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AAD
applied
acoustic
design

40 FROGNALL LANE, LONDON

NW3 6PP

ENVIRONMENTAL NOISE SURVEY AND

NOISE ASSESSMENT

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1.0 Brief

1.1 To undertake an environmental noise level survey to establish the background noise level climate nearby the site of 40 Frognall Lane, London, NW3 6PP.

1.2 To determine a noise level limit for proposed fixed plant and machinery with regard to the prevailing planning policy requirements of London Borough of Camden Council.

1.3 To investigate noise emission, to recommend mitigation methods and a noise emission criterion consistent with local planning policy.

2.0 Site Description

2.1 The proposed development at 40 Frognall Lane includes a swimming pool at basement level, which will be ventilated using a dedicated air handling unit. See figure 1 for the site plan and nearest sensitive receiver.

2.2 The associated fixed plant and machinery will be located in a sub-basement plant-room, with air intake and exhaust "mushroom" vents located externally at ground level in the rear garden of the property. There is an adjacent (third party) residential property overlooking the rear garden; this is taken to be the nearest noise sensitive property.

3.0 Survey Details

3.1 Instrumentation:

An environmental noise level survey was conducted using an automated noise level meter to record noise levels. The measurement equipment is as follows:

Sound Level Meter Larson Davis type 820: Serial No: 0902

The instrument was calibrated immediately prior to the commencement of the survey, and upon completion. No calibration drift was recorded.

3.2 Location:

The environmental noise level monitor was located in the rear garden of the application site. The microphone was located on a tripod at 1.2 m above ground level, in a free field position between the proposed plant vents and nearest sensitive receiver in the garden. This location is judged to represent ambient and background noise levels typical for the immediate locality, see Figure 1.

3.3 Period:

Noise level measurements were made continuously between 10:45 on Friday 7th May 2010 and 16:15 on Monday 10th May 2010.

3.4 Weather:

Prevailing weather conditions during the survey were dry with no rain and little wind. The measured data can be considered as an accurate representation of ambient noise levels.

3.5 Site Noise Characteristics:

The noise climate at the site was dominated by local road traffic noise.

3.6 Surveyor:

Christopher J Horwood BSc (Hons) MIOA

4.0 Survey Summary Results

4.1 The results summary of the background noise level measurements is presented below in Table 1. This is the mean value for night-time noise for the three consecutive night-time periods of the measurement. The minimum value measured was 28 dB $L_{A9015min}$. Figure 3 contains survey measurement data in graph form.

Table 1 – Measurement results L_{A90} dB

Location	Mean L_{A90} Night-time (23:00-07:00)
Position 1	34 dB

4.2 See figure 4 for a glossary of terms.

5.0 Environmental Noise Level Requirements

5.1 Planning issues regarding an incomplete application (Application Ref: 2008/3523/INVALID) were issued in a Letter dated 2nd June 2009, by Emily Whittredge at London Borough of Camden. Specific conditions which relate to noise and vibration issues for 38-40 Frognall Lane were addressed. The outstanding conditions which apply to this development are as follows;

"You need to submit an acoustic noise report to fully assess the noise impact of the scheme. In addition to the background noise levels an acoustic report should be submitted providing information as to noise output of proposed plant. An acoustic report should contain the following information: 1) Background noise levels; 2) manufacturers details and noise output from proposed plant; 3) Whether proposed plant would comply with Camden's noise standards (5 - 10dB below background levels); 4) Any means of attenuation or isolation necessary to ensure that the plant complies with noise standards".

6.0 Assessment

6.1 We are advised by the architect to use plant schedule and noise level information supplied by Brian Andrews of Heritage pools, which is as follows:

"Plant associated with the swimming pool:

1 Plant operates 24/7 365 days per annum:

Air Handling Unit	66 dB
Main Pool filter pump, 0.75kW	70 dB
Spa Pool filter pump 0.33kW	70 dB

2 As required by pool users:

Spa booster pump, 1.50kW	75 dB
Spa air blower, 1.0kW	85 dB"

6.2 We understand the pool plant as listed above is located in the pool plant-room as shown on architects drawing 0820 P 23, which is below ground.

