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Report no. 2104026-7

176 Prince of Wales Road
Camden
London

ENVIRONMENTAL NOISE SURVEY REPORT & ACOUSTIC ASSESSMENT

Prepared: 28th April 2021

Presented by:

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1.0 Introduction

1.1 Zabludowicz Collection has commissioned Noico Ltd to conduct an environmental noise survey at 176 Prince of Wales Road, Camden. The purpose of the survey is to obtain statistical noise data and to determine the background noise levels at the site. Based on the noise survey data, noise criteria are to be established for limiting noise emission from the mechanical plant installations serving the premises. The noise criteria are to be set in accordance with the requirements of the local planning authority (The London Borough of Camden Council).

2.0 Instrumentation

2.1 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.

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

3.0 Survey Details

3.1 Location: The environmental noise analyser microphone was located externally at ground floor level of the premises, below the proposed plant location and adjacent to the nearest noise sensitive windows – it was also largely away from any existing 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.

Note, from the observations made on site, the nearest noise affected properties are considered to be the two-storey residential building adjacent to the site (previously a Care Home). Note, the exact position of the nearest noise-affected properties is to be confirmed by the local planning authority, prior to final design of any necessary mechanical plant noise control measures.

3.2 Period: Monitoring was carried out continuously from approximately 14:00 hrs on the Thursday 15th April 2021 through to 13:00 hrs on Monday 19th April 2021. The instrument was set up to monitor noise levels continuously and store data in fifteen-minute intervals.

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

3.4 Site Noise Characteristics: The ambient noise level was characterised by road traffic noise along Prince of Wales Road and cars parking in the adjacent slip road/car park serving the residential properties. 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.

4.0 Survey Results

4.1 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}.

4.2 See Appendix 1 for a glossary of terms.

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

Daytime	(07:00 to 23:00hrs)	- 37.9 L_{A90}
Night time	(23:00 to 07:00hrs)	- 37.2 L_{A90}

5.0 Environmental Noise Level Criteria

5.1 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.

5.2 The London Borough of Camden Council has advised that noise arising from fixed plant installations should, when measured at the nearest noise affected property, be at least 10 dB(A) below the minimum background noise level (as expressed as a L_{A90}). The local authority also confirmed that tonal contributions from plant should be kept to a minimum wherever possible.

5.3 To conform to the above criteria, and in accordance with the minimum background noise levels measured during the survey (summarised in 4.3 above), noise from the proposed plant installations should not exceed the following value.

Daytime plant operation	(07:00 to 23:00hrs)	- 27.9 dB L_{Aeq}
24-hour plant operation		- 27.2 dB L_{Aeq}

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.

6.0 Acoustic Assessment

6.1 Following our site survey we established that the nearest noise sensitive windows to the proposed plant will be those in the adjacent residential property (formerly a Care Home). This location is to be called Assessment Location A and it is located at the side of the premises, below the proposed plant location. We have been advised that the plant is likely to run 24hours a day and so the proposed design target is 27dB(A) – i.e., the rounded 27.2dB(A) figure highlighted in section 5.3 above.

6.2 For Assessment Location A, we need to consider the noise from the proposed two rows of two Daikin REYQ20T top discharge condenser units. Due to their position, we have undertaken two calculations for the 'air in' to the proposed plant. Calculation Sheet 1A illustrates our acoustic calculations for the row of two condensers nearest to Assessment Location A. Due to the resulting high noise level it has been necessary to introduce mitigation measures in to the calculation in order to lower the level received at Assessment Location A. With such mitigation measures in place a level of 18dB(A) is achievable, which is below the design criteria of 27dB(A).

6.3 Calculation Sheet 2A illustrates our acoustic calculations for the 'air in' to the row of two condensers furthest away from Assessment Location A. Due to the resulting high noise level it has been necessary to introduce mitigation measures in to the calculation in order to lower the level received at Assessment Location A. With such mitigation measures in place a level of 16dB(A) is achievable, which is below the design criteria of 27dB(A).

6.4 Having completed the two individual calculations for the 'air in' to the proposed plant we then need to add the two resultant figures in order to obtain a combined level. When we add together 18dB(A) and 16dB(A) we end up with a combined total of 20dB(A) at Assessment Location A for noise generated on the 'air in' side of the plant.

6.5 For Assessment Location A, we now need to consider the noise from 'air out' of the proposed two rows of two Daikin REYQ20T top discharge condenser units. Due to the positioning of the eventual discharge location of the proposed plant, in this instance we can undertake a single calculation for the 'air out'. Calculation Sheet 3A illustrates our acoustic calculations for the proposed plant. Due to the resulting high noise level it has been necessary to introduce mitigation measures in to the calculation in order to lower the level received at Assessment Location A. With such mitigation measures in place a combined level of 25dB(A) is achievable, which is below the design criteria of 27dB(A).

