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Noise Assessment

New Build Extension
Windsor Nursing Home
Victoria Road East Hebburn
NE31 1YQ

Report Number	EMAT/TN/2015-03-04
Revision	0
Client	Leah Construction Ltd
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1.0 Background

South Tyneside Council has granted planning permission for the constrution of an extension to the Windsor Nursing Home on Victoria Road East, Hebburn, subect to a number of conditions. Condition 7 of approval ST/1118/13/FUL requires a noise assessment prior to the unit being brought into use.

EMAT was requested to carry out a noise survey and to assess the results against current standards for acceptability for residential occupation.

2.0 Background

The planning approval has been granted for a residential extension to an existing care home. Work on the development is close to completion and the developer has recognized the need to satisfy the condition on noise assessment before residents can move into the accommodation.

In EMAT's experience the local planning authority would require the developer to demonstrate that the new residential rooms would meet noise recommendations given by the World Health Organisation as presented in BS 8233 : 2014. Typically an assessment would be based on a survey that identified the levels in the local noise environment from which glazing and ventilation systems would be recommended to provide sufficient attenuation that would achieve satisfactory internal levels.

In this case the building has already been built so that actual internal noise levels can be measured, rather than relying on predictive calculations. There are, however, some limitations in this approach: the first is that both internal works and external earthworks at the site are in progress which corrupts the noise regime, secondly the rooms are complete and carpeted but unfurnished which will underestimate the absorption of the rooms. Nonetheless a direct measurement of the internal noise, with an awareness of the limitations, will give a good assessment of the potential noise impact on residents.

3.0 Measurements

A sound level meter was set up in a 1st floor residential room (Room 9) on the façade that overlooks Victoria Road East. The microphone was set at approximate bed head position, window trickle vents were set fully open and the meter was set to log for around 43 hours, covering day and nighttime periods. The meter was calibrated before and after the measurement and showed no drift.

The results of the full measurement period are shown in Fig 1 below.

4.0 Discussion of Results

From the plot in Fig 1 it is clear that works at the site are affecting the noise levels for most of the working day i.e. from about 07:30 to 16:30 hrs, although within that period there are episodes when noise falls back to the underlying level created by passing traffic and other local sources. For a more detailed analysis of the data the final 24 hour period of the survey has been extracted into Fig 2 with different periods highlighted for discussion below.

Fig 3 shows the night-time period only but with a time history of the $L_{AFmax,1\ sec}$ values.

Fig 2 with its table of results shows that the average measured night-time level is, $L_{Aeq,8\ hr}$ = 29 dB.

Fig 3 shows that the night-time L_{AFmax} generally fall below 45 dB, with only occasional events exceeding this value.

In rooms for sleep BS 8233 recommends an average internal noise level from 23:00 to 07:00 hrs below 30 dB. The WHO recommends that L_{AFmax} values for regular events should not exceed 45 dB to avoid sleep disturbance. Both these criteria are shown to be met in Figs 2 and 3.

The 16 hour daytime average level (07:00 to 23:00 hrs) was found to be 62 dB(A) but this includes periods of high noise level from construction activities on the site. Looking at the three hour period after work stops at around 16:30 hrs the average noise level is 37 dB. This is similar to a half hour period during the working day, probably a lunch break from about 13:00 to 13:30 hrs, when the noise level from non-site activities was also 37 dB(A). It is EMAT's opinion that this demonstrates that 37 dB(A) is likely to be representative of the daytime noise level within the rooms once works have finished on site.

