Noise and Residential Development

Adopted Supplementary Planning Guidance

Adopted Swindon Borough Local Plan, 1999
Swindon Borough Local Plan 2011, Revised Deposit Draft

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NOISE AND RESIDENTIAL DEVELOPMENT

1. Introduction

1.1 Noise is an unavoidable part of our lives. However, information we receive from residents of the Borough shows that it can have an adverse effect on peoples' quality of life. Research also tells us that exposure to unwanted noise can affect our health and welfare.

1.2 In relation to noise control, prevention is better than cure. Protection against noise in the construction, design and layout of residential developments is essential in ensuring that existing or future residents are not subjected to unacceptable levels of noise in their own homes.

1.3 The likelihood of noise affecting future residents is a key factor in assessing the suitability of a site for residential use.

1.4 Ideally, residential development should be restricted to areas with low ambient noise levels. However, an inflexible approach would inhibit regeneration and development and place more pressure on green-field sites. Although there will be sites in the built-up part of the Borough not suitable for residential use, elsewhere it is important to utilise noise control measures in order to make residential development feasible, and hence maximise the potential of previously developed land.

1.5 Solutions to acoustic problems can be technically complex and expensive and in all but small developments or particularly quiet locations it is likely that specialist advice will be required from acoustic consultants. Delaying contact with such specialists until later in a project may result in avoidable additional costs being incurred at the design and construction stages. The Council has produced this Supplementary Planning Guidance in order that developers can provide for the costs and practical considerations involved from the outset. The following advice, based on national guidance on planning and noise issues, should be followed for all residential development in the Swindon area, where internal or external noise is a factor.

2. Context

2.1 The starting point for this Supplementary Planning Guidance (SPG) is the adopted Swindon Borough Local Plan, which covers the period 1991-2001, but remains part of the development plan until replaced. Until that time, it remains the principal basis for planning decisions (a review is ongoing, the Revised Deposit Draft having just completed formal consultation). Certain issues have become more prominent since the Local Plan was adopted and warrant additional advice to assist developers coming to the Council for planning consent. This has necessitated the preparation of additional advice to assist decisions and provide further certainty to developers over what the Council would expect from them.

2.2 The current policy for the attenuation of noise on development sites is contained at policy SEV2 (d) which states that in relation to the site itself, to the adjoining property and to the locality in general, development
'protects the amenities of neighbouring residents in terms of visual intrusion, privacy, noise, disturbance, smell and pollution'.

2.3 This is supported in the adopted plan by a specific policy, SEV72, Traffic and Rail Noise, which states that:
'New residential development and other new noise sensitive establishments will not be permitted where:

a) traffic noise is already at, or is projected to rise to, a level of 68dBLA10 18 Hour 0600-0000 or above measured externally;
b) railway noise is already at, or is projected to rise to, a level of 60dbLAeq 24 hour or above or where peak noise levels are at or projected to rise to, 80dbLAMax or above, measured externally.

Notwithstanding the foregoing, new residential development shall not take place closer than 30 metres from the boundary of the railway, except where it is demonstrated by the developer that, by physical measures such as sound barriers, external noise levels from road and rail sources could be reduced below the maxima stipulated above'.

2.4 Policy SEV73 states that:
'New residential development and other sensitive establishments will not be permitted on land adjacent to existing industrial or commercial uses unless it can be adequately demonstrated that the future occupiers of the proposed development would not be expected to suffer any adverse environmental effects from the existing uses.

2.5 Policy DS6 (e) of the Revised Deposit Draft of the Local Plan 2011 carries forward the advice of SEV2 in respect of noise. It states that proposals shall, 'be compatible with, and protect the amenity of, nearby land uses in terms of visual intrusion including light pollution, privacy, noise, disturbance, smell, pollution and safety, or demonstrate compatibility with an approved development framework, masterplan or framework plan'.

