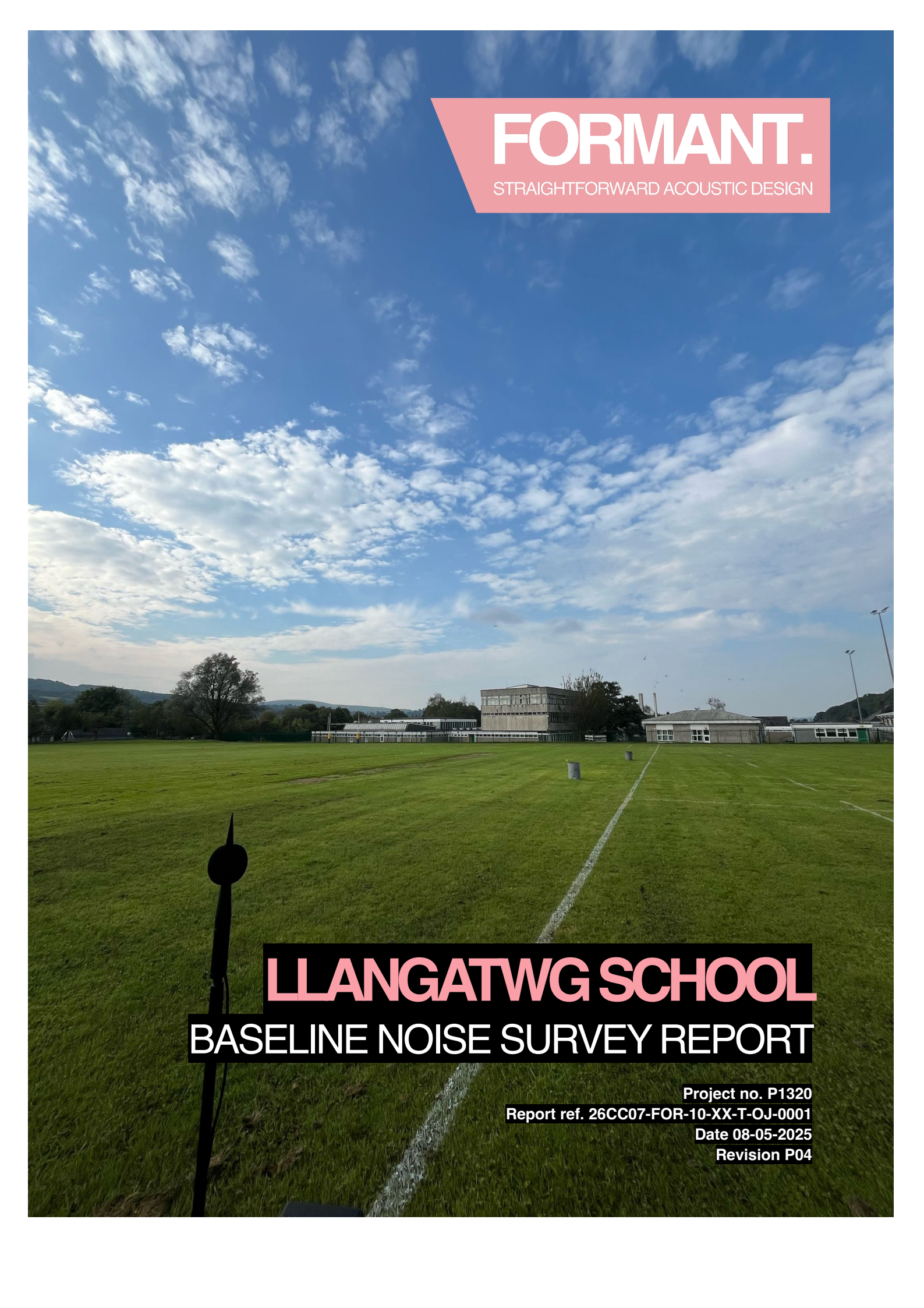




FORMANT.

STRAIGHTFORWARD ACOUSTIC DESIGN

LLANGATWYG SCHOOL

BASELINE NOISE SURVEY REPORT

Project no. P1320

Report ref. 26CC07-FOR-10-XX-T-OJ-0001

Date 08-05-2025

Revision P04



EXEC SUMMARY

Formant has been appointed by Morgan Sindall to assess the soundscape affecting a proposed development on the site of the existing Llangatwg School in Aberdulais. The proposed development is in the early stages of design but is expected include the demolition of the existing school buildings and a new replacement school building on the existing playing fields to the east of the site. This report summarises the results of a baseline noise survey at the site in September 2024 and an assessment of potential noise impacts arising from the proposed development.

