

24th September 2020

Lord Hope of Craighead
House of Lords
London
SW1A 0AA

Dear Lord Hope

HS2 Phase 2a Select Committee: Submission of evidence relating to false evidence from HS2 Ltd

Firstly, may I thank you and your fellow lordships for the opportunity you gave to myself and my colleagues to give evidence on behalf of Yarnfield & Cold Meece Parish Council, Stone Town Council and Chebsey Parish Council on Tuesday 15th September 2020. We appreciate and are grateful for your committee's respectful interest in our petition.

Although we were disappointed not to be able to present evidence relating directly to our alternative Railhead/IMB-R proposals at Aldersey's Rough, we are grateful to you for allowing us to explain why the Stone Railhead/IMB-R does not represent a feasible engineering proposition and why we believe that its continued pursuit will have severe, if not disastrous consequences, for the viability of HS2 Phase 2a, and for the Government's objectives for building the line in the first place.

The purpose of this letter is to address the many examples of what we consider to be the factually incorrect evidence provided to your lordships by Tim Smart, HS2 Ltd's Chief Engineer and Managing Director of Phase 2 when being examined by Mr Mould QC. The numerous inaccuracies considered individually might give the impression that we are being pedantic, however when taken as a whole they show evidence of a pattern of behaviour by HS2 Ltd and cast significant doubt on the buildability and cost of not only the Stone Railhead/IMB-R but all of Phase 2a.

I could provide multiple examples from past proceedings in front of the Phase 2a Committee in the other place. However, respecting your stated position, I have limited my comments to the five key subjects relating to Mr Smart's examination by Mr Mould on 15th September 2020.

It is difficult to explain our concerns about factual accuracy without referring to the detail, so please accept my apologies for the necessary technical references.

1: Use of Mercia Mudstone

Mr Smart stated in paragraph 441 that *"it is actually suitable for use in railway embankments. It depends where you use it. It can be used in a zone embankment. So, for example, we can use it in the bottom of earthworks that support the high-speed railway."*

This statement is incorrect, as demonstrated by the following information provided by HS2 Ltd itself:

- Slide A20(17) shows a typical cross-section produced by HS2 Ltd to illustrate the construction of its mainline railway embankment. It is clear from this drawing that all of

the layers used to construct the embankment comprise granular material and not cohesive material, such as Mercia Mudstone. None of the excavations at the Stone Railhead site contain granular material and therefore all of granular material requires importation from locations external to the site.

- The cross-section drawing shows that cohesive material (dark green – Note 8) is only used as landscape fill. This would be placed next to the HS2 embankment and is not used in its formation.
- Note 5 on slide A20(17), which refers to the amber layer, states that it would be formed from *“High quality engineering granular fill (Class 1 or Class 6). Or stabilised cohesive fill (but it seems unlikely that the cohesive fill known to be presents on site will be suitable for stabilising by adding materials such as cement or lime.”*
- A20(17) shows a typical HS2 railway embankment, therefore the ‘site’ being referred to in Note 5 is the entire Phase 2a railway. Furthermore, in paragraph 4.2.1 (P38(67)) of the report that Mr Mould referenced, it states that *“Cohesive fill, such as Mercia Mudstone, is considered suitable for railway embankments with low design speeds, but not suitable as a fill material for high-speed railway embankments.”*

In paragraph 442, Mr Smart adds *“Certainly, the cohesive material we can use in a lot of places, and indeed the M6 embankments adjacent to this site were built on Mercia mudstone.”*

This statement is also incorrect for the following reasons:

- The M6 adjacent to the site is constructed entirely in cutting with none of it built on embankment.
- The only nearby road embankments that may have been constructed of Mercia Mudstone are the ramps linking to the existing Yarnfield Lane on either side of the existing M6 overbridge. However, importantly, Yarnfield Lane is a minor road and is not comparable to a high-speed railway. It is also currently subject to a 7.5 tonne weight limit, and its use by larger vehicles is only permitted for access.

2. Excavation quantities at the Stone Railhead/IMB-R site

Mr Smart’s evidence in paragraphs 451 to 459 suggests that he may have misunderstood the earthworks quantities produced by his own staff and communicated to our parish councils.

All we have done is take HS2 Ltd’s quantities that have been provided by HS2 Ltd in its report dated 17th December 2019 (Ref P38(56) to (76)), together with subsequent correspondence including HS2 Ltd’s letter dated 17th April 2020 (Ref P38(162) to (172)) and put them into a simplified table format. The only exceptions to this are the yellow and amber highlighted rows, which we believe HS2 Ltd has omitted to include in its HGV calculations. It is therefore deeply concerning and regrettable that HS2 Ltd’s Chief Engineer is unable to understand the basis of this table and the numbers contained within it.

