Acoustic assessment of proposed new mechanical services equipment

102 Market Street, Manchester M1 1PB

Client: Wasabi

Report Reference: 260622-R001a

Date: 02/07/2026

Revision:	Date:	Author:	Checked:
-	02/07/2026	Rob Cant MIOA MIEnvSc	Tommy Burn BSc (Hons) MIOA

This report has been prepared by ACA Acoustics Limited (ACA) with all reasonable skill, care, and diligence in accordance with generally accepted acoustic consultancy principles and taking account of the services and terms agreed between ACA and our client. Any information provided by third parties and referred to herein may not have been checked or verified by ACA unless expressly stated otherwise. Certain statements made in the report may constitute estimates or projections and even though these are based on reasonable assumptions and good industry practice, such forward-looking statements by their nature involve risks and uncertainties which could cause actual results to differ materially from the results predicted. ACA does not guarantee or warrant any estimate or projection contained in this report.

Note that consideration of non-acoustic aspects including, but not limited to structural calculations, compliance with Building Regulations and other statutory requirements, or any assessment of fire regulations are outside the scope of ACA Acoustics Limited and should be considered by others accordingly.

This report is confidential to the client and ACA accepts no responsibility whatsoever to third parties unless formally agreed by ACA. Any such party relies upon the report at their own risk. © 2026 ACA Acoustics Limited.

Head Office
12 Sheep Street
Highworth
Wiltshire
SN6 7AA
Tel: 01793 766 324

London
3 Shortlands
Hammersmith
London
W6 8DA
Tel: 0203 609 8733

Manchester
Colony
5 Piccadilly Place
Manchester
M1 3BR
Tel: 0161 327 1681

Birmingham
11 Brindley Place
Brunswick Square
Birmingham
B1 2LP
Tel: 0121 769 3422

Email: info@aca-acoustics.co.uk
Website: www.aca-acoustics.co.uk
Registered in England & Wales No: 08228154

CONTENTS

0. SUMMARY 1

1. INTRODUCTION 2

2. ACOUSTIC CRITERIA 2

3. REVIEW OF SITE LOCATION 3

4. SOUND LEVEL SURVEY 5

5. ACOUSTIC ASSESSMENT 7

6. ACOUSTIC MITIGATION TREATMENTS 9

6.1. Duct Mounted Attenuators 9

6.2. Plantroom Acoustic Louvre 9

6.3. Vibration Isolators 10

7. CONCLUSION 10

Appendix A ..... A

Appendix B ..... B

0. SUMMARY

0.1. ACA Acoustics Limited has been commissioned to assess the acoustic impact of proposed new mechanical services equipment associated with a new Wasabi store to be installed at 102 Market Street, Manchester.

0.2. The assessment is required to provide evidence that noise emissions from the equipment will not be detrimental to the amenity of nearby noise-sensitive properties and complies with the Local Authority's requirements.

0.3. A survey has been carried out in the vicinity to establish existing background sound levels. Based on Manchester City Council's requirements, noise from the new plant should be assessed in accordance with BS 4142:2014+A1:2019. Manchester City Council require the rating level of the new plant to be at least 5dB below the background levels at the most noise-sensitive receptor.

0.4. Table 1 below summarises the assessment details of the plant to the most noise-sensitive receptors (NSR).

Ref	Description	Background Level, LA90	Calculated Rating Level, LAr	Excess of Rating Level Over Background Sound Level
NSR1	First floor windows of proposed new flats being formed at 102-104 Market Street, directly above the exhaust louvre.	55dB	47dB	-8dB
NSR2	First floor windows of proposed new flats being formed at 102-104 Market Street, directly above the supply louvre	55dB	45dB	-10dB

Table 1: Summary of Assessment

0.5. With the implementation of the recommended mitigation scheme outlined in this report, noise from the proposed equipment will not be disturbing or detrimental to the amenity of the most sensitive noise-sensitive receptors and complies with the planning requirements of Manchester City Council.

1. INTRODUCTION

New mechanical services equipment associated with a new Wasabi store is to be installed at 102 Market Street, Manchester.

ACA Acoustics Limited has been commissioned by Wasabi to carry out an assessment of noise emissions from the proposed mechanical plant and, where necessary, to make recommendations for a mitigation scheme to ensure that the amenity of nearby noise-sensitive properties is not compromised.

This report presents results of the sound level survey, computer modelling, and assessment.

2. ACOUSTIC CRITERIA

BS 4142:2014+A1:2019 is commonly used to assess the potential for loss of amenity due to noise from mechanical services equipment and is considered appropriate for this application.

The scope of BS 4142:2014+A1:2019 advises that "*this British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature … 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 assessment method of BS 4142:2014+A1:2019 corrects the specific sound level from the source under investigation to account for characteristics that could make the sound more obtrusive to obtain a rating level. This rating level is compared against the prevailing background noise outside the noise-sensitive property. Section 11 provides a commentary of the assessment result and advises that:

a) Typically the greater this difference [between the rating level and background sound level]*, the greater the magnitude of the impact;*
b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context;
d) 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.

Based on previous development within the city, it is understood that Manchester City Council's requirement is that noise from the new equipment shall be assessed in accordance with

BS 4142:2014+A1:2019, with the rating level to be at least 5dB below the prevailing background level at 1m outside windows of the nearest affected noise-sensitive properties.

