



Appendix 8.2

Legislation, Policy and Guidance



APPENDIX 8.2
LEGISLATION, POLICY, AND GUIDANCE

A8.2.1 National Planning Policy

Planning Policy Wales (“PPW”) sets out the land use planning policies of the Welsh Government.

The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental, and cultural wellbeing of Wales, as required by the Planning (Wales) Act 2015, the Wellbeing of Future Generations (Wales) Act 2015 and other key legislation and resultant duties such as the Socioeconomic Duty. A well-functioning planning system is fundamental for sustainable development and achieving sustainable places.

PPW promotes action at all levels of the planning process which is conducive to maximising its contribution to the wellbeing of Wales and its communities. It encourages a wider, sustainable, and problem-solving outlook that focuses on integrating and addressing multiple issues, rather than on an approach that is fragmented, uncoordinated and deals with issues in isolation. It provides an opportunity to remove any actual or perceived problems in current approaches and serves to stimulate and support innovative and creative ideas, as well as high standards of evidence and assessment to underpin the preparation of development plans and strategies and individual proposals. Monitoring and learning from development outcomes, so as to drive sustainable improvements in planning practice, is also important.

Sections 5.9.19 to 5.9.23 of the PPW set out the Government’s policy for renewable and low carbon energy development, as set out below (emphases have been added to key sections of the policy pertinent to this acoustic assessment):

‘... 5.9.19 *In determining applications for the range of renewable and low carbon energy technologies, planning authorities should take into account:*

- *the contribution a proposal will make to meeting identified Welsh, UK and European targets;*
- *the contribution to cutting greenhouse gas emissions; and*
- *the wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development....’*

‘... 5.9.20 *Planning authorities should also identify and require suitable ways to avoid, mitigate or compensate adverse impacts of renewable and low carbon energy development. The construction, operation, decommissioning, remediation and aftercare of proposals should take into account:*

- ***the need to minimise impacts on local communities, such as from noise and air pollution, to safeguard quality of life for existing and future generations;***
- *the impact on the natural and historic environment;*

- *cumulative impact;*
- *the capacity of, and effects on the transportation network;*
- *grid connection issues where renewable (electricity) energy developments are proposed; and*
- *the impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt to climate change impacts give rise to additional impacts ...'*

'... 5.9.21 Prior to an application being submitted, developers for renewable and low carbon energy developments should, wherever possible, consider how to avoid, or otherwise minimise, adverse impacts through careful consideration of location, scale, design and other measures ...'

'...5.9.22 Whatever the size of a scheme, developers should take an active role in engaging with the local community on renewable energy proposals. This should include pre-application discussion and provision of background information on the renewable energy technology that is proposed ...'

'... 5.9.23 The Welsh Government has produced separate practice guidance highlighting the planning implications of a wide variety of renewable energy technologies ...'

In summary, the PPW states the need for renewable and low carbon energy developments, but due consideration should also be given to the potential impact, including the noise impact on local communities. The Developer must consider appropriate design measures that are needed in order to avoid or minimise *adverse impacts* on noise sensitive receptors.

Sections 6.7.6 to 6.7.7 of the PPW set out the Government's policy for assessing the air quality and soundscape; emphases have been added to key sections of the policy pertinent to this assessment:

'... 6.7.6 In proposing new development, planning authorities and developers must, therefore:

- *address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors*
- *not create areas of poor air quality or inappropriate soundscape; and*
- *seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes ...'*



‘... 6.7.7 ***To assist decision making it will be important that the most appropriate level of information is provided and it may be necessary for a technical air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer ...***’

In summary, the PPW requires that a technical noise impact assessment of the scheme must be carried out by a suitably qualified and competent person.

A8.2.2 Future Wales – The National Plan 2040

The 'Future Wales – the National Plan 2040' document is as issued by the Welsh Government during 2021. This document provides the national development framework which sets out the direction for Developments of National Significance in Wales up to 2040.

