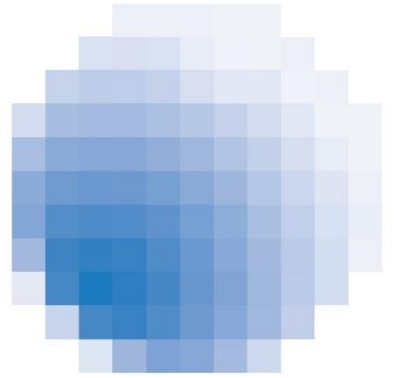




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NMGH Modular Offices
Crumpsall, Manchester

Environmental Noise Impact Assessment

P1919-REP03-BDH

15 July 2022

PROJECT: NMGH Modular Offices
Crumpsall, Manchester
Environmental Noise Impact Assessment

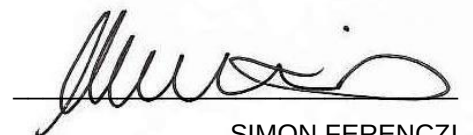
CLIENT: ESS Modular Ltd
Building One
Think Park, Mosely Road
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DOCUMENT
REFERENCE: P1919-REP03-BDH

SIGNED:


BRIAN HORNER

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DATE:

15 July 2022

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1 EXECUTIVE SUMMARY

Sol Acoustics Limited (“Sol”) has been commissioned by Extra Space Solutions (UK) Limited (“ESS”) to provide an environmental noise impact assessment of the existing North Manchester General Hospital modular offices (the “Facility”), as located on Ellis Drive in Crumpsall, Manchester.

This acoustic assessment report considers the environmental noise impact as arising from the operation of all externally sited mechanical services equipment associated with the Facility, as at the nearest noise sensitive residential housing.

The pre-existing environmental noise climate at has been measured by Sol between c.14:10 hours during Wednesday 9 December and c.13:30 hours during Thursday 10 December 2020.

The noise generated by the various as fitted mechanical services equipment has been measured by Sol during Friday 8 July 2022. The corresponding environmental noise emissions arising from the Facility at the surrounding noise sensitive receptors has been quantified, modelled, and assessed using proprietary “CadnaA” 3D acoustic software.

It is the conclusion of this acoustic assessment that the British Standard 4142:2014+A1:2019 defined noise “Rating Level” as arising from the operation of all as fitted externally sited mechanical services associated with the Facility is at least 5dB below the pre-existing Background Sound Level as during both daytime and night-time periods, and accordingly the prescribed acoustic requirements of Planning Condition 15 are thus met.

Please refer to the main report and appendices for further information.

2 INTRODUCTION

Sol Acoustics Limited (“Sol”) has been commissioned by Extra Space Solutions (UK) Limited (“ESS”) to provide an environmental noise impact assessment for the existing North Manchester General Hospital modular offices, as located on Ellis Drive in Crumpsall, Manchester (hereinafter referred to as the “Facility”). The purpose of this acoustic assessment is as follows:

- Identify the nearest pre-existing Noise Sensitive Receptors (NSRs) which are most likely to be affected by environmental noise arising from external building services plant associated with the Facility.
- Determine the prevailing, pre-existing daytime and night time Background Sound Level climate at the receptors through direct, environmental noise measurement.
- Identify all existing and significant discrete plant noise sources located at the Facility.
- Obtain, through direct noise level measurement, noise level data for the various acoustically significant externally sited mechanical services plant associated with the Facility.
- Calculate the resultant environmental noise level contribution and impact at the receptors, as during daytime and night time periods, and taking factors such as distance to receptors, acoustic screening effects and other environmental features into account.
- Assess compliance with the requirements of Planning Condition 15.

This acoustic report is structured as follows:

- Section 3 provides a basic description of the Facility and surrounding receptors, together with a brief description of the as installed plant.
- Section 4 provides summary details of the benchmark environmental noise survey undertaken in order to determine the pre-existing environmental noise climate at the identified NSRs.
- Section 5 provides the results of the benchmark environmental noise survey and the results of the plant noise level measurements.
- Section 6 provides a summary of BS 4142:2014+A1:2019 and the requirements of Planning Condition 15.
- Section 7 provides a summary of the proprietary 3D acoustic models constructed and acoustic calculations undertaken.
- Section 8 assesses compliance with the requirements of Planning Condition 15.

- Section 9 provides a conclusion statement.
- *Appendix A provides a glossary of acoustic terminology.*
- *Appendix B provides details of the noise surveys undertaken and a summary of the data obtained from these.*
- *Appendix C provides details of the 3D computer noise model as constructed for this project.*
- *Appendix D provides the results of the noise measurements of the as installed externally sited mechanical services plant.*
- *Appendix E gives details and qualifications of contributing Sol Acoustics' staff.*

3 DESCRIPTION OF SITE

3.1 General Overview and Noise Sensitive Receptors (NSRs)

The existing Facility is located at the corner of Ellis Drive and Eyam Road in Crumpsall, Manchester. The newly constructed four-storey office building comprises mainly of open plan offices, meeting rooms and quiet rooms.

The nearest pre-existing noise sensitive residential housing to the Facility is located approximately 10 metres to the south of the site boundary, on the opposite side of Magna Drive.

The existing externally sited building services equipment comprises of 12 off condenser units as installed to the north of the site, as follows:

- 1 off Mitsubishi PURY-P300YNW-A1 condenser. Sol has been informed that these units are only required to operate during daytime hours only (i.e. 07:00 – 23:00 hours).
- 3 off Mitsubishi PURY-P350YNW-A1 condensers. It is understood that these units also only operate during daytime hours.
- 4 off Mitsubishi PURY-P400YNW-A1 condensers. Again, it is understood that that these units only operate during daytime hours.
- 4 off Mitsubishi PUHZ-ZRP35VKA2 condensers. Unlike the above units, it is understood that these units can operate on a *24 hour basis*.

Figure 1 overleaf shows the location of the Facility in relation to the identified NSRs, and also the corresponding locations of the noise monitoring positions used in order to inform this acoustic assessment.

Figure 2 shows the as built external works layout drawing indicating the location of the external condenser compound.

Figure 3 shows the as installed location of each condenser within the external compound.

