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Project:

81 – 83 High Street, Ruislip

Title:

Plant Noise Impact Assessment

quietly moving forward

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CONTENTS:

1 INTRODUCTION

1.01 Environmental Equipment Corporation Limited has been commissioned by Loungers UK Limited to undertake a noise assessment of new external air conditioning and ventilation plant proposed to serve the existing commercial premises at 81 – 83 High Street, Ruislip.

1.02 This noise assessment has been conducted in accordance with the policies and requirements of Hillingdon Council and is based on a noise survey carried out at the site over a typical weekday period.

1.03 This assessment includes:

- the setting of plant noise limits in accordance with the requirements of Hillingdon Council and national planning policy, standards and guidance; and
- the prediction of noise impacts at the worst affected noise sensitive receptors based on the proposed items of plant and their location.

1.04 This report is prepared solely for Loungers UK Limited. Environmental Equipment Corporation Limited accepts no responsibility for its use by any third party. Note that the contents contained herein are produced for the purposes of review by relevant Planning Authority departments and do not constitute a detailed design or specification document to be used for the purposes of construction. Subsequent development of noise mitigation schemes shall engage EEC Ltd and Loungers UK Limited so as to support the conclusions of this report.

1.05 Whilst every effort has been made to ensure that this report is easy to understand, it is necessarily technical in nature. To assist the reader, an explanation of the terminology used in this report is contained in Appendix A.

2 SITE

2.01 81 – 83 High Street, Ruislip is an existing three-storey, mixed-use commercial and residential property located in a mixed commercial and residential area of Ruislip. Ground and first floors are understood to exist as a single commercial premises, with a residential apartment at second floor level.

2.02 The site is immediately bound by the following:

- North – Adjoined commercial premises of 77 – 79 High Street;
- East – The rear gardens and dwellings of South Drive;
- South – Adjoined mixed commercial and residential dwellings of High Street; and
- West – A4180 (High Street) carriageway and the mixed use premises thereof.

2.03 This report details an assessment of noise emissions from the proposed installation of new air conditioning and ventilation plant proposed to serve the commercial premises, to be located primarily at ground level on the rear façade of the site, as presented in Appendix B and detailed in Section 7.

2.04 The closest noise sensitive receptors to the proposed plant items have been identified as the following:

- The rear garden of 25 South Drive, approximately 15m (worst case) to the east of the proposed plant with a potential line of sight.

2.05 All other noise sensitive receptors are at a greater distance from the proposed location of the units, or are protected by more screening by the intervening structures, and as such will be subject to lower levels of noise.

3 GUIDANCE

3.01 National Planning Policy is presented in Appendix C of this document.

3.02 We understand that Loungers UK Limited have received guidance from the Local Authority (Hillingdon Council) that a noise assessment is required to *"identify the difference between the current 'background sound level' and the 'rating level' to confirm the impact of the extract and intake system".* No further guidance is understood to have been given, however it is assumed that this assessment is required to all items of new plant.

3.03 Noise from commercial sources is most commonly assessed in accordance with BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound.*

3.04 BS4142 gives guidance on assessing the likelihood of adverse impacts by calculating a 'rating level' of the new noise source and comparing its magnitude at noise sensitive locations to the existing or underlying background noise level. The background noise level is subtracted from the 'rating level' to assess the likelihood of complaints:

- The greater the difference the greater the likelihood of complaints.
- A difference of around +10dB or more is an indication of a significant adverse impact, depending on the context.
- A difference of +5dB 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 noise level, the less likely it is that the specific sound source will have an adverse impact or 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 sound impact, depending on the context.

3.05 It is commonly accepted that an installation achieving a 'low' impact assessment according to BS4142 will not normally lead to any loss of existing residential amenity.

4 MEASUREMENTS

4.01 Environmental noise measurements were carried out over a weekday period, between 09:30 hours on Tuesday 26th April 2022 and concluded 09:00 hours the following day to establish the existing noise levels at the site. The survey methodology and results are set out below.

4.02 Noise measurements have been carried out at the following position, as shown in Appendix B and described as:

- Position 1: located at a height of approximately 3 metres above ground level on the rear fire escape stairs of the property. This position was considered free-field and representative of the exiting noise climate.

4.03 This position is considered to be representative of the existing noise climate at the nearest noise sensitive receiver location to the proposed new plant.

5 EQUIPMENT

5.01 The equipment used for the survey was as follows:-

- 01dB Metravib Black Solo Integrating Sound Level Meter conforming to Class 1 BS EN 61672, Type 1 BS EN 60804 & BS EN 60651: 1994;
- 01dB Metravib MCE 212 Condenser Microphone, PRE 21 S Pre-amp and Connecting Leads;
- 01dB Outdoor Microphone Kit and a
- Tripod.

5.02 The equipment holds current UKAS or equivalent accreditation and serial numbers as follows:

Sound Level Meter 01dB Black Solo	Serial No.	61719
	Calibration Date	30th July 2020
	Cal Certificate No.	U35361
½" MCE 212 Condenser Mic.	Serial No.	166397
	Calibration Date	30th July 2020
	Cal Certificate No.	35360/U35361
Calibrator CAL 21	Serial No.	34634297
	Calibration Date	21st October, 2021
	Cal. Certificate No.	U37247

N.B. Copies of calibration certificates are available upon request.

