A1 Birtley to Coal House

Scheme Number: TR010031

6.3 Environmental Statement – Appendix 11.2 Legislation, Policy and Guidance

APFP Regulation 5(2)(a)

Planning Act 2008

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

Volume 6

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Infrastructure Planning

Planning Act 2008

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

A1 Birtley to Coal House

Development Consent Order 20[xx]

Environmental Statement - Appendix

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LEGISLATION, POLICY AND GUIDANCE

1.1. LEGISLATION

INTERNATIONAL

Directive 2002/49/EC of the European Parliament – Assessment and Management of Environmental Noise

1.1.1. Better known as the Environmental Noise Directive (END), this is the main EU instrument to identify noise pollution levels and to trigger the necessary action both at Member State and at EU level.

1.1.2. To pursue its stated aims, the Environmental Noise Directive focuses on three action areas:

- The determination of exposure to environmental noise;
- Ensuring that information on environmental noise and its effects is made available to the public; and
- Preventing and reducing environmental noise where necessary and preserving environmental noise quality where it is good.

1.1.3. The Directive applies to noise to which humans are exposed, particularly in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas. It does not apply to noise that is caused by the exposed person, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas.

1.1.4. The Directive requires Member States to prepare and publish, every 5 years, noise maps and noise management action plans for:

- Agglomerations with more than 100,000 inhabitants;
- Major roads (more than 3 million vehicles a year);
- Major railways (more than 30,000 trains a year); and
- Major airports (more than 50,000 movements a year, including small aircrafts and helicopters).

1.1.5. When developing noise management action plans, Member States' authorities are required to consult the concerned public.

1.1.6. It is important to note, however, that the Directive does not set limit or target values, nor does it prescribe the measures to be included in the action plans, thus leaving those issues at the discretion of the competent Member State authorities.

NATIONAL

Control of Pollution Act 1974 (COPA)

1.1.7. Sections 60 and 61 of the COPA give local authorities 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 (Section 61) or after they have started (Section 60). Section 61 is a prior consent process whereby approval is sought for the completion of construction works following prescribed methods, whilst Section 60 affords Local Authorities means of control of construction noise where a Section 61 has not previously been agreed.

Environmental Protection Act 1990 (EPA)

1.1.8. Section 79 of the EPA presents a number of matters which may be statutory nuisances, including noise. Under the provisions of the EPA, the Local Authority is required to inspect its area periodically to detect any nuisance and, where a valid complaint of a statutory nuisance is made by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint.

1.1.9. Section 80 of the EPA (Summary proceedings for statutory nuisances) provides Local Authorities with powers to serve an abatement notice requiring the abatement of a nuisance or requiring works to be executed to prevent their occurrence.

Land Compensation Act 1973 (LCA)

1.1.10. Part I of the LCA includes provision for compensation for loss in property value resulting from physical agents, including noise, linked to a new road scheme. Claims can be made under Part I of the Act from 1 to 7 years after the opening of a road project.

1.1.11. Part II of the LCA is associated with the mitigation of injurious effect from public works, including noise from new roads, and Section 20 allows the Secretary of State to make regulations imposing a duty or conferring powers on responsible authorities to insulate buildings against noise caused, or expected to be caused, by the construction or use of public works (including new roads), or to make a grant in respect of the cost of such insulation.

1.1.12. Additional parts of the LCA include Part III: *Provisions for benefit of persons displaced from land,* Part IV: *Compulsory purchase,* Part V: *Planning blight*¸ and Part VI: *Supplementary Provisions.*

The Noise Insulation Regulations 1975 (As Amended 1988) (NIR)

1.1.13. The NIR were made under powers inferred by Section 20 of Part II of the LCA. 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.

1.1.14. 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.

1.1.15. In respect of residential properties affected by noise from new or altered highways, in order 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 68dB(A) $L_{A10,18h}$. Predicted noise levels of 67.5dB $L_{A10,18h}$ and above are rounded up to 68dB $L_{A10,18h}$;
- 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 1dB(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 1.0dB $L_{A10,18h}$ to the Relevant Noise Level; and
- Locality - The property under consideration must be within 300m of the scheme.

1.1.16. The Regulations apply only to qualifying eligible rooms, which include living rooms and bedrooms affected by road traffic noise.

1.1.17. The NIR requires application of the road traffic noise level calculation method detailed within the Calculation of road traffic noise memorandum 1988 (CRTN).

