

APPENDIX 11.2A
ASSESSMENT POLICY, STANDARDS AND
GUIDELINES

Appendix 11.2A: Assessment Policy, Standards and Guidelines

National Planning Policy Framework

The Department for Communities and Local Government published the *National Planning Policy Framework* (NPPF) on 27th March 2012 and upon its publication, the majority of planning policy statements and guidance notes were withdrawn, including Planning Policy Guidance (PPG) 24 *Planning and Noise*, which until the emergence of the NPPF, set out the Government's position on how noise should be dealt with in the planning system.

The NPPF was revised on 24th July 2018, with the earlier 2012 version immediately withdrawn. Further updates were published on 19th February 2019 and 19th June 2019.

The general guiding principle in the NPPF is contained in Section 15 under the heading *Conserving and enhancing the natural environment*. Paragraph 170 states:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;”

The noise planning policy is contained in paragraph 180, which also appears in Section 15 of the NPPF:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;***
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;”***

A footnote to the point paragraph 180(a) refers to the *Explanatory Note of the Noise Policy Statement for England*, which defines both “significant adverse impacts on health and quality of life” and “adverse impacts on health and quality of life.”

Paragraph 182 of the NPPF sets out the ‘Agent of change’ principle:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

This means that, where sensitive development is adversely affected by existing businesses, the developer, as the agent of the change, is expected to provide mitigation before the

development is completed. This is interpreted to include implementing mitigation to the existing business, insofar as, such mitigation does not adversely affect that business.

Noise Policy Statement for England

The Department for Environment, Food and Rural Affairs published the *Noise Policy Statement for England* (NPSE) in March 2010. The explanatory note of the NPSE defines the terms used in the NPPF:

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

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

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

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.”

The NPSE does not define the SOAEL numerically, stating at paragraph 2.22:

“2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

There is no local or national guidance on how the three terms should be defined numerically.

There are three aims in the NPSE, two of which expand upon the first bullet point in paragraph 180 of the NPPF:

**“The first aim of the Noise Policy Statement for England
Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.**

2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).

**The second aim of the Noise Policy Statement for England
Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.**

2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking

into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.25 This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.”

Planning Practice Guidance

In March 2014, the Government released Planning Practice Guidance (PPG) on noise, titled *Noise*. This document sets out a number of principles in the form of questions and answers, and reinforces the guidance set out in the NPPF and the NPSE. The most recent version of this document was published in July 2019.

The noise PPG notes that:

“Noise needs to be considered when new development may create additional noise and when new developments would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced).”

It goes on to note that:

“Plan-making and decision taking need to take account of the acoustic environment and in doing so consider:

- **whether or not a significant adverse effect is occurring or likely to occur;**
- **whether or not an adverse effect is occurring or likely to occur; and**
- **whether or not a good standard of amenity can be achieved.”**

The noise PPG broadly repeats the NPSE definitions of the NOEL, LOAEL and SOAEL and it provides a summary table to explain how the terms relate to each other and to typical human reactions to sound. The table is replicated below in **Table A10.2.1**.

Table A10.2.1: Planning Practice Guidance summary of noise exposure hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No effect	No observed effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude of other physiological response. Can slightly affect the acoustic character of the area but	No observed adverse effect	No specific measures required

Perception	Examples of Outcomes	Increasing Effect Level	Action
	not such that there is a change in the quality of life.		
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep the windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting back to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed adverse effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable adverse effect	Prevent

It is noted that the text in paragraph 005 of the PPG for noise reiterates the point illustrated in **Table A03.2.1**, that there are degrees of adverse effect above the SOAEL. **Table A10.2.1** defines two degrees of significant adverse effect: a significant observed adverse effect, which is deemed noticeable and disruptive, and an unacceptable adverse effect, which is deemed noticeable and very disruptive.

The distinction between these two degrees of significant adverse effect is expanded upon in the text in paragraph 005 of the PPG for noise:

“Increasing noise exposure will at some point cause the ‘significant observed adverse effect’ level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained adverse changes in behaviour and / or health without an ability to mitigate the effect of the noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be avoided.”

The PPG, which is the most recent manifestation of Government advice on how noise should be treated within the planning system, is clear that a significant adverse effect, which lies above the SOAEL but below an unacceptable adverse effect, can be addressed (or ‘avoided’ in the terms of the PPG) through the provision of mitigation, including noise insulation; it is not until an unacceptable adverse effect is reached that the cause of the effect should be prevented.

