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ACOUSTIC REPORT No. 750135/1A

3rd March 2015

BIRKBECK UNIVERSITY OF LONDON

MALET STREET

LONDON

WC1E 7HX

GROUND FLOOR LOCATION

ADJACENT TO THE CLORE BUILDING

ENVIRONMENTAL NOISE SURVEY
&
PLANT NOISE ASSESSMENT

PREPARED BY:

J E Redknap

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CONTENTS

Forward

As part of the refurbishment of the premises new mechanical services plant is proposed, with the plant being located externally at ground floor level at the rear of the Clore Building. Consequently, there is a requirement for a pre-installation acoustic survey and report in order to establish compliance or otherwise with the planning requirements of the local council for this area.

Noico Limited has been commissioned to undertake an Environmental Noise Survey of the area prior to the installation and commissioning of the proposed new plant. The results of the survey will establish the Background Sound Level to enable checks to be made on the new mechanical services plant in order that they comply with planning requirements.

Summary

The lowest measured Background Sound Levels $L_{A90.15MIN}$ were as follows:

$L_{A90.15MIN}$ 47.7dB(A) between 07:00 hours to 23:00 hours (Daytime & Evening)
$L_{A90.15MIN}$ 46.8dB(A) between 23:00 hours to 07:00 hours (Night Time)

The combined sound level of all new plant when measured at the closest residential window should therefore not exceed:

$L_{A90.15MIN}$ 37.7dB(A) between 07:00 hours to 23:00 hours (Daytime & Evening)
$L_{A90.15MIN}$ 36.8dB(A) between 23:00 hours to 07:00 hours (Night Time)

1.0 Author

John E Redknap MBA, MIOA, MCMI

The author has been practising in noise control engineering since 1985. He has gained a wide range of experience over this period and is one of the acoustic engineers employed by Noico Limited.

2.0 Client

The Environmental Noise Survey and report has been undertaken on behalf of:

Birkbeck University of London
Malet Street
London
WC1E 7HX

3.0 Introduction

3.1 As part of the refurbishment of the premises new mechanical services plant is proposed, with the plant being located externally at ground floor level at the rear of the Clore Building. Consequently, there is a requirement for a pre-installation acoustic survey and report in order to establish compliance or otherwise with the planning requirements of the local council for this area.

3.2 Noico Limited has subsequently been commissioned to undertake an Environmental Noise Survey of the area prior to the installation and commissioning of the proposed new plant

3.3 The site itself is located at the rear of the Clore Building and is in an area comprising of a mix of residential and commercial premises. From the information provided and our observations made on site, the nearest noise affected properties appear to be the residential houses adjacent to the proposed plant location – see Fig 2 Site Plan.

4.0 Survey Objectives

4.1 To establish, by means of detailed environmental noise monitoring over a period of at least 24 hours, the existing A-weighted dB(A) $L_{90,}$ and L_{eq} environmental noise levels at the site, thought to be representative of the pre-existing ambient noise levels at the nearest adjacent residential properties.

4.2 Based on the noise survey data, noise criteria are to be established for limiting noise emissions from the proposed mechanical plant installations serving the premises. The noise criteria are to be set in accordance with the requirements of the local planning authority.

5.0 Instrumentation

5.1 A precision grade Norsonic 140 'Type 1' Integrating Sound Level Meter was used for the survey. This was equipped with an environmental microphone and extension cable. The instrument was powered by an external battery and stored in a weatherproof case.

5.2 The instrument was calibrated prior and subsequent to use with no calibration drift recorded.

6.0 Survey Details

6.1 Location: The environmental noise analyser microphone was located externally within the grounds of the site and as far away as possible from existing mechanical plant. This position was chosen as it was considered to be representative of the background noise environment which exists at the nearest noise affected properties adjacent to the site as previously described. Please refer to the attached site plan in Figure 2 of this report for further details.

6.2 Period: Monitoring was carried out continuously from approximately 13.30 hours on Wednesday 4th February 2015 through to 14:00 hours on Thursday 5th February 2015. The instrument was set up to monitor noise levels continuously and store data in fifteen minute intervals.

6.3 Weather: The prevailing weather condition throughout the majority of the survey period was satisfactory for noise monitoring, being cold with little precipitation and with a moderate breeze. Wind speed, although not recorded, was considered to be less than 5 m/s throughout the survey period.

