

# HS2

High Speed Rail (London –West Midlands)  
Act 2017

HS2 Ltd

Warwick District Council

Dalehouse Embankment and Finham Brook Viaduct  
Schedule 17 Plans and Specifications Written  
Statement for Information

WAC.PS.10022

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# 1 Introduction

## 1.1 Background Information

Table 1: Schedule 17 Address Details and Description of Works

Site	Details
Scheme	High Speed Two
Applicant	High Speed Two (HS2) Limited
Applicant Address:	<i>c/o Agent:</i> Balfour Beatty Vinci JV (BBV) IM House South Drive, Coleshill Manor, Coleshill, West Midlands, B46 1DF
Site Address	The works are located at; X (Easting): 430954.05, Y (Northing): 273336.21
Descriptor	Plans and Specifications submission under Schedule 17 to the High Speed Rail (London –West Midlands) Act 2017 for works comprising: <ul style="list-style-type: none"> <li>• Dalehouse Embankment, composed of earthworks with ground improvements measuring 55m in length with a maximum width of 35m and maximum height of 5m.</li> <li>• Finham Brook Viaduct which is a 50m long viaduct structure carrying the railway over Finham Brook.</li> <li>• A 2m high noise barrier and a 2.1m high acoustic parapet.</li> <li>• 1.8m high security fence.</li> <li>• Earthworks to form a drainage ditch along the toe of the northern slope of the embankment with a concrete slab ford to accommodate vehicle crossing.</li> </ul>

## 1.2 Terms of Reference

1.2.1 This Written Statement is compiled in accordance with the High Speed Two (HS2) Phase 1 Planning Memorandum and Planning Forum Notes (PFNs) as required by the planning regime established under Schedule 17 of the High Speed Rail (London – West Midlands) Act 2017 ('the Act').

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1.2.2 This statement provides Warwick District Council with information to assist with the determination of the Plans and Specifications submission under Schedule 17, in relation to the above description of works.

1.2.3 The information in this Written Statement is provided for information to assist in determining the request for approval. It is not for approval.

## 1.3 Introduction to High Speed 2

1.3.1 HS2 is a new high speed railway network that will connect major cities in Britain. It will bring significant benefits for inter-urban rail travellers through increased capacity and improved connectivity between London, the Midlands and the North. It will release capacity on the existing rail network and so provide opportunities to improve existing commuter, regional passenger and freight services.

1.3.2 Phase One of HS2 will provide a dedicated high speed rail service between London, Birmingham and the West Midlands. It will extend for approximately 230km (143 miles). Just north of Lichfield, high speed trains will join the West Coast Main Line for journeys to and from Manchester, the North West and Scotland.

1.3.3 For further information on HS2 and the route through Warwick District please refer to the Planning Context Report for Warwick District Council, deposited with the Council by HS2 Ltd.

## 1.4 High Speed Rail (London –West Midlands) Act 2017

1.4.1 The High Speed Rail (London –West Midlands) Act 2017 ('the Act') provides powers for the construction and operation of Phase 1 of High Speed Two. HS2 Ltd is the nominated undertaker in relation to the works subject to this Plans and Specifications submission.

1.4.2 Section 20 to the Act grants deemed planning permission for the works authorised by it, subject to the conditions set out in Schedule 17. Schedule 17 includes conditions requiring the following matters to be approved or agreed by the relevant LPA.

- Construction arrangements (including large goods vehicle routes);
- Plans and specifications;
- Bringing into use requests; and
- Site restoration schemes.

- 1.4.3 This is therefore a different planning regime to that which usually applies in England (i.e. the Town and Country Planning Act) and is different in terms of the nature of submissions and the issues that the LPAs can have regard to, in determining requests for approval.
- 1.4.4 Schedule 17 of the Act sets out the grounds on which the LPA may impose conditions on approvals, or refuse requests for approval.
- 1.4.5 This Written Statement includes information supporting the Plans and Specifications submission in relation to the matters outlined in **Table 2** below.

Table 2: Schedule 17 Plans and Specifications Submission Details

Site	Details
Plans and Specifications (permanent works)	<ul style="list-style-type: none"> <li>• Dalehouse Embankment, composed of earthworks with ground improvements measuring 55m in length with a maximum width of 35m and maximum height of 5m.</li> <li>• Finham Brook Viaduct which is a 50m long viaduct structure carrying the railway over Finham Brook.</li> <li>• A 2m high noise barrier and a 2.1m high acoustic parapet.</li> <li>• 1.8m high security fence.</li> <li>• Earthworks to form a drainage ditch along the toe of the northern slope of the embankment with a concrete slab ford to accommodate vehicle crossing.</li> </ul>

- 1.4.6 The works to which this application relates, and the cumulative impact of the works in conjunction with other HS2 development, have been assessed and are compliant with paragraph 1.1.3 (bullet point 2) of the HS2 Phase 1 Environmental Minimum Requirements General Principles<sup>1</sup>.

## 1.5 High Speed Two: Code of Construction Practice

- 1.5.1 HS2 Ltd as the nominated undertaker is contractually bound to comply with the controls set out in the Environmental Minimum Requirements (EMRs). The EMRs include the High Speed Two Code of Construction Practice (CoCP).

<sup>1</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/618074/General\\_principles.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/618074/General_principles.pdf)

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1.5.2 The works subject to this request for approval of Plans and Specifications will be undertaken in accordance with the Code of Construction Practice, and with the Class Approval issued by the Secretary of State (March 2017)<sup>2</sup>.

## 1.6 Schedule 17 Statutory Guidance

1.6.1 The Schedule 17 Statutory Guidance issued by the Secretary of State (April 2021)<sup>3</sup> provides guidance to all planning authorities determining requests for approval under Schedule 17 to the Act. Paragraph 20 of the Statutory Guidance states that planning authorities should not through the exercise of Schedule 17 seek to modify controls already in place such as the Environmental Minimum Requirements, other controls in the Act such as those under Schedule 4 or 33, or existing legislation.

## 1.7 Structure of Written Statement

1.7.1 This Written Statement is structured as follows:

- A description of the location and main characteristics of the works area is provided in **Section 2**;
- **Section 3** describes the main works being undertaken in the area, as set out in Schedule 1 of the Act, and those that are the subject of this Schedule 17 Plans and Specifications submission;
- The design criteria and rationale for the works which are the subject of this Schedule 17 Plans and Specifications submission are described in **Section 4**;
- **Section 5** summarises the pre-submission consultations that were undertaken, including a list of the consultees, dates, attendees at meetings and a brief summary of the outcome of these discussions;
- A high level programme for the works and how they fit into the wider programme for other works in the area, as set out in Schedule 1 of the Act, is provided in **Section 6**; and
- **Section 7** identifies any other main consents, or known forthcoming consents associated with the works.

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<sup>2</sup> [High Speed Rail \(London to West Midlands\) Act 2017: class approval –GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/high-speed-rail-london-to-west-midlands-act-2017-class-approval)

<sup>3</sup> <https://www.gov.uk/government/publications/high-speed-rail-london-to-west-midlands-act-2017-schedule-17-statutory-guidance/high-speed-rail-london-west-midlands-act-2017-schedule-17-statutory-guidance>

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## 2 Site Location and Characteristics

### 2.1 Site Location

- 2.1.1 Dalehouse Embankment and Finham Brook Viaduct will be located approximately 2.5km east of Kenilworth in an area of open fields immediately north of Dalehouse Lane and the Kenilworth Golf Course. The site and the surrounding area are predominantly agricultural with a few residential properties on Dalehouse Lane.
- 2.1.2 Finham Brook Viaduct will cross over Finham Brook and Dalehouse Embankment will be located in close proximity to the eastern boundary of Dalehouse Farm which is an existing residential property with a minor access road that crosses the brook on a small bridge.
- 2.1.3 The area to the north of the site is characterised by open fields and agricultural uses. The University of Warwick campus is located approximately 3km north of the site and includes Tocil Wood and Nature Reserve which is a designated Ancient & Semi - Natural Woodland.
- 2.1.4 Wainbody Wood lies immediately adjacent to the A429/Coventry Road in Gibbet Hill approximately 2.4km north of the site and has also been designated as an Ancient & Semi-Natural Woodland.
- 2.1.5 Coventry is the largest major settlement in proximity of the site and is located approximately 6.5km to the northwest of the site, however the suburbs of Green Lane and Finham are approximately 3.5km to the northeast. Coventry Airport is located approximately 5km to the northeast of the site.
- 2.1.6 Stoneleigh is a minor settlement located approximately 2.5km to the East of the site with a mix of residential and local convenience retail developments and the Stoneleigh Deer Park Golf Club. Stoneleigh Park Estate is located to the south of Stoneleigh and comprises recreational amenities and events spaces for agricultural and trade shows.
- 2.1.7 There are no statutory designated heritage sites within the site area. The nearest designated sites are Dale House Farmhouse (STN042), approximately 65m to the west. The non-designated Millburn Grange (STN045) is situated approximately 600m to the north west and Dale House, Dalehouse Lane (STN040) approximately 170m to the east. The site is situated within the non-designated Crackley Assarted Woodland (STN106), a Historic Landscape.



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## 2.2 Surrounding Highway Network

- 2.2.1 Dalehouse Embankment and Finham Brook Viaduct are located immediately north of Dalehouse Lane which is a dual carriageway running between Stoneleigh Road in the East and Kenilworth to the West where it becomes Mill End. There is a minor access track to Dalehouse Farm crossing Finham Brook from Dalehouse Lane.
- 2.2.2 The A46 runs roughly on a southwest-northeast axis approximately 1km southeast of the site. The A46 is a dual carriageway with a divided median, with 3 lanes traveling in each direction. The B4115 is a dual carriageway which runs roughly parallel to the A46 and provides access to Kenilworth and Stoneleigh via Crewe Lane and Stoneleigh Road.
- 2.2.3 The A429/Coventry Road is located approximately 1km north of the site and is a dual carriageway connecting Kenilworth and Coventry.
- 2.2.4 Stoneleigh Road is approximately 1.3km east of the site and runs roughly on a north-south axis between the University of Warwick Campus in the north and Stoneleigh in the south.

