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NOISE IMPACT ASSESSMENT FOR PROPOSED DEVELOPMENT:

28 Haymarket Street, Bury BL9 0AY

Prepared for:

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Test Report Number: AS24-04V2

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1.0 INTRODUCTION

1.1

Acoustic Solutions has been commissioned by Key Property (North West) Limited to undertake a noise impact assessment for a proposed development at the 28 Haymarket Street, Bury.

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 permission that is to be submitted to Bury 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 Key Property (North West) Limited and Acoustic Solutions as to the extent to which the findings may be appropriate for their use.

1.5

A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

2.0 NOISE IMPACT ASSESSMENT CRITERIA

2.1

In terms of noise impact assessment criteria, Paragraph 170e of the National Planning Policy Framework (NPPF) 2018 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 2014 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

Table 2.1 summarises noise exposure hierarchy, based on likely average response.

Table 2.1 LOAEL and SOAEL Values

Noise Source	Assessment Location	LOAEL	SOAEL	Time
	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)
General environmental noise: Road/Rail	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)

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)

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	L _{Aeq} (0700-2300)	N/A
Sleeping	Bedroom	L _{Aeq} (0700-2300)	30 L _{Aeq} (2300-0700)
			45 L _{Amax} (2300-0700)

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 *R_w*. The Standard also suggests that *"..standard insulating glass units have an insulation value of approximately 30 dB *R_w*"* 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 L_{Aeq}, and 55 dB L_{Aeq} 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	$L_{Aeq} (0700-2300)$	N/A
Sleeping	Bedroom	$L_{Aeq} (0700-2300)$	30 $L_{Aeq} (2300-0700)$
			45 $L_{Amax} (2300-0700)$

3.0 BASELINE NOISE SURVEY

3.1 Site Setting

The application site is 28 Haymarket Street, Bury (Appendix 2) (Planning Reference unknown). The proposal is for the creation of 4x dwellings on the first and second storeys of 28 Haymarket Street. Bury Council has made the following noise-related comments:

“The site of this proposed development is situated adjacent to multiple public houses/restaurants. It is likely that noise disturbances will occur to any residents of this proposed development from activities carried out on these adjacent sites or that may be carried out in the future, especially if these activities occur at night or early in the morning. As well as this, an extractor fan could be seen adjacent to the proposed development, presumably providing ventilation to the Lesterhouse Business Centre. A suitable noise investigation shall be conducted to the satisfaction of the Local Planning Authority (LPA) to determine the suitability for the site for the proposed development.”

This being the case, Acoustic Solutions will conduct an assessment of existing daytime and night time 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).
- d) Assess the sound insulation performance of ceiling partitions that separate the proposed dwellings and other adjoining flats and/or businesses.

3.2 Site Description

The application site is situated on Haymarket Street in Bury town centre. Haymarket Street consists of predominantly commercial retail outlets, restaurants and public houses. Number 28 (ground floor) is currently occupied by Roccos Coffee House. Number 28 is a corner plot. The proposed dwellings will face east onto Haymarket Street, north onto Broad Street and west onto Back Market Street (Figures 3.1 and 3.2).

Figure 3.1 Proposed First Storey



Figure 3.2 Proposed Second Storey



3.3 Noise Sources

Table 3.1 summarises the identified noise sources that have the potential to adversely impact future occupants of the building.

Table 3.1 Observed Noise Sources

Source	Distance at its closest point, m				Notes
	North	South	East	West	
Haymarket Street	N/A	N/A	7	N/A	Cars, buses, commercial vehicles, motorcycles, emergency vehicles etc.
Broad Street	7	N/A	N/A	N/A	Cars, buses, commercial vehicles, motorcycles, emergency vehicles etc.
Rayners Public House, 30-32 Haymarket Street (rooftop beer garden - first storey)	N/A	1	N/A	N/A	M: 10:00-23:00 hours T: 10:00-23:00 hours W: 10:00-23:00 hours T: 10:00-23:00 hours F: 10:00-01:00 hours S: 10:00-01:00 hours S: 10:00-23:00 hours
Rocco's Coffee House, 28 Haymarket Street	N/A	N/A	N/A	N/A	Below
Extraction Flue, Lesterhouse Business Centre	43	N/A	N/A	N/A	Extraction Flue

3.2

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 19 and 20 January 2024 between 07:00 and 23:00 hours (daytime/evening) and 23:00-07:00 hours (night time).

