

CSG

acoustics

EAT ITALIAN LTD
UNIT 3, 39-41 PARKER STREET

PLANT NOISE IMPACT ASSESSMENT
CSGA-C2010-T1

15th December 2023

PREFACE

Project	Eat Italian Restaurant
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1 INTRODUCTION

CSG Acoustics Ltd has been appointed by Carolyn Reid of Eat Italian Ltd to undertake an external plant noise assessment to support a planning application for fixed plant equipment at Unit 3, 39–41 Parker Street, City Tower, Manchester, M1 4BT.

The proposals include the fit out of the commercial unit into a new restaurant space which includes new ventilation, kitchen extract and air conditioning units.

In light of the above a noise assessment is required in accordance with the Manchester City Council planning policy. A noise impact assessment report (appended to this report) has previously been provided by Cundall (Acoustic Consultant) in July 2020 and the report details the site, noise survey and plant noise limits based on the Local Authority planning policy.

The assessment includes:

- Plant Noise Limits – taken from Cundall report;
- Prediction and assessment of plant noise levels at the closest worst-affected noise sensitive property (NSR).

This report is technical in nature therefore, to assist the reader, explanations of the relevant terminology are presented in Appendix A.

2 EXISTING / PROPOSED SITE

The proposed location of the restaurant is in a busy City Centre location and the external air conditioning condensers (ECU01 and ECU02) are to be located to the rear of the unit. All other equipment is venting out the front of the unit at high level.

The following new plant is proposed:

Table 2.1: Proposed Plant Details

Reference Number	Unit type	Quantity	Manufacturer	Model Number	Sound Power Level dB (A)
HRU01	Heat Recovery Unit	1	Samsung	AN100JSKLNK	37 (Casing Breakout)
SF01	Kitchen Supply Fan	1	Systemair	MUB016	43 (Casing Breakout)
KF01	Kitchen Extract Fan	1	Systemair	MUB016	43 (Casing Breakout)
WCF01	WC Extract Fan	1	Systemair	MUB025	41 (Casing Breakout)
ECU-01	Condenser Unit	1	Samsung	AC052RXADKG/EU	62
ECU-02	Condenser Unit	1	Samsung	AC140R/EU	64

Figure 2.2 below shows the plant internal layout terminating at the front façade of the restaurant (Parker Street).

Full noise data in octave bands can be found in Appendix B.

All the fans supplying and extracting from the restaurant will be fitted with in duct acoustic attenuation.

As shown in figure 2.1 below:

Figure 2.1: Acoustic Attenuator Schedule

Item	System Reference	Code	Suffix	DWG	L1	L2/ID	W	H	Vol	PD	Wt	No.		Performance, dB							
					mm	mm	mm	mm	m³/s	Pa	kg	Off.		63	125	250	500	1k	2k	4k	8k
1	ATT01 SF/01 FAI	PLP	G	A13G	600	300			0.3	15	16	1	IL	3	10	15	24	30	30	28	24
2	ATT02 SF/01 SUPPLY	PLP	G	A13G	900	300			0.3	15	21	1	IL	4	12	19	29	34	34	32	28
3	ATT03 HRU FAI	PL	G	A13G	600	300			0.3	5	10	1	IL	1	2	6	15	20	15	14	10
4	ATT04 HRU EXHAUST	PL	G	A13G	600	300			0.3	5	10	1	IL	1	2	6	15	20	15	14	10
5	ATT05 HRU EXTRACT	PLP	G	A13G	900	300			0.3	15	21	1	IL	4	12	19	29	34	34	32	28
6	ATT06 HRU SUPPLY	PLP	G	A13G	900	300			0.3	15	21	1	IL	4	12	19	29	34	34	32	28
7	ATT07 EF/02 EXHAUST	PL	G	A13G	600	150			0.05	5	6	1	IL	1	2	6	16	23	19	17	12
8	ATT08 EF/02 EXTRACT	PL	G	A13G	600	150			0.05	5	6	1	IL	1	2	6	16	23	19	17	12
9	ATT09 EF/01 EXHAUST	PLP	GM	A13G	900	300			0.3	15	21	1	IL	4	13	16	23	26	24	26	24
10	ATT10 EF/01 EXTRACT	PLP	GM	A13G	1200	300			0.3	15	26	1	IL	6	16	20	28	29	27	30	27