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## 3 Description of the Works

### 3.1 Introduction

- 3.1.1 This Written Statement supports the Schedule 17 submission for the approval of plans and specifications for Dalehouse Lane Embankment and Finham Brook Viaduct in the vicinity of Kenilworth.
- 3.1.2 The Plans and Specifications submitted for approval are listed in the pro-forma accompanying the application. A summary of the proposed works for approval is provided in Section 3.2 below.
- 3.1.3 Section 3.3 summarises the indicative mitigation relevant to the works being submitted in accordance with paragraph 7.5.2 of the Planning Memorandum.
- 3.1.4 Sections 3.4 –3.6 provide information on other aspects of the works to assist in understanding the context of the works being submitted for approval. The information in Sections 3.4- 3.6 is not for approval under Schedule 17.

### 3.2 Works for Approval

- 3.2.1 The relevant scheduled works as set out under Schedule 1 of the Act to which this Schedule 17 submission relates are:

*County of Warwickshire, District of Stratford-on-Avon, Parishes of Long Itchington and Ufton, District of Warwick, Parishes of Offchurch, Cubbington, Weston under Wetherly, Stoneleigh, Kenilworth and Burton Green, Metropolitan Borough of Solihull, Parish of Berkswell—*

- *Work No. 2/146 - A railway (21.57 kilometres in length) partly in tunnel and partly on viaduct commencing by a junction with the termination of Work No. 2/133 and passing north-westwards and terminating at a point 270 metres north-west of the bridge carrying Waste Lane over Kenilworth Greenway. Work No. 2/146 includes viaducts over the River Leam, Finham Brook and Work No. 2/175 and bridges over the Grand Union Canal, Work No. 2/151 and the River Avon.*

- 3.2.2 The works submitted for approval comprise Dalehouse Embankment and Finham Brook Viaduct. Dalehouse Embankment is an embankment approximately 55 metres long, composed of earthworks that forms the approach ramp to Finham Brook Viaduct. The viaduct is a 50 metre long concrete structure carrying the railway over Finham Brook to Finham Brook Embankment, which will be consented through a separate Schedule 17 submission (see details in Table 3).

- 3.2.3 The proposed works are shown on the General Arrangement Plan, drawing number 1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141301.
- 3.2.4 The works submitted for approval will link to Kenilworth Cutting to the north and Finham Brook Embankment to the south.
- 3.2.5 Adjacent works in this area that are also subject to a Schedule 17 submission are outlined in Table 3, below.

Table 3: Other Schedule 17 submissions for works in the surrounding area

Asset Name	HS2 Reference Number	Local Authority Submission Reference No.
Kenilworth Cutting (to the north)	000001131	WAC.PS.10007
Finham Brook Embankment (to the south)	000001128	WAC.PS.10066
Glasshouse Wood Cutting	000001127	WAC.PS.10037
Dalehouse Lane Overbridge	000001485	WAC.PS.10042

## Earthworks

### Dalehouse Embankment

- 3.2.6 Dalehouse Embankment is comprised of earthwork slopes and landscape bunds on either side of the railway. This embankment is approximately 55metres long with a maximum width of approximately 35m at the point where it meets Finham Brook Viaduct and a maximum height of approximately 5m. The embankment has engineered slopes of 1V:2H gradient which transitions to 1V:1H where landscaping is present.
- 3.2.7 The earthworks associated with Dalehouse Embankment will also include ground improvement works and a drainage ditch along the eastern perimeter of the embankment which takes runoff from the earthwork to Finham Brook. Scour protection will be provided in the area where the drainage ditch discharges into Finham Brook. The Scour protection will have a riprap (loose stones used to form a foundation for a breakwater or other structure) finish. The drainage ditch will be 36.6m long, 500mm deep with a base width of 300mm and 1:1 side slope.
- 3.2.8 The drainage perimeter ditches at Dalehouse Embankment accommodate vehicle crossing through the use of a ford. This comprises a small diameter pipe linking the

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ditches either side of the ford and a V-shaped concrete slab above the pipe to allow vehicles to cross. The concrete slab remains dry under normal conditions as the small diameter pipe can convey dry weather flow. If this pipe is overwhelmed during a storm, water can spill over the ford without preventing vehicles crossing, however, they should proceed with caution.

### **Maintenance Access Strip**

- 3.2.9 Minor earthworks (less than 500mm) will be used to form maintenance access strips (MAS) that will run adjacent to the land drainage ditch around Dalehouse Embankment.
- 3.2.10 The maintenance access strips are 3m wide and will be made from topsoil with a grass surface. The MAS includes a turning head at each end to accommodate one small vehicle. The MAS's and the associated parking bay / turning head have been designed in accordance with HS2 technical standards and will be used only for HS2 maintenance purposes at a low frequency. It will have no impact on road safety.
- 3.2.11 The earthworks for the MAS are negligibly small and are only required to accurately tie the MAS into existing ground level. In essence, the MAS is designed at existing ground level and is therefore not for approval in this submission.

### **Structures**

- 3.2.12 The works submitted include Finham Brook Viaduct which is a 2-Span reinforced concrete viaduct carrying HS2 Tracks over Finham Brook watercourse. The viaduct comprises of a 50m long and 13.2m wide reinforced concrete I-beams with a reinforced concrete slab. The viaduct will have an overall total height of approximately 7.4m from ground level to the top of the parapet. The structure is supported on bearings above reinforced concrete abutments and a central pier to provide 2 x 25m spans.
- 3.2.13 The structure has parapets on either side of the railway along the entire viaduct length. The parapets on the eastern side of the viaduct are approximately 1.1m high and follows the HS2 Common Design Element (CDE) principles. The external face of the parapet contains a crease detail on the bottom third of its total height. For long distance views the crease provides a shadow/light effect, thereby reducing its visual bulk and making the parapet appear slender. Practically, it also promotes water run-off, reducing the risk of staining. The parapet on the western side of the alignment incorporates a noise absorptive panel and is approximately 2.1m high. It is therefore not CDE compliant but follows the same architectural style and language in terms of a crease detail on the bottom part of the parapet. The noise parapet is required in

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this location to mitigate noise impacts, see section 3.3 below on further information regarding noise mitigation. The parapets will be precast concrete F3 / F4 finish.

- 3.2.14 In addition, concrete robust kerbs will be installed on either side of the railway along the entire viaduct length as an additional safety feature. The top of robust kerbs extends at least 350mm above the adjacent low rail level.
- 3.2.15 The pier will be concrete in an F3 / F4 finish and will be constructed in-situ. The pier comprise Common Design Elements agreed by the Phase 1 Planning Forum on 26th November 2020 Planning Forum Note (PFN 15). Scour protection with a riprap stone finish will be provided around the pier.
- 3.2.16 A description of the finishes for the structure is provided in the accompanying materials schedule –document reference: 1MC08-BBV\_MSD-PL-SCH-NS01\_NL03-100003.

### Noise Barriers

- 3.2.17 The noise demonstration report for the Stoneleigh, Glasshouse Wood, Canley area, 1MC08-BBV\_MSD-EV-REP-NS01\_NL03-100088, shows that reasonably practicable measures need to be taken for the purpose of mitigation of the effect of operational noise to meet the objectives set out in HS2 Planning Forum Note (PFN) 14 at Finham Brook Viaduct and Dalehouse Embankment. The report proposes the following noise mitigation measures: a 2.1m high acoustic parapet (downside) along the western length of Finham Brook viaduct and a 2m high noise barrier (downside) at Dalehouse Embankment on the western side of the tracks. Noise mitigation measure heights are given with reference to the top of rail height.
- 3.2.18 The acoustic parapet on Finham Brook viaduct is formed of pre-cast reinforced concrete panels which are post-fixed to the viaduct. The parapets include an absorptive acoustic layer attached to the trackside face which provide mitigation of airborne noise.
- 3.2.19 The noise barriers on Dalehouse Embankment located west of the tracks, will be formed of pre-cast concrete panels fixed in place at 4m centres with structural steel columns. Each column is individually supported on a pile and pile cap foundation. The trackside face of the noise barrier includes an absorptive acoustic layer which provides mitigation of airborne noise.

### Fences and walls

- 3.2.20 A type 3 security fence will be provided around Dalehouse Embankment to prevent unauthorised access to the tracks. The type 3 fence comprises of a protective coated

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1.8m high welded mesh fencing with three strands of barbed wire above (total height of 2.13m) in accordance with BS 1722-14.

### 3.3 Indicative Mitigation

- 3.3.1 The Planning Memorandum (paragraph 7.5.2) states: *'When designs of HS2 works are submitted for approval, the nominated undertaker shall, where reasonably necessary for the proper consideration of the design proposed, provide an indication or outline of the appropriate mitigation measures (if any) which it intends to submit subsequently under paragraphs 9 or 12 of the Planning Conditions Schedule..'* and *'...While not material to approvals under paragraph 2 or 3, this information will provide reassurance in advance of the request for approval under paragraph 9 that the mitigation is appropriate, and will present an opportunity to raise concerns.'*
- 3.3.2 Details of the indicative mitigation relevant to the design proposed in this application are shown on the Landscape and Environmental Masterplan (Drawing No. 1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141305).
- 3.3.3 The Council's views on the indicative mitigation have been requested separately to this application. A letter (Document reference 1MC08-BBV\_MSD-PL-CRO-NS01\_NL03-100014) providing a summary of the indicative mitigation has been included in this application package.
- 3.3.4 Details of planting and soft landscaping do not require approval of plans and specifications under paragraphs 2 or 3 of Schedule 17.
- 3.3.5 The mitigation will comprise part of the overall mitigation scheme in relation to the scheduled works listed in section 3.2 above.