Environmental Noise (England) Regulations 2006 (S.I. 2006/2238) (EN(E)R)

1.1.18. These Regulations (as amended 2008, 2009, 2010) *implement the Assessment and management of noise directive* 2002/49/EC (known as the Environmental noise directive - END). Under the END, strategic noise mapping of major roads, railways, airports and agglomerations has been completed across the UK.

1.1.19. Regulation 15.1(e) of the (EN(E)R) requires that action plans should "…apply in particular to the most important areas as established by the strategic noise maps…", and to this end Defra has identified Noise Important Areas (NIAs or noise "hot-spots") that are where 1% of the population are affected by the highest noise levels from major roads according to the results of the strategic noise mapping. This approach has been taken because those residing in these areas are likely to be at the greatest risk of experiencing a significant adverse impact to health and quality of life as a result of their exposure to road traffic noise.

POLICY

National

Noise Policy Statement for England (NPSE)

1.1.20. 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.

1.1.21. 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."

1.1.22. 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:

- *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."*

1.1.23. 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.
- SOAEL - Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur.

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

"it is acknowledged within the NPSE 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."

National Planning Policy Framework (NPPF)

1.1.25. Last 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*;"

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 life[60];

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;…"

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

National Policy Statement for National Networks (NPSNN)

1.1.26. The Department for Transport published the NPSNN in December 2015. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks.

Paragraph 5.189 of the NPSNN 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.

1.1.27. 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 NPSE and the NPPF.

1.1.28. The NPSNN also confirms that for most national network projects, the relevant NIR will apply.

LOCAL / REGIONAL – GATESHEAD COUNCIL

1.1.29. The Gateshead Local Plan comprises the *Core Strategy and Urban Core Plan for Gateshead and Newcastle upon Tyne, the Gateshead Unitary Development Plan*[1] and a number of additional documents that cover the full set of planning policies that will manage and influence future development within the Council area.

The Core Strategy and Urban Core Plan for Gateshead and Newcastle Upon Tyne 2010-2030 (CSUCP)

1.1.30. Adopted in March 2015, this document is the central document in the Local Plan and sets out the spatial planning framework including strategic policies and specific policies for the urban core, sub- areas and sites. There are several references to noise of which the following are relevant to the Scheme:

"Policy CS14 Wellbeing and Health

The wellbeing and health of communities will be maintained and improved by:

1. Requiring development to contribute to creating an age friendly, healthy and equitable living environment through:

…[several points including]…

iii. Preventing negative impacts on residential amenity and wider public safety from noise, ground instability, ground and water contamination, vibration and air quality…"

The Gateshead Unitary Development Plan (Gateshead UDP)

1.1.31. The Gateshead UDP was originally adopted in 2007, setting policies and proposals for land use, transport and the environment. With the introduction of the NPPF Gateshead will gradually replace the UDP with new development plan documents such as the CSUCP. However, remaining saved Gateshead UDP policies form part of Gateshead's Local Plan until they are superseded by policies in further documents forming part of the Local Plan. The saved policies which reference noise or vibration and which are relevant to the Scheme are as follows:

"DC1 Environment

Planning permission will be granted for new development where it:

...[several points including]…

[1] Unitary Development Plan (UDP 2007), Gateshead Council. https://www.gateshead.gov.uk/media/1935/Gateshead-Unitary-Development-Plan-2007/pdf/Gateshead UnitaryDevelopmentPlan2007.pdf

h) does not significantly pollute the environment with dust, noise, light, emissions, out-fall, or discharges of any kind;"

1.1.32. In addition to the above, Policy ENV 61 is for 'new noise-generating developments', but from the detail of the policy wording it is clear that it is concerned with industrial/commercial development rather than road traffic noise sources.

LOCAL / REGIONAL – NEWCASTLE CITY COUNCIL

1.1.33. The Newcastle City Council Local Plan includes the CSUCP as summarised in the Gateshead Council section above. In addition, following adoption of the CSUCP, a policy review was undertaken deleting a number of the previously 'saved' policies from the Newcastle Upon Tyne Unitary Development Plan. Ninety-five policies in the UDP are still considered relevant to planning decision making alongside the CSUCP and these are detailed within the Development Plan Document.