2.6 This policy is supplemented by a 'Control of Emissions' policy, ENV25, which states that where development is likely to lead to the emission of pollutants, including noise, that may affect existing development or vulnerable wildlife habitats, it will only be allowed where emissions are controlled to a point where there is no loss of amenity for those affected parties. The advice pertaining to noise relates back to the Government's guidance set out in Planning Policy Guidance Note 24, 'Planning and Noise' (1994).

2.7 It is intended that this supplementary planning guidance should be adopted in accord with the adopted plan and its policies, and ultimately be used alongside Policies DS6 and ENV25 of the emerging plan.

2.8 The remaining sections outline the practical ways in which noise can be measured and ameliorated, and how the Council will assess noise intrusion in residential development.

3. Noise Surveys

3.1 Noise is likely to be a material planning consideration in any location where it is unlikely that residents will be able to keep windows open or sit on/in a balcony/garden without being bothered by one or more possible external noise sources, such as traffic, industrial noise or customers of entertainment venues. Under these circumstances a noise survey will be required.

3.2 In the first instance, the applicant, or potential developer is encouraged to discuss the site with one of the Environmental Protection Officers to ascertain the type of survey required (see Annex 2 *Useful Contacts*).

3.3 Generally a 'worst case scenario' noise survey is most useful. For urban locations exposed to a mix of traffic noise, voices of pedestrians and entertainment noise, maximum noise as well as average noise levels need to be measured. (see 'Terminology' Annex 1)

3.4 For locations in or near town centres a 24 hour survey starting before rush hour on Friday morning is particularly useful at identifying the various noise sources.

3.5 Annex 1 sets out the design criteria for dwellings that will be sought by the Council for new residential development, prior to its occupation. Clearly, it will be beneficial for developers to allow for this in design and build rather than seeking preventative measures once dwellings are complete. Notwithstanding the requirements of Building Regulations, where proposed dwellings fail the criteria, the Environmental Protection team would be likely to recommend a refusal of planning consent, or that a condition to consent be applied to ensure that noise mitigation would be acceptable.

4. Overcoming Noise Problems

4.1 Where a noise survey has indicated that mitigation may be required, there are two main categories of noise reduction measures; design and construction, and screening. Each of these are discussed below.

4.2 Design and Construction

Building Orientation

4.2.1 The residence is orientated in such a way as to minimise noise exposure; for example, in barrier style housing the buildings form a continuous barrier to external noise sources. This is particularly

effective where one side of the development has a dominant noise source (i.e. a busy road/factory). The façade facing the noise source is constructed with high acoustic attenuation properties, for example fewer and smaller acoustic windows, or no windows at all. This can be used to great advantage, particularly if designed in conjunction with the layout of the rooms, whereby no bedrooms or living rooms face the noise source.

Layout of Rooms

4.2.2 The layout of rooms can be used in the control of noise in two ways.

4.2.3 Firstly, non-habitable rooms, for example kitchens, bathrooms, stairwells, can be situated on the noisier side of a building, providing a barrier to habitable rooms (living rooms and bedrooms) on the quieter side of the building.

4.2.4. Secondly, for flats and attached houses, the positioning of rooms relative to those in the adjacent residences is important to ensure that noisier areas, (i.e. bathrooms, living rooms, kitchens and stairwells do not share party walls or floors/ceilings with bedrooms. So, for example, in terraced housing it is desirable to position the bedrooms of adjoining residences adjacent to each other, and in flats the bedrooms should be above/below/adjacent to bedrooms

Windows and Doors

4.2.5 The windows and external doors of a building must be to a specification that ensures they provide sufficient insulation against external noise.

4.2.6 To achieve a good standard of insulation external doors should be close-sealed with no gaps in or around them, and have sufficient mass to resist external noise. Where necessary, higher standards may be achieved by providing entrance porches with double doors.

4.2.7 Providing they are properly fitted, standard thermal double glazed window units will generally reduce external noise levels by approximately 30 decibels. Increasing the thickness of the panes of glass (for example from 4mm to 6mm) provides an improvement as does increasing the air gap. For example panes of 10mm and 6mm with a 12mm gap between them will reduce noise levels by about 34 decibels.