Policy 18 of the document sets out the Government's policy for renewable and low carbon energy Developments of National Significance, and it states the following (emphases added):

'... Policy 18 – Renewable and Low Carbon Energy Developments of National Significance

Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria:

1. *Outside of the Pre-Assessed Areas for wind developments and everywhere for all other technologies, the proposal does not have an unacceptable adverse impact on the surrounding landscape (particularly on the setting of National Parks and Areas of Outstanding Natural Beauty)*
2. *There are no unacceptable adverse visual impacts on nearby communities and individual dwellings*
3. *There are no adverse effects on the integrity of Internationally designated sites (including National Site Network sites and Ramsar sites) and the features for which they have been designated (unless there are no alternative solutions, Imperative Reasons of Overriding Public Interest (IROPI) and appropriate compensatory measures have been secured)*
4. *There are no unacceptable adverse impacts on national statutory designated sites for nature conservation (and the features for which they have been designated), protected habitats and species*
5. *The proposal includes biodiversity enhancement measures to provide a net benefit for biodiversity*
6. *There are no unacceptable adverse impacts on statutorily protected built heritage assets*
7. ***There are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance***
8. *There are no unacceptable impacts on the operations of defence facilities and operations (including aviation and radar) or the Mid Wales Low Flying Tactical Training Area (TTA-7T)*



9. *There are no unacceptable adverse impacts on the transport network through the transportation of components or source fuels during its construction and/or ongoing operation*
10. *The proposal includes consideration of the materials needed or generated by the development to ensure the sustainable use and management of resources*
11. *There are acceptable provisions relating to the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration. The cumulative impacts of existing and consented renewable energy schemes should also be considered ...'*

In summary, Renewable and Low Carbon energy Developments of National Significance should not result in unacceptable “adverse impacts”. The cumulative noise impact of the Development with other existing and consented renewable energy schemes must also be considered.

A8.2.3 Noise and Soundscape Action Plan

The 'Noise and Soundscape Action Plan 2018-2023' document is as issued by the Welsh Government. Section 8.2 of the Action Plan sets out the Government's policy for the integrated pollution prevention and control of industrial noise, and it states the following:

'... The information in this section has been provided by NRW.

8.2.1 Sound emitted from major industrial sources is regulated by NRW ('A1 permits') and local authorities ('A2 permits') through the Environmental Permitting (England and Wales) Regulations 2016 (EPR).

8.2.2 UK guidance on meeting the requirements of industrial noise regulation under EPR is provided to operators in the 'Horizontal Guidance Note' IPPC H3. This is in the process of being reviewed by the UK's environment agencies to reflect current practices.

8.2.3 The commonly used methodology for assessing the adverse impacts of industrial noise, BS 4142, was updated in 2014. This standard now requires a broader consideration of the adverse impacts of noise and the context within which emissions occur, in particular:

- the absolute level;*
- the character of the noise, in particular whether it is tonal or impulsive, which can be as much a feature in any adverse impact as the level; and*
- the nature of the receptor, for example whether there are particular vulnerabilities, and whether the exposure is time-limited.*

8.2.4 There are a number of ways that potential adverse noise impacts arising from industrial sites can be avoided or at least minimised to such an extent that they do not impact upon people or the natural environment. These include:

- locating new developments, whether noise-generating or noise-sensitive, to avoid noise issues arising in the first instance (in other words, through the planning system);*
- increasing the distance between the source and receptors;*
- preventing noise at source by good design and maintenance;*
- using barriers or enclosures to prevent noise travelling, including through the use of green infrastructure;*
- minimising or containing noise at source by observing good working and management practices; and*
- avoiding noisy operations at certain times, such as at night.*

8.2.5 Under EPR, noise is regulated through the use of standard noise conditions and each site's environmental management plan, rather than through the use of specific limits. This provides greater flexibility for adaptation to a changing soundscape.

8.2.6 The enactment of the WFG Act and the Environment (Wales) Act 2016 provides a new dimension to the consideration of the adverse effects of industrial noise under EPR in Wales. The 2016 Act sets out the statutory purpose of NRW, and states that in the exercise of its functions, as far as is consistent with their proper exercise, NRW must pursue sustainable management of natural resources in relation to Wales, and apply the principles of sustainable management of natural resources. (This means that whilst there are opportunities in order to encourage operators to pursue actions beyond statutory limits to deliver the sustainable management of natural resources, the determination of permits under EPR is still bound by those statutory limits.)

8.2.7 Site operators are encouraged to undertake discussions with planners and regulators prior to the submission of an application for either planning permission or an environmental permit. This allows any potential issues to be identified early in the process, so that measures can be put in place to avoid adverse outcomes for operators, regulators and local communities. It also provides the greatest scope for building in aspects to the operation that can help to achieve the seven well-being goals and deliver the sustainable management of natural resources.

