

BRAIDEN ACOUSTICS LTD

Innovation Forum | 51 Frederick Road | Salford | Manchester | M6 6FP

ACOUSTIC SURVEY FOR PLANNING (RESTAURANT)

Client : Loungers Ltd

Date : 30 May 2017

Site : 1-5 Ash Lane, Rustington, West Sussex BN16 3BU

Report No. : 10541

1 INTRODUCTION

Braiden Acoustics has been commissioned by Loungers Ltd to undertake an acoustic survey at the site of 1-5 Ash Lane, Rustington, West Sussex BN16 3BU to discharge Condition 8 of planning application R/37/16/PL which proposes “Refurbishment & change of use from ground floor car showroom (Sui Generis) & first floor flats (C3 dwellings) to A3 (Restaurant and Cafes)”

Condition 8 states:

Before the development hereby permitted commences, a scheme shall be submitted and approved by the Local Planning Authority which specifies the provisions to be made for the control of noise emanating from the site. The agreed measures will be implemented and adhered to thereafter.

Reason: To protect the amenities of occupiers of adjoining properties in accordance with Arun District Local Plan policies GEN7 and GEN32.

1.1 AIM

This report shall investigate all pertinent noise sources that may affect surrounding ‘sensitive receptors’ and propose any mitigation, where necessary, so that noise levels are within relevant guidelines and the Condition above can be discharged.

2 DESCRIPTION OF SITE

The site is two story detached building with a flat roof – as shown in Figure 1.



Figure 1
Street view of site

2.1 SITE LOCATION AND SURROUNDING USES

The site is within Rustington town centre with Ash Lane to the west (front) and a service road to the south west. The immediate area is commercial, being as it is Rustington town centre. However, there is an apartment block directly to the north east, some 5m away at the closest point, as outlined in green in Figure 2



Figure 2
Site edge red

2.2 EXISTING USE

The site was a car show room with a residential flat above.

2.3 PROPOSED USE

It is proposed to use the ground and first floors as a restaurant – see drawings in the Appendix.

2.3.1 Opening hours

Daily 08:00 – 23:30

2.3.2 Building services

The external plant comprises of kitchen extract and intake ventilation as well as two condenser units.

The ventilation system will vent onto the roof and the condenser units shall be located on the rear elevation.

2.3.2.1 Kitchen Ventilation

There will be a kitchen extract and intake ducted ventilation systems; further details in the Appendix.

Kitchen Extract

System Air MUB/T 062 630D4

Kitchen Intake

SPP 500/4-3

Drawings showing the location of the plant are also shown in the Appendix.

The kitchen extract / intake ventilation system will only operate during opening hours.

The noise data for the fans and silencers are shown in the table below.



Extract	63	125	250	500	1000	2000	4000	8000
MUBTo62-630-d4	88	80	77	73	69	65	60	55
720sq 1800l silencer	7	9	16	36	48	28	17	12
Intake	63	125	250	500	1000	2000	4000	8000
SPP500 4/4/3	78	88	94	80	78	75	71	66
2D podded silencer	12	16	32	55	55	55	32	24

Table 1
Noise data for proposed kitchen ventilation system

2.3.2.2 External Condenser units

Cold Room condenser
Danfoss OP-MPH-M018

Cellar Condenser
J&E Hall JCC2 – 40E

3 ACOUSTIC CRITERIA AND METHODOLOGY

3.1 BS 4142

BS 4142:1999 “Method for rating industrial noise affecting mixed residential and industrial areas” [1] assesses industrial noise with regards to nearby residential dwellings. The guidance is commonly used to compare the equivalent noise from an industrial source only (specific noise level), L_{Aeq} , to the background noise level, L_{A90} , at the nearest sensitive receptor (NSR).

This Standard has been recently updated, BS 4142:2014 “Methods for rating and assessing industrial and commercial sound” [2]. Whereas the old standard added 5dB ‘penalty’ to the Specific Noise Level (SNL) if the noise source has a ‘character’ that can draw attention that may be described as tonal, intermittent or impulsive, the new standard gives clearer guidance on noise ‘character’. Furthermore, the previous Standard gave only one 5 dB penalty whereas the new Standard may not. When added to the specific noise level it forms the rating level. The new Standard gives the guidance for the following types of noise character:

Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.

NOTE 1 The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases the amount of masking varies as the residual sound changes in level and possibly character. The source’s tonal and/or impulsive characteristics could also vary with time.

Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.

Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

John Braden SSc & MSc Acoustics, MIOA
Acoustic Consultant



A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Once a penalty for noise character is added to the Specific Noise Level then this is termed the Rating Level.

The background level is then compared to the rating level. It is usual that the rating level due to the source should be below the background noise level at the nearest sensitive receptor; indeed BS 4142 states:

“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.”

3.2 BS 8233:2014

The British Standard BS 8233:2014 “Guidance on sound insulation and noise reduction for buildings” gives guidance on recommended indoor ambient noise levels for residential dwellings.

