

BARTON PEVERIL COLLEGE, SCHOOL OF ART AND DESIGN

BASELINE NOISE SURVEY

Acoustics Report A1973 R01a
16th December 2022

Report for: Barton Peveril College

Report issued to: Bidwells
Attention: Matthew Jobbins

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Glossary of Acoustic Terms

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1 Introduction

Ion Acoustics is appointed by Barton Peveril College to advise them and their design team on in respect of acoustics for a new block to accommodate the School of Art and Design on the existing site in Eastleigh. As part of this work, a baseline noise survey has been carried out to determine noise levels affecting the building and the background noise levels at nearby sensitive receptors. This report documents the noise survey.

The proposed School of Art and Design site is toward the rear of the college site and to the south of Cherbourg Road, with the closest existing residential address to the north on Cherbourg Road and Tennyson Road. The proposed development is registered under BREEAM 2018, with acoustic credits sought for POL05 and HEA05 criteria. There is also likely to be a planning requirement for noise from any new plant.

This report sets out the noise survey procedure and findings. It then assesses internal noise levels from external noise for the scheme (part of the BREEAM Hea 05 credit) and also sets plant noise emissions limits which will be required for planning and BREEAM Pol 05.

2 Proposed Scheme Details

The proposed new building is located on the north side of the existing college site, south of the rear of housing on Cherbourg Road, near the rear entrance. The site plan is shown in Figure 1, illustrating the proposed School of Art and Design block location, the nearest residential receptors, and the measurement position (MP1). The building will be a two storey block housing various art teaching facilities including various art studios, study areas, offices and ancillary accommodation.

There is a currently a single storey temporary building and some parking on part of the proposed site, and also a vehicle access to part of a MUGA. With the new scheme that local parking will no longer be in place, so noise of vehicles accessing that area and the vehicle access would need to be excluded from the assessment.

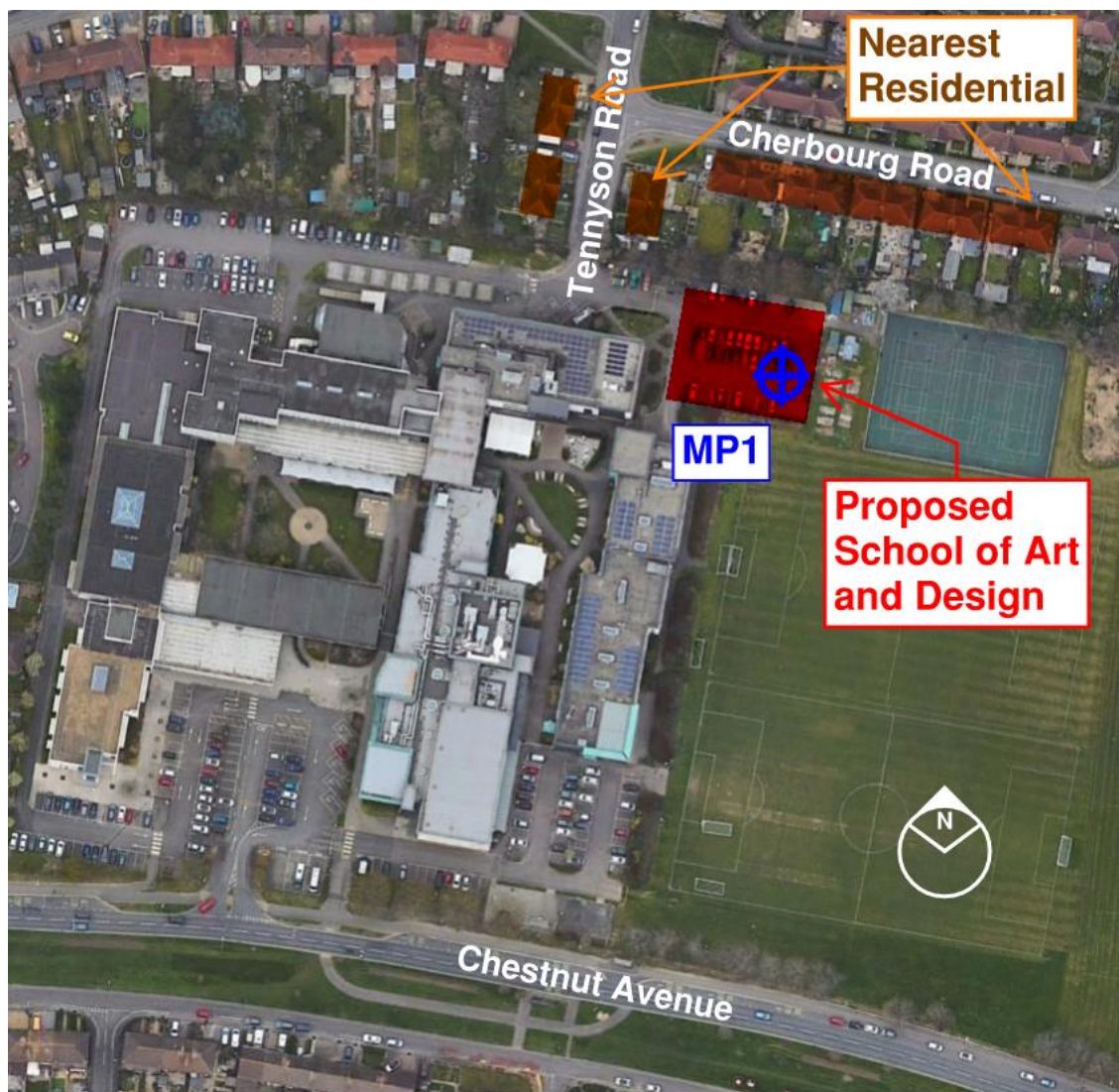


Figure 1 – Site plan and proposed site location

With regard to noise-sensitive receivers, there are existing houses immediately north of the school on Tennyson Road and Cherbourg Road (Shown in Figure 1).

The proposed for the internal layout of the School of Art and Design is shown in Figures 2 and 3.

