



BRAIDEN ACOUSTICS LTD

Innovation Forum | 51 Frederick Road | Salford | Manchester | M6 6FP

NOISE IMPACT ASSESSMENT (PIZZERIA)

Prepared For : Up North Architects

Date : 19 May 2023

Site : Ground Floor, 55 Spring Gardens, Manchester

Report No. : 11128revA

1 INTRODUCTION

Braiden Acoustics has been commissioned by Up North Architects to undertake an acoustic survey at the site of the Ground Floor, 55 Spring Gardens, Manchester to support planning application 136017/FO/2023 which proposes:

“Change to kitchen extraction system to accommodate a new pizza oven.”.

In order to validate the planning application, a noise impact assessment (NIA) is required. In a letter from Manchester City Council (MCC) dated 1 March 2023, it states:

Further to our previous correspondence, I am unable to progress your proposal as the application remains invalid or incomplete for the following reason(s):

1) Acoustic Report is required

I am therefore holding your application and if you wish to discuss the information required members of my staff will be pleased to assist.

****This is an updated report to verify the measured noise levels, include a short-term noise measurement for verification and to assess the offices above as a noise sensitive receiver****

1.1 AIM

This report shall investigate all pertinent noise sources that may affect surrounding ‘sensitive receptors’ and propose any mitigation, where necessary, so that noise levels are within relevant guidelines.

2 DESCRIPTION OF SITE

The application site comprises of one unit at ground floor level at 55 Spring Gardens, on the corner of Fountain Street in Manchester City Centre.



Figure 1
Street view of site

On the upper floors of the building are offices.

2.1 DESCRIPTION OF PROPOSED UNIT

The proposed site is looking to become a pizzeria with a wood burning oven (with an associated ventilation system) and internal seating – as shown in Figure 2.

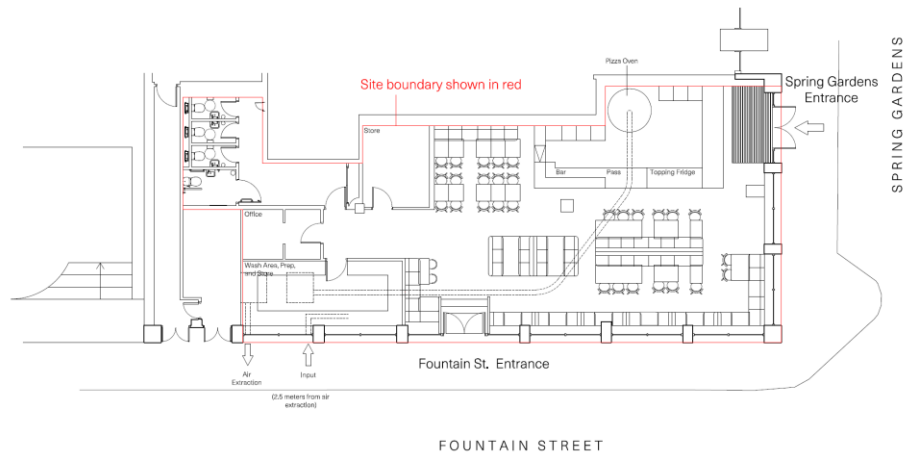


Figure 2
Proposed layout

2.2 SITE LOCATION AND SURROUNDING USES

The site is within Manchester town centre with Spring Gardens to the south and Fountain Street to the west. The immediate area is commercial and predominantly office spaces with some retail / commercial units at ground floor, i.e. coffee shops.



