Independent Acoustic
Consultancy Practice

Environmental Noise Assessment

Land adjacent to East Bay Close
Cardiff

7799/ENS1

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Environmental Noise Assessment

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1. INTRODUCTION

We understand a purpose-built student residential development consisting of 294 units is proposed at Land adjacent to East Bay Close, Cardiff, CF10 4BA.

This report has therefore been commissioned to assess existing ambient sound levels impinging on the site from local sources including from rail traffic, road traffic and commercial activities.

Survey results have been used for comparison with current planning guidance.

2. CRITERIA

2.1 Planning Policy Wales

The Welsh Government's Planning Policy Wales (Edition 12) dated February 2024, states the following;

"6.7.20 Where sensitive developments need to be located close to existing transportation infrastructure for sustainable movement and access they should be designed, as far as practicable, to limit harmful substances and noise levels within and around those developments both now and in the future. This may include employing the principles of good acoustic design and the inclusion of active travel or travel management measures as part of development proposals. Such development, however, should preferably be located away from existing sources of significant noise, which may include aircraft noise or roads, particularly new roads or those with programmed route improvements."

The document states *"For more information on the principles of good acoustic design, readers are referred to Professional Planning Guidance (ProPG) Supplementary Document 2, produced by the Association of Noise Consultants, the Institute of Acoustics and the Chartered Institute of Environmental Health (http://www.association-of-noise-consultants.co.uk/propg/). ProPG has been written principally to assist with the planning process in England, but the design principles put forward in Supplementary Document 2 may also be adopted in Wales.*

2.2 ProPG Supplementary Document 2

Professional Practice Guidance on Planning & Noise, New Residential Development 'Supplementary Document 2 – Good Acoustic Design' produced by the ANC, IOA and CIEH discusses the general principles of Good Acoustic Design, including the following hierarchy of noise management measures in descending order of preference;

i) Maximising the spatial separation of noise source(s) and receptor(s).
ii) Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.
iii) Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.
iv) Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.
v) Using the layout of the scheme to reduce noise propagation across the site.
vi) Using the orientation of the buildings to reduce the noise exposure of noise-sensitive rooms.
vii) Using the building envelope to mitigate noise to acceptable levels.

"It should be remembered that good acoustic design is a process that begins as soon as land is under consideration for development. The timeline for good acoustic design stretches from the conceptual design stage, through quality control during construction, and beyond to post construction performance testing.

Both internal and external spaces should be considered in the acoustic design process. Care should be taken to ensure that acoustic mitigation measures do not result in an otherwise unsatisfactory development. Good acoustic design must be regarded as an integrated part of the overall design process".

2.3 Technical Advice Note (Wales) 11

Noise bands defining categories A-D of TAN 11 are set in terms of $L_{Aeq,16hr}$ daytime and $L_{Aeq,8hr}$ night time levels for road traffic noise and mixed sources, free field 1.2-1.5m above ground level as follows;

Table 2.1 – TAN11 Noise Exposure Categories

Recommended noise exposure categories for new dwellings near existing noise sources (ref Table 2 of TAN 11 (Wales) October 1997)					
Noise Source	Time	Noise Exposure Categories			
		A	B	C	D
Road Traffic	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66
Rail Traffic	07:00-23:00	<55	55-66	66-74	>74
	23:00-07:00	<45	45-59	59-66	>66
Air Traffic	07:00-23:00	<57	57-66	66-72	>72
	23:00-07:00	<48	48-57	57-66	>66
Mixed Sources(4)	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66

Note: In addition, sites where individual noise events regularly exceed 82dB(A) L_{max}(slow), several times in any night time hour should be treated as being in NEC C, unless the L_{eq}(8 hour) already puts the site in NEC D.

(4) Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant.

2.4 British Standard 8233:2014

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' includes internal noise criteria of habitable rooms in residential dwellings, as shown below;

Table 2.2 – BS 8233:2014 Internal Ambient Noise Criteria for Habitable Rooms

Location	Desired		Reasonable *	
	07:00 to 23:00	23:00 to 07:00	07:00 to 23:00	23:00 to 07:00
Living room	35 dB $L_{Aeq,16hr}$	-	40 dB $L_{Aeq,16hr}$	-
Dining room/area	40 dB $L_{Aeq,16hr}$	-	45 dB $L_{Aeq,16hr}$	-
Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$	40 dB $L_{Aeq,16hr}$	35 dB $L_{Aeq,8hr}$

* *NOTE 7 states "Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.*

In addition BS 8233:2014 states: *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values."*

Reference is therefore made to World Health Organisation (WHO) 'Guidelines for Community Noise, 1999' which states *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991)".*

Section 7.7.3.2 of BS 8233:2014 entitled 'Design criteria for external noise' states;

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs to be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

The above criteria in BS 8233:2014 apply for sources without specific character, previously termed “anonymous noise”. BS 8233:2014 7.7.1 advises:

“NOTE: Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate.”

2.5 British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 “Methods for rating and assessing industrial and commercial sound”, provides current guidance for the assessment of industrial noise affecting residential receivers.

This standard describes a rating method comparing L_{Aeq} noise levels from the industrial source with pre-existing background L_{A90} levels at the residential receiver. It advises at a difference (industrial noise - background) of:

- +10dB or higher, likely to be an indication of a significant adverse impact, depending on the context.

- A difference of + 5dB, likely to be an indication of an adverse impact, depending on the context.

- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

A sliding scale of penalties can be applied to industrial/commercial sound levels which have acoustically distinguishing characteristics, including tonality, impulsivity and intermittency.

Tonality – A penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

Impulsivity – A penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it clearly perceptible, and 9dB where it is highly perceptible.

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

Intermittency – If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

BS 4142:2014 states under section 11;

"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) *The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."

3. ENVIRONMENTAL SOUND SURVEY

3.1 Procedures

Continuous sound monitoring was carried out from 1300hrs on Friday, 19 September 2025 to 1000hrs on Monday, 22 September 2025 at positions A-C.

Sound level data including L_{Amax}, L_{Aeq} and background L_{A90} were logged at 1 minute intervals over the monitoring period, along with continuous audio and 100ms data to allow source identification and further detailed analysis of results if required.

Figure 3.1 – Site Plan Showing Monitoring Locations

Site plan in Figure 3.1 above shows the development site and continuous monitoring positions used, namely:

Table 3.1 – Continuous Monitoring Location Details

Position	Description
A	On the northern site boundary – 15m from the closest rail track. Selected to monitor rail noise levels *microphone positions approximately 2m above local ground level.*
B	Located in the centre of the site – 15m from the Flyover. Selected to monitor road traffic noise levels, and any noise break-out from Cardiff Theatrical Services *microphone positions approximately 2.5m above local ground level.*
C	On the southern site boundary – 30m from Tyndall Street Selected to monitor road traffic noise levels, and any noise generating activities from Cardiff Theatrical Services *microphone positions approximately 3m above local ground level.*

3.2 Meteorological Conditions

Approximate weather conditions are shown in time history graphs in Figure B.1 and Figure B.2 of Appendix B.

To summarise, the weather conditions during the monitoring period generally dry, except for a heavy rain showers on the afternoon of Saturday 20^{th}.

Wind conditions were a light to gentle breeze from the south or south-west

3.3 Measurement Equipment

The following measurement equipment was used during the surveys:

Table 3.2 – Noise Monitoring Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-08723-E0	11 June 2025	UK-25-074
	Preamplifier	MA220	1820	11 June 2025	UK-25-074
	Filters	XL2-TA	A2A-08723-E0	11 June 2025	UK-25-074
	Microphone Capsule	MC230	9381	11 June 2025	UK-25-074
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	28 August 2025	UK-25-112
	Preamplifier	MA220	5435	28 August 2025	UK-25-112
	Microphone Capsule	MC230	8547	28 August 2025	UK-25-112
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-14577-E0	21 June 2024	UK-24-065
	Preamplifier	MA220	7485	21 June 2024	UK-24-065
	Microphone Capsule	MC230	A15594	21 June 2024	UK-24-065
Larson Davis	Calibrator (94.00dB / 114.03dB @ 1kHz)	CAL200	19047	29 August 2025	45898-19047-CAL200

Measurement systems were calibrated before and after the surveys and no variation occurred.

Note: Copies of traceable calibration certificates for all equipment are available upon request.

3.4 Results

Time history graphs in Figure B.4, Figure B.5 and Figure B.6 of Appendix B show L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels measured at positions A, B and C respectively.

3.4.1 *Ambient Sound Levels, $L_{Aeq,T}$*

The following $L_{Aeq,16hr}$ daytime (0700-2300hrs) and $L_{Aeq,8hr}$ night-time (2300-0700hrs) noise levels were measured;

Table 3.3 – Summary of Daytime $L_{Aeq,16hr}$ and Night-time $L_{Aeq,8hr}$ Results

Position A	
Friday 13:30 19/09/2025 - Saturday 07:00 20/09/2025	Daytime $L_{Aeq,9hr}$ = 63.0 dB Night-time $L_{Aeq,8hr}$ = 55.9 dB
Saturday 07:00 20/09/2025 - Sunday 07:00 21/09/2025	Daytime $L_{Aeq,16hr}$ = 60.4 dB Night-time $L_{Aeq,8hr}$ = 52.3 dB
Sunday 07:00 21/09/2025 - Monday 07:00 22/09/2025	Daytime $L_{Aeq,16hr}$ = 59.7 dB Night-time $L_{Aeq,8hr}$ = 57.4 dB
Position B	
Friday 13:30 19/09/2025 - Saturday 07:00 20/09/2025	Daytime $L_{Aeq,9hr}$ = 56.8 dB Night-time $L_{Aeq,8hr}$ = 51.9 dB
Saturday 07:00 20/09/2025 - Sunday 07:00 21/09/2025	Daytime $L_{Aeq,16hr}$ = 58.5 dB Night-time $L_{Aeq,8hr}$ = 53.4 dB
Sunday 07:00 21/09/2025 - Monday 07:00 22/09/2025	Daytime $L_{Aeq,16hr}$ = 57.7 dB Night-time $L_{Aeq,8hr}$ = 52.4 dB
Position C	
Friday 13:30 19/09/2025 - Saturday 07:00 20/09/2025	Daytime $L_{Aeq,9hr}$ = 58.0 dB Night-time $L_{Aeq,8hr}$ = 52.9 dB
Saturday 07:00 20/09/2025 - Sunday 07:00 21/09/2025	Daytime $L_{Aeq,16hr}$ = 59.8 dB Night-time $L_{Aeq,8hr}$ = 54.1 dB
Sunday 07:00 21/09/2025 - Monday 07:00 22/09/2025	Daytime $L_{Aeq,16hr}$ = 59.0 dB Night-time $L_{Aeq,8hr}$ = 54.0 dB

3.4.2 *Event Sound Levels, $L_{Amax,F}$*

Position A: The highest number of $L_{Amax,F}$ events from train pass-bys over 82dB measured during the night-time period (2300-0700hrs) was 5. The highest nighttime value was 88dB $L_{AMax,F}$ and the 10th highest value was 76dB $L_{AMax,F}$.

L_{AMax} spectra from highest and typical (10th highest) train pass-bys are given in Figure B.10.

Positions B & C: There were no $L_{Amax,F}$ events over 82dB measured during the night-time period (2300-0700hrs).

3.4.3 Background Sound Levels, L_{A90}

Graphs in Figure B.7,
Figure B.8 and Figure B.9 of Appendix B show statistical analysis of background sound levels measured at positions A, B and C respectively.

The following minimum consistent daytime and night-time background L_{A90} sound levels have been determined:

Table 3.4 – Minimum Consistent Daytime and Night-time Background L_{A90} Results

Period	Position		
	A	B	C
Daytime (0700-2300hrs) $L_{A90,1hr}$ (dB)	51	55	57
Night-time (2300-0700hrs) $L_{A90,15min}$ (dB)	44	42	47

4. COMMERCIAL ACTIVITY SOUND

No significant sound from activities, such as workshop noise break-out or vehicle movements, at Cardiff Theatre Services was identified during the monitoring. Sound levels at Positions B & C are controlled by road traffic noise.

