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63-71 HIGH STREET, HAMPTON HILL

NOISE IMPACT ASSESSMENT

Report 14054.NIA.01 Rev.C

Prepared on 25 November 2016

For:

GreatPlanet Limited

22 St James Square

London

SW1Y 4JH

Contents

List of Attachments

1.0 INTRODUCTION

KP Acoustics has been commissioned by GreatPlanet Limited, 22 St James Square, London, SW1Y 4JH, to assess the suitability of the site at 63-71 High Street, Hampton Hill, for residential development in accordance with the provisions of the National Planning Policy Framework and the Noise Policy Statement for England (NPSE).

This report presents the results of the environmental survey undertaken in order to measure prevailing background noise levels and outlines any necessary mitigation measures.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 Procedure

A noise survey was undertaken at the positions as shown in Figure 14054.SP2. These locations were chosen in order to collect data representative of the worst-case levels expected on the site due to all nearby sources.

Continuous automated monitoring was undertaken for the duration of the survey between 20 May 2016 and 23 May 2016.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise.

The measurement procedure complied with ISO 1996-2:2007 Acoustics “Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels”.

2.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- 2 No. Svantek Type 957 Class 1 Sound Level Meter
- 1 No. Svantek Type 958 Class 1 Sound Level Meter
- B&K Type 4231 Class 1 Calibrator

3.0 RESULTS

3.1 Noise Survey

The $L_{Aeq:\ 5min}$, $L_{Amax:\ 5min}$, $L_{A10:\ 5min}$ and $L_{A90:\ 5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 14054.TH-3.

Average daytime and night time noise levels are shown in Table 4.1.

4.0 DISCUSSION

The site is bounded by High Street to the East, and existing light commercial/residential properties to all other facades, with an access road to the rear. At the time of the survey, the background noise climate was dominated by road traffic noise from surrounding roads, and sporadic air traffic noise from overhead. A construction site to the North of the site is understood to have been inactive during the monitoring period.

Measured noise levels are representative of noise exposure levels expected to be experienced by all façades of the proposed development.

	Level dB(A)
Position 1	
Daytime $L_{Aeq,16hour}$	68
Night-time $L_{Aeq,8hour}$	63
Position 2	
Daytime $L_{Aeq,16hour}$	57
Night-time $L_{Aeq,8hour}$	51
Position 3	
Daytime $L_{Aeq,16hour}$	52
Night-time $L_{Aeq,8hour}$	46

Table 4.1 Site average noise levels for daytime and night time

5.0 NOISE IMPACT ASSESSMENT

5.1 Local Authority

As the London Borough of Richmond upon Thames local plan is currently not in place, reference will made to the Local Plan Pre-Publication Version July 2016-August 2016. This refers directly to NPPF and NPSE guidance as described in following sections.

The pre-publication version of the Local Plan states the requirement for "*measures to protect the occupiers of new developments from existing sources.*"

This aims to ensure that residential amenity as a result of air traffic noise and environmental noise is preserved. We have utilised the recommendations of BS8233:2014 for internal noise levels throughout this report in order to ensure that internal noise levels as recommended for amenable conditions are maintained. An environmental noise survey has been undertaken on site, which takes into account all environmental noise sources in-situ, including road traffic and air traffic noise.

5.2 NPPF Assessment

The national planning policy framework outlines national planning and design policies. By referencing NPSE, it sets out specific noise related objectives as follows:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The above objectives are explored further in NPSE in order to determine potential effects on health and quality of life in relation to noise.

5.3 NPSE Assessment

The Noise Policy Statement for England provides guidance for the objective of preserving health and quality of life in relation to environmental noise, neighbour noise and neighbourhood noise.

NPSE identifies three effect levels, based on guidance from the World Health Organisation, as follows:

- NOEL – No Observed Effect Level. This is the level below no effect can be detected.

- LOAEL – Lowest Observed Adverse Effect Level. At this level some adverse effects of the quality of health can be detected.
- SOAEL – Significant Observed Adverse Effect Level. This is the level at which significant effects on quality of life and health can occur and are detectable.