3.3

For the purpose of the assessment, three noise monitoring positions, MP1, MP2 and MP3 and were adopted in free field environments at over 1.5 metres above ground and over 3 metres from any vertical reflective surface (see Appendix 2):

- MP1. Haymarket Street. The microphone was located outside the front east-facing façade of 28 Haymarket Street. The noise environment at MP1 is sufficient to describe noise from road traffic, entertainment noise and pedestrians on Haymarket Street.

- MP2. Outside the north-facing façade of Broad Street. The noise environment at MP2 is sufficient to describe noise on Broad Street and coming from Lesterhouse Business Centre.
- MP3. Beer Garden, Rayners Public House. Outside first storey, south-facing façade of 28 Haymarket Street. The noise environment at MP3 is sufficient to describe noise from Rayners Public House.

3.4

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} .

3.5 MP1.

The principle existing noise source in the vicinity of MP1 was road traffic (including cars commercial vehicles and buses) travelling along Haymarket Street. Average daytime traffic numbers were 3x vehicle passes (both directions) per minute. This dropped to an average of <1x passes per minute at night. Between 19:00 and 00:00 hours, the noise environment was dominated by road traffic and noise from patrons moving between Raynors Public House, Knowsley Public House, Sky Bar Public House Nazbys and Colorado Chicken fast food restaurants. Noise from amplified music at the Sky bar was audible. From 01:00 hours onwards, sound levels decreased significantly.

Table 3.2 summarises daytime, evening and night time noise measurement data. For the purposes of this report, the average L_{Aeq} and 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	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	51.3	44	61.8
08:00	57.1	45.3	65
09:00	58.5	46.4	71.9
10:00	59	46.1	75.7
11:00	58.8	46.2	73.4
12:00	59.9	48.2	74.8
13:00	59.9	47.5	77
14:00	57.7	48	81.4
15:00	57.4	49.4	80
16:00	58	52.5	81.5
17:00	57.3	51.7	83.8
18:00	56.9	52.5	85.4
Average/Max	58	48	85
19:00	60.3	56.9	79.2
20:00	63.1	56.8	79
21:00	62.7	56.9	77.8
22:00	61.9	57.1	80.1
Average/Max	62	57	80
23:00	63.4	56.1	77.9
00:00	61.4	56.5	79.1
01:00	54.2	50.5	60
02:00	47	42.6	52.8
03:00	46	41	50
04:00	45.4	41	54.4
05:00	44.1	41.5	53.9
06:00	43.5	40.4	55
Average/Max	51	46	79

3.6 MP2.

The principle existing noise source in the vicinity of MP2 was road traffic (including cars commercial vehicles and buses) travelling along Broad Street. Average daytime traffic numbers were 5x vehicle passes (both directions) per minute. This dropped to an average of 2x passes per minute at night. Between 19:00 and 00:00 hours, the noise environment was dominated by road traffic and noise from patrons moving between Raynors Public House and Colorado Chicken fast food restaurant. Noise from amplified music at the Sky bar was

audible. From 01:00 hours onwards, sound levels decreased significantly. Noise from the extraction unit at Lesterhouse Business Centre was inaudible throughout the assessment.

Table 3.3 summarises daytime, evening and night time noise measurement data. For the purposes of this report, the average 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	62.9	48.2	83.1
08:00	57.1	48.3	76.5
09:00	59.4	47.1	64.2
10:00	60	46.1	75.7
11:00	58.8	45.2	73.4
12:00	59.4	45.2	61
13:00	58.9	46.5	63.2
14:00	57	45	76.1
15:00	59.1	45.2	66.8
16:00	58	45.1	65.8
17:00	57.9	45.6	84.9
18:00	59	45.1	65.2
Average/Max	59	46	85
19:00	60.1	45.1	75.9
20:00	59.6	46.2	79
21:00	58.3	46	78.5
22:00	58.7	45.9	82.1
Average/Max	59	46	82
23:00	57	43.7	75.6
00:00	55.1	44	78
01:00	45.4	40.1	55.1
02:00	44.6	40.5	52.8
03:00	44.2	39.9	50
04:00	44.9	40.1	54.4
05:00	43	38.6	53.9
06:00	43.5	38.9	55
Average/Max	47	41	78