However, continuously running extraction stacks were identified on site. These control the background sound at night, in between vehicle pass-bys. A plant sound level of 47dB(A) was recorded at Position C, which had tonal content. This is well below the residual night-time road traffic sound climate.

5. NOISE MAP MODELLING

Three-dimensional noise map modelling has been undertaken using environmental noise mapping software package, which in turn uses calculation methods of Calculation of Road Traffic Noise (CRTN) and ISO 9613.

Models have been set up to predict daytime and night-time noise levels across the site from surrounding sources based on measured noise levels discussed in section 3.4 of this report.

The model takes into account distance and screening losses from existing and new structures, allowing garden noise levels to be assessed, as well as predicting noise levels at proposed residential facades.

5.1 Developed Site

The proposed drawings referenced in Appendix D have been used for the developed model.

Noise map models in Figure C.1, Figure C.2, Figure C.3 and Figure C.4 show predicted daytime and night-time noise levels from rail and road, at 10.5m (3rd floor).

Figure C.5, Figure C.6, Figure C.7 and Figure C.8 show 3D models with predicted façade noise levels for each tower block.

Overall noise model results for each Studio are given in Table C.1, Table C.2 and Table C.3.

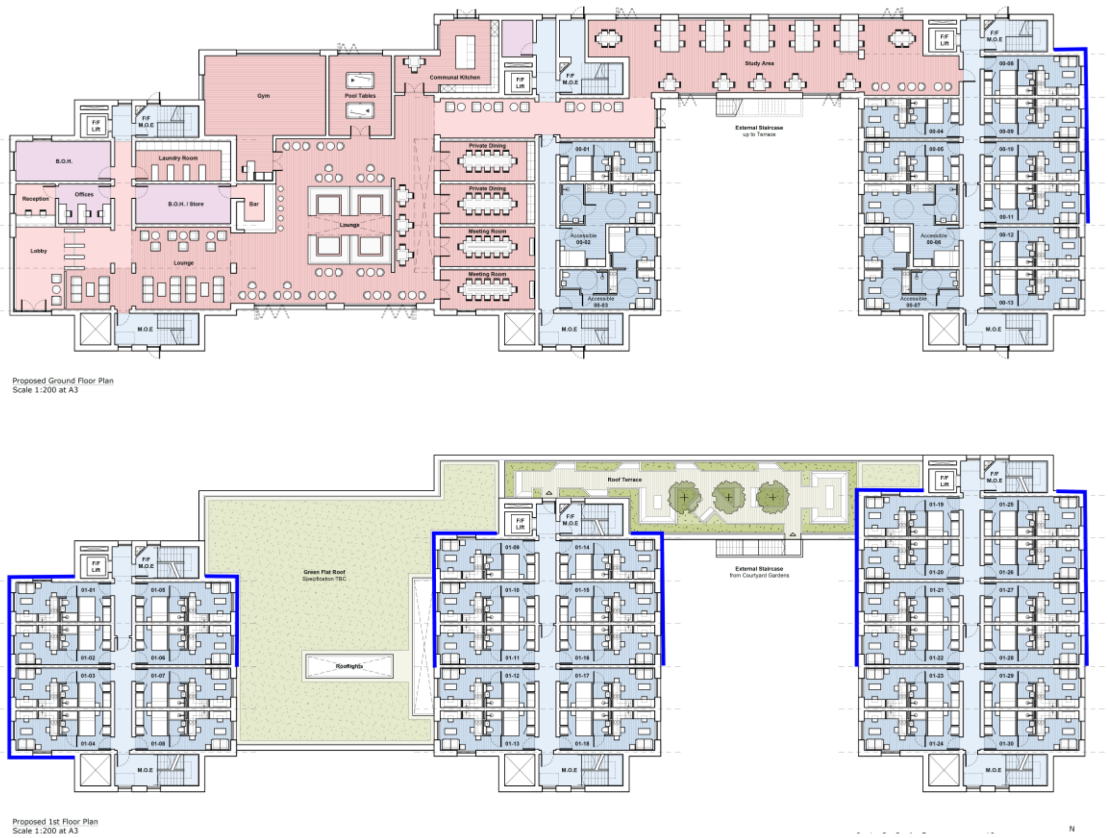
6. EXTERNAL BUILDING FABRIC ASSESSMENT

Based on survey results and noise map models, we have carried out an external building fabric assessment with the aim of controlling noise intrusion to habitable rooms to meet 35dB $L_{Aeq,16hr}$ daytime and 30dB $L_{Aeq,8hr}$ night-time, in line with the desirable internal ambient noise values quoted in BS 8233:2014 (see section 2.4 of this report) under whole dwelling ventilation conditions.

The assessment also aims to control $L_{Amax,F}$ noise intrusion from regular train pass-bys and road traffic in flats during the night.

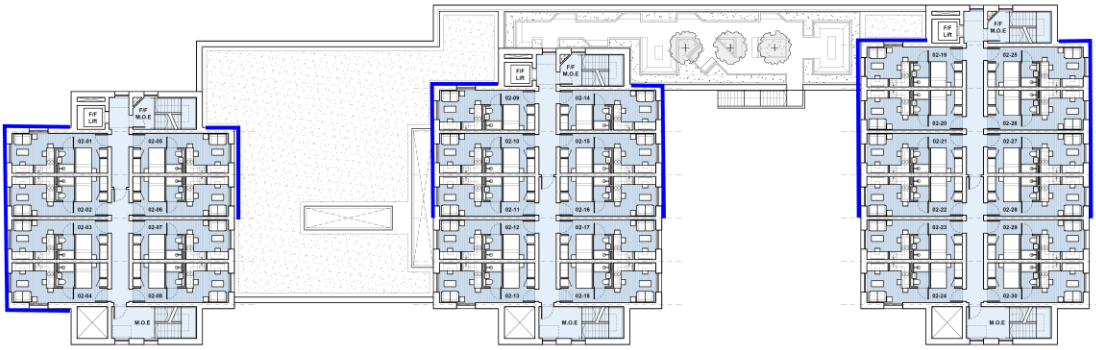
Critical façades are shown on site plan in Figure 6.1 below, marked up with and **BLUE** lines.

Figure 6.1 – Ground and First Floor Façades Requiring Additional Sound Insulation Measures



All rooms on façades highlighted above require up-rated acoustic glazing, walls, roof and ventilation as specified below. Standard thermal double glazing and trickle ventilation should be sufficient on remaining façades (not highlighted).

Figure 6.2 – 2nd to 9th Floor Façades Requiring Additional Sound Insulation Measures



Proposed 2nd-8th Floor Plans
Scale 1:200 at A3

Proposed 9th Floor Plan
Scale 1:200 at A3

Figure 6.3 10th & 11th Floor Façades Requiring Additional Sound Insulation Measures

Proposed 10th Floor Plan
Scale 1:200 at A3

Proposed 11th Floor Plan
Scale 1:200 at A3

The detailed noise intrusion assessment is intended to provide an initial indication of the sound insulation measures required to control noise intrusion. Final design proposals should be confirmed acceptable with a suitably qualified acoustician at the detailed design stage.

This assessment has been carried out based on the following parameter based on proposed architectural drawings listed in Table D.1.

- Noise intrusion is calculated to a room with dimensions of 4m (l) x 3m (w) x 2.5m (h)
- Façade area 1: exposed to external road/rail sound of 7.5m^2 , with glazing area of 3.5m^2
- Façade area 2: exposed to external road/rail sound of 17.5m^2, with glazing area of 7m^2

The analysis is based on the noise spectra quoted in Figure B.10.

6.1 External Walls

The following minimum façade sound reduction performance figures have been used in the preliminary analysis.

These are based on 'Brick and block external wall' (or lightweight inner leaf)

Table 6.1 – External Wall Sound Reduction Index Figures

Element	Description	Sound Reduction Index dB *R* (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)				
		125	250	500	1k	2k
External Wall	Brick / Cavity / Block *or* Brick / Cavity / Metal frame	40	44	45	51	56

The proposed external façade constructions should be capable of achieving these figures as a minimum.

If a lightweight external façade (e.g aluminium sandwich panels, rainscreen cladding, or render+board systems) is proposed, a detailed assessment of the façade element sound reduction performance should be carried out by a suitably qualified person to ensure the sound reduction performance of the façade is maintained.

6.2 Roof

The following minimum façade sound reduction performance figures have been used in the preliminary analysis.

These are based on 'Flat concrete roof' (or lightweight inner leaf)

Table 6.2 – Roof Sound Reduction Index Figures

Element	Description	Sound Reduction Index dB *R* (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)				
		125	250	500	1k	2k
Flat Roof	100mm concrete, plasterboard ceiling on mf	39	40	49	53	57

The proposed roof construction should be capable of achieving these figures as a minimum.

If a lightweight roof is proposed a detailed assessment of the roof element sound reduction performance should be carried out by a suitably qualified person to ensure the sound reduction performance of the roof is maintained.

6.3 Glazing

The housing layout plan in Figure 6.1 shows façades where windows require up-rating. The following sound reduction index figures shall be met for glazing on these critical façades:

Table 6.3 - Glazing Sound Reduction Index Figures

Glazing	Description	dB $R_w + C_{tr}$	Sound Reduction Index dB *R* (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)				
			125	250	500	1k	2k
BLUE	For budgetary guidance: based on Pilkington 10mm / 6 – 16mm / 6mm	**32**	24	24	32	37	37

A typical glazing system that should be capable of achieving the quoted SRI figures (based on Pilkington test data) is included in the table for initial budgetary guidance, however;

The successful glazing suppliers shall provide independent laboratory test data to BS EN ISO 10140-5 – 2010, confirming their proposed systems (including frames/seals) meet the quoted octave band sound reduction performance figures above.

For unmarked façades standard thermal double-glazing is indicated to be sufficient.

6.4 Ventilation

All rooms require a ventilation strategy that does not rely on opening windows to achieve 'extract ventilation' and 'whole building ventilation' rates as required by Building Regulations Part F, Regulation F1(1) 2010 *2022 Edition.*

> ***Continuous mechanical extract.*** *Guidance on minimum provisions for extract and whole building ventilation is set out in Para 1.61 & 1.62 of Building Regulations Part F.*
>
> ***Continuous mechanical supply and extract with heat recovery.*** *Guidance on minimum provisions for extract and whole building ventilation is set out Para 1.69 of Building Regulations Part F.*

These strategies rely on windows being closed; however, occupiers may still open windows for purge ventilation, or under normal ventilation conditions if they so choose to, and so glazing would not be 'fixed pane'.

The final proposed ventilation strategy should be confirmed acceptable with planners/ EHO and Building Control.

6.4.1 Continuous Mechanical Extract with Background Ventilators

Building Regs Part F advises: "***1.64*** *Where continuous mechanical extract ventilation is used, background ventilators should satisfy all of the following conditions:*

a. not be in wet rooms
b. provide minimum equivalent area of 4,000 mm² for each habitable room in the dwelling
c. Provide a minimum total number of ventilators that is the same as the number of bedrooms plus two ventilators (i.e. a one-bedroom dwelling should have three background ventilators, a two- bedroom dwelling should have four background ventilators, etc.)."

The background ventilators shall be acoustically treated to achieve the following ($D_{n,e}$) performance;

Table 6.4 – Acoustic Trickle Ventilator Specifications

Ventilator	Description	Element-Normalised Level Difference dB $D_{n,e}$ (BS EN ISO 10140-2:2010)				
		125	250	500	1k	2k
BLUE	For budgetary guidance: based on Greenwood *5000EA with 1 acoustic set* (open)	39	38	31	44	43

The calculation has allowed for a maximum of 1no acoustic trickle ventilators per room, meeting the minimum 4000mm^2 equivalent area requirement of Part F.

For budgetary guidance the above ventilator figures are based on Greenwood *5000EA + 1 acoustic set* ventilators. The successful tenderer shall provide independent laboratory test data showing their vent meets the above performance requirements.