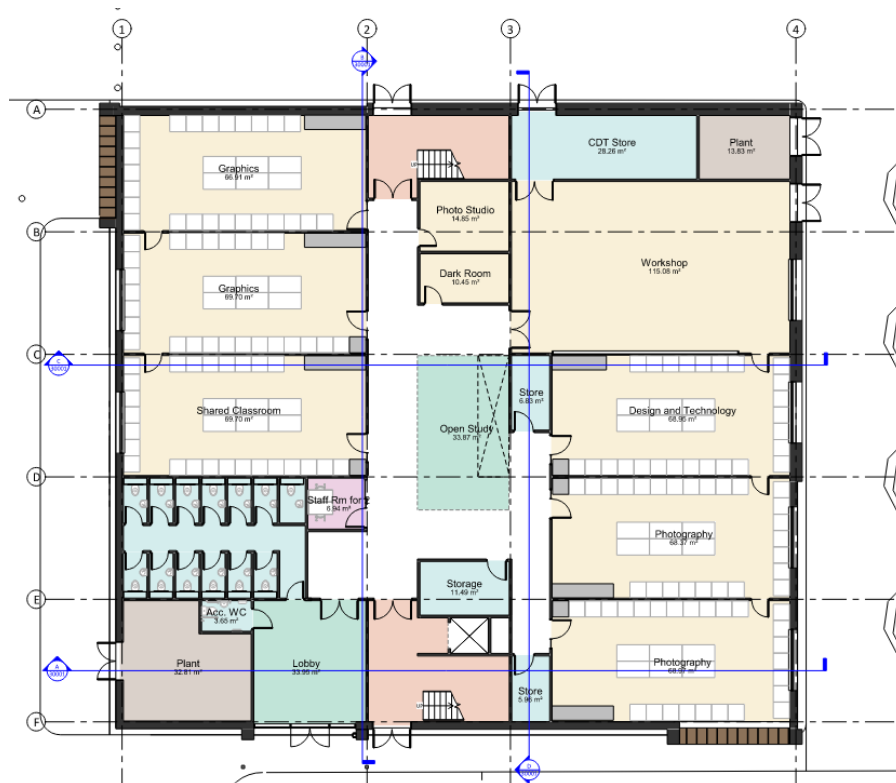


Figure 2. Plan of the ground floor

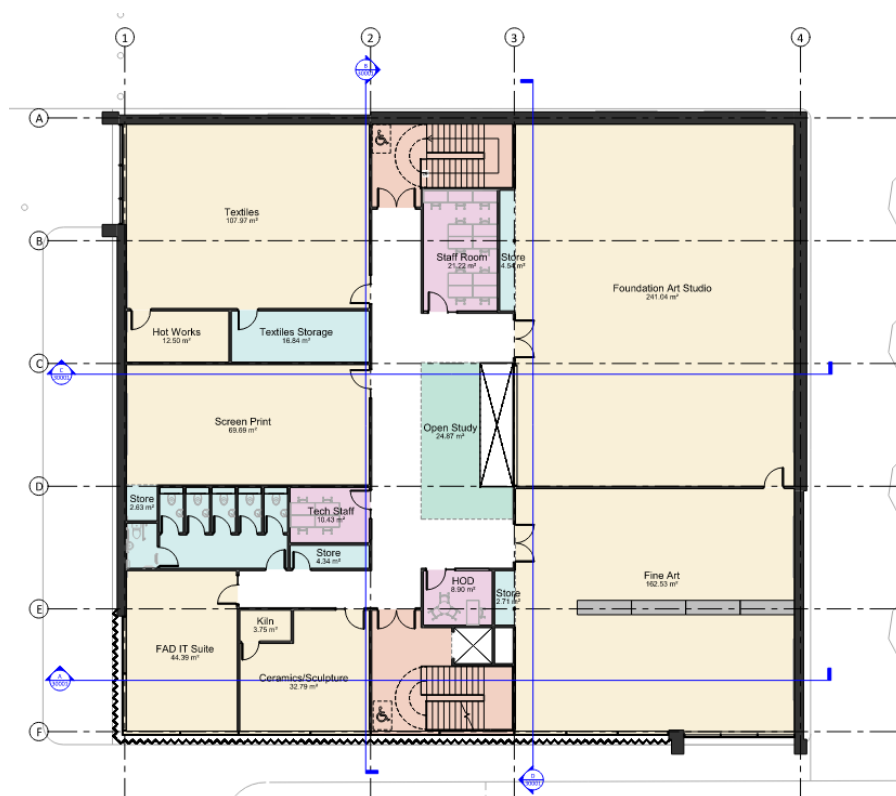


Figure 3. Plan of the first floor

3 Acoustic Criteria

3.1 BREEAM 2018

Credits under BREEAM 2018 are sought for this scheme, with two relevant areas available for acoustics, POL05 and HEA05. Both POL05 and HEA05 have performance requirements to meet, along with testing requirements to demonstrate compliance.

Suitably Qualified Acoustician

The assessment under BREEAM needs to be carried out by a Suitably Qualified Acoustician (SQA). In this case the noise survey has been carried out by Jonathan Croft AMIOA and supervised by David O'Neill MIOA as the SQA for the noise assessment report. Tony James MIOA, will be the main SQA for the project.

David O'Neill BEng CEng MSc MIOA. David holds a degree in acoustics and vibration from the Institute of Sound and Vibration Research at Southampton University and a Master of Science with distinction in Environmental Acoustics from South Bank University. David is a Chartered Engineer and has 30 years' continuous experience in acoustic consultancy.

Tony James BSc PgDip MIOA. Tony has over 6 years' experience in acoustic design and assessment works. He has a first class degree in BSC Audio and Recording Technology from De Montfort University and the IOA Postgraduate Diploma. Tony is a full Member of the Institute of Acoustics (MIOA).

