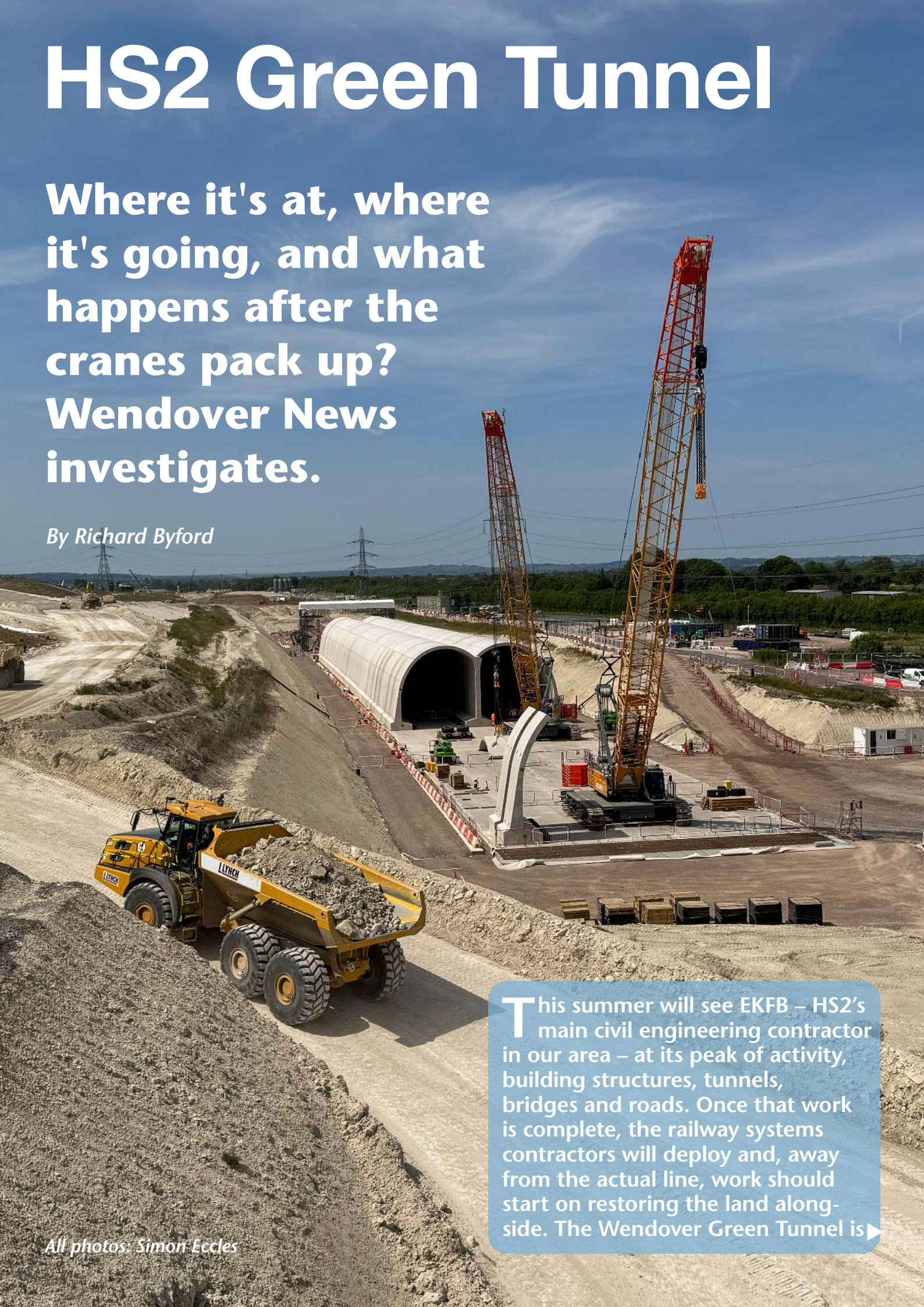
HS2 Green Tunnel

Where it's at, where it's going, and what happens after the cranes pack up? Wendover News investigates.

By Richard Byford



All photos: Simon Eccles

This summer will see EKFB – HS2's main civil engineering contractor in our area – at its peak of activity, building structures, tunnels, bridges and roads. Once that work is complete, the railway systems contractors will deploy and, away from the actual line, work should start on restoring the land alongside. The Wendover Green Tunnel is ▶

a pivotal step in the construction of the whole of HS2, and critical to the overall programme.

