ACOUSTIC SOLUTIONS

Consultant in Noise and Vibration

20 Netherhall Road, Baildon, West Yorkshire BD17 6QD;
Telephone: Redacted ;
Email: Redacted

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NOISE IMPACT ASSESSMENT FOR PROPOSED DEVELOPMENT:

28 Commercial Street, Batley, West Yorkshire WF17 5EY

Prepared for:

Rizwan Patel
28 Commercial Street
Batley
West Yorkshire
WF17 5EY

Prepared by:

Acoustic Solutions
20 Netherhall Road
Baildon
BD17 6QD

Institute of Acoustics number: 43468

Report Number: AS26-89.V1

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The author of this report represents Acoustic Solutions to the exclusion of all other organisations.

1.0 INTRODUCTION

1.1

Acoustic Solutions has been commissioned by Rizwan Patel to undertake a noise impact assessment for a proposed development at 28 Commercial Street, Batley.

1.2

The objectives for the noise impact assessment were as follows:

- Establish the daytime, evening and night time ambient and background sound levels at the application site and its surrounding environs;
- Establish the likely daytime and night time noise impact arising from the noise sources identified in the course of the assessment;
- If appropriate, provide recommendations with respect to management and/or structural controls to mitigate and control the potential noise impact upon future occupiers of the proposed development.

1.3

This report details the methodology and results of the assessment. It has been prepared to accompany an application for planning due to be submitted to Kirklees Council for the proposed development of the application site.

1.4

This report has been prepared for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult the client and Acoustic Solutions as to the extent to which the findings may be appropriate for their use.

2.0 NOISE IMPACT ASSESSMENT CRITERIA

2.1

In terms of noise impact assessment criteria, Paragraph 170e of the National Planning Policy Framework (NPPF) 2024 states that planning policies and decisions should contribute to and enhance the natural local environment by '*preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.*'

2.2

Planning Practice Guidance specifically dealing with noise was uploaded to the Government's Planning Portal in March 2024 as an accompaniment to the National Planning Policy Framework. This guidance is summarised herein.

2.3

The guidance states that noise needs to be considered when new developments may create additional noise. Whilst noise can override other planning concerns, neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement for England) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of proposed development.

2.4

In order to determine noise impact, local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur, and;
- Whether or not a good standard of amenity can be achieved.

2.5

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

2.6

In terms of Observed Effect Levels:

- No Observed Adverse Effect Level (NOAEL) – This is the level of noise exposure below which no effect at all on health or quality of life can be detected;
- Lowest Observed Adverse Effect Level (LOAEL) – This is the level of noise exposure above which adverse effects on health and quality of life can be detected, and;
- Significant Observed Adverse Effect Level (SOAEL) – This is the level of noise exposure above which significant adverse effects on health and quality of life occur.

2.7
At the lowest extreme, when noise is not noticeable, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed' effect level as it becomes noticeable. However, the noise has no adverse effect so long as the exposure is such that it does not cause any change in behaviour or attitude. The noise can slightly affect the acoustic character of an area but not to the extent there is a perceived change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

2.8
As the exposure increases further, it crosses the lowest observed adverse effect level boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

2.9
Increasing noise exposure will at some point cause the significant observed adverse effect level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is above this level the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.

2.10
At the highest extreme, noise exposure would cause extensive and sustained changes in behaviour without an ability to mitigate the effect of noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be prevented from occurring.

2.11
Tables 2.1 and 2.1B summarises noise exposure hierarchy, based on likely average response.

Table 2.1 LOAEL and SOAEL Values

Noise Source	Assessment Location	LOAEL	SOAEL	Time
General environmental noise: Road/Rail	Outdoor living space	55 dB $L_{Aeq,\ 1\ hour}$ (A)	56-60 dB $L_{Aeq,\ 1\ hour}$ (A)	Day (07:00-23:00)
	Façade	50 dB $L_{Aeq,\ 1\ hour}$ (A)	72 dB $L_{Aeq,\ 16\ hour}$ (A)	Day (07:00-23:00)
	Façade	45 dB $L_{Aeq,\ 8\ hour}$ (B)	67 dB $L_{Aeq,\ 8\ hour}$ (A)	Night (23:00-07:00)
	Habitable Room	30 dB $L_{Aeq,\ 8\ hour}$ (B)	40 dB $L_{Aeq,\ 8\ hour}$ (A)	Night (23:00-07:00)
	Habitable Room	35 dB $L_{Aeq,\ 16\ hour}$ (A)	45 dB $L_{Aeq,\ 16\ hour}$ (A)	Day (07:00-23:00)

A: World Health Organisation: Guideline for Community Noise (1999)

B: World Health Organisation: Noise Guidance for Europe (2009)

Table 2.1B NOAEL, LOAEL and SOAEL Values

SPL, dB	</=40	41-45	46-50	51-55	56-60	>/=60
Day	NOAEL	NOAEL	NOAEL	LOAEL	SOAEL	SOAEL+
Evening	NOAEL	NOAEL	LOAEL	SOAEL	SOAEL	SOAEL+
Night	NOAEL	LOAEL	SOAEL	SOAEL	SOAEL	SOAEL+

2.12
The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include:

- The source and absolute level of the noise together with the time of day it occurs;
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- The spectral content of the noise (i.e. whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features);
- The local acoustic character of the area.

2.13
In addition, further useful contextual guidance is provided in:

- British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233);
- World Health Organisation (WHO) Guidelines for Community Noise (1999);
- ProPG: Planning & Noise, Professional Practice Guidance on Planning & Noise: New Residential Development, 2017.

2.14
British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' sets indoor ambient noise levels from residential dwellings (see table below).

Table 2.2 – Indoor Ambient Noise Levels in Dwellings (BS 8233): 2014

Action	Location	Good Indoor Ambient Noise Levels, dB	
Resting	Living Room / Bedroom	$L_{Aeq\ (07:00\text{-}23:00)}$	35
Sleeping	Bedroom	$L_{Aeq\ (23:00\text{-}07:00)}$	30
Sleeping	Bedroom	$L_{AMax\ (23:00\text{-}07:00)}$	45
Action	**Location**	**Good Oudoor Ambient Noise Levels, dB**	
Resting	External Amenity	$L_{Aeq\ (07:00\text{-}23:00)}$	50-55

2.15
With regard to sound attenuation through the building envelope, the 'weak points' in the building façade are generally considered to be the windows. The worked example (G.1) at Annex G of BS 8233 suggests that a partially opened window would provide sound attenuation of approximately 15 dB Rw. The Standard also suggests that *"..standard insulating glass units have an insulation value of approximately 30 dB Rw"* when closed.

