

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

The Hinckley National Rail Freight Interchange Development Consent Order

Project reference TR050007

ES Appendix 10.2 Policy, Legislation and Guidance

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations
2009 Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Regulation 14

This document forms a part of the Environmental Statement for the Hinckley National Rail Freight Interchange project.

Tritax Symmetry (Hinckley) Limited (TSH) has applied to the Secretary of State for Transport for a Development Consent Order (DCO) for the Hinckley National Rail Freight Interchange (HNRFI).

To help inform the determination of the DCO application, TSH has undertaken an environmental impact assessment (EIA) of its proposals. EIA is a process that aims to improve the environmental design of a development proposal, and to provide the decision maker with sufficient information about the environmental effects of the project to make a decision.

The findings of an EIA are described in a written report known as an Environmental Statement (ES). An ES provides environmental information about the scheme, including a description of the development, its predicted environmental effects and the measures proposed to ameliorate any adverse effects.

Further details about the proposed Hinckley National Rail Freight Interchange are available on the project website:

<http://www.hinckleynrfi.co.uk/>

The DCO application and documents relating to the examination of the proposed development can be viewed on the Planning Inspectorate's National Infrastructure Planning website:

<https://infrastructure.planninginspectorate.gov.uk/projects/east-midlands/hinckley-national-rail-freight-interchange/>

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NOISE

National Planning Policy

National Policy Statement for National Networks

- 1.1. Paragraphs 5.186 to 5.200 details the requirements of noise and vibration assessments. It states that factors that will determine the likely noise impact include;
- construction and operational noise, including its characteristics;
 - the proximity of noise sensitive receptors/areas to the proposed development;
 - the proximity to quiet places, including areas that are valued for their tranquillity, acoustic environment or landscape quality; and
 - the proximity to designated sites.
- 1.2. The document also makes reference to relevant policies and standards and states that *'where a development is subject to EIA and significant noise impacts are likely to arise'*, the following should be included in the noise assessment;
- A description of the noise sources including likely usage in terms of number of movements, fleet mix and diurnal pattern. For any associated fixed structures, such as ventilation fans for tunnels, information about the noise sources including the identification of any distinctive tonal, impulsive or low frequency characteristics of the noise.
 - Identification of noise sensitive premises and noise sensitive areas that may be affected.
 - The characteristics of the existing noise environment.
 - A prediction on how the noise environment will change with the proposed development;
 - In the shorter term such as during the construction period;
 - In the longer term during the operating life of the infrastructure; and
 - At particular time of the day, evening and night as appropriate.
 - An assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas.
 - Measures to be employed in mitigating the effects of noise. Applicants should consider using best available techniques to reduce noise impacts.

- The nature and extent of the noise assessment should be proportionate to the likely noise impact.

National Planning Policy Framework

- 1.3. Published in July 2021, this document sets out the Government's planning policies for England and supersedes the previous NPPF published in 2012. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

'174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.'

- 1.4. It also makes the following references to noise in the Section entitled Ground conditions and pollution:

'185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁰;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

⁶⁰ See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)'

And

'187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be

required to provide suitable mitigation before the development has been completed.'

Noise Policy Statement for England

- 1.5. The Noise Policy Statement for England (NPSE) was published in March 2010 and sets out the long-term vision for government noise policy to *'Promote good health and a good quality of life through the effective management of noise'*.
- 1.6. This long-term vision is supported by the following aims:
- avoid significant adverse impacts on health and quality of life;
 - mitigate and minimise adverse impacts on health and quality of life; and
 - where possible, contribute to the improvement of health and quality of life.
- 1.7. To assist in the understanding of the terms 'significant adverse' and 'adverse', the NPSE acknowledges that there are two concepts applied to noise impacts by the World Health Organisation. They are:
- NOEL (No Observed Effect Level) - the level below which no effect can be detected i.e. below this level, there is no detectable effect on health & quality of life.
 - LOAEL - Lowest Observed Adverse Effect Level - the level above which adverse effects on health and quality of life can be detected.
- 1.8. The NPSE introduces a third concept referred to as a Significant Observed Adverse Effect Level (SOAEL) which is described as the level above which significant adverse effects on health and quality of life occur.
- 1.9. However, the NPSE goes on to state:
- 'It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.'*
- 1.10. In the absence of specific guidance within the NPPF and NPSE for the assessment of environmental noise, it is considered appropriate to base assessment on LPA requirements, current British Standards and national and international guidance (as described in the Chapter). However, one noteworthy advisory point in the NPSE is the need to place into context any general requirements that increases in ambient noise should be 'minimised'. In this regard the NPSE states:

