



ASSESSMENT, PREDICTION AND CONTROL OF NOISE

GUIDANCE NOTE

DEVON COUNTY COUNCIL

1st February 2005

As noise is often an important factor in assessing the environmental acceptability of a development proposal, and it should be one of the factors included in a planning application submission. The advice contained in this guidance note addresses how noise emissions should be predicted, limited and monitored.

Much of the development which is necessary for the creation of jobs and the construction and improvement of essential infrastructure will generate noise, and it is the responsibility of Devon County Council to ensure that such development does not cause an unacceptable degree of disturbance to local communities.

Noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration. The impact of noise from sport, recreation and education however, will depend to a large extent on the frequency of use and the design of facilities. More detailed advice on factors to consider in relation to the major noise sources including roads, railways, airports, industrial and recreational noise and their measurement is given in Annex 3 to Planning Policy Guidance note 24 and Minerals Planning Guidance Note 11 - "The Control of Noise at Surface Mineral Workings" (MPG 11).

Measures to mitigate the impact of noise

A number of measures can be introduced to control the source of, or limit exposure to, noise. Such measures should be proportionate and reasonable and may include one or more of the following:

- 1. Engineering:** reduction of noise at point of generation (eg by using quiet machines and/or quiet methods of working); containment of noise generated (eg by insulating buildings which house machinery and/or providing purpose-built barriers around the site); and protection of surrounding noise-sensitive buildings (eg by improving sound insulation in these buildings and/or screening them by purpose-built barriers);
- 2. Lay-out:** adequate distance between source and noise-sensitive building or area; screening by natural barriers, other buildings, or non-critical rooms in a building;
- 3. Administrative:** limiting operating time of source; restricting activities allowed on the site; specifying an acceptable noise limit.

Early consultation with Devon County Council is desirable to enable such measures to be incorporated into the design of planning proposals before they are formally submitted for determination. Alternatively it may be appropriate to ensure that such measures are introduced by imposing planning conditions.

Designated areas and the countryside

Special consideration of planning applications is required where noisy development is proposed in or near Sites of Special Scientific Interest (SSSIs). Proposals likely to affect SSSIs designated as internationally important under the EC Habitats or Birds Directives or the Ramsar Convention require extra scrutiny. Special consideration will also be given to development which would affect the quiet enjoyment of Areas of Outstanding Natural Beauty or Heritage Coasts. The effect of noise on the enjoyment of other areas of landscape, wildlife and historic value will also be taken into account.

Noise abatement controls

There are a number of existing practices which developers can adopt to reduce the impact of noise emission. Devon County Council may require many of these to be implemented by means of planning conditions. However if planning conditions to control noise have not been imposed, developers should nevertheless conduct their operations in an environmentally acceptable manner.

1. Work sequencing and site layout: Planning conditions can be used to specify the programme of work and the layout of a development site, and thereby significantly reduce noise levels as well as other environmental impacts.

Wherever possible, the development site should be arranged so that screening is provided for noise-sensitive properties from the noise generated by operations.

Mineral and waste sites in particular should ensure that fixed plant and facilities, including maintenance areas and permanent haul roads, are located so as to minimise their impact on noise-sensitive properties. Where feasible, acoustic screens around plant can help to reduce noise emissions. Speed limits within the site can help to reduce the noise from on-site traffic. Speed control beds and "sleeping policemen" can be used to this effect, though it should be noted that, when in the path of empty vehicles, the latter can sometimes cause noise through "body slap". Site roads should be kept as smooth as possible to reduce vehicle noise. Operators should also recognise that the manner in which vehicles are driven is very important.

2. Baffle mounds: These can make a significant reduction in the exposure of local people to noise emissions from mineral and waste workings. These mounds are frequently constructed from the top soil, sub-soil and over-burden which an operator has to remove and store.

3. Acoustic fencing: Developers may erect acoustic fencing as an alternative to baffle mounds to provide protection against noise, either where insufficient land is available for a baffle mound, or where a baffle mound would prevent the extraction of a significant mineral resource, or where there are difficulties in making a stable mound of adequate size.

The use of acoustic fencing on top of a mound can provide increased acoustic protection, or reduce the land take required for a given degree of protection. There may, however, be a conflict with landscape interests and care will be needed to protect the skyline from visual intrusion.

4. Vehicle reversing alarms: Vehicle reversing alarms are one of the sources of noise at mineral, waste and construction sites which cause the most environmental disturbance.

Alarms are fitted for safety reasons, but can cause annoyance through their tone even when the level of background noise is higher than the noise emitted by the alarm. This can be especially disturbing whilst working is taking place during the night.

Alternatives to the alarms currently in general use include those which adjust their noise level automatically to 5 dB (A) above the ambient noise level, and directional alarms which reduce the area over which these alarms are likely to cause annoyance. Other alternatives include flashing bright lights during the night (but these may also cause a nuisance if not operated with care), radar-operated safety devices which will automatically apply the brake on the vehicle if something or somebody is in its way, audible "warble" devices, TV camera systems, and reduced level audible warnings for night time use. Where it is not feasible to use these alternative devices, developers should consider whether their working practices can be arranged so that their vehicles reverse predominantly away from noise-sensitive properties.

