Proceedings of the Institute of Acoustics

UNSOUND INFORMATION ALLOWS NOISY DEVELOPMENTS?

D L Watts

Acoustical Investigation & Research Organisation Ltd, Hemel Hempstead, Herts

1. ABSTRACT

This paper presents the progress of a hypothetical Noise Exposure Assessment of a residential development, in the context of PPG 24. By exaggerating the problems faced by the Noise Consultant during the progress of the project, from the initial enquiry to the aftermath of the Noise Report, the paper seeks to illustrate issues of interpretation and implementation, both of PPG 24 itself and in the wider context of the planning process. In particular the paper seeks to show how poorly worded information about noise by either party, Local Authority or Noise Consultant, can lead to developments being exposed to far higher levels of noise than intended.

2. INTRODUCTION

The characters in this paper are Mr Snowed-Under and Mr Harassed, Planning Officer and Environmental Health Officer respectively of Dithertown District Council, Mr Armtwisted of Bent Ear Noise Consultants and Mr Roofless of Buildanywhere Developments.

3. THE BRIEF

Bent Ear Noise Consultants are engaged by Buildanywhere Developments. The brief is to conduct and report a noise assessment for their proposed residential development "which will meet Dithertown District Council's Planning Conditions for noise". Mr Armtwisted is informed by Mr Roofless that the housing layout and density is unalterable, that noise fences or mounds above 2 m high are unacceptable and they don't like secondary glazing or mechanical ventilation. "Oh and by the way the site is bordered to the south by a major trunk road. Could we have your report by the end of tomorrow?"

Mr Armtwisted telephones the Planning Officer and requests a copy of the Planning Condition(s) for noise for the site. The next day the following photocopy is received.

A scheme of works shall be submitted such that free-field noise levels at 1 m from the facade of any dwelling shall not exceed an L_{10}(16-hour) value of 65 dB(A) over the daytime period.

In the light of experience of other projects Mr Armtwisted checks with Mr Harassed in Environmental Health, the person who is suspected as the one to pass judgement on the noise report. "Of course we're working to PPG 24 now, any noise assessment should be to PPG 24".

4. THE METHODOLOGY

Bent Ear Noise Consultants favour prediction over measurement for traffic noise assessment since:-

- Calculation of Road Traffic Noise *is a universally accepted* methodology
- Calculation of Road Traffic Noise itself states, *prediction shall constitute the preferred method.*
- Annual Average Weekday Traffic forecasts are the foundation of the prediction method, not Specific One Off Encountered on the measurement day traffic flows.
- Future noise levels cannot be measured.
- Bent Ear Noise Consultants experience is that measured traffic noise levels almost always fall below equivalent predicted traffic noise levels, presumably because CRTN predictions are based on *moderately adverse wind velocities and directions* thus reports based on predictions err on the side of caution.

The response from Mr Harassed is uncommonly specific - "I will expect to see noise measurements in the report". The case for prediction only is gently reiterated. "I will expect to see noise measurements in the report". A third attempt is made using as much tact and diplomacy as possible to avoid antagonising Mr Harassed. "I will expect to see noise measurements in the report".

The cost of the noise report doubles but Mr Armtwisted consoles himself with the thought that he will at least get to visit the site enabling him to visualise some of the topographical information supplied in a very unclear photocopied drawing. The site is not secure so he decides that he cannot take the risk of leaving equipment overnight to measure night-time noise. He knows that it is not worth even proposing a very expensive manned overnight survey to Mr Roofless.

In any event he dreads justifying the hefty increase in the price for the work to Mr Roofless, he can anticipate the reply already - "We're on a very tight margin with this development, a couple of hundred pounds extra and the whole viability of the project is in doubt".

Somehow Mr Armtwisted can never quite reconcile a development of 25 houses hinging on a few hundred quid.

5. THE SURVEY

The on-site traffic noise measurements go unusually well. Mr Armtwisted manages to park within 100 m of the measurement points, only has to negotiate one padlocked gate and even the gamble that TV's Suzanne Charlton was being pessimistic in forecasting gales has paid off. The vehicle repair shop in the middle of the site came as a surprise.

It later transpired that Buildanywhere Developments had bought the repair shop out and were intending to demolish it "we didn't think it would affect the noise measurements so we didn't tell you about it".

Measurements of free-field traffic noise were made over the 3 consecutive hours (11:00 to 14:00) at 1.2 m above local ground at the position of the proposed facade, closest to the road.

The readings obtained were:-

	L_{10} in dB(A)
1100 - 1200	63
1200 - 1300	62
1300 - 1400	64

The free-field L_{10}(18-hour) value was obtained in accordance with the Shortened Measurement Procedure defined in Calculation of Road Traffic Noise.

Free-field L_{10}(18-hour) = 62 dB(A)

6. FURTHER ANALYSIS AND REPORTING

Back in the office, Mr Armtwisted sets up a prediction model to enable him to:

- predict noise levels at other proposed facades and floor heights across the site,
- allow for the potential screening effects of the proposed buildings themselves,
- evaluate noise barrier possibilities,
- predict future noise levels,
- quickly recalculate noise levels in response to the inevitable surprise layout changes.

The noise prediction model, in accordance with Calculation of Road Traffic Noise, presents results as L_{10}(18-hour) dB(A) noise levels.

