SHARPS REDMORE

ACOUSTIC CONSULTANTS • Established 1990

Report

Mercure Hotel, Bloomsbury

Plant noise assessment

Prepared by
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Project No 2221235

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Appendices

1.0 Introduction

1.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment of the installed plant serving the Mercure Hotel in Bloomsbury, London, to accompany a retrospective planning application.

1.2 The plant consists of 8 x AC condensers installed externally within a lightwell, which have been installed to replace multiple smaller AC units mounted on the external wall of the hotel – see Figure 1 below

Figure 1: Pre-existing plant (left) installed replacement plant (right)

1.3 Consent for an extension to the hotel, application reference 2018/3876/P was previously granted, subject to a number of planning conditions, Condition 4 relating to noise from fixed plant.

Application ref : 2018/3876/P, Condition 4:

"*The total noise from fixed plant associated with the application site, when at a point 1m external to the nearest noise sensitive residential facades shall comply with the Acoustic Design note (ref 18209/ADN002/js) i.e. be at least 45 dB L_{Aeq} (daytime hours) and 42 dB L_{Aeq} (night time hours), when all plant/equipment (or any part of it) is in operation unless the plant/equipment hereby permitted will have a noise that is distinguishable, discrete continuous note (whine, hiss, screech or hum) and/or if there are distinct impulse (bangs, clicks, clatters, thumps), then the noise levels from the plant/equipment at any noise sensitive façade shall be at least 40 dB L_{Aeq} (daytime hours) 37 dB L_{Aeq} (night time hours) i.e. 15 dBA below background noise level.*"

1.4 The wording of Condition 4, and report 18209/AD002/js, indicates that the requirement is for noise from plant to be at least 10 dB below the background noise climate.

1.5 The available methods of assessment and assessment criteria are presented at section 2.

1.6 An assessment of predicted plant noise levels is contained at section 3.0

1.7 Details of the noise model methodology are presented in Section 4.0

1.8 The site is located at 130-134 Southampton Row, London. The nearest residential property to the installed plant is at Russell Mansions, which overlooks the lightwell where the plant is installed.

2.0 Assessment methodology and criteria

2.1 The National Planning Policy Framework (NPPF), 2021, sets out the Government's planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 185 of the NPPF states the following:

"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; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation".

2.2 Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in the table below:

Table 1: Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such	Observed Adverse Effect	Mitigate ad reduce to a minimum

Response	Examples of Outcomes	Increasing Effect Level	Action
	that there is a small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.3 The NPPF and NPPG reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on 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."*

2.4 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"… all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

2.5 Taking an overview of national policy aims and guidance it is clear that when considering the impact of noise, the fact noise can be heard and causes impact, is not a reason to refuse an application as consideration should also be given to the significance of the impact and the mitigation measures available.

2.6 It is standard and good practice to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

i) The effect may be determined by reference to guideline noise values, such as those contained in the World Health Organisation (WHO) "*Guidelines for Community Noise"*.

ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.

iii) Another method is described within BS 4142:2014+A1:2019 which focuses on determining the significance of sound impact from sources of industrial and/or commercial nature. The sources that the newly revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

2.7 The assessment of fixed plant noise is principally undertaken in accordance with the methodology in BS 4142:2014. The scope of this standard states that it is suitable for the assessment of:

"a) sound from industrial and manufacturing processes;

b) sound from fixed installations which comprise mechanical and electrical plant and equipment;

c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

d) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site."

2.8 The significance of sound impact is to be determined according, in summary, to the following process:

i) Determine the typical background sound levels, in terms of the index L_{A90}, at the receptor locations of interest.

ii) Determine the specific sound level of the source being assessed, in terms of its L_{AeqT} level (T = 1 hour for day or 15 minutes for night), at the receptor location of interest.

iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.

iv) Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.

v) A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. 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 upon context.

2.9 Based on the guidance available, and the requirements on Condition 4 of the planning consent, the assessment of noise from the proposed plant has been undertaken in accordance with BS 4142:2014.

3.0 The fixed plant noise control scheme – conclusions and recommendations

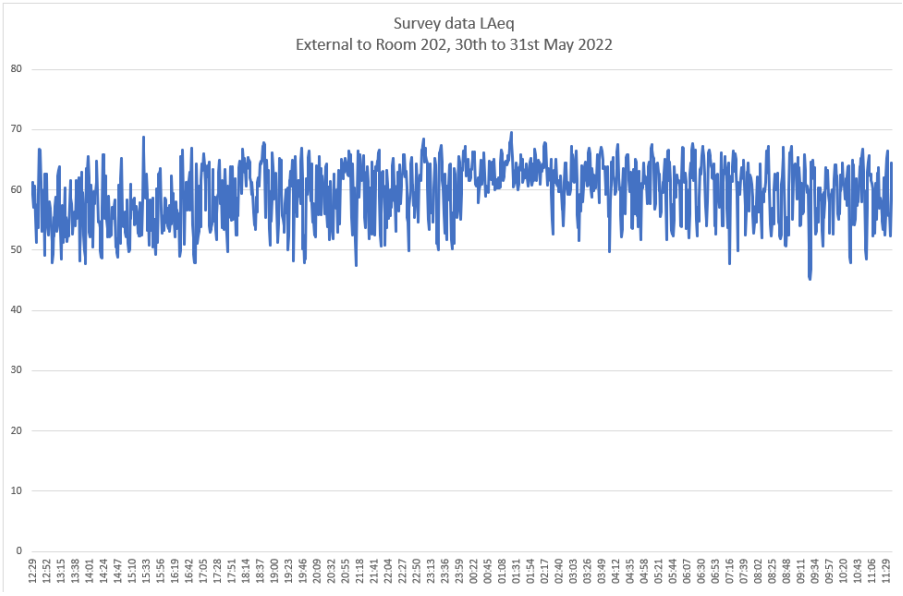
3.1 As the plant has already been installed, it has been possible to undertake on-site noise surveys to establish the noise level at the nearest residential property. A noise survey was undertaken with a microphone on a pole out of the window of room 202 of the hotel, which is in close proximity to the windows of the residential apartments in Russell Mansions.

Figure 2: Survey location – external to room 202 overlooking the plant

3.2 The noise survey was undertaken using a Norsonic 140 Type 1 sound level meter, with the microphone at 1m from the building façade, overlooking the plant, set to take samples every minute. The meter was calibrated before and after the survey with no signs of any drift.