#### Noise

- 3.3.6 Paragraph 7.5.2 of the Planning Memorandum, states: *'..Where the works for approval will have a mitigating effect in relation to operational noise from the railway or new roads, the nominated undertaker will provide information to show, so far as is reasonably practicable at that stage in the design process, how the noise mitigation performs and the expected conditions. While not material to approvals under paragraph 2 or 3, this information will provide reassurance in advance of the request for approval under paragraph 9 that the mitigation is appropriate and will present an opportunity to raise concerns.'*
- 3.3.7 A noise demonstration report, (reference 1MC08-BBV\_MSD-EV-REP-NS01\_NL03-100088), has been produced to accompany the Schedule 17 application that provides this information and includes the following:

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- a) A description of the works;
  - b) Plans showing the location of the works, the surrounding environment and receptor positions;
  - c) Details of the methodology used in predicting noise and vibration levels;
  - d) Assumptions relating to the acoustic performance of rolling stock and track;
  - e) Assumptions relating to the acoustic performance of the work, such as long-term acoustic performance, transmission, sound absorption/reflection, sound diffraction; and
  - f) Tables setting out the predicted levels of noise and vibration and tabulated predictions at all individual receptors where LOAEL<sup>4</sup> is likely to be exceeded.
- 3.3.8 Any predicted levels of noise provided in line with item f) above, that could be 'environmentally significant' will be identified.
- 3.3.9 The noise report will set out how the works reduce operational noise 'as far as reasonably practicable'.
- 3.3.10 At the time of the ES there were one major, two moderate and seven negligible daytime impacts, and one major, two moderate and 63 negligible night-time impacts at residential receptors above  $L_{pAeq}$  LOAEL. There were also three receptors where the  $L_{pAFm\ ax}$  was at or greater than SOAEL (assessment location ID 229088/OSV18-D01, and ID 226073/OSV18-D02), and 395 receptors where the  $L_{pAFm\ ax}$  was at or greater than LOAEL. No significant adverse impacts at non-residential receptors have been reported.
- 3.3.11 Information Paper E20 outlines the measures that are required to be put in place to control operational airborne noise. It sets out various objectives to minimise operational noise effects as summarised below.
- 3.3.12 HS2 and their contractors will take all reasonable steps to design and construct the scheme so that the combined airborne noise predicted, in all reasonably foreseeable circumstances (ARFC), does not exceed the lowest observed adverse effect level (LOAEL) at residential receptors.
- 3.3.13 Where it is not reasonably practicable to achieve this objective, HS2 and their contractors will reduce airborne noise as far as is reasonably practicable (AFARP).

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<sup>4</sup> The Lowest Observed Adverse Effect Level as set out in Table 1 of Information Paper E20 as 50 dB  $L_{pAeq,16hr}$  daytime (0700 –2300), 40 dB  $L_{pAeq,16hr}$  night (2300-0700), 60 dB  $L_{pAFmax}$  (at the façade, from any nightly noise event) at night ( 2300-0700).



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- 3.3.14 HS2 and their contractors are required to consider the following measures to control operational noise, ranked in order of desirability:
- Reduce noise generation at source;
  - Reduce noise propagation through noise barriers and/or landscape earthworks; and
  - Reduce the amount of noise entering eligible properties through the offer of noise insulation.
- 3.3.15 Noise insulation will be offered with the aim that operational airborne noise from the scheme does not give rise to significant adverse effects on health and quality of life that would otherwise be expected when airborne noise exceeds the significant observed adverse effect levels (SOAEL) at residential receptors.
- 3.3.16 There are no noise related undertakings and assurances (U&As) that are specifically applicable to Dalehouse Embankment and Finham Brook Viaduct.
- 3.3.17 HS2 and their contractors are required to consider a list of potential mitigation measures and undertake a proportionate Cost Benefit Analysis (CBA) and consider all relevant acoustic and non-acoustic costs and benefits including:
- Monetary benefit of noise reduction compared to cost (a qualitative comparison of the health and environmental benefit of the noise reduction provided compared to the long-life cost of the mitigation);
  - Engineering practicability (for example the practicability of a tall noise fence barrier on the shoulder of a tall railway embankment);
  - Impacts on other environmental disciplines, including landscape and visual (for example the potential for materially worsened landscape and visual impacts associated with taller noise fence barriers or landscape earthworks, or other conflict with the principles of the HS2 Design Vision); and
  - Consultation and stakeholder engagement responses (for example a stated preference for a noise barrier in the form of landscape earthworks rather than a fence, or reduced noise barrier heights to reduce visual impact).
- 3.3.18 It is noted that the NDR that accompanies this Schedule 17 application uses chainage references from the PMA 2.0 (Project Major Alignment) design stage and chainage values that are rounded to the nearest 5m. The chainage values on drawings that accompany this application and the text set out in paragraph 3.3.18 use the more recent PMA 3.0 references that have slightly different chainage values for the same location but there is a variable offset between the two sets of a chainage design stage of a few metres. The barriers are proposed in the same physical location and



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the noise levels and assessment are unchanged, but the chainage values differ slightly.

- 3.3.19 The noise demonstration report for the Stoneleigh, Glasshouse Wood, Canley area, 1MC08-BBV\_MSD-EV-REP-NS01\_NL03-100088, shows that reasonably practicable measures need to be taken for the purpose of mitigation of the effect of operational noise to meet the objectives set out in HS2 Planning Forum Note (PFN) 14 at Finham Brook viaduct and Dalehouse embankment. The report proposes the following noise mitigation measures: an acoustic parapet (downside) between chainages 141+355 to 141+420 at 2.1m, and a noise barrier (downside) between chainages 141+420 to 141+643 at 2m. Noise mitigation measure heights are given with reference to the top of rail height.

### Ecology

- 3.3.20 The existing habitats present within the footprint of the proposed Dalehouse Embankment and Finham Brook Viaduct consists of poor semi-improved grassland (assessed within the HS2 Phase 1 Environmental Statement (ES) (Volume 5: Ecology) as being of negligible value for biodiversity). The Warwickshire, Coventry and Solihull Local Biodiversity Action Plan (LBAP) lists rivers and streams as priority habitats and Finham Brook, which runs beneath the proposed viaduct, is assessed as being of district/borough value.
- 3.3.21 Bat activity surveys completed to support the ES found Finham Brook was a bat foraging area and supports a bat commuting route. A hibernation bat roost, a maternity roost and two day roosts have been recorded at Dalehouse Farm (to the south of Dalehouse Embankment), in buildings between 16m and 60m south of the asset. Roosts recorded include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, and serotine *Eptesicus serotinus*.
- 3.3.22 Populations of otter *Lutra lutra* of district/borough importance are present within the River Avon catchment, including both upstream and downstream of the railway along Finham Brook. A natal holt was identified approximately 35m north of the proposed viaduct, outside of the land required for construction of the railway, and areas of terrestrial habitat were also identified within the footprint of the asset.
- 3.3.23 Water vole *Arvicola amphibius* presence has also been confirmed along Finham Brook approximately 76m north of the assets.
- 3.3.24 An assemblage of fish of district/borough importance has been identified within the Canley Brook (upstream of railway crossing). Species identified included brown trout, a species of principal importance, and bullhead, a species of conservation interest.

3.3.25 Ponds supporting populations of great crested newt *Triturus cristatus* are located within 500m of the asset.

3.3.26



3.3.27 The following measures included in the design to mitigate impacts to the above habitats and species:

- Continuous woodland planting along the HS2 rail alignment has been designed to provide linear features to guide bats, badgers and other species to safe crossing points.
- Detailed design will maintain the floodplain connection to the Finham Brook and include enhancement of the riparian habitat. The avoidance of in-channel structures associated with the viaduct will prevent impacts to watercourse habitat, form and function and minimises impacts to fish species as well as otter and water vole.
- The viaduct provides approximately 2.8m headroom above the 'normal' water level (Qmed) to allow bats safe passage beneath the viaduct. Most bat species will fly beneath the structure by following the watercourse whilst the higher flying noctule, Leisler's and serotine are likely to navigate over the viaduct. Although there is a risk of individual bats being killed or injured by collision with trains, the risks are likely to be minimal and are unlikely to result in significant effects on the conservation status of any of the bat species concerned.
- The viaduct is approximately 13.2m wide and will allow dry passage for other species beneath the span, including otter and badgers.
- It will be possible for great crested newts (as well as other amphibians and reptiles) to pass freely beneath the HS2 tracks. Solid manhole covers will be provided for all catchpits along track drainage to prevent entrapment of these species.

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the track at this location and to guide them to the crossing point beneath Finham Brook Viaduct. The fencing shall extend at least 1500mm above ground with an additional 300mm at the top aligned outwards at a 45-degree angle. The fencing shall be firmly attached to, or incorporated into, a concrete sill, or extended

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below ground for a minimum of 300mm and with a return of at least 300mm. This is to be incorporated into the security fence.

- No bat roosts at Dalehouse Farm are planned to be lost but woodland planting and noise fences alongside the railway alignment will help to reduce disturbance.

### Landscape

3.3.28 The planting and seeding species selection are currently being considered: it is not possible to confirm these at the current stage of design. To inform this submission, the process by which the planting typologies and palette are determined is as set out below.