6.3 Pool plant-room atmospheric terminations comprise two shafts terminated with mushroom vents in the garden. Architects drawing 0820 D21 shows these are to be concealed within foliage and we understand that each accommodate ductwork.

6.4 We understand distance from mushroom vents to the nearest noise sensitive boundary is approximately 12m.

6.5 From Section 5.0 above, the criterion applicable to noise arising from fixed plant and machinery accommodated by the scheme is not to exceed (34 - 10) 24 dBA when measured or assessed at the site boundary.

6.6 From drawing 0820 P 23 the plant room volume is approximately 20m^3.

6.7 If we assume noise data provided amounts to a free field noise level measured at 1.0m in terms of "A" weighted dB, the semi reverberant noise level in the pool plant room is expected to be in the region of 95 dBA, with the Spa Booster running, which is clearly excessive and amounts to a health risk for a plant room occupant. It seems instead more likely the information provided is typical for "as installed" conditions, in which case the semi-reverberant plant-room noise level expectation is in the region of 86 dBA. This is still subjectively very noisy and is governed by the Spa Air blower, without which the total noise level drops to 78 dBA.

6.7 We are given to understand the mushroom vents accommodate air handling unit intake and extract air ductwork. As no fan sound power level data is forthcoming, and no plant configuration information available, our guidance to the applicant and planners is that any grant of consent should include a condition to restrict noise arising from plant-room and its atmospheric terminations to be no more than 43 dBA when measured at 1.0m from the curtilage of any vent or other atmospheric termination.

6.8 In terms of mitigation methods, we expect to see ducted attenuators with overall size 450mm x 450mm installed and mastic sealed into the shafts immediately beneath each mushroom vent. Calculations must be provided by the contractor demonstrating compliance, when all plant is operating simultaneously at design load at least with the criterion set out at Section 6.7.

7.0 Conclusion

7.1 A survey has been conducted in the garden of 40 Frognall Lane to establish prevailing levels of background noise.

7.2 The mean level of background noise between 23:00 and 007:00 determined over three night-time periods amounts to 34 dB $L_{A9015min.}$ The minimum level of background nose measured during the same survey amounted to 28 dB $L_{A9015min.}$

7.3 Camden Council's noise guideline is to restrict noise emission to a level that is from 5 to 10dB below background noise level.

7.4 This means the noise criterion, applicable at the boundary with other noise sensitive property is (34-10) = 24 dBA. Planners may impose this or a more onerous condition.

7.5 As the boundary is approximately 12m from the mushroom vents, our guidance is that contractors are tasked to ensure that noise, when measured at 1.0m from either mushroom vent must not exceed 43 dBA when all fixed plant and equipment associated with the development proposal are operating simultaneously at design load. Planners may impose this or a more onerous condition.

7.6 Although our recommended method of mitigation includes ducted attenuators for each mushroom vent, this has not arisen from a formal assessment as none was feasible with the level of technical information provided.

7.7 Our guidance is that calculations must be provided by the contractor, demonstrating compliance when all plant is operating simultaneously at design load, at least with the criterion set out in this report or as otherwise imposed by planners prior to commencement.