The successful trickle ventilator suppliers shall provide independent laboratory test data to BS EN ISO 10140-5 – 2010, confirming their proposed ventilator meet the quoted octave band performance figures above.

For unmarked façades standard (non-acoustic) trickle ventilators is indicated to be sufficient (based on 1no minimum 31dB $D_{ne,w}$+ C_{tr} trickle vents)

6.4.2 Mechanical Ventilation with Heat Recovery

Alternatively, a Mechanical Ventilation with Heat Recovery (MVHR) strategy could be utilised which does not require any background ventilators in the external façade.

6.4.3 Mechanical Ventilation System Noise

All mechanical ventilation systems should be designed to meet the noise criteria set out in Building Regulations Approved Document Part F, 2022 Edition – For use in Wales which states the following:

“Although there is no requirement to undertake noise testing, achieving the levels in the following guidance should ensure good acoustic conditions. The average A-weighted sound pressure level for a ventilator operating under normal conditions and not at boost rates should not exceed both of the following.

a) *30dB LAeq,T for noise-sensitive rooms (e.g. bedrooms and living rooms) when a continuous mechanical ventilation system is running on its minimum low rate.*

b) *45dB LAeq,T in less noise-sensitive rooms (e.g. kitchens and bathrooms) when a continuous operation system is running at the minimum high rate or an intermittent operation system is running.”*

6.4.4 General

Do not include standard background (trickle) ventilators within window frames on critical facades.

Final proposals should be confirmed with Building Control and Environmental Health prior to orders being placed.

7. EXTERNAL NOISE ASSESSMENT (EXTERNAL AMENITY SPACES)

Noise levels from road and rail sources are indicated to fall below the upper guideline value of 55dB(A) quoted in BS8233 in the central Courtyard Gardens and Terrace areas.

Road Traffic noise levels on the proposed Level 01 Roof Terrace are indicated to be in the range of $L_{Aeq,16hr}$ 55-58dB.

British Standard 8233:2014 advises:

"However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs to be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

8. CONCLUSION

An environmental noise assessment has been carried out for the proposed student residential development at Land adjacent to East Bay Close, Cardiff,CF10 4BA.

Environmental sound surveys have been carried out across the site. Road and rail traffic is indicated to control the ambient noise climate day and night.

Noise map models have been generated to show road and rail noise propagation to each façade of the proposed development.

An external building fabric assessment has been carried out. Critical facades requiring additional sound insulation measures have been highlighted and specifications for sound reduction performances for external wall, roof, ventilation and glazing elements are included.

External Noise levels from road and rail sources in the central Courtyard Gardens and Terrace area are indicated to fall below the upper guideline value of 55dB(A) quoted in BS8233. Road Traffic noise levels on the proposed Level 01 Roof Terrace are indicated to be in the range of $L_{Aeq,16hr}$ 55-58dB.

APPENDIX A - ACOUSTIC TERMINOLOGY

Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

The following units have been used in this report:

dB(A)	The sound pressure level A-weighted to correspond with the frequency response of the human ear and therefore a persons' subjective response to frequency content.
L_{eq}	The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
L_{max}	The highest instantaneous sound level recorded during the measurement period.
L_{10}	The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1 hour measurement - used as a measure of background noise.
L_{90}	The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1 hour measurement.
$L_{Ar,Tr}$	The 'rating' level, as described in BS 4142:2014 – the specific noise plus any adjustment for the characteristic features of the noise.
SSR	Sound sensitive receiver

APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Friday, 19 September 2025

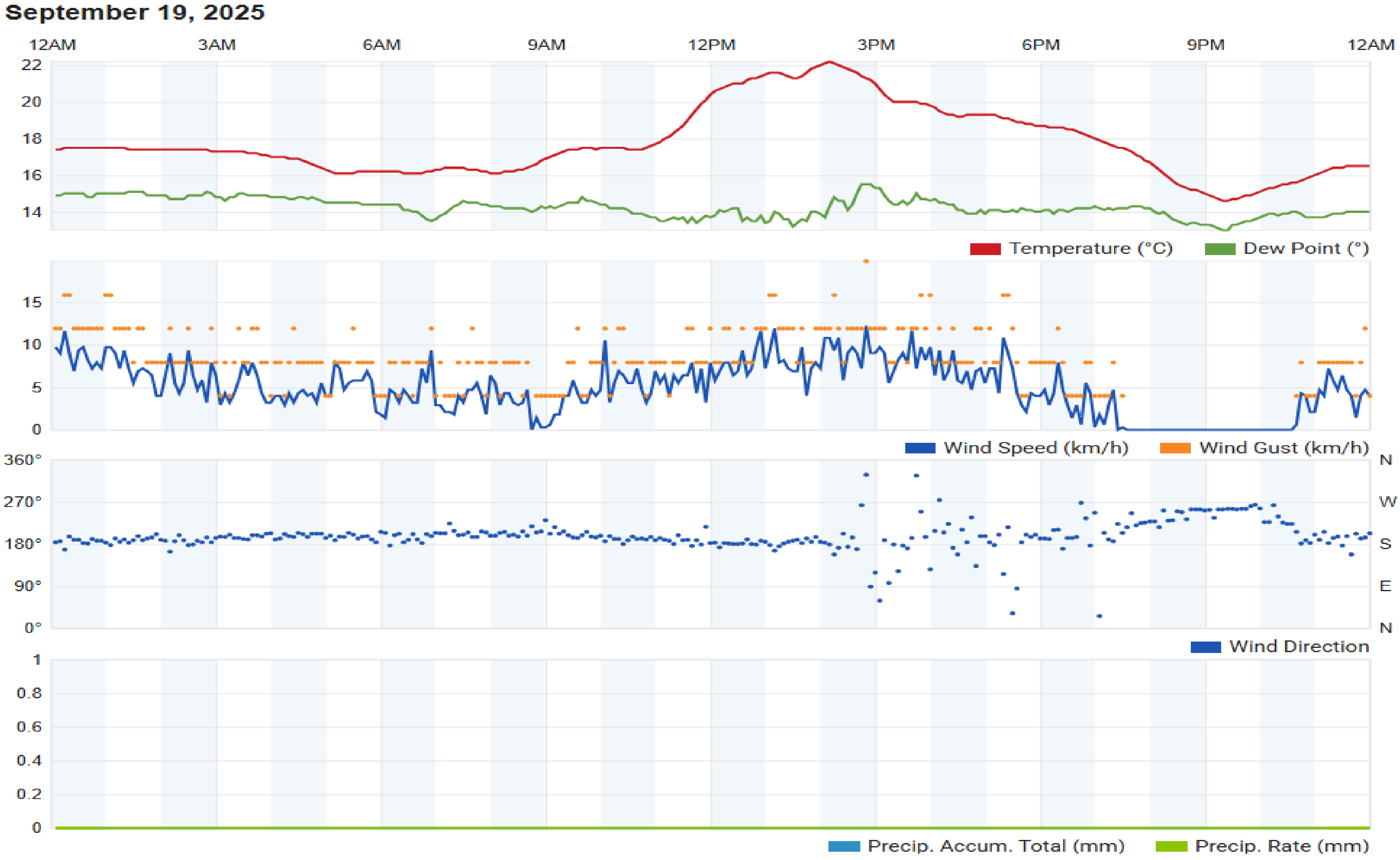


Figure B.2 – Approximate Weather History for Saturday, 20 September 2025

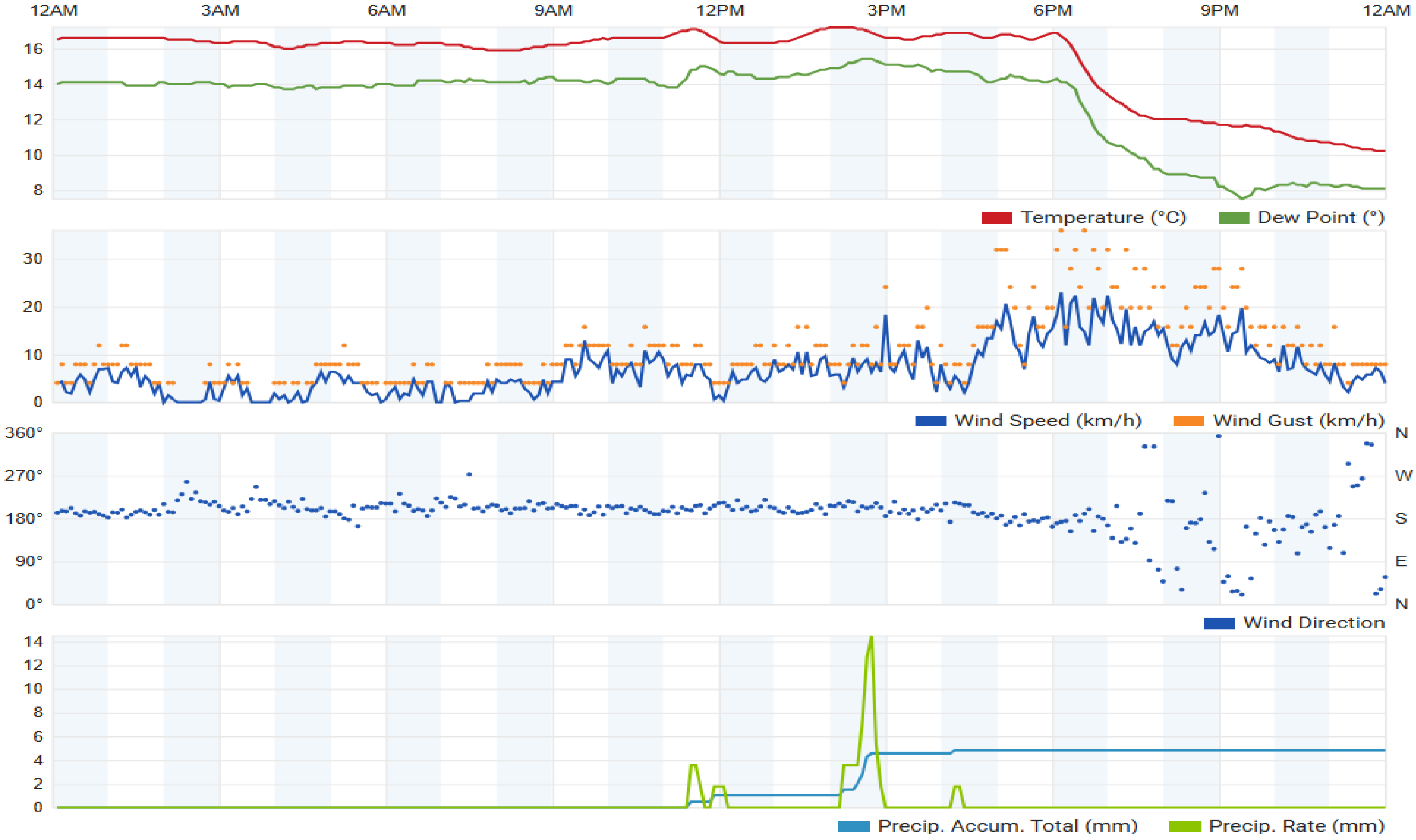
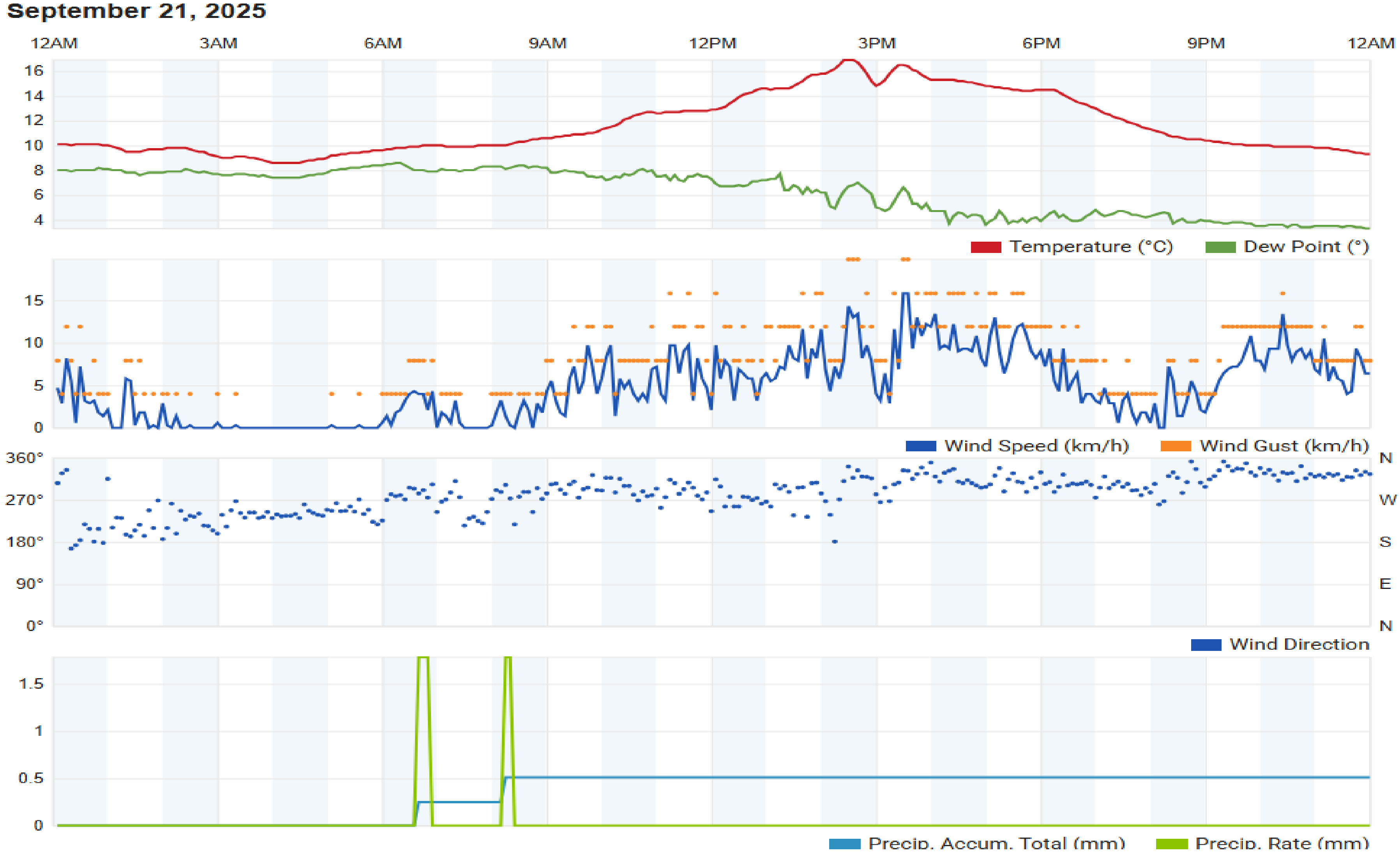


