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Ref: AS25-64.V1 Date: 7 August 2025

NOISE IMPACT ASSESSMENT FOR PROPOSED DEVELOPMENT:

78 John William Street, Huddersfield, West Yorkshire HD1 1EH

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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 to undertake a noise impact assessment for a proposed development at 78 John William Street, Huddersfield.

1.2

The objectives for the noise impact assessment were as follows:

- Establish the daytime, evening and nighttime ambient and background sound levels at the application site and its surrounding environs;
- Establish the likely daytime and nighttime 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 North Yorkshire 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 Calvert Homes (Cononley) 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) 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
	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)

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;
- Calculation of Railway Noise 1995 (Section III).

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 R_w. 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 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 / 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).

2.19

Calculation of Railway Noise 1995 (Section III) sets out a general step-by-step method of calculation for predicting noise levels at a given distance from a railway. The guidance document's aim is to permit prediction in as many cases as possible. Some additional procedures are then given to predict railway noise in some specific cases, including some types of noise from locomotives and rolling stock, and noise from guided transport systems other than railways, where the general method cannot be applied.

3.0 BASELINE NOISE SURVEY

3.1 Site Setting

The application site is 78 John William Street, Huddersfield. The proposal is for the change of use and alterations to convert offices to 14 apartments (use class C3) (Reference: Ref: 2025/62/90548/W) (Plans 3.1-3.6).

Plan 3.1 Proposed Development (1)



Plan 3.2 Proposed Development (2)



Plan 3.3 Proposed Development (3)



Plan 3.4 Proposed Development (4)



Plan 3.5 Proposed Development (5)



Plan 3.6 Proposed Development (6)



Kirklees Council Environmental Health has raised a number of noise-related concerns:

"The building is located within the town centre of Huddersfield on busy roadways, with nearby commercial buildings (customers/entertainment/deliveries) and a nearby operational railway.

The proposed accommodation may share party walls with commercial businesses, some of which may have plant located close to windows. The plant and lift within the proposed development could be a source of noise.

All of these have potential to produce noise that could be detrimental to the amenity of future occupiers. We are particularly concerned that living accommodation is shown on the lower ground and ground floors with large windows on street facing facades. Before the application can be determined, details of an assessment of all significant noise sources likely to affect the proposed development including road/rail traffic and commercial premises by a suitably competent person (see note) must be submitted in writing to the Local Planning Authority. The report shall:

a) *Determine the existing noise climate;*

b) *Predict the noise climate in the 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. If the noise attenuation measures include windows being kept closed, then details of alternative ventilation over background ventilation will be required.*

If levels predicted in the report are unacceptable, it may be necessary to refuse the application. Otherwise, it may be necessary to specify attenuation measures as conditions of consent. We require this information to ensure that the proposed use(s) does not give rise to the loss of amenity to future occupiers, by reason of noise or disturbance and to accord with the aims of
Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy Framework."

The report shall therefore:

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 a three-storey sandstone building located in Huddersfield city centre at the junction of John William Street and Brook Street. The front, western façade overlooks the busy John William Street which runs north-south. With the exception of number 78, the ground floors of John William Street properties are predominantly commercial in nature. Adjacent at 72-76 is the Istanbul Restaurant. 65 metres to the development site's western façade is Huddersfield Railway Station. The station is elevated by some 8 metres. It is therefore in clear line of sight from the development site's second floor windows. The northern façade overlooks Brook Street, which is quieter. A

private hire company, Woods Taxis, is located on the opposite side of the road, some 35 to the east, and car from this establishment were seen to be arriving and departing up until approximately 00:00 hours. The eastern façade overlooks Wood Street, a narrow highway. Road traffic on Wood Street is scarce, however the extraction system at the rear of and serving Istanbul Restaurant is located here. Deliveries also occur here. The southern façade (second storey only) overlooks rooftops which form a courtyard-type environment.

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.

Table 3.1. Observed Noise Sources

Source	Distance at its closest point, m				Notes
	North	South	East	West	
John Willliam Street	N/A	N/A	N/A	7	Pedestrians, cars, buses, commercial vehicles, motorcycles, emergency vehicles etc.
Istanbul Restaurant	N/A	5	N/A	N/A	Customers entering and exiting. Kitchen activities (opening hours 13:00 to 23:00 hours, seven days)
Brook Street	7	32	N/A	N/A	Road traffic, including that associated with Woods Taxis, 35m north-east
Wood Street	N/A	13	N/A	N/A	Kitchen extraction unit, deliveries
Huddersfield Railway Station	N/A	N/A	N/A	65	Trains

3.4

In order to establish the daytime, evening and nighttime background noise levels at the application site and its surrounding environs, a baseline noise survey was undertaken on Friday 1 August and Saturday 2 August 2025

between 07:00 and 23:00 hours (daytime/evening) and 23:00-07:00 hours (nighttime).

