



**BAM**

**GLAN CLWYD HOSPITAL -  
ABLETT UNIT REDEVELOPMENT**

**NOISE ASSESSMENT FOR PLANNING**

14 August 2020

AEC REPORT: P4144/R01/DMT

**Acoustic & Engineering Consultants Limited**

Lockside 1 Stockport Road Marple Stockport Cheshire SK6 6BD  
Telephone 0161 449 5900 mail@aecltd.co.uk www.aecltd.co.uk



## CONTENTS

	Page
1.0 INTRODUCTION	3
2.0 BASIS OF ASSESSMENT	4
3.0 BASELINE NOISE SURVEY	6
4.0 ASSESSMENT BUILDING SERVICES PLANT	7
5.0 ASSESSMENT OF SITE SUITABILITY	8
6.0 CONCLUSIONS	10
FIGURE B-1 – Site Plan Showing Noise Measurement Locations	15
APPENDIX A - Acoustic Terminology in Brief	11
APPENDIX B – Baseline Noise Survey Details	13
APPENDIX C – Strategic Noise Maps	16

Prepared by:  D M Terry BSc(Hons) MIOA

Rev	Date	Document Details	Author	Checked By
-	14/08/20	Issue	DMT	RDC

## 1.0 INTRODUCTION

### General

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by BAM to undertake a baseline noise survey and noise assessment for planning purposes, of the proposals for the new Ablett Unit building at Glan Clwyd Hospital, Rhuddlan, Wales.
- 1.2 The proposals are to replace the existing Ablett wards building and construct a new three storey building, with three roof top plant rooms. The new building will contain a mix of single and multi-bed wards (bedrooms) and various other spaces including offices, treatment rooms and seminar rooms. There will also be external garden areas provided.
- 1.3 This noise assessment report provides the following:
  - Noise criteria for external plant noise emissions and guidance on internal noise levels;
  - The findings of a baseline noise measurement survey;
  - Assessment of building services plant noise limits;
  - Assessment of external noise levels and site suitability, and
  - Provides mitigation measures where appropriate.
- 1.4 Meeting the proposed criteria for internal noise levels and external plant noise emissions would also satisfy the requirements of BREEAM, if the associated credits are being sought. This would be developed during the design stages.
- 1.5 Acoustic terminology used in this report is presented in Appendix A.

### CDM Regulations

- 1.6 Although this report may reference specific products and/or manufacturers, these are included as a suitable example only and there will normally be numerous alternative products that could be used.
- 1.7 The final specifications for construction materials and methods would be prepared by others and any potential health and safety issues associated with the use of specific construction materials and/or methods must be confirmed based on all available information including that from the manufacturer and/or supplier.
- 1.8 Some of the risks associated with the use of materials commonly suggested for acoustic design purposes and certain construction methods could include:
  - manual handling of heavy blocks and boards;
  - handling of hazardous substances such as mineral wool, which can be an irritant and the appropriate protection should be worn during its use;
  - noise exposure of construction workers, which, although is the responsibility of the contractor, it is important that appropriate protection is provided where necessary.
- 1.9 Based on the proposed building use, it is believed that that operational noise levels will not be potentially hazardous to staff or patients, however, the Client may need to be aware of potential noise exposure in plant rooms and any MRI scanners (if relevant).

## 2.0 BASIS OF ASSESSMENT

### Policy and Guidance

- 2.1 The Planning Policy Wales (PPW)<sup>1</sup>, repeatedly states the need for noise pollution to be considered and mitigated, during both construction and operational phases. This is to minimise or avoid adverse effects on individuals and communities due to noise emissions.
- 2.2 The PPW is supplemented by a series of Technical Advice Notes (TANs). TAN-11 – ‘Noise’<sup>2</sup>, provides more detailed guidance on noise and how adverse impacts of noise can be minimised without placing unreasonable restrictions on development or adding unduly to the costs or administrative burdens of business.
- 2.3 Paragraph 8 of TAN-11 states that “*Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions*”.
- 2.4 TAN-11 acknowledges the need to consider the acoustic character of the noise source in question as this can affect the assessment of the effects. Further to this, Appendix B.17 of TAN-11 refers to BS4142:1990 (superseded by 2019 edition), which presents a method for assessing noise from industrial and commercial developments. This would be the industry standard guidance for assessing noise from external building services plant, such as that proposed on the roof of the proposed development.
- 2.5 As indicated above, one important point inferred from the PPW and TAN-11 guidance is that, whilst noise can override other planning concerns, it should not be considered in isolation from the economic, social and other environmental dimensions of any proposed development.