Figure B.3 – Approximate Weather History for Sunday, 21 September 2025



Note: Taken from www.wunderground.com - ***Weather Station ID: ICARDIFF48 Station Name:****Heath,Cardiff, Wales, UK* ***Latitude / Longitude:****51.503° N, 3.187° W* ***Elevation:****30* ***City:****Cardiff*

Figure B.4 – Time History at Position A (Friday, 19 September 2025 to Monday, 22 September 2025)

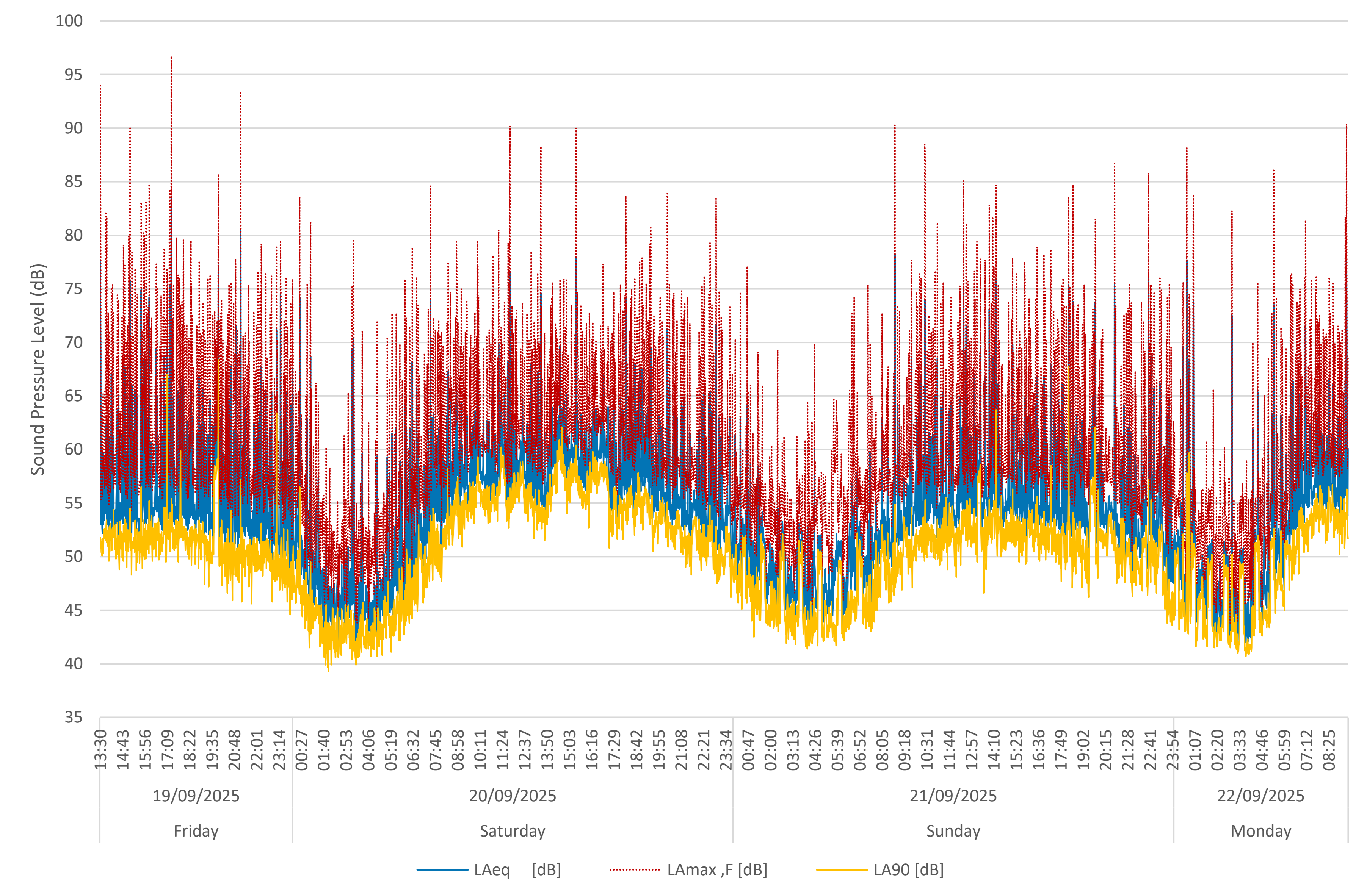


Figure B.5 – Time History at Position B (Friday, 19 September 2025 to Monday, 22 September 2025)

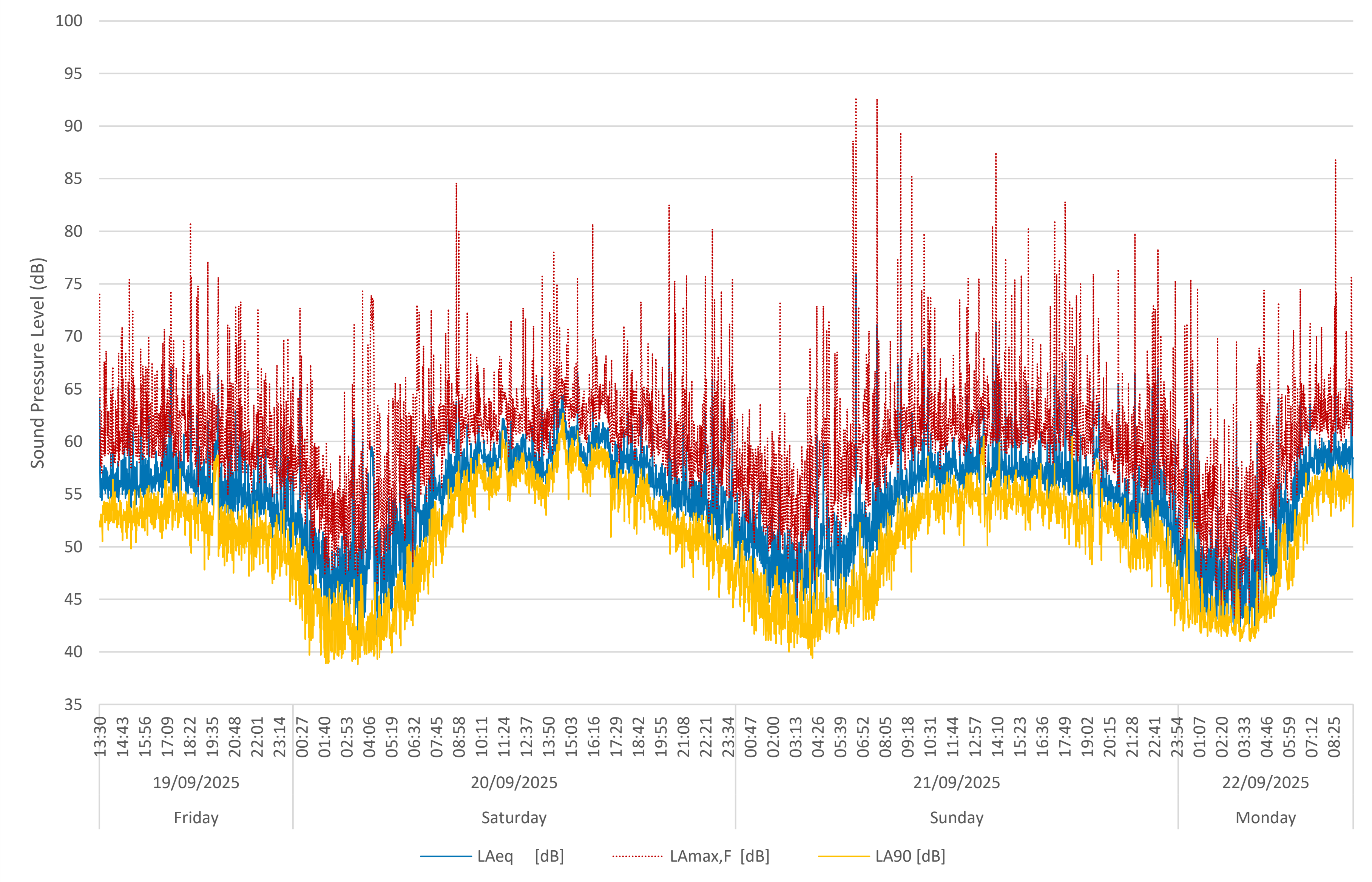


Figure B.6 – Time History at Position C (Friday, 19 September 2025 to Monday, 22 September 2025)