The noise PPG provides advice on how to mitigate the effects of noise, noting that there are options to reduce noise at source, to optimise site layouts, to use planning conditions, and providing insulation within affected properties.

The noise PPG also notes that:

“The noise impact may be partially offset if the residents of those dwellings have access to:

- ***a relatively quiet façade (containing windows to habitable rooms) as part of their dwelling, and/or***
- ***a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or***
- ***a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or***
- ***a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance).”***

Local Planning Policies

Uttlesford District Council (UDC) is currently developing a new Local Plan. Until the new plan is adopted, planning decisions will be determined against saved policies in the *Local Plan 2005*.

Policy ENV10 – *Noise Sensitive Development and Disturbance from Aircraft*, states:

“Housing and other noise sensitive development will not be permitted if the occupants would experience significant noise disturbance. This will be assessed by using the appropriate noise contour for the type of development and will take into account mitigation by design and sound proofing features.”

British Standard 5228

Part 1 of British Standard (BS) 5228: 2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites (including Amendment 1)*, titled *Noise*, sets out a method for predicting, assessing and controlling noise levels arising from a wide variety of

construction and related activities and sets out tables of sound power levels generated by a wide variety of construction plant to facilitate such predictions.

Noise levels generated by a construction site will depend upon a number of variables, the most significant of which are:

- the amount of noise generated by plant and equipment being used at the development site, generally expressed as a sound power level;
- the periods of operation of the plant at the development site, known as the “on-time”;
- the distance between the noise source and the receptor, known as the “stand-off”;
- the attenuation due to ground absorption or barrier screening effects; and
- the reflection of noise due to the presence of hard vertical faces such as walls.

The prediction method set out in Part 1 of BS5228 takes account of each of these variables, and provides typical source emission levels for a range of construction plant undertaking specific construction activities.

The predicted construction noise levels have been assessed against criteria derived using the “ABC Method” as described in Section E.3.2 of BS5228, which states:

“Table E.1 shows an example of the threshold of potential significant effect at dwellings when the site noise level, rounded to the nearest decibel, exceeds the listed value. The table can be used as follows: for the appropriate period (night, evening/weekends or day), the ambient noise level is determined and rounded to the nearest 5dB. 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.”

Table E.1 of BS5228 is reproduced here as **Table A10.2.2**.

Table A10.2.2: Threshold of significance effect at dwellings

Assessment Category and Threshold Value period (L_{Aeq})	Threshold Value, dB		
	Category A ^(A)	Category B ^(B)	Category C ^(C)
Night-time (23:00 to 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
<p>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.</p> <p>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} noise level for the period increases by more than 3dB due to site noise.</p> <p>Note 3: Applied to residential receptors only.</p>			
<p>Notes:</p> <p>(A) Category A: threshold values to use when ambient noise levels (rounded to the nearest 5dB) are less than these values.</p> <p>(B) Category B: threshold values to use when ambient noise levels (rounded to the nearest 5dB) are the same as Category A values.</p> <p>(C) Category C: threshold values to use when ambient noise levels (rounded to the nearest 5dB) are higher than Category A values.</p>			

Assessment Category and Threshold Value period (L_{Aeq})	Threshold Value, dB		
	Category A ^(A)	Category B ^(B)	Category C ^(C)
^(D) 19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays			

In broad terms, the ABC method requires the existing ambient noise level to be rounded to the nearest 5dB and compared with the Category A values. The appropriate assessment category is selected according to whether the rounded ambient noise levels are below the Category A values (use Category A), equal to the Category A values (use Category B), or above the Category A values (use Category C).

Part 2 of BS5228: 2009+A1:2014, *titled Code of practice for noise and vibration control on construction and open sites Part 2: Vibration*, relates to vibration that may be impulsive, such as that due to hammer-driven piling; transient, such as that due to vehicle movements along a railway; or continuous, such as that due to vibratory driven piling. The primary cause of community concern generally relates to building damage from both construction and operational sources of vibration, although the human body can perceive vibration at levels that are substantially lower than those required to cause building damage.

Part 2 of BS5228 indicates that vibration might be just perceptible at 0.14 mm/s (peak particle velocity or ppv) in the most sensitive situations for most vibration frequencies associated with construction. The standard goes on to note that at 0.3 mm/s vibration might be just perceptible in residential environments, at 1.0 mm/s vibration in residential environments is likely to cause complaint although it can be tolerated if prior warning and explanation has been given to the residents and at 10 mm/s vibration is likely to be intolerable for any more than a very brief exposure.