If you have ventured west of the Wendover bypass recently, you will almost certainly have noticed the huge amount of spoil that has been excavated to construct the tunnel. For people who like walking through that area or view it as part of the vista from Coombe Hill, it must be a devastating sight. We can only hope that when, eventually, the line comes into use, it will heal over and once more become part of our cherished landscape.

The Wendover Green Tunnel will be an 1,185m long cut-and-cover tunnel with 120m long porous portals (for noise reduction) at each end. The work area starts at the Wendover end of the Small Dean viaduct (which we've written about in the past), across Bacombe Lane and under the two temporary "Bailey" girder bridges at Ellesborough Road. From there it passes the area where the cricket club once played its matches, and then past Folly Bridge in the direction of Nash Lee Road.

In the early 2011 public consultation document, a 300m long cut-and-cover tunnel was proposed. After that consultation, it was extended by 800m, which "…would ensure effective visual and noise screening alongside the main residential area of Wendover." In 2013 it was further extended by the addition of porous acoustic portals and a further extension to its full length in 2016, before the design was formally finalised in 2017.

Work in progress

The first structural segments of the green tunnel were erected in early April. Since then, additional 2.5m long segments have been added at an impressive rate, and just before we went to press on 19 June, 350 of the 520 were already in place.

The principles employed for the design of tunnel elements were previously used for similar tunnels on the TGV railway in France. Each segment is made up of five parts which fit together in a weight-bearing pair of arches, without any need for mortar or additional concrete to hold them in place during construction. They arrive by road, as and when they are needed, from the manufacturing plant in Derbyshire. The Ellesborough Road diversion's Bailey bridge is a useful vantage point to watch them being put together using a 1,200-tonne crane.

In preparation for the pre-cast segments, the 65m-wide trench was first excavated down to the natural chalk which extends beyond the escarpment of the Chiltern Hills at that point. To dissipate the load and provide stability, the ground was then covered by a 500mm bed of aggregate. The process of creating the foundation continues with 120 truck loads being placed in the trench every day. A 125mm steel-reinforced concrete slab was then poured over a plastic waterproof membrane. These slabs form the temporary working area that you can see in front of the erected segments. Once enough segments have been erected, a second 500mm steel-reinforced concrete slab will be poured to fix the separate tunnel segments in place and make up the final foundation for the track.

Southern end of green tunnel showing waterproofing gantry

And then it starts to disappear...

At the north end of the tunnel a gantry is already in place to start the process of covering the tunnel with the top waterproof membrane. The next stage will be the carefully controlled backfill, initially along the side, then over the top. This is an incremental process, to ensure that equal pressure goes on each segment of the arch. The covering layers will be made up of material removed during the excavation, where possible. The final layer will be subsoil and topsoil thick enough to sustain the eventual grass/wildflower meadow with shrubs and trees.

Fitted with silencers?

When you create air pressure at one end of a tube, sound comes out of the other end. In the case of a trumpet or trombone, the vibrations created by the lips of the musician are melodic, can be modified in pitch by controls and are harmonically improved by the shape of the tube. In the case of a gun, the sound pressure is explosive and makes a loud bang which comes out of the muzzle.

A fast passenger train, entering a tunnel falls between the two. Not as alarming as a gun, but not as tuneful as a musical instrument. Silencers for guns are commonplace in action films, but less so for brass instruments.

There is a relatively simple way of stopping a train generating annoying or damaging sound waves. In Japan, the latest of the Shinkansen 'bullet' trains are built with highly extended sloping noses, to dissipate air pressure when the train is entering a tunnel. These extra-long aerodynamic sloped fronts work very well, but take up so much of the length of the train that they would be impractical for HS2 with its constrained platform lengths.

Instead, HS2 is relying on building 'porous portals.' As the train enters the portal, pressure waves that would otherwise cause a 'boom' on exit, are dissipated through a series of openings along the side. A similar structure completes the silencing as the train leaves the tunnel. Unlike the main tunnel, these cannot be covered with soil. There will be additional vertical sound barriers on the southern end, nearest St Mary's church and the Chiltern Way Academy.

Why did they start where they did?