NOISE AFFECTING THE PROPOSED SCHOOL

The proposed school building is located adjacent to a light industrial unit (Neath Coachbuilders) and a local road, Penscynnor. The A465 dual carriageway runs approximately 200 m to the south of the proposed building and these noise sources all have the potential to cause noise issues for the proposed school.

A baseline noise survey was undertaken between 20-23 Sept 2024. Daytime ambient noise level measurements results were around 50-54 dBL_{Aeq,T}, which means that natural ventilation is a feasible option in terms of noise break-in and no building envelope acoustic upgrades are expected to be required.

In summary the site is generally exposed to fairly low ambient noise levels and **no significant adverse noise impacts are predicted from environmental noise affecting the proposed school.**

NOISE IMPACT ARISING FROM THE PROPOSED SCHOOL

The nearest residential receptors (NSRs) are residential properties located to the southwest, east and north of the site. Representative background sound levels have been derived from the survey data for each of the NSR locations, ranging from 45/37 dBL_{A90} (day/night) to 51/43 dBL_{A90} (day/night) depending on their proximity to the nearby roads.

Plant selections are not known at this stage, but noise emissions limits have been set 5 dB below the representative background levels in line with BREEAM/BS 4142. An initial assessment of air source heat pump noise has been made and the results show that the proposed noise limits are achievable with standard plant and attenuation measures, therefore **no significant impacts are predicted as a result of plant noise emissions.**

An initial assessment of sports pitch noise showed that noise mitigation was required for the residential properties to the west of the site. Mitigation is proposed in the form of a noise barrier along the end of the proposed sports pitch and as a result, **no significant noise impacts are predicted as a result of the sports pitch noise.**



1 INTRODUCTION

Formant has been appointed by Morgan Sindall to assess the soundscape affecting a proposed new development on the site of the existing Llangatwg School, Main Rd, Aberdulais, Neath SA10 8DB. The proposed development is at the early stages of design and the location/layout of the proposed buildings is not yet finalised. This report provides:

- 1) A summary of applicable legislation, policy and guidance,
- 2) A description of the proposed development and its potential impacts,
- 3) The results of a baseline noise survey undertaken at the site and
- 4) A summary of the assessment of potential noise impacts

2 PROPOSED DEVELOPMENT

2.1 EXISTING SITE

The existing site comprises a complex of one and two storey school buildings, external play areas and car parking on the western side of the site, with grass playing fields on the eastern side of the site. The site slopes up gently from southwest to northeast with a change in elevation of roughly 10 m.

The site is bounded by a local Road, Penscynor, to the southeast and by residential properties to the west, north and east (on the opposite side of Penscynor). The A465 dual carriageway runs approx. 125 m from the southern site boundary but the road is in a fairly deep cutting at this point.

There is a light industrial unit, Neath Coachbuilders located immediately to the northeast of the site. We spoke to the management of the business during the survey and they confirmed that they were undertaking typical daytime operations during the baseline noise survey. An existing site location plan, showing the noise survey measurement positions and the location of the nearest noise sensitive receptors (numbered NSR1-5) is provided in Figure 1 overleaf.

2.2 PROPOSED DEVELOPMENT

The proposed development will involve the demolition of the existing buildings and the erection of a new school building plus associated external parking and play areas. The proposed design of the new school will be located on the existing school playing fields on the eastern part of the site. The existing school buildings will be demolished and reconfigured to provide either parking, playing fields or multi-use games areas (MUGAs).

2.3 POTENTIAL NOISE IMPACTS

The proposed development has the potential for adverse noise impacts in terms of:

- 1) Environmental noise at the site affecting noise-sensitive teaching spaces in the new school
- 2) Building services plant noise emissions from the proposed school affecting nearby NSRs
- 3) Changes in land use (e.g. provision of new MUGAs) changing noise levels at nearby NSRs.

The proposed school includes balconies and a courtyard on the front elevation, facing noise-sensitive receptors (NSRs) on Penscynor. The balconies will be used only during lesson times, in a controlled manner and under staff supervision. As such, noise generated is not expected to be significant, especially in the context of existing traffic noise from Penscynor Road.



