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PPG24 - A CONSULTANT'S VIEW

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1. INTRODUCTION

I started working in the acoustics field in January 1995, and was given a copy of PPG24 when I was shown my desk. I have the advantage of having nothing to compare it with, as I have never used Circular 10/73. What follows is a personal view, borne of a series of struggles to use the document in the context of its application to real life.

I was not involved in the consultation process for PPG24, and I readily acknowledge that criticising what exists is far easier than the task of writing from scratch.

2. PPG24 - A BRIEF GUIDE

2.1 The objectives of PPG24

PPG24 has been the Standard for the assessment of noise as a planning issue since it came out in September 1994.

The purpose of PPG24 is to provide guidance to Local Authorities on the allocation of land for various uses within their local plans, and the control of subsequent development in respect of noise. Paragraph 2 of the introduction makes it clear that: *'...the planning system should ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail, and air transport and certain types of industrial development).'*

The main objective for producing a national document must be, by implication, a desire to ensure reasonable consistency between different authorities. It must also be to clarify the issues which should be taken into account when considering sites for possible development, or proposed developments for possible approval.

2.2 The contents of PPG24 - an overview

The document's Introduction and General Principles sections contain a rational, sensible, common-sense background to the complex issues around noise and planning. For example:

Paragraph 1: *'(PPG24)..outlines some of the main considerations which local planning authorities should take into account in drawing up development policies...'*

Paragraph 7: *'.. plans should contain an indication of any general policies which the local planning authority propose to apply in respect of conditions or planning obligations'.*
Paragraph 11, on development control: *'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'.*

The rest of the document's main text is in a similar vein, rich with common sense and useful comment, addressing a range of issues including Noisy Development and Noise-Sensitive Development : the 'noise-to-people and 'people-to-noise' scenarios. The document is generally even-handed, perhaps sometimes to the point of becoming ambiguous, giving either side ammunition in a debate, but the general flavour is of balance and judgement. So far so good.

Annex 1 contains the Noise Exposure Categories for Dwellings, and the advice to apply to sites falling into each category. No doubt most will be familiar with them, but they are reproduced here for ease of reference:

NEC	
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection from noise.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

NOISE LEVELS CORRESPONDING TO THE NOISE EXPOSURE CATEGORIES FOR NEW DWELLINGS $L_{Aeq,T}$

NOISE SOURCE	A	B	C	D
Road traffic				
0700-2300	<55	55-63	63-72	>72
2300-0700	<45	45-57	57-66	>66
rail traffic				
0700-2300	<55	55-66	66-74	>74
2300-0700	<45	45-59	59-66	>66
Air traffic				
0700-2300	<57	57-66	66-72	>72
2300-0700	<48	48-57	57-66	>66
Mixed sources				
0700-2300	<55	55-63	63-72	>72
2300-0700	<45	45-57	57-66	>66

Most of the problems I have had with PPG24 have centred around the interpretation of these NEC's.

Noise is a complex issue: highly subjective in impact, often variable in nature, esoteric in its mathematics. The NEC table offers an opportunity to present all that complexity in a single number - the 'average L_{Aeq} ' from a site survey. All the common sense in the main text of the document is swept away in favour of a single, simple, simplistic rating. There are warnings on the limitations of use for the table, but the power of the numbers appears to be almost hypnotic, drawing attention away from the accompanying words.

3. USING PPG24 IN PRACTICE

3.1 Background

PPG24 is intended for use in assessing the noise issues surrounding a large range of planning scenarios. Two of the most common are the identification and assessment of sites for potential development for housing, and the assessment of housing development proposals. It seems to me that PPG24 is flawed in not making the distinction between the two. However, a large proportion of the document is aimed in the general direction of housing development, so for that reason, and in the interests of brevity I will concentrate my attention here.