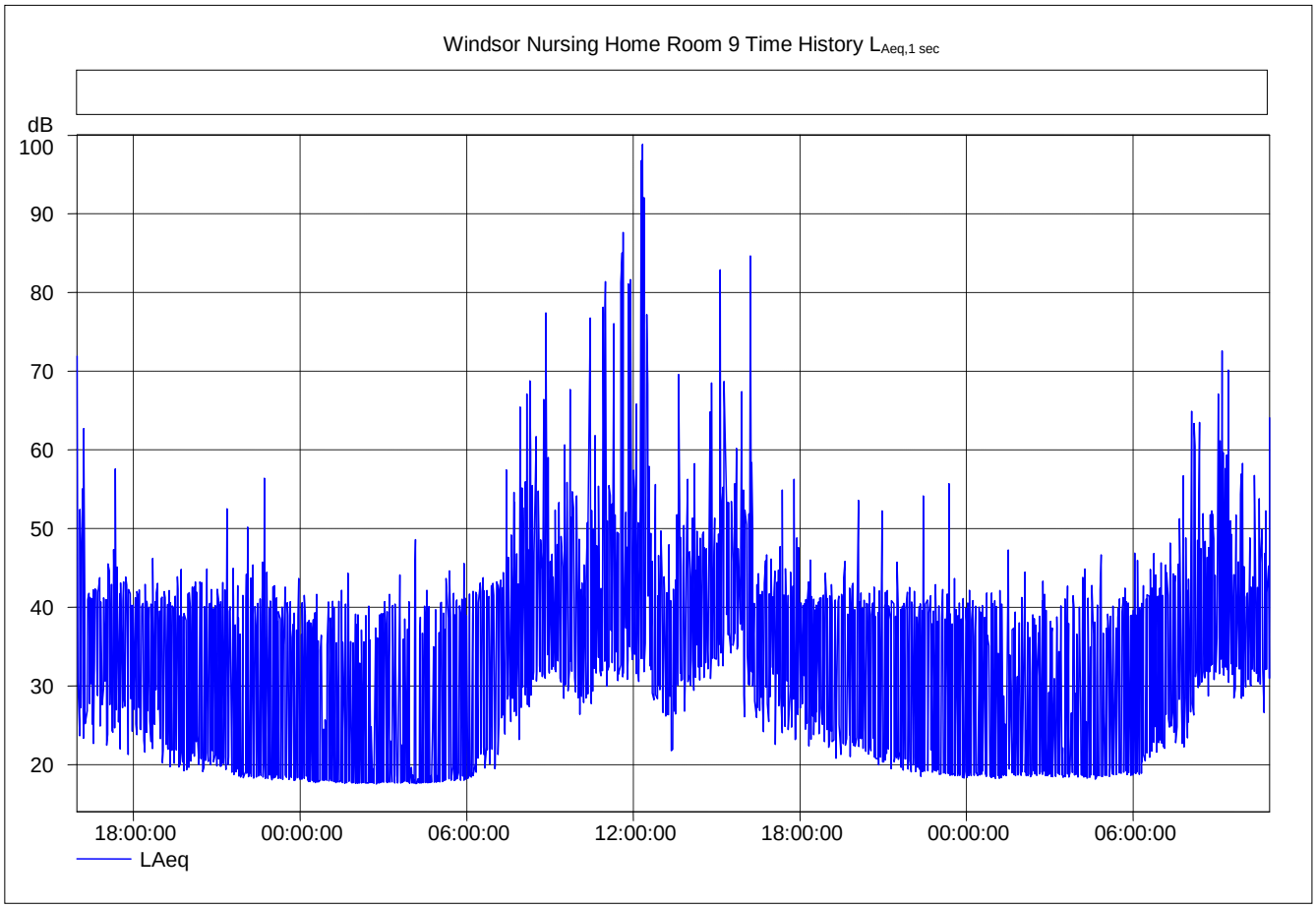
It should abe noted that the noise levels in the rooms will reduce when they are fully furnished with curtains, beds and upholstered chairs etc. In EMAT's experience an improvement of 1 to 2 dB would be expected.

BS 8233 recommends an average of 35 dB(A) for daytime resting in residential rooms and it is anticipated that the measured internal levels would drop to around 35 dB(A) once the rooms are furnished and occupied.