3.5

For the purpose of the assessment, four noise monitoring positions, MP1, MP2, MP3 and MP4 were adopted in free field environments at over 1.5 metres above ground and over 3 metres from any vertical reflective surface. With the microphone tripod-mounted (see Appendix 2):

- MP1. Northern façade, approximately 4 meters from Brook Street. The noise measurement data at collected at MP1 is sufficient to describe noise from all identified noise sources.

- MP2. Western facade, approximately 4 metres from John William Street. The noise measurement data collected at MP2 is sufficient to describe noise from road traffic noise on John William Street, railway traffic at Huddersfield Railway Station and Istanbul Restaurant patrons arriving/departing.

- MP3. Eastern façade, Wood Street. The noise measurement data collected at MP3 is sufficient to describe noise from all identified noise sources.

- MP4. Fitzwilliam Street car park, 5 metres north-west of railway tracks. The noise measurement data collected at MP4 is sufficient to describe noise from all arriving and departing trains, plus ancillary noises (platform announcements etc.).

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},SEL and L_{Amax}.

3.7 MP1

The principle existing noise source in the vicinity of MP1 was muted road traffic (including cars commercial vehicles and buses) travelling along John William Street. Traffic on Brook Street was steady (daytime (17:00 hours) traffic count: 10 vehicles per minute; nighttime traffic count: 4 vehicles per minute). Cars associated with Woods Taxis were observed up until approximately midnight.

Table 3.2 summarises daytime, evening and nighttime 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 Nighttime 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	52.4	48.5	77.4
08:00	57.8	52.8	67.7
09:00	57.4	52.7	67.1
10:00	57.7	52.6	67.4
11:00	57.7	53.0	67.7
12:00	57.3	53.1	67.1
13:00	56.7	52.5	67.9
14:00	57.7	53.1	67.2
15:00	57.1	52.7	68.1
16:00	56.6	52.6	67.2
17:00	57.6	52.6	67.6
18:00	56.6	52.7	67.8
Daytime Average/Max	**57**	**52**	**77**
19:00	55.1	48.6	60.4
20:00	51.0	48.6	57.5
21:00	51.0	48.4	57.1
22:00	49.6	48.6	57.2
Evening Average/Max	**52**	**49**	**60**
Daytime & Evening Average/Max	**56**	**51**	**77**
23:00	51.3	44.3	55.3
00:00	50.0	44.2	57.4
01:00	49.7	44.1	57.4
02:00	47.3	40.2	54.4
03:00	47.9	40.1	57.4
04:00	46.2	40.0	54.1
05:00	46.2	40.3	54.9
06:00	46.3	40.2	56.2
Nighttime Average/Max	**48**	**42**	**57**

3.8 MP2

The principle existing noise source at MP1 was road traffic (including cars commercial vehicles and buses) travelling along John William Street. Daytime (18:00 hours) traffic count: 23 vehicles per minute (both directions). Nighttime (03:00 hours) traffic count: 3 vehicles (both directions). At ground level, train passes were vaguely audible, but not significant. Noise from patrons arriving and departing from the Istanbul Restaurant (19:00-23:30 hours) was insignificant.

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 Nighttime 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	58.8	54.0	61.1
08:00	60.6	55.1	69.0
09:00	60.3	55.5	65.3
10:00	60.3	55.6	65.3
11:00	60.1	55.4	65.4
12:00	60.2	55.5	69.1
13:00	60.4	55.5	67.1
14:00	60.6	55.4	66.0
15:00	60.2	55.3	69.2
16:00	60.3	55.1	69.2
17:00	60.1	55.1	65.9
18:00	60.7	55.4	65.0
Daytime Average/Max	**60**	**55**	**69**
19:00	55.9	52.6	60.4
20:00	53.9	52.3	58.8
21:00	53.8	52.4	59.0
22:00	54.0	52.4	60.2
Evening Average/Max	**54**	**52**	**60**
Dayime & Evening Average/Max	**59**	**55**	**69**
23:00	50.2	45.9	58.6
00:00	50.0	45.8	58.8
01:00	48.6	45.9	57.5
02:00	48.7	43.8	58.0
03:00	48.6	43.9	58.6
04:00	48.7	43.8	58.7
05:00	47.1	44.0	57.6
06:00	47.1	44.0	58.2
Nighttime Average/Max	**49**	**45**	**59**