POL05 – Reduction of noise pollution

One credit is available for reducing the likelihood of noise arising from fixed plant installations on the new development affecting nearby noise-sensitive buildings. Criteria are automatically met where no noise-sensitive areas within the building, to within an 800m radius of the assessed site; however, this is not the case at Barton Peveril. Where there are noise-sensitive areas, a noise impact assessment compliant with BS 4142:2014 and BS 7558 must be commissioned and carried out by a suitably qualified acoustician. The assessment must show that the rating noise (L_{Ar}) from the assessed building will be at least 5 dB below the background noise level (L_{A90}) at the nearest or most exposed noise-sensitive development throughout the day and the night. Compliance at the design stage can be done using acousticians' calculations.

HEA05 – Acoustic Performance

For a college, up to three credits are available under Hea 05.

The following is required to demonstrate compliance:

The building meets the appropriate acoustic performance standards and testing requirements defined in the table below. These tables define criteria for the acoustic principles of:

1.a: Sound insulation

1.b: Indoor ambient noise level

1.c: Room acoustics.

First credit - Sound insulation

Criteria

Achieve the performance standards set out in Section 1 of Building Bulletin 93: Acoustic design of schools: performance standards, February 2015 (BB93)¹ relating to airborne sound insulation between spaces and impact sound insulation of floors.

Testing requirement

A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the BB93 requirements and the Association of Noise Consultants (ANC) Good Practice Guide, Acoustic testing of Schools².

Second credit - Indoor ambient noise levels

Criteria Achieve the indoor ambient noise level standards within Section 1 of BB93 for all room types.

Testing requirement

A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the ANC Good Practice Guide, Acoustic testing of schools.

Third credit - Room acoustics

Criteria

Room acoustics (Control of reverberation, sound absorption and speech transmission index (STI)):

Teaching and study spaces achieve the requirements relating to reverberation time for teaching and study spaces set out within Section 1 of BB93.

Open plan teaching spaces achieve the performance requirements relating to reverberation time and STI set out within Section 1 of BB93.

Corridor and stairwells, for those that give direct access to teaching and study spaces, achieve the performance requirements relating to sound absorption.

Testing requirement

Teaching and study spaces:

A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the requirements of BB93 and ANC Good Practice Guide, Acoustic testing of schools.

Open plan teaching spaces:

A programme of pre-completion acoustic testing of reverberation time is carried out within open plan teaching spaces. The measurement is carried out by a compliant test body in accordance with the requirements of BB93 and ANC Good Practice Guide, Acoustic testing of schools. STI testing is not required. To demonstrate compliance the SQA shall undertake measurements of reverberation times to compare against the STI model. The SQA should provide a report confirming that the surface finishes and distribution of sound absorption within the completed space is in line with the design intent implemented within the STI model. Where significant

changes or differences are observed, the SQA shall re-model the space accordingly to demonstrate that the STI measurement is met by the completed spaces.

Corridors and stairwells:

Installation of a specification compliant with the BB93 criteria demonstrates compliance.

A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.

Compliance testing

The contractor will need to arrange for the testing to be carried out by an appropriately accredited test organisation. The arrangements should include confirmation that appropriate measures have been installed for those areas where testing is not required but a design requirement applies. The testing will need to include testing to a sample of rooms meeting the requirements set out in BB93 and including:

- Airborne sound insulation between rooms (floors and walls)
- Impact sound insulation between rooms (floors)
- Internal noise levels
- Reverberation times

The contractor should submit a proposed test schedule for approval by the client team's acoustic advisers at least a week before the proposed testing. The testing will need to demonstrate compliance with the performance requirements in this report; any shortfalls will need to be made good and retesting carried out.

3.2 Planning

This survey report has been produced to accompany an application for planning permission. It is accepted that further information regarding the specifications of noise generating plant may be requested via planning condition. A recent application for the college (business school application F/21/90116) included the following condition, and a similar condition may be expected again:

Prior to the installation of any fixed plant or equipment on the exterior of the building or within the application site, the details of the fixed plant or equipment shall be submitted to and approved in writing by the Local Planning Authority. The details provide the specifications of the plant or equipment to be installed, their cumulative noise emissions and any mitigation necessary to ensure that the cumulative emission of such plant would not have an unacceptable impact on residential properties.

Reasons: in the interest of residential amenity.

This sets no specific numerical requirement for a plant noise assessment, but requires the plant noise to "not have an unacceptable impact on residential properties". It is expected that compliance with the BREEAM Pol 05 requirement requiring the rating level to be 5dB below the background level will be adequate to protect residential amenity and comply with potential plant emissions planning conditions. However, if the local authority imposes a more onerous planning requirement, the contractor will also be responsible for meeting that requirement.

3.3 Building Bulletin 93

The Hea 05 credits refer to compliance with design criteria from Building Bulletin 93 (BB93) which is the acoustic design guidance for schools for compliance with Building Regulation E4. This building is not a school, and therefore there is no Building Regulation acoustic requirements. However, the BB93 performance requirements need to be considered for BREEAM Hea05. They also represent good practice guidance for college teaching accommodation.

BB93 includes criteria in respect of internal sound insulation, control of reverberation and noise levels. This report addresses only external noise, and so only the internal noise in respect of external noise is considered. The other matters for BREEA Hea 05 will be addressed in an acoustic design report.

BB93 sets internal noise limits (IANL) for teaching rooms as set out in Table XX. BB93 permits a 5dB relaxation on the IANL values where the building is naturally ventilated. So the IANL value would apply for rooms which are either wholly mechanically ventilated or hybrid rooms when they are mechanically ventilated. The 5dB relaxation then applies when the rooms are ventilated through natural means, as shown in Table 1.

Table 1. Noise criteria for the teaching spaces including 5dB relaxation for ventilation.

Room type (as described in BB93)	IANL (dB, $L_{Aeq,30min}$)	5dB relaxation for natural ventilation ($L_{Aeq,T.}$)
Art teaching spaces; fine-art, photography, textiles, glassworks, Craft, Design and Technology, etc.	40	45
Atrium, General Store	45	50
WC	50	-

4 Noise Survey

4.1 Methodology and Equipment

A baseline noise survey has been undertaken at the site to quantify noise levels affecting the building over several days. The survey included a noise logger, which was left for two days. The survey was carried out according to BS 4142: 2014 and BS 7445 in line with the requirements of Pol 05.