It is not just the Green Tunnel that is being built. For the past few months, continuous convoys of fully laden trucks have been taking spoil along the haul road that passes through the huge cutting that's been made between Bacombe Lane and Ellesborough Road. Hard chalk is being trucked north to form the embankments near Stoke Mandeville and beyond. The brown clay spoil comes from the area up to Chiltern Tunnel near Great Missenden, over the conveyor line crossing the A414 around Small Dean, then piled up into the clay and chalk mountains visible from the road and high points around the area.

This gives clues as to why EKFB might have started erecting segments at the point that they did – neither in the middle, nor at one of the ends. The only place that dumper trucks can squeeze past the Ellesborough Road chicane, is in exactly the place where part of the green tunnel will be going.

Meanwhile, excavation is also proceeding for the southern section through Bacombe Lane and the link beyond Ellesborough Road.

The depth of the excavation in the extensive green tunnel work area should go a long way towards mitigating the dust nuisance. EKFB seems to be constantly damping down the road to stop dust from blowing away from the site. We must hope that there is not a water shortage over the summer…

Another reason for starting in the middle is that work on 400m of the northern end (towards Nash Lee Road) was on hold at the time being.

Murray Cooke, from the Wendover HS2 Mitigation Action Group explained why: "[It was] awaiting agreement by the Environment Agency about the impact on the aquifer groundwater flows from Coombe Hill. North of the tunnel there is a significant excavation planned for the 'Wendover North Cutting,' with the HS2 track-level being below the normal groundwater levels.

"To stop the aquifer discharging into the cutting, a massive 'tanking' (low porosity, ie waterproofing) wall is being created. This goes 30 metres down from ground level, through the porous chalk layer into the underlying clay, and extending 300m on each side of the cutting, up to Nash Lee Road. Work started on the wall in June last year and is expected to continue to September. An extension of the wall as far north as Nash Lee Lane is also being installed which will involve a full closure of Nash Lee Road for three weeks and 24 hour working, currently planned for 23rd July to 18th August. Traffic will be diverted through Stoke Mandeville."

The water has to go somewhere...

EKFB needs to build an underground "Spring Chamber" to monitor and to some extent regulate ground water flows from the aquifer that may be displaced, by the railway cutting and the tanking wall, into the fields close to Kings Farm and Nash Lee End.

As it is outside HS2 land, EKFB requires planning permission from Bucks Council.

This was turned down in April (Wendover News May 2025), because councillors were officially not satisfied with EKFB's proposals to mitigate its impact on the landscape (and in reality they were unhappy with EKFB's insistence on building a permanent road at the end of Dobbins Lane). EKFB is expected to appeal, but had not as we went to press.

Murray says: "The Environment Agency (EA) need the Spring Chamber to demonstrate that the groundwater mitigation for the North Cutting is effective.

We now understand that they have given permission for construction to commence in this area but will still require EKFB to provide proof of mitigation from the working Spring Chamber before the end of 2026. If this is true, then it avoids the additional alleged "tens of millions of pounds" that HS2 claimed that the rejection of the planning permission for the Spring Chamber would cause."