3.7 MP3.

The principle existing noise source in the vicinity of MP3 was amplified music and customers talking (19:00-00:00 hours). From 00:00 hours onwards, sound levels were dominated by a wall-mounted extraction flue serving Nazbys fast food restaurant. This continued until 04:00 hours. Between 04:00 and 07:00 hours, sound levels were low.

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

Table 3.4 – MP3: 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	40.4	30.4	64.5
08:00	43.2	33.1	67.1
09:00	43.2	33.7	66.8
10:00	45.7	33.4	65.4
11:00	59.1	44.4	66.0
12:00	59.5	45.3	67.4
13:00	59.4	44.6	66.9
14:00	60.0	44.5	65.7
15:00	59.7	45.2	64.0
16:00	61.4	45.0	66.5
17:00	62.1	45.5	66.7
18:00	60.1	45.7	65.9
Average/Max	54	41	67
19:00	64.0	53.8	83.7
20:00	64.4	55.0	84.4
21:00	63.7	54.6	81.0
22:00	64.2	55.4	87.4
Average/Max	64	55	87
23:00	64.3	54.7	83.5
00:00	59.3	51.0	63.4
01:00	59.2	51.1	65.0
02:00	59.3	51.3	62.8
03:00	59.1	50.8	65.0
04:00	41.0	26.3	52.6
05:00	38.5	26.2	49.9
06:00	38.6	26.0	49.5
Average/Max	52	42	84

4.0 DISCUSSION

4.1 External Noise Levels

4.1.1 Noise Policy Statement for England

Table 4.1 summaries the Observed Effect Levels for predicted daytime, evening and night time external SPL at MP1, MP2 and MP3.

Table 4.1: Predicted External Evening and Night Time Observed Effect Levels arising from Noise from external noise as predicted at MP1, MP2 and MP3

Location	Predicted Daytime Observed Effect Level	Predicted Evening Observed Effect Level	Predicted Night Time Observed Effect Level
MP1 (Eastern Façade)	SOAEL	SOAEL+	SOAEL
MP2 (Northern & Western Façades)	SOAEL	SOAEL	SOAEL
MP3 (Southern Façade)	SOAEL	SOAEL+	SOAEL

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 night time internal sound pressure levels arising from daytime, evening and night time noise sources can be predicted within east, north and west-facing rooms. The proposed dwellings' south-facing façade will have no windows. This being the case, noise-break-in will be predicted based upon an assumed attenuation, R (dB), provided by a cavity wall, 60 dB (see Table 4.2). 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. Tables 4.3, 4.4 and 4.5 summarise the predicted internal noise levels.

Table 4.2 Typical Sound Insulation Performance of a cavity block wall

R number, dB						
Construction Type	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	SPL
Block Wall Cavity	41	45	45	54	58	60

Table 4.3: Predicted Internal Daytime/Evening and Night Time noise levels at MP1

Time	Location	External SPL, dB	Open Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	East-facing rooms	59	15	44	No
Night	East-facing rooms	51	15	36	No

Table 4.4: Predicted Internal Daytime/Evening and Night Time noise levels at MP2

Time	Location	External SPL, dB	Open Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	North & west-facing rooms	59	15	44	No
Night	North & west-facing rooms	47	15	32	No

Table 4.5: Predicted Internal Daytime/Evening and Night Time noise levels at MP3

Time	Location	External SPL, dB	Wall Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	South-facing room	57	60	-3	Yes
Night	South-facing room	52	60	-8	Yes

5.0 RECOMMENDATIONS

5.1 Internal

5.1.1 East-Facing Glazing (MP1)

All habitable first and second storey east facing rooms should have glazing of 6.4mm laminated glass, 12mm air-filled cavity, 8.8mm toughened glass. Optional acoustic vents. The Pilkington datasheet (Pilkington, 2023) cites an insulation value of 32 dB, $R_w + C_{tr}$ (window closed) for this approximate specification.