3.3 The survey was undertaken between 1230 hours on 30th May and 1130 hours on 31st May.

Figure 3: Ambient noise levels May 30th to 31st 2022

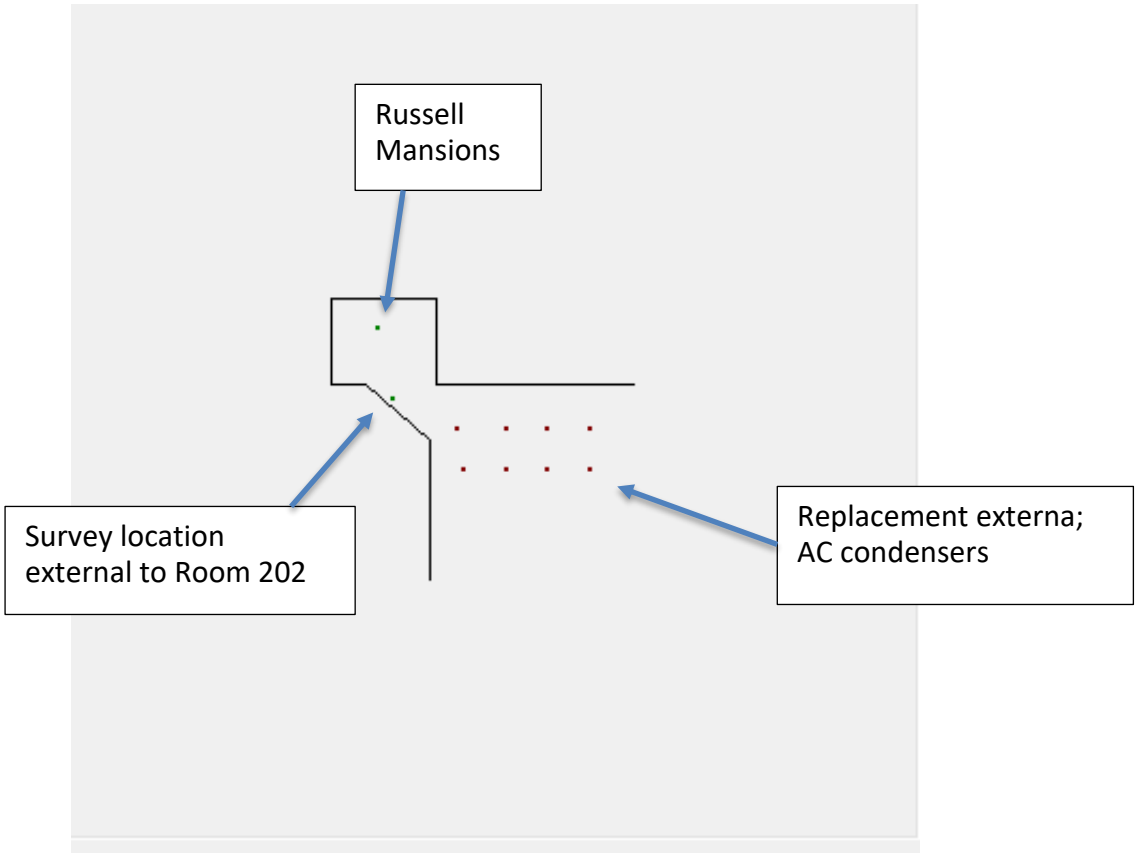


3.4 Based on the noise survey undertaken, the plant was quite intermittent in operation, ramping up and down based on the duty demands from the internal AC units, with noise levels at around L_{Aeq} 65 dB when the plant ramped up to duty.

3.5 Using the manufacturers noise data for the installed plant, an environmental noise model was used to established predicted noise from the plant when operational – see Section 4.0 for details of the noise modelling software.

3.6 Detailed below is a sketch from the noise model identifying the location of the plant, fence and receptors:

Figure 4: Sketch from noise model



3.7 Based on the environmental noise model, the predicted noise level at the survey location is L_{Aeq} 65 dB, which ties up with the noise survey data. It should be noted that based on the environmental noise model, the predicted noise level at 1m from the windows to Russell Mansions, is 4 dBA lower than the survey location, due to screening from some of the external AC condensers. See Table 2 below:

Table 2: Predicted noise levels based on manufacturers noise data

Receptor location	Predicted noise level L_{Aeq}
External to Room 202 (survey location)	65 dB
Russell Mansions 1st floor	61 dB
Russell Mansions 2nd floor	59 dB
Russell Mansions 3rd floor	57 dB
Russell Mansions 4th floor	55 dB
Russell Mansions 5th floor	53 dB

3.8 From the noise model, it is also possible to establish the contributions from each item of plant:

Table 3: Contributions from each item of plant to Russell Mansions 1st floor

Item of plant	Predicted noise level L_{Aeq}
5th floor PURY-P400	59 dB
7th floor PURY-P300	55 dB
6th floor PURY-P350	50 dB
3rd floor PURY-P400	36 dB
2nd floor PURY-P400	35 dB
1st floor PURY-P400	34 dB
4th floor PURY-P350	32 dB
Grd floor PURY-P250	27 dB
Overall	61 dB

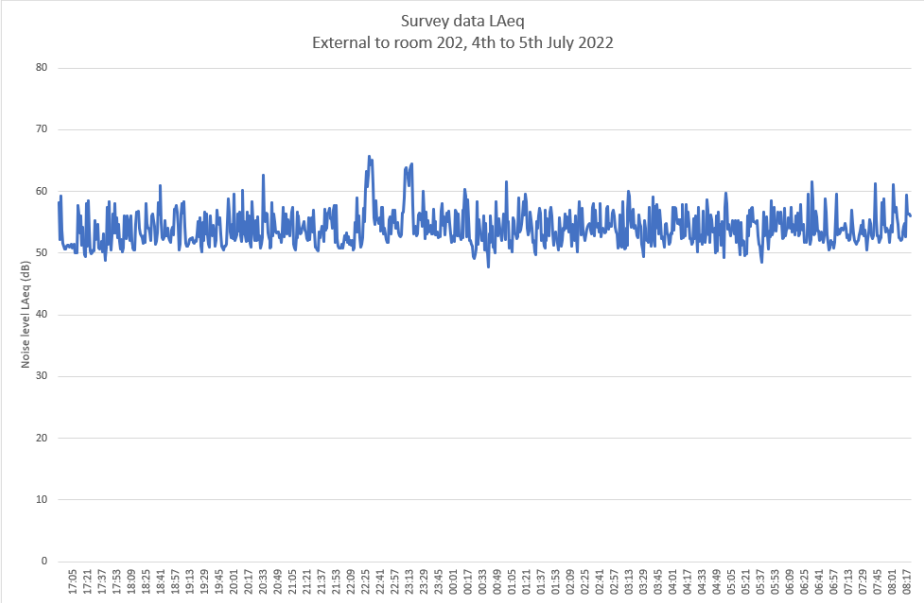
3.9 Based on the environmental noise survey and the predicted noise levels based on manufacturers noise data, the noise levels at Russell Mansions were exceeded the noise levels specified in Condition 4 of the planning consent.

3.10 Following SR's initial site visit, engineers have attended site, to re-set the controls, and cap the running to 75% capacity between 1730 and 0630 hours. The internal units have now been set-up to generally not operate from 2200 hours, although hotel guest will be able to override this as required.

3.11 The noise survey was repeated between 1700 hours on 4th July until 0820 hours on 5th July 2022. The survey was undertaken in the same location (external to room 202), using the same type of noise monitoring equipment, a Norsonic 140 Type 1 sound level meter, and the same methodology, with the microphone at 1m from the building façade, overlooking the plant, set to take samples every minute. The meter was calibrated before and after the survey with no signs of any drift.

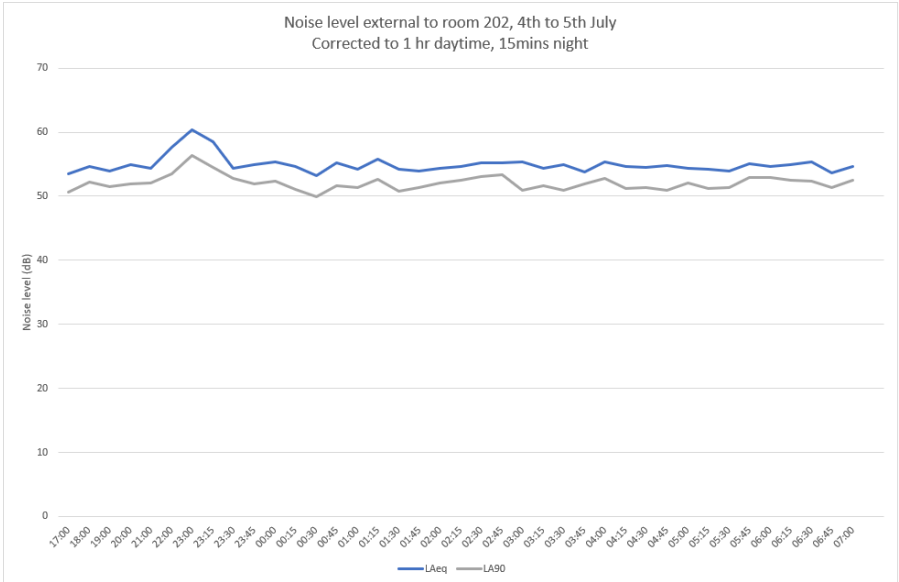
3.12 Based on the repeated noise survey undertaken, the following ambient noise levels were established:

Figure 5: Ambient noise levels July 4th to 5th 2022



3.13 In accordance with BS 4142:2014, we have also evaluated the specific measured noise levels over time periods of 1 hour during the day, and 15 mins at night. See Figure 6 below:

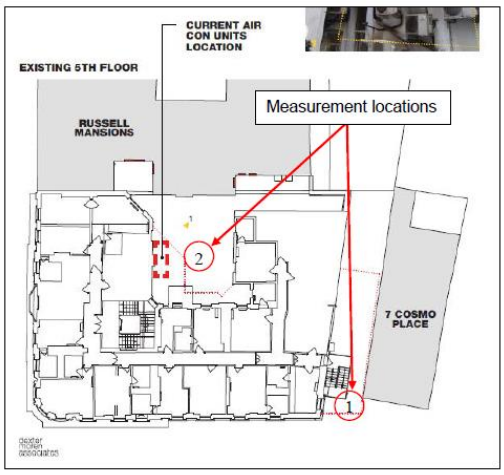
Figure 6: Ambient noise levels July 4th to 5th 2022 averaged over time basis of 1 hour during the day, and 15 mins at night



3.14 Based on the repeated noise survey, the noise level external to room 202 is typically L_{Aeq} 55 dB. In accordance with BS 4142:2014, due to the intermittent operation of the plant, a 3 dB penalty should be applied, resulting in a rating noise level of $L_{Ar,Tr}$ 58 dB at the survey location external to room 202, corresponding to a rating noise level of $L_{Ar,Tr}$ 54 dB at 1m from the windows to Russell Mansions.