The location of the measurement position is described below, as well as illustrated in Figure 1, and shown in Figure 4 below.

- **MP1** – Unattended logger position in a free-field location on an existing temporary school building representative of the location of the proposed School of Art and Design.

Position MP1 is in a similar location to the proposed building and, therefore, will represent noise levels affecting it. Additionally, it is a good proxy for the background noise levels affecting housing on Cherbourg Road and Tennyson Road.



Figure 4 – View of Sound level meter MP1 set up on roof, facing north east

The survey was carried out from 29th November to 1st December 2022. The equipment used for the survey was a Rion NL52 logging meter set to log various octave band and dBA noise indices L_{eq} , L_{90} , L_{Fmax} during sequential 15-minute measurement periods. The sound level meter was calibrated using a Brüel and Kjær 4231 calibrator. The microphone was fitted with a type WS-15 windshield. The microphone was placed 1.5m above a single storey roof, which is considered free-field and around 4m above local ground level.

Weather conditions during the survey were forecasted to be acceptable throughout the survey. The observations made at set up and collection were dry with low wind speeds of 0.5m/s at set up and collection. The weather forecast for the period had consistently low wind speeds and dry conditions, which was the reason this period was used.

4.2 Results

All broadband measurements from MP1 are provided in Appendix A, with a time history graph of measurements below in Figures 5-7.

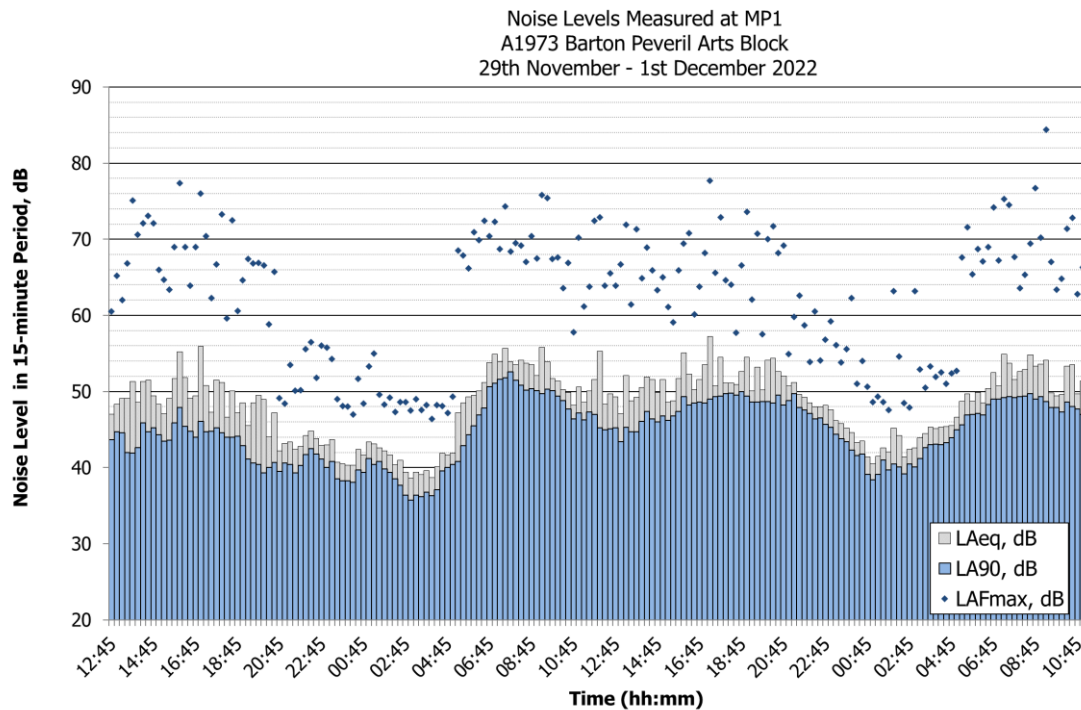


Figure 5 – Time history graph of measurements at MP1 averaged over 15-minute periods.

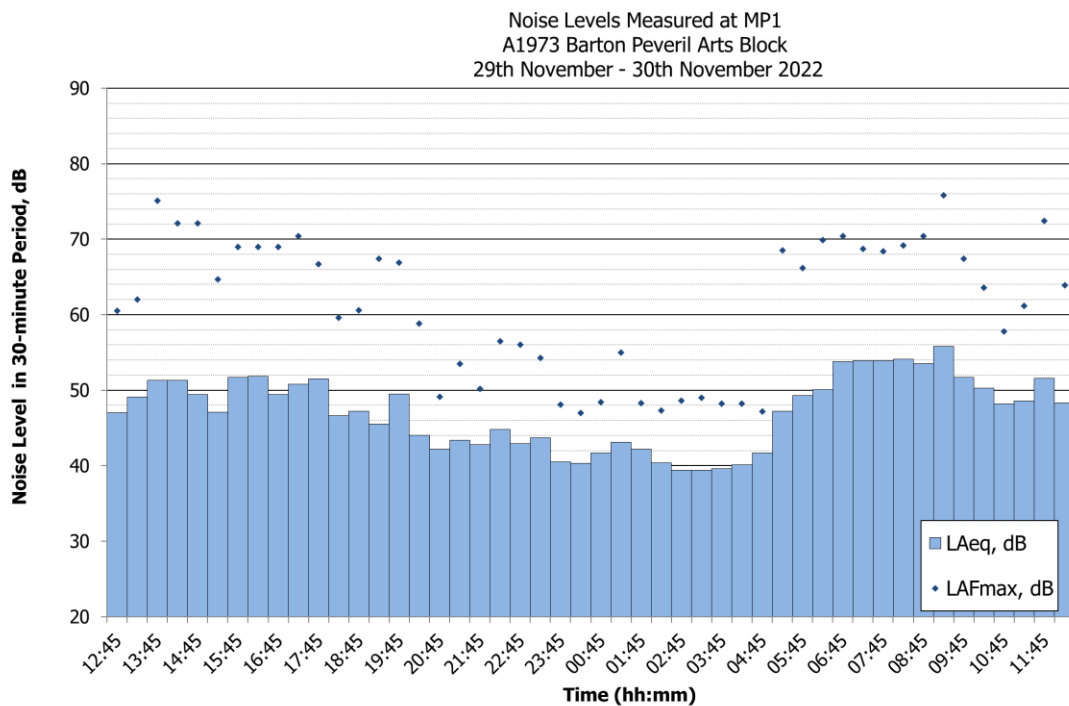


Figure 6 – Time history graph of measurements at MP1 averaged over 30-minute periods, 29th November – 30th November.

