Noise assessments and reports for planning applications

Guidance note for developers and consultants

Basingstoke and Deane

Environmental Protection
Guidance Note for Developers and Consultants

Produced by: Environmental Protection Team

Noise Assessments and Reports for Planning Applications

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Noise Assessments and Reports

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1. Aim

1.1 This technical guidance note on noise assessments is issued to assist developers, agents and their consultants where noise is a consideration for any proposed development. This could be where noise would be caused by the proposed development, or the proposed development would be exposed to existing noise sources.

1.2 It will help consultants, agents and their clients ensure any assessment of noise, and the subsequent report, meets the council's expectations. If the advice is followed, it should avoid situations which cause decisions on applications to be delayed or refused, because inadequate information has been provided in support of a proposal.

2. Introduction

2.1 Environmental noise is an inevitable by-product of day to day activities in the places we live and work. How loud noise is, what causes it, and how often particular noises are heard will vary enormously from place to place. These can be anonymous noise sources or be attributable to a specific source. While some noise (or noises) are often welcome and are an important part of everyday life, there are times when it will be considered intrusive or excessive. In these situations it can have an adverse effect on people's quality of life if it is not properly controlled. This might be an existing noise source, or one which is introduced. Adverse effects can range from annoyance to one individual through to a serious and long lasting disturbance affecting large parts of a community.

2.2 In the context of new development and the planning process, noise will often be a constraint due to pre-existing uses which may conflict with the development that is proposed. In these situations noise assessments are needed to quantify and understand the likely impact, and inform the decision making process. Where it is clear that noise requires consideration, noise assessments will usually need to be submitted at the application stage. If advice is sought, this will be highlighted during any pre-application discussions.

2.3 The requirement for a noise assessment and report arises in two common scenarios:

i) The proposed development may itself be noise sensitive e.g. a residential development which could be affected by existing noise sources e.g. industry, commercial premises, fixed mechanical plant, road traffic, railway or industrial site; or
ii) The proposed development will likely create noise which may affect existing nearby noise sensitive receptors e.g. a new industrial use near existing residential development, a kitchen extract serving a new restaurant, or new transport infrastructure.

2.4 The purpose of the noise impact assessment is to determine whether or not the proposed development is likely to be adversely affected by noise, or whether it may cause noise which would adversely affect existing development. This will inform the decision making process for proposed development. If a noise impact assessment highlights noise as an issue, mitigation will be considered. It is usually possible to mitigate the predicted impact and where the mitigation is demonstrated to be sufficient, concerns regarding noise should be alleviated.

3. When is a noise impact assessment required?

3.1 If a proposal could cause a noise impact, or may be affected by noise, advice should be sought from the Environmental Protection team at the council. This is an opportunity to discuss the proposed development and identify noise concerns, whether they are known to the developer or ones which the council can identify.

3.2 Where noise is likely to be a constraint or a consideration in the decision making process for a planning application, the council will expect a noise impact assessment to accompany a planning application.

3.3 The following tables set out the situations when a noise assessment would be required in support of a planning application.

Table 1

New noise sensitive development				
Type of development	**Noise source and is an NIA required?**			
	Close to an 'A' road or major 'B' road with a ≥50mph speed limit	Close to an 'A' road or major 'B' road with a ≤40mph speed limit	Close to a railway	Close to industry and commercial activity
Residential (new-build & conversions/change of use) C3 & C4	Yes	Dependant on circumstances*	Yes	Yes
Hotels & Guest houses (C1)	Yes*	Dependant on circumstances*	Yes*	Dependant on circumstances*
Residential institutions (C2 & C2a)	Yes	Dependant on circumstances*	Yes	Yes

*The determining factor will be how busy or otherwise the road nearest the residential premises is. The advice of the EH team should be sought in these situations.