Manchester City Council's criterion is more stringent than required by the Standard and will ensure there is no adverse impacts on nearby occupants.

3. REVIEW OF SITE LOCATION

The site is located in Manchester city centre, at the junction of Market Street and Fountain Street. The immediate vicinity of the site is primarily to commercial properties, however it appears that the top floor of The Shakespeare public house is residential use and The Brewdog Doghouse hotel is just beyond that on Fountain Street.

However, Prior Approval permitted development consent has been granted for the change of use of upper floors of the development site, at 102-104 Market Street, into residential apartments. Although not currently implemented, once developed these would become the closest receptors to the proposed plant.

New supply and extract fans along with air conditioning condensers are to be installed internally within the building. The supply fan, WC extract fan, and condensers will be ducted to louvres on the Fountain Street façade. However the main extract fan will be ducted to a plantroom containing the condensers, with a louvred opening allowing ventilation from the plant, all as detailed on Spiritus drawing STS-1378-M05A.

The most affected noise sensitive receptors (NSR) are discussed in Table 2 below.

Receptor	Description
NSR1 & 2	ACA Acoustics are aware that Prior Approval permitted development has been granted for the change of use of the upper floors of 102-104 Market Street, directly above the development site, into residential apartments. Therefore, the closest receptor will be windows above the extract plantroom louvre (NSR1) and supply fan louvre (NSR2). A drawing showing location of the louvres and windows is included below, taken from Wasabi drawing reference WAS-MKT ST-04.

Table 2: Noise sensitive receptor details

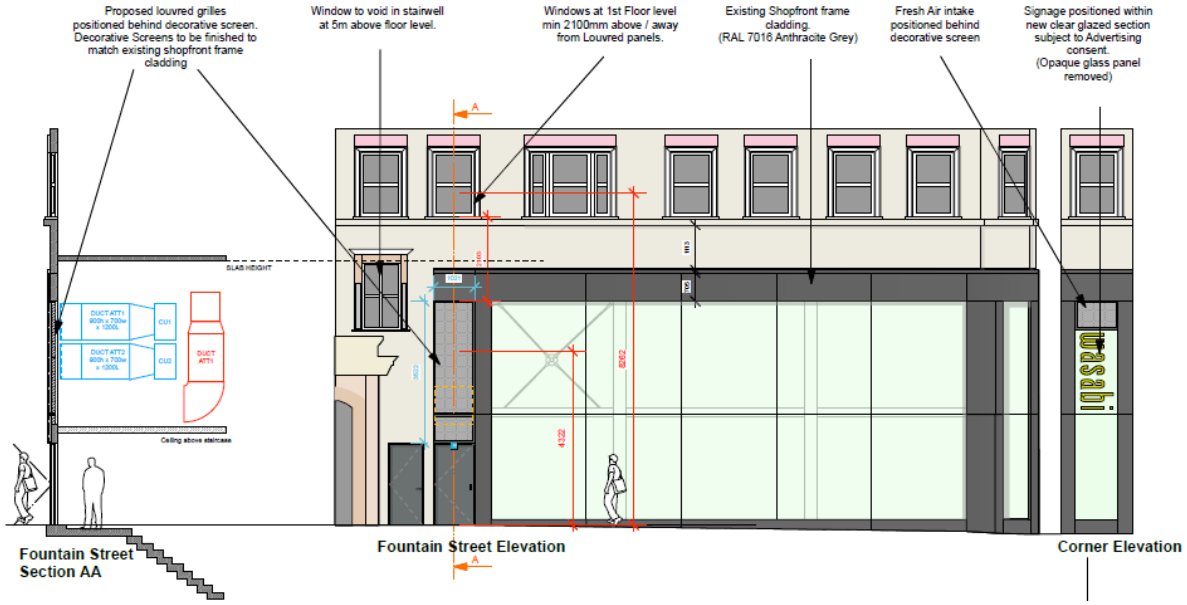


Figure 1: Fountain Street elevation showing louvres and closest noise-sensitive receptors

Other receptor locations in the vicinity have also been considered and may be affected by the proposed plant, however the receptor locations used in the assessment are the most sensitive – sound levels at other positions will be lower.

A marked-up aerial image is included in Figure 2, identifying the location of the proposed equipment and sound level survey measurement position.