5.0 Conclusions

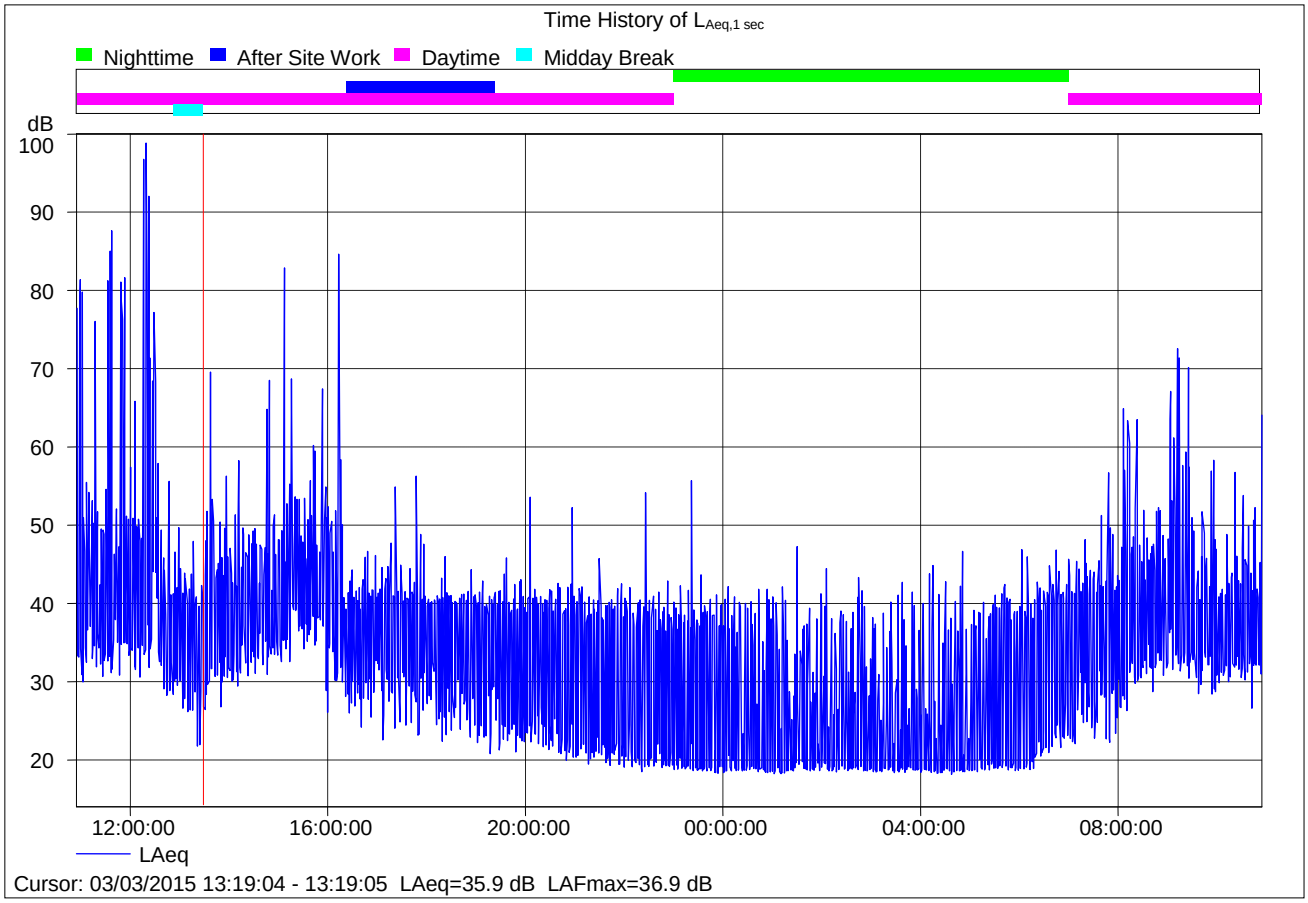
- Internal bedroom noise levels have been measured in completed but unfurnished residential rooms in the new extension to the Windsor Nursing Home, Victoria Road East, Hebburn
- Measured night-time noise levels, when there is no construction activity at the site, comply with BS 8233 : 2014 recommendations
- Measured daytime levels were slightly above the recommended BS 8233 values but are anticipated to fall within the requirements once the rooms are furnished and occupied
- It is EMAT's opinion that the building construction and the installed façade components provide sufficient noise attenuation to meet the recommendations of standards generally applied by Local Planning Authorities and that condition 7 of the planning approval should be discharged

It may be of interest to note that EMAT has measured internal noise levels in an almost identical situation with the façade of a care home overlooking a busy road. In that case, however, the home was fully occupied apart from the rooms under test. It was found that internal room noise was entirely dominated throughout the 24 hour period by noise generated inside the home rather than external road traffic and that façade performance was of secondary importance. In fact it could not be sensibly measured as it has been in the current situation in Victoria Road East.