Table 2

New/additional noise sources close to existing noise sensitive development		
Type of development	**NIA required**	**Advice**
Industrial type uses (B2 & B8)	Yes	This includes general industrial use. Activities will vary enormously from one to another. However if manufacturing, fabrication, or storage and distribution are involved there is very likely to be a noise impact if near a sensitive development
Entertainment/food & drink etc. A3, A4, A5, D2	Yes	Any premises preparing food and whose kitchen is served by air extraction units will require a NIA*. In addition, if premises are to hold entertainment/play music then a NIA would also be needed to consider this type of source.
Outdoor sports & recreation (D2 & sui generis)	Yes	Facilities such as skate parks, multi-use game areas, motor sports, clay pigeon shooting motor sports of any kind will all require NIAs.
Commercial uses (A1, A2 and B1)	Maybe	This covers shops, offices for businesses, light industry, and D1 broadly covers buildings with a community/public use. Often these types of uses will introduce air handling units, chillers, refrigeration units. It may also involve activities at un-sociable hours. Where either or both of these are part of a development an NIA will be required.
Non-residential institutions (D1)	Maybe	
Other (Sui Generis)	Yes	This covers a multitude of uses, and is usually large developments of one type or another. Based on the type of use this is likely to be, it is more likely that an NIA would be required than not.
Transport schemes	Yes	Early engagement with EH would be expected
Wind turbines	Yes	Early engagement with EH would be expected

4. Scope, content and competency

4.1 A noise impact assessment submitted in support of proposed development must demonstrate to the council that the source of noise is fully understood and quantified, that all nearby noise sensitive receptors have been identified, and that the impact on the receptor has been established with reference to relevant acceptability criteria.

4.2 It may also go on to set out specific ‘mitigation’ measures where it is necessary to achieve the relevant criteria.

4.3 Acceptability criteria are the noise levels which the council will expect to be achieved at a noise sensitive receptor. This is normally demonstrated by prediction.

4.4 The council may also ask for a post-completion noise assessment to demonstrate that the finished development (with mitigation) achieves the criteria. Most acceptability criteria are set out in British Standards or other published guidance (Appendix 3). For some scenarios, where there is no specific published guidance the council has its own criteria.

4.5 In the event the proposed development is large and complex, an Environmental Impact Assessment (EIA) may be required that includes the assessment of noise.

4.6 Preparation of the noise elements of an EIA can be more involved than for the stand alone noise assessment process described in this document. It can require a more systematic and formal approach to the assessment. The adequacy of the investigation undertaken and the scope of an assessment submitted as part of an EIA must be considered adequate.

4.7 It is likely that a noise consultant will need to prepare a number of documents which may be part of a larger process covering the other environmental effects of the proposal.

4.8 Noise is a specialist area of work, and therefore, where developers are required to submit a noise assessment, the council will expect the work to be done by a competent person. To be considered competent, it is expected that consultants hold qualifications on the assessment of environmental noise and/or building acoustics, and are members of the Institute of Acoustics or the Association of Noise Consultants.

4.9 If a developer engages someone who is not appropriately qualified or members of the above organisations, the Environmental Health team may not accept the work as competent.

4.10 The report submitted should be set out in a format which is logical and understandable. It will provide the council with the information it requires about the consultant, instrumentation used, methodology, relevant criteria, survey undertaken, noise source(s), receptors and the judged impact.

5. Assessing and determining the impact of noise

5.1 The single purpose of a noise assessment is to understand the impact of a noise source on a receptor.

5.2 National planning policy (National Planning Policy Framework, Noise Policy Statement for England, National Planning Practice Guide) does not set out specific noise level criteria for assessing the impact of noise. Reliance is therefore placed on other published guidance (see appendix 2 and 4), and the council's criteria, to judge the significance of noise for any proposed scheme. The council's noise criteria are detailed in Appendix 3.

5.3 Guidance published by government on considering the impact noise in a planning context, sets out three thresholds which are intended to convey levels of severity. Further detail is documented in the Noise Policy Statement for England (NPSE), however in summary these are:

SOAEL – Significant Observed Adverse Effect Level
LOAEL – Lowest Observed Adverse Effect Level
NOEL – No Observed Effect Level

5.4 These principles stand in isolation and do not align with any existing noise assessment methodology or published guidance. Aligning them to absolute noise levels would be a highly subjective and complex task. It is unlikely that absolute noise levels could be attributed to these terms given the varied scenarios and noise sources that can make noise a material consideration.