Annex 1 describes the NEC procedure and its scope. Para 4: *'The NEC procedure is only applicable where consideration is being given to introducing residential development into an area with an existing noise source rather than for the reverse situation where new noise sources are to be introduced into an existing residential area...'*

Para 8 contains the main instructions on how to carry out the rating:
'Values in the table refer to noise levels measured on an open site at the position of the proposed dwellings, well away from any existing buildings, and 1.2m to 1.5m above the ground. The arithmetic average of recorded readings should be rounded up. Where that average falls on the boundary between NEC's B and C it will be for the local planning authority to determine which is the more appropriate NEC for the proposal.'

The instruction appears straightforward, but on closer inspection of it and the document as a whole various problems emerge. Let us consider a few of them one at a time. Most of my experience has been with road and rail traffic noise and development planning, so I will use examples from that to illustrate a few points.

3.2 '...the position of proposed dwellings'

PPG24 is intended to help local authorities drawing up Local Plans. At Local Plan stage, there will not usually be any 'proposed dwellings'. If there are proposed dwellings, then it is likely that the site has already been identified as appropriate for housing for other reasons, and the table of advice relating to the NEC's may have already been undermined.

3.3 'The arithmetic average of recorded readings should be rounded up.'
Let us take a site next to a busy road. I measure at a representative position, in (attempted) accordance with para.8 quoted above. But what does 'the arithmetic average of recorded readings' mean? Do I measure at the position of every proposed facade (assuming this is known) and average those readings? (Please no!) or do I take spot readings at various times of the day and average those? Or both?

Leq meters are extensively used now. Do I make a separate note of all event leqs and the quiet bits in between and then arithmetically average those? (I could, couldn't I!)

For a large site, any measure of 'average' will conceal details that dwellings nearest the noise may be exposed to levels which will cause unacceptable internal levels.

This is a very carefully worded phrase - but it's intention is unclear (to me, at least).

3.4 'Measure at...1.2m to 1.5m above the ground'
Consider a flat site next to a busy road, with the road in a deep cutting. An existing fence along the boundary of the site provides excellent screening to the site such that on-site noise levels are category B, so ordinary thermal double glazing would provide a good standard indoors, and garden levels are generally acceptable.

But what about first floor? It is possible to measure at first floor levels using extension poles, but for higher buildings, calculation is often the only way. PPG24 does not recognise explicitly that conditions at first or higher floors can be significantly different to those at ground floor, or that higher floors are more difficult to protect using bunds or screens.

Let us say that first floor noise levels close to the barrier are in category 'D'. (Although if I were to average the noise levels for each dwelling position, the detail of high levels at a few dwellings would be concealed). Planning permission will probably be granted because 'the site' is in Category B. The pressure to squeeze as many dwellings as possible onto the site places a whole row of dwellings too close to the barrier for it to acheive any real reduction in noise to bedrooms. By the time I see the layout for the first time, it is too late to change much without redesigning the whole layout, which is judged too costly an option. I have to take the given layout and 'make it work'. A 'stable door' job.

Rating a site based on ground floor measurements only is an oversimplification, and takes no account of the intended development. This is commonsense, but doubt other consultants have found it convenient to follow the letter of the guidance rather than the spirit when it suits their clients purposes.

3.5 '(Local) plans should contain...general Policies (on noise)'
When I start on a 'planning' project for a developer, I contact the EHO who will be dealing with it to find out about local policy, as stated in the local plan, or from planning conditions, or similar sources. This gives me a lot of useful information about how my report will be

interpreted. In my experience, 'local policy' often causes its own problems. Some anonymous examples of recent advice from local authorities follow:

'Planning controls will be applied to ensure that new residential developments are designed to achieve a maximum internal L10 of 40dB from 0700 to 1900 in living rooms and 35 dB from 2200 to 2400 in bedrooms'. What about midnight to 7am? And what about that all-important 'A'? 40dB is not 40dBA. And L10? Fine for road noise, but some of the busiest railway lines in the country do not trigger the L10 for train noise.

'Noise reduction is to comply with British Standard 8233...bedroom internal noise criterion - Leq 30-33dBA; living rooms internal noise criterion - Leq 40 dBA' - over what period must this be measured? Any 2 minutes? and if it is quieter than 30 Laeq at night in bedrooms, that will be unacceptable? BS8233 does not specify noise reduction.

