7.2 Noise and Vibration Legislation Policy Standards and Guidance

1 Legislation

1.1 Control of Pollution Act

1.1.1 The Control of Pollution Act (CoPA) (HMSO, 1974) published in 1974 covers a wide range of environmental pollution including noise. Parts of the Act have been superseded by the Environmental Protection Act (EPA) (HMSO, 1990) published in 1990.

1.1.2 Section 60 of the Act relates to the 'Control of Noise on Construction Sites' and Section 61 relates to obtaining 'Prior Consent for Work on Construction Sites'. These parts of the Act are often used in conjunction with other standards to determine acceptable noise levels in relation to construction, hours of operation and specific working methods or mitigation.

1.1.3 A Section 61 application outlines the proposed construction works, hours of operation and a mitigation plan to reduce noise and vibration impact through the use of Best Practicable Means. It allows prior consent to be agreed between the contractor and the council and assists with protecting the contractor from legal action being taken under Section 60 of CoPA (HMSO, 1974) or Section 80 of the EPA (HMSO, 1990).

1.2 Environmental Protection Act

1.2.1 The Environmental Protection Act (EPA) (HMSO, 1990) published in 1990 requires local authorities to investigate noise complaints from premises (land and buildings) and vehicles, machinery or equipment in the street. This includes noise arising from construction sites.

1.2.2 If the local authority is satisfied that noise from a development amounts to a statutory nuisance then the authority must serve an abatement notice on the person responsible or in certain cases the owner or occupier of the property. The notice may require that the noise or nuisance is completely stopped or limited to certain times of the day.

2 Policy

2.1 Local Policy

Loch Lomond and The Trossachs National Park Local Development Plan

2.1.1 The Loch Lomond and The Trossachs National Park Local Development Plan (LLTNP, 2017) outlines the vision for how the National Park should change over the next 20 years, and the strategy needed to deliver the physical development. Noise is not specifically referred to within the Local Development Plan, although Policy 2 in Section 4 states:

> *"…Amenity and Environmental Effects: avoid any significant adverse impacts of; flooding, noise/vibration, air emissions/ odour/fumes/dust, light pollution, loss of privacy/sunlight/daylight…"*

2.2 National Policy

Scottish Planning Policy (SPP)

2.2.1 A revised Scottish Planning Policy was published in June 2014 (The Scottish Government, 2014) and sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land.

2.2.2 With respect to noise, Paragraph 106 states:

"*Efficient handling of planning applications should be a key priority, particularly where jobs and investment are involved. To assist with this, pre-application discussions are strongly encouraged to determine the information that should be submitted to support applications. Such information should be proportionate and relevant to the development and sufficient for the planning authority requirements on matters such as the number of jobs to be created, hours of working, transport requirements, environmental effects, noise levels and the layout and design of buildings. Decisions should be guided by the principles set out in paragraphs 28 to 35.*"

2.2.3 Paragraph 169 Development Management states:

"*Proposals for energy infrastructure developments should always take account of spatial frameworks for wind farms and heat maps where these are relevant. Considerations will vary relative to the scale of the proposal and area characteristics but are likely to include….:*

- *Impacts on communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker…".*

2.2.4 Paragraph 252 states that:

"*Applications should be supported, where necessary, by sufficient information to demonstrate:*

- *operational arrangements (including noise, light, access, waste and odour) are satisfactory and sufficient mitigation plans are in place…."*

3 Guidance and Relevant Technical Standards

Planning Advice Note PAN 1/2011 Planning and Noise

3.1.1 Planning Advice Note PAN 1/2011 Planning and Noise (LGCD, 2011) provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. Information and advice relating to noise impact assessments (NIA) methods is provided and includes details of the legislation, technical standards and codes of practice for specific noise issues.