The Welsh Government's requirements for the integrated pollution prevention and control of industrial noise aligns with guidance as provided by Natural Resources Wales ("NRW"). A summary of the current guidance as issued by the Environmental Agencies (a collective term which includes NRW) is provided in Section A7.2.6 of this Appendix.

A8.2.4 Local Planning Policy

The governing Local Authority for the Development is Vale of Glamorgan (“VoG”). VoG issued the current Local ‘*Development Plan (LDP) 2011 to 2026*’ document during 2017. Policy MD2 entitled ‘*Design of New Development*’ of the LDP presents VoGC’s requirements as regards to noise, which states the following (emphasis added to key sections of the policy pertinent to this acoustic assessment):

‘...POLICY MD2 - DESIGN OF NEW DEVELOPMENT

In order to create high quality, healthy, sustainable and locally distinct places development proposals should:

- 1. Be of a high standard of design that positively contributes to the context and character of the surrounding natural and built environment and protects existing features of townscape or landscape interest;*
- 2. Respond appropriately to the local context and character of neighbouring buildings and uses in terms of use, type, form, scale, mix, and density;*
- 3. Where appropriate, provide new or enhanced areas of public realm particularly in key locations such as town centres, major routes and junctions;*
- 4. Promote the creation of healthy and active environments and reduce the opportunity for crime and anti-social behaviour. In the case of retail centres, developments should provide active street frontages to create attractive and safe urban environments;*
- 5. Provide a safe and accessible environment for all users, giving priority to pedestrians, cyclists and public transport users;*
- 6. Have no unacceptable impact on highway safety nor cause or exacerbate existing traffic congestion to an unacceptable degree;*
- 7. Where appropriate, conserve and enhance the quality of, and access to, existing open spaces and community facilities;*
- 8. Safeguard existing public and residential amenity, particularly with regard to privacy, overlooking, security, noise and disturbance;***
- 9. Provide public open space, private amenity space and car parking in accordance with the council’s standards;*
- 10. Incorporate sensitive landscaping, including the retention and enhancement where appropriate of existing landscape features and biodiversity interests;*

11. *Provide adequate facilities and space for the collection, composting and recycling of waste materials and explore opportunities to incorporate re-used or recyclable materials or products into new buildings or structures; and*
12. *Mitigate the causes of climate change by minimising carbon and other greenhouse gas emissions associated with their design, construction, use and eventual demolition, and include features that provide effective adaptation to, and resilience against, the current and predicted future effects of climate change ...'*

Section 7.6 of the LDP states the following (emphasis added to key sections of the policy pertinent to this assessment):

*'... 7.6 All development proposals will be required to fully consider the context and character within which the development proposal is located so as to ensure that it contributes positively to the local setting including important views and vistas. Issues associated with safeguarding residential amenity should also be addressed during the design process especially where mixed use developments are proposed. **Solutions to problems such as overlooking and noise can often be overcome by good design. All new buildings should respond positively to and respect their surroundings and contribute towards healthy and vibrant communities**, reducing the fear of crime and creating a sense of place. In this regard developments must be of an appropriate scale, density and design for their location and make a positive contribution to the local environment. Further guidance will be provided in the Householder Design Guide Supplementary Planning Guidance ...'*

Policy MD7 of the LDP entitled '*Environmental Protection*' presents VoG's requirements as regards to noise, which states the following:

'... POLICY MD7 - ENVIRONMENTAL PROTECTION

Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from either:

1. *Pollution of land, surface water, ground water and the air;*
2. *Land contamination;*
3. *Hazardous substances;*
4. *Noise, vibration, odour nuisance and light pollution;*
5. *Flood risk and consequences;*
6. *Coastal erosion or land stability;*

7. *The loss of the best and most versatile agricultural land; or*
8. *Any other identified risk to public health and safety.*

Where impacts are identified the Council will require applicants to demonstrate that appropriate measures can be taken to minimise the impact identified to an acceptable level. Planning conditions may be imposed or legal obligation entered into, to secure any necessary mitigation and monitoring processes. ...'

A8.2.5 Technical Advice Note (Wales) 11, Noise

Planning Guidance (Wales), ‘*Technical Advice Note (Wales) 11, Noise – October 1997*’ (“TAN11”, as further updated by the Welsh Government in November 2015) sets out acoustic design criteria which is taken into account by Local Planning Authorities in Wales and may be material to decisions on individual planning applications. TAN11 provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development and/or adding unduly to the costs and administrative burdens of business.