Room	Criterion	Limit	
		night	day
Bedroom	Sleeping	30	35
Dining Room/Area	Dining	--	40
Living Room	Resting	--	35

Table 2

Recommending indoor ambient noise level thresholds from anonymous noise (taken from Table 4, BS 8233:2014)

Internal levels are simply predicted by the subtraction of the estimated sound reduction index (SRI) of the building façade from the external free field noise measurements. When considering the SRI of a particular façade it is usual to only consider the glazing as this is the weakest element acoustically.



3.3 COUNCIL CRITERION

The noise Condition simply states “provisions to be made for the control of noise emanating from the site”. Whilst no noise criterion or methodology is mentioned, it is usual, however, for Councils to adhere to a BS4142:2014. Section 11 d) of BS 4142:2014 (also see final paragraph of Section 3.1 of this report) says

“Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact”

Therefore the Rating Level should not exceed the Background Level to ensure any potential noise has a low impact.

4 MEASUREMENT DETAILS

In order to assess the noise levels from the plant, background noise levels have been taken at the rear of the site. The residential windows to the rear of the building are the nearest sensitive receptors.

For measuring background noise levels, BS 414 states:

“Ensure that the measurement time interval is sufficient to obtain a representative value of the background noise level.”

In order to obtain a worse case methodology, noise measurements included a relatively quiet time of week when the proposed site would be open.

4.1 MONITORING DETAILS

Personnel: John Braiden, BSc & MSc Acoustics, MIOA.

Weather: 16-22 °C; <5ms⁻¹ wind; ~20-60% cloud; no precipitation.

Equipment: NTi XL2 integrated real time analyser & B&K 4231 calibrator.

The sound level meter was calibrated before after the measurements with no drift reported.

Monitoring was unmanned.

4.2 MONITORING LOCATIONS

The location of the monitoring was 1.2m from the ground and at least 3.5m from the nearest reflecting surface, as shown be the white arrow in Figure 2.

4.3 MONITORING TIMES

Monitoring took place during a midweek evening (when background noise levels would be relatively quiet) when the restaurant would be open.



4.4 MONITORING RESULTS

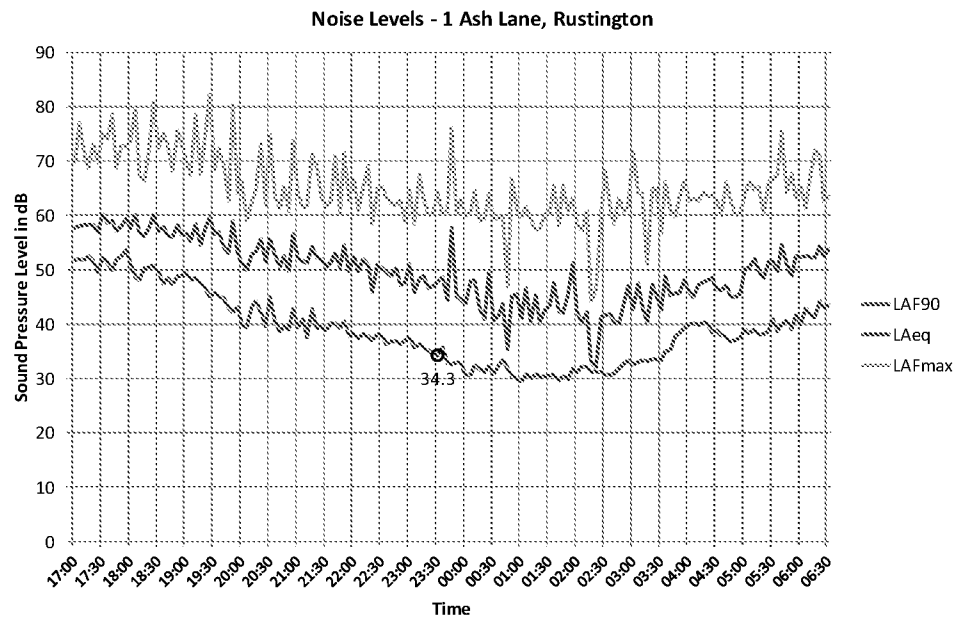


Figure 3
Measured noise levels

The lowest background noise level when the restaurant would be open is 34.3 dB(A). The octave band data for the background noise level will be used in the assessment.

