

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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Piccadilly Warehouse

Environmental noise survey report

London, Manchester, Edinburgh, Birmingham, Belfast, Leeds

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Summary

Sandy Brown has been commissioned to provide acoustic advice in relation to the proposed refurbishment and redevelopment of Mindel House and 11 Bloom Street on the corner of Bloom Street and Minshull Street, Manchester.

An environmental noise survey was previously carried out at the site in 2015 and 2016.

For the 2015-16 survey, measured average ambient noise levels across the site ranged from $L_{Aeq,16h}$ 62-63 dB during the day, $L_{Aeq,8h}$ 59-61 dB on weeknights and $L_{Aeq,8h}$ 64-70 dB on weekend nights. Representative background noise levels across the site were in the range $L_{90,5min}$ 53 to 55 dB during the day and $L_{90,5min}$ 46 to 51 dB during the night. The 15th highest night-time maxima around the site were in region of $L_{AFmax,5min}$ 86-92 dB.

A further environmental noise survey has been carried out to verify the previous survey results and further quantify existing sound levels in the area. The noise survey was carried out between 12:30 on 14 March 2024 and 15:00 on 18 March 2024.

Measured ambient noise levels across the site were in the range $L_{Aeq,15min}$ 61 to 64 dB during the day, and $L_{Aeq,15min}$ 57 to 63 dB during the night.

At Minshull Street, the representative background sound levels measured during the survey were $L_{A90,15min}$ 53 dB during the daytime and $L_{A90,15min}$ 48 dB at night. The 10th highest night-time $L_{AFmax,2min}$ values each night ranged from 78-82 dB.

At Richmond Street, the representative background sound levels measured during the survey were $L_{A90,15min}$ 56 dB during the daytime and $L_{A90,15min}$ 55 dB at night. The 10th highest night-time $L_{AFmax,2min}$ values each night ranged from 79-82 dB.

The results of the 2024 survey verify the previously measured ambient and background noise levels during the day and weeknights.

The weekend night-time ambient noise level and maxima results during the previous survey were influenced by entertainment noise from nearby venues. The 2024 night-time noise levels measured were lower than the previous survey, largely due to lower entertainment noise and less pedestrian activity. Various nearby venues have closed since the previous survey, including Madison Lounge and Void nightclubs. Measurements were carried out over St Patrick's day weekend, and events took place at bars in the area. As such, the 2024 weekend night-time ambient and maxima measurement results are considered representative of potential entertainment noise and night-time activity in the area.

Data from the survey will be used to inform the design of the development with respect to atmospheric noise emissions from building services plant and environmental noise ingress through the building envelope.

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1 Introduction

Sandy Brown has been commissioned to provide acoustic advice in relation to the proposed refurbishment and redevelopment of Mindel House and 11 Bloom Street on the corner of Bloom Street and Minshull Street, Manchester.

As part of this, an environmental noise survey is required, the purpose of which is to establish the existing sound levels on and around the site.

This report presents the survey method and results.

2 Site description

2.1 The site and its surrounding

The scheme comprises two adjacent existing grade II listed buildings, Mindel House and 11 Bloom Street, both of which are five storeys tall.

The site location in relation to its surroundings is shown in red in Figure 1.

The site is bounded by Minshull Street to the north-east (shown in cyan), Richmond Street to the south-east (shown in yellow), Bloom Street to the north-west (shown in magenta) and a car park to the south-west.

The site is located in the Village area, with a high concentration of restaurants, bars and night clubs in its proximity.