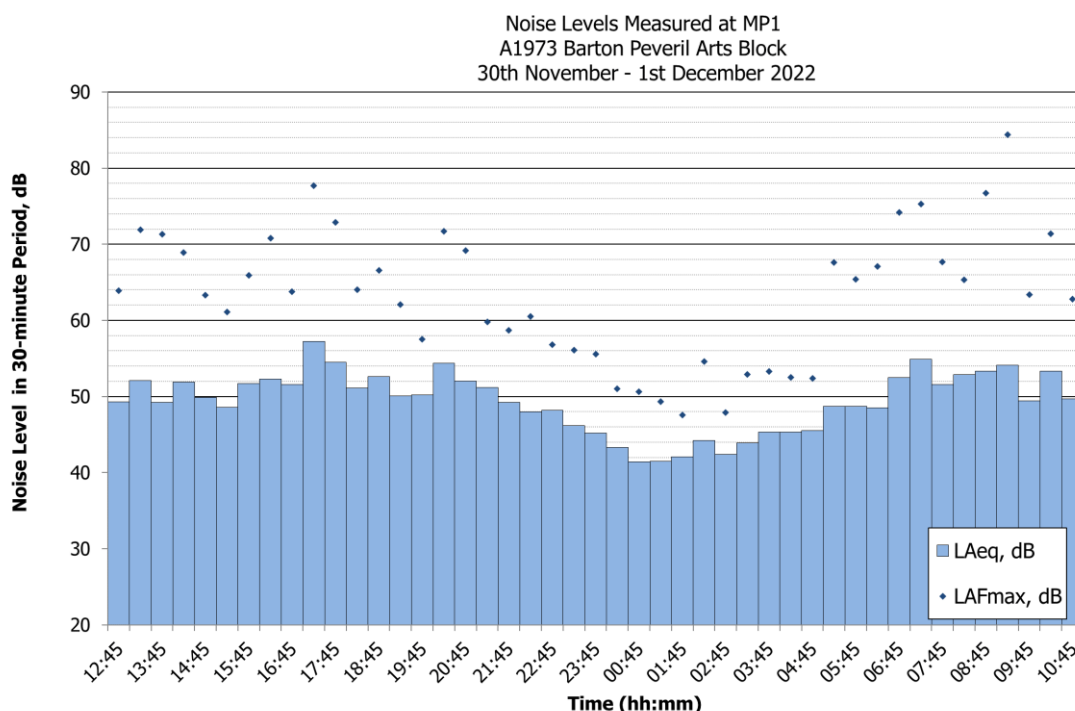


Figure 7 – Time history graph of measurements at MP1 averaged over 30-minute periods, 30th November – 1st December.

Generally, the noise levels are moderate during the day. Noise levels were mostly affected by road traffic on Chestnut Avenue, the A335, and the more distant M27 and M3 motorways. Aircraft noises were also heard from Southampton Airport. There was some activity around the building from vehicles and motorbikes/scooters which also contributed to the noise levels, although would not be present in the final scheme. There were condenser units fixed to the side of the existing building, but these were not operational during the survey and did not affect the survey.

A summary of the noise levels has been provided in Table 2 below. Typical background noise levels have been determined; these can be seen in the frequency distribution of the integer L_{A90} values as discussed in BS 4142:2014, as shown in Figure 8.

Table 2 – Summary of free-field noise levels measured during the survey at MP1

Period	Time hh:mm	Average ¹ Noise Level, dB $L_{Aeq,15mins}$	Representative Background Noise Level, dB L_{A90}	Maximum Noise level, dB L_{AFmax}
Day	07:00-19:00	52	45	84
Evening	19:00-23:00	50	41	74
Night	23:00-07:00	46	39	74

¹Logarithmic average of measured $L_{Aeq,T}$ during the day, evening, and night.