### External Building Services Plant – Assessment Method

- 2.6 External noise from building service plant is typically assessed to the guidance in BS 4142-2014+A1-2019 ‘*Methods for rating and assessing industrial and commercial sound*’ (BS4142).
- 2.7 In summary, BS4142 states that “*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.*”
- 2.8 A ‘rating’ noise level ( $dB_{L_{Ar,Tr}}$ ) is obtained by applying a character correction to the ‘specific’ noise level ( $dB_{A_{eq,Tr}}$ ) of a noise source (e.g. plant noise). The correction is applied if the noise has a defined acoustic character such as being tonal, impulsive, distinctive or intermittent in nature.

---

<sup>1</sup> PPW, published, December 2018

<sup>2</sup> TAN-11 ‘Noise’, published, October 1997

- 2.9 The magnitude of the correction is dependent on the character of the noise source and its level of perceptibility at the receiver. A correction of between 0 to +6dB and 0 to +9dB can be applied if the noise source is tonal or impulsive, respectively. Where the specific sound has characteristics, which are neither tonal nor impulsive but are distinctive against the residual sound climate, a +3dB penalty can be applied. A +3dB penalty can also be applied if the specific sound is intermittent in nature.
- 2.10 Based on the above, it is proposed that **the rating noise level from the proposed development is controlled to -5dB below the existing background noise level at the nearest noise sensitive receptors**. This would give a strong indication that the specific sound would have a low impact. Achieving this limit would be in-line with the aims of PPW and should satisfy any Local Authority requirements.

### Site Suitability (HTM 08-01) – Assessment Methodology

- 2.11 In terms of acoustics for healthcare buildings, and the suitability of the site, appropriate design advice is included in the Department of Health's Special Services '*Health Technical Memorandum 08-01: Acoustics*' (HTM 08-01).
- 2.12 To comply with HTM 08-01 the noise limits detailed in Table 2.1, below, for noise breaking in from external sources and mechanical services plant, must not be exceeded.

**Table 2.1 – Maximum Allowable Internal Noise Levels (HTM08-01)**

Room type		External sources, dBL <sub>Aeq,1h</sub>	Mechanical services noise (NR)
Single bed ward	Day (0700 to 2300h)	40	30
	Night (2300 to 0700h)	35 (& 45dBL <sub>AFmax</sub> )	
Multi bed ward	Day (0700 to 2300h)	45	
	Night (2300 to 0700h)	35 (& 45dBL <sub>AFmax</sub> )	
Large meeting rooms (>35m <sup>2</sup> ) – seminar, lecture theatres, classrooms			
En-suite toilet and shower		45	40
Small offices and meeting rooms (e.g. consulting, private office, small treatment, interview, small seminar)		40	35
Public Areas (waiting, dining, playroom)		50	40
Public and staff toilet and shower		55	45

- 2.13 With regard to the night-time maximum noise level limits for the wards, this is based on typical sources of noise, not occasional events (e.g. vehicle horns and helicopters).
- 2.14 HTM-08-01 does not stipulate noise level limits in external amenity areas (gardens). However, based on AEC's professional experience, noise levels in garden areas on a hospital site would ideally be less than 55dBL<sub>Aeq,T</sub>.

## 3.0 BASELINE NOISE SURVEY

### Measurement Methodology

- 3.1 AEC attended site on Thursday 16 and Friday 17 July 2020 to undertake external noise level measurements. Daytime measurements were undertaken on Thursday between approximately 1700 and 1810h and on Friday between approximately 1015 and 1245h. Night-time measurements were undertaken on Friday between approximately 0000 and 0240h.
- 3.2 The noise measurement survey was undertaken in general accordance with BS:7445-1: 2003 “*Description and measurement of environmental noise*” (BS7445-1) and HTM 08-01. The full measurement method is provided in Appendix B.
- 3.3 Noise measurements were undertaken at Location A, B and C, representing the proposed development and the nearby existing noise sensitive receptors. Noise measurement locations are identified on the attached Figure B-1 in Appendix B below.

