



Leeds City Council PLANNING CONSULTATION GUIDANCE

Noise & Vibration

Environmental Health, Communities & Environment

Transportation, City Development

Development Management, City Development

Strategic Planning, City Development

December 2019

1.0 PURPOSE

1.1 This document provides guidance to relevant environmental/acoustic professionals and planning officers within Leeds City Council (LCC) when deciding upon the applicable criteria to avoid a significant loss of amenity due to planning developments.

1.2 The document provides general guidelines, drawing on information that can be found in a number of local, national and international documents. For those occasions where issues are not fully addressed by this guidance, other guidance or criteria may be applicable, subject to an equivalent level of protection from loss of amenity being provided. The document may be used by developers to clarify the criteria expected to be achieved for developments and assist with the submission of supporting information that would be considered as acceptable in terms of noise and vibration.

1.3 It is intended that the document supports and promotes the policies contained in the Leeds City Council's Development Plan Core Strategy and Best City ambitions. It is also the intent of this document to reflect the noise-related guidance contained within the National Planning Policy Framework (NPPF) and the Noise Policy Statement for England (NPSE).

2.0 UNDERLYING PRINCIPLES

2.1 The basis of all good noise management lies in the initial design phase of a development. The most effective aspect of noise management is that which ensures that new developments are sited and designed in such a manner as to minimise the impact of noise and vibration that their introduction may cause, or the existing noise and vibration that they may be exposed to. Many potential noise problems can be resolved through the careful design of both noise-creating and noise sensitive premises.

2.2 It is expected that the design of developments will achieve a **good** standard of amenity, protecting both the inside and outside areas of dwellings and other noise sensitive premises. The design should minimise the need for fixed glazing to achieve internal noise levels that would be acceptable to Leeds City Council. Any mitigation measures that require windows to be kept closed to meet the internal noise level targets shall include a ventilation strategy, which provides for the control of room comfort during warm summer months that is sufficient to achieve this.

2.3 While in the vast majority of situations a design or mitigation solution will result in the expected criteria being achieved and an unacceptable loss of amenity being avoided, it should be accepted that there may occasionally be unavoidable situations where some specific uses are incompatible within certain locations.

2.4 For developments where specific details are not available the impact assessment should be based on the likely worst case scenario. For example, a proposal for A3/A4/A5 use until the early hours of the morning will need to assess the potential of loud music and patrons during the night time period. The more detail that is provided by the applicant, the less uncertainties, and greater the confidence in the specific situation that should form the assessment.

2.5 Post completion validation testing may be required in order to demonstrate compliance with noise criteria and ventilation strategies.

3.0 Anonymous Noise Sources: General Environmental Noise and Transportation Noise:

3.1 The British Standard, BS8233, provides guidance on sound insulation and noise reduction in buildings. This document deals with control of general anonymous noise from outside the building and noise from plant and services within it. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building, or takes into consideration the characteristics of unpleasant sounds. Its use beyond the intended scope should be with caution.

3.2 The World Health Organisation has released guidelines to protect the majority of people from annoyance and sleep disturbance (WHO Guidelines for Community Noise 1999 and WHO's Night Time Guidance for Europe 2009). This includes daytime, evening, and night time criteria levels for both the façade and internal habitable areas of noise sensitive premises, and also for outdoor living areas.

3.3 For steady noise sources the following sound levels at noise sensitive premises should be achieved:

Table 1

Noise source	Assessment location	Ambient Level (dB LAeq,T)	Time
General environmental noise, Road Traffic, Rail Traffic	Outdoor living space	55 dB LAeq, 1h	Day 07:00-23:00
	Façade	50 dB LAeq, 16h	Day 07:00-23:00
	Façade	45 dB LAeq, 8hr	Night 23:00-07:00
	Habitable room	30 dB LAeq, 8 hr	Night 23:00-07:00
	Habitable room	35 dB LAeq, 16 hr	Day 07:00-23:00

3.4 In addition to a steady noise level criteria the maximum noise levels (LAFmax) inside dwellings during the night time period should be no higher than 45 dB LAmax to prevent sleep disturbance.

3.5 Any mitigation measures that require windows to be kept closed to meet the internal noise level targets shall include a ventilation strategy. This strategy shall provide for the effective control of room comfort during warm summer months so that windows can remain closed at all times. This requirement shall also apply in relation to other noise sources.

3.6 Transportation associated with developments may also have an impact on the wider road network. Discussions should take place with the Leeds City Council Environmental Studies Team within the Highways and Transportation Department to determine the significance of the loss of amenity if increases in traffic noise have the potential for adverse effects on receptors. Similar discussions should take place for developments that may result in changes to current levels of rail or aircraft noise.

3.7 For the assessment of noise and vibration in connection with strategic transport infrastructure (e.g. road, rail, or airport) discussions should first take place

with the Environmental Studies Team of Leeds City Council, which sits within the Highways and Transportation Department.

