Introduction

Welcome to our engagement exhibition where you will see our updated plans for the design and construction of the Oxford Canal Viaduct, one of the Key Design Elements (KDE) of the railway.

HS2 Project Overview

HS2 is a new high speed railway that will form the backbone of Britain's transport network.

It will connect towns and cities in the South, Midlands and North with faster, easier and more reliable travel that will put more opportunities within reach for millions of people for work, business and leisure.

By increasing rail capacity, HS2 will free up space on existing lines for more commuter, regional and freight services. This will relieve overcrowding and improve reliability for millions of people using Britain's railways.

Engagement event summary

In April 2021 we held an online exhibition and two webinars to show you our developing design for the viaduct. We asked the public to complete a questionnaire and provide us with feedback on the design.

1,821 people viewed the boards, and we received 134 survey responses with comments and feedback.

These exhibition boards, as well as our live webinar, provide our response to the feedback we received and an update on our plans for the viaduct.

An artist's impression of the Oxford Canal Viaduct 10 to 15 years post operation.

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What is the Oxford Canal Viaduct?

The Oxford Canal Viaduct will cross the well-used Oxford Canal to the north of Wormleighton and the west of Priors Hardwick. The viaduct will be approximately 60 metres in length, with 3 spans.

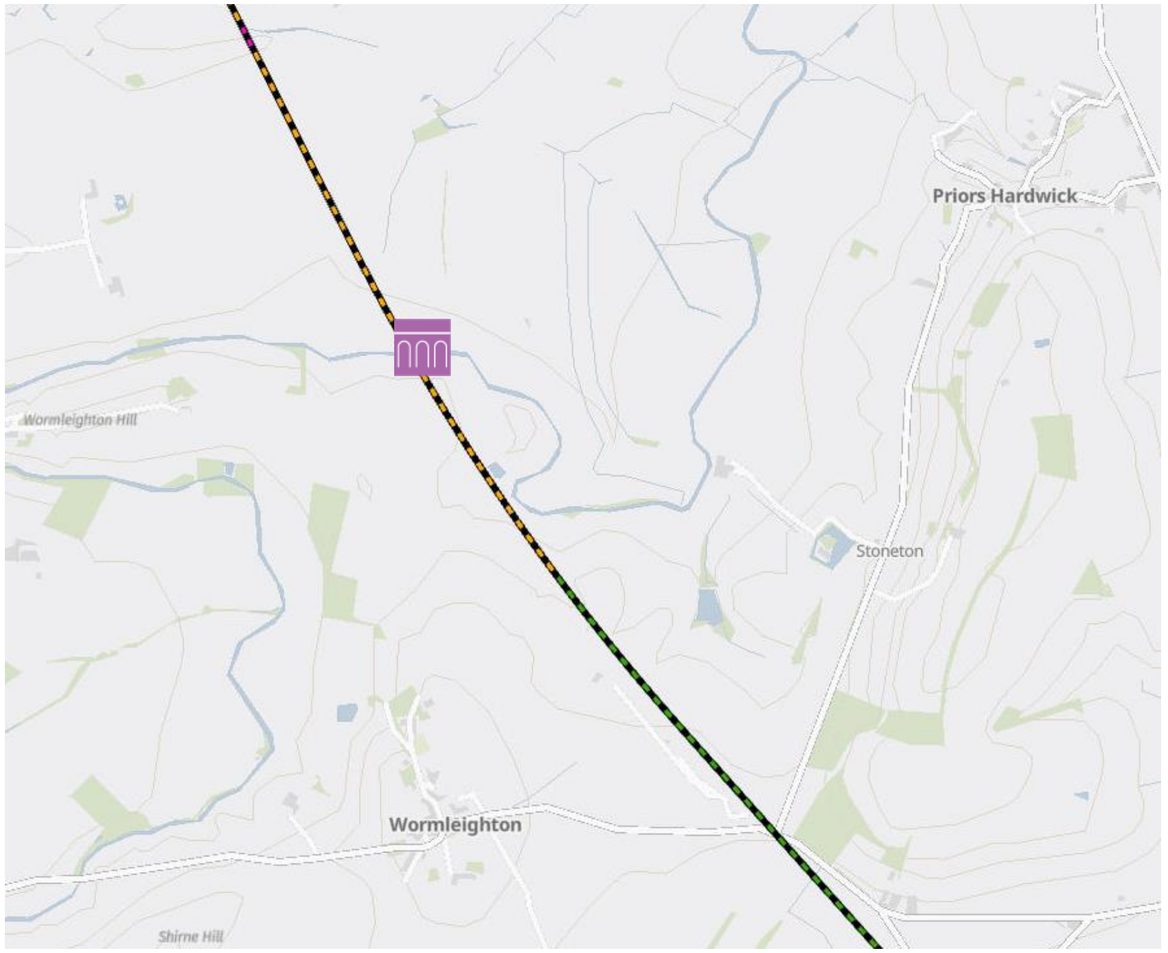
Viaduct design

A viaduct is a type of bridge, made up of multiple spans and connecting two points of terrain. On this project they will carry the high speed railway across valleys, rivers, roads and flood plains. In keeping with HS2's Design Principles, viaducts along the route must:

- be designed sustainably;
- minimise maintenance and materials used;
- be considerate to the area where they are being constructed; and
- meet the technical requirements of the railway.

Modern high speed trains travel at much faster speeds than conventional trains so they require a flatter, straighter track, passing over and under the natural landscape.