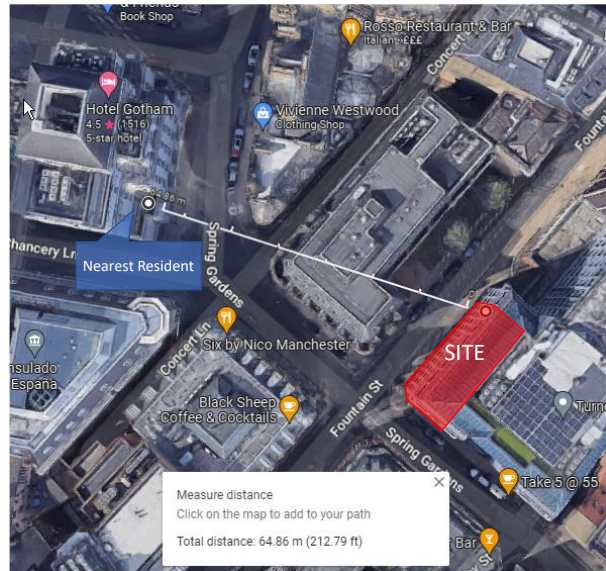


Figure 3
Site location and surrounding uses

2.3 EXISTING USE

The site was previously occupied by 'Lättsam', which was a cafe / bar.

2.4 PROPOSED USE

It is proposed to use the unit as a pizzeria.

2.4.1 Ground Floor

The ground floor will comprise of the following:

- arrival bar with seating,
- open kitchen with pizza oven,
- kitchen ventilation system,
- dining areas,
- wash area, prep and store,
- toilets,
- office.

2.4.2 Opening hours

Daily 12:00 - 23:00

2.4.3 Building services

The kitchen ventilation will comprise of air supply and extraction and vent via an existing louvre on the Fountain Street elevation.

The louvres are approximately 1.9m from the office windows above.



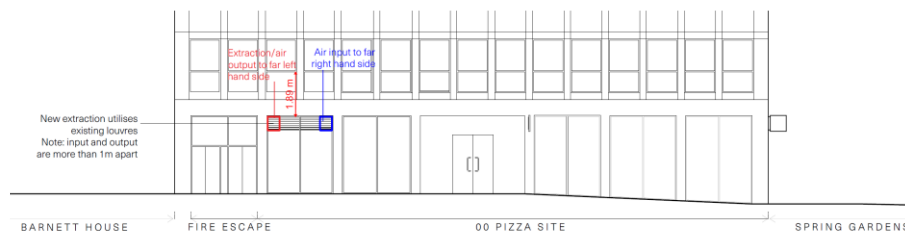


Figure 4
Fountain St elevation showing kitchen ventilation louvres

2.4.3.1 Kitchen Ventilation

The kitchen extract and supply will vent to Fountain Street via an existing louvre above the entrance door, as shown in Figure 4.

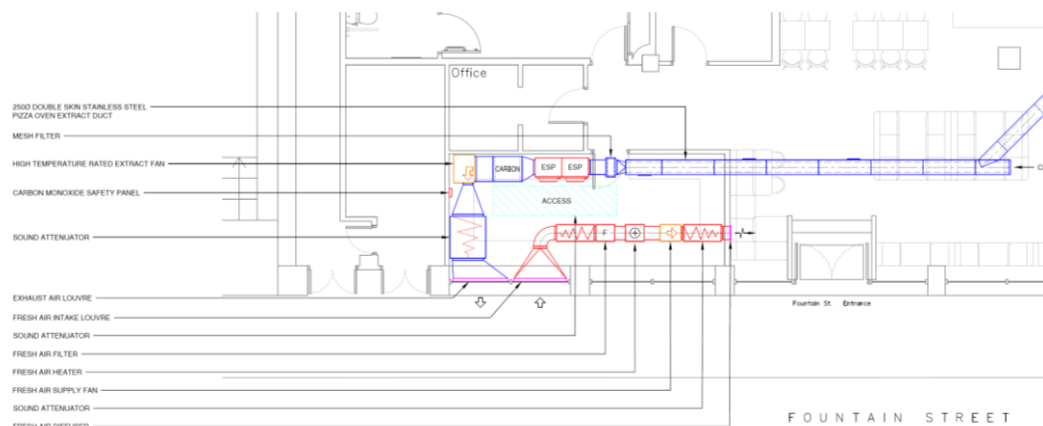


Figure 5
Kitchen ventilation layout

Kitchen Extract

Estoc Targe (PowerBox) 67-450-1

🔊	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	115	82	85	81	82	84	79	72	115	71
Outlet*	118	90	88	87	86	85	81	72	118	74
Breakout*	101	82	78	69	69	63	56	50	101	57

* Lw dB re 10^{-12} W
** dBA re 2×10^{-5} Pa
Sound data at requested duty.

