

# Introduction

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

At this exhibition we have two options of pier finish for you to have your say on so please leave your comments in the feedback form. These are referenced throughout as Option A and Option B. Option A is a smooth concrete finish, and Option B is a masonry leaf finish.

## Who is EKFB?

EKFB is a joint venture that brings together international, market-leading expertise from four renowned civil engineering and construction companies: Eiffage, Kier, Ferrovial Construction and BAM Nuttall.

All four partners bring specialist expertise in the design, construction, operation, financing and maintenance of railway networks, including some of Europe's high speed rail projects.

EKFB is proud to have been appointed by HS2 to deliver civil engineering works across an 80km section of the new high speed rail link between the Chiltern Tunnel and Long Itchington Wood. Our scope of the works includes 15 viaducts, 6.9km of green tunnels, 22km of road diversions, 81 bridges and around 30 million cubic metres of excavation.

## What are Key Design Elements?

These are structures along the route that have been recognised to be important. This could be due to their size, proximity to stakeholders or their location within sensitive areas.

The design for the viaduct has been developed with consideration for technical and structural requirements, as well as the impact on their surroundings.



An artist's impression of the Oxford Canal Viaduct with the smooth concrete finish (Option A)



An artist's impression of the Oxford Canal Viaduct with the masonry leaf finish (Option B)

# 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.

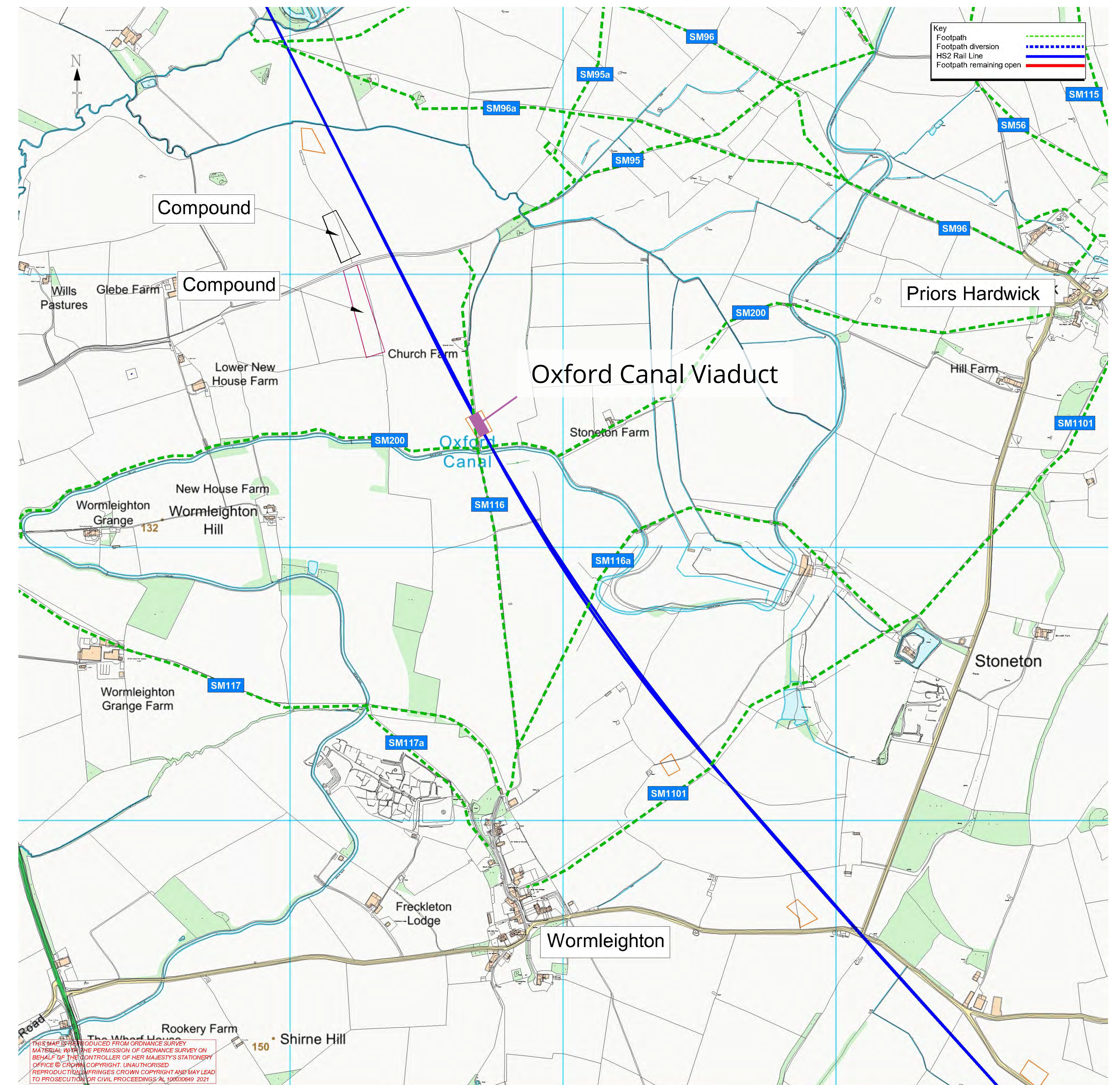
A viaduct is a type of bridge, made up of multiple spans and connecting two points of terrain. On this project they will carry the high speed railway across valleys, rivers, roads and flood plains.