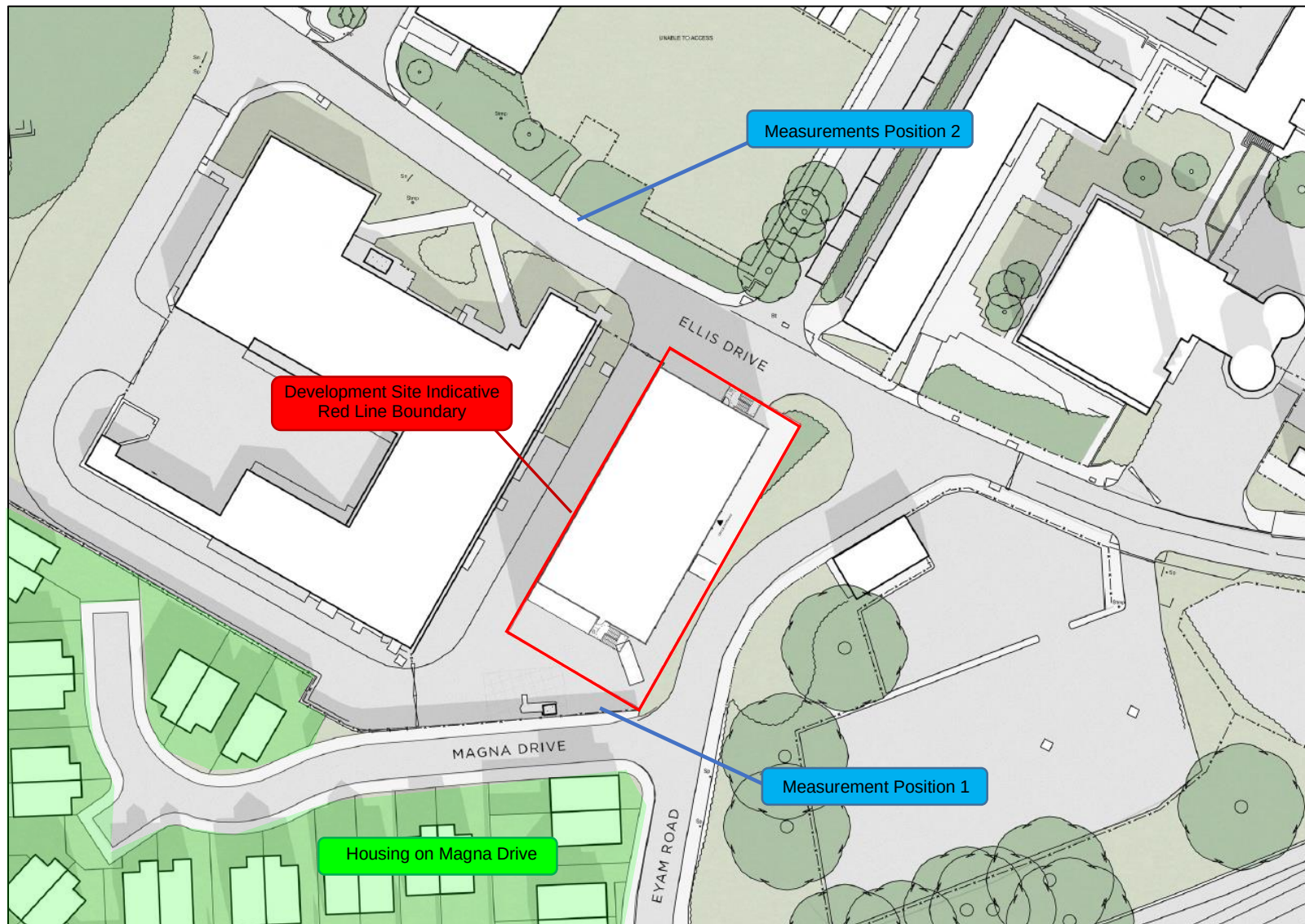


Figure 1: Aerial photography showing noise sensitive receptors (NSRs) and noise monitoring locations in relation to the Facility