Figure 6
Extract fan sound power data

Extract Silencer

440 Ø 2D unpodded - CDA.2D from Figure 7

STANDARD CIRCULAR SILENCER INSERTION LOSS DATA

@ +20°C and 5m/sec FACE VELOCITY

SILENCER SIZE	CODE	P.A.	OCTAVE BAND CENTRE FREQUENCIES (Hz)							
			63	125	250	500	1K	2K	4K	8K
200-550 dia	CDA.1D	ALL	2	4	6	10	14	10	7	8
	CDA.2D	A	4	8	13	17	23	17	12	11
		B	4	8	12	17	23	17	12	10
		C	4	7	10	15	19	16	12	9

FRESH AIR FAN

Figure 7
Extract silencer insertion loss data



Kitchen Supply
ePowerBox 50-355-1-4 (5FA)

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	43	47	52	51	44	42	38	35	56	31
Outlet*	51	55	62	58	51	45	38	36	64	38
Breakout*	49	49	45	30	21	<20	<20	<20	53	<20

* Lw dB re 10⁻¹² W
Sound data at requested duty. 🖱️

** dBA re 2x10⁻⁵ Pa

Figure 8
Supply fan acoustic data

Supply Silencer
355mm Ø 2D unpodded - CDA.2D

STANDARD CIRCULAR SILENCER INSERTION LOSS DATA
@ +20°C and 5m/sec FACE VELOCITY

SILENCER SIZE	CODE	P.A	OCTAVE BAND CENTRE FREQUENCIES (Hz)							
			63	125	250	500	1K	2K	4K	8K
200-550 dia	CDA.1D	ALL	2	4	6	10	14	10	7	8
	CDA.2D	A	4	8	13	17	23	17	12	11
		B	4	8	12	17	23	17	12	10
		C	4	7	10	15	19	16	12	9

FRESH AIR FAN

Figure 9
Supply silencer insertion loss data

The kitchen ventilation system will only operate during opening hours.

2.4.4 Sound system

As the proposed use is primarily for a restaurant, then the sound system will be modest and only playing background music.

However, details of any music system have yet to be confirmed.

3 ACOUSTIC CRITERIA AND METHODOLOGY

3.1 BS 4142

BS 4142:1999 “Method for rating industrial noise affecting mixed residential and industrial areas” [1] assesses industrial noise with regards to nearby residential dwellings. The guidance is commonly used to compare the equivalent noise from an industrial source only (*specific noise level*), L_{Aeq} , to the background noise level, L_{A90} , at the nearest sensitive receptor (NSR).

This Standard has been recently updated, BS 4142:2014 “Methods for rating and assessing industrial and commercial sound” [2]. Whereas the old standard added 5dB ‘penalty’ to the Specific Noise Level (SNL) if the noise source has a ‘character’ that can draw attention that may be described as tonal, intermittent or impulsive, the new standard gives clearer guidance on noise ‘character’. Furthermore, the previous Standard gave only one 5 dB penalty whereas the new Standard may not. When added to the specific noise level it forms the *rating level*. The new Standard gives the guidance for the following types of noise character:

Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.



Correct the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.

NOTE 1 The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases the amount of masking varies as the residual sound changes in level and possibly character. The source's tonal and/or impulsive characteristics could also vary with time.

Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.

Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Once a penalty for noise character is added to the Specific Noise Level then this is termed the Rating Level.

The background level is then compared to the rating level. It is usual that the rating level due to the source should be below the background noise level at the nearest sensitive receptor; indeed BS 4142 states:

“The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source 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.”

3.1.1 Council BS4142 criterion

Hitherto, there has been no mention of a BS4142 noise criterion.

However, section 11 d) of BS 4142:2014 says

“Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact”

Therefore, minimally, the Rating Level should not exceed the Background Level to ensure any potential noise has a low or no impact.