There is no definitive noise level at which SOAEL will occur. As such, further guidance from relevant standards should be used to define the noise impact and mitigation measures accordingly.

The assessment will aim to achieve the three main objectives of the document, as follows:

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

In the absence of technical guidance from NPPF or NPSE, we would refer to the now outdated document PPG24 in order to assess environmental and neighbourhood noise impact on the site in relation to observable effect levels of NPSE. This considers the Noise Exposure Categories (NEC) set out in PPG24 to assist Local Authorities in assessing the suitability of sites for residential development in terms of noise exposure. NECs range from A to D, where NEC A refers to the case where noise would not be an impeding factor in granting a planning application, whilst Category D refers to the case where development should normally be refused.

Based on the above document, the frontal façade of the site falls within NEC C during daytime and night-time, as shown in Table 5.1.

	Level dB(A)	NEC Category
Daytime $L_{Aeq,16hour}$	68	C
Night-time $L_{Aeq,8hour}$	63	C

Table 5.1 Road facing elevation noise levels and NEC categories for daytime and night time

Central areas of the site fall within NEC B during daytime and night-time, shown in Table 5.2.

	Level dB(A)	NEC Category
Daytime $L_{Aeq,16hour}$	57	B
Night-time $L_{Aeq,8hour}$	51	B

Table 5.2 Road facing elevation noise levels and NEC categories for daytime and night time

The rear façade of the site falls within NEC A during daytime and NEC B during night-time, as shown in Table 5.3.

	Level dB(A)	NEC Category
Daytime $L_{Aeq,16hour}$	52	A
Night-time $L_{Aeq,8hour}$	46	B

Table 5.3 Road facing elevation noise levels and NEC categories for daytime and night time

For NEC A, PPG24 states:

"Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level."

For NEC B, PPG24 states:

"Noise should be taken into account when considering planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise."

For NEC C, PPG24 states:

"Planning permission should not normally be granted. Where it is considered that permissions should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise."

In the UK, a majority of sites located within urban areas fall into NEC B and C. Provided adequate mitigation measures are put in place during the design and construction phase of a development, recommended internal noise levels may still be achieved.

When a site proposed for residential development falls outside Noise Exposure Category A, the proximity and benefit of local facilities such as transport and retail centres should be weighed against the levels of ambient noise generated as a result.

5.4 BS8233 Assessment

BS8233:2014 *"Sound insulation and noise reduction for buildings"* describes recommended internal noise levels for residential spaces during daytime and night-time. These levels are shown in Table 5.1.

Criterion	Typical Situations	Design range $L_{Aeq,T}$ dB	
		07:00-23:00	23:00-07:00
Reasonable resting/sleeping conditions	Living Rooms	35	--
	Bedrooms	35	30

Table 5.1 BS8233 recommended internal background noise levels

The external building fabric would need to be carefully designed to achieve these recommended internal levels. It is understood that the non-glazed external building fabric elements of the proposed development would be comprised of blockwork. This would contribute towards a significant reduction of ambient noise levels in combination with a good quality double-glazed window configuration, as shown in Section 6.

6.0 EXTERNAL BUILDING FABRIC SPECIFICATION

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from glazed and non-glazed elements in order to achieve recommended internal noise levels shown in Table 5.1, taking into account average and maximum noise levels monitored during the environmental noise survey.

Typical size bedrooms, with a high ratio of glazing to masonry, according to available proposed plans have been used for all glazing calculations for the all elevations.

6.1 Non-Glazed Elements

All non-glazed elements of the building façade have been assumed to provide a sound reduction performance of at least the figures shown in Table 6.1 when tested in accordance with BS EN ISO, 140-3:1995.