Mr Smart appears to have misunderstood what is meant by an initial shortfall of internal sources of fill, i.e. what is available from within the Stone site. The figure of 348,000m³ represents HS2 Ltd’s stated requirement for bulk granular fill to construct its railway embankments at the site, together with the Stone Headshunt. However, since none of this

material can be sourced from the Stone site, HS2 is proposing to obtain it from the vaguely referenced 'elsewhere on Phase 2a', as well as its Swynnerton North Cutting. We therefore believe that Mr Smart is wrong when he claims in paragraph 452 that it is not imported to the site.

Furthermore, HS2 Ltd has assumed that it would import another 273,000m³ from these sources, together with an additional 169,000m³ of Class 6 trackbed material from external commercial sources.

When all of these figures are combined it equates to the total of 790,000m³, as shown in A20(26) and we believe these are the basis of the HGV numbers shown in the AP2 histogram (Ref A20(8)), which means we have been able to reconcile some of HS2 Ltd's earthworks quantities to its claimed HGV movements.

In paragraph 451, Mr Mould seems to become confused when he refers to a table shown in P38(165) and a figure of 865,000m³. The difference between this figure and the 790,000m³ referred to above is 75,000m³, which represents cohesive (not granular) material, which will be sourced from the Yarlet North Cutting. This figure also appears in our table but, importantly, would not involve the use of HGVs because it would be transported on internal haul roads by articulated dump trucks ADTs).

Therefore, it is incorrect for Mr Smart to claim that we have double-counted or mis-calculated the excavation quantities or the amount that requires importing to the site. Any remaining shortfall (we have calculated 277,000m³) only relates to cohesive material, which can be sourced from the railway cuttings to the south of the Stone Railhead site using ADTs.

This therefore leaves the section of our A20(26) table entitled additional demand for fill which is the basis of the difference between us relating to the local demand for fill into the Yarnfield North Embankment Transfer Node. We believe that HS2 Ltd will need to import an additional 525,000m³ of granular fill resulting in an additional 105,000 HGV movements (Ref: paragraphs 167 and 168).

3. Ground treatment/ground investigations

In paragraph 459, with reference to HS2 Ltd's proposal to treat to a depth of 2m under parts of the site, Mr Smart states *"We would only do that in certain areas, so that is not a two metre input across the whole of our embankments, and certainly not in the IMB-R, which is the infrastructure maintenance base rail."*

This statement would seem to demonstrate that Mr Smart is unfamiliar with the findings of HS2 Ltd's 2019 ground investigations and the apparent worsening of the poor ground conditions that has been revealed under the most vulnerable parts of the proposed Stone Railhead/IMB-R construction site and the adjacent mainline railway embankment.

The issue here is that Slide A20(23), which was sourced from HS2 Ltd's December 2019 report (Ref: P38(69)), shows the footprint that HS2 Ltd has assumed it will need to ground treat to a depth of 2m, but it does not include its own mainline railway embankment that abuts the Norton Bridge to Stone Railway. At this point the mainline railway embankment will be built to a height of 15m in the immediate vicinity of one of its own boreholes (CR107 (Ref: A20(22))), where a total 13m depth of alluvium and Head has been recorded.

Furthermore, as explained in my evidence (Ref paragraphs 150 and 155), three years after submitting its proposals with the Hybrid Bill, HS2 Ltd has only completed a very limited ground investigation of the Pool House Farm area and therefore does not know the full geographical extent of the area underlain by deeply lying alluvium and glacial material (known as Head).

In paragraph 465, Mr Smart explained the inadequate number and distribution of boreholes at this location, i.e. where the Stone Railhead/IMB-R will require the greatest amount of fill, by claiming that *“The reason there’s only five bore holes shown there is getting land access requirements, because we can’t at the moment get in to get the access, but we have a lot more site investigation planned.”*

This statement is not correct for a number of reasons that the committee should be aware of:

- The land that HS2 Ltd has been unable to gain access to is located to the south of the Norton Bridge to Stone Railway and not to the north of it, where Pool House Farm is situated.
- On Friday 18th September 2020, the owner of Pool House Farm and the land in question, told me that he has not prevented HS2 Ltd from gaining access to the footprint of the Stone Railhead/IMB-R (Ref: A20(21)) and that HS2 Ltd’s contractor (Structural Soils Ltd) had constructed all of the boreholes and trial pits that it wished to. He added that HS2 Ltd had planned one additional borehole to those drilled, but unilaterally decided not to proceed with it.
- Furthermore, and contrary to the claims made by Mr Smart in paragraph 466 and HS2 Ltd’s July 2020 HS2 report (Ref: paragraphs 3.6.3 and 3.6.4 on P38(191)), HS2 Ltd has not even approached the landowner to seek permission to access his land to drill the extra boreholes as part of the WP4 PGI, which is due to commence in October 2020.
- The landowner has also informed me that HS2 Ltd has not fulfilled its licence requirements for groundwater monitoring at the WP3 PGI boreholes completed in August 2019 or made the necessary access payments. HS2 Ltd has also not visited the site to record groundwater levels since March 2020 and has not completed the licence documentation for groundwater monitoring over the next two years.

It is therefore clear from the above that Mr Smart has misunderstood the current situation regarding the limited extent of ground investigations at the Stone Railhead/IMB-R. Furthermore, HS2 Ltd has had plenty of opportunity to undertake a comprehensive site investigation of the footprint of the Stone Railhead/IMB-R and has failed to do so, despite the desk study information indicating that poor ground conditions were very likely to occur in that area.

Mr Smart has also implied (in paragraph 465) that the poor ground conditions at Pool House Farm are related to a former landfill site. However, this is also not correct, with the landowner confirming to me that the landfilled area comprises a small former pool, which was infilled with arisings from nearby M6 motorway construction works undertaken in the early 1960s. The far bigger problem is the natural geology through the Filly Brook valley, about which I gave evidence (Ref paragraphs 146 to 160), and about which HS2 Ltd appears to be in denial.

In paragraph 466, Mr Smart refers to the much-repeated claim that *“We would be looking to treat as much of this in situ, either by soil mixing or other ground methods, permeation grouting*

etc.” However, as I made clear in my evidence (Ref: paragraph 159), HS2 Ltd has provided no evidence to support the idea that such a treatment method would work, especially given the available evidence regarding the extent and depth of poor ground underneath the site.

It is also clear from what Mr Smart says in paragraph 466 that HS2 Ltd has only allowed for the export of a very small quantity of contaminated material from the Filly Brook valley. Whilst we understand that this is its assumption, we also know (Ref: P38(18)) that HS2 Ltd has assumed that very large quantities of excavation waste will need to be exported from the Yarlet North and Central Cuttings via the Yarnfield North Embankment Transfer Node and that this excavation waste will mostly comprise Mercia Mudstone.

It is also clear from HS2 Ltd earthworks calculations that it has assumed that the average 2m depth of excavation waste, which will mainly comprise alluvium and Head, under the footprint of the Stone Railhead and adjacent mainline railway embankments can be retained on site as landscaping fill. This is a very risky assumption, as is the idea that only an average 2m depth needs removing from the footprint or that the very deep underlying poor ground can be strengthened by ground mixing.

4. Yarnfield North Embankment Transfer Node

In paragraph 470 Mr Smart tries to provide re-assurance that the transfer node will work, denying, with unconvincing reference to unknown contractors, that it would result in a ‘*carousel of chaos*’. However, he fails to provide an answer to the central question of how it would be able to cope with one HGV arriving every 30 seconds, whilst only being able to dispatch one, even in the most efficient operation, at a rate of one every 10 minutes or more, other than claiming that there is room to hold some lorries in the transfer node.

What is also very concerning is that Mr Smart seems to have misunderstood what types of vehicles use which types of road on HS2 Ltd’s construction sites. He suggests that articulated dump trucks (ADTs) will be confined to the railway corridor or ‘*trace*’, but this is incorrect.

This is evident from HS2 Ltd’s own slide (P38(20)), which I referred to instead of A20(14) in my evidence (Ref: paragraph 132), because ADTs will need to deliver excavation waste to the Yarnfield North Embankment Transfer Node or be loaded with granular material imported into it for onward transportation to the individual construction sites along the trace at a rate of up to one every minute. Accordingly, this will entail ADTs operating on the same roads within the transfer node as the HGVs accessing the site from the local road network, including the M6. This, together with the endless circling of both types of vehicles within the transfer node will only exacerbate the operational problems of the site, especially during adverse weather conditions, and inevitably will lead to operational collapse of the transport logistics process.

