

The Network Rail (Huddersfield to Westtown (Dewsbury) Improvements)
Order – NR/PoE/AL/10.2



TRANSPORT AND WORKS ACT 1992
TRANSPORT AND WORKS (INQUIRIES PROCEDURES)
RULES 2004
NETWORK RAIL (HUDDERSFIELD TO WESTTOWN
(DEWSBURY) IMPROVEMENTS) ORDER

NOISE AND VIBRATION
PROOF OF EVIDENCE
ADAM LAWRENCE

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Proof of Evidence – Noise and Vibration

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1. INTRODUCTION

- 1.1.1 My name is Adam Lawrence. I am an Associate with Atkins Acoustics, Noise and Vibration. I hold a Bachelor's degree (with Honours) in Electroacoustics from the University of Salford. I am a Fellow of the Institute of Acoustics and a Chartered Engineer.
- 1.1.2 I have worked in acoustics for over 25 years, being primarily concerned with transportation and environmental noise issues. I have been responsible for aspects of the noise impact assessment and design of noise mitigation measures for railway schemes including East West Rail, Bicester Oxford Railway, Manchester Metrolink, Docklands Light Railway, Tilbury 2, High Speed 1 and High Speed 2. I have given evidence to inquiries and hearings in support of road schemes including the M25, the M2 and the A21 and supported other witnesses giving noise evidence for East West Rail and Tilbury 2.
- 1.1.3 I have been involved with the noise and vibration assessment of this Scheme since November 2020 when I was part of the team which prepared the Noise and Vibration Chapter(s) of the Environmental Statement (ES), where my role comprised reviewing the completed chapter(s).

2. GLOSSARY

Abbreviation	Definition
CoCP	Code of Construction Practice
Code of Construction Practice	The document that outlines how the Scheme will reduce or mitigate construction effects on the environment
dB	Decibel
Defra	Department for the Environment and Rural Affairs
DPP	Deemed Planning Permission
Deemed planning permission	On making an order under the Transport and Works Act 1992, the Secretary of State may direct that planning permission shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction.
EIA	Environmental Impact Assessment
Environmental Impact Assessment	The process by which the anticipated effects on the environment of a proposed development or Scheme are measures
ES	Environmental Statement
ES	The report setting out the process and findings of an Environmental Impact Assessment.
NIA	Noise Important Area
Noise Important Area	Areas where the top 1% of the worst affected people from road or railway noise in the UK were located according to the results of Defra strategic noise mapping
NIR	Noise Insulation Regulations
NOEL	No Observed Effect Level
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NPS NN	National Planning Statement for National Networks
NSR	Noise Sensitive Receptor (these receptors are also sensitive to vibration)
NVMP	Noise and Vibration Management Plan
OLE	Overhead Line Equipment
Overhead Line Equipment	Overhead line electrification equipment, which supplies electric power to the trains.
SOAEL	Significant Observed Adverse Effect Level
SOAEL	In policy terms impacts are significant when noise levels are above the threshold for significant adverse effects
SOCG	Statement of Common Ground
Statement of Common Ground	The Statement of Common Ground is a document that provides a succinct summary of the matters that have been resolved Network Rail and individual objectors/representations to the Order Scheme. It is also intended to provide a succinct summary of the matters that remain unresolved between the same parties.
TWA	Transport and Works Act

3. STRUCTURE OF THE PROOF OF EVIDENCE

3.1.1 I provide evidence on the following topics:

- a. The adequacy of the assessment
- b. The approach to the assessment
- c. The extent of noise and vibration impacts and proposed mitigation measures.
- d. Responses to specific objectors.