6.6 Having completed our calculations for both the 'air in' and the 'air out' of the proposed plant we then need to add the two resultant figures in order to obtain an overall combined level. When we add together 20dB(A) and 25dB(A) we end up with a combined total of 26dB(A) at Assessment Location A for noise generated by the proposed plant, which is below the design criteria of 27dB(A).

6.7 The above results are only achievable with mitigation measures in place which are summarised below for completeness.

All windows are to be sealed and blocked up on the inside of the plant room.
All walls to the plant room are to be acoustically lined with 100mm absorptive lining.
The 'air in' to the plant is to be via a 0.6m long attenuator mounted at roof level.
The 'air out' from each unit is ducted via a 400mm plenum and a 2.1m long attenuator.
These attenuators are to terminate in an acoustically lined discharge plenum.

7.0 Conclusion

7.1 A background noise level survey has been carried out at 176 Prince of Wales Road, Camden, and as outlined in this report noise criteria have been established for limiting noise emission from the mechanical plant installations serving the premises.

7.2 Subsequent acoustic assessments have been completed for the proposed plant (two rows of two condensers) at the assessment location previously identified, using the supplied information and data made available to us for our acoustic calculations.

7.3 Based upon the attached acoustic calculations, the proposed new plant will comply with the design criteria set out in this report and thereby meet the requirements of the local council, but only when the proposed mitigation measures are put in place.

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

Date	LAeq	LA90
(2021/04/15 14:00:01.00)	54.8	46.7
(2021/04/15 14:15:01.00)	51.6	47.1
(2021/04/15 14:30:01.00)	51.1	46.3
(2021/04/15 14:45:01.00)	51.0	44.8
(2021/04/15 15:00:01.00)	49.7	44.1
(2021/04/15 15:15:01.00)	48.9	44.9
(2021/04/15 15:30:01.00)	50.9	47.1
(2021/04/15 15:45:01.00)	50.6	46.1
(2021/04/15 16:00:01.00)	49.7	44.9
(2021/04/15 16:15:01.00)	48.5	43.3
(2021/04/15 16:30:01.00)	48.8	44.2
(2021/04/15 16:45:01.00)	47.2	43.8
(2021/04/15 17:00:01.00)	47.9	44.1
(2021/04/15 17:15:01.00)	47.3	42.7
(2021/04/15 17:30:01.00)	47.0	43.1
(2021/04/15 17:45:01.00)	52.9	43.0
(2021/04/15 18:00:01.00)	53.8	43.8
(2021/04/15 18:15:01.00)	49.1	43.6
(2021/04/15 18:30:01.00)	49.6	43.2
(2021/04/15 18:45:01.00)	48.7	41.9
(2021/04/15 19:00:01.00)	47.2	42.1
(2021/04/15 19:15:01.00)	47.1	42.3
(2021/04/15 19:30:01.00)	55.2	42.1
(2021/04/15 19:45:01.00)	45.9	41.5
(2021/04/15 20:00:01.00)	47.3	41.0
(2021/04/15 20:15:01.00)	45.9	41.6
(2021/04/15 20:30:01.00)	46.2	41.5
(2021/04/15 20:45:01.00)	46.5	41.7
(2021/04/15 21:00:01.00)	49.0	41.6
(2021/04/15 21:15:01.00)	55.3	41.3
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(2021/04/15 21:45:01.00)	46.3	42.0
(2021/04/15 22:00:01.00)	52.5	41.0
(2021/04/15 22:15:01.00)	45.6	40.5
(2021/04/15 22:30:01.00)	46.2	41.0
(2021/04/15 22:45:01.00)	45.5	41.0
(2021/04/15 23:00:01.00)	44.2	40.9
(2021/04/15 23:15:01.00)	44.3	40.5
(2021/04/15 23:30:01.00)	42.3	39.8
(2021/04/15 23:45:01.00)	45.7	40.4
(2021/04/16 00:00:02.00)	42.5	39.7
(2021/04/16 00:15:01.00)	42.7	39.7
(2021/04/16 00:30:01.00)	42.0	39.3
(2021/04/16 00:45:01.00)	59.1	47.4
(2021/04/16 01:00:01.00)	50.5	39.5
(2021/04/16 01:15:01.00)	41.0	38.8
(2021/04/16 01:30:01.00)	41.2	38.8