3.1.2 In relation to development management, Paragraph 15 states:

> *"Issues which may be relevant when considering noise in relation to a development proposal include:*
>
> - *Type of development and likelihood of significant noise impact,*
> - *Sensitivity of location (e.g. existing land uses, NMA, Quiet Area),*
> - *Existing noise level and likely change in noise levels,*
> - *Character (tonal, impulsivity etc), duration, frequency of any repetition and time of day of noise that is likely to be generated, and*
> - *Absolute level and possible dose-response relationships e.g. health effects if robust data available."*

3.1.3 Furthermore, Paragraph 16 states:

> *"It is preferable that satisfactory noise levels can be achieved within dwellings with the windows sufficiently open for ventilation. Local circumstances, particularly relating to the existing noise character of the area, should influence the approach taken to noise levels with open or closed windows. It may be appropriate to take a different approach to noise levels in different areas. It may also be appropriate to take a different approach to noise levels when considering the effects of new noisy development on existing residential properties from the approach taken to new residential development close to existing noisy land uses. Satisfactory internal noise levels with open windows may not always be achievable but are always preferable. Where satisfactory levels with open windows are not achievable, practicable mitigation solutions should be explored, taking into account their possible impact on the built environment. Design solutions may be possible, such as locating living rooms and bedrooms on the opposite side of a building to the source of the noise or use of windows designed to provide for ventilation while providing improved sound reduction. In some circumstances however, closed windows with alternative means of ventilation may be unavoidable. Passive systems may be considered but mechanical ventilation should only be used as a last resort. Sound levels in gardens and amenity areas may also need to be considered in terms of enabling a reasonable degree of peaceful enjoyment of these spaces for residents."*

3.1.4 In relation to industrial sources of noise, Paragraph 31 states:

> *"Due to its variable character industrial noise is generally difficult to assess. Since background noise levels vary throughout a 24-hour period it will usually be necessary for Noise Impact Assessments to assess the acceptability of noise levels for separate periods (e.g. day, evening, night and weekend) chosen to suit the hours of operation of the proposed development. Noise that may result from traffic generated by new industrial developments is likely to be a relevant consideration."*

TAN/1/2011 Planning and Noise:

3.1.5 Advice on the role of the planning system in helping to prevent and limit the adverse effects of noise is provided in Planning Advice Note (PAN) 1/2011 'Planning and Noise' (The Scottish Government, 2011b).

3.1.6 The methodology provided in Technical Advice Note (TAN) 1/2011'Assessment of Noise' (The Scottish Government, 2011b) is used to assess the suitability of the local noise environment for a residential development. This is a five stage process as follows:

Stage 1: Initial Process

3.1.7 The initial process of the methodology is to identify all receptors which could be impacted by the development.

3.1.8 The development is characterised on whether it is a Noise Generating Development (NGD) or a Noise Sensitive Development (NSD)

Stage 2: Quantitative Assessment

3.1.9 The quantitative assessment method depends on the type of development proposed i.e. Noise Sensitive Development (NSD) or Noise Generating Development (NGD) as follows:

- NSD - a quantitative assessment will be based on comparing an absolute noise level with an appropriate noise target, e.g. WHO guidelines etc.; and
- NGD – a quantitative assessment will be based on the change in noise climate before and after the new noise is introduced. This requires predictive calculations to be used to define post development noise.

3.1.10 In relation to the proposed development at West Riverside and Woodbank House, this is considered to be both a noise sensitive and noise generating development as proposed sensitive receptors are susceptible to noise from the existing road network, whilst existing residential receptors are susceptible to any increase in noise level that may be result from the increase in traffic flows generated by the development.

Noise Sensitive Development

3.1.11 The magnitude of the impact is defined by assessing the amount the road traffic noise level exceeds the assessment criteria for either day or evening periods. The magnitude of impact classifications used in this assessment and shown in **Table A7.1** are based on the consultation response from West Dunbartonshire Council and classifications provided in the Technical Advice Note of PAN 01/2011 (The Scottish Government, 2011a).

Table A7.1: Classification of magnitude of Noise Impacts; Noise sensitive Developments

Night Noise Level [1], x = (Existing -45) $L_{Aeq, T=8h}$	**Day Noise Level [1], x = (Existing – 55) L_{Aeq}, 16h**	**Magnitude of impact**
> 15	> 10	Major adverse
10 = x = 15	5 = x = 10	Moderate adverse
5 = x <10	3 = x < 5	Minor adverse
0 = x < 5	0 = x < 3	Negligible
x < 0	x < 0	No adverse impact

Stage 3: Qualitative assessment

3.1.12 The qualitative assessment allows the magnitude of the impact established in Stage 2 to be adjusted accordingly to take into account additional factors. It is based on perception and how noticeable the noise impact is in affecting the amenity value of the NSR. As noise becomes more noticeable, the level of disruption increases leading to significant changes in behaviour with a subsequent loss in the amenities associated with the NSR as follows:

- Where a new noise source is planned, the assessment will be based on the effect the new noise climate may have on the amenity value of the existing NSR; and
- Where a new NSD is planned the assessment will be based on the effect the existing noise climate may have on the amenity value of the proposed property.