4. SCOPE OF EVIDENCE

4.1 Adequacy of Environmental Statement

- 4.1.1 My evidence shows that the noise and vibration chapters of the Environmental Statement (ES) submitted with the TWA Order (NR16A, NR16B, NR16C) follow best practice and deal with noise and vibration impacts in an appropriate way.
- 4.1.2 The ES considers the noise and vibration impacts of the Scheme on sensitive receptors, both temporary impacts during the construction phase and permanent impacts during the operation of the completed Scheme.
- 4.1.3 The ES reports an Environmental Impact Assessment (EIA), undertaken in accordance with the Application Rules. Noise and Vibration were scoped into the EIA and the ES assesses those impacts and evaluates their significance.
- 4.1.4 The evaluation considers impacts both in terms of the EIA Regulations and Planning Policy, as set out in Section 8.2 of the ES. From an EIA perspective impacts are considered significant when they give rise to moderate or major impacts, and from a policy perspective impacts are considered significant when they are above thresholds for significant adverse effects.
- 4.1.5 The EIA Regulations (NR97) direct that an Environmental Statement must identify likely significant effects and describe measures which are used to avoid or reduce those significant effects. Similarly, the National Planning Policy Framework (NR29) sets out that planning decisions should prevent unacceptable levels of noise pollution and avoid significant impacts.
- 4.1.6 The Noise Policy Statement for England (NR91) forms the basis for considering noise and vibration in both the National Planning Policy Framework (NR29) and the National Planning Statement for National Networks (NR30). The policy statement sets out three aims;
- Avoid significant adverse impacts
 - Mitigate and minimise adverse impacts
 - Where possible, contribute to an improvement.
- 4.1.7 These aims are described in more detail in Section 8.2 of the ES.
- 4.1.8 The ES defines thresholds for significant adverse effects at receptors for each aspect of the assessment in line with the Noise Policy Statement for

England and sets out thresholds for moderate and major changes at receptors in line with the EIA Regulations.

- 4.1.9 The assessments calculate expected noise and vibration levels which are compared with these thresholds. The ES identifies receptors with potentially significant effects and sets out mitigation options for those locations.
- 4.1.10 The Noise Policy Statement for England notes that mitigation measures should be reasonable, and they must be considered in line with Government policy on sustainable development.
- 4.1.11 The ES sets out the impacts of the Scheme in terms of potential significance, allowing noise and vibration impacts to be considered alongside other impacts and allow decisions to be made about the Scheme.
- 4.1.12 Should the Scheme go ahead there would be statutory requirements to offer noise insulation in certain circumstances. The provision of noise insulation is a mitigation option used to avoid significant impacts, and the ES considers which properties are likely to be eligible for offers of noise insulation.
- 4.1.13 The Rail Environment Policy Statement (NR94) includes objectives to minimise the impact of noise, making reference to Noise Important Areas which have been defined across the network by Defra (NR96).

4.2 Approach to Assessment

- 4.2.1 The technical guidance upon which the methodologies for the noise and vibration assessments are based is described in Chapter 8 in paragraph 8.2.24 Volume 2i of the ES.
- 4.2.2 Separate assessments have been undertaken for construction noise, construction vibration, operational noise and operational vibration; the operational assessments cover both railway noise and road traffic noise. The methodologies for all assessments are described in Chapter 8, paragraphs 8.3.18 to 8.3.61 in Volume 2i of the ES. Each assessment has; relevant baseline data, an appropriate study area, a defined methodology, agreed significance criteria and thresholds for mitigation. Significance criteria are summarised in Table 8-11 in Volume 2i of the ES. Further information on the methodologies is given in Appendix 8-1 of the ES.

- 4.2.3 The approach to setting study areas, significance criteria and mitigation thresholds are best practice because they are in alignment with national policy and are consistent with other similar infrastructure schemes. The overall approach has also been subject to consultation with the Local Planning Authorities, as described in Chapter 8, paragraphs 8.3.62 to 8.3.63 in Volume 2i of the ES.
- 4.2.4 To undertake each assessment, it has also been necessary to obtain appropriate data and make appropriate assumptions about each activity. The data sources used are described in Chapter 8, paragraphs 8.3.12 to 8.3.17 in Volume 2i of the ES, which identifies the types of data used and indicates the relevant ES appendices for each assessment.
- 4.2.5 Where mitigation measures are needed there are three main approaches available. The first approach is to reduce noise levels at source, followed by attenuating noise between source and receptors. Lastly, attenuation measures at the receptor are considered.
- 4.2.6 For construction activities options for reductions at source are generally around choosing quieter methods of working, ensuring that plant and equipment is well suited for the job and is shut down after use, and ensuring that staff are aware of potential noise issues. Noise attenuation is generally covered by ensuring that noisy equipment is located away from receptors, orientated to minimise noise transmission or positioned behind structures to screen noise.
- 4.2.7 For operational activities the main reduction at source is the change in the type of train, with the Scheme avoiding the use of passenger services hauled by the Class 68 locomotives and the use of continuously welded rail. Noise attenuation would be provided by trackside noise barriers between the track and relevant receptors.
- 4.2.8 When considering mitigation at receptors the main method is to provide noise insulation at the property to reduce internal noise levels to acceptable levels, principally by improving the acoustic performance of the windows as these are generally the acoustic ‘weak points’. The noise insulation package provides its benefits when the windows are closed, and the package needs to ensure that adequate ventilation can be provided when windows remain closed.
- 4.2.9 There is a distinction between impacts that are significant in policy terms and impacts that are significant in EIA terms. In policy terms impacts are significant when noise levels are above the threshold for significant