### Measurement Findings

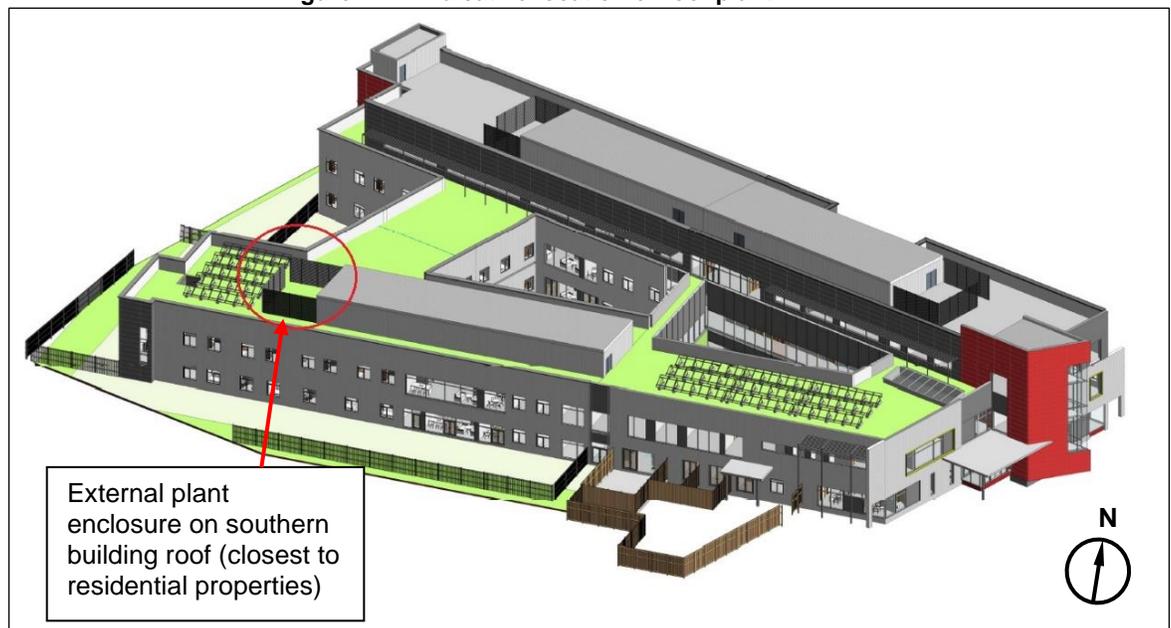
- 3.4 The noise climate affecting the site was dominated by mechanical building services associated with the existing hospital buildings. The main source of building services plant noise was from the roof of the pathology building. There are other distance sources of noise from the hospital site and a limited number of vehicle movements. There is some distant road traffic noise audible at locations A and B, due to vehicles on the A55.
- 3.5 In summary, the free-field noise levels affecting the proposed northern façade of the building, opposite the pathology building, are typically around  $57\text{dB}_{\text{L}_{\text{Aeq},1\text{hr}}}$  during the daytime and  $54\text{dB}_{\text{L}_{\text{Aeq},1\text{hr}}}$  during the night-time. In addition, free-field night-time maximum noise levels would typically be no greater than  $65\text{dB}_{\text{L}_{\text{Amax},\text{F}}}$  due to vehicles passing and trollies.
- 3.6 On the southern façade of the building and other elevations which are fully screened from the pathology building, free-field noise levels are typically around  $51\text{dB}_{\text{L}_{\text{Aeq},1\text{hr}}}$  during the daytime and  $46\text{dB}_{\text{L}_{\text{Aeq},1\text{hr}}}$  during the night-time. In addition, free-field night-time maximum noise levels would typically be no greater than  $60\text{dB}_{\text{L}_{\text{Amax},\text{F}}}$ , although seagulls could be slightly higher if active in the early morning period.
- 3.7 The background noise levels measured at the nearby residential properties (Location A and B) were typically  $46\text{dB}_{\text{L}_{\text{A90},\text{T}}}$  and  $43\text{dB}_{\text{L}_{\text{A90},\text{T}}}$  during the daytime and night-time periods, respectively. This noise was due to the constant building services plant noise from the pathology building.
- 3.8 Noise from ambulance sirens and helicopters are not included in this assessment. Ambulances were not using their sirens on-site during the noise survey and there were no helicopter flyovers observed. It is understood that occasional noise from these sources would be a site management issue.