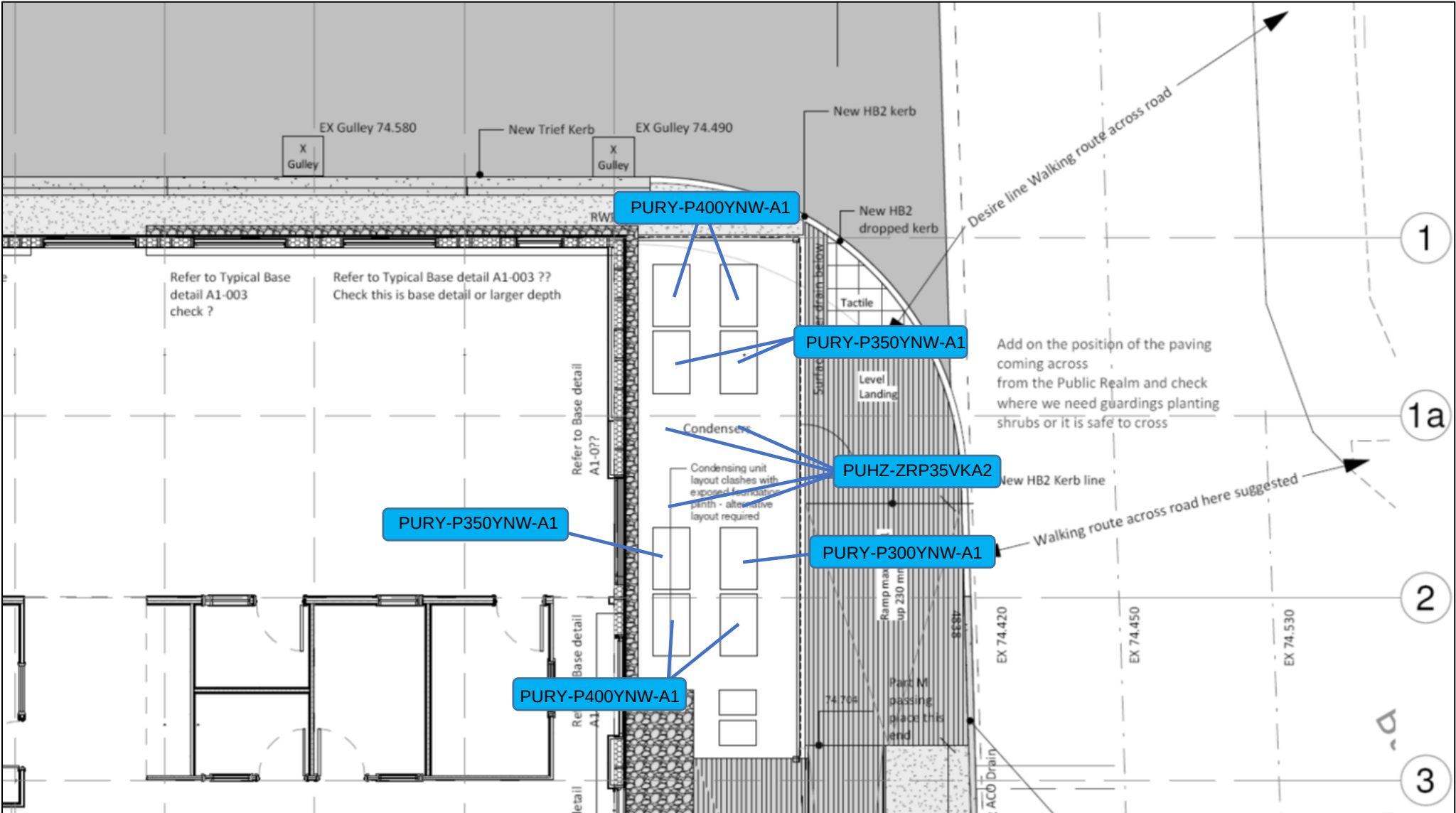


Figure 3: External condenser layout

4 DETAILS OF INVESTIGATION

4.1 Pre-Existing Environmental Noise Climate (December 2022)

In order to inform this acoustic assessment, an environmental noise survey has been conducted by Sol between c.14:10 hours during Wednesday 9 December and c.13:30 hours during Thursday 10 December 2020. The purpose of this survey was to determine the prevailing pre-existing Ambient and Background Sound Levels at the nearest residential receptors to the Facility, as during a typical weekday, daytime and night time period for environmental noise benchmarking and subsequent acoustic impact assessment purposes.

The environmental noise survey consisted of two environmental noise measurement positions:

- **Noise Monitoring Position 1:** Mast mounted microphone and weather station sited at 2.5 metres above local ground level, c.10 metres to the north of the existing residential housing on Magna Drive. Unattended environmental noise levels were recorded at this position between c.15:15 hours during Wednesday 9 December and c.13:30 hours during 10 December 2020.
- **Noise Monitoring Position 2:** Tripod mounted microphone sited at 1.5 metres above local ground level, situated on the north side of Ellis Drive. All construction activities on the site were stopped for the full duration of this measurement. Fully attended environmental noise levels were recorded at this position between c.14:10 hours and c.14:45 during Wednesday 9 December 2020.

The locations of the noise monitoring positions are shown in Figure 1. The full results are as presented in Appendix B.

Ground investigation works were being carried out on site during the survey in 2020. The Site Manager confirmed that works were only carried out as during daylight hours between c.08:00 hours and 17:00 hours. The results as recorded during the known periods of construction have been omitted from the assessment.

The noise survey was carried out using Type 1 Precision Grade noise monitoring equipment, and the complete measuring systems were field calibrated immediately prior to and following the noise survey period. (Full details of the noise monitoring systems are retained on file by Sol, including traceable calibration records; these are available for review if needed).

Meteorological data was recorded at Noise Monitoring Position 1 for the duration of the noise survey, as using a Professional Grade Vaisala "WXT520" weather station. The prevailing weather conditions remained favourable for the majority of the survey period for the purposes of environmental noise assessment. Brief periods of light rain were recorded between c.20:00 hours and 20:30 hours during 9 December 2020. Average wind speeds remained below 1ms^{-1} for the duration of the survey.

Notwithstanding the weather conditions recorded, the microphone systems were entirely weatherproofed and fitted with all-weather environmental windshields, each with bird spike.

4.2 Individual Plant Noise Measurements (July 2022)

Sol attended the Facility during Friday 8 July 2022 in order to carry out close-quarters noise measurements of all externally-sited mechanical services equipment. All plant was confirmed by the Site Operative to be operating at maximum design duty and speeds.

All noise measurements were carried out using Type 1 Precision Grade noise monitoring equipment. The complete measuring systems were field calibrated immediately prior to and following the noise survey period. (Full details of the noise monitoring systems are retained on file by Sol, including traceable calibration records; these are available for review if needed).

The noise survey comprised of full broadband A-weighted, $L_{Aeq,T}$, and one-third octave unweighted, $L_{eq,T}$, sound pressure level measurements. All measurements were conducted over 10-second sample periods, as using an omnidirectional microphone, at a measurement distance of 1 metre from each plant item. In all cases, two measurements were conducted at each position in order to demonstrate repeatability of the results.

The weather conditions remained favourable for the duration of the survey. The microphone systems were entirely weatherproofed and fitted with an all-weather environmental windshield.

The results of all individual plant noise measurements are summarised in Appendix D of this report.

5 ENVIRONMENTAL NOISE SURVEY RESULTS

5.1 Pre-Existing Environmental Noise Climate

Table 1 provides a basic summary of the average, free field environmental noise levels measured at Measurement Position 1 and Position 2:

Measurement Position	Daytime			Night time		
	dB L_{Amax}	dB $L_{Aeq,15min}$	dB $L_{A90,15min}$	dB L_{Amax}	dB $L_{Aeq,15min}$	dB $L_{A90,15min}$
1	54 – 72	42 – 51	39 – 45	41 – 68	36 – 50	35 – 45
2	71	45 – 49	42 – 44	-	-	-

Table 1: Summary of typical, measured environmental noise levels, broadband terms

Appendix B provides further information and a full summary of the measurement data.

6 ENVIRONMENTAL NOISE PERFORMANCE SPECIFICATION REQUIREMENTS

6.1 BS 4142: 2014+A1: 2019 '*Method for rating and assessing industrial and commercial sound*'

BS 4142:2014+A1:2019 is intended to be used to assess environmental noise of an industrial nature, which includes sound from fixed installations, which comprise mechanical and electrical plant and equipment. The methods prescribed in the British Standard 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.