Stage 4: Level of Significance

3.1.13 The level of significance of the noise impact at the NSR is obtained through the relationship of the receptor's sensitivity to noise and the magnitude of the noise impact. **Table A7.2** provides a framework for determining the level of significance in relation to the magnitude of the impact and the sensitivity of the receptor.

Table A7.2: Significance of Effects

Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor		
	Low	**Moderate**	**High**
Major	Slight / Moderate	Moderate / Large	Large / Very Large
Moderate	Neutral / Slight	Slight	Slight / Moderate
Minor	Neutral / Slight	Slight	Slight / Moderate
Negligible	Neutral / Slight	Neutral / Slight	Slight
No Change	Neutral	Neutral	Neutral

3.1.14 According to TAN 1/2011, an exceedance sound level of 'moderate' or above within gardens is considered as significant.

3.1.15 The definitions of the levels of significance are described as below:

- **Slight:** These effects may be raised but are unlikely to be of importance in the decision making process;
- **Moderate:** These effects, if adverse, while important, are not likely to be key decision making issues;
- **Large:** These effects are likely to be important considerations but where mitigation may be effectively employed such that resultant adverse effects are likely to have a Moderate or Slight significance; and
- **Very large:** These effects represent key factors in the decision making process. They are generally, but not exclusively associated with impacts where mitigation is not practical or would be ineffective.

Stage 5: The Decision Process

3.1.16 Stages 2 to 4 are repeated for all identified NSRs and a Summary Table of Significance is completed which provides an overview of the level of significance of the noise impact on all NSRs.

Noise Generating Development

3.1.17 The magnitude of impact is defined by assessing the change of road traffic noise from the baseline level vs the predicted future levels with and without the development. The impact of which are assessed for both day and evening time.

3.1.18 The classification of magnitude of impacts used for this assessment is shown in **Table A7.3**;

Table A7.3: Classification of Magnitude of Noise Impacts; Noise Generating Development

Change in Noise Level, x $L_{Aeq,T}$ dB	Magnitude of Impact
x ≥ 5	Major adverse
3 ≤ x < 5	Moderate adverse
1 ≤ x < 3	Minor adverse
0 < x < 1	Negligible adverse
x = 0	No change
-1 < x <0	Negligible beneficial
-3 < x ≤ -1	Minor beneficial
-5 < x ≤ -3	Moderate beneficial
x ≤ -5	Major beneficial

Department of Transport: Calculation of Road Traffic Noise

3.1.19 The Calculation of Road Traffic Noise (CRTN) (Department for Transport Welsh Office, 1988) describes the standard procedures for the measurement and calculation of traffic noise. It includes consideration of a number of factors including vehicle class, speed, road surface, distance attenuation and barrier attenuation.

3.1.20 Noise levels are measured or predicted in terms of the $L_{A10,1hour}$ or $L_{A10,18hour}$. The $L_{A10,18hour}$ is the arithmetic average of the measured or calculated $L_{A10,1hour}$ levels for each one-hour period between 06:00 hours and 00:00 hours.

3.1.21 Paragraph 43 details the methodology to be employed when calculating the $L_{A10,18hour}$ noise level using a shortened measurement procedure. This requires that the $L_{A10,1hour}$ sound levels associated with the road are measured over 3 consecutive one-hour periods anytime between 10:00 and 17:00 hours.

3.1.22 The measured $L_{A10,1hour}$ sound levels are arithmetically averaged to give a single figure $L_{A10,3hour}$ level as detailed below.

(1) $$L_{A10,18hour} = L_{A10,3hour} - 1dB$$

Environmental Noise Guidelines for the European Region

3.1.23 The World Health Organization (WHO) 'Environmental Noise Guidelines for the European Region' (WHO, 2018) sets out guidance on suitable external noise levels from specific noise

sources including road traffic railway, aircraft, wind turbine and leisure noise to inform policy makers.

