

Chapel Farm, Newbridge Road, Residential Development Ambient Noise & Building Envelope Assessment

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This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.

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1.0 SUMMARY

At the request of Fisher German (Chester), PDA Ltd has carried out a noise impact assessment for the proposed residential development at Chapel Farm, Newbridge Road, Cefn Mawr, Wrexham. The proposed development includes for the demolition of the existing farm building to site which is now derelict and the construction of a new residential dwelling in its place.

The assessment for the development has been undertaken in accordance with Technical Advice Noise (TAN) 11 – Noise. Overall the results of the noise survey and noise models indicate that the proposed development falls in NEC category B. In PDA's experience planning permission can usually be granted on the basis that suitable mitigation is applied to the proposed development.

To achieve the WHO 1999 & BS 8233 design criteria regarding internal noise levels, suitable minimum noise insulation specifications have been derived for the windows and trickle ventilators.

It is predicted that the recommended 55 dBA criteria will be exceeded within the external amenity spaces due to the proposed developments close proximity to Newbridge Road and the Trainline. However BS 8233, notes that the recommended design criteria is not achievable in all circumstances and that exceedance of 55 dBA does not indicate that the development should be prevented. The necessity to achieve the recommended 55 dBA external criteria should be considered against the benefits of including an external amenity area to the proposed development.

To achieve the WHO 1999 & BS 8233 internal ambient noise level criteria for bedrooms during the night-time period windows are required to remain closed. Therefore in accordance with ADO the overheating mitigation strategy for the proposed development should consider that windows may be required to remain closed during the hotter parts of the year and an alternative method of removing heat (other than opening windows) may be required.

All results are presented in this report.

2.0 SITE DESCRIPTION

The site is located to land off Newbridge Road, Cefn Mawr, Wrexham. The proposed development includes for the demolition of the existing farm building on site which is now derelict and the construction of a new residential dwelling in its place. An overview of the proposed site is shown in Figure 1 below:

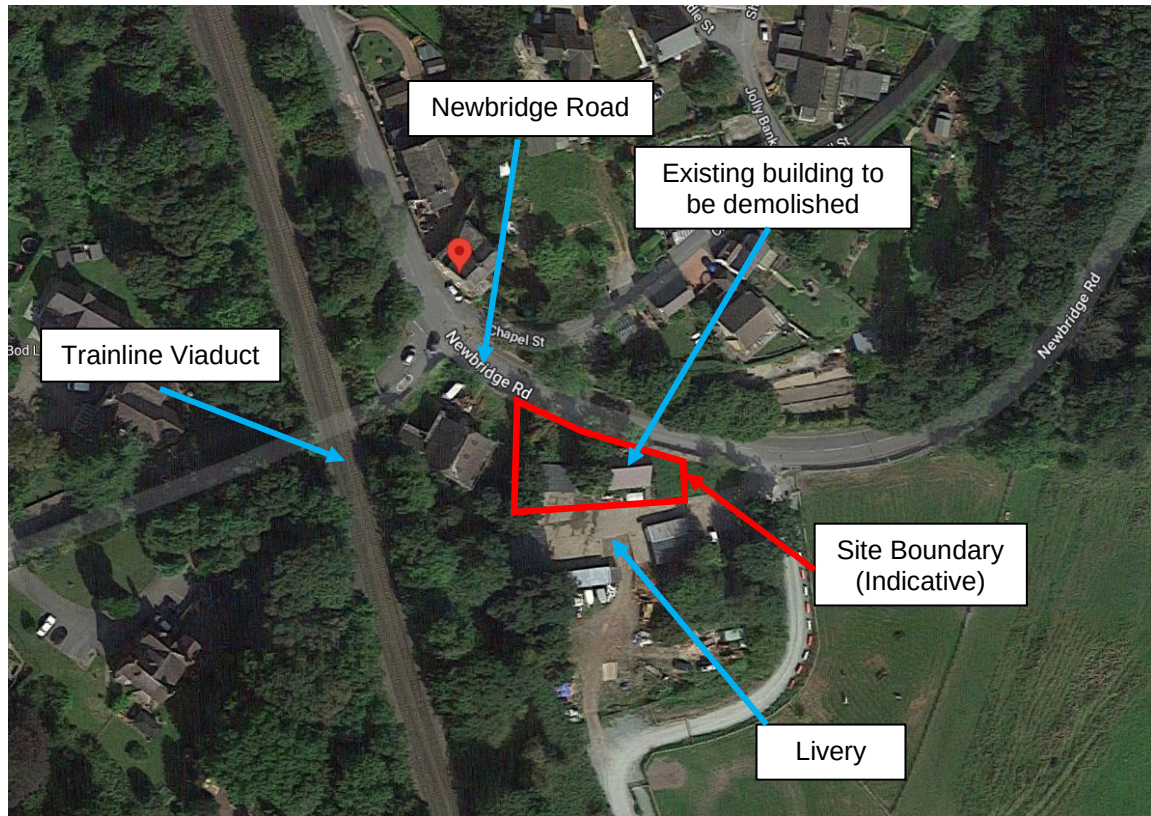


Figure 1. Existing Site (site boundary highlighted red, indicative)

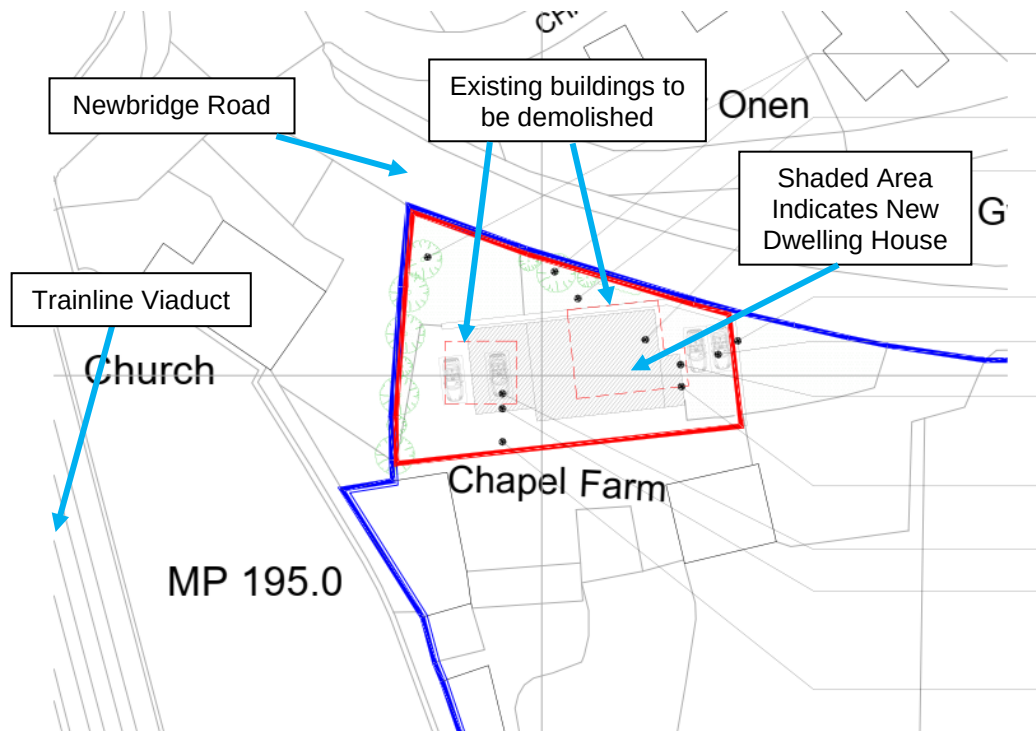


Figure 2. Proposed Site Layout

3.0 ASSESSMENT CRITERIA

3.1 Technical Advice Note (TAN 11) – Assessment of Noise

Technical Advice Note (Wales) 11 – Noise, determines whether noise should be a major factor when granting planning permission for development of residential developments.

With regard to noise-sensitive developments as is proposed here TAN11 states the following:

'Local planning authorities should consider whether proposals for new noise-sensitive development would be incompatible with existing activities, taking into account the likely level of noise exposure at the time of the application and any increase that may reasonably be expected in the foreseeable future. Such development should not normally be permitted in areas which are, or are expected to become, subject to unacceptably high levels of noise and should not normally be permitted where high levels of noise will continue throughout the night.'

The method used to assess whether noise dominates a development site is through the use of Noise Exposure Categories (NECs). TAN11 suggests, *'when assessing a proposal for residential development near a source of noise, local planning authorities should determine into which of the four noise exposure categories (NECs) the proposed site falls, taking account of both day and night-time noise levels. Local planning authorities should then have regard to the advice in the appropriate NEC, as below:'*

Table 1. Noise exposure categories for residential developments

NEC	Description of NEC Level
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

The NEC level is selected by its noise level and source category, as shown in the table below.

Table 2. Noise Exposure Category Levels

Noise Source		A	B	C	D
Road traffic:	0700-2300	<55	55-63	63-72	>72
	2300-0700	<45	45-57	57-66	>66
Rail traffic:	0700-2300	<55	55-66	66-74	>74
	2300-0700	<45	45-59	59-66	>66
Air traffic:	0700-2300	<57	57-66	66-72	>72
	2300-0700	<48	48-57	57-66	>66
Mixed sources:	0700-2300	<55	55-63	63-72	>72
	2300-0700	<45	45-57	57-66	>66

Furthermore, TAN11 suggests sites where individual noise events regularly exceed 82 dB L_{Amax} (slow time weighting) several times in any hour during the night time, the site should be treated as being in NEC C, regardless of the L_{Aeq,8H} (except where the L_{Aeq,8H} already puts the site in NEC D).

3.2 BS 8233:2014 Guidance on Sound Insulation and Noise reduction for Buildings

Dwelling houses, flats and rooms in residential use

British Standard 8233:2014, Guidance on Sound Insulation and noise reduction for buildings, gives guidance on internal noise levels within dwellings, flats and rooms in residential use when unoccupied. The following criteria are for Living and Dining Rooms for daytime use and Bedrooms for night time.

Table 3. BS 8233 Recommended Indoor Ambient Noise Levels

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 $L_{Aeq,16hour}$	–
Dining	Dining room/area	40 $L_{Aeq,16hour}$	–
Sleeping (daytime resting)	Bedrooms	35 $L_{Aeq,16hour}$	30 $L_{Aeq,8hour}$

It should however be stressed that the above criterion relates to steady noise, in this case from road traffic etc., excluding unusual noise events departing from the typical noise character of the area.

With regard to gardens and external areas, BS 8233:2014 (Section 7.7.3.2) gives the following advice:

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

3.3 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following noise levels are applicable to residential dwellings.

Table 4. WHO Guidelines for Community Noise Criteria

Specific Environment	Critical Health Effect(s)	L_{Aeq} dB	Time Base (hours) *
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16
Inside bedrooms	Sleep disturbance, night-time	30	8

* Typically taken to be daytime/evening - 07:00 – 23:00 hours and night time 23:00 – 07:00 hours.

In addition to the above continuous equivalent noise levels, WHO guidelines indicates that exceedances of 45 dB L_{Amax} for single sound events should be limited to no more than 10 – 15 times per night, when measured with a 'fast' time weighting.

3.4 Welsh Government, Approved Document O (ADO)

Approved Document O (ADO) 2021, provides guidance on meeting the requirements of the Building Regulations 2010, Part 'O1 Overheating mitigation'. The aim of the Building Regulations Part O1 is to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures.