2.16
With respect to noise affecting external areas, i.e. gardens, BS 8233 states that *".. it is desirable that the steady noise level does not exceed 50 dB LAeq, and 55 dB LAeq should be regarded as the upper limit".*

2.17
The World Health Organisation's Guidelines for Community Noise (1999) sets indoor ambient noise levels from residential dwellings (see table below).

Table 2.3 – Indoor Ambient Noise Levels in Dwellings (WHO 1999)

Action	Location	Good Indoor Ambient Noise Levels, dB	
Resting	Living Room / Bedroom	$L_{Aeq\ (07:00-23:00)}$	35
Sleeping	Bedroom	$L_{Aeq\ (23:00-07:00)}$	30
Sleeping	Bedroom	$L_{AMax\ (23:00-07:00)}$	45
Action	**Location**	**Good Oudoor Ambient Noise Levels, dB**	
Resting	External Amenity	$L_{Aeq\ (07:00-23:00)}$	50-55

2.18
ProPG: Planning & Noise, Professional Practice Guidance on Planning & Noise: New Residential Development, 2017 was developed by the Institute of Acoustics (IOA), the Chartered Institute of Environmental Health (CIEH) and the Association of Noise Consultants (ANC), the ProPG provides practitioners with guidance on a recommended approach to the management of noise within the planning system in England. The document provides guidance which encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise. ProPG takes a two stage approach.

Stage 1: Initial Site Noise Risk Assessment;
Stage 2:

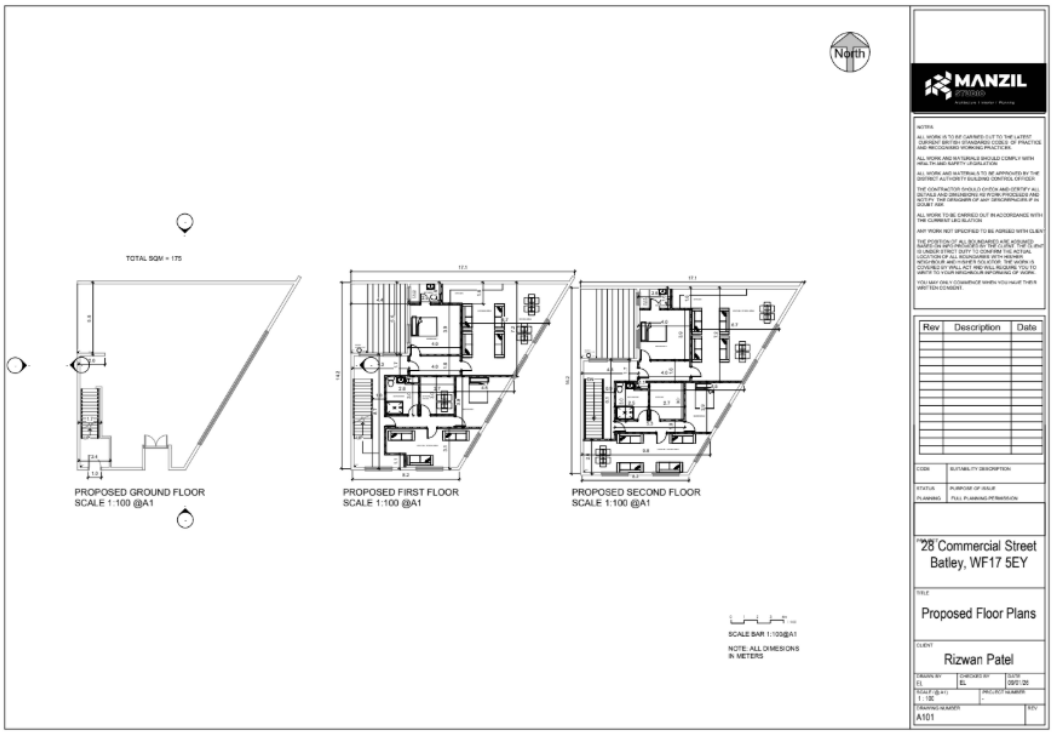
- Element 1 – Good Acoustic Design Process;
- Element 2 – Internal Noise Level Guidelines;
- Element 3 – External Amenity Area Noise Assessment;
- Element 4 – Assessment of Other Relevant Issues (compliance with relevant national and local policy; the magnitude and extent of compliance with ProPG; likely occupants of the development; acoustic design versus unintended adverse consequences; acoustic design versus wider planning objectives).

3.0 BASELINE NOISE SURVEY

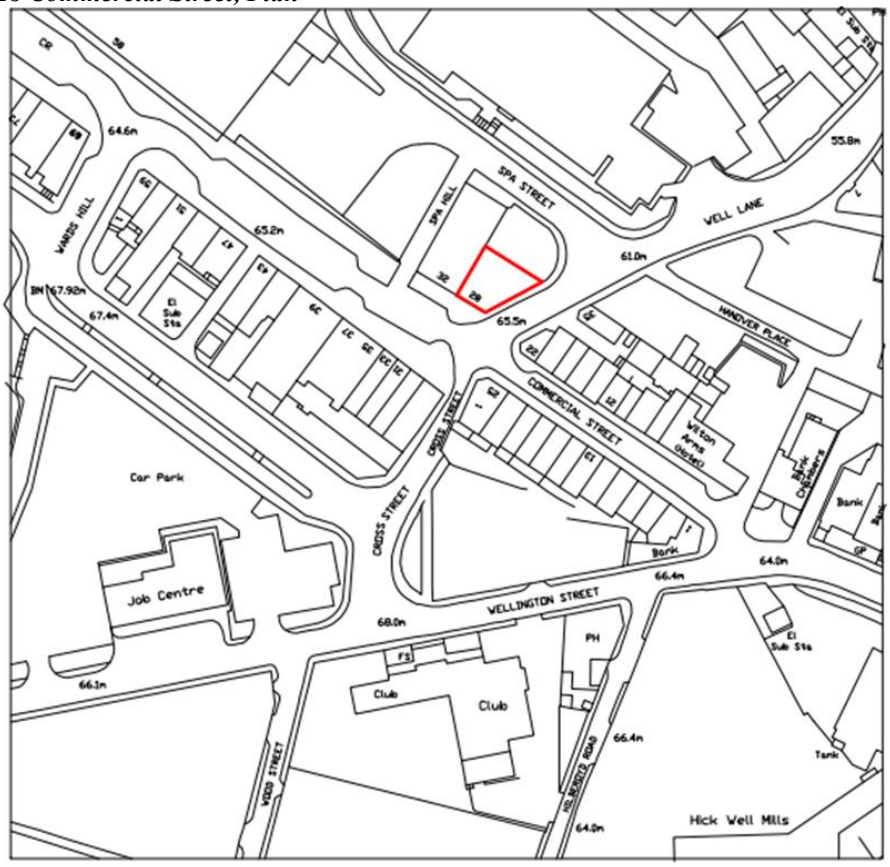
3.1 Site Setting

The application site is 28 Commercial Street, Batley. The proposal is for alterations to convert first and second floor retail to 4 residential units, as summarised in Plans 3.1 and 3.2, below. The ground floor is to remain commercial.