Figure 2.2: Plant Internal Layout and Acoustic Attenuation

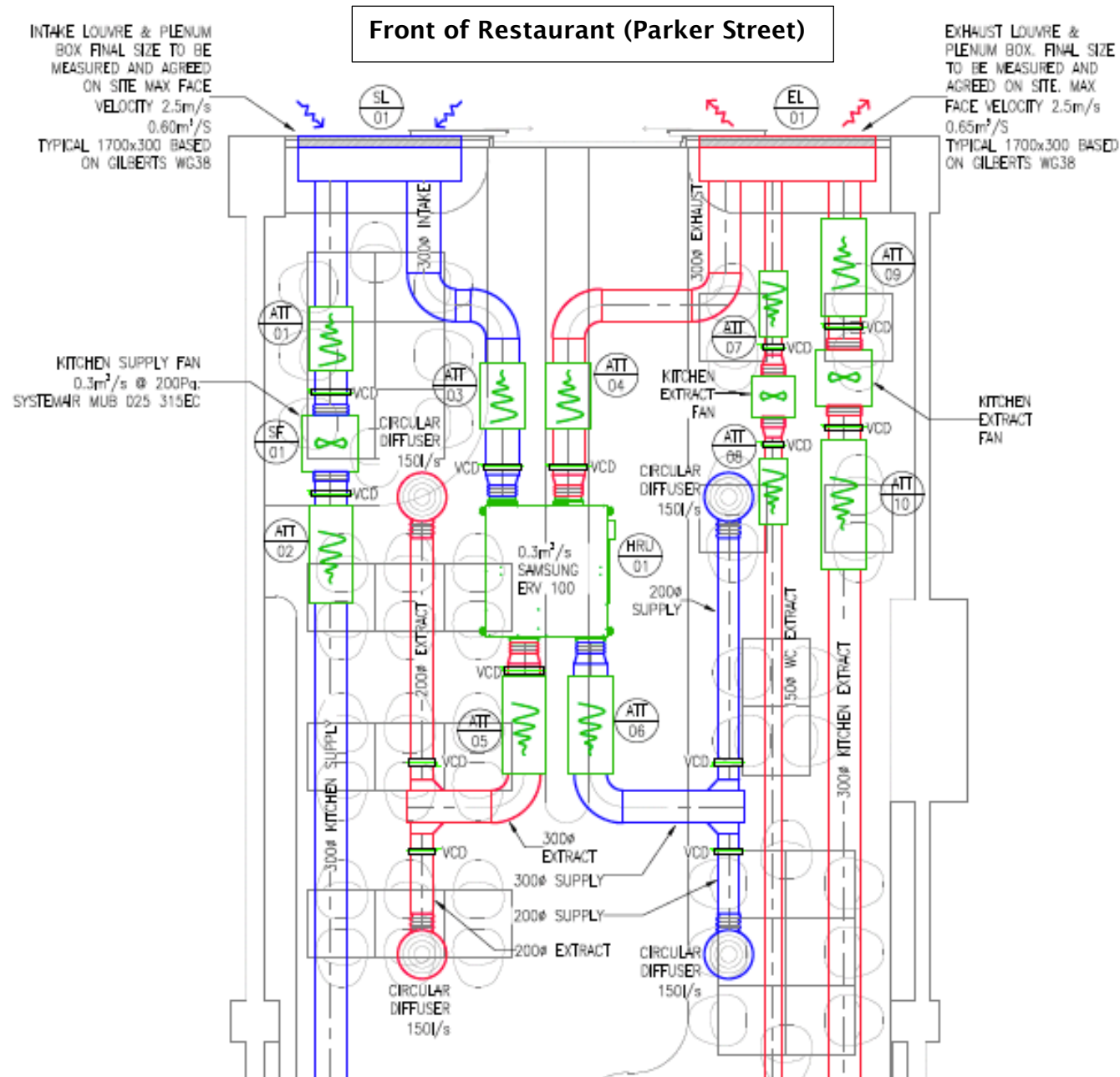
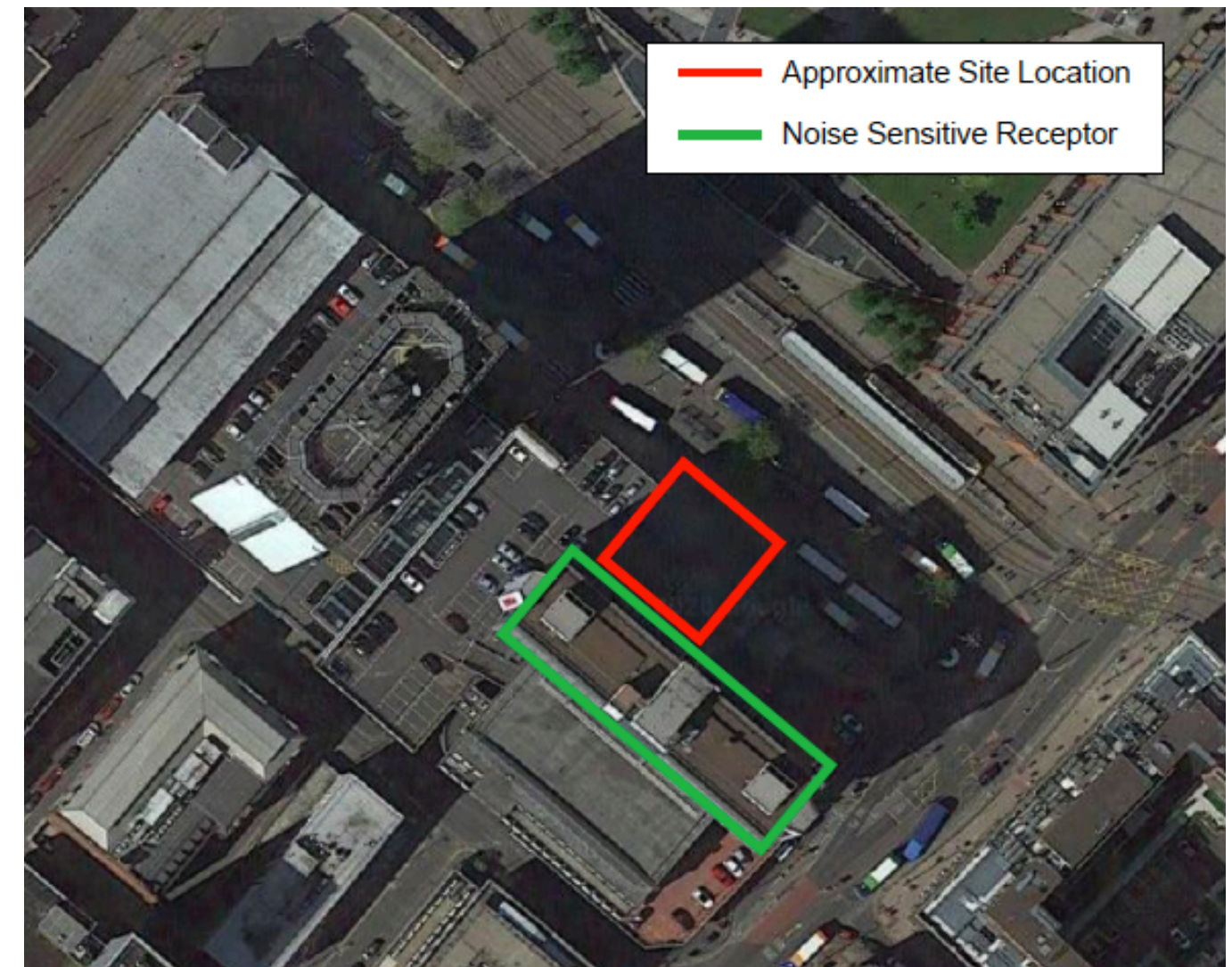


