be balanced with environmental and social impacts to ensure a sustainable future for all. Environmental Impact Assessment (EIA) plays a crucial safeguarding role in recognising the potential for effects on the environment and humans, informing design development, and identifying measures to protect and enhance our world.

At Arup, we know what works and why. Shaped by our engineering heritage, informed by our diverse skills, and powered by technology, we are working at the forefront of EIA practice to inform and communicate a clear understanding of the issues and opportunities, and to enable the right decisions to be made at the right time.



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Adaption of major infrastructure to work with rather than against ecosystems.

Our growing population results in growing infrastructure demands

"Thousands of hectares of farmland, woodland and wetland are built on every year to meet the needs of our increasingly urbanised population"

- State of Nature 2019



Between 2000 and 2019 the UK population has increased by approximately 12% to 66.8 million. This is projected to increase by a further 3 million to 69.4 million by 2028.



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Increased extreme weather events cause storms and flooding in the UK.

We have seen an unprecedented rise in recognition of the climate emergency.

The UK has committed to net zero carbon emissions by 2050

Energy

Digital

Highways





Arup has delivered EIA for complex projects across a variety of sectors.

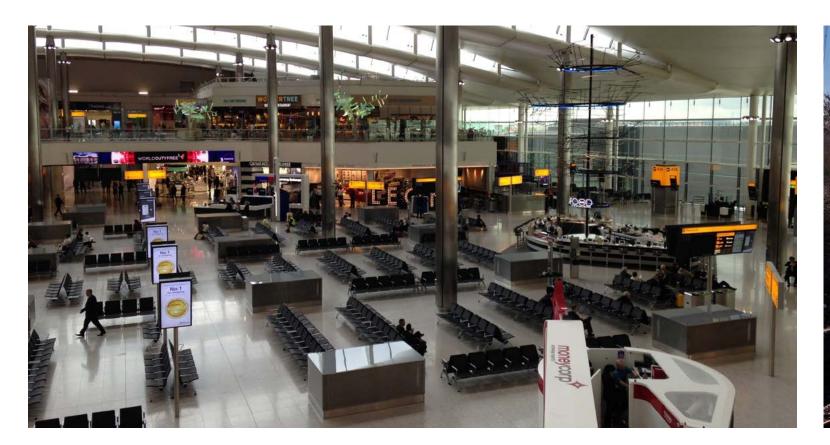






Masterplans

Aviation







Rail Water



Working Together

We work closely with our clients and associated project teams to deliver high quality:

- Environmental Impact Assessment
- Environmental Design
- Stakeholder Engagement/ Public Consultation
- Masterplanning
- Process and Legislative Compliance
- Digital and Artificial Intelligence (AI) Services
- Post-consent Support
- Environmental Management Plans

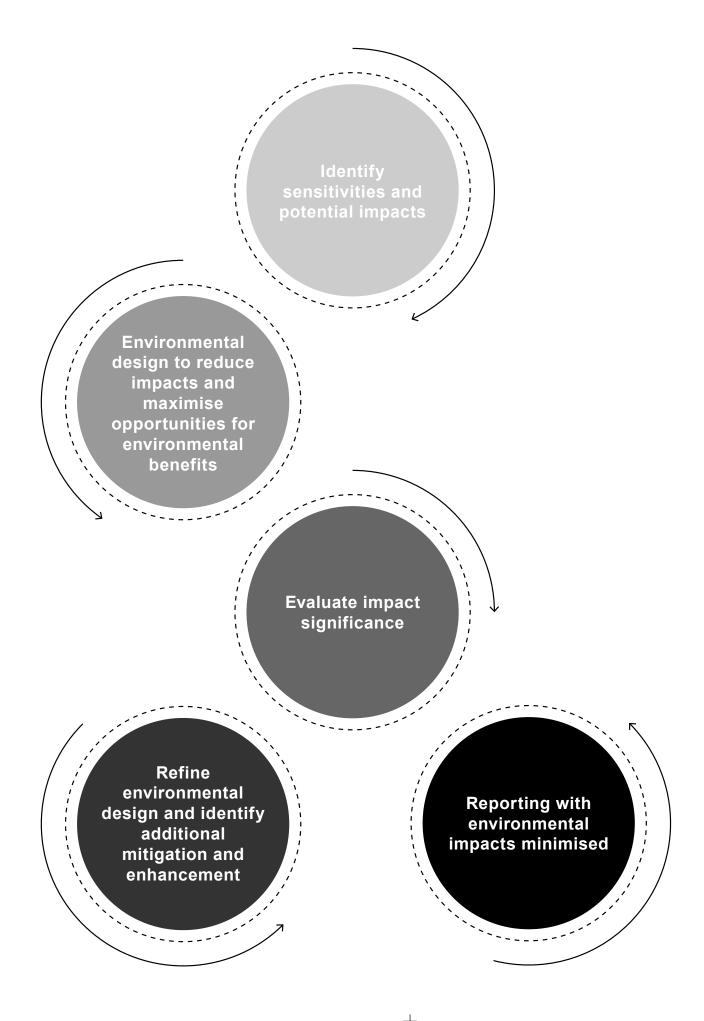
We identify and tailor the assessment strategy for each project to meet its specific objectives. We can assess all environmental topics in-house, providing an integrated and responsive service for our clients.

This approach ensures early identification of significant risks and constraints as well as highlighting opportunities to influence development positively without introducing prohibitive cost. Using this approach, we help our clients to focus their resources cost -effectively and efficiently.

We encourage proactive and open working relationships between our teams, our clients and stakeholders to optimise the benefits to all parties through appropriate environmental design and thereby facilitate the planning process. This approach assists at all stages, including post-submission, smoothing the process of discharging consent conditions and construction operations.

We have been awarded the Institute of Environmental Management and Assessment (IEMA) EIA Quality Mark, demonstrating our commitment to excellence in the EIAs we carry out.

The promotion of shared knowledge and continual learning is an important part of our ethos which we believe contributes towards more sustainable developments.