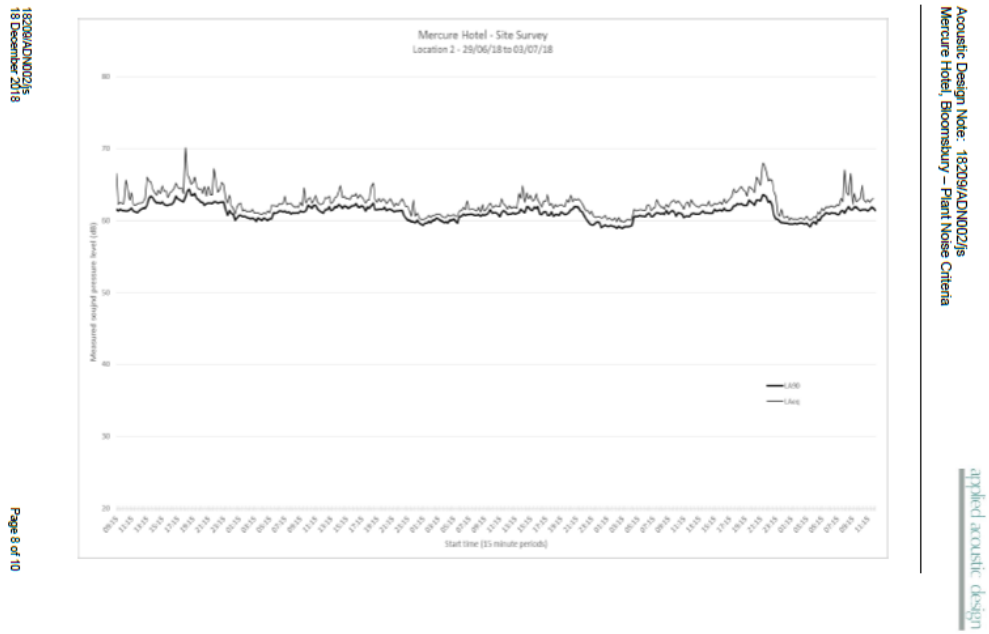
3.15 From previous noise surveys at the site by AAD undertook the original noise surveys in 2018, in 2 survey locations: Location 1 was adjacent to 7 Cosmo Place, and Location 2 was in the lightwell of the Mercure Hotel in the vicinity of the pre-existing AC condensers. See below:

Figure 7: Original noise survey locations



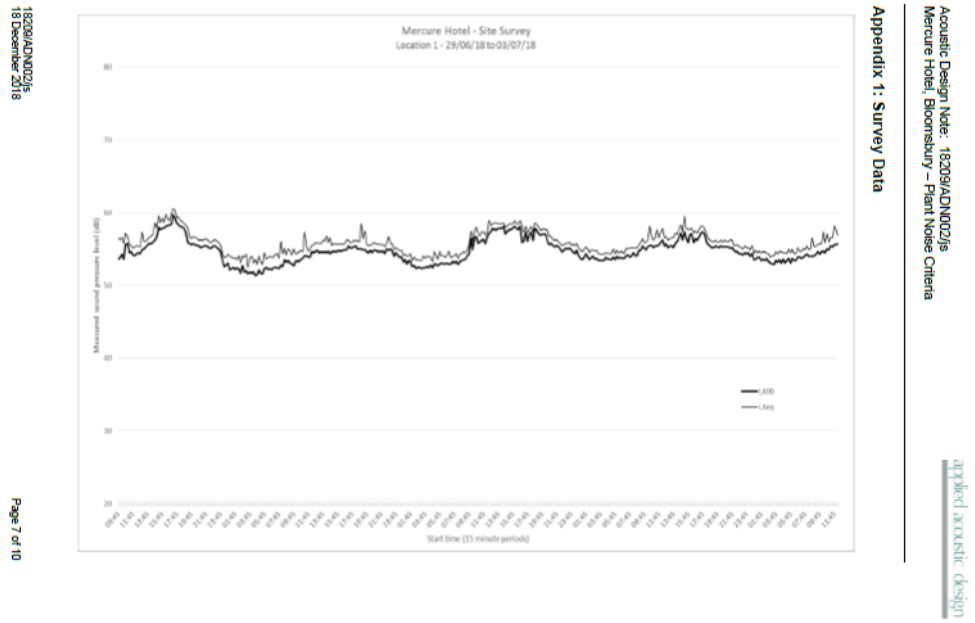
3.16 In the first AAD report (July 2018) reference was made to the corrected ambient noise climate being L_{Aeq} 61 dB during the day, and L_{Aeq} 58 dB at night. The survey location would have been influenced by noise from the pre-existing plant serving the hotel, and representative of the noise climate at Russell Mansions.

Figure 8: Original survey 2018 within lightwell



3.17 In the second AAD report (December 2018) whilst the typical background noise levels quoted L_{A90} 55 dB during the day, and L_{A90} 52 dB at night, appear to have been taken from chart for Location 1, in Cosmo Place, which would not be influenced by the pre-existing plant, and not representative of the pre-existing background noise climate in the lightwell, but have been used to establish the noise criteria specified in Condition 4, of 10 dB below background.

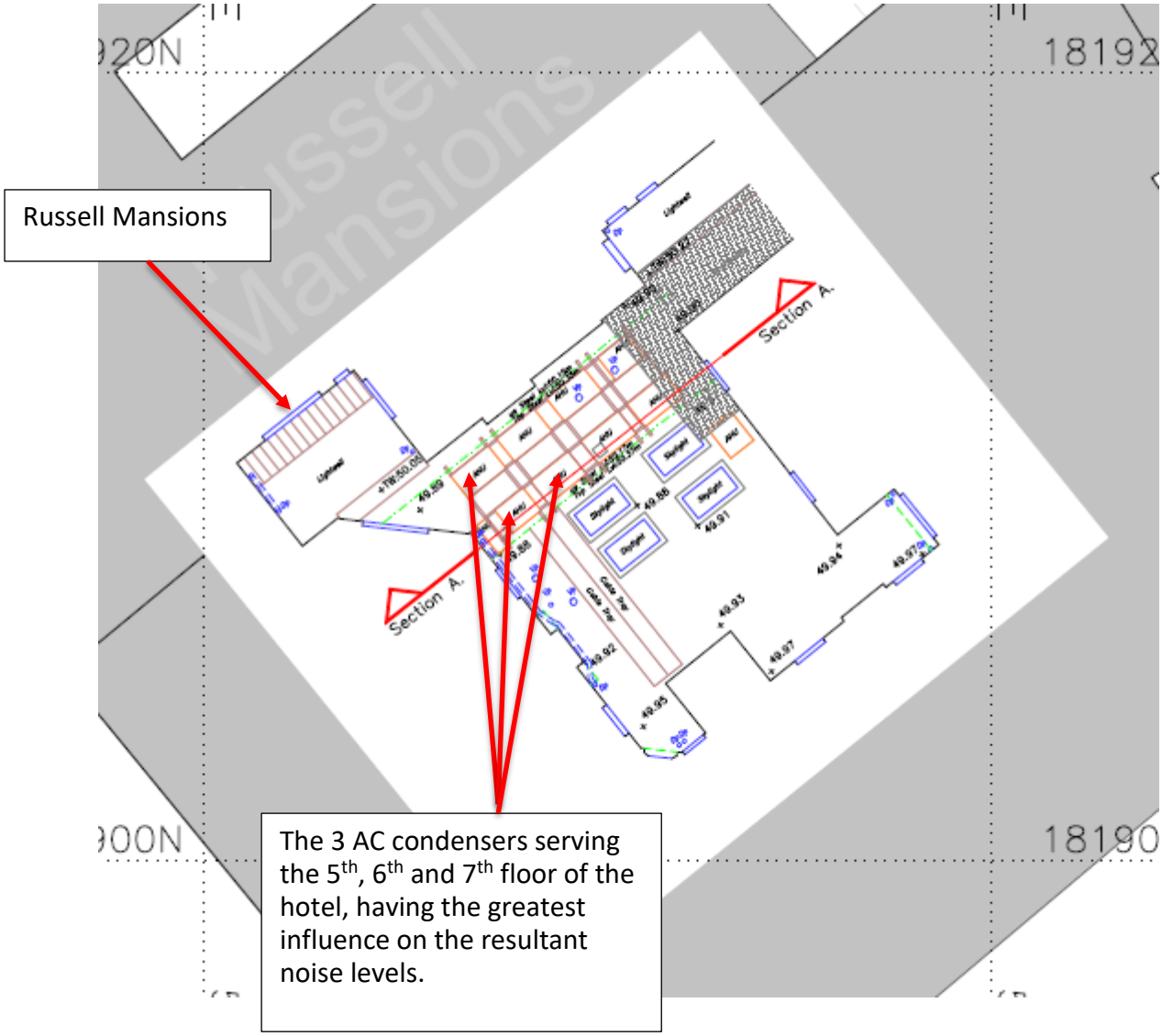
Figure 9: Original survey 2018 Cosmo Place



