READING BOROUGH LOCAL PLAN EXAMINATION
NOTE ON NOISE LEVEL IN POLICY EN17

The provisions within policy EN17 of the Submission Draft Local Plan on noise generating equipment were discussed on day 3 of the hearings (27th September 2018) under Issue 5. It was requested that the Council provide a note on this topic to cover the following matters:

- More information on the reason for the figure of 10dB below existing background noise levels; and
- Evidence of how the Council has applied this level in practice to date.

Reason for the Noise Source Specific Level

The significance of the 10dB below existing background noise levels quoted in policy EN17 is that this is the level below which the effects of additional noise sources will be considered to be "insignificant".

There are some published sources which back this up. Appendix 1 is an extract from The Little Red Book of Acoustics[1]. This discusses how the effects of additional noise is taken into account in acoustic calculations, and states that:

> "Two numbers of equal value, always sum to that number +3dB. If one number is 10dB smaller than that number, it is insignificant".

Further support for this is shown on the NoiseNet website[2], which sets out information on noise and vibration measurements. This states the following:

> **"Adding Noise Levels Together**
> Finally when adding or subtracting noise levels, the following table gives the appropriate corrections, to the nearest whole decibel.

Difference between the two levels [dBA]	Addition to higher level [dBA]
0	3
1	3
2	2
3	2
4	1
5	1
6	1
7	1
8	1
9	1
10 and over	0

[1] The Little Red Book of Acoustics: A Practical Guide (Second Edition), R. Watson and O. Downey, 2008
[2] http://www.noisenet.org/Noise_Terms_calcs.htm

> As an example if a noise source produces a level of say 53 at a particular location, and another source is to be installed which will produce say 59 at the same monitoring location, then the difference between the two levels is 6 dBA (59 - 53); therefore, from the table, the total level is calculated by addition 1 dB to the higher level, i.e. 60 dBA."

As can be seen, a difference of 10dB or more means that there is no addition to the higher level, i.e. this is once again considered insignificant.

Existing Application of the Noise Source Specific Level

As stated during the hearing session on 27th September, the noise level specified in the policy is a relatively frequent requirement for a variety of different noise-generating equipment, after consultation with the Environmental Protection team. It is generally applied through planning condition. In some cases, a pre-commencement condition requires a noise assessment which would need to demonstrate compliance with the requirement, although more usually the condition simply requires compliance with the stated levels.

One example of the type of equipment to which it might apply is air conditioning or related plant. For example, permission 172163 at 57 Milford Road is for *"Retention of external plant comprising 3no. extract ducts, 1no. extract vent, 2no. boiler extract flues, 1no. air supply louvre, 3no. air condenser units and external alterations comprising relocation of access door and installation of bike racks"*. Condition 3 of that permission is as follows:

> "3. The rating level of the plant/equipment hereby approved, LAr,Tr (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to sensitive facades, shall be at least 10dB below the existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation.
> Reason: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CS34 of the Reading Borough LDF Core Strategy 2008 (Altered 2015) and Policy DM4 of the Reading Borough LDF Sites and Detailed Policies Document 2012 (Altered 2015)."

Another type of application to which such requirements are frequently applied is for food preparation uses requiring air extraction. An example is application 170776 at 465 Oxford Road, for a change of use from A1 to an A3/5 bakery including an external rear extract duct. Condition 3 of that permission reads:

> "3. The rating level of the plant/equipment hereby approved, LAr,Tr (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to sensitive facades, shall be at least 10dB below the existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation.
> Reason: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CS34 and Policy DM4"

Such conditions would also be applied to a variety of other equipment. For instance, permission 151715 at Caversham Weir is for the installation of generators, gearboxes and the operating system for hydropower generation. Condition 6 states:

"6. No mechanical plant shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by this Council. The assessment shall be carried out in accordance with BS4141:2014 methodology. The predicted rating level, LAr,Tr (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise sensitive facades shall be at least 10dB below the existing background sound level, LA90,T when all plant/equipment (or any part of it) is in operation. The plant shall thereafter only be installed and maintained in accordance with the assessment.
Reason: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CS34 of the Reading Borough LDF Core Strategy 2008 (Altered 2015) and Policy DM4 of the Reading Borough LDF Sites and Detailed Policies Document 2012 (Altered 2015)."

The examples above therefore illustrate that the 10dB requirement is a regular requirement on planning applications for noise-generating equipment.

APPENDIX 1: EXTRACT FROM THE LITTLE RED BOOK OF ACOUSTICS

Log Addition, Subtraction, Averaging Decibels

Addition
Log Addition is done in the following way:

$$SPL = 10\log(10^{(L_1/10)} + 10^{(L_2/10)} + ...10^{(L_n/10)})$$

Two numbers of equal value, always sum to that value +3dB. If one number is 10dB smaller than another, it is insignificant

For example:

-3dB + -3dB	= 0dB
0dB + 0dB	= 3dB
50dB + 50dB	= 53dB
50dB + 60dB	= 60dB
10dB + 21dB	= 21dB

Subtraction
Log Subtraction of decibels works in the same way

$$SPL = 10\log(10^{(L_1/10)} - 10^{(L_2/10)})$$

If one number is 10dB smaller than another, it is considered insignificant.

For example:

60dB - 50dB	= 60dB
21dB - 10dB	= 21dB

Average
The first part of the equation uses log addition as described above, the sum is then divided by the number of items being averaged.

$$SPL = 10\log[(10^{(L_1/10)} + 10^{(L_2/10)} ... + 10^{(L_n/10)})/n]$$

where n is the number of items being averaged.

(see **Log Addition, Subtraction, Averaging Decibels – Calculation** in Appendix II)

Arithmetic Averaging Decibels

It is not always necessary to logarithmically average decibels, depending on the calculation. In some cases a simple arithmetic average is needed, as shown:

$$SPL = (L_1 + L_2 + L_3 + ...L_n)/n$$

where n is the number of items being averaged.

The CRTN shortened measurement method for example requires the arithmetic average of three L_{10} values (see **PPG24**).

(see **Arithmetic Averaging Decibels – Calculation** in Appendix II)