3.3.29 The basis of the designs are the character and species mixes of the existing vegetation found in the locale. For example, if the local landscape character is of small copses and fields bounded by clipped hedgerows with intermittent trees then the landscape design will aim to introduce planting of similar character.

3.3.30 The typologies will be broken down into subsets to better represent their makeup. Thus, mitigation planting shown as “woodland” can become woodland edge, woodland core, high woodland, scrub, shrubs, wet woodland etc, depending on various factors such as position in relation to the railway or roads, soil, levels of moisture, aesthetic consideration, ecological or screening function. Species selection is based on the relevant National Vegetation Classification (NVC) plant community categories for the area. The Phase 1 Habitat Survey and any local surveys will be used to add further native species to these generic communities.

### Built Heritage

3.3.31 Background monitoring of baseline vibration will be carried out on Dale House Farmhouse and buildings included in its curtilage (GAH ref: A1N1-EWC-1100). The design takes into account the setting of Dale House Farmhouse and the other heritage assets in the vicinity. Planting and earthworks are used to minimise as far as possible any visual impacts to the setting of the heritage assets. Noise mitigation in the form of a noise barrier and an acoustic parapet are used to mitigate noise impacts that might affect the character of the heritage assets.

### Archaeology

3.3.32 Intrusive survey works and trial trenching have been undertaken by Early Works Contractors (EWC), as outlined in the Location Specific Written Scheme of Investigation for Trial Trenching (Document Number: 1EW04-LMJ-EV-MST-NS01\_NL03-029002) and Project Plan for Trial Trenching (Document Number:

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1EW04-LMJ-EV-MST-NS01\_NL03-029004). The works were completed in December 2020.

3.3.33 Details of the indicative mitigation relevant to the design proposed in this application are shown on the following drawings:

- General Arrangement Plan (1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141301)
- Landscape and Environmental Masterplan (1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141305)

## 3.4 Construction Method

3.4.1 The works subject to this request for approval of Plans and Specifications will be undertaken in accordance with the HS2 Code of Construction Practice and the Class Approval issued by the Secretary of State (March 2017).

3.4.2 This section summarises the general construction methodology and the main temporary works arrangements. The arrangements described may alter, are for information and background only and do not form part of this request for approval.

### Dalehouse Embankment

3.4.3 It is anticipated that the embankment will be constructed in the following high level sequence:

- Temporary drainage and haul road;
- Topsoil stripping and preparation of piling platforms;
- Rigid inclusions (a ground improvement method to reduce settlement and increase bearing capacity);
- Construction of the embankment itself;
- Track drainage and noise barriers;
- Construction of the prepared subgrade; and
- Construction of the protection layer.

### Finham Brook Viaduct

3.4.4 It is anticipated that the viaduct will be constructed via bottom up methodology in the following high level sequence:

- Temporary drainage and haul road;
- Topsoil stripping and preparation of piling platforms;

- Piling works for pier and abutments;
- Construct pilecaps and elevations for pier and abutments;
- Backfill around pier;
- Install precast beams;
- Construct the deck and crossbeams;
- Technical backfill around abutments; and
- Install parapets, robust kerbs, walkway, drainage.

3.4.5 The temporary construction compound that will manage the construction of Dalehouse Embankment and Finham Brook Viaduct will be:

- A46 Kenilworth Bypass Overbridge Main compound

3.4.6 Approval for LGV/HGV routes have been sought from the local authority by the Early Works Contractors.

## 3.5 Historic Environment

3.5.1 As set out within the HS2 Heritage Memorandum (part of the HS2 Environmental Minimum Requirements), a route-wide generic written scheme of investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS) has been prepared in consultation with Historic England (HE) and the local planning authorities along the route. It sets out the research framework and general principles for design, evaluation, investigation, recording, analysis, reporting and archive deposition to be adopted for the design development and construction.

3.5.2 The HS2 Heritage Memorandum also sets out how the historic environment (including heritage assets and their setting) will be addressed during design. The HS2 Environmental Memorandum sets out the approach to landscape and visual mitigation which takes account of the historic environment.

3.5.3 The arrangements for the management of archaeology during construction are not a matter for approval under Schedule 17.

3.5.4 Relevant documents relating to this WP 029B Kenilworth to Balsall Common Written Statement include:

- Project Plan for Trial Trenching (Document Number: 1E04-LMJ-EV-PLN-NS01-NL03-029004). Engagement with the Warwickshire County Archaeologist took place on 24/09/2018, with comments received and amendments made on 08/10/2018.

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- Location Specific Written Scheme of Investigation for Trial Trenching (Document Number: 1EW04-LMJ-EV-MST-NS01\_NL03-029002. No engagement was discussed in the report, but it is part of the technical standard that all planned archaeological works will be reviewed by the local planning archaeologist.

3.5.5 The HS2 Heritage Memorandum also sets out how the historic environment (including heritage assets and their setting) will be addressed during design. The HS2 Environmental Memorandum sets out the approach to landscape and visual mitigation which takes account of the historic environment.

3.5.6 The ES notes that there will be a high, adverse and permanent impact on the setting of three heritage assets located within the vicinity of the railway. This primarily includes impacts on the setting of the assets:

- The setting of Dale House Farmhouse (STN042) will have a high adverse impact due to its proximity of the railway. The impact will predominantly be caused by the increased noise levels created by the railway, and its visibility from the heritage asset. This grade II listed asset and the buildings situated within its curtilage will be monitored throughout the works (GAH reference A1N1-EWC-1100).
- The setting of Dale House, Dalehouse Lane (STN040), which will experience a high adverse impact due to the proximity of the railway to the heritage asset, in particular due to increased noise levels and the intervisibility of the railway. No mitigation measures were mentioned in the ES. Further information on built heritage mitigation is included in section 3.3.31.
- The setting of the non-designated Millburn Grange (STN045), which will have a high adverse impact due to the proximity of the railway to the heritage asset, in particular due to increased noise levels and the intervisibility of the railway. No mitigation measures were mentioned in the ES. Further information on built heritage mitigation is included in section 3.3.31.
- Crackley Assarted Woodland (STN106) which is an area of historic landscape, will be directly impacted by the railway, which traverses the woodland, causing a high adverse impact by detracting from the asset's character and altering its rural character. No mitigation measures were mentioned in the ES. Further information on built heritage mitigation is included in section 3.3.31.

## 3.6 Environmental Management During Construction

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- 3.6.1 The Environmental Memorandum (part of the HS2 Environmental Minimum Requirements) sets out the arrangements for the management of environmental issues during construction and the Code of Construction Practice (CoCP) sets out specific details and working practices that apply. The CoCP is supported by Local Environmental Management Plans (LEMPs) which include specific measures by topic, relevant to each relevant local authority area. The LEMP relevant to the works subject to this Schedule 17 submission is Warwick District Council Local Environmental Management Plan and can be found here:  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/669187/warwick\\_local\\_environment\\_management\\_plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669187/warwick_local_environment_management_plan.pdf)
- 3.6.2 Environmental management arrangements during construction do not form part of this request for approval of Plans and Specifications under Schedule 17.
- 3.6.3 The EMR introduces the policy and environmental management principles which form the basis of Environmental Management Systems (EMS) to be implemented during construction in order to limit disturbance from construction activities as far as reasonably practicable. Any local site-specific requirements and protection measures will be detailed by HS2 within the relevant ESMP to avoid or limit the potential impact on ecological resources. The EMR comprises the EMR General Principles and its annexes, which includes the CoCP.
- 3.6.4 Section 9 of the CoCP sets out general provisions and measures which apply to ecology. Section 9.1.3 of the CoCP states that, where reasonably possible, mitigation will be provided by design and implemented by contractors. Section 9.1.5 of the CoCP also states that where possible habitat loss will be minimised by keeping the working area to that of the minimum required for construction of Phase 1.
- 3.6.5 The CoCP sets out which ecological management measures will be required, these measures include:
- The summary of ecological features (receptors) of statutory designated sites, non-statutory designated sites, and ancient woodland as identified within the ES which may be affected due to construction;
  - Plans showing the location of these statutory designated sites, non-statutory designated sites, and ancient woodland that may be impacted due to construction, including access routes;
  - The use of best practice methods to mitigate impacts on ecological features during construction and plans of proposed mitigation locations. The plans will be included in LEMPs.

3.6.6 The CoCP also includes, as a measure, that ESMPs are produced to include the above information for:

- Terrestrial and wetland habitats; and
- Legally protected, notable and invasive non-native species.

3.6.7 Further information on the scope of ESMPs is provided in the EMR General Principles Annexe 4 Environmental Memorandum (HS2-HS2-EV-STD-000-000004). Further sections of this document specify:

- Management measures to reduce impacts on ecological features, which are addressed in other sections of the CoCP such as air quality, landscape and visual, water resources and flood risk, noise and vibration, and general requirements for site lighting;
- Considerations for statutory designated sites, non-statutory sites and protected habitats and species;
- Control of invasive and non-native species, and
- Monitoring.



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## 4 Design Approach and Rationale

### 4.1 Introduction

4.1.1 All HS2 developments have been designed to the highest standard. The HS2 Design Vision considers three core design principles: People, Place and Time. The Dalehouse Embankment and the Finham Brook Viaduct has been subject to extensive design development to ensure a high-quality design that integrates with its surroundings. Mitigation measures outlined in Section 3.3 of this document highlight how the proposal will work to preserve the quality of the local environment and landscape.

4.1.2 Dalehouse Embankment comprises of a 55m long engineering and landscape earthwork embankment which is required at this location to form the approach ramp to Finham Brook Viaduct. Finham Brook viaduct is a 50m long viaduct that will carry the railway over Finham Brook to Finham Brook Embankment to the south.