3.9 MP3

The principle existing noise source in the vicinity of MP3 was the kitchen extraction system serving the Istanbul Restaurant (12:30 to 22:15 hours). Other noise included a single delivery to the restaurant (09:00 hours). Table 3.4 summarises daytime, evening and nighttime 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 3.4 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: Baseline Noise Measurement Data, Daytime, Evening and Nighttime 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	47.1	29.7	55.5
08:00	50.8	47.7	56.2
09:00	50.5	47.5	57.2
10:00	50.7	47.1	57.7
11:00	50.5	47.5	56.4
12:00	50.5	47.7	57.4
13:00	53.1	47.2	56.3
14:00	52.7	47.2	61.8
15:00	52.4	47.4	57.2
16:00	52.4	47.3	57.0
17:00	52.7	47.8	56.7
18:00	53.1	47.7	56.3
Daytime Average/Max	**51**	**46**	**62**
19:00	50.7	43.5	53.4
20:00	51.3	43.2	53.7
21:00	48.5	38.3	53.9
22:00	48.4	38.7	54.1
Evening Average/Max	**49**	**40**	**54**
Dayime & Evening Average/Max	**51**	**45**	**62**
23:00	43.2	36.4	51.3
00:00	42.3	36.3	51.1
01:00	42.5	36.1	49.5
02:00	42.3	36.2	50.3
03:00	42.5	36.2	49.3
04:00	40.2	36.3	50.1
05:00	40.4	36.2	50.8
06:00	40.1	36.3	50.3
Nighttime Average/Max	**42**	**36**	**51**

3.9 MP4

The principle existing noise source in the vicinity of MP4 was rail traffic arriving to and departing from Huddersfield Railway Station. The trains were slow-moving as they arrived/departed from the railway station. 12x train movements per hour (6x arriving, 6x departing) were observed during the day. The last train departure occurred at approximately 01:00 hours on 2 August. The first train movement on Saturday (2 August) morning was at approximately 03:45 hours. Other noise sources: amplified platform announcements. The sound level meter was paused in the absence of these noise sources.

Table 3.5 and 3.5A summarise noise from passing trains (both directions), and platform announcements specifically. For the purposes of this report, 5x sample daytime (06:00 to 00:00 hours) and 2x nighttime (00:00 to 06:00 hours) train noise sample have been taken. The noise data is represented in SEL: Sound Exposure Levels, dB.

Table 3.5. MP4: Noise Measurement Data: Trains (both directions)

Measurement Time	Trains Arriving/Departing, dB. SEL, 30 sec	Amplified Platform Announcements, dB, SEL, 10 sec
07:00	70.3	78.6
08:00	N/A	N/A
09:00	N/A	N/A
10:00	N/A	N/A
11:00	71.1	77.0
12:00	N/A	N/A
13:00	N/A	N/A
14:00	N/A	N/A
15:00	69.9	78,4
16:00	N/A	N/A
17:00	N/A	N/A
18:00	N/A	N/A
Daytime Mean SEL	**70**	**78**
19:00	71.1	78.5
20:00	N/A	N/A
21:00	N/A	N/A
22:00	69.7	76.9
Evening Mean SEL	**70**	**78**
Dayime & Evening Mean SEL	**70**	**78**
23:00	N/A	N/A
00:00	71.2	78.2
01:00	N/A	N/A
02:00	N/A	N/A
03:00	N/A	N/A
04:00	70.4	78.0
05:00	N/A	N/A
06:00	70.8	77.6
Nighttime Mean SEL	**71**	**78**

Table 3.5A MP4: Noise Measurement Data: Trains (both directions)

Time	Trains Inwards, dB, SEL	Trains Outwards, dB, SEL
06:00-00:00	70.8	70.8
06:00-00:00	70.3	70.3
06:00-00:00	71.1	71.1
06:00-00:00	69.9	69.7
06:00-00:00	71.1	71.1
Mean Daytime, dB, SEL, 30 sec	***70.6***	***70.6***
00:00-06:00	71.2	71.2
00:00-06:00	70.4	70.4
Mean Nighttime, dB SEL, 30 sec	***70.8***	***70.8***