5.03 The equipment was calibrated both before and after the survey with no difference noted in the levels.

6 RESULTS

6.01 The weather during the survey was suitable for noise measurement, it being dry with little wind for the duration of the survey.

6.02 Noise sources at the site include local and distant road traffic. There were no other significant sources of noise observed during the attended portions of the survey, however existing plant was observed to be present (but not operating) on some of the surrounding buildings.

6.03 A list of the levels measured is included in Appendix D and represented graphically in Appendix E.

6.04 A summary of the time averaged ambient levels and measured background levels over the measurement periods are shown in Table 6.1. The minimum L_{A90} is the lowest fifteen-minute measurement in the specified period; the BS4142:2014 *representative* background noise levels are in this instance the modal value in each period.

6.05 Note, the plant is understood to operate between the hours of 08:30 – 23:30 only, and so the representative levels below have been selected to reflect this.

Position	Period	Average $L_{Aeq,T}$ – dB	Representative L_{A90} – dB	Minimum L_{A90} – dB
1	Day time (0700-1900 hrs)	49	40	37
	Evening (1900-2300 hrs)	47	39	36
	Night-time Operation (2300-0000 hrs)	38	35	35

Table 6.1: Free-Field Measured Ambient and Background Noise Levels

7 PLANT ASSESSMENT

7.01 This report details an assessment of noise emission from the operation of new air conditioning and commercial ventilation plant proposed to serve the premises of 81 – 83 High Street, Ruislip, consisting of kitchen supply and extract systems, bathroom extract fans and external condenser units. The kitchen supply fan and bathroom extract fans will be located internally to the building with atmospheric duct terminations; the extract fan and condenser units will be located externally. Copies of the current site plants have been presented in Appendix B.

7.02 The proposed plant models and manufacturer's published noise emissions are given below. Copies of the manufacturer's plant data sheets are included in Appendix F.

Area Served	Plant Make & Model	Published Noise Emissions
Kitchen Extract	Systemair MUB/T 062 560	84 dBA SWL – Discharge (Outlet)
		59 dBA – Casing Radiated
Kitchen Supply	Systemair MUB 042 500	82 dBA SWL – Intake
Male WC Extract	Systemair KVK Silent 200	65 dBA SWL – Discharge (Outlet)
Female WC Extract	Systemair KVK Silent 200	65 dBA SWL – Discharge (Outlet)
WC Extract	Systemair KVK Silent 160	70 dBA SWL – Discharge (Outlet)
Condenser 1	Danfoss OP-MPYM012MP	62 dB SWL
Condenser 2	JE Hall J5LC20C	29 dBA SPL @ 10m
Condenser 3	Mitsubishi PUZ-M100	54 dBA SPL @ 1m (Heating)
Condenser 4	Mitsubishi PUZ-M200	60 dBA SPL @ 1m (Heating)
Condenser 5	Mitsubishi PUZ-M200	60 dBA SPL @ 1m (Heating)

Table 7.1: Proposed Plant and Published Noise Emissions

7.03 It is understood that the plant will operate between the hours of 08:30 – 23:30 only.

7.04 The WC extract fans and kitchen supply fan are to be housed internally to the building, and as such casing radiated and jobside noise from these units is expected to be sufficiently contained by the building fabric. The condenser units and kitchen extract fan are to be located externally to the building however and as such an assessment of their radiated noise is required.

MITIGATION MEASURES

7.05 The following noise mitigation measures are currently proposed:

- The kitchen extract fan casing (located externally to the building at ground level) will be contained within an acoustic enclosure. This enclosure shall be designed to achieve no less than 5 dB reduction of noise emissions.
- The kitchen extract and supply fans will incorporate in-line duct attenuation to the atmospheric ducts. Based on the provided octave-band insertion loss data from the supplier 'Acoustica', these attenuators will reduce noise emissions by 26 dB for the kitchen extract outlet and 26 dB for the kitchen supply fan inlet. Care should be taken to ensure that regenerated noise at these attenuators due to high resistances does not contribute to the overall noise levels.
- The WC extract fans will incorporate proprietary in-line attenuation offering 14 dB noise reductions of the Male and Female extracts, and 16 dB reductions for the WC extract system. Care should be taken to ensure that regenerated noise at these attenuators due to high resistances does not contribute to the overall noise levels.

7.06 In addition to the currently proposed noise mitigation measures, the following works will also be required in order to achieve suitable noise levels and a sufficiently low noise impact:

- Condenser unit 1 (Danfoss unit) to be housed within a full acoustic enclosure offering no less than 15 dBA reductions of noise emissions in all directions.
- Condenser unit 2 (JE Hall unit) to be housed within a full acoustic enclosure offering no less than 10 dBA reductions of noise emissions in all directions.
- Condenser unit 3 (Mitsubishi PUZ-M100) to be housed within a full acoustic enclosure offering no less than 15 dBA reductions of noise emissions in all directions.
- Condenser units 4 and 5 (Mitsubishi PUZ-M200 units) to be housed within a full acoustic enclosure offering no less than 20 dBA reductions of noise emissions in all directions.
- As all plant will be located in close proximity to existing residential premises, it is recommended that all plant and ductwork is mounted using effective vibration isolation mounts achieving no less than 95% isolation efficiency in-situ in order to mitigate the transfer of any acoustic energy into the building structure that may otherwise affect the integrity of the acoustic design.

7.07 Assuming that these measures are implemented, Tables 7.2 and 7.3 below present a summary calculation of the BS4142:214 *Specific* noise levels from the proposed plant at the most affected receiver identified above, using the propagation principles of ISO9613.

