Haweswater Aqueduct Resilience Programme - Proposed Bowland Section

Environmental Statement

Volume 4

Appendix 17.1: Legislation, Policy & Guidance Summary

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1. Legislation, Policy and Guidance Summary

1) This appendix describes the main legislation, policy and guidance relevant to construction Noise and Vibration assessment.

1.1 Legislation

1.1.1 Control of Pollution Act 1974

2) The Control of Pollution Act[1] (CoPA) grants powers to deal with noise nuisances. Much of CoPA has been replaced and extended by the Environmental Protection Act 1990. However, sections 60 and 61 which relate to Noise and Vibration from construction sites remain relevant.

3) Section 60 of CoPA allows a local authority to serve a notice of its requirements for the control of site noise to the individual or entity carrying out or controlling the works. The notice may stipulate noise limits for work, particular plant or machinery that should be avoided, hours during which construction activities may be carried out and provide for any change in circumstances.

4) Section 61 of CoPA concerns the procedures adopted when a contractor or developer approaches the local authority prior to any construction activities taking place, with the intention of agreeing Noise and Vibration limits in advance of works.

1.1.2 Environmental Protection Act 1990

5) Section 79 of the Environmental Protection Act[2] (EPA) defines what activities may constitute a statutory nuisance, and what activities are specifically exempt. The section imposes a duty on local authorities to periodically survey environmental noise levels and to investigate noise complaints. The EPA requires local authorities to serve notice when noise nuisance exists. Under these statutory nuisance provisions, the operators of a site or facility could be required to adopt best practicable means to abate noise nuisance at any time once operations have commenced. It is, therefore, essential that potential nuisance effects are properly considered, so as to ensure that the operators are seen to adopt best practice, and that any potential requirements for mitigation are considered.

1.2 Policy

1.2.1 Noise Policy Statement for England, 2010

6) The government's noise policy is set out in the Noise Policy Statement for England[3] (NPSE), which came into force in March 2010.

7) It contains the high-level vision of promoting good health and good quality of life (wellbeing) through the effective management of noise. It is supported by three aims and together they provide the necessary clarity and direction to enable decisions to be made in any particular situation, both nationally and locally, regarding what is an acceptable noise burden to place on society. These three aims are:

- To avoid significant adverse impacts on health and quality of life
- To mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life.

8) These three aims are be considered when determining whether the construction of the Proposed Programme of Works will cause significant effects. In defining these aims, the terms 'significant adverse' and 'adverse' are used, for which the NPSE notes that:

'There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

[1] Control of Pollution Act 1974. London. The Stationery Office.
[2] Environmental Protection Act 1990, Part III. London. The Stationery Office
[3] DEFRA (March 2010). The Noise Policy Statement for England (NPSE). London, the Department for Environment, Food and Rural Affairs.

▪ *NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*

▪ *LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.*

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

▪ *SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.'*

9) The LOAEL and SOAEL 'effect levels' are used within the assessment methodology adopted for the assessment of the Proposed Programme of Works (Haweswater Aqueduct Resilience Programme).

1.3 Guidance

1.3.1 British Standard BS 5228-1:2009+A1:2014: Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise

10) BS 5228-1[4] provides guidance and recommendations on methods for the measurement of construction noise and assessing its impact on those exposed to it. It also makes reference to the legislative background to noise control on construction sites and gives recommendations for basic methods of noise control. Also, suitable methods are provided for the calculation of noise from construction activities, including basic information regarding noise levels from a range of construction equipment.

11) Annex E of BS 5228-1 describes methods for evaluating the potential significant effect of construction noise depending on the existing noise level at the site. The Annex presents the ABC method, which considers that a potential adverse effect is indicated when the site noise level exceeds the value listed in an A/B/C category which is dictated by the existing noise level. Table 1 reproduces Table E.1 from BS 5228-1.

Table 1: ABC Method for assessing construction noise at dwellings

Reference Period	Threshold value (dB L_{Aeq})		
	Category A	Category B	Category C
Daytime weekdays (07.00–19.00) Daytime Saturdays (07.00–13.00)	65	70	75
Evenings weekdays (19:00-23:00) Saturdays (13.00–23.00) Sundays (07.00–23.00)	55	60	65
Night-time weekdays and weekends (23:00-07:00)	45	50	55

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

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

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

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.

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.

12) BS 5228-1 also provides information about when a developer / promoter should offer noise insulation or temporary rehousing to residents affected by construction works.

[4] British Standards Institution (BSI). 2014. BS5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites. Noise. London, BSI

13) The guidance suggests that a weekday or Saturday daytime noise impact of 75 dB $L_{Aeq,T}$ for ten or more days (or nights) in any 15 consecutive days (or 40 days in any six consecutive months) would be considered a trigger for the requirement to offer noise insulation to affected residents.

'Where, in spite of the mitigation measures applied and any Section 61 consents under the Control of Pollution Act 1974, noise levels at some properties are expected to exceed trigger levels for the periods defined below, a scheme for the installation of noise insulation or the reasonable costs thereof, or a scheme to facilitate temporary rehousing of occupants, as appropriate, should be implemented by the developer or promoter. The scheme should include provision for the notification of affected parties.

Noise insulation, or the reasonable costs thereof, should be offered by the developer or promoter to owners, where applied for by owners or occupiers, subject to meeting the other requirements of the proposed scheme, where the construction of the development causes, or is expected to cause, a measured or predicted airborne construction noise level that exceeds either of the following at property lawfully occupied as a permanent dwelling:

- *The noise insulation trigger levels presented in Table [2] for the corresponding times of day*
- *A noise level 5 dB or more above the existing pre-construction ambient noise level for the corresponding times of day.*

Whichever is the higher and for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months.'