Damage to buildings associated solely with ground-borne vibration is not common and although vibration may be noticeable, there is little evidence to suggest that they produce cosmetic damage such as a crack in plaster unless the magnitude of the vibration is excessively high. The most likely impact, where elevated levels of vibration do occur during the construction works, is associated with perceptibility.

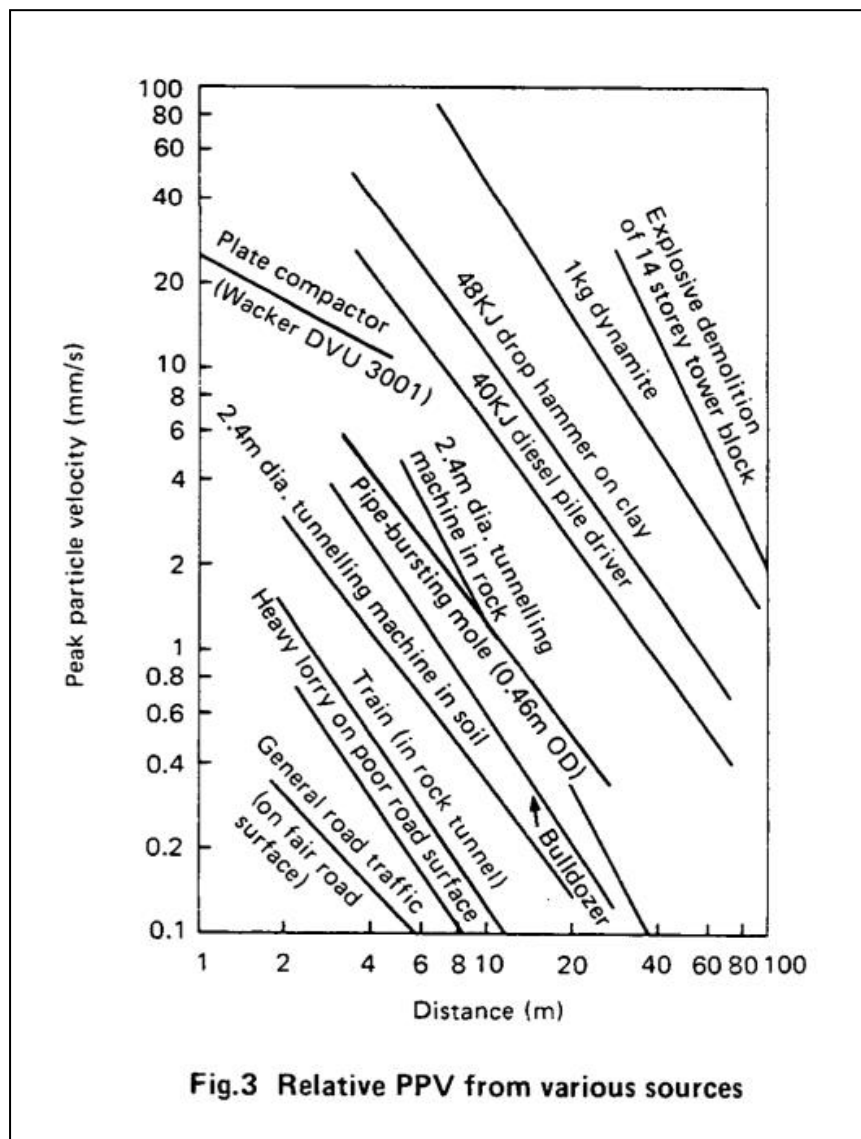
For cosmetic damage to residential properties in good condition, i.e. without any specific structural weaknesses, Part 2 BS5228 repeats the guidance contained in BS7385: Part 2: 1993 *Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from groundborne vibration*. It indicates that cosmetic damage may occur at peak particle velocities of 15 mm/s and above.

TRL Report 53

The 1986 Transport and Road Research Laboratory (TRL) produced a report in 1986 titled *Ground vibration caused by civil engineering works* (TRL Report 53). The report set out the findings of TRL's research into predicting and assessing ground vibration from civil engineering works.

Of particular use for this assessment is Figure 3 of the report, which sets out typical vibration levels from construction activities. Figure 3 is included here as **Figure A10.2.1**.

