



The Cost of a Creeping Background



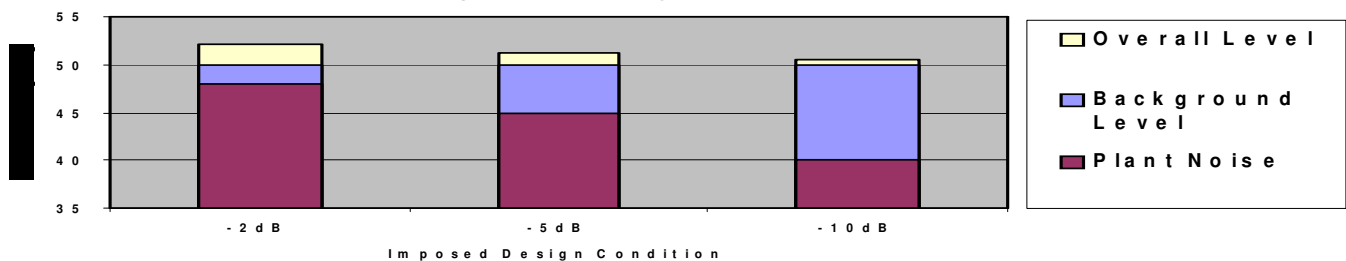
In a bid to stem creeping background noise levels there is a trend for Local Authorities to impose ever more stringent conditions on environmental noise emissions from building services plant and operational noise sources.

For example, it is now increasingly common for Local Authorities to impose conditions requiring building services noise emissions to be designed 10dBA below the minimum existing background, which is very stringent and of questionable justification. In some cases the imposed design conditions are expressed in terms of individual octave or 1/3 octave bands, in which case they are normally even more onerous – far more so than may at first appear from the numerical value.

Entertainment noise is now usually required to be completely inaudible at residences, particularly at night.

These trends have significant implications for most projects, both physically and financially, as this Client Information Bulletin explains.

Chart Showing the Effect on the Overall Noise Climate for Various Imposed Design Conditions



The following summarised extracts are examples of how building services environmental noise criteria have become more stringent in the past few years within certain Inner London Authorities:

“Old” condition: *‘The proposed air conditioning and refrigeration plant shall be so constructed as to ensure that noise generated will not increase the background $L_{A90(15mins)}$ noise level, as measured one metre from the nearest window of the nearest affected accommodation, by more than 2dBA at the most noise sensitive time of operation, i.e. the period of lowest background level.’ Note: This equates to designing plant noise to a level of 2dBA below the background L_{A90} .*

“New” condition: *‘All new plant and any associated equipment should be designed to a level of 10dBA below the lowest measured background $L_{A90(15mins)}$ noise level as measured one metre from the nearest affected window of the nearest affected property.’*



Photograph showing two air-cooled water chillers with full attenuation packages.

Are these stringent criteria new ?

No! Noise restrictions in planning conditions have always been at the discretion of the Local Authority and even of the individuals within the Authority. However, recently there has been a dramatic increase in stringency, with numerous Local Authorities having adopted far more onerous policies and standard conditions. For example, the City of Westminster's previously long standing condition of – 2dBA has now been replaced with –10dBA.

What is the difference between designing to – 2dBA or –10dBA?

The bar chart opposite illustrates the difference between the range of commonly encountered criteria, assuming a typical background noise level of 50dBA. Taking the two extremes, it can be seen that designing to 2dBA below or 10dBA below the background level equates to an overall increase of only 2 d B A or 0.4 d B A respectively. The combined noise level is therefore only 1.6dBA less with the more stringent criterion. However, due to the law of diminishing returns, this small overall benefit requires plant noise to be attenuated by a massive additional 8dBA. This has significant physical and cost implications as explained overleaf.

Are there any grounds for appeal ?

Yes! It is a legal requirement that Planning Conditions are both “reasonable” and “necessary”. A successful appeal may be possible in some cases, where it can be demonstrated that a Condition does not satisfy either of these criteria. However, such an appeal is

unlikely to be successful where new industrial developments are constructed in residential areas. Essentially, the grounds for appeal depend on the characteristics of the noise and the sensitivity of the receiver location.

What happens if we don't comply ?

With regard to noise from fixed plant, if non-compliance is proven, a Court injunction could be obtained preventing operation of the plant. This in turn could prevent the premises from even being occupied.

With regard to noise from entertainment or licenced premises, non-compliance can result in non-renewal of the licence. In extreme cases, the Magistrates Court could issue a Noise Abatement Notice, or even revoke the licence.

What are the implications for buildings containing noisy operations?

For buildings containing noisy operations, whether they be leisure (e.g. pubs, nightclubs, cinemas, aerobics studios) or industrial, the implications can be significant. In most cases it is likely that increased sound insulation will be required. This means greater space requirements, increased loadings and extended programmes – all of which mean additional cost.

In some cases it may not be even practicable to achieve the level of sound attenuation required. In these instances it is necessary to investigate non-engineering solutions, such as limiting the noise at source or changing juxtapositions. In extreme cases there may be no way in which the noise can be accommodated within the constraints of the project.

What are the implications for building Services?

For most sites it is fairly inevitable that:

- plant space and height requirements will be greater, in order to accommodate additional attenuation and (in the case of heat rejection plant) lower fan speeds and larger coils. All such implications can attract significant costs;
- capital and maintenance costs, together with energy consumption, will all be higher.

In many cases it is likely the basic design principles will need to be radically changed. For example, plant may need to be relocated and/or external heat rejection plant replaced with bespoke units or split systems. These systems will need all noisy components to be accommodated inside plantrooms and/or acoustic enclosures.

What design disciplines need worry about this trend ?

The Architect will have to consider greater building services plant space requirements. The Quantity Surveyor will need to re-evaluate the budget for acoustic hardware. The Planning Consultant may also need to consider a changing roofscape.

When are these conditions best tackled ?

These conditions should be considered as early as possible within the design process. Once the environmental noise climate and noise criteria have been established, the acoustic consultant should be commissioned to undertake a feasibility study of any proposed scheme. Consideration of these conditions at any later stage could result in additional costs due to significant re-designs and remedial works.

Hann Tucker Associates, the leading independent UK acoustic consultancy, can provide the necessary advice and professional assistance in tackling onerous environmental noise criteria.

By using the specialist knowledge and expertise HTA has gained during more than 30 years of practical consulting, potential problems can be quickly identified and cost effective solutions developed.



Hann Tucker Associates Consultants in Acoustics Noise & Vibration

Head Office:
Duke House, 1-2 Duke Street
Woking, Surrey, GU21 5BA
Tel: 01483 770595
Fax: 01483 729565

Northern Office:
First Floor, 346 Deansgate
Manchester, M3 4LY
Tel: 0161 832 7041
Fax: 0161 832 8075

Email: enquiries@hanntucker.co.uk

Web: www.hanntucker.co.uk