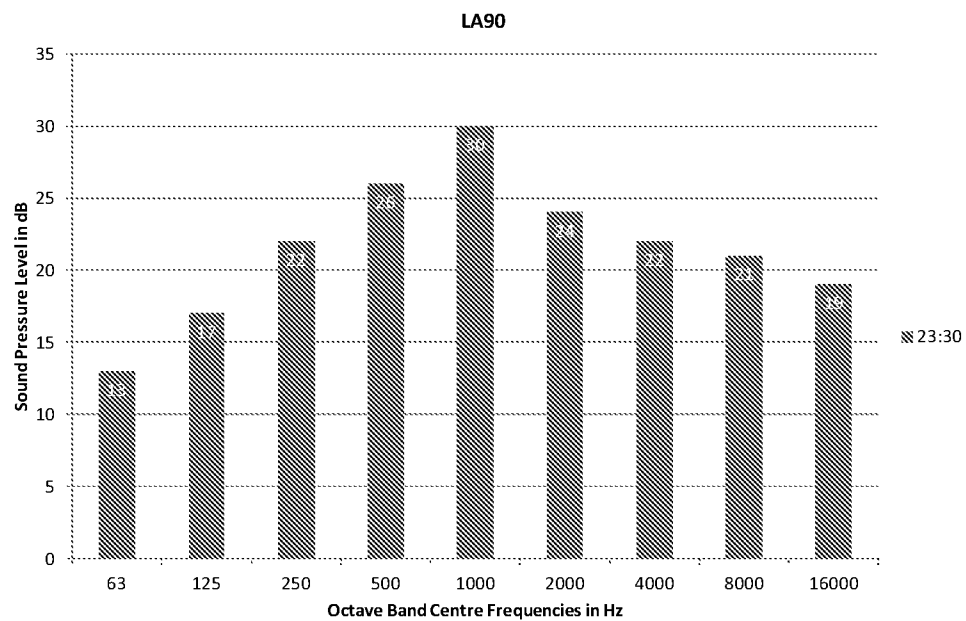


Figure 4
Octave Band data for lower background noise level

5 ACOUSTIC ASSESSMENT

The potential noise sources are:

1. noise from the various plant.

John Braiden BSc & MSc Acoustics, MIOA
Acoustic Consultant



5.1 KITCHEN VENTILATION ASSESSMENT

Noise levels from the ventilation fans have been calculated from the manufacturer's data and standard duct noise calculations. Details of the calculations are shown in the Appendix.

Details of the duct runs are also shown in the Appendix.

A +3dB penalty has been added to give the Rating Level for potential intermittency where the units may turn on and off.

There is no direct line of sight from either the extract or intake duct terminations. However, as a conservative measure grazing incidence has been assumed in the calculations.

BS 4142 Noise Assessment	Value	dB
Total Specific Noise Level @ NSR		26
BS 4141		
Tonality	0/2/4/4	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		29
Background Noise Level		33
Rating minus Background		-4

Table 3
Bs 4142 calculation

The table above shows that the total plant Rating Level at the rear is 4 dB **less** than the background noise level and thus any noise has a low impact, if any.

6 MITIGATION

In order to meet the noise threshold of Rating Level to not exceed Background Noise Level, it has been necessary to make some alterations to the ventilation system as well as some general recommendations to reduce noise and vibration.

6.1 VENTILATION SYSTEM

6.1.1 Kitchen extract

A MUB SIL 062 silencer must be used instead of the original one proposed in Section 2.3.2.

6.1.2 Kitchen intake

A MUB/T 062-S 500EC fan must be used instead of the original one proposed in Section 2.3.2.

A MUB SIL 062 silencer must be used instead of the original one proposed in Section 2.3.2.

6.1.3 Condenser units

The condenser units should be moved away from the nearby residents, at least 10m along the rear wall as shown in Figure 5.



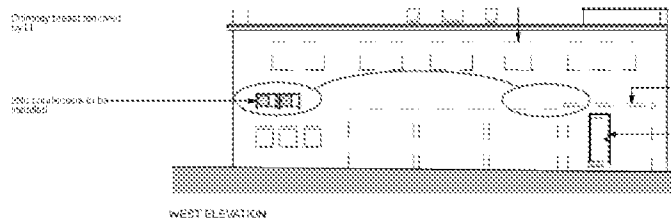


Figure 5
Re-siting of condenser units

6.2 SOUND SYSTEM

The sound system will only provide background music. However, for clarity, only small satellite loudspeakers should be used where the largest driver is no more than 100mm (4") in diameter.

7 CONCLUSION

An acoustic survey has taken place at 1-5 Ash Lane, Rustington, West Sussex BN16 3BU to assess noise levels from the proposed external plant and background music system.

A Bs 4142 assessment has been carried out where the Rating Level of the proposed plant has been compared to the lowest background noise level when the restaurant would be open.

Several mitigation measures have been suggested with details given in Section 6.

With the proposed mitigation measured, the BS 4142 assessment has determined that any noise from the external plant would be 'low impact'; therefore, no further mitigation is required for the external plant.

Due to residential accommodation on the first floor it is recommended that resilient anti vibration mounts are used for the ventilation system and loudspeaker system. Also, only satellite loudspeakers should be used where the largest driver is no more than 100mm in diameter.

With the above recommendations in place, amenity of the nearby residential will be safeguarded.

8 REFERENCES

- [1] BS 4142: 1997
Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.
- [2] BS 4142: 2014
Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.