The courtyard is intended for external dining during short periods at break and lunchtime. All active play will take place to the rear of the site, where higher noise levels are anticipated. In contrast, the courtyard is expected to remain a relatively quiet space, particularly when compared with the current sports pitches in this location. The overall change in noise levels is predicted to be negligible, and therefore, no significant impact is expected.

Internally, potentially noisy school activities—such as music lessons, design and technology workshops, or use of the sports hall—will be contained by the building envelope, which features acoustic-rated glazing and cladding. A mechanical ventilation system will also be in place to avoid the need to open windows or doors. On this basis, no significant noise impacts are predicted from internal school activities.



Figure 1: Existing site aerial photo showing measurement locations and NSRs.

3 LEGISLATION, POLICY AND GUIDANCE

3.1 LEGISLATION

Approved Document E of the Building Regulations states that new school buildings should comply with the requirements set out in Building Bulletin 93 (BB93). The development will be designed to comply fully with the requirements and they form the basis of the criteria used in this assessment.

3.2 LOCAL POLICY

Paragraph 5.3.46 of the NPT Local Development Plan states that

“In relation to noise, potentially noisy proposals should not be located close to sensitive uses (such as hospitals, schools and housing) and new noise-sensitive developments should not be located near to existing noisy uses (including industry and existing or proposed transport infrastructure) unless it can be shown that adverse effects can be dealt with through mitigation measures incorporated into the design.”

3.3 GUIDANCE

BS 4142:2014

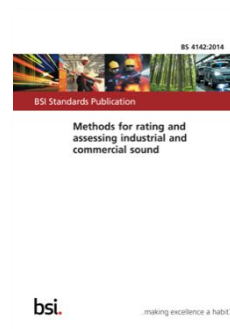
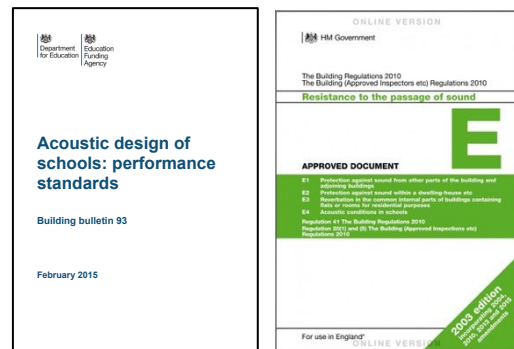
BS4142 provides a method for rating industrial and commercial sound and a method for assessing resulting impacts upon people. The method is applicable to fixed plant installations and has been used as the basis for the assessment of plant noise emissions.

BREEAM 2018: NON-DOMESTIC BUILDINGS

BREEAM provides criteria and assessment methods applicable to schools, under the Hea5 and Pol5 credits. These criteria have been adopted for this assessment.

SPORT ENGLAND: AGP ACOUSTICS (2015)

No specific guidance exists for assessing the noise impact from grass pitches in Wales, but Sport England's *Artificial Grass Pitch (AGP) Acoustics – Planning Implications* is considered the best proxy guidance document. It brings together relevant noise guidelines and UK planning policies and provides noise levels for AGPs, an assessment methodology and possible mitigation measures for consideration.





4 BASELINE NOISE SURVEY

4.1 MEASUREMENT METHODOLOGY

Environmental noise measurements were undertaken at positions MP1/MP2 (attended measurements) and MP3 (unattended noise logger) as shown in Figure 1 and the photos in Table 1. The measurements were made by Paul Driscoll MIOA between 09:00 on Friday 20 Sept 2024 and 09:00 hrs on Monday 23 Sept 2024.

The noise measurements were undertaken approximately 1.5 metres above local ground level, at a distance of at least 3 metres from the façade of any buildings and they are considered representative of free field measurements. Measurements were made in line with BS 7445:2003 *Description of Environmental Noise*.

4.2 EQUIPMENT

The following measurement equipment was used to conduct the survey:

- Nti XL2 Class 1 Sound level meter, SNo. A2A-18665-E0,
- Nti Larson Davies CAL200 Calibrator, SNo. 18652

All measurement equipment owned or hired and operated by Formant has annual or bi-annual calibration checks carried out by external companies traceable to UKAS or national standards. Copies of all calibration records are kept and can be provided upon request. The sound level meter was field calibrated before and after the measurements were undertaken and no significant drift was observed.

