

**591A STOCKPORT ROAD, MANCHESTER - PROPOSED WEDDING AND CONFERENCE VENUE:
NOISE IMPACT ASSESSMENT**

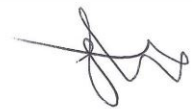
**On behalf of:
Wholelight Limited**

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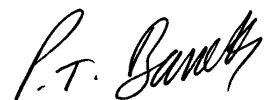
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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Wholelight to carry out a noise impact assessment in connection with a proposed planning application for a wedding and conference venue at 591a Stockport Road in Manchester.
- 1.2 The proposed venue is located to the rear of 591a Stockport Road and is used currently as storage for Longsight Bargains and for production of headstones by 'Elegant Memorials'. The single storey building is of substantial brick construction with a flat timber joist and asphalt roof. The plans show that there will be ancillary spaces including offices and WC's on the northern elevation.
- 1.3 To the rear of the building is a small car park, with a railway line running to the rear. The railway line is elevated such that it runs past the site around 6-7m above ground level.
- 1.4 To the north of the site on the other side of Brook Terrace is a public car park that is also used for customers of the nearby Lidl Supermarket as well as a large banqueting and conference hall. Brook Terrace itself is a lightly trafficked road that leads to the public carpark. Also to the north is a large three storey apartment block located at the corner of Stockport Road and Brook Terrace. To the south is the service yard of the businesses that front onto Stockport Road.
- 1.5 This assessment has been carried out to determine the potential noise impact from use of the proposed venue on the occupants of the nearest dwellings located to the rear of the apartment block on Stockport Road to the north. The location and orientation of the development relative to the nearest dwellings is shown in Figure 1.
- 1.6 We understand that the main entrance will be via a lobbied entrance off Brook Terrace, and an additional VIP entrance will be located to the rear of the building away from the dwellings. Limited car parking will be offered to VIP's whilst other guests travelling by car will park in the nearby public carpark.
- 1.7 It is understood from the client that the venue will not seek a license to sell alcohol and all events will finish at 23:00. The precise nature of wedding events will naturally vary according to clients' plans and wishes, however generally traditional celebrations are anticipated with a sit-down meal in the main function room. It has however been confirmed that there is to be no live music of any kind or prominent foreground recorded music reproduction and only 'background' music will be played at modest levels.

- 1.8 Proposals for any externally mounted building services equipment, are not yet available. We have therefore recommended appropriate plant noise design limits that can be used by the M&E consultant to design the system to adequately control noise impact where plant will be mounted externally
- 1.9 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.
- 1.10 The noise assessment has included:
- An inspection of the site and surrounding area;
 - Measurement of existing baseline noise levels during an evening period;
 - Determination of appropriate plant noise design limits;
 - Assessment of potential trading noise breakout from the building envelope to the nearby dwelling; and,
 - Recommendation of appropriate noise mitigation measures.

2.0 NOISE SURVEY

Baseline Noise Survey

- 2.1 Attended noise measurements were carried out between 21:20 and 23:00 on Friday 25th February 2022. The noise measurements were taken at a location representative of the noise climate prevailing at the nearest dwellings in the apartment block to the rear of Stockport Road.
- 2.2 The noise survey location is shown in Figure 1. The noise monitoring was undertaken using a Brüel & Kjær 2260 'Type 1' Integrating Sound Level Meter (serial no. 02467016).
- 2.3 Calibration checks were carried out on the Sound Level Meter before and after the monitoring using a and no variation in the calibration level was observed. Weather conditions during the noise survey were suitable for sound level measurements, full details of the weather conditions and the equipment used can be seen in Appendix II.
- 2.4 The noise measurements were taken in 15-minute periods. Full results of the noise survey can be seen in Appendix II, and a summary of the measured noise levels is shown in Table 1.
- 2.5 The summarised data is presented as the range of measured noise levels and (in brackets) the arithmetic means for L_{Amax} and L_{A90} values and the logarithmic means for L_{Aeq} values.

Table 1: Summary of Measured Noise Levels (dB)

Location	Measured Noise Level (dB)		
	L_{Amax}	L_{Aeq}	L_{A90}
Location 1	76-82 (78)	56-62 (59)	48-53 (49)

Noise Break-out Testing

- 2.6 Some indicative acoustic testing has been carried out to determine the current sound insulation performance of the building envelope. This was undertaken using a loudspeaker to generate high levels of pink noise within the proposed function room.
- 2.7 Noise levels were measured as moving averages around the inside of the space, towards the external walls and then also outside at relevant external locations, in the direction of the nearest residences.