3.1.24 The guidelines refer to L_{den} and L_{night} dB values for road traffic, railway, aircraft and railway noise. These are sound descriptors not commonly used within the UK. More commonly utilised descriptors are the daytime average ($L_{Aeq,16hours}$) and night-time average ($L_{Aeq,8\ hours}$) levels.

3.1.25 With respect to indoor noise levels, the guideline document states that "*the GDG recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid*."

World Health Organisation (WHO) Guidelines for Community Noise

3.1.26 In Guidelines for Community Noise, (World Health Organisation, 1999), 55dB(A) was indicated as a criteria threshold below which few people are seriously annoyed (for an outdoor living area), during daytime and evening and other circumstances. To avoid sleep disturbance night time noise events exceeding 45dB (A) at the outside facades of living spaces should be avoided. In addition, the guidance identifies that negative sleep impacts are avoided at 30dB for continuous noise sources. It also provides guidance on the attenuation provided to internal living areas when windows are partially opened i.e. up to 15dB reduction in external noise levels.

3.1.27 BS EN 12758:2011 'Glass in Building, Glazing and Sound Insulation; Product Descriptions and Determination of Properties'.

BS 7445:2003 Part 1 Description and Measurement of Environmental Noise. Guide to Quantities and Procedures.

3.1.28 BS 7445-1 describes methods and procedures for measuring noise from all sources which contribute to the total noise climate of a community environment, individually and in combination. The results are expressed as equivalent continuous A-weighted sound pressure levels, $L_{Aeq,T}$.

3.1.29 BS 7445-1 states that sound level meters that are used should conform to Class 1 (or Class 2 as a minimum) as described in BS EN 61672:2003 and should be calibrated according to the instructions of the manufacturer and field calibration should be undertaken at least before and after each series of measurements.

3.1.30 Key aspects of the outdoor measurement procedure are:

- Whenever possible the measurement should be completed more than 3.5m from a reflective structure other than the ground,
- The ideal measurement height is between 1.2m and 1.5m, and
- Measurement time intervals should be chosen so that measurements are completed within specified meteorological conditions.

3.1.31 The standard also provides advice on selecting appropriate parameters when recording various types of noise, e.g. steady noise, fluctuating noise etc.

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

3.1.32 BS 5228-1:2009+A1:2014 (BSI, 2014) gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites, where work activities/operations generate significant noise levels, including industry-specific guidance.

3.1.33 Annexes C and D detail current and historical sound level data associated with different construction and demolition operations that can be used to calculate the impact of noise from construction sites.

3.1.34 Annex E outlines example criteria for the assessment of the potential significance of noise effects and describes methods to identify the likely significance of noise levels from surface construction activity.

Assessment Methodology

3.1.35 Annex F provides a calculation method for estimating noise from construction sites. Source sound levels for stationary and quasi-stationary activities, obtained either from sound level data contained in Annexes C and D or from measurements, are corrected for source-received distance, reflections and screening or soft ground attenuation. For continuous plant, the source level should be adjusted to account for the proportion of the assessment period during which the plant is operating. For cyclic or intermittent plant, the source level should be adjusted for the number of complete sequences that will occur within the assessment period. The calculation procedure, as outlined in Paragraph F.2.2.2.1, is as follows:

- Stage 1: Obtain an activity $L_{Aeq,T}$ by direct measurement of similar plant in the same mode of operation, or use the values given in Annexes C and D:

- Stage 2. If the distance R, in metres (m), from the point of interest to the geometric centre of the plant or activity is other than 10 m, subtract from the $L_{Aeq,T}$ obtained in stage 1 a distance adjustment for either hard ground. K_h, or for soft ground, K_s, in decibels (dB), obtained either:

  - $K_h = 20log_{10}\frac{R}{10}$; or

  - $K_s = \left(25log_{10}\frac{R}{10}\right) - 2$

  where R ≥ 25 m;

- Stage 3: Make allowances for reflections and screening.

  The final results of this analysis then needs to be logarithmically summed and weighted to provide an "A" weighted level. Subtract any attenuation due to screening from the value of $L_{Aeq,T}$ calculated at the point of interest. Where the point of interest is 1 m from the façade of building, make an allowance for reflection by adding 3 dB to the calculated (free field) levels.

