70 GRAYS INN ROAD, LONDON

Planning Noise Assessment

Reference: 10706.RP01.PNA.0
Prepared: 16 December 2020
Revision Number: 0

Euro Grays Inn Inc.
180 Great Portland Street
London
W1W 5QZ

Planning Noise Assessment

70 GRAYS INN ROAD, LONDON

Reference: 10706.RP01.PNA.0
Prepared: 16 December 2020

Revision	Comment	Date	Prepared By	Approved By
1	First issue of report	16 December 2020	Daniel Flood	Martin Raisborough

Terms of contract:

RBA Acoustics Ltd has prepared this report in accordance with our Scope of Work 10706/SW01 dated 14 December 2020. RBA Acoustics Ltd shall not be responsible for any use of the report or its contents for any purpose other than that for which it was provided. Should the Client require the distribution of the report to other parties for information, the full report should be copied. No professional liability or warranty shall be extended to other parties by RBA Acoustics Ltd without written agreement from RBA Acoustics Ltd.

The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed in to full working drawings by the lead designer to incorporate all other design disciplines.

RBA ACOUSTICS

LONDON
44 Borough Road
London SE1 0AJ
T. +44 (0) 20 7620 1950

MANCHESTER
Lowry House, 17 Marble Street
Manchester, M2 3AW
T. +44 (0) 161 661 4504

Contents

1.0 INTRODUCTION

RBA Acoustics has been appointed by Euro Properties to undertake an acoustic review in relation to proposals to fit out the lower four floors (whole of first and second floors and parts of the ground and lower ground floors) which are currently speculative CAT A (Planning Class E(c)), for new teaching and learning spaces (Planning Class F1).

The landlord's refurbishment also includes the provision of new corner entrances from the street, one of which will be solely for the use for the proposed teaching and learning accommodation.

The only issue in relation to noise for planning is considered to be that of the installation of new building services plant items. As such, RBA Acoustics has been commissioned to undertake environmental noise monitoring of the prevailing noise conditions at the site in order to determine the atmospheric noise emissions limits from future plant installation, in accordance with Camden Council's requirements.

This report presents the results of the noise measurements, associated criteria and proposed noise limits. The report occasionally employs technical terminology. In order to assist the reader, a glossary of terms is presented in Appendix A.

2.0 SITE DESCRIPTION

70 Gray's Inn Road is a self-contained office building located over basement, ground and 5 upper floors on the Eastern side of Gray's Inn Road, between its junction with Holborn and Theobalds Road in the London Borough of Camden. The building is opposite Gray's Inn and is a short walk from both Chancery Lane and Farringdon Stations.

The site is bounded by the main Gray's Inn Road to the West and the minor Portpool Lane and Verulum Gardens to the north and south respectively. Bourne Estate Gardens borders the site to the East, beyond which lies Gooch Buildings, a 6 storey residential apartment building approximately 30 metres from the 70 Gray's Inn Road building. Other nearby noise sensitive receptors are identified to be those along Portpool Lane, approximately 25 metres to the north east of the site. These properties are considered to be the nearest affected noise sensitive receptors to the site.

In addition to the above, and although not strictly a planning requirement, it is recommended that the commercial office buildings forming Gray's Inn Square and Verulam Buildings on the opposite side of Gray's Inn Road to the site are also considered in terms of noise impact from future plant.

The proposed use of the lower floors of the building for teaching and learning is not considered contentious from a noise perspective. Other than noise from any proposed plant items, it is not considered that there will be any other noise generating activities that will result in any impacts on the amenity of the nearby noise sensitive receptors.

A plan of the site showing the local environment is shown on the plan in Appendix C.

3.0 ASSESSMENT METHODOLOGY

3.1 British Standard 4142

BS 4142 is the generally adopted method for assessing industrial and commercial noise emissions affecting residential areas and is also specified by the majority of local authorities for such instances. The BS 4142 Standard describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,Tr}$).The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound.

