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Silk Street, Newton Heath, Manchester

Environmental noise survey report

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Version	Date	Comments	Author	Reviewer
A	25 Apr 19		Jose M. Gonzalez	Mark Howarth
B	7 May 19	Update to noise egress limits (Table 4)	Jose M. Gonzalez	Mark Howarth

Summary

Sandy Brown has been commissioned by Faithful & Gould Limited to provide acoustic advice in relation to the proposed housing development at Silk Street, Newton Heath in Manchester.

An environmental noise survey has been carried out to determine the existing background sound levels in the area and to set appropriate plant noise limits in line with the requirements of Manchester City Council.

A noise survey was performed between 14:04 on18 April 2019 and 01:45 on 19 April 2019, and between 04:44 and 06: 21 on 24 April 2019.

To the west of the site (Smallwood Street), the representative background sound levels measured during the survey were $L_{A90,\ 15min}$ 49 dB during the daytime and $L_{A90,\ 15min}$ 48 dB at night. To the east of the site (Droylsden Road), the representative background sound levels measured during the survey were $L_{A90,15min}$ 47 dB during the daytime and $L_{A90,\ 15min}$ 43 dB at night.

Based on the requirements of Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises is to be at least 5 dB below the typical background noise levels measured.

These limits are cumulative, and apply with all plant operation under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied, and the limits will be more stringent than those set.

The results of the survey will be used in a 3D environmental model of the site, to carry out an assessment of noise ingress to the proposed development, and provide outline advice on sound insulation of windows and ventilation strategies. This will be provided in a report suitable for submission to the Local Authority in support of the planning application.

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1 Introduction

Sandy Brown has been commissioned by Faithful & Gould Limited to provide acoustic advice in relation to the proposed housing development at Silk Street, Newton Heath in Manchester.

As part of this, an environmental noise survey is required, the purpose of which is to establish the existing background sound levels in the vicinity of nearby noise sensitive premises and to set appropriate limits for noise egress from building services plant.

The results of the survey will also be used in a 3D environmental model of the site, to carry out an assessment of noise ingress to the proposed development and provide outline advice on the required minimum sound insulation performance of the facade and ventilation strategies, such that appropriate internal noise levels are in line with Manchester City Council internal noise limits criteria.

This report presents the survey method, results of the environmental noise survey, and a discussion of acceptable limits for noise emission from building services plant.

2 Site description

2.1 The site and its surrounding

The site location in relation to its surroundings is outlined in yellow in Figure 1. The existing site is an open vacant space.The proposed development site is bounded by the Manchester and Rochdale canal to the north, Droylsden Road to the east, Great Newton Street to the south and Smallwood Street to the west.

A public house, The New Crown Inn, is located on 23 Old Church Street approximately 25 m to the west of the site. DJs play amplified music on Friday and Saturday nights and there is karaoke on Sundays. The pub has an outdoor terrace space approximately 20 m from the site.

A supermarket (Lidl) is approximately 35 m to the north west across the canal. It is understood that there is a single daily night time delivery, which can occur any time between 02:00 and 06:00 hours. However, depending on stock and sales, there may be a second (smaller) delivery during the day time.

To the north of the site there is a bakery warehouse (Martins).

Newton Heath working men club is located on 67 Old Church Street and approximately 15 m to the south of the site. It is understood that there are performances and events in the function room located on the first-floor, which may include amplified sound.