Building Regulations Part O1 requires that dwellings, institutions or any other buildings containing one or more rooms for residential purposes (other than a room in a hotel) to:

- (a) *Limit unwanted solar gains in summer:*
- (b) *Provide an adequate means to remove heat from the indoor environment*

In regards to 'Noise at night', ADO stipulates the following.

2.2 High levels of external noise could limit the use of cross-ventilation to mitigate the risk of summer overheating. External noise is a material consideration considered when applying for Planning permission and mitigating measures may be required in the design in order to obtain Planning permission and controlled through a condition imposed on the consent. In exceptional cases, this could include non-openable windows. More commonly, windows will be openable in order to enable natural ventilation to occur at less sensitive times of day, when there is lower noise, when people are not present in the room, or when they are present but not engaged in noise-sensitive activities. But those windows may need to be kept closed at times to maintain acceptable indoor acoustic conditions, for example when people are using the rooms for sleep or office work. A noise issue may be identified at the Planning stage but rely on occupants to close windows at noise sensitive times rather than prevent them from ever opening them, and in those cases overheating strategies should assume windows will be closed during noise-sensitive periods even if they are not fixed closed.

2.3 When the removing excess heat as part of the overheating strategy, noise levels in bedrooms should be kept to a minimum during the sleeping hours of 23:00 – 07:00. Building control bodies may accept as evidence that this requirement is satisfied:

- a. *documentation to demonstrate that the local planning authority did not consider external noise to be an issue at the site at the planning stage or;*
- b. *if the local planning authority did consider external noise to be an issue that should be controlled through a condition at planning stage, then documentation to demonstrate that the proposals for heat removal (during the sleeping hours of 23.00 – 07.00) are accommodated within or do not conflict with documentation provided to the local planning authority to satisfy any related planning permission condition(s). (For example any expectation that windows on one or more façade, or in certain rooms, will need to be kept closed during noise-sensitive periods.)*

2.4 Where active measures (e.g. mechanical system) are used for removing excess heat within the overheating strategy, the noise generated by these measures, particularly within bedrooms and living rooms should be considered. Noise generated by ventilation/cooling systems (which may travel through ducts) and noise from the fan unit may disturb the occupants of the building and so discourage their use. Therefore, the designer should consider minimising noise by careful design and the specification of quieter products. Further guidance on mechanical ventilation systems can be found in Approved Document F.

4.0 SURVEY DETAILS AND RESULTS

4.1 Noise & Vibration Survey Details

An ambient noise survey was carried out between 11:04 hours, Monday 5th December 2022 and 11:01 hours, Tuesday 6th December 2022. All measurements were conducted in 5-minute samples by Tom Dixon of PDA Ltd. The measurement height was 1.2m above ground level.

The location for the measurement positions utilised for the noise survey are illustrated in Figure 3 below.

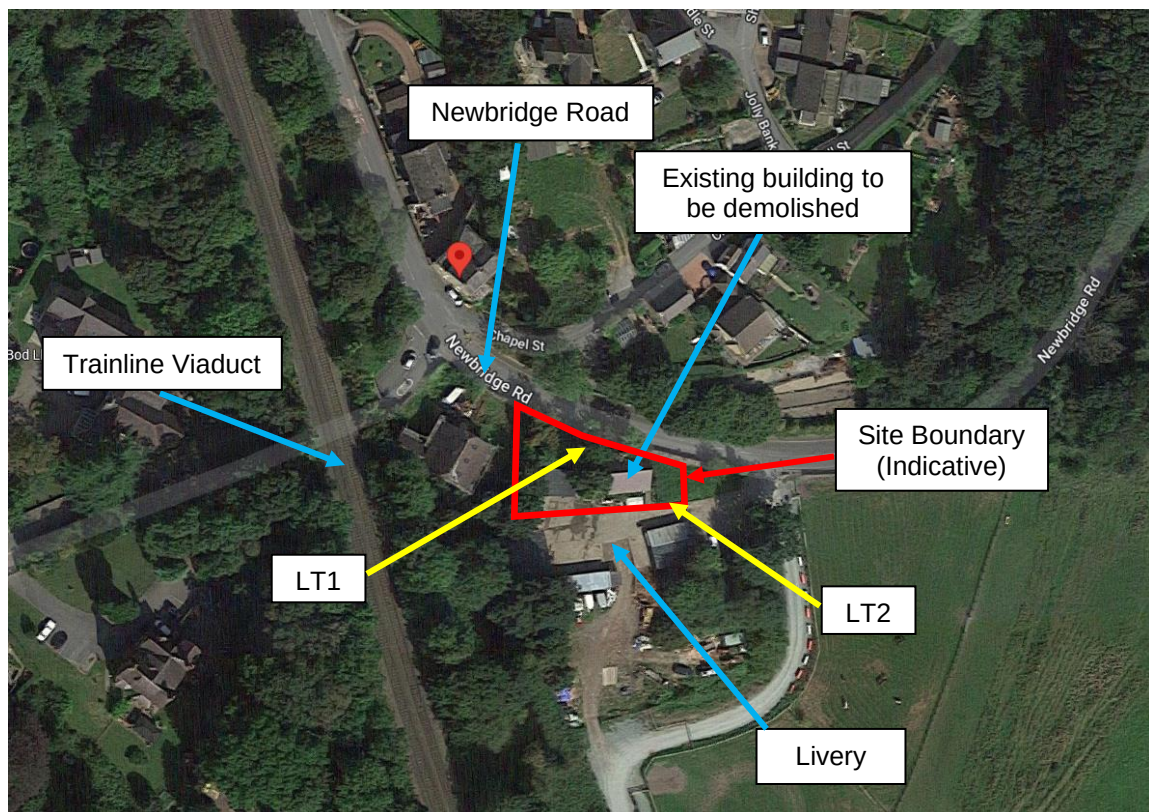


Figure 3. Noise Survey Monitoring Positions

With reference to Figure 3, Long-term noise measurements were conducted at positions LT1 & LT2. All noise measurements were conducted utilising the following equipment:

LT1-NTI XL2 (SN- A2A-08665-E0) -Sound Level Meter

LT2-NTI XL2 (SN- A2A-04169-D2) -Sound Level Meter

In accordance with IEC 61672-1:2002 the sound level meters have a Class 1 frequency response and can operate as an integrating sound level meter with frequency analysis and statistical functions.

The sound level meters were set to measure 'A' weighted, broadband and octave band sound pressure levels and various statistical parameters. Measurements were made utilising a 5-minute sampling period. The meters were field calibrated both before and after each measurement. A valid calibration certificate is held for the meters and calibrators. It was ensured that the sound level meters were fitted with a windshield at all times. Audio recordings were made throughout the survey.

4.2 Weather

Typical weather conditions throughout the survey were as follows:

Temperature-	10-12°C
Wind -	0.4m/s (S-W)
Cloud -	100%
Rain -	no rain

4.3 Noise Sources & Notes

During the noise survey the ambient noise climate was dominated by distant traffic sources. There were also intermittent short duration contributions to the overall ambient noise climate from trains passing to the west of site. There was no significant noise from the livery other than very occasional vehicle movement within the yard.

4.3.1 Note regarding Newbridge Road

It was noted during the noise survey that Newbridge was closed for regular traffic throughout the duration of the survey. It is understood that the road has been closed for some time due to damage caused by flooding in recent years and there is no plan to reopen the road in the near future. Some noise from vehicles to Newbridge Road were an influence on the survey results, however it is reasonably considered that the number of vehicles accessing the road during the noise survey was not representative of typical traffic flow levels once the road is fully re-open. We have therefore supplemented the findings of the noise survey with a CRTN (Calculation of Road Traffic Noise 1988) calculation and noise model as detailed in Section 5.1.

4.4 Results

The full results of the noise survey are available in the Appendix. An overview of the results is provided below.

Table 5. Summary of noise survey results

Monitoring Position	L _{Aeq,T} Day dBA	L _{Aeq,T} Night dBA	L _{Amax} Range Night dBA
LT1	56	50	36-84
LT2	52	47	41-81

5.0 RESIDENTIAL DEVELOPMENT, NOISE BREAK-IN CALCULATIONS & MITIGATION

5.1 Traffic to Newbridge Road & Noise Model

It is considered that the closure of Newbridge Road during the noise survey is likely to have affected the noise survey results (See Section 4.3.1). Therefore the following methodology has been employed in regards to assessing noise egress from Newbridge Road.

Based on the calculation methods as detailed in Calculation of Road Traffic Noise (CRTN), the $L_{A10,18hr}$ noise level at 10m from the edgeway of Newbridge Road has been assessed based on the latest predicted traffic flow data for the Newbridge Road as produced by the Department for Transport.

A Manual Traffic Count (MTC) point utilised by the DfT is located to Newbridge Road and within a short distance to the proposed development site. The location of the MTC in relation to the development is indicated in Figure 4 below.

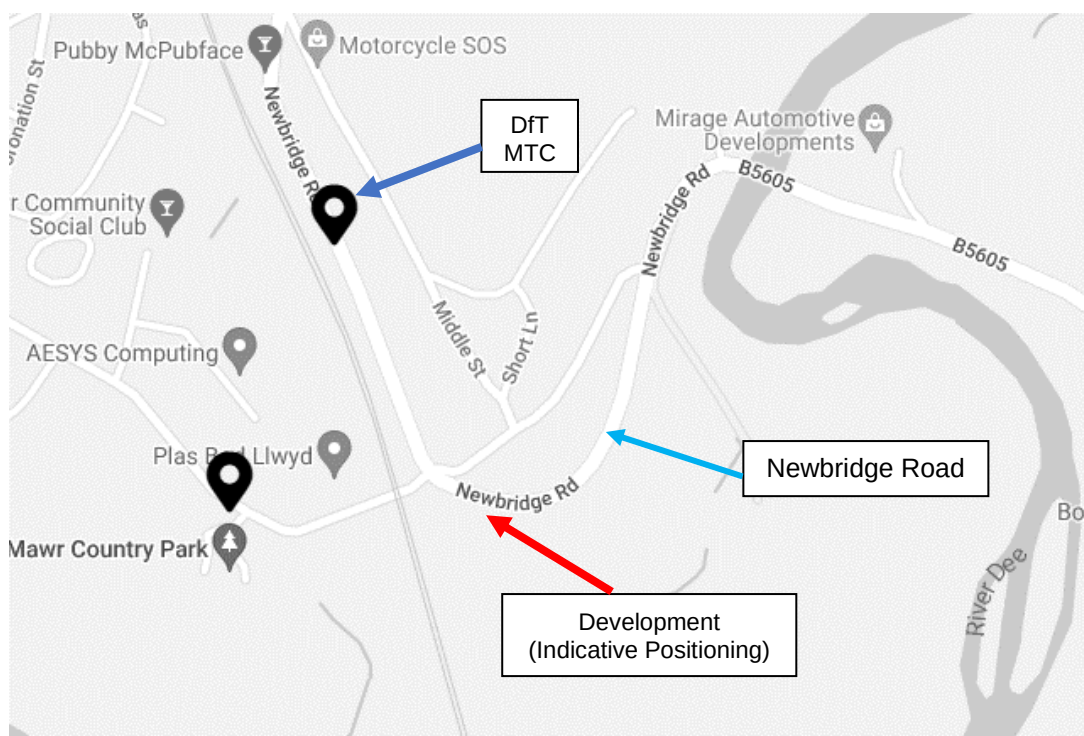


Figure 4. MTC relative to residential development

The latest Annual Average Daily Flow (AADF) for the MTC is as follows (AADF at MTC last assessed in 2021 based on traffic data from 2020, previous to the road closure).