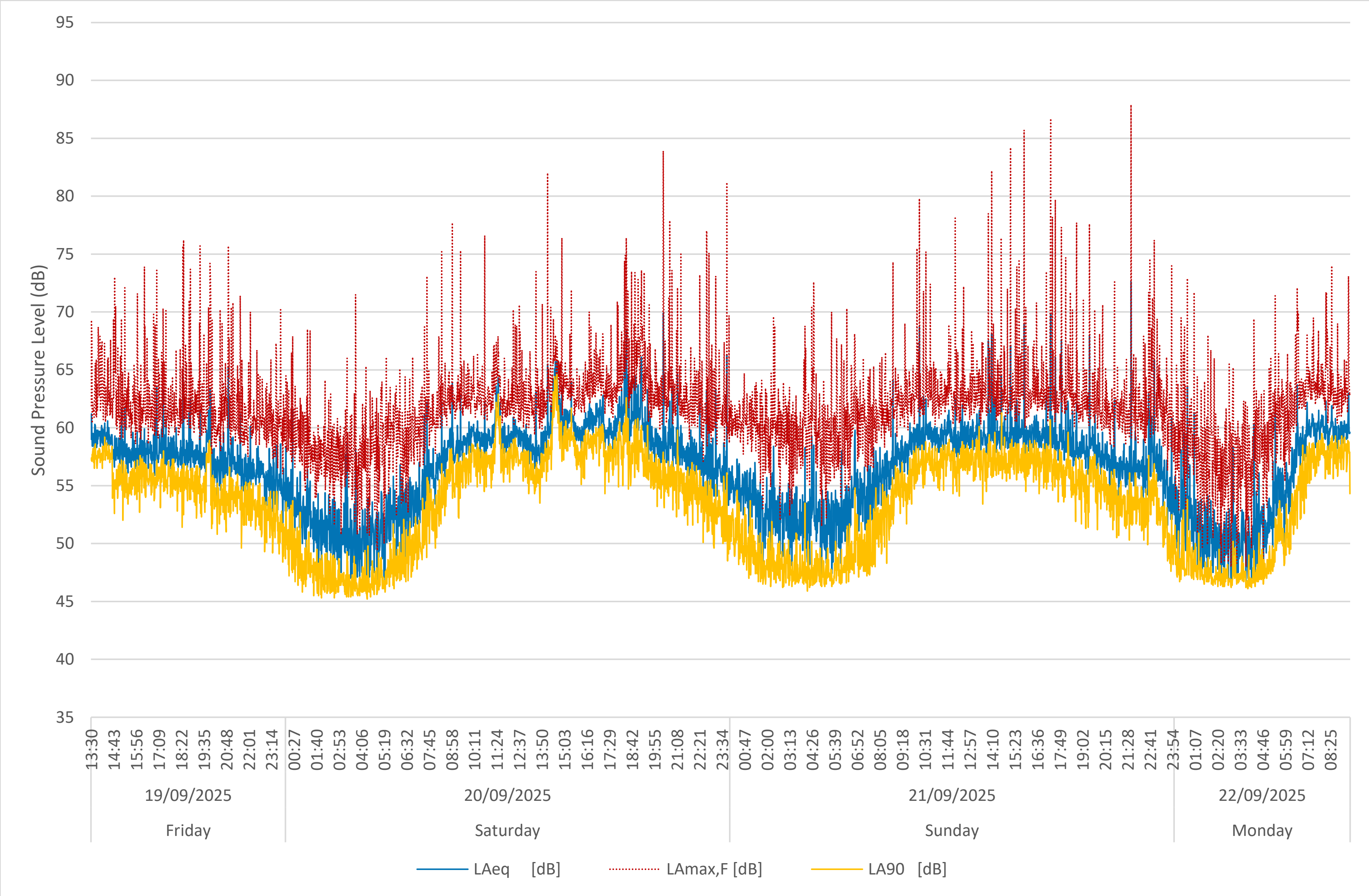


Figure B.7 – Statistical Analysis of Background Sound Levels Measured at Position A

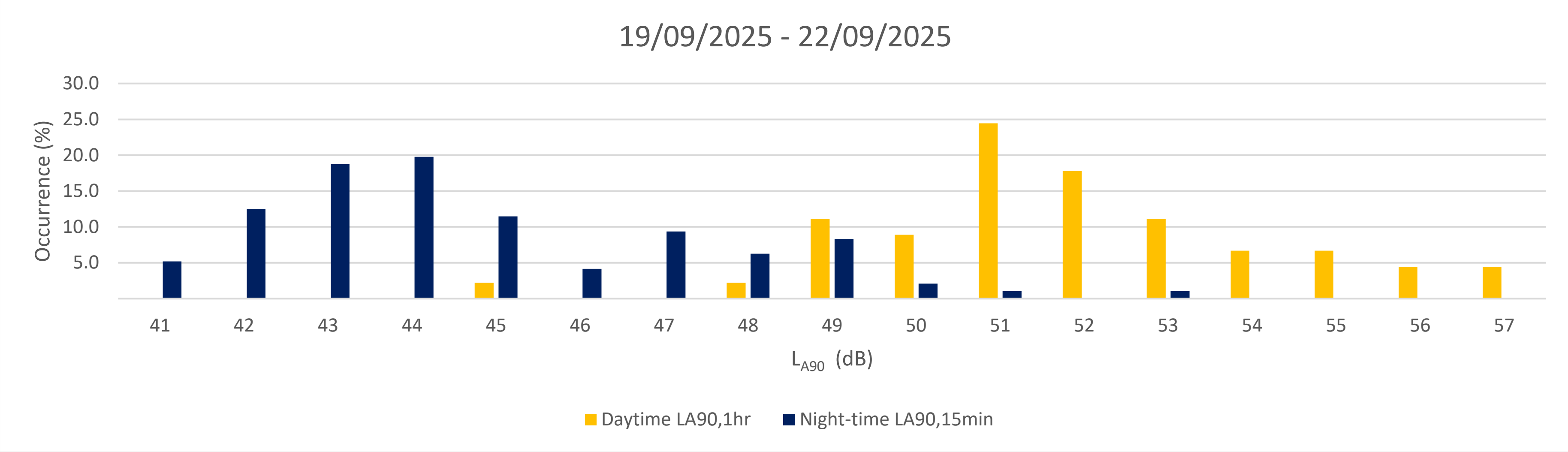


Figure B.8 – Statistical Analysis of Background Sound Levels Measured at Position B

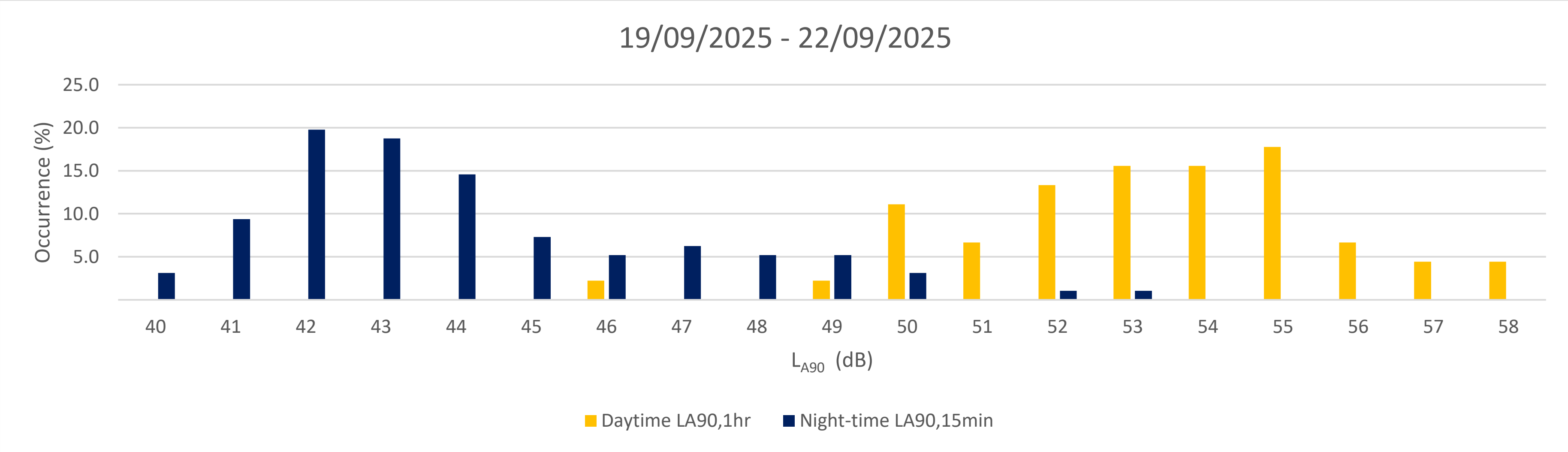


Figure B.9 – Statistical Analysis of Background Sound Levels Measured at Position C

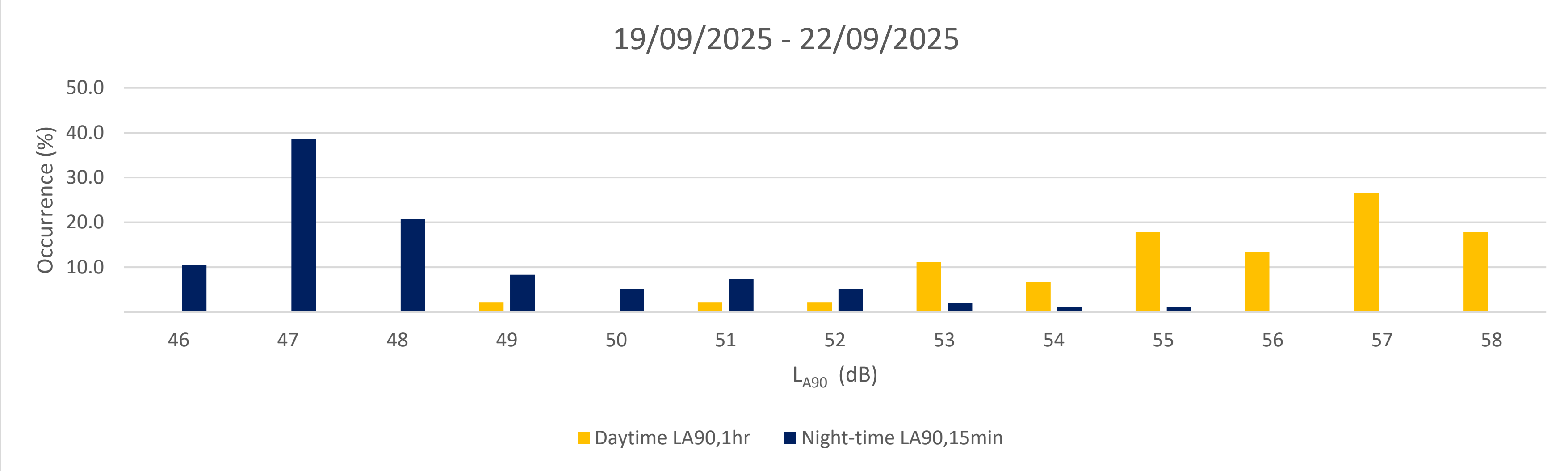
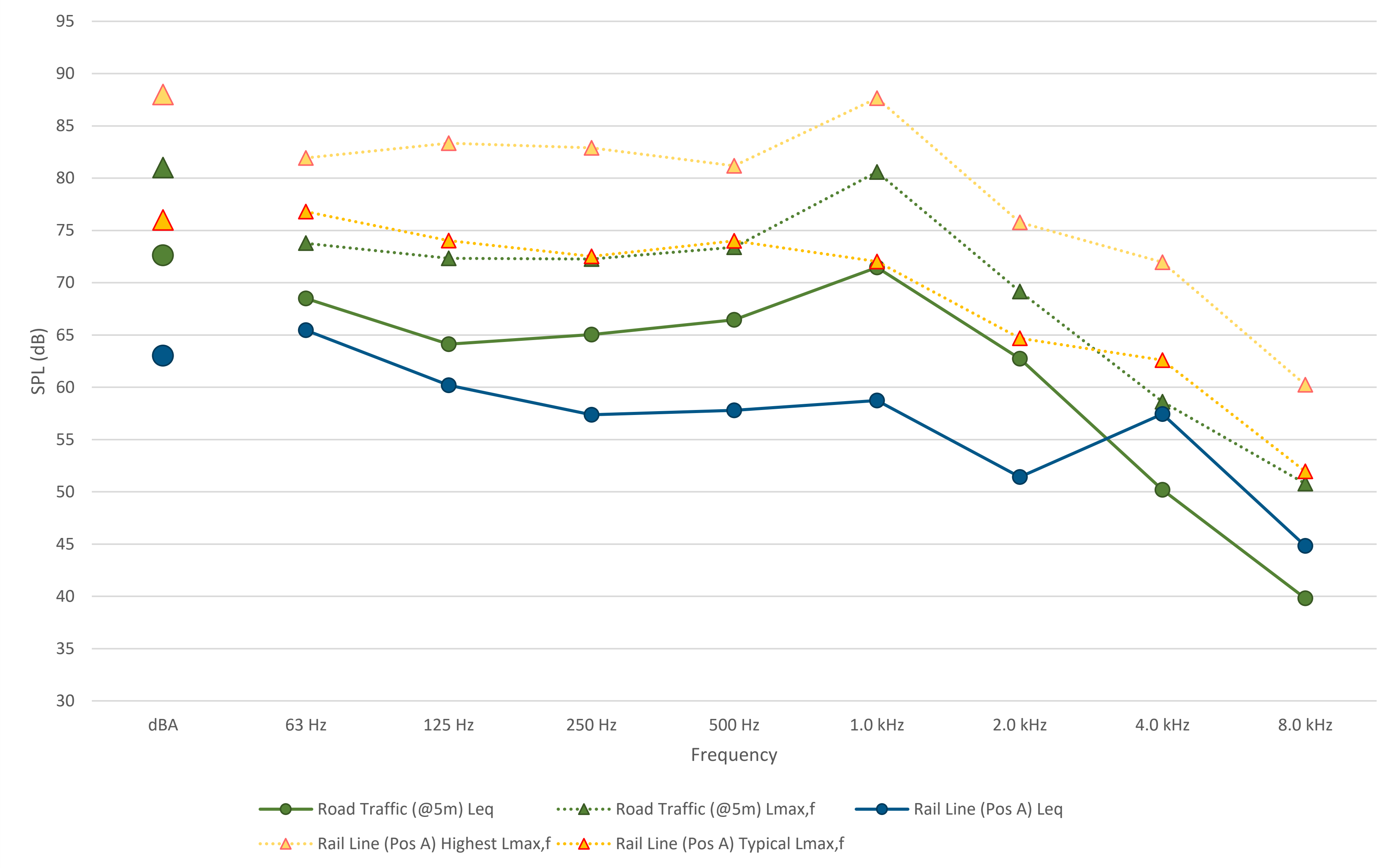