4.2.8 Where external noise levels are high, thermal double-glazing may fail to provide sufficient acoustic attenuation. Acoustic double-glazing is characterised by an air gap between the panes of at least 100mm and can be constructed with secondary sashes. Again, it is advisable for the two panes to be of different thickness and performance is further

improved if the sides of the air space are lined with sound absorbent material. Under some circumstances, triple glazing will be sought.

4.2.9 The acoustic performance of any door or window is dramatically reduced if it is left open or if there are gaps in or around the structure. For this reason best results are obtained if acoustic windows are sealed, although where windows are openable the resulting loss of insulation can be minimised by good fittings and seals. Bedrooms and living rooms must have openable windows.

4.2.10 An open window provides rapid ventilation, which is needed in certain circumstances, for example in hot weather or when cleaning or decorating solvents are used. However, under normal circumstances acoustic glazing must be kept closed to achieve optimum noise insulation and so an alternative means of ventilation will be needed.

Ventilation

4.2.11 Where occupiers are unable to open windows without external noise causing internal noise levels to rise above those outlined in Annex 1, then windows will be expected to be kept closed and an alternative source of mechanical supply air ventilation will be required.

4.2.12 Ventilation needs to be sufficient without providing an acoustic weak spot in the structure of the building. The minimum standard required is specified in Schedule 1 of the Noise Insulation Regulations 1975. Works must also comply with the Building Regulations 2001.

4.2.13 Passive systems (i.e. acoustic trickle vents/air bricks) should be considered for background ventilation purposes, but rarely provide sufficient ventilation to compensate for the need to keep windows closed.

4.2.14 Mechanical ventilation is the usual solution employed. It is important to ensure it is of a specialist design to allow for easy maintenance, provide sufficient ventilation and adequate insulation against the ingress of noise. In addition, mechanical systems should not themselves produce unacceptable levels of noise.

4.2.15 Figure 1 (Annex 4) is an example of an ideal system, with a motor that is situated in the roof or ceiling space, remote from the residents, facilitating noise control and flues that draw air out of bathrooms and kitchens. Fresh air is drawn from outside the building (away from possible sources of pollution) and ‘dropped’ into bedrooms and sitting rooms.

4.2.16 The system should also incorporate a heat recovery system (and if available a summer by-pass), to maximise energy efficiency. The unit should have a standard background setting and a ‘boost’ facility to provide maximum airflow in warm weather.

Structure Borne Noise and Vibration.

4.2.17 The walls and floors separating flats and terraced housing must provide adequate insulation to reduce the noise from adjacent residences to acceptable levels. The minimum legal requirements are detailed in Approved Document E to The Building Regulations 2001, on which your Building Control Officer will advise, (see Annex 3 *Useful Contacts*)

4.2.18 In certain circumstances, for example, where a room other than a bedroom necessarily shares a party wall or ceiling / floor with a bedroom, acoustic insulation over and above the Building Regulations standards will be required if it is impossible to re-arrange the room layout.

4.2.19 Where living accommodation is located adjacent to, or above or below industrial or commercial premises, ie where there is a physical connection between a dwelling and a potential source of noise or vibration, acoustic insulation can be technically complex and expensive and it may be cost effective to survey the existing insulation and noise sources prior to committing to the project.

4.2.20 Fire doors should be supplied with hydraulic self-closers to prevent impact noise from door slamming. 'Hidden' units are now available.

4.2.21 General advice can be found in BS8233 'Sound Insulation and Noise reduction for Buildings', but in most instances specialist technical advice will be needed.

Post Construction testing

4.2.22 The Building Regulations 2001 now require post construction testing to ensure internal noise attenuation is adequate.

4.3 Screening

4.3.1 Screening may take one or more of several forms. Where there is sufficient land available a screen may take the form of a barrier, for example an earth bund, a wall or a fence, which is independent from the development itself.