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 around four times the speed of Victorian 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 tonnes load, to the foundations.



A map showing the location of the Oxford Canal Viaduct,

# Viaduct design

Our design for this structure has been strongly influenced by the Canal & River Trust document *HS2 Design Principles for Waterway Crossings*.

## Design approach

We have designed an 'open' structure that allows for views across the landscape and the horizon. The design combines a simple overall structural form with a special focus on materials for the parts of the structure that are in close proximity to the canal and its visitors.

## Design context

We have incorporated a masonry 'collar' wrapping the abutment nearest the canal to form a hard edge to the watercourse. It will also provide a security line in this location, avoiding the need for additional fencing. Where the existing hedgerow running alongside the canal towpath is broken by the viaduct passing overhead, we will place another masonry wall to enclose the towpath and canal on both sides to create the 'canal corridor'. The same masonry is proposed for the towpath surface itself, to create symmetry and relate the design back to the adjacent brick-built arched bridge.

## Detailing

The parapets will feature the textured band developed for use on the other KDE viaduct in the area. The public will experience the pattern at a closer range on this structure than any other; the underside of the viaduct will be formed from smooth pre-cast beams showing a flat bottom edge to the canal when viewed in elevation.



An artist's impression of the underside of the viaduct with a smooth concrete finish on the piers (Option A)



An artist's impression of the viaduct showing the masonry 'collar'

# Construction

The Oxford Canal Viaduct will be approximately 60 metres in length, with 3 spans. The deck will be constructed from a reinforced concrete slab and concrete beams, while the viaduct supports will be made from reinforced concrete. The construction process for the viaduct is as follows:

- We will be using 'bored pile' foundations to reinforce the soft soil already present.
- The concrete beams will be lifted by crane onto the supports, and the permanent concrete for work planks placed on top.
- Once the foundations are in place, the support piers will be installed using pre-cast shells which are then filled with concrete on site.
- Once in position, the deck slabs and 'diaphragm' will be poured in-situ, which will hold the frame of the viaduct.
- The abutments will be reinforced concrete structures founded on piled foundations.
- After the deck has been constructed, deck finishes such as waterproofing and parapets will be fitted before rail systems can be installed.



An artist's impression of the underside of the viaduct with a smooth concrete finish on the piers (Option A)



We are currently in talks with the Canal and River Trust about plans to install a temporary bridge over the Oxford Canal known as a 'Bailey bridge' to allow traffic across the canal.