‘Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as is reasonably practical... the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications’.

Planning Practice Guidance

- 1.11. In March 2014, the Department for Communities and Local Government (DCLG) launched a national planning practice guidance web-based resource. The guidance is to complement the NPPF and provide advice on how to deliver its policies.
- 1.12. The section on noise includes a table which summarises ‘the noise exposure hierarchy, based on the likely average response’ and offers ‘examples of outcomes’ relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE.
- 1.13. The outcomes are in descriptive form and the guidance offers no numerical definition of the NOEL, LOAEL and SOAEL, or detailed advice regarding methodologies for determining them. There is also no reference to the further research identified as necessary in the NPSE in 2010.
- 1.14. The table identifying descriptive examples of outcomes presented in the PPG is summarised in Table 10.1.

Table 10.1: Planning Practice Guidance

Response	Example of outcomes	Increasing effect level	Action
Not present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required

Response	Example of outcomes	Increasing effect level	Action
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid

Response	Example of outcomes	Increasing effect level	Action
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Local Planning Policy

Blaby District Council Local Plan (Core Strategy) Development Plan Document, February 2013

- 1.15. The local plan was adopted in February 2013, and contains Policy CS18 which relates to Countryside and states the following;

'Policy CS18 – Countryside

Strategic objectives

- *To maximise sport and recreation opportunities;*
- *To protect the important areas of the District's natural environment (species and habitats), landscape and geology and to improve biodiversity, wildlife habitats and corridors through the design of new developments and the management of existing areas by working with partners; and*
- *To provide the appropriate quantity, quality and mix of employment opportunities to meet the needs of the District's current and future populations, and to meet strategic employment, education and training needs;*

[...]

Within areas designated as Countryside, planning permission will not be granted for built development, or other development which would have a significantly adverse effect on the appearance or character of the landscape.

Planning permission will, however, be granted for limited small scale employment

and leisure development (including dwellings essential for these needs) subject to consideration of its impacts.

The need to retain Countryside will be balanced against the need to provide new development (including housing) in the most sustainable locations. The detailed boundaries of Countryside will be determined through the Allocations, Designations and Development Management DPD.'

- 1.16. Policy CS18 also states that the boundaries will be determined through Blaby Green Space Strategy – 2012.

Blaby Green Space Strategy (2012)

- 1.17. The strategy details the vision and goals to be achieved in relation to green space and the resources and means of achieving them.
- 1.18. Natural Green Space, as detailed in the document, includes meadows, river floodplain, woodland and copse. The document states that Sites of Special Scientific Interest and Local Nature Reserves are to be safeguarded and enhanced. A list of 25 sites is detailed, which includes Aston Firs to the south west and for these sites the following is stated;

'any proposal which would have an effect on the 25 sites listed below will need to demonstrate that there would be no adverse impacts resulting from the development. These areas will be safeguarded and enhanced where they could be directly or indirectly by the development.'

- 1.19. Aston Firs/Burbage Common is also identified as an area that will be retained as an important recreation resource.

Blaby District Council Local Plan (Delivery) Development Plan Document, February 2019

- 1.20. The document was adopted in February 2019, and contains Development Management Policy 2, which relates to the Countryside and states the following;

'In areas designated as Countryside on the Policies Map, development proposals consistent with Core Strategy Policy CS18 will be supported where the following criteria are met:

General

[...]

b) The development provides a satisfactory relationship with nearby uses that would not be significantly detrimental to the amenities enjoyed by the existing or new occupiers, including but not limited to, consideration of:

[...]

ii. *privacy, light, noise, disturbance and overbearing effect;*

[...]