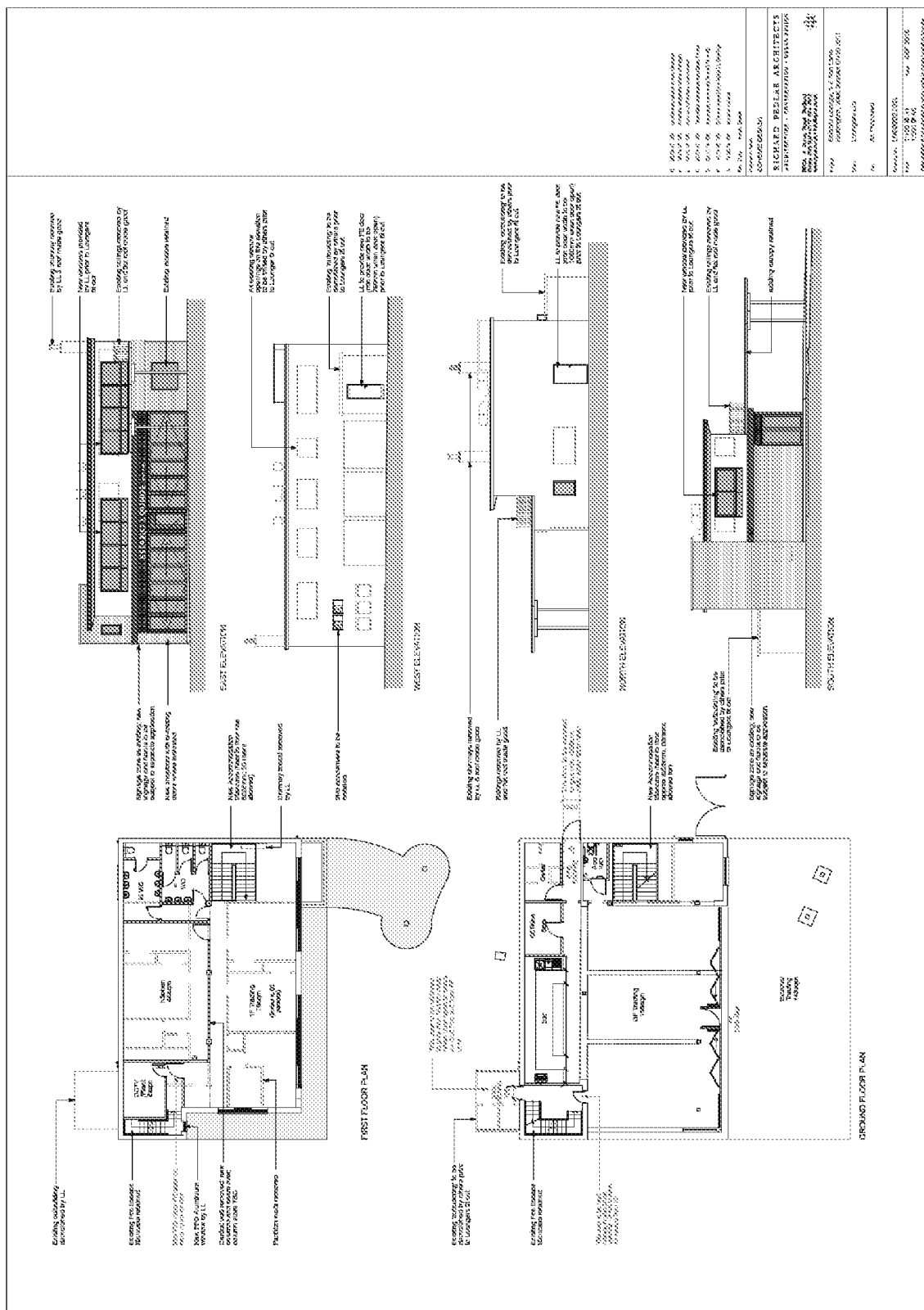


Appendix

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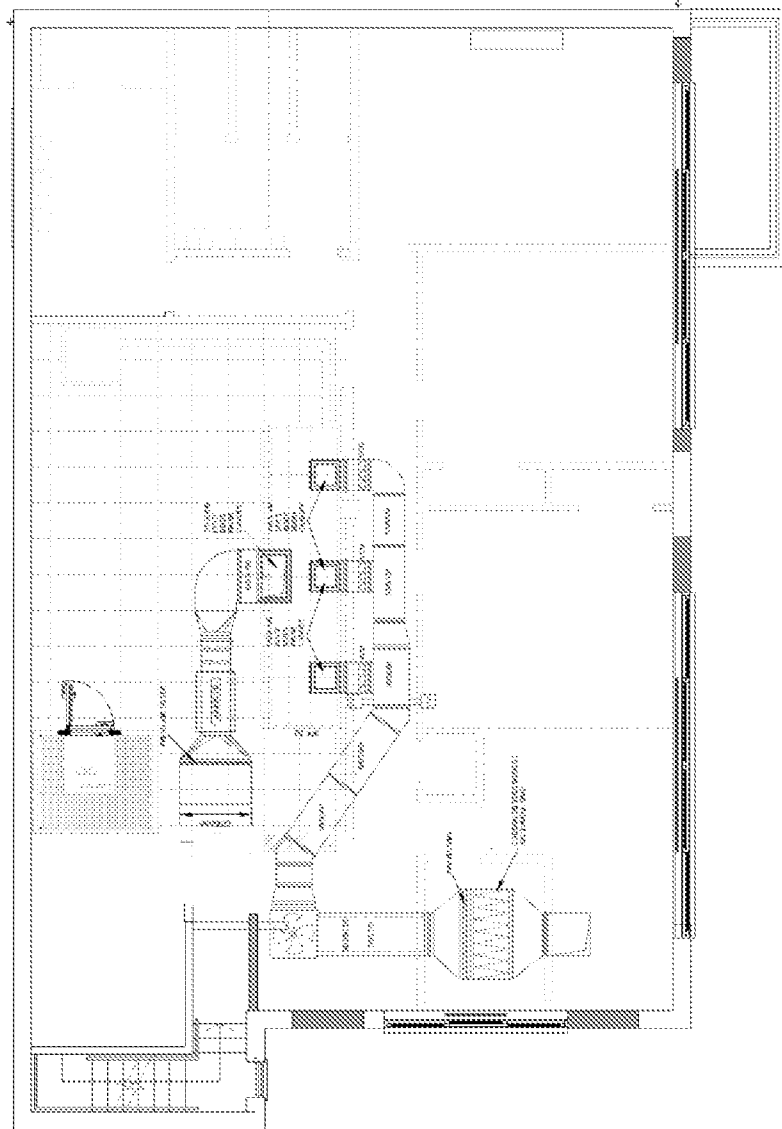
A1 PROPOSED DRAWINGS



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A2 PLANT LAYOUT

FLAT ROOF PLAN



RUSTINGTON LOUNGE

 PARTRIDGE VENTILATION Unit 10, The Enterprise, 1000-1010, The Parkway, Basingstoke, Hampshire, RG24 0AP, UK Tel: 01256 333333 Fax: 01256 333334 www.partridge.co.uk	
Partridge is a registered company in England. Registered office: Partridge Ventilation Ltd, Unit 10, The Enterprise, 1000-1010, The Parkway, Basingstoke, Hampshire, RG24 0AP, UK. Registered in England. No. 