Item	Published Noise Emissions, dBA	Noise Mitigation, dB	Total Duct System Losses, dB *(End reflections, directivity etc)*	Spherical Distance Losses, dB	Local Reflections, dB	Specific Level at Receiver, dBA
Kitchen Extract Discharge	84 dBA SWL	-26 dB *Attenuator*	+ 5 dB	- 35 dB (15m)	+ 3 dB	**31 dBA**
Kitchen Extract Casing	59 dBA SWL	- 5 dB *Acoustic Enclosure*	-	- 35 dB (15m)	+ 9 dB	**28 dBA**
Kitchen Supply Inlet	82 dBA SWL	- 26 dB *Attenuator*	+ 3 dB	- 35 dB (15m)	+ 3 dB	**27 dBA**
Male WC Extract Outlet	65 dBA SWL	- 14 dB *Attenuator*	0 dB	- 35 dB (15m)	+ 3 dB	**19 dBA**
Female WC Extract Outlet	65 dBA SWL	- 14 dB *Attenuator*	0 dB	- 35 dB (15m)	+ 3 dB	**19 dBA**
WC Extract Outlet	70 dBA SWL	- 16 dB *Attenuator*	0 dB	- 35 dB (15m)	+ 3 dB	**22 dBA**
Condenser 1	62 dBA SWL	- 15 dB *Acoustic Enclosure*	-	- 35 dB (15m)	+ 9 dB	**21 dBA**
Condenser 2	29 dBA @ 10m	- 10 dB *Acoustic Enclosure*	-	- 4 dB (15m)	+ 6 dB	**21 dBA**
Condenser 3	54 dBA @ 1m	- 15 dB *Acoustic Enclosure*	-	-24 dB (15m)	+ 6 dB	**21 dBA**
Condenser 4	60 dBA @ 1m	- 20 dB *Acoustic Enclosure*	-	-24 dB (15m)	+ 6 dB	**22 dBA**
Condenser 5	60 dBA @ 1m	- 20 dB *Acoustic Enclosure*	-	-24 dB (15m)	+ 6 dB	**22 dBA**
			Cumulative Specific Level			**35 dBA**

Table 7.2: Garden of 25 South Drive – Specific Plant Noise Calculation

7.08 As per BS4142:2014 guidance, the Specific noise level is subject corrections based on the character and context of the noise in order to produce a Rating level for further assessment. In this instance, and on the basis of the noise mitigation measures outlined above, it is expected that the plant will not contain any tonal, intermittent, impulsive or otherwise distinctive characteristics whereby the corrections of BS4142 would be applied.

7.09 As such the Rating level of this installation can be classified as **35 dBA.**

7.10 Table 7.3 presents a summary comparison of the predicted Rating level of the installation against the representative background noise levels measured in each time period.

Property	Period	Representative Background L_{A90}	Predicted Rating Level L_{Ar}	Exceedance	BS4142:2014 Impact level
Garden of 25 South Drive	Daytime	40 dB	35 dB	- 5 dB	Low/Negligible
	Evening	39 dB	35 dB	- 4 dB	Low/Negligible
	Night-time (2300 – 00:00)	35 dB	35 dB	0 dB	Low

Table 7.3: Assessment of Predicted Noise Levels Based on Proposed Noise Limit, Free-field dB(A)

7.11 It can be seen from the above tables that a worst-case 'low' impact will be achieved during the most sensitive night-time hours of operation at the closest and most affected receiver location, with the noise levels during daytime and evening operations being significantly below background. This would be considered as achieving the LOAEL in all instances and would be indicative of a low risk of complaint.

7.12 Achieving the above noise levels would also be considered to be in full compliance with the guidance of BS8233:2014 *'Guidance on sound insulation and noise reduction for buildings'* which states that that external amenity areas should (if possible) be designed so as to not exceed 50 - 55 dB $L_{Aeq,T}$ for acoustic comfort.

7.13 It is also important to note that noise levels at the nearest noise sensitive windows will be considerably lower than those calculated for the garden of 25 South Drive due to increased distance losses and screening. At approximately 35m from the plant location, noise levels at the rear windows of 25 South Drive will be 7 dB lower than those calculated above leading to a rating level of 28 dBA.

7.14 A rating level of 28 dBA would indicate a 'negligible' impact, being 7 dB below the night-time background noise levels and up to 12 dB below the daytime background noise levels. On the basis of World Health Organisation research, this could also be considered as achieving the No Observable Effect Level (NOEL).

8 CONCLUSIONS

8.01 Loungers UK Limited has appointed Environmental Equipment Corporation Limited to undertake a noise assessment of new ventilation and air conditioning plant proposed to serve the commercial premises of 81 – 83 High Street, Ruislip.

8.02 The assessment has been carried out in accordance with national planning guidance and the requirements of the Local Authority. and is based on an environmental noise survey conducted at the site over a mid-week period.

8.03 A noise assessment has been undertaken to evaluate the potential noise impact of the proposed plant at the nearest and most affected noise sensitive receptor, identified as the rear garden of 25 South Drive at approximately 15m from the plant.

8.04 Assuming that the plant and noise control measures outlined above are installed as currently proposed/recommended, BS4142:2014 predictions have shown that a worst-case 'low' impact will be achieved during all periods of operation (08:30 – 23:30) at this most affected receiver location, with noise levels at the nearest existing residential windows being significantly lower and achieving a 'negligible' impact, indicating that noise levels will likely be acceptable and of low risk of complaints.