4.3 WEATHER CONDITIONS

Weather conditions during the attended measurements were mild, with partial cloud cover, no precipitation and a gentle breeze. The weather and wind speeds during the unattended noise survey at MP3 are shown in the Appendix to this report (based on data from a nearby public weather station). The weather conditions were generally suitable for undertaking noise measurements with the exception of some periods of rainfall. The data from those periods has been excluded from the assessment (see Appendix for full details).

4.4 NOISE PARAMETERS

A full range of noise data was captured during the survey including the following statistical measurements:

L_{Amax}	The sound pressure level of the single noisiest event during the measurement period.
L_{Aeq}	Time averaged sound pressure level. This is generally considered to be an acceptable representative descriptor of environmental noise.
L_{A90}	Sound pressure level exceeded for 90% of the measurement period, this is generally accepted to be indicative of the continuous background noise level.

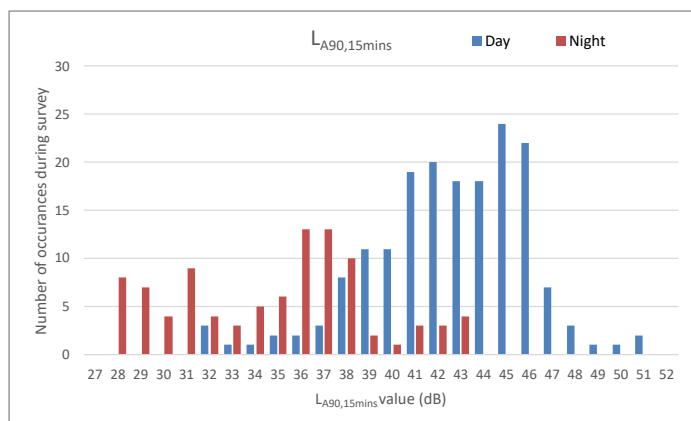
4.5 MEASUREMENT RESULTS

Position and description	Parameter	Result	Photo	
MP1 Existing school playing fields, approx. 85m from the south-eastern site boundary. Location representative of north elevation of proposed school building. Soundscape dominated by traffic on Penscynor, distant traffic and occasional noise from Neath Coachbuilders.	Date/time	09:20 hrs		
	Duration	15 mins		
	L _{Aeq}	50 dB		
	L _{Amax}	73 dB		
	L _{A90}	47 dB		
MP2 Existing school playing fields, approx. 30m from the south-eastern site boundary. Location representative of north elevation of proposed school building. Soundscape dominated by traffic on Penscynor, distant traffic and occasional noise from Neath Coachbuilders.	Date/time	09:43 hrs		
	Duration	15 mins		
	L _{Aeq}	54 dB		
	L _{Amax}	67 dB		
	L _{A90}	51 dB		
MP3 Western corner of the site, outside the rear of the existing school buildings, adjacent to residential properties. Soundscape not dominated by any specific sound sources.	Date/ time	11:00 20 Sept 2024 to 09:00 23 Sept 2024	[no photo]	
	Time period	Day 07:00-23:00		Night 23:00-07:00
	L _{Aeq,15min}	48-50 dB		39-42 dB
	L _{Amax(F)}	69 dB		57 dB
	L _{A90,15min}	45 dB		37 dB
* L_{Aeq} results are the logarithmic average of the 15-minute results during the day/night time periods during the survey. * L_{A90} results are the modal average of the 15-minute results during the day/night time periods during the survey.				

Table 1: Noise survey results summary

The distribution of background sound level results is shown in Figure 2 and a time history graph of the full results at MP2 are shown in Figure 3 (overleaf).

Figure 2: Distribution of background sound level results.