3.18 Following the alterations to the control settings, based on the noise survey undertaken, the predicted rating noise level from the plant is $L_{Ar,Tr}$ 54 dB at 1m from the windows to Russell Mansions. It should be noted that noise from the installed replacement plant is therefore lower than that previously established at the residential properties in Russell Mansions, of a similar character, and generally in-line with the pre-existing background noise climate, previously established in Cosmo Place. However, based on the survey undertaken, and manufacturers noise data, noise from the installed replacement plant, does exceed the criteria specified in Condition 4 of the previous consent granted for the extension of the hotel.

3.19 To achieve the target criteria specified in Condition 4 of the consent previously granted for this site additional mitigation will be required. Due to the height of the residential apartments in Russell Mansions, simple screening will not provide sufficient acoustic reduction. Based on a breakdown of the noise sources contributing to the overall noise level at Russell Mansions, as presented in Table 3, the 3 nearest units to Russell Mansions are the main noise sources influencing the overall noise level, as the remaining units benefit from screening provided by the building itself. See plant layout drawing in Figure 10 below.

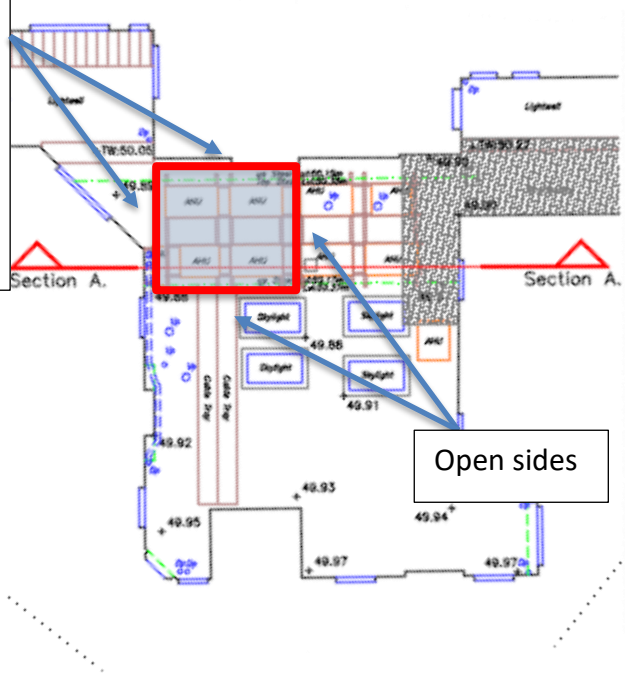
Figure 10: Plant layout drawing



3.20 To achieve the target criteria in-line with the LPA's requirements, a further reduction of at least 12 dBA is required. To achieve this, it is suggested that an enclosure (screen / canopy, bus shelter style) is required, with 2 sides (side and rear) and roof. It is also suggested that the internal surfaces are acoustically lined, to minimise reflections.

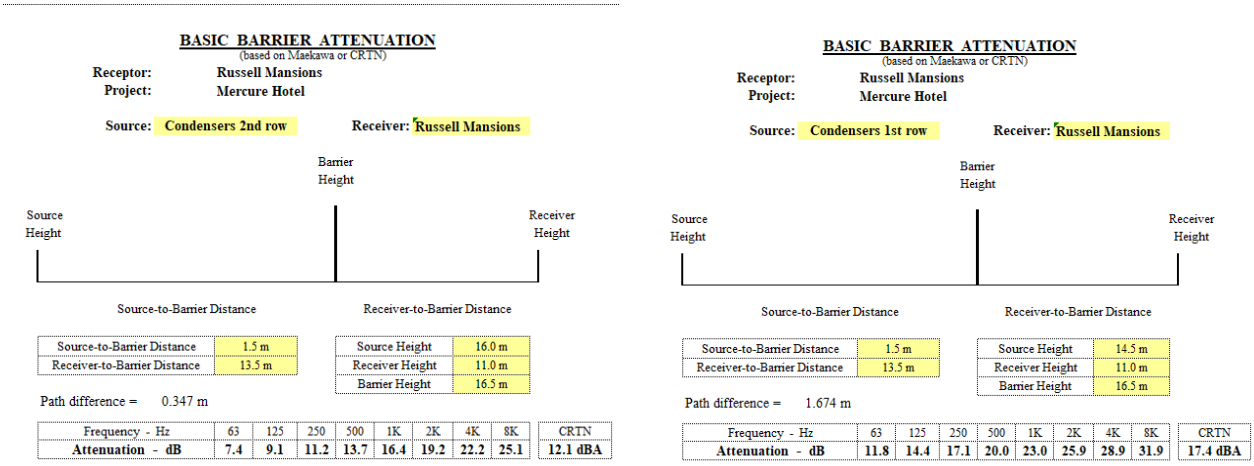
Figure 11: Enclosure / canopy location

Enclosure / canopy with side and rear panels, and roof. The facade of the building at the rear of the condensers can be considered as the rear of the canopy, as this is a solid wall with no windows.



3.21 Screening of this type will achieve around 12 dBA reduction from the units farthest from Russell Mansions and 17 dBA from those closest. See calculations below in Figure 12. Please note the heights presented on the calculation sheets are relative to each other rather than specific heights, and based on the elevation turned through 90° as the noise sources will be under a canopy.