Figure A10.2.1: Relative peak particle velocity (PPV) levels from various sources



The figure is of use in determining likely vibration levels from construction activities at the Proposed Development.

Design Manual for Roads and Bridges

Potential impacts associated with off-site operational traffic have been considered against the guidance set out in the Design Manual for Roads and Bridges (DMRB), Volume 11 *Environmental Assessment*, Section 3 *Environmental Assessment Techniques*, Part 7 LA 111 *Noise and Vibration*.

DMRB provides guidance on how to assess noise and vibration from road schemes in the UK. DMRB gives guidance and interpretation on the magnitude of noise impact from road traffic sources and it includes example impact scales for classifying the magnitude of short-term and long-term impacts, as shown in **Tables A10.2.3** and **A10.2.4**.

Table A10.2.3: DMRB short-term impact scale

Short-term magnitude	Short-term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	less than 1.0

Table A10.2.4: DMRB long-term impact scale

Long-term magnitude	Long-term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

The criteria above reflect key benchmarks that relate to human perception of sound. A change of 1dB is classed in DMRB as the smallest change that is considered perceptible in the short-term, a 3dB change is considered to be the smallest change in noise that is perceptible in the long-term, and a 10dB change is approximately a halving or doubling of loudness.

The criteria specified in **Table A10.2.3** and **Table A10.2.4** have been used as the basis to assess the potential impacts from both construction and operational traffic associated with the Proposed Development. The impact scales in **Table A10.2.3** and **Table A10.2.4** have been related to the magnitude of impact scale used elsewhere in the Environmental Statement, as set out in **Table A10.2.5** (short-term) and **Table A10.2.6** (long-term).

Table A10.2.5: Off-site road traffic magnitude of impact scale – short-term

Change in Noise Level dB(A)	Magnitude of Impact
0 - 0.9	Negligible
1.0 – 2.9	Low
3.0 – 4.9	Moderate
5+	High

Table A10.2.6: Off-site road traffic magnitude of impact scale – long-term

Change in Noise Level dB(A)	Magnitude of Impact
0 - 2.9	Negligible
3.0 – 4.9	Low
5.0 – 9.9	Moderate
10+	High

The current version of DMRB, i.e. LA111, scopes-out road traffic vibration on the basis that roads maintained in a good condition will not lead to adverse outcomes:

“Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects.”

Other relevant research and guidance on road traffic vibration are set out later in this section.

Calculation of Road Traffic Noise

Calculations of road traffic noise have been undertaken using the *Calculation of Road Traffic Noise* (CRTN), published in 1988 by the former Department of Transport and The Welsh Office.

CRTN sets out standard procedures for calculating noise levels from road traffic. The calculation method uses a number of input variables, including traffic flow volume, average vehicle speed, percentage of heavy goods vehicles, type of road surface, site geometry and the presence of noise barriers or acoustically absorbent ground, to predict the $L_{A10,18hrs}$ or $L_{A10,1hr}$ noise level for any receptor point at a given distance from the road.

Road Traffic Vibration

There are two key components to vibration from road traffic:

- groundborne vibration, which is caused by the interaction between the road surface and the vehicle and is transmitted through the ground into the receptor building; and
- low frequency airborne noise, which is typically caused by the engines and exhaust, particularly of larger vehicles such as heavy goods vehicles. It propagates through the air before inducing vibration in the receptor building.

The general conclusion of research on the subject of road traffic vibration is that it will not be generated at a level sufficient to affect buildings unless there is a defect in the road surface.

British Standard 7385-2: 1993 indicates that cosmetic damage may occur to residential properties in good condition, i.e. without any specific structural weaknesses at peak particle velocities of 15 mm/s and above. The German standard DIN4150-3: 2016-12 *Vibrations in buildings – Part 3: Effects on structures*, suggests that at low frequencies, damage to structures is possible at lower vibration levels of 5mm/s.

Road traffic will not typically generate vibration levels in the order of 5mm/s or more unless there is a defect in the road surface; the Transport and Road Research Laboratory report *Traffic induced vibrations in buildings* (TRRL RR 426) provides a formula for determining the amount of groundborne vibration likely to be generated by an HGV passing over a road defect or discontinuity. A defect or discontinuity of at least 30mm deep would be required to generate a vibration level of 5mm/s (peak particle velocity) at a distance of approximately 8 metres.