Modern viaducts have to cope with large longitudinal forces due to the braking and traction of high speed trains. They require stiff and strong supports to transfer the braking load forces from the train, which can be as much as a 770 tonne load, to the foundations.



The pink icon above shows the viaduct location with Wormleighton located to the south west and Priors Hardwick to the east.

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Your feedback

We asked for your feedback on four topics. We asked you to rank our objectives in order of priority and to tell us about anything else that was important to you. We also asked you to choose your preferred finish for the pier. We have summarised the feedback you provided below.

Viaduct design

- Screen the viaduct with wood and plants so that it is as invisible as possible.
- It needs to be more blended into the canal architecture.
- Maximise sunlight under the viaduct and on the surrounding towpath to encourage flora and fauna.
- When I take the boat down the canal I want to see brick bridges, or sand stone with detailing. I don't want to see flat concrete bridges.
- Additional parts of the viaduct could be finished in the masonry leaf to make it better.

Landscape design

- Plant more trees earlier in the project to reduce the construction impact.
- Blend in the design by using local materials and planting instead of adding new plant varieties
- Stop cutting down ancient trees.
- More wildlife around the viaduct will help to settle it into the landscape.

Construction

- Keep roads clean and minimise parking on verges and repair where damaged. HS2 construction is already causing traffic disruption.
- Maintain the canal route and minimise inconvenience to canal traffic.
- Make sure it is done during the winter. Work quietly and at more socially acceptable times. No beeping machines.
- A more minimal structure might save on costs and be quicker and less disruptive to construct.

Social benefit, employment and training

- Will you provide opportunities for unemployed, disadvantaged and underrepresented groups?
- How will the local area and the people who live here benefit?
- Can you work with local schools and colleges?
- Will you provide training, employment opportunities and apprenticeships?