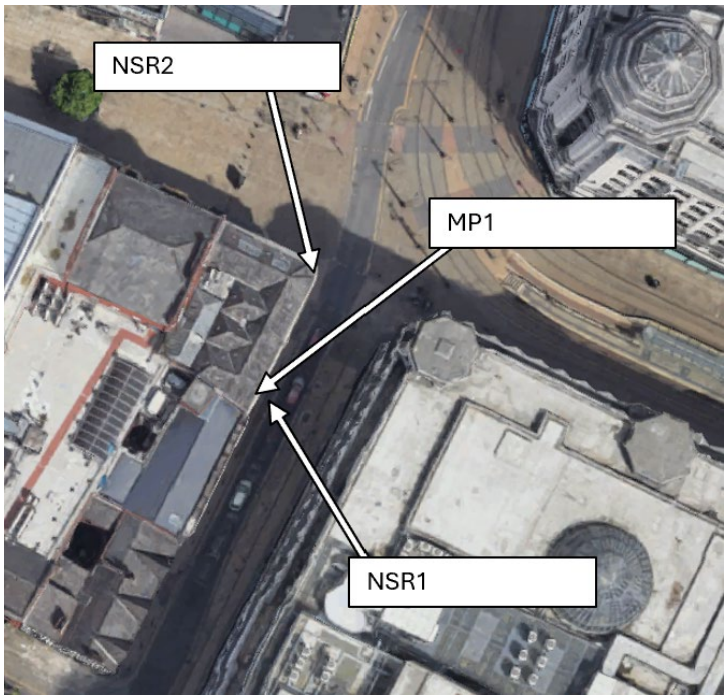


Figure 2: Equipment location, measurement position, and closest receptor (available at google.com/maps)

The client would like the capacity for the plant to operate at any time over a full 24-hour period.

4. SOUND LEVEL SURVEY

To assess sound levels from the new mechanical equipment, it is necessary to establish representative background sound levels in the vicinity during the proposed plant operating times.

A background sound level survey was carried out via an unattended survey at the MP1 position indicated in Figure 1. This position is directly below the future closest noise-sensitive receptors once the upper floors have been developed.

The survey was set up by Rob Cant of ACA Acoustics and conducted between the 10/12/2025 and 11/12/2025.

During the survey, the soundscape in the vicinity was influenced predominantly by high volume traffic and pedestrian activity, trams on Fountain Street, and existing third-party mechanical plant.

Following analysis of the survey results, it was identified that this existing third-party mechanical plant operated continuously overnight.

The following equipment was used during the survey. An on-site calibration check was conducted on the sound level meter prior to the survey and repeated after with no deviation noted.

Equipment	**Serial Number**
Svantek Class 1 sound level meter type SVAN971A, complete with MOLES weatherproof and lockable outdoor environmental kit	121131
Svantek calibrator type SV33B. Compliant to IEC 60942:2003	122245

Table 3: Equipment used for the sound level survey

Weather conditions at the time of setting up the survey consisted of 100% cloud cover, 14km/h northerly breeze, a temperature of around 10^{o}C and light drizzle.

At the start of the survey there was light drizzle. The damp ground conditions may have increased tyre noise slightly at this time, however the rain ceased around an hour after the survey was set up and background sound levels measured through the remainder of the survey, including the most important late evening and early morning periods will not have been affected. Meteorological conditions are not considered to have adversely impacted the outcome of the assessment.

Results of the survey at the MP1 position are shown in graphical form in Figure 3 below.

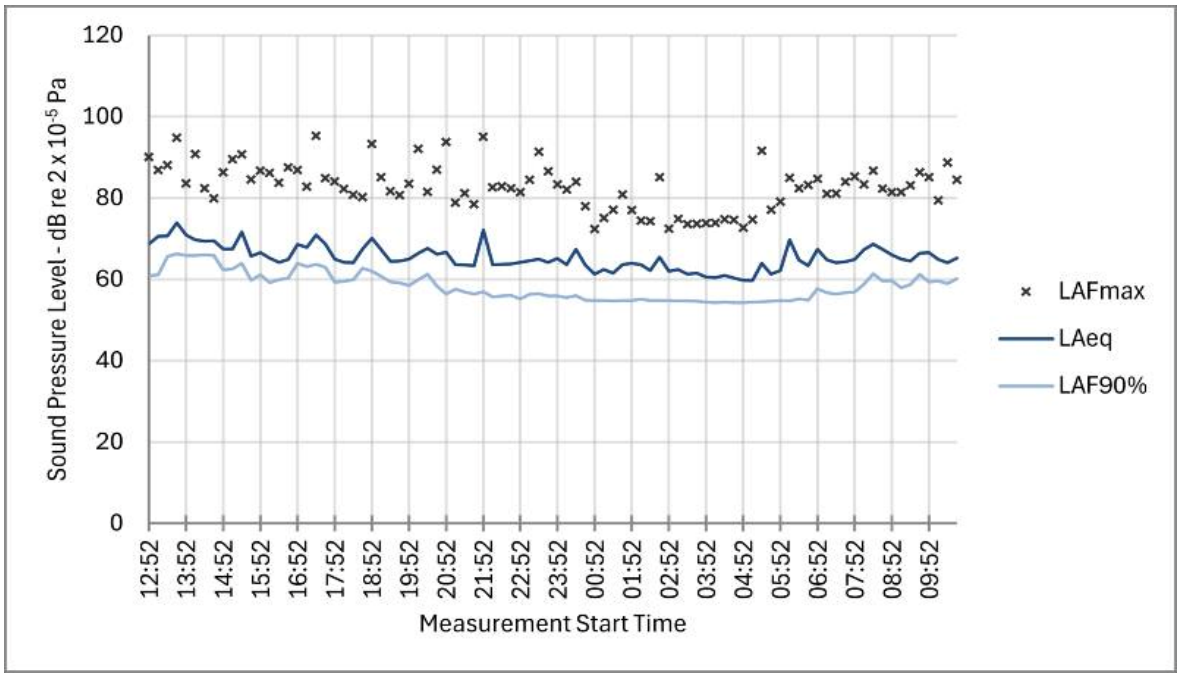


Figure 3: Sound level survey results MP1 – 10/12/2025 to 11/12/2025

In accordance with the methodology set out in BS 4142:2014+A1:2019, the background sound level is not necessarily the lowest recorded value. Instead, the background sound level should be a level which is representative of the underlying soundscape at the receptor location.