Process

The key stages of the Environmental Impact Assessment process



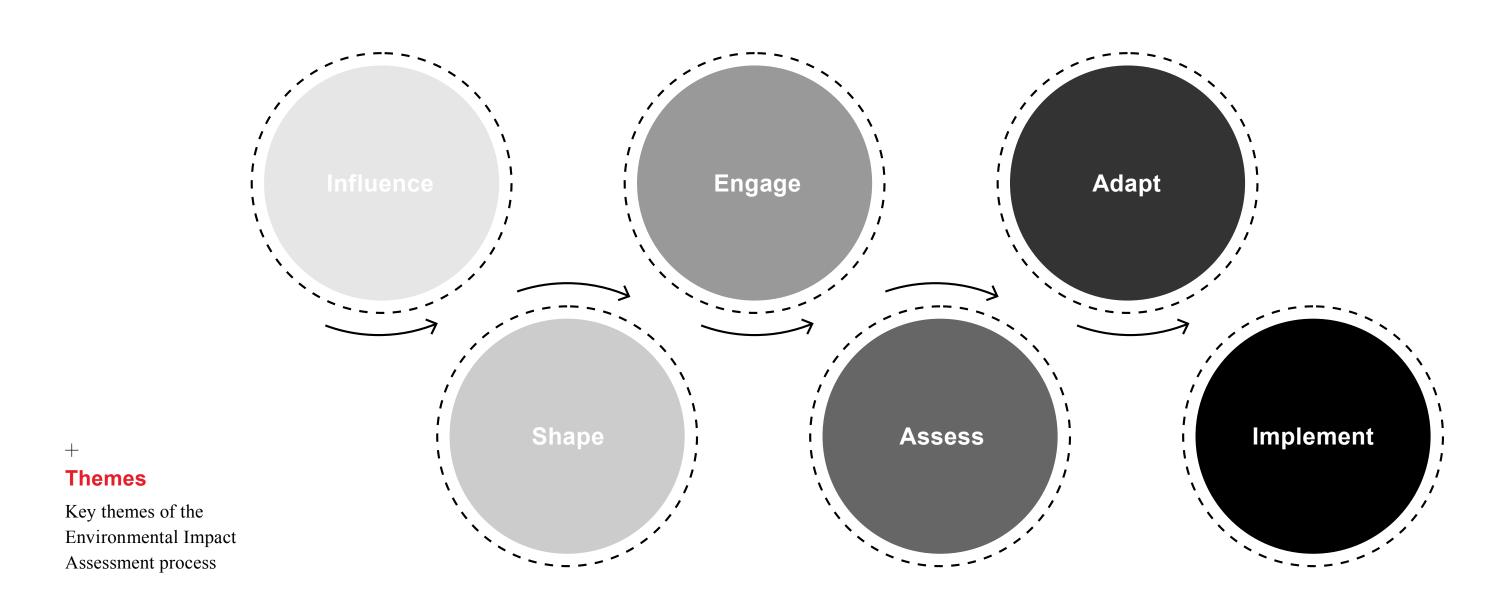
Environmental Impact Assessment

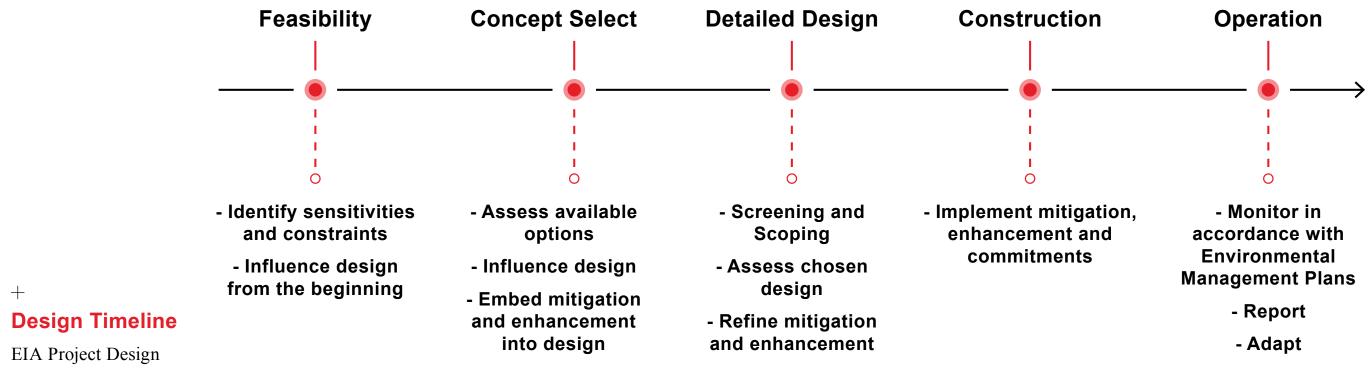
EIA is a decision-making tool to inform both project design and the consenting process. For many projects it is a legal requirement. It is an important part of ensuring that the likely effects of developments on the environment, including people, are understood, mitigated, and fully considered in the planning process.

EIA is an iterative process that can ultimately be used to reduce the negative effects of a project and enhance the positive through design and assessment.

Project Design

EIA feeds into every stage of the design process. Arup is here to support you from design feasibility through to post-consent support during construction and operation.