My own favorite is the most common: *'We use PPG24'*. PPG24 is not a policy. It is a policy guidance.

Once errors and misunderstandings are sorted out, I can proceed: If the local criteria are more generous than those allowed by PPG24, I get on with the job and submit the report. If local criteria are tighter than those allowed by PPG24, I negotiate with the EHO, using whatever limits my concience will allow. (I usually rely on WHO guidelines, upon which some of PPG24 is based.)

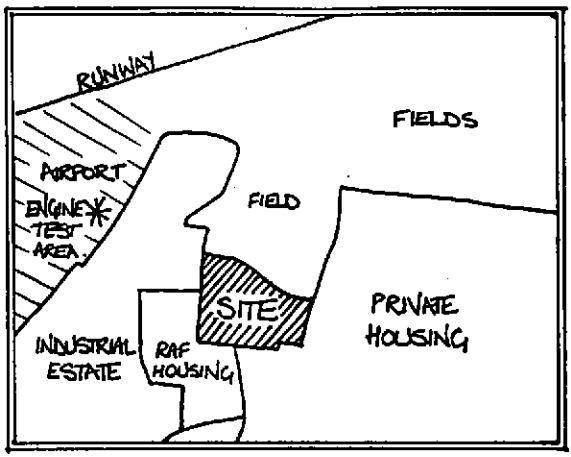
Most of the examples above are consistent and sensible in one respect- they ignore the NEC categories and rely on the achievement of noise levels within dwellings (and sometimes in gardens and open spaces).

There is one common omission from local authority criteria. Are internal levels to be met with windows open, closed, or with trickle vents open? The difference in facade levels which will acheive these levels is around 20dBA. ***This is as large a range as the whole NEC table.***

On some jobs, I have been required to show that we can meet the internal levels with windows closed, and on others with windows open. One authority wanted mechanically assisted ventilators where the levels on any facade were in category B, while another authority was content to allow facade levels of 68L $_{Aeq(day)}$ and no ventilators of any kind.

PPG24 is clearly not acheiving consistency between authorities, and my feeling is that acousticians are often being involved in the planning process in order to quantify and report on the status quo, rather than to achieve any improvement in conditions.

Take the example below, which I was involved with for the Local Authority against a major developer at an appeal against the Local Plan.



The local authority was keen to keep this greenfield site as a buffer between the existing housing and the airport and the industrial estate, in keeping with the objective of separating noise sensitive development and noise wherever possible. The developer's Expert measured the noise levels and found them to be generally in category A, if short duration intermittent high noise levels from the aircraft engine test facility were ignored as 'unrepresentative and unsubstantiated'.

From experience, the environmental health team knows that they will get complaints from homes here which will increase the pressure on the airport, and which will give rise to restrictions on the activities of the industrial estate. The Local Authority team fought the appeal against the local plan mainly in order to be able to say to the future complainants that they knew there would be trouble before the houses were built, but were overruled by the Inspectorate 'so hard luck, there is nothing we can do'.
I suspect this happens a lot. But it is hardly an effective way to conduct planning policy, wasting time and money on appeals, simply to acheive the defence of 'we told them so' against future complainants. The existence of the NEC table seems to deny Local Authorities the chance to use their judgement and experience to steer development away from sites where they expect problems, whatever the numbers say.

The overall picture of the noise affecting this site was a complex one, and the use of Leq was an oversimplification which gave an unrealistic impression of the site. The developer's expert justifiably included the noise from selected engine testing in the Leq. PPG24 states

3.6 Mixed sources and Industrial noise

If a site is affected by industrial noise and -say- road noise, the advice is to test if either is dominant. If the road noise is dominant, fine, use the road noise section of the table. If not, refer to paragraph 19 of annex 3, which says to use BS4142. It does not say whether the liklihood of complaint should be taken into account in granting planning permission, or who should pay for noise control if it ends up being required.