### 4.2 Key Design Considerations

#### Design Constraints

4.2.1 The following constraints have influenced the proposed design of Dalehouse Embankment and Finham Brook Viaduct and associated works:

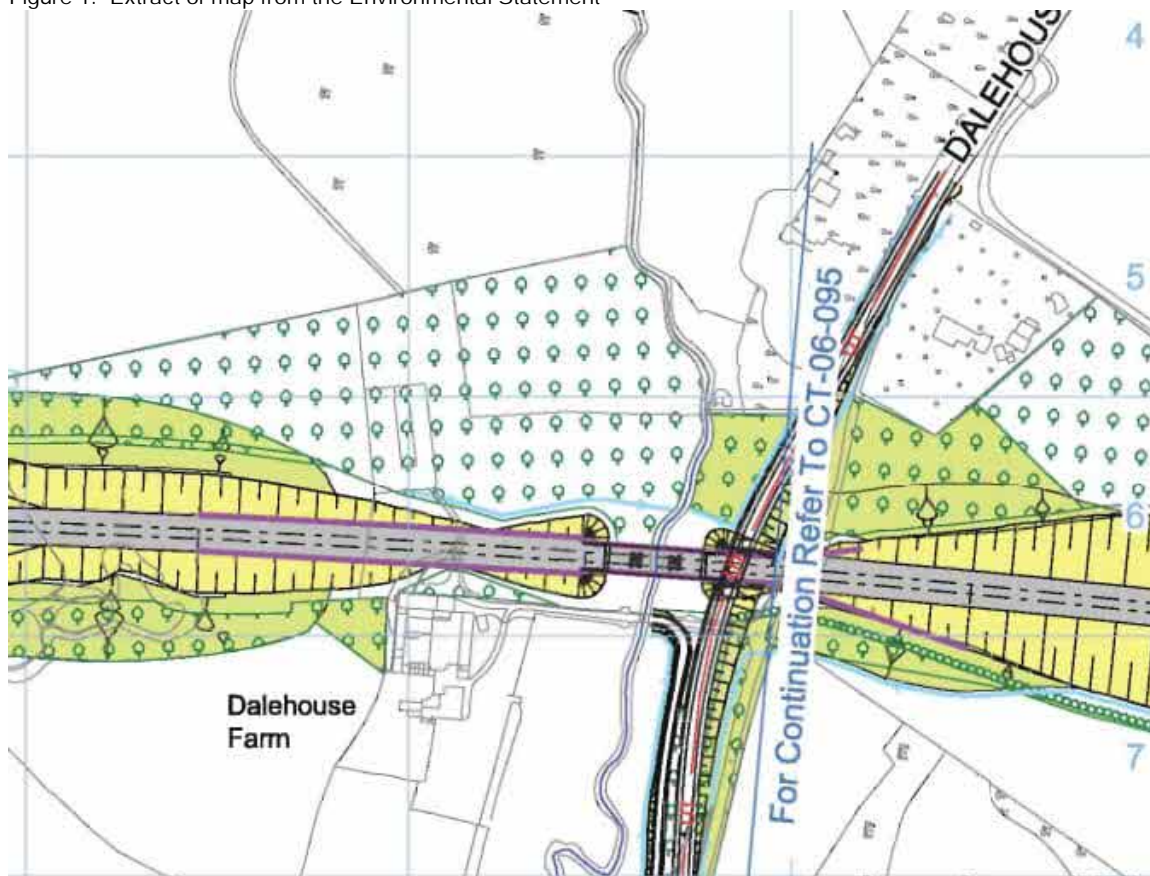
- Requirement to keep the footprint of the landscape and engineering earthworks minimal to stay within the Limits of Deviation (LOD) and to reduce disruptive impact to the surrounding landscape, including impact to Dalehouse Farm access track and adjacent existing watercourses.
- Requirement to meet targets for minimising flood modelling impacts to Finham Brook through reduction in landscaping beneath the viaduct and in the floodplain.
- The topography at Finham Brook, ecological mitigation to be implemented (e.g. bat passage route) and railway alignment have influenced the maintenance access strategy of the Finham Brook Viaduct. A reduced vertical clearance beneath the viaduct is available, and access is provided from both sides of the HS2 alignment at the abutment's location.
- Noise assessments for the Glasshouse Wood area identified the need for acoustic parapets along Finham Brook Viaduct which constrained the cross section.

#### Design Evolution Since Final Preliminary Design

4.2.2 This section explains the changes from the Final Preliminary Design (FPD) (the design used for the ES assessment).

- 4.2.3 At FPD, Finham Brook viaduct comprised of a voided cast –in-situ slab, three span (15m + 20m + 15m) viaduct. However, since then the structural form has now changed to precast I/T -beams and the arrangement of the viaduct has changed to a 2 span (25m + 25m) viaduct. The in-situ structural form was not considered desirable as this involved more temporary works and the span arrangement was changed because of the short spans in a 3 span arrangement and the side span to main span ratio. The reduction to a 2-span arrangement involves less foundation, and the reduction of one pier has cost saving benefits. The 50m length of the viaduct remains the same in both the 2-span and 3-span arrangements.
- 4.2.4 Dalehouse Embankment generally remains unchanged from FPD although the design now contains more detail including drainage ditches, security fence, noise barriers and maintenance access strips.

Figure 1: Extract of map from the Environmental Statement



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- 4.2.5 The impacts of the changes to the design are neutral in relation to the impacts assessed in the ES and AP2 ES for these works and therefore the design is EMR compliant.

### Options considered

- 4.2.6 The following options were considered for the viaduct span arrangement.
- Option 1 –Eliminates one pier; increased deck depth; fixity provided at central pier.
  - Option 2 –Eliminates two piers, but approach embankments increase; deck area decreased by 286sqm; increased deck depth; feasibility depends on flood analysis; integral abutments enable elimination of maintenance issues associated with bearings.
  - Option 3 –Eliminates two piers, but approach embankments increase; deck area decreased by 214.5sqm; increased deck depth; constricts the flood plain to a lesser extent than the single 25m span option; offsite production; isolated site; integral abutments enable elimination of maintenance issues associated with bearings.
  - Option 4 –Eliminates two piers, but approach embankments increase; deck area decreased by 143sqm; increased deck depth; larger capital costs than U-beam alternative; integral abutments enable elimination of maintenance issues associated with bearings.
- 4.2.7 Option 1 was selected to be progressed because longer spans are not required, and this solution provides the same deck length as the FPD solution.
- 4.2.8 In order to check the compliance with the EMR and flood levels accounting for a 70% allowance for climate change (70%CC), hydraulic modelling and flood risk analysis was undertaken for Dalehouse Embankment and Finham Brook Viaduct. The FPD design proved not to be compliant with the standards and the alternative options listed below were considered in order to comply with the EMR:
- Option 1 –Use of a replacement floodplain storage area. This option proved not to be compliant with the standards.
  - Option 2A –Removal of earthworks under north abutment. This option proved to be EMR compliant only while not meeting the 70%CC requirement.
  - Option 2B –Removal of earthwork under north abutment and ground improvements under viaduct. This option is compliant with both the EMR and 70% CC.
  - Option 3A- Move the viaduct north by 2m and remove the earthworks under the north abutment. This option is effective in mitigating the flood risk and is

compliant (EMR and 70% CC). However, this option required the abutment to be located nearer to the river and a non-contestable utility.

### Selected Option

4.2.9 Option 2B was chosen to be progressed because it is compliant with the standards and simplifies the design. This option also means that the north abutment is located further from the non-contestable utility. The result of the hydraulic modelling study and the options considered have been presented to the Environment Agency at a meeting held on the 4<sup>th</sup> of February 2021.

## 4.3 Consideration against the relevant grounds for refusal under Schedule 17

4.3.1 As set out in section 3 above, the proposed development includes a range of activities for which approval of Plans and Specifications is required, in line with Schedule 17 of the Act. These activities fall into the following categories:

- Building works
- Earthworks
- Fences and Walls
- Noise barrier

### Building Works

4.3.2 As set out in Section 3.2 above, this submission seeks consent for the construction of a 50m long two span railway viaduct which is required to carry the HS2 railway over Finham Brook.

4.3.3 Possible grounds for refusal relating to Building Works are set out in Section 2 of Schedule 17. These are assessed in Table 4 below:

Table 4: Possible grounds for refusal relating to building works

Possible Grounds for Refusal	Assessment of Proposed Development
That the design or external appearance of the works ought to, and could reasonably, be modified— (i) to preserve the local environment or local amenity,	A railway viaduct is necessary in this location to allow the rail alignment to cross Finham Brook between Finham Brook Embankment and Dalehouse Embankment.  The viaduct has been through an extensive design development process to ensure a

	<p>carefully considered, high -quality design that preserves the local environment and local amenity is proposed.</p> <p>The design of the proposed viaduct is broadly similar to the FPD in terms of its length, location, and height. This was assessed within the schemes ES, which parliament concluded was acceptable. The design changes to the viaduct from FPD in terms of a reduced span arrangement and change from precast to in-situ cast structural form improves on the FPD design as it involves less temporary works, and has cost saving implications.</p> <p>The Environmental Minimum Requirement process has assessed the final design proposed and confirmed that the impacts of the scheme are not materially different from those reported in the ES.</p> <p>The design of the viaduct adheres to the HS2 design vision principles aligning with the common architectural language of the HS2 works, following CDE principles in the design of the eastern parapet and adopting CDE architectural language in the non- CDE compliant acoustic parapet to the west, utilising a simple pallet of materials, keeping heights and the scale of physical development to the minimum required, using scour protections, an acoustic parapet to mitigate noise impacts, and ensuring that appropriate landscape mitigation is undertaken to provide long-term screening. It is considered that there is no reason that design or external appearance of the viaduct ought to, or could reasonably, be modified to better preserve the local environment or local amenity.</p>
<p>(ii) to prevent or reduce prejudicial effects o road safety or on the free flow of traffic in the local area, or</p>	<p>The proposed viaduct does not intersect with ar public highway or existing Public Right of Way. Therefore, the proposals will have no effect on road safety or the free flow of traffic in the local area.</p>
<p>(iii) to preserve a site of archaeological or histori interest or nature conservation value.</p>	<p>As set out in Section 3 (subsection s for Historic Environment, Archaeology and Built Heritage) above, the proposed development is located in proximity to three built heritage assets and limited archaeological interest.</p> <p>The proposed development will have high adverse impacts on the setting of Dale House Farmhouse (STN042), Dale House, Dalehouse Lane (STN040), the setting of the non-designated</p>