Date	LAeq	LA90
(2021/04/16 01:45:01.00)	42.1	38.7
(2021/04/16 02:00:01.00)	41.3	38.7
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(2021/04/16 07:45:01.00)	46.4	42.2
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(2021/04/16 09:00:01.00)	49.0	42.3
(2021/04/16 09:15:01.00)	46.9	42.0
(2021/04/16 09:30:01.00)	47.3	42.3
(2021/04/16 09:45:01.00)	48.7	44.1
(2021/04/16 10:00:01.00)	47.8	41.7
(2021/04/16 10:15:01.00)	47.2	41.3
(2021/04/16 10:30:01.00)	48.1	41.2
(2021/04/16 10:45:01.00)	47.2	41.4
(2021/04/16 11:00:01.00)	46.8	41.3
(2021/04/16 11:15:01.00)	48.5	42.2
(2021/04/16 11:30:01.00)	49.1	46.1
(2021/04/16 11:45:01.00)	49.5	44.9
(2021/04/16 12:00:01.00)	54.6	46.6
(2021/04/16 12:15:01.00)	49.3	43.4
(2021/04/16 12:30:01.00)	48.8	45.6
(2021/04/16 12:45:01.00)	46.8	41.5
(2021/04/16 13:00:01.00)	45.0	40.7
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(2021/04/17 13:30:01.00)	45.8	41.1

Date	LAeq	LA90
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(2021/04/17 14:00:01.00)	45.1	40.7
(2021/04/17 14:15:01.00)	45.8	40.1
(2021/04/17 14:30:01.00)	45.4	40.6
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(2021/04/17 16:30:01.00)	47.3	42.8
(2021/04/17 16:45:01.00)	47.8	42.6
(2021/04/17 17:00:01.00)	47.9	43.4
(2021/04/17 17:15:01.00)	48.3	43.3
(2021/04/17 17:30:01.00)	46.7	42.8
(2021/04/17 17:45:01.00)	48.6	44.3
(2021/04/17 18:00:01.00)	55.2	44.8
(2021/04/17 18:15:01.00)	50.2	45.3
(2021/04/17 18:30:01.00)	54.4	45.2
(2021/04/17 18:45:01.00)	51.2	44.5
(2021/04/17 19:00:01.00)	48.6	44.5
(2021/04/17 19:15:01.00)	49.9	44
(2021/04/17 19:30:01.00)	48.8	42.4
(2021/04/17 19:45:01.00)	48.2	42.3
(2021/04/17 20:00:01.00)	45.7	41.3
(2021/04/17 20:15:01.00)	46.0	41.7
(2021/04/17 20:30:01.00)	45.8	42.0
(2021/04/17 20:45:01.00)	47.5	42.2
(2021/04/17 21:00:01.00)	48.5	41.5
(2021/04/17 21:15:01.00)	48.5	41.1
(2021/04/17 21:30:01.00)	44.9	40.5
(2021/04/17 21:45:01.00)	47.8	41.4
(2021/04/17 22:00:01.00)	44.7	40.7
(2021/04/17 22:15:01.00)	44.6	40.5
(2021/04/17 22:30:01.00)	43.9	40.4
(2021/04/17 22:45:01.00)	43.8	40.0
(2021/04/17 23:00:01.00)	44.2	39.7
(2021/04/17 23:15:01.00)	45.3	39.5
(2021/04/17 23:30:01.00)	43.1	39.3
(2021/04/17 23:45:01.00)	43.0	38.9
(2021/04/18 00:00:02.00)	43.1	39.0
(2021/04/18 00:15:01.00)	45.1	39.2
(2021/04/18 00:30:01.00)	44.3	39.4
(2021/04/18 00:45:01.00)	43.2	38.8
(2021/04/18 01:00:01.00)	41.9	38.5
(2021/04/18 01:15:01.00)	42.0	38.3
(2021/04/18 01:30:01.00)	39.7	37.8

