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Consultants in Acoustics, Noise & Vibration

20478-R01-A

26 February 2021

Tattu, Charing Cross Road

Noise egress assessment

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Version	Date	Comments	Author	Reviewer
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Summary

Sandy Brown has been commissioned by Curry and Brown on behalf of Tattu to provide acoustic advice in relation to the proposed Tattu restaurant development at St Giles Circus.

Noise limits for restaurant activity noise egress have been set at the nearest noise sensitive receptors based upon the requirements of the Local Authority and recent noise survey data undertaken at the site.

An assessment has been undertaken of predicted noise breakout from activity in the proposed restaurant based upon operational noise data undertaken at another site owned by Tattu.

The resultant noise level at the nearest noise sensitive receptor, assumed to be Centre Point Tower, is 31 dBA. This is more than 10 dB below the lowest measured L_{Aeq} as required by the Local Authority.

Noise limits have been set within the office space located on Level 5. These are based on the British Council for Offices guidelines. A more stringent level of 10 dB below the recommended criteria has been proposed to provide a higher level of protection to the occupants of the office below.

The resultant noise level in the office space located on Level 5 is predicted to be L_{Aeq} 23 dB based upon typical levels, and L_{AFmax} 35 dB based on maximum individual events. This meets the criteria for break-in noise specified in BCO guidelines and the proposed enhanced criteria.

Contents

1 Introduction

Sandy Brown has been commissioned by Curry and Brown on behalf of Tattu to provide acoustic advice in relation to the proposed Tattu restaurant development at St Giles Circus.

An assessment has been carried out to understand whether typical activity within the restaurant is likely to impact nearby residential receptors and the office floor directly below.

This report details the findings from this assessment and outlines a discussion of acceptable limits for noise egress.

2 Site description

2.1 The site and its surrounding

The restaurant is to be located on Level 6 of the new multi-use development known as St Giles Circus. This site is to comprise of a mixture of office spaces, retail and the proposed Tattu restaurant on Level 6.

The site is located at the busy intersection of Charing Cross Road, Oxford Street, Tottenham Court Road and New Oxford Street. The site location in relation to its surroundings is shown in Figure 1.

Figure 1 Aerial view of site (courtesy of Google Earth Pro)

2.2 Adjacent premises

The nearest noise sensitive receptors are located within Centre Point Tower and are understood to comprise of residential and commercial tenants. These are located to the north and east of the development highlighted in pink in Figure 1.

Located to the south of the site on Denmark Street are noise sensitive receptors of mixed commercial and residential purpose. Sensitive receptors on Denmark street have been highlighted in blue in Figure 1. Whilst Denmark Street receptors are slightly closer in distance, there is no direct line of sight due to the newly constructed buildings in the vicinity.

Additional to the receptors located in adjacent buildings, an office tenant is proposed to be located on Level 5 directly below the proposed restaurant.

3 Criteria

3.1 Local Authority criteria

The *Camden Local Plan June 2017* outlines guidance on assessing the impact of noise and vibration from food, drink, entertainment and leisure noise.

Generally, the sources of noise and vibration which need to be included in an assessment are amplified or unamplified music, human voices, footfall and general activity.

Appendix 3: Noise Thresholds, outlines noise level limits within amenity areas and defines the level of impact entertainment noise will have. These are presented in Table 1.

Table 1 DP28 Noise limits for places of entertainment on adjoining residential sites

Existing noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings	Garden used for amenity (free field)	Day	The higher of 55 dB $L_{Aeq,5min}$ or 10 dB below existing $L_{Aeq,5min}$ without entertainment noise	56dB to 60dB $L_{Aeq,5min}$ Or 9dB to 3dB below existing $L_{Aeq,5min}$ without entertainment noise	The higher of 61 dB $L_{Aeq,5min}$ Or 2db below existing $L_{Aeq,5min}$ without entertainment noise

Existing noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings	Garden used for amenity (free field)	Evening	The higher of 50dB $L_{Aeq,5min}$ Or 10db below existing $L_{Aeq,5min}$ Without entertainment noise	51dB to 55dB $L_{Aeq,5min}$ Or 9dB to 3db below existing $L_{Aeq,5min}$ Without entertainment noise	The higher of 56dB $L_{Aeq,5min}$ Or 2dB below existing $L_{Aeq,5min}$ Without entertainment noise
Dwellings	Garden used for amenity (free field)	Night	The higher of 45dB $L_{Aeq,5min}$ Or 10db below existing $L_{Aeq,5min}$ Without entertainment noise	46dB to 50dB $L_{Aeq,5min}$ Or 9db to 3db below existing $L_{Aeq,5min}$	The higher of 51db $L_{Aeq,5min}$ Or 2dB below existing $L_{Aeq,5min}$ Without entertainment noise

To meet the daytime, evening and nighttime requirements set out in Table 1, a noise level limit of 10 dB below the lowest $L_{Aeq,15min}$ level, measured during the corresponding period, has been targeted.