8.05 On the basis of this assessment, it is considered that noise should not pose a material constraint to the operation of the proposed new plant.

APPENDIX A

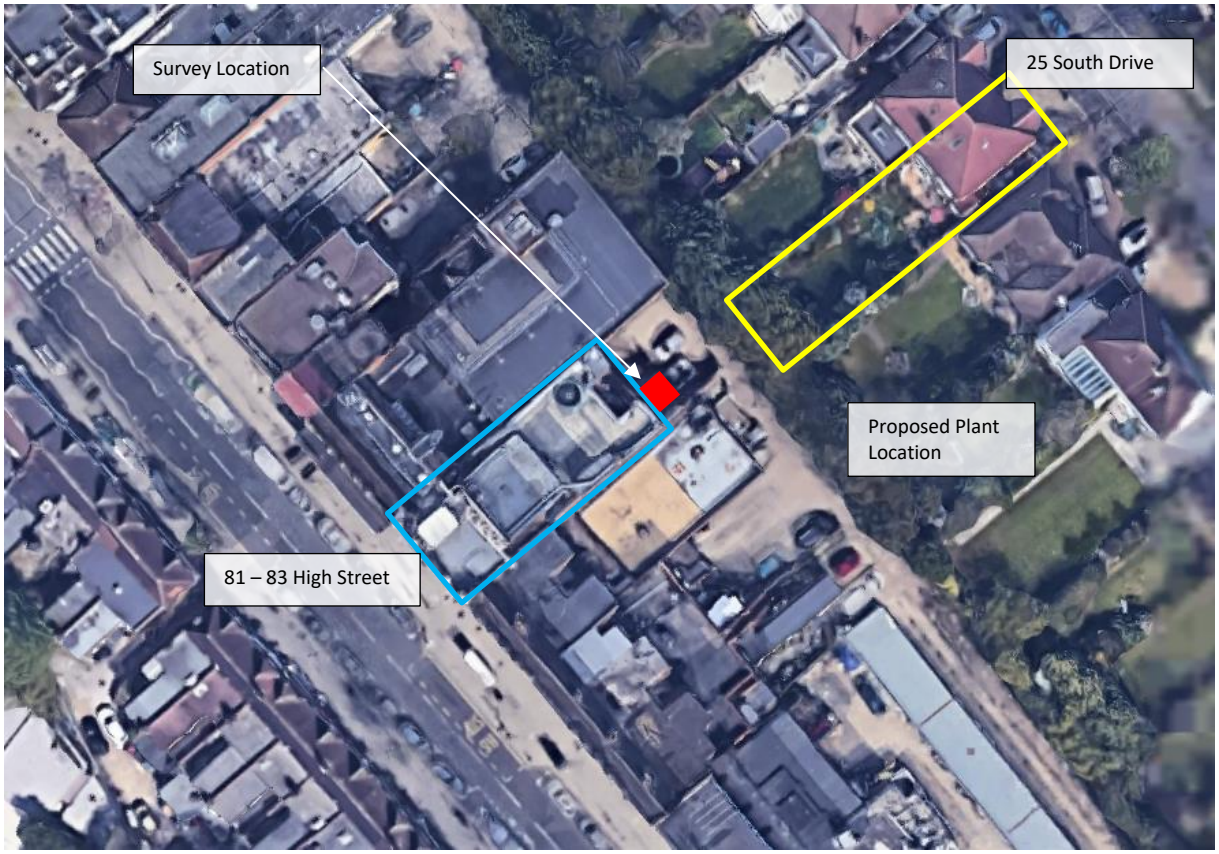
GLOSSARY OF TECHNICAL TERMS

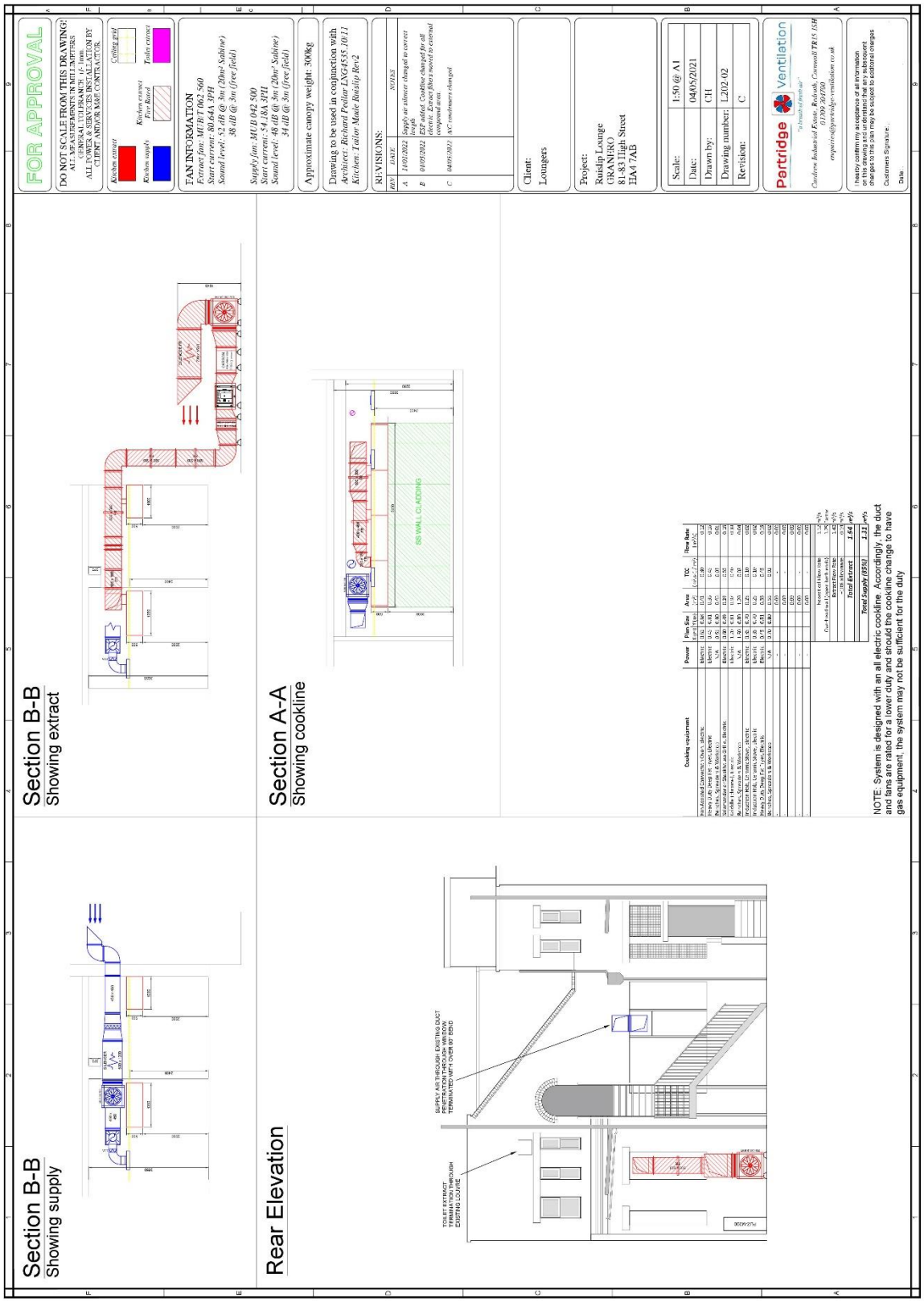
ACOUSTIC TERMINOLOGY

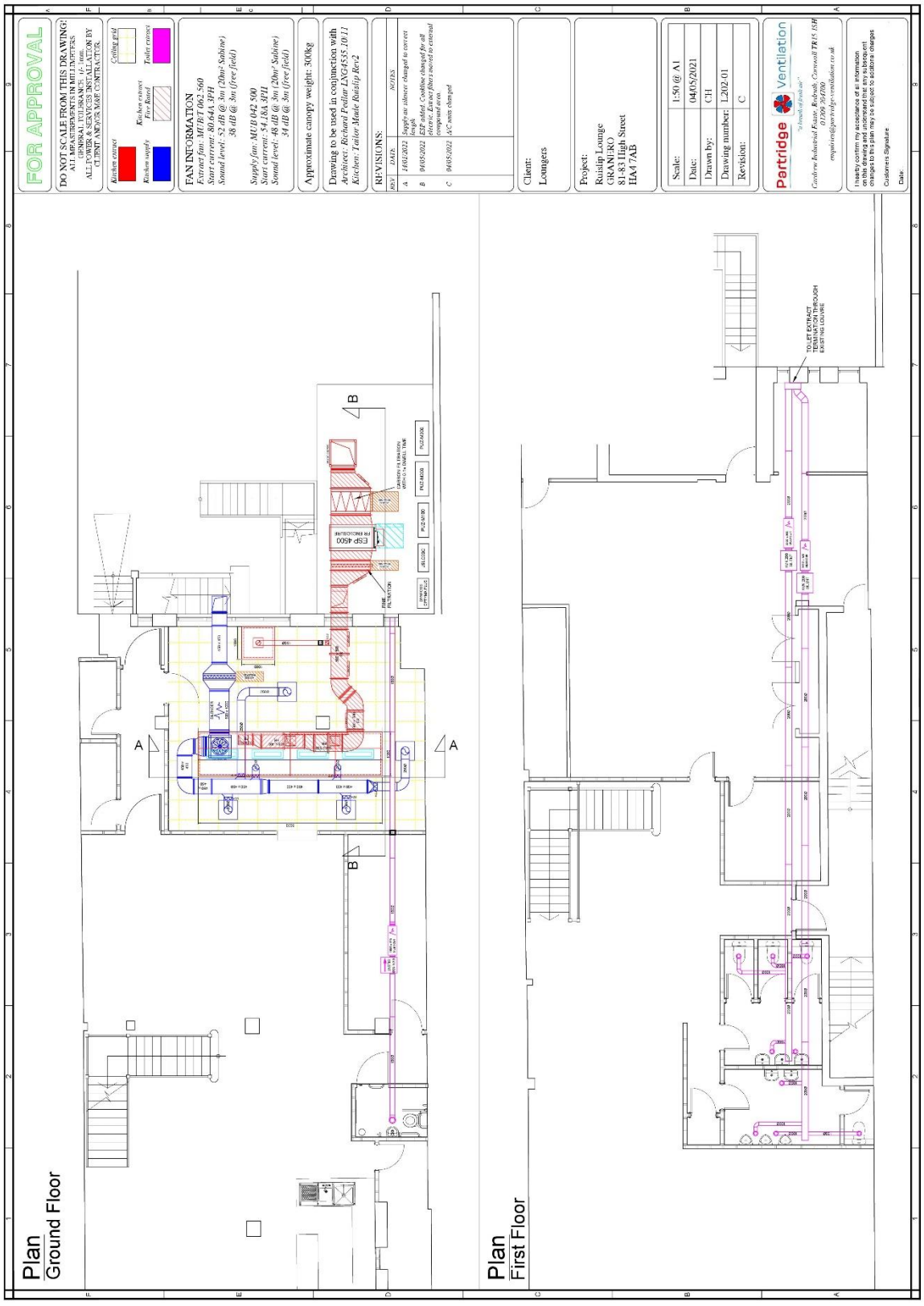
Absorption Classes	The sound absorption of a material is rated from Class A to Class E, where Class A materials provide the highest level of sound absorption.
Ambient Noise Levels	Noise levels measured in the absence of noise requiring control, frequently measured to determine the situation prior to the additional of a new noise source.
dB	Decibel. The logarithmic unit of sound level.
dBA	A-weighted decibel. The A-weighting approximates the response of the human ear.
$D_{nT,w}$	Weighted standardized level difference. A single number quantity of the sound level difference between two rooms. $D_{nT,w}$ is typically used to measure the on-site sound insulation performance of a building element such as a wall, floor or ceiling. Measured in accordance with BS EN ISO 16283-1 and weighted in accordance with BS EN ISO 717-1.
$D_{n,e,w}$	The weighted element-normalized level difference. A single number rating of the sound reduction provided by a sound passing through an individual element. $D_{n,e,w}$ is typically used to define the sound insulation provided by ventilators. Measured in accordance with BS EN ISO 10140-2:2010 and rated in accordance with BS EN ISO 717-1.
Flanking	Transmission of sound energy through paths adjacent to the building element being considered. For example, sound may be transmitted around a wall by travelling up into the ceiling space and then down into the adjacent room.