- 1.21. It also includes Development Management Policy 13 – Land Contamination and Pollution, which states the following;

‘Development proposals will be required to clearly demonstrate that any unacceptable adverse impacts related to land contamination, landfill, land stability and pollution (water, air, noise, light and soils) can be satisfactorily mitigated.

For the following circumstances, development proposals will be supported where they are accompanied by a detailed investigation of the issues and appropriate mitigation measures are identified to avoid any adverse impact upon the site or adjacent areas;

[...]

d) Close to a source of noise or light pollution and/or the proposal may be a source of noise or light pollution;

[...]

Blaby Landscape and Settlement Character Assessment, Final Report January 2020

- 1.22. The document provides a review of the landscape and settlement character evidence produced in 2008 and details a landscape sensitivity study. It provides a profile for each identified area.
- 1.23. The document also includes a section on guidance and opportunities for future development. For Elmesthorpe Floodplain and the area around Stoney Stanton, this states the following;

‘Ensure any new development is sensitively sited, aiming to avoid significantly affecting areas of rural character with locally important levels of tranquillity.’

Planning Guidance Note – Noise 2019

- 1.24. The Planning Guidance Note produced by Blaby District Council provides the information requirements which should be provided to support a planning application. The document also provides some detail on the preparation of noise impact assessments and includes a list of guidance and standards which are relevant to noise and vibration.

Hinckley and Bosworth Borough Council Site Allocations and Development Management Policies DPD, July 2016

- 1.25. The document contains a number of policies including the following which are

relevant to noise;

'Policy DM7 – Preventing Pollution and Flooding

Adverse impacts from pollution and flooding will be prevented by ensuring that development proposals demonstrate that:

[...]

d) it would not cause noise or vibration of a level which would disturb areas that are valued for their tranquillity in terms of recreation or amenity;

[...]

1.26. The policy goes on to state that;

'National policy seeks to avoid, mitigate and minimise the adverse impacts on health and quality of life arising from new development and where possible, encourages schemes which can contribute to improvements to amenity by using development to mitigate against existing impacts.

Rural and tranquil areas are more sensitive to disturbance from noise where the ambient noise levels are lower compared to urban areas. National policy specifies that planning policies should identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are valued for their recreational and amenity value for this reason.

[...]

1.27. The document also contains Policy DM10 which is detailed below.

'Policy DM10 – Development and Design

Developments will be permitted providing that the following requirements are met:

a) It would not have a significant adverse effect on the privacy and amenity of nearby residents and occupiers of adjacent buildings, including matters of lighting, air quality (including odour), noise, vibration and visual intrusion;

[...]

Standards and Guidance

BS 7445-1:2003 Description and Measurement of Environmental Noise – Part 1: Guide to quantities and procedures

1.28. This standard describes basic quantities used for the description of noise and procedures to determine the quantities. It details the instrumentation to be used, including required specifications and calibration procedures, and measurement

procedures to be adopted, including positions, weather conditions and information to be reported.

ISO 9613-2: Acoustic – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation

- 1.29. This standard details a method for calculating the attenuation of sound as it propagates across an area outdoors. This allows noise to be calculated at a given distance from various sources, including but not limited to, road or rail traffic, industrial noise sources and construction activities. The method accounts for geometrical divergence, atmospheric absorption, ground effects, screening, reflections and meteorological conditions.