We would now like to:

- **Share the feedback that we have received**
- **Let you know about the chosen pier finish**
- **Share the final designs we will be seeking consent from your local authority**

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Viaduct design feedback summary

You asked the following questions around the design. Here are our answers:

	You said	We did
1	*"Screen the viaduct with wood and plants so that it is as invisible as possible."*	We are incorporating native trees into the landscape design. This will reinforce the green corridors established along the HS2 route through woodland, linear tree belts, hedgerows, watercourse vegetation and wetland habitat creation. Working with our specialist landscape architects, we have developed our landscape proposals to provide both screening and enhancement. Where possible we will begin planting in advance to help screen the viaduct.
2	*"It needs to be more blended into the local canal architecture."*	We have taken regional architecture into consideration by incorporating a masonry finish where feasible. In our first event, we asked for your feedback on the pier finishes. You chose the masonry finish which we will be using. Masonry is an appropriate material in this application: it is durable and of a module suitable to a large structure. We will also use this masonry finish on the wall along the southern edge of the canal that encloses the abutment.
3	*"Maximise sunlight under the viaduct and on the surrounding towpath to encourage flora and fauna."*	The viaduct has an 'open' design, which allows for light to enter below the viaduct span as well as low parapets and below-deck structures. The landscape is designed to grow beneath the viaduct allowing, where possible, vegetation and ecology to flow along the route of the canal.

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Viaduct design feedback summary

You asked the following questions around the design. Here are our answers:

	You said	We did
4	*"When I take the boat down the canal I want to see brick bridges, or sandstone with detailing. I don't want to see flat concrete bridges"*	From the feedback at the previous event, the proposed masonry finish to the viaduct piers (the supports that the structure sits on) was preferred. These will be seen by canal and towpath users as they pass under the viaduct. We will also use this masonry finish on the wall along the southern edge of the canal that encloses the abutment. The parapets along the edges of the viaduct above will feature a band of textured concrete that will help to defuse and reflect light, softening the structure's visual mass.
5	*"Additional parts of the viaduct could be finished in the masonry to make it better"*	The masonry finish will be predominantly at the level of the towpath. Above ground level, the most appropriate material to provide the necessary strength, durability and ease of maintenance will be reinforced concrete. The concrete will be to a specification which gives it a more sympathetic, paler colour, and the construction process uses less carbon.

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Your choice of pier finish

During our first engagement event we asked which pier finish you preferred.

We presented a choice of two options with different textured finishes.

Option A was a smooth concrete finish with **Option B** being a masonry leaf finish.

134

People voted for their preferred choice in finish

We received a high volume of final votes. The preferred finish has now been incorporated within the emerging final designs.

94%

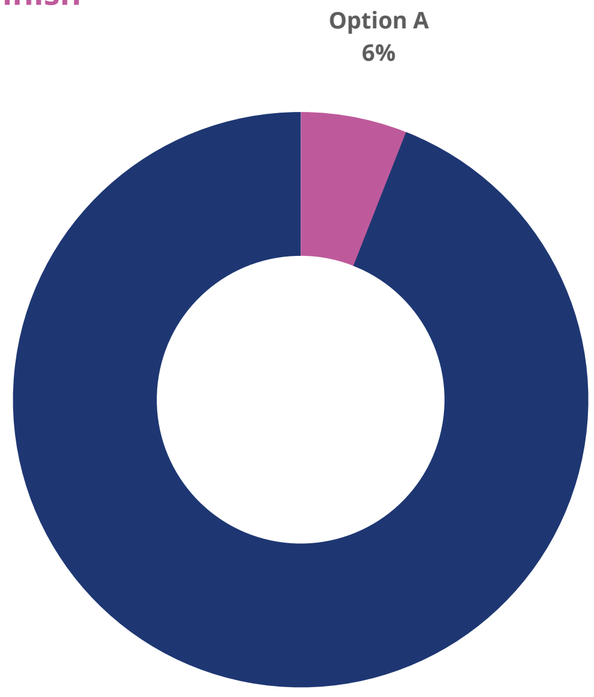
Voted for Option B

This was the favorite option with most of the votes. The textured masonry leaf finish balances the natural forms, found within the area, against the structure itself.

6%

Voted for Option A

The smooth finish option only received a handful of votes. This finish is more suited towards an urban environment and wasn't as reflective of the natural environment as the masonry finish.



Option A - An artist's impression with the smooth concrete finish.

Option B - An artist's impression with the masonry finish.