3.8 For hospitals or other similar uses the internal noise levels within the World Health Organisation – Guidelines for Community Noise should be achieved. This stipulates the LA_{max} of sound events should not exceed 40 dB LA_{max} during the night. For wardrooms in hospitals, the guideline values indoors are 30 dB LA_{eq}, together with 40 dB LA_{max} during the night. The equivalent sound pressure level should not exceed 35 dB LA_{eq} in other rooms in which patients are being treated or observed.

4.0 Industrial or Commercial Use near to Noise sensitive receptors (e.g. Residential dwellings and other locations that include quiet resting/sleeping):

4.1 This can involve the direct and associated noises from within industrial or commercial sites that have the potential to cause a nuisance or loss of amenity. The noise sources can include:

- internal and external plant;
- air extraction/conditioning;
- industrial activities;
- delivery of goods or refuse collection;
- loading and unloading;
- transportation within a premises; and
- general noise within a site that would be readily identifiable to the premises.

4.2 Where such potential exists, a noise impact assessment should be carried out at the façade of noise sensitive premises to demonstrate that the following criteria will be met:

- The Rating Level is no higher than the existing background noise level (L₉₀) when measured at noise sensitive premises, with the measurements and assessment or calculation made in accordance with BS4142:2014.
- The background level shall be determined for the period of interest and the measurement time interval must be sufficient to obtain a representative value. This does not simply equate to an average of the whole daytime or night time period. For example, background levels during the middle of the night can be distinctly different to the start or end of the night-time period.
- The rating level shall include the addition of any character corrections as appropriate. If the character is unknown at the design stage or cannot be evidenced then a penalty of 5dB should be applied to take into account the potential corrections; unless it is considered that an even greater correction would be justified.
- For emergency or standby generators, in use no more than 200 hours per year, the rating level shall be no higher than 5 dB above the existing background noise level (L₉₀) when measured at noise sensitive premises, with the measurements and assessment or calculation made in accordance with BS4142:2014.
- Between the hours of 19:00 and 07:00, the maximum noise levels (LAF_{max}) shall not exceed the LA₉₀ by more than 10 dB; however, where the existing background noise level is 45 dB LA₉₀ or less, the maximum noise levels shall not exceed 55 dB LAF_{max}.
- For residential developments in city centre locations where the preceding criteria cannot be achieved, but windows are required to be kept closed to meet acceptable internal noise levels, then the maximum noise levels inside dwellings during the night time period shall not exceed 45 dB LAF_{max}.

4.3 As an alternative to BS4142 the use of Noise Rating (NR) curves are acceptable in establishing suitable noise levels which will be achieved in noise sensitive premises. Where noise would be identifiable as emanating from commercial or industrial premises the following criteria should be demonstrated.

- NR 20 in bedrooms (23:00 to 07:00 hours).
- NR 25 in all habitable rooms (07:00 to 23:00 hours).
- Noise rating curves should be measured and assessed against a 15 minute linear Leq at the octave band centre frequencies 31.5 to 8 KHz.

4.4 Where a low frequency noise bias (excluding traffic noise and entertainment noise) may be likely, the noise shall also be assessed or calculated to demonstrate compliance at noise sensitive receptors with the "Criterion curve for assessment of low frequency noise" within the University of Salford "Procedure for the assessment of low frequency noise complaints" guide.

5.0 Noise from Entertainment Premises

5.1 Music and noise from customers activity (talking, shouting and applauding) emanating from entertainment premises that is to operate on a regular basis (including external areas such as balconies, gardens and smoking areas) should not be audible within any noise sensitive premises.

5.2 Where such potential exists, the likely impact of the entertainment premises upon noise sensitive receptors should be assessed. Premises must be designed so to ensure that music and associated noise is controlled, so as to be inaudible inside any residential premises within the vicinity. The following criteria should be used to demonstrate that virtual inaudibility will be achieved:

Inaudibility as defined by the Institute of Acoustics' Good Practice Guide on the Control of Noise from Pubs and Clubs 2003:

- Entertainment Noise Level, LA_{eq} (1 minute) should not exceed the Representative Background Noise Level, LA_{90} .
- Entertainment Noise Level, L_{10} (5 minutes) should not exceed Representative Background Noise Level, L_{90} , in any 1/3 octave band from 40Hz to 160Hz.

If the use of 1/3 octaves is problematic then the following criteria in octaves is considered to give the same level of protection:

- Entertainment Noise Level, LA_{eq} (1 minute) should not exceed the Representative Background Noise Level, LA_{90} (without entertainment noise).
- Entertainment Noise Level, LA_{eq} (1 minute) should be at least 3dB below the background noise level LA_{90} (without entertainment noise) in 63 and 125Hz octaves.