Date	LAeq	LA90
(2021/04/18 01:45:01.00)	41.1	37.8
(2021/04/18 02:00:01.00)	39.9	37.5
(2021/04/18 02:15:01.00)	40.7	37.8
(2021/04/18 02:30:01.00)	39.3	37.6
(2021/04/18 02:45:01.00)	42.6	37.6
(2021/04/18 03:00:01.00)	39.7	37.6
(2021/04/18 03:15:01.00)	39.9	37.7
(2021/04/18 03:30:01.00)	39.6	37.6
(2021/04/18 03:45:01.00)	40.0	37.8
(2021/04/18 04:00:01.00)	39.6	38.0
(2021/04/18 04:15:01.00)	39.5	37.8
(2021/04/18 04:30:01.00)	45.6	38.2
(2021/04/18 04:45:01.00)	41.6	38.1
(2021/04/18 05:00:01.00)	44.5	38.3
(2021/04/18 05:15:01.00)	45.9	38.7
(2021/04/18 05:30:01.00)	39.7	38.4
(2021/04/18 05:45:01.00)	39.8	38.0
(2021/04/18 06:00:01.00)	47.6	38.5
(2021/04/18 06:15:01.00)	42.2	38.3
(2021/04/18 06:30:01.00)	45.6	39.0
(2021/04/18 06:45:01.00)	44.5	38.8
(2021/04/18 07:00:01.00)	41.8	38.9
(2021/04/18 07:15:01.00)	40.7	38.1
(2021/04/18 07:30:01.00)	54.0	39.1
(2021/04/18 07:45:01.00)	44.6	39.7
(2021/04/18 08:00:01.00)	42.6	38.6
(2021/04/18 08:15:01.00)	41.8	38.2
(2021/04/18 08:30:01.00)	43.2	37.9
(2021/04/18 08:45:01.00)	50.6	38.6
(2021/04/18 09:00:01.00)	47.1	38.6
(2021/04/18 09:15:01.00)	42.7	38.0
(2021/04/18 09:30:01.00)	45.0	38.7
(2021/04/18 09:45:01.00)	43.5	38.7
(2021/04/18 10:00:01.00)	43.3	39.0
(2021/04/18 10:15:01.00)	42.2	38.2
(2021/04/18 10:30:01.00)	42.8	38.3
(2021/04/18 10:45:01.00)	57.2	39.3
(2021/04/18 11:00:01.00)	44.4	38.6
(2021/04/18 11:15:01.00)	45.1	38.6
(2021/04/18 11:30:01.00)	49.5	38.8
(2021/04/18 11:45:01.00)	43.7	40.1
(2021/04/18 12:00:01.00)	54.4	40.0
(2021/04/18 12:15:01.00)	44.8	39.3
(2021/04/18 12:30:01.00)	44.2	39.6
(2021/04/18 12:45:01.00)	46.1	39.6
(2021/04/18 13:00:01.00)	44.0	38.8
(2021/04/18 13:15:01.00)	43.4	38.9
(2021/04/18 13:30:01.00)	46.5	39.6

Date	LAeq	LA90
(2021/04/18 13:45:01.00)	46.3	39.9
(2021/04/18 14:00:01.00)	47.1	39.9
(2021/04/18 14:15:01.00)	44.5	39.9
(2021/04/18 14:30:01.00)	46.2	39.9
(2021/04/18 14:45:01.00)	45.6	40.0
(2021/04/18 15:00:01.00)	51.1	41.2
(2021/04/18 15:15:01.00)	45.8	40.5
(2021/04/18 15:30:01.00)	48.5	40.8
(2021/04/18 15:45:01.00)	54.4	42.8
(2021/04/18 16:00:01.00)	53.5	42.8
(2021/04/18 16:15:01.00)	52.4	41.2
(2021/04/18 16:30:01.00)	51.4	40.9
(2021/04/18 16:45:01.00)	46.1	40.9
(2021/04/18 17:00:01.00)	49.0	40.6
(2021/04/18 17:15:01.00)	46.7	42.2
(2021/04/18 17:30:01.00)	46.2	41.4
(2021/04/18 17:45:01.00)	48.6	41.7
(2021/04/18 18:00:01.00)	54.1	41.8
(2021/04/18 18:15:01.00)	47.4	39.9
(2021/04/18 18:30:01.00)	46.9	40.1
(2021/04/18 18:45:01.00)	46.6	40.2
(2021/04/18 19:00:01.00)	45.5	40.9
(2021/04/18 19:15:01.00)	45.1	40.4
(2021/04/18 19:30:01.00)	44.7	39.9
(2021/04/18 19:45:01.00)	46.7	40.1
(2021/04/18 20:00:01.00)	48.3	39.7
(2021/04/18 20:15:01.00)	48.8	39.2
(2021/04/18 20:30:01.00)	45.2	40.2
(2021/04/18 20:45:01.00)	44.5	40.4
(2021/04/18 21:00:01.00)	44.6	39.8
(2021/04/18 21:15:01.00)	44.8	39.8
(2021/04/18 21:30:01.00)	45.4	39.9
(2021/04/18 21:45:01.00)	43.9	39.8
(2021/04/18 22:00:01.00)	44.7	40.6
(2021/04/18 22:15:01.00)	46.7	39.5
(2021/04/18 22:30:01.00)	53.4	40.0
(2021/04/18 22:45:01.00)	42.8	39.2
(2021/04/18 23:00:01.00)	43.5	39.0
(2021/04/18 23:15:01.00)	41.6	38.5
(2021/04/18 23:30:01.00)	44.8	39.0
(2021/04/18 23:45:01.00)	41.7	38.5
(2021/04/19 00:00:02.00)	41.1	38.1
(2021/04/19 00:15:01.00)	40.7	37.9
(2021/04/19 00:30:01.00)	41.1	37.5
(2021/04/19 00:45:01.00)	51.7	37.7
(2021/04/19 01:00:01.00)	38.8	37.3
(2021/04/19 01:15:01.00)	39.2	37.4
(2021/04/19 01:30:01.00)	40.2	37.4