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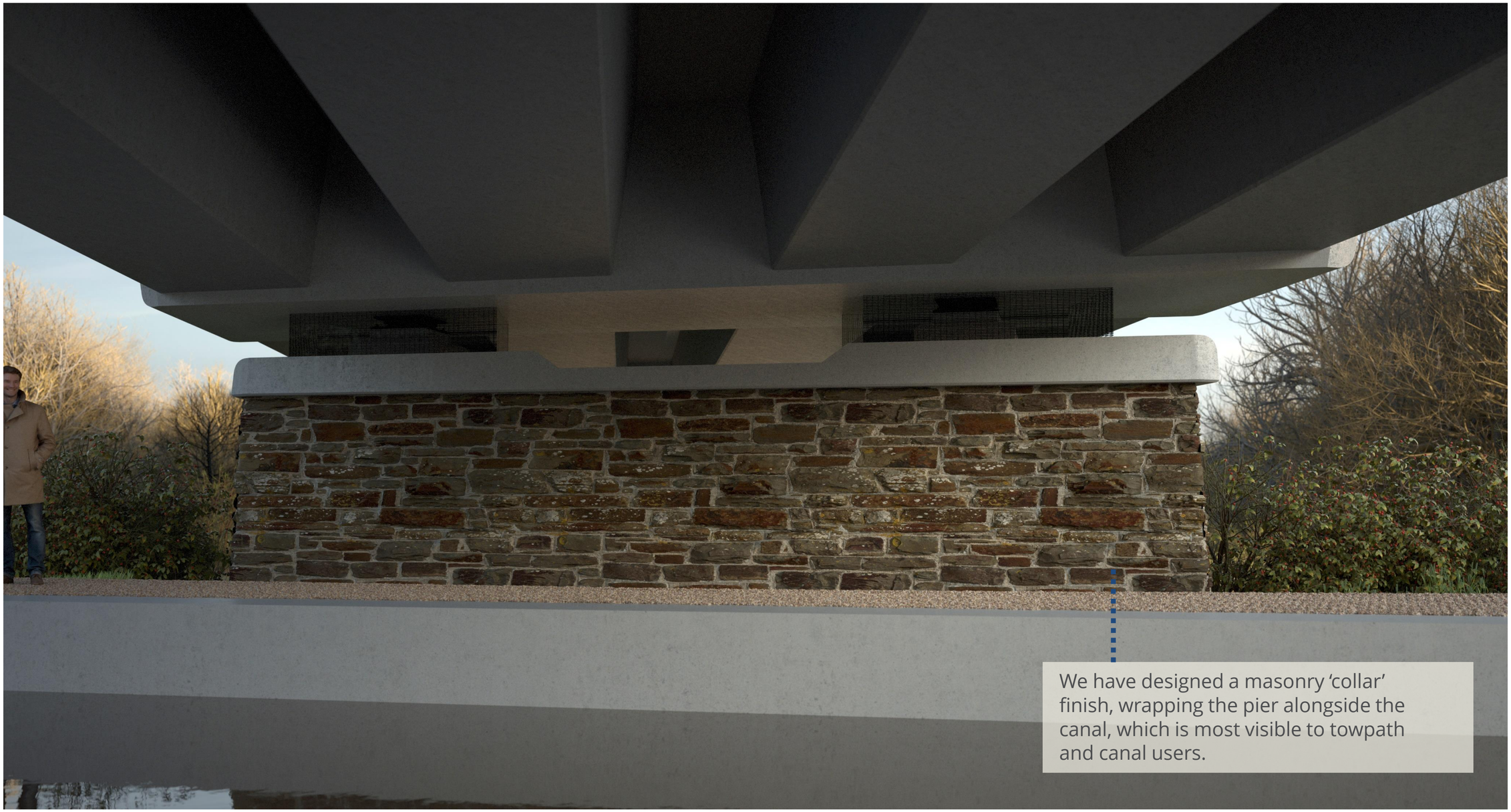
Viaduct design feedback



An artist’s impression of the viaduct showing the masonry ‘collar’ on the abutment.