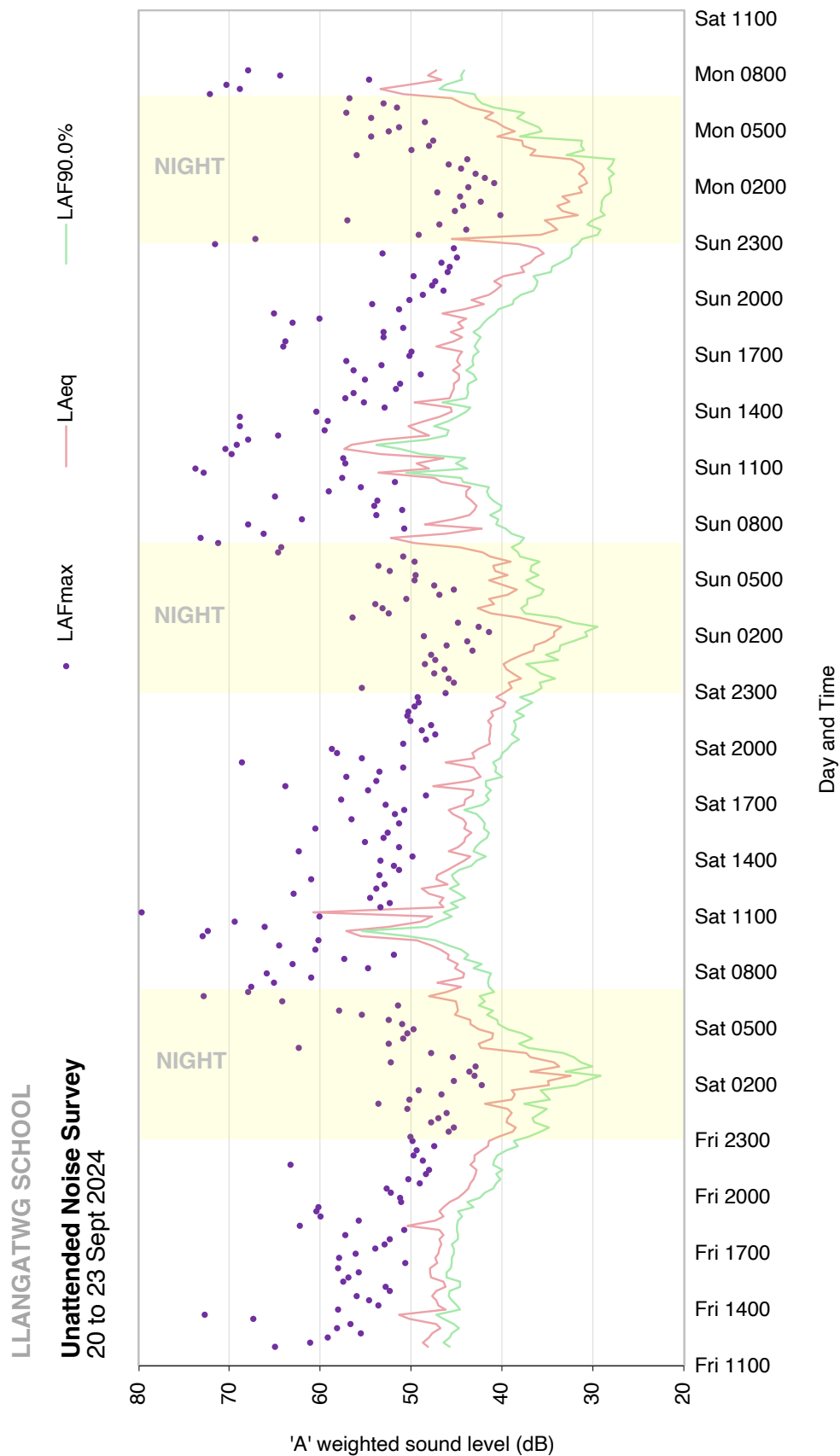


Figure 3: Time history graph of the measurement results at MP3.



5 NOISE BREAK-IN ASSESSMENT

Noise break-in to the proposed development was calculated in line with the calculation method and criteria set out in BB93.

ASSESSMENT CRITERIA

BB93 provides internal ambient noise level (IANL) criteria for each different type of space within a school. In general, most teaching spaces in a new-build school have an IANL criterion of 35 dB, with a +5 dB relaxation permitted for naturally ventilated spaces.

BB93 states that the IANL criteria can normally be achieved with:

- Single-sided ventilation where external noise levels exceed the IANL criterion by up to 16 dB, and
- Cross-ventilation where external noise levels exceed the IANL by up to 20 dB.

In short this means that most teaching spaces can typically be naturally ventilated where external noise levels do not exceed $L_{Aeq,30min}$ **51 dB for single-sided ventilation or 55 dB for cross-ventilation.**

VENTILATION STRATEGY

The results of the survey show that for general teaching spaces:

- a) Noise levels at all proposed facades are below the limit for cross ventilation.
- b) Teaching spaces which face Pencsryn may slightly exceed the limit for single sided vent but would still be suitable for cross ventilation.
- c) Teaching spaces which are screened from traffic on Pencsryn and/or set back a suitable distance are likely to be suitable for any type of ventilation strategy.