With regards to developments that generate noise, TAN11 states the following (emphases added to key sections of the note to this acoustic assessment):

‘... 8. *Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions ...*’

‘...9. *Noise characteristics and levels can vary substantially according to their source and the type of activity involved. **In the case of industrial development, for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration.** In addition to noise from aircraft landing and taking off, noise from aerodromes is likely to result from engine testing as well as ground movements. The impact of noise from sport, recreation and entertainment will depend to a large extent on frequency of use and the design of facilities. Advice on assessing noise and on factors to consider in relation to the major noise sources including roads, railways, airports, industrial and recreational noise and their measurement is given in Annex B ...*’

Section B17 of Annex B of TAN11 states the following for assessing noise from industrial and commercial developments (emphases added):

*'... B17. The likelihood of adverse impacts arising from noise of an industrial and/or commercial nature can be assessed, where the application of BS 4142:2014 is appropriate, using the guidance set out in that standard. Tonal or impulsive characteristics of the noise are likely to increase the scope for adverse effects and this is taken into account by the "rating level" defined in BS 4142. This rating level should be used when stipulating the level of noise that can be permitted. The significance of sound of an industrial and/or commercial nature typically depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and also the context in which the sound occurs. BS 4142:2014 states that as an initial estimate: "A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context." However, this initial estimate of the impact may need to be modified due to the context, and determining whether this is the case should include consideration of absolute sound levels, the character and level of the residual sound compared to the specific sound, the sensitivity of the receptor, and good building design. Since background sound levels vary throughout a 24-hour period it will usually be necessary to assess the acceptability of sound levels for separate periods (e.g. day and night) chosen to suit the hours of operation of the proposed development. Similar considerations apply to developments that will emit significant noise at the weekend as well as during the week. In addition, general guidance on acceptable sound levels within buildings can be found in BS 8233:2014. **Noise conditions can often be attached to environmental permits issued under the Environmental Permitting (England and Wales) Regulations 2010 (as amended). This will be particularly relevant when dealing with sites where the operator is working with the benefit of a planning permission not subject to a noise condition. Local planning authorities and environmental permitting authorities should consult closely at an early stage when considering the need for specific noise controls to be imposed by appropriate conditions in any planning permission or in the subsequent environmental permit ...'***

The TAN11 guidance recognises that noise-relating conditions can be attached to the Environmental Permit and that there is a need for consultation between Local Planning Authorities and Environmental Permitting Authorities to ensure appropriate conditions are imposed on the operation of the site in question. In this case, the Barry Biomass site ("the Development") currently has an Environmental Permit which has specific noise conditions attached, as imposed by the NRW. Given that VoG were a Consultee to the original Permit Application, it follows that the noise-related Conditions as attached to the Environmental Permit are accepted by both Regulating Authorities. The full Permit for the as-built Development is provided in Appendix 8.3.

The TAN 11 assessment methodology makes references to British Standards BS 4142:2014+A1:2019 and BS 8233:2014. A summary of the latest versions of these Standards is provided in Section A8.2.7 and A8.2.8 of this Appendix respectively.

A8.2.6 Guidance on Noise and Vibration Management: Environmental Permits

Published by the Environment Agency, Scottish Environment Protection Agency (“SEPA”), Natural Resources Wales (“NRW”) and Northern Ireland Environment Agency (collectively referred to as the “Environment Agencies”) as during 23 July 2021, and subsequently updated 31 January 2022, this document sets out the minimum requirements for environmental noise and vibration impact assessments as required in order to support a Permit Application. This guidance replaces the Environment Agency’s previously issued (and now superseded) ‘*Horizontal Guidance for Noise (H3), Parts 1 and 2*’.