Date	LAeq	LA90
(2021/04/19 01:45:01.00)	39.9	37.6
(2021/04/19 02:00:01.00)	39.5	37.5
(2021/04/19 02:15:01.00)	39.9	37.2
(2021/04/19 02:30:01.00)	39.1	37.3
(2021/04/19 02:45:01.00)	51.9	37.7
(2021/04/19 03:00:01.00)	38.8	37.5
(2021/04/19 03:15:01.00)	40.8	37.5
(2021/04/19 03:30:01.00)	41.0	37.3
(2021/04/19 03:45:01.00)	44.7	37.5
(2021/04/19 04:00:01.00)	44.0	37.6
(2021/04/19 04:15:01.00)	45.1	37.6
(2021/04/19 04:30:01.00)	44.1	38.6
(2021/04/19 04:45:01.00)	43.9	38.0
(2021/04/19 05:00:01.00)	47.4	38.5
(2021/04/19 05:15:01.00)	45.0	38.8
(2021/04/19 05:30:01.00)	44.8	38.5
(2021/04/19 05:45:01.00)	42.0	38.9
(2021/04/19 06:00:01.00)	48.7	39.6
(2021/04/19 06:15:01.00)	45.6	39.5
(2021/04/19 06:30:01.00)	53.9	42.7
(2021/04/19 06:45:01.00)	46.1	41.9
(2021/04/19 07:00:01.00)	45.3	40.5
(2021/04/19 07:15:01.00)	45.3	40.1
(2021/04/19 07:30:01.00)	53.7	41.1
(2021/04/19 07:45:01.00)	49.4	41.6
(2021/04/19 08:00:01.00)	46.6	41.6
(2021/04/19 08:15:01.00)	46.2	42.1
(2021/04/19 08:30:01.00)	48.1	41.8
(2021/04/19 08:45:01.00)	49.8	43.6
(2021/04/19 09:00:01.00)	49.9	43.2
(2021/04/19 09:15:01.00)	51.2	43.6
(2021/04/19 09:30:01.00)	50.7	44.5
(2021/04/19 09:45:01.00)	51.1	44.8
(2021/04/19 10:00:01.00)	45.4	41.1
(2021/04/19 10:15:01.00)	48.3	40.9
(2021/04/19 10:30:01.00)	46.7	41.4
(2021/04/19 10:45:01.00)	51.5	40.9
(2021/04/19 11:00:01.00)	50.9	42.3
(2021/04/19 11:15:01.00)	48.3	42.0
(2021/04/19 11:30:01.00)	52.4	42.8
(2021/04/19 11:45:01.00)	51.4	42.2
(2021/04/19 12:00:01.00)	55.8	44.5
(2021/04/19 12:15:01.00)	55.6	44.0
(2021/04/19 12:30:01.00)	47.8	42.6
(2021/04/19 12:45:01.00)	50.9	43.7
(2021/04/19 13:00:01.00)	48.2	42.2