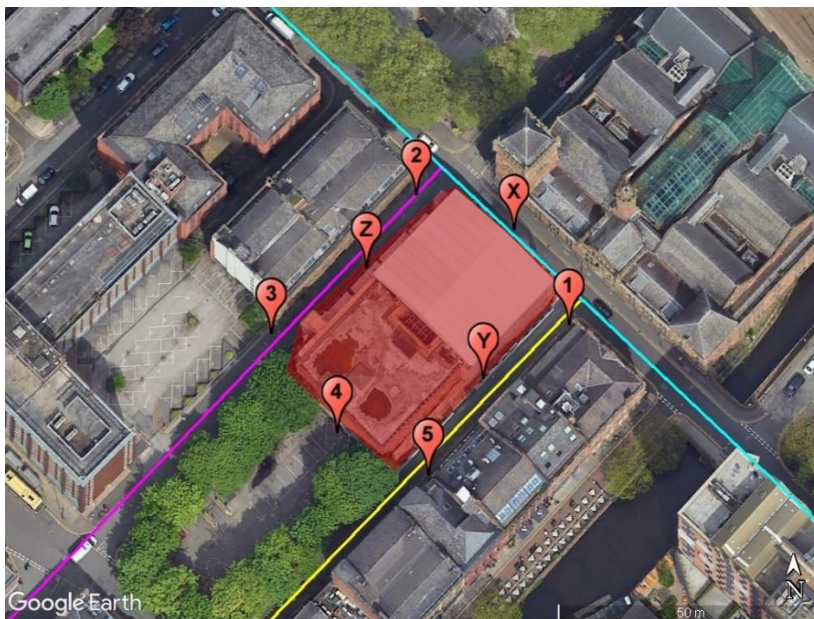


Figure 1 Aerial view of the site (Courtesy of Google Earth Pro)

2.2 Adjacent premises

The surrounding area consists of retail premises, bars, night clubs and offices. A number of restaurants, bars and clubs lie across from the site on Richmond Street. These include Velvet restaurant and hotel, The Brewers nightclub and The Church, which is a bar.

The nearest noise sensitive premises are considered to be Velvet Hotel approximately 10 m to south-east of the site on Canal Street and Cove Apartments approximately 30 m to the north-west of the site on Minshull Street.

3 Previous noise survey (2015-2016)

A noise survey was previously carried out by Sandy Brown at the site in 2015 and 2016. The full results are summarised in 16044-R01-B *Planning noise report – residential*, dated 18 January 2018.

Unattended noise monitoring was undertaken at 3 positions across the site over 12 weeks to monitor noise levels from the Madison Lounge nightclub in the basement of Mindel House between April and July 2015. As of 21 March 2024, the nightclub has been vacant for at least 5 years.

Attended sample measurements were also carried out across the site in June 2014 during the daytime and in February 2016 during the night.

The measurement positions for the previous environmental noise survey are presented in Figure 2.

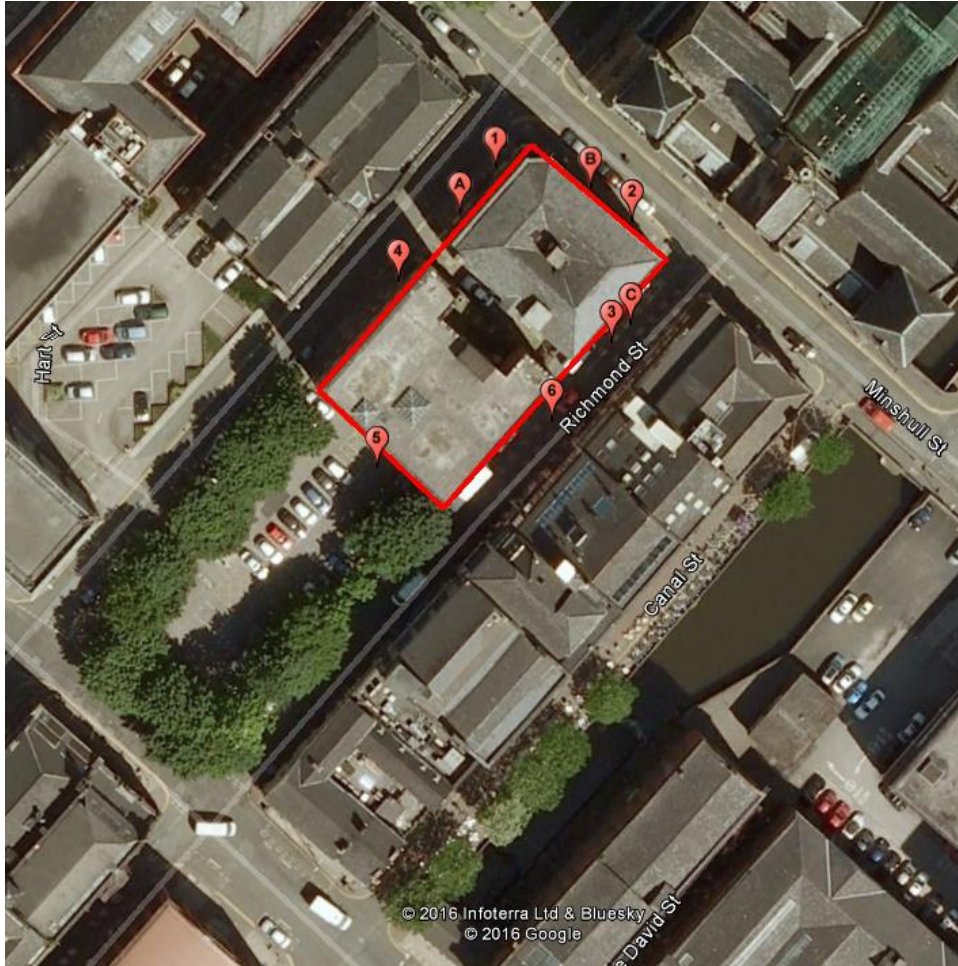


Figure 2 Previous environmental noise survey measurement positions (courtesy of Google Earth Pro)

