

Noise Planning Report

Newport Knowledge Quarter



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Date:
20 August 2026

Project/File:
NE0101-STN-XX-XX-RP-U-10005

Document control sheet

Issued by	Stantec UK Limited Wharton Place, 13 Wharton Street Cardiff CF10 1GS UNITED KINGDOM stantec.com	+44(0) 2920 023665 stantec.com
Client	WEPCo Limited	
Project name	Newport Knowledge Quarter	
Title	Noise Planning Report	
Doc ref	NE0101-STN-XX-XX-RP-U-10005	
Project number	333701109	
Status	A2-Planning	
Date	20 August 2026	

Document production record

Issue number	P01	Name	Signature
Prepared by		Paul Gurney BSc (Hons) MIOA	
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Technical Independent Review by		Steffan Davies	

Document revision record

Issue number	Status	Date	Revision details
P00	D2-Review	10/08/2026	Draft issue, suitable for review and comment.
P01	A2-Planning	20/08/2026	First issue, suitable for stage approval.

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Executive Summary

Stantec has prepared a noise impact assessment to support the planning application for the proposed Newport Knowledge Quarter development. The proposed scheme comprises a new six-storey educational building containing teaching spaces, workshops, offices and ancillary spaces. The assessment has considered both the potential impact of existing environmental noise on future building occupants and the potential impact of noise from the proposed development on nearby noise sensitive receptors.

Environmental noise monitoring undertaken at the site confirmed that the local sound environment is dominated by road traffic noise associated with the A4042 and the surrounding road network. The survey results indicate that the site is suitable for an educational facility, provided that the building envelope and ventilation strategy are designed to achieve the indoor ambient noise level criteria specified in Building Bulletin 93 (BB93).

An external building fabric assessment has therefore been completed to identify the glazing, façade and ventilation performance requirements necessary to achieve the BB93 internal noise criteria throughout the development. The assessment demonstrates that compliance can be achieved through the adoption of the recommended glazing specifications, external wall constructions and ventilation measures presented within this report.

Noise modelling has been undertaken to assess potential noise emissions associated with workshop activities, service yard operations and external plant equipment. The modelling was based on measured workshop noise levels, anticipated operational activities and preliminary mechanical plant specifications. Workshop breakout noise is predicted to remain substantially below prevailing background noise levels at the nearest noise sensitive receptors and is therefore expected to have a low impact, provided doors and windows remain closed during teaching activities.

External plant noise, including ventilation systems, air handling units, extract systems and air source heat pumps, has also been assessed. Subject to the incorporation of the recommended attenuation measures (including acoustic enclosures, attenuators and proprietary noise control treatments), plant noise is predicted to have a low impact during both daytime and night-time operation.

Service yard activities represent the most significant potential source of operational noise at the nearest noise sensitive receptors. The assessment results indicate that vehicular movements within the service yard could have an 'adverse impact' (depending on context) during the early-morning rush hour period between 06:00 and 07:00. Given the existing traffic-dominated acoustic environment, together with the implementation of Quiet Deliveries Good Practice Guidance, it is expected that the overall impact could be reduced to a 'low impact'. It is recommended that routine deliveries and service yard activities are restricted to daytime hours only (07:00 – 23:00) where possible to avoid a potential adverse impact on the nearby noise sensitive receptors.

The proposed emergency generator has been assessed and is considered acceptable at the proposed location, provided the manufacturer's acoustic enclosure is incorporated and routine testing is limited to brief daytime periods.



Overall, the assessment concludes that the proposed Newport Knowledge Quarter development is acoustically suitable for both future occupants and the surrounding noise sensitive receptors. Subject to implementation of the recommended building fabric specifications, plant noise mitigation measures and operational management controls identified within this report, the development is expected to comply with the requirements of BB93 and should not give rise to significant adverse noise impacts (as per BS 4142:2014+A1:2019).



1 Introduction

Stantec are appointed to prepare a noise planning report to accompany the planning application for the Newport Knowledge Quarter campus.

This document summarises the noise measurement results from unattended and attended surveys undertaken at the proposed and existing sites in May 2025 and February 2026 respectively.

The results of the unattended survey are used to determine façade noise mitigation measures requirements and a suitable ventilation strategy to achieve the Building Bulletin 93 'Acoustic Design of Schools' internal ambient noise level criteria within noise sensitive spaces.

An external noise impact assessment has been carried out to determine the likelihood of adverse impact on the nearby noise sensitive receptors due to noise emissions (workshop noise breakout, service yard noise and external plant noise) associated with the proposed development.

An external building fabric assessment has been carried out to determine suitable glazing and ventilation solutions to achieve the target internal ambient noise level criteria within noise sensitive spaces.

It should be noted that external plant specifications are not yet finalised; current selections have been used to model external plant noise emissions at the development site, however the current selections are subject to change since the design is currently ongoing. The assessment presented in this report is a robust prediction of proposed plant noise emissions at the nearest noise sensitive receptors, however it is advised that external plant noise emissions are conditioned as part of the planning process to protect the amenity of the nearby noise sensitive receptors.

1.1 Site Overview

The proposed development site is shown in Figure 1 overleaf, which is bounded by the A4042 to the east, Emlyn Street to the south and Kingsway Centre Car Park to the west. A new 6-storey building is proposed at the site, which will include classrooms, practical workshops, administration spaces (i.e. offices) and staff rest areas.

The nearest identified noise sensitive receptors to the proposed site are the following:

- Residential houses on Emlyn Street
- Residential houses on Cross Lane
- Residential apartments above the Dolman Theatre

The nearest identified noise sensitive receptors to the proposed site are shown in Figure 1 overleaf.



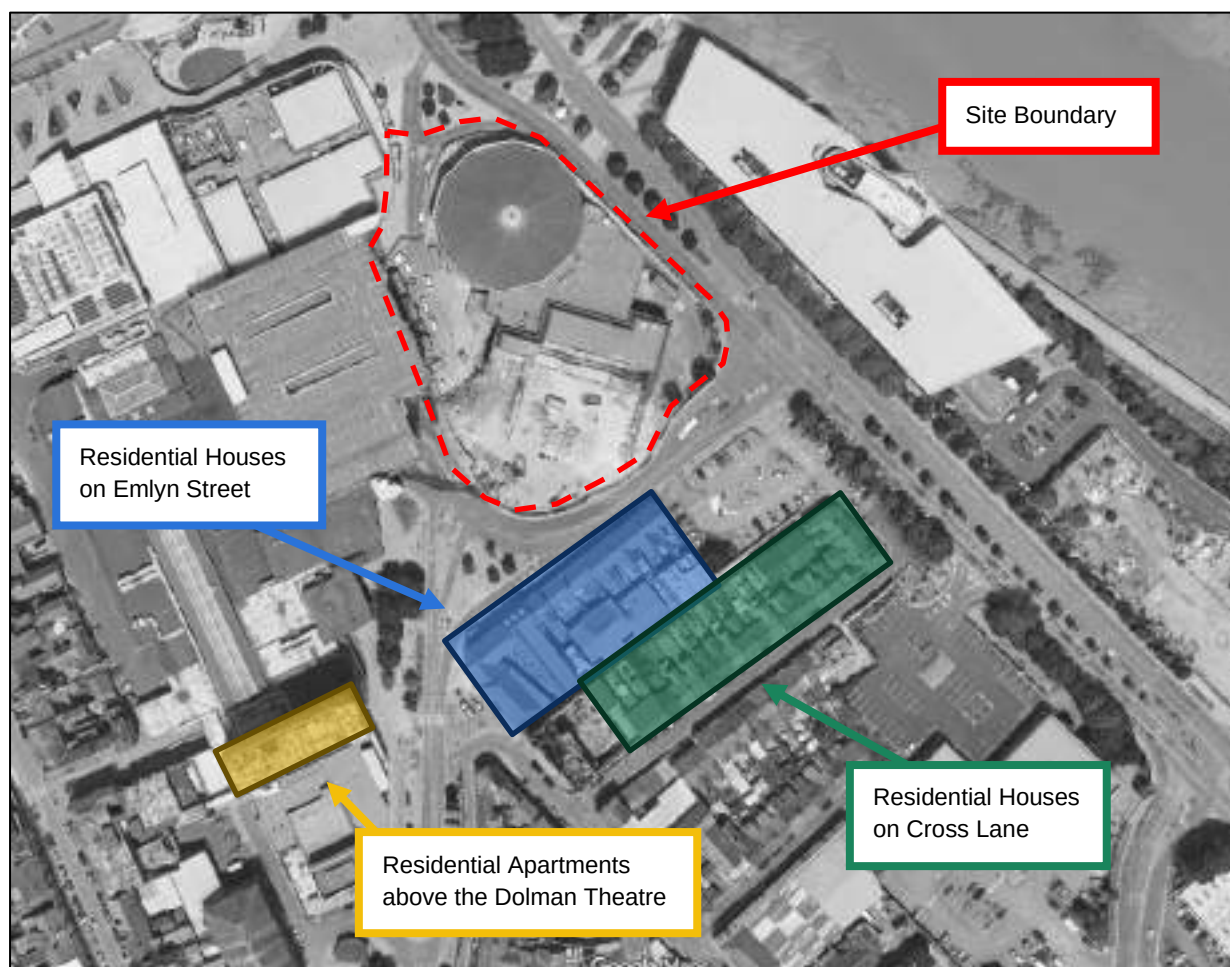


Figure 1: Proposed Development Site and Nearest Receptors (Image Source: Google Maps)

2 Policy & Guidance Documents

2.1 British Standard 4142:2014+A1 2019

British Standard 4142:2014+A1 2019 '*Methods for rating and assessing industrial and commercial sound*' is used to establish the impact of noise sources of an industrial nature on people residing in nearby dwellings.

The assessment method considers the characteristics of the sound, such as tonality, impulsivity and intermittency. Corrections are applied to the specific noise source to account for these characteristics to obtain the 'rating' noise level, where noise generated is tonal (up to 6dB), intermittent or impulsive (up to 9dB), or otherwise 'readily distinctive against the residual acoustic environment' (up to 3dB).

The development will introduce various items of fixed plant, which have the potential to be a permanent source of noise depending on their noise emissions. Therefore, plant rating noise limits at the nearest noise sensitive receptors (NSRs) are proposed relative to measured background noise levels and consideration has been given to whether these limits are practically achievable.

Plant rating noise limits have been set following the methodology contained within BS4142:2014+A1 2019, which defines the relevant parameters as follows:

- Specific noise level $L_{Aeq,T}$: The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval;
- Background level, $L_{A90,T}$: The 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T;
- Rating level, $L_{A,r,T,r}$: The equivalent continuous 'A' weighted sound pressure level of the item of plant or process considered (specific sound level), plus relevant adjustments made for any tonal, intermittent, or impulsive characteristics.

The specific noise level with the character correction (if necessary) is known as rating level ($L_{A,r,T,r}$) and the difference between the background noise and the rating level is determined to make the BS 4142 assessment. The following is then considered.

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- d) 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.



2.2 Building Bulletin 93 ‘Acoustic Design of Schools: Performance Standards’

Building Bulletin 93 (hereafter referred to as BB93) sets out indoor ambient noise level (IANL) criteria for a variety of spaces and is a legislative requirement for all new-build and refurbished schools. The IANL includes contributions from:

- External sources outside the building (including, but not limited to, road/rail/air traffic noise and/or noise from industrial and commercial premises).
- Building services (e.g. ventilation systems, plant, drainage, etc.). If a room is naturally ventilated, the IANL is calculated and measured with ventilators or windows open as required to provide ventilation. If a room is mechanically ventilated or cooled, the plant should be assumed to be running at its normal operating duty.

Whilst BB93 is written principally for schools, it is widely recognised as the most appropriate acoustic design standard for educational environments and has therefore been adopted as the design benchmark for the proposed FE college development.

Based on the RIBA Stage 3 development proposals, the IANL criteria relevant to this project are summarised in Table 1.

Table 1: New-Build Performance Standards for Indoor Ambient Noise Levels (IANL)

Room Type	Upper IANL Limit ($L_{Aeq,30mins}$, dB)
Greenscreen & Recording	30
Classrooms (Brickwork, Construction, Civils, Engineering, Electrical, H&B, Health & Care, Multiskills, Science & Maths, ILS, Business, Maths/English, ESOL), Multifaith Areas, Examination/Enrolment/Open Evening, Racing Simulator, Sound Studio, ILS Flat, ILS Sensory Room, ILS Assessment, Multifunction/Immersive Room	35
Offices, Staff Rooms, IT Rooms (Civils, Media, Care, Online Exams, Services to People), Tech Support Rooms, 1:1 Rooms, Tutorial Booths, Meeting Rooms, Reach, First Aid, Beauty/Hair Salons, Beauty Laser Treatment, Catering Rooms, Foundation Art, Level 2/3 Studios, AP Hub, Shared Spaces, CLT Rooms, Board Room, ILS Arts & Crafts, ILS Hygiene Room, ILS Kitchen, STL/Ward/Childcare Simulation Rooms, Biology/Chemistry/Physics Labs, Science Prep, Library & BoH, HE Hub, Electronics/Computer Workshops, Greenroom & Coordinator, Student Union, Head of Learner Services, Desk Based Visual Arts (ESOL)	40
Restaurant, Motorsports, Computer Lab (GF), Advanced Engineering, Fab/Weld Rooms, Brickwork/Masonry/Plaster Rooms, Engine Assembly, Foundation Workshop, Progression Workshop, Gas Level 3 Training/Assessment Rooms, Carpentry Machine Workshop, Carpentry/Woodwork Rooms, Renewables Workshop, Electrical Workshops, Multiskills Workshop	45
Production/Training Kitchens	50

The building envelope and ventilation strategy should be developed to achieve the IANL criteria prescribed by BB93.



3 Unattended Noise Survey at Proposed Site

3.1 Personnel

The environmental noise survey was undertaken by Sophie Bryan (Graduate Acoustic Consultant at Stantec). Sophie is an Associate Member of the Institute of Acoustics (AMIOA), and holds the following qualifications:

- Institute of Acoustics Diploma in Acoustics and Noise Control
- Institute of Acoustics Competence in Environmental Noise Measurement

3.2 Methodology

Unattended environmental noise measurements were undertaken between 11:00 on Wednesday 7th May 2025 and 11:30 on Friday 9th May 2025 by unattended noise monitoring equipment. Additional attended short-term noise measurements were undertaken between 09:50 and 10:35 Wednesday 7th May 2025. The noise monitoring locations are shown in Figure 2 and summarised in **Table 2**.