- 2.8 All internal noise levels were taken in octave bands at varying heights, and at least 1m from any room surface. All external noise levels were taken in octave bands at 1.5m above local ground, in free-field conditions.
- 2.9 Ambient noise levels in the absence of the tests sound source were also measured at a representative location in order to assist in correcting external noise levels for any influences of extraneous noise.
- 2.10 All sound insulation measurements were undertaken using a Bruel & Kjaer 2250 'Type 1' Integrating Sound Level Meter (serial no. 3011706). Calibration checks were carried out before and after the testing, and no variation in the calibration level was observed. The measurement microphone was fitted with a windshield.
- 2.11 The resultant noise level differences have been used for the purposes informing the noise assessment detailed in Section 4.0.

3.0 ACOUSTIC DESIGN CRITERIA

Control of Music Noise

3.1 There are no national government-approved British Standards relating specifically to applicable methods and criteria for assessment of music noise attributable to wedding venues and similar. However, Manchester City Council *Planning & Noise Technical Guidance 2015* does provide guidance for assessing the potential impact from entertainment noise at dwellings.

3.2 To ensure that the development is suitable for potential use within the context of the planning permission being sought, the Manchester City Council guidance states that:

“...applicants and consultants should predict the noise impact of a proposed entertainment venue using noise levels that are representative of those found in ‘typical’ venues of the kind being applied for.”

3.3 Given this consideration, in Section 4.0 we have used evening trading noise levels from a typical busy bar establishment with only background music playing as the basis for our assessment.

3.4 The Manchester City Council guidance also provides the following considerations where an entertainment venue is structurally detached from the nearest dwellings:

“Demonstrate that music noise from the proposal will not be ‘audible’ in nearby residential properties, assuming that the residential properties in question have their windows open.

‘Entertainment noise (L_{Aeq}) should be controlled to 10dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location”

3.5 To account for the potential low frequency noise elements often present in entertainment noise, the Manchester City Council Guidance also stipulates the following criteria for new developments:

“Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively”

3.6 Whilst these criteria are for new residential developments and are therefore not directly applicable to the proposed venue the guidance considers that operation within these criteria would result in ‘inaudible’ or ‘virtually inaudible’ entertainment noise, which would be desirable.

3.7 Therefore, we have adopted the following noise design criteria to take into account the broadband L_{Aeq} noise levels and the 63Hz and 125Hz octave band noise levels (L_{eq}) in line with the Manchester City Council Guidance discussed above:

- The overall noise level (L_{Aeq}) should be 10 dBA lower than the measured background noise level (L_{A90}) during normal operating hours outside the nearest noise sensitive dwelling; and
- Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively.

Control of Plant Noise

3.8 For control of environmental noise from mechanical services plant the Manchester City Council Guidance states:

'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 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location'.'

3.9 British Standard 4142: 2014+A1: 2019 'Methods for rating and assessing industrial and commercial sound' (referred hereafter as BS 4142) provides methods for rating and assessing sound of an industrial and/or commercial nature experienced outside residential locations; and requires the 'rating' sound level for the operation to be compared with the L_{A90} background sound level in the absence of the operational noise.

3.10 The 'rating' level is derived based on the 'specific' L_{Aeq} sound level attributable to the operation with an 'acoustic feature' penalty added for any sound sources which result in tonal, impulsive, intermittent, or other characteristics readily distinctive against the residual acoustic environment at the residential location.

3.11 BS 4142 stipulates that impacts should be assessed over a reference time interval of 1-hour during the daytime (07:00-23:00) and 15-minutes during the night-time (23:00-07:00).

3.12 An initial estimate of the impact of the operation is determined by subtracting the background level from the 'rating' level. BS 4142 states that:

- Typically, the greater this difference, the greater the magnitude of the impact
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context
- The lower the 'rating' level is relative to the measured background level, the less likely it is that the operation 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.

3.13 On this basis, it is recommended that the combined noise level from any building services plant to be installed at the development should be controlled so as to be 5 dB lower than the prevailing background noise level (L_{A90}).

3.14 Also, where equipment is likely to result in noise having intermittent, tonal or impulsive characteristics, the L_{Aeq} noise design limits must be reduced commensurately to account for the 'acoustic feature' penalty, in line with BS 4142.