Criteria

5.5 Basingstoke and Deane Borough Council will expect that the relevant noise acceptability criteria detailed in Appendix 3 are met by prospective developments.

5.6 In line with the NPSE and the National Planning Policy Framework (NPPF), development should ensure a good standard of amenity for all existing and future occupants of land and buildings. Developers are expected to adhere to the following guiding principles:

i) Development should not give rise to, or be exposed to noise, which would have any adverse impact on quality of life. Where possible development should contribute to the improvement of quality of life.

ii) It may not always be possible to achieve 'i)' due to land use pressures, and the development of land in urban environments where environmental noise often cannot be avoided. As such where a noise source is to be introduced, or a new development is to be exposed to an existing noise source, exposure to the noise in question must be mitigated and minimised to avoid adverse impacts on quality of life.

iii) There will be occasions where existing noise or noise from proposed development is inevitable, and any proposed mitigation has limited benefit. However, the development in question may be viewed as favourable for a variety of other reasons. In this situation, where all mitigation options have been explored, and noise is to be mitigated as far as reasonably practicable; as a minimum standard, noise should not give rise to any significant adverse impacts on quality of life. Developments which are considered to have significant adverse impacts will not be supported.

5.7 Where proposals do not follow these principles, they are unlikely to be supported by officers.

5.8 Some published methodologies give guidance on determining the degree of impact that can be expected with certain types of noise sources at certain levels. In those situations the council will follow the advice of these published methodologies and accompanying guidance.

6. Vibration

6.1 Certain developments, notably those in close proximity to railway lines and heavy industry, will require additional assessments to assess the effects of vibration. On sites where vibration is a potential issue, the appropriate measurement methodology must be used and findings presented. In most situations this will be the methodology described in BS 6472-1:2008 (Guidance to Evaluation of Human Exposure to Vibration in Buildings Part 1: Vibration sources other than Blasting).

6.2 While the methods for assessing vibration are different to noise, in reporting the findings and determining any impact, it is expected that the principles outlined in sections 5 of this document are followed. It is the expectation of the council that levels be no greater than the *'low probability of adverse comment'* as per the criteria given in BS6472.

6.3 Although measurements should normally be taken on a building's structural surface, where a building does not exist that would allow vibration to be measured, assessments would need to be 'free-field' in nature. Where this is the case the relevant multiplying factor and corrections should be used to establish whether vibration is likely to have an impact on the end user.

Appendix 1 – Contact details for acoustics organisations

Institute of Acoustics

77A St Peter's Street
St. Albans
Hertfordshire
AL1 3BN
United Kingdom
Tel: +44(0) 1727 848195
Fax: +44(0) 1727 850553

Email: ioa@ioa.org.uk

IOA web site link to assist in finding a suitable noise consultant

http://www.ioa.org.uk/find-a-specialist/

The Association of Noise Consultants

105 St Peters Street
St Albans
AL1 3EJ

Tel: +44(0)1727 896092
Fax: +44(0)1727 896026

ANC web site link to assist in finding a suitable noise consultant

http://www.association-of-noise-consultants.co.uk/index.php?*p=memberlist

Building Research Establishment

Garston
Watford WD2 7JR

Tel: (01923) 664 000
Fax: (01923) 664 010

Appendix 2 – Noise measurement survey & report format

1.0 Each assessment is expected to detail the following:

1.1 Weather conditions

Noise surveys must be carried out in suitable conditions i.e. in the absence of strong winds, rain, snow etc. Where road traffic noise is concerned, road surfaces should be dry, and not commenced until at least 1 hour after the cessation of any rainfall, or until roads are visibly dry. The microphone of the sound level meter shall be fitted with an appropriate environmental windshield when taking measurements outdoors, and details of weather conditions during the survey shall be given in the report. The report shall include a location plan showing measurement positions in relation to the development site.

1.2 Attendance at survey

Generally, it is preferred that surveys should be attended by the noise consultant. There can then be certainty as to the origins of noise which has been measured and recorded. On occasions when long term unattended measurements are needed, these should be supplemented at certain times with attended measurements so that variations seen in the record for the longer term measurement can be accounted for.