Figure 12: Screening calculations



BASIC BARRIER ATTENUATION
(based on Maekawa or CRTN)

Receptor: Russell Mansions
Project: Mercure Hotel

Source: Condensers 2nd row Receiver: Russell Mansions

Source-to-Barrier Distance	1.5 m
Receiver-to-Barrier Distance	13.5 m

Source Height	16.0 m
Receiver Height	11.0 m
Barrier Height	16.5 m

Path difference = 0.347 m

Frequency - Hz	63	125	250	500	1K	2K	4K	8K	CRTN
Attenuation - dB	7.4	9.1	11.2	13.7	16.4	19.2	22.2	25.1	12.1 dBA

BASIC BARRIER ATTENUATION
(based on Maekawa or CRTN)

Receptor: Russell Mansions
Project: Mercure Hotel

Source: Condensers 1st row Receiver: Russell Mansions

Source-to-Barrier Distance	1.5 m
Receiver-to-Barrier Distance	13.5 m

Source Height	14.5 m
Receiver Height	11.0 m
Barrier Height	16.5 m

Path difference = 1.674 m

Frequency - Hz	63	125	250	500	1K	2K	4K	8K	CRTN
Attenuation - dB	11.8	14.4	17.1	20.0	23.0	25.9	28.9	31.9	17.4 dBA

3.22 With these reductions applied to the specific AC condensers in the environmental noise model, the following resultant noise levels are predicted:

Table 4: Predicted noise levels with mitigation (screen / canopy)

Receptor	Noise level L_{Aeq} (dB)			
Russell Mansions	Predicted without mitigation	Predicted rating* level after controls modified	Predicted rating* level including screening	Adopted criteria (night time)
1st floor	61 dB	54 dB	39 dB	42 dB
2nd floor	59 dB	52 dB	38 dB	42 dB
3rd floor	57 dB	50 dB	36 dB	42 dB
4th floor	55 dB	48 dB	34 dB	42 dB
5th floor	53 dB	46 dB	32 dB	42 dB

*Rating noise level includes a 3 dB penalty for intermittent operating

3.23 The AC condensers installed, incorporate vertical discharge fans. Should a canopy above the units cause airflow issues, it may be necessary to construct the roof or side wall from acoustic louvres, rather than a solid construction. We have therefore assessed the predicted noise levels based on the following transmission loss:

Table 5: Acoustic louvre transmission loss

Louvre	Transmission loss (dB)							
	63	125	250	500	1k	2k	4k	8k
Nominal 300mm	4	5	8	12	19	18	30	29

3.24 Based on the above acoustic louvre transmission loss the following resultant noise levels are predicted:

Table 4: Predicted noise levels with mitigation (acoustic louvred canopy)

Receptor	Noise level L_{Aeq} (dB)			
Russell Mansions	Predicted without mitigation	Predicted rating* level after controls modified	Predicted rating* level including screening	Adopted criteria (night time)
1st floor	61 dB	54 dB	42 dB	42 dB
2nd floor	59 dB	52 dB	41 dB	42 dB
3rd floor	57 dB	50 dB	39 dB	42 dB
4th floor	55 dB	48 dB	36 dB	42 dB
5th floor	53 dB	46 dB	35 dB	42 dB

*Rating noise level includes a 3 dB penalty for intermittent operating

3.25 The comparisons presented in Tables 4 and 6, with the modified controls, and additional screening / canopy, the predicted noise levels are in compliance with the criteria previously specified for the development of the hotel.

3.26 Based on discussions with an acoustic equipment manufacturer, the canopy / enclosure is proposed to be constructed from acoustic panels formed from galvanised sheet steel, with a perforated sheet steel inner facing to retain acoustic grade mineral wool, and acoustic louvres forming 1 wall, for airflow purposes. See Appendix D for the manufacturers proposals.

4.0 The noise model and prediction methodology

4.1 The noise model employed has been written in-house to provide an accurate prediction method for assessing environmental noise from, in particular, plant and equipment items which can be perceived as being point sources. It has been mainly used for the prediction of noise emanating from superstores.

4.2 There are three input spreadsheets containing:

- noise sources data
- receiver data
- acoustic screening data

These are included in Appendix B.

4.3 The noise sources data include one of the following forms for each item of plant:

- either, octave band sound power levels in the range of 63 to 8000Hz – this being available from manufacturer of many of the supply and extract fans.
- or, octave band sound pressure levels in the range of 63 to 8000Hz – this is available usually for the small, externally mounted split units' condenser fans from the manufacturer's product catalogue when measured at one metre in anechoic conditions, thus allowing straight forward calculation of the equivalent sound power levels.
- or, single value sound pressure levels at a stated distance

4.4 The relative location of the plant using X and Y co-ordinates with an arbitrary datum point and a Z (height) co-ordinate based on supporting steel and screening heights from the main contractor and then the equipment heights based, in this case, on the mechanical services contractor drawings.

4.5 Where known, the area and orientation of the noise outlet is entered together with its location adjacent to either one, two or three reflective surfaces so that the calculation can establish the directivity pattern and outlet reflection losses.

4.6 The receiver data needed are the X, Y and Z co-ordinates so that the relative distance and angle can be calculated between the source and the receiver.

4.7 Finally, several types of acoustic screening may be entered. In this case, this is designated "F" meaning a barrier of a finite length, indicating the façades of the building itself.

4.8 The noise model carries out "text book" atmospheric side calculations at each receiver position from each source allowing for the attenuation from such as the calculated distance and screening. The calculations are performed in eight Octave bands from 63 to 8000Hz but can then be summarised as dBA, NR or NC for convenience. In this case, the overall summary levels are in dBA. Calculations for the plant are included in Appendix C. The computer maintains a logarithmic total of the noise +levels in Octave bands.

4.9 At the end of each program “run”, the overall day or night time noise level at each receiver position are calculated and ranked in descending order of noise level. Where this ranking shows that the receiver position’s noise level exceeds the noise criterion, each calculation can be interrogated to determine the plant items needing more detailed inspection to establish the attenuation needed. The process is repeated until either the noise level meets the noise criterion or the program demonstrates that other noise control methods are needed. This may take the form of restricting the offending plant’s period of operation or improving the screening or re-selection to give quieter plant.

4.10 Plant noise predictions are shown in summary form; full calculations of noise from each source to each receptor are available on request

5.0 Assessment conclusions

5.1 This assessment has been undertaken in accordance with the guidelines in BS 4142:2014.

5.2 Based on the comparisons presented in Tables 4 and 6, with the modified controls, and additional screening / canopy, the predicted noise levels are in compliance with the criteria previously specified for the development of the hotel, of 10 dB below the background noise climate.

5.3 This assessment objectively demonstrates that noise arising from the fixed plant, complies with the requirement of paragraph 185 of the NPPF to avoid significant adverse impact.

APPENDIX A

NOISE SOURCE DATA

Client: Mecure Hotels			A						Page: 1 of 1			
Project: Bloomsbury			Project no: 2221235									
Consultant: MT			Date: 11 August 2022									
Sound power levels (Lw) & sound pressure levels (Lp) for fans & other equipment												
	Lw/	Dist.	On time	Mid-frequency Octave Bands (Hz)							
Equipment name/reference	Lp	(m)	D/N/A	63	125	250	500	1k	2k	4k	8k
5th flr PURY-P400	Lp	1	N	81	70	70	68	62	59	54	49
4th flr PURY-P350	Lp	1	N	72	71	64	62	57	54	52	48
3rd flr PURY-P400	Lp	1	N	81	70	70	68	62	59	54	49
Grd flr PURY-P250	Lp	1	N	69	63	62	60	54	50	51	44
7th flr PURY-P300	Lp	1	N	75	70	69	66	61	57	52	48
6th flr PURY-P350	Lp	1	N	72	71	64	62	57	54	52	48
2nd flr PURY-P400	Lp	1	N	81	70	70	68	62	59	54	49
1st flr PURY-P400	Lp	1	N	81	70	70	68	62	59	54	49

Notes:

1. Lw/Lp
   Lw means sound power level (dB)
   Lp means sound pressure level at the stated distance (dB@m)
2. On times (On.time D/N/A):
   D (Day) means that the fan/equipment could operate at any time between 0700 and 2300 hours
   N (Night) means that the fan/equipment could operate at any time between 2300 and 0700 hours
   A (All) means that the fan/equipment could operate at any time during the day and night

APPENDIX B

NOISE MODEL INPUT DATA

Sharps Redmore Partnership
The White House, London Road, Copdock, Ipswich, IP8 3JH

Filename: p:\22 - Projects\2221235 Mercure, Bloomsbury- MOT\110722_1Russell Mansions

Date: 11August 2022

Entries by: MT

Project no: 2221235

Project title: Bloomsbury

Client's name: Mecure Hotels

Map/plot details:

Length:	3200	
Width:	3200	
Height:	250	

Sharps Redmore Partnership
The White House, London Road, Copdock, Ipswich, IP8 3JH

Source data - description, co-ordinates, outlet size, percentage to atmosphere, directivity, sound levels and running period

Filename: p:\22 - Projects\2221235 Mercure, Bloomsbury- MOT\110722_1Russell Mansions