Figure 2.3: Site Layout Plan and NSR location



As identified in the Cundall Noise Impact Assessment report the nearest sensitive receiver to the proposed new plant is the Mercure Hotel windows located above the position of the restaurant.

Figure 2.4 shows the position of the restaurant and NSR windows (assumed to be at least 10m from the plant terminations). The Restaurant sits under an overhang and the intake, extract and condenser units to the rear of the unit are all screened from the NSR by local architecture.

3 GUIDANCE AND CONSULTATION

This assessment has been undertaken in accordance with National and Local planning policy for the Manchester City Council and relevant British Standards.

National Planning Policy is presented in Appendix B of this document.

3.1 LOCAL PLANNING POLICY

Manchester City Council Core Strategy

The Core Strategy Development Plan Document 2012 –2027 (the Core Strategy) was adopted by the City Council in July 2012. It is the key document in Manchester's Local Development Framework and sets out the core development principles relating to noise.

The Core Strategy refers to British Standard BS4142:2014 as a suitable assessment method. The assessment method is based on the difference between the measured background sound level without the influence of any industrial noise source and the ‘rating level’ of the industrial source, at the receiver location.

The background sound level ($L_{A90,T}$) is the sound level existing in the absence of the ‘specific sound level’ at the receiver location. The specific sound level ($L_{Aeq,Tr}$) from the industrial source can be subject to a certain weighting (penalty) where it displays an identifiable character (such as tonality, impulsivity, intermittency or otherwise distinctive features) to provide a ‘rating level’ ($L_{Ar,Tr}$).

Criteria

The Manchester City Council Policy states the following for noise from fixed plant equipment:

Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a ‘rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.

4 PLANT NOISE ASSESSMENT

This report is to support a planning application at Unit 3, 39–41 Parker Street, which includes proposals for external fixed plant and plant venting externally.

4.1 PLANT NOISE LIMITS

The Noise Impact Assessment carried out by Cundall (as detailed in attached report), included a noise survey to establish the existing background noise levels and plant noise limits.

Table 4 of the Cundall report details the noise survey results and subsequent plant noise limits in line with the Local Authority criteria.

Based on the Cundall survey and the Local Authority requirements, Table 5.1 presents the proposed plant noise limit in accordance with BS4142:2014 and Manchester City Council Planning Policy.

Table 4.1: Plant Noise Emission Limits Based on Measured L_{A90} , (Free-field) dB

Period	Lowest Measured Existing Background Level ($L_{A90,15min}$)	Plant Noise Limit (L_{Ar})
Day (07:00–23:00)	57 dB	52 dB
Night (23:00–0700)	57 dB	52 dB

Note that the limits suggested above are rating levels (L_{Ar}) and as such any design should consider the acoustic characteristics of the plant items in line with BS4142:2014.

It should be noted that the proposed units do not display characteristics whereby the acoustic corrections should be applied and as such no correction will be applied in this assessment.

Should any other items of plant be installed as part of the development, the cumulative noise from all items should not exceed the limits stated in Table 5.1.

4.2 EXTERNAL PLANT NOISE IMPACT ASSESSMENT

Noise data of the proposed plant used in this assessment can be found in Appendix B.

Calculations based on the manufacturer noise data and proposed acoustic attenuation have been undertaken. The duct lengths, bends and terminations have been taken in to account in the predictions. Table 4.2 to Table 4.5 presents the noise data and predicted noise levels for the front and rear of the unit.

Table 4.2: Plant Noise Levels – Front (Parker Street)

Plant Assessment		Octave Band Centre Frequency, dB re 2 x 10 ⁻⁵							dBA
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Samsung HRU (Intake)	Sound Power Levels (L _w)	57	57	56	55	54	52	49	59
Samsung HRU (Exhaust)		57	57	56	55	54	52	49	59
Kitchen Supply		33	49	53	58	62	62	55	66
Kitchen Extract		33	49	53	58	62	62	55	66
WC Extract		27	41	42	43	47	49	47	54

Table 4.3: Plant Noise Planning Demonstration – Front (Parker Street)

Plant Noise Predictions		Octave Band Centre Frequency, dB re 2 x 10 ⁻⁵							dBA
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Samsung HRU	Predicted SPL 2 1m from restaurant facade	48	51	50	44	42	40	35	48
Kitchen Supply		21	21	25	24	23	23	18	29
WC extract		0	18	19	14	14	21	21	26
Kitchen Extract		8	19	25	26	28	30	21	33
Plant Noise Level at 1m from façade of Restaurant		48	51	50	44	42	41	35	48

Table 4.4: Plant Noise Levels – Rear (Service Corridor)

Plant Assessment		Octave Band Centre Frequency, dB re 2 x 10 ⁻⁵							dBA
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Samsung Condenser AC052	Sound Power Levels (L _w)	35*	43	61	60	58	53	47	64
Samsung Condenser AC140		38*	44	62	61	60	55	50	62
Combined Sound Power		40	47	65	64	62	57	52	66

*Estimated – No manufactures data

Table 4.5: Plant Noise Planning Demonstration – Rear (Service Corridor)

