Report VA1658.161220.ENS

32 Ferncroft Avenue, London

Environmental Noise Survey Report

20 December 2016

Knowles
Suite 2
Silwood Business entre
Silwood Park
Buckhust Road
Ascot
SL5 7PY

01962 461016
0203 8650332
mail@ventaacoustics.com

registered company no. 10139494

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VA1658/SP1	Indicative Site Plan
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1. Introduction

It is proposed to undertake works to form a new basement extension at 32 Ferncroft Avenue, London.

Venta Acoustics has been commissioned by Knowles to undertake an environmental noise survey to determine the pre-existing noise climate in the locality. This is to accompany the Construction Management Plan, as required by Camden Council.

2. Site Description

As illustrated on the attached site plan VA1658/SP1, the site consists of a semi-detached building located in a residential area with other residential dwellings to the east, west and south across Ferncroft Avenue. To the north is the property's back yard, beyond which is a green and then residential dwellings. There is also a pre-school on the opposite side of Ferncroft Avenue.

It is understood that construction will take place from the front of the house where there is a driveway between the house and the road (approximately 10m distance).

The most affected noise sensitive receivers are expected to be the residential unit to the east (forming a portion of the semi-detached building) and, at a greater distance, the school and residential units to the south and west.

3. Environmental Noise Survey

3.1 Survey Procedure & Equipment

In order to establish the existing noise levels at the site, a noise survey was carried out between Thursday15th December and Monday 19th December 2016 at first floor level on the façade facing Ferncroft Avenue. This location, shown in site plan VA1658/SP1, is directly above the driveway where the construction works are intended to take place and is considered to be representative of the noise level at the most affected noise sensitive receivers.

Continuous 5-minute samples of the L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels were undertaken at the measurement location.

The weather during the survey period was generally dry with light winds although intermittent rainfall was recorded. The background noise data is not considered to have been compromised by these conditions.

Measurements were made generally in accordance with ISO 1996 2:2007 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels*.

The following equipment was used in the course of the survey:

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-12202-E0	42647-A2A-12202-E0	4/10/16
Larson Davis calibrator	CAL200	13069	42530-13069	9/6/16

Table 3.1 – Equipment used for the survey

The calibration of the sound level meter was verified before and after use with no significant calibration drift observed.

3.2 Results

The measured sound levels are shown as time-history plots on the attached charts VA1658/TH1-5.

The local noise climate is primarily determined by traffic on surrounding roads. It is noted that the week of the survey corresponded with school holidays. As there are several schools in the area, noise levels can be expected to increase during school term time.

The typical background and average ambient noise levels measured are summarised below:

Monitoring Period	Typical $L_{A90,5min}$	Average L_{Aeq}
07:00 – 23:00 hours	36 dB	58 dB
23:00 – 07:00 hours	30 dB	53 dB
Camden Weekday Construction hours (08:00 – 18:00 hours)	43 dB	61 dB
Camden Saturday Construction Hours (08:00-13:00 hours)	38 dB	55 dB

Table 3.2 – Typical background and average ambient noise levels

4. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the pre-existing noise climate in the locality of 32 Ferncroft Avenue, London to accompany a Construction Management Plan for a basement extension as required by Camden Council.

The results of the noise survey have been recorded for further reference if required.