Source description	Co-ordinates			Outlet details					Run	Lp/	dBA	Dist	Mid frequency octave bands (Hz)							
	X m	Y m	Z m	Amm	Bmm	Ang.	%	Q	dna	Lw	Y/N	(m)	63	125	250	500	1k	2k	4k	8k
5th flr PURY-P400	194.8	198.5	2.0	0	0	0	100	2	N	P	N	10	81	70	70	68	62	59	54	49
4th flr PURY-P350	196.5	198.5	2.0	0	0	0	100	2	N	P	N	10	72	71	64	62	57	54	52	48
3rd flr PURY-P400	198.0	198.5	2.0	0	0	0	100	2	N	P	N	10	81	70	70	68	62	59	54	49
Grd flr PURY-P250	199.5	198.5	2.0	0	0	0	100	2	N	P	N	10	69	63	62	60	54	50	51	44
7th flr PURY-P300	195.0	197.0	2.0	0	0	0	100	2	N	P	N	10	75	70	69	66	61	57	52	48
6th flr PURY-P350	196.5	197.0	2.0	0	0	0	100	2	N	P	N	10	72	71	64	62	57	54	52	48
2nd flr PURY-P400	198.0	197.0	2.0	0	0	0	100	2	N	P	N	10	81	70	70	68	62	59	54	49
1st flr PURY-P400	199.5	197.0	2.0	0	0	0	100	2	N	P	N	10	81	70	70	68	62	59	54	49

Sharps Redmore Partnership
The White House, London Road, Copdock, Ipswich, IP8 3JH

Receptor data - description and co-ordinates

Filename: p:\22 - Projects\222123\5 Mercure, Bloomsbury- MOT\11\0722_1Russell Mansions

Receptor description	__Co-ordinates__			
	X m	Y m	Z m	DNA
Residential 1st flr	192.0	202.0	2.0	A
Residential 2nd flr	192.0	202.0	5.0	A
Residential 3rd flr	192.0	202.0	8.0	A
Residential 4th flr	192.0	202.0	11.0	A
Residential 5th flr	192.0	202.0	14.0	A
Hotel 2nd flr (survey location) Rm 20	192.5	199.5	5.0	A

Sharps Redmore Partnership
The White House, London Road, Copdock, Ipswich, IP8 3JH

Barrier data - description and co-ordinates

Filename: p:\22 - Projects\222123\5 Mercure, Bloomsbury- MOT\11\0722_1Russell Mansions

Barrier description	_____Co-ordinates_____					
		Start			End	
	X m	Y m	Z m	X m	Y m	Z m
F	2010	200.0	20.0	194.0	200.0	20.0
F	194.0	200.0	20.0	194.0	203.0	20.0
F	194.0	203.0	20.0	190.3	203.0	20.0
F	190.3	203.0	20.0	190.3	200.0	20.0
F	190.3	200.0	20.0	1915	200.0	20.0
F	1915	200.0	20.0	193.8	198.0	20.0
F	193.8	198.0	20.0	193.8	193.0	20.0

APPENDIX C

PREDICTED NOISE LEVEL – BASED ON MANUFACTURERS NOISE DATA

(NO MITIGATION)

Overall receptor listings

Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Hotel 2nd flr (survey location) Rm 202	76	67	66	63	58	55	50	46	65
Residential 1st flr	72	63	62	60	54	51	46	42	61
Residential 2nd flr	70	62	61	58	53	49	45	40	59
Residential 3rd flr	68	60	59	56	51	47	43	38	57
Residential 4th flr	65	58	56	53	48	44	40	36	55
Residential 5th flr	64	56	54	51	46	43	38	34	53

Source noise levels at receiver: Residential 1st flr

Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
5th flr PURY-P400	71	60	60	58	52	49	44	39	59
7th flr PURY-P300	63	58	57	54	49	45	40	36	55
6th flr PURY-P350	58	57	50	48	43	40	38	34	50
3rd flr PURY-P400	53	39	36	34	28	25	20	15	36
2nd flr PURY-P400	53	39	36	33	27	24	19	14	35
1st flr PURY-P400	53	39	36	32	26	23	18	13	34
4th flr PURY-P350	45	41	32	30	25	22	20	16	32
Grd flr PURY-P250	41	32	28	25	19	15	16	9	27
Total Free field Lp and dBA	72	63	62	60	54	51	46	42	61

Source noise levels at receiver: Residential 2nd flr

Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
5th flr PURY-P400	69	58	58	56	50	47	42	37	57
7th flr PURY-P300	62	57	56	53	48	44	39	35	54
6th flr PURY-P350	58	57	50	48	43	40	38	34	50
2nd flr PURY-P400	53	39	36	33	27	24	19	14	35
3rd flr PURY-P400	52	38	35	33	27	24	19	14	35
1st flr PURY-P400	52	38	35	31	25	22	17	12	33
4th flr PURY-P350	44	40	31	29	24	21	19	15	31
Grd flr PURY-P250	40	31	27	24	18	14	15	8	26
Total Free field Lp and dBA	70	62	61	58	53	49	45	40	59

Source noise levels at receiver: Residential 3rd flr

Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
5th flr PURY-P400	67	56	56	54	48	45	40	35	55
7th flr PURY-P300	60	55	54	51	46	42	37	33	52
6th flr PURY-P350	56	55	48	46	41	38	36	32	48
3rd flr PURY-P400	51	37	34	32	26	23	18	13	34
2nd flr PURY-P400	51	37	34	31	25	22	17	12	33
1st flr PURY-P400	51	37	34	30	24	21	16	11	32
4th flr PURY-P350	42	39	29	27	22	19	17	13	30
Grd flr PURY-P250	39	30	26	23	17	13	14	7	25
Total Free field Lp and dBA	68	60	59	56	51	47	43	38	57

Source noise levels at receiver: Residential 4th flr

Period: Night-time — Mid frequency octave bands (Hz)

	63	125	250	500	1k	2k	4k	8k	dBA
5th flr PURY-P400	64	53	53	51	45	42	37	32	52
7th flr PURY-P300	57	52	51	48	43	39	34	30	49
6th flr PURY-P350	54	53	46	44	39	36	34	30	46
3rd flr PURY-P400	49	36	33	30	24	21	16	11	32
1st flr PURY-P400	50	36	33	29	23	20	15	10	31
2nd flr PURY-P400	49	35	32	29	23	20	15	10	31
4th flr PURY-P350	40	36	26	24	19	16	14	10	27
Grd flr PURY-P250	37	28	25	21	15	11	12	5	23
Total Free field Lp and dBA	65	58	56	53	48	44	40	36	55

Source noise levels at receiver: Residential 5th flr

Period: Night-time — Mid frequency octave bands (Hz)

	63	125	250	500	1k	2k	4k	8k	dBA
5th flr PURY-P400	62	51	51	49	43	40	35	30	50
7th flr PURY-P300	55	50	49	46	41	37	32	28	47
6th flr PURY-P350	52	51	44	42	37	34	32	28	44
3rd flr PURY-P400	48	34	31	28	22	19	14	9	30
2nd flr PURY-P400	48	34	31	28	22	19	14	9	30
1st flr PURY-P400	48	34	31	27	21	18	13	8	29
4th flr PURY-P350	39	35	25	23	18	15	13	9	26
Grd flr PURY-P250	37	28	24	20	14	10	11	4	22
Total Free field Lp and dBA	64	56	54	51	46	43	38	34	53