Newcastle Upon Tyne Unitary Development Plan (Newcastle UDP)

1.1.34. Saved policies from the UDP include the following which reference noise or vibration and are relevant to the Scheme:

"H2 Development which would harm the amenity of any dwelling, or group of dwellings will not be allowed. Impact on residential amenity will be assessed with particular regard to:

…[a number of points including]…

e. ensuring that non-residential development and/or associated operations will not harm residential amenity through an increase in noise, disturbance, smells, fumes or other harmful effects."

"EN1.1 All development will be required to meet high standards of design in accordance with the following principles:

…[a number of points including]…

L. maximising the use of buildings, structures and land forms to screen noise sensitive development and spaces."

"POL7 Development which generates noise sufficient significantly [sic] to affect existing ambient sound or vibration levels in residential areas or other noise sensitive areas will only be allowed if it complies with the attenuation and monitoring requirements of the development control policy statement 22 - noise and vibration."

1.1.35. Paragraphs 1 to 5 of Development Control Policy Statement 22 (DCPS22) are concerned with noise sensitive development and so are not relevant to highway schemes. Paragraphs 6 to 10 are duplicated as follows:

"6. The City Council will not normally grant planning permission for new development proposals which are likely to be generators of noise and/or vibration where:

- *New development is likely to generate levels of noise where it either increases the existing background noise level by more than 5 dBA; or*
- *Cause the background level in the vicinity of noise sensitive properties to increase such that the noise exposure category of that vicinity is changed.*

7. In all circumstances the City Council will take the following into account:

- *The effectiveness of attenuation measures which can be provided to mitigate the levels of noise and/or vibration;*
- *Reduction of noise at source by, inter alia, improving the sound insulation of sensitive buildings;*
- *Layout and design; and*
- *Administrative measures e.g. limiting operating time of noise sources, restricting activities on the site.*

8. Where either existing development causing noise or vibration might result in harm to proposed noise or vibration sensitive development, or where proposed development might generate potentially unacceptable levels of noise or vibration, applicants will be required to provide an assessment of the likely impact and of the measures proposed to mitigate the impact.

9. Agreements under Section 106 Town and Country Planning Act 1980 may be required to ensure effective long term monitoring and compliance with planning conditions which may be imposed.

10. The grant of planning permission may include conditions to control and/or monitor noise relating to, inter alia;

- *Implementation of approved sound attenuating measures before noise sensitive development is occupied;*
- *The provision of acoustic glazing together with mechanical ventilation and other similar measures;*
- *Conditions restricting the use of development to control noise generating activities;*
- *Restricting the use of buildings within Classes of the Town and Country Planning (Use Classes) Order 1987;*
- *Restrictions on the noise emitted from noise generating developments;*
- *Restrictions on plant and machinery; and*
- *Specifying maximum noise levels at site boundaries."*

LOCAL / REGIONAL – CITY OF SUNDERLAND COUNCIL

1.1.36. The Sunderland City Local Plan is currently being developed, with the final consultation period on the Core Strategy and Development Plan 2015-2033 Publication Draft[2] being 15 June to 27 July 2018. After this, it will be submitted to the government for examination.

1.1.37. Until adoption, saved policies from the Sunderland Unitary Development Plan set the planning policy basis for assessing all planning applications and development proposals.

City of Sunderland Unitary Development Plan (Sunderland UDP)

1.1.38. The noise and vibration section of the UDP is duplicated as follows:

"NOISE AND VIBRATION

9.4 Nuisance from noise and vibration can be controlled under various legislation. The Control of Pollution Act 1974 provides for the designation of Noise Abatement Zones; one has been declared at the Wear Industrial Estate in Washington. Road traffic can also be a source of noise nuisance. On new roads this can be overcome by careful design; on existing roads 'traffic calming' measures may have some effect. Building Regulations require new building works to comply with prescribed standards of sound insulation, whilst noise can also be a material consideration under planning legislation (PPG24 para. 2)."

Paragraph 9.22 of the Sunderland UDP also references the need to consider potential cumulative effects stating: "*It* [cumulative impact] *could also arise where communities are exposed to the adverse environmental effects of more than one scheme e.g. traffic, noise, etc…*".

1.1.39. The saved policies that reference noise or vibration and which are applicable to the Scheme are as follows:

"EN5. Where development is likely to generate noise sufficient to increase significantly the existing ambient sound or vibration levels in residential or other noise sensitive areas, the council will require the applicant to carry out an assessment of the nature and extent of likely problems and to incorporate suitable mitigation measures in the design of the development. Where such measures are not practical, permission will normally be refused."