Plan 3.1 Proposed First and Second Storeys (Courtesy of Manzil Studio)



Plan 3.2 28 Commercial Street, Plan



The application for alterations to convert first and second floor retail to 4 residential units at 28 Commercial Street (Application Number: 2021/62/91174/E) has received planning permission from Kirklees Council, subject to the following condition (Condition 3):

"Before development commences a report specifying the measures to be taken to protect the development from noise from road traffic on Commercial Street, Batley and nearby commercial premises shall be submitted to and approved in writing by the Local Planning Authority. The report shall:

a) Determine the existing noise climate;

b) Predict the noise climate in living rooms (daytime), bedrooms (night-time) and other habitable rooms of the development;

c) Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required).

The development shall not be occupied until all works specified in the approved report have been carried out in full and such works shall be thereafter retained.

Reason: This is a pre-commencement condition, which is necessary to ensure the future occupiers of the proposed flats benefit a good standard of amenity in the town centre location and to accord with LP24 of the Kirklees Local Plan."

Acoustic Solutions has assessed existing daytime, evening and nighttime noise sources that have the potential to adversely impact upon the amenity of the premises' future occupiers. Based upon this, this report will then specify the measures to be taken to protect the development from noise from all significant noise sources that are likely to affect the proposed development. The report shall:

a) Determine the existing noise climate;
b) Predict the noise climate in living rooms (daytime), bedrooms (night-time) and other habitable rooms of the development;
c) Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required).

3.2 Site Description

The development site is located at 28 Commercial Street in the centre of Batley. 28 Commercial Street is a three storey building. It sits at the junction of Commercial Street and Well Lane.

Commercial Street is a highway that runs east-west. The southern façade of number 28 faces onto Commercial Street. Commercial Street is overwhelmingly commercial in nature, with premises in the development site's vicinity comprising of retail and fast food premises. On the ground floor of number 28 is Chum Chee's restaurant.

Well Lane is located to the east of the development site. It runs north-south between Commercial Street to the south and Bradford Road to the north. It is commercial in nature. To the east of number 28 is a takeaway, Shan Kitchen. Well Lane leads to the entrance of Tesco supermarket that stands 19 metres to the north of the development site. No glazing is proposed for number 28's northern or western façades (second storey). Its western elevation adjoins Batley DIY Centre at ground and first storey level.

3.3 Noise Sources

Table 3.1 summarises the identified noise sources that have the potential to adversely impact future occupiers of the building, and their respective distances to the perimeters of the application site. It is understood that the proprietor of Chum Chee Restaurant is willing to relocate the kitchen extraction flue located on the north-eastern façade of the development site.

Table 3.1. Observed Noise Sources

Noise Sources Potentially Affecting Occupiers of Proposed Dwellings	Distance at its closest point, m				Notes	Microphone Position
	North	South	East	West		
Road traffic on Commercial Street	**N/A**	**9**	**N/A**	**N/A**	Cars, buses, commercial vehicles, motorcycles, emergecy vehicles etc.	MP1
Road traffic on Well Lane	N/A	N/A	4	N/A	Cars, buses, commercial vehicles, motorcycles, emergecy vehicles etc.	MP2
Chum Chee Diner	N/A	N/A	NA	N/A	Opening hours: 16:30-23:00 hours (Suday-Wednesdays) 16:30-01:00 hours (Thursday to Saturday). Noise break out between ground and first floor	N/A
Chum Chee Diner	N/A	N/A	N/A	3	Kitchen extraction flue on premiese' north-western façade	MP3
Chum Chee Diner	N/A	5	N/A	N/A	Patrons arriving and departing	MP1
Shan's Kitchen, 35 Well Street	N/A	N/A	21	N/A	Open hours:17:00-03:00 hours. Patrons arriving and departing	MP1

3.4

In order to establish the daytime, evening and night time background noise levels at the application site and its surrounding environs, a baseline noise survey was undertaken on Wednesday 17 September 2026 between 07:00 and 23:00 hours (daytime/evening) and 23:00-07:00 hours (nighttime).

3.5

For the purpose of the assessment, three noise monitoring positions, MP1, MP2 and MP3 were adopted in free field environments at over 1.5 metres above ground and over 3 metres from any vertical reflective surface. A microphone tripod-mounted at street level was used for MP1 and MP2. A boom arm extended from the north-east-facing window at first floor level was used for MP3.

- MP1. Southern façade, overlooking Commercial Street. The noise measurement data at collected at MP1 is sufficient to describe noise from pedestrians on Commercial Street and from road traffic on the Well Lane/Commercial Street junction and noise associated with Chum Chee's Restaurant.

- MP2. Eastern façade, overlooking Well Lane. The noise measurement data collected at MP2 is sufficient to describe noise from road traffic and pedestrian noise on Well Lane.

- MP3 North-eastern façade of the development site. The noise measurement data at collected at MP3 is sufficient to describe noise from the kitchen extraction flue serving Chum Chee Restaurant.

3.6

At all microphone positions a series of hourly 15-minute noise measurements were undertaken using a Type 1 integrating sound level meter (Appendix 3). The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end. Weather conditions throughout the survey were dry and clear. Wind speeds were commensurate for the assessment

methodology. Measurements consisted of A–weighted parameters: L_{Aeq}, L_{A90} and L_{Amax}.

3.7 MP1

The principle existing noise source in the vicinity of MP1 was pedestrians and road traffic (including cars commercial vehicles and buses). Other noise sources includes patrons arriving and departing on foot from Chum Chee's Restaurant, but this was not significant. The busiest arrival period was between 19:00 and 20:00 hours. Patrons left between 21:00 and 21:30 hours.