The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed to operate in the future.

Comparing the rating level with the background sound level, BS 4142 states:

- "Typically, the greater this difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

This standard and methodology will be in conjunction with the requirements of the London borough of Camden to provide noise emission limits for future plant items.

3.2 London Borough of Camden Requirements

The requirements of Camden Council's Environmental Health Department regarding new building services plant are understood to be as follows.

Any noise generated by new building services plant should be designed to a level 10dB below the lowest background L_{A90} 15 minute sample during operational hours, as measured 1m outside the nearest affected residential window.

In accordance with BS 4142: 2014, should the proposed plant be identified as having intermittent or tonal characteristics, a further 5 dB penalty should be subtracted from any of the above proposed noise emission limits. It should be noted that the above requirements are applied at the nearest residential adjacencies and alternative criteria should be incorporated if there are also commercial properties affected by the proposed plant installations.

4.0 ENVIRONMENTAL SOUND MONITORING

4.1 General

Baseline environmental sound monitoring was undertaken at the site between 13:00 hours on Monday 21st October and 13:30 hours Tuesday 22nd October 2019. The survey was undertaken by Daniel Flood (MSc Environmental and Architectural Acoustics, AMIOA).

Measurements were made of the L_{A90}, L_{Amax} and L_{Aeq} noise levels over sample periods of 15 minutes duration.

4.2 Measurement Location

The measurement was undertaken at the rear of the building, at second floor level. The microphone was mounted on an A-frame such that is was at a distance of 1 metre from the building façade. This measurement position was considered to be representative of the noise climate at the closest identified residential receptors within Gooch Buildings on the opposite side of the gardens of Bourne Estate and those along Portpool Lane.

The measurement position is also illustrated on the site plan in Figure 1 in Appendix C.

The prevailing noise climate at the measurement location was determined by traffic movements along the nearby and surrounding roads.

4.3 Weather Conditions

Weather conditions throughout the survey were considered to be conducive to the measurement of environmental sound. At the beginning of the survey weather conditions were noted to be dry with around 60% cloud cover and southerly winds of around 4-5m/s north easterly) and a temperature of 13^0C. At the end of the survey, the weather conditions were dry with around 40% cloud cover and light winds (2-3m/s easterly) and a temperature of 16^0C.

As the survey was unattended, detailed records of weather conditions throughout the survey were not able to be recorded, however, it is understood from weather reports from nearby stations that weather conditions remained dry and still throughout the survey, with winds around 2 to 3 m/s and night time low temperatures of around 5^0C.

4.4 Instrumentation

Details of the instrumentation used to undertake the survey are provided in Appendix B.

The sound level meter was calibrated both prior to and on completion of the survey with no significant calibration drift observed.

4.5 Results

The full results of the monitoring survey are presented in the time history graphs in Appendix C. A summary of the results is presented in Table 1 below in terms of the lowest background (L_{A90}) sound levels measured in any 15 minute period.

Table 1 – Measured Levels

Measurement Period	Sound Pressure Levels (dB re $20x10^{-6}$ Pa.)	
	Lowest $L_{90,\ 15\ minute}$ (dBA)	Lowest $L_{90,\ 15\ minute}$ L_{eq} (dBA)
Daytime (07:00 – 19:00)	49	57
Evening (19:00 – 23:00)	48	54
Night-time (23:00 – 07:00)	47	51

5.0 PLANT NOISE EMISSION LIMITS

Based on the results of the environmental sound survey in Section 4 and the plant noise control requirements of the Local Authority in Section 3, noise emission limits for future items of noise generating plant serving the new facility may be derived.

Noise emission limits will be dependent on the hours of operation of the plant. As such, it is considered appropriate to provide recommended noise emission limits for periods of the day and evening during which the plant is expected to be operational.

Based on the above, Table 2 presents recommended noise emission limits for plant. These limits are to be achieved at the façade location of the nearest affected noise sensitive properties to the site, identified to be those indicated on the site plan in Appendix C.

