

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.7 Environmental Statement – Appendix 6.2 Legislation, Policy and Guidance

Part A

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

**The A1 in Northumberland: Morpeth to Ellingham
Development Consent Order 20[xx]**

Environmental Statement - Appendix

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LEGISLATION, POLICY AND GUIDANCE

INTERNATIONAL LEGISLATION

DIRECTIVE 2014/52/EU OF THE EUROPEAN PARLIAMENT, 2014

- 6.1.1. This Directive published on 16 April 2014 amends Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- 6.1.2. It was considered necessary to amend the 2011 Directive to strengthen the quality of the environmental impact assessment procedure, align that procedure with current best practice and other relevant legislation and policies developed by the European Union and Member States.
- 6.1.3. An Environmental Impact Assessment report prepared under this legislation should include, inter alia, a description of the likely significant effects of the project and the measures envisaged to avoid, reduce or, if possible, offset any identified significant adverse effects on the environment.

DIRECTIVE 2002/49/EC OF THE EUROPEAN PARLIAMENT, 2002

- 6.1.4. This Directive relates to the assessment and management of environmental noise, and it is commonly referred to as the Environmental Noise Directive (END). It promotes the implementation of a three-step process:
 - a. Undertake strategic noise mapping to determine exposure to environmental noise
 - b. Ensure information on environmental noise is made available to the public
 - c. Establish Action Plans based on the strategic noise mapping results, to reduce environmental noise where necessary, and to preserve environmental noise quality where it is good

NATIONAL LEGISLATION

THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

- 6.1.5. EU Directive 2014/52/EU has been transposed into UK law through the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

ENVIRONMENTAL NOISE (ENGLAND) REGULATIONS 2006

- 6.1.6. EU Directive 2002/49/EC has been transposed into UK law as the Environmental Noise (England) Regulations 2006 (as amended). As part of this process, noise mapping has been undertaken and Noise Important Areas (NIAs) have been identified at locations where the 1 % of the population that are affected by the highest noise levels are located, in order to identify the areas which, require potential action.

THE NOISE INSULATION REGULATIONS 1975 (AS AMENDED 1988) (NIR)

- 6.1.7. The NIR were made under powers inferred by Section 20 of Part II of the Land Compensation Act. Regulation 3 imposes a duty on authorities to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings, subject to meeting certain criteria given in the Regulation, for new roads or carriageways.
- 6.1.8. Regulation 4 provides authorities with discretionary powers to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings for an altered road. Regulation 5 provides authorities with discretionary powers to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings during construction works for a substantial period of time, but in respect of which building no duty under Regulation 3 or power under Regulation 4 has arisen.
- 6.1.9. With respect to residential properties affected by noise from new or altered highways, to qualify for such an offer, four criteria must all be fulfilled at 1m in front of the most exposed door or window of an eligible room in the façade of a property:
- Level - The highest total traffic noise level expected within the first fifteen years use of the road (the 'Relevant Noise Level') must be not less than the Specified Level of 68 dB LA10,18h. Predicted noise levels of 67.5 dB LA10,18h and above are rounded up to 68 dB LA10,18h.
 - Increase - The Relevant Noise Level in the design year, or within any other year between the year before the highway construction works commenced and the design year, must be at least 1 dB(A) greater than that immediately before construction commenced (the 'Prevailing Noise Level').
 - Contribution - Noise from traffic on the road for which the Regulations apply must contribute at least 1.0 dB LA10,18h to the Relevant Noise Level.
 - Locality - The property under consideration must be within 300 m of the Scheme.
- 6.1.10. The Regulations apply only to qualifying eligible rooms, which include living rooms and bedrooms affected by road traffic noise.
- 6.1.11. The NIR requires application of the road traffic noise level calculation method detailed within the Calculation of road traffic noise memorandum 1988 (CRTN).

CONTROL OF POLLUTION ACT, 1974

- 6.1.12. The principal legislation covering demolition and construction noise is the Control of Pollution Act 1974, Part III. Sections 60 and 61 of the Act give the local authority special powers for controlling noise arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. Works within the scope of these provisions include repair and maintenance work and road works. These powers may be exercised either before works start or after they have started.