BS 5228-1:2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise

- 1.30. This standard sets out techniques to predict the likely noise effects from construction works, based on detailed information on the type and number of plant being used, their location and the length of time they are in operation.
- 1.31. The noise prediction methods can be used to establish likely noise levels in terms of the $L_{Aeq,T}$ over the core working day. This standard also documents a database of information, including previously measured sound pressure level data for a variety of different construction plant undertaking various common activities.
- 1.32. Three example methods are presented for determining the significance of construction noise impacts. In summary, these methods adopt either a series of fixed noise level limits, are concerned with ambient noise level changes as a result of the construction operations or a combination of the two.
- 1.33. With respect to absolute fixed noise limits, those detailed within Advisory Leaflet 72: 1976: Noise control on building sites are presented. These limits are presented according to the nature of the surrounding environment, for a 12-hour working day. The presented limits are:
- 70 dB(A) in rural, suburban and urban areas away from main road traffic and industrial noise; and
 - 75 dB(A) in urban areas near main roads and heavy industrial areas.
 - The above noise level limits are applicable at the façade of the receptor in question (not free-field).
- 1.34. The standard goes on to provide methods for determining the significance of construction noise levels by considering the change in the ambient noise level that would arise as a result of the construction operations. Two example assessment methods are presented. These are the 'ABC method' as summarised within Table 10.2 and the '5 dB(A) change' method as described below.

Table 10.2: Example Threshold of Potential Significant Effect at Dwellings (Construction Noise) – ABC Method

Assessment category and threshold value period	Threshold value in decibels (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

NOTE 1: A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2: If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity

NOTE 3: Applied to residential receptors only

A) Category A: threshold values to use when ambient levels (when rounded to the nearest 5 dB) are less than these values.

B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.

C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

D) 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays

1.35. The 5 dB method states the following:

'Noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-

construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB L_{Aeq} , from construction noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact.'

BS 5228:-2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration

- 1.36. This standard provides recommendations for basic methods of vibration control relating to construction and open sites. The legislative background to vibration control is described and guidance is provided concerning methods of measuring vibration and assessing its effects on the environment.
- 1.37. Guidance criteria are suggested for the assessment of the significance of vibration effects; such criteria are provided in terms of Peak Particle Velocities (PPV) and are concerned with both human and structural responses to vibration. Those applicable to human perception and disturbance are presented within Table 10.3.

Table 10.3: Guidance criteria for the assessment of significance of vibration for human perception and disturbance

Vibration level	Effect
0.14 mms^{-1}	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mms^{-1}	Vibration might be just perceptible in residential environments.
1.0 mms^{-1}	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10 mms^{-1}	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

- 1.38. The standard goes on to present guidance criteria applicable to the vibration response limits of buildings in terms of the component PPV. These are presented

within Table 10.4. It should be noted that the values presented within Table 10.4 are applicable to cosmetic damage only. It is stated within BS 5228-2:2009+A1:2014 that minor damage is possible at vibration magnitudes which are greater than twice those given in the table.

Table 10.4: Guidance criteria for the assessment of significance of transient vibration for cosmetic building damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	5 Hz to 15 Hz	5 Hz to 15 Hz
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 15 Hz and above
Unreinforced or light framed structures Residential or light industrial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

NOTE 1: Values referred to are at the base of the building.

NOTE 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded (Unreinforced or light framed structures, Residential or light industrial buildings only).

BS 6472-1:2008: Guide to Evaluation of Human Exposure to Vibration in Buildings; Part 1: Vibration Sources other than Blasting

- 1.39. With respect to human exposure to building vibration, BS 6472 provides guideline values (using the vibration dose value (VDV) above which various degrees of adverse comment may be expected from the occupants of residential buildings. The VDV is defined mathematically as the fourth root of the time integral of the fourth power of the vibration acceleration, after it has been frequency weighted. The guideline values recommended by BS 6472 are shown in Table 10.5 below.

Table 10.5: Guideline criteria, Vibration Dose Values (MS -1.75)

Place	Adverse comment not expected	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
Residential buildings 16 hour (Daytime)	<0.2	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 hour (night-time)	<0.1	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

- 1.40. It is stated within this document that, for offices and workshops, multiplying factors of 2 and 4 respectively should be applied to the above Vibration Dose Value ranges for a 16-hour day. It can be seen therefore that the most stringent criteria apply to residential properties.
- 1.41. BS 6472 defines procedures for calculating the Vibration Dose Value (eVDV), based on the number and duration of vibration events and the recorded value of the root mean square frequency weighted vibration acceleration. The frequency weighting takes into account the response of the human body to vibration of different frequencies in different orientations (i.e. transverse, longitudinal or vertical).
- 1.42. The above guidance relates to vibration measured at the point of entry into the human body, which is usually taken to mean the ground surface or at a point mid-span of an upper storey floor, rather than the point of entry into the building (a foundation element).
- 1.43. For the purpose of this assessment, the nature of the proposed built development (e.g. foundation design etc.) is not known. The assessment has therefore been undertaken based on measurements undertaken on the ground surface.

BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 1.44. This standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

- 1.45. The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings for steady external noise sources. It is stated that it is desirable that the internal ambient noise level does not exceed the following criteria set out in Table 10.6.

Table 10.6: Summary of internal ambient noise levels to be achieved in habitable rooms

Activity	Location	Period	
		07:00 to 23:00 Hours	23:00 to 07:00 Hours
Resting	Living Room	35 dB $L_{Aeq, 16}$ Hour	-
Dining	Dining Room	40 dB $L_{Aeq, 16}$ Hour	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16}$ Hour	30 dB $L_{Aeq, 8}$ Hour

- 1.46. Whilst BS 8233:2014 recognises that a guideline value may be set in terms of SEL or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: Guidelines for Community Noise.
- 1.47. With respect to external amenity space such as gardens and patios it is stated that it is desirable that the noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

World Health Organisation Guidelines for Community Noise (1999)

- 1.48. The internal and external ambient noise level criteria from BS 8233 are broadly

concordant with those stated within the World Health Organisation (WHO): 1999: Guidelines for community noise. The guidelines also contain guidance on L_{AFmax} noise levels during the night, the document draws upon guidance from Vallet and Vernet, which states:

'For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night'

World Health Organisation Environmental Noise Guidelines for the European Region (2018)

- 1.49. The guidelines detail health-based recommendations based on noise exposure from sources including road traffic, rail, aircraft, leisure and wind turbines. The aim of the guidelines is to inform policy and legislation. The guidelines provide further detail on the relationship between noise exposure and health, and broadly align with the World Health Organisation Guidelines for Community Noise.

BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound

- 1.50. The BS 4142 Standard describes methods for rating and assessing the following:
- sound from industrial and manufacturing processes;
 - sound from fixed installations which comprise mechanical and electrical plant and equipment;
 - sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
 - sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.
- 1.51. The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The Standard advises the purpose of the methodology includes the assessment of sound from any plant and activities associated with existing industrial and/or commercial uses at proposed residential dwellings.
- 1.52. If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,Tr}$). The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($LA_{90,T}$) in the absence of the specific sound.
- 1.53. The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed

to operate in the future.

- 1.54. Comparing the rating level with the background sound level, BS 4142 states:

'Typically, the greater this difference, the greater the magnitude of impact.

A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'

IEMA Guidelines for Environmental Noise Impact Assessment (2014)

- 1.55. The Institute of Environment Management and Assessment (IEMA) has produced a guidance document of Noise Impact Assessment. This document details the principles, methodology and techniques for undertaking a noise impact assessment, and how this is adopted within the EIA process.
- 1.56. The document also details an example of how change in ambient noise levels can be assessed. Table 2.4 of that document categorises the change in noise level for a NSR such as a residential dwelling where the nature of the noise does not change, and is reproduced below.

Table 10.7: Impact from change in sound levels

Sound level change dB $L_{Aeq,T}$ T = either 16hr day or 8hr night	Magnitude of impact
≥ 10dB	High
≥ 5.0dB and < 10dB	Medium
≥ 3.0dB and < 5dB	Low
≥ 0dB and < 3dB	Very Low

Department of Transport - Calculation of Road Traffic Noise 1998 (CRTN)

- 1.57. The document Calculation of Road Traffic Noise (CRTN) describes procedures for calculating noise from road traffic. The procedures are necessary to enable entitlement under The Noise Insulation Regulations (1975) to be determined but they also provide guidance appropriate to the calculation of traffic noise for more general applications e.g. environmental appraisal of road schemes, highways design and land use planning.