1.1.40. The associated explanatory text to the above policy includes the following:

"9.27 Housing, hospitals and schools should generally be regarded as noise-sensitive development. In residential areas, gardens can be as important to protect from noise as rooms within a dwelling. The City Council also considers that, in some circumstances, recreational and some B1 uses (offices, research and development) could also be 'noise-sensitive' for the purposes of Policies EN5…"

[2] Core Strategy and Development Plan 2015-2033 Publication Draft. June 2018 https://www.sunderland.gov.uk/media/20404/Core-Strategy-and-Development-Plan-2015-2033-Publication-Draft/pdf/Core_Strategy_and_Development_Plan_Publication_Draft_2018.pdf

1.1.41. Within the section entitled "T16 Highways, Traffic Management and Freight", it is stated that:

"16.12 The highway network can have a major effect on the environment of surrounding areas by virtue of the associated noise (to which attention has been drawn in recent Government advice: see PPG24), pollution and danger, as well as the intrusive visual impact. With anticipated increases in traffic flows it can be expected that the effects will be exacerbated…"

and

"16.53…Together with the question of safety, the environmental effects of noise, vibration and exhaust emissions are among the most noticeable forms of pollution. Transportation policies must therefore address these issues..."

And the associated Policy T18 is as follows

"T18 in all highway construction and improvement works special consideration will be given to:

(i) the design, selection and use of street furniture which complements the environment;

(ii) implementation of landscaping, planting and other environmental improvements."

Highways England Policy

Road Investment Strategy for the 2015/ 16 – 2019/ 20 Road Period[3] (RIS)

1.1.42. This Strategy was published in 2015 and sets out policies relating to the strategic planning and funding of the road network.

1.1.43. It states that Highways England aspires to be a better neighbour to communities, such that by 2040 over 90% fewer people will be impacted by noise from the strategic road network. 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. and commits to investigating and mitigating at least 1,150 Noise Important Areas by the end of Road Period 1 (RP1), to help improve the quality of life of around 250,000 people living and working near the network.

1.1.44. 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.

[3] Department for Transport (2015). Road Investment Strategy for the 2015/ 16 – 2019/ 20 Road Period. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/408514/ris-for-2015-16-road-period-web-version.pdf

Highways England Delivery Plan (2015 - 2020)[4]

1.1.45. This plan reiterates that the Government has challenged Highways England to mitigate noise in at least 1,150 NIAs over RP1. Within the section entitled 'Planning the long term maintenance of the network', there is reference that this will include 'low noise surfacing of the network' and that this will contribute significantly to achieving that target to mitigate 1150 NIAs.

Highways England Licence (2015)[5]

1.1.46. This Licence was published in 2015 and includes a number of general requirements including ensuring that protecting and enhancing the environment is embedded into its business decision-making processes; ensuring the best practicable environmental outcomes are achieved, while working in the context of sustainable development and delivering value for money; and considering the cumulative environmental impact of its activities across its network.

1.1.47. In complying with paragraph 4.2(g) 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 operations. 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."

GUIDANCE

Planning Practice Guidance (PPG)

1.1.48. Last updated on 22 July 2019, 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

1.1.49. The section on noise was published on 06 March 2014, but was last updated 22 July 2019. The guidance includes a table which summarises *"the noise exposure hierarchy based on the likely average response of those affected"* and which 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.

[4] Highways England (2015). Delivery Plan 2015-2020. https://www.gov.uk/government/publications/highways-england-delivery-plan-2015-2020

[5] Department for Transport (2015). Highways England: Licence, Secretary of State for Transport statutory directions and guidance to the strategic highways company. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/431389/strategic-highways-licence.pdf

1.1.50. These outcomes are in descriptive form and there is still 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. There is reference to a number of other information sources, including British Standards, and it is confirmed that '*Some of these documents contain numerical criteria.' (*albeit not that seek to define to the NOEL, LOALE or SOAEL), and it is then advised that *'These values are not to be regarded as fixed thresholds and as outcomes that have to be achieved in every circumstance'*

1.1.51. The noise exposure hierarchy table is duplicated below in **Table 2-1**.

Table 2-1 - Noise Exposure Hierarchy Based on the Likely Average Response

Response	Examples 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 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			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during	Significant Observed Adverse Effect	Avoid

Response	Examples of outcomes	Increasing effect level	Action
	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.		
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

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

1.1.52. This Standard sets out techniques to predict and assess 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. The noise prediction method is 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, comprising previously measured sound power levels for a variety of different construction plant undertaking various common activities.