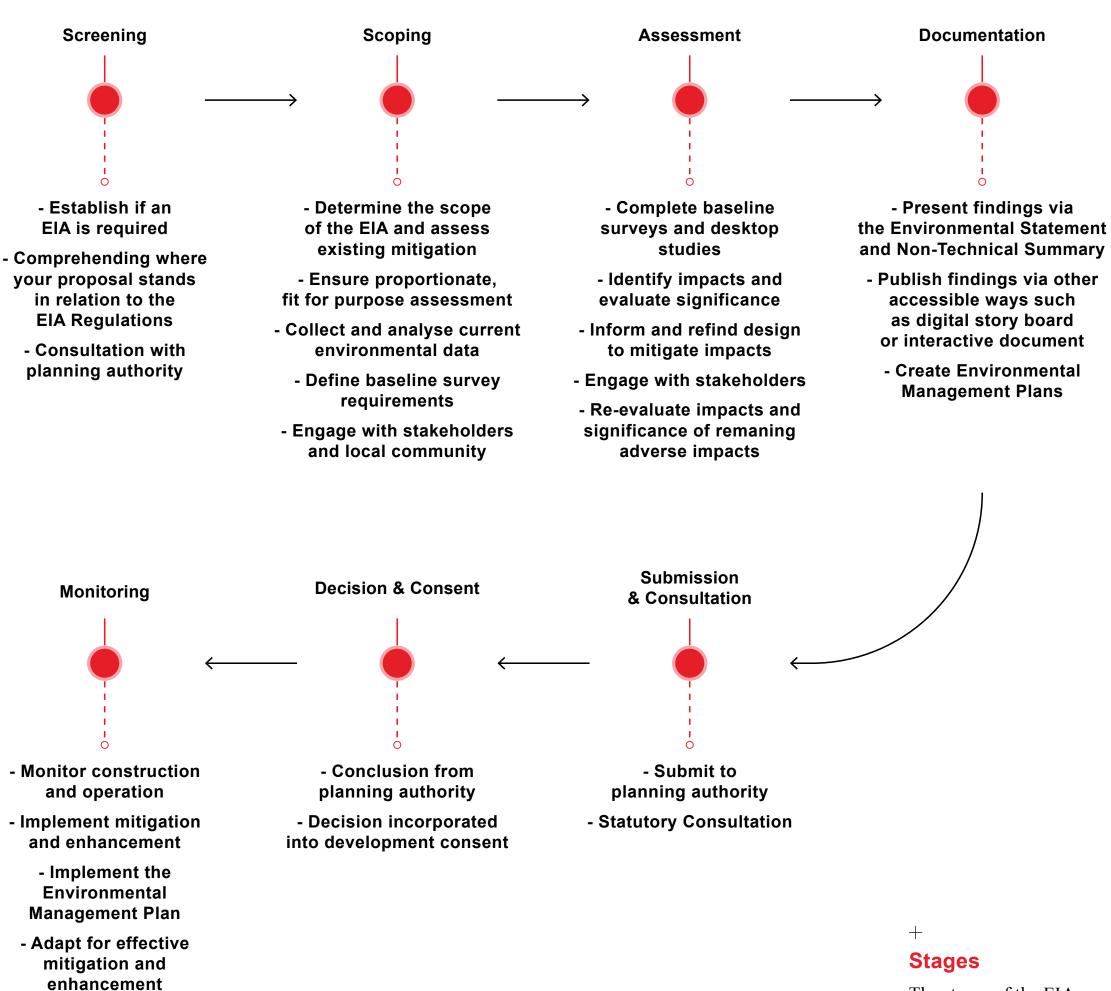




EIA Stages

Arup's focus is to drive efficiency in the EIA process. Ensuring EIA is proportionate to the key issues associated with a project is critical to reducing risk, ensuring cost efficiency and, in the end, delivering a successful EIA. Early and ongoing stakeholder engagement is key to the process, as is mitigation from the outset.

By embedding mitigation from design inception and achieving good environmental design, there is the potential for the EIA to be scaled down, for some technical topics to be scoped out or in some cases, for the need to undertake an EIA to be removed completely.



EIA Leaders

The stages of the EIA process

Engagement





EIA Topics

Arup delivers professional and expert advice on all technical aspects of EIA, including:.



Air Quality & Odour



Climate Change & Greenhouse Gas Emissions



Cultural Heritage



Cumulative Effects Assessment



Ecology, Biodiversity & Nature Conservation



Land Quality



Landscape & Visual



Major Accidents & Disasters



Noise & Vibration



Population, Community & Human Health



Socio-economics



Traffic & Transport



Waste & Materials



Water, Drainage & Flooding



Wind Analysis



Daylight, Sunlight & Shadowing



Digital & Al Services



Electro-magnetic Interference (EMI)



Environmental Design



Environmental Management Plans



Lighting



Post-consent Support



Process & Legislative Compliance



Stakeholder Engagement/Public Consultation



Sustainability

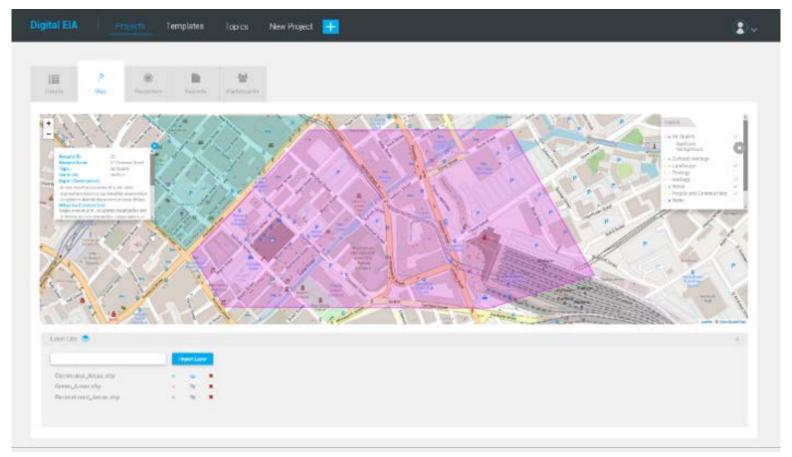
EIA



Digital EIA

Digital technology adoption is increasing across many aspects of EIA. Whether through speedier access to quality data, enhanced analytics, online consultation or engaging, interactive outputs we are seeing wider use and adoption of technology across industry. The Covid pandemic has accelerated many aspects of this, though there is much still to be gained through alignment across industry, collaboration and sharing data across evolving platforms. At Arup, we have developed and implemented digital interventions and technologies throughout EIA practice and we believe our ongoing development will result in positive industry-wide change in EIA delivery.







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Modernising EIA

There is increasing focus on the need to modernise EIA to deliver appropriate, effective and efficient assessment. Arup provides a tailored approach to meet our clients' needs, from digital reporting to digitising the full assessment and engaging in the design process.

Interactive Reporting

To enable comprehensive understanding of environmental data, continued and enhanced use of digital technology that facilitates interactivity within data is key to producing better environmental outcomes. Web-based platforms that support Digital ES' are now commonplace and an important step forward. However, at Arup we are increasingly using digital platforms and common data environments throughout project scoping, assessment and delivery to uncover new insights, drive efficiency and provide better outcomes for the natural world.

Outputs

Digital reporting creates more user-friendly outputs, assisting with stakeholder engagement and consultation that enables people to examine the environmental context of a scheme in an interactive and intuitive way. Arup have developed industry leading platforms to facilitate increase engagement and accessibility not only for public engagement, but for partners, suppliers and clients to promote collaboration and find a better way.

Digital

EIA Leaders

Stakeholder Engagement and Consultation

Our virtual exhibitions allow the public to access information, view maps and drawings, watch design option fly throughs and share feedback from any location, at any time.

We can provide a fully virtual digital room where people can navigate the hall, opening panels to read information and watch media before leaving their comments on the proposed plan. This offers users the feeling of being in a real consultation environment from wherever they are - at home, at work, commuting etc.

This has successfully been used on a number of projects, including Highways England's A417 Missing Link project and A96 Dualling East of Huntly to Aberdeen. This ability to engage with stakeholders virtually has been immensly valuable throughout the 2020/2021 pandemic where in person events were not possible. Some clients saw engagement statistics for previously unreached demographics improve significantly.

Further information is available on our <u>virtual exhibitions</u> <u>webpage</u>.