Figure B.10 – L_{eq} and $L_{max,F}$ Octave Band Spectra – Road and Rail sources



APPENDIX C - NOISE MAP MODELS

Figure C.1 – Daytime Noise Map (Rail) $L_{Aeq,16hr}$ Contours at 10.5m Height

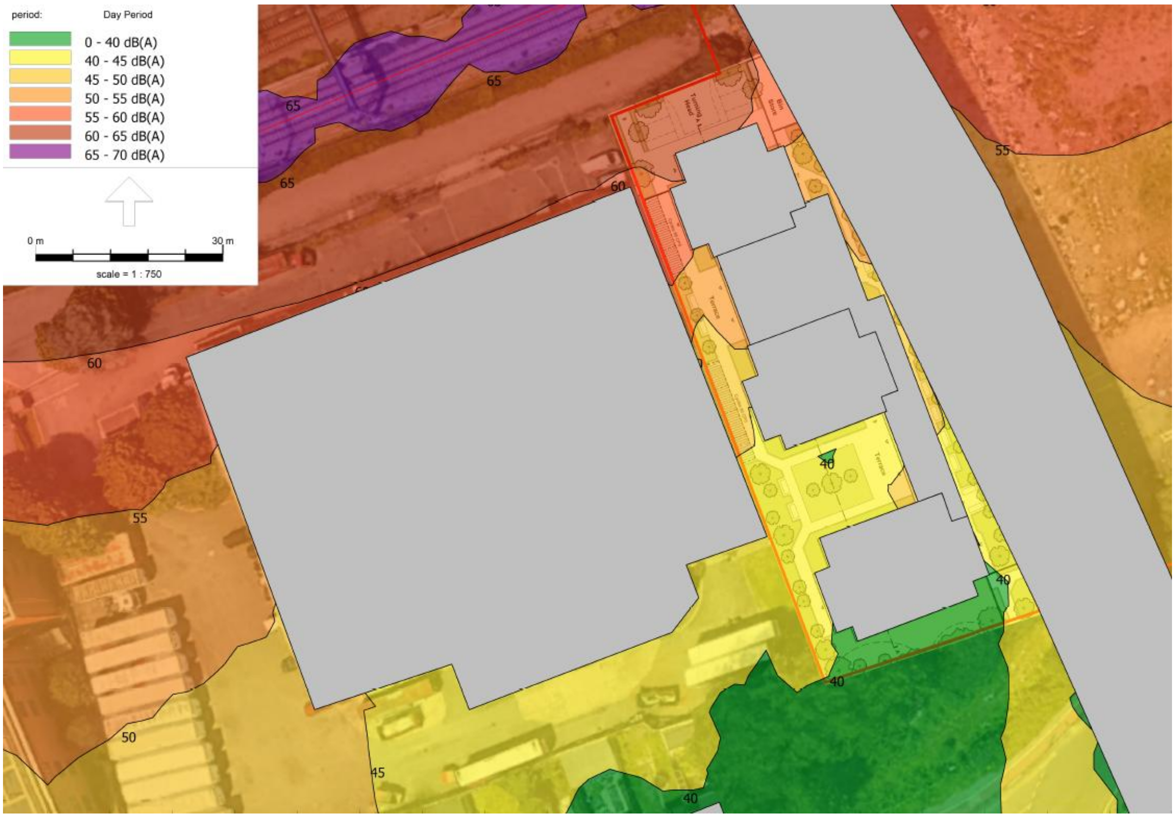


Figure C.2 – Night-time Noise Map (Rail) $L_{Aeq,8hr}$ Contours at 10.5m Height

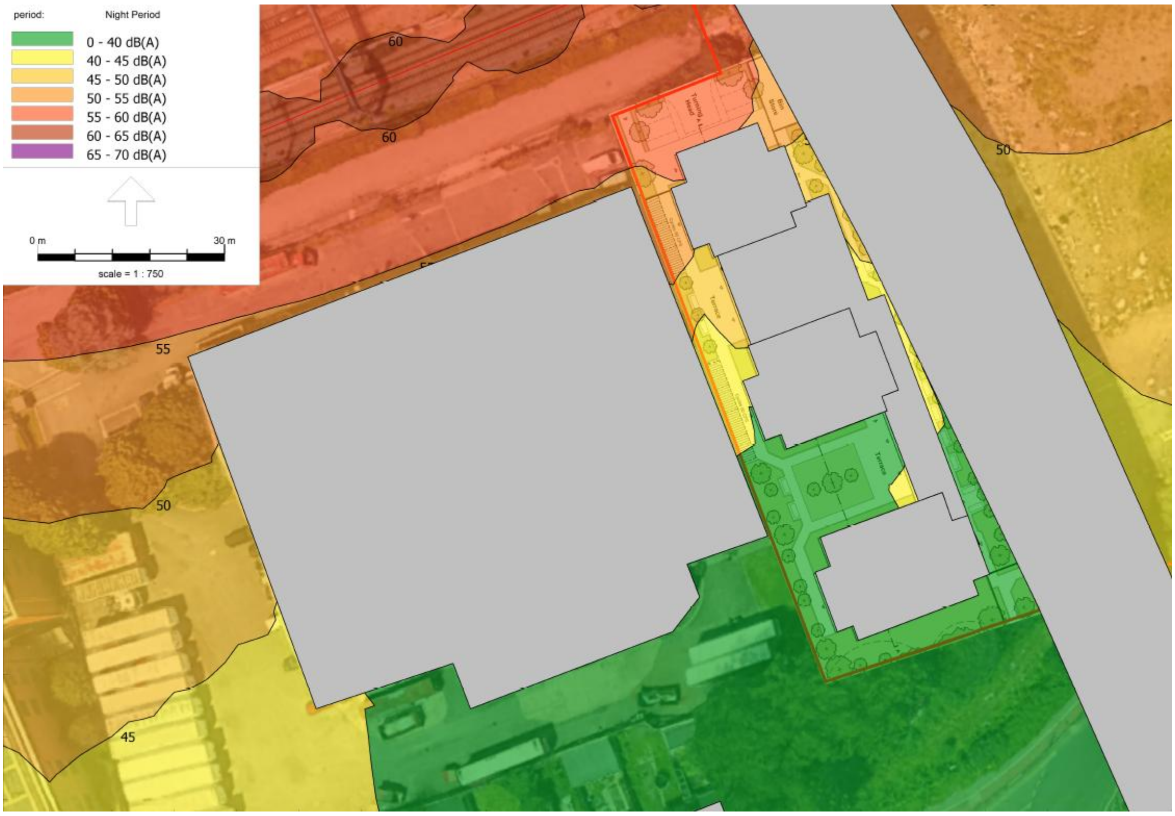


Figure C.3 – Daytime Noise Map (Road) $L_{Aeq,16hr}$ Contours at 10.5m Height

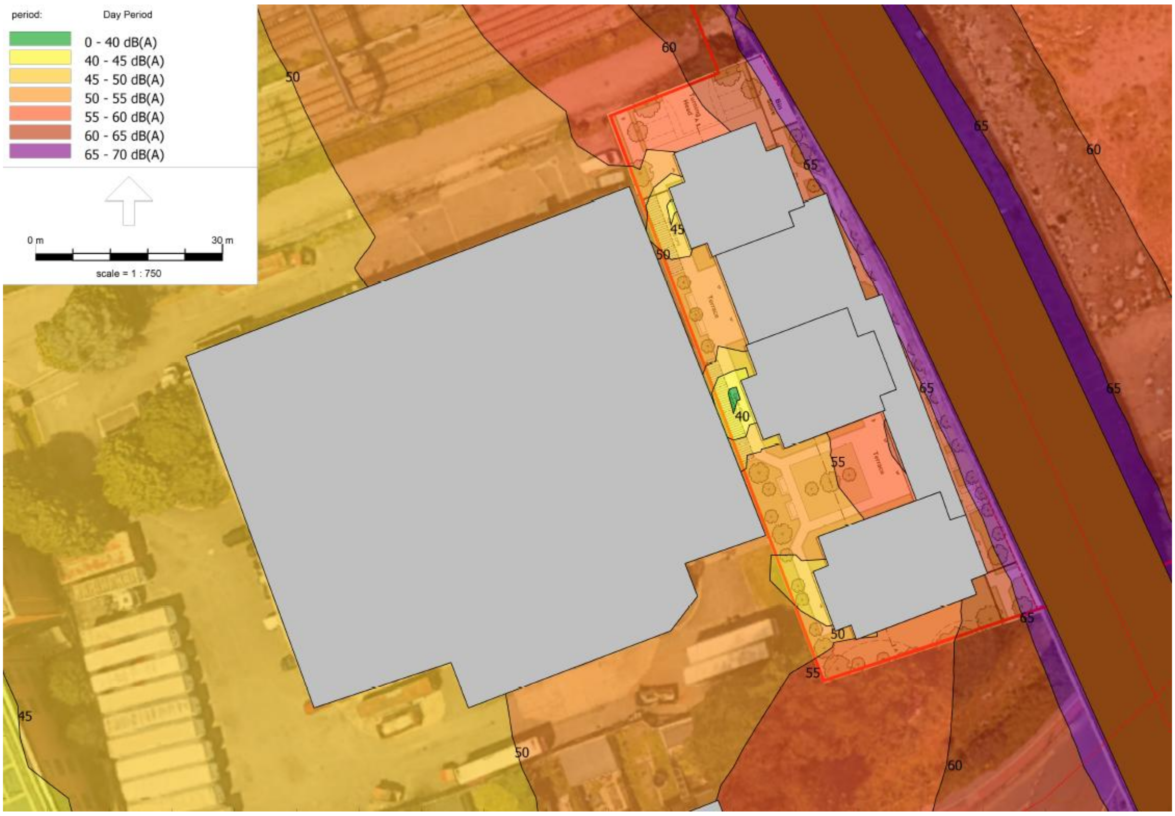


Figure C.4 – Night-time Noise Map (Road) $L_{Aeq,8hr}$ Contours at 10.5m Height