For more noise sensitive spaces within the school (e.g. Music Ensemble Room, Recording Studio and teaching spaces intended specifically for students with special hearing and communication needs), the site is still considered to be suitable for natural ventilation. However, for music rooms, it may be considered beneficial to provide mechanical ventilation in order to reduce noise break-out via open windows. This will be developed as the design progresses.

FAÇADE SOUND INSULATION

The noise levels are at a level where we would not normally expect there to be a need for façade sound insulation enhancements. We will review this requirement as the design progresses, but standard cladding, roof and windows are expected to be suitable acoustically.



6 PLANT NOISE EMISSIONS – INITIAL ASSESSMENT

REPRESENTATIVE BACKGROUND SOUND LEVELS

The noise logger data from MP3 is considered suitable for determining the variation in noise level between daytime (0700-2300 hrs) and night time (2300-0700 hrs). However, the measurement position, at the rear of the existing school buildings, was completely screened from local noise sources, therefore cannot be considered representative of all NSR locations.

We therefore propose the following process to determine representative background sound levels for each NSR location:

NSR location	Daytime (0700-2300 hrs)		Night-time (2300-0700 hrs)	
	Representative background level dBL _{A90}	Data based on...	Representative background level dBL _{A90}	Data based on...
NSR1, NSR2 and NSR5	45	Results at MP3 (no corrections applied)	37	Results at MP3 (no corrections applied)
NSR3 and NSR4	51	Results at MP2 (no corrections applied)	43	Results at MP3 +6 dB correction to reflect location

Figure 4: Representative background sound levels for use in assessment of plant noise emissions

ASSESSMENT CRITERIA

In line with BREEAM Pol 5 and BS 4142, we propose rating noise limits 5 dB lower than the background noise level at nearby residential receptors. The noise limits are therefore as follows:

NSR location	Daytime (0700-2300 hrs)		Night-time (2300-0700 hrs)	
	Representative background level dBL _{A90}	Plant noise limits, dBL _{A,r}	Representative background level dBL _{A90}	Plant noise limits, dBL _{A,r}
NSR1, NSR2 and NSR5	45	40	37	32
NSR3 and NSR4	51	46	43	37

Figure 5: Representative background sound levels for use in assessment of plant noise emissions

PROPOSED PLANT

Plant selections have not been made at this stage of the design, however we have run an initial model of two ASHPs in the location shown on the masterplan to assess the suitability of this location. The calculations are based on 2 no. Thermonova NOVA 330 ASHPs with sound power levels of 86 dBA (including attenuators), but with no screening. The results of the model are shown below:



Figure 6: Noise contour plot for indicative ASHP selections.

The results of the model show that the noise levels at the nearby NSRs outside the site are close to compliance with the noise limits and once the screening effect of the sprinkler tanks and boundary fences are factored into the model, we would expect this ASHP location to be capable of full compliance with the noise limits at the nearest NSRs.

The design of the ASHPs will require further coordination during detailed design to take account of the required thermal load of the building and to ensure noise levels at nearby classroom windows are acceptable. However, the proposed ASHP location is considered viable at this stage, therefore **no significant adverse noise impacts are predicted as a result of plant noise.**



7 SPORTS PITCH NOISE ASSESSMENT

7.1 SPORTS PITCH NOISE

ASSESSMENT CRITERIA

AGP Acoustics quotes the World Health Organisation's *Guidelines on Community Noise* (1999) regarding internal noise: *"To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB L_{Aeq}."*

In relating this to an external noise limit, it states: *"Based on a 15 dB sound reduction of a partially open window, the noise level outside a residential property during the daytime about 1 metre from façades of living spaces should not exceed 50 dB L_{Aeq}."*

Based on the AGP Acoustics guidance, we propose to assess the potential noise impact against the following criteria:

- External noise level limit: 50 dBL_{Aeq,1h}
- Internal noise level limit: 35 dBL_{Aeq,1h}

ASSESSMENT METHOD

The source noise levels for a generic sports pitch are based on the AGP Acoustics quoted level of 58 dBL_{Aeq,1h} at 10 m from the halfway line.