	<p>Millburn Grange (STN045), and Crackley Assarted Woodland (STN106).</p> <p>To mitigate this, the proposed works includes a 2.1m high acoustic parapet on the viaduct to reduce the noise impacts to the setting of the nearby heritage assets.</p> <p>Landscape mitigation in the form of planting and earthworks is used to reduce and soften the visual impacts and will help to integrate the viaduct into the local landscape and surrounding context, and filter views of, or screen as far as possible.</p> <p>The impact of the Finham Brook Viaduct was assessed as part of the ES. The final design, which incorporates minor changes to the scheme that have occurred as part of the design refinement process, has been assessed and remains EMR compliant.</p> <p>There is, therefore, no cause for the proposed design to be altered or opportunity to do so while retaining functionality.</p>
<p>That the development ought to, and could reasonably, be carried out elsewhere within the development's permitted limits.</p>	<p>Opportunities for alternative locations for the viaduct are limited by the need to connect with the adjacent earthworks, the need to cross Finham Brook at an appropriate location, the limits of the LOD and Limit of land to be acquired or used (LLAU) set out within the HS2 Act and the area of land vested by the project (with a presumption that land shall not be taken needlessly).</p> <p>The relocation of the viaduct elsewhere within the permitted limits is therefore not an applicable consideration.</p>

## Earthworks

- 4.3.4 As detailed in Section 3 above, various earthworks (engineering and landscape) are proposed within the site boundary.
- 4.3.5 Possible grounds for refusal relating to earthworks are set out in Section 3 of Schedule 17. These are considered in Table 5 below:



Table 5: Possible grounds for refusal relating to earthworks

Possible Grounds for Refusal	Assessment of Proposed Development
<p>That the design or external appearance of the works ought to, and could reasonably, be modified—</p> <p>(a) to preserve the local environment or local amenity,</p>	<p>Dalehouse Embankment is required in this location to alter the existing topography to accommodate the HS2 rail line in this area. The earthwork forms an approach embankment for the adjacent Finham Brook Viaduct to provide sufficient height to cross over Finham Brook.</p> <p>The proposed earthworks have been carefully considered in the design process to minimise the visual prominence and impacts of the proposal. Landscape mitigation in the form of planting will be used to reduce and soften the visual impacts and will help to integrate the earthworks into the local landscape and surrounding context, and filter views as far as possible.</p> <p>Design vision principles have been adhered to by following the common architectural language of the HS2 works, keeping heights and the scale of physical development to the minimum required and ensuring that appropriate landscape mitigation is undertaken to provide long-term screening.</p> <p>Also, the design of the proposed embankments is reduced in scale in comparison to the FPD which was assessed within the scheme’s Environmental Statement (ES) and which parliament concluded acceptable. Therefore, the reduced embankment is likely to have reduced impacts in comparison to FPD design.</p> <p>It is considered that there are no reasonable modifications that ought to be made to the design to preserve the local environment or local amenity.</p>
<p>(b) to prevent or reduce prejudicial effects on road safety or on the free flow of traffic in the local area, or</p>	<p>Dalehouse Embankment and Finham Brook Viaduct does not intersect with any public highways or existing Public Right of Way.</p> <p>Therefore, the proposal will have no effect on road safety or the free flow of traffic in the local area.</p>
<p>(c) to preserve a site of archaeological or historic interest or nature conservation value.</p>	<p>As set out in Section 3 (subsections for Historical Environment, Archaeology and Built Heritage) above, the proposed development is located in proximity to 3 built heritage assets. Landscape mitigation in the form of planting and earthworks is used to reduce the visual impacts and will help to integrate the viaduct into the local landscape and surrounding context, and filter views as far as possible.</p>

	<p>The impact of the Dalehouse Embankment was assessed as part of the Environmental Impact Assessment. The final design, which incorporates minor changes to the scheme that have occurred as part of the design refinement process, has been assessed and remains EMR compliant.</p>
<p>That the development ought to, and could reasonably, be carried out elsewhere within the development's permitted limits.</p>	<p>Opportunities for alternative locations for the embankment are limited by the need for an approach embankment to connect to the adjacent Finham Brook Viaduct, the need to cross Finham Brook at an appropriate location, the limits of the LOD and Limit of land to be acquired or used (LLAU) set out within the HS2 Act and the area of land vested by the project (with a presumption that land shall not be taken needlessly).</p> <p>The form and location of the proposed earthworks cannot be reasonably altered to avoid the identified sensitive environs, which include residential properties and historical receptors as the proposed works are required in this location to facilitate the HS2 rail line.</p>

### Fences and Walls

4.3.6 The location of fencing is set out on the General Arrangement plans (Reference: 1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141301) and summary details are provided in Section 3 above.

4.3.7 Possible grounds for refusal relating to fences or walls are set out in Section 3 of Schedule 17. This is considered in Table 6 below:

Table 6: Possible grounds for refusal relating to fences.

Possible Grounds for Refusal	Assessment of Proposed Development
<p>That the development ought to, and could reasonably, be carried out elsewhere within the development's permitted limits.</p>	<p>The proposed work includes extents of security fencing which also incorporates ecological fencing around the earthworks embankment and including alignment under Finham Brook Viaduct. The presence of security fencing in this location is an absolute requirement in the interests of public safety and security of the railway. The purpose of the security fence in this location is to prevent access to the track. The fence is positioned as close as possible to the embankment and it is considered that the purpose of the fence would be unachievable in</p>



	any other location and as such cannot be carried out elsewhere.
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### Noise Barrier

4.3.8 The location of the proposed noise barriers and acoustic parapet is set out on the General Arrangement plans (Reference: 1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141301) and summary details are provided in Section 3 above.

4.3.9 Possible grounds for refusal relating to noise screens are set out in Section 3 of Schedule 17. This is considered in Table 7, below:

Table 7: Possible grounds for refusal relating to noise barriers

Possible Grounds for Refusal	Assessment of Proposed Development
<p>That the design or external appearance of the works ought to, and could reasonably, be modified—</p> <p>(a) to preserve the local environment or local amenity,</p>	<p>A 2m high noise barrier, formed of pre-cast concrete panels will be incorporated within the embankment. A 2.1m high acoustic parapet is also incorporated within the viaduct.</p> <p>The noise barriers are required in this location to preserve the local environment by minimising the noise pollution that will arise from the development including identified impacts to the built heritage assets as set out in section 3 above.</p> <p>Design vision principles have been adhered to by following the common architectural language of the HS2 works, keeping heights and the scale of physical development to the minimum required and ensuring that appropriate landscape mitigation is undertaken to provide long-term screening.</p>
<p>(b) to prevent or reduce prejudicial effects on road safety or on the free flow of traffic in the local area, or</p>	<p>The proposed noise barriers will have no effect on road safety or the free flow of traffic in the local area.</p>
<p>(c) to preserve a site of archaeological or historical interest or nature conservation value.</p>	<p>As set out in Section 3 (subsections for Historical Environment, Archaeology and Built Heritage) above, the proposed development is located in proximity to 3 built heritage assets.</p> <p>The ES identified that the proposed works will have high adverse impacts on the setting of Dale House Farmhouse (STN042), Dale House, Dalehouse Lane (STN040), the setting of the non-designated Millburn Grange (STN045), and Crackley Assarted Woodland (STN106).</p> <p>To mitigate this, the proposed noise barrier on Dalehouse Embankment and the acoustic</p>

	parapet on Finham Brook Viaduct is required to reduce the adverse noise impacts to the setting of the nearby heritage assets.
That the development ought to, and could reasonably, be carried out elsewhere within the development's permitted limits.	The form and location of the proposed noise barriers cannot be reasonably altered in order for it to achieve its overall objective which is to mitigate impacts on identified sensitive environments, which include residential properties and local historical receptors.

## 4.4 Conclusion

4.4.1 In conclusion, as set out in the tables above, it is considered that the scheme proposed for Dalehouse Embankment and Finham Brook Viaduct meets the requirements of Sections 2 and 3 of Schedule 17. The proposals have been carefully considered and designed to ensure a scheme that preserves the local environment and local amenity while meeting HS2's operational, maintenance, safety, efficiency, buildability and best value requirements, as detailed in Information Paper D1: Design Policy. No part of the proposed scheme would be better located elsewhere within the permitted limits.

## 5 Pre-submission Consultation

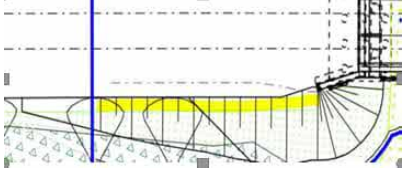

5.1.1 Pre-submission consultation with the Local Planning Authority, statutory consultees and other relevant stakeholders is summarised in **Table 8** below.