Frequency	Sound can occur over a range of frequencies extending from the very low, such as the rumble of thunder, up to the very high such as the crash of cymbals. Sound is generally described over the frequency range from 63Hz to 4kHz, roughly equal to the range of frequencies on a piano.
Impact Sound	Sound produced by an object impacting directly on a building structure, such as footfall noise or chairs scrapping on a floor.
$L_{Aeq,t}$	The equivalent continuous sound level measured in dBA. This is commonly referred to as the average noise level. 't' is the interval time for the measurement. Typically 't' of 16hrs and 8hrs is used for day and night time ambient noise respectively or 't' is defined by the period of interest in BS4142 assessments.
$L_{A90,t}$	The noise level exceeded for 90% of the measurement period, measured in dBA. This is commonly referred to as the background noise level.
$L'_{nT,w}$	Weighted, standardized impact sound pressure level. A single number rating of the impact sound insulation of a floor/ceiling when impacted on by a standard "tapper" machine. The lower the $L'_{nT,w}$, the better the acoustic performance. Measured in accordance with BBS EN ISO 140-7 and rated in accordance with BS EN ISO 717-2.
NR	Noise Rating. A single number rating which is based on the sound level in the octave bands 31.5Hz – 8kHz inclusive, generally used to assess noise from mechanical services in buildings.
Octave Band	Frequencies are often grouped together into octaves for analysis. Octave bands are labelled by their centre frequency which are: 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz and 4kHz.