A statistical analysis of the measured LA90 results during the most sensitive night-time period is shown below, following guidance set out in the Standard.

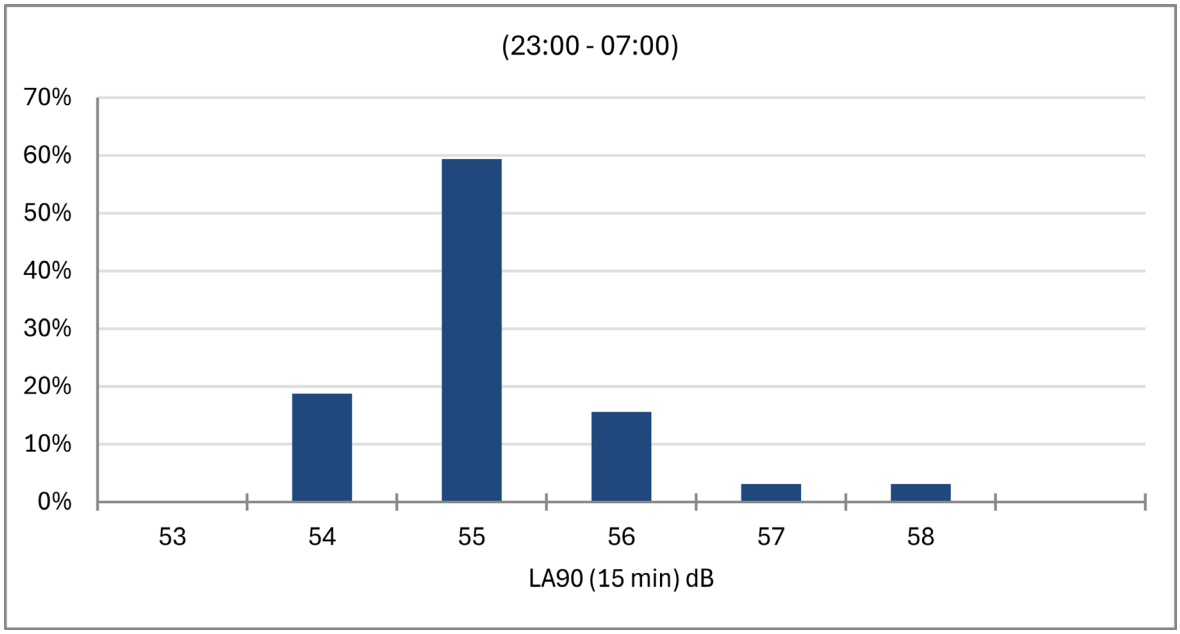


Figure 4: Statistical analysis of measured LA90 sound levels – MP1

Summary results of the survey are provided in Table 4 below.

Receptor	Period	Background Sound Level During Operating Period LA90
NSR1 & 2	24-hours	55dB

Table 4: Summary sound level survey results

5. ACOUSTIC ASSESSMENT

Confirmation of the equipment models used in the assessment is provided in Table 5 below.

Description	Equipment Model	Airflow (m3/s)	Sound Level (LwA)	Quantity
EF1 Exhaust	Systemair MUB 062 500EC	1.31	75dB	1
SF1 Inlet	Systemair MUB 042 500EC	0.96	76dB	1
TF1 Exhaust	Systemair PRIO ECO 125 EC	0.04	69dB	1
CU1 & 2	Daikin RZA200D	2.1	76dB	2

Table 5: Proposed new mechanical equipment used in the assessment

A computer model has been used to calculate the noise contribution from the proposed plant to outside nearest noise-sensitive windows, using manufacturer's published sound data for the proposed new plant. Ductwork system losses have been calculated in accordance with CIBSE Guide B4 *Noise and vibration control for HVAC*. Environmental corrections have been calculated in accordance with ISO 9613-2.

The assessment has been undertaken using drawing reference "*STS-1378M05A",* as provided by the client.

Mitigation recommendations outlined in Section 6 of this report are included in the computer model.

The cumulative calculated specific sound level to outside the most sensitive receptor with all equipment operating is shown in Table 6 below. Summary printouts from the calculation models are included in Appendix A.

Receptor Reference	Location	Calculated Specific Sound Level
NSR1	102-104 Market Street	47dBA
NSR2	102-104 Market Street	45dB

Table 6: Calculated cumulative equipment sound levels at 1m outside noise-sensitive windows

Assessment of the calculated rating level to the receptors for the cumulative impact of all equipment, in accordance with BS 4142:2014+A1:2019, is provided in Table 7 below.