Element	Octave band centre frequency SRI, dB					
	125	250	500	1k	2k	4k
Non glazed element SRI	41	43	48	50	55	55

Table 6.1 Non-glazed elements assumed sound reduction performance

6.2 Glazed Elements

Minimum octave band sound reduction index (SRI) values required for all glazed elements to be installed are shown in Table 6.2. The performance is specified for the whole window unit, including the frame and other design features such as the inclusion of trickle vents. Sole glass performance data would not demonstrate compliance with this specification.

Glazing performance calculations have been based on average measured daytime noise levels as recommended by BS8233. Furthermore, predicted internal noise levels have been verified against the L_{Amax} spectrum of individual events in order to comply with a maximum internal noise level of 45dB(A). The combined most robust results of these calculations are shown in Table 6.2.

Glazing Type	Octave band centre frequency SRI, dB					
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
East Front Elevations (Type 1)	28	36	42	46	43	37
East Middle Elevations (Type 2)	20	26	28	34	32	30
West Middle Elevations (Type 3)	20	26	28	31	29	27
West Rear Elevations (Type 4)	18	23	24	29	27	27

Table 6.2 Required glazing performance

All major building elements should be tested in accordance with BS EN ISO 140-3:1995.

Independent testing at a UKAS accredited laboratory will be required in order to confirm the performance of the chosen system for an “actual” configuration.

No further mitigation measures would be required to achieve good internal noise levels.

7.0 EXTERNAL AMENITY SPACES

According to BS8233:2014, the design criteria for external noise levels is summarised as follows:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

The above statement makes reference to desirable levels to be achieved within external amenity spaces. In this case it would be expected that all balconies with the exception of those located on the frontal façade would fall within this criteria.

These recommendations are however based on amenity areas where the space is intentionally used for relaxation and amenity spaces, BS8233:2014 makes further comment for small balconies which may be used for utility purposes as follows:

"Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses."

In light of this, it would be expected that the balconies to the frontal facades would not experience any issue with regards to exposure from external noise.

8.0 VEHICLE MOVEMENTS ON CAR PARK RAMP

The scheme incorporates access to the basement parking facilities via a ramp situated parallel to the south boundary. The ramp is designed so that no more than one car will be able to travel along it at any one time and has changes of gradient which will act as natural calming of vehicle speeds.

As the background noise profile of the area is dominated by road traffic noise form the High Street, it would be expected that noise emissions from one car manoeuvring at low speed would not present any noticeable increase in the noise profile of the area, and would therefore not pose any risk to the amenity of nearby residents, or future residents of the development.

In order to further ensure that the risk of disturbance is minimised, it would be recommended that the following precautionary pro-active mitigation measures are implemented.

- Signage to be displayed clearly to drivers to request that they manoeuvre slowly, and in a courteous manner, while parking and using the ramp.
- Surveillance cameras to be in place to identify vehicles manoeuvring inappropriately and notify appropriate residents.

With the above measures in place, it would not be expected that any disturbance would occur to nearby residents as a consequence of vehicles manoeuvring on the ramp.

9.0 CONCLUSION

An environmental noise survey has been undertaken in the area of the proposed development at 63-71 High Street, Hampton Hill. Measured noise levels allowed the proposal of a robust glazing specification which would provide internal noise levels for all residential environments of the development commensurate to the recommendations of BS8233:2014.

No further mitigation measures should be required in order to protect the proposed residential properties from external noise intrusion.

Report by:	Checked by:
Duncan Arkley AMIOA	**Kyriakos Papanagiotou MIOA**
KP Acoustics Ltd.	**KP Acoustics Ltd.**

63-71 High Street, Hampton Hill
Environmental Noise Time History
20th May to 23rd May 2016