4.0 ASSESSMENT

Control of Trading Area Noise

4.1 Based on the indicative acoustic testing of the current sound insulation performance of the building envelope and the adopted trading noise levels based on noise measurements previously undertaken by Hepworth Acoustics at other venues, we have calculated predicted noise break-out level for an evening wedding event at the nearest dwellings.

4.2 The adopted trading noise levels are shown below in Table 2.

Table 2: Adopted Trading Noise Levels (dB)

Description	Octave band centre frequency (Hz)								A
	63	125	250	500	1k	2k	4k	8k	
Adopted Trading Noise Levels (L_{eq})	66	72	75	81	80	76	69	57	84

4.3 In addition, appropriate corrections for the attenuation of sound over distance have been taken into account. With respect to the nearest dwellings, a correction of 23 dB per octave has been applied based on an overall minimum distance from the venue.

4.4 On this basis, resultant noise levels during an event are predicted as set out in Table 3.

Table 3: Music Noise Predictions at Nearest Dwellings

Location	Noise Level dB								
	Octave Band Centre Frequency Hz								A
	63	125	250	500	1k	2k	4k	8k	
Adopted Trading Noise Levels	66	72	75	81	80	76	69	57	84
Calculated Noise Level at Dwellings	29	32	22	22	14	3	-8	-22	22
Lowest Measured Background (L_{90})	55	50	45	44	44	39	30	19	48
Difference	-26	-18	-23	-22	-30	-36	-38	-41	-26

4.5 Table 3 demonstrates that the calculated break-out noise levels are low and achieve the Council's noise control requirements at 63Hz and 125Hz. In addition, the noise levels meet Manchester City Council's criterion of controlling the break out of entertainment noise to at least 10 dB L_{Aeq} below the background noise level at the nearest dwellings.

- 4.6 On this basis it is considered that no special physical noise mitigation measures or sound insulation upgrades are necessary for the building and that as a consequence there is no impediment by reason of noise to allowing the proposed change of use.

Control of Plant Noise

- 4.7 We have provided suitable plant noise limits for externally mounted plant installed in line with BS 4142 guidance and Manchester City Council criterion.
- 4.8 In order to determine a representative background noise level, we have used the noise levels measured close to the nearest dwellings. As the plant will only operate during the daytime (07:00-23:00) we have determined the representative background noise level by method of statistical analysis of the L_{A90} levels that were measured over the evening survey. The adopted background level is 48 dB L_{A90} , which is the mode of the measured noise levels in line with BS 4142 guidance and this is also the lowest measured level.
- 4.9 As per the Manchester City Council guidance 5dB has been subtracted from the adopted derive the plant noise design limits at the nearest dwelling for any externally mounted plant. The plant noise limit is shown below in Table 4.

Table 4: Combined Plant Noise Limits in terms of Leq (dB)