Table 8: Pre-submission Consultation with LPA and Statutory Consultees

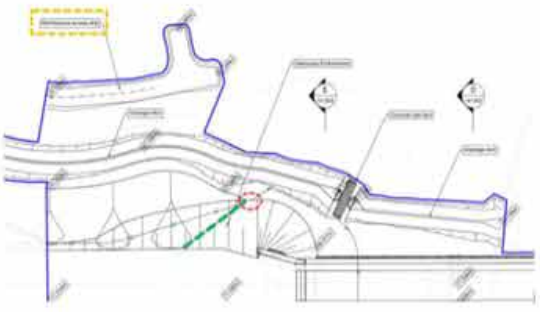
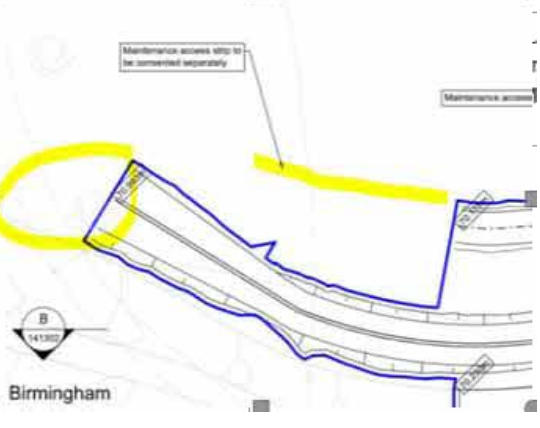
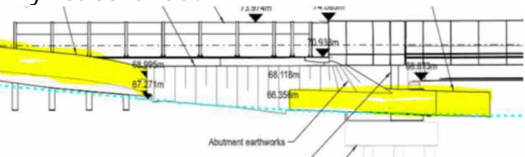
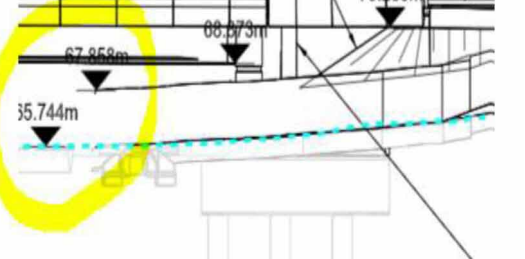
Consultee Name	Consultation Date	Method of Consultation / Attended by	Summary of Consultation Outcome
Environment Agency	04/02/2021	Meeting (remote)	Discussion of outcomes of hydraulic modelling and the impacts upon the design of Finham Brook Viaduct.  Design options 2B or 2C were preferred, which are compliant in flood risk.  Noted opportunities for collaboration between the EA and HS2 in the area.
	05/10/2021	Meeting	Early engagement meeting with the Environment Agency.
	21/03/2022	Site visit	Site visit to Finham Brook with the Environment Agency.
	08/04/2022	Presentation	Presentation of construction method to the Environment Agency.
	04/10/2022	Presentation	Presentation discussing the proposed scour protection for Finham Brook Viaduct to the Environment Agency.
Warwick District Council Local Planning Authority	28/03/2023	Letter	Draft schedule 17 submitted for pre-application consultation.
	01/09/2023	Letter	Pre-application consultation responses

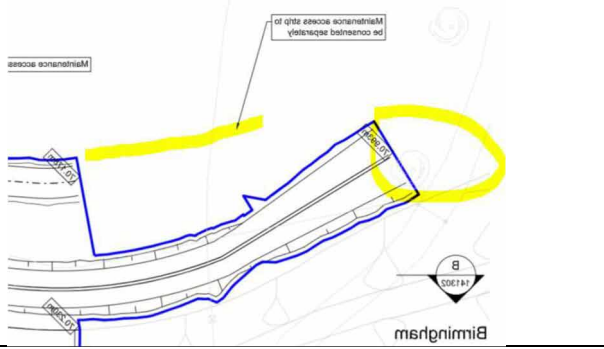

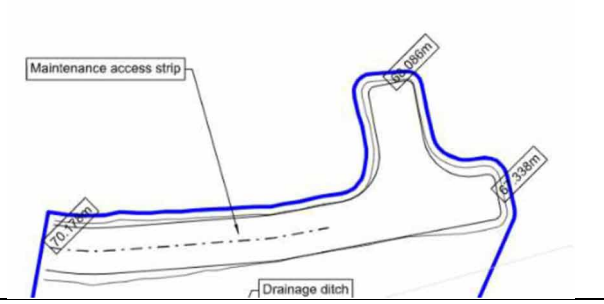
Consultee Name	Consultation Date	Method of Consultation / Attended by	Summary of Consultation Outcome
			received from Warwick District Council.

Table 9: Comments Raised by WDC During the Pre-Application Period and the Applicant's Response

WDC Comment	Applicant Response
<p>Align hatch to drawing where necessary</p> 	<p>As far as is possible the draughting error identified in the LEMP has been updated. (See drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141305).</p> <p>The LEMP is indicative and provided for information only. Final details regarding planting and all mitigation will be provided at the bringing into use stage.</p> <p>An updated LEMP is going to be produced for Dalehouse Embankment and any outstanding draughting errors will be amended in the updated LEMP.</p>
<p>Hatch over what looks to be turning head? Can the size of this be reduced to what is absolutely necessary, and can it be labelled with the material indicated. Permeable surface without edging? Need for a threshold with a consolidated surface</p> 	<p>An updated LEMP is going to be produced for Dalehouse Embankment but in the interim the LEMP has been revised so that the hatch isn't shown over the turning head. (See drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141305).</p> <p>The 3m width of the maintenance access strips is what is required in the HS2 access technical standard. The turning head / parking bay is also designed to allow a vehicle to turn and therefore cannot be smaller.</p> <p>Maintenance access strips made from grass or topsoil are the required form of access in accordance with the HS2 Access technical standard. There is no requirement for stone or other similar materials for accesses that will be only occasionally used.</p>
<p>Generally hatching over areas which shouldn't be across the drawing.</p>	<p>A label has been added to the LEMP (drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141305) to clarify that the landscaping is below Finham Brook Viaduct in this location. Please note that the LEMP is a draft drawing, provided for information and is not for approval. Final details regarding planting and</p>

	<p>all mitigation will be provided as part of bringing into use application.</p>
<p>Scalloped security fence line. Also crossing viaduct could this be greyed or labelled that it is underneath for clarity.</p>	<p>A label has been added to the GA drawing (ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141301) to clarify that the security fencing goes underneath Finham Brook Viaduct in this location.</p>
<p>Landscape and Engineering earthworks hachure overlap. Spot heights need reference points.</p>	<p>The GA drawing has been updated (see drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141301). The landscape and engineering earthworks hachure no longer overlap in the drawing and spot heights now have reference points.</p>
<p>Purpose of line highlighted in green is unclear; best removed? Continuation of fence in the red area is unclear; avoid awkward angles? Maintenance access strip – is this as narrow as possible? Permeable surface without edging? Permeable soil retention systems are preferred for hardstanding/parking areas</p>	<p>The GA drawing has been updated (see drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141301). The line indicates the point where the landscape earthworks connects with the engineering earthworks.</p>

	
<p>line appears missing, and needs a label</p> 	<p>The GA drawing has been updated and now shows wider context in grey (see drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141301).</p>
<p>Why not continuous:</p> 	<p>The elevation drawing has been updated (drawing ref: 1MC08-BBV_MSD-PL-DEL-NS01_NL03-141302).</p>
	<p>The elevation drawing has been updated (drawing ref: 1MC08-BBV_MSD-PL-DEL-NS01_NL03-141302).</p>
<p>Drawings have been provided to accompany this submission which identify that the embankments will have soft slopes to reduce the visual impact of the assets. At application stage it is considered that additional context to the plan (shown in grey) to show how the earthworks connect to the wider landscape would assist in the determination of the eventual Schedule 17 submission. In particular, it would help if the drainage ditch continuations and continuation of the maintenance access track outside the blue line are shown for clarity. This is</p>	<p>The GA drawing has been updated and now shows the wider context in grey including the continuation of the drainage ditch and the maintenance access strip.</p>

<p>beneficial to Officers during assessment and also to anyone viewing upcoming documents publicly.</p> 	
<p>Junction here with greyed works looks o .</p> 	<p>This is amended in the updated GA drawing (ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141301).</p>
<p>Material of access strip to be labelled on drawing ideally, turning point size to be no more than necessary.</p> 	<p>Grass is proposed on the maintenance access strip, and this is now labelled on the GA drawing. The maintenance access strip is 3m wide which aligns with the HS2 access technical standard and therefore cannot be reduced. The turning head is also designed to allow a vehicle to turn and therefore cannot be smaller.</p>
<p>At application stage it is considered that a additional context to the plan (shown in grey) to show how the earthworks connect to the wider landscape would assist in the determination of the eventual Schedule 17 submission. In particular, it would help if the drainage ditch continuations and continuation of the maintenance access track outside the blue line are shown for clarity. This is beneficial to Officers during assessment and also to anyone viewing upcoming documents publicly.</p>	<p>The GA (ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141301) has been updated and wider context is now shown in grey.</p>
<p>Security fencing is shown, though there are some concerns raised over the illustration of this on the drawings, as it appears scalloped in plan and interrupted in elevation. This should be resolved before application submission. The location of the</p>	<p>The proposed fence is a type 3 security fence. The type 3 fence comprises of a protective coated 1.8m high welded mesh fencing with three strands of barbed wire above (total height of 2.13m) in accordance with BS 1722-</p>