1.3 Baseline situation

Before any judgement can be made on the likely impact of a development, it will usually be necessary to have a full understanding of the existing noise climate in the vicinity of the receptor.

This is achieved by carrying out a survey of background and ambient noise levels over periods of time which are representative of the times and days when the noise source will be operational.

1.4 Noise sources and times of operation

A detailed knowledge of the noise source (or in the case of a proposed development, the likely noise source) is essential.

Where the noise source already exists, the data from the noise survey should give information on noise levels, duration, frequency content and variability during and between days. Levels may be measured at the proposed receptor location or calculated later, based on data from the same noise at a different location or the technical specification and sound power levels.

If the noise source arises from transport, it will be appropriate to consider projected noise levels from the mode of transport in question, fifteen years forward of the noise assessment, taking into account future growth for that transport mode.

1.5 Report format & content

The noise impact assessment report should set out all of the required information in a format which is logical and understandable. It will provide the Council with the information it requires about the proposal, its location, the agreed criteria, surveys undertaken, the instrumentation used, the noise source(s), the receptors, mitigation measures and the impact with respect to acceptability criteria.

1.6 As a minimum the report should include:

i) An introduction
ii) Statement of qualifications, competency, professional memberships and experience
iii) Description of site and proposal including the noise source and associated detail
iv) Identification of the receptor, proximity to source and their sensitivity
v) Acceptability criteria
vi) Details of noise measurement survey to include (but not limited to) details of the device(s) used, the chosen methodology, location, duration, meteorological conditions interpretation of results , data summary, and any additional calculations
vii) Impact assessment – analysis of results against acceptability criteria
viii) Noise mitigation measures – discussion of any need for, the options available to mitigate observed noise levels, and the improvement various options might provide.
ix) Conclusions
x) Recommendation
xi) Appendices, for raw measurement data, calibration certificates, calculations, additional maps and plans, details and specifications for mitigation measures.

Appendix 3 – BDBC noise criteria

1. Target noise criteria for residential premises arising from external sources which will often be anonymous in nature e.g. transport noise sources

Table 3

Location	Noise criteria		Applicable hours
	Preferred	Upper limit	
Outdoor amenity space	50dB $L_{Aeq,16hr}$	55 dB $L_{Aeq,16hr}$	0700 – 2300
Bedrooms	n/a	30 dB $L_{Aeq,8hr}$	2300 – 0700
		35 dB $L_{Aeq,16hr}$	0700 – 2300
		>15 events of ≥ 45 dB $L_{Amax,1hr\ (fast)}$	2300 – 0700
Living rooms	n/a	35 dB $L_{Aeq,16hr}$	0700 – 2300

(BS8233:2014)

1.1 Paragraph 7.7 of BS 8233:2014 discusses most of these thresholds and their application in residential accommodation. Paragraph 5.4 and sub-paragraphs give advice on noise control measures that should be considered as part of minimising the impact of noise on development.

2.0 External noise levels

2.1 New developments that cannot achieve these requirements with a mitigation scheme in place are unlikely to be supported.

2.2 However in existing higher noise areas e.g. high levels of noise arising from the transport network, it may not be possible to achieve the desired levels for outdoor amenity space, though the development may still be desirable due to housing need and other factors. Where this is the case, development should be designed with mitigation to achieve the lowest practicable levels, and in any case they should be no greater than 60 dB $L_{Aeq,16hr}$ 0700 – 2300.

2.3 As stated in BS8233, *where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.*

2.4 The decision to exercise this discretion will be determined by the degree to which mitigation is proposed. This relaxation is not to be applied ahead of mitigation schemes which would provide the desired level of protection.

2.5 Some developments e.g. flats and apartment blocks may be built with small balconies or terraces. Where this is the case and provision is made for outdoor amenity space elsewhere in the development e.g. roof gardens or in grounds surrounding the development, the external design criteria will not be applied to the small balcony or terrace.