1.1.53. 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.

1.1.54. With respect to absolute fixed noise limits, BS 5228-1 discusses those included within Advisory Leaflet 72: 1976: *Noise control on building sites*[6] (AL72). These limits are presented according to the nature of the surrounding environment, for a 12-hour working day. The presented limits are:

[6] The Department of the Environment. 1976. Advisory Leaflet 72: *Noise control on building sites*. London: HMSO.

- 70dB(A) L_{eq} in rural, suburban and urban areas away from main road traffic and industrial noise; and
- 75dB(A) L_{eq} in urban areas near main roads and heavy industrial areas.

1.1.55. The above noise level limits are applicable at the façade of the receptor in question (i.e. not free-field).

1.1.56. 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 2-2** and the '5dB(A) change' method under that table.

Table 2-2 - Example Threshold of Potential Significance Effect at Dwellings - ABC Method

Assessment category and threshold value period	Threshold value, in decibels $L_{Aeq,T}$ (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 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.

NOTE 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 3dB due to site noise.

NOTE 3: Applied to residential receptors only.

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

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

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

[D] 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays

1.1.57. With respect to the '5dB(A) change' method, the guidance states:

"Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5dB or more, subject to lower cut-off values of 65dB, 55dB and 45dB $L_{Aeq,T}$, from site 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 effect."

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

1.1.58. 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.

1.1.59. 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 2-3**.

Table 2-3 - Guidance Criteria for the Assessment of Significance of Vibration for Human Perception and Disturbance (from BS 5228-2:2009+A1:2014)

Vibration Level [A], [B], [C] (PPV)	Effect
0.14mms^{-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.
0.3mms^{-1}	Vibration might be just perceptible in residential environments.
1.0mms^{-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.
10mms^{-1}	Vibration is likely to be intolerable for any more than a very brief

Vibration Level [A), B), C)] (PPV)	Effect
	exposure to this level in most building environments.

A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.

C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1[7] or BS 6472-2[8], and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

1.1.60. 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 2-4**. It should be noted that the values presented within **Table 2-4** are applicable to cosmetic damage only. It is stated within BS 5228-2 that minor damage is possible at vibration magnitudes which are greater than twice those given in the table.

Table 2-4 - Guidance Criteria for the Assessment of Significance of Transient Vibration for Cosmetic Building Damage (from BS 5228-2:2009+A1:2014)

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4Hz to 16Hz	15Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50mm/s at Hz and above	50mm/s at Hz and above
Unreinforced or light framed	15mm/s at 4Hz increasing to	20mm/s at 15Hz increasing

[7] The British Standards Institution, Subcommittee HME/21/6 (2008), BS 6472: *Guide to evaluation of human exposure to vibration in buildings*. Part 1: *Vibration sources other than blasting*

[8] The British Standards Institution, Subcommittee HME/21/6 (2008), BS 6472: *Guide to evaluation of human exposure to vibration in buildings*. Part 2: *Blast induced vibration*

structures. Residential or light commercial buildings.	20mm/s at 15Hz	to 50mm/s at 40Hz and above

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

NOTE 2: At frequencies below 4Hz, a maximum displacement of 0.6mm (zero to peak) is not to be exceeded.

OTHER

Calculation of Road Traffic Noise 1988 (CRTN)

1.1.61. Published by the Department of Transport and the Welsh Office in 1988, CRTN sets out standard procedures for calculating noise levels from road traffic. The calculation methods use a number of input variables, including traffic flow volume, average vehicle speed, percentage of heavy duty vehicles (HDVs), type of road surface, site geometry and the presence of noise barriers or acoustically absorbent ground. CRTN predicts the $L_{A10,18h}$ or $L_{A10,1h}$ noise level for any receptor point at a given distance, up to 300m, from the road.

1.1.62. CRTN also documents procedures for the measurement of road traffic noise. Three methods of road traffic noise measurement are described, the first entitled 'The Measurement Method', for direct measurement of the $L_{A10,18h}$ noise level, the second entitled the 'Shortened Measurement Procedure', for measurement of the $L_{A10,3h}$ noise level from which the $L_{A10,18h}$ level can be derived and the third entitled 'Comparative Measurements' which is a procedure to establish noise levels from a single road traffic route at various points, provided that the route remains the dominant source. CRTN states that if the Shortened Measurement Procedure is followed, a correction of -1dB can be applied to the determined LA10,3h noise level to approximate the $L_{A10,18h}$ noise level.