4.3.2 Generally speaking the denser and therefore heavier the barrier, the more effective it will be at attenuating noise. Therefore an earth bund, which is necessarily wide as well as dense, will provide very effective screening. The drawback of an earth bund is that the width required to provide an adequate height takes up considerable space. Therefore it is generally only cost-effective to provide an earth bund to a large development where there is a considerable source to be screened, for example a road running the length of a housing estate development.

4.3.3 Other forms of independent barrier include walls and fences. The density of a brick or concrete block wall again results in a good acoustic attenuation performance. Fences are less effective, however acoustic close boarded style fencing can provide an effective noise reduction for some sources, unlike standard fence panels, which due to their lightweight construction are only designed to provide visual screening.

4.3.4 Trees and other vegetation are often proposed as acoustic barriers. However, although they are generally perceived as having diminished a noise nuisance (probably because they visually screen the source) measurements show that they generally only provide minimal noise reduction, due to their lack of density.

4.3.5 The drawback with all types of independent acoustic barrier is that they only reduce the noise between a source and receiver where they interrupt the line of sight between the two, and even then, a reduced amount of noise will pass around, or over the barrier. So, in order to screen buildings at first floor level or above, depending upon the topography of the land, a very high barrier is needed. This is often not possible both because it is so unsightly as to be unacceptable in planning terms, would block out too much light, or simply would not be stable.

4.3.6 Screening may also take the form of other buildings. This can be very effective for a larger development where less noise-sensitive buildings are also planned, which can be situated between residential premises and a noise source, commonly on the periphery of the site.

4.3.7 Garages can be used in a similar way, though usually only for ground floor rooms and gardens.

Annex 1

Design Criteria for Dwellings

The following design criteria will normally be required:

Bedrooms and living rooms (Night). LAeq 1 hr = 30 dB or less and individual noise events typical to the area should not normally exceed 45dB LA max (F time weighting). (Over the period 10.00 pm-7.00 am)

Bedrooms and living rooms (Day). LAeq 15 hr = 35dB or less (7.00 am-10.00 pm)

Gardens and balconies LAeq = 55dB or less

Terminology:

dB = Decibels. The human range of hearing covers such a wide range of sound pressures that a logarithmic scale is needed to make the numbers manageable. Audible sound ranges from the threshold of hearing at 0dB to the pain threshold at 130dB.

LAeq T = Equivalent continuous A-weighted sound pressure level over the given time period (T)– a form of average noise level.

LAmax = Maximum A weighted noise level recorded during a noise event.

'A' weighting: Human hearing is less sensitive at very low and very high frequencies. In order to account for this, the noise is 'weighted' to provide results which conform approximately to the response of the human ear. Denoted as dB **(A)**

'Loudness' = The smallest perceptible change in a noise level that the average person can recognise is approximately 1dB, however an increase of about 8dB is required before the sound subjectively appears to be significantly louder.

Time weighting Fast or slow (F) (S)= this determines the speed at which the sound level meter responds to changes in the noise level. Fast weighting provides a more accurate and higher response to sudden noises.

Annex 2

Useful References

Building Regulations 2001

Part F Ventilation and condensation in roofs. 1995

Part L Conservation of fuel and power. 2002

Part E Resistance to the passage of sound. 2003
(Please note that the Building Regulations do not currently consider the impact of external noise on buildings: A house with standard windows could be built 2 metres from a runway at Heathrow and still meet the Building Regulations Standards, yet it would be uninhabitable. Only the planning system can provide the full level control on noise problems at the present time).

BS 8233-Sound Insulation and Noise Reduction for Buildings 1999

Noise Insulation Regulations 1975

Planning Policy Guidance PPG 24-Planning and Noise 1994

Annex 3

Useful Contacts

Swindon Borough Council

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Annex 4

Fig 1: Typical system for mechanical ventilation with heat recovery