Steven Liddell MIOA


Most Affected Receiver
Noise monitoring location

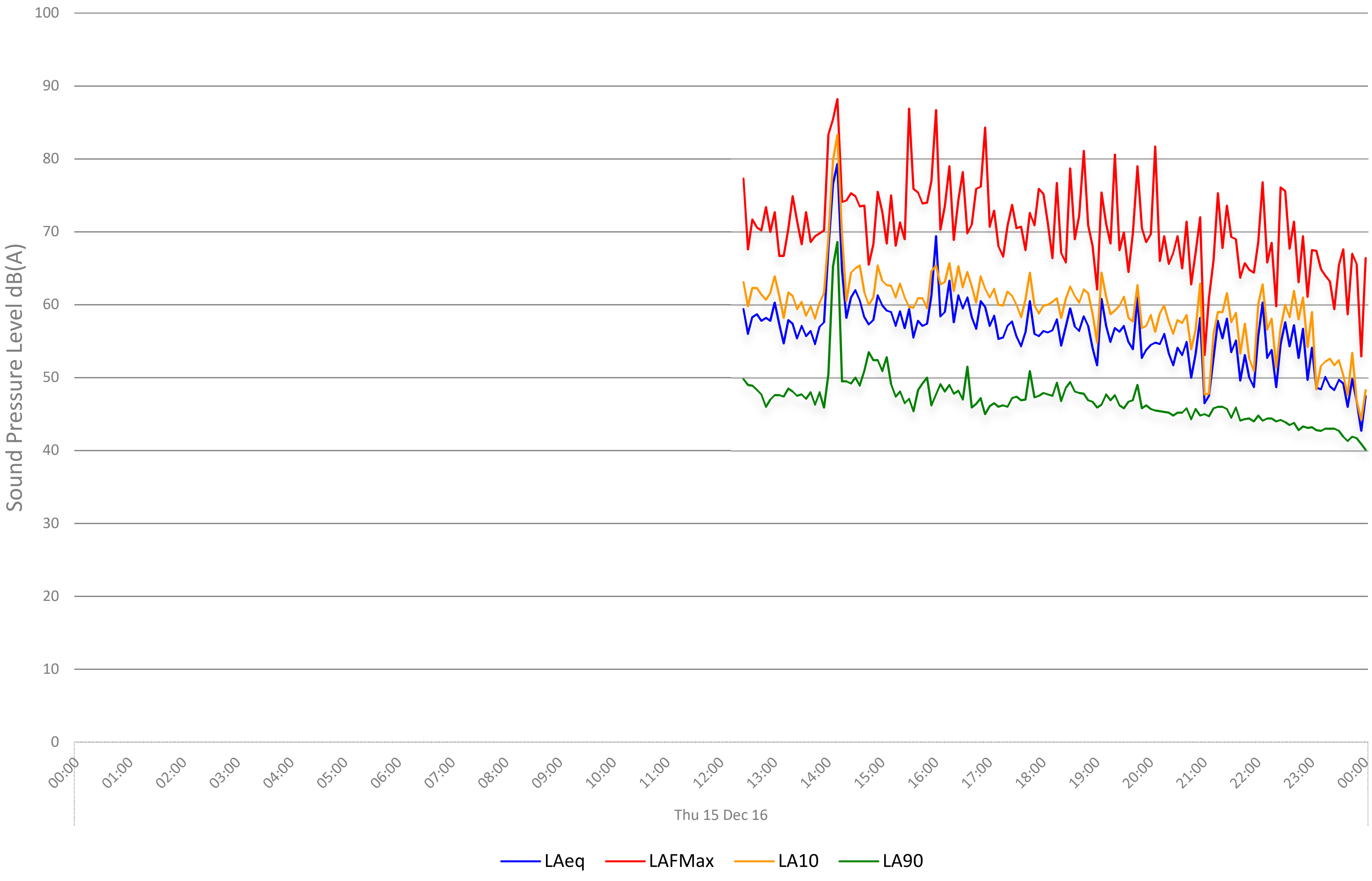
32 Ferncroft Avenue, London

Environmental Noise Time History: 1

Front Facade

Venta Acoustics

Figure VA1658/TH1