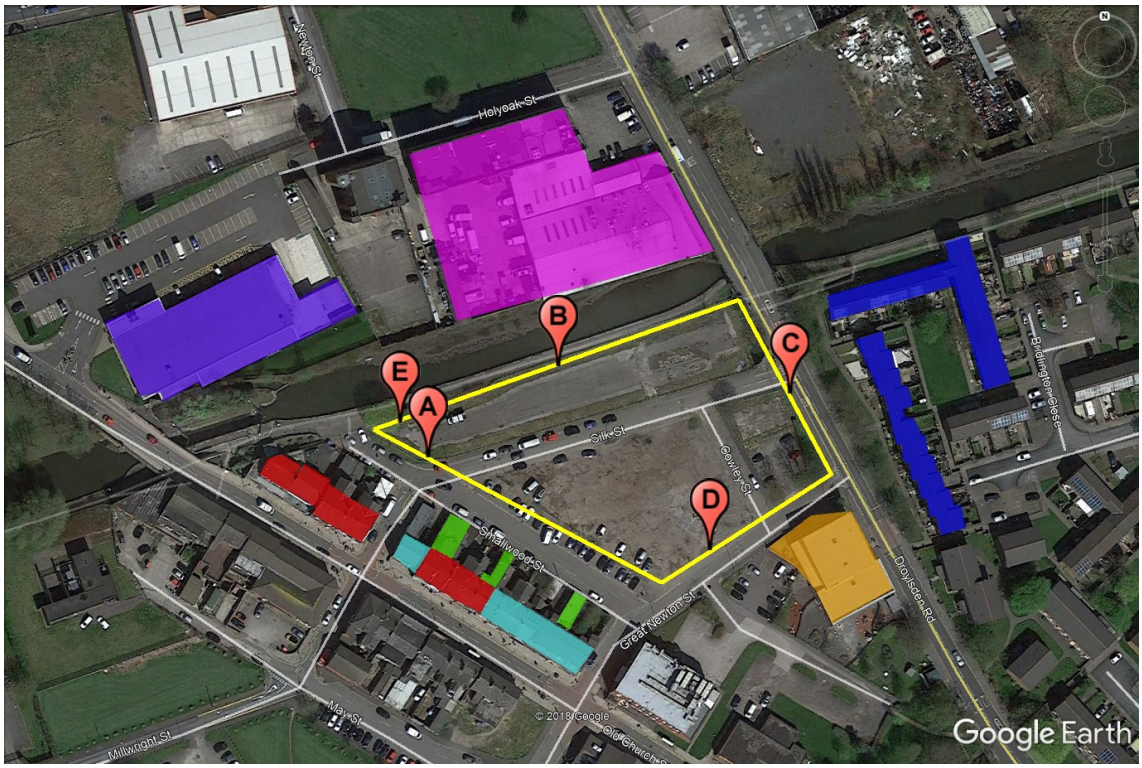

Figure 1 Site map (courtesy of Google Earth Pro)

2.2 Adjacent premises

The proposed development is in a mixed-use area. The nearby premises to the site consist of residential, commercial and industrial accommodation.

Existing residential premises are located on Old Church Street approximately 10 m to the west of the site, and along Droylsden Road approximately 20 m to the east. These are highlighted in red and blue respectively in Figure 1.

The nearest industrial building is located approximately 15 m to the north, this is highlighted in pink in Figure 1.

The nearest commercial and retail units are located on Smallwood Street approximately 18 m to the west and along Old Church Street approximately 25 m to the west of the site. These are highlighted in light green and light blue respectively in Figure 1. In addition, there is a commercial building approximately 35 m to the north. This is highlighted in purple in Figure 1.

Newton Heath Children's Centre is approximately 8 m to the south east of the proposed development site, this is highlighted in orange in Figure 1.

3 Method

Details of the equipment used, the noise indices and the weather conditions during the survey are provided in Appendix A. Further information on the specific survey method is provided in this section.

No secure and safely accessible location was available at the site to leave unattended monitoring equipment. Attended sample measurements were therefore carried out by Jose M. Gonzalez at five locations around the proposed development site. These are indicated in Figure 1 as positions A to E.

Attended measurements were carried out over 15 minute periods during the following times to quantify existing noise levels from road traffic, pedestrians and other significant noise sources in the area:

- 13:45 on 18 April 2019 and 01:45 on 19 April 2019
- 04:44 and 05:01 on 24 April 2019.,

Additional attended 5 minute sample measurements were carried out between 05:02 and 06:31 on 24 April 2019 with the purpose of determining noise levels from a supermarket delivery, and warehouse activities located to the north.

In each case the microphone was mounted on a tripod approximately 1.5 m above the ground level and at least 5 m from any other reflective surface.

4 Measurement results

4.1 Observations

The dominant noise sources observed at the site during the survey consisted of road traffic along Droylsden Road and Old Church Street, and cars passing by on Silk Street and Great Newton Street.

Less significant noise sources included The New Crown Inn. From observations on site, the door leading from the main room to the outdoor terrace could be left open at times.

During the survey, vehicle movements and loading/unloading at the bakery warehouse was noted during the daytime and at night, including plant operation.

4.2 Attended measurement results

4.2.1 Daytime sample measurement results

The sound pressure levels recorded are summarised in Table 1. The dominant noise sources noted during the measurements are also described in Table 1.