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Virtual Engagement

We have developed our Arup Virtual Engagement Suite of Services that allow us to bring individual stakeholders into digital shared spaces. 360 degree online bespoke virtual exhibitions that engage public interaction and increase accessibility

ARUF

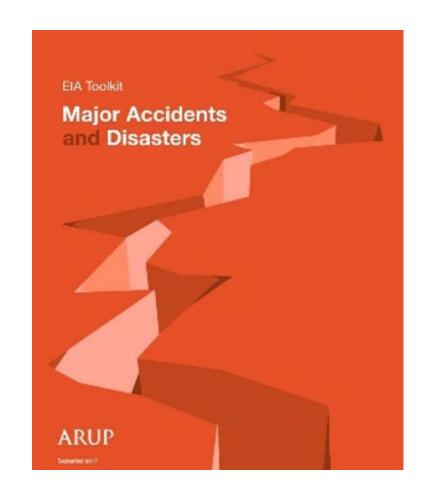
EIA Toolkit

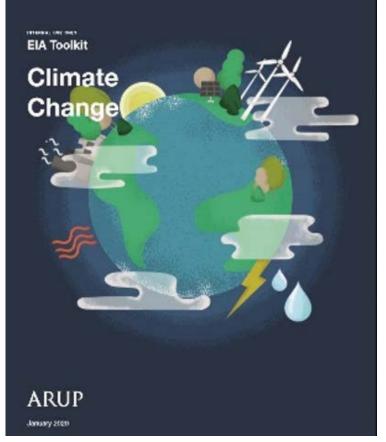
Arup uses an internal EIA Toolkit to ensure quality and consistency across all the elements of our EIA work.

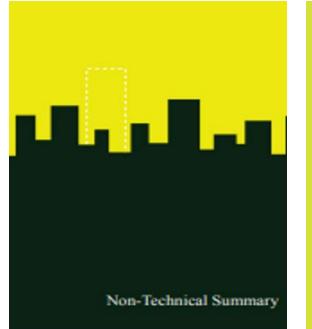
The toolkit comprises a series of practical guidance notes developed over a period of time and are based on our collective experience of managing a wide range of EIA projects in the UK.

Where appropriate, we also contribute material derived from our EIA toolkit for use by wider industry, for example via our active involvement with the Institute of Environmental Management and Assessment (IEMA).

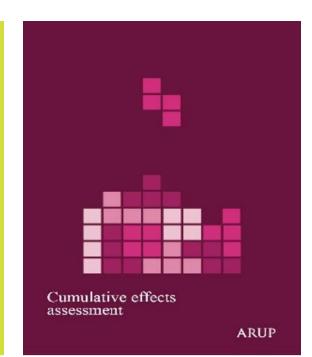
The toolkit is continuously being expanded to meet the needs of clients and EIA practitioners, highlighting areas that are of particular relevance at the time.



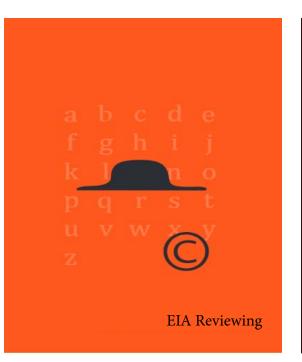


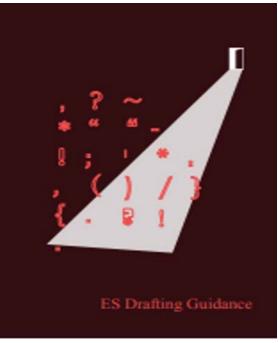






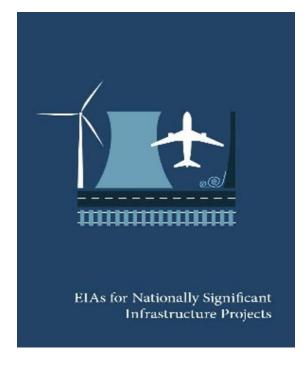




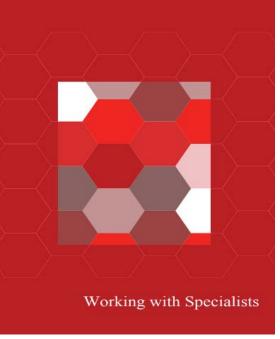
















Environmental Impact Assessment

Case Studies

Arup has a successful track record in undertaking complex and challenging EIAs. We identify and tailor the assessment strategy for each project to meet its specific objectives. We can assess all environmental topics in-house, providing an integrated and responsive service for our clients. The following case studies give examples of our work across different sectors.





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EIA Topics

Case Studies

A487 Dyfi Bridge, Welsh Government

Improving the safety, efficiency and reliability of the Afon Dyfi crossing on the west coast of Wales, just north of Machynlleth. A project set in a sensitive setting, on the edge of Snowdonia National Park with complex environmental requirements

The A487 Fishguard to Bangor Trunk Road is the principal strategic route along the west coast of Wales and has been subject to increased traffic flows and repeated flooding.

Dyfi Bridge has a poor alignment and visibility, no footways and a poor junction at the northern end all of which results in traffic collisions and bridge strikes. During bridge closures, trunk road traffic is required to take a diversion of up to 30 miles.

The project provides a new 1.2km section of trunk road consisting of a new 725m long viaduct across the floodplain and a river bridge to cross the River Dyfi, with the existing Dyfi Bridge being restricted to walkers, cyclists and horse-riders only.

The primary challenge faced by the design team was related to the impact on the river flooding and minimising any increases in flood levels. The initial flood modelling showed unacceptable increases in flood levels and so Arup identified and tested a wide range of options to reduce the impact of the scheme. Throughout the assessment process the team worked closely with Welsh Government and other key stakeholders to explain the range of options and their impacts. The extensive assessment of options and impacts provided meant Natural Resources Wales (NRW) were comfortable with the scheme.