3.1 Observations

3.1.1 Daytime attended survey (6 June 2014)

During the daytime survey carried out on 6 June 2014, the dominant noise sources were:

- Occasional road traffic along on Minshall Street and Bloom Street
- Distant road traffic along Portland Street, Aytoun Street and Chorlton Street
- Pedestrians passing
- Plant noise from the rear of a restaurant on Richmond Street
- Trams passing on Aytoun Street.

Less significant noise sources included occasional distant construction works.

3.1.2 Night time attended survey (5 February 2016)

During the night time survey carried out on 5 February 2016, the dominant noise sources were:

- Road traffic along Bloom Street and Minshull Street
- Amplified music egress from Void
- Pedestrians passing
- Plant noise from the rear of a restaurant on Richmond Street.

Amplified music egress from Madison Lounge was also audible at times. Amplified music egress was more significant via the door to the nightclub on Bloom Street and vents in the facade on Richmond Street, however efforts were made to minimise the impact from these sources on the measurements.

It should be noted that Madison Lounge nightclub and the nightclub on Bloom Street are no longer operational.

3.2 Measurement results

3.2.1 Unattended measurement results

A summary of the average ambient noise levels at each of the unattended measurement positions is provided in Table 1. The measurement positions refer to those shown in Figure 2. The results are presented as facade levels.

Table 1 Measured average ambient noise levels, April-July 2015

Measurement position	Average ambient noise level (dB)		
	Daytime $L_{Aeq,16h}$ (07:00-23:00)	Weeknight $L_{Aeq,8h}$ (23:00-07:00)	Weekend night $L_{Aeq,8h}$ (23:00-07:00)
A	62	59	70
B	64	61	66
C	63	61	64

A summary of the representative background noise levels at each of the measurement positions is provided in Table 2.

Table 2 Measured representative background sound levels, April-July 2015

Measurement position	Representative background noise level (dB)	
	Daytime $L_{90,5min}$ (07:00-23:00)	Night $L_{90,5min}$ (23:00-07:00)
A – Bloom Street	53	46
B – Minshull Street	54	47
C – Richmond Street	55	51

Based on the results from the noise survey, the maximum noise levels not exceeded more than 15 times at the various facades are as follows:

- Minshull Street - $L_{AFmax,5min}$ 86 dB
- Bloom Street - $L_{AFmax,5min}$ 92 dB
- Richmond Street - $L_{AFmax,5min}$ 86 dB
- Car park - $L_{AFmax,5min}$ 89 dB.

3.2.2 Attended measurement results

Attended measurements were performed at 3 locations around the site on 6 June 2014. The sound pressure levels recorded during these measurements are summarised in Table 3. The dominant noise sources noted during the measurements are also described.

Table 3 Sound pressure levels from attended measurements (6 June 2014)

Position	Start time	Sound pressure levels (dB)		Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	
1	16:10	61	78	Cars passing on Bloom Street, trams passing on Aytoun Street, pedestrians passing, faint plant noise
	16:15	63	78	
	16:20	61	76	
2	16:30	64	78	Cars passing on Minshull Street, pedestrians passing, road traffic noise from Aytoun Street, *motorbike passing
	16:35	63	78	
	16:40	64	85*	
3	16:45	63	75	Plant noise from back of restaurant on Canal Street, occasional cars passing on Richmond Street
	16:50	61	72	
	16:55	61	75	

The sound pressure levels recorded during the attended measurements carried out during the night of 5 February 2016 are summarised in Table 4. The dominant noise sources noted during the measurements are also described.