Table 1 Sound pressure levels from attended measurements

Position	Date	Start time	Sound pressure levels (dB)			Noise sources
			$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
A	18 Apr 19	13:45	55	69	51	Distant road traffic on Old Church St and Droylsden Road, car passing by, aircraft overhead.
		14:58	58	80	51	As above plus distant roller shutter, L_{Amax} 80 dB motorcycle on Old Church St
		19:02	59	87	50	As above, L_{Amax} 87 dB motorcycle on towpath along the canal
		21:33	54	75	49	Distant road traffic on Old Church St and Droylsden Road, distant people talking in outdoor terrace, audible low frequency amplified sound, distant tonal plant
B		14:04	55	72	52	Distant road traffic on Droylsden Road, constant plant, distant geese honk, pedestrians passing by talking
		15:14	54	72	52	

Position	Date	Start time	Sound pressure levels (dB)			Noise sources
			$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
B		19:17	51	66	48	Distant road traffic on Droylsden Road
		22:10	50	67	47	Distant road traffic on Droylsden Road, distant siren, cars passing by on Silk St.
C		14:22	67	82	57	Cars passing by Droylsden Road, distant car slamming door, L_{Amax} 90 dB car horn
		15:30	67	90	55	
		19:34	64	77	51	Cars passing by Droylsden Road
		22:27	63	78	47	
D		14:40	59	81	52	Distant road traffic on Droylsden Road, cars passing by, L_{Amax} 81 dB car horn
		15:47	60	83	51	As above, L_{Amax} 83 dB distant siren
		19:52	55	69	49	Distant road traffic on Droylsden Road and Old Church Street, cars passing by
		22:43	54	73	47	As above plus distance siren
E		20:10	53	77	50	Distant road traffic on Droylsden Road and Old Church St, people talking in outdoor terrace, audible low frequency amplified sound, distant canal lock waterfall.
		21:49	53	65	50	

4.2.2 Night-time sample measurement results

The sound pressure levels recorded during the attended measurements are summarised in Table 2. The dominant noise sources noted during the measurements are also described in Table 2.

Table 2 Sound pressure levels from daytime attended measurements performed over 15 minute periods

Position	Date	Start time	Sound pressure levels (dB)			Noise sources
			$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
A	18 Apr 19	23:01	53	74	48	Distant road traffic on Droylsden Road, car passing by on Silk St, distant low frequency amplified sound, geese honk
B		23:32	49	61	48	Distant road traffic on Droylsden Road, constant plant, car passing by on Silk St
	19 Apr 19	00:55	47	63	45	
C		01:11	58	75	43	Cars passing by, distant road traffic on Droylsden Road, distant plant
D		00:06	50	67	46	Cars passing by Great Newton St, distant road traffic on Droylsden Road
		01:30	49	58	46	Distant road traffic on Old Church St
E	18 Apr 19	23:16	51	70	49	Distant road traffic on Droylsden Road, people talking in outdoor terrace, audible low frequency amplified sound, distant waterfall
	19 Apr 19	00:39	52	63	49	

Position	Date	Start time	Sound pressure levels (dB)			Noise sources
			$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
E	24 Apr 19	04:44	48	64	46	Distant road traffic on Droylsden Road, warehouse activities, canal lock waterfall, L_{Amax} 64 dB geese honk

Table 3 Sound pressure levels from night time attended measurements performed over 5 minute periods

Position	Date	Start time	Sound pressure levels (dB)			Noise sources
			$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
E	24 Apr 19	05:02	51	62	47	Bird song, distant road traffic on Droylsden Road
		05:10	48	60	46	
		05:15	49	59	47	
		05:21	51	60	48	As above plus delivery truck arriving to commercial unit
		05:26	51	64	48	Bird song, distant road traffic on Droylsden Road, distant plant, work outdoor activity on warehouse.
		05:32	50	62	48	Distant road traffic on Droylsden Road, delivery to retail on Smallwood Street (L_{Amax} 72 dB)
		05:37	52	72	48	
		06:03	51	66	48	Distant road traffic on Droylsden Road, bird song
		06:09	52	67	49	
		06:22	53	61	50	

Position	Date	Start time	Sound pressure levels (dB)			Noise sources
			$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
E	24 Apr 19	06:29	53	60	50	Distant road traffic on Droylsden Road, delivery truck leaving commercial unit.