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Viaduct design feedback

An artist’s impression of the viaduct, from the south side of the canal looking east, showing the masonry ‘collar’ on the abutments and piers, 10 to 15 years post operation.

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Viaduct design feedback

An artist's impression of the viaduct, 10 to 15 years post operation, from the east, showing the viaduct passing over the waterway with the existing canal bridge in the background to the west.

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Construction feedback summary

You asked the following questions around construction. Here are our answers:

	You said	We did
1	*"Keep roads clean and minimise parking on verges and repair where damaged. HS2 construction is already causing traffic disruption"*	Construction traffic for the Oxford Canal Viaduct will use an internal access road built within our construction area. This road connects our compounds and work areas, and significantly reduces the volume of construction traffic on local highways. No construction vehicles or staff will be accessing the viaduct by local roads. This means the verges will not be used for parking. In addition, we have extensive wheel-wash facilities at our compounds, as well as a fleet of road sweepers to keep the local roads clean.
2	*"Maintain the canal route and minimise inconvenience to canal traffic."*	We have recently built a temporary bridge over the canal so we can transport equipment and materials to the construction area. We will be able to build the abutments and piers with minimal impact on waterway and towpath users. There will need to be some short-term closures to install the canal beams and supporting framework. We will liaise closely with the Canal & River Trust to ensure users have sufficient notice, but we do not anticipate any extended periods of canal closure.
3	*"Work quietly and at more socially acceptable times. No beeping machines."*	We expect the viaduct to take approximately 12-18 months to complete and throughout that period we will follow the HS2 Code of Construction Practice. This code contains the environmental control measures to be implemented throughout the construction of HS2 Phase One. In addition, wherever possible, we have removed the warning beep from our machines and deployed alternative safety measures.
4	*"A more minimal structure might save on costs and be quicker and less disruptive to construct."*	The proposed design is a streamlined structure which has been designed in close collaboration with the local authority and the Canal & River Trust. This dialogue has included consideration around minimising disruption for canal and towpath users. The overall height of the viaduct has been minimised with low parapets and the below-deck structure.

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Construction progress photos

These photos show our site progress throughout 2022 near the Oxford Canal (clockwise): piling for the Oxford Canal temporary bridge; plant machinery in operation near Wormleighton; further piling work on the canal bank; nearby stockpiling of materials; the canal temporary bridge deck installation.

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Landscape design feedback summary

You asked the following questions around the landscape design. Here are our answers:

	You said	We did
1	*"Will the planting programme be one of the first things done to give the wildlife a chance to grow before the viaduct is finished?"*	During construction we will put the highest levels of mitigation into place to ensure all existing ecology is recorded and relocated to areas away from the main works. We will plant hedgerows and wildflowers around the viaduct to enhance connectivity and biodiversity. Where possible, we will begin planting early to help screen the viaduct and support wildlife.
2	*"Blend in the design by using local planting instead of adding new plant varieties."*	One of the many ways we will be enhancing the biodiversity is by reintroducing native planting with species most suited to our changing climate and less prone to disease. Our landscape design will include oak, hazel, hawthorn, blackthorn, dog rose, birch and wayfaring trees. Views beneath the viaduct are maintained using wetland meadows, which allow visual connection beneath the viaduct.
3	*"Stop cutting down ancient trees."*	We will retain as much vegetation as possible and only remove what is necessary for construction of the viaduct. As part of our 'no net loss' approach to biodiversity, the landscape and planting plans will support the creation of a green corridor for nature to flourish along the route creating a landscape that is richer in plants and wildlife. Where ancient trees have been removed, we are mitigating for this by planting tree species that are associated with the surrounding landscape.
4	*"More wildlife around the viaduct will help to settle it into the landscape."*	The landscape design will reinforce the green corridors established along the HS2 route, as well as the nature corridor created by the canal. Our planting scheme will include woodland areas, linear tree belts, hedgerows, watercourse vegetation and wetland habitat creation. We will also include bird and bat boxes within the landscape along the railway.