The key requirements of this guidance, which are applicable to this assessment, are as presented below:

- The environmental noise impact assessment must be undertaken in accordance with British Standard BS 4142:2014+A1:2019: ‘*Method for rating and assessing industrial and commercial sound*’ (BS 4142). A summary of this Standard is provided in Section A8.2.7.
- The acoustic character of the sound generated must be considered. More specifically, this must consider whether the sound is tonal, impulsive, or intermittent in operation. For industrial noise sources where the sound is neither impulsive nor tonal - but is readily distinguishable against the residual acoustic environment - the Environment Agency will expect a minimum acoustic character correction of +3dB to be applied, unless otherwise justified in a technically robust manner.
- The BS 4142-defined “Background Sound Levels” and “Residual Sound Levels” as used to inform the assessment must not include noise from the Development. The Development must not be operational during the environmental noise level measurements.
- Noise from the Development must not result in a BS 4142 defined “*significant adverse impact*” (following consideration of the context) at the surrounding NSRs. The NRW will not issue a Permit where the site is - or is predicted to be - operating at this level of environmental noise impact at receptor(s).
- As stated above, this guidance recognises that the context of the situation can affect the outcome of the BS 4142 assessment but states that there are practical limits. The guidance stipulates that it is unlikely to be acceptable to adjust the magnitude of the impact beyond the next BS 4142 assessment magnitude band (e.g., suggesting that a Rating Level of around 10dB above the Background Sound level (i.e., “significant adverse impact, depending on the context”) is actually a “low impact” purely on the grounds of context - this is unlikely to be acceptable).
- Notwithstanding the above, the assessment must demonstrate that Best Available Techniques (“BAT”) has been universally applied in order to prevent or minimise noise emissions.

A8.2.7 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019: *'Method for rating and assessing industrial and commercial sound'* ("BS4142") is intended to be used to assess noise of an industrial nature, which includes sound from fixed installations comprising of mechanical and/or electrical plant and equipment. The methods prescribed in this British Standard use outdoor sound levels in order to assess the likely effects of sound on people who might be inside or outside a dwelling or premises that is used for residential purposes upon which sound is incident.

The procedure contained in BS4142 for assessing environmental noise impact is to compare the measured or predicted noise level from the source in question - the "Specific Sound Level" immediately outside the noise sensitive premises - with the corresponding "Background Sound Level". Where the noise contains attention attracting characteristics such as tonal, impulsive and/or intermittent elements, it may be appropriate to apply a correction to the Specific Sound Level in order to obtain the "Rating Level".

BS4142 states that the significance of sound arising from an industrial and/or commercial nature depends upon both the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, and also the context in which the sound occurs:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.

For the daytime, the assessment is carried out over a one-hour period, and over a 15-minute period at night. The daytime and night time periods are defined as occurring between 07:00 hours to 23:00 hours, and 23:00 hours to 07:00 hours respectively.

BS4142 requires that the level of uncertainty must be considered as part of any assessment. Section 10 of BS4142 specifically states the following with regards to uncertainty:

'... Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty ...'

It is clear, therefore, that BS4142 requires that the level of uncertainty be considered as part of the assessment and take reasonably practical steps to reduce the level of uncertainty in the assessment.

A8.2.8 BS 8233:2014

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

The guidance provided includes appropriate internal and external noise level criteria that are applicable to dwellings for steady external noise sources. Specifically, it is stated that it is desirable that the internal ambient noise level does not exceed the criteria set out in Table A8.2.1:

BS8233:2014 – Indoor ambient noise levels for dwellings			
Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35dB $L_{Aeq,16hours}$	-
Dining	Dining room / area	40dB $L_{Aeq,16hours}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hours}$	30dB $L_{Aeq,8hours}$

Table A8.2.1: Indoor ambient noise levels for dwellings

With respect to external amenity spaces such as gardens and patios, the guidance states that it is desirable that the noise level does not exceed 50dB $L_{Aeq,T}$ at these locations, with a corresponding upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. The guidance further advises that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource. In these cases, the development should be designed to achieve the lowest practicable levels in external amenity spaces but should not be prohibited on these grounds alone.

BS8233:2014 also sets out appropriate guidance for typical indoor ambient noise levels within non-domestic developments as summarised in Table A8.2.2:

Activity	Location	Design Rang, dB $L_{Aeq,T}$
Speech or telephone communications	Department Store, Cafeteria, Canteen, Kitchen	50 – 55
	Concourse, Corridor, Circulation Space	45 – 55
Study and work requiring concentration	Library, Gallery, Museum	40 – 50
	Staff/Meeting Room, Training Room	35 – 45
	Executive Office	35 – 40
Listening	Place of Worship, Counselling, Meditation, Relaxation	35 – 35

Table A8.2.2: Typical noise levels in non-domestic buildings

A8.2.9 IEMA Guidelines for Environmental Noise Impact Assessment (Version 1.2, November 2014)

The Institute of Environmental Management & Assessment (“IEMA”) sets out key principles of noise impact assessment that are applicable to all development proposals where noise effects are likely to occur. These guidelines provide specific support on how noise impact assessment fits within the Environmental Impact Assessment.