- 6.1.13. Section 60 enables a local authority in whose area work is going to be carried out, or is being carried out, to serve a notice of its requirements for the control of site noise on the person who appears to the local authority to be carrying out the works. Such a notice may also be served on others appearing to the local authority to be responsible for, or to have control over, the carrying out of the works.
- 6.1.14. This notice can:
- a. Specify the plant or machinery that is or is not to be used
 - b. Specify the hours during which the construction work can be carried out
 - c. Specify the level of noise that can be emitted
 - d. Provide for any changes of circumstances
- 6.1.15. Section 61 of the Act provides a mechanism for the main contractor or developer to take the initiative and approach the local authority to ascertain its noise requirements before construction work starts. If a formal application for "prior consent" is received by the local authority it is obliged to give a decision within 28 days; failure to do so or the attachment of unnecessary or unreasonable conditions are grounds for appeal by the applicant.
- 6.1.16. In cases where the local authority determines that the proposals for minimising the noise of the construction activities are adequate it will issue a consent although this may be subject to conditions limiting certain aspects of the consent such as hours of use, noise levels for particular activities, etc. Provided that the applicant takes all reasonable steps to operate within the terms of the consent, even if the local authority subsequently decides to take proceedings under section 60(8), the applicant should be able to rely on the defence provided in the Act and prove that the alleged contravention amounted to the carrying out of works in accordance with a consent given under section 61.

NATIONAL POLICY AND GUIDANCE

NATIONAL POLICY STATEMENT FOR NATIONAL NETWORKS (NPS NN), 2015

- 6.1.17. The Department for Transport published the NPS NN in December 2015. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks.
- 6.1.18. Paragraph 5.189 of the NPS NN states where a development is subject to EIA and significant noise impacts are likely to arise from the Scheme, the applicant should include a noise assessment which details the noise and vibration baseline, sensitive receptors, predictions of changes in baseline with the Scheme and mitigation measures.
- 6.1.19. It goes on to state in paragraph 5.193 that developments must be undertaken in accordance with the statutory requirements for noise and that due regard must be given to the relevant sections of the National Policy Statement for England, National Planning Policy Framework and the Government's associated planning guidance on noise.

6.1.20. The NPS NN also confirms that for most national network projects, the relevant Noise Insulation Regulations will apply.

NOISE POLICY STATEMENT FOR ENGLAND (NPSE), 2010

6.1.21. The NPSE seeks to ensure that noise issues are considered at the right time during the development of policy and decision making, and not in isolation. It highlights the underlying principles on noise management already found in existing legislation and guidance.

6.1.22. The NPSE sets out the long-term vision of Government noise policy as follows:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development” (Paragraph 1.6, page 3).

6.1.23. This long-term vision is supported by the following aims:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- a. Avoid significant adverse impacts on health and quality of life*
- b. Mitigate and minimise adverse impacts on health and quality of life*
- c. Where possible, contribute to the improvement of health and quality of life” (Paragraph 1.7, page 4)*

6.1.24. To assist in the understanding of the terms ‘significant adverse’ and ‘adverse’, the NPSE acknowledges that there are concepts that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

- **NOEL - No Observed Effect Level** - This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.
- **LOAEL - Lowest Observable Adverse Effect Level** - This is the level above which adverse effects on health and quality of life can be detected (Paragraph 2.20, page 8).
- **SOAEL - Significant Observed Adverse Effect Level** - This is the level above which significant adverse effects on health and quality of life occur (Paragraph 2.21, page 9).

6.1.25. However, the NPSE goes on to state that:

“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” (Paragraph 2.22, page 9).

NATIONAL PLANNING POLICY FRAMEWORK (NPPF), 2019

6.1.26. First published in 2012 and most recently updated in February 2019, the NPPF sets out the Government’s planning policies for England and how these are expected to be applied. The NPPF superseded Planning Policy Guidance Note (PPG) 24: Planning and noise amongst other PPG’s and Planning Policy Statements (PPS’s). In contrast to PPG 24, reference to noise is scant within the NPPF. Noise is referenced within the document as follows:

“170. Planning policies and decisions should contribute to and enhance the natural and local environments by:...[a number of points including]...

- *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” (Page 49);*

and

“180. 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; and

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....” (Page 52).

6.1.27. Reference number 60 of the above quotation points to the Explanatory Note to the Noise Policy Statement for England (NPSE).