In reality, the noise level will fluctuate depending on the activity and the specific location of the noise source at any given time. The pitch is therefore better modelled as an area source over the entire pitch area to reflect the fact that the noise source location (i.e. people) will vary over the entire pitch area during a typical 1-hour period.

The assessment is based on noise levels at 1.5 m above ground level. This reflects the fact that:

- (a) players shouting/communicating (with heads approx. 1.5 m above ground level) is typically the dominant noise source from a sports pitch and
- (b) the assessment covers daytime and evening time periods when people will typically be in their gardens or in ground floor rooms, rather than in bedrooms on upper storeys.

MODEL RESULTS AND NOISE MITIGATION

The 3D computer noise model of the site has been used to develop noise mitigation which is capable of meeting the AGP Acoustics target of 50 dBL_{Aeq,1h} at all residential NSRs near the site.

During Stage 2 we worked closely with the architect and landscape architect to maximise the distance between the sports pitches and nearby residential NSRs and to use the site topography/building massing to screen the pitches from the NSRs. The proposed layout is considered to be the best practicable solution which fits the required sports pitches on the site and provides the maximum practicable noise screening, however a minimum 3 dB additional noise mitigation is required to screen the residential properties to the west of the site.

To achieve the 50 dBL_{Aeq,1h} limit at all NSRs, we have run the model with a 2 m tall solid noise barrier along the western edge of the main sports pitch and the results of the model are shown in Figure 5, demonstrating compliance at all NSR locations.



Figure 7: Sports pitch model noise contours and NSR levels

The model results shown above demonstrate compliance with the AGP Acoustics guidelines, therefore **no significant adverse noise impacts are predicted as a result of sports pitch noise.** We would still recommend that the school adopts a good practice guide for all users of the pitches to respect the fact that the noise of the pitches may still be audible at the NSR locations, despite being within the guideline noise levels.



APPENDIX: WEATHER DATA



Date Time	Temp (°C)	Precip (mm)	Wind gust (kph)	Wind speed (kph)	Conditions
2024-09-20T11:00:00	16.2	0	30.2	19.9	Partially cloudy
2024-09-20T12:00:00	17.2	0	30.2	22.3	Partially cloudy
2024-09-20T13:00:00	18.2	0	27.7	20.5	Overcast
2024-09-20T14:00:00	17.6	0	29.9	23.4	Overcast
2024-09-20T15:00:00	17.6	0	27.4	23.4	Partially cloudy
2024-09-20T16:00:00	18.1	0	26.3	19.6	Partially cloudy
2024-09-20T17:00:00	18	0.1	26.3	24.2	Rain, Partially cloudy
2024-09-20T18:00:00	16.6	0.1	27.7	17.3	Rain, Partially cloudy
2024-09-20T19:00:00	16.6	0	20.9	19.7	Partially cloudy
2024-09-20T20:00:00	16.1	0	21.2	17.2	Partially cloudy
2024-09-20T21:00:00	15.7	0	17.3	21.6	Partially cloudy
2024-09-20T22:00:00	15.7	0	10.1	24.6	Partially cloudy
2024-09-20T23:00:00	15.7	0.4	7.2	22.3	Rain, Partially cloudy
2024-09-21T00:00:00	15.3	0.1	16.2	22.3	Rain, Partially cloudy
2024-09-21T01:00:00	15.2	0.1	20.9	22.2	Rain, Partially cloudy
2024-09-21T02:00:00	14.7	0	20.5	15.1	Partially cloudy
2024-09-21T03:00:00	14.3	0	18.4	17.9	Overcast
2024-09-21T04:00:00	14.4	0.2	14	19.7	Rain, Overcast
2024-09-21T05:00:00	14.9	0.9	10.4	17.9	Rain, Partially cloudy
2024-09-21T06:00:00	15.3	0.8	10.4	17.9	Rain, Overcast
2024-09-21T07:00:00	15.4	0	14.8	18.6	Overcast
2024-09-21T08:00:00	15.8	0	16.6	18.7	Overcast
2024-09-21T09:00:00	15.8	0.4	20.2	18.2	Rain, Partially cloudy
2024-09-21T10:00:00	15.8	0.5	33.5	18.9	Rain, Partially cloudy
2024-09-21T11:00:00	15.8	0.5	36.7	20.1	Rain, Overcast
2024-09-21T12:00:00	15.8	0.1	38.5	20.8	Rain, Overcast
2024-09-21T13:00:00	16.5	0.1	29.9	19.4	Rain, Overcast
2024-09-21T14:00:00	17.5	0	30.2	18.7	Overcast
2024-09-21T15:00:00	18.9	0.4	28.1	17.2	Rain, Overcast
2024-09-21T16:00:00	18.9	0.5	22.7	12.2	Rain, Partially cloudy
2024-09-21T17:00:00	18.9	1.5	18.4	9.6	Rain, Partially cloudy
2024-09-21T18:00:00	19.4	1.7	22	9.1	Rain, Partially cloudy
2024-09-21T19:00:00	17.8	0.7	23.4	9.7	Rain, Partially cloudy
2024-09-21T20:00:00	16.8	0	23	12.4	Partially cloudy
2024-09-21T21:00:00	16.8	0	19.8	14	Overcast
2024-09-21T22:00:00	16.4	0	16.9	12.4	Partially cloudy
2024-09-21T23:00:00	16.3	0	18	15.9	Partially cloudy
2024-09-22T00:00:00	15.8	0.1	18.4	15.3	Rain, Overcast