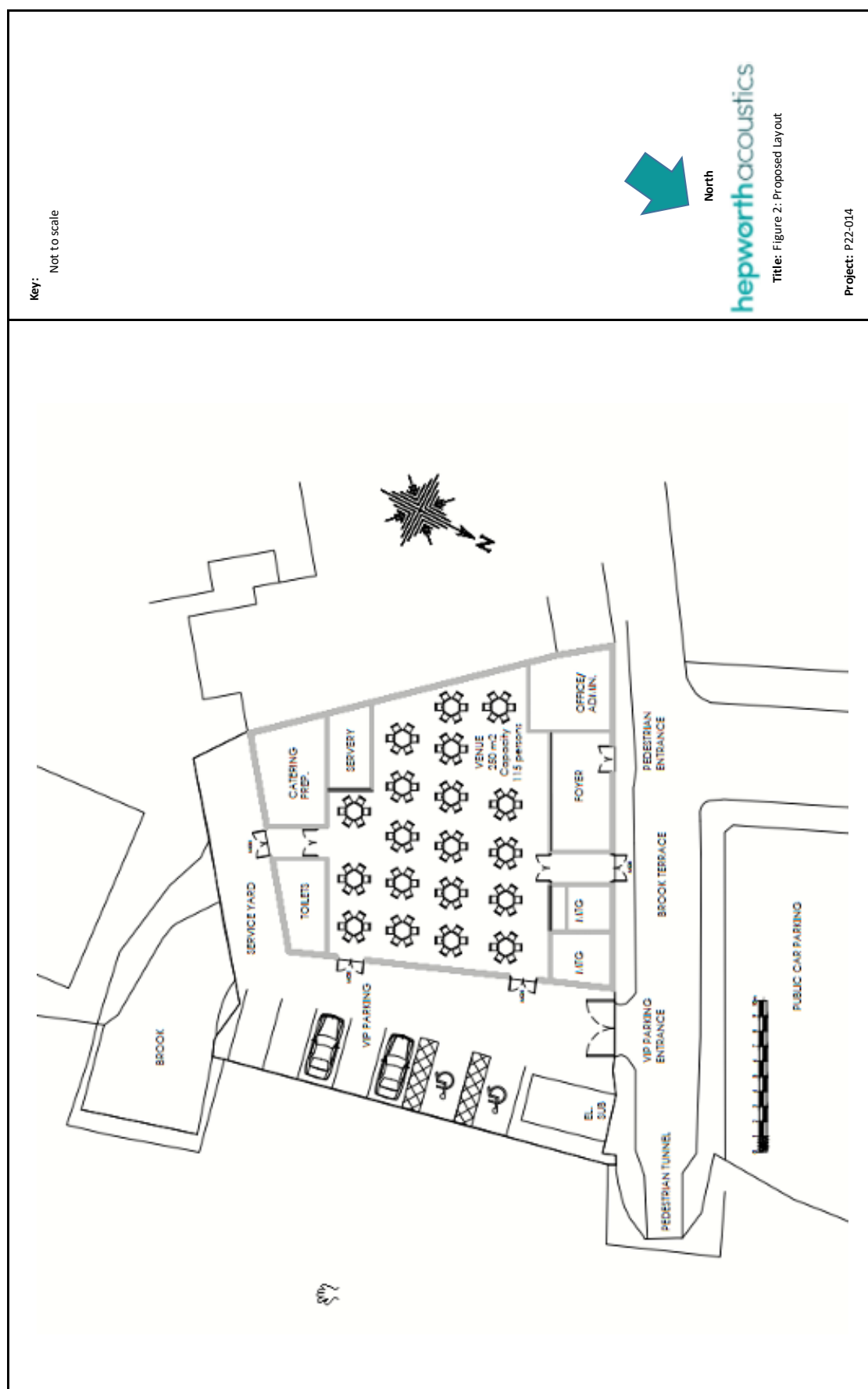
Description	Plant Noise Limit
Plant Noise Limit (Leq)	43

- 4.10 Any externally mounted plant to be installed at the development should be controlled to operate within the noise limits presented above in Table 4. This will ensure that there will be no adverse noise impact on the amenity of local residents.

5.0 SUMMARY AND CONCLUSION

- 5.1 Hepworth Acoustics Ltd was commissioned by Wholelight Limited to carry out a noise impact assessment in connection with a proposed planning application for a wedding and conference centre at 591a Stockport Road in Manchester. The venue will not seek a license to sell alcohol and the venue will not include DJ's or live music events.
- 5.2 Appropriate noise criteria have been adopted to ensure the residential amenity of the nearest dwelling adjacent to the proposed development. An environmental noise survey was carried out during the late evening in line with the proposed operating hours of the venue, the purpose of the survey was to measure the prevailing noise climate in the area.
- 5.3 An appropriate noise design limit for any externally mounted mechanical services plant have been determined based on the noise survey data and Manchester City Council requirements.
- 5.4 Trading noise break-out levels have been calculated and assessed in line with Manchester City Council guidance.
- 5.5 Our findings show that operation of the proposed venue would not result in an unacceptable noise impact at the nearest dwellings.





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.

$L_{Aeq,T}$ 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, $L_{Aeq,T}$ 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_{AFmax} This is the maximum A-weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.

$L_{A10,T}$ This is the A-weighted noise level exceeded for 10% of the time period. $L_{A10,T}$ is usually used as a measure of traffic noise.

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

Appendix II: Noise Survey Results

Date(s):	Friday 25 th February 2022
Equipment	Brüel & Kjær 2260 'Type/Class 1' sound analyser (serial no. 2467016) with tripod and associated calibrator
Weather	Dry, ~8-9°C, overcast and calm <3 m/s

All levels in dB(A)

Location 1:

Time		Measured Noise Levels (dB)			Comments
Start	End	L_{AFmax}	$L_{Aeq,T}$	$L_{A90,T}$	
21:25	21:40	79.5	61.0	52.8	Occasional train passbys, vehicles coming & going from car park, pedestrians
21:40	21:55	76.1	57.7	49.4	
21:55	22:10	79.3	57.2	49.2	
22:10	22:25	76.8	58.1	48.4	
22:30	22:45	82.4	62.2	47.8	
22:45	23:00	76.5	56.0	48.4	