Table 3.2 summarises daytime, evening and night time noise measurement data. For the purposes of this report, the average L_{Aeq} and maximum L_{Amax} values measured will be used so to provide an accurate illustration of the noise environment.

Table 3.2. MP1: Baseline Noise Measurement Data, Daytime, Evening and Night Time Noise Measurements

Measurement Time	Sound Pressure Level, dB, $L_{Aeq, 15\ min}$	Sound Pressure Level, dB $L_{A90, 15\ min}$	Sound Pressure Level, dB $L_{AMax, 15\ min}$
07:00	58.7	47.3	73.3
08:00	62.5	48.3	71.9
09:00	63.4	48.2	77.9
10:00	64.4	48.5	78.1
11:00	64.3	48.4	77.7
12:00	64.1	48.2	77.9
13:00	64.3	48.4	77.9
14:00	64.3	48.7	78.0
15:00	64.0	48.4	77.9
16:00	64.2	48.6	78.3
17:00	63.7	48.0	77.7
18:00	63.7	48.2	77.9
Daytime Average/Max	**63**	**48**	**78**
19:00	54.9	43.7	75.8
20:00	57.1	43.6	75.7
21:00	54.9	41.6	75.6
22:00	59.0	41.5	75.6
Evening Average/Max	**56**	**43**	**76**
Daytime & Evening Average/Max	**61**	**47**	**78**
23:00	51.5	38.6	73.5
00:00	46.7	40.8	73.6
01:00	43.1	37.3	70.3
02:00	44.4	36.8	73.9
03:00	44.0	37.5	73.8
04:00	43.5	37.7	70.9
05:00	45.9	38.0	72.0
06:00	43.9	35.5	71.3
Nighttime Average/Max	**45**	**38**	**74**

3.8 MP2

The principle existing noise source at MP2 was road traffic (including cars commercial vehicles and buses) travelling along Well Lane. Daytime (16:00 hours) traffic count: 4 vehicles per minute (both directions). Nighttime (03:00 hours) traffic count: 2 vehicles per ten minutes. Other noise sources includes patrons arriving and departing on foot from Chum Chee's Restaurant, but this was not significant. The busiest arrival period was between 19:00 and 20:00 hours. Patrons left between 21:00 and 21:30 hours. There was little or noise associated with Shans Kitchen.

Table 3.3 summarises daytime, evening and nighttime noise measurement data. For the purposes of this report, the average and maximum L_{Aeq} and L_{Amax} values measured will be used so to provide an accurate illustration of the noise environment.

Table 3.3. MP2: Baseline Noise Measurement Data, Daytime, Evening and Night Time Noise Measurements

Measurement Time	Residual Noise Level, dB, $L_{Aeq, 15\ min}$	Background Noise Level, dB $L_{A90, 15\ min}$	Measured Noise Level, dB $L_{AMax, 15\ min}$
07:00	52.9	44.3	76.3
08:00	59.5	47.5	76.4
09:00	59.3	47.4	77.3
10:00	60.4	47.9	76.0
11:00	60.6	47.3	76.3
12:00	59.3	47.9	77.4
13:00	59.5	47.4	76.1
14:00	59.5	47.7	76.2
15:00	59.1	47.9	76.9
16:00	59.6	47.8	76.9
17:00	59.8	47.6	76.5
18:00	59.2	47.7	77.2
Daytime Average/Max	**59**	**47**	**77**
19:00	50.7	43.4	71.9
20:00	51.7	43.8	71.3
21:00	50.7	43.8	73.5
22:00	51.0	43.3	71.4
Evening Average/Max	**51**	**44**	**73**
Dayime & Evening Average/Max	**57**	**46**	**77**
23:00	45.4	36.9	73.4
00:00	42.9	36.4	73.4
01:00	41.9	36.5	72.7
02:00	43.2	36.8	72.8
03:00	42.2	36.5	72.4
04:00	43.3	36.7	73.7
05:00	42.3	36.4	73.6
06:00	43.7	37.0	72.2
Nighttime Average/Max	**43**	**37**	**74**

3.9 MP3

Between 16:00 and 23:00 hours, the principle existing noise source at MP3 was the kitchen extraction flue. At 15:00 and 00:00 hours the principle existing noise source was road traffic on Commercial Street.

Table 3.4 summarises daytime, evening and nighttime noise measurement data. For the purposes of this report, the average and maximum L_{Aeq} and L_{Amax} values measured will be used so to provide an accurate illustration of the noise environment.

Table 3.4. MP3: Specific and Residual/Background Noise Measurement Data, Daytime, Evening and Night Time Noise Measurements

Measurement Time	Residual Noise Level, dB, $L_{Aeq, 15\ min}$	Background Noise Level, dB $L_{A90, 15\ min}$	Measured Noise Level, dB $L_{AMax, 15\ min}$
07:00	N/A	N/A	N/A
08:00	N/A	N/A	N/A
09:00	N/A	N/A	N/A
10:00	N/A	N/A	N/A
11:00	N/A	N/A	N/A
12:00	N/A	N/A	N/A
13:00	N/A	N/A	N/A
14:00	N/A	N/A	N/A
15:00	68.7	64.7	72.4
16:00	78.3	N/A	84.3
17:00	80.6	N/A	84.4
18:00	80.7	N/A	84.4
Daytime Average/Max	**77.1**	**64.7**	**84.4**
19:00	80.8	N/A	84.3
20:00	80.7	N/A	84.4
21:00	80.7	N/A	84.4
22:00	77.0	N/A	84.4
Daytime/Evening Average/Max	**52.8**	**N/A**	**84.4**
Evening Average/Max	**80.0**	**N/A**	**84.4**
23:00	61.3	52.7	64.4
00:00	N/A	N/A	N/A
01:00	N/A	N/A	N/A
02:00	N/A	N/A	N/A
03:00	N/A	N/A	N/A
04:00	N/A	N/A	N/A
05:00	N/A	N/A	N/A
06:00	N/A	N/A	N/A
Nighttime Average/Max	**61.3**	**52.7**	**64.4**

4.0 DISCUSSION

4.1 External Noise Levels

4.1.1 BS4142+A1: 2019

Table 4.1 summarises the predicted daytime/evening noise impact of the kitchen extraction unit directly outside the nearest north-eastern facing first floor window at the development site. Daytime impact will be calculated using 16:00-18:00 hours measurement data (Specific Noise Level, dB, L_{Aeq}) and 15:00 hours measurement data (Background Noise Level, dB, L_{A90}). Evening impact will be calculated using 19:00-23:00 hours measurement data (Specific Noise Level, dB, L_{Aeq}) and 00:00 hours measurement data (Background Noise Level, dB, L_{A90}). For the purpose of the assessment, a +3 dB tonal correction has been applied. This presents a worst case scenario for the development.