The procedure contained in BS 4142:2014+A1:2019 for assessing the impact is to compare the measured or predicted noise level from the source in question, the "Specific Sound Level" immediately outside the noise sensitive premises, with the "Background Sound Level." Where the noise contains attention attracting characteristics (i.e. acoustic features) such as tonal, impulsive, intermittent elements, it may be appropriate to apply a correction to the Specific Sound Level to obtain the "Rating Level."

BS 4142:2014+A1:2019 states 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:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +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 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.

For the daytime, the assessment is carried out over a one-hour period, and over a 15-minute period at night. The daytime and night time periods are typically defined as occurring between 07:00 hours to 23:00 hours, and 23:00 hours to 07:00 hours, respectively.

6.2 Planning Condition 15

Planning Permission for the Facility was granted by Manchester City Council during 3 November 2020 (Planning Application number: 127914/FO/2020). Condition 15 relates to noise and states the following:

'... 15) (a) Prior to the first occupation of the development hereby approved, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment, and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

(b) Prior to the first occupation of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority, and thereafter retained and maintained in situ.

Reason - To minimise the impact of plant on the occupants of the development pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995) ...'

Accordingly, it is necessary to limit the total, aggregate environmental noise from all M&E plant, when operating simultaneously, to not exceed an ambient noise level (in $L_{Aeq,T}$ terms) equating to the pre-existing typical daytime or night time background noise level at any residential property façade, in $L_{A90,T}$ terms, less a further 5dB. The lowest typical recorded daytime and night time background noise levels, in the absence of construction noise, as recorded at Position 1 were 41dB $L_{A90,T}$ and 36dB $L_{A90,T}$ respectively. On this basis, Table 2 provides the maximum permissible noise limits for externally sited plant to be achieved at the residential housing on Magna Drive (free-field) as required to comply with the requirements of Planning Condition 15:

Location	Maximum Permissible Rating Level Limit Imposed by Condition 15, dB $L_{Aeq,T}$	
	Daytime (07:00hrs to 23:00hrs)	Night time (23:00hrs to 07:00hrs)
Housing on Magna Drive	36	31

Table 2: Maximum permissible noise level limits for externally sided building services plant

7 ENVIRONMENTAL NOISE MODEL

7.1 Methodology and Basis of 3D Environmental Noise Models

In order to predict the likely noise levels impinging on the surrounding noise sensitive receptors, proprietary 3D computer noise models were created using the DataKustik “CadnaA” Noise Mapping software. The following assumptions have been made when building all the noise models:

- (a) The noise model was set up to apply the noise prediction methodology set out in ISO 9613-2: ‘*Acoustics – Attenuation of Sound propagation outdoors – Part 2: General Method of Calculation*’.
- (b) The model was set to include third order reflected noise from solid structures.
- (c) Ground absorption, as defined in ISO 9613-2, has been taken into consideration in the construction of the model. The base ground absorption for the model has been set to $G = 0.0$ (hard ground).
- (d) The noise impact as expected at the worst affected NSRs has been determined at a receptor grid height of 4 metres above local ground level (to approximate first floor level).

Figure 4 provide three-dimensional visualisations of the noise model used to inform the noise impact assessment.