Dumper trucks heading in the direction of Nash Lee

Other structures you might not notice

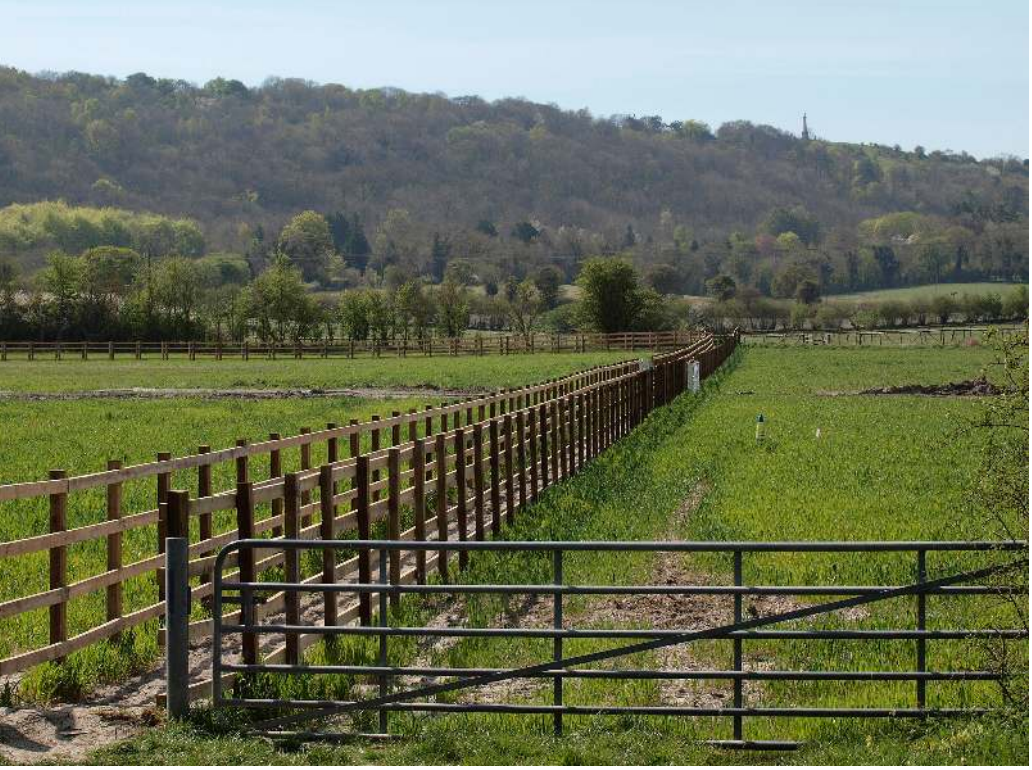
On the Ellesborough side of the wide trench, contractors are working underground on an additional 2.4m diameter tunnel. This is designed to take water run-off from a very large area to the south and is calculated to be large enough to cope with flash floods that might only happen once in 100 years. This tunnelling will be concurrent and parallel with construction of the green tunnel and will finally emerge at a point about half-way between Folly bridge and the current exit to the concrete plant at the northern end of Wendover Bypass.

At each end of the green tunnel, there will be a portal building to house mechanical, electrical and emergency facilities. These will be low in the ground, so should not be visually intrusive and will have 'green' roofs, planted with vegetation, as part of the design.

Now put it back how it was...

Once the top layer of soil is in place, the land will be reinstated. In most areas alongside HS2, the land will be 'restored to its former use.' Exceptions will be alongside and on top of the green tunnel, where new 'natural' habitat will be created.

Roughly a third of the land either side of the Ellesborough Road – including the fields furthest from Wendover – will be put back



to agriculture. The rest will be given back to nature in the form of grass meadow, with sections planted with bushes and shrubs and native wildflowers.

Areas all along the green tunnel will be planted with specimen trees, including a few where the houses were demolished on Ellesborough Road.

The area immediately above the tunnel has been set aside for the construction of a greenway for walkers and cyclists. This will probably connect with a similar path going south to Great Missenden beside the A413, and north to Aylesbury and beyond to Waddesdon.

When the railway is completed and the constructors have gone, the shape of the land will be changed, but probably less than most people would imagine and fear. From what we can discern from the documents presented to Buckinghamshire County Council in 2023, the soil covering the tunnel will raise the level of the land in a few places but it won't stick out like a conspicuous 'hump'. It will rise at some point to a level of 10m over the tunnel, but this seems to be around Ellesborough Road and the Bailey bridge where the original ground level rises too.

On the Wendover (east) side of the tunnel beside the bypass, the land will be made into a slope of between 1-in-6 to 1-in-7. To the west, it will be levelled off until it meets land at the existing elevation.

Footpaths will be reinstated very close to their original routes. It seems likely that the recreated open 'natural' area will be freely accessible from previously existing footpaths, including the much-missed route over Folly Bridge and the footbridge at Wendover Station that forms part of the Aylesbury Ring.

Between the northern end of the main green tunnel and Nash Lee Road, the railway will run through a cutting and will be crossed by a new overbridge in Nash Lee Road.

West of that, and parallel to the cutting, there will be further grass meadow land with shrubs and a string of inter-connected ponds to balance the flow of redirected water into the Stoke Brook going towards Stoke Mandeville. The ponds will be surrounded by vegetation and will not be accessible – unless you are a frog, duck, hedgehog or similar.

Something to celebrate?