Reverberation Time (T_{mf})	Reverberation time is used for assessing the acoustic qualities of a space. It is defined as the time it takes for an impulse to decay by 60dB. T_{mf} is the arithmetic average of the reverberation time in the mid frequency bands (500Hz, 1kHz and 2kHz).
R_w	Weighted sound reduction index. A single number rating of the sound insulation performance of a specific building element. R_w is measured in a laboratory. R_w is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete. Measured in accordance with BS EN ISO 10140-2:2010 and rated in accordance with BS EN ISO 717-1.
Sound Absorption	When sound hits a surface, some of the sound energy is absorbed by the surface material. Sound absorption refers to the ability of a material to absorb sound, rated from 0, complete reflection, to 1, complete absorption.
Sound Insulation	When sound hits a surface, some of the sound energy travels through the material. 'Sound insulation' refers to the ability of a material to prevent the travel of sound.
Structure-borne transmission	Transmission of sound energy as vibrations via the structure of a building.

APPENDIX B

SITE PLAN
&
MEASUREMENT LOCATION







APPENDIX C

PLANNING POLICY AND GUIDANCE

PLANNING POLICY AND GUIDANCE

National Planning Policy Framework and the Noise Policy Statement for England

The Department for Communities and Local Government published the National Planning Policy Framework (NPPF) on 27th March 2012 (as amended on 20th July 2021) and upon its publication, the majority of planning policy statements and guidance notes were withdrawn, including Planning Policy Guidance 24 Planning and Noise, which previously presented the government's overarching planning policy on noise.