- 3.9 It should be noted that while the noise measurements were taken during the Covid-19 restrictions, it is anticipated that the measured noise levels are representative due to activities in and around hospitals remaining unaffected during the restrictions. Any minor changes to the noise levels during 'normal' conditions are not expected to have any material affect on the advice given in this report.
- 3.10 The A55 is a major trunk road located approximately 530m to the south of the site. Traffic noise is audible at locations A and B, however, the existing building services plant noise is the dominant source.
- 3.11 In order to confirm that road traffic noise levels on the A55 have not reduced as a result of the Covid-19 restrictions, AEC has accessed the strategic noise maps produced by the Department of Agriculture, Environments and Rural Affairs (DEFRA). These are publicly available online and excerpts are provided in Appendix C. These maps show that the measured traffic noise levels are comparable to the predicted noise levels for normal conditions and therefore, would indicate that AEC's on-site measurements are suitable to be used in this noise assessment.

## 4.0 ASSESSMENT BUILDING SERVICES PLANT

- 4.1 It is understood that the mechanical plant serving the proposed development could be operational 24 hours a day, seven days a week. The majority of building services plant is split over three roof top plant rooms, each with an external plant enclosure.
- 4.2 The nearest noise sensitive properties to the new mechanical services plant would be the existing residential properties on Ffordd Park Castell. The plan distance between the external plant enclosure on the southern block of the proposed development (see Figure 4.1 below) and the nearest noise sensitive receptor on Ffordd park Castell is approximately 30 metres.

Figure 4.1 – Indicative location of roof plant



- 4.3 The night-time background noise levels measured at these residential receptors was around  $43\text{dB}_{\text{LA90}}$ . As such, noise from all new building services plant should be controlled to no greater than  $38\text{dB}_{\text{LA,r,T}}$  external to the windows of the existing residential receptors to comply with the proposed noise limit.
- 4.4 As an example, based on the above external plant area only and assuming a 3dB acoustic character correction for being distinct, this would equate to a plant noise level limit of approximately  $55\text{dB}_{\text{LAeq,T}}$  at 3 metres from the external plant noise enclosure.
- 4.5 Achieving this noise limit should not be particularly onerous, however, it will likely require standard design/mitigation measures, including: selection of quiet plant items; acoustic attenuation/silencers, and potentially other mitigation measures e.g. solid section of enclosure to the south and/or other screening.
- 4.6 There are no openings in the southern façade of the plantroom on the southern block. Noise from other the other plant rooms and plant enclosures should be controlled to a similar noise limit to ensure they do not also contribute to noise levels at the residential receptors. Noise from these plant areas will also need to be controlled to such a limit to ensure there are no issues with noise ingress to the sensitive rooms within the proposed development. This will require further consideration as the design develops.

#### Plant Mounting

- 4.7 The majority of the plant is understood to be located in the plant rooms/enclosures on the roof of the building. It will therefore be necessary to control structure-borne noise by effectively isolating roof mounted plant from the supporting structure where required. This will be developed as part of the acoustic design input.

## **5.0 ASSESSMENT OF SITE SUITABILITY**

- 5.1 Although this is not thought to be a strict planning requirement, an outline assessment of site suitability is provided below.

### **External Levels in Garden Areas**

- 5.2 The proposed garden areas are all fully or partially screened from the existing building services noise from the pathology building. Therefore, external noise levels in the proposed garden areas will be less than  $55\text{dB}_{\text{LAeq,T}}$  and are likely to be below  $50\text{dB}_{\text{LAeq,T}}$ , provided building service noise from the proposed development is suitably controlled. Therefore, based on the measured baseline noise levels and proposed layout, external noise levels in the garden areas will be suitable for its intended use.