Design Manual for Roads and Bridges (DMRB)

1.1.63. Prepared by the Highways Agency (Now Highways England), Transport Scotland, Welsh Assembly Government & 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.

Volume 11: *Environmental assessment*, Section 3: *Environmental assessment techniques*: Part 7: HD 213/11 – Revision 1: *Noise and vibration* (HD 213/11) provides guidance on the assessment of road traffic noise and vibration from new road projects. A staged approach to assessment is presented, with an increasing level of detail through the following three levels of assessment:

- Scoping;
- Simple; and
- Detailed.

1.1.64. This staged approach has been designed to ensure a proportionate assessment, with the level of detail dependent upon the potential for impacts to occur, which will typically also be dependent upon the scale of the proposed project, the site and local circumstances.

1.1.65. In brief, at the scoping stage, consideration is given to whether the following threshold noise and vibration criteria are anticipated to be exceeded at any identified sensitive receptors within a defined study area:

- A permanent change in magnitude of 1dB $L_{A10,18h}$ in the short term (i.e. upon the scheme opening);
- A permanent change in magnitude of 3dB $L_{A10,18h}$ in the long term (i.e. between year of development opening and future assessment year);
- The predicted night-time noise level $L_{night,outside}$ greater than 55dB(A) in any scenario and is expected to change by at least 3dB in the long-term; and
- An increase in the PPV level of groundborne vibration to a level of 0.3mm/s or above, or an existing level above 0.3mm/s is predicted to increase.

1.1.66. Where it is not expected nor clear that the above threshold criteria will be exceeded, the project would normally proceed to completion of the Simple Assessment, with the option of subsequent completion of the Detailed Assessment where the Simple Assessment results identify this as appropriate.

1.1.67. Where the Scoping Assessment results identify that the above criteria would be exceeded, it is allowable to bypass the Simple Assessment, progressing directly to the Detailed Assessment, as followed for this Scheme.

DETAILED ASSESSMENT

Assessments

1.1.68. At the Detailed Assessment stage, the following assessment elements are required:

- Assessment of permanent traffic noise impacts;
- Assessment of permanent traffic nuisance impacts (for noise);
- Consideration to potential groundborne vibration impacts from road traffic;
- Assessment of temporary impacts; and
- Assessment of cumulative impacts.

1.1.69. In addition, *'where appropriate'* an assessment of permanent traffic induced airborne vibration nuisance should be undertaken.

1.1.70. The assessment of temporary impacts includes consideration to, for example, construction traffic on haul routes or existing road traffic routes, construction noise, construction vibration and impacts associated with any necessary temporary traffic diversions.

1.1.71. The objective of the assessments is to gain an appreciation of the noise and vibration climate both *'with'* and *'without'* the road project.

Scenarios

1.1.72. 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.

1.1.73. The short-term scheme impacts are derived by comparing the 'Do Minimum' scenario (i.e. without the Proposed Development) in the 'opening year'[9], 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.

1.1.74. For this assessment, this year of opening is 2023 and the design year is 2038.

1.1.75. To complete the assessment, a comparison is also made between the Do Minimum opening year with the Do Minimum design year. The abbreviations used in this Technical Report for each scenario are:

- Do Minimum Opening Year (2023): DM 2023;
- Do Something Opening Year (2023): DS 2023;
- Do Minimum Design Year (2038): DM 2038; and
- Do Something Design Year (2038): DS 2038.

1.1.76. In summary the Detailed Assessment requires that, for the daytime, the following three comparisons are drawn:

- DM 2023 against DM 2038;
- DM 2023 against DS 2023; and
- DM 2023 against DS 2038.

1.1.77. For night-time noise impacts, comparisons in the long term only are required, as follows:

- DM 2023 against DM 2038; and
- DM 2023 against DS 2038.

Study Area

1.1.78. The DMRB sets out a process by which the area for study is defined. The following steps are detailed:

i. Designate the start and end points of the physical works associated with the

[9] 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'.

Proposed Development;

ii. Identify the existing routes that are being bypassed or improved, and any proposed new routes, between the identified start and end points;
iii. Define a one kilometre boundary from the carriageway edge of the routes identified in ii);
iv. Define the 'Calculation Area' as the area within 600 m of the carriageway edge of all routes identified in ii), and within 600 m of the carriageway edge of any 'affected routes' falling within the boundary defined in iii);
v. Identify any 'affected routes' outside the boundary defined in iii); and
vi. Define a boundary 50 m from the carriageway edge of routes identified in v) above.