Table 4.1 BS4142 Noise Impact Assessment, Bedrooms Flat 1 and Flat 3

Period	Background Noise, dB, $L_{A90,15}$	Specific Noise Level, dB, L_{Aeq}	Tonal Penalty (3-6)	Impulsive Penalty (3-9)	Intermittency Penalty (0-3)	Rating, dB	Comments
Day	65	81	3	0	0	19	Significant Adverse Impact
Evening	53	81	3	0	0	31	Significant Adverse Impact

4.2 Internal Noise Levels

4.2.1 World Health Organisation: 1999 and BS8233: 2014 (Internal)

Assuming a -15 dB attenuation provided by a slightly open window, daytime, evening and nighttime internal sound pressure levels arising from daytime, evening and nighttime noise sources can be predicted within habitable rooms. These values can then be compared against maximum noise criteria, as set out in the World Health Organisation's 'Guidelines for Community Noise (1999) and BS8233: 2014. Table 4.1 summarises the predicted internal noise levels.

Table 4.1. Internal Daytime/Evening measured SPLs at MP1, MP2 and MP3 compared against BS8233 and WHO: 1999

Time	Location	External SPL, dB, L_{Aeq}	Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35/30 dB Criteria met?
Daytime/Evening	MP1	61	15	46	No
Night	MP1	45	15	30	Yes
Time	**Location**	**External SPL, dB, L_{AMax}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**
Night	MP1	74	15	59	No
Time	**Location**	**External SPL, dB, L_{Aeq}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 35/30 dB Criteria met?**
Daytime/Evening	MP2	57	15	42	No
Night	MP2	43	15	28	Yes
Time	**Location**	**External SPL, dB, L_{AMax}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**
Night	MP2	74	15	59	No
Time	**Location**	**External SPL, dB, L_{Aeq}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 35/30 dB Criteria met?**
Daytime/Evening	MP3	81	15	66	No
Night	MP3	42	15	27	Yes
Time	**Location**	**External SPL, dB, L_{AMax}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**
Night	MP3	64	15	49	No

5.0 NOISE TRANSMISSION BETWEEN GROUND AND FIRST FLOORS

5.1 Test Details

The tests were conducted on 17 September 2026. All measurements were made by Acoustic Solutions.

The equipment used during the tests is as listed in Appendix One of this report. The sound level meter (SLM) was calibrated before, after and during the tests as appropriate. No significant calibration deviation was observed. The SLM, acoustic calibrator and microphone are all covered by current manufacturers' calibration certificates and/or certificates of compliance.

The testing methods for airborne sound insulation were in accordance with the principles presented in BS EN 16283-2:2015. The results were analysed in accordance with BS EN ISO 16283-1:2014 (airborne sound insulation).

Additionally, all procedures in Annex B of the Approved Document E, guidance to the Building Regulations, have been followed.

5.2 Basic Procedures

5.2.1 Airborne Sound

The field testing of structures for airborne sound insulation involves generating a controlled level of noise in one room (the source room) and measuring the resulting noise in the other room (the receiving room) which is separated from the source room by the element being tested. Spatial and temporal averaging of the noise level in both rooms is carried out by manually repositioning the microphone in the receiving room.

Two separate measurements were completed. Corrections are applied to the measured levels for the effects of background noise and acoustic absorption; the latter being characterised by reverberation time measurements.

The corrected, measured source and receiving room levels are used to derive the Standardised Level Difference. The data, which is analysed in third octave bands, is compared with reference values using a defined matching criteria to determine the single figure Weighted Standardised Level Difference.

From this data, a Spectrum Adaptation term is calculated. This gives an indication of the performance of the element under test when it is exposed to particular types of noise. This term is additive to the Weighted Standardised Level Difference, and is quoted when referring to the element's sound insulation performance.

Reverberation times in the receiving rooms must also be recorded. This involves generating a controlled level of noise in a minimum of one source position for a pre-determined period of time, and measuring the decay time of the sound energy over a range of not less than 20 dB.

5.3 Ceiling Construction

At the time of the assessment the ceiling consisted of floorboards and existing timber joists.

5.4 Terms of Reference

Approved Document E "Resistance to the Passage of Sound" 2003 edition provides guidance to meeting the requirements of the Building Regulations 2000. The document provides specific values of sound insulation that are required in a number of situations including purpose-built dwelling houses and rooms, and dwelling houses and rooms formed by material change of use. In the case of impact sound insulation of both separating floors, the required sound insulation performance standards are quoted in terms of the LnT,w + CI values. In this case the CI value is a low frequency adaptation term. In the case of airborne sound insulation of both separating walls and floors, the required sound insulation performance standards are quoted in terms of the DnT,w + Ctr values. In this case the Ctr value is a low frequency adaptation term.

Table 5.1 summarises the requirements for separating wall and ceiling partitions.

Table 5.1 requirements for separating wall and ceiling partitions

E1. Room for Residential Purposes	Airborne Sound Insulation, DnT,w+Ctr, dB
Walls	55
Floors	55

With reference to the airborne sound insulation requirement, a separating element will be judged to have "passed" the rest providing that the result which has been obtained from the site measurements is at or above the minimum value detailed in the table above.

5.5 Background Noise Levels

Measurements of typical noise levels were made within the receiving rooms during the tests. Background noise comprised of road traffic noise. It should be remembered that low background noise levels are not taken into account by Approved Document E. Consequently, even if a wall or floor is performing satisfactorily, it may still be the case that sound will be heard passing between adjacent spaces; this being a result of a lack of masking sound provided by background noise.

5.6 Airborne Sound Results

The airborne noise measurements obtained on site have been processed to produce the standardised level difference, DnT, between the source and receiver rooms. The DnT is detailed with the weighted Standardised Level Difference, DnT,w and the Ctr values. The DnT,w + Ctr allows the sound insulation performance of the elements tested to be compared with the Approved Document E requirements detailed in Paragraph 4, above. Full measurement data is available upon request.