Description	NSR1 Receptor	NSR2 Receptor	Relevant Clause	Commentary
Calculated specific sound level to receptor	LAeq 47dB	LAeq 45dB	7.1 7.3.6	New equipment operating. Refer to calculation sheets in Appendix A.
Background sound level	LA90 55dB	LA90 55dB	8.1.3 8.3	Measured representative background sound level.
Acoustic feature correction	0dB	0dB	9.2	The calculated specific sound levels do not indicate any distinctive component and the equipment will be significantly below the background and residual sound levels. The existing background sound level overnight is dominated by existing mechanical plant and therefore the new equipment will not be noticeable against the existing soundscape.
Rating level	LAr 47dB	LAr 45dB	9.2	
Excess of rating level over background sound level	**-8dB**	**-10dB**	**11**	**Assessment indicates a low likelihood of adverse impact**

Table 7: Assessment of results in accordance with BS 4142:2014+A1:2019 for all equipment operating

The table above shows the rating level of the proposed new equipment will be at least 8dB below the background LA90 sound level to outside the closest noise-sensitive properties and is therefore compliant with the requirements of Manchester City Council.

BS 4142:2014+A1:2019 requires an assessment to consider the context of the development, rather than simply adhering to numerical values. The proposals involve new items of mechanical equipment being introduced to an area with other commercial and retail uses in the vicinity. In this scenario, the change in acoustic character, and subsequent potential for loss of amenity, is lower than if, say, there were no other similar businesses in the area.

The author considers that the context of the assessment does not alter the initial estimate of the impact, and that sound levels from the new mechanical equipment should not be detrimental to the amenity of any residential occupiers in the vicinity.

6. ACOUSTIC MITIGATION TREATMENTS

As discussed in Section 5, noise control treatments have been included in the calculation model. Acoustic specification for the mitigation scheme is provided below. These have been incorporated into the HVAC design, as detailed on the Spiritus drawing.

6.1. Duct Mounted Attenuators

The calculation model includes benefit of duct-mounted attenuators to the atmospheric side of the plant. Schedule of minimum insertion loss performance for the attenuators along with description of typical silencer to comply with the specified performance is provided in a schedule in Appendix B. Dynamic insertion losses are shown in the relevant calculation sheet.

Note that the dimensions and free area shown are nominal and the successful supplier should confirm their own selections to meet the minimum required insertion loss performance.

It is important airflow generated noise from the atmospheric terminal does not increase the cumulative sound level at nearby noise-sensitive properties. Suitable airflow velocity is dependent on the profile of the terminal used and should be verified with the manufacturer accordingly.

6.2. Plantroom Acoustic Louvre

It is recommended that an acoustic louvre is used for the plantroom ventilation louvre. Suitable louvre would typically be 150mm deep. Schedule of minimum insertion loss performance for the louvre is included in Appendix B.

Alternatively, should the client prefer, a traditional weather louvre could be used to the external façade, allowing a common appearance with the supply louvre, and a silencer installed with a plenum to the rear. The silencer should achieve the same minimum insertion loss performance shown in the schedule.

6.3. Vibration Isolators

To control the potential for structure-borne noise and vibration from the mechanical equipment affecting adjoining commercial occupants, it is recommended that the plant is installed on suitable vibration isolators.

7. CONCLUSION

A planning application is to be submitted for the installation of new mechanical plant and equipment associated with a new Wasabi store at 102 Market Street, Manchester.

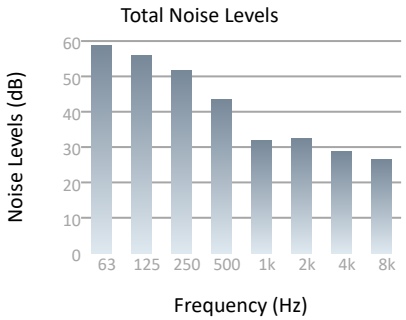
ACA Acoustics have undertaken an assessment of noise from the proposed equipment using manufacturer's published acoustic data. Calculated rating levels for the plant will be at least 5dB below the background sound level during proposed operating times of the equipment when assessed at 1m from the closest noise-sensitive receptors.

The author considers that allowing for the proposed mitigation scheme in this report, the proposed equipment achieves the Local Authority's planning requirements for this development and will not be detrimental to the amenity of nearby noise-sensitive occupants.

Appendix A

Acoustic Calculations

Project Name	Wasabi, Market Street, Manchester
Project Reference	260622
Reference	102-104 Market Street - NSR1
Description	Proposed Flats
Noise Limit	50
dBA	47



Calculated Lp at Receptor

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
CU1 - Condenser	1	55	51	43	34	21	22	19	20
CU2 - Condenser	1	55	51	43	34	21	22	19	20
TF1 - Exhaust	1	47	49	49	39	27	26	18	14
Plantroom	1	52	48	45	40	29	30	27	24

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Calculation Sheet

CU1 - Condenser to 102-104 Market Street - NSR1

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - CU1 - Condenser								
Sound Power Levels	**79.0**	**78.0**	**76.0**	**75.0**	**69.0**	**68.0**	**63.0**	**59.0**
Silencer								
	-3.0	*-5.0*	*-10.0*	*-14.9*	*-18.9*	*-14.6*	*-12.4*	*-7.9*
End Reflection & Directional Directivity	*-6.9*	*-5.9*	*-7.4*	*-10.2*	*-13.4*	*-15.0*	*-15.0*	*-15.0*
Dc - Reflections & Directivity								
	6.0	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*
Adiv - Geometrical Divergance								
	-23.5	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*
Aatm - Atmospheric Absorption								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.5*
Agr - Ground Attenuation								
	3.0	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*
Abar - Barrier Attenuation								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver								
External Receiver - 102-104 Market Street - NSR1								
Sound Pressure, Lp:	**54.6**	**51.1**	**42.6**	**33.9**	**20.6**	**22.3**	**19.4**	**19.6**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Calculation Sheet