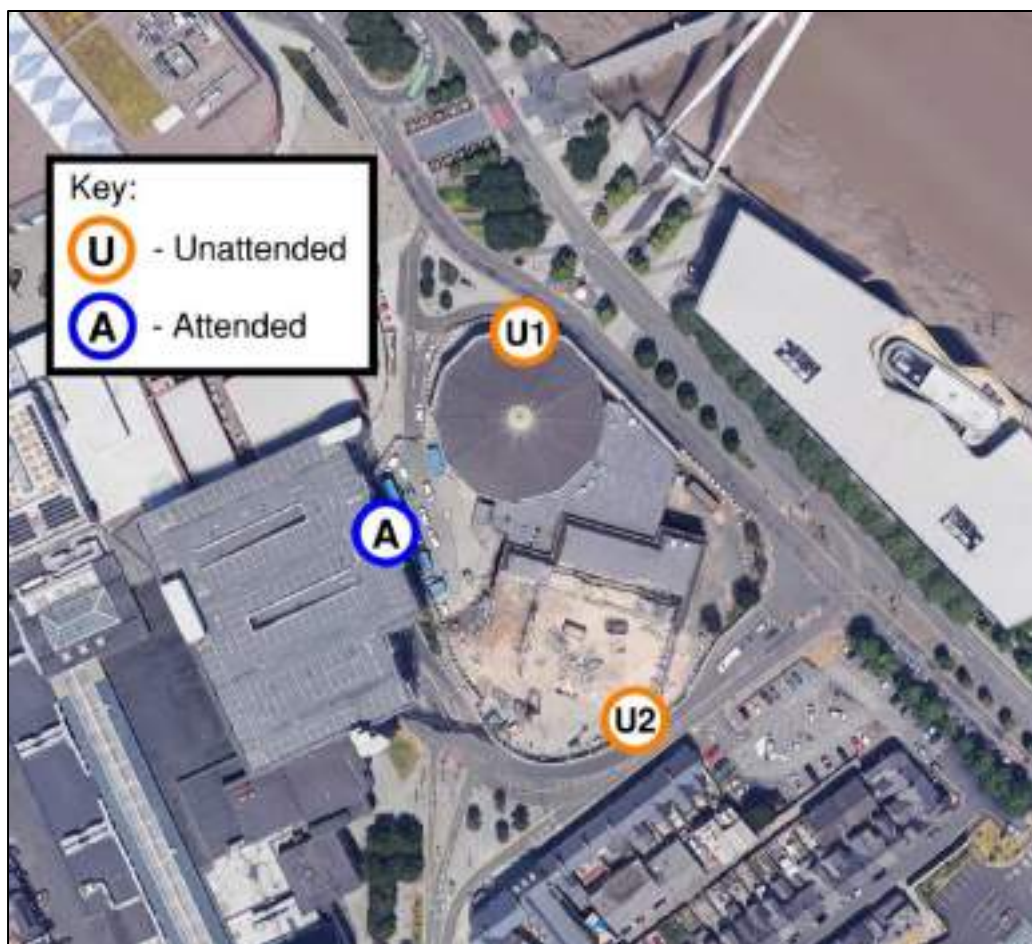


Figure 2: Noise Monitoring Positions (Image Source: Google Maps)

Table 2: Description of Noise Monitoring Locations

ID	Description of Noise Monitoring Position
U1	Unattended continuous noise monitoring undertaken at the northern boundary of the site, overlooking the A4042. The microphone was attached to a tripod and secured to the site hoarding.
U2	Unattended continuous noise monitoring undertaken at the southern boundary of the site, overlooking Emlyn Street. The microphone was attached to a tripod and secured to the site hoarding. The monitoring position is deemed representative of noise levels at the residential properties on Emlyn Street.
A	Attended short-term noise measurements undertaken within Kingsway Car Park on floors 1, 3 and 5.

The measurement microphones were located at a height of ~1.5m above local ground in all instances. Measurements were undertaken in accordance with the guidance outlined in the relevant British Standards, BS 4142:2014 and BS 7445-1:2003. The monitoring procedure followed the guidance outlined in BS 7445:2003 Part 1, Section 5.2.3 and Section 5.2.2.

Unattended measurements were 'free field', i.e. the microphone was more than 3.5m from reflective elements except the ground. A suitable wind shield was fitted to the monitoring equipment throughout the monitoring period. Observation and subjective evaluation of noise sources was carried out during the setup and collection of the survey equipment.

3.3 Equipment

The noise monitoring equipment used for the environmental noise survey is summarised in **Table 3**

Table 3: Equipment Table – Environmental Noise Survey

Monitoring ID	Equipment	Manufacturer	Instrument	Serial No.
U1	Sound Level Meter	01dB	FUSION	14526
	Microphone	GRAS	40CD	470800
	Calibrator	Cirrus	CR:515	96051
U2 & A	Sound Level Meter	NTi Audio	XL2-TA	A2A-20607-E0
	Pre-amp		MA220	10684
	Microphone		MC230A	A23089
	Calibrator		CR:515	95714

The sound level meters used for the noise survey are verified as conforming to BS EN 61672-1. The acoustic calibrators used conform to BS EN IEC 60942. Equipment calibration certificates can be provided on request. The sound level meters were calibrated to a reference level of 94 dB at 1kHz both prior to, and on completion of, the noise survey period. No significant drift in calibration was noted during the survey (≤ 0.5 dB).



3.4 Weather Conditions

Approximate weather history for Newport can be viewed in Appendix A. To summarise conditions, the weather was dry and calm with a gentle breeze.

“Average recorded wind speeds during the environmental noise measurement process did not exceed 5 m/s. BS 4142:2014 provides the following guidance with regards to the acquisition of environmental noise measurements and weather conditions:

An effective windshield should be used to minimize turbulence at the microphone.

NOTE Windshields are generally effective up to wind speeds of 5 m/s’ and ‘exercise caution when making measurements in poor weather conditions such as wind speeds greater than 5 m/s.”

Weather conditions during the noise survey were suitable for the acquisition of noise data. Measurements are therefore considered to adhere to the guidance of the relevant British Standard and no corrections to the measured noise dataset has been applied.

3.5 Environmental Noise Survey Results

The following noise level indices are relevant to this assessment:

- $L_{Aeq,T}$ dB ('A' weighted equivalent continuous sound pressure level) - defined as the level of a continuous noise with the same total energy as the actual fluctuating sound over the measurement time periods. It is sometimes referred to as the 'ambient noise level' and can be considered an average.
- $L_{A90,T}$ dB - defined as the 'A' weighted sound pressure level exceeded for 90% of the measurement period 'T'. It is used to describe the prevailing background sound level within BS4142:2014 +A1 2019.
- $L_{A1,T}$ dB - defined as the 'A' weighted sound pressure level exceeded for 1% of the measurement period 'T'.

A summary of the measured average ambient noise levels at the unattended noise monitoring positions is presented in **Table 4**. The ambient noise levels ($L_{Aeq,T}$) are logarithmically averaged over each period. The full results are provided graphically in Appendix B.

Table 4: Measured Average Ambient Noise Levels at Unattended Positions

Position	Period	Range of Measured Ambient Noise Levels, dB $L_{Aeq,30mins}$	Average Ambient Noise Level, dB $L_{Aeq,13hrs}$
U1	Operational Hours (08:00-21:00)	53-73	67
U2	Operational Hours (08:00-21:00)	48-79	63

The typical daytime & night-time background sound levels are presented in Table 5, and are determined by observing the most commonly-occurring background sound levels during daytime (07:00 – 23:00) and night-time (23:00 – 07:00) hours.



The background sound level distribution graphs are shown in Appendix C. Note that background sound levels are much higher between 06:00 and 07:00 compared to the remainder of the night-time period (23:00 – 06:00) due to morning rush hour traffic, therefore the lowest measured background sound levels ($L_{A90,15mins}$) measured at each position between 06:00 and 07:00 are also shown in the table below.

Table 5: Typical Background Sound Levels at Unattended Positions

Position	Period	Typical Background Sound Level, dB $L_{A90,T}$
U1	Daytime (07:00 – 23:00)	58dB $L_{A90,1hr}$
	Morning Rush Hour Period (06:00 – 07:00)	51dB $L_{A90,15mins}^*$
	Night-time (23:00 – 07:00)	44dB $L_{A90,15mins}$
U2	Daytime (07:00 – 23:00)	54dB $L_{A90,1hr}$
	Morning Rush Hour Period (06:00 – 07:00)	50dB $L_{A90,15mins}^*$
	Night-time (23:00 – 07:00)	47dB $L_{A90,15mins}$

***Note:** The background sound level shown is the lowest background sound level ($L_{A90,15mins}$) measured at the respective position between 06:00 and 07:00.

Table 6 presents a summary of the discrete noise events ($L_{A1,30mins}$) measured at the site that exceeds 60dB during the daytime period (07:00 – 23:00) on each day of the survey period. The range, median and mode are presented to determine typical discrete noise events at the proposed development site. This assessment has been carried out interrogating 30-minute $L_{A1,30min}$ data, in line with BB93 guidance.

Table 6: Summary of Discrete Noise Events at Unattended Positions

Position	Discrete Noise Events during daytime, dB $L_{A1,30min}$		
	Range	Median	Mode
U1	69 - 82	76	76
U2	67 - 77	72	72

Additional short-term attended measurements were carried out at the Kingsway Centre car park between 09:50 and 10:35 on Wednesday 7th May 2025 to assist in modelling car park noise impinging on the proposed development building. Six 15-minute sample measurements were taken at the façade of the car park overlooking the development site across three floors. The measured noise level ($L_{Aeq,15min}$) ranged between 60dB and 61dB at all short-term attended measurement positions.

3.6 Environmental Noise Survey Results Discussion

Based on the unattended noise survey measurements results, the site is deemed feasible for a new college campus development provided that the external building fabric and ventilation strategy are designed to control external noise intrusion in-line with the IANL limits shown in Table 1. An external building fabric assessment has been carried out accordingly; full details are provided in **Section 6**.



Noise generating activities and equipment at the site (i.e. noise from workshop activities and noise from new external plant) have been modelled and assessed to determine whether an adverse impact is predicted at the nearest noise sensitive receptors, which are identified as being the existing residential terraced houses on Emlyn Street; full details of the noise modelling are provided in **Section 4**.

The predicted rating noise level of the noise generating activities and equipment is assessed in accordance with BS4142 (see **Section 2.1**) to determine whether any noise mitigation measures are necessary to avoid an adverse impact on the nearby noise sensitive receptors; full details of the BS4142 assessment are provided in **Section 5**.



4 Noise Modelling

4.1 Road Traffic Noise Modelling

A noise model has been generated using SoundPlan 9.1 to predict noise levels impinging on the proposed development façades during daytime hours (07:00 – 23:00). Noise emissions from the nearby roads (A4042 and Emlyn Street) and Kingsway Centre Car Park have been predicted based on the unattended and attended environmental noise survey results.

The SoundPlan 9.1 noise model has been used to calculate the highest predicted external noise levels at each façade of the proposed development. The noise modelling results are presented in **Appendix G.1**, and are used to inform the external building fabric assessment (see **Section 6**).

Predicted daytime road traffic noise levels are shown to range between 67-69dB $L_{Aeq,30mins}$ on the critical north-eastern façade.

4.2 Workshop Breakout Noise Modelling

The Newport Knowledge Quarter development includes proposals for workshops at ground floor and first floor level. The workshops are to provide dedicated teaching spaces for various vocational subjects including (but not limited to) carpentry, plumbing, bricklaying, engineering and motorsports activities.

Noise breakout levels from the proposed workshops have been modelled within SoundPlan 9.1 based on the reasonable worst-case internal reverberant noise levels ($L_{Aeq,1hr}$) measured at the site in February 2026, which are summarised in **Appendix D**.

For the purposes of the noise modelling, the external building elements (wall, door, glazing and roller shutter) are assumed to provide the minimum sound insulation performance values shown in Table 7.

Table 7: Assumed Sound Insulation Performance of External Building Elements

External Building Element	Sound Reduction Index (dB) at Octave Band Frequency (Hz)							R_w
	63	125	250	500	1000	2000	4000	
01 Wall ¹	20	33	41	46	50	48	48	48
02 Glazing ²	16	22	21	30	40	41	42	34
03 Door(s) ³	4	11	25	33	30	31	35	30
04 Roller Shutter ³	0	7	13	18	21	17	17	19
05 Roof ⁴	42	40	44	52	59	64	69	56

Note¹: See **Section 6.2**.

Note²: See **Section 6.1**.

Note³: External doors (including roller shutter doors) should be specified to achieve the min. sound reduction figures shown.



Note⁴: Only applicable to the Electrical Workshops at second floor level, which has a 250mm reinforced concrete roof. The sound reduction figures shown are a conservative estimate of what this construction is predicted to achieve in terms of sound insulation.

4.3 Service Yard Noise Modelling

External noise emissions due to vehicle movements and delivery activities within the service yard have been modelled within SoundPlan 9.1. Noise predictions have been calculated to the nearest noise sensitive receptors in order to carry out a comprehensive noise impact assessment in line with BS 4142:2014+A1:2019.

Different vehicle types are expected to arrive and depart the site via the transport routes shown in **Figure 3**. The no. of vehicle movements during the peak daytime (07:00 – 23:00) and the early morning rush hour (06:00 – 07:00) periods are summarised in Table 8. Vehicles are not expected to typically enter or depart from the service yard between 23:00 and 06:00.

Table 8: No. of Vehicle Movements during Peak Periods

Assessment Period	Extended Vehicles with Trailer		Minibuses		Rigid Trucks/HGVs, Large Refuse Vehicles and Small Skip Truck/Lorries	
	Arrive	Depart	Arrive	Depart	Arrive	Depart
Peak 1-Hour Period between 07:00 and 23:00	1	1	2	2	2	2
Peak 15-Minute Period between 06:00 and 07:00	0	0	0	0	1	1

Each vehicle movement is modelled as a moving point source moving at an average speed of 2.2m/s. Large vehicles (i.e. rigid trucks/HGVs, large refuse vehicles, small skip trucks/lorries) are assumed to have an overall sound power level of 100dB(A) when moving, whilst smaller vehicles (i.e. extended vehicles with trailer, minibuses) are assumed to have an overall sound power level of 95dB(A) when moving. When a vehicle arrives at the site, it is assumed that the driver switches off the engine (i.e. does not idle).



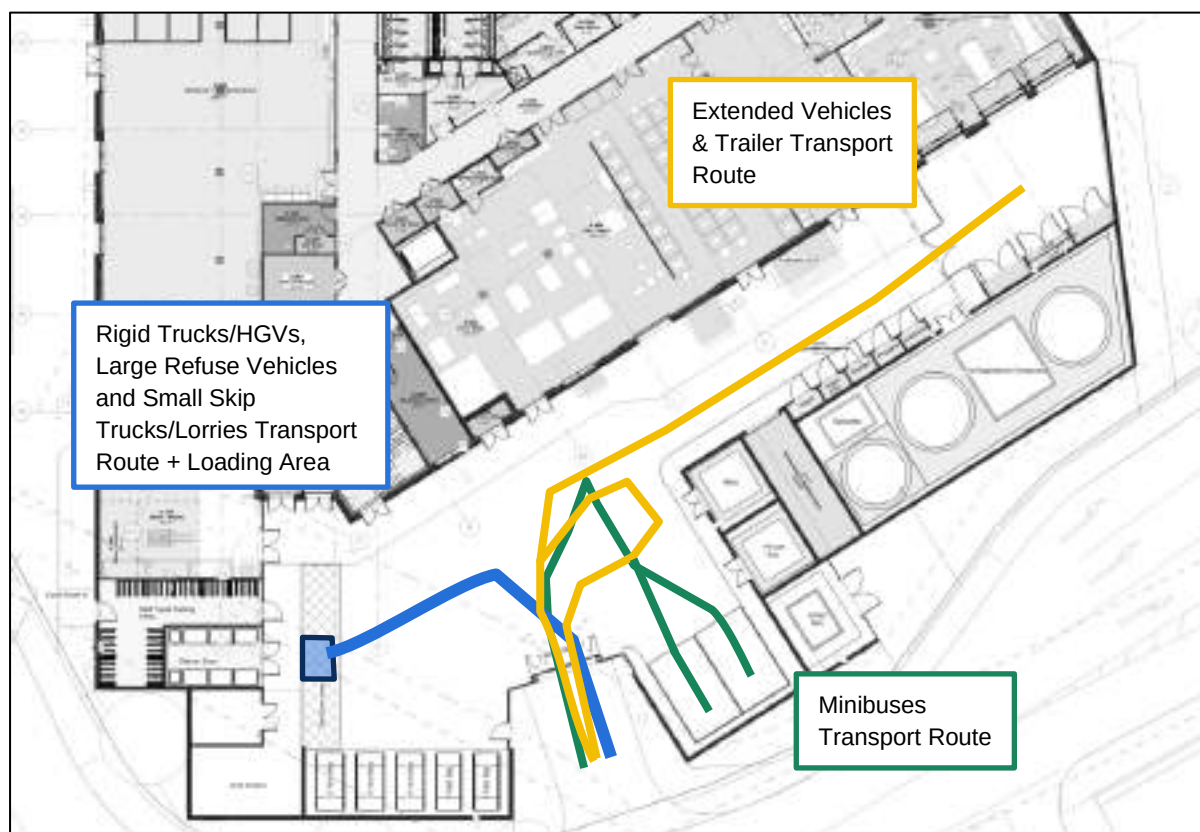


Figure 3: Delivery Vehicle Route & Forklift Location (Image Source: Austin-Smith Lord)

A loading activity noise source is modelled as a stationary point source within the general loading area shown in Figure 3; loading activity noise emissions are derived from a previous noise measurement of loading activity at a different site, which is summarised in Table 9.

Table 9: 2-Minute Noise Measurement of Loading Activity

Noise Measurement Description	Noise Level (dB, $L_{eq,2min}$) at Centre Octave Band Frequency (Hz)								Overall dB $L_{Aeq,2mins}$
	63	125	250	500	1000	2000	4000	8000	
Loading bay activity, measured externally at approx. 3.5m away from noise source, circa 2-minute measurement	72	73	71	68	63	56	54	44	69

During the peak 1-hour period between 07:00 and 23:00, an on-time correction of -5dB has been applied to the point source as loading activity is expected to occur for approximately 20 minutes during the overall 1-hour period.