Plant Noise Predictions	Octave Band Centre Frequency, dB re 2 x 10 ⁻⁵							dBA
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Source Level	40	47	65	64	62	57	52	66
Power to Pressure	-11	-11	-11	-11	-11	-11	-11	-11
Distance Loss (approx. 10m)	-20	-20	-20	-20	-20	-20	-20	-20
Screening	-5	-5	-5	-5	-5	-5	-5	-5
Surface Correction	+6	+6	+6	+6	+6	+6	+6	+6
Plant Noise Level at 1m from NSR	10	17	35	34	32	27	22	36

As seen in Table 4.3 and 4.5 the predicted level of the new plant items is **48dBA** at 1m from the front of the restaurant and **36 dBA** at 1m from the facade of the NSR at the rear of the restaurant. Note that the predictions have been made using conservative assumptions of screening and distance loss for demonstration of compliance.

The levels predicted are significantly below the plant noise limits and the existing lowest measured background noise levels at the NSR and therefore predicted to meet the requirements of the Local Authority.

5 CONCLUSION

CSG Acoustics Ltd has been appointed by Carolyn Reid of Eat Italian Ltd to undertake an external plant noise assessment to support a planning application for new fixed plant equipment at Unit 3, 39–41 Parker Street, Manchester.

The proposals include the fit out of the commercial unit into a new restaurant space which includes new ventilation, kitchen extract and air conditioning units.

The assessment has been carried out in accordance with national planning guidance and the requirements of the Manchester City Council planning policy, and is based on a noise survey conducted by Cundall (Acoustic Consultants).

A prediction of the noise at the worst affected noise sensitive property has been undertaken in line with BS4142 and the operation of the plant would be considered to have a low impact on the noise climate surrounding the site.

Plant noise levels are predicted to be significantly below the plant noise limits and therefore meet the requirements of the Local Planning Authority.

Assuming the noise limits are met and with respect to the principles of the National Planning Policy Framework, the predicted noise levels will be at the LOAEL (Lowest Observed Adverse Effect Level).



APPENDICES

APPENDIX A: GLOSSARY OF TERMS

Decibel (dB) – The unit used to describe sound. A logarithmic scale is used to describe sound pressure levels and sound power levels. The logarithms used are to base 10; hence, an increase of 10dB in sound pressure level corresponds to a doubling in perceived loudness of the sound.

Sound Power Level (SWL) – This is a product of the source alone and is independent of its surroundings. It is a measure of the amount of sound power output measured in decibels.

Sound Pressure Level (SPL) – This is a function of the source and its surroundings and is a measure of the sound pressure at a point in space. The sound pressure measured or reported can be influenced by room/mounting conditions and the distance that the measurement is taken.

Octave Bands – The human ear is sensitive to sound over a range of approximately 20 Hz to 20 KHz and is generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum is divided into frequency bands and the sound pressure level is measured in each band. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it.

"A" Weighting – A number of frequency weightings have been developed to imitate the ear's varying sensitivity to sound of different frequencies. The most commonly used weighting is the "A" weighting. The "A" weighted SPL can be measured directly or derived from octave or one-third octave band SPLs. The result is a single figure index which gives some idea of the subjective loudness of the sound, but which contains no information as to its frequency content.

Intermittency and Time-Weighting – The degree of annoyance caused by a noise also depends on its duration and intermittency of a noise. Intermittent, impulsive or repetitive noises tend to be more annoying than continuous noises. Various time-weightings have been derived to measure sounds of differing intermittences and these can be measured directly on modern equipment. The most common time-weightings in use are as follows:-

L_{90} This is the sound pressure level exceeded for 90% of the measurement period. It is widely used to measure background noise levels.

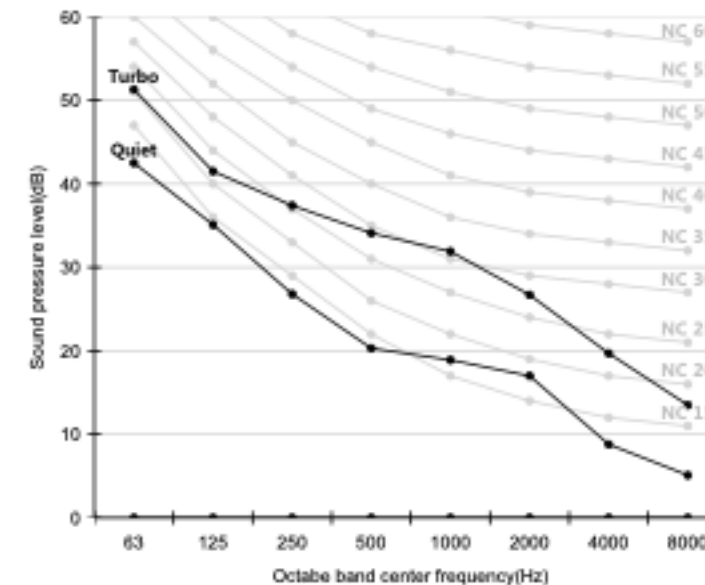
L_{eq} The equivalent continuous noise level is often used to measure intermittent noise. It is defined as the notional steady noise level that would contain the same acoustic energy as the varying noise. Because the averaging process used is logarithmic, the L_{eq} level tends to be dominated by the higher noise levels measured.