4.0 DISCUSSION

4.1 Road Traffic Noise

4.1.1 Road Traffic Noise - External Noise Levels

4.1.1.1 Noise Policy Statement for England

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

Table 4.1. Predicted External Evening and Nighttime 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	57	52	48
MP1	SOAEL	LOAEL	LOAEL
MP2	60	54	42
MP2	SOAEL	SOAEL	LOAEL
MP3	51	49	42
MP3	NOAEL	NOAEL	NOAEL
MP4	52	51	45
MP4	LOAEL	SOAEL	LOAEL

4.1.2 Internal Noise Levels

4.1.2.1 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 4.2 summarises the predicted internal noise levels.

Table 4.2. Internal Daytime/Evening measured SPLs at MP1, MP2 and MP3 compared against BS8233 and WHO: 1999

Time	Location	External SPL, dB, $L_{Aeq, 15\ min}$	Open Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35/30 dB Criteria met?	Exceeds by, dB
Daytime/Evening	MP1	56	15	41	No	6
Nighttime	MP1	48	15	33	No	3
Daytime/Evening	MP2	59	15	44	No	9
Nighttime	MP2	49	15	34	No	4
Daytime/Evening	MP3	51	15	36	No	1
Nighttime	MP3	42	15	27	Yes	-3
Time	**Location**	**External SPL, dB, $L_{AMax, 15\ min}$**	**Open Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**	**Exceeds by, dB**
Nighttime	MP1	57	15	42	Yes	-3
Nighttime	MP2	59	15	44	Yes	-1
Nighttime	MP3	51	15	36	Yes	-9

4.2 Railway Noise

4.2.1 Calculation of Railway Noise: 1995

The CRN has been used to predict the daytime and nighttime noise impact of railway noise at the development site's western façade.

The CRN assessment methodology requires the measured SEL sound levels to be converted into $L_{Aeq, 18\ hour}$ (daytime) and $L_{Aeq, 6\ hour}$ (nighttime) values. These values can then be compared against the criteria set out in Noise Policy Statement for England, World Health Organisation: 1999 and BS8244: 2014.

The conversion equations are:

Equation 4.1. SEL to L_{Aeq} Conversion (Daytime)

$$\text{(Daytime) } L_{Aeq,\ 18\ hours} = SEL - 48.1 + 10\log Q_{day}$$

Equation 4.2. SEL to L_{Aeq} Conversion (Daytime)

$$\text{(Nighttime) } L_{Aeq,\ 6\ hours} = SEL - 43.3 + 10\log Q_{night}$$

(where:

Q_{day} is the number of trains counted between 0600 and midnight;

Q_{night} is the number of trains counted between midnight and 0600).

Single-figure Daytime and Nighttime L_{Aeq} values are calculated.

Table 4.3 Predicted Single-Figure Railway Noise Levels at 5m, L_{Aeq}

	Daytime Inwards Train Movements SEL (5x train sample)	Daytime Outwards Train Movements SEL (5x train sample)	Nighttime Inwards Train Movements SEL (2x train sample)	Nighttime Outwards Train Movements SEL (2 train sample)	
	70.8	70.8	71.2	71.2	
	70.3	70.3	70.4	70.4	
	71.1	71.1	N/A	N/A	
	69.9	69.7	N/A	N/A	
	71.1	71.1	N/A	N/A	
Mean, dB	71	71	71	71	Mean, dB
Number of trains	6	6	6	6	Number of trains
SEL to $L_{Aeq18\ hour}$ value, dB	30	30	35	35	SEL to $L_{Aeq\ 6\ hour}$ value, dB
Daytime Train Noise, dB $L_{Aeq18\ hour}$	**33**	**dB**	**38**	**dB**	Nightime Train Noise, dB $L_{Aeq\ 6\ hour}$

4.2.2 Distance Correction

Train movements were measured at 5 metres' distance from source. Since the development site's western facade is 65 metres from the railway station, a distance calculation, Equation 4.3, below is used to predict train movement's noise impact outside west-facing windows (first storey and above). Table 4.4 summarises the trains' daytime and nighttime distance-attenuated noise impact at the western façade.