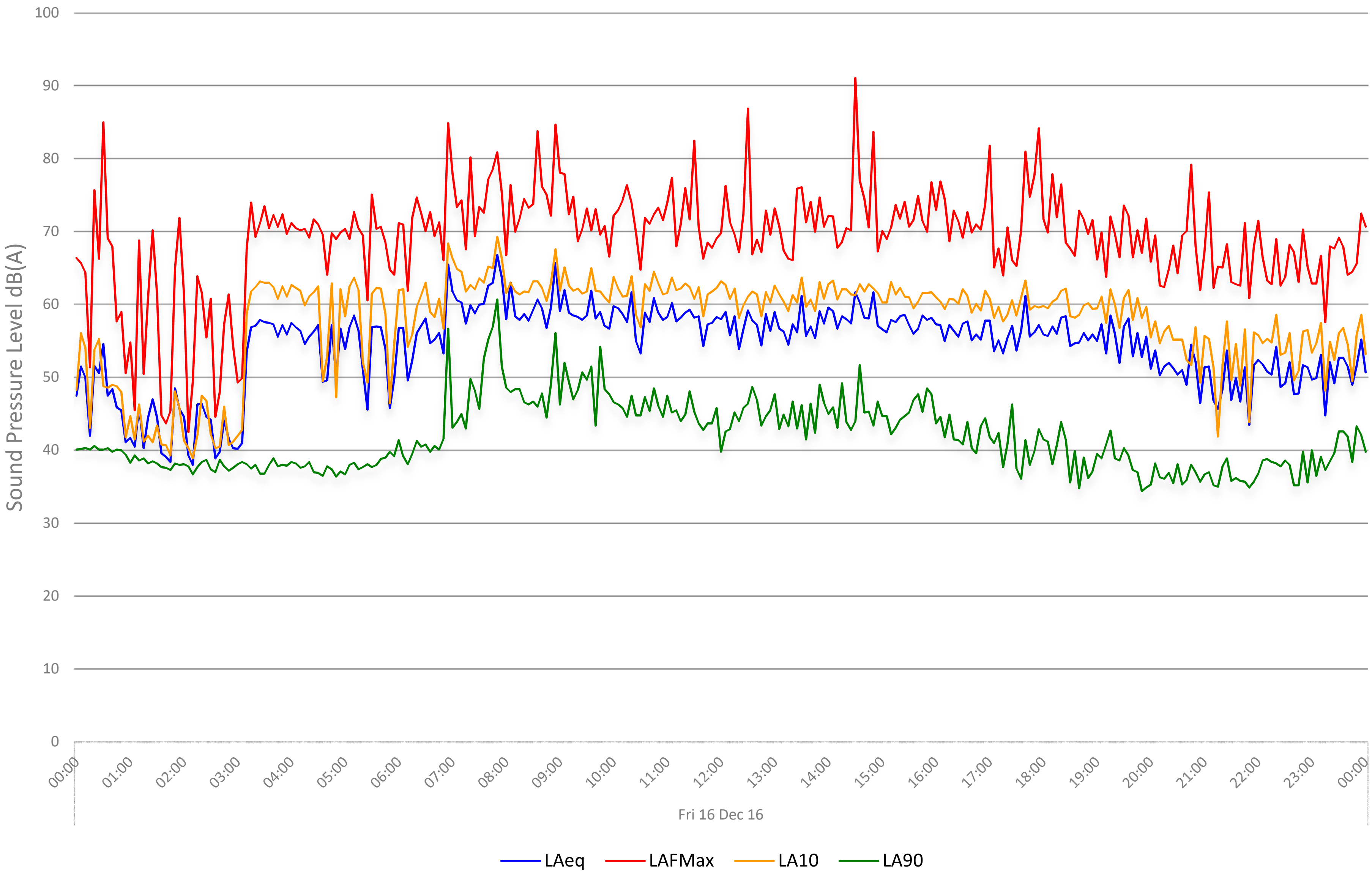
32 Ferncroft Avenue, London

Environmental Noise Time History: 2

Front Facade

Venta Acoustics

Figure VA1658/TH2



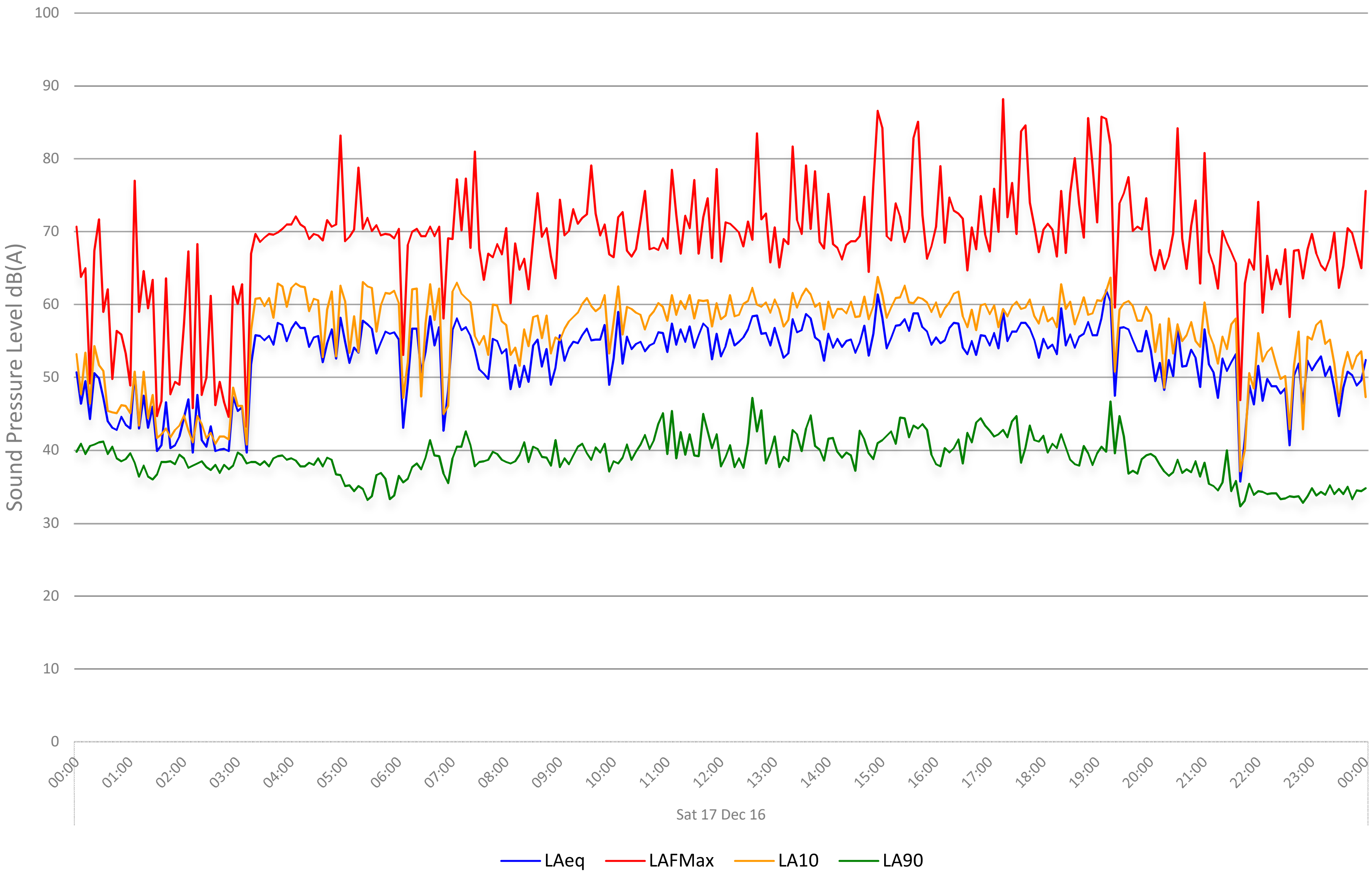
32 Ferncroft Avenue, London