Appendix 3 – Acoustic Calculations

CALCULATION SHEET 1A										
PROJECT:	**Prince of Wales Road**		**Plant Location - Side Roof - nom. second floor level**							
DATE:	**28th April 2021**		**Plant Operation - 24 Hour**					**Row 1 of 2 units**		
			Octave Band Centre Frequency (Hz)							
Description			**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**dB(A)**
LOCATION 'A' ASSESSMENT										
Daikin REYQ20T		Lp @ 1m	**66**	**65**	**67**	**65**	**60**	**57**	**53**	**45**	**66**
Daikin REYQ20T		Lp @ 1m	**66**	**65**	**67**	**65**	**60**	**57**	**53**	**45**	**66**
Other			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Other			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Other			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Combined Total			**69**	**68**	**70**	**68**	**63**	**60**	**56**	**48**	**69**
Additional Surface Reflections		One	3	3	3	3	3	3	3	3	
Distance: 1m to 7m to nearest window			-17	-17	-17	-17	-17	-17	-17	-17	
Screenining via building			-11	-13	-16	-18	-20	-20	-20	-20	
Absorptive wall lining to all walls (100mm thk)			-6	-6	-6	-6	-6	-6	-6	-6	
Attenuator Losses (600 long - 40% FA)			-4	-6	-10	-17	-23	-16	-12	-10	
Façade Correction			3	3	3	3	3	3	3	3	
Lp @1m from receivers façade			**37**	**32**	**27**	**16**	**3**	**7**	**7**	**1**	**22**
										Night Time (24 Hour) Design Target =	**27**
Night Time Set Back										**Excess =**	**-5**
Lp @1m from receivers façade			**37**	**32**	**27**	**16**	**3**	**7**	**7**	**1**	**22**
Night Time Set Back on All Plant			-4	-4	-4	-4	-4	-4	-4	-4	
Lp @1m from receivers façade			**33**	**28**	**23**	**12**	**-1**	**3**	**3**	**-3**	**18**
										Night Time (24 Hour) Design Target =	**27**
										Excess =	**-9**
Notes											
Calculations to the nearest top floor noise sensitive windows in the adjacent property (previously a Care Home)											
No allowance has been made in the above calculations for any noise/vibration transfer through the structure											
Vibration isolation will be required for the new plant											

CALCULATION SHEET 2A

PROJECT:	Prince of Wales Road	Plant Location - Side Roof - nom. second floor level								
DATE:	28th April 2021	Plant Operation - 24 Hour					Row 2 of 2 units			
		Octave Band Centre Frequency (Hz)								
Description		**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**dB(A)**
LOCATION 'A' ASSESSMENT										
Daikin REYQ20T	Lp @ 1m	**66**	**65**	**67**	**65**	**60**	**57**	**53**	**45**	**66**
Daikin REYQ20T	Lp @ 1m	**66**	**65**	**67**	**65**	**60**	**57**	**53**	**45**	**66**
Other		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Other		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Other		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Combined Total		**69**	**68**	**70**	**68**	**63**	**60**	**56**	**48**	**69**
Additional Surface Reflections	One	3	3	3	3	3	3	3	3	
Distance: 1m to 8m to nearest window		-19	-19	-19	-19	-19	-19	-19	-19	
Screenining via building		-10	-13	-15	-18	-20	-20	-20	-20	
Absorptive wall lining to all walls (100mm thk)		-6	-6	-6	-6	-6	-6	-6	-6	
Attenuator Losses (600 long - 40% FA)		-4	-6	-10	-17	-23	-16	-12	-10	
Façade Correction		3	3	3	3	3	3	3	3	
Lp @1m from receivers façade		**36**	**30**	**26**	**14**	**1**	**5**	**5**	**-1**	**20**
									Night Time (24 Hour) Design Target =	**27**
Night Time Set Back									**Excess =**	**-7**
Lp @1m from receivers façade		**36**	**30**	**26**	**14**	**1**	**5**	**5**	**-1**	**20**
Night Time Set Back on All Plant		-4	-4	-4	-4	-4	-4	-4	-4	
Lp @1m from receivers façade		**32**	**26**	**22**	**10**	**-3**	**1**	**1**	**-5**	**16**
									Night Time (24 Hour) Design Target =	**27**
									Excess =	**-11**

Notes

Calculations to the nearest top floor noise sensitive windows in the adjacent property (previously a Care Home)

No allowance has been made in the above calculations for any noise/vibration transfer through the structure

Vibration isolation will be required for the new plant

CALCULATION SHEET 3A

PROJECT:	Prince of Wales Road	Plant Location - Side Roof - nom. second floor level							
DATE:	28th April 2021	Plant Operation - 24 Hour				2 rows of 2 units			
		Octave Band Centre Frequency (Hz)							
Description		**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**dB(A)**
LOCATION 'A' ASSESSMENT										
Daikin REYQ20T	Lw	**87**	**87**	**88**	**87**	**83**	**78**	**74**	**69**	**88**
Two rows of two units = Four Units in total = +6		**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	
Combined Total		**93**	**93**	**94**	**93**	**89**	**84**	**80**	**75**	**94**
Duct work losses		-1	-1	0	0	0	0	0	0	
Line of sight reduction		-5	-5	-5	-5	-5	-5	-5	-5	
End Reflection		-2	0	0	0	0	0	0	0	
Directivity Loss (135 degrees)		1	1	0	0	-3	-3	-3	-3	
Distance Loss: 10m to nearest window		-31	-31	-31	-31	-31	-31	-31	-31	
Attenuator Losses (2100 long - 40% FA)		-10	-16	-28	-46	-50	-50	-40	-22	
Lined plenum		0	-1	-2	-3	-3	-3	-3	-3	
Façade Correction		3	3	3	3	3	3	3	3	
Lp @1m from receivers façade		**48**	**43**	**31**	**11**	**0**	**-5**	**1**	**14**	**29**
								Night Time (24 Hour) Design Target =		**27**
Night Time Set Back									**Excess =**	**2**
Lp @1m from receivers façade		**48**	**43**	**31**	**11**	**0**	**-5**	**1**	**14**	**29**
Night Time Set Back on All Plant		-4	-4	-4	-4	-4	-4	-4	-4	
Lp @1m from receivers façade		**44**	**39**	**27**	**7**	**-4**	**-9**	**-3**	**10**	**25**
								Night Time (24 Hour) Design Target =		**27**
									Excess =	**-2**