Table 4 Sound pressure levels from attended measurements (5 February 2016)

Position	Time	Sound pressure levels (dB)		Noise sources
		$L_{Aeq,1min}$	$L_{AFmax,1min}$	
2	23:29-23:43	64-75	72-89	Road traffic along Minshull Street, pedestrians, low frequency amplified music egress from Madison Lounge audible at times.
4	23:09-00:04	56-69	64-84	Road traffic along Bloom Street, pedestrians, low frequency amplified music egress from Madison Lounge audible at times.
5	23:10-00:01	56-67	63-74	Low frequency amplified music egress from Void night club, road traffic noise along Bloom Street, occasional car park activity.
6	23:28-23:42	58-66	64-82	Plant noise from rear of restaurant on Richmond Street, some low frequency amplified music egress from Madison Lounge audible at times, road traffic along Minshull St and occasionally along Richmond St.

4 Noise survey method (2024)

The survey included unattended and attended noise measurements.

4.1 Unattended measurements

Unattended noise monitoring was undertaken at 3 positions across the site over 5 days.

Details of the equipment used and the noise indices measured are provided in Appendix A.

The unattended measurements were taken over 15-minute periods between 12:00 on 14 March 2024 and 15:00 on 18 March 2024.

The measurement positions used during the survey are indicated in Figure 1, denoted by the letters X, Y and Z. These locations were chosen to be reasonably representative of noise levels at the site and outside the nearest noise sensitive premises.

In each location the microphone was attached to scaffolding approximately 1.5 m from the facade of the Mindel House. Each of the microphone positions were approximately 6 m above the ground and at least 3 m from any other reflective surface.

A photograph showing the unattended measurement position on Richmond Street is provided in Figure 3.



Figure 3 Unattended measurement position overlooking Richmond Street

4.2 Attended measurements

Attended sample measurements were taken at 5 locations around the site. These are indicated in Figure 1 as positions 1 to 5. The measurements were carried out during the day and night on 15 March 2024, over 5-minute periods.

At each position the microphone was mounted on a tripod approximately 1.2 m above the ground level and at least 1 m from any other reflective surface. Details of the equipment used and the noise indices measured are provided in Appendix A.

Dominant noise sources occurring during the measurements were noted.

4.3 Weather conditions

Weather conditions during the survey are described in Appendix A.

5 Noise survey results (2024)

5.1 Observations

The dominant noise sources observed at the site during the survey were from road traffic noise on Minshull, Richmond and Bloom Street. Less significant noise sources included distant road traffic, which could be heard from Aytoun Street and Chorlton Street, and pedestrian noise.

It should be noted that traffic flow was reduced to a single direction only around the site due to the hoarding at ground level, which protrudes into the road. It is expected that this led to overall marginally reduced traffic noise around the site when compared to the previous noise survey.

The unattended and attended measurements were undertaken over St Patrick's Day weekend, which is anticipated to be a busier than typical weekend for the surrounding clubs and bars.

At measurement positions near Richmond Street, externally mounted plant items and vent terminations on the rear of hotels and bars were significant noise sources. However, measurement positions were selected to minimise the influence of these sources.

5.2 Noise measurement results

5.2.1 *Unattended measurement results at position X – Minshull Street*

A graph showing the results of the unattended measurements is provided in Appendix B.

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 5. The results are presented as facade levels.

Table 5 Ambient noise levels measured during the unattended survey – Minshull Street

Date	Daytime (07:00 – 23:00)	Night (23:00 – 07:00)
	$L_{Aeq,16h}$ (dB)	$L_{Aeq,8h}$ (dB)
Thursday 14 March 2024	63 ^[1]	61
Friday 15 March 2024	64	60
Saturday 16 March 2024	63	63
Sunday 17 March 2024	61	57
Monday 18 March 2024	62 ^[1]	-
Average	63	61

^[1] Measurement not made over full period due to monitoring start and end time (the measurement on 14 March 2024 was over 10 hours, and on 18 March 2024 over 8 hours); not included in the average.

In line with BS 4142:2014+A1:2019, representative background sound levels have been determined using statistical analysis of the continuous measurements.

Daytime and night statistical analysis of representative values at position X are given in Figure 4.