3.2 BS 8233: 2014

3.2.1 Residential

The British Standard BS 8233:2014 “Guidance on sound insulation and noise reduction for buildings” gives guidance on recommended indoor ambient noise levels for residential dwellings.

Room	Criterion	$L_{Aeq,T}$	
		night	day
Bedroom	Sleeping	30	35
Dining Room/Area	Dining	--	40
Living Room	Resting	--	35

Table 1

Recommending indoor ambient noise level thresholds from anonymous noise (taken from Table 4, BS 8233:2014)

Internal levels are simply predicted by the subtraction of the estimated sound reduction index (SRI) of the building façade from the external free field noise measurements. When considering the SRI of a particular façade it is usual to only consider the glazing as this is the weakest element acoustically.

3.2.2 Offices

Table 2 in BS 8233:2014 give a range of target noise levels for a variety of internal spaces, such as offices. The upper limits should not be breached in order for the occupants of the space to not be disturbed. However, for open-plan offices for example, a minimum noise level can be useful to provide masking for acoustic privacy.

Table 2 ¹ Indoor ambient noise levels in spaces when they are unoccupied and privacy is also important		
Objective	Typical situations	Design range $L_{Aeq,T}$ dB
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40 – 55
	Open plan office	45 – 50
	Night club, public house	40 – 45
	Ballroom, banqueting hall	35 – 40
	Living room	35 – 40
NOTE See Noise control in building services [28] and BS EN ISO 3382.		

Table 2

Target internal noise levels of unoccupied spaces

As Table 2 above shows, the noise levels within an open plan office should be between 45 – 50 dB(A).

3.3 COUNCIL NOISE CRITERIA

Guidance on noise and planning is given in the Manchester City Council’s (MCC) document “Planning and Noise Technical Guidance” [3].

3.3.1 Residential noise criteria

Section 3.7.1.1 of the Planning & Noise Technical Guidance document [3:§ 3.7.1.1] states the following:

The Council has adopted the following noise limits for residential properties:



- **Bedrooms (night time 23.00 - 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 10 times)**
- **Living Rooms (daytime 07.00 - 23.00) 35 dB L_{Aeq}**
- **Gardens and terraces (daytime) 55 dB L_{Aeq}**

These criteria have been adopted for the following reasons:

- BS 8233: 2014 recognises these levels as a good standard for resting/sleeping conditions.
- The WHO document 'Guidelines for Community Noise' recommends an internal L_{Aeq} of 30dB for optimal sleep conditions (and no more than 35dB for internal rooms during daytime).
- The performance of acoustic insulation schemes can often be below that specified, according to the quality of installation, materials, noise spectrum and deterioration / wear and tear of building elements. A high design specification introduces a 'safety margin' should building elements not perform as well as expected ('on-site' performance).
- Performance specification for glazing does not usually take into account the detrimental effect of vents on the sound insulation. Even 'acoustic' vents will reduce the performance of the facade insulation, as they will inherently contain a free open area for air exchange.
- There is a general increase in urban noise levels, which can in the future be reasonably accommodated by these standards.
- The standards support the Local Authority corporate objective to prevent ill-health and improve local peoples' health and well-being. Bedrooms (night time - 23.00 - 07.00) 30 dB L_{Aeq}

3.3.2 Industrial noise criteria

With regards to industrial noise, from external plant for example, [3:§ 3.7.1.5] states:

BS 4142 should be used to assess the likely impact of noise from industrial and commercial sources at noise sensitive premises (section 3.5). One of the indications of the impact of a BS 4142 assessment is the lower the Rating Level is relative to the measured Background Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Level, this is an indication of the specific sound source having a low impact, depending on the context.

The Council considers that new developments should contribute and enhance the area in which they are located and where possible, contribute to the improvement of people's health and quality of life as per the NPSE. With this in mind, the design objective should be:

'The development should be 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.'

Where this criterion cannot be achieved, the various noise control measures considered as part of the assessment should be fully explained (i.e. relocation of noise sources, use of quieter equipment, enclosures, screening, restriction of the hours of operation) and the achievable noise level should be identified. This information will allow a judgement to be made concerning the application and its likely impact on the surrounding area.