5.3 All noise levels shall be taken with windows open or closed (whichever makes the music seem louder), or with alternatively provided acoustic ventilation over and above "background" ventilation and assessed at the nearest noise sensitive premises.

5.4 The use of Noise Rating (NR) curves (as discussed in the DEFRA document, '*Noise from Pubs and Clubs, Phase 1*' (2005)), is an alternate way of establishing acceptable levels in noise sensitive premises, as long as this will achieve the

equivalent level of protection as provided by 5.2. It is expected that the following criteria will be demonstrated:

- NR 20 in bedrooms (23:00 to 07:00 hours); (Where low frequency noise is a particular concern then NR15 at 63 and 125Hz octaves should be achieved in bedrooms).
- NR 25 in all habitable rooms (07:00 to 23:00 hours).
- Noise rating curves should be measured and assessed against a 15 minute linear L_{eq} at the octave band centre frequencies 31.5 to 8 KHz.

5.5 For open air concerts and events the criteria within The Code of Practice on Environmental Noise Control at Concerts, issued by the Noise Council, would be applicable and expected to be complied with.

5.6 Other noise sources from places of entertainment, such as air conditioning plant and kitchen odour extraction systems shall be treated as commercial noise and assessed as per the relevant guidance set out in this document.

6.0 Mixed Use Schemes:

6.1 Where a mixed-use development is to be considered, the parts of the development containing noise sources shall be assessed as if the proposed noise sensitive areas are already in situ, with reference to the sections above.

7.0 Wind Turbines

7.1 For Small to Medium Sized Wind Turbines (up to and including 50kW) the noise assessment criteria for wind turbine developments of \leq 50kW should be one other than ETSU-R-97. The British Wind Energy Association (BWEA) document, 'Small Wind Turbine Performance & Safety Standard (2008) sets out a procedure for the acoustic testing of small-medium scale turbines.

7.2 For applications for wind turbines greater than 50kW, the assessment procedures detailed in ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms', and the Institute of Acoustics' "A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise' (2013) should be followed.

8.0 Multi-Use Games Areas (MUGA)

8.1 The likely impact of a new MUGA upon the noise environment should be assessed. The detrimental noise impact of a MUGA may often only become fully realised over a lengthy period of time and that sound measurement data compiled over a relatively short time period may not accurately reflect the impact of a noise that will recur day upon day throughout the year. Therefore, a stringent criteria should be applied.

8.2 The MUGA must be designed to ensure that noise associated with it is controlled, so as to be inaudible inside any residential premises within the vicinity. Where such potential exists, a noise impact assessment should be carried out at the façade of the closest noise sensitive premises to demonstrate that the following criteria will be met:

- The MUGA Noise Level, L_{Aeq} (1 minute) should not exceed Representative Background Noise Level, L_{A90} .

- The external noise level from a MUGA should not exceed 50 dB LAeq,T at the boundary of the nearest noise sensitive premises, in accordance with World Health Organisation Guidelines of Community Noise 1999.
- Between the hours of 19:00 and 07:00, the maximum noise levels (LAFmax) from shall not exceed the LA90 by more than 10 dB; however, where the existing background noise level is 45 dB LA90 or less, the maximum noise levels shall not exceed 55 dB LAFmax.

8.3 Developers must also consider the following noise mitigation measures:

- The use of bunds and acoustic barriers to remove line of sight;
- The provision of perimeter netting to prevent impact noise;
- Restrictions on hours and days of use;
- Restrictions on the use of floodlighting;
- User-management controls;
- Maximising any distances to nearby noise-sensitive premises.

9.0 Nurseries and Schools

9.1 The likely impact of the nursery upon the noise environment should be assessed. The assessment shall be in accordance with the options available for assessing “Other Noise Sources (not anonymous)” within Section 12.

9.2 Developers must consider the following noise mitigation measures:

- Restrictions on hours and days of use;
- Restrictions on the number of children using the nursery and its external play areas;
- The use of acoustic barriers to remove line of sight;
- The implementation of sound airborne and impact sound insulation measures where the proposed nursery adjoins noise-sensitive premises;
- The layout of external play areas in relation to neighbouring noise-sensitive premises;
- User-management controls.

9.3 The sound insulation criteria for schools formulated for the prevention of noise break-in is set out in Building Bulletin 93, Acoustic Design of Schools, Performance Standards. Developers should adhere to these criteria.

9.4 Ancillary noise sources such as plant, air extraction, entertainment noise and the provision of MUGAs for school/after-school use should be considered using the appropriate guidance set out in this document.

10.0 Demolition, Construction and Open Sites.

10.1 The significance of noise and vibration 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 may generate problematic noise levels, should be assessed in accordance with BS5228.

10.2 The potential significance of noise can be based on fixed noise limits or upon noise change, whichever provides the most protection. However, the ABC method would be acceptable for the majority of circumstances. A significant impact shall be avoided unless there are health and safety and operational constraints and clear justification is provided.