As attended measurements have been carried rather than unattended noise monitoring over a few days a statistical analysis to determine the representative background noise level is not considered appropriate. The minimum background sound level measured has therefore been used as the representative background sound level.

To the west of the site (Smallwood Street), the representative background sound levels measured during the survey were $L_{A90,\ 15min}$ 49 dB during the daytime and $L_{A90,\ 15min}$ 48 dB at night. To the east of the site (Droylsden Road), the representative background sound levels measured during the survey were $L_{A90,15min}$ 47 dB during the daytime and $L_{A90,\ 15min}$ 43 dB at night.

5 Building services noise egress limits

5.1 Standard guidance

Guidance for noise emission from proposed new items of building services plant is given in BS 4142: 2014 '*Methods for rating and assessing industrial and commercial sound*'.

BS 4142 provides a method for assessing noise from items such as building services plant against the existing background sound levels at the nearest noise sensitive.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

5.2 Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to plant noise emissions in *Planning and Noise Technical Guidance* document dated December 2015 states the following in relation to plant noise egress:

'The development should be 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.'

5.2.1 Basic limits

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the limits set out in Table 4.

Table 4 Plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Residential accommodation on Old Church Street	41	40
Residential accommodation on Droylsden Road	39	35

The limits set out in Table 4 do not include any attention catching features. The penalties for attention catching features may be significant, and will need to be considered as the building services design progresses. This is discussed further in Section 5.2.2.

5.2.2 Attention catching features

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), the plant should be designed to achieve a limit below those set out above, based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible

For noise which is equally both impulsive and tonal, then both features can be taken into account by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment is not appropriate then an objective assessment can be made. A noise source is deemed to be tonal if the time averaged sound pressure level in a one-third octave band exceeds the level in adjacent one-third octave bands by the level differences given below:

- 15 dB in the low frequency one-third octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency one-third octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency one-third octave bands (500 Hz to 10000 Hz)

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

5.3 Assessment

At this stage, no information is available in relation to the proposed installation of building services plant, and this will need to be assessed in detail as the design progresses. However, all plant items will be designed to achieve the plant noise limits set out above, including any corrections for attention catching features.

6 Conclusion

A noise survey has been carried out to determine the existing background sound levels in the vicinity of the site and surrounding noise sensitive premises. To the west of the site (Smallwood Street), the representative background sound levels measured during the survey were $L_{A90,\ 15min}$ 49 dB during the daytime and $L_{A90,\ 15min}$ 48 dB at night. To the east of the site (Droylsden Road), the representative background sound levels measured during the survey were $L_{A90,15min}$ 47 dB during the daytime and $L_{A90,\ 15min}$ 43 dB at night.

On the basis of the requirements of Manchester City Council and on the results of the noise survey, the cumulative noise level from plant at 1 m from the worst affected window of the nearby, noise sensitive premises is to be at least 5 dB below the typical background noise level measured.

These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features the limits should not exceed 5 dB below the typical external noise level in octave bands. These limits are set out in Table 4.

At this stage, no detailed information is available in relation to the proposed installation of building services plant, and this will need to be assessed in detail as the design progresses.

The results of the survey will be used in a 3D environmental model of the site, to carry out an assessment of noise ingress to the proposed development and provide outline advice on sound insulation of windows and ventilation strategies. This will be provided in a report suitable for submission to the Local Authority in support of the planning application

Appendix A

Survey details

Equipment

A Rion NL 52 sound level meter was used to undertake the attended measurements. The 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-52/00242704	Rion	24 May 20	TCRT18/1459
Microphone	UC-59/06187	Rion	24 May 20	TCRT18/1459
Pre-amp	NH-25/32732	Rion	24 May 20	TCRT18/1459
Calibrator	SV30A/7451	Svantek	24 May 20	TCRT18/1457

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

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.

Noise indices

The equipment was set to record a continuous series of broadband sound pressure levels. 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 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.

The L_{A90} is considered most representative of the background sound level for the purposes of complying with any local authority requirements.

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 measurements carried out between 18 and 19 April 2019 and on 24 April 2019, the weather was generally clear and dry and no rain occurred. Wind speeds varied between approximately 0 m/s and 3 m/s.

These weather conditions are considered suitable for obtaining representative measurements.