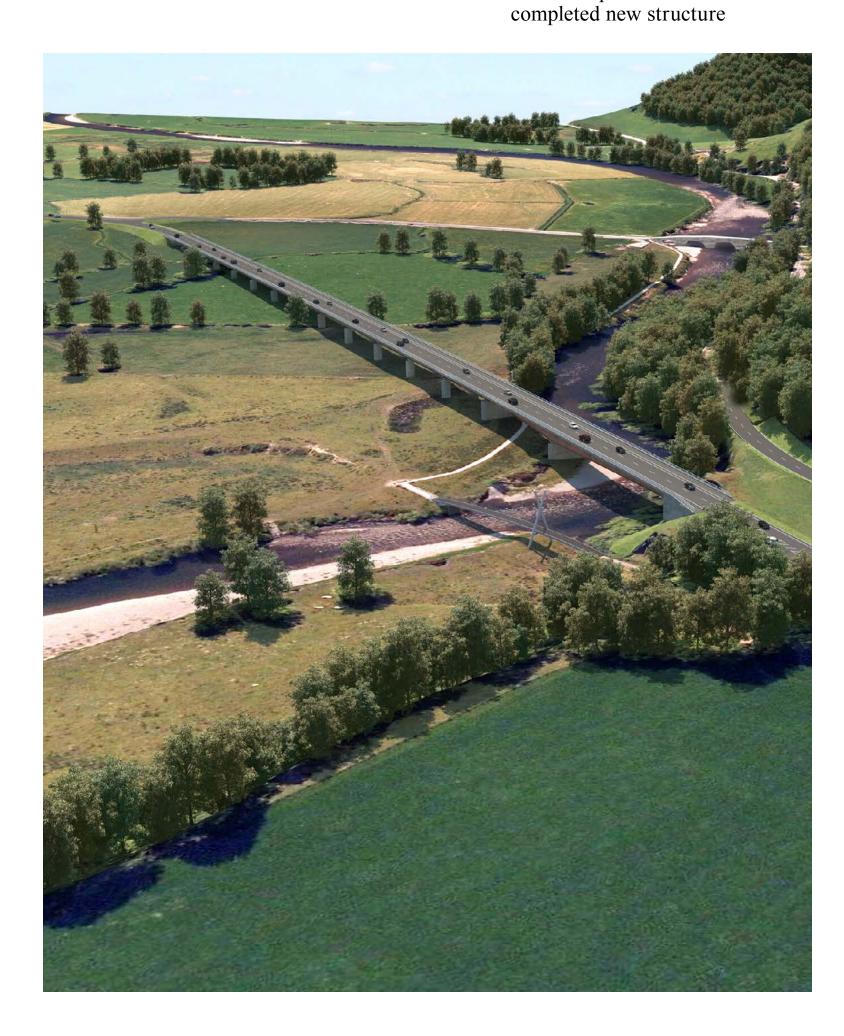
Arup undertook the EIA, ensuring the new crossings would comply with all relevant guidance and legislation. Arup worked with the contractor to minimise environmental impacts and limit works within the floodplain, by constructing the majority of the viaduct in sections, on a 20m wide temporary platform /embankment and 'push launch' it across the flood plain.

Arup led a successful Public Exhibition to engage the local community, listen to local feedback and incorporate additional works into the projecy to maximise benefits to the community. In order to fully convey the proposed Scheme, Arup developed a comprehensive 3D visualisation model. Fly-through videos and 360° viewpoints allowed local residents and stakeholders to interact with the scheme and understand the proposals in a sensitive setting on the southern edge of Snowdonia National Park. This avoided any public local inquiry being required. Construction has commenced and the road is due to open in summer 2023.

View the ES here.

Key collaborators: Alun Griffiths contractors & Wallingford HydroSolutions Ltd.







Case Studies

A417 Missing Link, Highways England

Improving traffic management and safety on the section of the A417 near Birdlip, Cotswolds that forms the only section of single carriageway along the route.

The A417 Missing Link is a "Nationally Significant Infrastructure Project" under the Planning Act 2008. It is intending to improve safety, support the economy, ease congestion and reduce pollution. The A417/A419 is a strategic route connecting the West Midlands and the south of England. The scheme provides 3.4 miles (5.5 kilometres) of new dual carriageway connecting the existing A417 Brockworth bypass with the existing A417 dual carriageway south of Cowley.

The scheme has many environmental and engineering constraints and is particularly sensitive due to its location in the Cotswolds Area of Outstanding Natural Beauty (AONB), which is rich in cultural heritage and unique landscape characteristics. It also climbs the Cotswold escarpment, and passes through areas supporting important habitats and wildlife. Development within the AONB requires the need to demonstrate compelling reasoning and cost benefit analysis.

Arup services included an integrated design team, stakeholder engagement and consultation, land access, Development Consent Order (DCO) and planning advice, traffic modelling and economic appraisal, environmental impact assessment, Habitat Regulation Assessment and Equality Impact Assessment.

Stakeholder engagement was fundamental in obtaining support for the scheme. Collaboration was particularly important for the design of new 37m wide multi-purpose crossing to provide essential mitigation for bats and an enhancement opportunity for ecology, landscape and the community.

It was also vital in designing the crossing for walkers, cyclists and horse riders (WCH), including users with disabilities.

Arup hosted virtual statutory public consultations in 2019 and 2020. This gave stakeholders the opportunity to fully immerse themselves into the immediate surroundings of the scheme as if it were operational, including 3D modelling, fly-through videos, and a driving simulator. The video delivered the key scheme messages without relying on text-heavy technical documents and plans. The immersive tools helped stakeholders understand the operational scheme in more detail and added a fun and engaging element, which helped to widen the demographic of attendees.

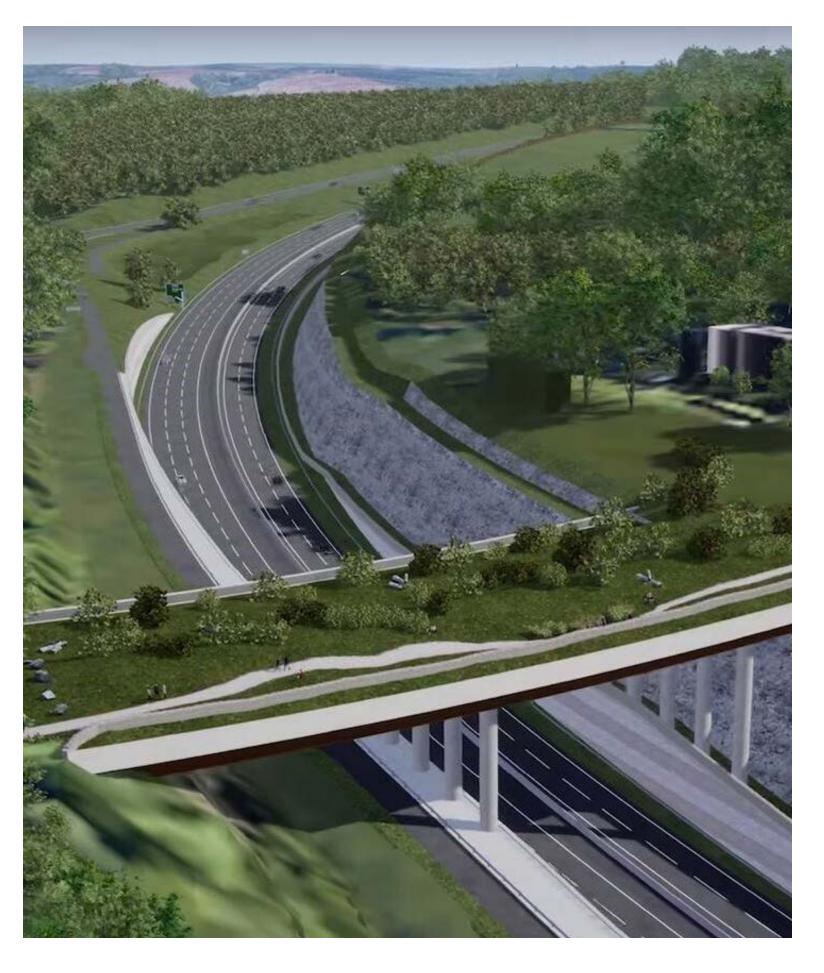
In addition to the virtual engage, a digital preliminary environmental information **report** was created to support the second consultation. The site provided an accessible and easy-to-navigate website that helped visitors to understand the environmental and social effects of the proposals to enable effective public participation in decision making.