Environmental Noise Time History: 3

Front Facade

Venta Acoustics

Figure VA1658/TH3



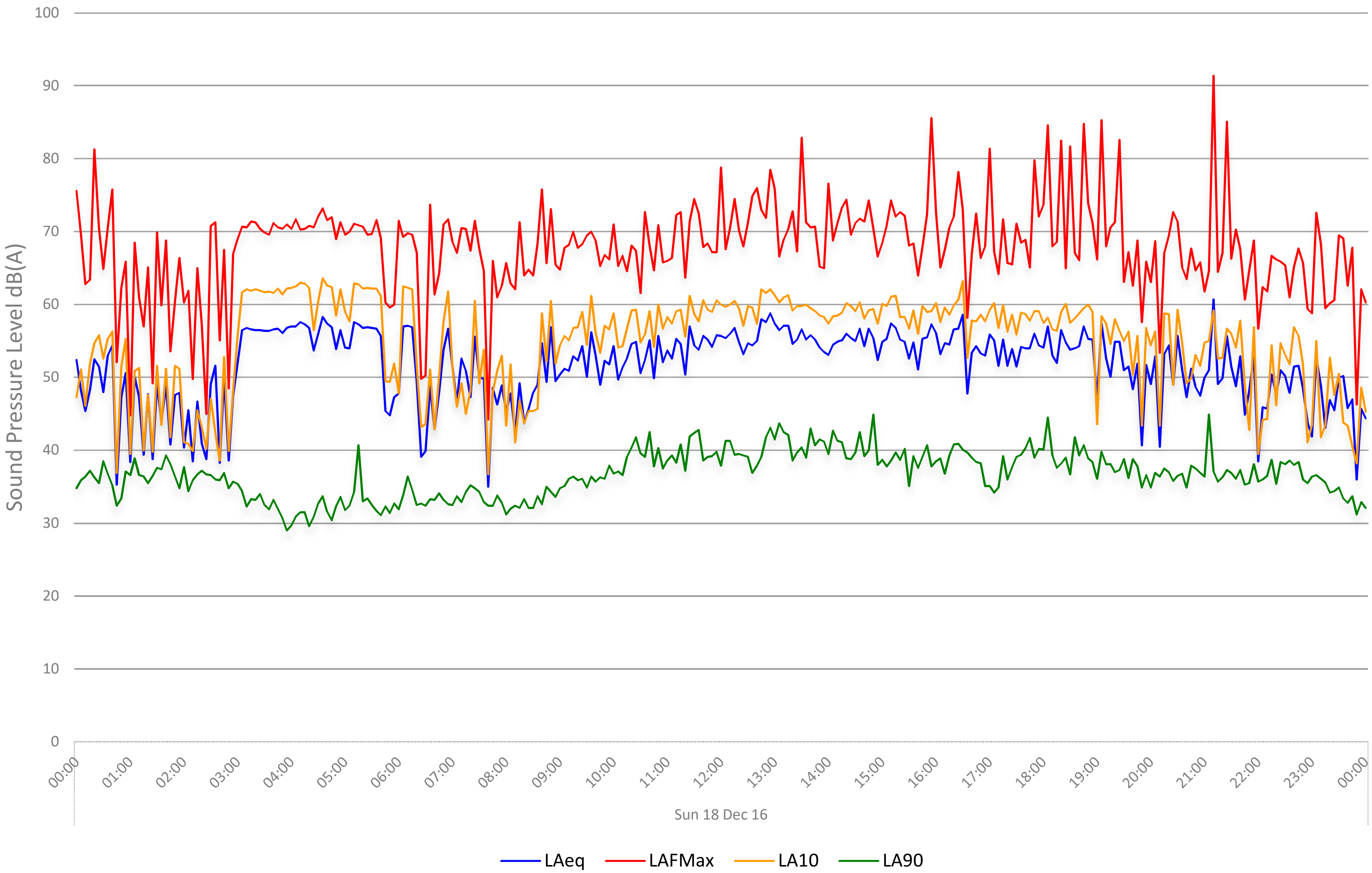
32 Ferncroft Avenue, London

Environmental Noise Time History: 4

Front Facade

Venta Acoustics