Equation 4.3. Sound Attenuation by Distance

$$SPL2 = SWL\text{-}20\log r$$

Table 4.4 Distance-Attenuated Noise Impact at Western Facade

Time	Unattenuated L_{Aeq} (5 m from source), dB	Distance	Distance-Attenuated Noise Level, dB	Attenuation Value, dB
Daytime	33	60	-11	44
Nighttime	38	60	-6	44

4.3 MP3 Cumulative Road and Railway Noise

Table 4.5 summarises the measured daytime noise level at the development site's western façade, MP2, and the predicted daytime railway noise impact are logarithmically added to predict the cumulative daytime and nighttime noise levels of road and rail traffic at this location (first storey and above). It is

predicted that train's noise contribution is insignificant, and that it does not increase daytime or nighttime noise levels.

Table 4.5 MP2 Predicted cumulative daytime and nighttime external noise levels

Time	Road Traffic Contribution, dB	Rail Traffic Contribution, dB	Culmulative Contricution, dB
Daytime	60	-11	60
Nightime	49	-11	49

4.4 Plant (MP3) and Platform Announcement (MP2) Noise Impact

Table 4.6 summarises external BS4142+A1: 2019 noise impact assessments of amplified platform announcements and a kitchen extraction system. The assessments compares the daytime, evening and nighttime background noise (L_{A90}), as measured at MP2, and daytime and evening background noise at MP3, occurring between 13:00 and 23:00 hours: the operational hours of Istanbul Restaurant. The prediction for MP2 utilises distance calculation summarised in Equation 4.3, above.

For the purpose of the assessment, the extraction unit's Specific Noise Level has been calculated by logarithmically subtracting the sound level measured at 23:00 hours from the sound level measured at 22:00 hours.

Table 4.6 BS4142+A1: 2019 Assessments at MP2 and MP3

MP2	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 Above Background	Comments
Day	55	34	0	0	3	-18	No Adverse Impact
Evening	52	34	0	0	3	-16	No Adverse Impact
Night	45	34	0	0	3	-8	No Adverse Impact
MP3	**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	47	47	3	0	0	2	Minor Adverse Impact
Evening	40	47	3	0	0	10	Significant Adverse Impact

5.0 RECOMMENDATIONS

5.1 Internal

5.1.1 North-Facing Glazing – All Habitable Rooms

Table 5.1 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all north-facing habitable rooms are within the maximum recommended by WHO: 1999 and BS8233: 2014.

For all north-facing habitable rooms, glazing units of the following specification are recommended:

10mm/(6-16mm)6mm

The Pilkington data sheet (reproduced here as Table 5.3) states that glazing with this specification will provide 32 dB noise attenuation (closed windows). Table 5.2 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming this recommended glazing).

5.1.2 West-Facing Glazing – All Habitable Rooms

Table 5.1 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all west-facing habitable rooms are within the maximum recommended by WHO: 1999 and BS8233: 2014.

For all west-facing habitable rooms, glazing units of the following specification are recommended:

10mm/(6-16mm)6mm

The Pilkington data sheet (reproduced here as Table 5.3) states that glazing with this specification will provide 32 dB noise attenuation (closed windows). Table 5.2 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming the recommended glazing).

5.1.3 East-Facing Glazing – All Habitable Rooms

Table 4.1 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all east-facing habitable rooms are within the maximum recommended by WHO: 1999 and BS8233: 2014.

For all east-facing habitable rooms, glazing units of the following specification are recommended:

10mm/(6-16mm)6mm

The Pilkington data sheet (reproduced here as Table 5.3) states that glazing with this specification will provide 32 dB noise attenuation (closed windows). Table 5.2 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming the recommended glazing).

5.1.4 South-Facing (Courtyard) Glazing – All Habitable Rooms

Table 4.1 summarises the glazing necessary to ensure that daytime and nighttime noise levels in all east-facing habitable rooms are within the maximum recommended by WHO: 1999 and BS8233: 2014.

For all east-facing habitable rooms, glazing units of the following specification are recommended:

10mm/(6-16mm)6mm

The Pilkington data sheet (reproduced here as Table 5.3) states that glazing with this specification will provide 32 dB noise attenuation (closed windows). Table 5.2 summarises the predicted daytime and nighttime internal sound levels with closed windows (assuming the recommended glazing).