adverse effects (SOAEL) whereas impacts can be significant below this level in EIA terms. The threshold for significant adverse effects has been set at the threshold for statutory noise insulation (NR53 and NR66), and therefore the statutory noise insulation package is the mitigation measure for those impacts which are significant under Policy.

- 4.2.10 The reduction in noise required to bring internal levels down is smaller for impacts which are significant in EIA terms than those which are significant in Policy terms. A lower acoustic specification is therefore required for impacts significant in EIA terms compared with impacts significant in Policy terms, and this is referred to as a non-statutory noise insulation package.
- 4.2.11 In practice the package which would be offered in these non-statutory cases would depend on the existing windows and ventilation at the property. Properties with more recently installed windows and ventilation may already have sufficient attenuation to give rise to acceptable levels in the future situation. Where non-statutory noise insulation is proposed the acoustic performance of the existing situation would be reviewed first to determine appropriate ways of improving noise insulation, if relevant.

4.3 Construction Noise Impacts and Mitigation

- 4.3.1 Construction noise impacts at receptors are considered significant when noise levels exceed the threshold for significant adverse effects (SOAEL) for a specified duration.
- 4.3.2 The key control for construction noise and vibration is the Code of Construction Practice (CoCP). All controls and measures expected to be used are set out in paragraphs 8.6.1 to 8.6.32 of the ES. Many of the controls reduce noise and/or vibration at source, whereas others provide attenuation to reduce the noise and/or vibration reaching the receptors.
- 4.3.3 Part A of the CoCP contains general measures for controlling noise and vibration and managing construction traffic. This Part was submitted as Appendix 2-1 of the ES (NR16B); however, the general control measures are also described in paragraphs 8.6.18 to 8.6.25 of the ES.
- 4.3.4 Part B of the CoCP will include details for specific activities, a Noise and Vibration Management Plan (NVMP) and an External Communications Plan. The NVMP will include a requirement to seek consent for construction works under Section 61 of the Control of Pollution Act 1974 (NR52) and will detail survey and monitoring requirements. Part B will be

submitted to the Local Authority for approval under Condition 5 of the Deemed Planning Permission (DPP) (NR12).

- 4.3.5 Decisions to apply for Section 61 consents are made on a project by project basis in discussion with the local planning authority. It is intended that consent will be applied for under Section 61, and their application will set out the agreed expected noise and vibration levels and set upper limits for these. Integral to this process are the changing significance thresholds with time of day, identified in Table 8-11 of the ES. Where works are required outside normal core working hours there will be tighter noise limits in place to minimise disturbance.
- 4.3.6 To minimise noise and vibration impacts across all route sections during construction, the mitigation measures set out in the CoCP will be implemented and where possible materials in bulk will be transported by rail. Where reasonably practicable measures will be implemented so they are in place prior to the start of the works.
- 4.3.7 In addition to the CoCP there are specific mitigation measures for construction noise impacts which would otherwise be significant.
- 4.3.8 Potentially significant noise effects were identified at receptors near Hillhouse Compound. At this location a noise barrier will be erected, and nearby receptors assessed for non-statutory noise insulation. The barrier would be 2m high and approximately 165m in length.
- 4.3.9 The existing level of noise insulation will be assessed at 30 receptors and non-statutory noise insulation will be offered where it is reasonably practicable to offer improved noise insulation:
- No. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, and 22 Abbey Road (11 receptors, 11 properties);
 - No 120, 122, 124, 126, 128, and 130 Alder Street (6 receptors, 6 properties);
 - No. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, and 26 Hammond Street (13 receptors, 13 properties).
- 4.3.10 With deployment of the CoCP, noise barrier installation and acceptance of offers of non-statutory noise insulation there would be no significant adverse noise effects from construction activities associated with the Scheme. Adverse noise impacts would be expected at around 2000 receptors.