10.3 Where applicable the thresholds within BS5228 should be used to determine the eligibility for noise insulation and temporary rehousing.

10.4 In circumstances where vibration is a potential source of disturbance, it is expected that a vibration survey or prediction is carried out. To avoid complex investigations an initial screening survey can be carried out.

10.5 If vibration levels are expected to be below a peak particle velocity (PPV) of $0.3 \text{ mm}\cdot\text{s}^{-1}$ then no further action is necessary. If this level may be exceeded a more detailed assessment is required. The assessment and potential significance of vibration shall be based on Part 2 of BS5228 and with reference to BS 6472. However, vibration from activities would not be permitted to exceed a peak particle velocity (PPV) of $1.0 \text{ mm}\cdot\text{s}^{-1}$ at sensitive receptors without prior agreement with the Local Authority.

10.6 As an alternative for large infrastructure projects, the potential significance of vibration may be determined as vibration dose values (VDV) in $\text{m/s}^{1.75}$. However, the VDV from activities shall not exceed $0.4 \text{ m/s}^{1.75}$ at sensitive receptors between 07.00 and 23.00 and $0.2 \text{ m/s}^{1.75}$ at sensitive receptors between 23.00 and 07.00.

10.7 For sites which are likely to involve noisy night time activities or day time works over a significant period of time it is expected that a communication strategy should be implemented to inform relevant noise sensitive receptors of the effect and duration of the works.

11.0 Minerals activities

11.1 The supporting 'Minerals' PPG is the current Government advice applicable to the control of noise from surface mineral workings in England. This guidance should be used to determine acceptable noise criteria for mineral extraction in plan making and the application process, with the addition of relevant criteria from within BS5228 where applicable.

11.2 It is expected that vibration from activities shall not exceed a peak particle velocity (PPV) of $1.0 \text{ mm}\cdot\text{s}^{-1}$ without prior agreement with the Local Authority.

11.3 For any blasting operations an average PPV of $6 \text{ mm}\cdot\text{s}^{-1}$ shall not be exceeded, with no individual blast exceeding a PPV of $12 \text{ mm}\cdot\text{s}^{-1}$ as measured at vibration sensitive buildings. In addition, air overpressure levels from blasting shall not exceed 120 dB (lin) at nearby sensitive premises.

11.4 Noise sources, other than from mineral extraction and similar processes, such as downstream processing (e.g. stone cutting within buildings) shall be treated as industrial or commercial noise and assessed as per the relevant guidance set out in this document.

12.0 Other Noise Sources (not anonymous)

12.1 There may be occasions where the noise for assessment does not easily fit into one of the types described above, despite being clearly not anonymous. In this situation the assessment methodology should be sufficient to determine the potential impact and level of annoyance on receptors. Acceptable methodology includes:

- A comparison of the source sound level against the background noise.

- Reduction of the criteria provided in Table 4.1 of the WHO's Guidelines for Community Noise 1999 to allow for the non-anonymous nature of the noise source.
- Where only internal noise levels are under consideration, the demonstration of compliance with acceptable Noise Rating (NR) curves.

12.2 The comparison of the source level to the background level will take account of the existing noise environment. Such a methodology is similar to that described in BS 4142 and the noise level under consideration should be no higher than the existing background noise level (L90) when measured at noise sensitive premises. If the noise includes a clearly distinguishable feature which would make it stand out to the receptor, then a 5dB character correction should be added when making the comparison.

12.3 The values given in Table 4.1 of the WHO's Guidelines for Community Noise 1999 could be applied to scenarios where the noise in question can be easily attributable to a specific source. However, the WHO guidelines give precautionary advice and suggest adjustments for noise which has a certain character. In such cases, a 5 dB reduction to the value given for outdoor living spaces should be applied.

12.4 Suitable Noise Rating (NR) curves which would be acceptable if achieved in noise sensitive premises are NR 20 in bedrooms (23:00 to 07:00 hours) and NR 25 in all habitable rooms (07:00 to 23:00 hours). Noise rating curves measured and assessed against a 15 minute linear Leq at the octave band centre frequencies 31.5 to 8 KHz.

For further advice and guidance in relation to acceptable noise criteria:

Noise from premises and equipment
Environmental Protection Team, Environmental Health, Elections & Regulatory, Communities & Environment, Leeds City Council.

- 0113 3785959, epteam@leeds.gov.uk

Noise from traffic or in connection with strategic transport infrastructure
Environmental Studies Team, Transport Strategy, Highways and Transportation, City Development, Leeds City Council.

- 0113 3787513, Simon.Clothier@leeds.gov.uk
- 0113 3787523, David.Lightfoot@leeds.gov.uk
- 0113 3787532, Timothy.Summers@leeds.gov.uk