PLANNING PRACTICE GUIDANCE NOISE, 2014 (UPDATED JULY 2019)

6.1.28. This web-based resource was issued for use by the Department for Communities and Local Government (DCLG). The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies

6.1.29. The section on noise was published in 2014 and last updated in July 2019. It includes a table that summarises “the noise exposure hierarchy based on the likely average response of those affected” and offers “examples of outcomes” relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE. The term Unacceptable Adverse Effect (UAE)

level is introduced which equates to noise perceived as "present and very disruptive". It is stated that UAEs should be prevented.

6.1.30. These outcomes are in descriptive form and there is no numerical definition of the NOEL, LOAEL and SOAEL (or UAE), or detailed advice regarding methodologies for their determination. There is also no reference to the further research that is identified as necessary in the NPSE. The noise exposure hierarchy table is duplicated in **Table 6-1** below.

Table 6-1 - Noise Exposure Hierarchy Based on the Likely Average Responses

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or 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
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			

Perception	Examples of outcomes	Increasing effect level	Action
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
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

ROAD INVESTMENT STRATEGY: FOR THE 2015/16 – 2109/20 ROAD PERIOD, 2015

- 6.1.31. The Department for Transport document, Road Investment Strategy: for the 2015/16 - 2019/20 Road Period (RIS), was published in March 2015 and sets out policies relating to the strategic planning and funding of the road network.
- 6.1.32. The document outlines (in Section 6) an aspiration for a 90 % reduction in the number of people impacted by noise from the Strategic Road Network (SRN) by 2040.
- 6.1.33. The RIS identifies a capacity to improve noise levels through the management and redevelopment of Highways England assets, via low noise road surfacing, noise barriers etc. It is expected that Highways England will deliver mitigation measures to at least 1,150 NIAs, helping to improve the quality of life of around 250,000 people by the end of the first road period.
- 6.1.34. All new and improved road schemes will, therefore, be expected to utilise low noise road surfaces as a default and investigate noise attenuating barriers and other potential mitigation options, where practicable.

HIGHWAYS ENGLAND: LICENCE, 2015

6.1.35. The Department for Transport document titled Highways England: Licence (Secretary of State for Transport statutory directions and guidance to the strategic highways company) was published in April 2015.

6.1.36. In complying with paragraph 4.2(g) (page 8) and paragraph 5.26 (page 15) respectively, and its general duty under section 5(2) of the Infrastructure Act 2015, Highways England should:

"Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment [and ensure this is considered at all levels of operation]"

"In exercising its functions, the licence holder must have due regard to relevant principles and guidance on good design, to ensure that the development of the network takes account of geographical, environmental and socio-economic context."

LOCAL POLICY AND GUIDANCE

EMERGING NORTHUMBERLAND LOCAL PLAN

6.1.37. The Emerging Northumberland Local Plan – Publication Draft Plan (Regulation 19) Consultation (January 2019) is intended to replace all current District and County Council Local Plans and Core Strategy documents into a single document. Neighbourhood Plans will not be replaced and will remain of relevance when determining planning applications.

6.1.38. The document has a number of policies which seek to alleviate the potential for adverse noise or vibration effects.

NORTHUMBERLAND CONSOLIDATED PLANNING POLICY FRAMEWORK

6.1.39. In July 2007 the Government announced that Northumberland would become a unitary council, replacing the previous two-tier system. The previous system comprised seven local planning authorities including Castle Morpeth and Alnwick, through which the Scheme passes¹.

6.1.40. In the past, each local planning authority produced its own set of planning documents to guide development in their area. As the seven local authorities become one, there was a need to collate relevant planning policy for the new council and to identify the geographical area to which these policies relate.

¹ Most of the Part A: Morpeth to Felton (Part A) passes through the area comprising the former Castle Morpeth District Council. It is only the most northerly section of Part A that passes through the area comprising the former Alnwick District Council

6.1.41. The Consolidated Planning Policy Framework for Northumberland (the latest version of which, 26, was published in October 2018) details the planning policy documents that are currently used to determine and guide planning applications in Northumberland. The framework comprises two sections. It is Section A, the schedule of documents that form the Statutory Development Plan, that is most relevant and in particular Part 1 of Section A which includes a schedule of adopted Statutory Development Plan Documents. Two of these documents are described briefly below.