4.4 Construction Vibration Impacts and Mitigation

- 4.4.1 Construction vibration impacts at receptors are considered significant when vibration levels exceed the threshold for significant adverse effects for a specified duration. Impacts are also considered in terms of vibration affecting the structure of buildings.
- 4.4.2 The CoCP also includes relevant controls for construction vibration. Impacts have been considered from ground compaction activities and from piling for overhead line equipment (OLE), potentially affecting receptors close to the track alignment.
- 4.4.3 In respect of impacts on people within buildings, significant adverse impacts are not expected, principally as vibration effects are expected to be short-term. Adverse vibration impacts potentially affect around 1000 receptors.
- 4.4.4 In respect of structures, the ES has adopted a worst-case assessment for construction vibration. Nine receptors have been identified with potential for vibration to exceed 12.5mm/s from compaction and 20 receptors similarly from piling. Vibration of this magnitude is noted in BS5228-2 (NR72) to be where the probability of cosmetic damage to buildings tends towards zero. An example of cosmetic damage is noted in that standard as the initiation or extension of cracks in plasterwork.
- 4.4.5 Table 8-15 in Volume 2i of the ES identifies the affected receptors, which summarises as:
- Six receptors from ground compaction during compound set-up
 - Two receptors from track and ballast works
 - One receptor from ground compaction during drainage and culvert works
 - Four receptors from piling during noise barrier erection
 - Five receptors from piling during structures works
 - Eleven receptors from piling during overhead gantry installation
- 4.4.6 A programme of surveys and monitoring will be agreed and documented in the Noise and Vibration Management Plan (NVMP) for these receptors to ensure that damage is not caused from vibration during the Scheme construction. The NVMP will also detail the process for carrying out any remedial measures, should they be required.

- 4.4.7 Whilst no significant effects from vibration are predicted at Dr Reddy's, given the nature of operations at the facility and in line with precautionary good practice, an alternative piling method will be used in the area near to the facility to minimise the vibration impacts from installation of overhead gantries.
- 4.4.8 The ES notes in Paragraph 8.5.26 of Volume 2i that vibration levels would need to be two to four times higher than 12.5mm/s to have potential to cause structural damage. Heavier reinforced buildings can withstand higher vibration levels before damage occurs.
- 4.4.9 The assessment presented in Table A8-3 of Appendix 8-4 of the ES identifies the distances for potential cosmetic damage from construction activities. When considering a higher threshold of 25mm/s for potential structural damage, ground compaction works would not give rise to these vibration levels. Percussive piling would only have the potential to cause structural damage at receptor distances closer than 5m from works.
- 4.4.10 Of the receptors affected by vibration from piling activities, all receptors are further than 5m, except for three non-residential receptors which are potentially within 5m.

4.5 Construction Traffic Impacts and Mitigation

- 4.5.1 Impacts from construction traffic are considered significant at receptors when there would be a moderate or major change in noise.
- 4.5.2 The ES states there would be temporary significant effects from road traffic noise due to temporary diversions and construction traffic at some 1250 receptors.
- 4.5.3 Further analysis has identified that there would be some 1000 receptors with potential for significant impacts along routes set out in Table 4-1.

Table 4-1: Receptors with potential for significant impacts

Location (Route)	Reason	Receptors (moderate impact)	Receptors (major impact)	Duration
Hillhouse / Fartown (Alder Street / Woodhouse Hill)	Diversions	76	141	6 months
Sheepridge (Sheepridge Road / Keldregate / Deighton Road / Whitacre Street)	Diversions due to A62 closure	252	107	3 months

Location (Route)	Reason	Receptors (moderate impact)	Receptors (major impact)	Duration
Dalton Bank Road	Construction traffic	91	0	2 years
Mirfield / Lower Hopton (Station Road, Hopton New Road, Back Station Road, Granny Lane, Hopton Lane, Calder Road)	Construction traffic	22	65	13 months
Kirkheaton / Upper Hopton (Hopton Hall Lane, Cockley Hill Lane, Heaton Moor Road, Town Road)	Construction traffic	108	104	13 months
Mirfield (Newgate)	Station Road Diversion	0	9	4 months
Dewsbury (Forge Lane)	Ravensthorpe Road Diversion	2	0	5 months
Dewsbury (Warren Street)	Thornhill Road Diversion	36	0	2 months

4.5.4 This table shows potentially significant effects from diversions at approximately 600 receptors lasting up to six months, and from construction traffic at approximately 400 receptors lasting up to 2 years. The receptors on each route are those within approximately 50m of the route and with a reasonably direct view of that route.