Table 2 – Proposed Noise Limits

Measurement Period	Target Rating Sound Level, (dB)
Daytime (07:00 – 19:00)	39dB $L_{Ar,\ 1\ hour}$
Evening (19:00 – 23:00)	38dB $L_{Ar,\ 1\ hour}$
Night-time (23:00 – 07:00)	37dB $L_{Ar,\ 15\ minutes}$

In accordance with BS 4142: 2014, should the proposed plant be identified as having intermittent or tonal characteristics, a further 5 dB penalty should be subtracted from any of the above proposed noise emission limits. It should be noted that the above requirements are applied at the nearest residential adjacencies and alternative criteria should be incorporated if there are also commercial properties affected by the proposed plant installations.

In addition to the above, and in line with good practice, it is recommended that noise from plant impacting on the nearby commercial office uses does not exceed a level of 50dBA during typical daytime working hours.

6.0 VIBRATION CONTROL

In addition to the control of airborne noise transfer, it is also important to consider the transfer of noise as vibration to adjacent properties (as well as to any sensitive areas of the same building).

We would typically advise that condensing units and AHUs be isolated from the supporting structure by means of either steel spring isolators or rubber footings. For particularly sensitive locations, or when on lightweight structures the mounts should ideally be caged and be of the restrained type.

It is important the isolation is not “short-circuited” by associated pipework or conduits. To this end, any conduits should be looped and flexible connectors should be introduced between the condenser and any associated pipework. Pipework should be supported by brackets containing neoprene inserts.

7.0 CONCLUSION

RBA Acoustics has been appointed by Euro Properties to undertake an acoustic review in relation to proposals to fit out the lower four floors (whole of first and second floors and parts of the ground and lower ground floors) which are currently speculative CAT A (Planning Class E(c)), for new teaching and learning spaces (Planning Class F1).

In order to support a planning application, environmental noise monitoring of the prevailing noise conditions at the site has been undertaken at the site between 13:00 hours on Monday 21st October and 13:30 hours Tuesday 22nd October 2019.

Based on the results of the environmental sound survey, and the plant noise control requirements of the Local Authority, noise emission limits for future items of noise generating plant serving the new facility have been derived. These are presented in Table 2 of this report. It is also recommend that noise from plant impacting on the nearby commercial office uses does not exceed a level of 50dBA during typical daytime working hours.

If the recommendations in this report are complied with, it is not considered that there will be any impacts on residential or commercial amenity on the nearby surrounding properties due to noise and vibration.

Initial guidance has also been provided in relation to the control of vibration from future plant items.

Appendix A - Acoustic Terminology

dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
L_{eq}	L_{eq} is defined as 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 (1 hour).
L_{Aeq}	The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.
L_{An} (e.g L_{A10}, L_{A90})	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and 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 the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the L_{eq} value.

Appendix B - Instrumentation

The following equipment was used for the measurements:

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1406970	U32886	20 September 2021
Norsonic Pre Amplifier	1209	21205		
Norsonic ½“ Microphone	1225	271055	32885	20 September 2021
Norsonic Sound Calibrator	1251	35020	U32884	20 September 2021