In addition to the above, maximum noise levels should also be adequately controlled. Where particular uses generate high noise levels of a short duration (e.g. loud bangs) on a regular basis, these should aim to be controlled so as not to exceed 60 dB (L_{Amax}) at the façade of noise sensitive premises nearby in accordance with the recommendations of the WHO (section 3.6).

4 MEASUREMENT DETAILS

It was not possible to undertake long term noise measurements due to difficulty accessing suitable monitoring locations.



However, a short-term daytime measurement was made and compared to the noise monitoring of the previous noise assessment, at the same site, by Clement Acoustics in February 2020¹.

4.1 NOISE MONITORING LOCATIONS

Long term noise monitoring took place at first floor level, one metre from the façade.

Short term noise monitoring took place at ground floor level, one metre from the façade.



Figure 10
Monitoring locations

4.2 MONITORING DATES & TIMES

ML 1	Long term monitoring	West Moseley St
	14:15	Thursday 6 February 2020 to 11:30 on Monday 10 February 2020
ML21	Short term monitoring	Fountain St
	14:49	Thursday 18 th May to 15:04 Thursday 18 th May 2023

4.3 MONITORING RESULTS

4.3.1 Long term monitoring

The results of the long monitoring are shown in Figure 11.

It can be seen that the background noise level fluctuated between approximately 55 and 60 dB L_{A90} .

The minimum background noise level was measured at 54 dB L_{A90} .

¹ The previous monitoring took place before Lockdown (March 2020).



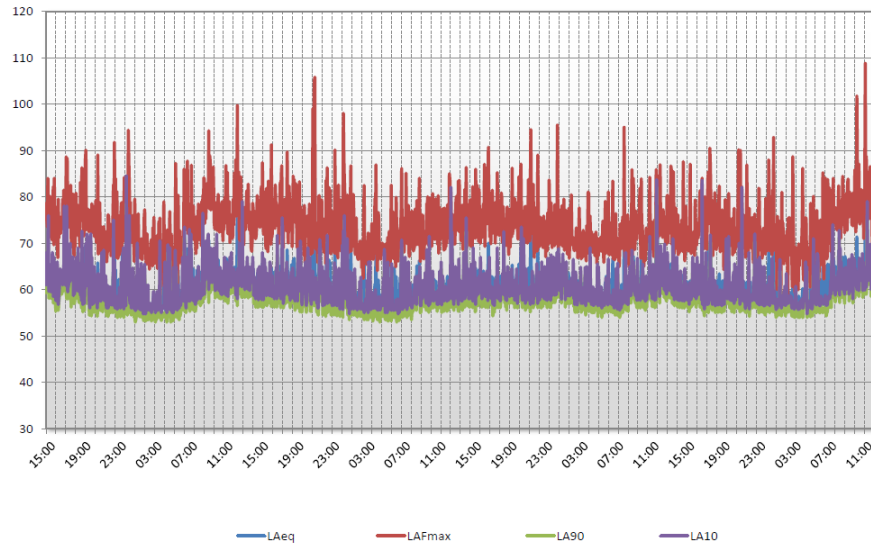


Figure 11
Long term monitoring

4.3.2 Short term monitoring

Short term noise monitoring took place on Fountain St, during office hours but at a relatively quiet time of the day – mid-afternoon.

Date	Time		Duration	Time Period	L_{A90} dB	L_{Aeq} dB	L_{Amax} dB
	Start	Finish					
Thurs 18/05/202	14:49:44	15:05:03	00:15:19	day	54.0	58.6	76.6

Table 3
Summary of visit 2 - front

Comparing the background level around 15:00 of the long-term monitoring (Figure 11) and the short term value of 54dB L_{A90} shown in Table 3, it can be seen that the short term monitoring is a few decibels lower than the long term monitoring, at the same time of day; thus using the lower daytime background level is a worst-case methodology.

Therefore, the lowest² background noise will be used, as with the previous assessment.

54 dB L_{A90} .

5 ACOUSTIC ASSESSMENT

The potential noise issues to be assessed are:

1. Noise from external plant
 - a. kitchen ventilation system

² rather than 'typical'.