Table 2: 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 $L_{Aeq,T}$)
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
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

14) Where construction noise levels would be such that noise insulation would not provide sufficient attenuation to prevent disturbance or interference with activities or sleep, then the occupants can be temporarily re-housed away from the construction site. The guidance advises that:

'Temporary rehousing, or the reasonable costs thereof, should be offered by the developer or promoter to owners, where applied for by owners or occupiers, subject to meeting the other requirements of the proposed scheme, where the construction of the development causes, or is expected to cause, a measured or predicted airborne construction noise level that exceeds either of the following at property lawfully occupied as a permanent dwelling:

- *A noise level 10 dB above any of the trigger noise levels presented in [Table 2] for the corresponding times of the day; or*

- *A noise level 10 dB above the pre-construction ambient noise level for the corresponding times of the day*

Whichever is the higher and for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months.

Non-residential buildings where the occupants of which are likely to be particularly sensitive to noise (these include commercial and educational establishments, hospitals and clinics) should be subject to individual consideration by the developer or promoter, upon application by the affected party.'

1.3.2 British Standard BS 5228-2:2009+A1:2014: Code of practice for Noise and Vibration control on construction and open sites – Part 2: Vibration

15) BS 5228-2[5] provides guidance in relation to the effects of construction vibration upon the surroundings. Vibration nuisance is frequently associated with the assumption that, if vibration can be felt, then damage is inevitable. However, considerably greater levels of vibration are required to cause damage to buildings and structures than are perceptible. In any neighbourhood, some individuals will be more sensitive to vibration than others.

16) BS 5228-2 states (paragraph B.2) that '*Human beings are known to be very sensitive to vibration, the threshold of perception being typically in the PPV range of 0.14 mm/s to 0.3 mm/s. Vibrations above these values can disturb, startle, cause annoyance or interfere with work activities. At higher levels they can be described as unpleasant or even painful. In residential accommodation, vibrations can promote anxiety lest some structural mishap might occur*'. A table of guidance levels is provided in BS 5228-2 and is reproduced in Table 3.

Table 3: Magnitude of impact for vibration annoyance (human response)

Vibration level, PPV (mm/s)	Definition
> 10.0	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
1.0 to 10	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.
0.3 to 1.0	Vibration might be just perceptible in residential environment.
< 0.3	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction.
PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal. It is specified in millimetres per second (mm/s). It is important to note that the PPV refers to the movement within the ground of molecular particles and not surface movement.	

17) For very high sensitivity properties, e.g. vibration sensitive research and manufacturing (e.g. computer chip manufacture); hospitals with vibration sensitive equipment/operations; universities with vibration sensitive research equipment/operations, a risk assessment approach would be undertaken. The risk assessment would be based on the information currently available for the relevant equipment/process, or where information is provided by the building owner or equipment manufacture[6].

1.3.3 Design Manual for Roads and Bridges (DMRB) LA 111: Noise and Vibration

18) This document provides a framework for assessing and managing the Noise and Vibration effects associated with construction, improvement, use and maintenance of motorways and all-purpose trunk roads. It sets out the requirements for Noise and Vibration assessments from road projects, applying a

[5] British Standards Institution (BSI). 2014. BS5228-2:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites. Vibration. London, BSI

[6] The assessment will be based on all information available to the project but it is accepted that it will not be possible to identify every potentially vibration sensitive process or item of equipment. The assessment methodology provides a basis for assessing and mitigating if necessary any vibration sensitive process or equipment at the time the project becomes aware of it.

proportionate and consistent approach using best practice and ensuring compliance with relevant legislation.

19) Although LA 111[7] is intended for the assessment of impacts from the construction and operation of large road projects, the construction assessment approach presented within the document (which is based on the guidance within BS 5228-1 for construction sites) is considered applicable to other large construction work programmes, and has been taken account of in the approach and methods for assessment of the Proposed Programme of Works.

20) Table 4 presents the LOAEL and SOAEL levels used in the assessment of construction noise (including that from construction traffic on existing roads, and access roads constructed as part of the Programme of Works). Table 5 presents the impact magnitude criteria used in assessing construction noise, while Table 6 presents the impact magnitude criteria for assessing construction road traffic noise.

21) LA 111 states that *'Construction noise and construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:*

1) 10 or more days or nights in any 15 consecutive days or nights;

2) a total number of days exceeding 40 in any 6 consecutive months.'

Table 4: Construction noise LOAEL and SOAEL values at dwellings

Construction Airborne Noise Effect Level	Threshold Value ($L_{Aeq,T}$) 1m in front of the relevant façade
Lowest Observed Adverse Effect Level (LOAEL)	Existing $L_{Aeq,T}$ sound level for day, evening or night
Significant Observed Adverse Effect Level (SOAEL)	Threshold level determined as per BS 5228-1:2009+A1:2014 Section E3.2 and Table E.1 (reproduced in Table 1)

Table 5: Magnitude of impact for construction works

Magnitude of impact	Construction noise level
Major	Above or equal to SOAEL+5 dB
Moderate	Above or equal to SOAEL and below SOAEL+5 dB
Minor	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

Table 6: Magnitude of impact for construction road traffic

Magnitude of impact	Increase in BNL of closest public road used for construction traffic (dB)
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

[7] Highways England, Transport Scotland, Welsh Government, Department for Infrastructure. 2020. Sustainability & Environment Appraisal LA 111 Noise and Vibration. Revision 2.

22) A potentially significant adverse effect due to construction traffic would occur where road traffic Basic Noise Levels (BNL) are predicted to be equal to or exceed the SOAEL and result in a change in BNL of 3.0 dB or more (i.e. an impact magnitude of moderate or major).