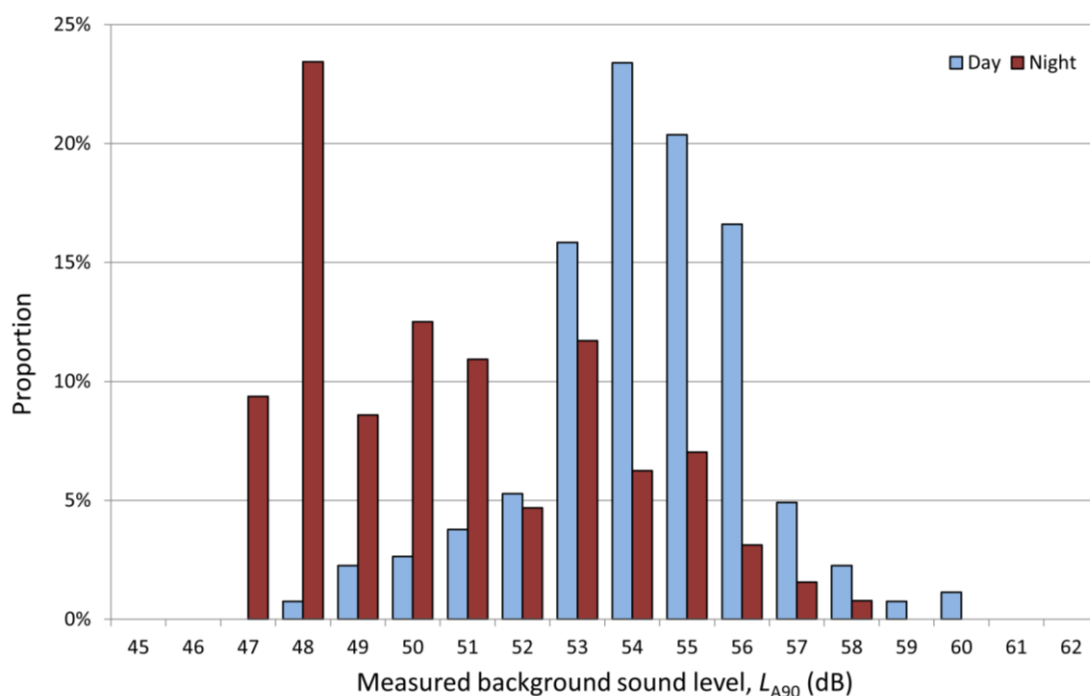


Figure 4 Statistical analysis of background sound levels at position X

From this analysis, the representative background sound levels measured during the survey were $L_{A90,15min}$ 53 dB during the daytime and $L_{A90,15min}$ 48 dB at night.

5.2.2 Unattended measurement results at position Y – Richmond Street

A graph showing the results of the unattended measurements is provided in Appendix B.

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 6. The results are presented as facade levels.

Table 6 Ambient noise levels measured during the unattended survey – Richmond Street

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Thursday 14 March 2024	61 ^[1]	62
Friday 15 March 2024	61	60
Saturday 16 March 2024	61	61
Sunday 17 March 2024	62	61
Monday 18 March 2024	60 ^[1]	-
Average	61	61

^[1] Measurement not made over full period due to monitoring start and end time (the measurement on 14 March 2024 was over 10 hours, and on 18 March 2024 over 8 hours); not included in the average.

In line with BS 4142:2014+A1:2019, representative background sound levels have been determined using statistical analysis of the continuous measurements.

Daytime and night statistical analysis of representative values at position Y are given in Figure 5.