This is to be assessed at 1 m from the façade of Centre Point Tower 20 m to the north of the proposed restaurant.

3.2 Airborne noise transfer to below

The British Council for Offices (BCO) requirements for office noise from external activities and mechanical services are as follows:

- Open plan NR 40 ($L_{eq,T}$)
- Speculative office NR 38 ($L_{eq,T}$)
- Meeting rooms / cellular offices NR 35 ($L_{eq,T}$)

In addition, BCO refers to maximum levels of L_{AFmax} 55 dB in open plan offices and 50 dB in cellular offices for occasional events.

On this basis and given the potentially intrusive nature of noise from activities in the restaurant, limits are to be 10 dB more stringent than the BCO guidelines recommends. This would result in noise levels from the restaurant not exceeding limits of NR 25 L_{Aeq} / NR 40 L_{Amax} in adjacent office spaces.

4 External noise survey

A noise survey was conducted at the site in November 2020 to inform the attenuation required for external building services. Details of this survey are provided in Sandy Brown Report *20478 – R01- B Noise survey and plant noise egress report*. Noise levels observed at the site were dominated by traffic and pedestrian movements from the nearby busy streets. The levels measured here would be considered representative of those experienced at the nearest noise sensitive receptors located at Centre Point Tower.

4.1 Noise measurement results

Details of the equipment used for the noise survey is presented in Appendix A. A graph showing the results of the unattended measurements is provided in Appendix B.

The lowest ambient noise levels measured during the unattended survey are $L_{Aeq,15min}$ 50 dB during the day, $L_{Aeq,15min}$ 50 dB in the evening, and $L_{Aeq,15min}$ 48 dB at night.

5 Operational noise measurements

Prior to the lockdown restrictions, operational noise measurements were undertaken in the Leeds Tattu restaurant to inform the design of future developments.

All measurements were taken over five-minute periods, and average noise levels varied between $L_{Aeq,5min}$ 77-80 dB. Maximum noise levels typically varied between $L_{AFmax,5min}$ 86-93 dB. The highest levels in each of these ranges have been used to ensure a conservative assessment.

The sound in the restaurant was dominated by customers talking. Background music was also audible throughout the measurements. Other common noise sources included impacts due to cutlery, crockery and glasses.

The noise levels used as the basis for the assessment can be found in Table 2 as reverberant sound pressure levels.

Table 2 Source levels

Source	Octave-band center frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Representative sound pressure level, L_{eq} (dB)	83	74	73	78	76	72	65	59	80
Representative sound pressure level, L_{max} (dB)	83	76	74	93	89	82	72	58	93

6 Noise egress assessment

6.1 Proposed noise limits

As outlined in Section 3.1, the noise limits from the proposed restaurant when measured at 1 m from the facade of the nearest noise sensitive receptors should be 10 dB below the lowest L_{Aeq} level.

Noise limits should not exceed the levels outlined in Table 3 when measured at 1 m from the facade of the residential aspect of Centre Point.

Table 3 Noise limits at the nearest noise sensitive receptor

Date	Day (07:00 – 19:00)	Evening (19:00 – 23:00)	Night (23:00 – 07:00)
	$L_{Aeq,5min}$ (dB)	$L_{Aeq,5min}$ (dB)	$L_{Aeq,5min}$ (dB)
Noise limit	40	40	38

6.2 Noise breakout to Centre Point

An assessment has been undertaken to calculate the indicative levels of noise at the nearest noise sensitive residential receptors to the North of the site. The calculation is based on noise breakout through the balcony doors of the restaurant development.

The calculation and predicted noise level at 1 m from the receptor are included in Table 4.