6.4 Site Noise Characteristics: Although the survey was un-manned, it is assumed that the ambient noise level was characterised by road traffic noise and to a lesser extent from existing mechanical plant. It is thought that no unusual events occurred during the survey period and the data are considered to be a true representation of ambient noise levels.

7.0 Survey Results

7.1 The results of the environmental survey are presented in graphical and numerical format in the attached appendices, showing the recorded values of L_{Aeq} and L_{A90}.

7.2 See Appendix 1 for a glossary of terms.

7.3 With reference to the measured data, the minimum background noise level measured during the survey period was:

$L_{A90.15MIN}$ 47.7dB(A) between 07:00 hours to 23:00 hours (Daytime & Evening)
$L_{A90.15MIN}$ 46.8dB(A) between 23:00 hours to 07:00 hours (Night Time)

8.0 Environmental Noise Level Criteria

8.1 Criteria for mechanical services noise emission are normally based upon the prevailing level of background noise in the period of concern and may be set against this to a level as normally defined by the local planning authority.

8.2 The local planning authority would advise that noise arising from fixed plant installations should not cause an increase in the existing minimum background noise level (as expressed as a L_{A90}) at the nearest noise affected property. In practical terms, this means that the noise arising from the plant should be at least 10 dB(A) below the minimum background noise level. The local authority would also confirm that tonal contributions from plant should be kept to a minimum wherever possible.

8.3 To conform to the above criteria, and in accordance with the minimum background noise levels measured during the survey (summarised in 7.3 above), noise from the proposed plant installations should not exceed the following value.

Daytime plant operation (07:00 to 23:00hrs)	37.7 dB $L_{A90.15MIN}$
24 hour plant operation	36.8 dB $L_{A90.15MIN}$

Note: These levels must be achieved cumulatively with all plant operating, and as measured at 1 metre from the window of the nearest affected property.

9.0 Conclusion

9.1 A background noise level survey has been carried out at ground level of the site located at the rear of the Clore Building for Birkbeck University of London, Malet Street, London. WC1E 7HX .

9.2 Based upon the survey results and discussions with the local planning authority, criteria applicable to noise from the mechanical services plant have been established.

Appendix 1 - 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).
Frequency	Is related to sound pitch; frequency equals the ratio between velocity of sound and wavelength.
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.
Traffic Noise Level	The value of $L_{A10,T}$.
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 dB(A) 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 1 m from the façade of the nearest affected sensitive property.