Internal Noise Time History:
Start 2/3/2015 : End 4/3/2015

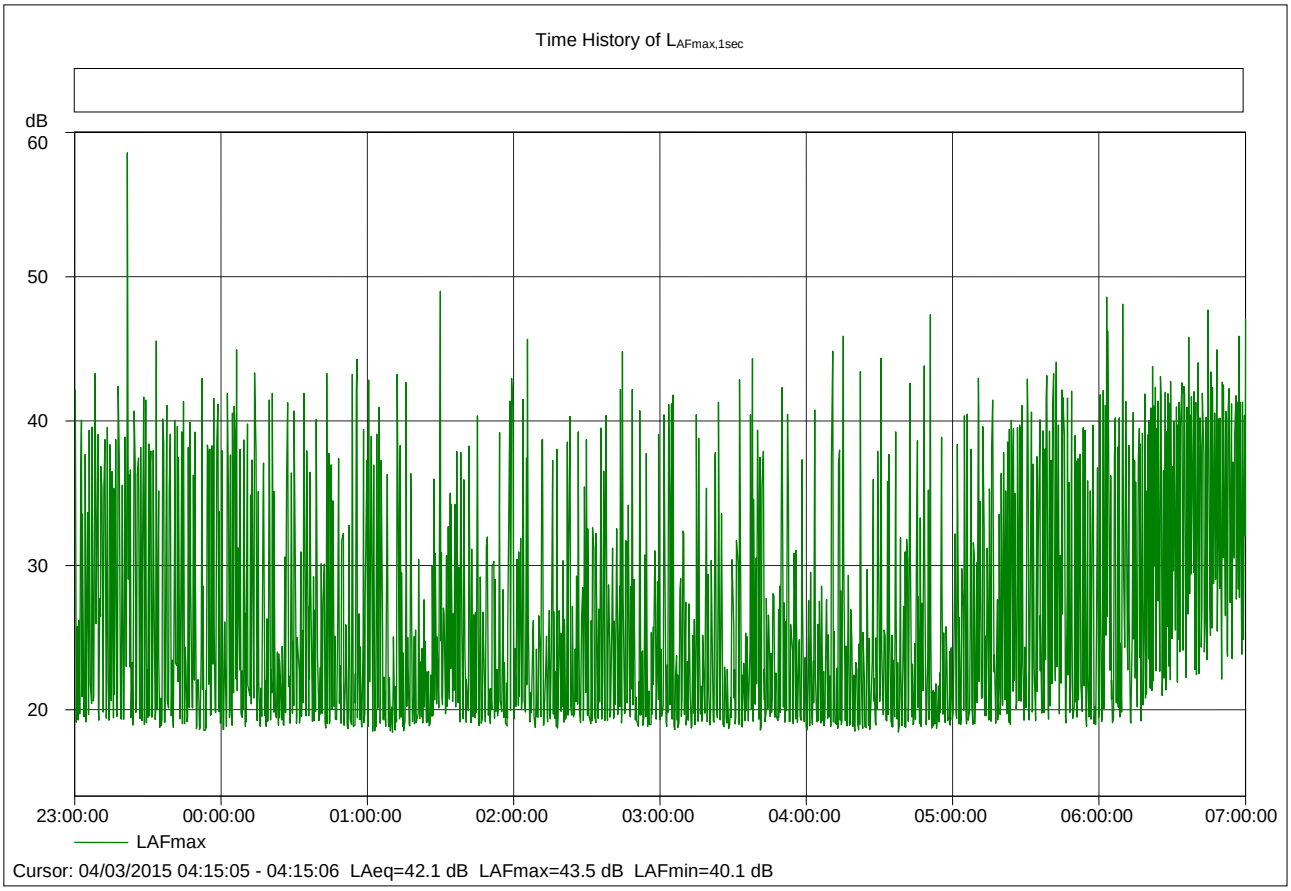
Fig 1



Name	Start time	Duration	LAeq [dB]
Nighttime	03/03/2015 23:00:00	8:00:00	28.9
Daytime	03/03/2015 10:55:33	15:59:07	61.9
After Site Work	03/03/2015 16:22:32	3:00:00	36.7
Midday Break	03/03/2015 12:52:31	0:36:21	36.6

Internal Noise Time History:
Final 24 Hour Period

Fig 2



Internal Noise Time History:
Night-time L_{AFmax}

Fig 2