Take this example: Category A site. Road noise dominant, but only just. Ignore the industrial noise. Build the houses, with bunding against road noise as required. Complaints flood in about the industrial process. For five minutes in every hour, day and night, the factory screeches and hums at 50 $L_{Aeq(5\ minutes)}$. Background due to road noise is 44$L_{Aeq\ (night)}$. Clear cause for complaint. Take action against the factory on the strength of BS4142.

The letter of PPG24's NEC advice has been followed, but the planning system has failed to meet its primary objective of separating noise and noise-sensitive development. The costs to the factory of meeting tighter noise control standards, and the implications for local employment have not been considered.

3.7 General Problems

As I have already said, the numbers of the NEC table are a powerful force against which the arguments and caveats in the text of PPG24 are relatively ineffectual. The correct application of PPG24 to any particular situation depends on those using the document having a basic understanding of noise calculation methodology and its limitations, and a general understanding of the logarithmic scale and its implications. (What does +10dBA *sound* like?).

Ultimately, the judgement may end up in the hands of a Planning Inspector. I quote below from a judgement by an Inspector on a recent case where noise issues were critical for a multi-million pound industrial development, and make no further comment about it:
'When the site consists of undeveloped open land, I find it difficult to see how noise measurements (around the site) would have yielded useful information on whether a night-time ban should be imposed on various noisy activities once it was developed.'

4. THE NEC'S - WHAT DO THEY MEAN?

The assumption by developers and local authorities is often that a site can be assessed 'in accordance with PPG24' and that the resulting report will rubberstamp the development and make it absolutely clear what has to be done in order for it to comply.

4.1 Category A - 'Noise need not be considered'

Most of the time, this advice will be appropriate, but for some situations it allows developers to force through plans for unsuitable sites.

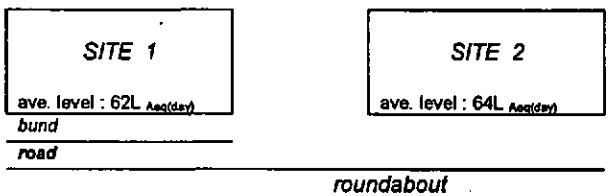
in several places that factors such as the character of intermittent noise should be 'taken into account', but it does not make clear how this should be done. In the absence of clear guidance, the NEC table takes precedence in almost all circumstances. A 16-hour or even 8-hour Leq can hide a lot of problems.

4.2 Category B v Category C

B - '..noise should be taken into account...conditions imposed...'

C - '...Planning permission should not normally be granted (unless) conditions (are) imposed.'

Consider these two sites:



Majority of traffic turns left onto main road at the roundabout.

Site surveys put site 1 in category B, site 2 in category C. But with bunding, site 2 would be a better site for housing than site 1. The logic of this argument crops up frequently, and so I lead the EHO through it, working towards an agreement to look at internal levels in proposed dwellings rather than a less helpful 'site rating'.

The noise you measure on site does not necessarily give a good indication of the noise which will affect any future dwellings on the site, unless you do all the sums. But then what do you assess the sums against? The Table talks about levels 'on an open site'.

In practice the distinction between categories B and C can often prove to be meaningless. The phrase in the Category C advice *'...where it is considered that permission should be given..'* ALWAYS APPLIES. Considered by whom? The developer? Me? The Advice is aimed at local authorities, but is available to all interested parties.

Following the letter of the guidance, noise levels can usually be reduced by engineering work to take the rating into the next category down. Reassess the site, and a new set of guidance applies. Hint for developers: build the bund first, *then* get the site assessment done. Anything below Cat D and you can go ahead. And even Cat D is not always a problem...

4.3 Category D - 'Planning permission should normally be refused'

There will be occasions where it makes sense to develop a site with noise levels in category D. ADL has helped with the design of successful developments adjacent to some of the busiest rail lines in the country, with noise levels of 70$L_{Aeq\ (night)}$, and frequent maxima

of over 82 $L_{amax,f}$, clearly in catelory D. The dwellings were designed as single-aspect, with only tiny windows to bathrooms in the noisy wall and all living rooms and bedrooms facing away from the railway. The finished dwellings achieved good standards for internal levels of noise, and can be considered a success. Potential purchasers were able to judge for themselves the internal noise standards, as external noise events were regular and frequent. There have been no reported noise problems with the dwellings.