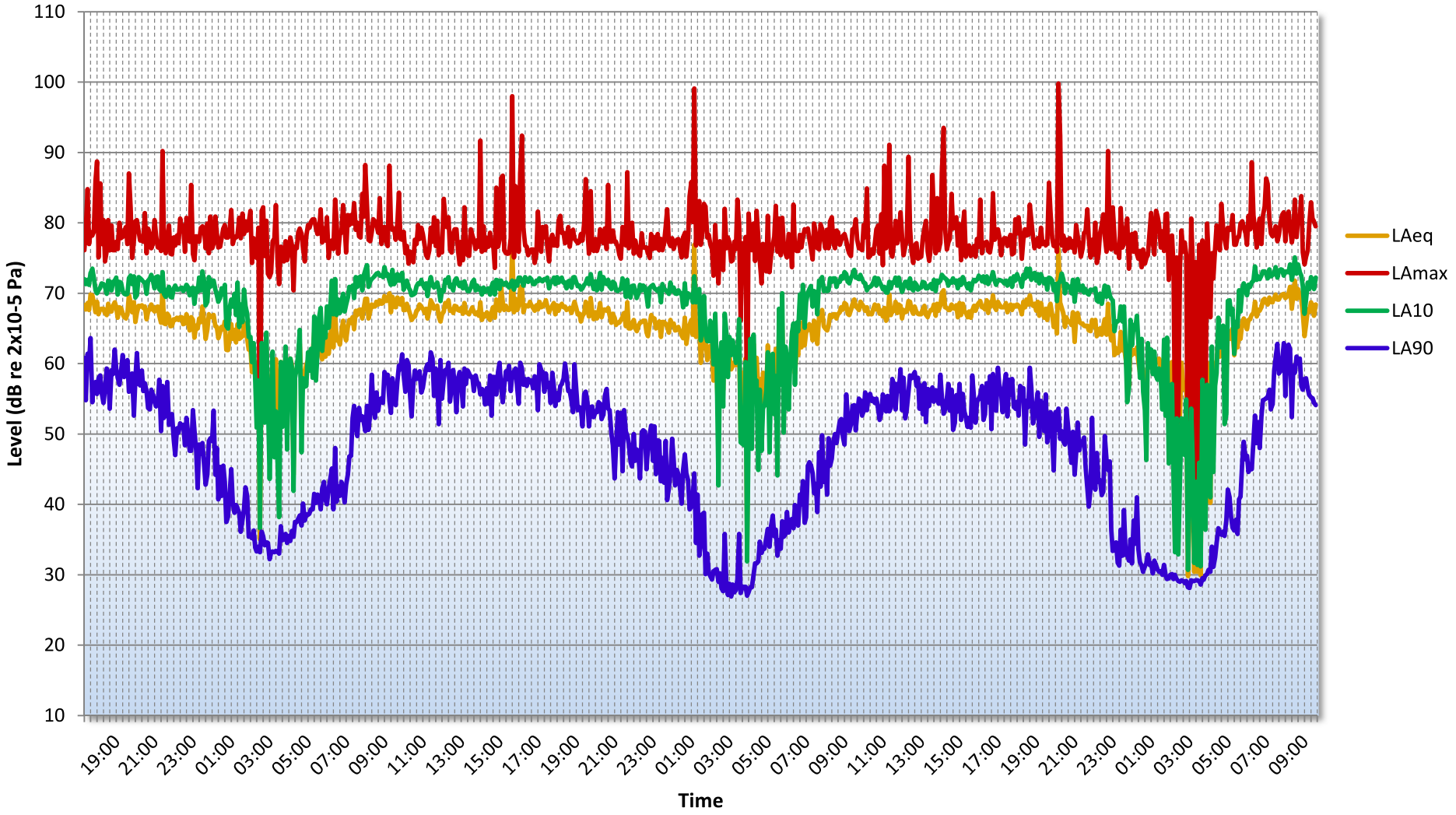


Figure 14054.TH1.Front Facade

63-71 High Street, Hampton Hill
Environmental Noise Time History
20th May to 23rd May 2016

