ALIGN Working in partnership with HS2

Contact our HS2 Helpdesk team on **08081 434 434**

HS2 Update

Chiltern Tunnel | Spring 2022

High Speed Two (HS2) is the new high speed railway for Britain. The tunnel boring machines digging the Chiltern Tunnel were launched in early summer last year by Align, the main works contractor building both the tunnel and the Colne Valley Viaduct. This newsletter updates on their progress.

Florence and Cecilia

Our tunnel boring machines (TBMs) - Florence and Cecilia - began their journey in May and June last year. They have now both reached the first Chiltern Tunnel shaft, heading northward, at Chalfont St Peter and are halted there for maintenance.

They will be ready to head off again in mid-March and will tunnel towards the second shaft off Bottom House Farm Lane in Chalfont St Giles. They are due there in early autumn this year. On average each TBM travels about 15 metres a day. All the spoil removed as part of the tunnelling process is pumped back to the main site at the South Portal next to the M25. This spoil is dried and is being used to create new landscaping across the Colne Valley Western slopes (CVWS).

This area covers 127 hectares creating a new wildlife-rich chalk grassland habitat which has been in decline across the Chiltern Hills, with only 700 hectares left across the Chilterns AONB. The chalk grassland will sit alongside new areas of woodland, wood pasture and wetlands, including almost 65,000 trees and shrubs of 32 species and nearly 3.5km of new hedgerows. Around 4.5km of new footpath, cycling and horse-riding routes will also be created.

TBM FAQ

Each TBM weighs 2,000 tonnes

They are nearly 1.5 times the length of a football pitch

They will take three years to dig the twin bore Chiltern Tunnel which is 10 miles long

Each cutterhead is about the height of two giraffes standing on top of each other

The tunnels will be lined with 112,000 concrete segments which weigh 8.5 tonnes each

The tunnel shafts

Chalfont St Peter and Chalfont St Giles

These are the first two ventilation shafts. Chalfont St Peter is the deepest at just over 60 metres. The shaft itself has now been constructed (pictured right) and the site team are now preparing the ground around it for the shaft headhouse and buildings, using a technique called shallow box piling. The two TBMs pass through the shaft in March and will then continue their journey to the next shaft at Chalfont St Giles.

Chalfont St Giles is just over 34 metres deep. The shaft excavation at this site is also completed and the site team are working to prepare the ground for the headhouse building. These buildings will sit on top of the shaft and house some of the machinery which will manage the ventilation system for the tunnel. The TBMs are due to reach Chalfont St Giles in early autumn.

Chalfont St Peter vent shaft

Amersham and Little Missenden

The excavation of the shaft at Amersham, which is nearly 43 metres deep, was completed in mid-February. The site itself is surrounded by hoarding inspired by the history of Amersham (pictured right) as part of our community investment activity. The site team are now preparing the site for the headhouse building which will sit on top of the shaft, and for the arrival of the TBMs in early 2024.

The shaft at Little Missenden is currently being excavated and will be nearly 35 metres deep. Little Missenden is also the final ventilation shaft. The design of the headhouse at Little Missenden has changed slightly since we held the 'You Said, We Did' design engagement event last May. The revised design has seen the roof changed to a single (mono) pitch roof with the orientations selected to best align with the landscape and views into the site.

Amersham hoarding

Chesham Road and North Portal

Chesham Road intervention shaft

This is the final shaft, before the North Portal, where the railway line will leave the Chiltern Tunnel. The shaft here does not provide ventilation but is for use by the emergency services if they need access. It is 43.5 metres deep at this point.

The construction method being used is known as caisson. This is where a temporary sheet pile cofferdam is constructed. The cofferdam is circular and allows excavation of the weaker superficial clays so that the caisson can be installed directly into the stronger chalk. The cofferdam is excavated to a depth of around 10m. A concrete guide collar is installed within the cofferdam, to ensure that the caisson is cast to the correct shape and that it is sunk straight down to create the shaft.

Chesham Road headhouse design

North Portal and engagement events

The North Portal is where the railway will exit the Chiltern Tunnel. Works currently taking place on site include the construction of 96 'barrettes' which are concrete piles which we need to put into the ground just before the portal exit to strengthen the ground.

We are holding design engagement events for both Chesham Road and the North Portal towards the end of March, as well as a webinar. For Chesham Road it is the follow up 'You Said, We Did' event showing the final design of the head house buildings and landscaping for site. For the North Portal we are engaging on designs for how the plant building, where the machinery to manage the portal entrance, will be housed. Please visit HS2.org.uk and the in your area page to find out more.

Inside a tunnel boring machine

What happens in a TBM?