Table 4 Noise breakout to Centre Point

	Octave-band centre frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Representative sound pressure level, L_{eq}(dB)	83	74	73	78	76	72	65	59	80
Sound reduction of typical glazed door set with area correction	-23	-23	-26	-26	-25	-26	-26	-24	-
20 m Distance attenuation	-26	-26	-26	-26	-26	-26	-26	-26	-
Internal to external correction	-14	-14	-14	-14	-14	-14	-14	-14	-
Facade correction	3	3	3	3	3	3	3	3	-
Resultant noise level at 1m from Centre Point	37	28	24	29	28	23	16	12	**31**

The predicted noise levels at the nearest noise sensitive receptor are well below the day, evening and nighttime requirements of the Local Authority for LOAEL.

6.3 Predicted air-borne noise transfer to offices

6.3.1 Existing construction

A site inspection has been undertaken to assess the likely sound insulation performance of the existing floor build-up. At the time of the visit there were several openings in the slab where services are still to be boxed in. It was not possible to test the sound insulation performance of the floor, therefore the acoustic prediction software Insul has been used to calculate the expected sound insulation performance based upon the base-build construction information.

It should be noted that to achieve the base-build criteria, the design has included provisions for a sound insulating ceiling below the separating slab. To reduce the risk associated with this project should a future tenant choose to remove this ceiling, this assessment is based on the sound insulation performance of the concrete slab only. This assessment is based upon the predicted sound reduction provided by the base build 200 mm concrete slab.

6.3.2 Assessment

The predicted noise levels in the office space due to restaurant activity are presented in Table 5 and Table 6.

Table 5 Predicted internal noise levels in office spaces from restaurant activity noise (maximum events)

Source	Octave-band centre frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	(A)
Representative sound pressure level, L_{max} (dB)	83	76	74	93	89	82	72	58	93
Sound reduction of 200 mm Concrete floor	-44	-44	-47	-54	-61	-66	-71	-71	-
Room correction*	4	0	-2	-2	-2	-2	-2	-2	-
Resultant L_{max} (dB) within the office space on Level 5.	43	32	25	37	26	14	0	0	35

*Based on typical finishes of a cellular office space

Table 5 demonstrates that the predicted maximum sound pressure levels ($L_{Amax,5min}$) are anticipated to be < 40 dB(A) and therefore meeting the requirements outlined in the BCO guidelines and the recommended enhanced performance

Table 6 Predicted internal noise levels in office spaces from restaurant activity noise (Typical noise levels)

Source	Octave-band centre frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	(A)
Representative sound pressure level, L_{Aeq} (dB)	83	74	73	78	76	72	65	59	80
Sound reduction of 200 mm Concrete floor	-44	-44	-47	-54	-61	-66	-71	-71	-
Room correction*	4	0	-2	-2	-2	-2	-2	-2	-
Resultant L_{Aeq} (dB) within the office space on Level 5.	43	30	24	22	13	4	0	0	23

*Based on typical finishes of a cellular office space

Table 5 demonstrates that the predicted typical sound pressure levels ($L_{Aeq,5min}$) are anticipated to be < 25 dB(A) thus meeting the requirements outlined in the BCO guidelines and the recommended enhanced performance.

7 Conclusion

An assessment has been undertaken of predicted noise breakout from the proposed restaurant to the nearest noise sensitive receptor to the St Giles Circus development. Additionally, an assessment has been undertaken of noise breakout to the office floor directly below the proposed restaurant.

The resultant noise level at the nearest noise sensitive receptor is assumed as Centre Point Tower is 31 dBA. This is more than 10 dB below the lowest measured L_{Aeq}, as required by the Local Authority.

The resultant noise level in the office space located on Level 5 is 35 dBA based upon maximum event levels and 23 dBA based upon typical levels. This is below the recommended criteria of L_{Amax} 40 dB/L_{Aeq} 25 dB in adjacent office spaces.

Appendix A

Survey details

Equipment

The unattended noise measurements were taken using a Rion NL 52 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	NL-52/00375679	Rion	9 Jul 21	TCRT19/1541
Microphone	UC-59/11168	Rion	9 Jul 21	TCRT19/1541
Pre-amp	NH-25/65806	Rion	9 Jul 21	TCRT19/1541
Calibrator	SV30A/10576	Svan	9 Jul 21	TCRT19/1539

[1] Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meter 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.
- $L_{ASmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a slow 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.*