CASTLE MORPETH DISTRICT LOCAL PLAN, 1991-2006

6.1.42. Policy RE10 relates to noise, but specifically noise sensitive development and aircraft noise and so this is not relevant to the Scheme.

6.1.43. There are a few other references to noise and vibration in this document, but these are also not relevant to the Scheme.

6.1.44. In Chapter 8 – Roads and Transportation – reference is made to the local plan adopting the five Local Transport Plan objectives, one of which is to “*extend the highways network only where necessary to improve road safety, reduce unacceptable environmental impacts on communities or to enable new development*” (Paragraph 8.13.1, page 129).

6.1.45. Reference is made in paragraph 8.14.2 (page 130) to the upgrading of the A1 “*There is a strong case for pressing the Scottish Office and the Department for Transport to adopt a policy to improve the A1 to dual carriageway standard between Newcastle and Edinburgh and for implementation to take place within the foreseeable future. The Council fully supports this proposal and will, through the policies of the Local Plan, assist in the realisation of this objective*”.

ALNWICK DISTRICT WIDE LOCAL PLAN, 1997

6.1.46. Although there are no guidelines or policies that directly refer to noise and vibration, there are some specific aims within the Traffic and Transport Chapter which would be applicable:

a. Aim TT1: “*improve the accessibility of the residents and businesses of the District to the national transportation systems*” (Paragraph 5.2.1, page 52)

b. Aim TT3: “*ameliorate the impact of the motor vehicle on the rural and built environment*” (Paragraph 5.2.1, page 52)

6.1.47. Aim TT6 describes the same objective mentioned in the Castle Morpeth Local Plan (refer to paragraph B4-7): “*encourage the Highways Agency to upgrade the A1 Truck Road to dual carriageway standard through the District at the earliest opportunity*” (Paragraph 5.2.1, page 53).

6.1.48. In the Community Development Chapter, Policy CD32 reinforces the requirement for development not to result in unacceptable environmental impacts or to cause harm to residential amenity: “*planning permission will not be granted for development which would cause demonstrable harm to the amenity of residential areas or to the environment*”

generally as a result of releases to water, land or air, or of noise, dust, vibration, light or heat” (Paragraph 8.12.1, page 92).

ALNWICK DISTRICT LOCAL DEVELOPMENT FRAMEWORK, CORE STRATEGY DEVELOPMENT PLAN DOCUMENT, 2007

- 6.1.49. Although there is no specific guidance or policy relating to noise and vibration, two strategic policies provide generic guidance which might be applied to the Scheme:
- a.** Policy S3 sets out sustainability criteria which the council will need to be satisfied are met before granting planning permission for new development. The fifth criterion (out of six) states that *“there would be no significant adverse effects on the natural resources, environment, biodiversity, cultural, historic and community assets of the district” (Paragraph 4.2.6, page 21).*
 - b.** Policy S16 sets out the strategic principles of good design which should be applied to all developments *“Proposals should take full account of the need to protect and enhance local environment having regard to their layout, scale, appearance, access and landscaping...” (Paragraph 9.3.4, page 46).*
- 6.1.50. Paragraph 2.5.1, under the sub-heading Transport, notes that Alnwick is crossed by a number of strategic routes including the A1 and that some villages in the district, on or close to these routes suffer significantly from the effects of traffic flows and speeding traffic which has a detrimental impact on residential amenity and safety for residents. The core strategy goes on to identify key challenges, one of which is the *“Need to reduce environmental impact or transport while meeting the needs of people and business for access” (Paragraph 2.5.4, page 9).*
- 6.1.51. This theme is revisited later in Chapter 7 of the Core Strategy with Objective 6 which is to *“assist in the delivery of a sustainable integrated transport system an enhance accessibility for all” (Paragraph 7.1.4, page 36).*

TECHNICAL GUIDANCE

DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB), 2011

- 6.1.52. Prepared by the Highways Agency (now Highways England), Transport Scotland, Welsh Assembly Government and The Department for Regional Development Northern Ireland, the DMRB is a comprehensive manual which contains requirements, advice and other published documents relating to both the design, maintenance, operation and assessment of trunk roads and motorways, but it is stated that it may also, in part, be applicable to other roads with similar characteristics. Commentary advice is provided for where Local Authorities adopt the guidance for local roads.
- 6.1.53. Volume 11: Environmental assessment, Section 3: Environmental assessment techniques: Part 7: HD 213/11 – Revision 1: Noise and vibration (HD 213/11, published in November

2013) provides guidance on the assessment of road traffic noise and vibration from new road projects.