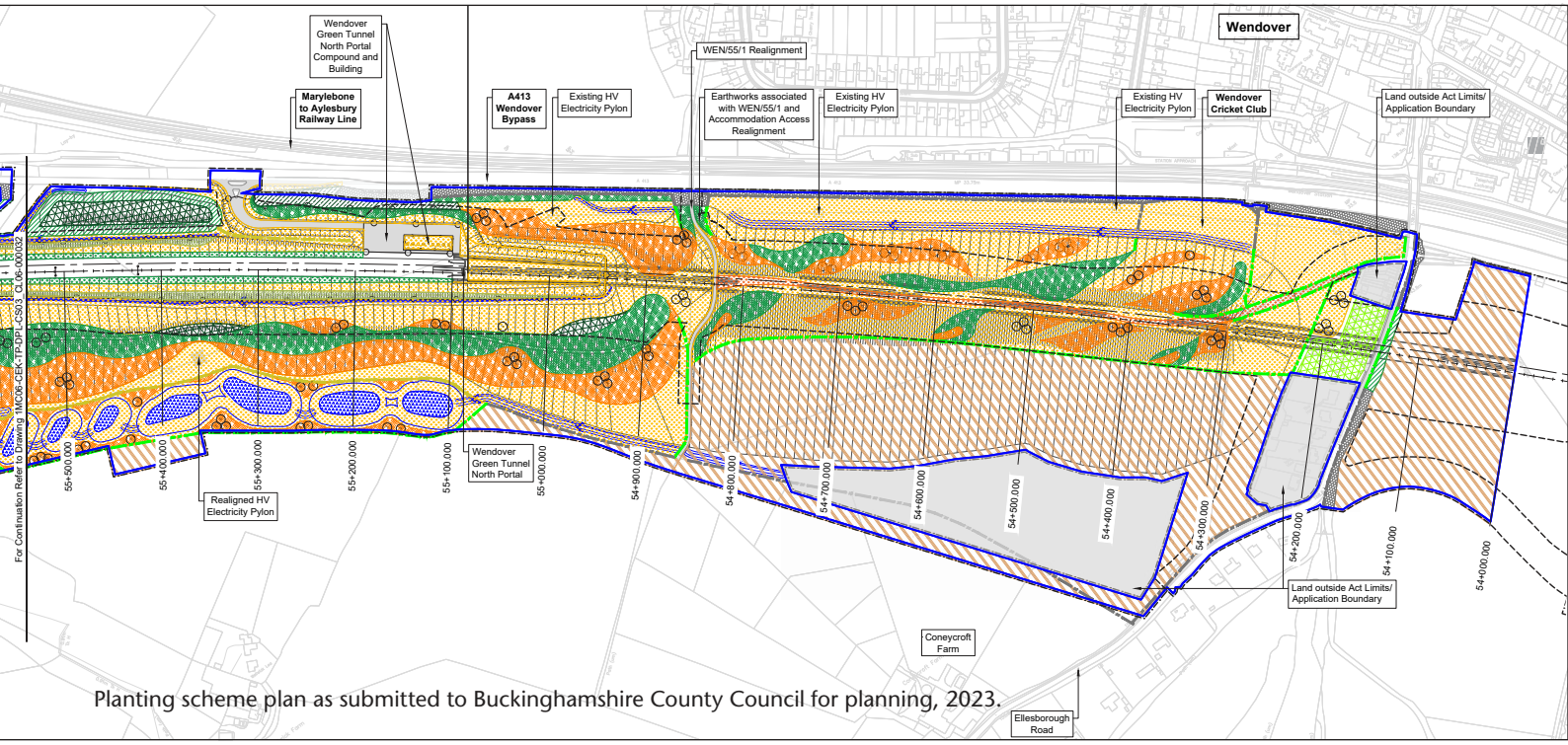
First, we don't know when this is likely to be finished. Before the green tunnel arches can be installed at the Ellesborough Road cutting end, HS2 and EKFB will need to be very confident that all the earth moving work for the cuttings and embankments to the north of Aylesbury towards Stoke Mandeville has been completed.

This is because the green tunnel arches will fill the width of the cutting so it can't be used as a haul road for dump trucks any more.

We don't know when that will be, because on 15 June, there was a government declaration that it no longer knows when HS2 would be finished, but it certainly won't be the former (delayed) date in 2033.

In the meantime, at a national level the pressure is on to re-purpose the former green-belt land that has been disturbed. The government may want to re-designate some of the HS2 land around Wendover as 'grey-belt' for potential housing.