Paragraph 174 in Section 15 of the NPPF (2021), entitled Conserving and enhancing the natural environment, states that:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability…"*

Paragraph 185 in Section 15 also states that:

> "*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason…"*

The Department for Environment Food and Rural Affairs published the Noise Policy Statement for England (NPSE) in March 2010. The explanatory note of NPSE defines the following terms used in the NPPF:

> *"NOEL – No Observed Effect Level*
>
> *This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*
>
> *LOAEL – Lowest Observed Adverse Effect Level*
>
> *This is the level above which adverse effects on health and quality of life can be detected.*
>
> *2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*
>
> *SOAEL – Significant Observed Adverse Effect Level*
>
> *This is the level above which significant adverse effects on health and quality of life occur."*

The NPSE does not define any of the above effect levels numerically.

The NPSE presents the Noise Policy Aims as:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy and sustainable development:

avoid significant adverse impacts on health and quality of life;

mitigate and minimise adverse impacts on health and quality of life; and

where possible, contribute to the improvement of health and quality of life."

It can be seen that the first two bullet points are similar to Section 11 of the NPPF, with a third aim that seeks to improve health and quality of life. The NPSE later expands on the Noise Policy Aims, stating:

2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).

2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.

2.25 This aim (the third aim)*, seeks where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."*

It is clear that noise described in the NPSE as SOAEL that would lead to significant adverse effects should be avoided, although there is no definition as to what constitutes a significant adverse effect. Similarly, noise should be mitigated where it is high enough to lead to adverse effects, termed the LOAEL, but not so high that it leads to significant adverse effects.

British Standard 4142

To assess the acceptability of the resultant noise levels we have consulted the relevant standards. BS 4142:2014 'Methods for rating and assessing industrial and commercial sound' has been used to assess the likelihood any adverse impacts based on the resultant noise level from the new plant item, including any corrections for the character of the noise against the existing background noise level.

BS4142 gives guidance on assessing the likelihood of adverse impacts by calculating a 'rating level' of the new noise source and comparing its magnitude at noise sensitive locations to the existing or underlying background noise level. The background noise level is subtracted from the 'rating level' to assess the likelihood of complaints:

- The greater the difference the greater the likelihood of complaints.
- A difference of around +10dB or more is an indication of a significant adverse impact, depending on the context.
- A difference of +5dB 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 noise level, the less likely it is that the specific sound source will have an adverse impact or 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 sound impact, depending on the context.

This assessment is carried out over a one hour period for the daytime and a fifteen minute period for the night-time. For the purposes of the standard it states that daytime and night-time are typically 07:00 to 23:00 hours and 23:00 to 07:00 hours respectively.

The 'rating level' of the noise source is obtained taking the following factors into consideration:

- The new plant noise (the specific noise) is measured or predicted in terms of L_{Aeq}.
- An additional correction shall be included if the noise contains a distinguishable, discrete continuous note, if the noise contains distinct impulses or if the noise is irregular enough to attract attention. The value for any tonal noise can be an addition of up to 6dB and for impulsive noise of up to 9dB.

BS 4142 goes onto state that:

'The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.'

BS4142 has been referenced in setting noise limits for any fixed plant proposed as part of the proposed development.

APPENDIX D

SURVEY RESULTS
(TABULAR)