A Digital Environmental Statement has been created to enable stakeholders to develop an informed view of the likely significant environmental effects. It accompanied the DCO application, which was submitted and accepted at the end of June 2021.

Key collaborators: Taylor Woodrow, Burges Salmon and Copper Consultancy.

+ A417 Missing Link

Artists impression of a proposed green crossing as part of the road improvements



Case Studies

Alexander Stadium Redevelopment, Birmingham City Council

Redeveloping Alexander Stadium into a world call centre of sporting excellence.

Birmingham City Council engaged Arup to redevelop Alexander Stadium into a high-profile venue for diverse sporting, leisure and cultural events. The venue at Walsall Road, Perry Barr, will be the focal point of the 2022 Commonwealth Games, hosting the Opening and Closing Ceremonies as well as the athletics competition.

This set of requirements led to a hybrid planning application being submitted temporarily facilitate the Commonwealth Games on the site and provide a re-developed permanent legacy stadium

Key features of the Alexander Stadium redevelopment include a replacement west stand with increased stadium seating capacity for up to 18,000 spectators, a new northern

plaza, a re-layered international competition athletics track new warm up track, improved public realm and parking provision, with additional landscaping and signage, new stadium sports lighting and practice throwing field, and a new access road.

Additional temporary facilities will be installed at Perry Park for the 2022 Commonwealth Games, including temporary seating to increase capacity up to 40,000. These will be removed following completion of the Games and Perry Park restored to green parkland.

Arup lead was lead EIA coordinator for the project and overall, 33 disciplines from across Arup contributed to the planning and design of the proposals.





The Arup environmental team were central in the developing design, and gave expert advice to push the project towards a holistic outcome to ensure impacts were reduced as far as possible.

The hybrid planning application for both the stadium redevelopment and the additional elements to support the games was submitted under the Town & Country Planning Act in 2019. The project successfully gained planning permission in January 2020 and will be operational for the start of the 2022 Commonwealth Games.

View the EIA here.

Key collaborators: Birmingham City Council, Commonwealth Games Organising Committee & Mace

Alexander Stadium

Artists impression of the Alexander Stadium that demonstrate how the project will look once completed

EIA Toolkit



EIA Topics

Case Studies

Belfast Transport Hub, Translink

Providing capacity to accommodate passenger growth.

The Belfast Transport Hub is an integrated transport facility which will provide bus and rail services within a single station located on the site of the existing city centre bus and rail stations. It will provide capacity to accommodate the considerable growth in passenger numbers and create an accessible, safe, comfortable and attractive environment for customers, visitors and employees alike.

Arup were the integrated design team lead for the concept and design including preparation of the EIA and support to the planning application process.

A complex implementation strategy was required for the construction phase to ensure that the current bus and rail services could continue. The EIA was produced in parallel with the development of the contractor tender documentation to facilitate the programme. This ensured the EIA commitments were embedded into the contract and programme. The project gained planning approval in 2019 and is currently under construction. The Arup environment team are continuing to support the project as part of the enabling works contract, development of the main works contract and discharge of the environmental planning conditions.



View the EIA **here**.

Key collaborators: Juno Planning & Environmental Ltd; John McAslan & Partners

Belfast Transport Hub

Artist impression of the Belfast Transport Hub once completed

Case Studies

Future Luton, Luton Rising

(a trading names for London Luton Airport Limited)

Making the best use of the existing runway at London Luton Airport to accommodate passenger growth.

Arup are leading the multiorganisational environmental workstream supporting Luton Rising, the owners of London Luton Airport, in the preparation of their application for Development Consent Oder to expand the airport from the currently permitted capacity of 18mppa to 32mppa.

The global pandemic resulted in considerable impact on and uncertainty within the aviation industry, and Arup, along with partner organisations assembled a team to provide strategic advice to ensure a viable scheme could continue to be promoted.

This included the preparation of a second Preliminary **Environmental Information** Report, responding to these impacts, extensive stakeholder feedback, changing legislation and policy regimes, including biodiversity net gain and climate change, to support statutory consultation. Arup will lead the full Environmental Impact Assessment and preparation of the Environmental Statement, and well as surface access modelling and assessment, to support the application in 2022.

View the Preliminary Environmental Information Report <u>here</u>.

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations)



Proposed development layout at 32 million passengers per annum capacity



Case Studies

Glasgow Queen Street Station, Network Rail

Redevelopment to facilitate passenger growth, provide new services and improve entrances.

The project comprises redevelopment of the concourse area of Glasgow Queen Street Station to enable platform extensions and offer new station services and facilities, along with improved entrances. Station operations were maintained throughout construction.

Arup prepared the EIA and successfully undertook the expert witness role, representing Network Rail at the Public Local Inquiry. All objections, bar those from the neighbouring hotel were closed out prior to the Public Local Inquiry. The original design required the removal and relocation of some of the neighbouring hotel's facilities.

Arup worked closely with the Network Rail Sponsor team, legal advisors and Parliamentary Agents to respond to the concerns of objectors throughout the EIA process, including the preparation of an EIA Addendum to re-assess and mitigate impacts of the project on the hotel remaining operational, leading to a successful outcome at the Public Local Inquiry.

View the EIA Report <u>here</u>.

Key collaborators: Network Rail, First Scotrail, BDP and Turner & Townsend



- "Many thanks for your evidence today. You did really well and your preparation paid off. Thank you so much for your important contribution to this project."
- Senior Legal Counsel, Network Rail

Glasgow Queen St. Station

Artist impression of the new station once works are complete

Case Studies

Glenmuckloch Pumped Storage Hydro, 2020 Renewables Ltd.