Table 5.1 summarises the predicted internal daytime, evening and night time noise levels given a -32 dB noise reduction. These values are below the maximum internal noise levels recommended by WHO: 1999 and BS8233: 2014. Open-window ventilation will result in excessive internal sound levels during daytime hours; therefore closed-window mechanical ventilation should be available. ProPG calls for glazing with 'good ventilation' (see the link to Pilkington Glass in Appendix 4).

The risk of overheating should be prevented by means of controllable mechanical ventilation, with a control range extending from background/trickle through to purge. It is recommended that all habitable east-facing dwellings (first and second storeys) be ventilated by 1x Titon Ultimate Decentralised Mechanical Ventilation Unit (dMEV) per habitable room (Titon, 2023).

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 recommended ventilation system meets this criteria. Additionally, its sound rating at 13 l/s is 10 dB @ 3 metres. Assuming an existing night time internal sound level of 30 dB, an additional 10 dB would be inaudible.

Table 5.1: MP1. Predicted closed window internal daytime, evening and night time noise levels

Time	Location	External SPL, dB	Closed Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	East-facing rooms	59	32	27	Yes
Night	East-facing rooms	51	32	19	Yes

5.1.2 North & West-Facing Glazing (MP2)

All habitable first and second storey north and west-facing rooms should have glazing of 6.4mm laminated glass, 12mm air-filled cavity, 8.8mm toughened glass. Optional acoustic vents. The Pilkington datasheet (Pilkington, 2023) cites an insulation value of 32 dB, $R_w + C_{tr}$ (window closed) for this approximate specification. Because it is predicted that open-window ventilation will result in an internal night time noise level of 32 dB (for both first and second storeys), open-window ventilation should be available, subject to the caveat cited in Paragraph 5.1.3

Table 5.2 summarises the predicted internal daytime, evening and night time noise levels given a -32 dB (closed window) noise reduction. These values are below the maximum internal noise levels recommended by WHO: 1999 and BS8233: 2014. Open-window ventilation will result in excessive internal sound levels during daytime hours; therefore closed-window mechanical ventilation should be available. ProPG calls for glazing with ‘good ventilation’ (see the link to Pilkington Glass in Appendix 4).

The risk of overheating should be prevented by means of controllable mechanical ventilation, with a control range extending from background/trickle through to purge. It is recommended that all habitable north and west-facing dwellings (first and second storeys) be ventilated by 1x Titon Ultimate Decentralised Mechanical Ventilation Unit (dMEV) per habitable room (Titon, 2023).

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 recommended ventilation system meets this criteria. Additionally, its sound rating at 13 l/s is 10 dB @ 3 metres. Assuming an existing night time internal sound level of 30 dB, an additional 10 dB would be inaudible.

Table 5.2: MP2. Predicted closed window internal daytime, evening and night time noise levels

Time	Location	External SPL, dB	Closed Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	North & west-facing rooms	59	32	27	Yes
Night	North & west-facing rooms	47	32	15	Yes

5.1.3

BS8233: 2014 states that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. Consequently, it is recommended that provided internal ambient noise levels with windows partially open (in relation to the overheating condition) do not exceed the levels shown in Table 5.3, a reasonable balance between elevated noise levels and reduction in overheating risk is provided.

Table 5.3: +5 dB Relaxation of BS8233: 2014 daytime and night time criteria

Time	Relaxed BS8233 +5 dB Criteria
Daytime/ Evening	40
Night	35
Night, L _{AMax}	50

5.2 External

There is no proposed outdoor amenity.

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 p_0 = 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 increasingly 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.

LA 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 Noise Monitoring Positions



MP1: Eastern Façade

MP2: Northern & Western Facades

MP3: Southern 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 17/10/22

B & K 4230 Model calibrator
Serial Number 724157
Last Laboratory Calibrated 21/2/23

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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