Figure VA1658/TH4

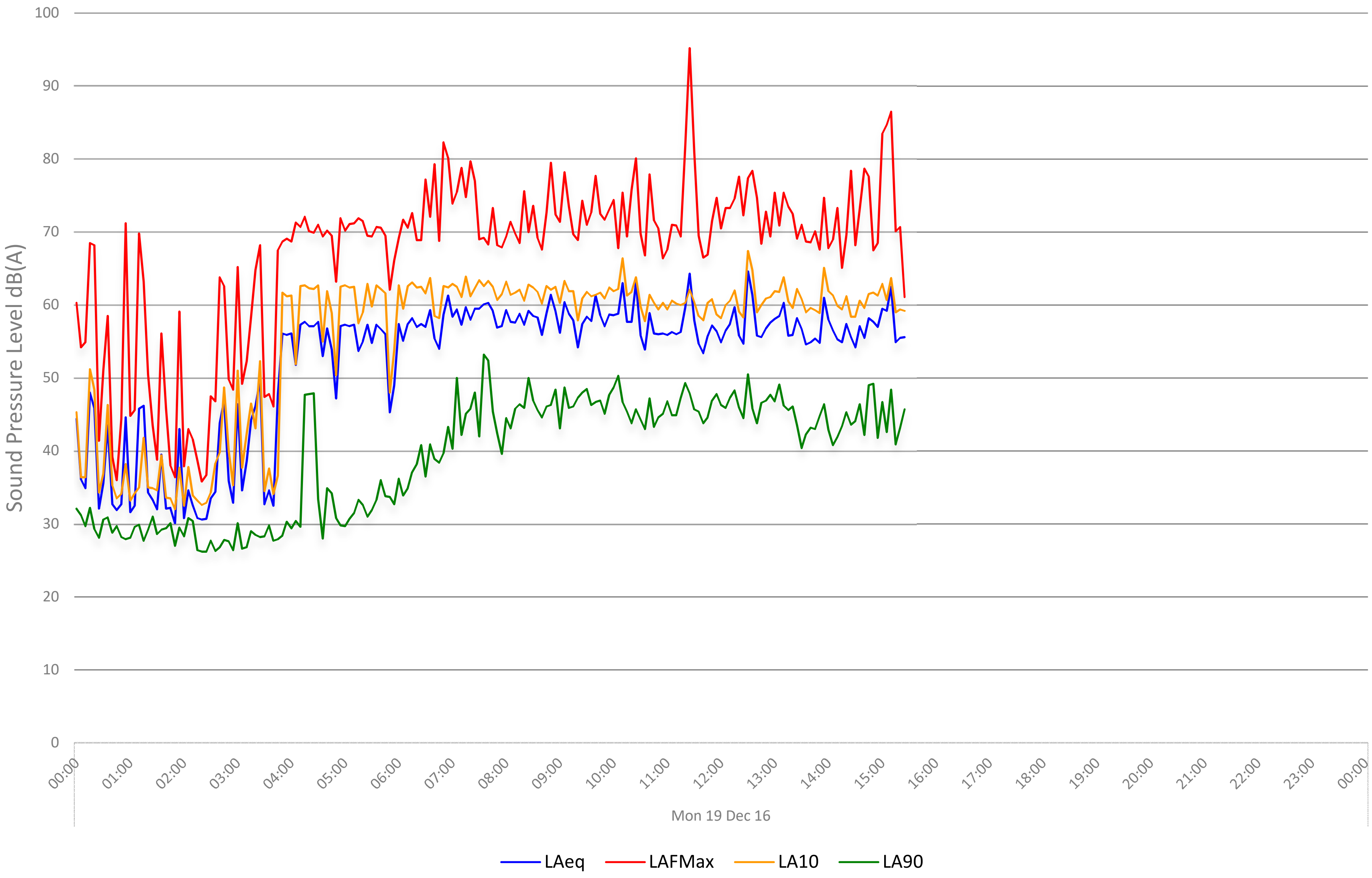


32 Ferncroft Avenue, London

Environmental Noise Time History: 5

Front Facade

Figure VA1658/TH5



APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A.
L_{eq} :	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90} :	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max} :	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

1.4 Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.