EC 19168 - Lounges Ruislip

Loungers UK Limited

Tabulated Noise data

Time	L_{Aeq}	L_{AMax}	L_{A90}
09:30	47	68	39
09:45	44	69	38
10:00	49	70	40
10:15	54	84	40
10:30	46	62	39
10:45	53	72	39
11:00	48	73	40
11:15	53	76	37
11:30	48	67	38
11:45	50	71	40
12:00	55	85	40
12:15	49	72	40
12:30	51	74	41
12:45	45	65	40
13:00	49	76	40
13:15	49	72	41
13:30	52	83	40
13:45	47	67	41
14:00	46	68	41
14:15	46	67	40
14:30	46	68	41
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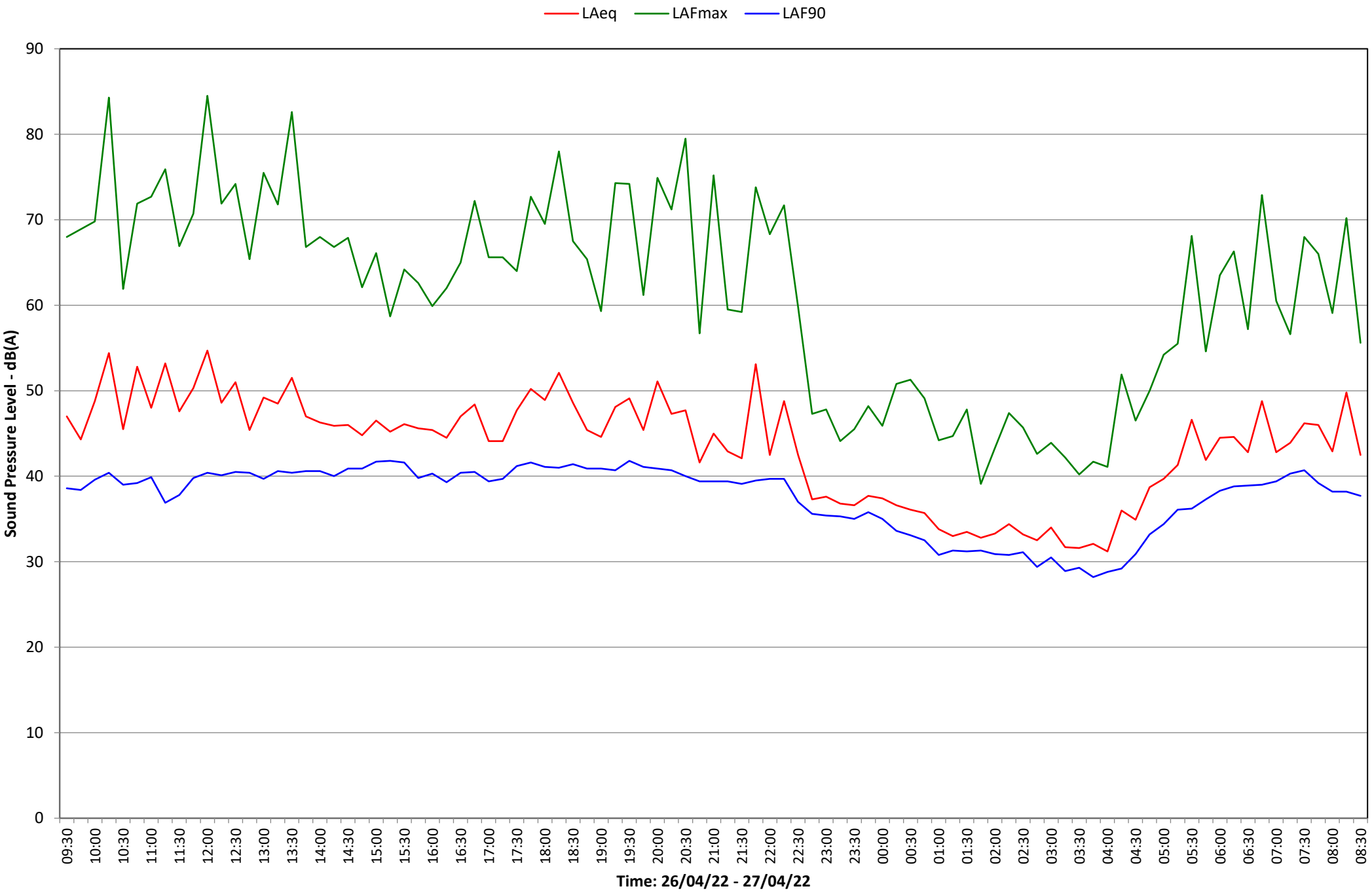
16:30	47	65	40
16:45	48	72	41
17:00	44	66	39
17:15	44	66	40
17:30	48	64	41
17:45	50	73	42
18:00	49	70	41
18:15	52	78	41
18:30	49	68	41
18:45	45	65	41
19:00	45	59	41
19:15	48	74	41
19:30	49	74	42
19:45	45	61	41
20:00	51	75	41
20:15	47	71	41
20:30	48	80	40
20:45	42	57	39
21:00	45	75	39
21:15	43	60	39

Time	L_{Aeq}	L_{AMax}	L_{A90}
21:30	42	59	39
21:45	53	74	40
22:00	43	68	40
22:15	49	72	40
22:30	43	60	37
22:45	37	47	36
23:00	38	48	35
23:15	37	44	35
23:30	37	46	35
23:45	38	48	36
00:00	37	46	35
00:15	37	51	34
00:30	36	51	33
00:45	36	49	33
01:00	34	44	31
01:15	33	45	31
01:30	34	48	31
01:45	33	39	31
02:00	33	43	31
02:15	34	47	31
02:30	33	46	31
02:45	33	43	29
03:00	34	44	31
03:15	32	42	29
03:30	32	40	29
03:45	32	42	28
04:00	31	41	29
04:15	36	52	29
04:30	35	47	31
04:45	39	50	33
05:00	40	54	34
05:15	41	56	36
05:30	47	68	36
05:45	42	55	37
06:00	45	64	38
06:15	45	66	39
06:30	43	57	39
06:45	49	73	39
07:00	43	61	39
07:15	44	57	40
07:30	46	68	41
07:45	46	66	39
08:00	43	59	38
08:15	50	70	38
08:30	43	56	38

APPENDIX E

SURVEY RESULTS
(GRAPHICAL)

Noise Level Time History at Lounges Ruislip



APPENDIX F

PUBLISHED PLANT NOISE DATA

Make & Model	Noise Source	Published Noise Emission Spectra, dBz								
		63	125	250	500	1k	2k	4k	8k	dBA
Systemair MUB/T 062 630	Outlet	77	91	84	8	79	75	72	66	84 SWL
	Casing	56	74	56	47	47	45	38	29	59 SWL
Systemair MUB 062 560	Inlet	73	85	80	79	77	73	71	64	82 SWL
Systemair KVK Silent 200	Outlet	74	65	69	62	56	56	50	41	65 SWL
Systemair KVK Silent 160	Outlet	80	75	74	68	63	59	51	41	70 SWL
Mitsubishi PUZ-M100	Casing	60	55	54	51	48	45	40	31	54 SPL @ 1m
Mitsubishi PUZ-M200	Casing	65	60	58	59	54	51	46	41	60 SPL @ 1m
JE Hall J5LC20C	Casing	-	-	-	-	-	-	-	-	29 SPL @ 10m
Danfoss OP-MPYM012MP	Casing	68	69	63	60	56	54	48	43	62 SWL

		Attenuator Insertion Losses, dB								
Kitchen Extract Discharge	-	7	14	20	29	29	31	29	25	-
Kitchen Supply Inlet	-	5	9	18	32	40	39	28	19	-
Male/Female WC Extract Discharge	-	2	4	8	24	32	34	13	10	-
WC Extract Discharge	-	2	4	10	28	42	43	20	15	-