## Internal Noise Levels

- 5.3 A partially open window for ventilation provides up to 15dB attenuation from outside to inside. Therefore, to meet the HTM08-01 internal noise levels detailed in Table 2.1 above, external noise levels should not typically exceed the following limits:
- Single Wards / Bedrooms - Daytime: 55dB<sub>LAeq,T</sub>
  - Single Wards / Bedrooms - Night-time: 50dB<sub>LAeq,T</sub>
  - Single Wards / Bedrooms - Night-time: 60dB<sub>LAmax,F</sub>
- 5.4 Based on the findings of the baseline noise measurement survey, it is expected that all elevations could be ventilated naturally, by means of a partially open window, with the exception of the northern elevation facing the pathology building, where mitigation measures would be required.
- 5.5 In terms of the mitigation measures on the northern elevation, initial calculations indicate that standard thermal double glazing and standard through the frame trickle vents should be sufficient to reduce external noise levels to meet the HTM-08-01 requirements inside the bedrooms of proposed development.
- 5.6 These mitigation measures would also be required to other noise sensitive rooms on the northern elevation including, small seminar rooms, consultation rooms, treatment rooms (not an exhaustive list). This will be developed as part of the acoustic design input.
- 5.7 In general, the proposed development site has been surveyed and is not considered excessively noisy. Therefore, in terms of noise, it is considered suitable for development of noise sensitive uses, including bedrooms, seminar rooms and consulting rooms (not an exhaustive list). Basic noise mitigation measures are required to the northern elevation in the form of standard thermal glazing and trickle vents, to allow background ventilation to be provided without the need to open windows. This will be developed with the design team.
- 5.8 There are no particular sound insulation requirements for the remaining elements of the building envelope, as the most basic wall and roof constructions will provide a suitable sound insulation performance. Where there is new building services plant proposed on the roof, suitable acoustic design advice will ensure the noise levels are controlled to other areas of the development and that the roof structure is suitable for the control of noise ingress.

## 6.0 CONCLUSIONS

- 6.1 AEC attended the proposed development site on Thursday 16 and Friday 17 July 2020 to undertake a baseline noise survey. This survey established the noise levels affecting the proposed development and the baseline background noise levels at the existing noise sensitive residential receptors on Fford Park Castell.
- 6.2 The night-time background noise levels measured at the residential receptors was around 43dB<sub>LA90</sub>. As such, it is recommended that free-field noise from all new building services plant should be controlled to no greater than 38dB<sub>LA,r,Tr</sub> external to the windows of the existing residential properties to comply with the proposed noise limit.
- 6.3 Achieving this plant noise limit would give a strong indication of a low impact on the residential receptors, in accordance with BS4142 and it should not be particularly onerous to meet this limit. However, it will likely require standard design/mitigation measures, including: selection of quiet plant items; acoustic attenuation/silencers, and potentially other mitigation measures e.g. solid section of enclosure to the south and/or other screening.
- 6.4 In terms of the site suitably, although not a strict planning requirement, the proposed development site has been surveyed and is not considered excessively noisy. Therefore, in terms of noise, it is considered suitable for development of noise sensitive uses, including bedrooms, seminar rooms and consulting rooms (not an exhaustive list). Basic noise mitigation measures are required to the northern elevation in the form of standard thermal glazing and trickle vents, to allow background ventilation to be provided without the need to open windows, if required. This will be developed with the design team.
- 6.5 Based on the above assessment and the implementation of the standard noise mitigation measures discussed, it is considered that noise should not be considered a determining factor in relation to the planning permission being sought for the proposed development.

## APPENDIX A - Acoustic Terminology in Brief

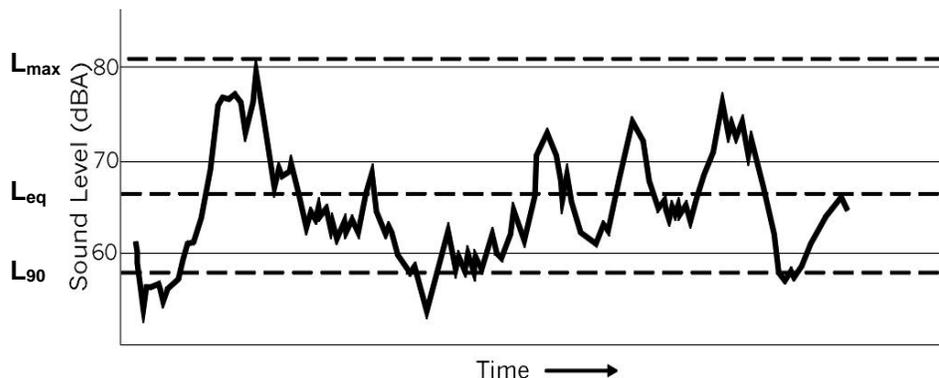
Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discreet frequency - a 'pure tone' - most sound is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasizes or reduces the importance of certain frequencies within the audible range.