02068089. Registered office: Partridge Ventilation Ltd, Unit 10, The Enterprise, 1000-1010, The Parkway, Basingstoke, Hampshire, RG24 0AP, UK.	

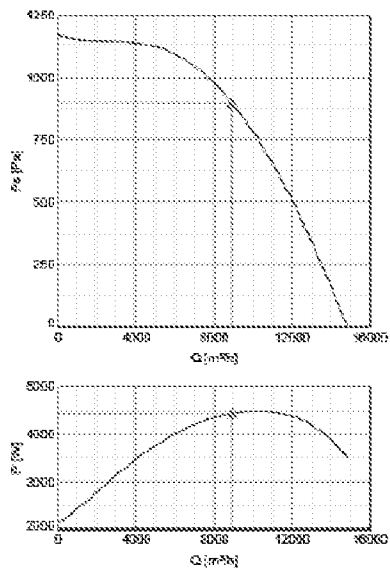
*John Borden III & III Acoustics, 88104
Acoustic Consultant*



A3 EXTERNAL PLANT NOISE LEVELS

A3.1 Kitchen extract

MUB/T 062 630D4 IE2



Hydraulic data

	Working point						
	Q (m³/s)	Ps (Pa)	Pt (Pa)	n (%)	i (Pa)	SFP (kW/m³)	U (m/s)
	8907	896	4449	1452	7.75	1.8	480

Acoustics

Mid-frequency band, Hz

630D4	Hz	Tot	63	125	250	500	1k	2k	4k	8k
LwA Inlet	dB(A)	88	75	75	79	81	80	77	72	66
LwA Outlet	dB(A)	88	75	77	81	83	82	79	74	67
LwA Surrounding	dB(A)	75	62	64	68	70	66	68	61	54

