

Our ref: Dukes Meadow Letter 20Dec11

20 December 2011



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Dear Mr Parker

Phases 3/4 Dukes Meadow, Waterlooville – Noise Mitigation

Further to your email dated 9 December 2011, I set out below our considerations regarding noise from the Brambles Farm Industrial Estate located to the east of the Dukes Meadow development.

The original ES noted that as the measured daytime level was 53 dB $L_{Aeq,16h}$ at the site boundary, there would be no particular restriction on the development with respect to meeting the relevant Havant Borough Council (HBC) external daytime target value of 55 dB.

However, the original ES noted that the noise level measured at the boundary during the night (55 dB $L_{Aeq,5min}$) was 10 dB above the HBC external night-time target value of 45 dB. Consequently, it was identified that the design target could be achieved at nominal ground and first storey levels in new dwellings constructed within 30m of the site boundary, providing that a 3m high acoustic barrier was erected along the shared boundary.

In the subsequent addendum ES, it was noted that to counter flood risk the finished floor levels of dwellings adjacent to the Brambles Farm Industrial Estate would be increased in height by up to 1m and on this basis it was recommended that the acoustic barrier should also increase in height by 1m to 4m. It was proposed that the barrier should comprise a 1.5m high earth bund with a 2.5m close-boarded fence on top.

Now it is proposed to omit the boundary barrier altogether and this letter considers the acoustic implications of this proposal. As noted above, the day-time noise levels pose no particular constraint to development and so the deliberations below are based on the night-time scenario.

As noted above, the maximum measured night-time noise level at the boundary was 55 dB $L_{Aeq,5min}$. At 30m from the boundary where the development starts, this level would reduce to about 50 dB without a barrier.

Consequently, the HBC external night-time target value of 45 dB would not be met. However, whilst external noise levels are important during the day to protect external amenity areas (i.e. gardens), at night they are far less critical. Instead, it is the internal level within bedrooms, where people are sleeping, that is most important.

The HBC guidelines require that a level of 30 dB is achieved internally in bedrooms at night; this is in line with the World Health Organisation's *Guidelines for Community Noise* and the 'good' standard specified in BS 8233: 1999 *Sound Insulation and noise reduction for buildings – Code of Practice*.

BS 8233 identifies two methods to determine the degree of noise attenuation required from a building façade based on a known external noise level, one of which is a 'simple calculation' and the other a 'more rigorous calculation' which considers the frequency spectrum of the noise source and the acoustic absorption in the room. With respect to the simple calculation, BS 8233 (paragraph 6.7.1) includes the following advice:

"Strictly, the insulation values used here relate to a pink noise spectrum, and actual values achieved will be lower for traffic noise. Furthermore, the method does not take account of the absorption (e.g. furnishings) in the room. However, the R_w values will suffice for a rough calculation, although it is likely to underestimate the level in the room by up to 5 dBA. Where the estimate is within 5 dBA of the limit, a more rigorous calculation should be carried out using octave bands....."

The table below identifies the degree of sound insulation required from the building façade in order to meet the required night-time target value. The 5 dB adjustment to allow for the frequency content of the noise source and the acoustics of the habitable rooms has cautiously been included.

Sound reduction required to achieve the HBC night-time internal target value (based on BS 8233)

Period	External Free-field Noise Level	Frequency / Absorption Adjustment	Adjusted External Noise Level	HBC Internal Target Value	Sound Insulation R_w
Night	50 dB $L_{Aeq,5min}$	+5 dB	55 dB	30 dB	25 dB

BS 6262 *Glazing for buildings – Part 2: 2005 Code of practice for energy, light and sound* identifies typical sound reduction properties for various glazing units. The sound reduction index (R_w) for a basic 4/12/4 thermal double-glazed unit is 29 dB. It can be seen that this (or a similar) unit would be more than sufficient to meet the relevant internal target value.

The glazing will need to remain closed in order to achieve the internal target value and, therefore, an alternative means of background and purge ventilation is required other than opening windows. It is recommended that those properties identified on the attached plan should have a mechanical ventilation system installed within bedrooms. This may be achieved in a number of ways, for example through the use of individual room units or a whole house system, which could include a heat recovery system. The ventilation inlets and outlets should either be located on the quiet side of the building or, if air is drawn-in or expelled through a facade facing the Brambles Farm Industrial Estate, they should be acoustically attenuated.

Providing that the glazing and ventilation requirements specified above are implemented, then suitable internal noise levels would be achieved within bedrooms.

Please do not hesitate to contact me should you have any queries or require anything further.

Yours sincerely



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