### Sound Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the sound.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of sound can be described by several different levels. The most common of these are described below. It should be noted that in many instances in the main body of text, the unit will be preceded by a *dB* descriptor in the report e.g.  $L_{Aeq,T}$  could be written  $dB_{LAeq,T}$



Example of Sound Level Varying With Time

**$L_{Aeq,T}$**  The equivalent continuous (A-weighted) sound level. It may be thought of as the "average" sound level over a given time, *T*. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises and can be considered as the "ambient" noise level.

**$L_{A1}$**  The (A-weighted) sound level exceeded for 1% of a measurement period. It is the value generally used to indicate a 'typical' maximum noise level.

**$L_{A90}$**  The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe background noise.

**L<sub>Amax</sub>** The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' meter response should be cited.

**Free-field Level** This refers to the sound level measured outside, away from reflecting surfaces.

#### **Other Acoustics Units**

**NRC** Noise reduction coefficient – a single figure number sometimes used to describe the performance of sound absorbing materials based on a combination of its absorption coefficient at various frequencies.

**NR** Noise rating – a graphical method for assigning a single number rating to a noise spectrum and is often use to specify noise level limits for mechanical services.

## APPENDIX B – Baseline Noise Survey Details

<b>Date &amp; Time of Survey:</b>	Day - Thursday 16 July 2020, 1700 to 1810h Day – Friday 17 July 2020, 1015 to 1245h Night – Friday 17 June 2020, 0000 to 0240h					
<b>Personnel:</b>	David Terry (AEC)					
<b>Equipment Used:</b>	B&K 2260 Real Time Analyser (AEC Kit 2)					
<b>Calibration:</b>	The sound level analyser, which conforms to BS EN 61672-1: 2013 ' <i>Electro acoustics – sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
<b>Measurement Conditions:</b>	<b>Date</b>	<b>Period</b>	<b>Wet/Dry</b>	<b>Temp°C</b>	<b>Wind Speed &amp; Direction</b>	<b>Cloud Cover</b>
	16/07/2020	Day	Dry	18°C	1-2m/s southwesterly	80%
	17/07/2020	Night	Dry	15°C	Negligible	70%
	17/07/2020	Day	Dry	21°C	1-3m/s southwesterly	50%
<b>Measurement Locations:</b>	<p>Measurements were undertaken at three locations around the proposed development area. Identified as A to C on Figure B-1 and described below.</p> <p>A – Southwest corner of site and representative of residential properties on Ffordd Parc Castell.</p> <p>B – Southeast corner of site and representative of student accommodation.</p> <p>C – Northern site boundary, representative of northern building elevations, opposite existing pathology building.</p>					
<b>Measurement Details:</b>	Measurements were all undertaken over 15-minutes periods in terms of $L_{eq}$ , $L_{10}$ , $L_{90}$ , and $L_{max}$ .					
<b>Façade / Free-Field:</b>	All measurement positions were free-field.					
<b>Measured Data:</b>	Full 1/3 octave band centre frequency data was obtained for all measurements and can be made available on request.					
	Full results for the attended measurements are given in Tables B1 and B2.					