During the peak 15-minute period between 06:00 and 07:00, an on-time correction of -5dB has been applied to the point source as loading activity is expected to occur for approximately 5 minutes during the overall 15-minute period.



4.4 External Plant Noise Modelling

New external plant units serving the proposed development have been modelled to predict the resultant noise level at the nearest noise sensitive receptors during typical operation. New plant units at the site which are expected to produce notable external noise emissions are summarised within Table 10.

Table 10: Proposed Plant Units Summary

Location	Unit Type	Number of Units at Location
Internal, GF	Mechanical Ventilation and Heat Recovery (MVHR) Units	15
	Hybrid Ventilation and Heat Recovery (HVHR) Units	7
	Extract Fan (EF) Units	2
Service Yard, GF	Local Extract Ventilation (LEV) Units	2
Internal, 1F	Mechanical Ventilation and Heat Recovery (MVHR) Units	21
	Hybrid Ventilation and Heat Recovery (HVHR) Units	3
Internal, 2F	Mechanical Ventilation and Heat Recovery (MVHR) Units	29
	Hybrid Ventilation and Heat Recovery (HVHR) Units	7
Internal, 3F	Mechanical Ventilation and Heat Recovery (MVHR) Units	26
	Hybrid Ventilation and Heat Recovery (HVHR) Units	12
Internal, 4F	Mechanical Ventilation and Heat Recovery (MVHR) Units	26
	Hybrid Ventilation and Heat Recovery (HVHR) Units	20
Internal, 5F	Mechanical Ventilation and Heat Recovery (MVHR) Units	4
	Hybrid Ventilation and Heat Recovery (HVHR) Units	6
	Extract Fan (EF) Units	2
Rooftop, 5F	Air Handling Units (AHU)	8
	Air Conditioning (AC) Condenser Units	14
	Air Source Heat Pump (ASHP) Units	17
	Local Extract Ventilation (LEV) Units	2
Rooftop, 6F	Fume Extract Fan (FEF) Units	3

The locations of the external plant units on the rooftop are shown in **Appendix E**. The proposed plant schedule and noise assessment data are shown in **Appendix F**.



It is understood that all new plant units should only typically operate during daytime hours only (07:00 – 23:00), except for the air source heat pump (ASHP) units at rooftop level (5F) and the fume extract fan (FEF) units at rooftop level (6F) which may operate during night-time hours (23:00 – 07:00).

4.4.1 MVHR Noise Modelling

121no. SystemAir Topvex MVHR units are proposed to serve the new building. The intake (inlet) and exhaust (outlet) ductwork terminals for all MVHR units have been modelled at the façades of the new building. Each inlet/outlet terminal is modelled as a point source.

Whilst the attenuator selections are not yet finalised, an allowance has been made for an attenuator to be installed within each intake and exhaust ductwork path from the unit to the façade of the building. Based on our calculations, the preliminary attenuator selections shown in Table 11 are advised to control MVHR noise at the nearest noise sensitive receptors. To achieve the insertion loss figures shown below, spatial allowance should be made for a min. 900mm attenuator in each ductwork path.

Table 11: Preliminary MVHR Attenuator Selections

Inlet/ Outlet	Min. Insertion Loss (dB) at Centre Octave Band Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Inlet	2	4	9	15	17	14	10	8
Outlet	4	7	13	19	23	23	16	14

The MVHR noise assessment data used for the noise model is provided in **Appendix F**, which has been calculated based on **A)** the manufacturer-provided sound power levels for the SystemAir Topvex FC25-R-HWH unit, **B)** the insertion loss levels from the proposed attenuator selections (see Table 11) and **C)** a correction for duct end reflection loss.

4.4.2 HVHR Noise Modelling

55no. Monodraught APX Zero X HVHR units are proposed to serve the new building. The louvre connections to all HVHR units have been modelled at the façades of the new building. Each louvre connection is modelled as a point source. The HVHR noise assessment data used for the noise model is provided in **Appendix F**.

4.4.3 EF Noise Modelling

4no. EF units are proposed to serve the new building. The exhaust (outlet) ductwork terminals for all EF units have been modelled at the façades of the new building. Each outlet terminal is modelled as a point source. The unit selections are not yet confirmed, therefore the overall noise level and spectrum for each unit are based on the noise data for the SystemAir Prio 150EC EF for noise modelling purposes.

Whilst the attenuator selections are not yet finalised, an allowance has been made for an attenuator to be installed within each exhaust ductwork path from the unit to the façade of the building. Based on our calculations, the preliminary attenuator selection shown in **Table 12** are advised to control EF noise at the nearest noise sensitive receptors. To achieve the insertion loss figures shown below, spatial allowance should be made for a min. 900mm attenuator in each ductwork path.



Table 12: Preliminary EF Attenuator Selection

Inlet/ Outlet	Min. Insertion Loss (dB) at Centre Octave Band Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Outlet	4	7	13	19	23	23	16	14

The EF noise assessment data used for the noise model is provided in **Appendix F**, which has been calculated based on **A**) the manufacturer-provided sound power levels for the SystemAir Prio 150EC Circ. Duct Fan unit, **B**) the insertion loss levels from the proposed attenuator selection (see Table 12) and **C**) a correction for duct end reflection loss.

4.4.4 AHU Noise Modelling

2no. bespoke SystemAir units (AHU-01 & AHU-02) and 6no. bespoke Airedale units (AHU-03, AHU-04, AHU-05, AHU-06, AHU-07 & AHU-08) are proposed to serve the new building. Breakout noise from the AHU itself has been modelled as an area source, whereas the supply (inlet) and exhaust (outlet) ductwork terminals are modelled as point sources.

Based on our calculations, the preliminary attenuator selection shown in **Table 13** are advised to control AHU noise at the nearest noise sensitive receptors. To achieve the insertion loss figures shown below, spatial allowance should be made for a min. 1200mm attenuator in each ductwork path.

Table 13: Preliminary AHU Attenuator Selection

AHU	Inlet/ Outlet	Min. Insertion Loss (dB) at Centre Octave Band Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
AHU-01, AHU-02	Inlet	7	12	20	33	39	40	35	28
	Outlet	7	12	20	33	39	40	35	28
AHU-03, AHU-04, AHU-05, AHU-06, AHU-07, AHU-08	Inlet	4	9	17	26	31	30	23	16
	Outlet	4	9	17	26	31	30	23	16

The AHU noise assessment data used for the noise model is provided in **Appendix F**, which has been calculated based on **A**) the manufacturer-provided sound power levels for the proposed AHU units, **B**) the insertion loss levels from the proposed attenuator selection (see **Table 13**) and **C**) a correction for duct end reflection loss.

It should be noted that Airedale do not provide 'surrounding' (AKA 'breakout' or 'casing radiated') noise data for their AHUs. Therefore, the 'surrounding' noise data provided for the SystemAir AHUs has been applied to the Airedale AHUs for a worst-case noise assessment scenario.



4.4.5 ASHP Noise Modelling

5no. Advenco ADVS16W, 2no. Mitsubishi NX-Q-G06/SL/0202P and 10no. Mitsubishi EAHV-M1500YCL(-N) ASHP units are proposed to serve the new building. Each ASHP unit is modelled as an area source on the roof of the building.

Advenco do not provide octave band sound levels for the ADVS16W ASHP model, therefore noise emissions from the 5no. Advenco ASHP units are modelled based on the overall single-figure sound power level (69dBA) at 500Hz.

It should also be noted that 1no. Mitsubishi NX-Q-G06/SL/0202P ASHP unit will be active at any given time, as one unit will be on standby whilst the other is on duty. Therefore, only 1no. Mitsubishi NX-Q-G06/SL/0202P ASHP unit is 'active' within the noise model.

Due to the high overall noise level from the Mitsubishi EAHV-M1500YCL(-N) ASHP unit, it has been agreed with the mechanical design team that an enclosure will be required to mitigate noise emissions from the 10no. Mitsubishi EAHV-M1500YCL(-N) ASHP units. The enclosure should provide the minimum insertion loss figures shown in Table 14 below. Allaway Acoustics have confirmed that their 'AA303SX' acoustic enclosure can achieve the minimum insertion loss figures without impeding on the operation of the ASHP units, however other manufacturers may also be able to provide an enclosure that can achieve the minimum required insertion loss figures.

Table 14: EAHV-M1500YCL(-N) Enclosure Requirements

Minimum Insertion Loss (dB) at Centre Octave Band Frequency (Hz)							
63	125	250	500	1000	2000	4000	8000
4	8	13	22	24	21	18	14

The ASHP noise assessment data used for the noise model is provided in **Appendix F**, which has been calculated based on **A)** the manufacturer-provided sound power levels for the proposed ASHP units **B)** the insertion loss levels from the proposed enclosure (EAHV units only, see Table 14).

4.4.6 LEV Noise Modelling

2no. Nederman Fan N40 LEV units (LEV-01 & LEV-02) are proposed on the rooftop of the building, which are both modelled as point sources. The 2no. N40 LEV units do not require additional noise mitigation.

2no. Nederman Combifab FZ40-S450 LEV units (LEV-03 & LEV-04) are proposed within the service yard at ground floor level, which are shown in Figure 4 overleaf. Nederman provide a proprietary 'soundbox' attenuation kit that significantly reduces noise emissions from the FZ40-S450 LEV units, therefore the unit proposals must include the 'soundbox' attenuation kit provided by the manufacturer.

1no. Nederman FM 4kW Fan LEV unit (LEV-05) is proposed within the service yard at ground floor level, which are shown in Figure 4 overleaf. The manufacturer has not provided a sound pressure level or sound power level for this unit, however it is understood that it will likely produce a similar level of noise to the Nederman Fan N40 LEV unit. Therefore, the overall noise level and spectrum for the FM 4kW Fan is assumed to be the same as the Fan N40 LEV unit for noise modelling purposes.



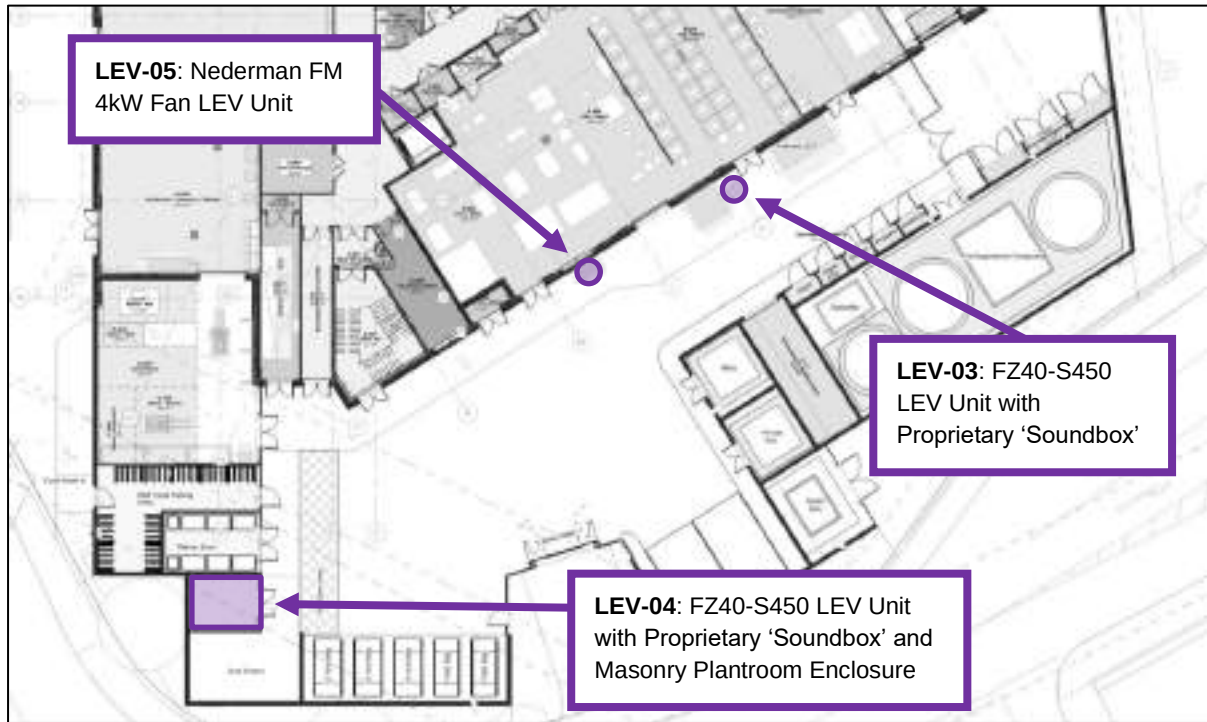


Figure 4: Service Yard LEV Locations (Image Source: Austin-Smith Lord)

The LEV unit noise assessment data used for the noise model is provided in **Appendix F**.

It should be noted that a masonry plantroom enclosure will be required to control noise emissions from the LEV-04 unit (see Figure 4 above) in addition to the proprietary 'soundbox' attenuation kit. The masonry plantroom will require the following constructions to sufficiently control noise breakout from the unit:

- Min. 100mm concrete blockwork walls (min. density 1800kg/m³), capable of achieving a min. sound reduction performance value of 46dB R_w
- A masonry roof construction OR lightweight roof construction with suspended ceiling, capable of achieving a min. sound reduction performance value of 46dB R_w
- An acoustically rated doorset on the east-facing façade of the plantroom enclosure (2.1m x 1.8m), capable of achieving a min. sound reduction performance value of 40dB R_w
- 2no. acoustically rated weather louvres on the east-facing façade of the plantroom enclosure (0.6m x 0.6m, 1no. at high level and 1no. at low level), capable of achieving a min. sound reduction performance value of 8dB R_w

4.4.7 Condenser (AC) Noise Modelling

14no. SystemAir condenser units are proposed to serve the new building. Each condenser unit is modelled as a point source on the roof of the building. The condenser unit noise assessment data used for the noise model is provided in **Appendix F**.



4.5 3D Noise Model

A snapshot of the 3D noise model of the proposed development site inclusive of all sound sources listed above is shown in Figure 5 below.