CU2 - Condenser to 102-104 Market Street - NSR1

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - CU2 - Condenser								
Sound Power Levels	**79.0**	**78.0**	**76.0**	**75.0**	**69.0**	**68.0**	**63.0**	**59.0**
Silencer								
	-3.0	*-5.0*	*-10.0*	*-14.9*	*-18.9*	*-14.6*	*-12.4*	*-7.9*
End Reflection & Directional Directivity	*-6.9*	*-5.9*	*-7.4*	*-10.2*	*-13.4*	*-15.0*	*-15.0*	*-15.0*
Dc - Reflections & Directivity								
	6.0	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*
Adiv - Geometrical Divergance								
	-23.5	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*
Aatm - Atmospheric Absorption								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.5*
Agr - Ground Attenuation								
	3.0	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*
Abar - Barrier Attenuation								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver								
External Receiver - 102-104 Market Street - NSR1								
Sound Pressure, Lp:	**54.6**	**51.1**	**42.6**	**33.9**	**20.6**	**22.3**	**19.4**	**19.6**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Calculation Sheet

TF1 - Exhaust to 102-104 Market Street - NSR1

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - TF1 - Exhaust								
Sound Power Levels	**77.0**	**77.0**	**75.0**	**63.0**	**52.0**	**53.0**	**48.0**	**48.0**
Silencer								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Bend Loss								
	0.0	*0.0*	*-1.0*	*-2.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*
End Reflection & Directional Directivity	*-16.2*	*-12.6*	*-9.1*	*-6.3*	*-6.2*	*-8.2*	*-11.2*	*-14.5*
Dc - Reflections & Directivity								
	6.0	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*
Adiv - Geometrical Divergance								
	-23.3	*-23.3*	*-23.3*	*-23.3*	*-23.3*	*-23.3*	*-23.3*	*-23.3*
Aatm - Atmospheric Absorption								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.5*
Agr - Ground Attenuation								
	3.0	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*
Abar - Barrier Attenuation								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver								
External Receiver - 102-104 Market Street - NSR1								
Sound Pressure, Lp:	**46.5**	**48.6**	**49.1**	**38.9**	**27.0**	**25.9**	**17.8**	**14.2**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Calculation Sheet

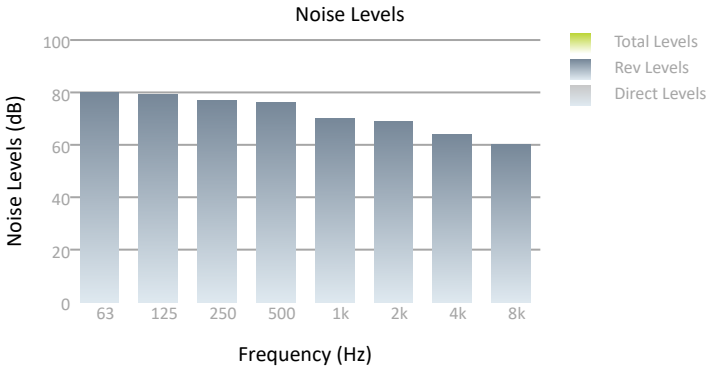
Plantroom to 102-104 Market Street - NSR1

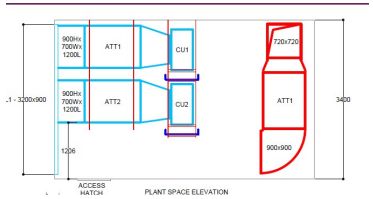
		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Internal Receiver Noise									
Internal Receiver Noise - Plantroom									
Total Sound Pressure Level (dB)		**80.1**	**79.1**	**77.1**	**76.1**	**70.1**	**69.1**	**64.1**	**60.1**
Diffusivity - Cd									
Composite R' of structural elements									
Facade Wall - Louvre									
Element Area (m2)	3.2								
Facade Area	3.2								
Radiating Lw		**69.1**	**67.1**	**64.1**	**59.1**	**48.1**	**49.1**	**46.1**	**43.1**
10 log (S)									
		5.1	*5.1*	*5.1*	*5.1*	*5.1*	*5.1*	*5.1*	*5.1*
Directivity Correction - Dc									
		-2.0	*-2.0*	*-2.0*	*-2.0*	*-2.0*	*-2.0*	*-2.0*	*-2.0*
Adiv - Geometrical Divergance									
		-23.5	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*	*-23.5*
Aatm - Atmospheric Absorption									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.5*
Agr - Ground Attenuation									
		3.0	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*
Abar - Barrier Attenuation									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver									
External Receiver - 102-104 Market Street - NSR1									
Sound Pressure, Lp:		**51.6**	**48.2**	**45.1**	**40.1**	**29.1**	**30.0**	**27.0**	**23.7**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Wasabi, Market Street, Manchester