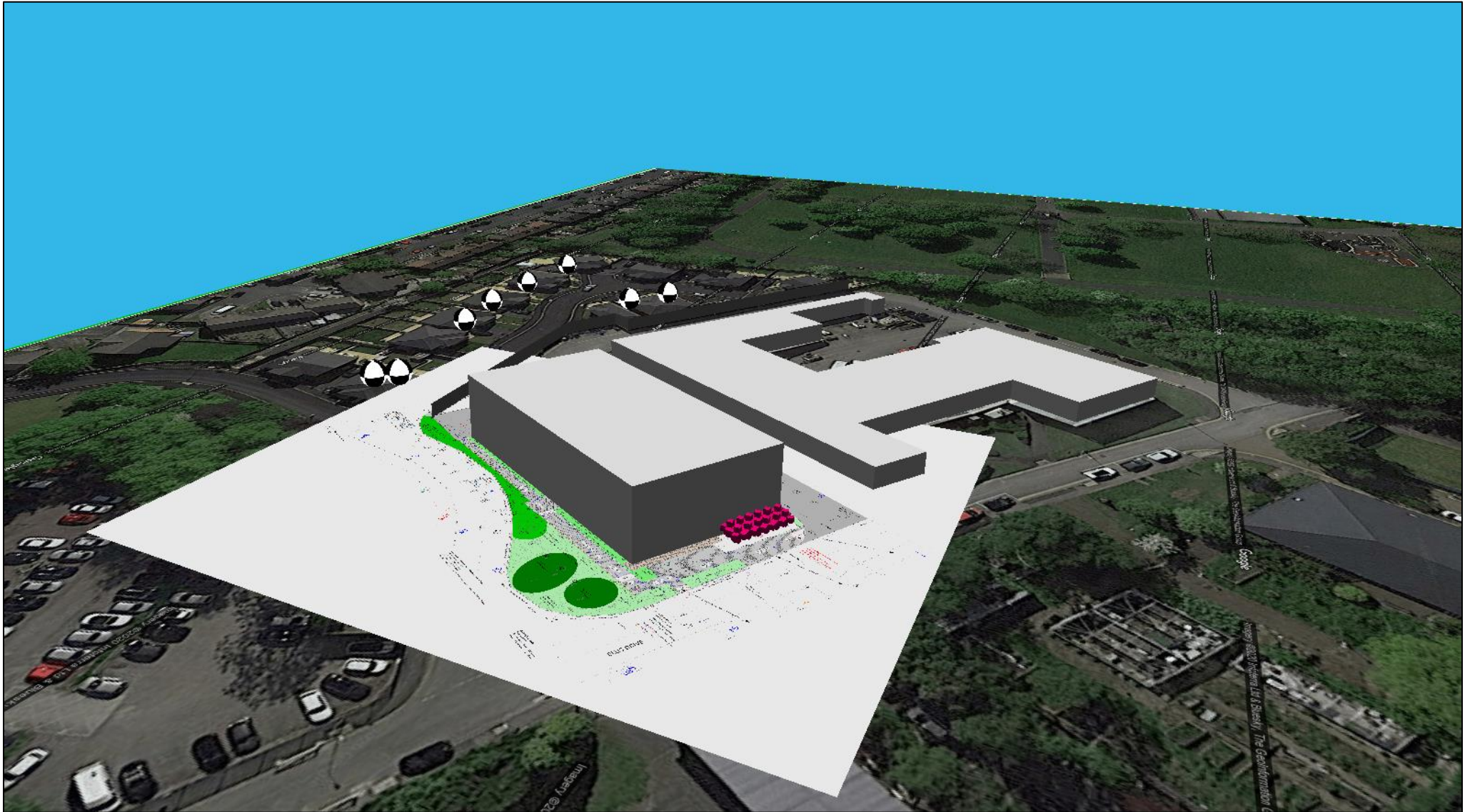


Figure 4: 3D view of the noise model of the plant

8 ENVIRONMENTAL NOISE IMPACT ASSESSMENT

The 3D noise model has been used to predict the Specific Sound Level at the Magna Drive NSR. *Appendix C provides full details of CadnaA noise map which present the Specific Sound Levels predicted.*

Table 3 shows the predicted Specific Sound Level at the assessed NSR during the daytime and night time. The BS 4142:2014+A1:2019 defined “Rating Level” have then been determined from the predicted Specific Sound Levels by applying an acoustic character correction. In this case, the predicted Specific Sound Levels are significantly below the pre-existing Background Sound Level during the daytime and night time periods. As such, any acoustic character associated with the combined operation of the condenser units is not expected to be of any significance when observed at the residential housing, and thus no BS 4142:2014+A1:2019 penalty correction has been applied in order to determine the Rating Level for acoustic assessment purposes:

Noise Sensitive Receptor	Assessment Period	Predicted Specific Level, dB $L_{Aeq,T}$	Acoustic Character Correction, dB	Predicted Rating Level, dB $L_{Ar,Tr}$	Maximum Permissible Noise Rating Level Limit Imposed by Condition 15, dB $L_{Ar,Tr}$	Pass/Fail
A – Housing on Magna Drive (south west of the Facility)	Daytime (07:00hrs – 23:00hrs) $T = 1$ hour	30	+0	30	36	Pass
	Night Time (23:00hrs – 07:00hrs) $T = 15$ minutes	17	+0	17	31	Pass

Table 3: Planning Condition 15 summary assessment

Table 3 shows that the predicted Rating Level at the existing noise sensitive residential housing on Magna Drive meets the maximum permissible noise Rating Level limits as imposed by Planning Condition 15.

8.1 Uncertainty

Section 10 of BS 4142:2014+A1:2019 states the following with regards to uncertainty:

‘... Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty...’

In accordance with the requirements of BS 4142:2014+A1:2019, Sol have undertaken the following steps to limit the level of uncertainty in the acoustic assessment:

1. All noise measurements have been carried out using Type 1 Precision Grade noise mounting equipment. All noise measuring instruments have traceable laboratory calibration certification.
2. All noise measurements were accompanied by continuous meteorological measurements as conducted at, or close to, the measurement position in order to ensure that the measurement data was not adversely affected by unfavourable weather conditions. Periods of adverse weather conditions have been excluded from the assessment.
3. Calculations have been conducted in line with appropriate and nationally recognised acoustic standards (ISO 9613-2), and using proprietary 3D noise modelling software, CadnaA.
4. The assessment assumes downwind propagation in all cases as this represents the worst case.

9 CONCLUSION

Sol has been commissioned by ESS to provide an environmental noise impact assessment of the as existing new North Manchester General Hospital modular offices, as located on Ellis Drive in Crumpsall, Manchester.

This acoustic assessment report considers the environmental noise impact as arising from the anticipated operation of all externally mounted mechanical services associated with the Facility at the nearest Noise Sensitive Receptors.

The pre-existing environmental noise climate at has been measured by Sol between c.14:10 hours during Wednesday 9 December and c.13:30 hours during Thursday 10 December 2020.

The noise levels as generated by the various as fitted, externally sited mechanical services equipment has been measured by Sol during Friday 8 July 2022. The environmental noise emissions from the Facility at the surrounding noise sensitive receptors has been predicted using proprietary "CadnaA" 3D acoustic software.

It is the conclusion of this acoustic assessment that the BS 4142:2014+A1:2019 defined Rating Level as arising from the operation of all as fitted externally sited mechanical services associated with the Facility is at least 5dB below the pre-existing Background Sound Level as during daytime and night-time periods and thus meets the acoustic requirements of Planning Condition 15.

APPENDIX A

GLOSSARY OF ACOUSTIC TERMS

Term	Abbreviation	Description
Decibel	dB	A scale for comparing the ratios of two quantities, including sound pressure and sound power.
A-weighting	dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the change in sensitivity of the human ear at varying frequencies.
Sound Pressure Level	L_{pA}	A measure of the sound pressure at a particular location. Typically expressed in dB(A) referenced to 2×10^{-5} Pascals.
Equivalent Continuous Sound Level	$L_{Aeq,T}$	The steady level of sound over a prescribed period of time which would contain the same total sound energy as the actual fluctuating noise under consideration in the same period of time.
Statistical Sound Levels	L_{A10} and L_{A90}	The level of noise exceeded for a percentage of the time period being sampled, namely 10% or 90% respectively.
Background Sound Level	$L_{A90,T}$	The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of the time period being sampled.
Maximum Sound Level	L_{Amax}	The maximum sound or noise level determined with instrumentation set to either a fast time weighting, L_{AFmax} , or a slow time weighting, L_{ASmax} , as occurring during the time period being sampled.
Sound Power Level	L_{WA}	A measure of the total sound energy radiated from a source. Like sound pressure levels, this is also expressed in dB(A) terms, but it is referenced to 1×10^{-12} W.
Broadband		Sound sampled over a wide range of frequencies.
Narrow band		Sound sampled over a specific, restricted frequency range. Used to ascertain the amplitude and significant of individual, audible tones, and to assist in identifying particular sources of noise within a complex, multi-source soundscape environment.
Ambient Sound	$L_{eq,T}$	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, both near and far.
Specific Sound Level	$L_{eq,T}$	The Equivalent Continuous A-Weighted Sound Level at an assessment position produced by a specific sound over a given reference time interval, T_r
Rating Level	L_{Ar,T_r}	The Specific Sound Level plus any adjustment for the acoustic characteristic features of the noise (e.g. intermittency, tones etc.).
Residual Noise	$L_{Aeq,T}$	The ambient sound remaining at given position in a given situation, when the specific sound source is suppressed to such an extent that it no longer contributes to the ambient sound.
Sound Reduction Index	SRI	The reduction in sound energy when transmitted through a panel or similar planar element, typically used in relation to single octave or one-third octave frequency band values.
Weighted Sound Reduction Index	R_w	The Sound Reduction Index expressed as a single figure, as expressed against a reference curve.
Dynamic Insertion Loss	DIL	Reduction in acoustic energy resulting from the insertion of a noise control element (e.g. an attenuator, acoustic enclosure etc.).
Free Field		Noise measuring location that is free from the presence of sound reflecting objects (except the ground), usually taken to mean being at least 3.5 metres distance from reflective surface(s) or greater.