APPENDIX B: MANUFACTURERS NOISE DATA

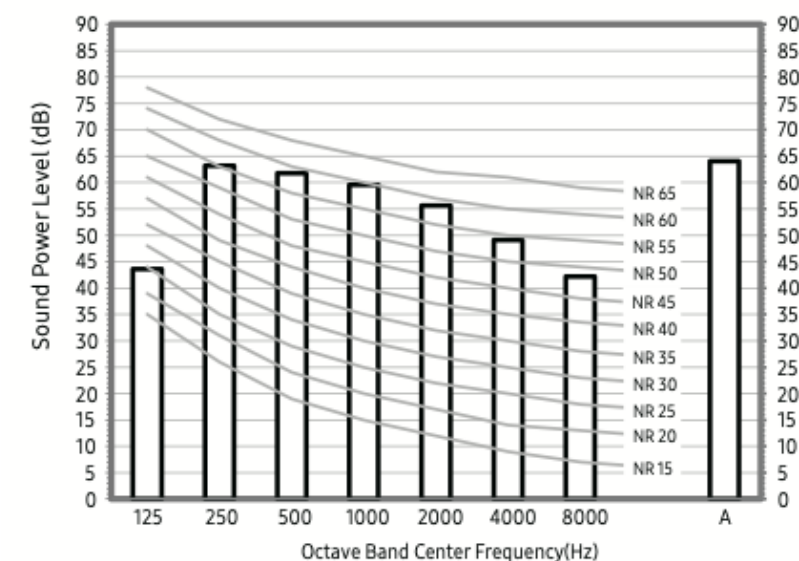
Samsung HRU

NC curve

1) AN100JSKLKN



Samsung External Condensers



Kitchen Supply and Kitchen Extract Fan – MUB025 x 2

Sound power level		63	125	250	500	1k	2k	4k	8k	Total
Inlet	dB(A)	33	49	53	58	62	62	55	45	66
Outlet	dB(A)	34	50	54	59	63	63	56	46	68
Surrounding	dB(A)	11	29	28	27	32	34	23	10	38
Sound pressure level at 3m (20m ² Sabine)	dB(A)	-	-	-	-	-	-	-	-	31
Sound pressure level at 3m free field	dB(A)	-	-	-	-	-	-	-	-	17

WC Extract – MUB016 x 1

Sound power level		63	125	250	500	1k	2k	4k	8k	Total
Inlet	dB(A)	25	40	41	42	45	47	46	32	52
Outlet	dB(A)	27	41	42	43	47	49	47	33	54
Surrounding	dB(A)	<10	24	24	15	19	24	19	<10	30
Sound pressure level at 3m (20m ² Sabine)	dB(A)	-	-	-	-	-	-	-	-	23
Sound pressure level at 3m free field	dB(A)	-	-	-	-	-	-	-	-	<10

APPENDIX C: PLANNING POLICY AND GUIDANCE

National Planning Policy

National Planning Policy Framework and the Noise Policy Statement for England

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

The NPPF contains four aims, which are set out at paragraph 123 in Section 11 of the document, titled *Conserving and enhancing the natural environment*:

“Planning policies and decisions should aim to:

Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them cause of changes in nearby land uses since they were established; and

Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

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

“NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.”

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

The NPSE presents the Noise Policy Aims as:

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

- Avoid significant adverse impacts on health and quality of life;*
- Mitigate and minimise adverse impacts on health and quality of life; and*
- Where possible, contribute to the improvement of health and quality of life.”*

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

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

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

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

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

Local Planning Policy

British Standard 4142

British Standard (BS) 4142: 2014 *Methods for rating and assessing industrial and commercial sound* is intended to be used to assess whether noise from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises is likely to give rise to complaints from people residing in nearby dwellings.

The procedure contained in BS4142 for assessing the likelihood of complaints is to compare the “*specific sound level*”, which is the measured or predicted sound level from the source in question immediately outside the dwelling, with the background sound level.

NOTE 1 of paragraph 8.1.4 states that when determining the background sound level for the assessment;

“A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value”

BS4142 provides various corrective methods depending on if the sound source is tonal (0 to +6dB), impulsive (0 to +9dB) or distinctive (0 to 3dB), which can be applied.

“The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level. BS4142 states:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB 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.

NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.”

In the context of the NPPF, it is considered that a situation between where BS4142 suggests a low impact (specific sound levels below the measured background noise level) and an indication of significant adverse impact (specific sound levels exceed +10dB above the measured background noise level) would equate to the Lowest Observed Adverse Effect Level (LOAEL).

Noise levels that are more than 10dB below the measured background would equate to the No Observed Effect Level (NOEL).

Setting plant noise limits in accordance with the requirements of the LA will result in noise levels between the LOAEL and the NOEL.

This assessment is carried out over a one-hour period for the daytime and a fifteen-minute period for the night-time. Day or night are not defined in the standard but it states that night should cover the times when the general adult population are preparing for sleep or are actually sleeping. For the purposes of this assessment, it is assumed that daytime and night-time are 07:00 to 23:00 hours and 23:00 to 07:00 hours respectively.

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

39-41 Piccadilly Plaza, Manchester

Noise Impact Assessment Report

City Tower Unit Trust

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Doc Ref: 1027102-RPT-AS-001
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Report title	Noise Impact Assessment Report	1027107

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Principal author	Checked by	Verified by
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1.0

Introduction

1.0 Introduction

Proposals are for the change of use from existing sui generis (casino) to a flexible space (to include A1, A2 and A3). The unit is situated at 39 – 41 Piccadilly Plaza directly adjacent to Piccadilly Gardens.

Cundall has been commissioned by City Tower Unit Trust to stipulate limiting levels for new items of services plant associated with the new development.

The purpose of this report is:

- To assess existing noise levels around the site based upon previous noise surveys undertaken by Cundall at the Piccadilly / City Tower complex
- To set cumulative noise emission limits at the nearest noise sensitive receptors for items of plant associated with the new development, in line with relevant British standards and the requirements of Manchester City Council as outlined in their Planning & Noise Technical Guidance document.

2.0

Assessment criteria

2.0 Assessment criteria

This section of the report outlines the key legislation and guidance relevant to the assessment of noise for a development of this type.