# Landscape design

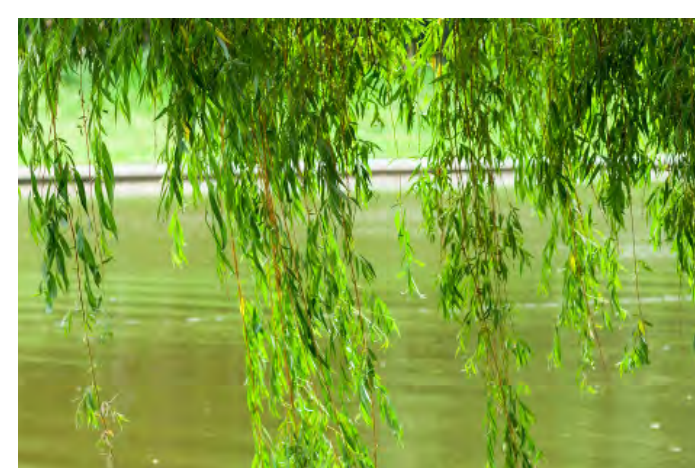
This viaduct will be seen by the users of the canal and therefore the landscape design for this structure focuses on the following:

- 1 The heritage of the canal
- 2 The everyday users of the canal
- 3 The biodiversity of the area and how we can enhance it

The landscape design will reinforce the green corridors established along the route through woodland, linear tree belts, hedgerows, watercourse vegetation and wetland habitat creation.

These strong landscape elements help to provide biodiversity connectivity by linking into the viaduct and allowing the vegetation to pass underneath, connecting the planting and engineering design to the surrounding landscape.

Typically the area consists of a wide range of native UK plant species. We are also incorporating into the landscape design the introduction of a new green native tree and shrub planting area including:



Willow



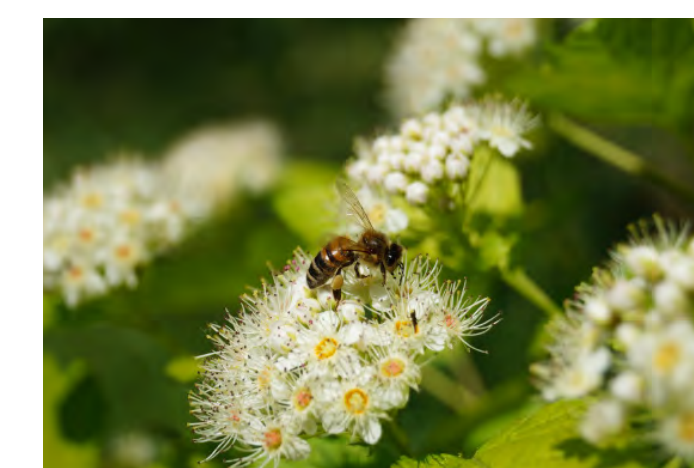
Blackthorn



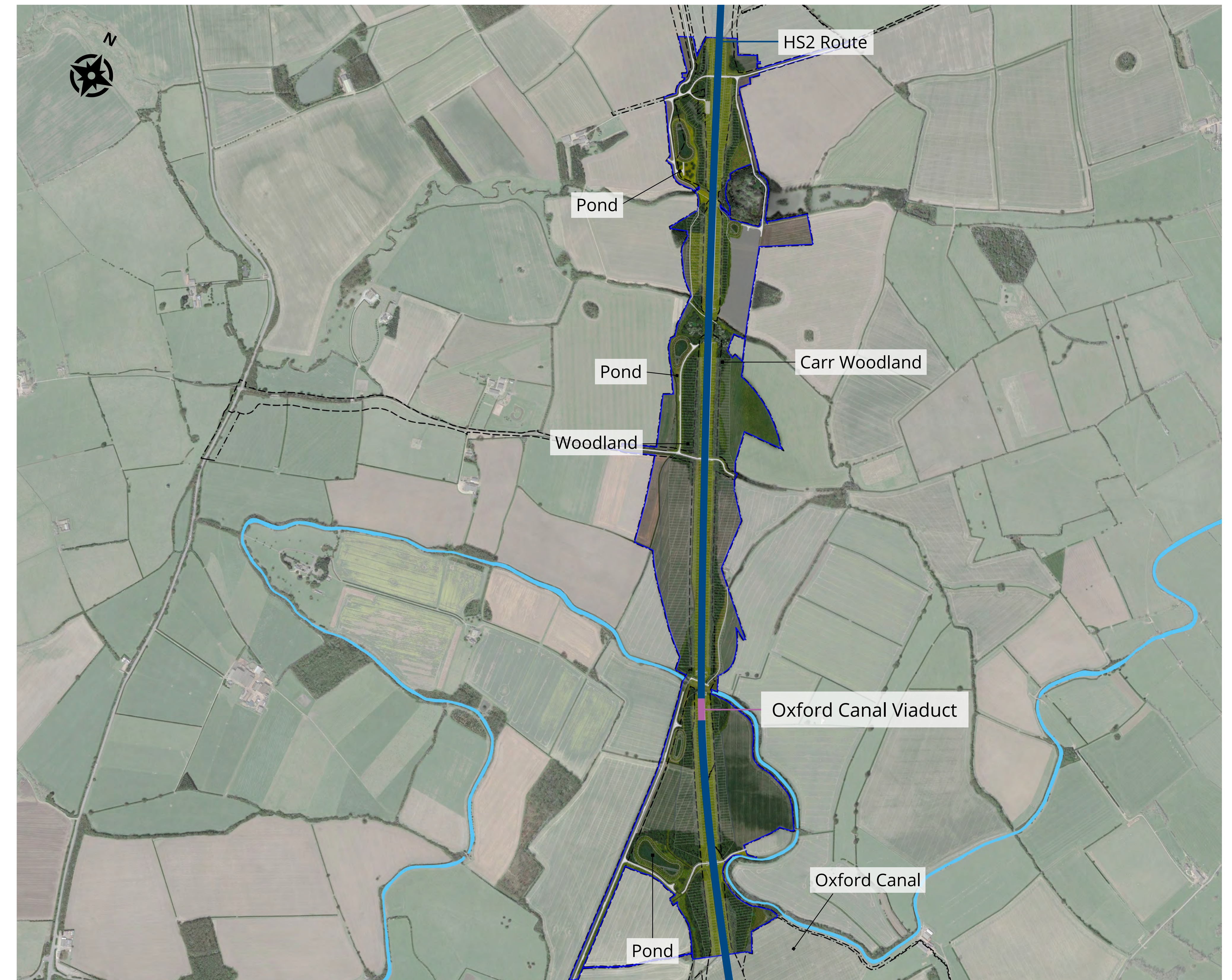
Dog Rose



Birch



Wayfaring Tree



A map showing the route of the railway, the location of the viaduct and suggested planting plan

# Archaeology

HS2 is currently undertaking one of the largest archaeological investigations along the line of route. Local investigations within the Wormleighton Parish are uncovering many exciting discoveries.

## Banjo Enclosure

Evaluation work indicated that several sites contained significant archaeology within the Wormleighton area. The site at Church Farm was the first to be fully excavated with the archaeology uncovered by hand. Dating back to the late Bronze Age/early Iron Age, the image shows the faint soil marks of a circular stock enclosure known as a 'Banjo Enclosure'.

This would have contained livestock, but pottery shows that it was also being used for domestic settlement. The 40 metre diameter enclosure boundary comprised of a wall and ditch to keep animals contained within it. A funnelled entrance made herding livestock into the enclosure easier, whilst maintaining a smaller access point for securing the livestock. Settlement activity discoveries within the enclosure indicate that the enclosure was then reused several hundred years later in the late Iron Age period.