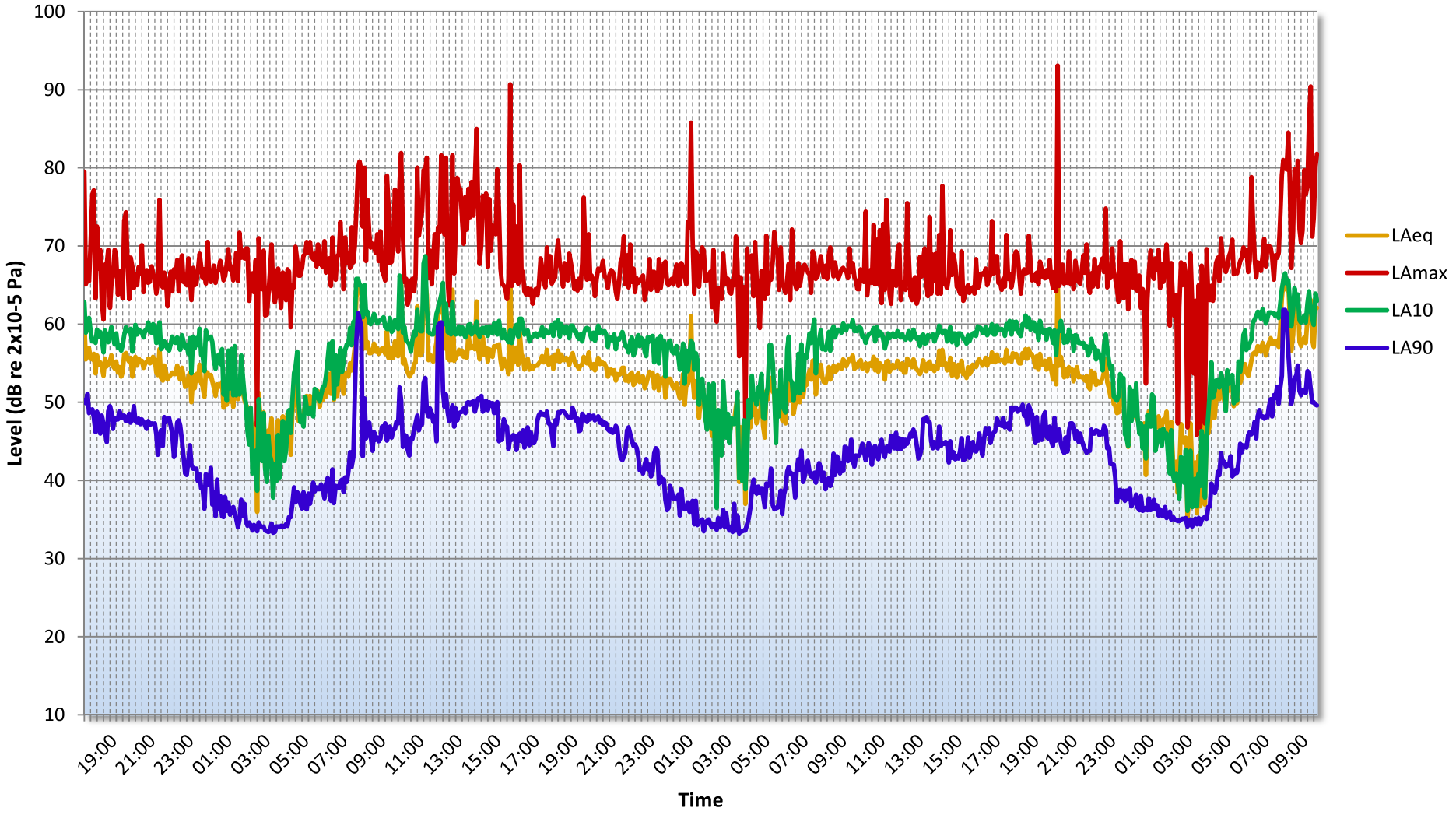


Figure 14054.TH2.Central Position

63-71 High Street, Hampton Hill
Environmental Noise Time History
20th May to 23rd May 2016