2.6 Where provision for amenity space is not made in flat and apartment block developments in the form of roof gardens or garden space in the grounds, a judgement will be made on a case by case basis on the need for any balcony or terraces provided with those flats to meet the external noise criteria.

3.0 Internal levels

3.1 It is often necessary to open windows during the warmer months of the year to achieve comfortable internal temperatures. Windows might remain open for extended periods to cool the internal habitable rooms including bedrooms. This is often referred to as summer cooling and essentially means an increased flow of air through habitable rooms to cool these spaces. This is not discussed in BS8233 or Approved Documents E or F of the Building Regulations. However the requirements related to "purge ventilation" and the purpose of purge ventilation are comparable to the purpose of opening windows for reasons of cooling i.e. the internal environment is not comfortable and rapid air changes should serve to improve that comfort.

3.2 Where the internal noise levels referred to in table 1 cannot be achieved with windows open, alternative mechanical ventilation such as mechanical heat recovery system (with cool air bypass) should be provided. This ventilation must:

i) Be capable of providing air changes at volumes equivalent to an open window for the purposes of rapid cooling and ventilation.
ii) Not compromise the façade insulation or the resulting internal noise level.
iii) Operate at a level to comply with noise rating curve NR25 or lower.

4.0 Internal building services

4.1 This is applicable when considering high rise residential developments which are served by lifts.

Table 4 (BS 8233:2014)

Room	Maximum noise level (dB $L_{Amax, F}$)
Bedroom	25
Living room	30
Other areas	35

5.0 Industrial and commercial noise

5.1 The updated BS4142 is the governing guidance where noise of an industrial nature or commercial nature is under consideration. This method is to be used for assessing impact from noise sources within the scope of this methodology. Please refer to BS 4142:2014 for further information.

5.2 Where BS 4142 assessments are carried out the council's advice is detailed below.

6.0 New noise sources

6.1 While a noise source which is assessed to be at, or marginally above the existing background noise level is unlikely to lead direct adverse impacts; where various noise generating development occurs over time, ambient and background noise levels are likely to progressively creep upwards.

6.2 As such, to protect existing noise levels and prevent creeping levels, as a starting point, noise from new sources should be no greater than 5dB below the existing background level at the most sensitive period when the plant will be operated (e.g. evening, nights and weekends).

6.3 If this cannot be achieved, then a view will be taken on the context and character of the noise as discussed in section 11 of BS 4142.

6.4 Where new retail, commercial or industrial premises are proposed, hours of delivery are often a relevant noise consideration. Unless there is reason to stipulate otherwise, reasonable hours of delivery are considered to be 0730 to 2200 Monday to Saturday and 0900 to 1600 on Sundays or public holidays which will may be stipulated by a planning condition.

7.0 Existing noise sources and noise sensitive development

7.1 As stated in BS 4142, *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 context.*

7.2 Where a noise already exists, as a general rule, the rated noise level should be no greater than 3dBA above the background noise level (where the specific noise is present and rated). However the acceptability of the proposal will be dependent on any particular characteristics and the context of the noise, as discussed in BS4142. While a rated level below background is preferable, this can only be demonstrated by prediction.

7.3 In situations where schemes are shown to be exposed to rated noise levels of +5dB or more above the background where the specific noise is absent, the development proposal will not be supported by officers.

8.0 Internal building design and layout

8.1 When considering the design of new residential buildings or conversions, the internal layout, and how the layout in neighbouring units correspond with each other is extremely important in the context of noise. This is advocated by the BRE's Sound Control for Homes document (Planning to control internal noise) and reiterated in section 5.4.1 of BS8233. Where rooms are arranged such that functional living spaces are positioned above, below or adjacent to bedrooms located in separate dwellings, there is significant scope for conflict to arise between two neighbouring properties. Compliance with Building Regulations does not provide any certainty that this would not be a problem for future occupiers, due to the limitations of the acoustic separation required by Approved Document E.