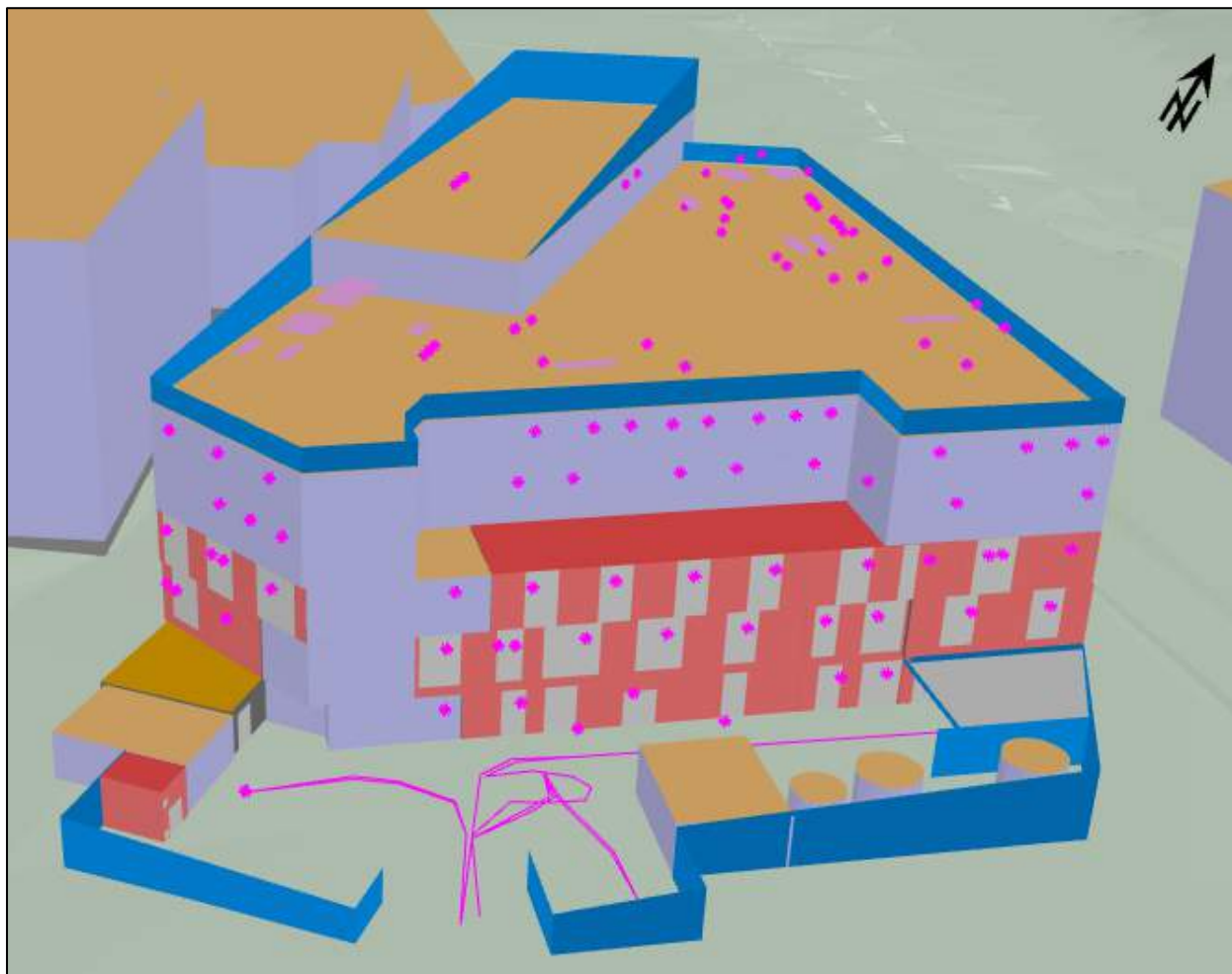


Figure 5: 3D Noise Model Snapshot

5 BS4142 Assessment

5.1 Noise Modelling Results

Based on the noise modelling methodology and assessment data detailed in the previous sections, external specific noise levels ($L_{Aeq,T}$) have been predicted at the nearest noise sensitive receptors (residential terraced houses on Emlyn Street) for the following 7no. assessment scenarios:

- 1) Workshop breakout noise during the peak 1-hour period ($L_{Aeq,1hr}$) within daytime hours (07:00 – 23:00)
- 2) Service yard vehicle movement noise during the peak 1-hour period ($L_{Aeq,1hr}$) within daytime hours (07:00 – 23:00)
- 3) Service yard delivery noise during the peak 1-hour period ($L_{Aeq,1hr}$) within daytime hours (07:00 – 23:00)
- 4) Service yard vehicle movement noise during the peak 15-minute period ($L_{Aeq,15mins}$) between 06:00 and 07:00 (early morning night-time)
- 5) Service yard delivery noise during the peak 15-minute period ($L_{Aeq,15mins}$) between 06:00 and 07:00 (early morning night-time)
- 6) External plant noise during the peak 1-hour period ($L_{Aeq,1hr}$) within daytime hours (07:00 – 23:00)
- 7) External plant noise during the peak 15-minute period ($L_{Aeq,15mins}$) within night-time hours (23:00 – 07:00)

The noise modelling graphics for the 7no. assessment scenarios outlined above are displayed in **Appendix G**. The noise modelling results at the worst-affected noise sensitive receptors are compared against the typical measured background sound level ($L_{A90,T}$) at noise monitoring position U2 in **Table 15** (workshop breakout noise), **Table 16** (service yard vehicle movement noise), **Table 17** (service yard delivery noise), and **Table 18** (plant noise). Note that noise monitoring position U2 is deemed best representative of the background sound level at the nearby noise sensitive receptors due to the proximity of the microphone to the affected receptors.

Table 15: Noise Modelling Results Summary – Workshop Breakout Noise

Noise Sensitive Receptor	Assessment Period	Highest Predicted Specific Sound Level at Noise Sensitive Receptor	Representative Background Sound Level at NSRs (Position U2)
Residential Houses on Emlyn Street	07:00 – 23:00	35dB $L_{Aeq,1hr}$	54dB $L_{A90,1hr}$
Residential Houses on Cross Lane	07:00 – 23:00	29dB $L_{Aeq,1hr}$	54dB $L_{A90,1hr}$
Apartments above the Dolman Theatre	07:00 – 23:00	28dB $L_{Aeq,1hr}$	54dB $L_{A90,1hr}$



Table 16: Noise Modelling Results Summary – Service Yard Vehicle Movement Noise

Noise Sensitive Receptor	Assessment Period	Highest Predicted Specific Sound Level at Noise Sensitive Receptor	Representative Background Sound Level at NSRs (Position U2)
Residential Houses on Emlyn Street	07:00 – 23:00	50dB LAeq,1hr	54dB LA90,1hr
	06:00 – 07:00	51dB LAeq,15mins	50dB LA90,15mins
Residential Houses on Cross Lane	07:00 – 23:00	37dB LAeq,1hr	54dB LA90,1hr
	06:00 – 07:00	39dB LAeq,15mins	50dB LA90,15mins
Apartments above the Dolman Theatre	07:00 – 23:00	35dB LAeq,1hr	54dB LA90,1hr
	06:00 – 07:00	36dB LAeq,15mins	50dB LA90,15mins

Table 17: Noise Modelling Results Summary – Service Yard Delivery Noise

Noise Sensitive Receptor	Assessment Period	Highest Predicted Specific Sound Level at Noise Sensitive Receptor	Representative Background Sound Level at NSRs (Position U2)
Residential Houses on Emlyn Street	07:00 – 23:00	44dB LAeq,1hr	54dB LA90,1hr
	06:00 – 07:00	44dB LAeq,15mins	50dB LA90,15mins
Residential Houses on Cross Lane	07:00 – 23:00	38dB LAeq,1hr	54dB LA90,1hr
	06:00 – 07:00	38dB LAeq,15mins	50dB LA90,15mins
Apartments above the Dolman Theatre	07:00 – 23:00	36dB LAeq,1hr	54dB LA90,1hr
	06:00 – 07:00	36dB LAeq,15mins	50dB LA90,15mins

Table 18: Noise Modelling Results Summary – Plant Noise

Noise Sensitive Receptor	Assessment Period	Highest Predicted Specific Sound Level at Noise Sensitive Receptor	Representative Background Sound Level at NSRs (Position U2)
Residential Houses on Emlyn Street	07:00 – 23:00	48dB LAeq,1hr	54dB LA90,1hr
	23:00 – 07:00	35dB LAeq,15mins	47dB LA90,15mins
Residential Houses on Cross Lane	07:00 – 23:00	42dB LAeq,1hr	54dB LA90,1hr
	23:00 – 07:00	33dB LAeq,15mins	47dB LA90,15mins



Noise Sensitive Receptor	Assessment Period	Highest Predicted Specific Sound Level at Noise Sensitive Receptor	Representative Background Sound Level at NSRs (Position U2)
Apartments above the Dolman Theatre	07:00 – 23:00	42dB L _{Aeq,1hr}	54dB L _{A90,1hr}
	23:00 – 07:00	34dB L _{Aeq,15mins}	47dB L _{A90,15mins}

5.2 BS4142 Numerical Assessment Results

Based on the noise modelling results outlined in **Section 5.1** and shown in **Appendix G**, BS4142 assessment tables have been prepared for the 7no. assessment scenarios. A summary of the BS4142 assessment results is provided in Table 19 below.

Table 19: BS4142 Assessment Results Summary

Noise Source	Assessment Period	Excess of Rating over Background Sound Level	Assessment Outcome
Workshop Breakout Noise	07:00 – 23:00	-16dB	Assessment indicates a low impact depending on context
Service Yard Vehicle Movement Noise	07:00 – 23:00	-4dB	Assessment indicates a low impact depending on context
	06:00 – 07:00	+1dB	Assessment indicates an adverse impact depending on context
Service Yard Delivery Noise	07:00 – 23:00	-5dB	Assessment indicates a low impact depending on context
	06:00 – 07:00	-1dB	Assessment indicates a low impact depending on context
External Plant Noise	07:00 – 23:00	-4dB	Assessment indicates a low impact depending on context
	23:00 – 07:00	-7dB	Assessment indicates a low impact depending on context

5.3 BS4142 Assessment Discussion

5.3.1 Workshop Breakout Noise during Daytime Hours

At 16dB below the representative background noise level, breakout noise from the proposed workshops (GF, 1F and 2F) during the peak 1-hour period within daytime hours (07:00 – 23:00) is expected to have a '**low impact**' on the nearby noise sensitive receptors, depending on context. It should be noted that the assessment assumes that all workshops are operating simultaneously, which is likely only to occur during the busiest periods of the day.



A +3dB character correction has been applied to account for workshop breakout noise being perceptible against the residual sound climate. It should be noted that since the specific sound level from workshop breakout noise falls significantly below the background sound level, workshop noise is likely to be perceptible only in quiet lulls in road traffic.

The assessment assumes that all external doors (including roller shutter doors) and windows remain closed during teaching sessions. The workshops have been designed with a mechanical ventilation system that provides the required ventilation without the need to open doors or windows, including the higher ventilation rates needed during teaching sessions for the removal of dust and fumes.

Staff should be made aware that doors and windows do not need to be opened during teaching sessions and should be trained to ensure they remain closed. This will help prevent an adverse impact on the nearby noise sensitive receptors.

Provided that doors/windows are kept shut during teaching sessions, it is expected that workshop breakout noise emissions will have a 'low impact' on the nearby noise sensitive receptors.

5.3.2 Service Yard Noise during Daytime Hours

At 4dB below the representative background noise level, vehicular noise within the service yard during the peak 1-hour period within daytime hours (07:00 – 23:00) is expected to have a 'low impact' on the nearby noise sensitive receptors, depending on context.

At 5dB below the representative background noise level, delivery activity noise within the service yard during the peak 1-hour period within daytime hours (07:00 – 23:00) is also expected to have a 'low impact' on the nearby noise sensitive receptors, depending on context.

It should be noted that the assessment assumes that 1no. extended vehicle with trailer, 2no. minibuses and 2no. large vehicles (e.g. rigid trucks, HGVs, large refuse vehicles or small skip trucks/lorries) all arrive and depart from the service yard within a 1-hour period. Therefore, the assessment considers a reasonable worst-case scenario which is unlikely to occur on a regular basis. It is more likely that only 1no. vehicle may arrive and depart from the service yard within a typical 1-hour period.

Character corrections have not been applied for vehicular movement noise since the existing ambient sound climate during daytime hours is already dominated by road traffic noise, therefore additional noise from vehicular movement within the proposed service yard is not expected to be distinctly perceptible from the existing road traffic noise.

Character corrections have been included to account for the tonal (+2dB) and impulsive (+3dB) nature of delivery activities, such as pallet handling and waste disposal, but excluding vehicle movements. These corrections have been applied on a precautionary basis to represent a worst-case delivery noise scenario. The impact of service yard operations can be further reduced through the adoption of quiet delivery practices, as detailed in **Appendix I**. Given that the predicted specific sound level is considerably lower than the prevailing background sound level, delivery noise is likely to be perceptible only during temporary lulls in road traffic noise.

Provided the mitigation measures and management practices presented in the good practice guidance for quiet deliveries can be adopted, it is expected that service yard noise emissions from vehicle movements and deliveries will have a 'low impact' on the nearby noise sensitive receptors.



5.3.3 Service Yard Vehicle Movement Noise between 06:00 and 07:00

At 1dB above the lowest measured background noise level between 06:00 and 07:00, vehicular noise within the service yard during the peak 15-minute period between 06:00 and 07:00 may be perceptible and therefore warrants consideration in context. BS 4142 guidance states that when the rating noise level exceeds the background sound level by up to 5dB, this could provide an **'adverse impact'** on the nearby noise sensitive receptors, depending on context.

At 1dB below the representative background noise level, delivery noise within the service yard during the peak 1-hour period within daytime hours (07:00 – 23:00) is expected to have a **'low impact'** on the nearby noise sensitive receptors, depending on context.

It should be noted that a large vehicle arriving and departing between 06:00 and 07:00 is unlikely to occur on a regular basis. Typically, it is expected that large vehicles will arrive and depart from the service yard during daytime hours only (07:00 – 23:00).

Character corrections have not been applied for vehicular movement noise since the existing ambient sound climate between 06:00 and 07:00 is already dominated by road traffic noise, therefore additional noise from vehicular movement within the proposed service yard is not expected to be distinctly perceptible from the existing road traffic noise.

Character corrections have been included to account for the tonal (+2dB) and impulsive (+3dB) nature of delivery activities, such as pallet handling and waste disposal, but excluding vehicle movements. These corrections have been applied on a precautionary basis to represent a worst-case delivery noise scenario. The impact of service yard operations can be further reduced through the adoption of quiet delivery practices, as detailed in **Appendix I**.

Provided the mitigation measures and management practices presented in the good practice guidance for quiet deliveries can be adopted, it is expected that the potential impact of service yard noise could be reduced from an **'adverse impact'** to a **'low impact'** when considering the context of the existing sound climate and the proposed noise mitigation measures/management practices. It is encouraged that service yard activity and delivery operations are carried out during daytime hours only (07:00 – 23:00) to limit adverse noise impact and the likelihood of complaint from the nearest noise sensitive receptors (residential houses on Emlyn Street).

5.3.4 External Plant Noise during Daytime Hours

At 4dB below the representative background noise level, plant noise emissions from the proposed development during the peak 1-hour period within daytime hours (07:00 – 23:00) are expected to have a **'low impact'** on the nearby noise sensitive receptors, depending on context.

It should be noted that the assessment assumes that all external plant units are operating at peak load simultaneously, which is likely only to occur during the busiest periods of the day (if at all). Therefore, the assessment considers a reasonable worst-case scenario which is unlikely to occur on a regular basis.

A +2dB tonal character correction has been applied to represent a scenario in which noise from the plant could exhibit a mildly perceptible tone at nearby noise-sensitive receptors. However, given that the



existing sound environment is dominated by broadband road traffic noise, and that the predicted specific sound level from the external plant is 6dB below the background sound level, the likelihood of any tonal character being perceptible at the nearest receptors is considered low, although it cannot be ruled out entirely.

This assessment assumes that all noise mitigation measures identified in **Section 4.4** (e.g. attenuators, enclosures and sound boxes) are incorporated into the final design. The omission of, or reduction in the effectiveness of, any of these measures could increase the potential noise impact. It is therefore essential that the recommended mitigation measures are implemented to achieve a '**low impact**' at nearby noise-sensitive receptors.

5.3.5 External Plant Noise during Night-time Hours

At 7dB below the representative background noise level, plant noise emissions from the proposed development during the peak 15-minute period within night-time hours (23:00 – 07:00) are expected to have a '**low impact**' on the nearby noise sensitive receptors, depending on context.

It should be noted that the assessment assumes that all ASHP units and FEF units are operating at peak load simultaneously, which is likely only to occur during periods of extreme weather (if at all) for internal temperature control. Therefore, the assessment considers a reasonable worst-case scenario which is unlikely to occur on a regular basis.

Since the ASHP units and FEF units may periodically switch on and off throughout the night-time period, a +3dB intermittency character correction is applied for robustness. A +2dB tonality character correction is applied to cover a scenario where a tone from the units may be mildly perceptible at the nearby noise sensitive receptors. It should be noted that since the existing ambient sound climate is dominated by broadband road traffic noise, and since the specific sound level from external plant noise is 12dB below the background sound level, the likelihood of a tone being perceptible at the nearest receptors is considered low, although it cannot be ruled out entirely.

The assessment assumes that all noise mitigation measures listed under **Section 4.4** (notably the ASHP enclosure for the EAHV units, see **Section 4.4.5**) have been adopted and incorporated into the project proposals. The omission of, or reduction in the effectiveness of, any of these measures could increase the potential noise impact. It is therefore essential that the recommended mitigation measures are implemented to achieve a '**low impact**' at nearby noise sensitive receptors.

5.4 Uncertainty

Uncertainty in the background measurements is considered to be low, as the unattended noise monitors were installed on-site for a 48-hour period (between 11:00 on Wednesday 7th May 2025 and 11:30 on Friday 9th May 2025) and weather conditions were deemed suitable for noise monitoring for the duration of the measurement period (i.e. average wind speeds less than 5m/s, no rain).

The representative daytime and night-time background sound levels were determined by observing the most commonly occurring background sound levels during these time periods ($L_{A90,1hr}$ during daytime, $L_{A90,15mins}$ during night-time), which is deemed to be best practice in determining the 'typical' prevailing background noise at the nearby noise sensitive receptors. For the early-morning rush hour period (06:00 – 07:00), the lowest measured background sound level ($L_{A90,15mins}$) has been used instead for robustness.