The TBMs have a crew of 17 people to operate each one, working in shifts running 24/7. The team consists of a specialist tunnelling pilot, engineer, electrician, mechanic and tunnelling operatives, called 'miners'. They are supported by over 100 colleagues on the surface to manage and ensure the smooth progress of each machine. Florence and Cecilia are now nearly two miles into the construction of the Chiltern Tunnel, which is ten miles long and are due to reach the North Portal, near South Heath, in early 2024.

The TBMs are specially designed to tunnel through the mix of chalk and flint they will encounter under the Chilterns. The TBMs operate by excavating the ground ahead of them and installing the segments to create the finished tunnel lining. They do this by pushing themselves forwards using powerful hydraulic jacks against the tunnel lining whilst a large cutting head at the front rotates, removing the chalk in front and allowing the TBMs to propel themselves forward into the excavated ground.

FAQ

Tunnelling through the Chilterns

Q: How do the TBMs know where they are going?

A: They use a fixed guidance system installed in the tunnel. A dedicated team of tunnel surveyors ensure the position of the TBM is continuously monitored and updated to give a real time position and ensure the alignment is correct, to within a few millimetres.

Q: Does it get very hot underground?

A: The tunnel is warmer than the surface, however fresh air is pumped in from the surface. Each machine has a rest room for breaks and to eat meals.

Q: How do the staff get to the TBMs? Do they walk?

A: No, they use a multi-service vehicle (MSV) which drives the miners to and from the TBMs.

Colne Valley Western Slopes

South Portal of the Chiltern Tunnel

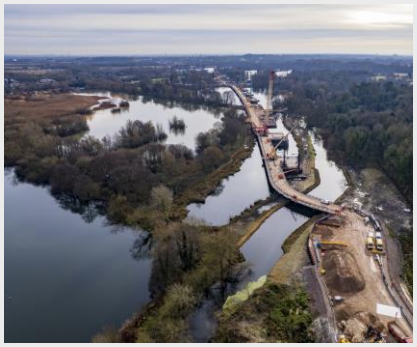
The main activities taking place at our main compound site include:

- Fabrication of the tunnel lining segments for the 10-mile-long Chiltern Tunnel
- Fabrication of the deck segments for the Colne Valley Viaduct
- Treatment and conversion of slurry (wet chalk) from the two TBMs into reusable landscaping material.

Over 400,000 m³ of soil from the Chiltern Tunnel has now been recycled and placed at the former Pynesfield quarry site, marking a significant step in the habitat creation of the calcareous grassland of the Colne Valley Western Slopes.

Colne Valley Viaduct

This will be the UK's longest railway bridge and construction began in early 2021. The viaduct will carry the railway line for just over two miles across the lakes, River Colne and the Grand Union Canal in the Colne Valley. This is longer than the Forth Rail Bridge. The trains will be travelling at up to 200mph on the viaduct.



Production of 1,000 enormous concrete segments that will form the deck of the Colne Valley Viaduct has started. The huge deck segments – which weigh up to 140 tonnes – are being made on site at a temporary factory built specifically for the project.

Work has also begun on the 56 giant piers that will support the viaduct, working from north to south. This includes creating a temporary jetty across the lakes to take construction traffic off local roads.

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Keeping you informed

We are committed to keeping you informed about work on HS2. This includes ensuring you know what to expect and when to expect it, as well as how we can help you.

The Residents' Commissioner

The independent Residents' Commissioner oversees and monitors our commitments to you.

The commissioner's reports and our responses can be found at www.gov.uk/government/collections/hs2-ltd-residents-commissioner

The Residents' Commissioner makes sure we fulfil the commitments in the HS2 Community Engagement Strategy (https://bit.ly/3oOA25j).

The Residents' Commissioner can be contacted on: residentscommissioner@hs2.org.uk

Construction Commissioner

The independent Construction Commissioner regularly meets our Chief Executive Officer to raise any concerns or emerging trends across HS2.

The Construction Commissioner's role has been developed to monitor the way we manage and respond to construction complaints.

The commissioner mediates on disputes about construction, involving individuals and organisations, that we can't resolve. The commissioner advises members of the public about how to make a complaint about construction.

The Construction Commissioner can be contacted on: complaints@hs2-cc.org.uk

Property and compensation

You can find out about HS2 and properties along the route by visiting: www.gov.uk/government/collections/hs2-property

Find out if you can claim compensation at: www.gov.uk/claim-compensation-if-affected-by-hs2

Holding us to account

If you are unhappy for any reason you can make a complaint by contacting the HS2 Helpdesk. For more details on our complaints process, please visit: www.hs2.org.uk/in-your-area/contact-us/how-to-complain/

Contact us

Contact our HS2 Helpdesk team all day, every day of the year on:

Freephone **08081 434 434**

Minicom **08081 456 472**

Email **HS2enquiries@hs2.org.uk**

Write to:
FREEPOST
HS2 Community Engagement

Website **www.hs2.org.uk**

To keep up to date with what is happening in your local area, visit: **www.HS2inyourarea.co.uk**

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