4.6 Temporary Operational Effects During Construction Impacts and Mitigation

4.6.1 The use of temporary Hillhouse Compound station during the construction phase has potential for noise impacts at receptors. Impacts would be considered significant if; there were complaints likely from the PA system, if changes in road traffic noise were moderate or major, or if noise from the operation of the sidings exceeded the background levels by at least 10dB.

4.6.2 Taking into account the noise barrier and non-statutory noise insulation described above for Hillhouse Compound significant adverse effects would not be expected from the use of the temporary Hillhouse Compound station or from bus replacement services operating in the evening and early morning.

4.7 Operational Railway noise Impacts and Mitigation

- 4.7.1 The daytime threshold for significant adverse effects has been set at the same level as the threshold for statutory noise insulation. Impacts from changes in railway noise are considered significant at receptors if they are shown to be moderate or major in magnitude unless noise levels are above the threshold for significant adverse effects. Above the threshold for significant effects impacts are considered significant if the change in noise exceeds 1dB.
- 4.7.2 Where significant adverse noise effects are predicted at groups of properties, noise attenuation will be provided in the form of eight trackside acoustic barriers, with an approximate combined total length 1.2 km. The noise barrier proposed to mitigate construction impacts at Hillhouse will also mitigate potentially significant noise from the operation of the stabling sidings.
- 4.7.3 Whilst the noise barriers are primarily intended for avoiding significant adverse effects, they will also benefit other nearby receptors exposed to adverse effects.
- 4.7.4 All trackside barriers will have a noise-absorptive finish on the track-facing side. The noise barriers are typically 2m high, which is measured above rail height when the track is at grade or on embankment, and above ground level when the track is in cutting or when the barrier is positioned on a structure.
- 4.7.5 The appearance, size and location of the noise barriers is to be approved by the local planning authority (pursuant to Condition 13 of the Deemed Planning Permission). The locations proposed are:
- Hillhouse, Huddersfield (2m high, approx. length 165m).
 - Red Doles Road, Huddersfield (2m high, approx. length 175m).
 - Topaz Close, Huddersfield (2m high, approx. length 175m).
 - Station Road, Bradley (2.5m high, approx. length 85m).
 - Helm Lane/Wood Lane, Mirfield (2m high, approx. length 120m).
 - Woodend Road, Mirfield (2m high, approx. length 160m).
 - Mirfield Viaduct (2m high, approx. length 70m).
 - Huddleston Court/Marina (2m high, approx. length 215m).
 - Mavis Street/Mavis Avenue (2m high, approx. length 170m).

- 4.7.6 With the proposed noise barriers there will be no significant adverse effects at non-residential receptors. However, there are residential 22 receptors which would have significant adverse effects from the operation of the railway and 30 residential receptors with potentially significant adverse effects from the operation of Hillhouse stabling sidings.
- 4.7.7 The proposed noise barriers would result in 47 fewer receptors with significant adverse daytime effects and 26 fewer receptors with significant adverse night-time effects. The barriers also mitigate adverse effects at some 150 receptors.
- 4.7.8 The barriers at Topaz Close, Station Road and Woodend Road are at the locations of the three Noise Important Areas within the Order limits which were identified in Round 1 of the Noise Action Plans produced by Defra in 2010 and described in Paragraph 8.4.8 of 53 of Volume 2i. These areas were no longer identified as Noise Important Areas in the subsequent Round 2 (2014) or Round 3 (2019) Noise Action Plans, indicating that these properties are no longer in the top 1% of population exposed to railway noise. The barriers in these locations will improve the noise levels at these locations.
- 4.7.9 The 30 receptors at Hillhouse are the same receptors identified in the construction noise assessment and these would have been offered non-statutory noise insulation to deal with those construction impacts. The non-statutory noise insulation would also mitigate noise from the operation of the stabling sidings.
- 4.7.10 Noise insulation will be offered at 22 receptors in other areas where significant adverse effects are predicted, but noise barriers are not considered appropriate.
- 4.7.11 The statutory noise insulation criteria are currently considered to be met at 10 receptors. Two further receptors meet the criteria under the contiguous façade power in the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (NR66). An assessment would be undertaken to establish qualifying rooms within these receptors and statutory noise insulation would be offered accordingly at 12 receptors:
- No. 11 and 13 Whitacre Street (2 receptors, 2 properties).
 - No. 11 and 12 Lilac Court (2 receptors, 2 properties).
 - No. 682 and 684 Leeds Road (2 receptors, 2 properties).
 - Hopton Care Cottages (1 receptor, multiple properties).