Measuring point: qv = 2,47 m³/s, Ps = 896 Pa

Dimensions



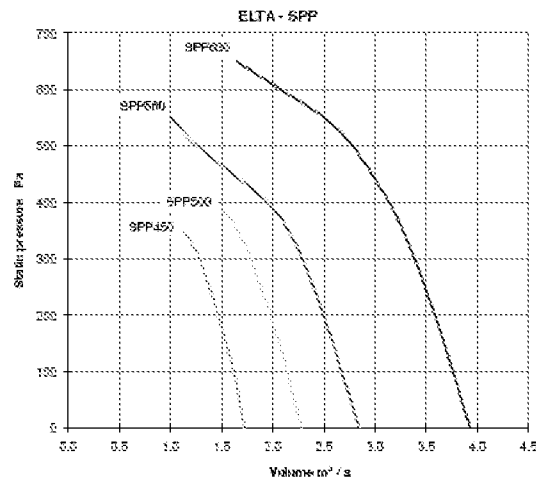
A3.2 Kitchen intake

SPP 500/4-3



Technical Data

Product Code	r/min	Airflow/ SFP	Airflow m³ / s @ Static Pressure Pa												
			0	50	100	150	200	250	300	350	400	450	500	550	600
SPP450/4-3	1410	m³ / s	1.724	1.673	1.617	1.546	1.464	1.373	1.293	1.128					
		W / (g/s)	0.38	0.42	0.46	0.52	0.58	0.66	0.74	0.84					
SPP500/4-3	1260	m³ / s	2.276	2.213	2.143	2.063	1.975	1.882	1.793	1.66					
		W / (g/s)	0.47	0.49	0.50	0.55	0.61	0.67	0.74	0.82					
SPP550/4-3	1400	m³ / s	2.846	2.759	2.672	2.566	2.466	2.366	2.266	2.149	1.946	1.587	1.269	1.01	
		W / (g/s)	0.47	0.47	0.52	0.57	0.62	0.67	0.73	0.80	0.90	1.10	1.35	1.69	
SPP630/4-3	1450	m³ / s	3.927	3.644	3.79	3.674	3.585	3.499	3.385	3.260	3.137	2.979	2.779	2.490	2.073
		W / (g/s)	0.49	0.49	0.56	0.64	0.69	0.73	0.78	0.83	0.90	0.95	0.99	1.04	1.24



Product Code	Sound Power Level dBW @ Octave Band Hz								dBA @ 3m	Input Amps #	Output kW	230V/3/50Hz				400V/3/50Hz			
	63	125	250	500	1K	2K	4K	8K				FLC	SC	FLC	SC	FLC	SC	FLC	SC
SPP450/4-3	Inlet	71	72	81	78	74	70	64	59	59	4.1	0.74	3.1	14.8	2.0	9.8			
	Outlet	70	72	81	78	75	72	68	61	59									
SPP500/4-3	Inlet	76	76	83	81	79	76	71	64	63	9.7	1.1	4.5	20.4	2.8	13.9			
	Outlet	77	77	83	80	80	79	74	66	64									
SPP550/4-3	Inlet	81	80	85	84	83	81	77	70	67	7.6	1.5	5.6	26.3	3.7	19			
	Outlet	83	81	85	83	84	80	73	66	66									
SPP630/4-3	Inlet	89	85	86	90	87	85	81	75	72	11.6	2.2	8.7	42.1	4.8	31.2			
	Outlet	87	85	86	90	88	86	84	79	73									

dBA = Specific Fan Power in Watts per liter per second.

All data must always refer to a 230V/50Hz supply.

Performance data is based on tests conducted in accordance with EN 12599 (ISO 9001) and EN 12599.

Acoustic data refers to the propagation of the sound wave from the fan to the room. The sound power level is a measure of the sound energy radiated by the fan. The sound pressure level is a measure of the sound energy received by the ear. The sound power level is a measure of the sound energy radiated by the fan. The sound pressure level is a measure of the sound energy received by the ear.

Our fans have a policy of continuous product development and improvement and therefore reserve the right to supply products which may differ from those illustrated and described in this presentation. Our monitor or standard and data will be supplied on request.