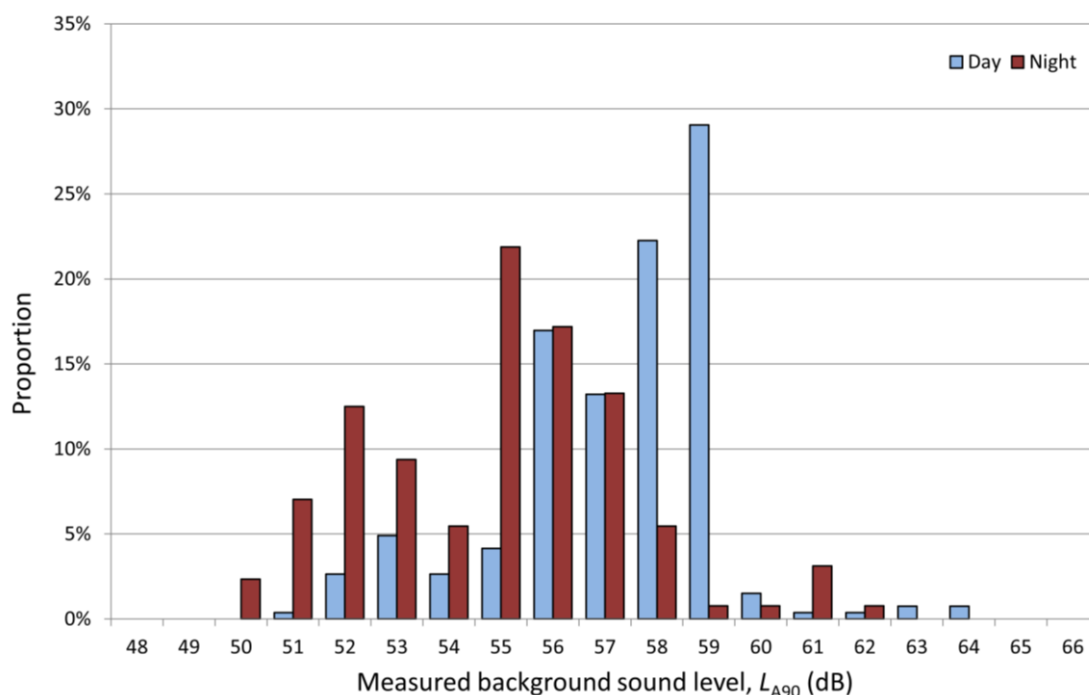


Figure 5 Statistical analysis of background sound levels at position Y

From this analysis, the representative background sound levels measured during the survey were $L_{A90,15min}$ 56 dB during the daytime and $L_{A90,15min}$ 55 dB at night.

5.2.3 Unattended measurement results at position Z – Bloom Street

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 7. The results are presented as facade levels.

A graph showing the results of the unattended measurements is provided in Appendix B.

Measurements were only taken over a period of approximately 13 hours due to an issue with the measurement equipment.

Table 7 Ambient noise levels measured during the unattended survey – Bloom Street

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Thursday 14 March 2024	59 ^[1]	61 ^[1]

^[1] Measurement not made over full period due to monitoring start and end time (the measurement on 14 March 2024 was over 10 hours, and on 18 March 2024 over 3 hours).

5.2.4 Night-time maximum noise levels

The 10th highest $L_{AFmax,2min}$ has been calculated for each night of the survey at positions X and Y. These are presented in Table 8.

Table 8 10th highest maximum noise levels measured at night

Date	10th highest $L_{AFmax,2min}$ (dB) at night (23:00-07:00)	
	Position X – Minshull Street	Position Y – Richmond Street
Thursday 14 March 2024	78	81
Friday 15 March 2024	82	82
Saturday 16 March 2024	81	79
Sunday 17 March 2024	78	79

5.2.5 Attended measurement results – Day

Noise levels and key sources recorded during the attended measurements in the day are summarised in Table 9. Measurement results at positions 1, 2 and 5 are presented as facade level results. Measurement results at positions 3 and 4 are presented as free-field results.

Unless otherwise stated, the maximum noise levels were caused by road traffic.

Table 9 Noise levels and key noise sources from attended measurements – Day

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	15:30	70	90	57	Road traffic on Minshull Street is the dominant noise source. Background noise level driven by external plant items on Richmond Street.
	15:35	63	76	57	
	15:40	62	72	57	
2	15:45	61	77	55	Road traffic on Minshull Street is the dominant noise source. Pedestrian noise on Minshull Street also contributes.
	15:50	65	90	53	
	15:55	65	80	56	

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
3	16:00	59	77	52	No dominant noise sources noted. Background noise level driven by distant road traffic.
	16:05	61	76	52	
	16:10	62	80	53	
4	16:30	56	67	52	No dominant noise sources noted. Background noise level driven by distant road traffic.
	16:35	55	63	52	
	16:40	55	68	52	
5	16:45	62	78	60	No significant road traffic noise. Background noise level driven by external plant items on Richmond Street. L_{AFmax} 94 dB caused by a door slamming approximately 2 m from the microphone.
	16:50	63	75	61	
	16:55	66	94	61	

5.2.6 Attended measurement results – Night

Noise levels and key sources recorded during the attended measurements in the night are summarised in Table 10.

Table 10 Noise levels and key noise sources from attended measurements – Night

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	23:00	65	84	55	Road traffic on Minshull Street is the dominant noise source. Background noise level driven by external plant items on Richmond Street. Pedestrian noise is a significant noise source.
	23:05	63	73	57	
	23:10	64	81	55	
	23:15	62	74	55	
	23:20	63	77	55	
	23:25	63	77	56	