5. Off-site road traffic: As well as seeking to control noise emission from the development site itself, Devon County Council will also consider the noise caused by traffic going to and from the site. Noise from off-site traffic related to a minerals and waste operations can sometimes cause as much, if not more, annoyance as the noise from the operation itself.

Voluntary agreements may be used to control lorry movements. However, it is typically more appropriate to use planning obligations (under section 106 of the Town and Country Planning Act 1990) to restrict lorry movements to particular times or particular routes (DoE Circular 16/91 (WO Circular 53/91)).

Developers can do much to counter the noise nuisance that can be caused by off-site traffic. They should ensure that their own lorries use routes and operate at times which cause the least disturbance, and include the same requirement in their contracts with other transport firms whose lorries take material away from the site.

6. Maintenance of plant: The regular and effective maintenance of plant can play an important role in keeping noise within reasonable standards. Devon County Council may request that developers submit a general programme of regular maintenance paying particular attention to the lubrication of bearings, the sharpness of cutting edges and the integrity of silencers.

7. Equipment selection: Developers should supply information on predicted noise levels in support of a planning application. Devon County Council might require the applicant to supply data on the sound level generated by the equipment which it is proposed to use. Such data, if determined by a competent acoustic agency, can be used in place of the information contained in BS 5228 Part 1 Appendix C for prediction purposes.

It is open to Devon County Council to specify planning conditions setting noise limits to important individual items of plant and equipment, eg those with certain tonal noise characteristics.

8. Acoustic double glazing and secondary glazing: In addition to planning conditions and voluntary agreements to control noise emissions, Devon County Council may exceptionally find it appropriate to ask developers to pay for acoustic double glazing or secondary glazing for people who live in noise-sensitive properties. These requests will be consistent with the Government's general policy on the use of planning obligations, set out in DoE Circular 16/91 (WO 53/91), and will only be

made where the need for double glazing or secondary glazing is directly related to the nuisance caused by the development.

The use of double glazing and secondary glazing should not be seen as alternatives to other measures to control noise emissions, nor should their installation be seen as a means of legitimising higher noise limits. Instead they should be seen as additional safeguards on the quality of life for local residents.

Specifying Noise Limits

1. Type of limit: Depending on circumstances, it may be appropriate to set either:
(a) an absolute limit based on the average level of noise which should not be exceeded in a specified time period;
(b) a relative limit based on the permitted increase in noise level with respect to the background level. This is the approach used in BS 4142:1990.

2. Noise index: Because noises vary over time and have different characteristics many indices have been developed to describe noise levels. The equivalent continuous noise level over a time period T (LAeq,T) has emerged as the best general purpose index for environmental noise. For road traffic noise LA10,18h is still widely used; and to describe background noise LA90,T is appropriate.

3. Monitoring point(s): Normally the noise limit will be chosen to protect the nearest noise-sensitive premises and the best position for the monitoring point(s) will often be outside the sensitive premises. However, this does not mean that the monitoring point must always be close to the premises. Normally noise limits refer only to noise from the source under consideration and not to the total measured value which may include, for example, traffic noise. In situations where extraneous noise makes monitoring difficult it may be easier to monitor a suitably adjusted level at the boundary of the site instead of outside the premises to be protected. This approach requires that the noise level at the boundary monitoring point is a reliable indicator of the level at the building to be protected and this may not be the case if the noise source is mobile. Monitoring points should be accessible to all parties concerned.

4. Meteorological conditions: The noise level measured at a monitoring point will be affected by wind speed and direction, and temperature gradients, particularly when the monitoring point is remote (>30m) from the source. The size of these effects is hard to predict, and so measurements (or predictions) should be made under reasonably stable conditions. A suitable condition is a light wind with a vector component up to 2 m/s from source to receiver; this will increase the noise level by about 2 dB(A) compared with the no wind case.

For further information or planning application forms, please contact:

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Glossary

Decibel (dB): a unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 Pa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB(A): decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).

Hertz (Hz): unit of frequency, equal to one cycle per second. Frequency is related to the pitch of a sound.

LA10,T : the A weighted level of noise exceeded for 10% of the specified measurement period (T). It gives an indication of the upper limit of fluctuating noise such as that from road traffic. LA10,18h is the arithmetic average of the 18 hourly LA10,1h values from 06.00 to 24.00.

LA90,T : the A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 1990 it is used to define background noise level.

LAeq,T : the equivalent continuous sound level -the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). LAeq,T is used to describe many types of noise and can be measured directly with an integrating sound level meter. It is written as Leq in connection with aircraft noise.

LAm_{ax}: the highest A weighted noise level recorded during a noise event. The time weighting used (F or S) should be stated.

Noise and Number Index (NNI): A composite measure of exposure to aircraft noise that takes into account the average peak noise level and the number of aircraft in a specific period. Now generally superseded by Leq.

Noise index: a measure of noise over a period of time which correlates well with average subjective response.

Rating level: the noise level of an industrial noise source which includes an adjustment for the character of the noise. Used in BS 4142: 1990.

Rw: single number rating used to describe the sound insulation of building elements. It is defined in BS 5821: 1984.