Notes

Calculations to the nearest top floor noise sensitive windows in the adjacent property (previously a Care Home)

No allowance has been made in the above calculations for any noise/vibration transfer through the structure

Vibration isolation will be required for the new plant

Figure 1

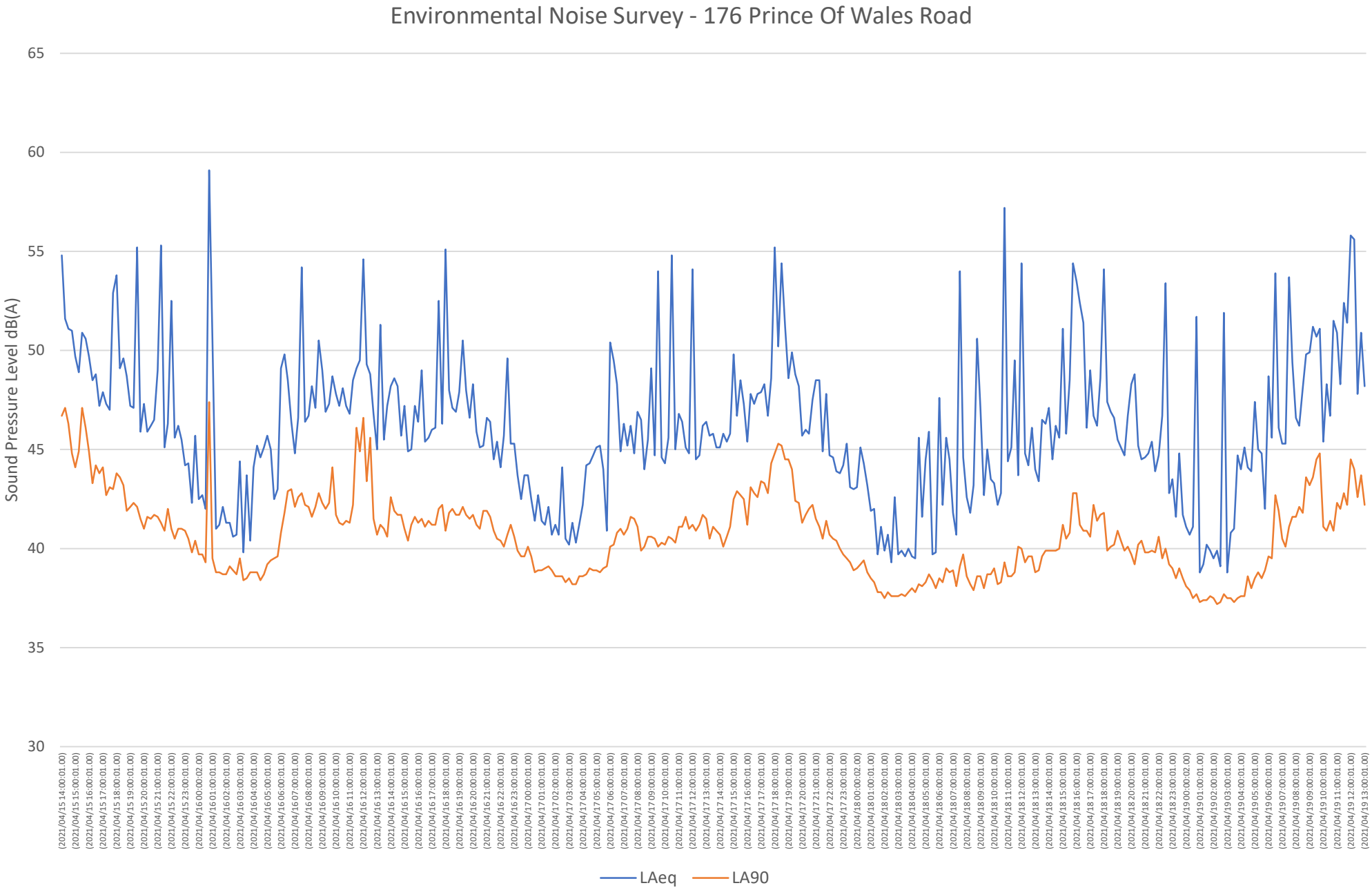