Reference	Plantroom
Description	EF1 & Condenser Plantroom
Target Sound Level	
Max Sound Level	
Calculated Sound Level	-
Calculated Tmf T60 (s)	0.5
Volume (m^3)	22.8





Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
EF1 - Exhaust	1	58	62	48	43	39	42	42	42
Cumulative Lp	1	77	76	74	73	67	66	61	57
Cumulative Lp	1	77	76	74	73	67	66	61	57

ACA Acoustics Limited

Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA
London Office: 3 Shortlands, Hammersmith, London, W6 8DA
w: www.aca-acoustics.co.uk

Tel: 01793 766 324
Tel: 0203 609 8733

Calculation Sheet

EF1 - Exhaust to Plantroom

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - EF1 - Exhaust								
Sound Power Levels	**74.0**	**82.0**	**71.0**	**72.0**	**71.0**	**66.0**	**61.0**	**57.0**
Bend Loss								
	-1.0	*-2.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*
Silencer								
	-7.0	*-12.0*	*-16.0*	*-22.8*	*-26.6*	*-18.8*	*-13.9*	*-9.0*
Bend Loss								
	-2.0	*-3.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*	*-3.0*
End Reflection - Rect Flush								
	-4.5	*-1.7*	*-0.5*	*-0.2*	*0.0*	*0.0*	*0.0*	*0.0*
Grille Lw to Lp Direct								
Lw grille (dB)	59.5	63.3	48.5	43.0	38.3	41.1	41.1	42.0
LPdirect (dB)	**54.1**	**58.8**	**44.9**	**40.1**	**36.0**	**39.1**	**39.1**	**40.0**
	-5.5	*-4.4*	*-3.6*	*-2.9*	*-2.3*	*-2.0*	*-2.0*	*-2.0*
Lw (dB)								
InLink Output	**59.5**	**63.3**	**48.5**	**43.0**	**38.3**	**41.1**	**41.1**	**42.0**
Lw to LpRev (Src In Room)								
Lw (dB)	59.5	63.3	48.5	43.0	38.3	41.1	41.1	42.0
LpRev (dB)	**56.3**	**60.0**	**45.3**	**39.8**	**35.1**	**37.9**	**37.9**	**38.8**
	-3.2	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*
Arithmetic Sum								
Result	**56.3**	**60.0**	**45.3**	**39.8**	**35.1**	**37.9**	**37.9**	**38.8**
Grille Lw to LpRev								
Log Sum								
LPdirect (dB)	54.1	58.8	44.9	40.1	36.0	39.1	39.1	40.0
LpRev (dB)	56.3	60.0	45.3	39.8	35.1	37.9	37.9	38.8
Result	**58.4**	**62.5**	**48.1**	**42.9**	**38.6**	**41.6**	**41.6**	**42.5**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Internal Receiver Noise								
Internal Receiver Noise - Plantroom								
Reverberant Field, LPrev	**58.4**	**62.5**	**48.1**	**42.9**	**38.6**	**41.6**	**41.6**	**42.5**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Calculation Sheet

CU1 - Condenser to Plantroom

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - CU1 - Condenser										
Sound Power Levels		**79.0**	**78.0**	**76.0**	**75.0**	**69.0**	**68.0**	**63.0**	**59.0**	**Row A**
Direct Field Corrections										
Q Factor - Plane										
Distance to Listener (m)	1.0									
InLink Input		79.0	78.0	76.0	75.0	69.0	68.0	63.0	59.0	From Row A
OutLink Output		**71.0**	**70.0**	**68.0**	**67.0**	**61.0**	**60.0**	**55.0**	**51.0**	**Row B**
		-8.0	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	
Reverberant Field Correction										
Internal Receiver RA - Plantroom										
Equipment Sound Levels		79.0	78.0	76.0	75.0	69.0	68.0	63.0	59.0	From Row A
Reverberant Noise Level in Room		**75.8**	**74.8**	**72.8**	**71.8**	**65.8**	**64.8**	**59.8**	**55.8**	**Row C**
		-3.2	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	
Cumulative Lp										
OutLink Output		71.0	70.0	68.0	67.0	61.0	60.0	55.0	51.0	From Row B
Reverberant Noise Level in Room		75.8	74.8	72.8	71.8	65.8	64.8	59.8	55.8	From Row C
Result		**77.0**	**76.0**	**74.0**	**73.0**	**67.0**	**66.0**	**61.0**	**57.0**	
Internal Receiver Noise										
Internal Receiver Noise - Plantroom										
Reverberant Field, LPrev		**77.0**	**76.0**	**74.0**	**73.0**	**67.0**	**66.0**	**61.0**	**57.0**	