www.demandcontrolventilation.com

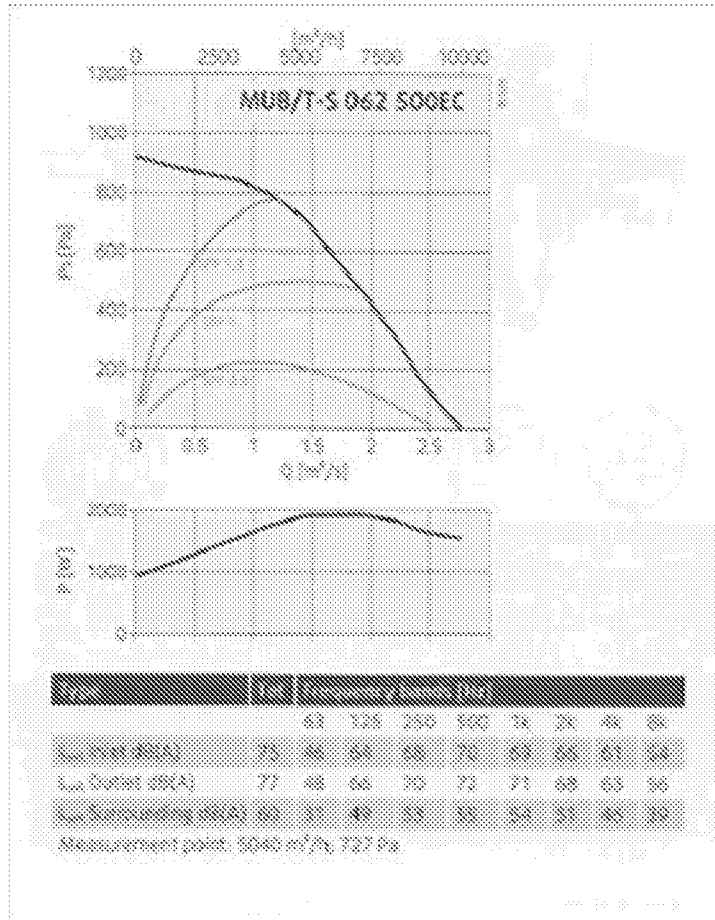
13

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Acoustic Consultant



A3.3 Kitchen intake

MUB/T-S 062 500EC



A3.4 Cold Room Condenser

Danfoss OP-MPH-M018

DANFOSS TESTING SECTION				
MODEL: MPHIC 018-1		(note: full insulation)		Date: 15/8/2007
COMPRESSOR: SC108MLX		Ambient: 32 °C		
1/1 Octave Sound Pressure Level (dB, ref 20µPa)				
After Unit Running				
	Front	Back	Side comp	Side
125Hz				
250Hz				
500Hz				
1kHz				
2kHz				
4kHz				
8kHz				
A(dBA)				

	TE = -10°C			
	Front	Back	Side Comp	Side
125Hz	48.9	49.1	42.2	41.0
250Hz	47.0	44.0	47.5	46.0
500Hz	39.6	38.1	36.4	38.8
1kHz	34.6	32.7	27.5	32.3
2kHz	25.3	27.0	24.8	28.6
4kHz	25.9	28.2	27.7	23.8
8kHz	24.5	25.5	24.9	23.2
A(dBA)	41.5	41.4	42.1	42.1

Microphone position: 1m away from the unit and 1m above floor level.
For sound pressures in 15m distance you deducted 20 dB(A) from the stated value

Tested by: Zale	Checked by: Har KB	Approved by:
Date: 15/8/2007	Date: 15/8/2007	Date:

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Acoustic Consultant



A3.5 Cellar Conditioning Condenser

J&E Hall JCC2 – 40E¹

Outdoor Sound pressure levels @ 1m

	1/1 Octave Sound Pressure Level (dB, ref 20µPa)							Overall A-weighted Sound Pressure Level (dBA)
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Model J5LC20C	49	48	46	45	40	35	27	49
							Total	49

A4 PLANT CALCULATIONS

A4.1 Kitchen extract

Rustington Lounge		Duct Calculation		Kitchen Extract		Octave band centre frequency						
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	Total level	
1a		Sound Pressure Level @ Xm	SWL data used	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.5	
1b		Sound Power Level of unit	MUB/T062 630D4 IE2, LwA	75.0	77.0	81.0	83.0	82.0	79.0	74.0	88.3	
		A weighting	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
2		PLENUM Insetion Loss	no									
3	2 m	Duct Length in metres	Rectangular 600 x 600	-1.3	-1.3	-0.7	-0.3	-0.3	-0.3	-0.3		
4	1	Number of bends	500 mm bend without absorber	0	0	0	-6	-8	-4	-3		
5	0 mm	Branch area	10log(branch mm2/duct mm2)	0	0	0	0	0	0	0		
6		Silencer attenuation (1)	MUB SIL 062	-9	-12	-20	-30	-36	-32	-25		
7		Silencer attenuation (2)	no silencer or n/a	0	0	0	0	0	0	0		
7		Silencer attenuation (2)	none or n/a	0	0	0	0	0	0	0		
8		Att due to end reflection	500 mm end reflection	-8	-4	-1	0	0	0	0		
9		Louvre attenuation	no acoustic louvre or n/a	0	0	0	0	0	0	0		
10		Sound power at termination		56.7	59.7	59.3	46.7	37.7	42.7	45.7	63.7	
11	Q 2	Directivity**	1 surface	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
12	23 m	Distance Attenuation	20*log10(r)	-27.23	-27.23	-27.23	-27.23	-27.23	-27.23	-27.23		
		Air absorption	15°C, 80% humidity	0.00	-0.01	-0.03	-0.06	-0.09	-0.19	-0.55		
		Numerical correction	SPL = SWL - 20log(r) + DI - 11	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00		
6 0		Barrier	yes	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8		
SPL(A) at NSR				<i>L</i> _{pA,NSR}	16.7	19.7	19.3	6.6	0.0	2.5	5.2	23.7 dB
Background Noise Level @ NSR				<i>L</i> _{A90,NSR}	13.0	17.0	22.0	26.0	30.0	24.0	22.0	33.1