- Ledgard Wharf (1 receptor, multiple properties).
- No. 24 and 26 Brooks Yard (2 receptors, 2 properties).
- No. 28 and 30 Brooks Yard (2 receptors, 2 properties – contiguous façade criteria).

4.7.12 At Hopton Care Cottages the assessment showed that first floor receptors facing the railway met the criteria for noise insulation. The majority of properties at the cottages are single storey. Depending on internal layouts there may be some seven to ten properties meeting the criteria for insulation, and potentially a similar number under the contiguous façade power in the Regulations.

4.7.13 At Ledgard Wharf the assessment showed that first floor and above receptors facing the railway met the criteria for noise insulation, along both the façade parallel with the railway and with some receptors on the façade overlooking the bridge over the River Calder. There are approximately 50 dwellings on these facades. Depending on internal layouts there may be some 12-15 properties meetings the criteria for insulation. There is potential for further properties to qualify under the contiguous façade power in the Regulations.

4.7.14 There are 12 receptors where there are predicted to be significant adverse effects where noise levels are below the threshold for statutory noise insulation. At these receptors the existing level of noise insulation will be assessed, and non-statutory noise insulation will be offered where it is reasonably practicable to offer improved noise insulation:

- No. 43, 45, 47, 49, 51 and 54 Whitacre Close (6 receptors, 6 properties).
- No. 14, 16, 18 and 20 Mavis Street (4 receptors, 4 properties).
- No. 20 and 22 Mavis Avenue (2 receptors, 2 properties).

4.7.15 Significant adverse effects would be avoided within all receptors where offers of noise insulation are accepted. As noise insulation does not alter outdoor noise levels, effects in external amenity areas are not altered with noise insulation.

4.8 Operational Railway Vibration Impacts and Mitigation

4.8.1 Impacts from railway vibration at receptors are considered significant if they are shown to be moderate or major in magnitude unless vibration levels are above the threshold for significant adverse effects. Above the

threshold for significant effects impacts are considered significant if the change is minor in magnitude.

- 4.8.2 Impacts from groundborne noise generated by vibration are considered significant where there would be an increase of at least 3dB at night.
- 4.8.3 There would be no significant adverse vibration or groundborne noise impacts from the Scheme.

4.9 Operational Road Traffic Noise Impacts and Mitigation

- 4.9.1 Impacts from road traffic noise are considered significant at receptors when there would be a moderate or major change in noise.
- 4.9.2 Four locations are identified where road realignments are required as part of the Scheme. Adverse and significant adverse effects are not expected at three of these realignments. The realignment of Thornhill Road at Brooks Yard is shown to give rise to significant effects at two receptors.
- 4.9.3 The provision of a noise barrier is not considered feasible for this location, however a new garden wall will be constructed as part of the highways realignment which would serve as a noise barrier to benefit the garden and ground floor areas.
- 4.9.4 No. 24 and 26 Brooks Yard are currently considered to meet the criteria for statutory noise insulation. Two further receptors (28 and 30 Brooks Yard) also meet the criteria under the contiguous façade power in the Noise Insulation Regulations 1975 (NR53). An assessment would be undertaken to establish qualifying rooms within these receptors and statutory noise insulation would be offered accordingly at 4 receptors:
 - No. 24 and 26 Brooks Yard (2 receptors, 2 properties).
 - No. 28 and 30 Brooks Yard (2 receptors, 2 properties – contiguous façade power).
- 4.9.5 These four receptors and properties also meet the criteria for statutory railway noise insulation, and the consideration of insulation at these properties would consider both sets of Regulations in determining the qualifying rooms and the offer of insulation.
- 4.9.6 Significant adverse effects would be avoided within all receptors where offers of noise insulation are accepted. As noise insulation does not alter outdoor noise levels, effects in external amenity areas are not altered with noise insulation.

