

1 PORTLAND STREET, MANCHESTER - TAKE-AWAY RESTAURANT

NOISE IMPACT ASSESSMENT

**On behalf of:
Players Cafe Ltd**

Report No: P19-436-R01v1
November 2019

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CONTENTS

1.0	INTRODUCTION	1
2.0	NOISE SURVEY	2
3.0	NOISE ASSESSMENT	4
4.0	SUMMARY AND CONCLUSION	8
FIGURE 1 – SITE LOCATION AND NOISE MEASUREMENT POSITION		9
APPENDIX I: NOISE UNITS & INDICES		10
APPENDIX II: NOISE SURVEY RESULTS		12

1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Players MCR Ltd to carry out a noise impact assessment in connection with a proposed planning application for change of use from A1 retail to A3 restaurant with ancillary A5 takeaway at 1 Portland Street, Manchester. The proposed restaurant/take-away will be open in the late evening.
- 1.2 The noise assessment has included:
- An inspection of the surrounding area;
 - Measurement of noise levels in the late evening;
 - Assessment of the potential impact from noise break out of the proposed premises.
 - Assessment of potential noise impact from proposed fixed plant;
 - Recommendation of appropriate mitigation measures.
- 1.3 The building is located at the junction Portland Street, Piccadilly (A6) and Newton Street in Manchester. The development comprises the change of use of a ground floor unit of the 1 Portland Street building from a retail unit to a restaurant/take-away. The location of the building is shown in Figure 1.
- 1.4 The site is located in a predominantly commercial area in the centre of Manchester opposite Piccadilly Gardens. There are a number of other late-night premises in the area including public houses/bars, take-aways, and restaurants.
- 1.5 The nearest noise sensitive 'receptor' is the Ibis hotel on Portland Street (formerly Portland Hotel/Thistle Hotel) adjacent to the site. The hotel extends to the rear of the premises on Hope Street.
- 1.6 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 NOISE SURVEY

- 2.1 A noise survey was carried out on Thursday 29 August 2019 between approximately 21:40 to 23:00 hours.
- 2.2 The purpose of the noise survey was to establish the prevailing ambient/background noise climate of the area during a late evening period when noise levels are likely to be at their lowest and potential noise impact at its highest.
- 2.3 Noise levels were measured at one location representative of the nearest noise sensitive receiver to the proposed fixed plant. The measurement location is shown in Figure 1.
- 2.4 The noise survey was carried out using a Bruel & Kjaer 2250 'Type 1' sound level meter (s/n: 3011706). Calibration checks were carried out both before and after the measurement periods with no variance in levels noted. Frequency analysis was also carried out. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.4 metres above the ground.
- 2.5 The weather conditions during the noise survey were dry, mild and calm (<2 m/s) and considered suitable for the purposes of the survey and subsequent assessment.
- 2.6 The results of the noise survey are summarised in Table 1 and the full results are shown in Appendix II.

Table 1: Summary of measured noise levels (dB)

Location	L _{Aeq,15 mins}	L _{A90,15 mins}
Hope Street	57 – 60	53 – 54

- 2.7 These are fairly high levels of noise that reflect the city centre location. During the proposed periods of operation, the noise climate of the area was due to pedestrians, trading noise break out from bars/venues within the city centre area and traffic on the surrounding road network.
- 2.8 For assessing the impact of noise from building services equipment, it is necessary to consider the existing background noise climate in octave bands. The measured octave band values corresponding to the lowest background noise level measured within the proposed trading hours are shown in Table 2 below.

Table 2: Lowest measured background noise level (dB)

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Measured L ₉₀ octave band values	58	57	52	50	48	43	39

- 2.9 Hoare Lea Acoustics undertook an assessment previously for the site (report ref: REP1-S-10-06168-BD-18022016-R1). Noise levels measured by Hoare Lea in February 2016 were similar to the noise levels that we measured on Hope Street in August 2019. Hoare Lea Acoustics also carried out measurements on Portland Street in the late evening/night with the lowest measured noise levels being 55 dB L_{Aeq,5mins} and 53 dB L_{A90,5mins}.

3.0 NOISE ASSESSMENT

- 3.1 As requested by the client the assessment consider the noise impact in the late evening (i.e. up to 23:00 hours) when the premises will be trading.

Potential Trading Noise Break Out

- 3.2 Hepworth Acoustics has carried out numerous noise assessments in connection with proposed restaurants in the past and we have a library of noise levels for a variety of restaurant styles. We understand that the proposed restaurant/take-away will feature music at modest background levels only. We have measured the following trading noise levels during busy weekend evening trading periods in similar premises:

Table 3: Adopted trading noise levels (dB)

Period	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1k	2k	4k	
Busy weekend evening (L_{eq})	64	69	70	75	73	70	62	77

- 3.3 Table 4 below shows the calculated noise level from trading noise break-out through the premises shopfront outside the adjacent hotel on Portland Street. The shopfront is a double glazed facade. Therefore, the calculation considers the noise break out through the building façade with corrections for distance and barrier/line of sight attenuation.