AADF – 3338 (All vehicles), 55 vehicular movements attributed to HGV's (1.6% of total vehicular movements)

Data available from <https://roadtraffic.dft.gov.uk/manualcountpoints/811701>

The following parameters have been utilised for the CRTN calculation.

-Average of 185.4 vehicle movements per hour during the day-time period. This has been calculated as the predicted AADF divided by a factor of 18. ($3338/18 = 185.4$). This is considered a conservative

estimate for the average hourly flow over the 18hr period (06:00-24:00) as the AADF accounts for traffic over a full 24hr period.

- 30mph speed limit
- 1.6% of total traffic flow associated with HGV movements
- 3% average road gradient
- Standard bituminous material road surface

The calculated $L_{A10,18hr}$ at 10m from the edge of the road is 62.6 dBA.

An approximation for the $L_{Aeq,16hr}$ parameter can be deduced by the subtraction of 2dB from the $L_{A10,18hr}$. (This is based guidance as given in Planning Policy Guidance 24 (PPG24), which advises that $L_{Aeq,16hr}$ parameter can be approximated from $L_{A10,18hr} - 2dB$). The equivalent $L_{Aeq,16hr}$ at 10m from the road edges has therefore been evaluated as 60.6 dBA. Applying a correction to account for a measurement distance of 10m, the evaluated L_w per (m) for the roads during the daytime period is 76.9 dBA. In our experience similar roads to the Newbridge Road have a reduction in noise level during the night-time relative to the daytime of 7-10dB. On a conservative basis the equivalent L_w per (m) for the road during the night-time has been evaluated by the subtraction of 7dB from the L_w per (m) for the road during the day-time period. The evaluated L_w per (m) for the road during the night-time period is therefore 69.9 dBA.

The L_w 's for the road as detailed above have been used to inform a Sound Plan (SP) computer model which predicts noise egress from Newbridge road across site. This software has been set up to model the sources by taking into account for all reflections and shielding around the site. Please note that the calculations follow the methodology detailed within ISO 9613-2 Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

An overview of the model is depicted below.

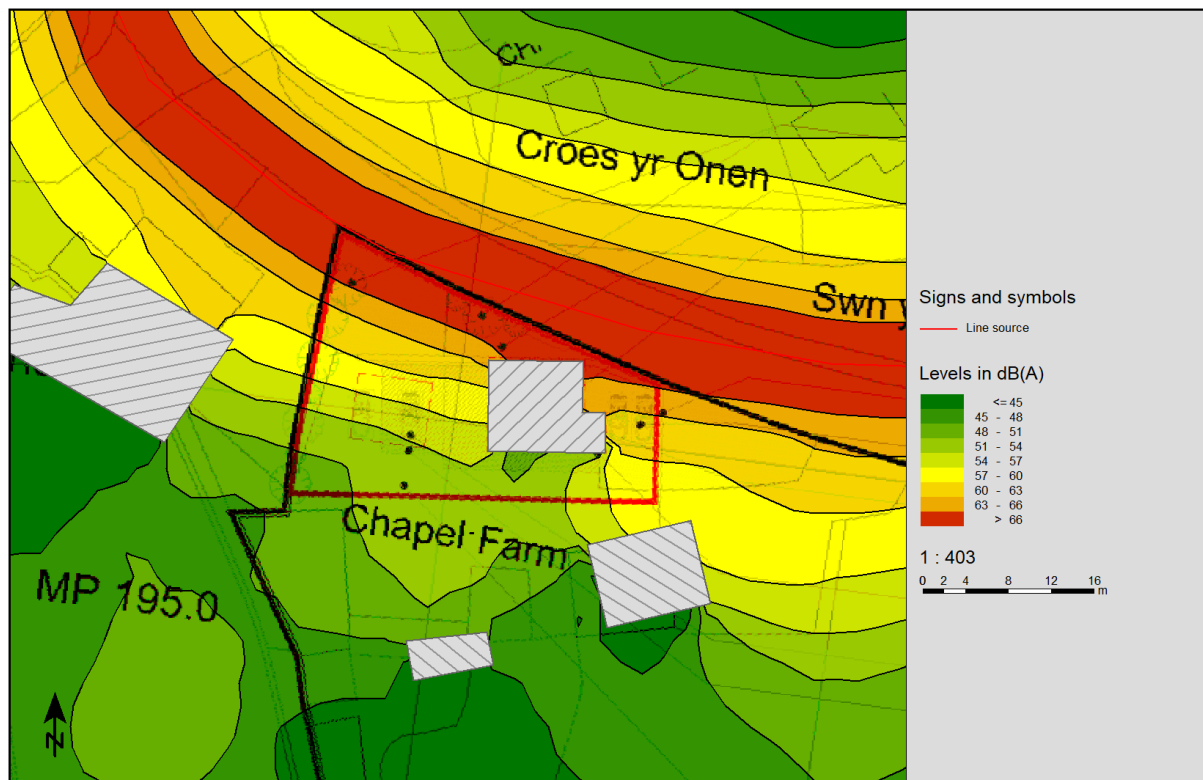


Figure 5. Sound Plan (SP), Day Time, Newbridge Road CRTN Noise Model

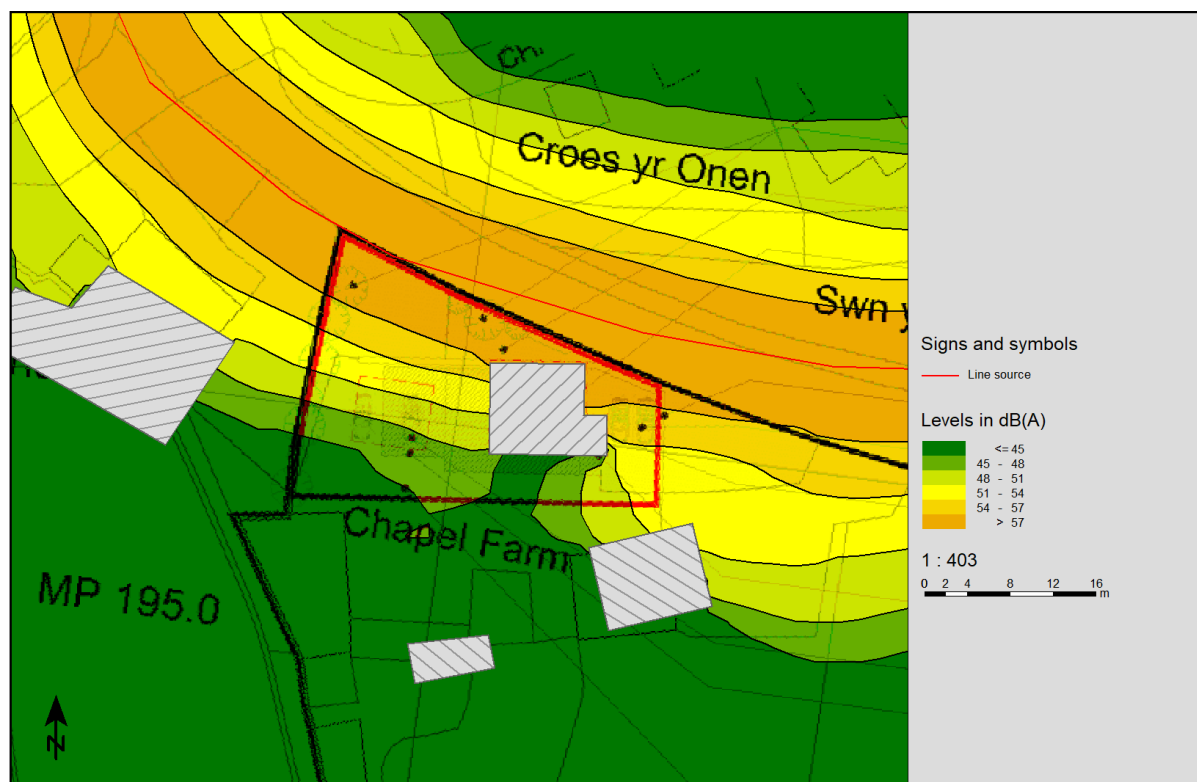


Figure 6. Sound Plan (SP), Night Time, Newbridge Road CRTN Noise Model

5.2 TAN 11 NEC Categories & Assessment

The Tan 11 categories relevant to proposed site are reproduced below for reference.

Table 6. Noise Exposure Category Levels (Newbridge Road)

Noise Source		A	B	C	D
Road traffic:	0700-2300	<55	55-63	63-72	>72
	2300-0700	<45	45-57	57-66	>66
Rail traffic:	0700-2300	<55	55-66	66-74	>74
	2300-0700	<45	45-59	59-66	>66

The road traffic CRTN noise models for Newbridge Road as detailed in Section 5.1 indicate that predominantly NEC Category B noise levels are achieved across site except at the north facing facades of the development. Noise levels to the north facing facades are predicted to achieve NEC Category C.

With regards to Rail noise, the results of the noise survey indicate that noise egress from the train line to the west of site fall into Category B noise levels across site. Additionally based on the results of the noise survey L_{Amax} noise levels are not predicted to exceed 82 dBA on a regular basis in any given 1-hour period throughout the night.

Further to the above it is PDA's experience that developments with the measured/modelled noise levels above are suitable for residential development provided that adequate acoustic attenuation is provided to habitable areas. Therefore in accordance with TAN 11 the proposed development is considered to achieve NEC Category B.

Suitable internal noise level criterion for the proposed residential dwelling is taken from the good practice guidance as detailed in Section 3.3-3.4 (BS8233:2014 and WHO Guidelines for Community Noise).

Considering the acoustic weak points of a building façade, typically the glazing and the ventilation elements, calculations have been undertaken to determine building fabric specifications to ensure that internal noise levels as detailed in Tables 3 & 4 can be achieved.

5.3 Break-in Calculation Method

The results of the noise survey and results of the Newbridge Road noise models as detailed in Section 5.1 have been used to inform a Sound Plan (SP) computer model which predicts the external noise levels to the proposed residential dwelling. The Sound Plan software has been set up to model the sources by taking into account for all reflections and shielding around the site. Please note that the calculations follow the methodology detailed within ISO 9613-2 Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

An overview of the SP model is provided below.