6.1.54. Amongst many other things the DMRB provides the following guidance that is relevant to the assessment of operational road traffic:

Scenarios

6.1.55. For the assessment of permanent noise and vibration impacts, consideration is given to the noise level changes that will arise both in the short-term and the long-term.

6.1.56. The short-term Scheme impacts are derived by comparing the ‘Do Minimum’ scenario (i.e. without the Proposed Development) in the ‘opening year’², with the ‘Do Something’ scenario (i.e. with the Proposed Development) in the same year. The long-term impacts are derived by comparing ‘Do Minimum’ scenario in the opening year with the ‘Do Something’ scenario in the ‘design year’. The design year is typically taken as the 15th year after opening, although this may be different, if for example higher traffic flows are expected in an earlier year.

Impact Criteria

6.1.57. To assist in determining the likely effects of a scheme, HD 213/11 presents the magnitude of impact tables duplicated below in **Table 6-2** and **Table 6-3**. The tables make an important distinction between short term and long-term impacts. In the long-term, the impact of an equivalent change in noise level is considered to be reduced in magnitude compared with the short-term.

6.1.58. It should also be noted that the current version of the DMRB requires nighttime noise impacts to be considered in the long-term only and for receptors subject to predicted levels equal to or greater than 55 dB(A) L_{night} .

Table 6-2 - DMRB Criteria for Magnitude of Operational Daytime Road Noise Impacts in the Short-term

Noise change ($L_{A10,18h}$), dB	Magnitude of impact
0	No Change
0.1 – 0.9	Negligible

² It should be noted that the DMRB text actually refers to this assessment year as the ‘baseline year’. To avoid confusion for the purpose of this technical report, the terminology used is ‘opening year’, and ‘baseline year’ is reserved for an assessment year specified prior to the Proposed Development opening. This is in order to make a clear differentiation between the noise assessment prediction model and the ‘baseline survey’.

Noise change (LA10,18h), dB	Magnitude of impact
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

Table 6-3 - DMRB Criteria for Magnitude of Operational Daytime Road Noise Impacts in the Long-term

Noise change (LA10,18h), dB	Magnitude of impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

CALCULATION OF ROAD TRAFFIC NOISE (CRTN), 1988

- 6.1.59. The former Department of Transport/Welsh Office technical memorandum Calculation of Road Traffic Noise (CRTN) methodologies have been adopted.
- 6.1.60. The factors which may influence road traffic noise levels at source can be divided into two groups:
- a.** Road related factors - gradient and surface type
 - b.** Traffic related factors - flow, speed and the proportion of heavy-duty vehicles
- 6.1.61. The propagation of noise is also covered in CRTN and can influence the noise levels at receptor locations.

INTERIM ADVICE NOTE 185/15 (IAN185/15)

- 6.1.62. Updated traffic, air quality and noise advice on the assessment of link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 Air Quality and Volume 11, Section 3, Part 7 Noise
- 6.1.63. IAN 185/15 provides guidance to those generating traffic data, and particularly vehicle speeds, for Highways England air quality and noise road scheme assessments.

- 6.1.64. The IAN recognises that significant emphasis is often placed on traffic speeds that are generated by the traffic model for individual links, but that the traffic model does not have a similar level of certainty.
- 6.1.65. Consequently, the following process has been conceived, which “*provides a pragmatic and robust approach to support air quality and noise assessments and is not unduly influenced by artificial precision*” (Section 2, page 4):
- a. Analyse the performance of modelled traffic speeds on individual road links, comparing against observed speeds on the same road links
 - b. Adjust, where required, modelled traffic speeds on individual road links to better reflect observed speeds; this is known as ‘speed pivoting’
 - c. Assign the resulting speed on individual road links to a relevant speed-band category (different categories are used for motorway and non-motorway roads) for use within air quality and noise modelling; this is known as ‘speed banding’

TRL PROJECT REPORT PR/SE/451/02, 2002

Converting the UK traffic noise index $LA_{10,18h}$ to EU noise indices for noise mapping