5.1 EXTERNAL PLANT NOISE

The most sensitive receptors to ventilation noise are the residents of Hotel Gotham, further up Spring Gardens. There is, however, an intervening building between the ventilation louvre and the hotel – as can be seen in Figure 3.

There are also offices on the upper floors of the building, with the openable part of the window some 1.9m above the louvres – see Figure 4

Typical specification of the external plant is given in Section 2.4.3. The Rating Level of the external plant must not exceed 5dB below the Background Level. Therefore, the Rating Level of any item of plant, at the nearest sensitive receptor must not exceed:

$$49 \text{ dB(A)}.$$

5.2 BS4142 ASSESSMENT

The following noise sources are to be assessed:

- duct noise from the extract fan,
- noise from the supply louvre.

The lowest³ measured background noise level is a starting point. The Specific Noise Levels are calculated at the nearest office window and then corrected for distance and barrier effect (where appropriate) with any relevant penalties to give the Rating Level at the nearest sensitive receptor (NSR) façade. The lowest background noise level at that part of the site is 54dB(A).

The nearest office window is 1.9m from the ventilation louvre.

There is no barrier effect for the noise sources to the office windows.

The Specific Noise Level from each noise was calculated in octave bands where possible. See Appendix for the full calculations.

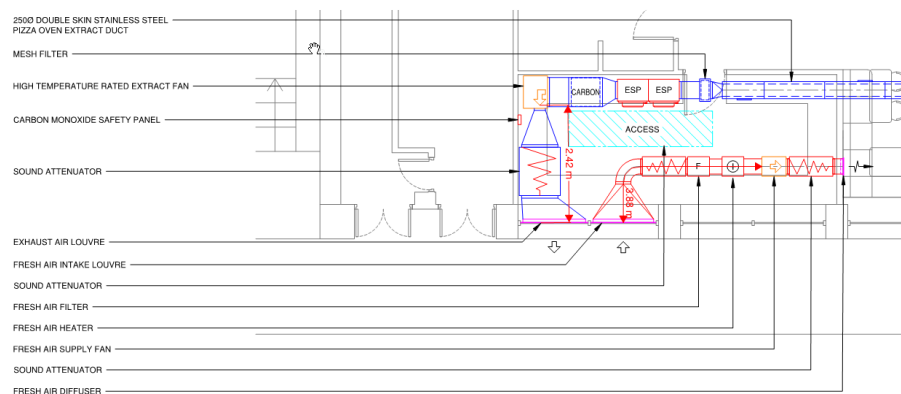


Figure 12
Duct configuration with dimensions

³ the lowest background noise level, rather than the typical, is used as a worst-case methodology.



5.2.1 Extract fan– duct noise

BS 4142 Noise Assessment (Extract – duct)	Value	dB
Noise level at NSR – office (unweighted)	Leq	56
BS 4141		
Tonality	0/2/4/4	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		59
Background, L90 (unweighted)		64
Rating minus Background		-5

Table 4
BS4142 assessment – extract duct

Noise from the duct termination of the extract fan is below the Background Level by 5dB, as shown in Table 4, and thus of **low impact**. No further noise mitigation is required.

5.2.2 Supply grille

The same calculation was repeated for the supply fan.

BS 4142 Noise Assessment (Supply Grille)	Value	dB
Noise level at NSR (unweighted)	Leq	26
BS 4141		
Tonality	0/2/4/4	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		29
Background (unweighted)	L90	64
Rating minus Background		-35

Table 5
BS4142 assessment –supply grille

The Rating Level from the supply grille is 35 dB below the Background Level, as shown in Table 5, and thus of **low impact**. No further noise mitigation is required.

6 CONCLUSION

An initial acoustic survey has taken place at Ground Floor, 55 Spring Gardens, Manchester.

A detailed description of the proposal has been given.

External plant noise transmission from the site has been assessed and noise levels to the nearest sensitive receiver (1st floor offices) is within acceptable noise limits.

No further mitigation is required.