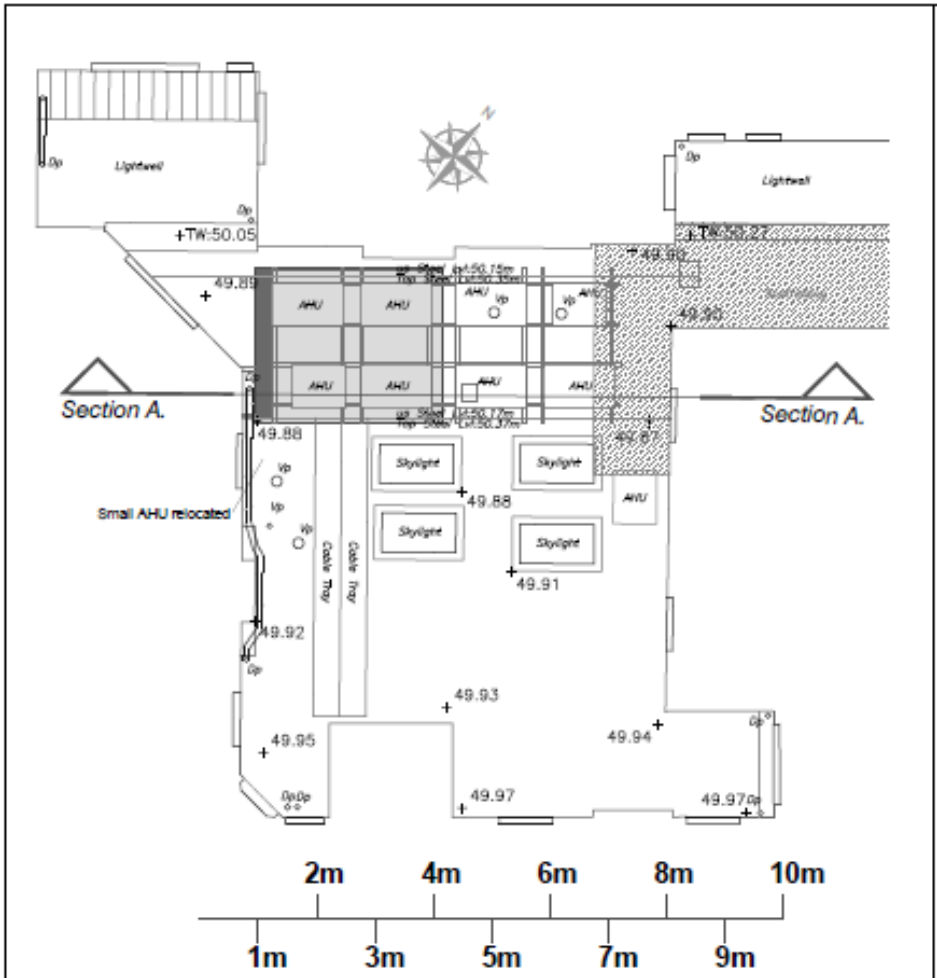
Source noise levels at receiver: Hotel 2nd flr (survey location) Rm 202

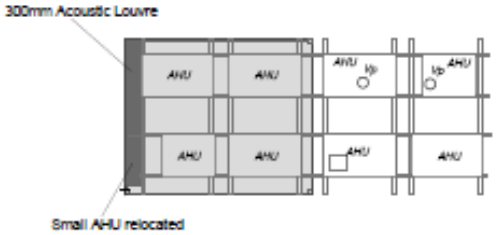
Period: Night-time — Mid frequency octave bands (Hz)

	63	125	250	500	1k	2k	4k	8k	dBA
5th flr PURY-P400	72	61	61	59	53	50	45	40	60
7th flr PURY-P300	65	60	59	56	51	47	42	38	57
3rd flr PURY-P400	68	57	57	55	49	46	41	36	56
2nd flr PURY-P400	67	56	56	54	48	45	40	35	55
1st flr PURY-P400	66	55	55	53	47	44	39	34	54
4th flr PURY-P350	61	60	53	51	46	43	41	37	53
6th flr PURY-P350	60	59	52	50	45	42	40	36	52
Grd flr PURY-P250	54	48	47	45	39	35	36	29	46
Total Free field Lp and dBA	76	67	66	63	58	55	50	46	65

APPENDIX D

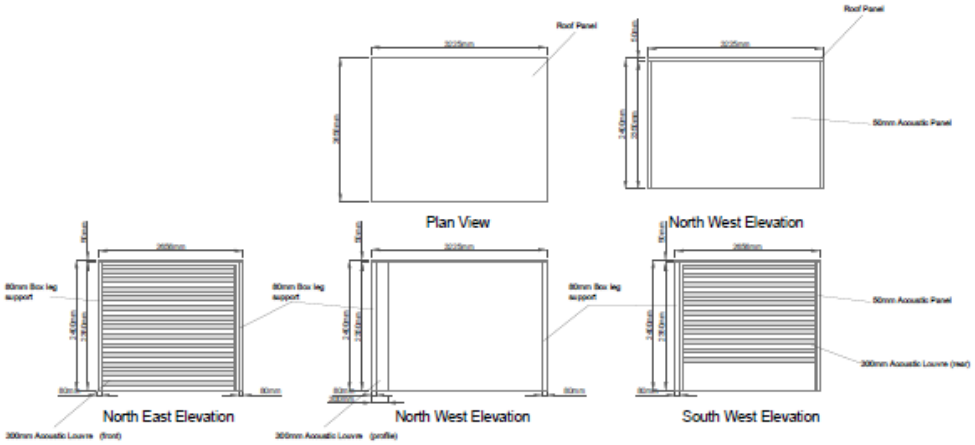
PROPOSED CANOPY / ENCLOSURE DETAILS

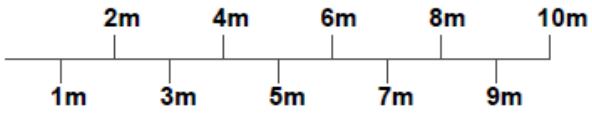




Rev	Amendment	Date	Project: Sound Enclosure	Scale: 1:100 @A4	Date: 11/08/2022	Sound Planning Limited Farnham Surrey Phone: 01252 711972 Fax: 01252 801083 Email: enquiries@soundplanning.co.uk
Notes:			Title: Southampton Row Holborn London	Drawn: B.Walker		
				Drawing No: SR0HD		

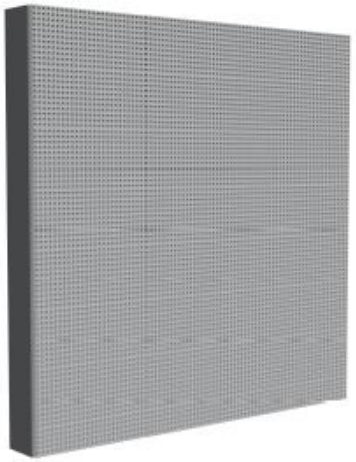
soundplanning



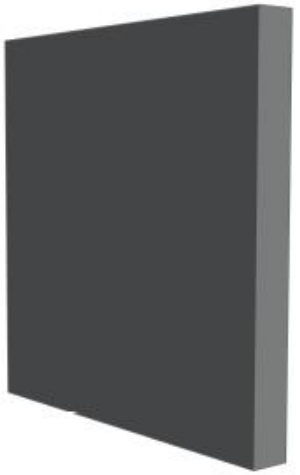


Rev	Amendment	Date	Project: Sound Enclosure	Scale: 1:100@A4	Date: 11/08/2022	soundplanning	Sound Planning Limited Farnham Surrey Phone: 01252 711972 Fax: 01252 601083 Email: enquiries@soundplanning.co.uk
Notes: No scaling permitted from this drawing. All dimensions shown to be verified prior to construction / manufacture.			Title: Southampton Row Holborn London	Drawn: B.Walker			
				Drawing No: SR0f1D1			

Profile



Front



Back

CONSTRUCTION DETAIL:

1.2mm folded galvanised sheet steel frame

0.9mm galvanised steel perforated sheet retaining controlled density mineral wool infill

Stainless Steel (grade 316 & 304) and Aluminium options

Suitable, non-hardening sealent around the perimeter, by others

SOUND REDUCTION INDEX (SRI)									
Frequency (Hz)	63	125	250	500	1k	2k	4k	8k	Overall R_w
(dB)	16	17	21	33	44	52	59	46	34

Rev	Amendment	Date	Project: Acoustic Panel	Scale: NTS @A4	Date: 15/11/21	soundplanning	Sound Planning Limited Farnham Surrey Phone: 01252 711972 Fax: 01252 601083 Email: enquiries@soundplanning.co.uk
Notes: No scaling permitted from this drawing. All dimensions shown to be verified prior to construction / manufacture.			Title: Acoustic Panel 100mm	Drawn: B.Walker			
				Drawing No: AP100mm			

Laboratory measurements of airborne sound insulation of building elements
Octave bands
ISO 140-3 (1995)

Client: Sound Planning Limited
48 Windermere Way
Farnham
Surrey
GU9 0DE

Object: "100mm Panel"