- 6.1.66. The Calculation of Road Traffic Noise prediction method produces noise levels in terms of LA_{10} , either over a 1-hour or an 18-hour period.
- 6.1.67. The European-wide noise mapping exercise required by EU Directive 2002/49/EC relating to the assessment and management of environmental noise (colloquially known as the Environmental Noise Directive or END), requires outputs in terms of L_{den} and L_{night} , both of which are based on the equivalent continuous noise level L_{den} .
- 6.1.68. TRL published a report in 2002, which provided a ‘back-end’ correction for converting the UK traffic noise index $LA_{10,18h}$ to the noise indices required for EU noise mapping.
- 6.1.69. The TRL report presented equations for three potential methods of conversion, depending on the quantity and quality of traffic data available.
- a. *Method 1* is the most detailed and can be used when the assessor has available hourly traffic data. Equations are provided for motorway and non-motorway roads to convert $LA_{10,1h}$ to $L_{Aeq,1h}$, with the generated $L_{Aeq,1h}$ values subsequently being used to derive values of L_{den} and L_{night} as required by the END.
 - b. *Method 2* can be used where traffic data are known or can be estimated for the relevant time periods specified in the END (i.e. 12-hour day, 4-hour evening and 8-hour night) as well as the 18-hour period, with the generated L_{day} , $L_{evening}$ and L_{night} values subsequently being used to derive values of L_{den} as required by the END.
 - c. *Method 3* is the least detailed and can be used when only $LA_{10,18h}$ traffic data are available. Equations are provided for motorway and non-motorway roads to convert $LA_{10,18h}$ directly to the L_{den} and L_{night} values as required by the END.

6.1.70. For this assessment method 3 has been adopted and as none of the roads in the Study Area (including the Scheme) are motorways, all calculations to determine the L_{night} have utilised the non-motorway correction.

BS5228-1:2009+A1:2014

Code of Practice for Noise and Vibration Control on Construction and Open Sites

Part 1 Noise

- 6.1.71. This Standard provides the latest recommendations for basic methods of noise control where there is a need for the protection of persons living and working in the vicinity of, and those working on, construction and open sites.
- 6.1.72. The Standard includes guidance on assessing the significance of noise effects. In particular, Annex E provides a discussion on the different approaches to the assessment of construction noise, in doing so giving consideration to absolute noise levels (in section E2) and to two different approaches to setting criteria based on the ambient noise level ($L_{Aeq,T}$) in the absence of construction noise (in section E3).
- 6.1.73. Firstly, the Standard describes the ‘older and more simplistic’ approach based on the advice in AL 72, noting that the original advice “*has been expanded over time to include a suite of noise levels covering the whole day/week period taking into account the varying sensitivities through these periods*” (Section E.2, page 118). **Table 6-4** below (Table E.2 in sub-clause E.4 of the Standard) illustrates the approach – the levels are also stated as being often used as limits above which noise insulation would be provided, subject to the temporal conditions described following the table.

Table 6-4 - Examples of Time Periods, Averaging Times and Noise Levels Associated with the Determination of Eligibility for Noise Insulation

Time	Relevant time period	Averaging time, ‘T’	Noise insulation trigger level dB $L_{Aeq,T}$ (A)
Monday to Friday	07.00 – 08.00	1 h	70
	08.00 – 18.00	10 h	75
	18.00 – 19.00	1 h	70
	19.00 – 22.00	3 h	65
	22.00 – 07.00	1 h	55

Time	Relevant time period	Averaging time, 'T'	Noise insulation trigger level dB L _{Aeq,T} (A)
Saturday	07.00 – 08.00	1 h	70
	08.00 – 13.00	5 h	75
	13.00 – 14.00	1 h	70
	14.00 – 22.00	3 h	65
	22.00 – 07.00	1 h	55
Sunday and Public Holidays	07.00 – 21.00	1 h	65
	21.00 – 07.00	1 h	55

Notes:

(A) All noise levels are predicted or measured at a point 1 m in front of the most exposed of any windows and doors in any façade of any eligible dwelling.