Date Time	Temp (°C)	Precip (mm)	Wind gust (kph)	Wind speed (kph)	Conditions
2024-09-22T01:00:00	15.7	0	8.3	16.9	Partially cloudy
2024-09-22T02:00:00	15.2	0.1	8.6	18.7	Rain, Partially cloudy
2024-09-22T03:00:00	14.8	0	6.1	19.7	Partially cloudy
2024-09-22T04:00:00	15.3	0.3	7.6	19.3	Rain, Partially cloudy
2024-09-22T05:00:00	15.3	0.9	11.2	20	Rain, Partially cloudy
2024-09-22T06:00:00	14.9	0.7	11.2	15.1	Rain, Partially cloudy
2024-09-22T07:00:00	15	0	5.8	15.1	Overcast
2024-09-22T08:00:00	15.4	0	9.4	17.8	Partially cloudy
2024-09-22T09:00:00	15.8	0.4	11.9	17.8	Rain, Overcast
2024-09-22T10:00:00	16.1	2.2	10.4	17	Rain, Partially cloudy
2024-09-22T11:00:00	16.2	4.3	10.8	16.8	Rain, Overcast
2024-09-22T12:00:00	15.8	1.2	13.7	17.1	Rain, Partially cloudy
2024-09-22T13:00:00	16.6	1	20.2	21.7	Rain, Overcast
2024-09-22T14:00:00	16.4	0	21.2	19.2	Overcast
2024-09-22T15:00:00	15.9	1	16.9	16.5	Rain, Overcast
2024-09-22T16:00:00	16.4	0.6	15.5	17.4	Rain, Overcast
2024-09-22T17:00:00	17	0.2	14	14.2	Rain, Partially cloudy
2024-09-22T18:00:00	16.5	0.4	13.7	11.6	Rain, Partially cloudy
2024-09-22T19:00:00	16.4	0.1	13.7	9.9	Rain, Overcast
2024-09-22T20:00:00	16.4	0	13.3	10.4	Overcast
2024-09-22T21:00:00	15.5	0.1	13.7	9.6	Rain, Partially cloudy
2024-09-22T22:00:00	15.9	0.1	12.6	8	Rain, Overcast
2024-09-22T23:00:00	15.8	0.3	12.6	7.1	Rain, Overcast
2024-09-23T00:00:00	15.4	0.2	12.2	3.4	Rain, Overcast
2024-09-23T01:00:00	15.4	0.3	7.6	2.9	Rain, Overcast
2024-09-23T02:00:00	15.4	0	10.1	3.4	Overcast
2024-09-23T03:00:00	14.8	0.5	10.8	5.4	Rain, Overcast
2024-09-23T04:00:00	14.9	0.3	12.2	6.7	Rain, Overcast
2024-09-23T05:00:00	14.9	0.2	13	8.6	Rain, Overcast
2024-09-23T06:00:00	14.9	0.5	14	8.6	Rain, Overcast
2024-09-23T07:00:00	14.8	2.1	15.1	9.9	Rain, Overcast
2024-09-23T08:00:00	14.8	6.4	13.7	6.7	Rain, Overcast
2024-09-23T09:00:00	14.8	0.9	13.3	10.4	Rain, Overcast
Data in red has been excluded from the assessment as it was affected by significant quantities of rain					