Table 4: Calculated trading noise break-out (dB)

Location	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Outside hotel bedrooms on Portland Street	29	26	28	26	12	2	-5

- 3.4 The calculated noise levels outside the hotel bedrooms are low, and in terms of broadband noise would equal 25 dB $L_{Aeq,T}$. This is significantly below the lowest existing noise levels measured on Portland Street in terms of ambient (i.e. $L_{Aeq,T}$) and background (i.e. $L_{A90,T}$) levels. We therefore conclude that there will be no significant impact associated with noise trading break-out from the premises.
- 3.5 Nevertheless, some recommendations are proposed below to the premises to ensure noise break out is adequately controlled.

Recommendations

- 3.6 We recommend the following noise control/mitigation measures are carried out;
- Careful and appropriate design of the loudspeaker system to be installed in the premises is recommended in order to minimise noise levels in the entrance areas i.e. by orientating loudspeakers away from entrances, and by careful selection of loudspeakers etc;
 - Loudspeakers should be installed on appropriate resilient mounts;
 - Entrance doors should be fitted with effective perimeter seals and should not be pinned open during the late evening.

British Standard 4142: 2014

- 3.7 BS4142: 2014 'Methods for rating and assessing industrial and commercial sound', provides a suitable methodology for rating and assessing sound of an industrial and/or commercial nature, including sound from fixed installations which comprise mechanical and electrical plant and equipment. The standard requires the sound from a specific source (in L_{Aeq}) to be compared with the existing background sound level (L_{A90}) outside residential locations. The standard also puts weight on the importance on the context in which the sound will occur.
- 3.8 A 'character correction' is added to the specific sound level where 'certain acoustic features can increase the significance of impact' at the residential locations. Penalties ranging from 2 – 9 dB are added where the sound sources are considered tonal or impulsive or 'otherwise are readily distinctive against the residual acoustic environment'.
- 3.9 BS 4142 states that if the rated sound level exceeds the L_{A90} background sound level by around 10 dB or more it 'is likely to be an indication of significant adverse impact'. An excess of around 5 dB over the background sound level is 'likely to be an indication of an adverse impact'.
- 3.10 The lower the rating level is relative to the measured background sound level, the less likely it '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'.
- 3.11 BS 4142 also states in respect of background sound levels *"that values are reliable and suitably represent the particular circumstances and periods of interest... the objective is not simply to*

ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.

Kitchen Ventilation Plant Noise Assessment

- 3.12 We understand that Manchester City Council require that any noise from the external plant achieves a BS4142 rating noise level of 5dB (L_{Aeq}) below the existing background (L_{A90}) in each octave band at the nearest noise sensitive location.
- 3.13 The client has provided the manufacturer’s noise output data for the proposed (Maxfan Compac 50) externally mounted equipment. The broadband noise emission levels of the two proposed fans are as follows:

Table 5: Kitchen Ventilation Plant Noise Levels (dB)

Fan	Sound Pressure Level in dB at 3 metres
Extract – Outlet	71
Supply – Inlet	72

- 3.14 The character of the noise from the new equipment is broadband and generally steady/continuous in nature. Therefore, an acoustic character penalty is not warranted.
- 3.15 The most exposed noise sensitive location are Ibis hotel bedrooms approximately 25 metres from the duct terminations to the rear of the premises on Hope Street.
- 3.16 The likely resulting plant noise levels outside these dwellings have been calculated, with appropriate allowances for duct breakout, duct terminations, directivity, distance and barrier attenuation, and are shown in Table 6. The representative background sound level is also shown.

Table 6: Calculated noise levels from kitchen extract equipment (dB)