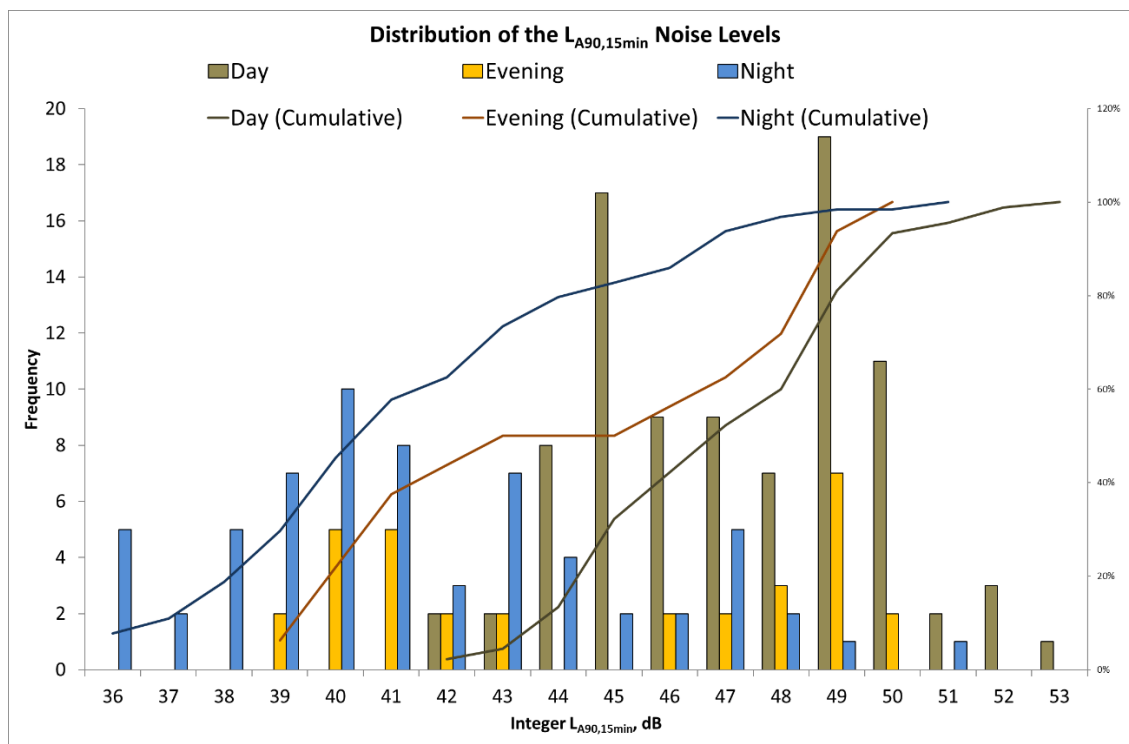


Figure 8 – Distribution of $L_{A90,15\text{minute}}$ noise levels during the day, evening, and night.

5 Plant Noise Limits – POL05

The plant noise emissions limits are based on the requirements for BREEAM Pol 05 with the limit for the rating level set at 5dB below the typical background noise levels. There is also likely to be a planning requirement in respect of plant emissions. BS 4142:2014 states that a rating level no greater than the background level is a low noise impact, therefore adopting the BREEAM Pol 05 limit would give 5dB better protection than that, and is therefore considered an acceptable limit for both Pol 05 and planning purposes.

POL05 criteria are set at a relative value to the representative background noise level. Plant noise levels have been derived from the background noise levels in Table 1 and provided in Table 3 below:

Table 3 – Proposed Plant Noise Limits

Period	Representative Background Noise Level, L_{A90}	Criterion relative to L_{A90}	Proposed Plant Noise Limits, $L_{A,T,Tf}$
Day (07:00-19:00)	45dB	-5dB	40dB
Evening (19:00-23:00)	41dB	-5dB	36dB
Night (23:00-07:00)	39dB	-5dB	34dB

The specific external plant equipment is not selected at this point; however, the plant noise limits given in Table 2 above represent the limits for the acoustician's calculations which BREEAM POL05 accepts as a demonstration of compliance during the design stage. The limit applies to the

aggregate of all plant operating associated with the scheme. Calculations will be required to demonstrate compliance.

The limit has been calculated from a free field measurement at MP1, which is representative of a nearby residential assessment position. The limit, however, applies at 1m from the façade of the residences; therefore, if commissioning measurements were performed at this distance from the façade, results would be expected to be 3dB higher due to façade reflections.

6 Internal Ambient Noise – HEA05

6.1 Building Envelope Sound Insulation

Internal Ambient Noise Level criteria are set in terms of $L_{Aeq,30min}$ as used within BB93. Appropriate values for all areas have been taken from BB93 and BS8233:2014. It should be noted that BB93 allows a relaxation of the IANL by 5 dB where a room is naturally ventilated; however, the IANL value given in the acoustic requirement markup would still be necessary for internal mechanical plant equipment.

BB93 provides guidance on the amount of attenuation achieved from the external to the internal level through windows open for ventilation. It states that typically 16 dB(A) attenuation can be achieved for single-sided ventilation (openings on one façade) and 20 dB(A) attenuation for cross ventilation where windows on two sides need to be opened to a lesser degree to achieve sufficient airflow and ventilation.

6.2 Indoor Ambient Noise Levels

The building will be used for multidisciplinary arts, including fine art, photography, textiles, glassworks, and Craft, Design and Technology. Therefore, BB93 classifies these rooms as design and technology. These rooms will have an upper limit for the indoor ambient noise level of 40 dB $L_{Aeq,30mins}$.

Other rooms within the buildings include an atrium and WCs, the upper limits for these rooms, according to BB93 are 45dB and 50dB, respectively.

The representative external daytime ambient noise levels were 52dB $L_{Aeq,T}$. The internal noise levels expected for single-sided ventilation and cross-ventilation are set out in Table 4, using the 16dB and 20dB attenuation levels, respectively, as discussed earlier.

Table 4 - Ventilation limitations for each room type.

Room type (as described in BB93)	IANL (dB, $L_{Aeq,30min}$)	External day ambient noise ($L_{Aeq,T}$)	Single-sided ventilation (-16dB)	Cross-ventilation (-20dB)
Art teaching spaces; fine-art, photography, textiles, glassworks, Craft, Design and Technology, etc.	40	52	36	32
Atrium, General Store	45			
WC	50			

As shown, the external ambient daytime noise level is low enough that single-sided or cross-ventilation would be sufficient to meet the internal ambient noise limits.

The IANL internal noise limits can be comfortably met with windows closed with standard thermal double-glazed windows and most forms of practical building envelope. Therefore, there are no specific minimum building envelope sound insulation requirements.

It is noted that the noise levels measured were affected by various activity in the near field which will not be present following the development and therefore the noise levels measured during the day are considered to be higher than would be expected in the future.

7 Conclusion

This report documents the baseline noise survey at Barton Peveril College regarding the development of the proposed School of Art and Design block and forms the noise report for planning and BREEAM. Relevant criteria relating to BREEAM POL05 and HEA05 and BB93 are set out.

Plant noise limits have been determined from the noise survey based on the requirements of POL05. These plant noise limits are considered appropriate to satisfy potential local authority plant noise emissions requirements.

Internal HEA05 criteria have been considered, for which the internal noise levels with openable windows for ventilation would be are low enough that the building could be natural ventilated from an acoustic point of view.

Glossary of Acoustic Terms

dB – Decibel. The unit used to describe noise levels. It is a logarithmic ratio of the sound pressure.

A Weighting – A frequency weighting applied to the measured sound spectrum which corrects the level to simulate the frequency response of the hearing system to sound levels of varying frequencies.