Added to that, everything that we have been told to expect from HS2 – much of it well-meaning – could move from the 'must do' to the 'nice to have' pile if the HS2 budget heads any closer to the financial cliff.



Planting scheme plan as submitted to Buckinghamshire County Council for planning, 2023.

Wendover HS2
Mitigation Action Group

Nash Lee Road Overbridge

Abnormal lorry loads have also been making overnight deliveries of the massive steel girders for the Nash Lee Road overbridge, and the dramatic scale of the 148m long structure is now starting to become apparent.

Small Dean Lane and the Cycleway

Wendover Parish Council responded to a detailed HS2 planning application for the bridge over Small Dean Lane, which now includes a 4m wide bridleway. Regrettably there was no indication of when a safe cycling route between Wendover and Dunsmore will be restored in line with the legal undertaking that was made in the HS2 Act.

While originally suggested that the bridleway would be closed for a year from last September, the reopening date seems to have slipped repeatedly and Bucks Council has agreed to take this up with EKFB.

Dobbins Lane/Spring Chamber

As we go to press there is still no indication from HS2 about what it is going to do following Bucks Council's decision to reject the "Spring Chamber" Planning Application (Wendover News May issue).

We understand that it has made a commitment to the Environment Agency to have it functioning by the end of 2026, but this will be still subject to approval by the Council.

Issues with HS2?

If you're affected by the construction activity, please contact the HS2 Helpdesk team on 08081 434 434 (which is available 24 hours a day) or email hs2enquiries@hs2.org.uk to get your issues resolved.

It helps if you have photographic evidence and please get a complaint reference number so that we can follow up issues as needed.

Need our help?

If you need further help, want to join us, or have ideas and suggestions that would mitigate the community impact, then get in touch at enquiries@whs2.org.

We are always keen to have new members. If any readers are interested in joining us see www.whs2.org for details.

We are looking for volunteers to help us further with our public communications, challenging HS2 over noise issues and making sure we build up a decent case for returning land to its natural state and not being developed.

EKFB Working in partnership with HS2

Information provided by EKFB, main contractor for HS2 at Wendover and Stoke Mandeville.

HS2 in Wendover

The EKFB Geology team has been shortlisted for a community outreach award at a construction industry event. The team is involved in geological mapping and engineering record-keeping to identify geological ground hazards that could impact the design, construction, and operation of the railway. Areas being constructed by EKFB span geological strata ranging from the Triassic limestones of the Penarth Group to the Cretaceous Chalk found at Wendover, covering the entire British Jurassic geological system. This construction has generated significant interest within the geoscience community.

Photo: Simon Eccles

Since mid-2023, the EKFB Geology team has led site visits for various visiting academics, resulting in notable discoveries such as a partially complete ichthyosaur skeleton. The team has also developed a programme of outreach activities for local schoolchildren. They have delivered school visits to over 700 children, covering topics like geoscience careers and the geology under HS2. Their efforts aim to inspire the next generation of geoscientists through engaging and educational activities.

Moving through to current works, at the Wendover north cutting we have been constructing a low permeability wall. This structure is intended to control groundwater and potential flooding of local brooks, ensuring both environmental protection and infrastructure integrity in the area. The wall is being built in sections and acts as a barrier for groundwater, preventing flooding at Wendover north cutting.

We are now approaching the next phase of construction where the wall will be installed over the temporary diversion of Nash Lee Road. The road will be closed for just under four weeks between July and August 2025. The works will include removing the vehicle restraint system (VRS) and kerbing, excavating for the wall, and installing slabs over the road, followed by tarmacking. During the closure, there will be a fully signposted diversion route through Stoke Mandeville.


Photo: Simon Eccles

Dates of Nash Lee Road closure:

An advance works notice with more details will be shared at least two weeks prior to the works so please sign up on the HS2 website to receive further details. Please note that these dates may be subject to change but works will be completed in or around the set timeframes.

If you would like to read more about the works and view the advance works notices and maps, then please go to HS2 website www.hs2.org.uk and click the 'in your area section' to view the interactive map. (HS2 in your area - HS2)

Alternatively, if you have a question about HS2 please contact our HS2 Helpdesk team on 08081 434 434 or email hs2enquiries@hs2.org.uk