Mr Armtwisted decides that the trunk road is sufficiently new to warrant allowing for 15 years traffic growth in the prediction model.

The predicted noise level at the position of the ground floor facade closest to the road, ie at the same position as the noise measurements, he determines as:-

Facade L_{10}(18-hour) = 68 dB(A)

Realising that 68 dB(A) places the site at the boundary point between NEC's B and C, he evaluates a 2 m high noise barrier at the boundary of the site adjacent to the road. Although the topography restricts the performance of the barrier it nevertheless reduces the predicted noise level by 1 dB to 67 dB(A).

Mr Armtwisted writes his report concluding that the site, in the worst case, is in NEC B. He takes great care to explain the various noise indices and conversions using wherever possible the words of PPG 24 itself.

7. THE RESPONSE

Some time later a facsimile arrives from Mr Roofless, a request that Mr Armtwisted responds to observations made about the Noise Report by the Planning Officer who "will be recommending that Planning Permission be refused". In terms of noise the Planning Officer has been advised by his Environmental Health Department that their own noise measurements indicate traffic noise levels at the closest facade place the site in Noise Exposure Category C, as defined in PPG 24. The Environmental Health Department's noise report is appended and Mr Armtwisted peruses it with interest. An extract from it is shown below:-

My officers conducted a measurement survey, also following the Shortened Measurement Procedure employed by Bent Ear Noise Consultants. Measurements were made at 1.2 m above local ground at the position of the proposed facade, closest to the road.

The value obtained in accordance with the Shortened Measurement Procedure was 63 dB(A). Whilst this level is very similar to that measured by Bent Ear Noise Consultants I conclude that the site is at the boundary of NEC's B and C where *it will be for the local planning authority to determine which is the more appropriate NEC for the proposal.*

Mr Armtwisted writes a hurried response explaining that the free-field L_{10} (18-hour) value of 63 places the site in Noise Exposure Category B but the damage has been done, the Planning Officer is already set against development and regards the further submission about noise as the action of a condemned man clutching at straws.

The sub-committee upholds the Planning Officers recommendation and the development is refused planning permission.

8. COMMENTARY

PPG 24 allows a nationally equivalent traffic noise level to be represented as, for instance:-

Facade L_{10} (18-hour) of	68 dB(A)
Free-field L_{10} (18-hour) of	65 dB(A)
Free-field $L_{Aeq,16h}$ of	63 dB

UNSOUND INFORMATION ALLOWS NOISY DEVELOPMENTS?

Misunderstandings about what a numerical value means in terms of a noise level leads, in some instances, to development which meets PPG 24 noise level criteria being blocked and in other instances leads to development being permitted which exceeds PPG 24 noise level requirements.

A Local Authority policy which uses phrases like:-

"Development will not be permitted where noise levels exceed 68 dB(A)."

may enable a Report to be submitted which uses phrases like:-

"The measured noise level was 64 dB and therefore complies with Local Authority requirements."

If the LA requirement was intended to be a facade L_{10} (18-hour) noise level of 68 dB(A) and the consultant measured a free-field $L_{Aeq,16h}$ of 64 dB, although a noise level numerically 4 dB lower than required has been presented on behalf of the developer, a true like for like comparison can only be made when both are presented using the same index.

Index	Measured Noise Level	LA requirement
L_{10} (18-hour) facade	69 dB(A)	68 dB(A)
L_{10} (18-hour) free-field	66 dB(A)	65 dB(A)
$L_{Aeq,16h}$ free-field	64 dB(A)	63 dB(A)

It may be seen that the LA requirement has been exceeded and development should have been blocked.

This difficulty over noise indices has become a common problem for assessments of road traffic noise since the introduction of PPG 24 because the L_{10} (18-hour) index is enshrined in Calculation of Road Traffic Noise and The Noise Insulation Regulations.

It is assumed that traffic noise methodology will eventually adopt L_{eq} values, it is understood that there is research showing as good a correlation of average dissatisfaction against traffic noise with L_{eq} noise levels as for L_{10} noise levels.

Bear in mind that misinterpretation to the tune of 3 dB could enable houses to be built twice as near to the road as intended or could blight land over double the area than a correctly interpreted noise level.

8. CONCLUDING REMARKS

TO THE DEVELOPER

Employ a noise consultant at the time potential housing layouts are being considered, it must be more cost effective to have noise considered in the design at an early stage, there is a much lesser likelihood that unwelcome mitigation measures will be forced on the development if noise is considered early in the design.

TO THE LOCAL AUTHORITY

Be totally clear about the interpretation of, and acceptable conversions between different noise indices.

Accept properly conducted predictions of traffic noise as an alternative to measurements.

Apply PPG 24 as literally as the document allows, throw away lines like "noise in the gardens remains a concern" are not helpful.

TO THE NOISE CONSULTANT

Apply PPG 24 as literally as the document allows.

Be totally clear in the presentation of noise level information.

9. REFERENCES

PPG 24 Planning Policy Guidance : Planning & Noise
Department of the Environment
HMSO, September 1994

Calculation of Road Traffic Noise
Department of Transport and the Welsh Office
HMSO, 1988

The Noise Insulation Regulations 1975,
Statutory Instruments 1975 No. 1763, HMSO

The Noise Insulation (Amendment) Regulations 1988,
Statutory Instruments 1988 No. 2000, HMSO

ISBN 1 873082 81 9