5. THE WAY FORWARD - A PERSONAL VIEW

Throwing mud at a target is easy- so what about constructive suggestions?
Given a blank sheet of paper and an instruction to redraft PPG24 in half an hour, I would keep most of the words, but I would scrap the existing NEC table in favour of advice which defined targets in terms of internal noise levels in habitable rooms and external levels in amenity spaces and gardens.

A good system would have to address two distinct audiences: local authorities, looking for advice drawing up their local plans, and developers, who want to know how much work they would have to do on a particular site to get a plan passed for noise.

Local Authorities could assess potential sites against a single number: 55L $_{Aeq}$ (Day or sample?), *and their own judgement*. Below 55? =noise is *probably* no problem. Above 55? =advise developers to see a noise specialist before drawing up their layouts, and make clear to them that the higher the number, the more difficult it will be to meet the required levels. **Equal weight** should be given to the number *and* the more subjective assessment (based on BS4142?) of any noise problems which might be anticipated. The system has to make allowances for the need to describe complex situations with more than one number.

The overall targets could be the levels determined by the WHO, that is 45 $L_{Aeq\ day}$ in living rooms, 35 $L_{Aeq\ night}$ in bedrooms, and 55 $L_{Aeq\ day}$ in amenity areas and gardens.

Planners and deveopers need an answer to the question: Would dwellings on this site offer a reasonable environment to occupiers? In summary the answers are straightforward: Category A=YES B= MAYBE C= NO

Category A: Noise need not be considered as a planning issue.
External levels will be below 55 $L_{Aeq\ day}$ in all gardens and amenity areas, regardless of layout or screening. Acceptable internal levels can be acheived with windows open.
Subjectively householders would be unlikely to have any cause for complaint about any existing or planned installation or feature which generates noise in the area.

Category B: Potential problem: Acceptable levels can only be acheived with effort. Scheme of protection must be shown.
Developers must show that internal levels can be met with adequate alternative ventilation in place where windows cannot be opened without exceeding the limits. Engineering work to the whole site (bunds/screens), site layout, and sound insulation measures may all be

utilised. There may be a marginal liklihood of complaints about any existing or planned installation or feature which generates noise. Planning permission should normally be granted where the WHO limits (internal and external) can be achieved within an acceptable scheme. The WHO limit for gardens and amenity areas may be relaxed for appropriate developments. Internal criteria should only be relaxed in exceptional circumstances.

Category C: Planning permission should be refused. Internal noise criteria cannot be met.

It is not possible to determine a noise limit for the boundary between the new categories B and C - as described earlier, single aspect dwellings can sometimes make impossible sites possible.

Not perfect. But possibly better.

6. CONCLUSIONS

Noise is measureable, and therefore quantifiable. PPG24 offers us a straightforward mechanism for making decisions based on a simple measured quantity. But there are problems with its interpretation and application.

The NEC table is the key to PPG24 in respect of housing, but the logic forming the foundations of the table crumbles under the pressure of real life. Potential development sites are not all equal, and the potential for noise reduction to a whole site from engineering solutions can vary enormously. Reaction to noise varies according to a large range of factors including noise source, noise quality, time of day, the weather, duration of events, pre-exisiting conditions, background levels, age of the listener and so on. It is not reasonable to deal with the complexity of an issue by oversimplifying it.

In a perfect world, the common sense of the words in the body of PPG24 would carry the day, but common sense is often an early victim in a commercial world. Developers of housing can consider the current NEC table as a powerful weapon in their favour, even though the current muddles over its interpretation and application cost them dear in time and money.

PPG24 is useful in enabling Local Authorities to require site engineering works or the installation of ventilators to mitigate the effects of noise, but in my experience, it demonstrably fails to meet its own primary objective: ***'the planning system should ensure that wherever practicable, noise-sensitive developments are separated from major sources of noise'.***

6. REFERENCES

1. PPG24 - Planning Policy Guidance : Planning and noise. Dept. of the Environment, Sept. 1994.