Figure 1: Survey location and nearest sensitive receiver

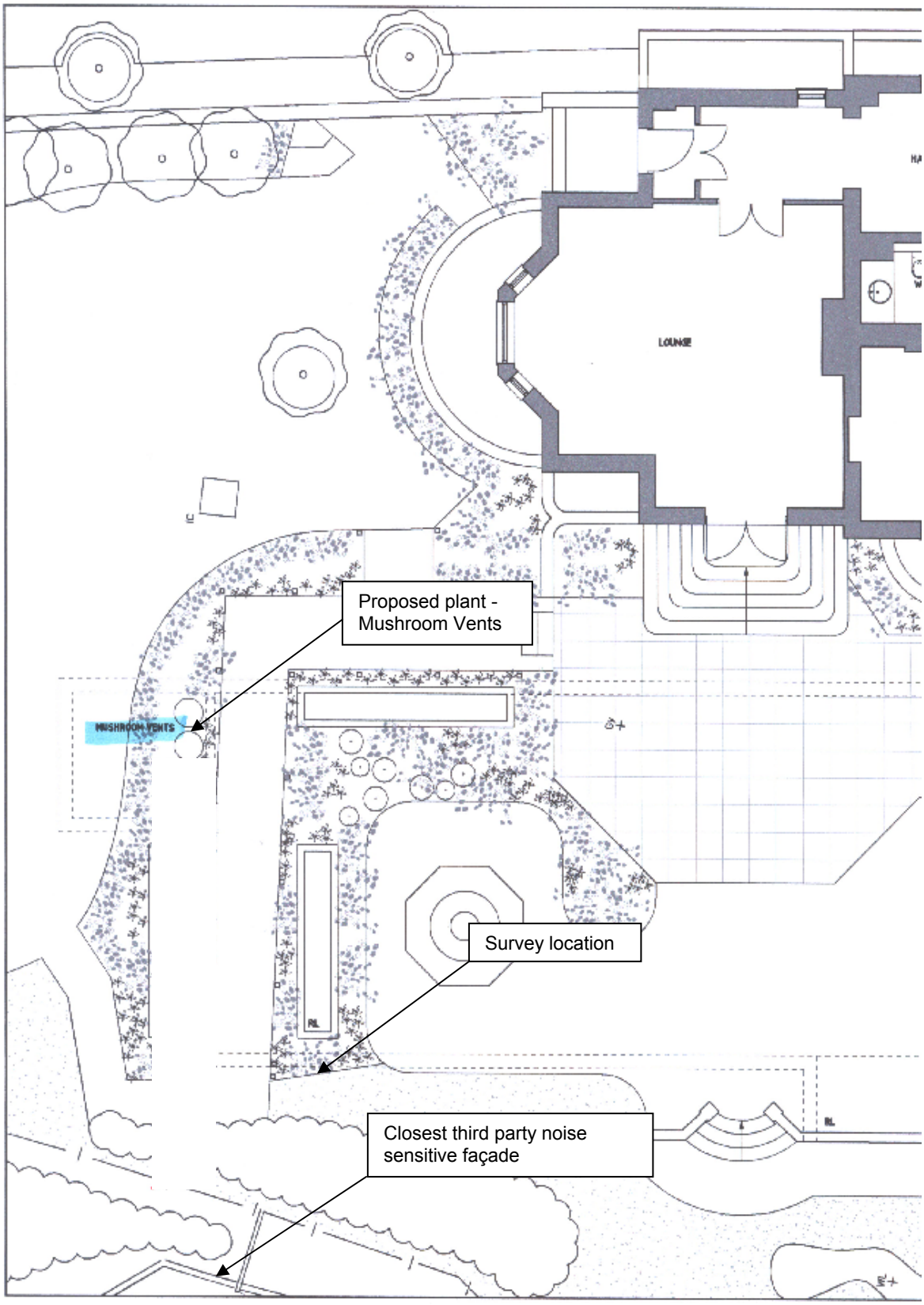

Figure 2: - Proposed site plan

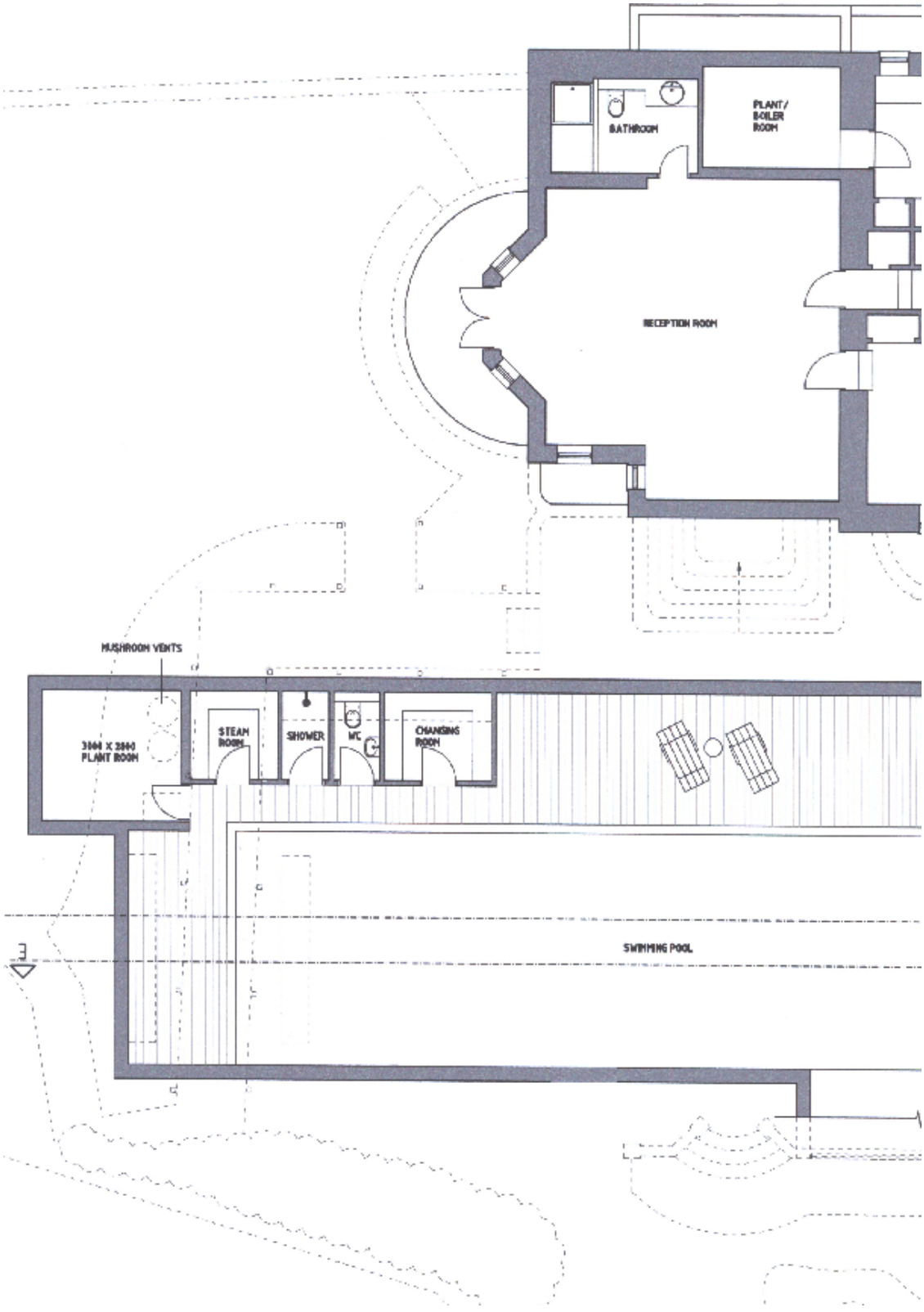

Figure 3: - Noise Level Time History

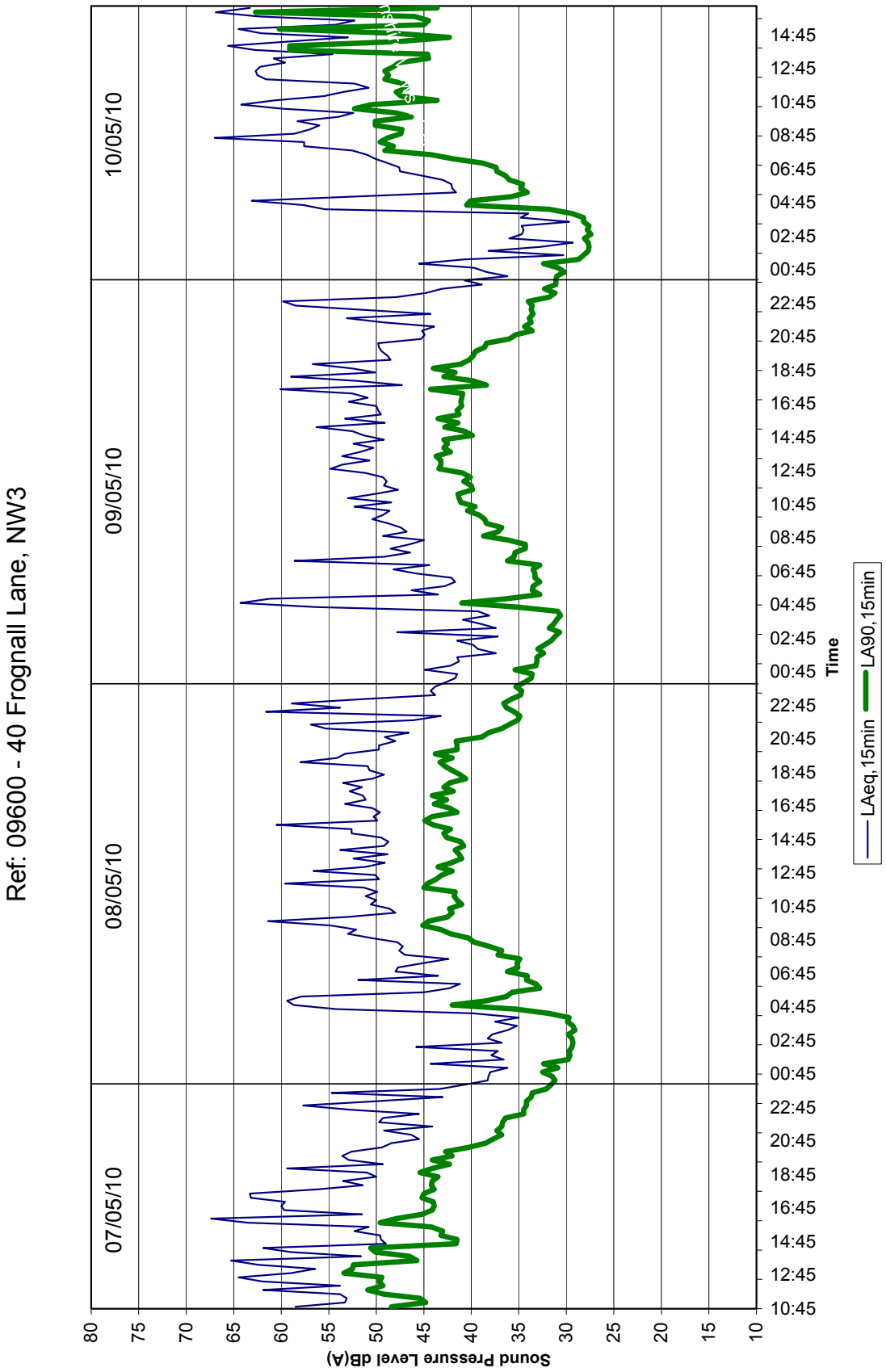

Figure 4 : - Glossary of Terms

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (Lp) the reference quantity is $2x10^{-5}$ N/m^2. The sound pressure level existing when microphone measured pressure is $2x10^{-5}$ N/m^2 is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (Lp) or Sound Power Level (Lw).
Frequency	Number of cycles per second, measured in hertz (Hz), related to sound pitch.
A weighting	Arithmetic corrections applied to values of Lp according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of Lp actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of Lp actually measured.
$L_{n,T}$	Lp which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during time, T.
$L_{Amax,T}$	The instantaneous maximum A weighted sound pressure level which occurred during time, T.
Background Noise Level	The value of $L_{A90,T}$, ref. BS4142:1997.
Specific Noise Level	The value of $L_{Aeq,T}$ at the assessment position produced by the specific noise source, ref. BS4142:1997.
Rating Level	The specific noise level, corrected to account for any characteristic features of the noise, by adding a 5 dBA penalty for any tonal, impulsive or irregular qualities, ref. BS4142:1997.
Specific Noise Source	The noise source under consideration when assessing the likelihood of complaint.
Assessment Position	Unless otherwise noted, is a point at 1m from the façade of the nearest affected sensitive property.