APPENDIX B

NOISE SURVEY DETAILS AND SUMMARY RESULTS

LOCATION

Ellis Drive, Crumpsall, Manchester

DATES, TIMES, AND WEATHER CONDITIONS

Date	Daytime (07:00 hours – 23:00 Hours)				Night Time (23:00 hours – 07:00 hours)			
	Temp, °C	Rain, mm/h	Wind Direction	Average Wind Speed, m/s	Temp, °C	Rain, mm	Wind Direction	Average Wind Speed, m/s
09/12/2020	5	0.6	E	0.4	6	0.1	SE	0.5
10/12/2020	7	0.0	SE	0.9	-	-	-	-

PERSONNEL

Brian Horner BSc (Hons) MIOA – Sol Acoustics Ltd

INSTRUMENTATION

Measurement Position 1 (December 2020)

01dB Cube Sound Level Meter (Serial No. 12068)
01dB Pre22 Microphone Preamplifier (Serial No. 1936010)
GRAS 40CD Microphone Capsule (Serial No. 292577)
01dB CAL 21 Acoustic Calibrator (Serial No. 34675320)

Measurement Position 2 (December 2020)

01dB Cube Sound Level Meter (Serial No. 12070)
01dB Pre22 Microphone Preamplifier (Serial No. 1915040)
GRAS 40CD Microphone Capsule (Serial No. 288057)
01dB CAL 21 Acoustic Calibrator (Serial No. 34675320)

Plant noise measurements (July 2022)

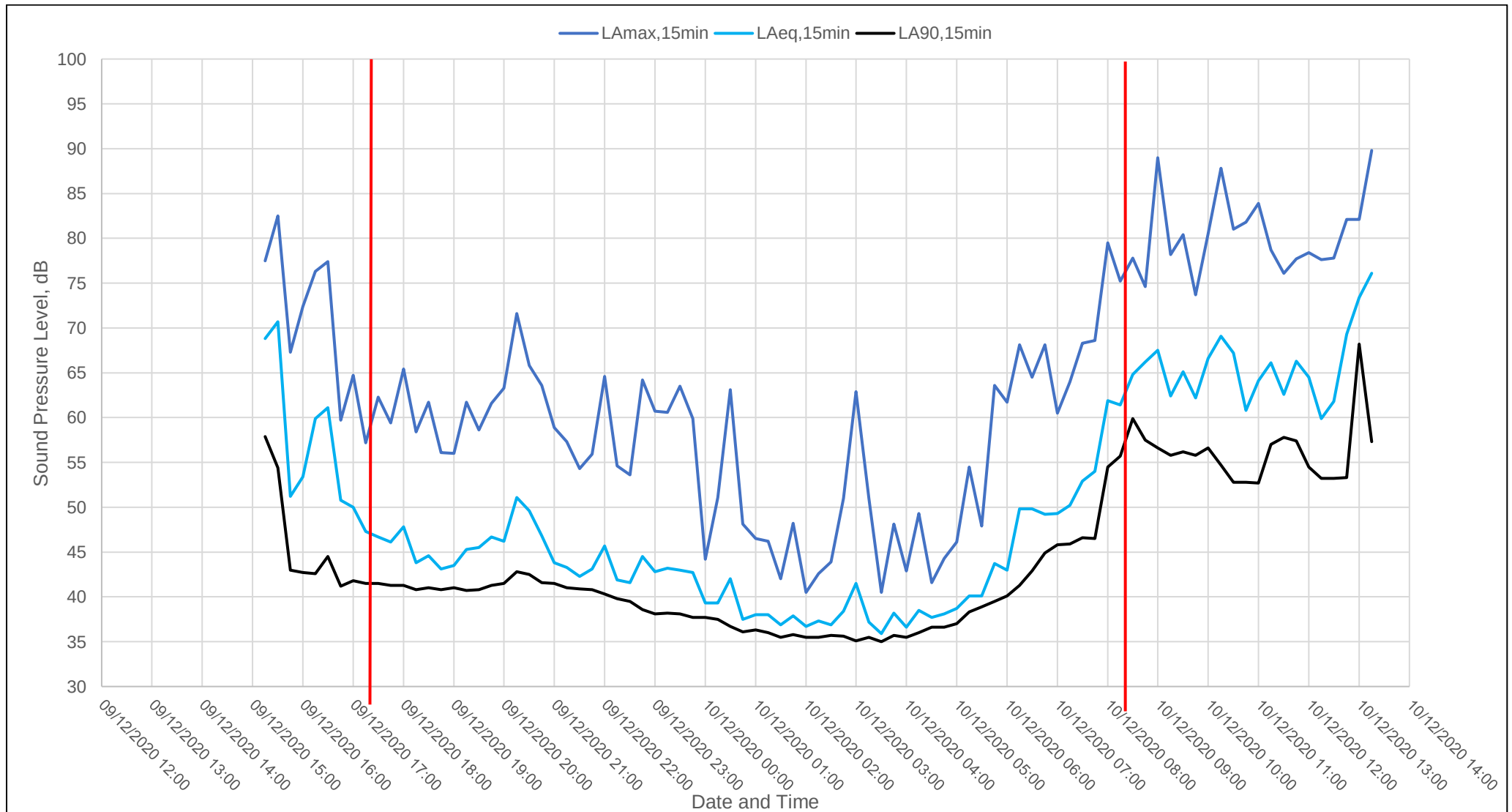
Norsonic 118 sound level meter (serial no. 28260)
Norsonic 1206 Microphone preamplifier (serial no. 30962)
Norsonic 1225 Microphone capsule (serial no. 285614)
Norsonic 1251 Acoustic Calibrator (serial no. 29917)

METHODOLOGY

Before and after the measurements the noise monitoring equipment was calibrated to an accuracy of $\pm 0.3\text{dB}$ using the Cal 21 Calibrator. The calibrator produces a sound pressure level of $94\text{dB re } 2 \times 10^{-5} \text{Pa @ } 1\text{kHz}$.