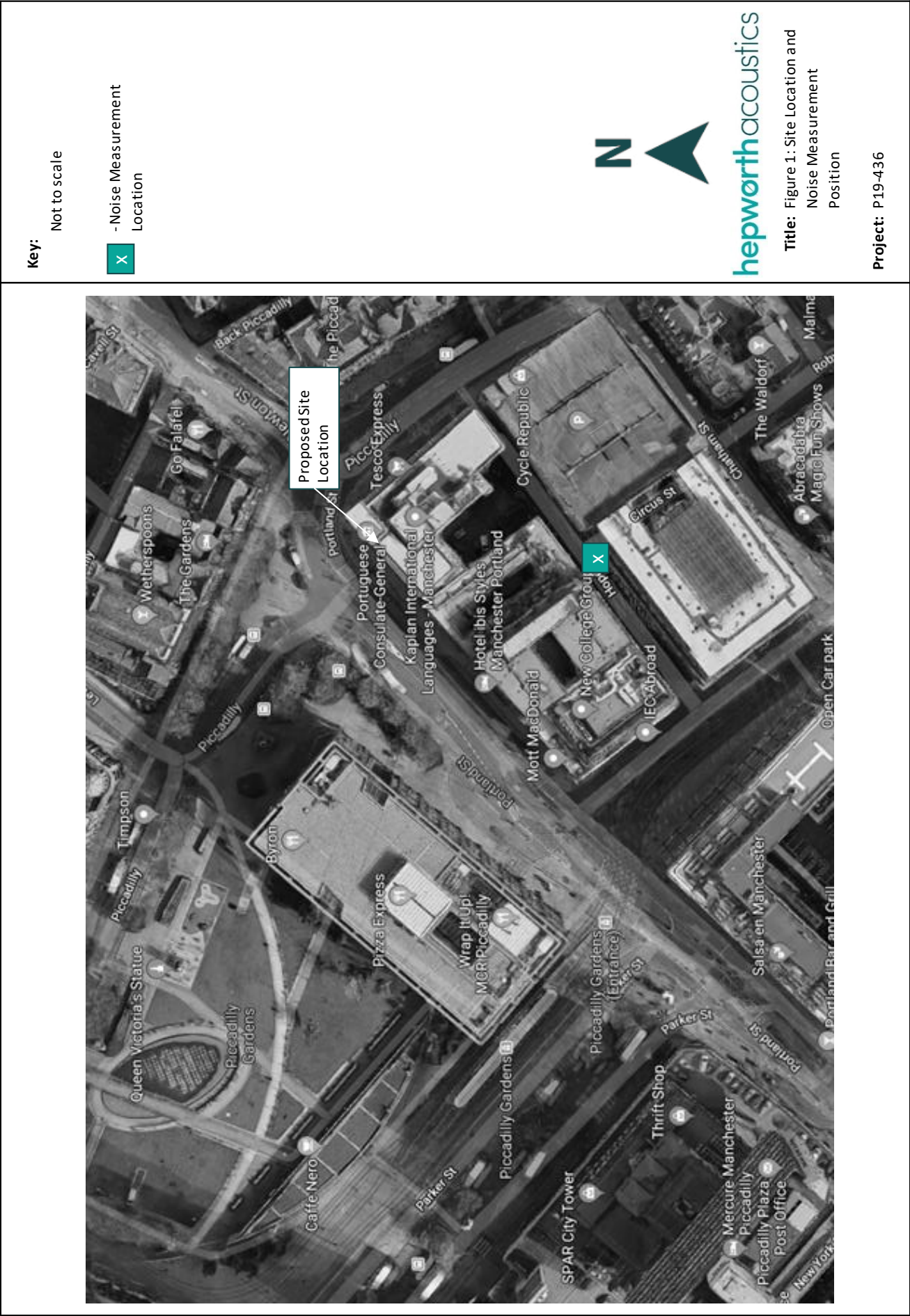
	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1k	2k	4k	
Noise Outside Hotel Bedroom Windows	46	41	32	20	21	7	-1	29
Background Noise Level	58	57	52	50	48	43	39	53
Difference	-12	-16	-20	-30	-27	-36	-38	

- 3.17 The octave band noise levels shown in Table 6 are all well within the ‘5 dB below’ design criterion.

- 3.18 We therefore conclude that there will be no unacceptable noise impact from operation of the new kitchen ventilation equipment and no specific noise control measures are warranted.

4.0 SUMMARY AND CONCLUSION

- 4.1 Hepworth Acoustics was commissioned by Players MCR Ltd to assess the potential noise impact of the proposed restaurant/take-away at 1 Portland Street, Manchester
- 4.2 This assessment has involved carrying out a baseline noise monitoring survey and evaluating potential noise impacts associated with the proposed restaurant.
- 4.3 The potential impact of noise breakout from the trading area of the proposed restaurant has been assessed. This has shown that operation of the restaurant is not expected to result in any significant noise impact at hotel. Nevertheless, some measures are recommended in respect of the control of trading noise.
- 4.4 Noise calculations have been carried out for the proposed kitchen ventilation equipment the results of which demonstrate that there will be no significant noise impact at the hotel resulting from the operation of the new equipment.



Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.

L_{Amax} This is the maximum A-weighted noise level that was recorded during the monitoring period.

L_{A90} This is the A-weighted noise level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

Appendix II: Noise Survey Results

Date(s): Thursday 29 August 2019

Equipment: B&K 2250 'Type 1' sound analyser (serial no. 3011706) with tripod and calibrator

Weather: Dry, mild and calm (<2 m/s)

All levels in dB(A)

Location : Outside Portland Hotel bedroom windows on Hope Street

Time		Measured Noise Levels (dB)			Comments
Start	End	L _{Amax}	L _{Aeq}	L _{A90}	
21:38	21:53	87.7	58.5	52.6	Nearby fixed plant, occasional pedestrians, distant road traffic
21:54	22:09	71.9	57.6	53.4	
22:13	22:28	73.5	59.7	53.9	
22:28	22:43	77.7	58.7	53.0	
22:44	22:59	72.8	56.6	52.6	