5.7 Airborne Sound Insulation Ceiling Partition

The obtained results for the separating partitions have not met the minimum value of sound insulation required by Approved Document E, 2003, and as such may be regarded as not having "passed" the test. The subjective impression was that the sound insulation was poor, with inadequate containment of sound energy within the separating partition structure. Airborne Insulation values are described in Table 5.2.

Table 5.2. Airborne Sound: Ceilings

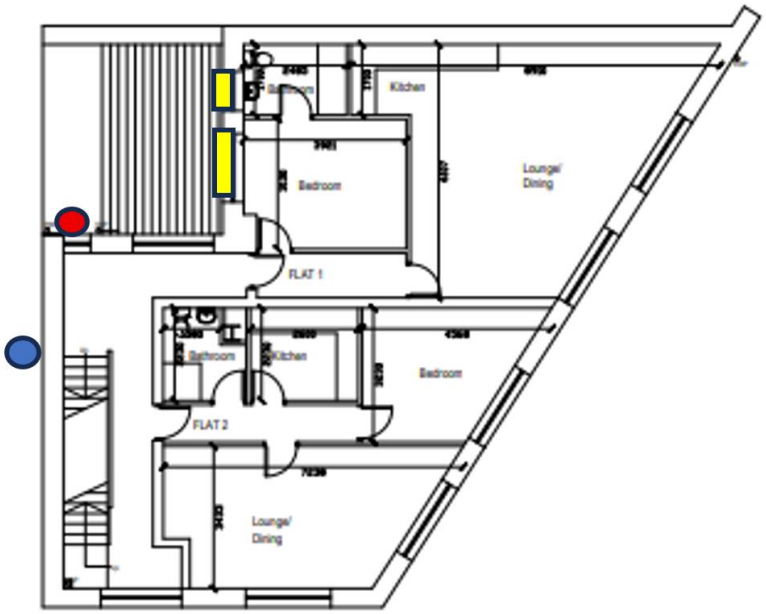
Test	Detail	Source Address	Room Type	Receiver Address	Room Type	D_{nT}	C_{tr}	$D_{nT}+C_{tr}$	Pass/Fail
T1AIR	Ceiling	28 Commercial Street, Batley, West Yorkshire WF17 5EY	Ground floor	28 Commercial Street, Batley, West Yorkshire WF17 5EY	First floor	44.0	-8.77	35.23	FAIL

6.0 RECOMMENDATIONS

6.1 Extraction Flue Serving Chum Chee Restaurant

It is recommended that the extraction system be relocated from its current position on the north-eastern façade of the development site to the site's north-western façade, as shown in Figure 6.1.

Figure 6.1 Proposed Flue Relocation (Red: current flue location; Blue: recommended flue location; Yellow: location of nearest habitable room glazing)



The building's north-west/north-east corner would act as a noise barrier between the relocated flue and the glazing. Using Equation 6.1, it is predicted that this 'barrier' would provide 15-20 dB noise attenuation, as summarised in Table 6.1. The barrier calculations are based upon the following assumed dimensions:

- Relocated flue to NW/NE corner distance, 5m;
- NW/NE corner to NE/NW corner distance, 7m;
- NE/NW corner to glazing, 3m;
- NW/NW corner to glazing, 14m.

Equation 6.1 Barrier Attenuation

$$N = 10 \log \left(3 \pm 40 \frac{\delta}{\lambda} \right)$$

Where:

δ	a+b-d
λ	wavelength
±	+ if source can be seen. - if source cannot be seen'

Table 6.1 Predicted Barrier Attenuation

Frequency, Hz	Attenuation, dB
125	12.5
250	15.1
500	17.9
1000	20.8
2000	23.7
4000	26.7
A-Weighted Single Figure Attenuation based on an estimated 1 m path-length difference	**20**

Table 6.2 summarises the predicted daytime/evening noise impact of the relocated kitchen extraction unit, affording a -15 dB noise attenuation. Daytime impact will be calculated using 16:00-18:00 hours measurement data (Specific Noise Level, dB, L_{Aeq}) and 15:00 hours measurement data (Background Noise Level, dB, L_{A90}). Evening impact will be calculated using 19:00-23:00 hours measurement data (Specific Noise Level, dB, L_{Aeq}) and 00:00 hours measurement data (Background Noise Level, dB, L_{A90}). For the purpose of the assessment, a +3 dB tonal correction has been applied. This presents a worst case scenario for the development.

Table 6.2. BS4142 Noise Impact Assessment, Bedrooms Flat 1 and Flat 3

Period	Background Noise, dB, $L_{A90,15}$	Specific Noise Level, dB, L_{Aeq}	Tonal Penalty (3-6)	Impulsive Penalty (3-9)	Intermittency Penalty (0-3)	Rating, dB	Comments
Day	65	66	3	0	0	4	Minor Adverse Impact
Evening	53	66	3	0	0	16	Significant Adverse Impact

6.2 Room Layout

The current proposal is for the first (Flat 1) and second floor (Flat 3) bedrooms to face north-west towards the extraction system. It is recommended that Flat 1 and 2's layouts be altered so that the bedrooms will face south-east. A re-orientation of these rooms will result in a predicted BS4142 evening noise impact outside the living room of +16 dB. This recommendation should be considered in conjunction with Recommendation 6.1.

6.3 Glazing

All glazing recommendations made in conjunction with Recommendations 6.1 and 6.2.

6.3.1 South-Facing Glazing (MP1) – All Habitable Rooms

Table 6.3 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all habitable rooms are within the maximum recommended by WHO: 1999 and BS8233. For all habitable rooms, glazing units of the following specification are recommended:

10mm (6-16mm) 6mm glass

The Pilkington data sheet (reproduced here as Table 6.5) states that glazing with this specification will provide 32 dB noise attenuation (closed windows). Table 6.4 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming this recommended glazing).

6.3.2 South-East-Facing Glazing (MP2)– All Habitable Rooms
Table 6.3 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all habitable rooms are within the maximum recommended by WHO: 1999 and BS8233.For all habitable rooms, glazing units of the following specification are recommended:

10mm (6-16mm) 6mm glass

The Pilkington data sheet (reproduced here as Table 6.5) states that glazing with this specification will provide 32 dB noise attenuation (closed windows). Table 6.4 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming the recommended glazing).

6.3.3 North-East-Facing Glazing (MP3)– All Habitable Rooms
Table 6.3 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all habitable rooms are within the maximum recommended by WHO: 1999 and BS8233. For all habitable rooms, glazing units of the following specification are recommended:

6mm/16mm argon/6.8mm Pilkington Optiphon

The Pilkington data sheet (reproduced here as Table 5.6) states that glazing with this specification will provide 34 dB noise attenuation (closed windows). Table 5.6 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming the recommended glazing).