Appendix C – Graphs and Site Plans

70 Grays Inn Road

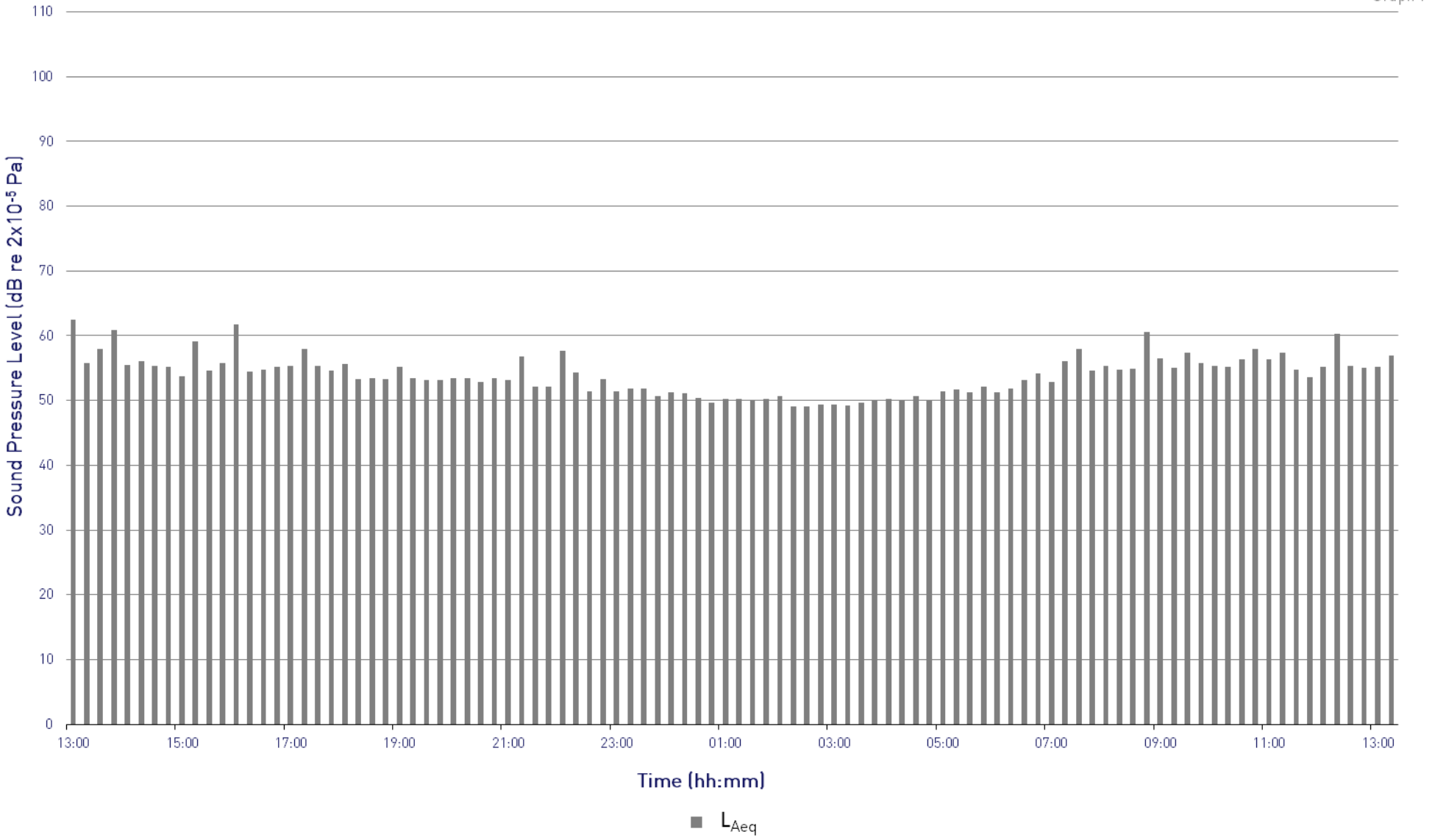
L_{Aeq} Time History 21 - 22 October 2019