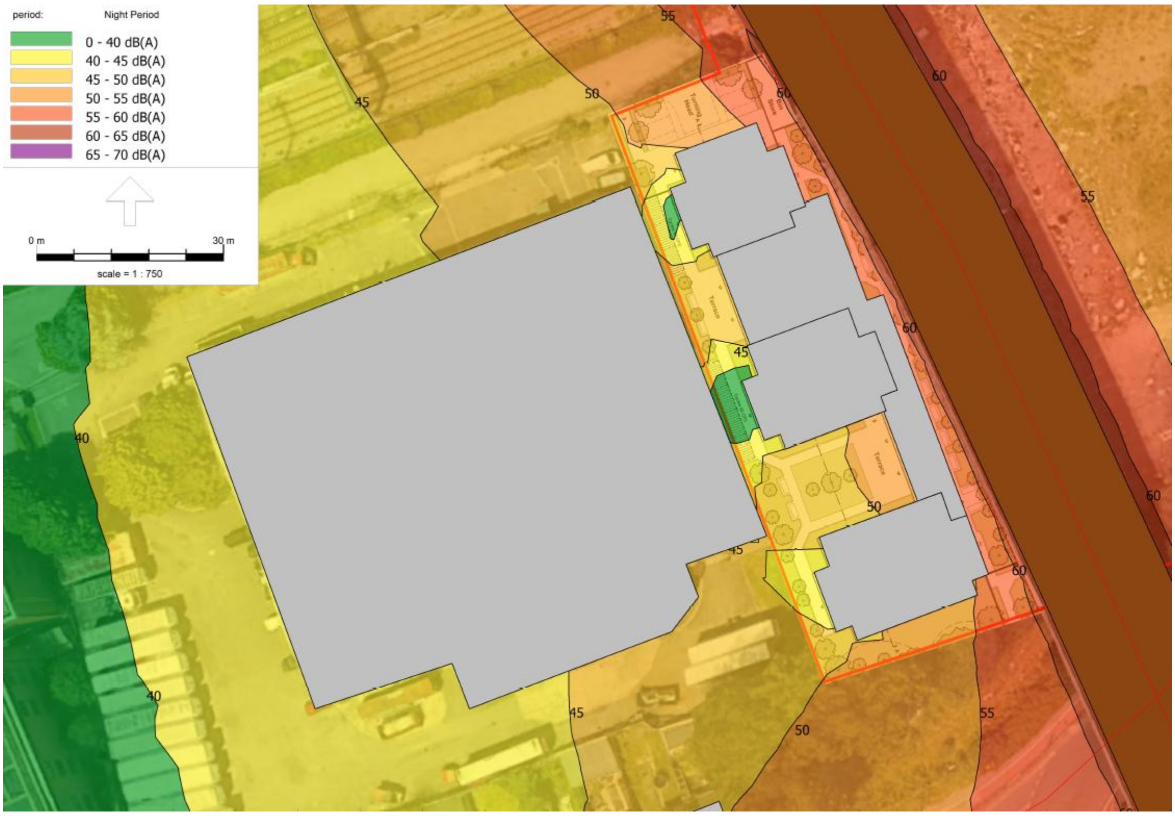


Figure C.5 –Daytime 3D Road & Rail Noise Model (SE) $L_{Aeq,16hr}$

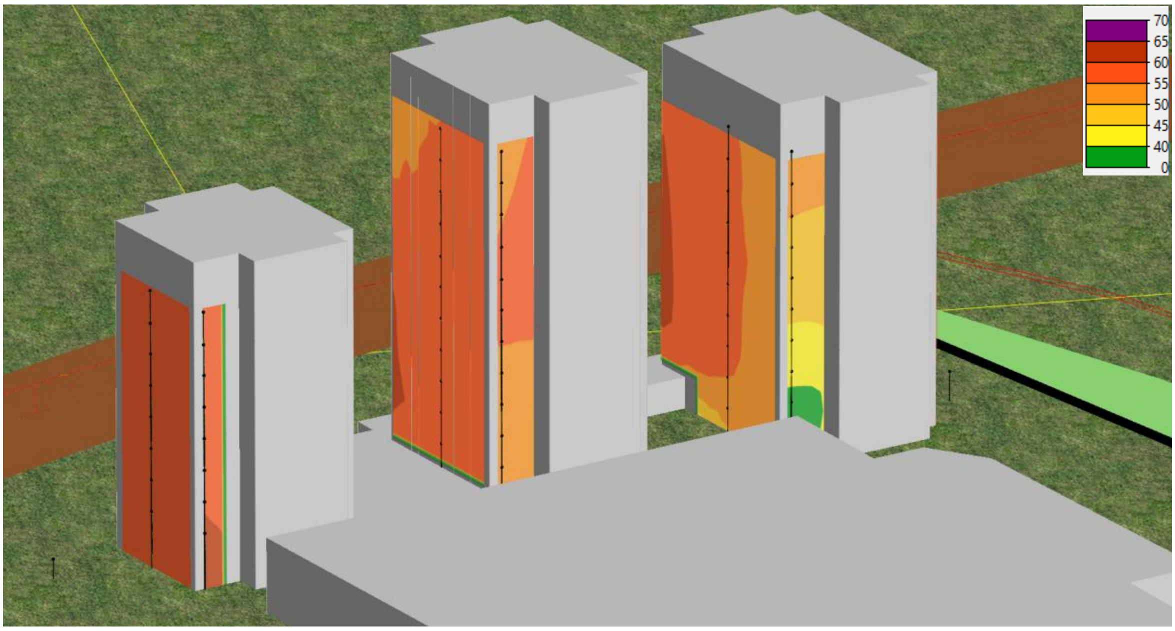


Figure C.6 – Daytime 3D Road & Rail Noise Model (NW) $L_{Aeq,16hr}$

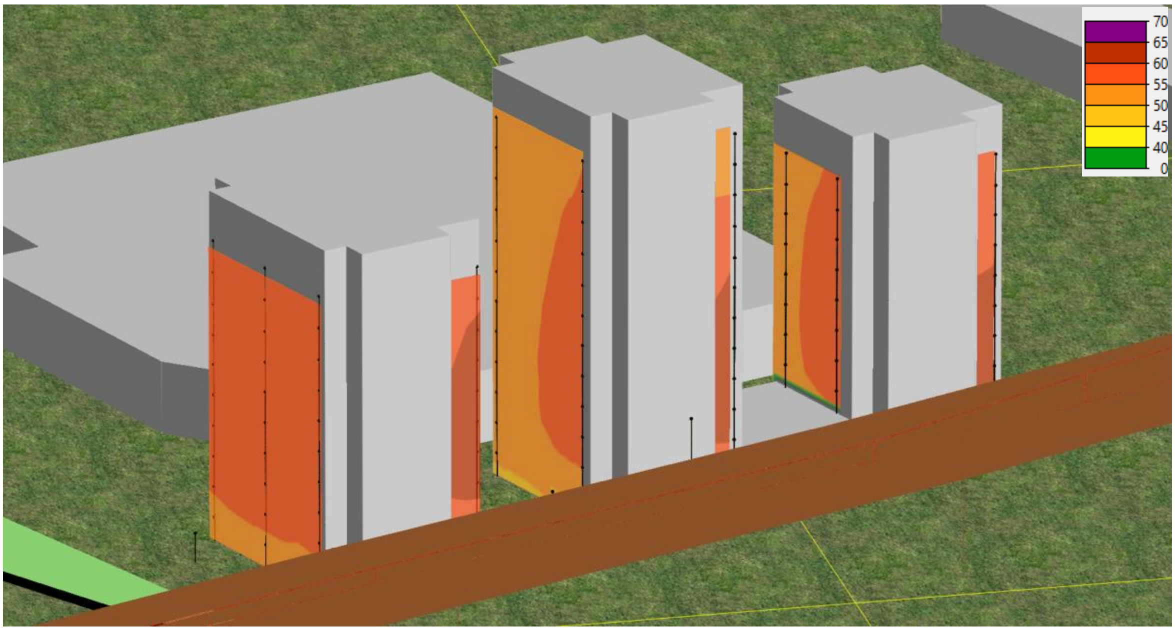


Figure C.7 – Night-time 3D Road & Rail Noise Model (SE) $L_{Aeq,8hr}$

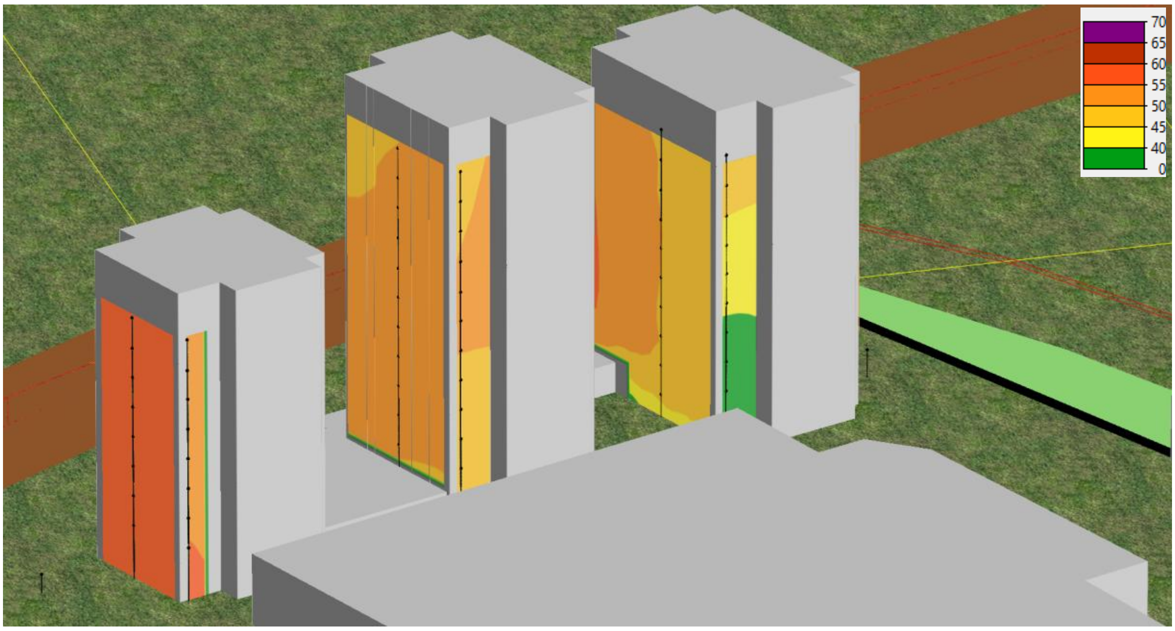


Figure C.8 – Night-time 3D Road & Rail Noise Model (NW) $L_{Aeq,8hr}$

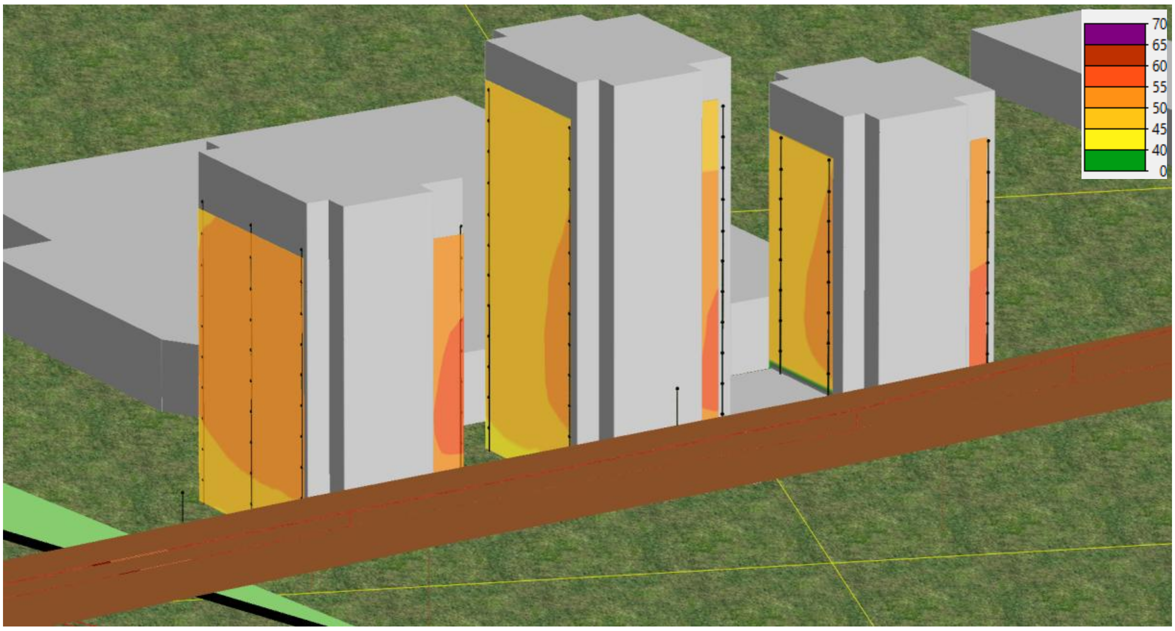


Table C.1 Noise Model Receiver Results (Northern Tower)