8.2 Conflicting room uses should be avoided as far as is reasonably practical. As a general rule:

i) Bedrooms should not be positioned above, below or next to kitchens or living rooms serving separate dwellings. Services should be kept away from bedrooms.
ii) Where possible, the room layout of neighbouring dwellings should be stacked and mirror each other.
iii) Avoid locating large family units above smaller units.
iv) Use halls as buffer zones between noise sensitive rooms and noisy communal/service areas.
v) Avoid locating stairs of one dwelling next to bedrooms in adjacent dwellings.

8.3 Where stacking cannot be arranged such that layouts mirror each other, a higher degree of insulation between dwellings will be appropriate. Various robust details schemes state attenuation to greater levels than that stipulated by building regulations, however their effectiveness will be dependent on the workmanship.

8.4 Where there are unavoidable conflicting room uses and the scheme is desirable, there is an expectation that an enhanced scheme of sound insulation be submitted with a justification for the DnT, W + Ctr used, based on the likely noise sources.

9.0 Criteria for proposed residential accommodation affected by noise from existing sources of amplified music

9.1 Non adjoining buildings

9.2 Special attention should be given to the sound insulation of low frequency noise where living accommodation in non-adjoining buildings is likely to be affected by amplified or live music (for example from pubs and clubs). The expected design criteria are as follows:

i) Noise Rating Curve NR25 in bedrooms – 2300 to 0700
ii) Noise Rating Curve NR35 in all habitable rooms – 0700 to 2300

9.3 Adjoining buildings

9.4 For proposed residential accommodation in buildings that are, or would be adjoining, and affected by amplified or live music e.g. pubs and clubs, the expected design criteria for the dwellings is as follows:

i) Noise Rating Curve NR20 in bedrooms – 2300 to 0700
ii) Noise Rating Curve NR30 in all habitable rooms – 0700 to 2300

(Noise Rating Curves should be measured as a 15 minute linear Leq at the octave band centre frequencies)

Music should be inaudible inside noise sensitive property between the hours of 2300 and 0700. Noise is considered to be inaudible when it is at a sufficiently low level such that is not recognizable as emanating from the source in question and it does not alter the perception of the ambient noise environment that would prevail in the absence of the source in question.

10.0 Criteria for proposed licensed premises (night clubs and public houses) where there will be amplified music

10.1 Amplified music and speech – insulation of building envelope

10.2 In the case of amplified music and speech break-out from premises, the insulation of the premises and volume and bass setting inside must be adequate to avoid causing disturbance. This will also require an adequate mechanical ventilation system to supply sufficient fresh air for patrons in the warmest weather, thus ensuring that sound proofed doors and windows remain closed. The fitting of a limiter device to control the bass and overall noise levels at source may also be required.

10.3 Amplified music transmitted from a source not attached to a sensitive premises – criteria

10.4 The noise control shall be designed so that the background noise level ($L_{90,15min}$ Linear for the one third octave band levels of 50 to 160 Hz and the overall linear noise level), as measured at one metre outside the nearest affected façade of the nearest affected premises with the amplified music and/or vocals switched off, shall not be increased when the music or vocals are played at the typically highest level and a measurement is repeated in L_{90} Linear at the same position over any 5 minute period, with the music, vocals and current background noise measured together.

10.5 Breakout of amplified music from a source attached to a sensitive premises – criteria

10.6 The noise control shall be designed so that the background noise level ($L_{90,15min}$ Linear for the one third octave band levels of 50 to 160 Hz and the overall linear noise level), as measured in the centre of a habitable room attached to the source, with the amplified music and/or vocals switched off, shall not be increased when the music or vocals are played at the typically highest level and a measurement is repeated in L_{90} Linear at the same position over any 5 minute period, with the music, vocals and current background noise measured together.

11.0 Vibration

11.1 Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings

Table 5 (BS6472-1:2008)

Place and time	**Low probability of adverse comment** $m.s^{-1.75}$	**Adverse comment possible** $m.s^{-1.75}$	**Adverse comment probable** $m.s^{-1.75}$
Residential buildings 16h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

12.0 Choosing a methodology

12.1 Where there is a relevant published methodology or available good practice for assessing a particular noise and determining its impact, it is expected that this be followed when conducting and submitting a noise impact assessment.