Table 7-14 of the IEMA Guidance provides guidance for assessing the potential noise impact as due to the change in sound levels. Table A8.2.3 below sets out the appropriate assessment criteria for a short-term impact classification:

Short Term Impact Classification	Sound Level Change dB $L_{Aeq,T}$ (positive or Negative), T = either 16hour day or 8hour night
Negligible	≥ 0 dB and < 1 dB
Minor	≥ 1 dB and < 3 dB
Moderate	≥ 3 dB and < 5 dB
Major	≥ 5 dB

Table A8.2.3: Impact from the change in sound level (short-term only)

A8.2.10 Design Manual for Roads and Bridges, LA 111, Noise and Vibration, Revision 2

The ‘*Design Manual for Roads and Bridges, LA 111, Noise and Vibration, Revision 2*’ document, as issued by Highways England, Transport Scotland, Welsh Government, and the Department for Infrastructure during May 2020 (“DMRB”) has been used to assess the noise level impact as due to Development-generated road traffic at surrounding receptor locations.

Separate guidance is provided within the DMRB for the assessment of “short term” (i.e. when the project is opened) and “long term” (i.e. typically 15 years after the project is opened) impacts. Table A8.2.4 and Table A8.2.5 provide the DMRB criteria for assessing the magnitude of a noise impact, both in the short term and long term respectively:

Short Terms Magnitude of Impact	Short Term Noise Change, (dB $L_{A10,18\text{hour}}$ or dB L_{Anight})
Negligible	Less than 1.0
Minor	1.0 to 2.9
Moderate	3.0 to 4.9
Major	Greater than or equal to 5.0

Table A8.2.4: Classification of the magnitude of change (“short term”)

Short Terms Magnitude of Impact	Short Term Noise Change, (dB $L_{A10,18\text{hour}}$ or dB L_{Anight})
Negligible	Less than 3.0
Minor	3.0 to 4.9
Moderate	5.0 to 9.9
Major	Greater than or equal to 10.0

Table A8.2.5: Classification of the magnitude of change (“long term”)

A8.2.11 Permit Requirements

NRW is the Regulator for all environmental emissions and operations associated with the Development. A Permit for the as-built development has been issued by the NRW during 7 February 2018 (Permit Number EPR/AB3790ZB). Section 3.4 of the Permit specifically relates to noise level and vibration emissions from the Development, and this states the following:

'... 3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

(a) if notified Natural Resources Wales that the activities are giving rise to pollution outside the site due to noise and vibration, submit to Natural Resources Wales for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales ...'

In addition to the above, Improvement Condition 4 (IC4) also relates to noise and this states the following:

Ref.	Requirement	Date
IC4	<p>Following successful commissioning and establishment of routine steady operation, the Operator shall undertake noise monitoring at the nearest local receptors. This shall include:</p> <ul style="list-style-type: none"> • A full noise monitoring survey and assessment meeting the BS4142:2014 standard • 1/3rd octave and narrow band (FFT) measurements to identify any tonal elements or low frequency noise • Reference to the World Health Organisation guidelines for community noise <p>Upon completion of the work, a written report shall be submitted to Natural Resources Wales. The report shall refer to the predictions in the report produced as part of the application. If rating levels likely to cause adverse impact at sensitive receptors are detected, the report shall include an assessment of the most suitable abatement techniques, an estimate of the cost and a proposed timetable for their installation.</p>	Within 6 months of the completion of commissioning

Table A8.2.6: Requirements of Improvement Condition 4

In short, the requirements of IC4 are clear in that a post completion environmental noise survey and BS 4142 assessment is required to be completed and the resulting Rating Level at any receptor is not to exceed an *Adverse Impact* (which in BS 4142 terms is specifically defined as being a Rating Level exceeding the Background Sound Level by +5dB). A Summary of BS 4142 assessment methodology is as presented in Section A8.2.7 of this Appendix.

A8.2.12 BS5228

A8.2.12.1 Noise

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") sets out a method for measuring and predicting noise from construction works. The method considers - amongst other things - the noise emission level of the plant, the separation distance between the source and receiver, and the effect of the intervening topography and structures.