Appendix 2 - Environmental Noise Monitoring Data

File	Date & Time	Leq(A)	L90 dB(A)
NOR140_FILE_150204_0005.NBF	(2015/02/04 13:34:22.00)	54.6	49.6
NOR140_FILE_150204_0006.NBF	(2015/02/04 13:49:24.00)	52.1	47.7
NOR140_FILE_150204_0007.NBF	(2015/02/04 14:04:26.00)	51.0	49.4
NOR140_FILE_150204_0008.NBF	(2015/02/04 14:19:29.00)	51.0	49.6
NOR140_FILE_150204_0009.NBF	(2015/02/04 14:34:31.00)	50.9	49.5
NOR140_FILE_150204_0010.NBF	(2015/02/04 14:49:33.00)	51.2	49.2
NOR140_FILE_150204_0011.NBF	(2015/02/04 15:04:35.00)	51.0	48.5
NOR140_FILE_150204_0012.NBF	(2015/02/04 15:19:38.00)	55.2	49.9
NOR140_FILE_150204_0013.NBF	(2015/02/04 15:34:40.00)	50.9	49.7
NOR140_FILE_150204_0014.NBF	(2015/02/04 15:49:43.00)	51.9	50.2
NOR140_FILE_150204_0015.NBF	(2015/02/04 16:04:46.00)	54.7	50.0
NOR140_FILE_150204_0016.NBF	(2015/02/04 16:19:49.00)	51.7	48.4
NOR140_FILE_150204_0017.NBF	(2015/02/04 16:34:52.00)	56.3	50.2
NOR140_FILE_150204_0018.NBF	(2015/02/04 16:49:55.00)	54.2	49.7
NOR140_FILE_150204_0019.NBF	(2015/02/04 17:04:58.00)	52.2	49.7
NOR140_FILE_150204_0020.NBF	(2015/02/04 17:20:01.00)	52.5	49.8
NOR140_FILE_150204_0021.NBF	(2015/02/04 17:35:03.00)	51.6	49.7
NOR140_FILE_150204_0022.NBF	(2015/02/04 17:50:05.00)	51.6	50.0
NOR140_FILE_150204_0023.NBF	(2015/02/04 18:05:08.00)	51.1	48.1
NOR140_FILE_150204_0024.NBF	(2015/02/04 18:20:10.00)	51.6	49.8
NOR140_FILE_150204_0025.NBF	(2015/02/04 18:35:12.00)	51.8	49.6
NOR140_FILE_150204_0026.NBF	(2015/02/04 18:50:15.00)	51.2	49.7
NOR140_FILE_150204_0027.NBF	(2015/02/04 19:05:17.00)	54.6	50.2
NOR140_FILE_150204_0028.NBF	(2015/02/04 19:20:21.00)	53.9	49.6
NOR140_FILE_150204_0029.NBF	(2015/02/04 19:35:23.00)	51.4	49.4
NOR140_FILE_150204_0030.NBF	(2015/02/04 19:50:26.00)	50.7	49.4
NOR140_FILE_150204_0031.NBF	(2015/02/04 20:05:29.00)	51.7	49.2
NOR140_FILE_150204_0032.NBF	(2015/02/04 20:20:32.00)	56.1	49.5
NOR140_FILE_150204_0033.NBF	(2015/02/04 20:35:35.00)	50.5	48.6
NOR140_FILE_150204_0034.NBF	(2015/02/04 20:50:38.00)	49.5	48.2
NOR140_FILE_150204_0035.NBF	(2015/02/04 21:05:40.00)	49.2	48.1
NOR140_FILE_150204_0036.NBF	(2015/02/04 21:20:43.00)	50.8	48.0
NOR140_FILE_150204_0037.NBF	(2015/02/04 21:35:46.00)	50.2	48.2
NOR140_FILE_150204_0038.NBF	(2015/02/04 21:50:48.00)	50.2	48.3
NOR140_FILE_150204_0039.NBF	(2015/02/04 22:05:51.00)	49.3	47.9
NOR140_FILE_150204_0040.NBF	(2015/02/04 22:20:53.00)	49.1	47.9
NOR140_FILE_150204_0041.NBF	(2015/02/04 22:35:55.00)	48.4	47.7
NOR140_FILE_150204_0042.NBF	(2015/02/04 22:50:58.00)	49.2	47.8
NOR140_FILE_150204_0043.NBF	(2015/02/04 23:06:00.00)	48.4	47.2

File	Date & Time	Leq(A)	L90dB(A)
NOR140_FILE_150204_0044.NBF	(2015/02/04 23:21:03.00)	49.4	47.8
NOR140_FILE_150204_0045.NBF	(2015/02/04 23:36:06.00)	48.4	47.3
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NOR140_FILE_150205_0005.NBF	(2015/02/05 01:06:23.00)	47.6	46.9
NOR140_FILE_150205_0006.NBF	(2015/02/05 01:21:26.00)	48.2	47.1
NOR140_FILE_150205_0007.NBF	(2015/02/05 01:36:29.00)	47.5	46.9
NOR140_FILE_150205_0008.NBF	(2015/02/05 01:51:32.00)	48.7	47.6
NOR140_FILE_150205_0009.NBF	(2015/02/05 02:06:35.00)	47.9	47.2
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NOR140_FILE_150205_0011.NBF	(2015/02/05 02:36:41.00)	47.6	47.1
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NOR140_FILE_150205_0015.NBF	(2015/02/05 03:36:50.00)	47.5	47.0
NOR140_FILE_150205_0016.NBF	(2015/02/05 03:51:52.00)	47.5	47.0
NOR140_FILE_150205_0017.NBF	(2015/02/05 04:06:55.00)	48.6	47.3
NOR140_FILE_150205_0018.NBF	(2015/02/05 04:21:58.00)	47.9	47.1
NOR140_FILE_150205_0019.NBF	(2015/02/05 04:37:01.00)	47.8	46.8
NOR140_FILE_150205_0020.NBF	(2015/02/05 04:52:03.00)	48.5	47.5
NOR140_FILE_150205_0021.NBF	(2015/02/05 05:07:06.00)	52.0	47.3
NOR140_FILE_150205_0022.NBF	(2015/02/05 05:22:09.00)	48.9	47.6
NOR140_FILE_150205_0023.NBF	(2015/02/05 05:37:13.00)	48.3	47.7
NOR140_FILE_150205_0024.NBF	(2015/02/05 05:52:15.00)	48.9	47.8
NOR140_FILE_150205_0025.NBF	(2015/02/05 06:07:19.00)	49.0	47.6
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File	Date & Time	Leq(A)	L90dB(A)
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NOR140_FILE_150205_0045.NBF	(2015/02/05 11:08:13.00)	53.5	49.8
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NOR140_FILE_150205_0050.NBF	(2015/02/05 12:23:26.00)	51.8	49.5
NOR140_FILE_150205_0051.NBF	(2015/02/05 12:38:28.00)	51.3	49.7
NOR140_FILE_150205_0052.NBF	(2015/02/05 12:53:31.00)	56.7	50.5
NOR140_FILE_150205_0053.NBF	(2015/02/05 13:08:33.00)	54.5	50.3
NOR140_FILE_150205_0054.NBF	(2015/02/05 13:23:37.00)	52.5	49.9
NOR140_FILE_150205_0055.NBF	(2015/02/05 13:38:40.00)	56.3	50.0
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Figure 1