6.4 Ventilation
All ventilation recommendations made in conjunction with Recommendations 6.1, 6.2 and 6.3.
Windows should be openable; however, where summarised in Table 4.1, above, open-window ventilation may result in excessive internal sound levels during daytime and night time hours. The glazing must incorporate sufficient ventilation so to prevent overheating. ProPG calls for glazing with 'good ventilation'. In terms of temperature, this report interprets this as ventilation sufficient to provide a range of between 15-21^{0}C. Table 6.3 summarises the recommended ventilation scheme for all habitable rooms.

6.4.1 Ventilation. South-Facing Glazing (MP1) – All Habitable Rooms

It is recommended that all habitable rooms be ventilated by:

Open window & 1x Titon Ultimate dMEV decentralised mechanical extraction fan

Table 5.1.b of Approved Document F, 'Approved means of ventilation' (2022) prescribes a whole dwelling ventilation rate of 13 l/s per bedroom. The Titon Ultimate dMEV meets this criterion. The unit's sound rating is 10 dB. Assuming an existing daytime internal sound level of 25 dB or above, an additional 10 dB would be inaudible.

6.4.2 Ventilation. East-Facing Glazing (MP2) – All Habitable Rooms

It is recommended that all habitable rooms be ventilated by:

Open Window & 1x Titon Ultimate dMEV decentralised mechanical extraction fan

Table 5.1.b of Approved Document F, 'Approved means of ventilation' (2022) prescribes a whole dwelling ventilation rate of 13 l/s per bedroom. The Titon Ultimate dMEV meets this criterion. The unit's sound rating is 10 dB. Assuming an existing daytime internal sound level of 25 dB or above, an additional 10 dB would be inaudible. Open-window ventilation is acceptable at nighttime.

6.4.3 Ventilation. East-Facing Glazing (MP3) – All Habitable Rooms

It is recommended that all habitable rooms be ventilated by:

Open window and trickle ventilation, model TA5220 (SF Xtra Vent) + TA5005 (SF 418) 2500EA

Table 5.1.b of Approved Document F, 'Approved means of ventilation' (2022) prescribes a whole dwelling ventilation rate of 13 l/s per bedroom. The Titon Ultimate dMEV meets this criterion. The unit's sound rating is 10 dB. Assuming an existing daytime internal sound level of 25 dB or above, an additional 10 dB would be inaudible. Open-window ventilation is acceptable at nighttime.

Table 6.3 Recommended Glazing and Ventilation

Location	Glazing	R_w, C_{tr}, dB	Ventilation	Open Window
All Habitable South Facing Rooms (MP1)	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan	Yes
All Habitable South-EastFacing Rooms (MP2)	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan	Yes
All Habitable North-West Facing Rooms (MP3)	6mm/16mm argon/6.8mm Pilkington Optiphon	34	TA5220 (SF Xtra Vent) + TA5005 (SF 418) 2500EA	Yes

Table 6.4. Predicted internal noise levels upon the adoption of recommended glazing

Time	Location	External SPL, dB, L_{Aeq}	Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35/30 dB Criteria met?
Daytime/Evening	MP1	61	32	29	No
Night	MP1	45	32	13	Yes
Time	**Location**	**External SPL, dB, L_{AMax}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**
Night	MP1	74	32	42	Yes
Time	**Location**	**External SPL, dB, L_{Aeq}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 35/30 dB Criteria met?**
Daytime/Evening	MP2	57	32	25	Yes
Night	MP2	43	32	11	Yes
Time	**Location**	**External SPL, dB, L_{AMax}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**
Night	MP2	74	32	42	Yes
Time	**Location**	**External SPL, dB, L_{Aeq}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 35/30 dB Criteria met?**
Daytime/Evening	MP3	66	34	32	Yes
Night	MP3	42	34	8	Yes
Time	**Location**	**External SPL, dB, L_{AMax}**	**Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**
Night	MP3	64	34	30	Yes

Table 6.5 Pilkington Data Sheet (Yellow: Recommended Glazing for MP1 and MP2; Green: Recommended glazing for MP3)

Glass	Sound Reduction Index Octave Band Centre Frequency (Hz)								
	125	250	500	1000	2000	4000	Rw	Rw + C	Rw + C_{tr}
Single Glazing									
6.8 Pilkington Optiphon	22	26	31	37	40	40	36	36(-1;-4)	32
8.8 Pilkington Optiphon	27	29	34	38	40	43	37	37(-0;-2)	35
10.8 Pilkington Optiphon	26	30	35	39	40	46	38	38(-1;-3)	35
12.8 Pilkington Optiphon	29	32	36	41	42	51	40	40(-1;-3)	37
16.8 Pilkington Optiphon	31	33	38	41	43	54	41	41(-1;-3)	38
Insulating Glass Units									
6mm/16mm argon/6.8mm Pilkington Optiphon	21	28	37	48	48	54	40	40(-2;-6)	34
6mm/16mm argon/8.8mm Pilkington Optiphon	25	27	38	48	47	55	41	41(-2;-6)	35
8mm/16mm argon/8.8mm Pilkington Optiphon	21	30	39	47	50	55	42	42(-3;-8)	34
10mm/16mm argon/8.8mm Pilkington Optiphon	28	31	42	45	50	58	44	44(-2;-6)	38
10mm/20mm argon/8.8mm Pilkington Optiphon	28	36	43	47	49	58	46	46(-2;-6)	40
8.8mm Pilkington Optiphon/16mm argon/12.8mm Pilkington	28	36	45	53	56	64	48	48(-2;-7)	41
10.8mm Pilkington Optiphon/24mm argon/16.8mm Pilkington	35	41	48	53	55	65	52	52(-2;-6)	46
12.8mm Pilkington Optiphon/20mm argon/16.8mm Pilkington	35	45	49	50	54	65	51	51(-1;-4)	47
4mm/(6-16mm)/4mm	21	17	25	35	37	31	29	28	25
6mm/(6-16mm)/4mm	21	20	26	38	37	39	32	30	28
6mm/(6-16mm)/6mm	20	18	28	38	34	38	31	30	27
8mm/(6-16mm)/4mm	22	21	28	38	40	47	33	32	29
8mm/(6-16mm)/6mm	20	21	33	40	36	48	35	33	29
10mm/(6-16mm)4mm	24	21	32	37	42	43	35	33	30
10mm/(6-16mm)6mm	24	24	32	37	37	44	35	34	32
6mm/(6-16mm)/6mm laminated	20	19	30	39	37	46	33	31	28
6mm/(6-16mm)/10mm laminated	24	25	33	39	40	49	37	36	32