7 REFERENCES

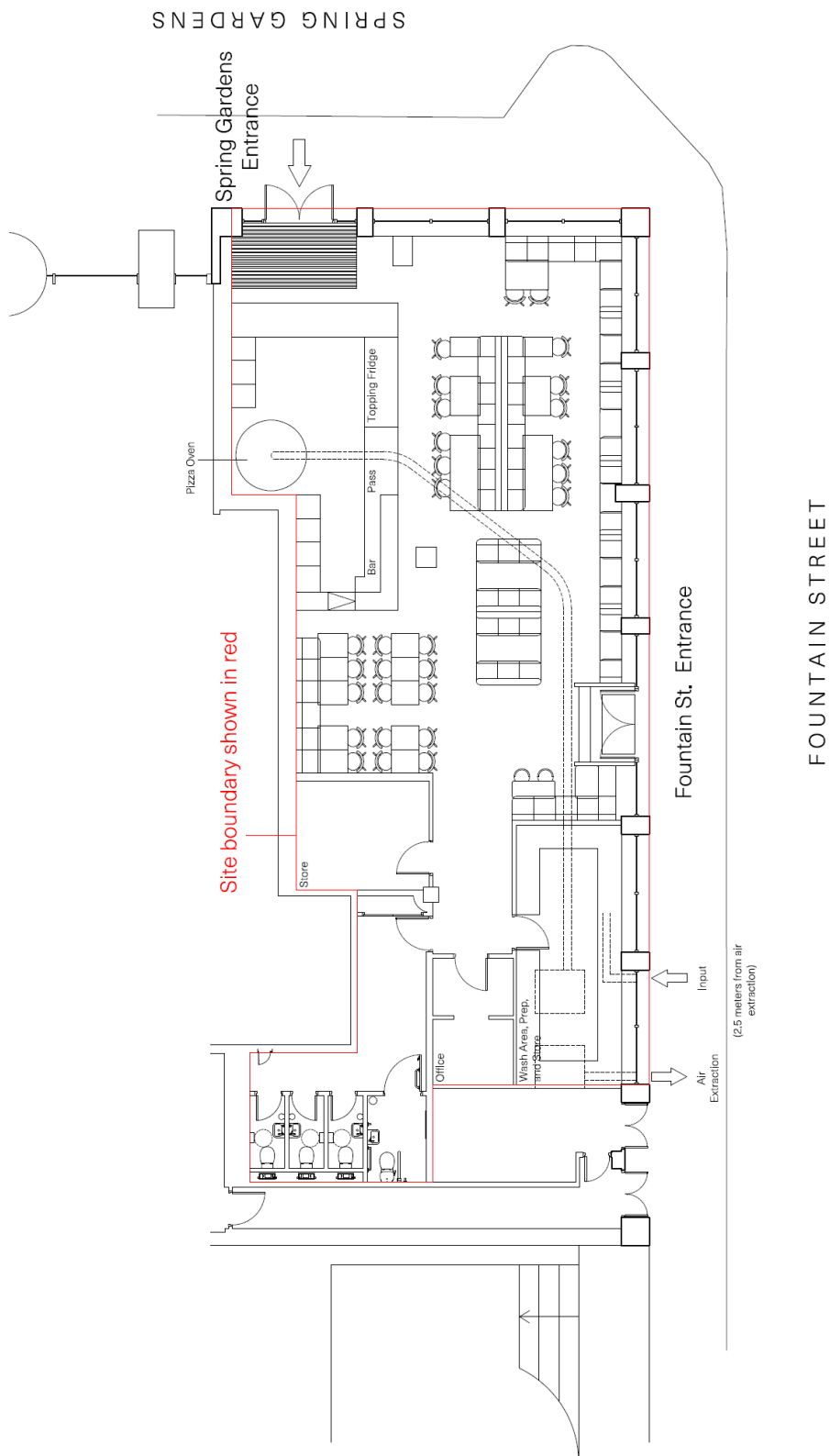
- [1] BS 4142: 1997
Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.
- [2] BS 4142: 2014
Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.
- [3] Environmental Protection, Environmental Health
Planning and Noise Technical Guidance
Manchester City Council, October 2022.