12.2 It is unavoidable that some developments and noise sources will fall outside of the scope of the published noise assessment methodologies. Some of these may be covered by examples of good practice that have emerged over time. These should be used where appropriate.

12.3 These situations may necessitate the use of parts of, or a combination of published assessment criteria to be utilised, and a more bespoke assessment methodology for measuring and assessing the noise utilised. Irrespective of how a methodology is put together, the impact of the noise in question must be fully understood. In these circumstances, early consultation with the Environmental Health team is essential to ensure the assessment methodology and criteria are agreed prior to any noise survey work being carried out.

12.4 This would usually mean agreement needing to be reached on the duration of the survey, the location and the metrics to be reported on which could be used to accurately assess and convey noise impact.

Appendix 4 – Noise mitigation measures

1.0 Noise mitigation measures

1.1 The need for any noise mitigation measures will be determined by the outcome of the noise assessment. Noise mitigation or noise reduction measures should be considered and presented in the noise assessment report. Any noise mitigation or reduction methods must detail how and whether they will achieve the relevant noise criteria.

1.2 Generally, the most effective measures will be those which reduce levels at source, rather than in transmission or at the receptor. Where the proposal will introduce a new noise source, it is preferable to reduce levels at source as far as possible, before considering other mitigation measures.

1.3 Where appropriate, the following should be considered:

Reduction of noise at source

1.4 Using equipment or systems with lower sound power levels is highly effective and can avoid the need for other more costly and intrusive mitigation options. Noise impact can also be mitigated by reducing total running times or by arranging activities and operations to less sensitive times of the day. On occasions such approaches may be a sufficient method of control, which would permit the development to proceed.

1.5 The use of acoustic silencers and enclosures around the source may also be effective but should not be the first consideration.

Reduction of noise in transmission

1.6 The simplest way to reduce noise once emitted is by increasing distance to receptors. Clearly this is not always possible, but if it can be achieved, reductions of 3-6dB per doubling the distance of receptor from source can be expected.

1.7 This might be achieved by siting mechanical plant associated with industrial premises as far away from sensitive receptors as possible (and potentially providing some screening as a result). Alternatively a new housing development may be set out such that dwellings are set back from a noise source, compared to other less sensitive parts of the development e.g. communal amenity space. In many cases, a properly calculated ‘buffer zone’ between source and receptor will represent the most cost effective noise control measure.

1.8 Where land is scarce, or distance alone provides insufficient noise mitigation, a noise barrier or bund may be useful, especially in combination with other control measures. To be fully effective, the height and location must be carefully calculated. In general, to be effective, barriers will need to break the line of sight between the source and the receptor, maximise the path difference between the source and receptor, and they will also need to be of an impervious material and of sufficient kg/m^2.

Reduction of noise at a receptor

1.9 This may be the only option to reduce noise impact where a noise sensitive proposal is located in a busy urban environment, and the applicant has no control over land where a noise source is situated.

1.10 The orientation of noise sensitive receptors, away from the predominant noise source can be an effective mitigation tool. This works in two ways: firstly the building itself acts as a noise

barrier screening external areas; secondly if noise sensitive rooms are located on the sheltered side of the building, the noise impact on these receptors will be reduced. See the BRE's Sound Control for Homes document for further details.

1.11 These are factors that must be considered prior to a final layout being determined, in order that they form part of the design brief. Mitigation measures themselves will often influence the design of a scheme and be a material consideration if they have a visual impact. In such circumstances mitigation measures should not be determined by planning condition.

1.12 Where no other options are available, improving the sound insulation of a building facade can be effective in reducing internal noise levels. However as soon as windows are open this benefit will be significantly compromised. There is no expectation that windows should have to remain closed to achieve a reasonable degree of comfort in relation to noise, and doing so will give rise to other issues e.g. thermal comfort during warmer parts of the year. As such, it will often also be necessary to provide acoustically treated mechanical ventilation, to avoid the need to open windows in warm or humid weather.

Appendix 5 – Construction Noise Management Plans (CNMP)

1.0 When a development proposal involves a significant period of construction, there may be short to medium term noise impact due to the construction phase. This has the potential to be significant in terms of disturbance to neighbouring premises, and as such should be considered as part of a noise impact assessment.