5.1.5 Ventilation.

All windows should be openable; however, where summarised in Table 4.2, above, open-window ventilation may result in excessive internal sound levels during daytime 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. For east and west facing rooms, where summertime solar-gain will result in rapid heating, ventilation can be provided by open windows. Table 4.1 summarises the recommended ventilation scheme for all habitable rooms.

5.1.5.1 Ventilation. All North-Facing Habitable Rooms

It is recommended that habitable rooms be ventilated by:

Open Window / Trickle Vents. Model: TA5220 (SF Xtra Vent) + TA5202 (C25) 2500EA

5.1.5.2 Ventilation. All West-Facing Habitable Rooms

It is recommended that habitable rooms be ventilated by:

Titon Ultimate dMEV decentralised mechanical extraction fan

5.1.5.3 Ventilation. All East-Facing Habitable Rooms

It is recommended that habitable rooms be ventilated by:

Titon Ultimate dMEV decentralised mechanical extraction fan

5.1.5.4 Ventilation. All South-Facing (Courtyard) Habitable Rooms

It is recommended that habitable rooms be ventilated by:

Open Window

Table 5.1 Glazing and Ventilation Recommendations

Location	Storey	Glazing	R_{rw}, C_{tr}, dB	Ventilation
North	Ground	10mm/(6-16mm)6mm	32	Open Window / TitonTrickle Vent (Model: TA5220 (SF Xtra Vent) + TA5005 (SF 418) 2500EA)
	First	10mm/(6-16mm)6mm	32	Open Window / TitonTrickle Vent (Model: TA5220 (SF Xtra Vent) + TA5005 (SF 418) 2500EA)
	Second	10mm/(6-16mm)6mm	32	Open Window / TitonTrickle Vent (Model: TA5220 (SF Xtra Vent) + TA5005 (SF 418) 2500EA)
West	Ground	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan
	First	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan
	Second	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan
East	Ground	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan
	First	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan
	Second	10mm/(6-16mm)6mm	32	Titon Ultimate dMEV decentralised mechanical extraction fan
Courtyard	Ground	N/A	N/A	N/A
	First	N/A	N/A	N/A
	Second	10mm/(6-16mm)6mm	32	Open Window

Table 5.2 Predicted Internal Noise Levels

Time	Location	External SPL, dB, $L_{Aeq,\ 15\ min}$	Open Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35/30 dB Criteria met?	Exceeds by, dB
Daytime/Evening	MP1	56	32	24	Yes	-11
Nighttime	MP1	48	32	16	Yes	-14
Daytime/Evening	MP2	59	32	27	Yes	-8
Nighttime	MP2	49	32	17	Yes	-13
Daytime/Evening	MP3	51	32	19	Yes	-16
Nighttime	MP3	42	32	10	Yes	-20
Time	**Location**	**External SPL, dB, $L_{AMax,\ 15\ min}$**	**Open Window Attenuation, dB**	**Predicted Internal SPL, dB**	**WHO & BS8233 45 dB Criteria met?**	**Exceeds by, dB**
Nighttime	MP1	57	32	25	Yes	-20
Nighttime	MP2	59	32	27	Yes	-18
Nighttime	MP3	51	32	19	Yes	-26

Table 5.3 Pilkington Data Sheet (yellow: recommended glazing)

Glass	Octave Band Centre Frequency (Hz)								
	125	250	500	1000	2000	4000	Rw	Rw + C	Rw + Ctr
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 5.4 Titon Trickle Vent Data Sheet (yellow: recommended model for Plots 1, 2 & 3 (north-facing glazing))

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

5.2 External

No external amenity is proposed, so no recommendations are necessary.

5.3 Party Walls

At the time of the assessment, Acoustic Solutions was unable to access the development site's interior, therefore the sound insulation performance, $D_{nT,w}$ of the party wall separating number 78 and the Istanbul Restaurant is not currently known.

Paragraph 4.5 of West Yorkshire Planning Consultation Guidance (Condensed Version) Noise & Vibration guidance document cites a party wall criterion for dwellings abutting licenced premises as being 55 dB, $D_{nT,w}$. It is recommended that the wall's sound insulation be assessed against this criteria at a later date.

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 Noise Monitoring Positions



MP1
MP2
MP3
MP4

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 21/2/25

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

Pilkington (2025) [Online]. Available at:
assetmanager-ws.pilkington.com/fileserver.aspx?cmd=get_file&ref=8222&cd...
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