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
2	23:30	61	78	54	Road traffic on Minshull Street is the dominant noise source. Pedestrian noise is also significant.
	23:35	62	74	51	
	23:40	62	81	52	
	23:45	61	76	51	
	23:50	59	75	51	
	23:55	59	72	51	
3	23:30	59	75	54	No dominant noise sources noted. Distant road traffic and pedestrian noise contribute. L_{AFmax} 87 dB caused by pedestrians shouting near microphone.
	23:35	59	76	53	
	23:40	58	73	52	
	23:45	62	87	52	
	23:50	54	82	52	
	23:55	54	63	52	
4	00:15	54	64	52	No dominant noise sources noted. Distant amplified music from nightclubs is audible but not significant. Some pedestrian noise.
	00:20	54	67	52	
	00:25	55	70	53	
	00:30	55	66	52	
	00:35	55	70	52	
	00:40	59	77	53	
5	23:00	71	95	60	Pedestrian noise was a significant noise source. Background noise level driven by external plant items on Richmond Street. L_{AFmax} 95 dB caused by glass bottles being emptied into a bin approximately 2 m from the microphone.
	23:05	62	77	60	
	23:10	63	79	59	
	23:15	62	76	57	
	23:20	60	78	57	
	23:25	61	78	57	

6 Discussion

The measured ambient noise levels at positions X and Y are similar or slightly lower during the day than the previous noise survey. This reduction potentially correlates with the reduced traffic flow around the site during the latest survey due to the one-way traffic restrictions.

The measured ambient noise levels around the site were up to 9 dB lower than previously measured on a weekend night. Additionally, the weekend night-time maxima were up to 10 dB lower than the previous noise survey. It is expected that these reductions are due to the closure of a number of nightclubs and bars surrounding the site, most notably Madison Lounge.

7 Conclusion

A noise survey has been carried out at the site. The dominant noise source at the site was noted as road traffic on Minshull Street.

Measured ambient noise levels were in the range $L_{Aeq,15min}$ 61 to 64 dB during the day, and $L_{Aeq,15min}$ 57 to 63 dB during the night. The lowest background sound levels measured during the survey were $L_{A90,15min}$ 48 dB during the daytime and $L_{A90,15min}$ 46 dB at night. The 10th highest night-time maxima measurement results were in the range of $L_{AFmax,2min}$ 78-82 dB.

The results of the 2024 survey verify the previously measured ambient and background noise levels during the day and weeknights.

The weekend night-time ambient noise level and maxima results during the previous survey were influenced by entertainment noise from nearby venues. The 2024 night-time noise levels measured were lower than the previous survey, largely due to lower entertainment noise and less pedestrian activity. Various nearby venues have closed since the previous survey, including Madison Lounge and Void nightclubs. Measurements were carried out over St Patrick's day weekend, and events took place at bars in the area. As such, the 2024 weekend night-time ambient and maxima measurement results are considered representative of potential entertainment noise and night-time activity in the area.

The data collected will be used to determine appropriate plant noise egress limits and sound insulation requirements for the building envelope.

Appendix A

Survey details

Equipment

The unattended and attended noise measurements were taken using Rion NL-52 sound levels meter and a Brüel & Kjær 2250 sound level meter.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	2250/3011964	Brüel & Kjær	11 Sep 25	UCRT23/2163 UCRT23/2167
Microphone	4189/3100176	Brüel & Kjær	11 Sep 25	UCRT23/2163 UCRT23/2167
Pre-amp	ZC0032/26376	Brüel & Kjær	11 Sep 25	UCRT23/2163 UCRT23/2167
Calibrator	4231/3019123	Brüel & Kjær	11 Sep 25	UCRT23/2162
Sound level meter	NL-52/00932326	Rion	7 Nov 25	TCRT23/1806
Microphone	UC-59/24147	Rion	7 Nov 25	TCRT23/1806
Pre-amp	NH-25/32354	Rion	7 Nov 25	TCRT23/1806
Calibrator	NC-74/34125432	Rion	9 Aug 25	TCRT23/1576
Sound level meter	NL-52/01143564	Rion	15 Dec 24	TCRT22/1766
Microphone	UC-59/10153	Rion	15 Dec 24	TCRT22/1766
Pre-amp	NH-25/43581	Rion	15 Dec 24	TCRT22/1766
Calibrator	NC-74/34257023	Rion	15 Dec 24	TCRT22/1765
Sound level meter	NL-52/01010788	Rion	20 Sep 25	TCRT23/1666
Microphone	UC-59/20416	Rion	20 Sep 25	TCRT23/1666
Pre-amp	NH-25/11436	Rion	20 Sep 25	TCRT23/1666
Calibrator	SV30A/10559	Svantek	20 Sep 25	TCRT23/1665

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00242704	Rion	7 Jun 24	TCRT22/1349
Microphone	UC-59/06187	Rion	7 Jun 24	TCRT22/1349
Pre-amp	NH-25/32732	Rion	7 Jun 24	TCRT22/1349
Calibrator	SV30A/10558	Svantek	6 Jun 24	TCRT22/1344

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*.