L_{eq} – This is a quasi-average noise level which includes all the sound energy during the measurement period averaged out across the period. It is typically used to describe the ambient noise level. The A weighted value is the L_{Aeq}.

L₉₀ – This is the level exceeded for 90% of the measurement period and indicates the steady underlying background noise level. The A weighted Level is the L_{A90}.

R_w - Weighted sound reduction index of a single element only: dB. This is generally tested in a laboratory and does not account for any flanking or other sound paths.

D_w - Weighted level difference: dB. This is the sound level difference between two rooms and also includes the effect of flanking, other sound paths, workmanship, on site construction and absorption in the receiver room.

RT - Reverberation Time: seconds. This is the time taken for reverberant sound in the room to decay by 60 dB. A dead space with many soft finishes would have a short RT whereas a lively space, comprising mainly hard surfaces, would have a long RT.

NR - The Noise Rating, NR, is used to describe steady noise levels such as mechanical services noise. A family of curves is defined in octave frequency bands and the NR rating for a particular noise is the lowest NR curve which is entirely above the spectrum of the noise under consideration.

Appendix A
Barton Peveril College, School of Art and Design
Baseline Noise Survey –
Full Measurement Details



Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB	Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB
29/11/2022 12:30	53.9	83.5	47.0	30/11/2022 00:30	42.4	51.7	39.7
29/11/2022 12:45	47.0	60.5	43.7	30/11/2022 00:45	41.7	48.4	39.4
29/11/2022 13:00	48.3	65.2	44.7	30/11/2022 01:00	43.4	53.3	41.2
29/11/2022 13:15	49.1	62.0	44.6	30/11/2022 01:15	43.1	55.0	40.4
29/11/2022 13:30	49.1	66.8	42.0	30/11/2022 01:30	42.6	49.6	40.8
29/11/2022 13:45	51.3	75.1	41.9	30/11/2022 01:45	42.2	48.3	39.8
29/11/2022 14:00	48.6	70.6	42.6	30/11/2022 02:00	41.7	49.2	39.4
29/11/2022 14:15	51.3	72.1	45.9	30/11/2022 02:15	40.4	47.3	38.5
29/11/2022 14:30	51.5	73.1	44.7	30/11/2022 02:30	41.0	48.6	37.7
29/11/2022 14:45	49.4	72.1	45.2	30/11/2022 02:45	39.4	48.6	36.4
29/11/2022 15:00	48.3	66.0	44.3	30/11/2022 03:00	38.6	47.5	35.7
29/11/2022 15:15	47.1	64.7	43.5	30/11/2022 03:15	39.4	49.0	36.4
29/11/2022 15:30	49.1	63.4	43.6	30/11/2022 03:30	39.1	47.6	36.2
29/11/2022 15:45	51.7	69.0	45.9	30/11/2022 03:45	39.6	48.2	36.8
29/11/2022 16:00	55.2	77.4	47.9	30/11/2022 04:00	38.7	46.4	36.3
29/11/2022 16:15	51.8	69.0	45.4	30/11/2022 04:15	40.1	48.2	37.1
29/11/2022 16:30	49.1	63.9	44.8	30/11/2022 04:30	41.9	48.1	39.6
29/11/2022 16:45	49.4	69.0	44.0	30/11/2022 04:45	41.7	47.2	40.0
29/11/2022 17:00	55.9	76.0	46.1	30/11/2022 05:00	41.9	49.3	40.4
29/11/2022 17:15	50.8	70.4	44.7	30/11/2022 05:15	47.2	68.5	40.8
29/11/2022 17:30	47.3	62.3	44.8	30/11/2022 05:30	48.5	67.9	42.9
29/11/2022 17:45	51.5	66.7	45.2	30/11/2022 05:45	49.3	66.2	44.3
29/11/2022 18:00	51.2	73.3	44.6	30/11/2022 06:00	49.5	70.9	45.5
29/11/2022 18:15	46.6	59.6	44.0	30/11/2022 06:15	50.1	69.9	46.9
29/11/2022 18:30	50.1	72.5	44.0	30/11/2022 06:30	51.2	72.4	47.8
29/11/2022 18:45	47.2	60.6	44.1	30/11/2022 06:45	53.8	70.4	50.6
29/11/2022 19:00	48.5	64.6	42.9	30/11/2022 07:00	54.9	72.3	51.1
29/11/2022 19:15	45.5	67.4	41.1	30/11/2022 07:15	53.9	68.7	51.6
29/11/2022 19:30	48.5	66.8	40.6	30/11/2022 07:30	55.7	74.3	51.8
29/11/2022 19:45	49.5	66.9	40.4	30/11/2022 07:45	53.9	68.4	52.6
29/11/2022 20:00	49.0	66.6	39.3	30/11/2022 08:00	53.5	69.5	51.5
29/11/2022 20:15	44.0	58.8	40.0	30/11/2022 08:15	54.1	69.2	50.8
29/11/2022 20:30	47.2	65.7	40.7	30/11/2022 08:30	53.7	67.0	50.2
29/11/2022 20:45	42.2	49.1	39.5	30/11/2022 08:45	53.5	70.4	50.4
29/11/2022 21:00	43.2	48.4	40.6	30/11/2022 09:00	52.1	67.5	50.1
29/11/2022 21:15	43.4	53.5	40.4	30/11/2022 09:15	55.8	75.8	49.7
29/11/2022 21:30	42.4	50.1	39.3	30/11/2022 09:30	53.9	75.4	50.3
29/11/2022 21:45	42.8	50.2	40.3	30/11/2022 09:45	51.7	67.4	50.1
29/11/2022 22:00	44.2	55.6	41.7	30/11/2022 10:00	51.4	67.6	49.4
29/11/2022 22:15	44.8	56.5	42.5	30/11/2022 10:15	50.3	63.6	48.8
29/11/2022 22:30	43.8	51.8	41.8	30/11/2022 10:30	49.9	66.9	47.7
29/11/2022 22:45	42.9	56.0	41.1	30/11/2022 10:45	48.2	57.8	46.4
29/11/2022 23:00	43.0	55.8	40.0	30/11/2022 11:00	50.6	70.2	47.2
29/11/2022 23:15	43.7	54.3	40.8	30/11/2022 11:15	48.6	61.2	46.3
29/11/2022 23:30	40.7	49.0	38.5	30/11/2022 11:30	50.1	63.8	47.3
29/11/2022 23:45	40.5	48.1	38.3	30/11/2022 11:45	51.6	72.4	47.0
30/11/2022 00:00	40.3	48.0	38.3	30/11/2022 12:00	55.3	72.9	45.2
30/11/2022 00:15	40.3	47.0	38.1	30/11/2022 12:15	48.3	63.9	45.0