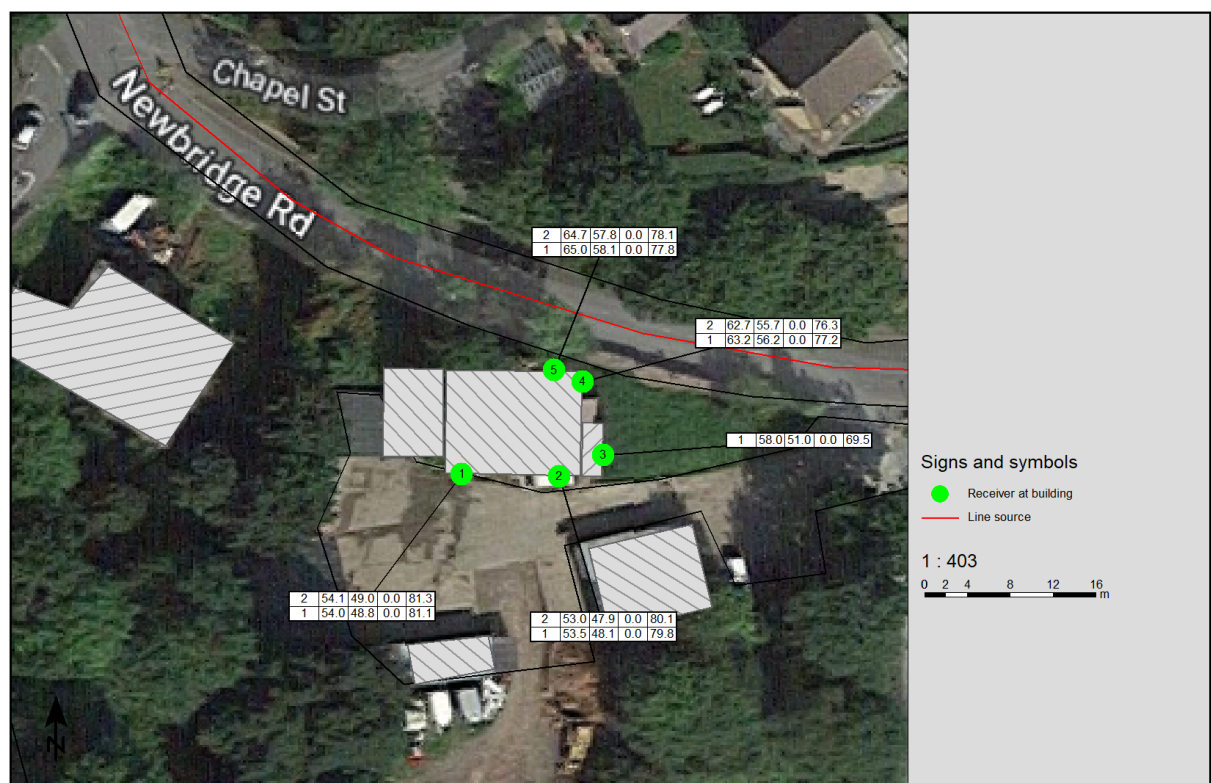


Figure 7. SP Overview, Façade Noise Levels

The results of the SP model have been used to calculate the equivalent internal ambient noise levels. Internal noise levels have been determined by calculating the noise break-in through the façade elements in octave frequency bands from 63 Hz – 8kHz. The internal noise levels have been determined, taking into account the sound insulation and area of each element, the room volume and reverberation time, and finally A-weighting the resulting spectrum to determine the internal noise levels. In accordance with the reverberation time standardisation detailed within ISO 140-4 the reverberation time within residential habitable rooms is assumed to be 0.5 seconds.

An assessment of the required acoustic insulation performance for the new residential development has been conducted. The assessment has been based on achieving the internal ambient acoustic conditions specified in Section 3 to this report.

Calculated internal noise levels have been based on the results of the noise model and details for external walls and internal room dimensions as described in Sections 5.4-5.5 below. Minimum acoustic specifications have been identified for the glazing and trickle ventilators. These have been summarised as detailed in Section 5.6 below.

5.4 External Walls

Internal noise levels have been calculated on the basis that the building envelope construction achieves the following composite sound reduction index's (R's).

Table 7. Sound Reduction Index Values, Basic Façade Construction, Break In Calculations

	External Walls, Composite R's dB							
Frequency	63	125	250	500	1k	2k	4k	8k
Sound Reduction Index, R, dB	23	26	37	37	46	55	63	58

The above sound reduction indices would typically be achieved by an external cladding layer to cavity with mineral wool insulation, cement particle/weather board, supported on SFS with mineral wool in cavity and 1-2no layers plasterboard internal room finish. A brick/blockwork cavity construction would also typically be suitable.

5.5 Room Dimensions & Volumes

Internal noise levels to the proposed development have been calculated based on the room/external window dimensions as detailed in the room layout and façade drawings for this development. These are provided in the Appendix.

5.6 Mitigation Strategies

The following required mitigation strategies have been derived based on the results of the SP noise model and assumed details as described in Sections 5.4-5.5, to achieve the recommended internal noise level criteria as detailed in BS 8233 & WHO 1999.

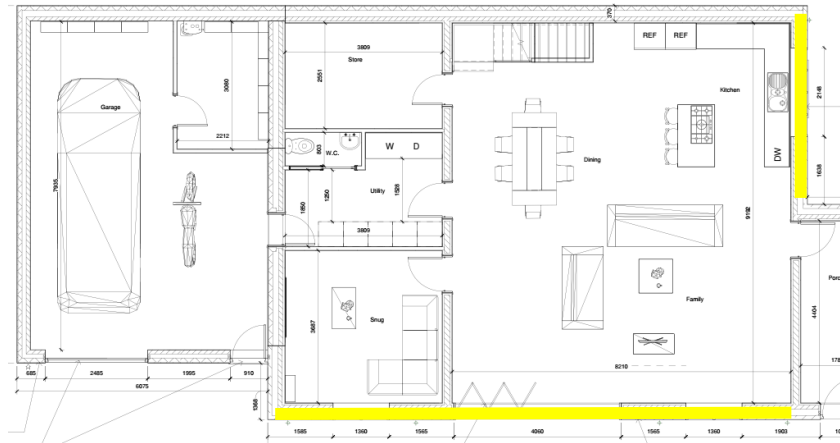


Figure 8. Glazing & Ventilation Mitigation Strategy, Ground Floor

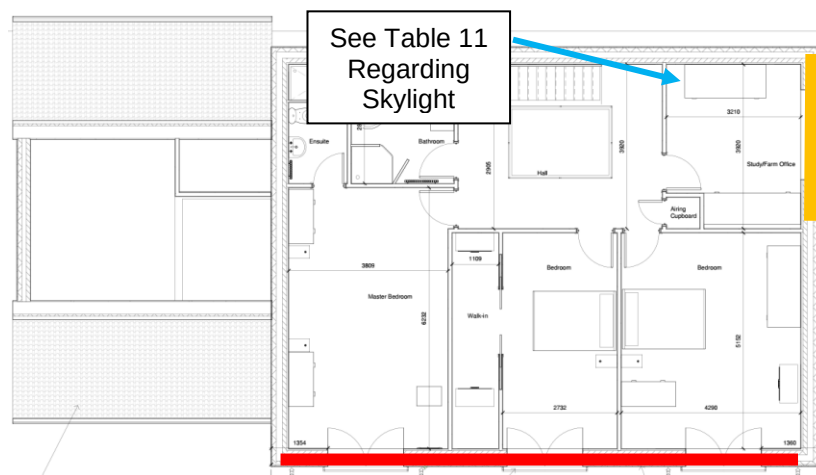


Figure 9. Glazing & Ventilation Mitigation Strategy, First Floor

Key

- -Mitigation Strategy A
- -Mitigation Strategy B
- -Mitigation Strategy C

Table 8. Mitigation Strategy A – Bedrooms (South Façade) ■

Windows/Glazing Noise Insulation								
Typical Product	Minimum Sound Reduction Index R (dB) at Octave Band Centre Frequency (Hz)							R_w
	63	125	250	500	1000	2000	4000	
10/12/6.4Amm (acoustic laminate)	23	27	29	36	41	42	52	40
Ventilation Noise Insulation								
Typical Product	Minimum $D_{n,e}$ (dB) at Octave Band Centre Frequency (Hz)							$D_{n,e,w}$
	63	125	250	500	1000	2000	4000	
Greenwood 2500EAW.AC2	32	42	40	38	47	53	55	45

Table 9. Mitigation Strategy B – Bedroom/Snug/Office (North Facade) ■

Windows/Glazing Noise Insulation								
Typical Product	Minimum Sound Reduction Index R (dB) at Octave Band Centre Frequency (Hz)							R_w
	63	125	250	500	1000	2000	4000	
10/12/6mm	22	26	27	34	40	38	46	38
Ventilation Noise Insulation								
Typical Product	Minimum $D_{n,e}$ (dB) at Octave Band Centre Frequency (Hz)							$D_{n,e,w}$
	63	125	250	500	1000	2000	4000	
Simon Acoustic EHAS	36	40	36	34	35	44	40	38

Table 10. Mitigation Strategy C – Living Rooms ■

Windows/Glazing Noise Insulation								
Typical Product	Minimum Sound Reduction Index R (dB) at Octave Band Centre Frequency (Hz)							R_w
	63	125	250	500	1000	2000	4000	
4/12/4mm	20	24	20	25	35	38	35	31
Ventilation Noise Insulation								
Typical Product	Minimum $D_{n,e}$ (dB) at Octave Band Centre Frequency (Hz)							$D_{n,e,w}$
	63	125	250	500	1000	2000	4000	
Simon Airstrip 300	23	28	26	26	29	29	29	29

Table 11. Bedroom Skylight

Glazing Noise Insulation								
Typical Product	Minimum Sound Reduction Index R (dB) at Octave Band Centre Frequency (Hz)							R_w
	63	125	250	500	1000	2000	4000	
4/12/4mm	20	24	20	25	35	38	35	31

Notes on Glazing Insulation

For the glazing specifications in Tables 8-11, all sound insulation values quoted above must be achieved by the overall combination of frame and glazing, and not just by the glazing alone. The frame should not reduce the performance of the system overall.

Glazing framing systems must be fully sealed with any small gaps (<10mm nominal) around the perimeter to be stuffed with dense mineral wool to full frame depth and sealed both sides with acoustic non-setting mastic, with additional weathering protection to be applied additionally externally to this. No gaps should be left unsealed.

Notes on Ventilation Insulation

The ventilator inlets described in Tables 8-10, are calculated to provide adequate sound insulation to maintain internal noise levels compliant with the guidance criteria when used in conjunction with the specified glazing described in Tables 8-10. Selected ventilation inlets should provide equal or greater sound insulation performance across the frequency range to the values in Tables 8-10. Specifications are based on the use of one (1) ventilator per room only.

The acoustic specification relates to the combined performance of all ventilation elements. Where two or more ventilators are required to meet the ventilation requirement, the acoustic performance for a single ventilator must be selected so that the combined performance is as stated in the Tables 8-10. As an example, to achieve an overall acoustic insulation performance of $D_{n,e,w}$ 29 dB utilising two ventilators in a single wall, both individual ventilators should be rated at $D_{n,e,w}$ 32 dB. Requirements should be checked with the manufacturer.

Please note that the specification of vents is in terms of acoustic performance only. It should be checked by others that the ventilation requirements of the Building Regulations are also met.

Fan-assisted ventilation systems should be reviewed to ensure that the fan itself does not exceed the noise criteria as specified in Section 3.

5.7 Break-In Noise Calculations Results

Based on mitigation strategies as outlined in Section 5.6 being implemented into the final building envelope design and results of the noise survey, the following predicted internal noise levels have been calculated.

Table 12. Calculated Internal Ambient Noise Levels with Mitigation

Room Type	L _{Aeq16hr} , Day 07:00-23:00, dBA	L _{Aeq8hr} , Night 23:00-07:00, dBA	L _{Amax} 23:00-07:00 dBA
Bedroom	32	25	45
Kitchen/Lounge	32	-	-

Note: The reported internal ambient noise levels as detailed above are based on the worst affected bedrooms/living spaces in regards to noise ingress.

As can be seen from Table 12, with the implementation of the mitigation strategy as outlined in Section 5.6 of this report the internal ambient noise levels are expected to be within the internal noise level limit criteria stipulated by BS 8233:2014 & WHO 1999.

5.8 Quality Control

Please note that achieving performance standards requires strict adherence to best practice construction methodology on site. A checklist of acoustic requirements for quality control is attached at the rear of this report.