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

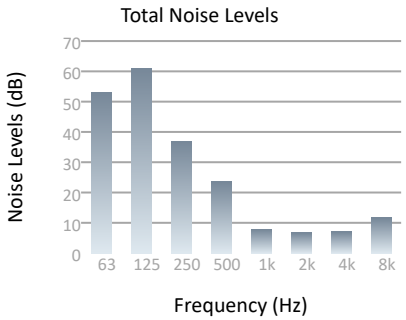
Calculation Sheet

CU2 - Condenser to Plantroom

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Noise Source									
Noise Source - CU2 - Condenser									
Sound Power Levels	**79.0**	**78.0**	**76.0**	**75.0**	**69.0**	**68.0**	**63.0**	**59.0**	**Row A**
Direct Field Corrections									
InLink Input	79.0	78.0	76.0	75.0	69.0	68.0	63.0	59.0	From Row A
OutLink Output	**71.0**	**70.0**	**68.0**	**67.0**	**61.0**	**60.0**	**55.0**	**51.0**	**Row B**
	-8.0	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	
Reverberant Field Correction									
Internal Receiver RA - Plantroom									
Equipment Sound Levels	79.0	78.0	76.0	75.0	69.0	68.0	63.0	59.0	From Row A
Reverberant Noise Level in Room	**75.8**	**74.8**	**72.8**	**71.8**	**65.8**	**64.8**	**59.8**	**55.8**	**Row C**
	-3.2	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	*-3.2*	
Cumulative Lp									
OutLink Output	71.0	70.0	68.0	67.0	61.0	60.0	55.0	51.0	From Row B
Reverberant Noise Level in Room	75.8	74.8	72.8	71.8	65.8	64.8	59.8	55.8	From Row C
Result	**77.0**	**76.0**	**74.0**	**73.0**	**67.0**	**66.0**	**61.0**	**57.0**	
Internal Receiver Noise									
Internal Receiver Noise - Plantroom									
Reverberant Field, LPrev	**77.0**	**76.0**	**74.0**	**73.0**	**67.0**	**66.0**	**61.0**	**57.0**	

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Project Name	Wasabi, Market Street, Manchester
Project Reference	260622
Reference	102-104 Market Street - NSR2
Description	Proposed Flats
Noise Limit	50
dBA	45



Calculated Lp at Receptor

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
SF1 - Inlet	1	53	61	37	24	8	7	7	12

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Calculation Sheet

SF1 - Inlet to 102-104 Market Street - NSR2

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Noise Source								
Noise Source - SF1 - Inlet								
Sound Power Levels	**76.0**	**88.0**	**73.0**	**72.0**	**70.0**	**65.0**	**61.0**	**56.0**
Silencer								
	-5.0	*-9.0*	*-17.0*	*-26.8*	*-37.3*	*-31.1*	*-26.7*	*-16.9*
End Reflection & Directional Directivity	*-7.4*	*-5.9*	*-6.9*	*-9.5*	*-12.7*	*-15.0*	*-15.0*	*-15.0*
Dc - Reflections & Directivity								
	6.0	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*
Adiv - Geometrical Divergance								
	-19.6	*-19.6*	*-19.6*	*-19.6*	*-19.6*	*-19.6*	*-19.6*	*-19.6*
Aatm - Atmospheric Absorption								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.3*
Agr - Ground Attenuation								
	3.0	*1.4*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*
Abar - Barrier Attenuation								
	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver								
External Receiver - 102-104 Market Street - NSR2								
Sound Pressure, Lp:	**53.0**	**60.9**	**37.0**	**23.5**	**7.9**	**6.7**	**7.1**	**11.6**

ACA Acoustics Limited
Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA Tel: 01793 766 324
London Office: 3 Shortlands, Hammersmith, London, W6 8DA Tel: 0203 609 8733
Manchester Office: Colony, 5 Piccadilly Place, Manchester, M1 3BR Tel: 0161 327 1681
w: www.aca-acoustics.co.uk

Appendix B

Noise Control Treatment

ACA acoustics

Wasabi, Market Street, Manchester

Attenuator Schedule

Reference	Location	Description	Insertion Losses (dB)							
			63	125	250	500	1k	2k	4k	8k
ATT1-CU1	CU1 Exhaust	600L 50% Free Area	3	5	10	15	20	15	13	8
ATT2-CU2	CU2 Exhaust	600L 50% Free Area	3	5	10	15	20	15	13	8
ATT3-EF1	EF1 Exhaust	900L 40 % Free Area c/w Melinex	7	12	16	23	27	19	14	9
ATT4-SF1	SF1 Inlet	900L 40% Free Area	5	9	17	27	41	33	28	17

Notes:
1. All dimensions in mm
2. Performance shown as static insertion loss. Dynamic insertion loss performance allowing for airflow generated noise is shown on the relevant calculation sheet.
3. Selections are nominal and the successful supplier should ensure their proposal achieves the minimum required static and dynamic insertion loss performance.

ACA Acoustics Limited

Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA
London Office: 3 Shortlands, Hammersmith, London, W6 8DA
w: www.aca-acoustics.co.uk

Tel: 01793 766 324
Tel: 0203 609 8733

Schedule of Noise Control Treatments

Reference	Location	Description	Insertion Losses (dB)							
			63	125	250	500	1k	2k	4k	8k
AL1	Plantroom	Noico Standard 150mm Acoustic Louvre	2	3	4	8	13	11	9	8

ACA Acoustics Limited

Head Office: 12 Sheep Street, Highworth, Wiltshire, SN6 7AA
London Office: 3 Shortlands, Hammersmith, London, W6 8DA
w: www.aca-acoustics.co.uk

Tel: 01793 766 324
Tel: 0203 609 8733