Rear façade

RBA ACOUSTICS

Project: 9768

Graph 1



70 Grays Inn Road

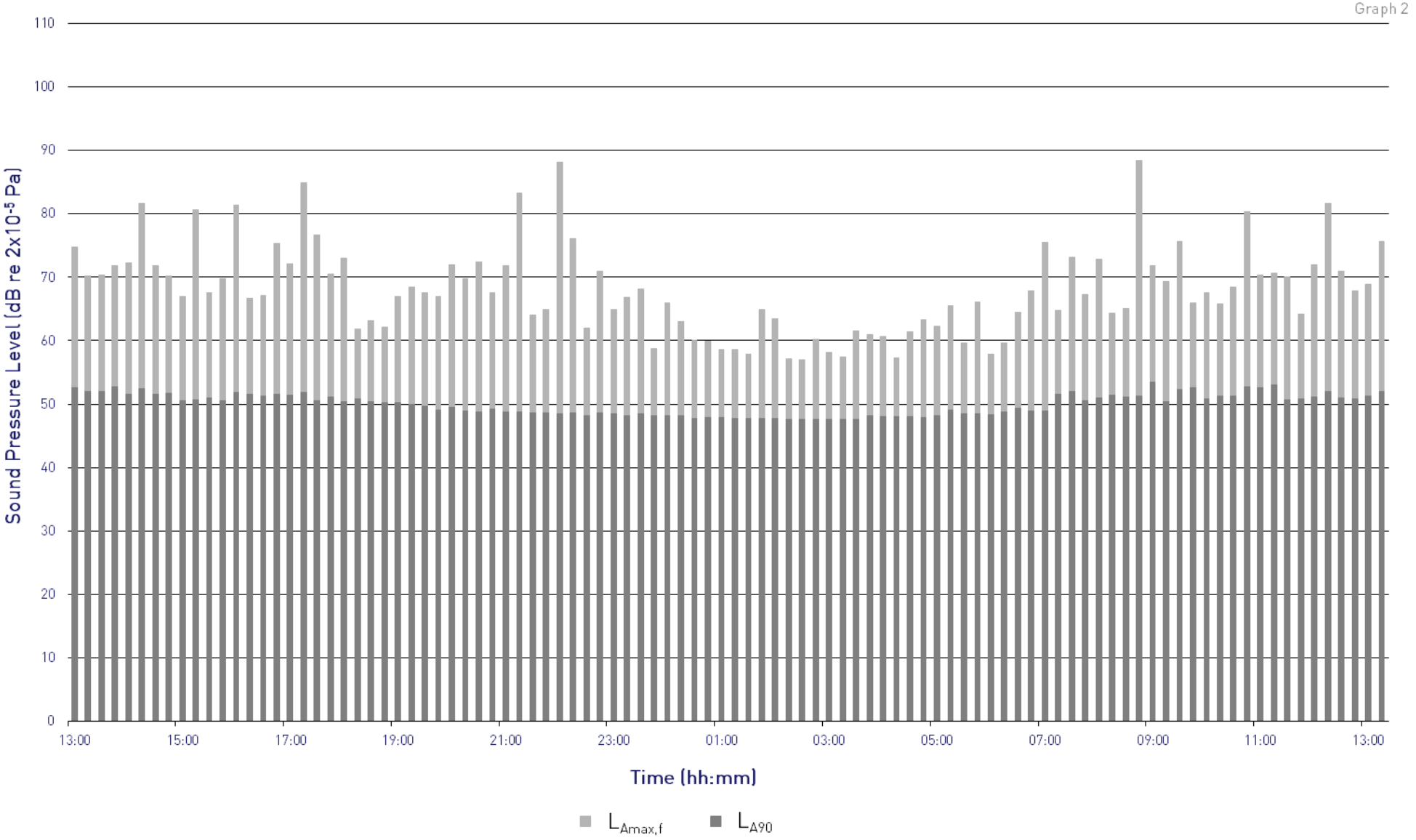
$L_{Amax,f}$ and L_{A90} Time History 21 - 22 October 2019