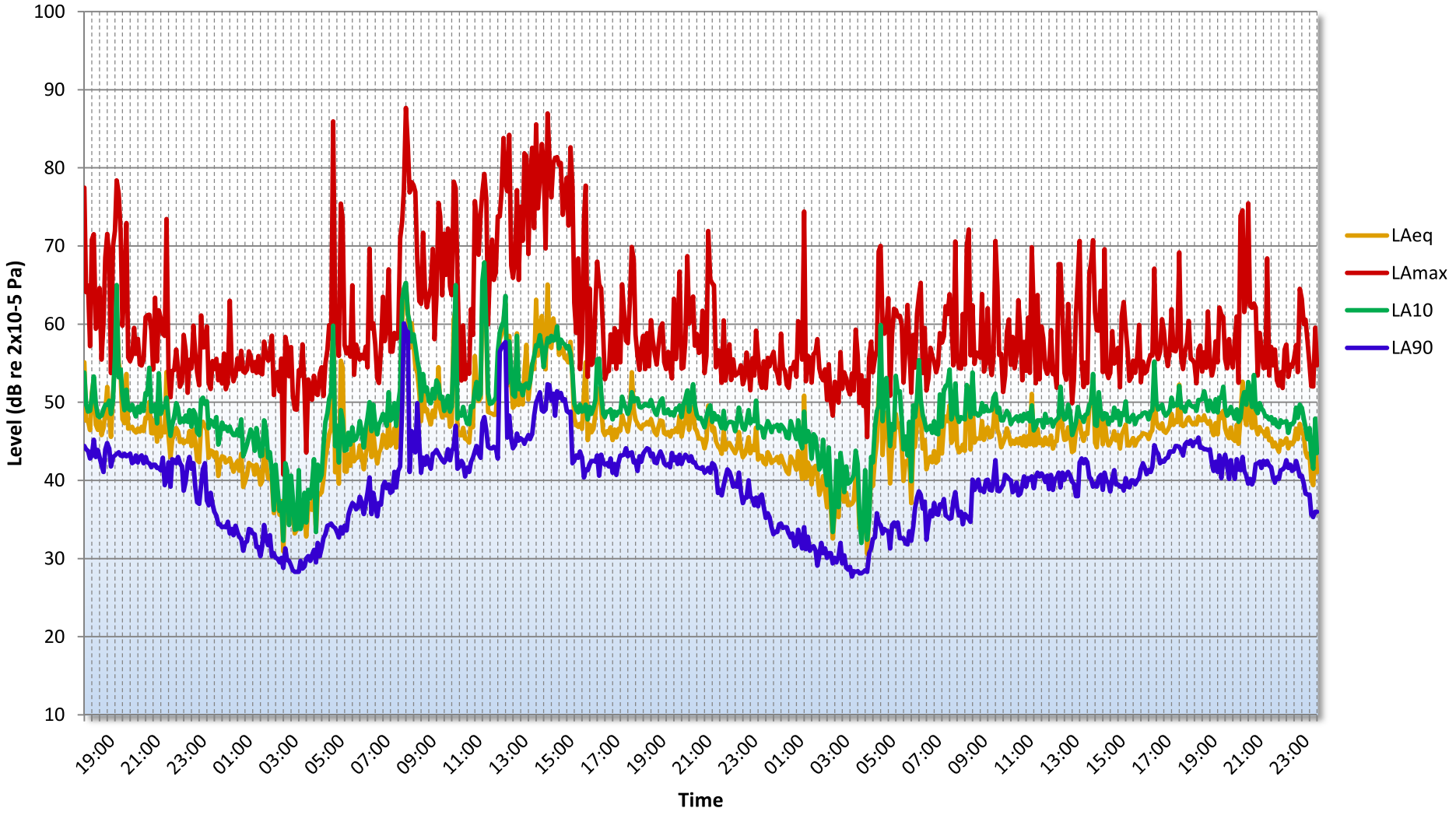
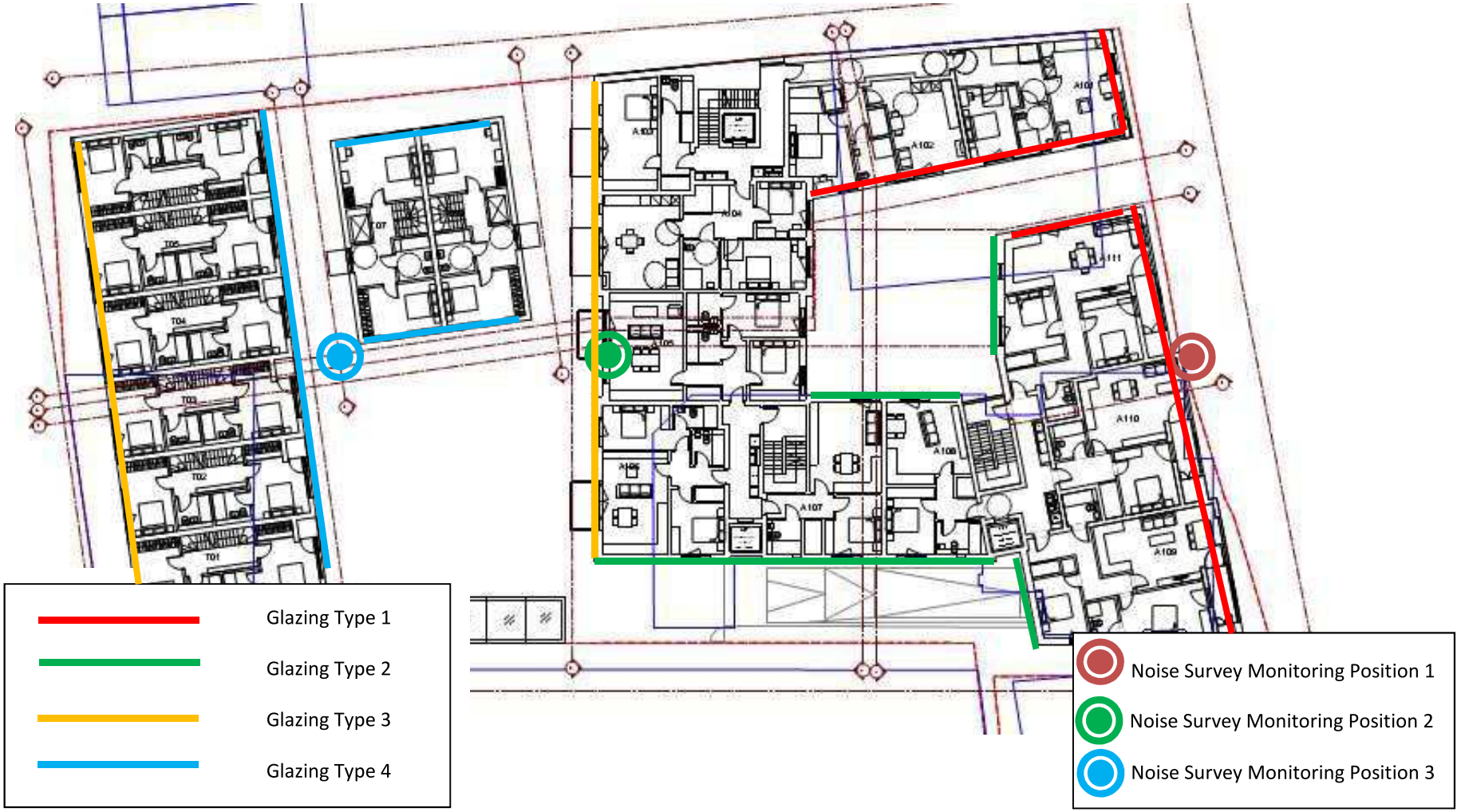


Figure 14054.TH3.Rear Facade



Title:

Indicative site plan showing noise monitoring position and Glazing types relative to proposed development

Date: 27 October 2016

FIGURE 14054.SP2

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APPENDIX A

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPENDIX A

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.