This Standard sets out the techniques that are needed in order to predict the likely noise effects from construction works, all as based on detailed information on the type and number of plant being used, their location and the length of time they will be in operation. This noise prediction method is used to establish likely overall, time-averaged noise levels (in terms of the $L_{Aeq,7}$) as over the core working day.

This Standard also includes a database of information, including previously measured sound pressure level data as for a variety of different construction plant undertaking various common activities.

Three example methods are presented for the assessment of the significance of noise effects. In summary, these methods are based on either a series of fixed noise limits or the anticipated change to the existing ambient noise level as a result of the construction operations - or a combination of both of these.

With respect to absolute fixed noise limits, BS 5228-1 discusses the absolute noise limits included within the '*Advisory Leaflet 72: 1976 Noise Control on Building Sites*' document. These noise limits are presented according to the nature of the surrounding environment, as for a 12-hour working day that is defined as occurring between 07:00 hours – 19:00 hours. The presented limits are:

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

These noise level limits are applicable directly at the façade of the receptor in question (i.e. they are not in so-called “free-field” conditions). It is important to note, however, that the proposed construction times for the Development exceed the 12-hour working day as defined above, and as such they are not appropriate. The Standard also provides methods for determining the significance of effect at dwellings as based upon the change in the ambient noise level as a result of the construction activity. Two example assessment methods are presented; these are the “ABC Method” (as summarised within Table A8.2.7) and the “5dB(A) Change Method:

Assessment Category and Threshold Value Period	Threshold Values, in decibels (dB)		
	Category (A) ^{A)}	Category (B) ^{B)}	Category (C) ^{C)}
Night time (23:00 – 07:00 hours)	45	50	55
Evenings and Weekends ^{D)}	55	60	65
Daytime (07:00 – 19:00 hours) and Saturdays (07:00 – 13:00 hours)	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 3 dB due to site noise		
NOTE 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.		

Table A8.2.7: Example Threshold of Significant Effect at Dwellings – ABC Method

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 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 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 ...’

A8.2.12.2 Vibration

BS 5228-2:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration’ (“BS5228-2”) gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration levels, including industry-specific guidance. The document is concerned primarily with the control of vibration rather than the prediction of vibration at a given receptor.

Table A8.2.8 below summarises the BS5288-2 guidance for the effects of vibration levels as based on human response (as presented in Table B1 of BS5228-2):

Vibration level, mm·s ⁻¹ A), B), C)	Effect
0.14	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	Vibration might be just perceptible in residential environments.
1.0	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.
10.0	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.
<p>^{A)} The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.</p> <p>^{B)} A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.</p> <p>^{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 or -2, 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.</p>	

Table A8.2.8: BS 5288-2 Guidance on the effect of vibration levels

BS 5228-2:2009+A1:2014 also provides guidance for the possibility of vibration-induced damage in buildings. It states the following:

‘... BS 7385-2 gives guidance on the assessment of the possibility of vibration-induced damage in buildings due to a variety of sources. This guidance indicates that the probability of damage tends towards zero at a component PPV of 12.5 mm·s⁻¹ ...’

A8.2.13 A Simple Outdoor Criterion for Assessment of Low Frequency Noise Emission

The Acoustic Australia Journal Vol. 39 April (2011) No. 1 'A Simple Outdoor Criterion for Assessment of Low Frequency Noise Emission' provides simple absolute outdoor criteria for the assessment of low frequency noise emissions at outdoor locations, including at residential receptors. The criteria as set out within the Journal are provided in absolute terms only and as such these do not consider the pre-existing environmental noise climate.

Table A8.2.9 below summarises the absolute noise level guidance for the assessment of low frequency noise at residential, commercial, office and industrial receptors:

Sensitive Receiver		Range	Criteria, dB $L_{Ceq,T}$
Residential	Night time or plant operation 24/7	Desirable	60
		Maximum	65
	Daytime or Intermittent (1-2 hours)	Desirable	65
		Maximum	70
Commercial/ Office/ Industrial	Night time or plant operation 24/7	Desirable	70
		Maximum	75
	Daytime or Intermittent (1-2 hours)	Desirable	75
		Maximum	80

Table A8.2.9: Criteria for assessment of low frequency noise

The Journal states that if the noise is fluctuating by at least 5dB(C), then the noise levels as presented within the above table should be reduced by a further 5dB(C). The assessment should consider "infrasonic" sound energy as arising from the 10Hz one-third octave frequency band and upwards (albeit an upper limiting frequency limit is not defined).