

For the building services designer there is a need to appreciate a method by which environmental noise can be monitored and assessed. With this information, the designer can agree limits with the Local Authority Environmental Health or Planning Officer at the boundary of the development, or at the nearest residential or commercial properties. If required, noise control measures can be implemented such as plant attenuation or the setting of limiting noise levels for specific plant and equipment.

BS 4142:1997“Method for rating industrial noise affecting mixed residential and industrial areas”

This standard can be used as a method of determining the level of a noise applicable to a development site, whether new build or the refurbishment of an existing building.

Measuring environmental noise generally in accordance with BS 4142:1997

The **specific noise level** is the equivalent continuous A-weighted sound pressure level of a specific noise source determined at the assessment location, over the time interval T. For existing noise sources the specific noise level is usually determined by direct measurement. If the specific noise source is not yet in operation, the specific noise level may be determined by calculation or by measurement of an existing “similar” type of source.

The **background noise level** is defined as the A-weighted sound pressure level of the residual noise, exceeded for 90% of the time interval, T. The background noise level is measured in the absence of the specific noise source, over a representative period of the plant's actual/proposed operation. Measurements are normally made at the assessment location, although where this is not possible measurements can be made at another position which is assumed to be equivalent.

Certain acoustic features can increase the likelihood of complaint over that expected from a simple comparison between the specific noise level and the background noise level. These features include discrete continuous notes; whines, screeches, hums, or distinct impulses; bangs, clicks, clatters etc.. Where present at the assessment location, such features are accounted for by adding 5dB to the measured or calculated specific noise level. Addition of the 5dB correction to the specific noise level gives the **rating level**, applicable at the assessment location.

Assessing the likelihood of complaint

The Local Authority Planning or Environmental Health Department often have standard conditions relating to mechanical plant noise emissions, and these usually form an appropriate basis for design. In the absence of specific Local Authority guidance, BS 4142 gives general advice on the likelihood of complaint as follows:

- A difference between the rating and background noise level of around +10 dB or more indicates that complaints are likely.
- A difference between the rating and background noise level of around +5 dB is of marginal significance.
- If the rating level is more than 10dB below the measured background noise level, then this is a positive indication that complaints are unlikely.

Limitations of BS 4142:1997

The standard is necessarily general in nature and may not cover all situations. For example, the method is not suitable for assessing the noise measured inside buildings, or when the background and rating levels are both very low, i.e. below about 30dB(A) and 35dB (A) respectively.