Uncertainty has been limited in the specific sound level calculations by using the noise modelling software SoundPlan 9.1, which has calculated noise levels in-line with the ISO 9613-2: 2024-1 calculation methodology. Reasonable worst-case noise levels based on survey measurement data have been used to limit uncertainty within the calculations of on-site activity (i.e. workshop reverberant noise levels and delivery noise) to nearby noise sensitive receptors. Manufacturer data has been used to limit uncertainty within the calculations of external plant noise to nearby noise sensitive receptors.

It should be noted that external plant specifications are not yet finalised; current selections have been used to model external plant noise emissions at the development site, however the current selections are subject to change since the design is currently ongoing. The assessment presented in this report is a robust prediction of proposed plant noise emissions at the nearest noise sensitive receptors.



6 External Building Fabric Assessment

An external building fabric assessment has been undertaken to determine the façade performance requirements necessary to control noise ingress to critical teaching spaces and achieve the BB93 internal ambient noise level criteria. The assessment has also considered noise breakout from potentially noisy workspaces, including the construction and motorsports workshops, to ensure that impacts at nearby noise sensitive receptors are acceptable.

The assessment has been used to inform any glazing, ventilation and building fabric requirements needed to provide a suitable internal acoustic environment and to limit noise emissions from the development.

6.1 External Glazing

Based on the results of the external building fabric calculations, the preliminary façade glazing specifications provided within **Table 20** are indicated necessary to achieve the internal ambient noise level design criteria. The glazing types should be applied as per the external glazing specifications markup shown in **Appendix J**.

Table 20: Preliminary Façade Glazing Specifications

Glazing Type	Example Glazing Configuration	Minimum Sound Reduction Index dB 'R' (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)							dB R _w
		63	125	250	500	1k	2k	4k	
Type 1 	6/12/4 standard double glazing	16	22	21	30	40	41	42	34
Type 2 	10/12/6 standard double glazing	21	26	27	34	40	38	36	37
Type 3 	6/12/13 enhanced double glazing	19	26	28	38	46	44	56	41

The glazing specifications have been determined based on **a)** the proposed glazed areas shown in the RIBA Stage 3 architectural model/drawings and **b)** the proposed ventilation strategy in each space (i.e. mechanical ventilation or hybrid ventilation, discussed in **Section 6.4**). If the proposed glazing area or the proposed ventilation strategy in a room were to be altered, the glazing specification would need to be updated accordingly.

It should be noted that the external glazing specifications at fifth floor level for the ESOL classrooms have been specified based on the preliminary external plant noise modelling (discussed in **Section 4**). The external glazing specifications for these classrooms may be uprated or downrated at detailed design stage pending confirmation of all mechanical plant on the roof.



6.2 External Walls

The minimum sound insulation requirements for the external wall construction are shown in **Table 21**.

Table 21: Minimum Sound Insulation Requirements for External Wall Construction

Example Construction	Minimum Sound Reduction Index dB 'R' (BS EN ISO 10140-2:2010) @ Octave Band Centre Frequency (Hz)							R _w
	63	125	250	500	1k	2k	4k	
External cladding on SFS, clear cavity, 2no. layers of 15mm plasterboard (min. combined surface mass of 20kg/m ²) on inner-leaf studwork.	20	33	41	46	50	48	48	48

The external wall construction is not yet finalised; however, is likely to comprise of the buildup outlined in the table above. Once final specifications are confirmed, the proposed external wall construction will be assessed to determine whether it can achieve the minimum sound insulation requirements shown in **Table 21**.

6.3 Roof Construction

The proposed roof construction for rooms at fourth floor level includes a 250mm reinforced concrete slab, which is deemed sufficient to achieve the minimum sound insulation performance requirement for external noise intrusion to noise sensitive spaces in terms of both airborne noise and rain noise. No additional sound attenuation measures should be required.

The proposed roof construction for rooms at fifth floor level is a lightweight roof construction which will include the Axter J41 Excel roofing system and the D159 TATA Roofdek profiled metal deck. The combination of these roofing elements with a suspended ceiling is expected to be sufficient to achieve the target IANL criteria within the ESOL classrooms at fifth floor level, however the predicted acoustic performance of the overall roof construction will need to be reviewed at detailed design stage when architectural drawings of the overall roof construction are made available.

BB93 recommends that a lightweight roof system should be designed to provide suitable control of rain noise in teaching spaces (calculated using laboratory test data with 'Heavy' rain noise excitation as defined in BS EN ISO 140-18). In accordance with BB93, levels during heavy rain must not be more than 25dB above the appropriate indoor ambient noise level.

Rain noise performance data will need to be acquired from the roof manufacturer at detailed design stage to accurately assess noise levels within teaching spaces (i.e. the ESOL classrooms at fifth floor level) and determine compliance with the BB93 rain noise criteria. If rain noise performance data cannot be acquired from the roof manufacturer at detailed design stage, then the overall roof construction will be modelled using INSUL to predict the rain noise performance of the system.



6.4 Noise Intrusion via Hybrid Ventilation Heat Recovery Units

Current proposals show that some rooms will be ventilated via hybrid ventilation heat recovery (HVHR) units. To achieve the BB93 IANL criteria, a noise intrusion assessment has been prepared to determine whether any additional noise mitigation measures are required to control noise intrusion via the HVHR units. The results of the HVHR feasibility assessment are summarised in Table 22 and shown on the external glazing specifications markup in **Appendix J**.

Note that the HVHR feasibility assessment has been prepared on the basis that each room is ventilated by up to 2no. Monodraught HVHR Zero X units, which has an acoustic performance rating of 39dB $D_{n,e,w}$. An alternative HVHR unit would also be sufficient, provided it has a min. acoustic performance rating of 39dB $D_{n,e,w}$. Where an attenuator is required in the ductwork, allowance should be made for a min. 900mm length attenuator.

Table 22: HVHR Feasibility Assessment

Room	HVHR Feasibility Assessment
Reach (GF), Restaurant (GF), Brickwork Classroom (GF), Caretaker Office (GF), ILS Flat (3F), HoS – Health & Social (3F), ILS Staff (3F), STL Simulation Room (3F), Childcare Simulation Room (3F), Care IT Classroom (3F), ESOL Classrooms (4F), IT Rooms (4F), Business Classrooms (4F), English & Maths Classroom* (4F)	No additional noise control measures required. *Note: Applicable only to the 'English & Maths Classroom' on the west façade at fourth floor level.
Shared Workspace (1F), CEO (2F), Board Room (3F), HE Hub (4F), PCP/Med Meeting Room (4F), Desk Based Visual Arts (4F), ESOL Classrooms (5F)	Up to 2no. HVHR units in ceiling void indicated to be sufficient, provided the room has a suspended mineral fibre tile or plasterboard ceiling, and provided that an attenuator can be installed within the ductwork.
Office (2F), CLT 03 (2F), SAA Office (3F), Greenroom & Coordinator (4F), Student Union (4F), Head of Learner Services (4F)	Up to 1no. HVHR unit in ceiling void indicated to be sufficient, provided the room has a suspended mineral fibre tile or plasterboard ceiling, and provided that an attenuator can be installed within the ductwork.



7 Emergency Generator Noise Impact Assessment

1no. industrial generator set (Rehiko KD110) is proposed within the service yard at the location shown in Figure 6. The industrial generator set is understood to be used for emergency purposes only, however the system will likely need to be tested on a monthly basis. The soundproofed version of the industrial generator set has a manufacturer-guaranteed sound power level of 97dB(A).



Figure 6: Emergency Generator Location in Service Yard (Image Source: Austin-Smith Lord)

The emergency generator has been modelled in SoundPlan 9.1. When the emergency generator is operational, the highest predicted façade noise level at the worst-affected noise sensitive receptor is 50dB(A), as shown in **Appendix G.9**. Note that the modelling assumes that the emergency generator is operational for the entire duration of the 1-hour assessment period, however this would likely only happen in an emergency. When testing, the generator should only be on for max. 15-minutes within a 1-hour period, which would result in a -6dB on-time correction at the nearby noise sensitive receptors.

Emergency plant noise emissions are typically expected to not exceed 10dB above the representative background sound level (54dB $L_{A90,1hr}$), equating to a rating level limit of ≤ 64 dB $L_{Ar,1hr}$. Since the emergency generator falls 4dB below the representative background sound level during daytime hours (54dB $L_{A90,1hr}$), the proposed emergency generator location and specification is deemed sufficient, provided that the proprietary soundproofing measures are included within the proposals.

To limit the noise impact of the emergency generator testing on the nearby noise sensitive receptors and noise sensitive room types at the college, the emergency generator should only be tested when absolutely necessary. The emergency generator should only be switched on for the time required to complete the test, then immediately switched off to prevent excessive noise emissions impinging on the nearby façades. Liaison with the nearby receptors informing them of the testing schedules is advised to limit the potential for noise complaints.



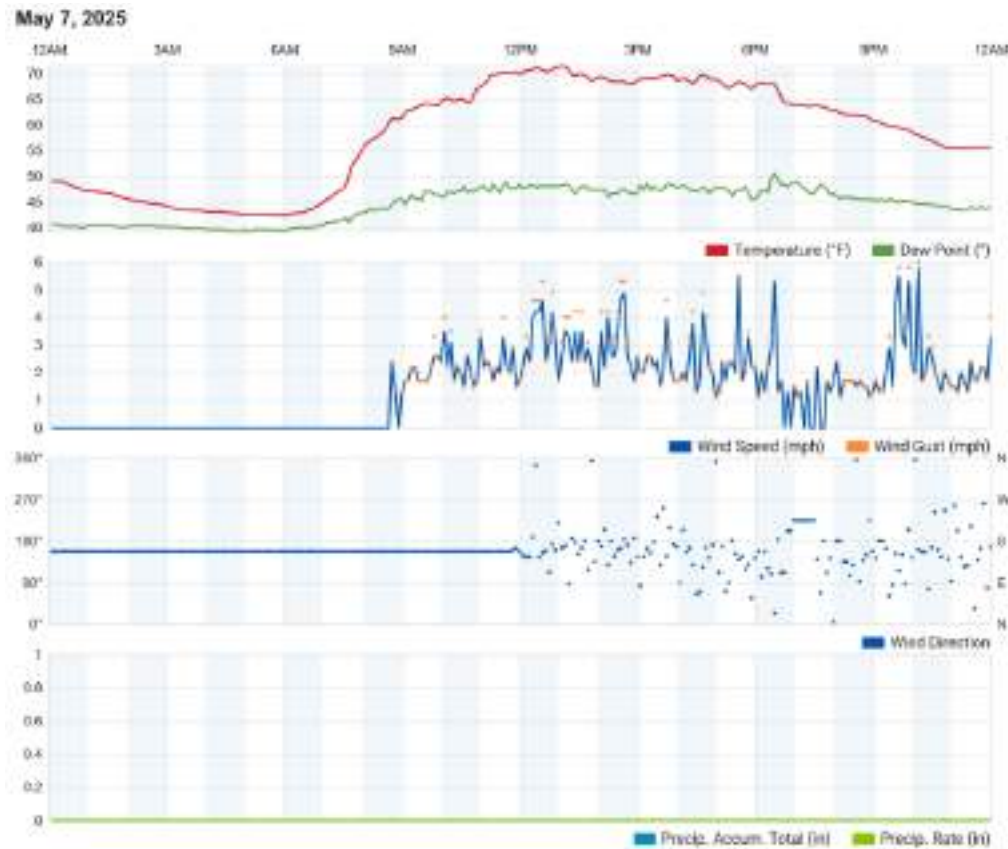


Appendices



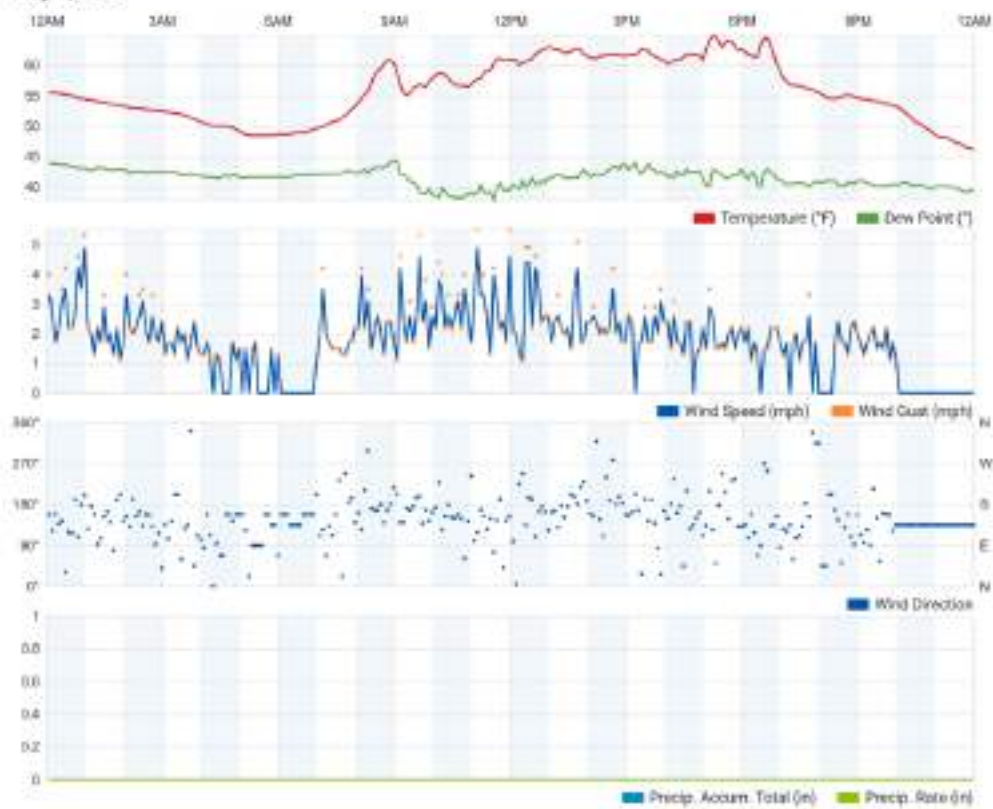
Appendix A Approximate Weather History

Note: Weather history graphs taken from www.wunderground.com (INEWPO127)