HS2 Ltd is also likely to encounter similar problems at other transfer nodes along the route of Phase 2a and especially of those being supplied with excavation waste from the Yarnfield North Embankment Transfer leading to further inefficiency, project delay and cost overruns.

Furthermore, and as I have explained (Ref: paragraphs 144 and 145), HS2 Ltd has refused to rule out ADTs travelling on unsurfaced haul roads from Swynnerton North Cutting, using the existing Yarnfield Lane and M6 overbridge, together with the connecting road to the northbound M6 roundabout to access the Yarnfield North Embankment Transfer Road. This would involve HGVs and ADTs using the same road over a distance of approximately 1km, with the resultant health and safety risks to the drivers of those vehicles, as well as potential

users of the northbound M6 from the dirt and debris that would be deposited by HS2 HGVs on the northbound motorway carriageway.

5. Response to Mr Gould's railway evidence regarding the Stone IMB-R

In paragraph 485, Mr Smart stated that *"Mr Gould misunderstood my evidence. When I refer to a freight railway, I said that we would be bringing in trains at night when it is operating as a freight railway, because of course it has three trains up and down; it has six."*

However, Mr Gould quoted (Ref: paragraphs 366 and 367) directly from the exchanges in Hansard from 25th April 2018. It is clear from this written record that Mr Smart made no attempt to correct Mr Martin's misunderstanding of the status of the Norton Bridge to Stone railway, despite his attempt last Tuesday to reinterpret his remarks from that time.

In addition, in the last sentence of paragraph 485, Mr Smart states *"Ballast at the challenges we've got is a challenge, which is why we are not using ballasted track form. We are on slab track."*

He then goes on to say in paragraph 486 *"Therefore, we do not need to bring the ballasted trains into Stone. We would use it for our railhead for fit out, for rail systems, when we're bringing in long welded rail and maybe other componentry, to minimise traffic on the roads."*

These statements strongly suggest that Mr Smart has not distinguished between the use of the Stone facility as a construction railhead, whose purpose is only to 'fit out' the Phase 2a railway, and as an IMB-R. However, it should have been clear to him that Mr Gould's evidence is entirely about the latter, i.e. once the HS2 railway is operating, when the Stone IMB-R will be used in perpetuity as a maintenance base.

It is also important to note that it has always been HS2 Ltd's clear intention to use the Stone IMB-R to maintain both Phase 2a and Phase 2b (West). However, whilst Phase 2a is to be constructed from slab track, Phase 2b is to be constructed using ballasted track. Because of this fact, which is confirmed in the last paragraph on page 4 of HS2 Ltd's letter dated 1st September 2020 (Ref: P38(212)), Phase 2b will need significantly more maintenance than Phase 2a over the projected 120 to 150-year lifespan of the project.

Mr Gould also made this absolutely clear throughout his presentation (Ref: paragraphs 369 to 379) and provided compelling evidence, as he did on 25th April 2018, that the Stone IMB-R cannot accommodate 800m ballast trains. Instead, it could only be supplied by two 400m long ballast trains requiring two train paths (not one), which would need to be joined together to create an 800m long train on separate sidings located next to the HS2 mainline itself.

We also believe that it is this evidence that led HS2 Ltd to rethink its position over permanent maintenance facilities on Phase 2b (West). Consequently, in June 2019 as part of its design refinement consultation for Phase 2b, the company announced that it was proposing to construct separate railhead and IMB-R facilities near to the village of Ashley (Ref: A20(30)) 3km to the west of Manchester airport. However, we believe that such facilities would not be required if Aldersey's Rough was part of the Phase 2a scheme, and that this would potentially save the Government and UK taxpayer another £500 million in construction costs at Ashley.

This is in addition to the £92.9 million of savings and three years of construction time identified by Mr Byng as the benefit that will be achieved if the Phase 2a Railhead/IMB-R is built at Aldersey's Rough instead of Stone. It also does not include the £millions of annual running

cost savings that we would also expect to be achieved throughout the lifetime of the project from making this change to the proposals.

Finally, in addition to the details we have outlined above, we have encountered many such inaccuracies in HS2 Ltd's evidence over several years and at various stages of the process. This leads us to have serious reservations about the assumptions and engineering calculations that underpin the company's plans for the Stone Railhead/IMB-R and explains why we believe that its continued inclusion in the Phase 2a project will threaten the viability of the entire Phase 2a project.

Thank you for upholding the democratic process that allowed our local councils to be heard.

Yours sincerely,



Trevor Parkin
Engineering and Environmental Lead for the Stone Railhead Crisis Group