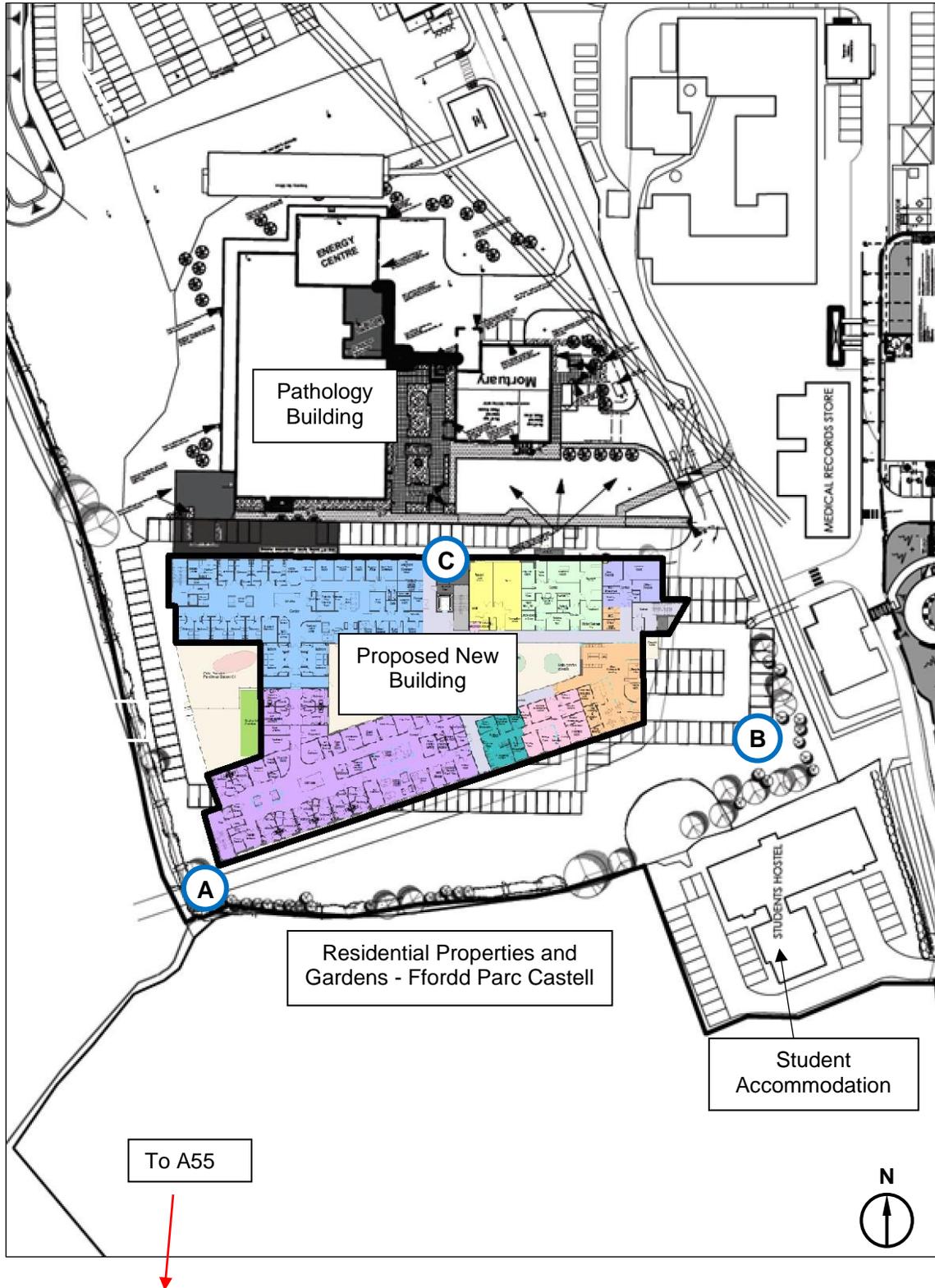
**TABLE B1 – Measured Daytime Noise Levels**

Location	Date	Period, h	Noise Level, dB				File / Comments
			L <sub>Aeq</sub>	L <sub>A1</sub>	L <sub>A90</sub>	L <sub>Amax, F</sub>	
A	16/07/2020	1716-1731	48.3	54.0	46.2	65.0	001 Plant noise and distant road traffic.
	17/07/2020	1017-1032	49.7	52.8	47.8	64.0	017 Plant noise and distant road traffic.
	17/07/2020	1113-1128	52.4	55.0	50.6	57.5	016 Plant noise and distant road traffic. – Wind increasing slightly to 3m/s.
B	16/07/2020	1733-1748	50.2	57.8	48.0	64.5	002 Constant noise from plant on Pathology building. Seagulls.
	17/07/2020	1035-1050	51.0	57.4	48.6	66.9	014 Constant noise from plant on Pathology building. Seagulls.
	17/07/2020	1135-1150	52.0	55.4	50.2	61.7	017 Constant noise from plant on Pathology building. Seagulls.
C	16/07/2020	1754-1809	56.2	64.4	53.6	75.9	003 Constant noise from existing plant on Pathology building. 76dBL <sub>Amax, F</sub> due to small van at 2 metres.
	17/07/2020	1051-1104	56.3	61.2	54.6	65.6	015 Constant noise from existing plant on Pathology building.
	17/07/2020	1230-1245	57.0	62.1	55.8	69.8	018 Constant noise from existing plant on Pathology building.