<p>fencing should be kept as tight to the embankment as is feasible, with tree planting outside of the fence line, and awkward angles should be avoided to keep the footprint and impact of visibly disruptive elements to the absolute minimum. The General Arrangement drawing would also benefit from labelling at the Viaduct to indicate that the fencing passes underneath.</p>	<p>14. A label is included in the GA to indicate that the fencing passes underneath Finham Brook Viaduct.</p>
<p>With respect to the landscape proposals, it is acknowledged these are indicative. However, they seem somewhat inaccurate and there are some draughting errors which have been raised in previous correspondence. Most notably, woodland planting is shown over the maintenance access routes, immediately abutting the top edge of the railway embankments and overlapping the course of Finham Brook.</p>	<p>As far as is possible the draughting errors identified in the LEMP have been updated. Woodland planting is no longer shown over the maintenance access strips. The LEMP is indicative and provided for information. Final details regarding planting and all mitigation will be provided at the bringing into use stage.</p>
<p>The Landscape Officer has made comments raising concern over the access tracks, as they appear unnecessarily wide. There are two maintenance accesses in close proximity to each other; the question is posed whether these could be rationalised into a single access, so justification or reasoning as to why this is not the case should be given. Similarly, some of the turning areas and bellmouths seem too large for their purpose. All tracks and turning areas should be as narrow and small in scale as possible.</p>	<p>The maintenance access strip is 3m wide which is in accordance with the HS2 access technical standard and therefore cannot be reduced. The turning head is designed to allow a vehicle to turn and therefore cannot be smaller. The MAS and the associated turning head / parking bay will be used only for HS2 maintenance purposes at a low frequency and will have no impact on road safety. The MAS's cannot be rationalised into a single access despite their close proximity because maintenance access is required on both sides of the rail tracks for maintenance purposes.</p>
<p>Maintenance access routes should be gated to prevent unauthorised access. If materials are indicated on forthcoming application drawings, permeable surfaces such as stone should be considered, with reinforced, permeable areas for parking/turning, left unedged so they appear similar in scale and appearance to adjacent farm tracks.</p>	<p>Maintenance access strips made from grass or topsoil are the required form of access for this asset in accordance with the HS2 access technical standard. There is no requirement for stone or other similar materials for accesses that will be only occasionally used. The width of the maintenance access strips is 3m and this aligns with the HS2 access technical standard, the turning head is also designed to allow a vehicle to turn and therefore cannot be smaller. The maintenance access routes are gated to avoid unauthorised use.</p>
<p>Details of landscaping mitigation will form part of later Bringing Into Use application, having regards to para. 8, 9, 10 and 12 of Schedule 17 of the HS2 Act 2017; however, it is understood that the scheme will include woodland habitat creation and predominantly low maintenance grassland. I am satisfied that the landscape proposals show how the planting will connect beyond the line of the</p>	<p>As far as is possible the LEMP (drawing ref: 1MC08-BBV_MSD-PL-DGA-NS01_NL03-141305) has been updated to resolve general draughting errors. As stated, the LEMP is indicative and provided for information. Final details regarding the fencing, planting and all mitigation will be provided at the bringing into use stage.</p>



<p>application site to the north west; however, it would be beneficial to show some of the planting context on the opposite side of Finham Brook to the south for clarity. The relationship between the maintenance access tracks and the planting outlines should also be clarified. At BIU stage, please provide further details with regard to the planting and fencing.</p>	
<p>The Environmental Health Officer concludes that the proposed scheme does not give rise to any additional effects that are environmentally significant, and hence the requirements of the HS2 General Principles have been met and that no other 'reasonably practicable' measures are available to reduce noise further, so the requirements of IP E20 have also been met.</p> <p>Whilst the overall conclusion is that meeting 'the letter' of the HS2 Phase 1 Environmental Minimum Requirements in relation to this area has been demonstrated, removal of a barrier proposed at the ES stage does not meet 'the spirit' of what was proposed at the parliamentary stage of the HS2 Bill. A clear impression was given to the public that ES predictions were absolute worst case, and the expectation was raised that actual noise levels would be lower than predicted. It is accepted that at this stage of the Schedule 17 process there are still significant uncertainties regarding train source noise and therefore some uncertainty regarding the modelled results, so complete removal of a noise barrier on the east of the trace needs to be more clearly justified in this case. In summary, the removal of the barrier on the embankment to the east requires clearer justification.</p> <p>Attention should be drawn to the EHO's comments requesting further information with the application submission. It would aid understanding of the actual acoustic effects of the various options in the NDR if the modelling data was made available for review.</p> <p>This would help clarify issues, e.g. how the impact changes to track and barrier dimensions and train service patterns have impacted noise predictions compared to the ES and hence the equivalent 'effective' barrier height to match those proposed in the ES. This would also allow more detailed analysis of the impacts arising from the various options</p>	<p>The extant noise mitigation design in the Dalehouse Embankment and Finham Brook Viaduct area is presented within the Noise Demonstration Report for Stoneleigh, Glasshouse Wood, Canley 1MC08-BBV_MSD-EV-REP-NS01_NL03-100088, together with accompanying information on candidate mitigation options to demonstrate that the proposed design will not result in a materially different noise environment compared to the ES design.</p> <p>Table 7 of the NDR presents details of the options considered, including information on the mitigation appraisal requirements which include monetary benefit of noise reduction compared to cost as well as impacts on other environmental disciplines e.g. landscape and visual, to demonstrate how the proposed design achieves optimum balance between the relevant parameters.</p> <p>The table includes information on resultant noise impacts for each option which enable a direct comparison to the ES on a noise impact basis.</p> <p>It is noted that while no barrier is included on the east of the embankment (upside) at this location, review of the design options suggests that barrier mitigation is not effective at this location and is not required as no material change occurs even in the absence of any barrier mitigation.</p> <p>A summary of the modelling output for each design option is provided within the associated section of the NDR.</p> <p>The design team would be happy to provide additional information if necessary or facilitate a meeting for further discussion to ensure the necessary assurances are provided.</p>
<p>Based on the information provided when viewed within the context of Schedule 17 I would be grateful if further information, justification and</p>	<p>The GA drawing has been updated and now shows spot heights with reference points.</p> <p>In terms of requested revisions to the access</p>

clarification may be submitted with any future Schedule 17 application.

I have set out below the information which I consider may be helpful to support any future application:

- Spot heights on the General Arrangement plan should show reference points next to the height labels
- Further clarification around the options listed in the NDR
- Revised access track layout / sizes where possible
- Revised landscape proposals (in accordance with comments made within this response)
- In addition, through previous correspondence it has been stated that there are general draughting issues to be addressed across the drawings, and the addition of colour will make them more legible.

track sizes and layout, the 3m width of the maintenance access strips accords with the HS2 access technical standard and therefore cannot be reduced, the turning head is also designed to allow a vehicle to turn and therefore cannot be smaller. Maintenance access is required on opposite sides of the rail track and therefore there isn't an opportunity to rationalise the two maintenance access strips into one.

As far as is possible, the LEMP (drawing ref: 1MC08-BBV\_MSD-PL-DGA-NS01\_NL03-141305) has been updated to resolve general draughting errors. Note that the LEMP is a draft drawing provided for information and is not for approval. Final details regarding planting and all mitigation will be provided at a later stage.

Also, an updated LEMP that is based on new modelling information is going to be produced which will incorporate any outstanding draughting errors.

Drawings - The GA, elevations, sections and LEMP have been updated in line with the latest drawing guidance.

## 6 Construction Programme

6.1.1 A high level programme for the works subject to this submission and how they fit into the overall programme for other works in the area is contained in **Table 10** below. The programme for works on site may vary from the indicative dates shown.

Table 10: Proposed Programme and Sequence of Works

Anticipated Start on Site Date (quarter/year)	Activity	Estimated Completion of Works (quarter/year)
<b>Dalehouse Embankmen</b>		
Q3 2024	Drainage	Q3 2026
Q3 2024	Topsoil / subsoil placement	Q3 2024
Q2 2024	Embankment fill	Q3 2026
Q3 2025	Noise barrier work:	Q3 2025
Q2 2026	Prepare subgrade	Q2 2026
Q3 2026	Protection layer	Q4 2026
<b>Finham Brook Viaduc</b>		
Q4 2022	Piles and pile caps construction	Q3 2023
Q1 2024	Abutments , pier , beams and deck construction	Q3 2024
Q3 2024	Installation of equipment and finish	Q4 2024
Q4 2024	Drainage	Q4 2024
Q3 2025	Robust kerbs and noise barrier	Q3 2025

## 7 Other Consents

7.1.1 Other main consents likely to be required for the works are summarised in **Table 11** below. Consent requirements may alter during design development and further consents not identified in the table may be required.

Table 11: Other Consent Requirements

Consent	Works Requiring Consent
Section 61, Control of Pollution Act	Finham Brook Viaduct, Dalehouse Lane Embankment – Consent to undertake permanent works.
HS2 Act, Schedule 33 Part 5	<p>Finham Brook Viaduct - Works affecting ordinary watercourse, main river (and flood zone 3), within Secondary A (superficial) aquifer and principal (bedrock) Aquifer and attenuation pond (and associated outfall structure).</p> <p>Dalehouse Lane Embankment – Works affecting main river and flood zone 3.</p>
Schedule 17, Plans and Specs Consent	<ul style="list-style-type: none"> <li>• Kenilworth Cutting</li> <li>• Dalehouse Lane Overbridge</li> <li>• Canley Brook Cutting</li> <li>• Glasshouse Wood Cutting</li> <li>• Finham Brook Embankment</li> </ul>
Schedule 17, Bringing into Use Consent	<ul style="list-style-type: none"> <li>• Kenilworth Cutting</li> <li>• Dalehouse Lane Overbridge</li> <li>• Canley Brook Cutting</li> <li>• Glasshouse Wood Cutting</li> <li>• Finham Brook Embankment</li> </ul>