Room		Daytime dB $L_{Aeq,16hr}$	Night-time dB $L_{Aeq,8hr}$	Rail dB $L_{Amax,F}$	Road dB $L_{Amax,F}$
01	**01**	62.9	57.3	66.6	74.9
02	**01**	63.6	57.9	66.5	81.4
03	**01**	63.0	57.0	66.3	81.5
04	**01**	60.3	54.4	66.0	80.4
05	**01**	59.6	53.8	65.7	78.9
06	**01**	56.9	51.4	65.3	77.2
07	**01**	57.2	51.7	64.9	75.7
08	**01**	57.1	51.7	64.5	74.3
01	**02-03**	63.4	58.2	75.1	74.2
02	**02-03**	63.7	58.4	75.0	76.4
03	**02-03**	63.3	58.0	74.7	76.5
04	**02-03**	62.3	56.9	74.4	76.1
05	**02-03**	61.2	56.0	74.0	75.4
06	**02-03**	61.0	55.8	73.6	74.6
07	**02-03**	60.8	55.6	73.1	73.7
08	**02-03**	60.7	55.5	72.6	72.7
01	**04**	60.2	55.1	66.9	54.4
02	**04**	60.1	55.0	66.8	54.5
03	**04**	60.0	54.9	66.6	54.5
04	**04**	59.6	54.6	66.3	54.4
05	**04**	59.3	54.2	66	54.1
06	**04**	59.1	54.0	65.6	53.7
07	**04**	58.8	53.7	65.2	53.4
08	**04**	58.5	53.4	64.8	52.9
01	**05-06**	56.7	50.7	46.8	75.6
02	**05-06**	57.8	51.7	46.7	73.4
03	**05-06**	57.9	51.8	46.6	76.1
04	**05-06**	57.6	51.6	46.5	73.2
05	**05-06**	57.4	51.2	46.4	76.1
06	**05-06**	56.9	50.9	46.2	75.6
07	**05-06**	56.5	50.5	46.1	74.8
08	**05-06**	56.1	50.0	45.9	73.8
01	**07-08**	54.0	48.0	46.9	71.2
02	**07-08**	54.5	48.4	46.8	70.8
03	**07-08**	54.5	48.5	46.7	70.8
04	**07-08**	54.3	48.2	46.6	70.7
05	**07-08**	54.2	48.1	46.5	70.8
06	**07-08**	54.0	48.0	46.3	70.7
07	**07-08**	53.8	47.8	46.2	70.3
08	**07-08**	53.5	47.6	46.0	69.8

Table C.2 Noise Model Receiver Results (Central Tower)

Room		Daytime dB $L_{Aeq,16hr}$	Night-time dB $L_{Aeq,8hr}$	Rail dB $L_{Amax,F}$	Road dB $L_{Amax,F}$
01	09	60.7	54.9	51.4	79.4
02	09	62.3	56.4	51.4	80.5
03	09	62.0	56.0	51.4	80.5
04	09	61.8	55.8	51.3	79.7
05	09	61.3	55.3	51.3	78.3
06	09	60.6	54.5	51.2	76.8
07	09	60.0	54.0	51.1	75.8
08	09	58.2	52.4	51.0	74.1
09	01	56.9	51.2	50.9	75.3
10	01	53.3	48.1	50.8	71.8
11	01	53.2	48.0	50.7	74.7
01	10-12	57.1	51.3	46.5	73.2
02	10-12	57.6	51.8	46.5	72.1
03	10-12	57.1	51.2	46.4	73.3
04	10-12	57.1	51.3	46.4	71.9
05	10-12	57.9	52.2	46.3	73.3
06	10-12	57.8	52.2	46.2	70.8
07	10-12	57.6	52.0	46.2	73.1
08	10-12	57.1	51.5	46.1	69.8
09	02-04	56.9	51.4	46.0	72.8
10	02-04	56.6	51.2	48.7	69.2
11	02-04	55.0	49.8	48.6	72.3
01	13	51.3	46.3	55.9	63.8
02	13	52.0	46.9	53.0	53
03	13	52.6	47.5	46.6	53.7
04	13	53.2	48.2	46.6	52.7
05	13	55.2	50.2	46.5	53.7
06	13	55.3	50.3	46.4	52.4
07	13	55.2	50.1	46.4	53.6
08	13	55.1	50.0	46.2	52
09	05	54.9	49.9	46.1	53.4
10	05	54.8	49.8	46.0	51.7
11	05	54.6	49.6	45.9	53.2
00	01-02	48.5	42.4	40.4	73.3
01	14-16	55.7	49.6	42.0	75.7
02	14-16	57.8	51.8	42.0	77.5
03	14-16	58.3	52.2	42.0	74.5
04	14-16	58.1	52.0	41.8	78.1
05	14-16	57.8	51.7	41.7	73.6
06	14-16	57.4	51.3	41.7	78.1
07	14-16	56.8	50.7	41.6	72.4
08	14-16	56.3	50.2	41.5	77.6
09	06-08	55.8	49.8	41.4	71.4
10	06-08	55.3	49.4	41.4	76.7

11	**06-08**	54.9	48.9	41.3	70.5
00	**03**	50.9	44.9	42.1	70.5
01	**17-18**	52.1	46.1	42.3	70.5
02	**17-18**	52.7	46.7	42.3	70.6
03	**17-18**	52.6	46.7	42.2	69.8
04	**17-18**	52.7	46.8	42.2	69.9
05	**17-18**	52.7	46.8	42.1	69.6
06	**17-18**	52.8	46.9	42.0	69.9
07	**17-18**	52.7	46.8	42.0	69.1
08	**17-18**	52.5	46.7	41.9	69.8

Table C.3 Noise Model Receiver Results (Southern Tower)

Room		Daytime dB $L_{Aeq,16hr}$	Night-time dB $L_{Aeq,8hr}$	Rail dB $L_{Amax,F}$	Road dB $L_{Amax,F}$
09	**09-10**	52.3	46.5	41.8	68.3
10	**09-10**	52.0	46.1	41.7	69.6
11	**09-10**	51.8	45.9	41.6	67.5
01	**19**	58.4	52.6	43.9	80.3
02	**19**	62.0	56.0	43.9	81.5
03	**19**	62.5	56.4	43.9	81.5
04	**19**	62.1	56.1	43.8	80.5
05	**19**	61.7	55.7	43.8	78.9
06	**19**	61.2	55.1	43.7	77.2
07	**19**	60.5	54.5	43.7	76.1
08	**19**	59.9	53.9	43.7	75.6
09	**11**	59.2	53.2	43.6	75
00	**04-06**	52.2	46.1	40.5	73.3
01	**20-23**	54.9	49.0	41.4	73.7
02	**20-23**	55.6	49.7	41.4	73.9
03	**20-23**	55.6	49.5	41.4	73.9
04	**20-23**	55.7	49.7	41.3	73.7
05	**20-23**	55.7	49.7	41.3	73.3
06	**20-23**	55.7	49.8	41.3	72.8
07	**20-23**	55.5	49.7	41.2	72.2
08	**20-23**	55.5	49.7	41.2	72.2
09	**12-15**	55.2	49.5	41.1	71.9
00	**07**	35.2	29.9	41.7	59.5
01	**24**	36.6	31.4	41.7	56.3
02	**24**	41.9	36.8	41.7	56.2
03	**24**	43.5	38.3	41.7	51.9
04	**24**	46.0	41.0	41.6	52.4
05	**24**	47.9	42.8	41.6	51.6
06	**24**	48.8	43.8	41.6	52.4
07	**24**	50.1	45.0	41.5	51.3
08	**24**	52.3	47.2	41.5	52.3
09	**16**	52.5	47.5	41.4	52.2

00	**08-09**	52.7	46.9	37.8	72.2
01	**25-26**	55.8	49.9	38.1	73.6
02	**25-26**	59.2	53.2	38.1	75.8
03	**25-26**	59.9	53.9	38.0	72.4
04	**25-26**	59.8	53.8	38.0	76.5
05	**25-26**	59.5	53.5	37.9	71.2
06	**25-26**	59.0	53.0	37.9	76.5
07	**25-26**	58.5	52.5	37.9	70
09	**17-18**	57.6	51.6	37.8	75.9
00	**10-11**	53.2	47.3	36.6	74.8
01	**27-28**	56.2	50.3	36.6	70.4
02	**27-28**	57.3	51.4	36.6	70
03	**27-28**	57.7	51.8	36.5	70.8
04	**27-28**	57.8	51.8	36.5	69.4
05	**27-28**	57.6	51.7	36.5	71
06	**27-28**	57.4	51.5	36.5	68.8
07	**27-28**	57.2	51.2	36.4	71.1
08	**27-28**	56.8	50.9	36.4	68.1
09	**19-20**	56.5	50.6	36.3	70.9
00	**12-13**	53.9	48.0	38.1	70.5
01	**29-30**	55.3	49.4	38.1	67.5
02	**29-30**	56.0	50.0	38.1	67.3
03	**29-30**	56.4	50.5	38.1	67.7
04	**29-30**	56.4	50.5	38.1	66.9
05	**29-30**	56.4	50.5	38.0	67.8
06	**29-30**	56.3	50.4	38.0	66.5
07	**29-30**	56.1	50.1	38.0	67.8
08	**29-30**	55.9	50.0	37.9	66.1
09	**21-22**	55.6	49.7	37.9	67.7

APPENDIX D - DRAWING LISTS

The following Rutter Architects drawings have been used in our assessment;

Table D.1 – Drawing List

Drawing Number	Rev	Date	Drawing Title
RA-1075-PL-101	-	SEP2025	Site Location Plan
RA-1075-PL-102	-	SEP2025	Proposed Site & Block Plan
RA-1075-PL-103	-	SEP2025	Proposed Ground and 1st Floor Plans
RA-1075-PL-104	-	SEP2025	Proposed 2nd-8th & 9th Floor Plans
RA-1075-PL-105	-	SEP2025	Proposed 10th & 11th Floor Plans
RA-1075-PL-110	-	OCT2025	Elevation 01
RA-1075-PL-111	-	OCT2025	Elevation 02
RA-1075-PL-112	-	OCT2025	Elevation 03
RA-1075-PL-113	-	OCT2025	Elevation 04
RA-1075-PL-114	-	OCT2025	Elevation 05
RA-1075-PL-115	-	OCT2025	Elevation 06
RA-1075-PL-116	-	OCT2025	Elevation 07
RA-1075-PL-117	-	OCT2025	Elevation 08
RA-1075-PL-118	-	OCT2025	Section 01