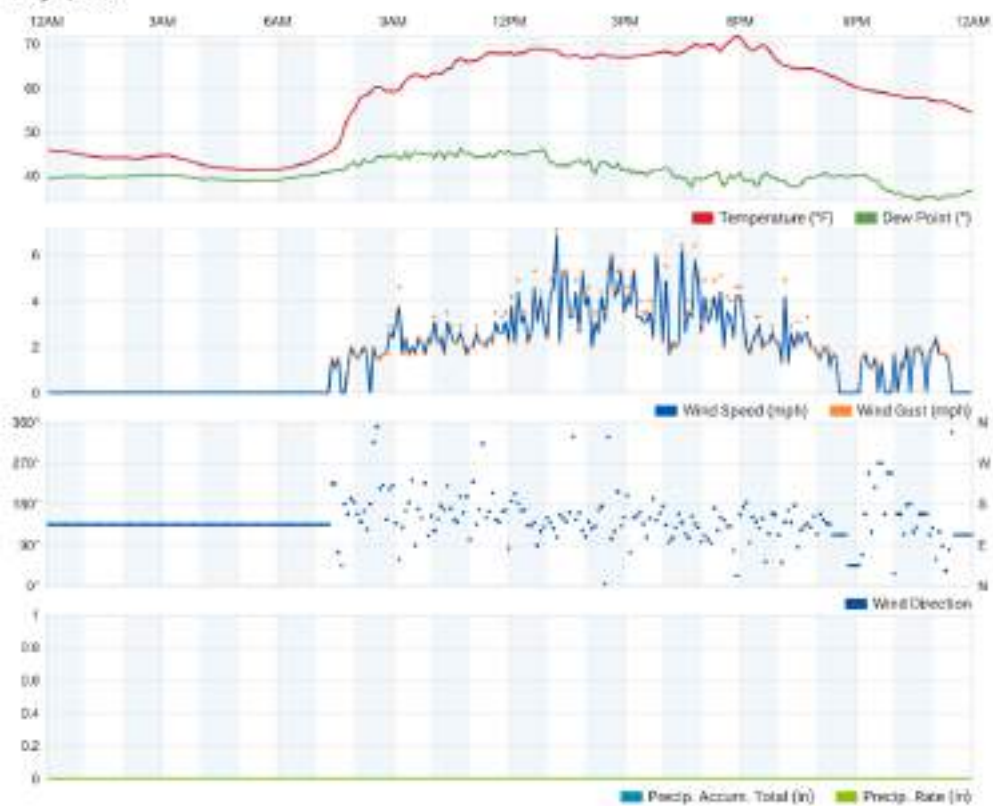


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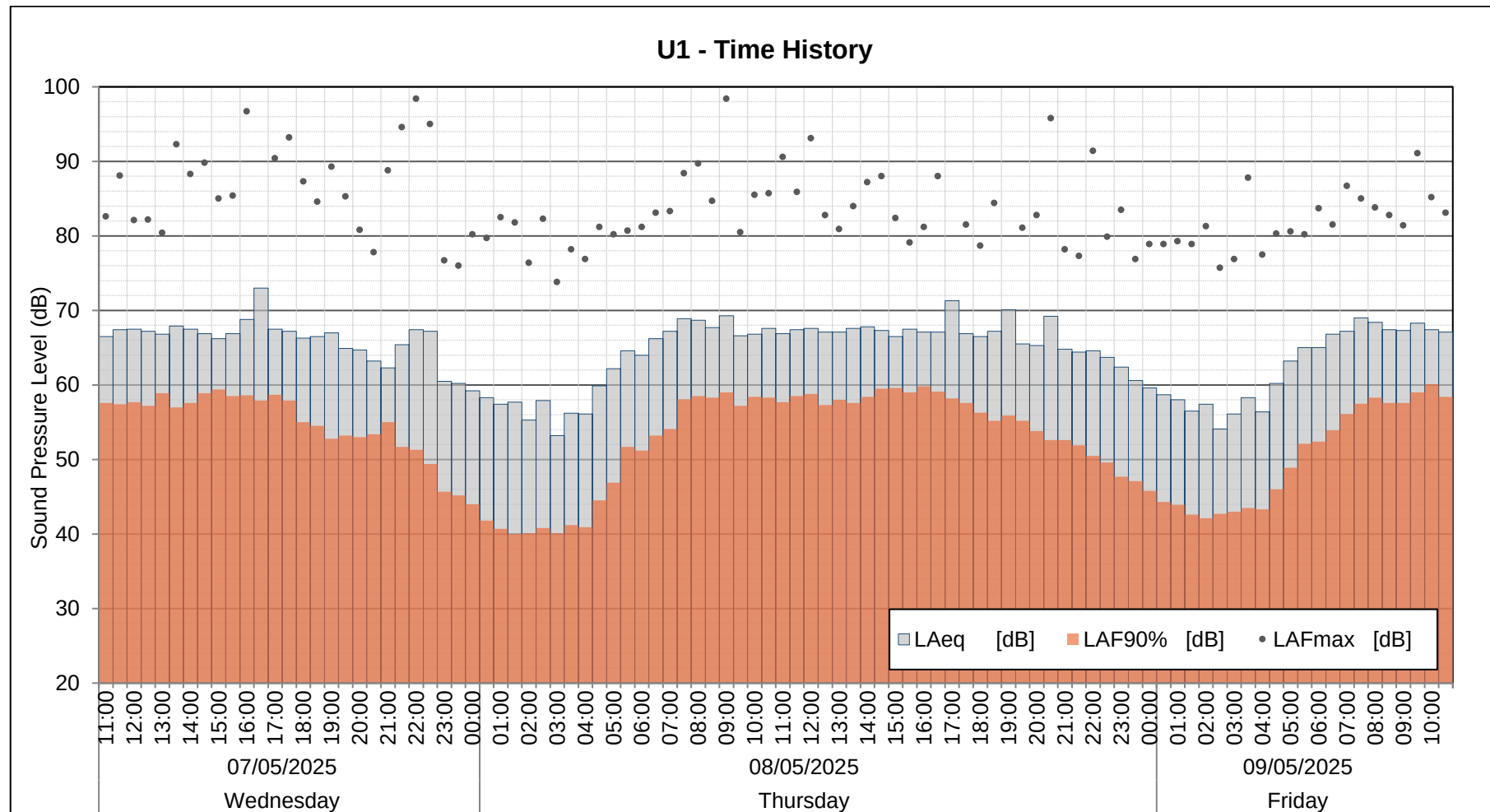
May 8, 2025



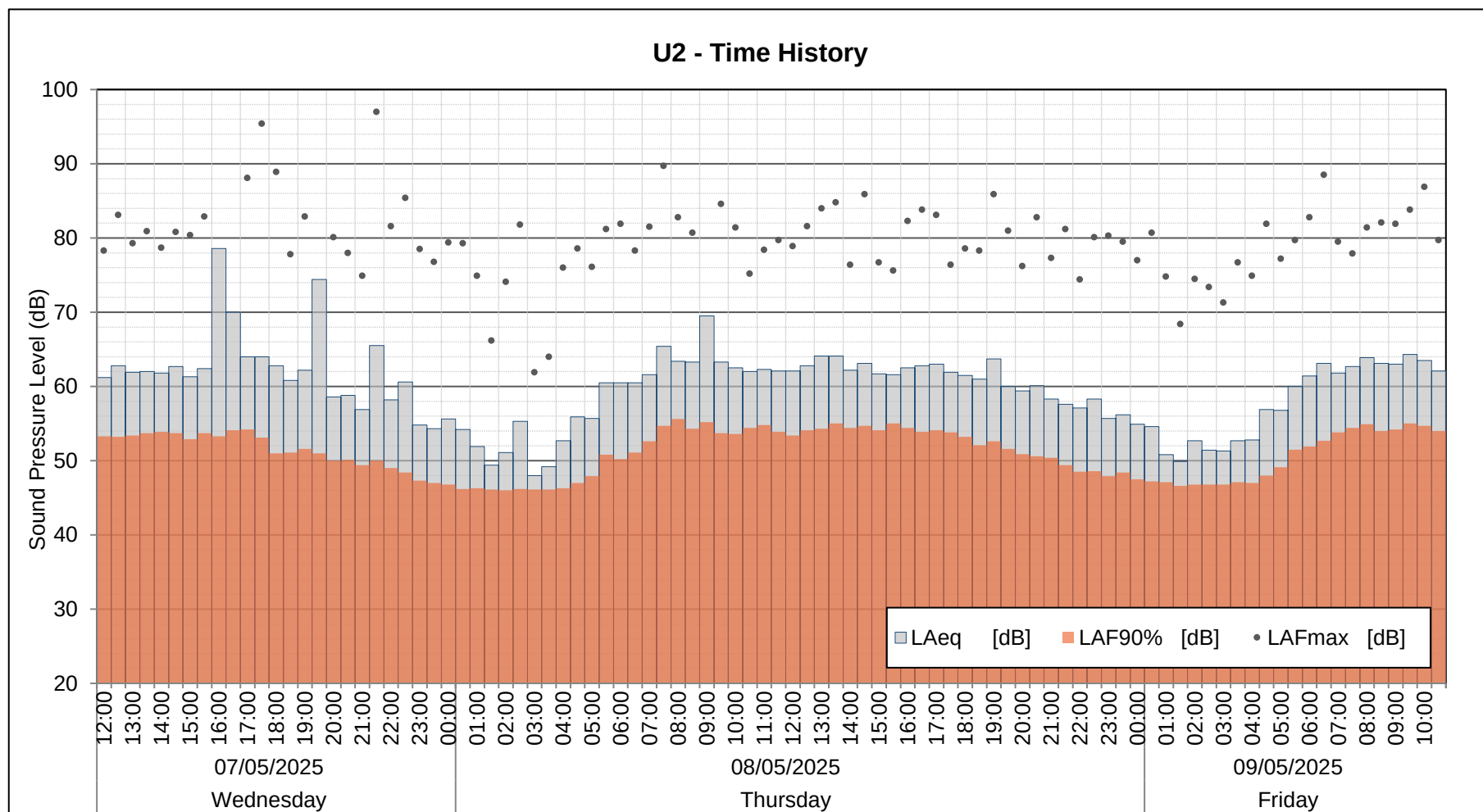
May 9, 2025



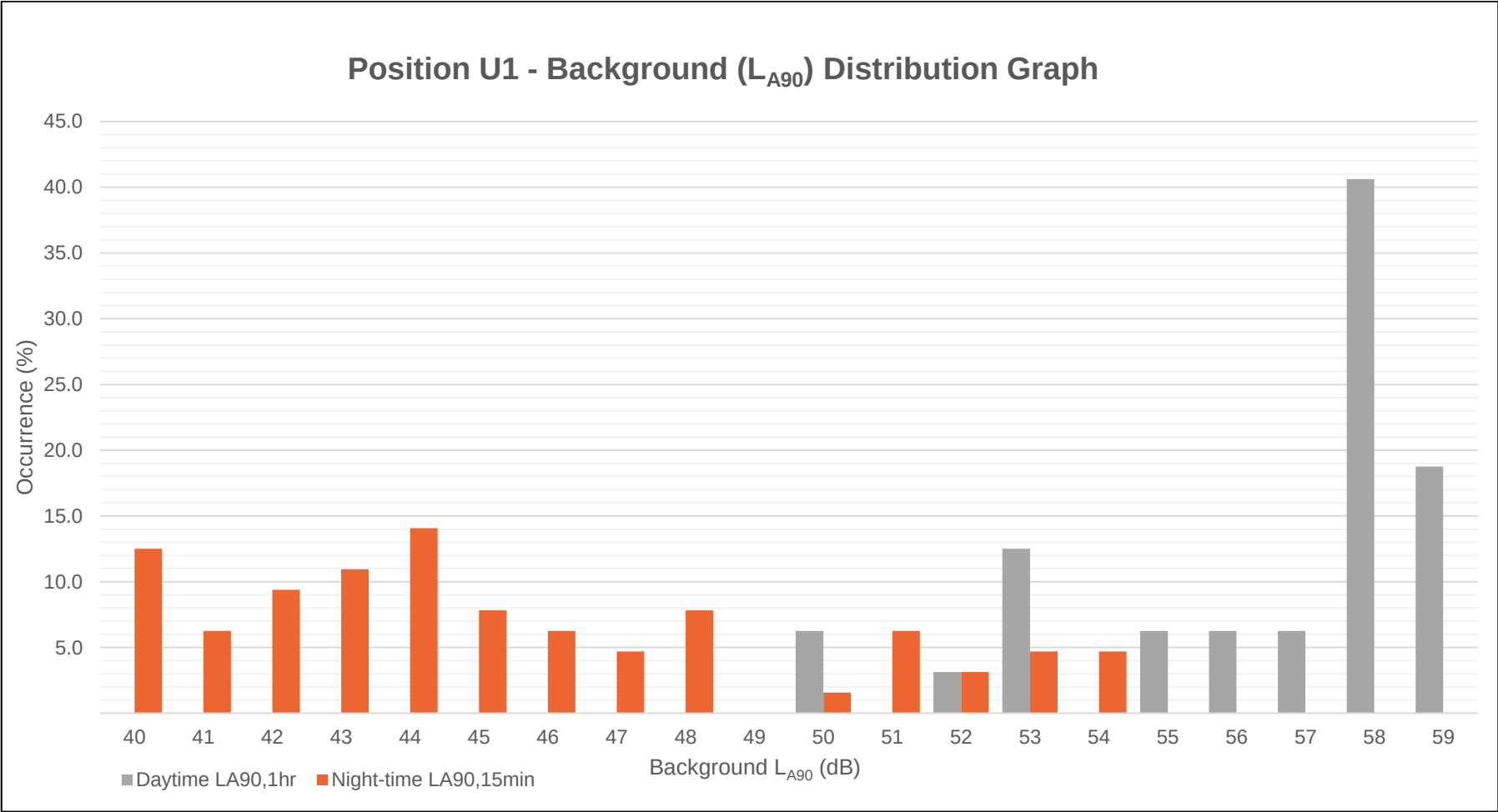
Appendix B Noise Time History Graphs

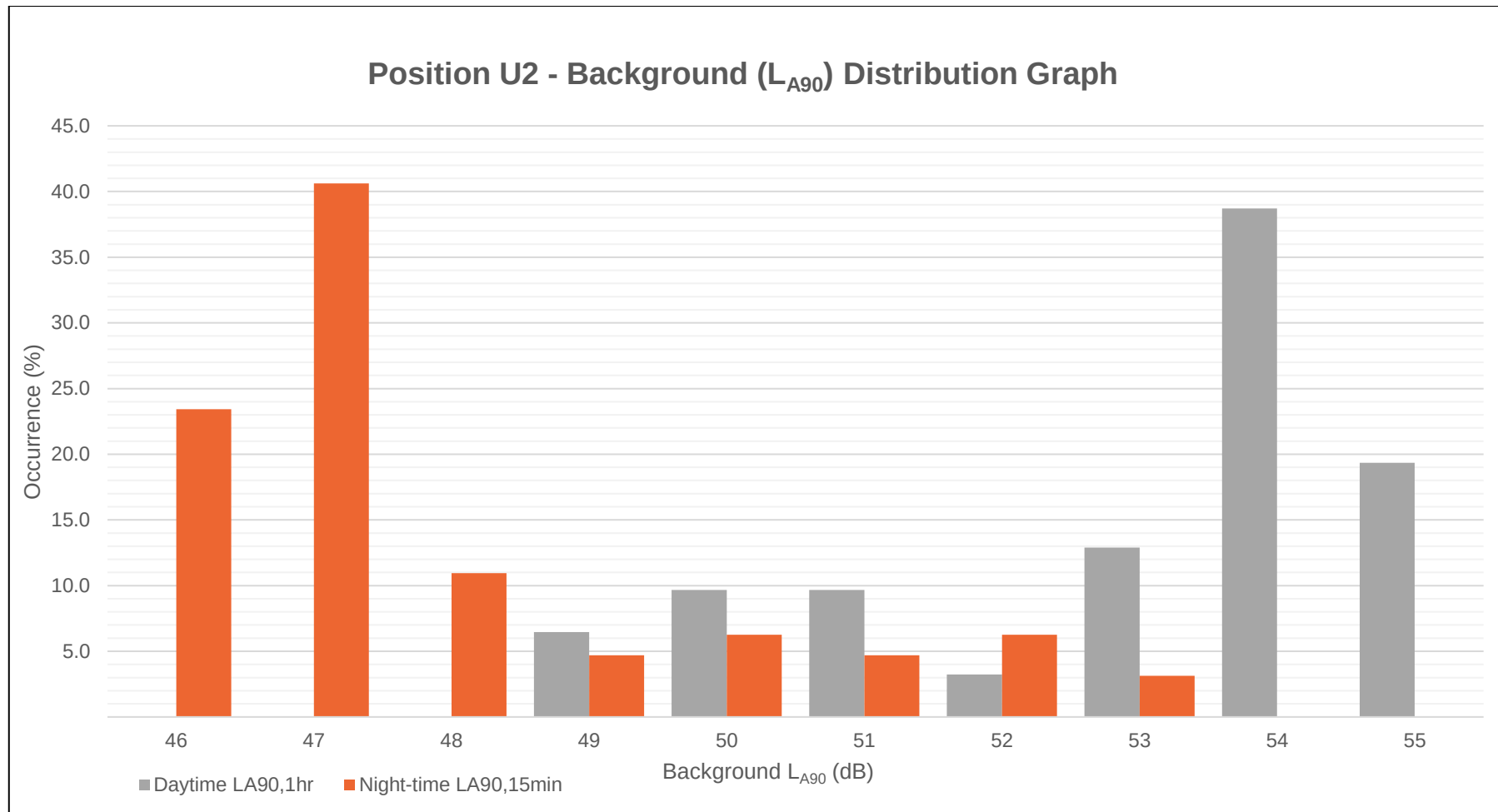


Noise Planning Report



Appendix C Background Sound Level Distribution Graphs





Appendix D Attended Noise Survey at Existing Campus

Additional survey works were undertaken by Stantec Acoustics to measure reasonable worst-case noise levels arising from machinery and workshop activities involved with the following college courses at the existing campus:

- Fabrication & Welding
- Bricklaying
- Motorsports

The noise measurements were carried out on Monday 2nd February and Tuesday 3rd February 2026.