2.1 Noise Policy Statement for England

The National Planning Policy Framework (NPPF) was originally published in March 2012 and amended in February 2019. The NPPF is part of government reform to make the planning system less complex and more accessible, and to promote sustainable growth. It replaced existing national planning policies such as Planning Policy Guidance PPG24: Planning and Noise.

The NPPF states:

“170 - Planning policies and decisions should contribute to and enhance the natural and local environment by;

*e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or **noise pollution** or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;”*

and

“180 - 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;”

2.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and amended in July 2019. The NPPF is part of government reform to make the planning system less complex and more accessible, and to promote sustainable growth. It replaces existing national planning policies such as Planning Policy Guidance PPG24: Planning and Noise.

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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;"

2.3 Planning Practice Guidance

In March 2014 Planning Practice Guidance for noise was published. This online document advises on how planning can manage potential noise impacts in new development.

2.4 Local Authority noise policy guidance

Section 3.6.1.5.1 of the Manchester City Council (MCC) 'Planning & Noise - Technical Guidance' document (December 2015) relates to noise limits for building services plant and states:

"Many of the noise complaints Environmental Health receive about noise from plant, equipment and machinery specifically concern the character of the noise emitted. Any noise assessment needs to consider not only the overall level of noise emitted but also its particular characteristics. The noise assessment should be based on BS 4142: 2014 and any application for fixed plant, equipment or machinery must demonstrate that:

Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."

2.5 BS 4142:2014

BS 4142:2014 provides methods for rating and assessing sound of an industrial and/or commercial nature, which includes sound from industrial and manufacturing processes, fixed services plant, sound generated by the loading/unloading of goods and sound from mobile plant / vehicles associated with industrial / commercial premises (e.g. fork-lift trucks).

Typically, the greater the difference between the background and rating level, the greater the magnitude of impact, although BS 4142 emphasises that this is highly context-specific.

As a guideline, BS 4142 states that:

- *A difference (between the background and rating level) of around +10 dB or more is likely to be indicative of significant adverse impact, depending on context*
- *A difference (between the background and rating level) of around +5 dB or more is likely to be indicative of adverse impact, depending on context*
- *The lower the rating level relative to the background level, the less likely it is that the specific sound will have an adverse impact*
- *Where the rating level does not exceed the background level, this is an indication that the specific sound will have a low impact, depending on context*

BS 4142:2014 also outlines ratings penalties for sound based on a subjective assessment of its characteristics:

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 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

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. Subjectively, this can be converted to a penalty of 3 dB for impulsivity that is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."

3.0

Site context

3.0 Site context

The proposed development is situated at 39 – 41 Piccadilly Plaza directly adjacent to Piccadilly Gardens.

The site is bounded by Parker Street to the north east, Portland Street to the south east, New York Street to the south west and Mosley Street to the north west.

Proposals are for the change of use from existing sui generis (casino) to a flexible space (to include A1, A2 and A3).

It is understood that the nearest residential receptor is the Mercure Manchester Piccadilly Hotel.

An aerial photograph indicating the approximate site location (red) and nearest noise sensitive receptor (green) is presented in Figure 1 below:

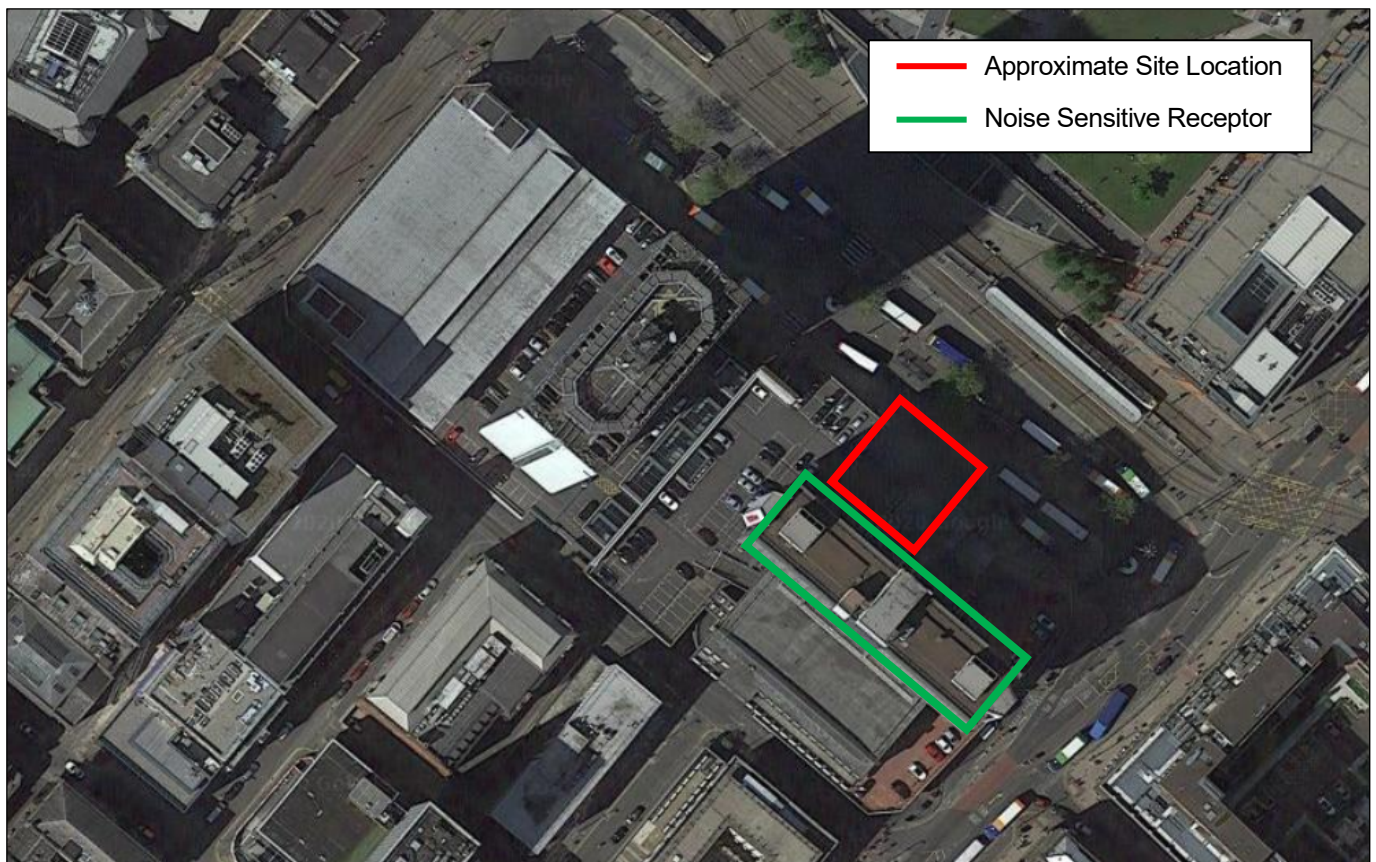


Figure 1 - Site and receptor locations

4.0

Environmental noise survey

4.0 Environmental noise survey

4.1 Approach

It is usual practice to undertake environmental noise surveys to help determine prevailing background noise levels, however this has not been possible due to current COVID-19 guidance; any noise measurements undertaken at present would not be representative of normal background noise levels as a result of reduced road traffic and leisure / retail operations around Piccadilly Gardens.

In line with current guidance¹ published by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA), this report has instead been informed by existing survey data available from a previous noise assessment carried out by Cundall on the second-floor podium level of the existing City Tower in Manchester, currently occupied by car parking spaces.

4.2 Survey summary

Attended noise measurements were carried out on the 14 and 15 June 2018 at three positions around the site. The timings of these measurements include the likely worst-case quietest daytime and night-time periods at the nearest noise-sensitive location.

A mark-up of the approximate noise measurement positions (in blue) is shown in Figure 2 below.

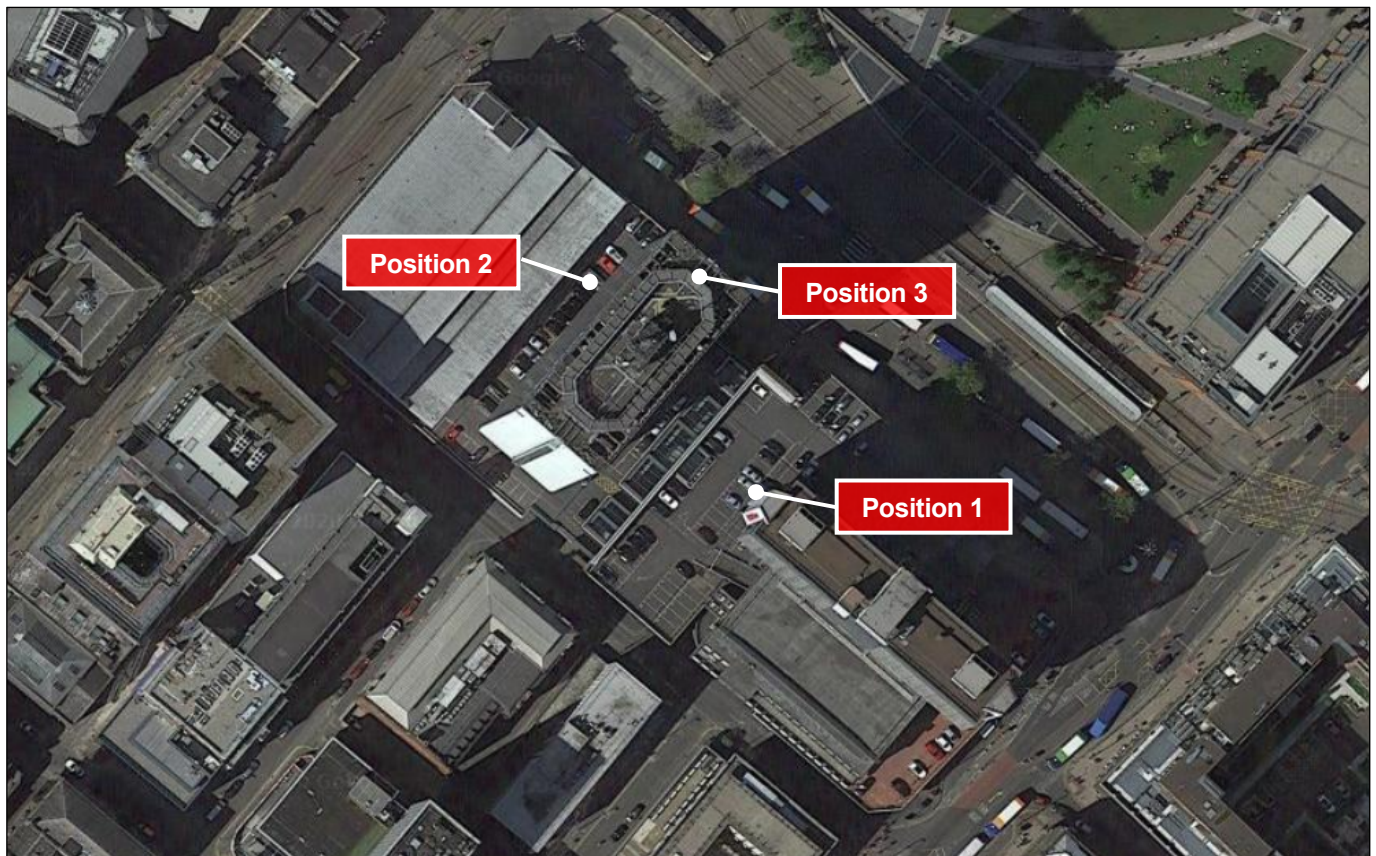


Figure 2 - Noise measurement positions mark-up

¹ 'Joint Guidance On The Impact Of Covid-19 On The Practicality And Reliability Of Baseline Sound Level Surveying And The Provision Of Sound & Noise Impact Assessments (Version 4)' accessed on 29/06/2020 at