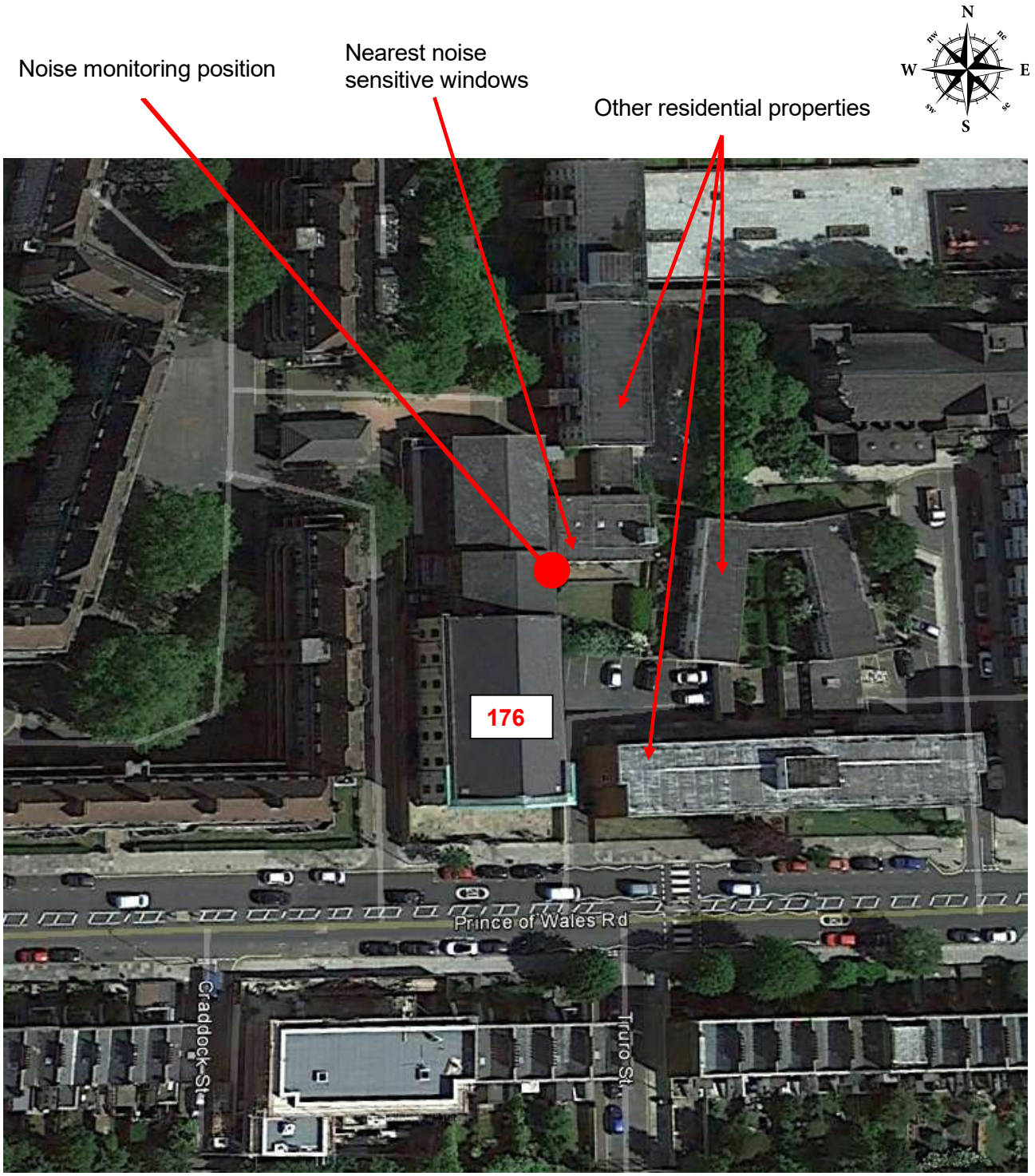

Environmental Noise Survey - 176 Prince Of Wales Road
Sound Pressure Level dB(A)
65
60
55
50
45
40
35
30
LAeq
LA90

Figure 2



NOICO Noise Control Engineers	Project: 176 Prince of Wales Road	Title: Noise Survey Position
	Dwg No. 2104026-7	Date: 28th April 2021