- Stage 4: Repeat stages 1 to 3 for each activity;

- Stage 5: Estimate the percentage of the assessment period for which each activity takes place. Then use one of the methods outlined in F.2.6 of BS 5228-1:2009+A1:2014 to predict the assessment period $L_{Aeq,T}$ from the individual activity $L_{Aeq,T}$ values obtained in Stage 3, which might be on a shorter time-base.

Assessment Criteria

3.1.36 Annex E outlines example criteria for the assessment of the potential significance of noise effects and describes methods to identify the likely significance of noise levels from surface construction activity.

3.1.37 The ABC method provides the threshold of potential significant effect at dwellings when the site noise level, rounded to the nearest decibel, exceeds the threshold value. For the appropriate period (night, evening/weekends or day), the ambient noise level is determined and rounded to the nearest 5 dB. This is then compared with the site noise level. If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated. The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect.

3.1.38 **Table A7.4** describes the example threshold of potential significant effects of noise from construction and open sites at dwellings.

Table A7.4: Example Threshold of Potential Significant Effect at Dwellings

	Threshold Value, in decibels (dB)		
	Category A [A)]	**Category B [B)]**	**Category C [C)]**
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends [D)]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1 A 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.			

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

3.1.39 BS 5228-2:2009+A1:2014 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.

3.1.40 Annex B outlines criteria for the assessment of the significance of vibration effects. Furthermore, Table B.1 provides guidance that compares the predicted Peak Particle Velocity (PPV) and the consequences in terms of human perception and disturbance.

3.1.41 **Table A7.5** outlines the guidance on effects of vibration levels.

Table A7.5: Guidance on Effects of Vibration Levels

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

3.1.42 Table B.2 of BS 5228-2:2009+A1:2014 provides guidance on PPV vibration limits for transient excitation for different building types**.** **Table A7.6** outlines the transient vibration guide values for cosmetic damage to buildings.

Table A7.6: Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or Framed Structures. Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
Un-reinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
NOTE 1 Values referred to are at the base of the building. NOTE 2 At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not be exceeded.		

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

3.1.43 BS 4142:2014 +A1:2019 (BSI, 2019) describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in the standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

3.1.44 The standard is used to determine the rating levels for sources of sound of an industrial and/or commercial nature and the ambient, background and residual sound levels at outdoor locations. These levels could be used for the purposes of investigating complaints; assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and assessing sound at proposed new dwellings or premises used for residential purposes. However, the determination of noise amounting to a nuisance is beyond the scope of the standard.

3.1.45 The standard should not be used to assess sound from the passage of vehicles on public roads and railway systems; recreational activities; music and other entertainment; shooting grounds; construction and demolition; domestic animals; people; public address systems for speech and other sources falling within the scopes of other standards or guidance. The standard cannot be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels.

3.1.46 The procedure contained in BS 4142 assesses the significance of sound which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs/will occur. It is noted that a BS 4142 assessment is reliant on measuring relevant background sound levels.

3.1.47 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and considering the following:

- Typically, the greater this difference, the greater the magnitude of the impact;
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- 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.

3.1.48 When considering the introduction of a new noise sensitive receptor Section 8.5 states:

> "*Measure the background sound at the intended location of any new noise-sensitive receptor(s) in the absence of any specific sound.*
>
> *NOTE Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation*."

3.1.49 In order to consider the context, BS 4142 advises that the following factors should be considered:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as:
  - Façade insulation treatment;
  - Ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation; and
  - Acoustic screening.

Design Manual for Road and Bridges– Design Manual for Road and Bridges LA 111 Traffic Noise and Vibration

3.1.50 The Design Manual for Roads and Bridges (DMRB) is considered to be the regulatory standard for the design of a new road or improvements to an existing road. In particular, LA 111 (Standards for Highways, 2020) was published in 2020 by National Highways and provides guidance on the assessment and the reporting of noise and vibration impacts relating to roads (including the change in traffic flows and construction).

3.1.51 Typically, the impact of the proposed development on the noise climate in the surrounding areas is based on the change in noise levels at noise sensitive receptors due to the changes in the volume of road traffic generated by the proposed development.

3.1.52 The DMRB provides two magnitude scales of impact for the change in noise levels in the 'short-term' (opening year) and in the 'long-term' (future year). The choice of impact scale depends on whether the assessment is comparing the opening year with and without the development, or the opening year without development and the future year with development.