Weather conditions

During the attended noise measurements, the weather was generally clear and dry and no rain occurred. Wind speeds did not exceed 10 m/s.

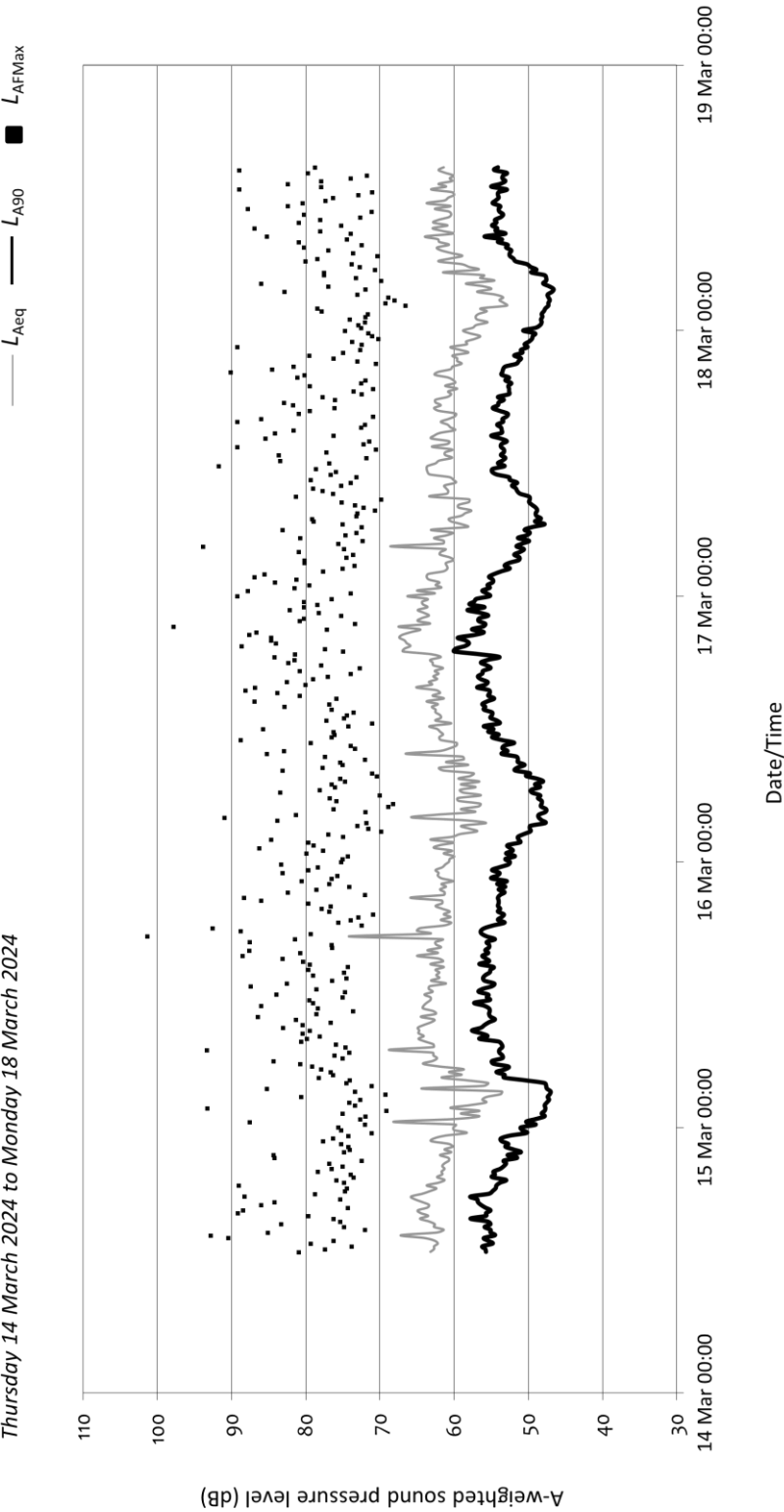
During the unattended noise measurements, weather reports for the area indicated that temperatures varied between 0°C at night and 15°C during the day, and the wind speed was less than 10 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements

Piccadilly Warehouse
Results of noise logging survey at Position X (Minshull Street)
Thursday 14 March 2024 to Monday 18 March 2024



Piccadilly Warehouse
Results of noise logging survey at Position Y (Richmond Street)
Thursday 14 March 2024 to Monday 18 March 2024