5.9 Approved Document O (ADO), Method of Removing Heat

With reference to the noise survey and noise models as detailed above, the results indicate that in order to achieve the BS 8233 & WHO internal noise level guideline levels at night within bedrooms, the windows are required to remain shut. Therefore in accordance with ADO the overheating mitigation strategy for the proposed development should consider that windows may be required to remain closed during the hotter parts of the year and an alternative method of removing heat (other than opening windows) may be required.

6.0 EXTERNAL NOISE LEVELS

The SP model as detailed in Section 5 has been used to predict the external noise levels to the external amenity area to the north of the development. Initial calculations indicate that the noise to the amenity space is circa 62-66 dBA depending on the exact position throughout the amenity area. However with the inclusion of a 2m acoustic fence to the site boundary as indicated below this may be reduced to 56-58 dBA for the majority of the amenity area. An overview of the SP model is provided below.

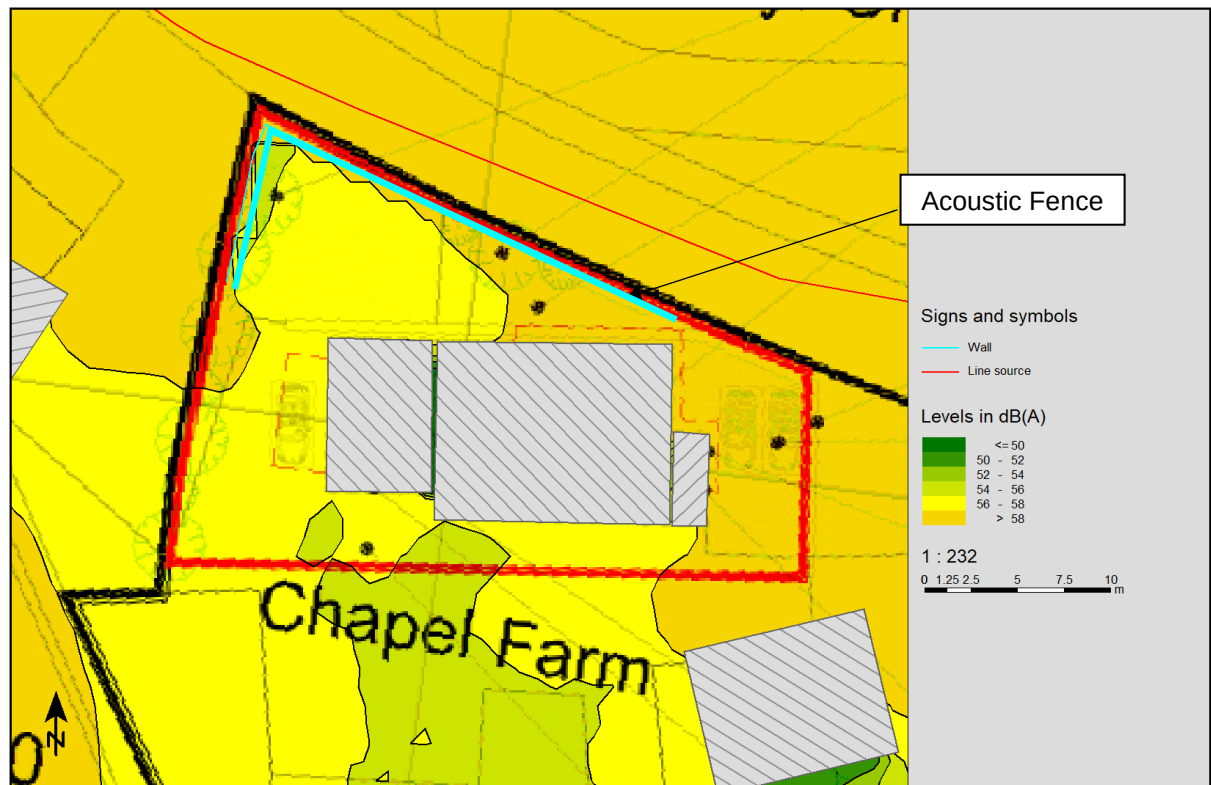


Figure 10. SP (overview), External Noise Levels to Amenity Areas

It should be noted that the SoundPlan model accounts for an acoustic fence to the site boundary as illustrated by Figure 10. The acoustic fence should meet the following minimum specification:

- minimum 2m height (above the existing stone wall to site)
- minimum 10kg/m²
- close boarded, with no gaps including at the bottom

It can be noted the effectiveness of the proposed acoustic fence to site is limited in this case in reducing the overall external ambient noise level to the amenity space due to noise egress from the train line. Noise egress from the train line cannot be attenuated further as this noise source is significantly elevated above the site and therefore barriers cannot be used effectively to attenuate noise from the train line. BS 8233 notes that the recommended design criteria is not achievable in all circumstances and that exceedance of 55 dBA does not indicate that development should be prevented.

BS 8233:2014 (section 7.7.3.2) gives the following advice:

For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise

areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

If for non-acoustical reasons amenity spaces are considered desirable for the proposed development, the necessity to achieve the recommended 55 dBA external criteria should be considered against the benefits of locating amenity spaces to these areas.

It should be noted that the BS8233 advisory guidelines have not been adopted in UK noise or planning policy. In addition using the 55 dBA guideline as a fixed threshold beyond which noise sensitive development should be prohibited is unrealistic. The National Noise Incidence Study undertaken by DEFRA in 2009 indicates that more than 50% of the UK population is exposed to daytime noise levels of more than 55 dBA however the majority of persons surveyed do not report being highly annoyed within the National Noise Attitude Survey 2000 undertaken by Defra. In addition the National Noise Attitude Survey 2012 (NNAS2012) Summary Report December 2014 - reports that "in general 72% of respondents had a positive attitude to their local noise environment."

7.0 CONCLUSION

At the request of Fisher German (Chester), PDA Ltd has carried out a noise impact assessment for the proposed residential development at Chapel Farm, Newbridge Road, Cefn Mawr, Wrexham. The proposed development includes for the demolition of the existing farm building on site which is now derelict and the construction of a new residential dwelling in its place.

The assessment for the development has been undertaken in accordance with Technical Advice Noise (TAN) 11 – Noise. Overall the results of the noise survey and noise models indicate that the proposed development falls in NEC category B. In PDA's experience planning permission can usually be granted on the basis that suitable mitigation is applied to the proposed development.

To achieve the WHO 1999 & BS 8233 design criteria regarding internal noise levels, suitable minimum noise insulation specifications have been derived for the windows and trickle ventilators.

It is predicted that the recommended 55 dBA criteria will be exceeded within the external amenity spaces due to the proposed developments close proximity to Newbridge Road and the Trainline. However BS 8233, notes that the recommended design criteria is not achievable in all circumstances and that exceedance of 55 dBA does not indicate that the development should be prevented. The necessity to achieve the recommended 55 dBA external criteria should be considered against the benefits of including an external amenity area to the proposed development.

To achieve the WHO 1999 & BS 8233 internal ambient noise level criteria for bedrooms during the night-time period windows are required to remain closed. Therefore in accordance with ADO the overheating mitigation strategy for the proposed development should consider that windows may be required to remain closed during the hotter parts of the year and an alternative method of removing heat (other than opening windows) may be required.

All results are presented in this report.

APPENDIX I – NOISE SURVEY FULL RESULTS

Noise levels recorded during the noise survey are presented below. All noise levels are of 5-minute sample periods.

LT1, Newbridge Road

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	10:55:00	52.2	61.2	49.7	49.3	48.0	48.4	44.9	39.2	32.9	38.3	69.3
05/12/2022	11:00:00	56.7	58.8	48.3	49.2	49.3	53.7	49.8	44.3	42.4	37.9	77.2
05/12/2022	11:05:00	48.3	54.1	47.7	45.4	44.0	44.8	40.8	34.3	29.6	38.4	66.0
05/12/2022	11:10:00	44.4	50.7	44.2	41.0	40.6	41.5	35.6	28.8	25.6	38.4	59.2
05/12/2022	11:15:00	48.6	53.5	43.6	43.1	43.9	45.0	42.0	36.0	31.3	38.3	66.5
05/12/2022	11:20:00	46.1	54.2	49.4	43.7	41.2	42.3	37.5	33.0	35.3	38.5	60.1
05/12/2022	11:25:00	55.5	53.8	47.6	49.2	50.7	53.0	47.8	40.0	35.4	37.4	75.7
05/12/2022	11:30:00	41.8	51.3	38.1	37.3	37.3	38.3	34.9	27.7	22.6	37.5	58.8
05/12/2022	11:35:00	55.7	52.1	45.3	46.0	46.4	51.2	48.7	46.7	48.2	38.4	77.0
05/12/2022	11:40:00	60.9	62.6	53.2	53.5	54.2	57.2	55.0	50.3	43.8	38.3	81.5
05/12/2022	11:45:00	58.5	61.5	51.4	52.2	52.3	55.3	51.2	48.7	42.8	38.0	76.1
05/12/2022	11:50:00	53.6	58.5	47.8	46.4	46.0	50.9	47.6	36.2	28.0	38.3	75.1
05/12/2022	11:55:00	44.2	50.4	42.8	40.9	40.5	41.0	35.8	28.6	23.3	37.9	58.8
05/12/2022	12:00:00	55.9	55.1	44.4	47.2	51.6	53.7	47.4	40.9	33.1	38.6	73.7
05/12/2022	12:05:00	55.9	60.0	48.6	49.9	50.4	53.1	49.0	39.6	35.4	36.5	76.9
05/12/2022	12:10:00	53.6	50.8	46.2	46.4	47.2	50.2	48.0	38.2	36.0	37.7	73.7
05/12/2022	12:15:00	53.0	57.3	47.7	45.9	47.0	49.5	46.5	41.8	37.7	37.8	74.6
05/12/2022	12:20:00	44.6	51.3	42.7	40.4	40.1	41.9	36.2	29.4	26.0	38.4	56.5
05/12/2022	12:25:00	39.8	44.4	36.4	34.3	36.5	37.4	29.7	23.0	20.5	37.1	50.3
05/12/2022	12:30:00	45.9	49.5	42.7	40.9	40.1	42.9	37.4	35.9	31.2	36.7	63.0
05/12/2022	12:35:00	41.1	44.5	37.2	35.4	36.2	38.7	32.6	25.4	21.8	37.2	54.0
05/12/2022	12:40:00	47.8	51.7	43.8	45.6	41.9	44.2	40.3	33.3	37.6	39.4	64.0
05/12/2022	12:45:00	47.4	48.0	40.6	37.9	41.6	43.2	42.6	33.1	24.6	37.6	74.5
05/12/2022	12:50:00	55.5	53.9	47.8	48.1	48.3	53.2	48.6	37.8	33.8	37.1	76.9
05/12/2022	12:55:00	50.3	59.8	48.0	47.5	48.5	46.7	41.3	34.3	30.2	37.8	68.3
05/12/2022	13:00:00	51.8	55.3	54.3	53.4	49.1	46.9	42.4	39.3	27.8	37.8	67.2
05/12/2022	13:05:00	44.1	49.2	42.1	41.9	40.7	41.5	33.3	26.0	30.3	37.6	57.3
05/12/2022	13:10:00	46.9	55.4	53.4	49.8	43.5	41.2	36.2	33.5	31.2	38.9	61.9
05/12/2022	13:15:00	53.4	54.1	46.3	48.0	48.0	49.8	47.0	41.3	35.7	37.4	74.3
05/12/2022	13:20:00	53.5	55.3	45.9	47.6	47.7	50.4	46.1	41.8	40.6	37.7	75.1
05/12/2022	13:25:00	52.3	51.3	46.6	45.5	45.8	49.7	45.7	35.3	28.5	37.7	74.0
05/12/2022	13:30:00	45.8	55.4	49.4	42.9	41.9	42.8	37.0	28.1	22.0	37.4	59.3
05/12/2022	13:35:00	55.7	52.1	45.2	46.6	48.4	53.3	49.5	37.7	32.9	37.2	78.5
05/12/2022	13:40:00	54.7	53.1	45.0	48.4	49.6	51.5	47.6	38.7	42.9	37.6	75.4