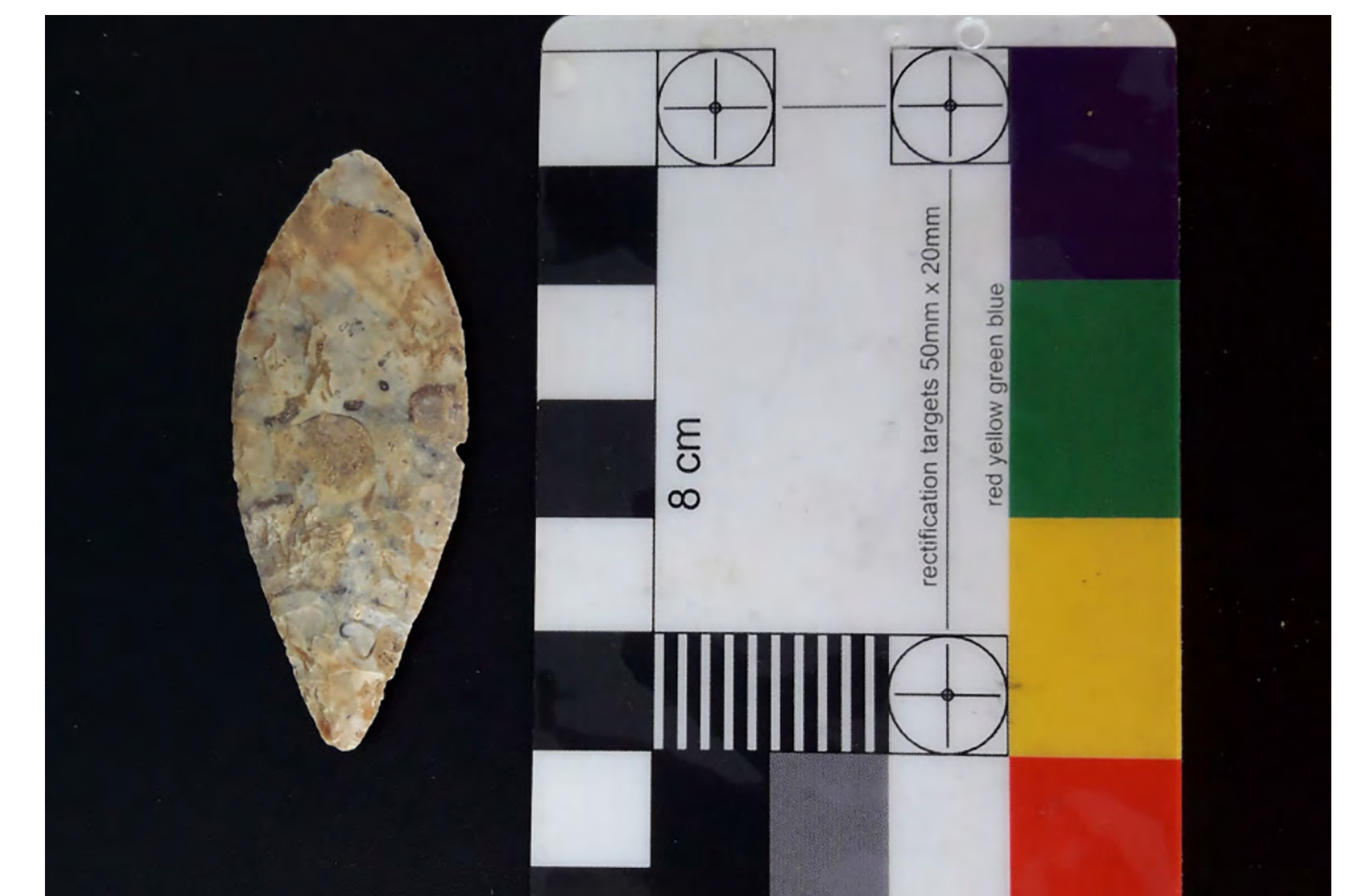
## Roman and other activity

Two archaeological sites in Wormleighton Parish are still to be completely excavated. Indications are that a significantly sized Romano-British population once inhabited this area. Just to the south of the Oxford Canal a concentration of remains suggest a small Roman village, and further to the south close to Banbury Lane is a farmstead that may have been used from the Iron Age.

Dating back 4000 years, this rare Bronze Age arrow/spear head was recently discovered at our Wormleighton site. It is exciting evidence that humans have been active in this area for many millennia.



An image showing excavation of a 'Banjo Enclosure' from the late Bronze Age/early Iron Age



A rare Bronze Age arrow/spear head recently discovered at our Wormleighton site

# HS2 in the local area

HS2 Ltd has established community funding to support local environmental and economic improvements along the route. In total, two funding pots totalling £40 million have been made available. These programmes were created to help offset the disruption of HS2 on local communities and so far, over 100 projects have been awarded funding.