1.1.79. An affected route is defined as a road with the possibility of a change in noise level of 1dB $L_{A10,18h}$ or more in the short-term, or 3dB $L_{A10,18h}$ or more in the long-term (i.e. corresponding to minor impacts or greater - see impact criteria set out below).

1.1.80. This process is used to determine the overall area for calculation and assessment of operational noise impacts around the Proposed Development.

1.1.81. It should be noted that the resulting Study Area is different to that used in the determination of those properties that qualify for entitlement under the NIR, as detailed above.

Noise Sensitive Receptors

1.1.82. The assessment requires consideration to noise and vibration sensitive receptors within the Study Area, including specific noise level predictions for those receptors which are located within the Calculation Area. Property counts and Basic Noise Level (BNL) changes are undertaken for those routes for which 50m buffers are determined.

1.1.83. Further advice on sensitive receptors is found within the Scoping Assessment methodology where the following examples are given:

- Dwellings;
- Hospitals;
- Schools;
- Community facilities;
- Designated areas (e.g. Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Site of Special Scientific Interest (SSSI), Schedule Ancient Monuments (now 'Ancient Monuments' (AM)); and
- Public rights of way.

1.1.84. For 'open space' receptors, the DMRB advises that an assessment location should be chosen at a representative position within the open space and in close proximity to the road project, where the public could be exposed to the road traffic noise.

Noise Level Predictions

1.1.85. For each of the scenarios requiring consideration, noise level predictions are required to be undertaken for noise sensitive receptors identified within the Calculation Area. HD 213/11 requires that the noise level prediction method detailed in CRTN is applied in conjunction with the additional advice for CRTN procedures as detailed within Annex 4 of HD 213/11. The additional advice includes information on how to address a series of issues within road traffic noise level predictions, including the use of dual or single source lines, vehicle classifications, traffic forecasts and speeds, surface corrections for thin surfacing systems, existing low noise surfaces, new low noise surfaces, assumptions and limitations, extrapolation beyond the CRTN 300m limits, sound absorptive noise barriers and retaining walls, reflection from opposite facades, congestion management, variable speeds, high occupancy lanes and hard shoulder running, noise measurements and the CRTN Shortened Measurement Procedure.

Impact Criteria

1.1.86. To assist in the determination of the magnitude of noise impacts HD 213/11 presents the classification tables duplicated below. The tables show 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.

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

Table 2-5 - 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
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

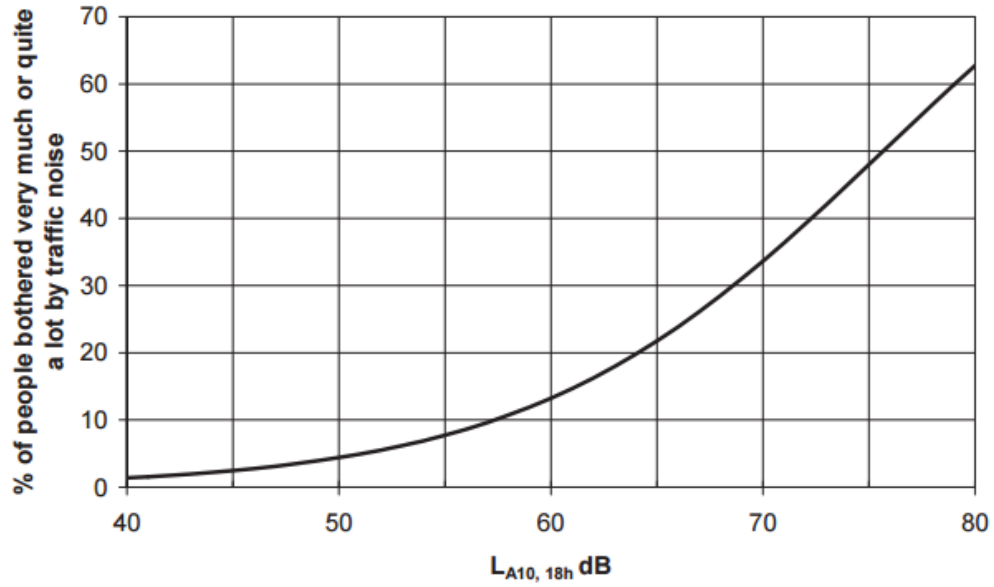
Table 2-6 - DMRB Criteria for Magnitude of Operational Day or Night-time Road Noise Impacts in the Long term