4.10 Public Address System Noise Impacts and Mitigation

- 4.10.1 Impacts from the use of public address systems at stations at receptors would be considered significant if there complaints were likely from using the system.
- 4.10.2 Significant adverse effects are not expected from the operation of public address systems, but there is potential for adverse effects at receptors near Deighton and Mirfield stations during the night.

5. RESPONSES TO SPECIFIC OBJECTORS

5.1.1 Objectors referring to noise and vibration matters are:

- OBJ 24 – Rosemary Carr
- OBJ 26 – Dr Reddy’s
- OBJ 33 – Kirklees Council
- OBJ 38 – Huddersfield Town AFC
- OBJ 40 – West Yorkshire Combined Authority

5.2 OBJ 24 – Rosemary Carr

Objection

- 5.2.1 Rosemary Carr does not mention noise or vibration in her objection. Detrimental impacts are mentioned in the introductory paragraphs, but these are not subsequently referred to in the reasons for objection.
- 5.2.2 Neither noise nor vibration are mentioned in their Statement of Case, however the second bullet of 2.1 refers to a “lack of consideration to the effect on the residential properties.”
- 5.2.3 In subsequent correspondence queries have been raised about the potential impact on their properties on Chadwick Fold Lane, near Mirfield station, initially querying if these properties have been considered in the assessment.

Response

- 5.2.4 These properties have been considered as receptors in the assessments.
- 5.2.5 In terms of construction noise, sheet 7 of Figure 8.3 shows that without mitigation there is potential for significant adverse effects from daytime construction activities from works on Mirfield Viaduct. The deployment of the CoCP is expected to reduce construction noise impacts below the threshold of significance and avoid those potentially significant impacts.
- 5.2.6 In terms of operational noise, sheet 6 of Figure 8.6 shows noise levels below SOAEL and a negligible daytime operational noise impact, and sheet 6 of Figure 8.7 shows night-time noise levels approximately equal to SOAEL and a negligible noise impact smaller than 1dB. The operation of the Scheme will not materially change noise levels at these receptors and negligible changes in noise are not considered significant.

5.3 OBJ 26 – Dr Reddy’s

Objection

- 5.3.1 Dr Reddy’s are concerned about vibration from the operation and construction of the Scheme affecting their laboratories (see Section 6 of their Statement of Case). Their concerns are primarily around their precision weighing balances, liquid chromatography and gas chromatography equipment.

Response

- 5.3.2 Dr Reddy’s laboratory operates adjacent to the existing railway, and the baseline vibration measurements undertaken for the Scheme show that the ground directly outside the laboratory vibrates between 0.3 and 0.5mm/s during current train passbys.
- 5.3.3 Network Rail have been in discussion with Dr Reddy’s to identify the vibration sensitivity of their equipment. No specific vibration sensitivity information is available from the equipment manufacturers, so it is not possible to determine an appropriate vibration limit for the site. However, Dr Reddy’s have indicated that they are able to operate their equipment successfully with the existing railway operations, and therefore the existing vibration levels from train passbys and maintenance activities sets an acceptable vibration level.
- 5.3.4 The ES does not identify potentially significant impacts at Dr Reddy’s either during construction or operation of the Scheme and paragraph 8.5.53 of Volume 2i indicates that vibration levels due to the operation of the Scheme are expected to reduce slightly.
- 5.3.5 During construction the highest vibration levels would occur during piling for the overhead gantries and ballast tamping. An alternative foundation strategy (pad foundations) would be employed for overhead gantries nearest to Dr Reddy’s to ensure that vibration from piling is no higher than that from the existing trains or maintenance activities.
- 5.3.6 Ballast tamping on the existing tracks would generate vibration levels less than 1mm/s, and this activity already occurs during routine maintenance of the existing tracks. The new tracks are further from Dr Reddy’s laboratory, and vibration from ballast tamping on these would be around 0.5mm/s, which is similar to the vibration levels from existing train passbys.