Personnel

The additional survey works were undertaken by Sophie Bryan (Graduate Acoustic Consultant at Stantec) and Paul Gurney (Senior Acoustic Consultant at Stantec).

Sophie is an Associate Member of the Institute of Acoustics (AMIOA), and holds the following qualifications:

- Institute of Acoustics Diploma in Acoustics and Noise Control
- Institute of Acoustics Competence in Environmental Noise Measurement

Paul is a Corporate Member of the Institute of Acoustics (MIOA) and holds the IOA Diploma in Acoustics and Noise Control.

Equipment

The sound level meter used for the noise survey is verified as conforming to BS EN 61672-1. The acoustic calibrator used conforms to BS EN IEC 60942. Equipment calibration certificates can be provided on request. The sound level meter was calibrated to a reference level of 94 dB at 1kHz both prior to, and on completion of, the noise survey period – no drift in calibration was recorded.

Table 23: Additional Survey Works – Equipment Table

Equipment	Manufacturer	Instrument	Serial No.
Sound Level Meter	01dB	FUSION	14526
Microphone	GRAS	40CD	470800
Calibrator	Cirrus	CR:515	96051



Measurement Procedure

A continuous one-hour noise measurement was conducted within the Fabrication & Welding, Brickwork, and Motorsports facilities. The sound level meter (SLM) was located in a fixed position with a clear line of sight to ongoing work activities while remaining outside primary work areas to avoid disruption. For each measurement, the SLM was placed approximately 1m away from the nearest wall.

During each measurement, members of staff and some students demonstrated the noisiest activities that could occur within each workshop in order to measure a reasonable worst-case 1-hour noise level that can be used for noise modelling purposes.

Additional Survey Works Results

The results of the additional survey works are summarised in **Table 24**.

Table 24: Additional Survey Works – Overall Results

Measurement Location	dB L _{Aeq,1hr}	dB L _{Amax}	dB L _{A1,1hr}
Fabrication & Welding Workshop	80	107	86
Brickwork Workshop	72	92	81
Motorsports Main Workshop	77	106	90
Motorsports Body Repair Workshop	82	100	92

The octave band average ambient noise level measurement results are summarised in Table 25.

Table 25: Additional Survey Works – Octave Band Average Ambient Noise Level Results

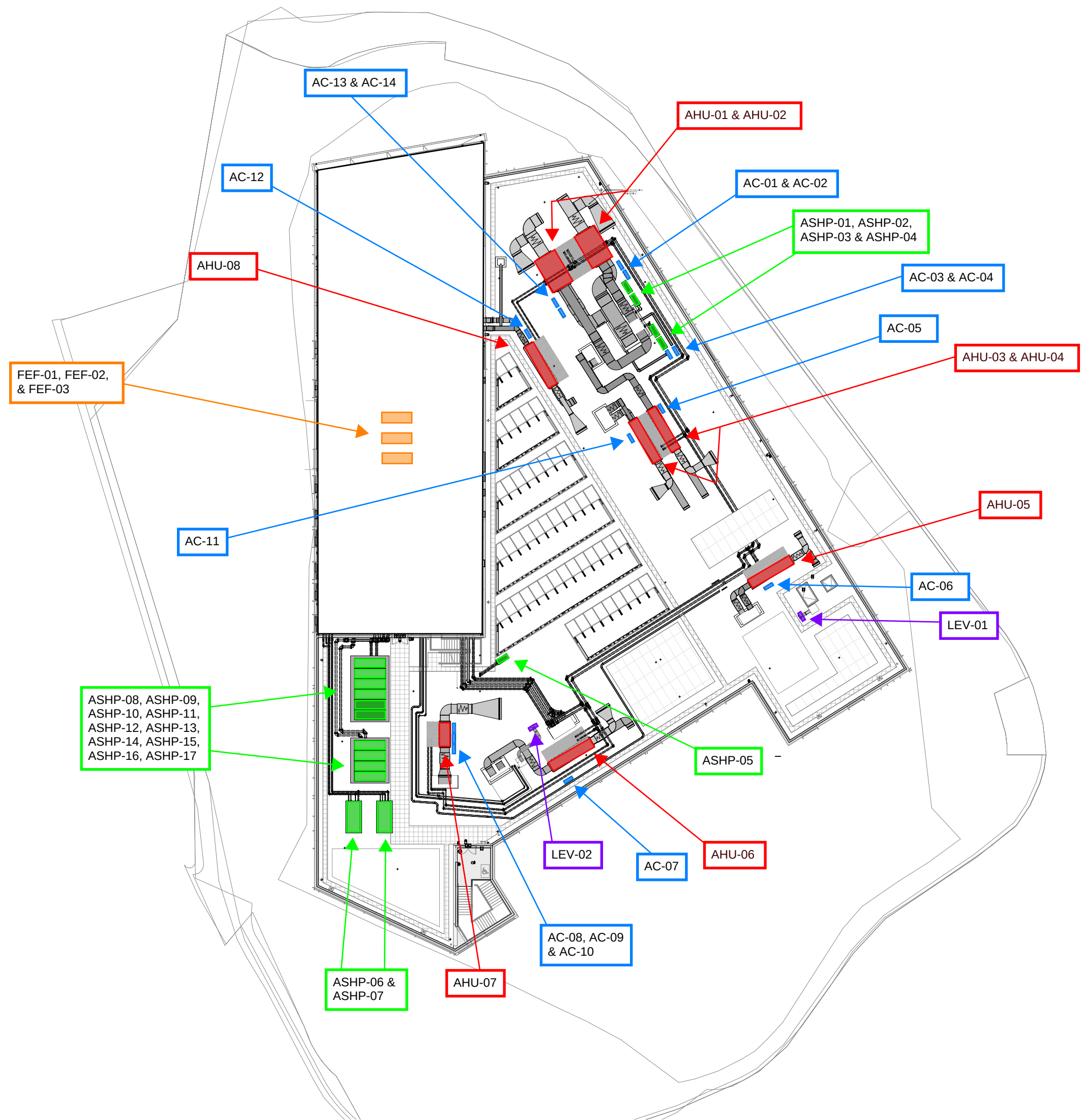
Measurement Location	Average Ambient Noise Level (dB, L _{eq,1hr}), at Octave Band Frequency (Hz)								dB L _{Aeq,1hr}
	63	125	250	500	1000	2000	4000	8000	
Fabrication & Welding Workshop	73	76	77	74	74	73	72	69	80
Brickwork Workshop	73	77	74	75	72	69	66	57	72
Motorsports Main Workshop	65	64	67	68	66	65	64	58	77
Motorsports Body Repair Workshop	72	72	72	76	73	74	76	74	82

The noise level measurement results will be used to model reasonable worst-case noise emissions from workshops when the new college campus is fully operational.



Appendix E Rooftop External Plant Unit Locations





Appendix F Proposed Plant Schedule and Noise Assessment Data



Unit Ref	Location	Make/Model No.	Typical Operating Hours	Element	Sound Power Level (dB L _w) at Centre Octave Band Frequency (Hz)								Overall Sound Power	
					63	125	250	500	1000	2000	4000	8000	Level dB(A) L _{WA}	
	AHU-01	Rooftop (5F)	SystemAir Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	86	75	68	52	43	39	39	43	64
					Outlet	87	77	70	53	44	40	40	44	66
					Surrounding	82	80	73	56	54	53	45	38	68
	AHU-02	Rooftop (5F)	SystemAir Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	86	75	68	52	43	39	39	43	64
					Outlet	87	77	70	53	44	40	40	44	66
					Surrounding	82	80	73	56	54	53	45	38	68
	AHU-03	Rooftop (5F)	Airedale Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	67	71	60	49	40	40	43	45	58
					Outlet	61	62	56	51	42	45	47	52	56
	AHU-04	Rooftop (5F)	Airedale Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	69	73	62	51	42	42	45	47	60
					Outlet	63	64	58	53	44	47	49	54	58
	AHU-05	Rooftop (5F)	Airedale Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	67	71	60	49	40	40	43	45	58
					Outlet	61	62	56	51	42	45	47	52	56
	AHU-06	Rooftop (5F)	Airedale Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	67	71	60	49	40	40	43	45	58
					Outlet	61	62	56	51	42	45	47	52	56
	AHU-07	Rooftop (5F)	Airedale Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	67	71	60	49	40	40	43	45	58
	AHU-08	Rooftop (5F)	Airedale Bespoke Air Handling Unit	Daytime Only (07:00 - 23:00)	Inlet	70	74	63	52	43	43	46	48	61
					Outlet	60	61	55	50	41	44	46	51	55
	AC-01	Rooftop (5F)	Systemair SYSVRF3 180 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	75	73	70	67	65	57	53	73
	AC-02	Rooftop (5F)	Systemair SYSVRF3 180 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	75	73	70	67	65	57	53	73
	AC-03	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	24 Hours	N/A	74	78	72	67	67	62	60	51	72
	AC-04	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	24 Hours	N/A	74	78	72	67	67	62	60	51	72
	AC-05	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	78	72	67	67	62	60	51	72
	AC-06	Rooftop (5F)	Systemair SYSVRF3 120 AIR EVO32 HP Q	Daytime Only (07:00 - 23:00)	N/A	72	76	70	65	65	59	58	49	70
	AC-07	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	78	72	67	67	62	60	51	72
	AC-08	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	78	72	67	67	62	60	51	72
	AC-09	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	78	72	67	67	62	60	51	72
	AC-10	Rooftop (5F)	Systemair SYSVRF3 160 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	78	72	67	67	62	60	51	72
	AC-11	Rooftop (5F)	Systemair SYSVRF3 120 AIR EVO32 HP Q	Daytime Only (07:00 - 23:00)	N/A	72	76	70	65	65	59	58	49	70
	AC-12	Rooftop (5F)	Systemair SYSVRF3 120 AIR EVO32 HP Q	Daytime Only (07:00 - 23:00)	N/A	72	76	70	65	65	59	58	49	70
	AC-13	Rooftop (5F)	Systemair SYSVRF3 180 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	75	73	70	67	65	57	53	73
	AC-14	Rooftop (5F)	Systemair SYSVRF3 180 AIR EVO32 HP R	Daytime Only (07:00 - 23:00)	N/A	74	75	73	70	67	65	57	53	73
	ASHP-01	Rooftop (5F)	Adveco ADVS16W	24 Hours	N/A	Manufacturer does not provide octave band sound levels for review								69
	ASHP-02	Rooftop (5F)	Adveco ADVS16W	24 Hours	N/A	Manufacturer does not provide octave band sound levels for review								69
	ASHP-03	Rooftop (5F)	Adveco ADVS16W	24 Hours	N/A	Manufacturer does not provide octave band sound levels for review								69
	ASHP-04	Rooftop (5F)	Adveco ADVS16W	24 Hours	N/A	Manufacturer does not provide octave band sound levels for review								69
	ASHP-05	Rooftop (5F)	Adveco ADVS16W	24 Hours	N/A	Manufacturer does not provide octave band sound levels for review								69
	ASHP-06	Rooftop (5F)	Mitsubishi NX-Q-G06/SL/0202P	24 Hours	N/A	81	79	82	79	74	70	62	60	80
	ASHP-07	Rooftop (5F)	Mitsubishi NX-Q-G06/SL/0202P	24 Hours	N/A	81	79	82	79	74	70	62	60	80
	ASHP-08	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-09	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-10	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-11	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-12	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-13	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73

Unit Ref		Location	Make/Model No.	Typical Operating Hours	Element	Sound Power Level (dB L _w) at Centre Octave Band Frequency (Hz)								Overall Sound Power Level dB(A) L _{WA}
						63	125	250	500	1000	2000	4000	8000	
	ASHP-14	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-15	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-16	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	ASHP-17	Rooftop (5F)	Mitsubishi EAHV-M1500YCL(-N)	24 Hours	N/A	91	83	77	64	60	59	58	49	73
	FEF-01	Rooftop (6F)	<i>N/A: example spectrum based on historical data</i>	24 Hours	Outlet	86	82	72	68	66	62	57	52	72
	FEF-02	Rooftop (6F)	<i>N/A: example spectrum based on historical data</i>	24 Hours	Outlet	86	82	72	68	66	62	57	52	72
	FEF-03	Rooftop (6F)	<i>N/A: example spectrum based on historical data</i>	24 Hours	Outlet	86	82	72	68	66	62	57	52	72
	LEV-01	Rooftop (5F)	Nederman Fan N40	Daytime Only (07:00 - 23:00)	N/A	80	83	79	83	75	75	70	68	83
	LEV-02	Rooftop (5F)	Nederman Fan N40	Daytime Only (07:00 - 23:00)	N/A	80	83	79	83	75	75	70	68	83
	LEV-03	Service Yard (GF)	Nederman Combifab FZ40-S450 with Soundbox	Daytime Only (07:00 - 23:00)	N/A	102	104	86	78	77	64	65	52	89
	LEV-04	Service Yard (GF)	Nederman Combifab FZ40-S450 with Soundbox	Daytime Only (07:00 - 23:00)	N/A	102	104	86	78	77	64	65	52	89
	LEV-05	Service Yard (GF)	Nederman FM 4kW Fan	Daytime Only (07:00 - 23:00)	N/A	80*	83*	79*	83*	75*	75*	70*	68*	83*
	MVHR	Internal, Ducted To Façade	SystemAir Topvex FC25-R-HWH	Daytime Only (07:00 - 23:00)	Inlet	72	70	50	36	33	27	25	24	59
		Internal, Ducted To Façade	SystemAir Topvex FC25-R-HWH	Daytime Only (07:00 - 23:00)	Outlet	69	69	62	48	42	40	35	27	62
	EF	Internal, Ducted To Façade	<i>SystemAir Prio 150EC Circ. Duct Fan (Example Only)</i>	Daytime Only (07:00 - 23:00)	Outlet	61	60	57	54	42	40	42	35	54
	HVHR	Internal, Ducted To Façade	Monodraught HVR Zero X	Daytime Only (07:00 - 23:00)	N/A	45	45	45	44	40	33	25	26	45

***Note:** The manufacturer has not provided a sound pressure level or sound power level for this unit, however it is understood that it will likely produce a similar level of noise to the Nederman Fan N40 LEV unit. Therefore, the overall noise level and spectrum for the FM 4kW Fan is assumed to be the same as the Fan N40 LEV unit for noise modelling purposes.