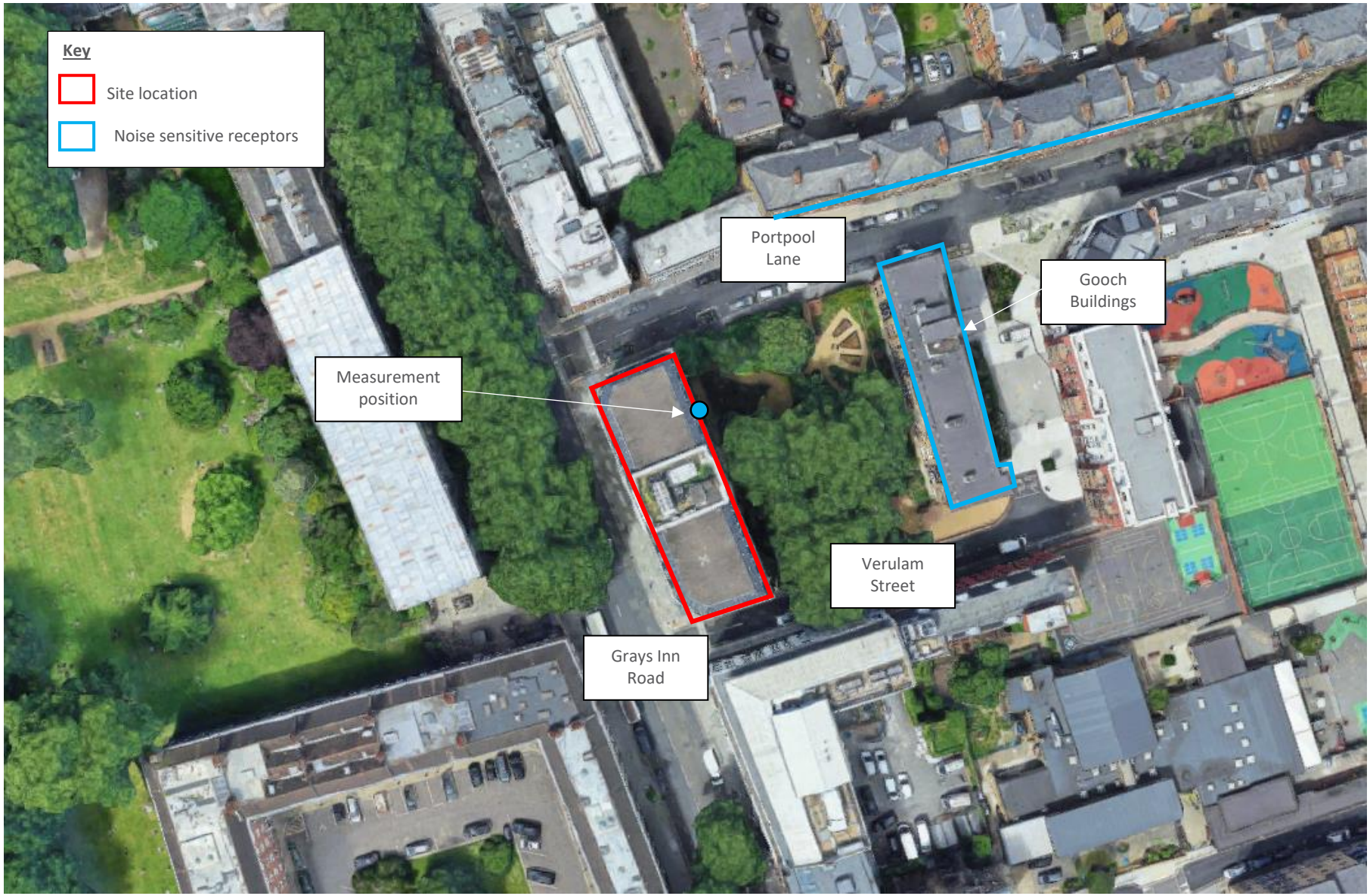
Rear façade

RBA ACOUSTICS

Project: 9768

Graph 2





70 Grays Inn Road, London
Site location Plan
Project 10706

Figure 1
16 December 2020
Not to Scale

RBA ACOUSTICS

RBA ACOUSTICS
W. www.rba-acoustics.co.uk
E. info@rba-acoustics.co.uk

London:
44 Borough Road
London SE1 0AJ
T. +44 (0) 20 7620 1950

Manchester:
Lowry House, 17 Marble Street
Manchester M2 3AW
T. +44 (0) 16 1661 4504