Table 6.6 Trickle Vents. Orange: Trickle vent recommendation for MP3)

Product	Open	Closed	EA (mm^2)
TA5225 (V75) + TA5206 (C75) 2500EA	Dn,e,w (C,Ctr) = 44 (-2;-3) dB	Dn,e,w (C,Ctr) = 55 (-1;-5) dB	2500
TA5225 (V75) + TA5204 (C50) 2500EA	Dn,e,w (C,Ctr) = 42 (-1;-2) dB	Dn,e,w (C,Ctr) = 55 (-2;-5) dB	2500
TA5225 (V75) + TA5005 (SF 418) 2500EA	Dn,e,w (C,Ctr) = 40 (-1;-2) dB	Dn,e,w (C,Ctr) = 53 (-1;-4) dB	2500
TA5223 (V50) + TA5202 (C25) 2500EA	Dn,e,w (C,Ctr) = 39 (-1;-2) dB	Dn,e,w (C,Ctr) = 55 (-2;-5) dB	2500
TA5223 (V50) + TA5005 (SF 418) 2500EA	Dn,e,w (C,Ctr) = 38 (-1;-2) dB	Dn,e,w (C,Ctr) = 55 (-2;-5) dB	2500
TA5221 (V25) + TA5202 (C25) 2500EA	Dn,e,w (C,Ctr) = 36 (-0;-2) dB	Dn,e,w (C,Ctr) = 55 (-1;-5) dB	2500
TA5221 (V25) + TA5005 (SF 418) 2500EA	Dn,e,w (C,Ctr) = 35 (-0;-1) dB	Dn,e,w (C,Ctr) = 54 (-1;-4) dB	2500
TA5220 (SF Xtra Vent) + TA5202 (C25) 2500EA	Dn,e,w (C,Ctr) = 35 (-0;-1) dB	Dn,e,w (C,Ctr) = 55 (-1;-5) dB	2500
TA5220 (SF Xtra Vent) + TA5005 (SF 418) 2500EA	Dn,e,w (C,Ctr) = 32 (-1;-0) dB	Dn,e,w (C,Ctr) = 52 (-2;-4) dB	2500
TA5235 (V75) + TA5236 (C75) 5000EA	Dn,e,w (C,Ctr) = 40 (-2;-3) dB	Dn,e,w (C,Ctr) = 51 (-1;-4) dB	5000

6.7 External

No external amenity is proposed, so no external noise attenuation recommendations have been made.

6.8 Sound Transmission between ground and first floor

In order for the ceiling partition to meet an insulation performance of 55 dB, $D_{nT,w+Ctr}$, it is recommended that the ceiling's construction is as follows:

- Platform floor above 22mm acoustic flooring;
- Existing floorboards;
- Existing timber joists;
- Suspended ceiling: 15mm gypsum plank soundboard;
- 100mm Isowool APR 1200,
- 2x 12.5 soundboards, 5mm skim.

Appendix 1
Glossary of Acoustic Terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_0)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p0 = reference sound pressure (20 µPa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified period of time. In other words, L_{Aeq} is the level if a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. L_{Aeq} is increasing being used as the preferred parameter for all forms of environmental noise.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{A\ max}$

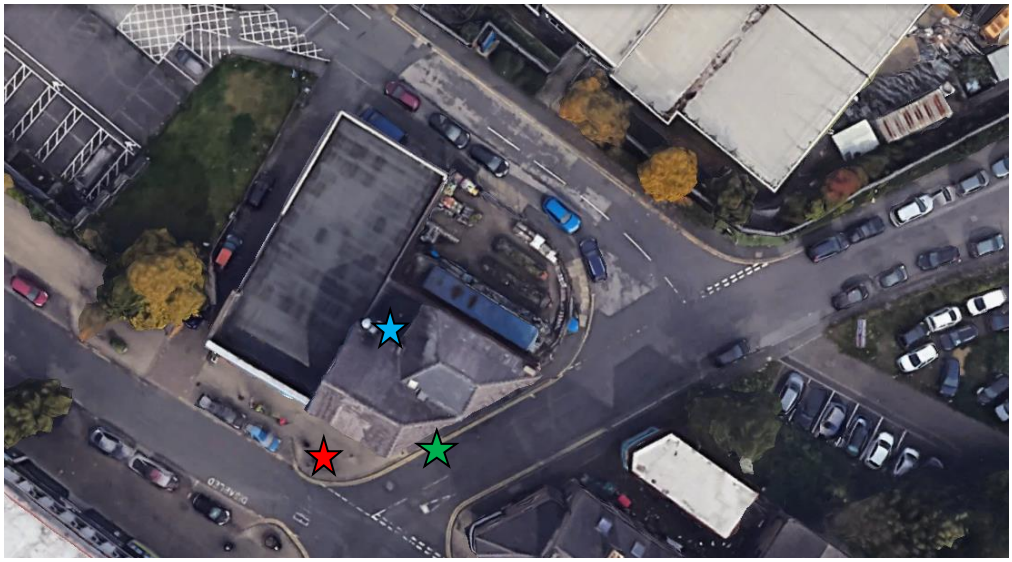
The maximum A-weighted noise level recorded during the measurement period.

Hz

The unit of frequency. The number of cycles (in the context of acoustics, the number of complete sound waves generated) per second.

Appendix 2

Location Plan and Microphone Positions (MPs)



MP1 Commercial Street
MP2 Well Lane
MP3 North-Eastern Facade

Appendix 3

Equipment Used

Noise measurements were undertaken using a precision grade sound level meter:

Norsonic Nor145 Model integrating sound level meter.
Serial Number 14529307
Certificate Number U35939/U35940
Last Laboratory Calibrated 17/10/24

B & K 4230 Model calibrator
Serial Number 724157
Last Laboratory Calibrated 21/2/24

The Sound Level Meter was calibrated before and after both measurement periods, with no significant change in calibration. All calibrations took place at the measurement position.

The SLM met the requirements of BS EN 60651: 1994 and BS EN 60804: 2001 IEC 60804: 2000. It was capable of simultaneously measuring Leq and Ln values. Batteries for the SLM and calibrator were checked prior to all measurements.

Appendix 4
References

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