Noise change ($L_{A10,18h}$), dB	Magnitude of impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

NOISE AND VIBRATION NUISANCE

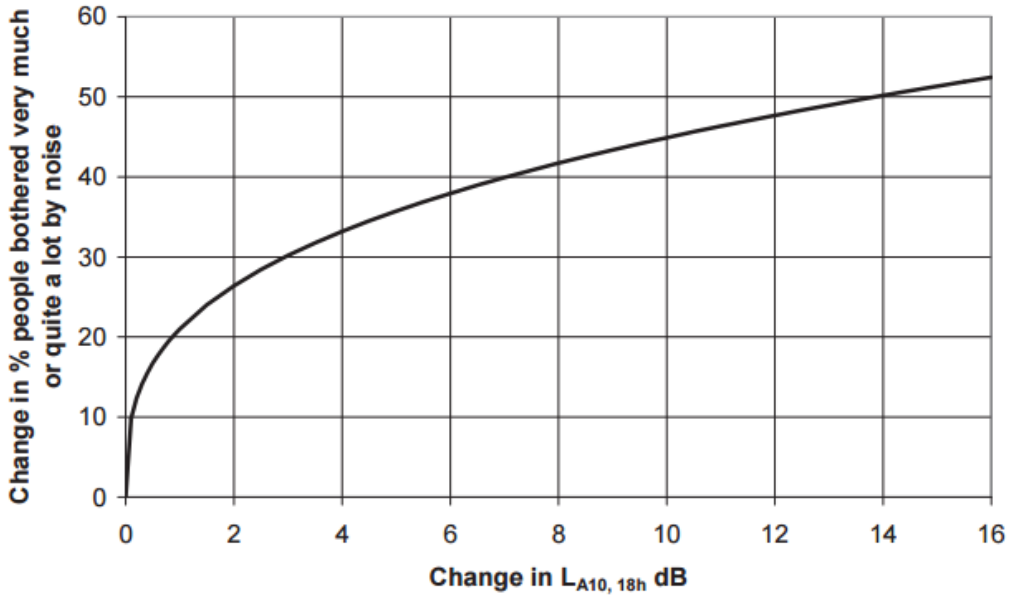
1.1.88. A limitation of an assessment of changes in noise level is that it does not consider the effect of the absolute levels expected at a receptor. This is considered within the DMRB by assessing overall road traffic 'noise nuisance' changes expected as a result of the Proposed Development. The following noise level / annoyance response curve is presented based on historic research considering average community response.

Figure 2-1 - Estimation of Traffic Noise Nuisance - Steady State or Before Change



1.1.89. In addition, and also based on historic research, the following relationship is presented depicting how the change in noise level relates to the change nuisance.

Figure 2-2 - Estimation of Traffic Noise Nuisance – Change in % Bothered Very Much or Quite a lot by Traffic Noise



1.1.90. An assessment of noise nuisance is required with application of the above relationships to the predicted receptor LA10,18h noise levels and associated noise level changes. It is required that the change in the number of people bothered 'very much' or 'quite a lot' is categorised into the following increase and decrease bands: 0, <10%, 10<20%, 20<30%, 30<40% and ≥ 40%.

1.1.91. A similar assessment is also required to determine the change in vibration nuisance (airborne). It is advised that the percentage of people bothered is 10% lower than for noise, with, on average, traffic induced vibration nuisance tending to zero at around 58dB $L_{A10,18h}$.

TRL Project Report PR/SE/451/02, 2002 - Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping

1.1.92. The Calculation of Road Traffic Noise prediction method produces noise levels in terms of L_{A10}, either over a 1-hour or an 18-hour period.

1.1.93. 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 $L_{Aeq.}$

1.1.94. TRL published a report in 2002, which provided a 'back-end' correction for converting the UK traffic noise index $L_{A10,18h}$ to the noise indices required for EU noise mapping.

1.1.95. The TRL report presented equations for three potential methods of conversion, depending on the quantity and quality of traffic data available.

- *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 covert

$L_{A10,1h}$ 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.

- *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.
- *Method 3* is the least detailed and can be used when only $L_{A10,18h}$ traffic data are available. Equations are provided for motorway and non-motorway roads to covert $L_{A10,18h}$ directly to the L_{den} and L_{night} values as required by the END.

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

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