1.1 It is accepted that noise is an unavoidable feature of the construction process, the developer will be expected to take all reasonable steps to minimise disturbance.

Hours of work

1.2 Where there are noise sensitive receptors in the vicinity of the construction, working hours on site should normally be confined to 0730 to 1800 on weekdays, and 0800 to 1300 Saturdays, with no noisy work on Sundays or Bank Holidays. These hours are likely to be specified in a planning condition.

1.3 Where construction noise is expected to be particularly significant, the council may add a planning condition requiring the developer to submit a Construction Noise Management Plan. An applicant may wish to submit such a plan with the application, avoiding the need for a condition.

1.4 This document must detail the particular activities that are likely to give rise to noise, an assessment of how loud they are likely to be at the receptor(s), and where they exceed levels detailed in British Standards, the scheme of mitigation that will be put in place.

1.5 The plan should represent a set of commitments by the developer to minimise the creation of noise throughout the demolition and construction phases. Whilst the developer has the primary responsibility, they will also ensure that the requirements are included in contracts, agreements and orders with contractors, sub-contractors, and suppliers.

1.6 The key elements in a Construction Noise Management Plan are likely to include:

i) Nomination of a Responsible Person for implementation of the scheme.
ii) The intended hours and days of work. It may also deal with emergency situations and where other enforcement agencies require work to take place outside of these normal hours.
iii) The Best Practicable Means (BPM) for carrying out work on site. This will include the use of the quietest machinery, methods of work, modern serviced and silenced equipment, where possible maximising distance to sensitive receptors.
iv) Measures to avoiding inconsiderate behaviour such as shouting and playing radios loudly.

Appendix 6 – Useful references

Where formal guidance and protocols have been produced, either from central Government or other authoritative sources, it is the policy of Basingstoke and Deane Borough Council that the acoustic investigations shall be carried out with regard to the relevant British Standards, legislation and other guidelines.

Some of the more commonly used Standards and Guidance which may be applicable are listed below. In the event these documents are updated by the relevant publishing body, for the purposes of conducting a noise impact assessment the most current document and best practice shall be the authoritative document:

1. IEMA – Guidelines for Noise Impact Assessment (November 2014)
2. BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings - Code of Practice
3. BS 4142:2014 – Method for rating and assessing industrial and commercial sound
4. BS 5228:2009 – Noise and vibration control on construction and open sites – Part 1: Noise
5. BS 5228:2009 – Noise and vibration control on construction and open sites – Part 2: Vibration
6. BS 5228:1992 – Noise control on construction and open sites – Part 4: Piling Operations
7. BS 5228:1997 – Noise and vibration on construction and open sites – Part 5: Surface mineral extraction
8. BS 6472-1:2008 – Guide to the evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting
9. BS 6841:1987 – Guide to measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock
10. ISO 4866:2010 – Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects of structures.
11. BS 7445:2003 – Description and measurement of environmental noise – Part 1: Guide to quantities and procedures
12. BS 7445:2003 – Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use
13. BS 7445:2003 – Description and measurement of environmental noise – Part 3: Guide to application to noise limits
14. ISO 9613-1:1993 – Attenuation of sound propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere
15. ISO 9613-2:1996 – Attenuation of sound propagation outdoors – Part 2: General method of calculation
16. National Planning Policy Framework – Communities and Local Government
17. National Planning Practice Guidance – Noise
18. Noise Policy Statement for England (NPSE) – DEFRA
19. World Health Organisation – Guidelines for Community Noise, 1999

20. World Health Organisation – Night Noise Guidelines for Europe, 2009
21. ETSU-R-97 – The assessment and rating of noise from wind farms
22. IOA – Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise
23. IEC 61672-1:2002 Electroacoustics – Sound level meters - Part 1:Specifications
24. The Building Regulations 2010 Approved Document E – Resistance to the passage of sound
25. The Building Regulations 2010 Approved Document F – Ventilation
26. Building Research Establishment – Sound control for Homes 1993

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