¹ J5LC20C is the actual condensing unit model for the JCC2 40E cellar cooler system as confirmed by Dave Tully from J & E Hall International



A4.2 Kitchen supply

Rustington Lounge		Duct Calculation	Kitchen Supply	Octave band centre frequency							Total level
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	
		Sound Pressure Level @ Xm	SWL data used	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57.5
		Sound Power Level of unit	MUB/T062-S500EC, LwA in	48.0	64.0	68.0	70.0	69.0	66.0	61.0	75.1
		A weighting	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		PLENUM Insetion Loss	no								
	0 m	Duct Length in metres	Rectangular 600 x 600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0	Number of bends	500 mm bend without absorber	0	0	0	0	0	0	0	
	0 mm	Branch area	10log(branch mm2/duct mm2)	0	0	0	0	0	0	0	
		Silencer attenuation (1)	MUB SIL 062	-9	-12	-20	-30	-36	-32	-25	
		Silencer attenuation (2)	no silencer or n/a	0	0	0	0	0	0	0	
		Silencer attenuation (2)	none or n/a	0	0	0	0	0	0	0	
		Att due to end reflection	1000 mm end reflection	-4	-1	0	0	0	0	0	
		Louvre attenuation	no acoustic louvre or n/a	0	0	0	0	0	0	0	
		Sound power at termination		35.0	51.0	48.0	40.0	33.0	34.0	36.0	53.2
	Q 2	Directivity**	1 surface	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	19 m	Distance Attenuation	20*log10(r)	-25.58	-25.58	-25.58	-25.58	-25.58	-25.58	-25.58	
		Air absorption	15°C, 80% humidity	0.00	-0.01	-0.02	-0.05	-0.08	-0.16	-0.45	
		Numerical correction	SPL = SWL - 20log(r) + DI - 11	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	
	6 0	Barrier	yes	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8	
		SPL(A) at NSR	$L_{pA,NSR}$	0.0	12.7	9.6	1.6	0.0	0.0	0.0	13.2 dB
		Background Noise Level @ NSR	$L_{A90,NSR}$	13.0	17.0	22.0	26.0	30.0	24.0	22.0	33.1

A4.3 Coldroom Condenser

Rustington Lounge		Noise calculation	Cold Room Condenser	Octave band centre frequency							Total level
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	
1a	1 m	Sound Pressure Level @ 1m	MPHC 018-1 @ 1m (front)	48.9	48.9	47.0	39.6	34.6	25.3	25.9	57.5
1b		Sound Power Level of unit	SPL data used	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5
		A weighting	yes	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
	N 1	Number of sources	10*log(N)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	Q 2	Directivity**	1 surface	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
12	19 m	Distance Attenuation	20*log10(r)	-25.58	-25.58	-25.58	-25.58	-25.58	-25.58	-25.58	
		Air absorption	15°C, 80% humidity	0.00	-0.01	-0.02	-0.05	-0.08	-0.16	-0.45	
	6 0	Barrier	yes	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8	
		SPL(A) at NSR	$L_{pA,NSR}$	0.0	5.5	11.0	9.0	7.2	0.0	0.0	13.1 dB
		Background Noise Level @ NSR	$L_{A90,NSR}$	13.0	17.0	22.0	26.0	30.0	24.0	22.0	33.1

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A4.4 Cellar Condenser

Rustington Lounge		Noise calculation	Cellar Condenser	Octave band centre frequency								Total level
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000		
1a	1 m	Sound Pressure Level @ 1m	JCC2-40E @ 1m	49.0	49.0	48.0	46.0	45.0	40.0	35.0		57.5
1b		Sound Power Level of unit	SPL data used	0.0	0.0	0.0	0.0	0.0	0.0	0.0		8.5
		A weighting	yes	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0		
	N 1	Number of sources	10*log(N)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
11	Q 2	Directivity**	1 surface	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
12	19 m	Distance Attenuation	20*log10(r)	-25.58	-25.58	-25.58	-25.58	-25.58	-25.58	-25.58		
		Air absorption	15°C, 80% humidity	0.00	-0.01	-0.02	-0.05	-0.08	-0.16	-0.45		
6 0		Barrier	yes	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8	-4.8		
		SPL(A) at NSR	$L_{pA,NSR}$	0.0	5.6	12.0	15.4	17.6	13.7	8.2	21.5	dB
		Background Noise Level @ NSR	$L_{A90,NSR}$	13.0	17.0	22.0	26.0	30.0	24.0	22.0	33.1	

A4.5 Summary

	63	125	250	500	1000	2000	4000	Total
Kitchen Extract	17	20	19	7	0	3	5	24
Kitchen Supply	0	13	10	2	0	0	0	15
Cold Room Condenser	0	5	11	9	7	0	0	15
Cellar Condenser	0	6	12	15	18	14	8	22
Total Plant Noise, Day	17	21	21	17	18	5	0	26

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