A £75,000 grant from the Community and Environment Fund (CEF) has now been awarded by HS2 to the Wormleighton Parochial Church Council (PCC), to contribute towards making St. Peter's Church in Wormleighton, a 900-year old building that acts as a community hub for up to 183 people living in the village of Wormleighton, more accessible through the installation of an accessible toilet and basic catering facilities.

Over £75,000 was awarded for a new play area in Boddington at the Charles Cowper Field. This impressive facility was opened in 2018 with parents and children consulted throughout the development process to ensure the end result would offer inclusive play opportunities for children of all ages and abilities, while enhancing the local rural environment.

## Supply chain opportunities

We are keen to engage with supply chain partners who share our values and enthusiasm, regardless of how big or small your organisation may be. We believe in fair and inclusive procurement in order to stimulate a more competitive marketplace.

For more opportunities and information about how your business could become a supply chain partner of EKFB, please visit our CompeteFor page:

[www.competefor.com/ekfb/](http://www.competefor.com/ekfb/)



The new play area in Boddington



**For more information on the CEF and BLEF funding visit [www.hs2funds.org.uk](http://www.hs2funds.org.uk) to find out more on the application process for your local causes.**



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# Objectives

We think that the following objectives are important. Do you agree? Please let us know which of these issues is the most important to you in our feedback form, and any other comments that you have about our plans.

## Viaduct design

- Pay special attention to the appearance of the viaduct, making use of piers and deck connections
- Create a simple connection with the approach embankments
- Design the viaduct to fit the route of the canal
- Use materials to be inkeeping with the immediate canal environment

## Which pier option do you prefer?

- Option A - smooth concrete
- Option B - masonry leaf

## Construction

- Minimise disruption to traffic on roads
- Maintain footpaths
- Minimise noise generated by construction activity
- Minimise dust generated by construction activity
- Be kept informed about the work in advance of it being carried out
- Reduce the duration of works where possible

## Landscape design

- Respect the landscape setting and design the viaduct to fit the existing terrain
- Preserve existing field patterns, hedgerows, fence lines, water courses and existing woodland
- Plant different variations of species along the route to match existing vegetation in the local area
- Enhance biodiversity of the landscape
- Maximise green infrastructure and opportunities to link ecology along the line
- Retain as much of the existing habitat as possible, and provide habitat connectivity

## Social benefit, employment and training

- Work with local companies to support construction work activities
- Provide training, employment opportunities and apprenticeships
- Provide opportunities for unemployed, disadvantaged and underrepresented groups
- Provide long term job opportunities for the operational phase of HS2
- Develop relationships with Local Authorities and Local Enterprise Partnerships
- Work with local schools and colleges



# Have your say

Which objectives are most important to you?  
Which pier finish do you prefer?  
What are your views on landscape design?

## How to have your say

Please provide us with your feedback by 30 April 2021. It is important we receive your comments by this date so we can consider your feedback in the next stage of review for the viaduct.

You can provide feedback in the ways listed below:

### Online Survey

Visit [www.hs2inwarwickshire.co.uk](http://www.hs2inwarwickshire.co.uk) for a link to a survey.

### Email

[hs2enquiries@hs2.org.uk](mailto:hs2enquiries@hs2.org.uk)

### Telephone

Call the HS2 helpdesk on 08081 434 434.

### Information Events

We are committed to keeping you informed and will be having more engagement events in the future.

Due to the COVID-19 pandemic we are not currently able to hold face-to-face public events. For more information and to find out how to join these meetings, please visit:

[www.hs2inwarwickshire.co.uk/](http://www.hs2inwarwickshire.co.uk/)

### Next Steps

We will consider the responses we receive and whether aspects of them can be incorporated into the final design.

1

### Consider responses

We will consider the responses we receive and whether aspects of them can be incorporated into the final proposed design

2

### Feedback report

We will summarise the comments we received and confirm how they can inform the final design

3

### "You said, we did"

We will continue engagement with detailed information on the feedback that we received, and any changes made to the final design

4

### Submit schedule 17

We will submit our request for approval of the Schedule 17 application, seeking approval for the final design

5

### Construction engagement

We will continue engagement with the local community to describe and discuss the construction impacts and the mitigation that we will put in place



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