<https://www.ioa.org.uk/sites/default/files/Joint%20Guidance%20On%20the%20Impact%20of%20Covid.IOA%20ANC%20V4.pdf>

4.3 Weather conditions

The weather conditions during the site visits were recorded and are presented in the table below.

Date	Period	Weather conditions
14/06/2018	06:00 – 07:00 hours	Dry and cool, 16°C, 7 m/s southern wind, full cloud coverage
	21:00 – 00:00 hours	Dry and cool, 17°C, 5 m/s south-western wind, clear sky
15/06/2018	07:00 – 10:00 hours	Dry and cool, 15°C, 7 m/s western wind, full cloud coverage

Table 1 - Summary of weather conditions during the site visits

4.4 Survey details

Attended noise measurements have been undertaken using a Casella CEL 63X (serial number 1211404) precision sound level meter in accordance with BS 7445-1: 2003. The meter was field calibrated before and after each set of measurements, with no significant drift witnessed. Calibration certificates for all equipment are available upon request.

Monitoring equipment was set up by competently trained Cundall staff and all measurements have been reported for free-field conditions. A table presenting the subjective impressions from site during each site visit is shown below.

Measurement position	Date and time		Noise contributions
1	14/06/2018	06:00 – 07:00 hours	Generally quiet. Faint hum from air conditioning units operating nearby. Some distant noise from construction site on ground floor level to the west of the City Tower, and occasional Metrolink horns.
		23:00 hours – midnight	Some music from the Piccadilly Plaza. Buses and Metrolink tram movements, with occasional tram horns.
2		21:00 – 23:00 hours	Generally quiet. Background noise levels dominated by a hum from air conditioning units operating nearby.
3	15/06/2018	08:00 – 10:00 hours	General noise from the Piccadilly Plaza, including contributions from busses, Metrolink trams and people passing by. Occasional contributions were noted from tram horns, as well as cars driving, reversing and parking near the measurement location. No audible plant.

Table 2 - Summary of measurement periods and subjective impressions for noise contributions on site

4.5 Survey results

A summary of the average ambient noise levels recorded during the survey is detailed within Table 3. The values within the table are the logarithmically averaged $L_{Aeq,15min}$, the maximum $L_{AFmax,15min}$ and the range of $L_{A10,15min}$ and $L_{A90,15min}$ values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Measurement date and time		Position	Average dB $L_{Aeq,15min}$	Max dB $L_{AFmax,15min}$	Range dB $L_{A10,15min}$	Range dB $L_{A90,15min}$
14/06/2018	05:59 – 06:59h	1	60	69	60 – 61	59
14/06/2018	23:08 – 00:08h		58	70	59 – 60	57 – 58
14/06/2018	21:05 – 23:02h*	2	57	72	58 – 60	52 – 56
15/06/2018	07:03 – 10:00h	3	65	85	66 – 69	59 – 62

*The last interval measurement is 2:30 mins shorter due to battery failure on the sound level meter.

Table 3 - Summary of attended noise measurement data

5.0

Plant noise emission limits

5.0 Plant noise emission limits

As detailed in Section 2.4, Manchester City Council stipulate the following criteria with respect to noise emissions from new building services plant installations:

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

5.1 Limiting noise levels

Measurements taken at Position 1 are those considered most representative of background levels at the Mercure Hotel. The original survey did not take any daytime measurements at this position. It has therefore been decided to apply background limits taken at night-time to daytime hours. Given that background levels are higher during daytime hours, setting limits based upon night-time levels is considered a heavily onerous approach which will see risk of adverse noise effects during daytime hours achieved by default.

Table 4 below summarises the existing background noise levels measured at the site along with limiting noise levels for all new items of services plant, when measured at 1 m from the nearest noise sensitive receptor.

Period	Lowest measured existing background level, $L_{A90,15min}$ dB*	Cumulative limiting noise level for all items of building services plant, $L_{A,T,r}$ dB
Daytime (07:00 – 23:00 hours)	57	52
Night-time (23:00 – 07:00 hours)	57	52

Table 4 - Limiting plant noise levels

The above limit is applicable to the cumulative noise level from all new items of plant when running under normal operation. Where applicable, acoustic feature corrections should be applied to the specific plant noise level to account for any distinguishable acoustic characteristics (e.g. tonality, impulsivity, intermittency).

5.2 Services Plant Proposals

At this stage, the services plant associated with the commercial unit is unknown. It is therefore not possible to carry out an assessment of compliance with the limits stipulated above. It is envisaged that this report will be updated to incorporate an assessment of proposed plant noise once HVAC requirements are known and selections have been made.

6.0

Conclusions

6.0 Conclusions

Prevailing noise levels at 39 – 41 Piccadilly Plaza have been identified based upon historical noise data through a survey undertaken by Cundall. The positions selected for this previous survey are considered to be representative of levels at the nearest noise sensitive receptor, the Mercure Hotel.

Limiting noise levels have been provided for external noise impacts at existing nearby noise-sensitive receptors, in order to minimise the potential for adverse noise effects in line with Local and National Planning Policy. These limits should see that the level of amenity is maintained in the surrounding area.

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