Appendix G Noise Modelling Graphics

G.1 Road Traffic and Car Park Noise Modelling at Development Façades, Daytime (07:00-23:00)



G.2 Workshop Breakout Noise during the Peak 1-Hour Period ($L_{Aeq,1hr}$), Daytime (07:00–23:00)



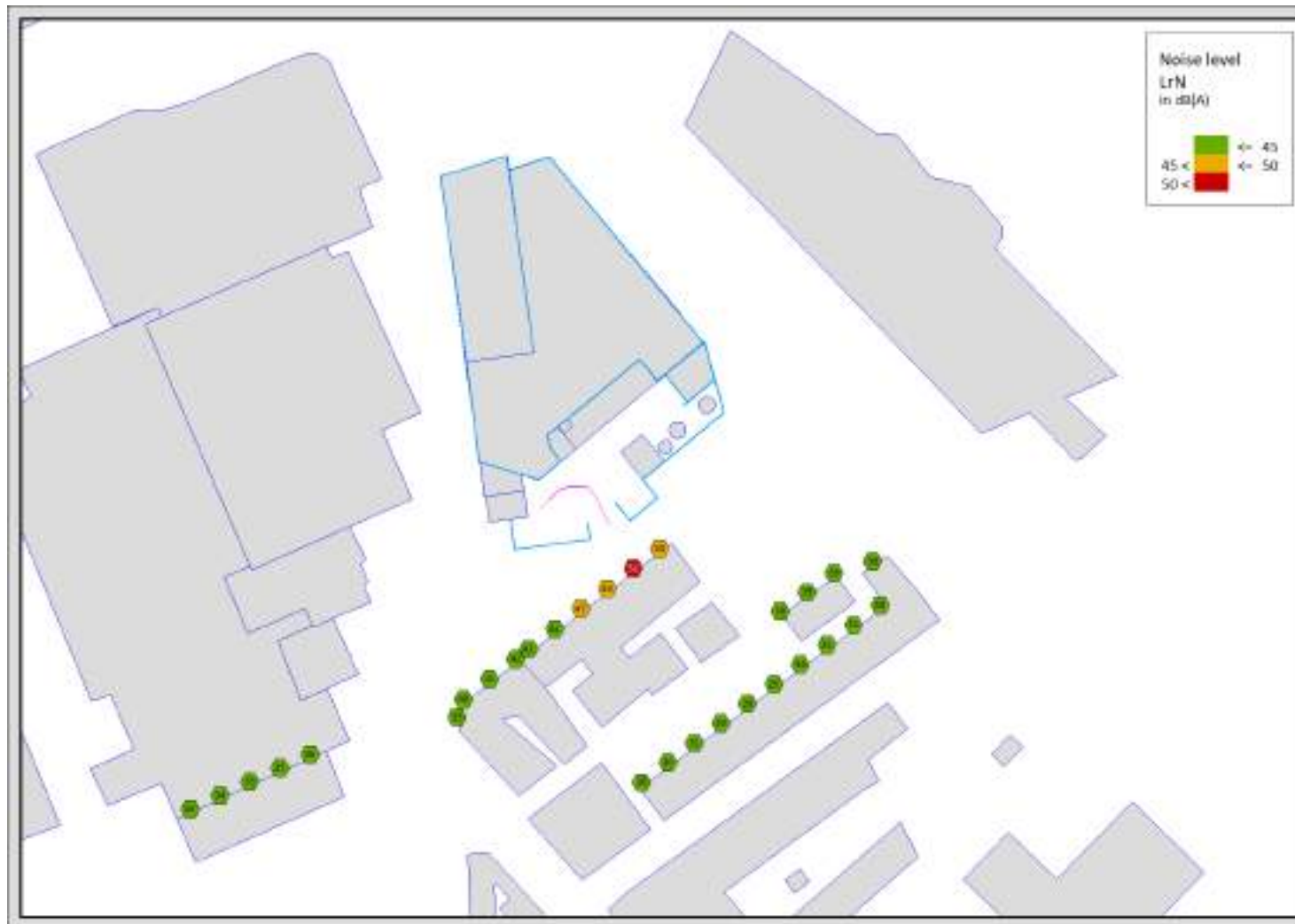
G.3 Service Yard Vehicle Movement Noise during the Peak 1-Hour Period ($L_{Aeq,1hr}$), Daytime (07:00–23:00)



G.4 Service Yard Delivery Noise during the Peak 1-Hour Period ($L_{Aeq,1hr}$), Daytime (07:00–23:00)



G.5 Service Yard Vehicle Movement Noise during the Peak 15-Minute Period ($L_{Aeq,15mins}$), 06:00-07:00



G.6 Service Yard Delivery Noise during the Peak 15-Minute Period ($L_{Aeq,15mins}$), 06:00-07:00



G.7 External Plant Noise during the Peak 1-Hour Period ($L_{Aeq,1hr}$), Daytime Hours (07:00–23:00)



G.8 External Plant Noise during the Peak 15-Minute Period ($L_{Aeq,15mins}$), Night-Time (23:00–07:00)



G.9 Emergency Generator Noise during a 1-Hour Period ($L_{Aeq,1hr}$), Daytime (07:00-23:00)



Appendix H BS4142:2014+A1:2019 Assessment Tables

H.1 BS4142:2014+A1:2019 Assessment of Workshop Breakout Noise Emissions (07:00-23:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to workshop breakout noise from the proposed development site during the peak 1-hour period within daytime hours (07:00 – 23:00)	$L_{Aeq} =$	35dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.2 .
Representative background sound level at receptor (daytime)	$L_{A90} =$	54dB	8.1.3, 8.3	Typical daytime background sound level measured at monitoring position U2, see Table 5 .
Assessment made during the daytime, therefore the reference time interval is 1 hour			7.2	
Acoustic feature correction		+3dB	9.2	A +3dB character correction has been applied to account for workshop breakout noise being perceptible against the residual sound climate. It should be noted that since the specific sound level from workshop breakout noise falls significantly below the background sound level, workshop noise is likely to be perceptible only in quiet lulls in road traffic.
Rating level	$(35 + 3) =$	38dB		
Excess of rating over background sound level	$(38 - 54) =$	-16dB	11	
Assessment indicates low impact depending on context			11	At 16dB below the representative background sound level, this is an indication of the sound having a low impact, depending on the context. The context is discussed under Section 5.3.1 .
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4 .



H.2 BS4142:2014+A1:2019 Assessment of Service Yard Vehicle Movement Noise Emissions (07:00-23:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to vehicular noise from the proposed service yard during the peak 1-hour period within daytime hours (07:00 – 23:00)	$L_{Aeq} =$	50dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.3 .
Representative background sound level at receptor (daytime)	$L_{A90} =$	54dB	8.1.3, 8.3	Typical daytime background sound level measured at monitoring position U2, see Table 5 .
Assessment made during the daytime, therefore the reference time interval is 1 hour			7.2	
Acoustic feature correction		0dB	9.2	Character corrections have not been applied for vehicular movement noise since the existing ambient sound climate during daytime hours is already dominated by road traffic noise, therefore additional noise from vehicular movement within the proposed service yard is not expected to be distinctly perceptible from the existing road traffic noise.
Rating level	$(50 + 0) =$	50dB		
Excess of rating over background sound level	$(50 - 54) =$	-4dB	11	
Assessment indicates a low impact depending on context			11	At 4dB below the representative background sound level, this is an indication of the sound having a low impact, depending on the context. The context is discussed under Section 5.3.2 .
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4 .



H.3 BS4142:2014+A1:2019 Assessment of Service Yard Delivery Noise Emissions (07:00-23:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to delivery noise from the proposed service yard during the peak 1-hour period within daytime hours (07:00 – 23:00)	$L_{Aeq} =$	44dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.4 .
Representative background sound level at receptor (daytime)	$L_{A90} =$	54dB	8.1.3, 8.3	Typical daytime background sound level measured at monitoring position U2, see Table 5 .
Assessment made during the daytime, therefore the reference time interval is 1 hour			7.2	
Acoustic feature correction		+5dB	9.2	Character corrections have been included to account for the tonal (+2dB) and impulsive (+3dB) nature of delivery activities, such as pallet handling and waste disposal, but excluding vehicle movements. These corrections have been applied on a precautionary basis to represent a worst-case delivery noise scenario. The impact of service yard operations can be further reduced through the adoption of quiet delivery practices, as detailed in Appendix I . Given that the predicted specific sound level is considerably lower than the prevailing background sound level, delivery noise is likely to be perceptible only during temporary lulls in road traffic noise.
Rating level	$(44 + 5) =$	49dB		
Excess of rating over background sound level	$(49 - 54) =$	-5dB	11	
Assessment indicates a low impact depending on context			11	At 5dB below the representative background sound level, this is an indication of the sound having a low impact, depending on the context. The context is discussed under Section 5.3.2 .
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4 .



H.4 BS4142:2014+A1:2019 Assessment of Service Yard Vehicle Movement Noise Emissions (06:00-07:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to vehicular noise from the proposed service yard during the peak 15-minute period between 06:00 and 07:00	$L_{Aeq} =$	51dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.5 .
Representative background sound level at receptor (06:00 - 07:00)	$L_{A90} =$	50dB	8.1.3, 8.3	Lowest background sound level measured between 06:00 and 07:00 at monitoring position U2, see Table 5 .
Assessment made during the night-time, therefore the reference time interval is 15-minutes			7.2	
Acoustic feature correction		0dB	9.2	Character corrections have not been applied for vehicular movement noise since the existing ambient sound climate between 06:00 and 07:00 is already dominated by road traffic noise, therefore additional noise from vehicular movement within the proposed service yard is not expected to be distinctly perceptible from the existing road traffic noise.
Rating level	$(51 + 0) =$	51dB		
Excess of rating over background sound level	$(51 - 50) =$	1dB	11	
Assessment indicates an adverse impact depending on context			11	At 1dB above the representative background sound level, this is an indication of the sound having an adverse impact, depending on the context. The context is discussed under Section 5.3.3 .
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4 .



H.5 BS4142:2014+A1:2019 Assessment of Service Yard Delivery Noise Emissions (06:00-07:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to delivery noise from the proposed service yard during the peak 15-minute period between 06:00 and 07:00	$L_{Aeq} =$	44dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.6 .
Representative background sound level at receptor (06:00 - 07:00)	$L_{A90} =$	50dB	8.1.3, 8.3	Lowest background sound level measured between 06:00 and 07:00 at monitoring position U2, see Table 5 .
Assessment made during the night-time, therefore the reference time interval is 15-minutes			7.2	
Acoustic feature correction		+5dB	9.2	Character corrections have been included to account for the tonal (+2dB) and impulsive (+3dB) nature of delivery activities, such as pallet handling and waste disposal, but excluding vehicle movements. These corrections have been applied on a precautionary basis to represent a worst-case delivery noise scenario. The impact of service yard operations can be further reduced through the adoption of quiet delivery practices, as detailed in Appendix I .
Rating level	$(44 + 5) =$	49dB		
Excess of rating over background sound level	$(49 - 50) =$	-1dB	11	
Assessment indicates a low impact depending on context			11	At 1dB below the representative background sound level, this is an indication of the sound having a low impact, depending on the context. The context is discussed under Section 5.3.3 .
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4 .



H.6 BS4142:2014+A1:2019 Assessment of External Plant Noise Emissions (07:00-23:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to external plant noise from the proposed development site during the peak 1-hour period between 07:00 and 23:00	$L_{Aeq} =$	48dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.7.
Representative background sound level at receptor (daytime)	$L_{A90} =$	54dB	8.1.3, 8.3	Typical daytime background sound level measured at monitoring position U2, see Table 5.
Assessment made during the daytime, therefore the reference time interval is 1-hour			7.2	
Acoustic feature correction		2dB	9.2	A +2dB tonal character correction has been applied to represent a scenario in which noise from the plant could exhibit a mildly perceptible tone at nearby noise-sensitive receptors. However, given that the existing sound environment is dominated by broadband road traffic noise, and that the predicted specific sound level from the external plant is 6dB below the background sound level, the likelihood of any tonal character being perceptible at the nearest receptors is considered low, although it cannot be ruled out entirely.
Rating level	$(48 + 2) =$	50dB		
Excess of rating over background sound level	$(50 - 54) =$	-4dB	11	
Assessment indicates a low impact depending on context			11	At 4dB below the representative background sound level, this is an indication of the sound having a low impact, depending on the context. The context is discussed under Section 5.3.4.
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4.



H.7 BS4142:2014+A1:2019 Assessment of External Plant Noise Emissions (23:00-07:00)

Results			Relevant Clause	Commentary
Predicted specific sound level at worst-affected receptor (residential house on Emlyn Street) due to external plant noise from the proposed development site during the peak 15-minute period between 23:00 – 07:00.	$L_{Aeq} =$	35dB	7.3.2	Predicted sound level at receptor calculated using SoundPlan 9.1 noise model, see Appendix G.8.
Representative background sound level at receptor (night-time)	$L_{A90} =$	47dB	8.1.3, 8.3	Typical night-time background sound level measured at monitoring position U2, see Table 5.
Assessment made during the night-time, therefore the reference time interval is 15-minutes			7.2	
Acoustic feature correction		+5dB	9.2	Since the ASHP units and FEF units may periodically switch on and off throughout the night-time period, a +3dB intermittency character correction is applied for robustness. A +2dB tonality character correction is applied to cover a scenario where a tone from the units may be mildly perceptible at the nearby noise sensitive receptors. It should be noted that since the existing ambient sound climate is dominated by broadband road traffic noise, and since the specific sound level from external plant noise is 12dB below the background sound level, the likelihood of a tone being perceptible at the nearest receptors is considered low, although it cannot be ruled out entirely.
Rating level	$(35 + 5) =$	40dB		
Excess of rating over background sound level	$(40 - 47) =$	-7dB	11	
Assessment indicates a low impact depending on context			11	At 7dB below the representative background sound level, this is an indication of the sound having a low impact, depending on the context. The context is discussed under Section 5.3.5.
Uncertainty of assessment			10	Assessment uncertainty is considered low, as discussed in Section 5.4.



Appendix I Quiet Deliveries Good Practice Guidance

From [*'Quiet Deliveries Good Practice Guidance – Key Principles and Processes for Retailers'*](#) (Department for Transport, April 2014).

General guidance – activities mainly within your control

- Think about the potential noise impact of any out-of-hours activity on local residents, and review the likely sources and consider how to address these by:
- Using newer and quieter delivery vehicles and equipment, where possible
- Making sure all equipment – both on the vehicle and at the delivery point – is in good working order and maintained or modernised to minimise noise when in operation
- Ensuring all staff involved in delivery activity are briefed and trained appropriately, in accordance with the code of practice
- Ensuring all suppliers and carriers receive copies of the code and are aware of its importance

General guidance – activities that you will need to collaborate on

- Liaising with your local Borough/District Council and contacting the Environmental Health Officer (responsible for noise issues) to explain the plans to manage night-time delivery and servicing activity. This needs to happen in partnership with your key customer/retailer.
- Liaising with your local Borough/District Council and contacting the Planning Department to identify and help address any variations to planning conditions required and the process for carrying this out. This needs to happen in partnership with your key customer/retailer.
- Liaising with clients, colleagues, other local businesses, suppliers and carriers to minimise the likelihood of more than one vehicle arriving at the same time

Ensure all drivers/deliveries/loading/unloading personnel follow the guidance below:

The delivery point:

- Ensure delivery bay doors, gates and shutters are well maintained to minimise noise when opening and closing
- Switch off any external tannoy systems
- Avoid using external bells at delivery points
- Switch off the radio when delivery point doors are open



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- Ensure the delivery point and surrounding areas are clear of obstructions so vehicles can manoeuvre easily
- Keep doors other than the delivery point closed to ensure noise does not escape
- Where possible, prepare all empty handling units, salvage and returns behind closed doors. Check they are in the correct condition and position and at the right height before taking them out. This will minimise outdoor activity and unnecessary noise
- Think about how to minimise contact between hard surfaces, particularly metal on metal, during the unloading/loading processes. For example, use rubber matting and buffering material on doors
- Service any delivery equipment in advance to minimise noise
- Make sure the delivery point is ready for the vehicle before it arrives – gates and doors should be open to avoid the vehicle idling
- Make sure the driver knows the precise location of your delivery point and is aware of any local access issues
- Ensure staff do not shout or whistle to get the attention of the driver

Ensure all drivers/deliveries/loading/unloading personnel follow the guidance below:

The driver:

- Plan ahead to ensure you know the location of the delivery point and the appropriate access route
- Adjust or restrict routings for evening/night-time deliveries to avoid housing areas
- If early for your delivery slot, do not wait near residential property and switch off the engine
- As you approach the site and manoeuvre your vehicle into position, remain aware of the effect noise levels can have on local residents
- Do not sound your horn
- Reversing alarms should be switched off or modified for white noise, if not subject to health and safety requirements or localised risk assessment issues (e.g. proximity to a cycle route). Use a qualified banksman instead, if available
- Engines should be switched off immediately when not manoeuvring, however, try to minimise start-ups and avoid over-revving
- Refrigeration equipment should be switched off in advance of arrival at premises
- If the radio is on, ensure the cab windows are closed and switch the radio off before opening the door
- Minimise the frequency of opening and closing vehicle doors, and do so quietly
- Allow extra time if needed to unload as quietly as possible. Take particular care to minimise rattle from metal-on-metal contact when moving roll cages



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- Where practical, notify staff at the delivery point in advance of arrival to ensure they are ready for you
- Be aware of how far your voice can carry when talking outside at night
- If opening a gate/cellar flap/roller shutter door to gain access, do so gently and as little as possible
- Lower flaps on tail-lifts carefully and quietly
- Do not whistle or shout to get the attention of store employees
- When moving gates, locks and load restraint bars ensure they are placed gently in their resting position/stowage point – do not drop or drag them on the ground
- When safe to do so, use sidelights rather than headlights while off-road and manoeuvring, to minimise light intrusion
- Minimise excessive air brake noise
- When working in the vehicle load space avoid banging cages into the vehicle walls
- When finished unloading/loading, close up the vehicle quietly
- For keg deliveries, ensure that dropping beds are always used when dropping kegs into and out of the vehicle. If rolling kegs to the delivery point, use rubber matting. Consider using a sack truck with pneumatic tyres to move kegs from the vehicle to the delivery point
- Show the same consideration when leaving the site as when arriving



Appendix J External Glazing Specifications Markup