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	13:45:00	43.9	46.0	40.6	36.9	39.3	37.8	31.8	35.4	39.6	37.3	59.6
05/12/2022	13:50:00	61.7	65.5	59.8	62.9	59.7	56.2	53.2	46.9	42.0	38.8	83.2
05/12/2022	13:55:00	55.9	56.3	46.6	48.8	49.8	53.3	49.5	40.3	30.4	37.2	77.3
05/12/2022	14:00:00	49.1	49.8	42.5	41.5	44.7	42.5	39.5	42.2	42.7	36.8	68.2
05/12/2022	14:05:00	60.6	62.5	54.2	54.2	56.0	56.4	54.2	49.3	44.7	37.8	80.1
05/12/2022	14:10:00	62.1	61.5	54.6	54.7	58.1	59.1	54.5	49.3	44.8	39.0	79.9
05/12/2022	14:15:00	51.5	50.2	45.9	47.1	44.7	48.8	44.6	36.5	30.8	36.6	70.2
05/12/2022	14:20:00	43.0	53.4	41.4	38.8	39.0	40.6	33.1	25.6	21.6	37.5	53.7
05/12/2022	14:25:00	54.7	54.1	47.5	47.2	49.3	52.5	47.2	37.9	31.3	37.5	77.9
05/12/2022	14:30:00	54.6	51.5	48.4	49.2	49.3	51.5	48.3	40.3	34.1	37.7	73.5
05/12/2022	14:35:00	56.6	62.5	50.5	50.0	50.7	53.2	50.6	42.6	36.0	38.6	76.0
05/12/2022	14:40:00	58.6	55.9	52.3	50.6	51.5	55.9	52.5	42.2	35.1	39.4	79.7
05/12/2022	14:45:00	53.9	54.0	43.8	46.1	46.4	51.0	48.1	37.0	35.3	38.7	76.2
05/12/2022	14:50:00	58.2	59.8	52.0	53.0	52.3	55.4	51.7	42.8	33.9	40.4	77.8
05/12/2022	14:55:00	53.9	54.6	52.7	50.7	49.3	50.9	46.0	40.2	38.5	38.3	72.3
05/12/2022	15:00:00	53.3	57.3	48.6	48.4	46.6	49.9	47.6	39.1	32.8	37.6	69.8
05/12/2022	15:05:00	57.9	57.9	50.2	52.0	52.2	54.7	51.6	44.4	35.6	37.1	75.9
05/12/2022	15:10:00	49.2	50.8	44.3	42.3	40.8	42.7	45.6	38.1	32.5	37.9	66.9
05/12/2022	15:15:00	57.2	60.6	48.8	49.9	51.1	54.1	51.1	43.1	36.8	38.2	75.0
05/12/2022	15:20:00	48.9	53.5	48.3	49.0	43.2	45.1	41.4	33.7	37.1	38.3	67.2
05/12/2022	15:25:00	46.8	51.4	45.6	40.3	39.5	42.1	42.2	34.1	30.8	38.2	59.6
05/12/2022	15:30:00	56.5	55.3	46.9	47.5	49.0	52.2	51.5	45.3	41.0	37.6	76.5
05/12/2022	15:35:00	52.0	51.9	44.7	43.5	43.0	46.1	48.2	41.4	34.5	37.8	71.5
05/12/2022	15:40:00	55.4	51.3	46.2	50.0	49.3	52.7	48.8	36.8	31.8	39.2	78.2
05/12/2022	15:45:00	54.3	60.1	50.6	46.6	48.0	51.1	48.3	40.6	35.2	38.4	75.2
05/12/2022	15:50:00	50.0	54.2	49.1	49.2	48.0	45.5	42.2	34.7	27.3	37.8	68.2
05/12/2022	15:55:00	52.5	56.5	43.7	45.5	45.7	50.1	45.2	37.4	34.5	37.8	71.8
05/12/2022	16:00:00	58.7	55.4	44.6	48.3	55.4	56.6	49.2	42.9	32.5	37.7	76.8
05/12/2022	16:05:00	44.2	54.0	52.7	43.2	38.4	39.2	32.5	34.3	34.6	38.0	62.2
05/12/2022	16:10:00	45.6	50.2	40.5	39.3	38.1	39.4	33.8	39.7	40.0	37.3	67.5
05/12/2022	16:15:00	53.7	51.8	45.3	48.5	47.5	51.1	46.6	38.5	33.4	37.9	69.8
05/12/2022	16:20:00	52.2	56.3	45.4	46.4	46.2	49.6	45.0	37.1	30.9	38.7	71.8
05/12/2022	16:25:00	54.7	61.5	49.5	48.9	47.5	52.4	47.7	36.5	30.4	39.3	73.4
05/12/2022	16:30:00	43.9	48.0	41.5	39.7	40.6	41.3	34.7	27.7	25.2	38.6	60.0
05/12/2022	16:35:00	55.1	60.3	57.4	59.3	52.5	48.1	44.8	40.1	35.4	38.5	77.2
05/12/2022	16:40:00	55.1	53.7	50.0	49.3	48.2	52.1	49.1	39.1	32.5	39.1	75.4
05/12/2022	16:45:00	54.2	61.1	48.3	48.9	49.3	51.2	47.1	39.3	32.2	39.3	71.3
05/12/2022	16:50:00	56.0	57.1	49.9	50.5	51.4	53.5	48.3	40.4	32.8	40.7	74.8
05/12/2022	16:55:00	56.8	52.2	45.5	48.1	49.7	54.1	50.9	39.1	31.9	38.7	75.4
05/12/2022	17:00:00	52.6	62.9	48.7	47.9	46.6	48.9	46.5	38.4	32.3	39.2	70.5



Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	17:05:00	52.8	52.8	46.7	47.0	46.8	50.5	45.4	35.0	28.4	40.2	69.2
05/12/2022	17:10:00	49.6	64.8	47.9	47.4	47.0	45.9	40.6	33.4	26.4	40.3	66.3
05/12/2022	17:15:00	53.0	52.9	45.5	46.2	45.6	50.1	47.2	36.6	27.2	38.9	70.9
05/12/2022	17:20:00	57.0	66.1	54.4	52.0	51.0	54.4	49.4	41.7	36.2	39.6	72.5
05/12/2022	17:25:00	59.4	57.2	52.1	50.9	52.1	56.9	53.4	40.2	30.4	38.4	81.2
05/12/2022	17:30:00	54.8	57.0	48.2	47.3	48.1	52.1	48.7	36.7	29.2	38.5	77.5
05/12/2022	17:35:00	52.9	54.0	57.4	48.7	46.3	49.2	47.0	35.3	26.1	38.8	73.9
05/12/2022	17:40:00	55.9	52.9	43.3	46.0	47.7	53.2	50.1	38.5	28.6	38.6	79.9
05/12/2022	17:45:00	52.2	52.6	46.0	44.0	44.9	49.7	45.7	34.5	27.0	38.5	74.4
05/12/2022	17:50:00	53.4	58.3	45.1	46.5	48.3	50.9	46.0	37.1	31.3	38.7	76.4
05/12/2022	17:55:00	56.2	63.6	54.0	51.9	51.7	53.3	48.5	41.4	34.4	39.4	74.6
05/12/2022	18:00:00	48.5	62.6	45.8	46.4	46.0	44.7	39.9	32.2	25.0	38.4	66.6
05/12/2022	18:05:00	60.6	67.1	55.0	53.5	53.8	57.3	54.9	46.2	41.1	38.3	79.3
05/12/2022	18:10:00	58.6	57.1	48.8	50.6	51.1	56.1	52.6	40.3	30.1	38.4	78.0
05/12/2022	18:15:00	53.2	50.9	46.3	48.4	48.0	50.3	46.2	38.0	35.3	37.9	70.4
05/12/2022	18:20:00	51.8	53.9	53.6	48.8	46.4	48.8	44.3	36.1	28.9	37.9	69.7
05/12/2022	18:25:00	57.6	50.9	63.8	55.6	52.9	54.2	49.3	41.7	35.6	36.9	80.3
05/12/2022	18:30:00	45.9	51.3	44.4	41.4	42.2	43.6	36.4	27.8	21.8	39.1	59.0
05/12/2022	18:35:00	47.7	52.4	44.3	42.7	42.1	45.7	38.9	29.4	20.8	39.4	64.6
05/12/2022	18:40:00	56.0	58.7	46.8	49.5	49.2	53.6	49.3	39.6	33.0	37.2	75.1
05/12/2022	18:45:00	56.8	57.8	45.7	47.6	51.8	54.4	49.4	41.9	32.8	37.2	75.6
05/12/2022	18:50:00	52.3	61.2	51.6	48.7	46.4	48.5	46.2	38.3	27.9	37.6	69.2
05/12/2022	18:55:00	56.2	61.6	48.4	49.0	49.7	53.4	49.9	39.6	32.3	37.0	78.7
05/12/2022	19:00:00	54.9	59.7	47.3	47.4	48.2	52.6	47.9	38.5	33.3	36.6	73.4
05/12/2022	19:05:00	43.6	43.6	37.3	37.3	37.1	40.9	37.3	26.4	19.7	36.7	66.6
05/12/2022	19:10:00	71.4	53.6	48.1	55.6	67.7	67.9	64.5	60.0	49.3	36.0	85.2
05/12/2022	19:15:00	46.6	47.1	41.2	38.0	40.7	43.3	40.8	31.9	22.4	35.3	66.2
05/12/2022	19:20:00	52.7	59.8	54.0	45.4	47.5	49.9	45.6	36.3	31.0	35.5	74.3
05/12/2022	19:25:00	53.1	48.9	43.4	44.1	45.2	50.0	47.8	35.3	26.7	34.7	73.2
05/12/2022	19:30:00	54.8	54.2	48.4	48.6	48.8	51.9	48.6	39.7	29.7	35.1	74.9
05/12/2022	19:35:00	43.6	43.0	39.7	35.9	38.5	41.0	36.4	27.8	18.5	34.4	55.3
05/12/2022	19:40:00	50.4	57.9	53.5	47.5	45.1	47.2	43.0	34.3	29.2	34.3	72.3
05/12/2022	19:45:00	56.5	51.8	44.0	46.5	52.8	53.9	48.4	41.0	30.1	34.9	74.3
05/12/2022	19:50:00	43.2	48.4	48.2	40.8	37.8	40.6	34.4	23.9	19.1	36.1	52.5
05/12/2022	19:55:00	55.6	51.7	43.7	47.7	49.4	52.5	50.1	36.4	29.4	34.9	77.7
05/12/2022	20:00:00	54.1	59.5	48.3	48.9	49.3	51.8	46.0	38.9	30.9	35.2	73.4
05/12/2022	20:05:00	43.2	40.2	34.7	35.2	37.3	37.9	35.8	33.3	37.0	35.0	64.1
05/12/2022	20:10:00	40.5	42.2	39.0	36.7	37.2	37.7	30.7	25.6	21.1	36.1	60.4
05/12/2022	20:15:00	43.0	46.0	40.1	37.8	38.7	40.9	33.3	23.8	20.6	34.8	55.3
05/12/2022	20:20:00	51.6	59.2	51.9	48.1	45.3	48.4	45.0	37.0	32.3	34.8	71.8



Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	20:25:00	41.9	48.5	51.1	44.8	37.3	36.9	29.6	18.5	16.5	36.3	53.7
05/12/2022	20:30:00	42.2	46.5	41.0	39.2	39.0	39.9	31.6	22.3	18.3	35.4	54.3
05/12/2022	20:35:00	53.8	57.3	46.1	47.9	47.6	51.5	46.4	36.8	30.7	34.8	76.0
05/12/2022	20:40:00	58.1	59.6	50.9	51.9	51.3	54.7	52.4	44.1	36.7	35.9	78.7
05/12/2022	20:45:00	47.1	47.4	48.0	45.1	45.1	42.6	38.9	30.2	25.1	36.6	66.9
05/12/2022	20:50:00	52.5	57.8	46.1	48.4	48.5	49.4	45.0	38.5	30.6	36.2	70.4
05/12/2022	20:55:00	54.3	46.8	38.7	46.5	52.9	51.5	43.9	37.2	24.6	35.7	73.6
05/12/2022	21:00:00	40.2	43.1	37.9	39.6	36.6	37.2	31.1	23.0	19.3	34.4	54.6
05/12/2022	21:05:00	35.4	38.4	33.4	30.9	32.2	33.2	24.9	16.6	16.6	34.2	38.8
05/12/2022	21:10:00	38.8	40.8	34.0	33.1	34.8	36.4	30.0	19.9	16.8	35.3	50.3
05/12/2022	21:15:00	63.5	68.1	67.0	63.7	58.8	56.5	57.1	54.6	46.4	35.5	80.1
05/12/2022	21:20:00	46.2	48.4	48.2	45.2	44.9	41.9	36.5	27.3	22.1	35.5	63.7
05/12/2022	21:25:00	38.0	44.1	33.7	33.5	34.5	35.7	27.9	19.4	17.2	35.0	49.2
05/12/2022	21:30:00	60.5	60.1	57.1	58.7	56.2	55.9	53.9	48.5	46.3	35.5	82.1
05/12/2022	21:35:00	49.5	58.5	51.5	51.1	45.5	44.3	41.8	36.7	31.7	34.7	66.2
05/12/2022	21:40:00	41.0	47.5	36.8	35.9	36.7	38.5	32.5	26.2	19.2	34.4	53.0
05/12/2022	21:45:00	58.6	54.8	49.0	53.3	55.4	56.0	49.4	43.7	33.0	33.0	76.9
05/12/2022	21:50:00	34.0	38.0	31.4	28.4	30.0	31.5	24.5	18.8	18.1	32.3	44.1
05/12/2022	21:55:00	36.3	44.6	36.8	33.8	33.2	33.3	26.7	19.1	17.3	33.6	46.6
05/12/2022	22:00:00	42.1	52.1	43.3	39.8	37.9	39.2	33.3	24.6	18.9	33.7	53.7
05/12/2022	22:05:00	52.5	54.6	42.9	44.3	45.7	49.6	46.9	34.2	25.6	32.4	73.8
05/12/2022	22:10:00	48.4	50.1	50.0	47.8	46.2	43.9	40.4	34.2	26.3	33.8	67.3
05/12/2022	22:15:00	40.8	44.2	43.1	44.0	39.6	35.4	28.1	22.2	18.2	32.8	54.1
05/12/2022	22:20:00	49.1	42.7	42.0	43.6	42.4	47.3	40.6	31.5	26.3	32.8	68.3
05/12/2022	22:25:00	37.7	39.9	33.3	31.2	32.4	35.5	29.4	19.6	17.1	32.8	50.6
05/12/2022	22:30:00	34.7	41.6	37.2	30.5	29.8	31.1	26.7	23.1	21.1	32.5	49.4
05/12/2022	22:35:00	37.4	43.2	34.3	33.4	33.7	33.7	30.0	24.9	19.7	32.1	54.5
05/12/2022	22:40:00	53.3	46.4	45.1	43.7	44.0	49.4	49.0	38.4	28.0	32.7	76.5
05/12/2022	22:45:00	38.9	40.4	37.4	35.4	34.0	36.4	30.5	22.3	19.8	32.5	52.5
05/12/2022	22:50:00	39.2	42.1	42.0	39.8	35.0	35.0	30.2	27.0	24.1	33.7	51.6
05/12/2022	22:55:00	34.3	37.1	29.0	27.4	30.2	30.7	26.2	23.2	21.2	31.8	48.3
05/12/2022	23:00:00	50.0	62.8	46.4	45.4	48.0	46.8	40.9	34.0	25.2	31.6	68.3
05/12/2022	23:05:00	50.7	56.2	46.7	47.1	45.9	47.6	43.2	37.3	27.3	31.8	68.7
05/12/2022	23:10:00	38.5	42.5	34.3	33.6	33.3	35.4	31.3	24.7	21.7	32.3	52.3
05/12/2022	23:15:00	41.4	44.0	45.0	37.0	35.9	38.3	33.4	29.6	26.6	32.9	55.4
05/12/2022	23:20:00	33.1	36.5	32.2	27.5	29.3	29.2	25.4	21.4	19.7	30.8	42.9
05/12/2022	23:25:00	33.9	37.6	32.2	28.7	29.9	30.5	26.2	20.5	18.7	30.0	48.8
05/12/2022	23:30:00	40.6	41.8	36.4	33.6	34.9	38.7	31.6	22.1	18.1	30.2	54.4
05/12/2022	23:35:00	39.0	38.1	38.8	34.4	36.8	34.9	30.4	26.9	24.0	31.4	56.3
05/12/2022	23:40:00	66.9	59.3	51.0	56.4	64.2	62.6	59.9	55.7	44.2	37.8	84.1



Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	23:45:00	51.4	47.6	40.4	42.3	43.5	48.8	45.5	36.0	29.7	31.2	72.4
05/12/2022	23:50:00	34.9	35.6	37.9	38.3	32.7	28.0	24.1	22.0	20.7	30.4	51.1
05/12/2022	23:55:00	33.1	34.6	28.3	26.0	29.3	29.1	24.2	24.6	18.7	30.9	43.9
06/12/2022	00:00:00	51.5	46.1	39.7	41.8	43.2	48.3	46.3	35.6	27.4	30.6	73.9
06/12/2022	00:05:00	47.7	63.9	43.2	45.9	45.8	43.2	38.8	32.9	26.3	30.5	66.6
06/12/2022	00:10:00	32.1	34.4	28.2	26.9	28.6	29.1	23.4	17.6	16.9	30.7	38.1
06/12/2022	00:15:00	32.4	35.4	28.2	26.9	29.6	28.9	23.8	18.5	17.5	31.0	44.1
06/12/2022	00:20:00	38.2	40.5	34.3	33.5	33.5	35.6	30.0	20.9	17.7	30.8	52.4
06/12/2022	00:25:00	36.4	35.6	29.1	28.5	33.1	34.8	24.4	18.7	18.3	30.3	52.8
06/12/2022	00:30:00	32.6	38.7	30.6	30.9	29.4	28.2	23.4	17.7	24.0	30.4	41.4
06/12/2022	00:35:00	33.0	32.8	27.0	26.3	29.6	29.3	24.8	21.4	19.8	30.5	40.8
06/12/2022	00:40:00	34.3	37.1	32.8	26.6	28.8	29.0	27.8	25.8	23.2	30.5	46.8
06/12/2022	00:45:00	31.6	31.8	26.6	25.4	27.6	28.2	24.2	17.2	17.0	30.2	41.3
06/12/2022	00:50:00	33.4	34.4	29.0	27.2	31.5	30.0	24.2	17.7	17.0	30.7	50.7
06/12/2022	00:55:00	34.0	38.2	34.1	30.4	30.3	30.0	26.6	21.2	17.8	31.2	55.2
06/12/2022	01:00:00	33.2	37.0	37.1	34.0	29.6	29.3	23.7	17.1	16.7	30.4	50.6
06/12/2022	01:05:00	31.0	36.5	29.1	25.6	27.0	27.4	23.4	16.9	16.6	29.6	41.7
06/12/2022	01:10:00	40.2	39.8	39.3	35.9	35.9	37.8	31.7	21.3	17.1	30.3	55.8
06/12/2022	01:15:00	35.7	41.4	38.8	33.3	33.8	31.8	26.2	18.3	16.8	29.8	55.3
06/12/2022	01:20:00	34.6	37.4	37.1	32.3	32.8	30.7	24.9	17.5	17.0	29.9	52.1
06/12/2022	01:25:00	32.7	34.5	29.4	27.5	30.3	29.6	23.3	16.5	16.5	31.0	40.2
06/12/2022	01:30:00	32.5	37.1	30.6	27.1	30.4	29.2	23.2	16.1	16.4	30.9	41.3
06/12/2022	01:35:00	31.4	34.8	29.9	26.8	28.4	28.0	22.8	16.0	17.1	30.3	38.7
06/12/2022	01:40:00	31.9	35.3	31.7	31.6	28.4	27.8	22.9	19.7	17.2	30.5	45.4
06/12/2022	01:45:00	31.7	35.4	31.5	28.0	28.7	28.2	23.0	17.7	16.5	30.2	42.3
06/12/2022	01:50:00	33.9	36.9	30.7	28.1	29.4	29.2	23.2	26.0	26.0	30.5	45.0
06/12/2022	01:55:00	33.4	40.1	36.0	30.8	30.3	29.9	24.3	16.6	16.4	31.0	46.4
06/12/2022	02:00:00	35.3	39.3	38.4	31.6	33.2	31.5	26.1	19.1	19.9	30.0	54.3
06/12/2022	02:05:00	33.5	32.4	28.3	26.0	28.4	27.5	22.3	28.2	23.9	29.8	46.8
06/12/2022	02:10:00	32.1	34.4	30.2	27.5	28.7	27.8	21.9	24.2	17.5	29.6	47.6
06/12/2022	02:15:00	35.5	30.1	26.1	24.8	26.3	26.2	22.3	31.0	30.9	29.0	54.8
06/12/2022	02:20:00	33.5	34.4	27.2	25.1	26.9	26.3	22.1	26.1	29.5	29.3	52.4
06/12/2022	02:25:00	29.9	30.8	26.7	24.6	26.4	26.2	22.5	15.7	16.3	29.0	43.4
06/12/2022	02:30:00	36.9	31.8	29.0	25.3	27.8	27.5	23.8	29.5	34.6	29.6	59.1
06/12/2022	02:35:00	30.8	30.8	26.4	25.2	27.0	27.4	23.3	15.7	16.3	30.1	37.7
06/12/2022	02:40:00	31.8	33.0	26.3	26.0	29.0	28.6	23.2	15.6	16.3	30.8	35.8
06/12/2022	02:45:00	31.9	33.8	28.8	26.4	29.2	28.6	23.1	15.9	16.2	30.7	38.4
06/12/2022	02:50:00	32.9	34.1	30.5	27.1	28.9	28.0	23.1	21.6	27.2	30.4	46.8
06/12/2022	02:55:00	31.6	33.3	29.4	26.9	28.7	28.2	23.3	15.8	16.8	30.4	39.8
06/12/2022	03:00:00	32.7	33.9	28.6	26.7	28.7	28.3	23.4	24.4	22.1	30.9	46.7