Pumped Storage Hydro (PSH) scheme at the Glenmuckloch Surface Coal Mine, Dumfries and Galloway.

The Pumped Storage Hydro scheme was part of a suite of proposals at the site to restore the surface coal mine and develop it as an Energy Park, accommodating a range of energy technologies, including proposals for an eight-turbine wind farm.

The project comprises two reservoirs. The first reservoir will make use of the existing open cast void, the second reservoir will be created above the surface mine.

Arup provided the overall project management of the EIA including management of a range of sub-consultants to deliver the full EIA.

Along with leading the EIA, Arup identified the need for a site specific habitat management plan, supported stakeholder engagement, and completed consenting application documents to the Energy Consents Unit. Arup also undertook an options review of water supply sources for start-up and top-up water for the project.

The project secured planning consent in 2016, however the client decided to delay the start of construction. Consent was due to lapse at the end of 2021 and so Arup was commissioned to apply for a variation under Section 36C of the Electricity Act to extend the life of the consent. This involved a new EIA application to update the Ecology chapter and newly required Climate chapter.



The delivery program for this work was very tight, with high expectations from the client of meeting their hard deadline, based on the client launching the sale of the site. The team exceeded expectations by producing the new EIA Report, conducting surveys required, completing a round of virtual stakeholder engagement, and submitting all consenting documents to the Energy Consents Unit.

Quarry

Existing quarry of the former surface coal mine, to be developed into the lower reservoir of the proposed pumped storage hydro scheme

Case Studies

Liverpool Festival Gardens, Liverpool City Council

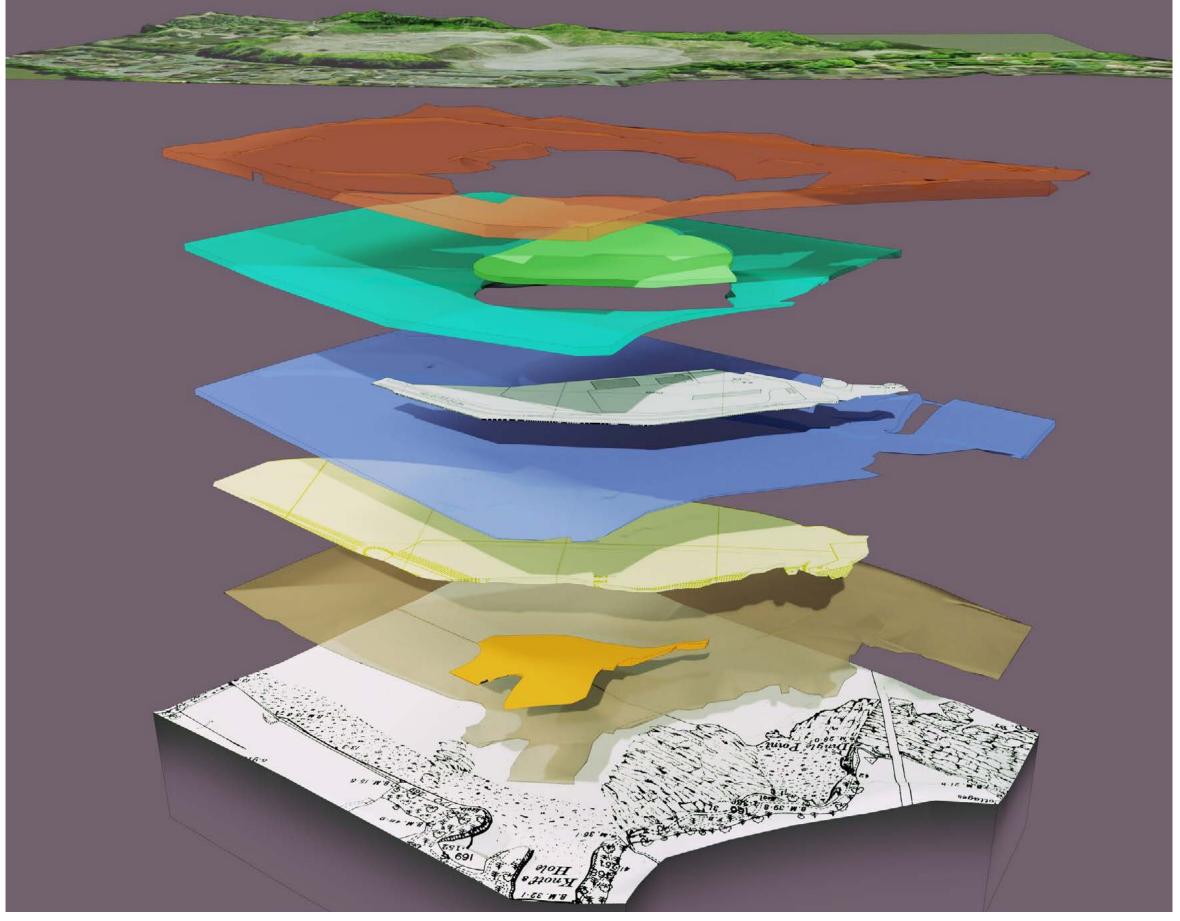
Brownfield site remediation for future development.

Arup was appointed by Liverpool City Council (LCC) to provide environmental, planning and geotechnical services for the remediation and landscaping of the former Liverpool Festival Gardens (LFG) site for future development. The scheme also included amenity and habitat improvements to an existing area of open space..

Working closely with Arup's Geotechnical team, the EIA team contributed to the development of a remediation strategy that ensures risks to controlled waters are managed, as well as protecting existing receptors adjacent to the site and potential future users of the site from ground gas risk. Arup prepared a multi-disciplinary Environmental Statement to support the planning application which was awarded consent in March 2020.

Early engagement with LCC in its role as Local Planning Authority enabled the environment team to focus the scope of the EIA and to ensure that the required ecological surveys were undertaken within the appropriate survey windows and did not affect the planning application programme.

View the ES here.



"The team from Arup have provided, and continue to provide, the technical expertise and professional service necessary to give reassurance for the City Council that our ambitious plans are achievable."

- Liverpool City



Festival Gardens

Exploded view of the natural strata and made ground deposits encountered at the development

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EIA Topics

Case Studies

Meridian Water, London Borough of Enfield

Regeneration mixed-use project within the London Borough of Enfield.

Meridian Water is a multiphase, long-term, £6bn regeneration project, delivering new homes, retail and community space, offices, and a primary school across two phases.

The Meridian Water site is complex with multiple environmental constraints, including heavily channelised waterways, ground contamination, noise and air quality issues associated with the nearby the north circular road, ecological constraints associated with the Lee Valley Regional Park and proximity to existing heritage and residential receptors.