- 5.3.7 Dr Reddy's will be consulted about vibration producing activities during the construction of the Scheme to ensure that all parties are aware of risks and concerns.
- 5.3.8 Once operational, vibration from freight trains would remain at the same level as experienced currently. Vibration from passenger trains would decrease because the passenger trains hauled by class 68 locos would be replaced by multiple units, which have lower vibration levels. The reported reduction in vibration is not a "significant operational vibration impact" as noted in paragraph 6.17 of Dr Reddy's Statement of Case.
- 5.3.9 The faster (express) services would run on the tracks furthest from Dr Reddy's, minimising vibration from passenger services. Should services be amended i.e. should works or issues on the railway result in express services having to utilise the slow lines closes to the Dr Reddy's facility, these services would be restricted to the line speed on the slow track which is similar to existing and therefore vibration levels would be similar or less than existing for reasons as set out in 4.2.8.

5.4 OBJ 33 – Kirklees Council

Objection

- 5.4.1 Kirklees Council raised several points about noise and vibration in their objection to the Scheme. Of these, non-statutory noise insulation at Whitacre Close and noise mitigation during construction at Hillhouse compound/sidings are presented in their Statement of Matters (7.2.5 to 7.2.15).
- 5.4.2 Kirklees sought three changes to three proposed conditions to address their remaining noise and vibration concerns:
- Amended Proposed Condition 5 (APC5) is put forward to suggest converting the CoCP to a CEMP.
 - Additional/Alternative Condition 15 (AAC15) is put forward to prevent any works from taking place until a report identifying residential receptors eligible for noise insulation or temporary re-housing has been submitted and approved.
 - Amended Proposed Condition 16 (APC16) is put forward to include measures as well as structures at Hillhouses Yard.

Response

- 5.4.3 Technical issues are being resolved through collaborative effort in workshops between Network Rail and Kirklees Council. Noise insulation and noise mitigation are dealt with in the Statement of Common Ground currently being developed between the two parties.
- 5.4.4 Issues relating to the proposed change to conditions of the Deemed Planning Permission are dealt with in the SoCG and the Proof of Evidence of Mr Tony Rivero (NR/PoE/TR/4.2). However, for varying reasons it was concluded that the three proposed changes would not be carried forward.

5.5 OBJ 38 – Huddersfield Town AFC

Objection

- 5.5.1 Noise is not referenced in their Statement of Case but was raised through their objection, as a concern on impacts that any noise generating activity carried out will have on the use of the adjoining playing fields.

Response

- 5.5.2 Additional receptors have been added to the noise model to assess the impacts at the Huddersfield Town AFC playing fields.
- 5.5.3 During construction of the Scheme noise levels from track and ballast works are above the threshold for significance at the playing fields, but the duration of these works is sufficiently short for the effect not to be considered a significant effect. It is also noted that these works would mostly be undertaken at night when the playing fields are not expected to be in use. Adverse (but not significant) effects may be expected from works at Field House Lane overbridge (MVL3/98) and from the setting up of Field House Lane compound.
- 5.5.4 Once operational the Scheme would result in minor increases in noise at the playing fields. Following the assessment methodology in the ES these impacts are considered to be adverse but not significant.

5.6 OBJ 40 – West Yorkshire Combined Authority

Objection

- 5.6.1 Noise is mentioned once in the West Yorkshire Combined Authority objection, in connection with operation of Huddersfield Bus Station

alongside vibration and structural damage. It is not mentioned in their comments about the Environmental Statement.

Response

- 5.6.2 Additional receptors have been added to the noise model to assess the impacts at Huddersfield Bus Station.
- 5.6.3 During construction of the Scheme adverse and significant noise effects are not expected at Huddersfield Bus Station, and so the construction of the Scheme should not give rise to noise impacts on the users or tenants of the bus station.
- 5.6.4 Similarly, during construction of the Scheme adverse and significant vibration effects are not expected at Huddersfield Bus Station, so the construction of the Scheme should not give rise to vibration impacts on the users or tenants of the bus station or give rise to structural damage to the buildings.

6. WITNESS DECLARATION

6.1 Statement of declaration

6.1.1 I hereby declare as follows:

- (i) This Proof of Evidence includes the facts which I regard as being relevant to the opinions which I have expressed, and the Inquiry's attention has been drawn to any matter which would affect the validity of that opinion.
- (ii) I believe the facts which I have stated in this Proof of Evidence are true and that the opinions expressed are correct.
- (iii) I understand my duty to the Inquiry to help it with matters within my expertise and I have complied with that duty.