Size (m^2): 1.01
Thickness (mm): 100
Mass per unit area (kg/m^2): 21.3

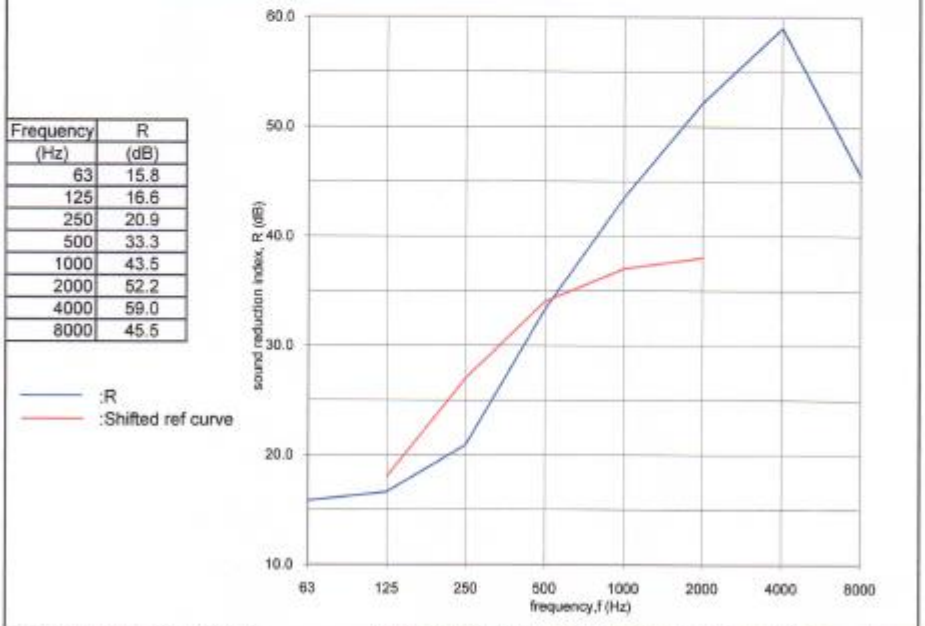
Source room:		Receiving room:	
Volume (m^3):	136	Volume (m^3):	217
Temperature [°C]:	20.3	Temperature [°C]:	19.3
Humidity [%]:	34.2	Humidity [%]:	36.8

Rating according to ISO 717-1 (1996):

R_W 34 dB

f range (Hz)	125-2000	63-4000
C (dB)	-2	-1
C_{tr} (dB)	-7	-7

Frequency (Hz)	R (dB)
63	15.8
125	16.6
250	20.9
500	33.3
1000	43.5
2000	52.2
4000	59.0
8000	45.5



Test reference No.: 254-174
University of Salford, School of Computing, Science & Engineering

Date: 21/02/2011
Signature:

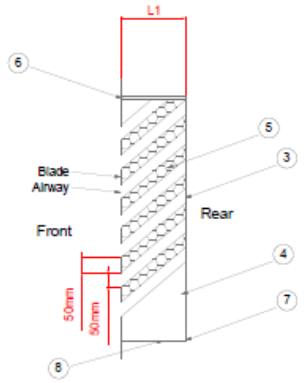
SSV1

Notes

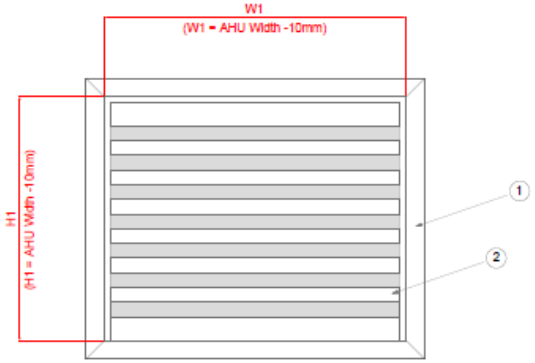
(A) All Dimensions are in Millimetres (Manufacturing Tolerance +0/-4mm)

(B) Louvre Blade Pitch May Vary Slightly to Suit Louvre Height

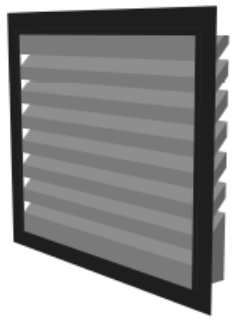
(C) Manufactured from British Steel to Colour Detailed Below



Profile



Front Elevation



3D View

KEY

(1) 0.9mm Folded Galvanised Steel Sheet Frame

(2) 0.9mm Folded Galvanised Steel Blade Section

(3) Birdmesh/Insect Mesh Guard Where Required

(4) 0.9mm Blanking to Rear of Dummy Bottom Blade

(5) 0.9mm Galvanised Perforated Steel Sheet Retaining Controlled Density Mineral Wool Infill

(6) 30x30x1.6mm Flashing Trims to all Four Sides of the Louvre with Mitred Corners. Flashings Supplied Loose.

(7) Louvre to Fix Through Back Into Steel Post/Frame

(8) Client to Fix Through Rear of Frame to Back of Louvre Frame

Rev	Amendment	Date	Project: Acoustic Louvre Drawing	Scale: N.T.S	Date: 04/09/21	soundplanning
				Drawn: B.Walker		
Notes: No scaling permitted from this drawing. All dimensions shown to be verified prior to construction / manufacture.			Title: Generic Louvre	Drawing No: ALD2		

Sound Planning Limited
Farnham
Surrey

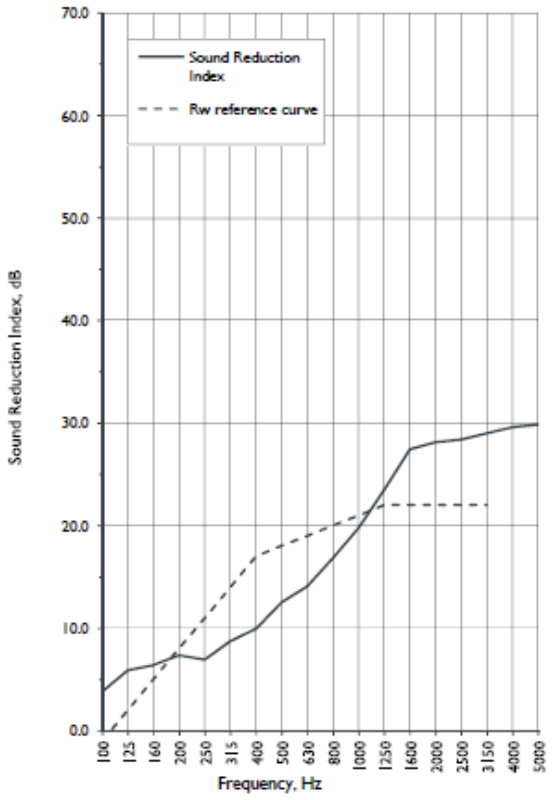
Phone: 01252 711972
Fax: 01252 601083
Email: enquiries@soundplanning.co.uk

Data Sheet 7

			Test Room:	Source	Receiving
Test Number:	8		**Air Temperature:**	10.6 °C	11.4 °C
Client:	Sound Planning Ltd		**Air Humidity:**	63 %	58 %
Test Date:	17/02/2020		**Volume:**	55 m³	50 m³
Sample Height:	1.1 m				
Sample Width:	1.1 m				
Sample Weight:	N/A kg/m²		**Air Pressure:**		999 mbar

Product Identification: Louvre AL300 50/50 P45

Freq, f Hz	Sound Reduction Index, dB	
	⅓ Oct	Octave
50+	20.2	12.5
63+	21.4	
80+	8.2	
100	3.8	5.2
125	5.9	
160	6.4	
200	7.3	7.6
250	6.9	
315	8.7	
400	9.9	11.8
500	12.5	
630	14.1	
800	16.8	19.2
1000	19.8	
1250	23.5	
1600	27.4	27.9
2000	28.1	
2500	28.4	
3150	29.0	29.5
4000	29.6	
5000	29.9	
6300+	29.8	27.8
8000+	28.6	
10000+	25.9	
Average 100-3150	15.5	Version v3.1



Rating according to BS EN ISO 717-1:2013

$R_w(C;C_{tr})$= 18 (-1 ; -4) dB

* shows measurement corrected for background

> shows measurement limited by background

\+ shows Frequency beyond standard and not UKAS accredited