Arup developed the planning strategy and coordinated the planning application for the Phase 1 and Phase 2 EIA, completing the EIA and Transport Assessment. There was a critical need to design and manage a complex programme of archaeological fieldwork and investigation, alongside requirements for contaminated land investigation and remediation that Arup led on.

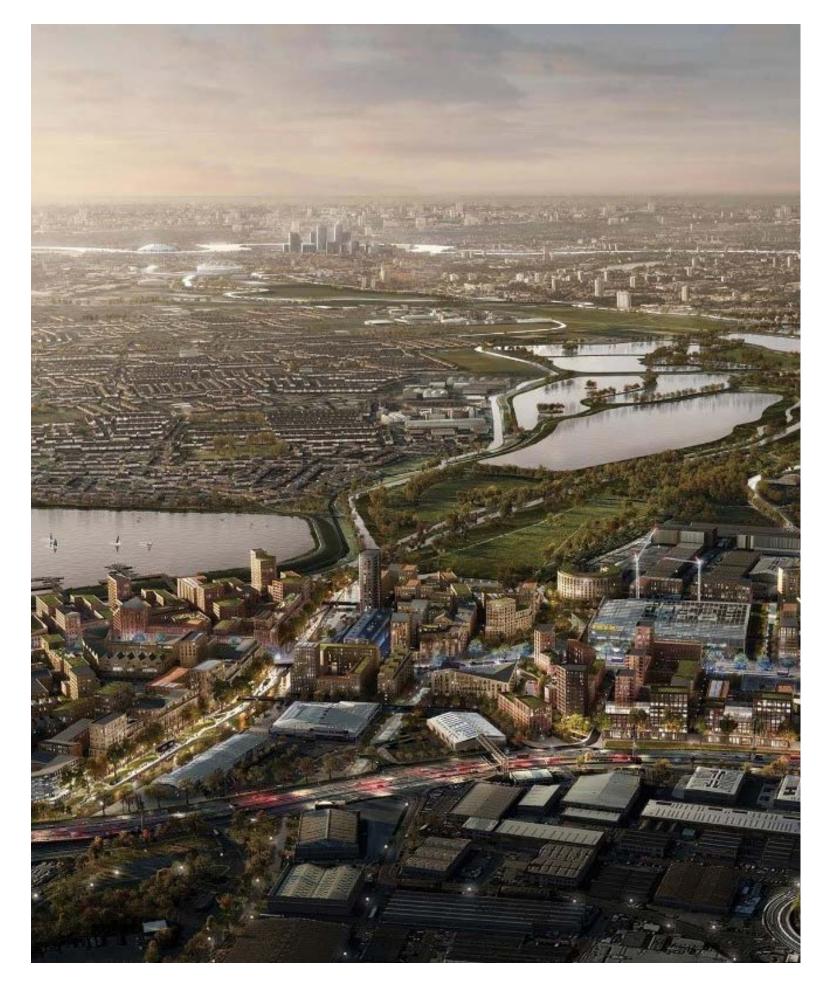
Arup supported the client to negotiate the tight timescales and requirements dictated by the Mayor of London's Housing Zone funding agreement as well as the complex and evolving planning policy context at regional and local levels.

Additionally, Arup undertook the Health Impact Assessment (HIA) which identified beneficial effects associated with improvements to the site and will help to develop a new community providing a range of housing choices, community facilities, play space, cycle paths and footpaths. These will all deliver multiple benefits to a range of health determinants.

View the Phase 1 EIA <u>here</u>.

View the Phase 2 EIA **here**.

Key collaborators: Karakusevic Carson Architects



"Thank you very much for the amazing work done on Housing Infrastructure Fund /Phase 2 planning application to date. I personally think we couldn't have brought the project to this stage if it wasn't for you and your team."

- Design and Planning Lead, Meridian Water, London Borough of Enfield

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Meridian Water

Artists impression of the Meridian Water development once completed



Uplands Farm Estate Development, Hampshire County Council

Delivering up to 980 new homes, a new secondary school, playing fields, open space, local centre and allotments.

The Uplands Farm Estate development comprises two sites that were previously used as agricultural land. Although the project was subject to two separate planning applications, the EIA, led by Arup, encompassed both sites to ensure that the environmental impacts of the project, as a whole, were considered.

The secondary school construction programme is critical path. Therefore, extensive consultation was undertaken by Arup specialists with the Local Planning Authority and their ecologists to design-in mitigation and their requirements to reduce the risk for planning rejection or considerable changes to the school design.

Within the development site is a large corridor of ancient woodland and local designated site of importance for nature conservation. Biodiversity enhancement and protection of this area were incorporated from the outset into the masterplan and detailed design of the secondary school.

The Arup team worked closely to design an enhancement area within the site boundary to continue a green corridor which also provided landscape mitigation. This led to opportunities to secure enhanced biodiversity whilst also retaining the design for residential development.



The project was consented in September 2019 and construction has since commenced. Arup are still closely involved with the project, supporting the discharge of planning conditions and reserved matters.

Key collaborators: Kier Construction; Hampshire Engineering Consultancy.

Planning Awards
2019 finalist - best
use of publicly owned
land and/or property
in placemaking.

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Uplands Farm Estate

Masterplan image of both proposed sites



Case Studies

York Central, Homes England, City of York Council, Network Rail & National Rail Museum Partnership

Redevelopment masterplan providing residential, commercial, leisure, open space and transport improvements.

York Central is one of the largest city brownfield regeneration sites in England. The site will be redeveloped to provide mixedused development including up to 2,500 homes, office, retail, and leisure use, a hotel, expansion of the National Railway museum, multi-storey car parks and provision of community uses all with associated works including new open space, ancillary car parking, demolition of and alterations to existing buildings and associated vehicular, rail, cycle and pedestrian access improvement.

Arup were engaged to lead on the EIA coordination and submission, supported by key in house technical disciplines.

Arup's transport team created a transport and traffic assessment and optioneering report to support the submission. This was an integral aspect to the project to develop access points and alternative transport such as pedestrian and cyclist options focused on sustainable transport.

Given York's historical importance, maintaining views across the city was a key focus of the design. Extensive consultation was held with Historic England to develop a set of parameter plans which set restrictions on the massing and height of future development to protect the important views. Consultation with the local authority, highways authority and Environment Agency were also lead by Arup.

Consented was granted 2019, and Arup has continued involvement in the Reserved Matters Approval (RMAs) and continued design development.

View the EIA here.

Key collaborators: Allies & Morrison; Gustafson, Porter & Bowman



Masterplan design of the proposed site, artists impression of how the site could look once completed