MEASUREMENT RESULTS

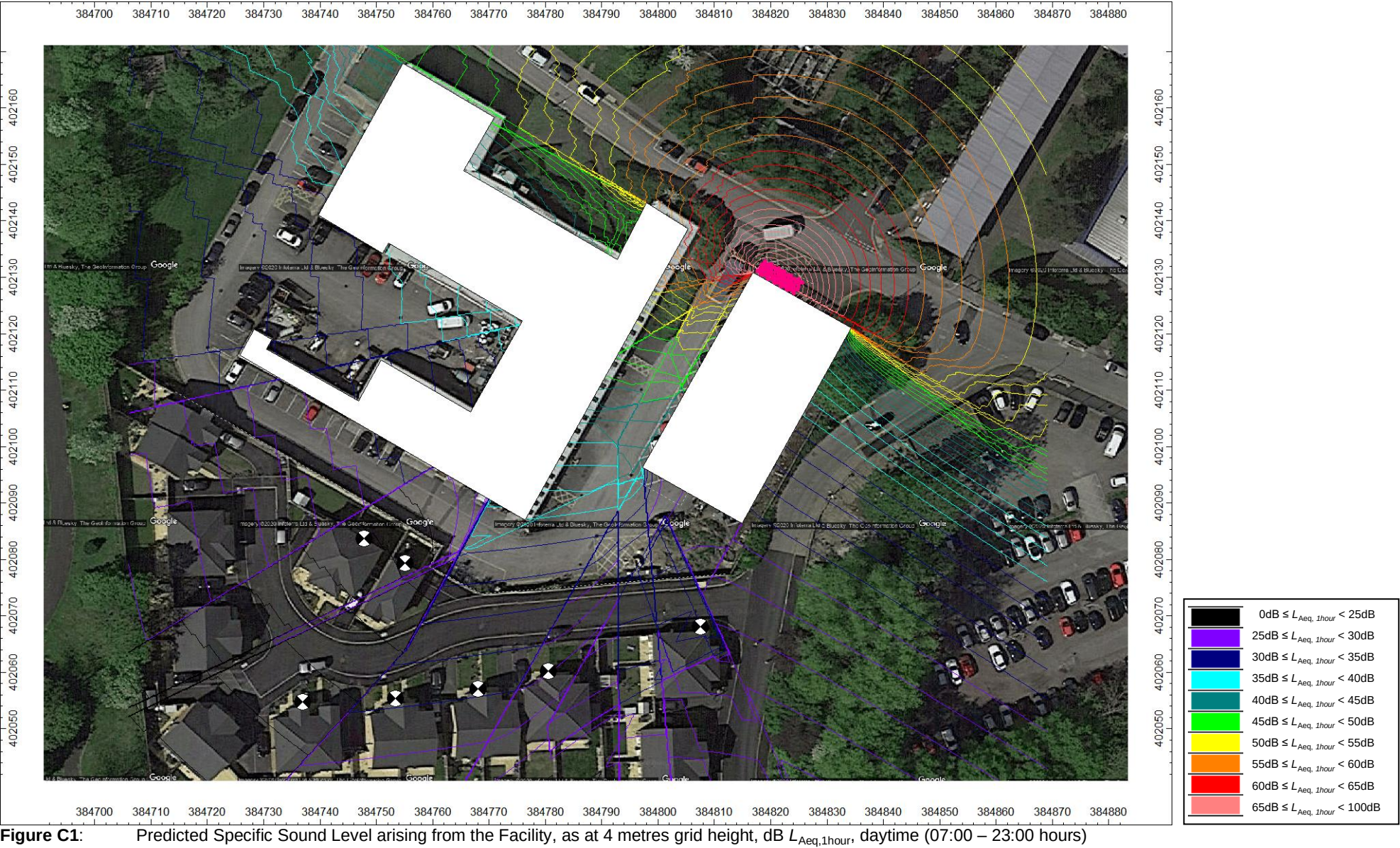
Graphs B1 summarises the broadband A-weighted results obtained at Monitoring Position 1.



Graph B1: A-weighted environmental noise levels at Measurement Position 1, 9 to 10 December 2020