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Barton Peveril College, School of Art and Design
Baseline Noise Survey –
Full Measurement Details



Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB	Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB
30/11/2022 12:30	49.7	65.5	45.1	01/12/2022 00:30	43.5	54.0	41.8
30/11/2022 12:45	49.3	63.9	45.2	01/12/2022 00:45	41.4	50.6	39.1
30/11/2022 13:00	47.1	66.7	43.4	01/12/2022 01:00	40.5	48.6	38.4
30/11/2022 13:15	52.1	71.9	45.3	01/12/2022 01:15	41.5	49.3	39.1
30/11/2022 13:30	48.8	61.4	44.7	01/12/2022 01:30	42.6	48.6	41.0
30/11/2022 13:45	49.2	71.3	44.7	01/12/2022 01:45	42.1	47.6	39.7
30/11/2022 14:00	50.5	64.9	46.1	01/12/2022 02:00	45.2	63.2	40.5
30/11/2022 14:15	51.9	68.9	47.4	01/12/2022 02:15	44.2	54.6	40.1
30/11/2022 14:30	51.6	65.9	46.4	01/12/2022 02:30	41.4	48.5	39.2
30/11/2022 14:45	49.9	63.3	46.0	01/12/2022 02:45	42.4	47.9	40.5
30/11/2022 15:00	51.6	65.0	46.8	01/12/2022 03:00	42.6	63.2	40.1
30/11/2022 15:15	48.6	61.1	46.2	01/12/2022 03:15	43.9	52.9	41.2
30/11/2022 15:30	48.8	59.1	46.8	01/12/2022 03:30	44.5	50.5	42.6
30/11/2022 15:45	51.7	65.9	47.4	01/12/2022 03:45	45.3	53.3	43.0
30/11/2022 16:00	55.1	69.4	49.3	01/12/2022 04:00	45.1	51.9	43.1
30/11/2022 16:15	52.3	70.8	48.2	01/12/2022 04:15	45.3	52.5	43.0
30/11/2022 16:30	50.3	60.1	48.5	01/12/2022 04:30	45.4	51.0	43.3
30/11/2022 16:45	51.6	63.8	48.6	01/12/2022 04:45	45.5	52.4	43.9
30/11/2022 17:00	53.5	68.2	48.5	01/12/2022 05:00	46.6	52.7	45.0
30/11/2022 17:15	57.2	77.7	49.0	01/12/2022 05:15	48.7	67.6	45.6
30/11/2022 17:30	50.7	65.6	49.3	01/12/2022 05:30	49.7	71.6	46.9
30/11/2022 17:45	54.5	72.9	49.4	01/12/2022 05:45	48.7	65.4	47.0
30/11/2022 18:00	51.1	64.6	49.7	01/12/2022 06:00	49.9	68.7	47.1
30/11/2022 18:15	51.1	64.0	49.8	01/12/2022 06:15	48.5	67.1	46.9
30/11/2022 18:30	50.9	57.7	49.5	01/12/2022 06:30	50.4	69.0	48.3
30/11/2022 18:45	52.6	66.6	50.0	01/12/2022 06:45	52.5	74.2	49.0
30/11/2022 19:00	54.5	73.6	49.4	01/12/2022 07:00	50.7	67.2	49.0
30/11/2022 19:15	50.1	62.1	48.6	01/12/2022 07:15	54.9	75.3	49.2
30/11/2022 19:30	53.2	70.7	48.6	01/12/2022 07:30	53.7	74.5	49.3
30/11/2022 19:45	50.2	57.5	48.7	01/12/2022 07:45	51.6	67.7	49.2
30/11/2022 20:00	54.1	70.0	48.7	01/12/2022 08:00	52.6	63.6	49.3
30/11/2022 20:15	54.4	71.7	48.5	01/12/2022 08:15	52.9	65.3	49.4
30/11/2022 20:30	52.6	68.2	49.5	01/12/2022 08:30	54.8	69.4	49.7
30/11/2022 20:45	52.0	69.2	48.2	01/12/2022 08:45	53.3	76.7	49.0
30/11/2022 21:00	50.7	54.9	48.8	01/12/2022 09:00	53.6	70.2	49.3
30/11/2022 21:15	51.2	59.8	49.7	01/12/2022 09:15	54.1	84.4	48.7
30/11/2022 21:30	49.6	62.6	47.9	01/12/2022 09:30	49.8	67.0	47.9
30/11/2022 21:45	49.2	58.7	47.6	01/12/2022 09:45	49.4	63.4	47.9
30/11/2022 22:00	48.5	53.9	47.1	01/12/2022 10:00	49.6	64.8	47.3
30/11/2022 22:15	48.0	60.5	46.4	01/12/2022 10:15	53.3	71.4	48.6
30/11/2022 22:30	48.0	54.1	46.5	01/12/2022 10:30	53.5	72.8	48.0
30/11/2022 22:45	48.2	56.8	45.7	01/12/2022 10:45	49.7	62.8	47.7
30/11/2022 23:00	47.6	59.2	45.3	01/12/2022 11:00	51.4	66.3	47.0
30/11/2022 23:15	46.2	56.1	44.4				
30/11/2022 23:30	45.8	53.8	43.8				
30/11/2022 23:45	45.2	55.6	43.4				
01/12/2022 00:00	44.6	62.3	42.3				
01/12/2022 00:15	43.3	51.0	41.6				