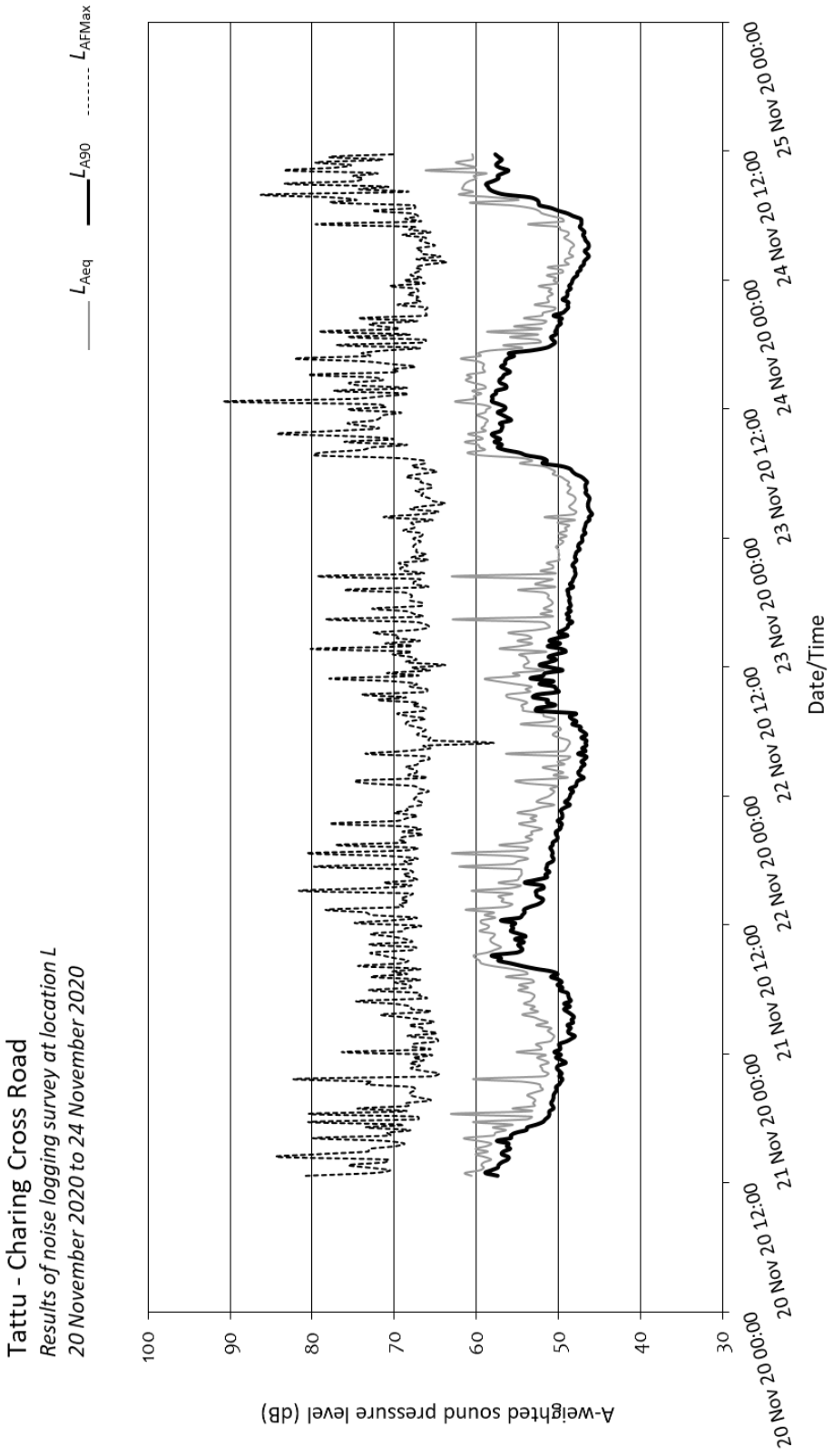
Weather conditions

During the unattended noise measurements, weather reports for the area indicated that temperatures varied between 8°C at night and 17°C during the day, and the wind speed was less than 6 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements


Tattu - Charing Cross Road
Results of noise logging survey at location L
20 November 2020 to 24 November 2020
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
100
90
80
70
60
50
40
30
20 Nov 20 00:00
20 Nov 20 12:00
21 Nov 20 00:00
21 Nov 20 12:00
22 Nov 20 00:00
22 Nov 20 12:00
23 Nov 20 00:00
23 Nov 20 12:00
24 Nov 20 00:00
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25 Nov 20 00:00
Date/Time