Appendix



A1 PROPOSED DRAWINGS



FOUNTAIN STREET

Up North Architects	North	Drawing Title: 00 Pizza, Manchester	Drawing Number: 010	Revisions: 4	Scale: 1:100 @ A3	Job No.: M888	Date: Jan 2023	RIBA Stage: 02 - Concept Design	Drawing Purpose: For Information
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A2 CALCS

A2.1 Extract

00Pizzeria		Duct Calculation		Extract Fan		Octave band centre frequency						
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	Total level	
1a		Sound Pressure Level @ Xm	SWL data used	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
1b		Sound Power Level of unit	Estoc Targe (PowerBox) 67-450-1, Lw out	79.0	79.0	72.0	69.0	72.0	69.0	67.0	83.3	
2		PLENUMInsetion Loss	no									
3	2.4 m	Duct Length in metres	Round > 300	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
4	0	Number of bends	500mm round bend	0	0	0	0	0	0	0		
5	mm	Branch area	10log(branch mm2/duct mm2)	0	0	0	0	0	0	0		
6		Silencer attenuation (1)	CDA 2D (200-550 dia)	-4	-7	-10	-15	-19	-16	-12		
7		Silencer attenuation (2)	no silencer or n/a	0	0	0	0	0	0	0		
8		Att due to end reflection	2000 mm end reflection	-1	0	0	0	0	0	0		
9		Louvre attenuation	standard louvre	-3	-3	-3	-3	-3	-3	-3		
		A weighting	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
10		Sound power at termination		71.0	69.0	59.0	51.0	50.0	50.0	52.0	73.4	
		Directivity	1m2 @ 80° - 1 surface	-1	-1	-4	-4	-30	-30	-30		
11	Q 1	No. of reflective surfaces	0 surfaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
12	1.9 m	Distance Attenuation	20*log10(r)	-5.58	-5.58	-5.58	-5.58	-5.58	-5.58	-5.58		
		Air absorption	15°C; 80% humidity	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.05		
		Numerical correction	SPL = SWL - 20log(r) +DI - 11	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00		
	δ	Barrier	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		SPL(A) at NSR	LpA,NSR	53.4	51.4	38.4	30.4	3.4	3.4	5.4	55.6 dB	

A2.2 Supply

00Pizzeria		Duct Calculation		Supply Fan		Octave band centre frequency						
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	Total level	
1a		Sound Pressure Level @ Xm	SWL data used	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
1b		Sound Power Level of unit	Estoc Targe (PowerBox) 50-355-1-4 (5FA), Lw in	43.0	47.0	52.0	51.0	44.0	42.0	48.0	56.6	
2		PLENUMInsetion Loss	no									
3	3.88 m	Duct Length in metres	Round >300	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
4	1	Number of bends	500mm round bend	-1	-1	-2	-3	-3	-3	-3		
5	mm	Branch area	10log(branch mm2/duct mm2)	0	0	0	0	0	0	0		
6		Silencer attenuation (1)	CDA 2D (200-550 dia)	-4	-7	-10	-15	-19	-16	-12		
7		Silencer attenuation (2)	no silencer or n/a	0	0	0	0	0	0	0		
8		Att due to end reflection	2000 mm end reflection	-1	0	0	0	0	0	0		
9		Louvre attenuation	no acoustic louvre or n/a	0	0	0	0	0	0	0		
		A weighting	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
10		Sound power at termination		37.0	39.0	40.0	33.0	22.0	23.0	33.0	44.4	
		Directivity	1m2 @ 80° - 1 surface	-1	-1	-4	-4	-30	-30	-30		
11	Q 1	No. of reflective surfaces	0 surfaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
12	1.9 m	Distance Attenuation	20*log10(r)	-5.58	-5.58	-5.58	-5.58	-5.58	-5.58	-5.58		
		Air absorption	15°C; 80% humidity	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.05		
		Numerical correction	SPL = SWL - 20log(r) +DI - 11	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00		
	δ 1	Barrier	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		SPL(A) at NSR	LpA,NSR	19.4	21.4	19.4	12.4	0.0	0.0	0.0	25.2 dB	