**TABLE B2 – Measured Night-Time Noise Levels – 17/07/2020**

Location	Period, h	Noise Level, dB				File Ref / Comments
		L <sub>Aeq</sub>	L <sub>A1</sub>	L <sub>A90</sub>	L <sub>Amax, F</sub>	
A	0002-0017	44.4	46.8	43.2	57.2	004 Hospital plant noise and distant road traffic.
	0104-0119	44.5	47.4	43.2	53.3	007 As above
	0152-0207	46.0	50.0	43.6	52.0	010 As above, Extra road traffic.
B	0019-0034	47.1	49.2	46.2	52.9	005 Hospital plant noise and distant road traffic.
	0120-0135	46.6	48.8	45.4	52.3	008 As above
	0209-0224	46.4	49.8	45.0	53.2	011 As above.
C	0041-0056	54.0	55.0	53.4	59.5	006 Hospital plant noise constant.
	0136-0151	54.6	56.2	53.8	63.5	009 As above.
	0225-0240	53.8	55.4	53.0	56.3	012 As above.

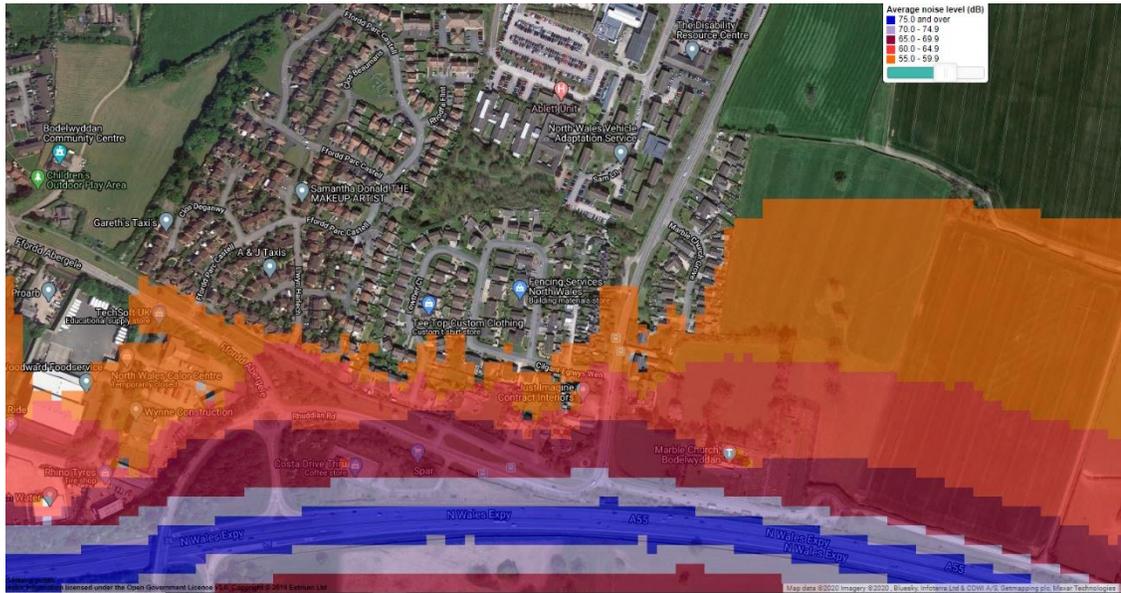
**FIGURE B-1 – Site Plan Showing Noise Measurement Locations**



### APPENDIX C – Strategic Noise Maps

#### C-1 - Daytime – LAeq,16hr (0700-2300h)

Site



#### C-2 - Night-time – LAeq,8hr (2300-0700h)

Site