- 6.1.74. The Standard suggests that where, in spite of the mitigation measures applied, the measured or predicted construction noise level exceeds 75 dB(A) (for a period of ten or more days of working in any fifteen consecutive days or for a total of days exceeding 40 in any six-month period), a scheme for the installation of noise insulation or the reasonable costs thereof will be implemented by the developer or promoter.
- 6.1.75. In sub-clause E.3 an alternative approach is described based on considering the change in the ambient noise level that the construction noise causes. This approach is used commonly in EIA. Two methods are described.
- 6.1.76. The first is the ABC method an example of which is set out in **Table 6-5** below (Table E.1 in the Standard). Three categories, A, B and C are described in terms of threshold noise levels for a daytime (07:00 to 19:00 weekdays, 07:00 to 13:00 Saturday), evening and weekend, and finally a nighttime period (23:00 to 07:00). If the combined ambient noise and construction noise exceed the relevant threshold level this is deemed a 'significant effect'.

Table 6-5 - Example Threshold of Potential Significant Effect at Dwellings

Assessment category and threshold value period	Threshold value, in decibels (dB $L_{Aeq,T}$)		
	Category A ^(A)	Category B ^(B)	Category C ^(C)
Nighttime (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

Notes:

[1] A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

[2] If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

[3] Applied to residential receptors only.

(A) Category A: threshold values to use when ambient noise 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.

6.1.77. The second method states that “Noise levels generated by site activities are deemed to be potentially significant if the construction noise level 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 $L_{Aeq,T}$ from site noise alone, for the daytime, evening and nighttime periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact.”

6.1.78. These criteria may be applied not just to residential buildings, but also to hotels and hostels and buildings in religious, educational and health/community use.

- 6.1.79. The +5 dB criterion for a period of one month or more, might also be deemed to cause significant effects in public open space. However, the extent of the area impacted relative to the total available are also needs to be taken into account.
- 6.1.80. Annex F of the Standard provides guidance on estimating noise from construction sites. The estimation procedures described in this Annex take into account the more significant factors:
- a. The sound power outputs of processes and plant
 - b. The periods of operation of processes and plant
 - c. The distances from source to receiver
 - d. The presence of screening by barriers
 - e. The reflections of sound
 - f. Attenuation from absorbent ground
- 6.1.81. Four discrete prediction methods are described, two for stationary plant – the activity $L_{Aeq,T}$ method and the plant sound power method – and two for mobile plant – the method for mobile plant in a defined area and the method for haul roads.

BS5228-2:2009+A1:2014

Code of Practice for Noise and Vibration Control on Construction and Open Sites

Part 2 Vibration

- 6.1.82. The Standard provides the latest recommendations for basic methods of vibration control where there is a need for the protection of persons living and working in the vicinity of, and those working on, construction and open sites.
- 6.1.83. With respect to human exposure to building vibration, Table B1 of Annex B to BS 5228-2 provides guidance on the effects of vibration levels on human beings, and it is these that are reproduced in **Table 6-6** below and that the construction vibration effects have been based upon.

Table 6-6 - BS 5228-2 Guidance on Effects of Vibration Levels

Vibration level	Effect
0.14 mm·s ⁻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 mm·s ⁻¹	Vibration might be just perceptible in residential environments.

Vibration level	Effect
1.0 mm·s ⁻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 mm·s ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

6.1.84. Guide values for cosmetic damage to buildings are given in Table B.2 of the Standard, and this is reproduced in **Table 6-7** below, together with **Figure 6-1** below to which it refers:

Table 6-7 - BS 5228-2 Guidance on Transient Vibration Guide Values for Cosmetic Damage

Line (refer to Figure B1)	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm·s ⁻¹ at 4 Hz and above	50 mm·s ⁻¹ at 4 Hz and above
2	Unreinforced or light framed structures Residential or light commercial buildings	15 mm·s ⁻¹ at 4 Hz increasing to 20 mm·s ⁻¹ at 15 Hz	20 mm·s ⁻¹ at 15 Hz increasing to 50 mm·s ⁻¹ at 40 Hz and above