APPENDIX C

ENVIRONMENTAL NOISE MODELLING RESULTS



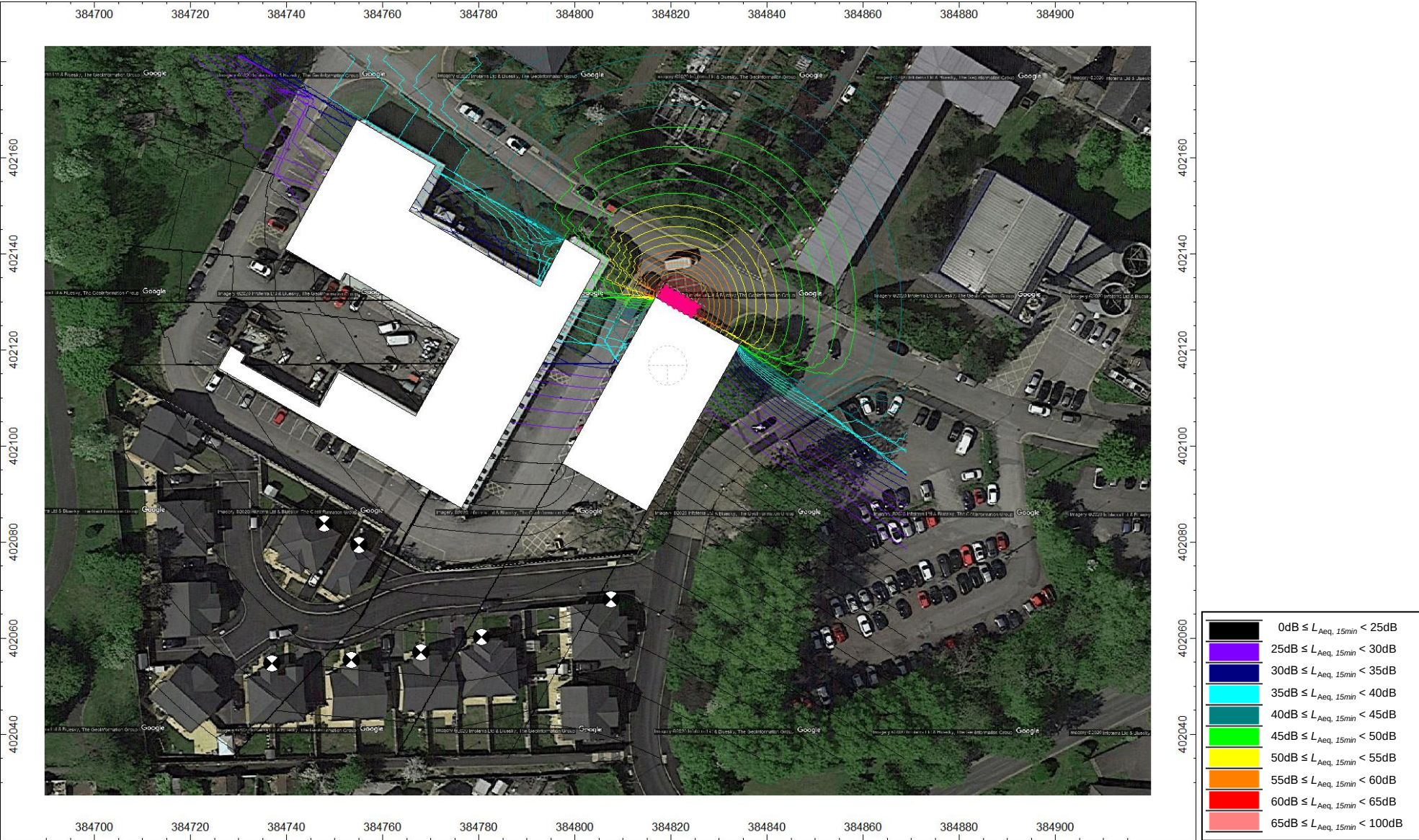


Figure C2: Predicted Specific Sound Level arising from the Facility, as at 4 metres grid height, dB $L_{Aeq, 1hour}$, night time (23:00 – 07:00 hours)

Housing on Magna Drive Predicted Specific Sound Levels Daytime (07:00 – 23:00 hours)	
Source Description	Specific Sound Level, dB $L_{Aeq,T}$
PURY-P400YNW-A1	25.4
PURY-P400YNW-A1	23.5
PURY-P350YNW-A1	22.5
PURY-P350YNW-A1	20.4
PURY-P350YNW-A1	16.8
PURY-P400YNW-A1	16.0
PURY-P400YNW-A1	15.5
PURY-P300YNW-A1	13.8
PUHZ-ZRP35VKA2	11.6
PUHZ-ZRP35VKA2	10.4
PUHZ-ZRP35VKA2	10.3
PUHZ-ZRP35VKA2	9.3
Total	30.2

Table C1: Housing on Magna Drive predicted Specific Sound Levels, daytime

Housing on Magna Drive Predicted Specific Sound Levels Night time (23:00 – 07:00 hours)	
Source Description	Specific Sound Level, dB $L_{Aeq,T}$
PUHZ-ZRP35VKA2	11.6
PUHZ-ZRP35VKA2	10.4
PUHZ-ZRP35VKA2	10.3
PUHZ-ZRP35VKA2	9.3
Total	16.5

Table C2: Housing on Magna Drive predicted Specific Sound Levels, night time

APPENDIX D
NOISE SOURCE SCHEDULE



Equipment Name	Data Source / Specification	Number of Sources	Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz								Average Sound Pressure Level on Measurement Surface, dB L_{pA}	Measurement Distance, m	Measurement Surface area at Measurement Position, m ²	Overall Sound Power Level, dB L_{WA}	Utilisation		Source: Area (A) Line (L) Point (P) or internal (I)	
			32	63	125	250	500	1k	2k	4k					8k	Daytime		Night time
PURY-P400YNW-A1	On-site sound level measurement during 8 July 2022 (SPL@1m)	4	85	76	71	66	65	61	57	53	46	67	1	43	83	100%	0%	P
PURY-P350YNW-A1	On-site sound level measurement during 8 July 2022 (SPL@1m)	3	75	74	72	69	66	63	58	56	54	68	1	43	85	100%	0%	P
PURY-P300YNW-A1	On-site sound level measurement during 8 July 2022 (SPL@1m)	1	72	71	68	65	62	59	56	53	44	65	1	40	81	100%	0%	P
PUHZ-ZRP35VKA2	On-site sound level measurement during 8 July 2022 (SPL@1m)	4	70	73	69	65	63	59	56	52	44	65	1	13	76	100%	100%	P

Table D1: Noise source schedule

APPENDIX E
DETAILS AND PROFESSIONAL QUALIFICATIONS OF CONTRIBUTING SOL STAFF

Company Details

Name of Organisation: Sol Acoustics Limited

Status: Private Limited Company

Address: Unit 11, Brunel Court,
Gadbrook Park
CW9 7LP

Telephone Number: 01565 632535

E-Mail: info@solacoustics.co.uk

Nature of Business: Acoustic Consultancy

Directors: Simon Ferenczi

Company Registration Number: 4218702

Key Technical Personnel & Qualifications

Simon Ferenczi	Institute of Acoustics Diploma (with additional modules), MIOA
Brian Horner	BSc (Hons), MIOA

Company Accreditations

Sol Acoustics is a member of The Association of Noise Consultants (ANC) and is qualified to perform sound insulation testing under the ANC's accredited testing scheme to demonstrate compliance with the requirements of Approved Document E of the Building Regulations.