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Landscape design feedback

An artist's impression of the viaduct, 10 to 15 years post operation, from the west.

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Landscape design feedback

An artist's impression of the viaduct, 10 to 15 years post operation, from the west on the existing canal bridge.

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Gallery images

An artist's impression of the viaduct, 10 to 15 years post operation, from the west under the existing canal bridge.

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Gallery images

An artist's impression of the viaduct, 10 to 15 years post operation, from the east.

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Gallery images

Artist’s impression of the viaduct in summer,10 to 15 years post operation, looking west.

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Gallery images

Artist's impression of the viaduct in summer, 10 to 15 years post operation, looking north east.

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Gallery images

Artist’s impression of the viaduct in summer, 10 to 15 years post operation, looking north east.

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Social benefit, employment and training

You asked the following questions around what HS2 means for your community. Here are our answers:

	You said	We did
1	*"How will the local area and the people who live here benefit?"*	We have invested 2000 volunteering hours across the project in the past 12 months for the benefit of local communities. In the local area, we have delivered over a dozen community investment projects including supporting events such as Queen's Jubilee celebrations and Fireworks displays. We are also currently working with communities to help with access to local venues such as village halls and churches. In addition, we are proud sponsors of the junior girls' team at Southam United FC. We welcome any leads on how we can utilise our skills and expertise for the local benefit.
2	*"Will you provide training, employment opportunities and apprenticeships?"*	Working alongside our supply chain, we are supporting more than 120 apprentices as well as free training opportunities. An example of this free training is a skills bootcamp, operated on site by our supplier Flannery, which offers Construction Plant Competence Scheme qualifications. We also provided construction skills training via a local supplier in Warwickshire. We trained over 400 people who each received an industry accredited qualification to support their journey into a career in construction and civil engineering.
3	*"Will you provide opportunities for unemployed, disadvantaged and underrepresented groups?"*	We are establishing working partnerships with Buildforce and various other adult careers services. We have run a successful employability programme for young people with special educational needs and disabilities (SEND) to prepare them for work when they leave school. After a successful event last year, we will be running this again at our Chipping Warden site, with local SEND schools this spring.
4	*"Can you work with local schools and colleges?"*	We are working extensively with local schools and welcome suggestions of schools in the wider area that may benefit from working with us. We have held a 'Safety Day' at Chipping Warden Primary Academy and lead educational sessions in local primary schools. We support mock interviews at several secondary schools in Warwickshire and attended careers fairs and other employability events at local schools and colleges.

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Local supplier case study

Keller Group plc have their UK headquarters near Coventry and are the world's largest geotechnical specialist contractor. They are closely involved in the Oxford Canal Viaduct construction as our geotechnical supply partner.

Keller employ 90 people in the region, including nine apprentices.

No day is the same at Keller. I enjoy getting to work on a large variety of equipment and meeting people from different parts of the business, who have different stories to tell.

Dominic Ward, former Keller apprentice now Mechatronics Engineer

What are Keller Construction doing to support the local community?

- They have helped with work at St Leonard's Church in the village of Ryton, and with Warwickshire Wildlife Trust volunteers to carry out hedgerow planting at Stoneleigh in Warwickshire.
- Their Employees have taken part in a Wild Work Day at Brandon Marsh Nature Reserve, near Coventry. The work included reedbed restoration and invasive species removal.
- They have sponsored two local football clubs this season - Rugby Town Women's and Girls' FC and Whitley Juniors in Coventry.
- They have regular charity fundraising programmes including a 'Christmas Giving Tree' where staff leave presents which are given to the Coventry Haven Women's Aid.

Some of the Keller team and apprentices who took part in volunteer work.

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