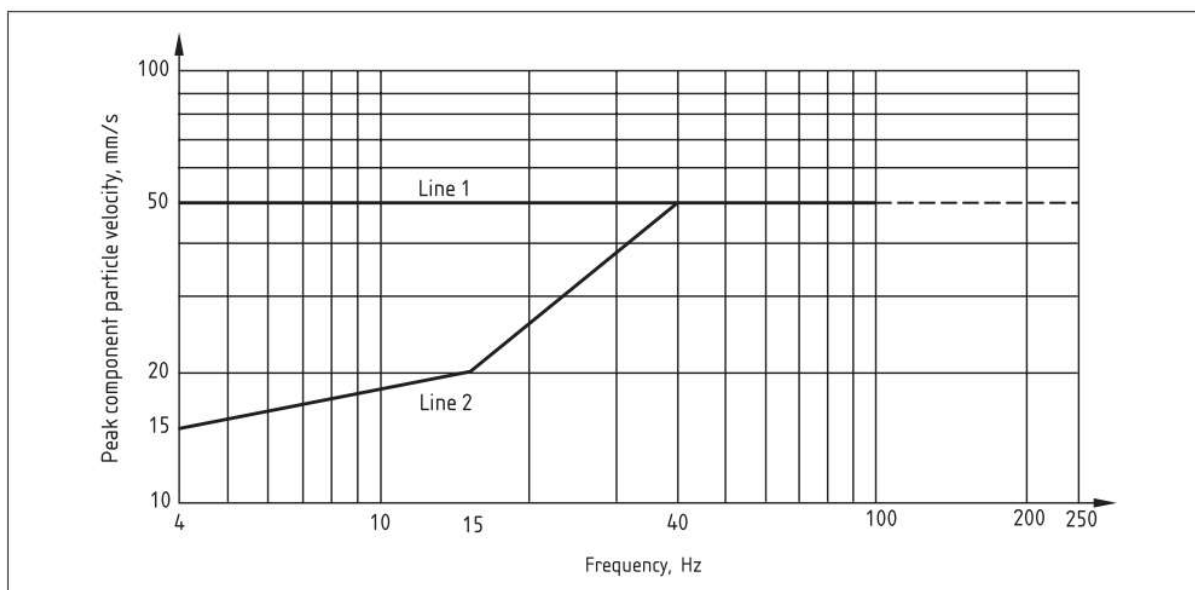
Notes:

[1] Values referred to are at the base of the building.

[2] For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

6.1.85. It should be noted that the above guidance is for transient vibration. For continuous vibration, such as may occur during the use of vibratory equipment, the guidance in the Standard is that the levels in **Table 6-7** above and **Figure 6-1** below be reduced by 50 %.

Figure 6-1 - BS 5228-2 Guidance on Transient Vibration Guide Values for Cosmetic Damage



WORLD HEALTH ORGANISATION, GUIDELINES FOR COMMUNITY NOISE, 1999

- 6.1.86. The WHO guidelines consolidate scientific knowledge on the health effects of community noise and provide guidance to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments. The main sources of community noise are identified as road, rail and air traffic, industries, construction and public work and neighbours.
- 6.1.87. A wide range of specific effects and environments re considered in the guidelines but a few that relate to this study are described below.
- 6.1.88. With regard to community noise, the guidelines state (in paragraph 4.2.7, page 60) that annoyance *“varies with the type of activity producing the noise.....During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55 dB; or moderately annoyed with L_{Aeq} levels below 50 dB.”* The time base for these values, which relate to the daytime period, is 16 hours.
- 6.1.89. With respect to cardiovascular effects, the guidelines state (in paragraph 4.2.4, page 59) that *“epidemiological studies show that cardiovascular effects occur after long-term exposure to noise (aircraft and road traffic) with $L_{Aeq,24h}$ values of 65–70 dB.”*

WORLD HEALTH ORGANISATION, NIGHT NOISE GUIDELINES FOR EUROPE, 2009

- 6.1.90. This document presents the conclusions of the WHO working group whose remit was to prepare guidelines for exposure to noise during sleep. The document is an extension of the WHO Guidelines for community Noise (1999).
- 6.1.91. As direct evidence concerning the effects of night noise on health is rarely available, the guidelines also use indirect evidence such as the effects of noise on sleep and the relation between sleep and health.
- 6.1.92. The guidelines concluded (in section 5.6, page 109) that *“there is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{night, outside}$ are harmful to health. However, adverse health effects are observed at the level above 40 dB $L_{night, outside}$, such as self-reported sleep disturbance, environmental insomnia, and increased use of somnifacient drugs and sedatives. Therefore, 40 dB $L_{night, outside}$ is equivalent to the LOAEL for night noise. Above 55 dB the cardiovascular effects become the major public health concern, which are likely to be less dependent on the nature of the noise.”*

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