Department of Transport - Calculation of Rail Noise 1995 (CRN)

- 1.58. The document Calculation of Rail Noise (CRN) describes a method for determining the entitlement under The Noise Insulation Regulations (1975). They also provide guidance appropriate to the calculation of railway and other guided transport system noise for more general applications e.g. the assessment of the noise impact of railways, the design and location of new tracks and land use planning.

DEFRA Additional Railway Noise Source Terms for 'Calculation of Rail Noise 1995'

- 1.59. This document supplements the CRN methodology to take account of the change in vehicles and stock fleet that has occurred since the publication of CRN in 1995. Source term corrections are provided for a number of locomotives.

Public Health England – Noise and Health

- 1.60. Public Health England (PHE) believes that Nationally Significant Infrastructure Documents should limit significant adverse effects and improve health and quality of life where possible. PHE's guidance makes reference to the 2018 Environmental Noise Guidelines for the Europe Region. Emphasis is placed on defining significance of impacts at an early stage with an emphasis on the NPSE guidance.
- 1.61. The guidance also relies on high quality systematic reviews of scientific evidence to determine health outcomes from transportation sources and provides guidance on the selection of receptors, characterising the baseline sound environment and mitigation.

Tranquil Spaces – Measuring the Tranquillity of Public Spaces, Sharps Redmore Press 2019

- 1.62. The publication provides an overview of a number of methods for assessing tranquillity, the most notable being the 'University of Bradford Method' and The Campaign to Protect Rural England Method.
- 1.63. A new method is also detailed within the publication which is based on a number of parameters although it is recognised within the text that further research is required to refine the methodology. In addition, the book also provides a number of case

studies.

Transport Research Laboratory RR 246 Traffic Induced Vibrations in Buildings

- 1.64. The report provides a summary of a number of studies undertaken by Transport and Road Research Laboratory into the effects of vibration on people, buildings and equipment.
- 1.65. The paper is divided into two parts, the first detailing a method to determine the degree of disturbance arising from air-borne and ground-borne vibration. The second part provides an insight into the effects of traffic vibration on buildings. Although it is concluded that traffic vibration can result in severe annoyance to people, there is no evidence that significant damage to buildings occurs as a result of traffic vibration.

The Design Manual for Roads and Bridges (DMRB): LA111 Noise and Vibration (Revision 2)

- 1.66. This document sets out procedures for undertaking the environmental assessment of new road schemes, including the assessment of noise impacts from road traffic. In particular, it describes a method for assessing the severity of a noise impact, in terms of the number of people who will be bothered by any noise increases/decreases due to a new road scheme. When undertaking a DMRB assessment, the methodology contained within the Department for Transport 1988 document Calculation of Road Traffic Noise (CRTN) should be used to calculate levels of road traffic noise.
- 1.67. Although the DMRB strictly applies to new road schemes, the principles of the approach contained within the document can also be applied to the assessment of noise from road traffic in general. The Proposed Development has the potential to affect road traffic noise levels along existing roads, hence there is a need for such an assessment.
- 1.68. The DMRB assessment methodology suggests that the magnitude of noise changes from a project should be classified into levels of impact. LA111 considers how the magnitude of change can be affected by whether a noise level change occurs in the short term (e.g. as a result of a sudden opening of a scheme), or in the long term (e.g. gradually over time, such as that associated with natural traffic growth).
- 1.69. The example classification scale for short term changes is the most stringent and is presented in Table 10.8. The classification for the long-term changes is shown in Table 10.9.

Table 10.8: Classification for short-term changes

Noise change, $L_{A10,18hr}$ dB	Magnitude of impact
≥ 5	High
3 to 4.9	Medium
1 to 2.9	Low
< 1	Very Low

Table 10.9: Classification for long-term changes

Noise change, $L_{A10,18hr}$ dB	Magnitude of impact
≥ 10	High
5 to 9.9	Medium
3 to 4.9	Low
< 3	Very Low