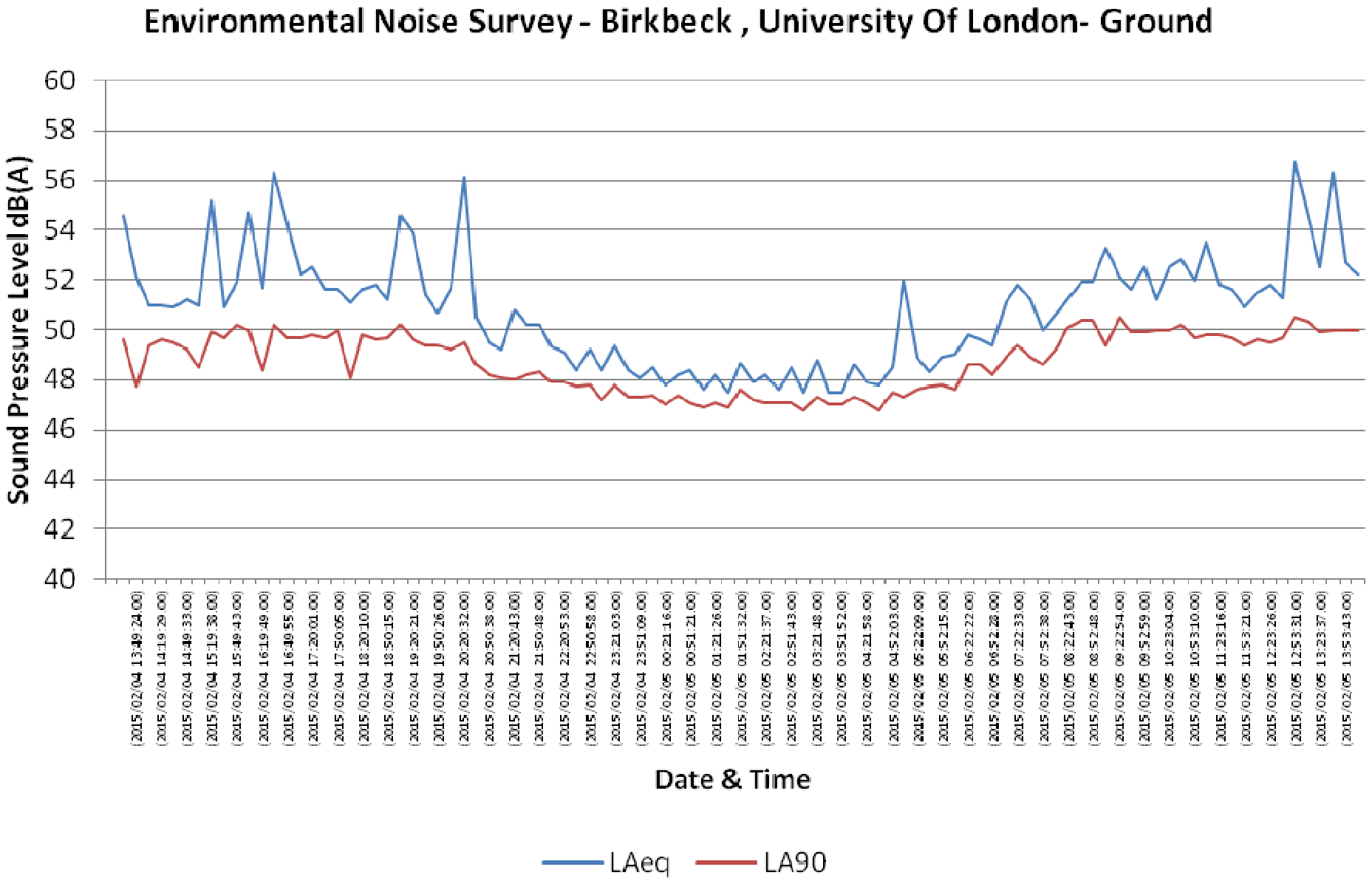
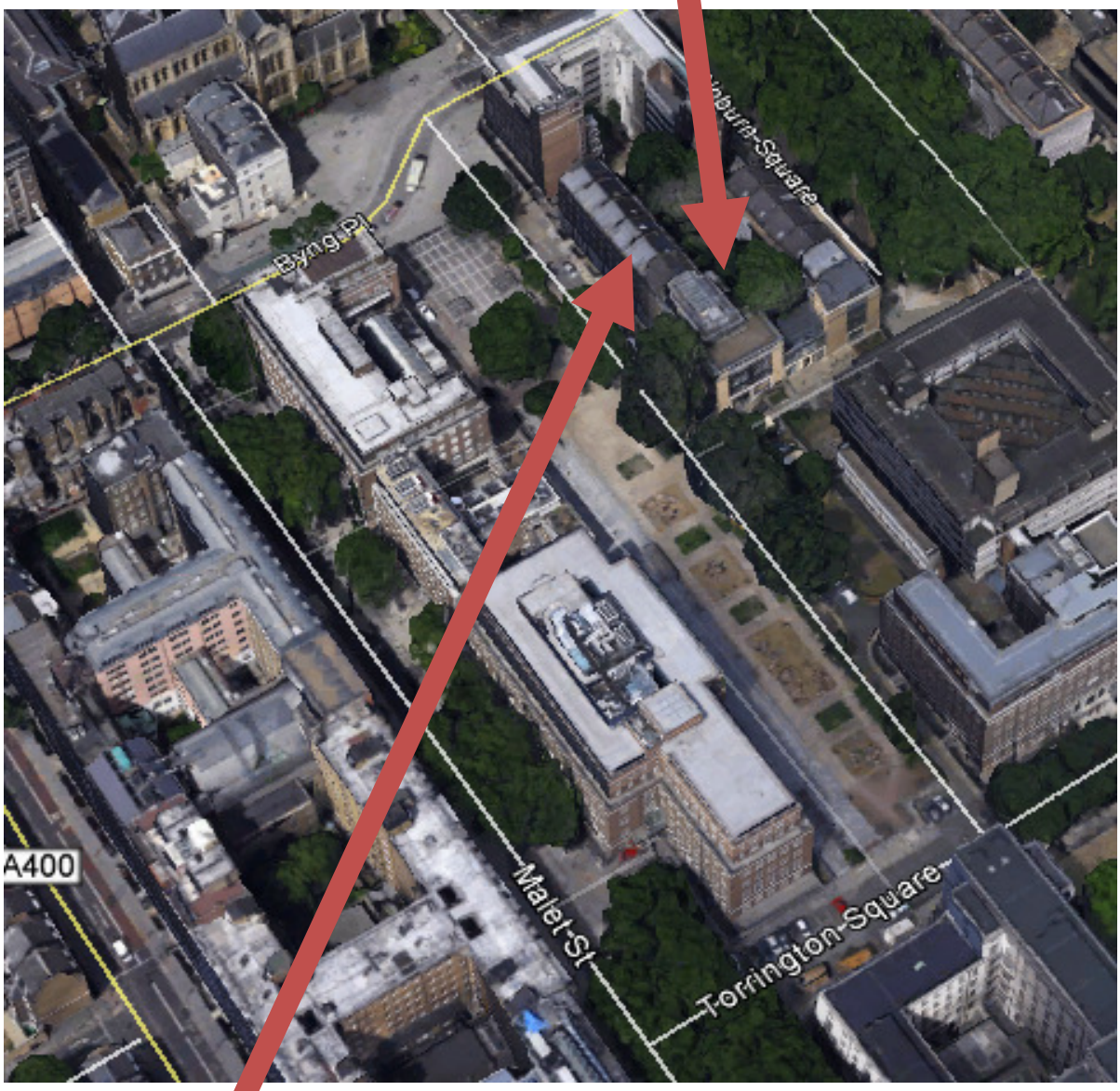

Environmental Noise Survey - Birkbeck , University Of London- Ground
Sound Pressure Level dB(A)
60
58
56
54
52
50
48
46
44
42
40
Date & Time
LAeq
LA90

Figure 2



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