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
06/12/2022	03:05:00	33.4	35.8	34.7	30.2	30.7	29.7	24.6	18.6	16.7	30.2	48.2
06/12/2022	03:10:00	41.9	34.4	29.3	27.3	30.0	28.9	23.3	36.3	40.0	31.2	63.7
06/12/2022	03:15:00	32.2	36.8	28.2	26.8	29.7	28.9	23.4	15.9	17.4	30.7	41.9
06/12/2022	03:20:00	30.9	32.5	27.2	25.7	27.5	27.4	23.0	15.8	17.0	30.0	39.9
06/12/2022	03:25:00	30.9	36.1	33.9	28.9	27.4	27.2	22.2	15.5	17.4	30.0	39.7
06/12/2022	03:30:00	34.2	32.4	29.3	26.9	29.4	28.6	30.0	18.6	17.7	29.9	50.7
06/12/2022	03:35:00	32.3	34.1	28.8	26.8	29.9	29.0	23.3	16.4	16.7	30.9	42.5
06/12/2022	03:40:00	40.5	33.2	27.5	26.2	29.1	28.5	23.0	34.9	38.4	30.5	63.7
06/12/2022	03:45:00	39.2	53.6	55.9	38.2	28.8	28.8	23.5	15.8	16.2	31.1	50.8
06/12/2022	03:50:00	35.6	36.8	35.9	32.7	33.6	31.9	25.1	17.1	24.0	31.9	52.4
06/12/2022	03:55:00	32.6	35.9	30.6	28.3	30.2	29.2	23.8	15.8	16.5	31.4	40.8
06/12/2022	04:00:00	32.1	33.1	28.0	27.1	29.0	28.5	23.2	19.2	19.8	30.7	44.3
06/12/2022	04:05:00	46.3	34.1	28.1	28.0	30.8	29.8	23.6	41.9	43.8	31.5	66.3
06/12/2022	04:10:00	37.1	40.0	31.2	30.7	32.7	34.2	27.8	25.0	22.6	31.6	50.2
06/12/2022	04:15:00	40.8	42.9	32.7	34.2	35.3	38.3	31.0	26.7	31.5	32.8	59.5
06/12/2022	04:20:00	37.0	37.2	30.0	29.1	33.1	31.9	25.1	30.4	28.9	33.5	54.1
06/12/2022	04:25:00	34.5	34.7	28.1	28.3	31.8	30.6	23.9	25.7	19.4	31.7	49.8
06/12/2022	04:30:00	35.2	37.3	29.0	28.4	32.5	30.7	23.7	27.8	21.5	31.8	45.2
06/12/2022	04:35:00	35.1	35.0	28.9	33.7	32.9	31.4	24.0	24.0	17.9	31.6	45.9
06/12/2022	04:40:00	43.2	36.0	29.3	28.8	31.6	31.0	25.2	37.4	41.2	32.3	65.3
06/12/2022	04:45:00	42.6	43.0	38.7	37.1	36.3	39.1	31.9	32.8	35.3	31.7	56.5
06/12/2022	04:50:00	39.5	44.8	36.4	34.2	34.0	37.2	30.3	25.5	22.0	32.3	51.8
06/12/2022	04:55:00	42.8	40.9	34.8	32.2	33.0	34.9	28.6	30.9	41.3	31.8	61.4
06/12/2022	05:00:00	43.9	41.9	33.0	34.1	35.0	36.8	31.8	30.8	42.1	33.7	58.7
06/12/2022	05:05:00	49.6	42.1	35.8	33.0	34.9	35.8	32.8	47.0	43.8	33.3	68.3
06/12/2022	05:10:00	42.4	41.6	32.7	34.8	33.9	34.8	29.7	33.5	40.0	33.8	64.2
06/12/2022	05:15:00	41.9	41.5	33.7	35.8	36.0	38.0	32.1	34.1	32.2	34.3	61.0
06/12/2022	05:20:00	47.8	45.0	38.9	35.6	35.7	39.2	33.1	45.1	39.0	34.8	67.2
06/12/2022	05:25:00	48.2	39.4	32.4	32.0	34.4	33.8	30.7	45.5	42.9	35.2	68.6
06/12/2022	05:30:00	47.5	44.3	37.5	35.6	35.5	38.1	33.0	43.4	42.7	35.5	66.3
06/12/2022	05:35:00	47.4	42.8	34.3	35.7	35.7	36.5	33.8	44.3	41.0	34.7	66.5
06/12/2022	05:40:00	39.2	42.5	32.6	35.1	35.8	35.2	30.0	26.6	29.8	34.4	52.4
06/12/2022	05:45:00	44.2	38.7	32.3	31.2	34.0	33.5	26.1	37.9	42.2	34.9	65.1
06/12/2022	05:50:00	43.0	45.6	39.9	37.3	38.5	39.0	36.3	31.6	27.8	34.5	60.6
06/12/2022	05:55:00	58.8	57.3	50.9	51.4	54.6	56.1	49.6	47.3	41.4	35.3	76.1
06/12/2022	06:00:00	45.5	45.6	37.6	37.9	38.1	39.8	34.2	37.9	41.1	35.0	64.8
06/12/2022	06:05:00	47.0	44.7	35.2	35.1	35.7	37.2	33.8	43.0	42.2	35.0	66.4
06/12/2022	06:10:00	41.6	44.0	34.6	34.7	36.2	37.5	30.0	29.5	37.0	35.3	57.5
06/12/2022	06:15:00	49.5	44.8	41.7	43.0	41.6	45.1	43.0	35.2	43.0	35.5	67.5
06/12/2022	06:20:00	58.6	64.5	50.5	50.0	51.3	56.0	52.7	42.0	34.0	35.3	80.8

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
06/12/2022	06:25:00	49.6	55.2	46.6	44.2	44.1	45.4	44.1	35.5	35.1	35.3	70.8
06/12/2022	06:30:00	45.2	47.0	39.8	39.0	39.6	39.5	32.1	32.6	42.2	35.8	58.9
06/12/2022	06:35:00	56.6	58.3	59.0	60.0	55.4	46.8	45.9	44.8	44.7	35.3	76.9
06/12/2022	06:40:00	45.8	46.4	37.1	35.6	36.4	36.9	32.2	42.6	37.6	35.9	67.0
06/12/2022	06:45:00	51.7	60.8	45.7	47.2	49.9	48.2	42.4	36.0	35.2	36.0	70.3
06/12/2022	06:50:00	49.9	52.4	46.1	45.7	44.9	43.9	37.6	44.7	40.8	35.8	68.6
06/12/2022	06:55:00	43.0	44.9	36.1	35.7	36.8	37.9	32.0	35.2	37.3	35.6	66.0
06/12/2022	07:00:00	46.3	43.8	35.9	34.7	35.3	36.7	32.6	43.1	39.6	35.4	66.5
06/12/2022	07:05:00	60.0	50.9	47.4	50.6	52.9	57.5	52.4	48.3	45.0	36.2	82.0
06/12/2022	07:10:00	54.1	53.8	47.0	46.1	45.9	50.6	47.4	45.0	39.7	36.0	77.0
06/12/2022	07:15:00	55.0	58.9	50.1	47.4	48.0	51.1	47.6	47.0	41.4	36.1	73.4
06/12/2022	07:20:00	51.6	50.9	42.2	41.9	41.0	43.8	41.6	47.0	45.6	38.8	68.0
06/12/2022	07:25:00	51.4	55.4	46.9	47.9	46.8	47.0	44.0	42.2	37.0	38.8	68.6
06/12/2022	07:30:00	58.2	55.7	48.2	49.6	50.4	55.2	51.7	46.7	40.7	39.7	77.6
06/12/2022	07:35:00	57.1	60.0	49.6	50.1	49.9	54.0	50.9	44.4	38.2	37.1	76.7
06/12/2022	07:40:00	56.4	61.8	47.6	48.1	50.5	53.3	50.3	40.6	36.9	36.3	78.0
06/12/2022	07:45:00	60.7	57.3	52.9	51.7	52.0	57.1	55.4	49.2	42.2	36.3	79.1
06/12/2022	07:50:00	54.3	60.4	49.7	48.3	48.1	50.8	47.6	42.5	40.5	35.5	72.5
06/12/2022	07:55:00	51.9	57.2	47.9	48.9	47.4	47.6	46.2	39.1	28.5	36.6	68.9
06/12/2022	08:00:00	55.5	53.4	44.4	46.7	51.5	53.0	47.4	41.3	34.4	37.8	72.3
06/12/2022	08:05:00	58.6	52.9	58.8	57.4	54.6	54.1	50.8	47.5	42.5	36.3	78.4
06/12/2022	08:10:00	60.4	65.4	53.4	57.5	53.4	57.6	53.9	44.3	40.3	37.4	78.8
06/12/2022	08:15:00	55.9	61.7	49.2	50.6	50.5	53.3	48.4	40.1	34.8	36.2	76.0
06/12/2022	08:20:00	55.2	63.7	53.4	49.4	48.7	51.4	49.7	40.2	38.4	36.1	74.0
06/12/2022	08:25:00	49.3	51.8	43.6	41.3	39.8	41.5	45.3	36.6	42.5	36.0	70.9
06/12/2022	08:30:00	58.5	57.8	52.6	49.2	50.4	54.0	54.3	42.2	42.6	37.6	77.8
06/12/2022	08:35:00	48.1	44.7	39.7	36.6	36.1	39.2	45.0	38.8	35.7	35.4	68.3
06/12/2022	08:40:00	59.0	58.7	47.1	50.3	51.2	55.8	53.8	42.5	34.4	35.8	78.5
06/12/2022	08:45:00	56.7	62.4	49.8	50.2	51.7	54.0	49.5	40.4	34.0	36.3	75.7
06/12/2022	08:50:00	55.2	56.9	46.8	48.6	49.5	51.1	48.4	45.9	41.3	36.0	71.4
06/12/2022	08:55:00	54.9	54.7	45.7	45.9	48.4	52.0	48.2	41.3	42.6	34.9	76.0
06/12/2022	09:00:00	59.0	57.9	48.7	52.0	52.1	55.8	53.6	43.4	36.9	35.7	77.8
06/12/2022	09:05:00	43.6	47.7	40.7	38.5	38.2	39.1	37.9	31.3	29.4	35.3	62.7
06/12/2022	09:10:00	59.8	58.3	48.6	50.6	51.9	57.5	53.3	43.3	40.2	36.0	79.7
06/12/2022	09:15:00	54.9	65.6	47.3	50.2	49.2	51.8	47.4	40.1	41.9	35.1	73.3
06/12/2022	09:20:00	54.2	55.5	46.6	48.3	48.5	51.5	47.1	39.6	33.1	34.5	71.9
06/12/2022	09:25:00	42.7	47.2	44.4	42.1	37.0	35.6	31.3	36.2	35.8	34.6	62.9
06/12/2022	09:30:00	43.8	47.2	37.6	36.7	37.8	38.4	32.4	35.1	39.2	33.7	62.2
06/12/2022	09:35:00	61.0	65.9	58.9	58.7	57.5	57.2	53.6	46.5	38.9	36.2	75.2
06/12/2022	09:40:00	43.4	44.8	35.1	34.3	34.7	36.6	33.5	36.6	38.9	33.1	61.5

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
06/12/2022	09:45:00	51.6	51.3	45.9	44.4	44.0	48.5	45.9	36.0	28.2	34.6	71.8
06/12/2022	09:50:00	59.5	53.9	45.6	49.0	54.8	57.1	51.7	43.3	38.2	31.9	77.0
06/12/2022	09:55:00	57.2	55.8	47.4	47.3	51.4	54.4	51.2	40.9	33.8	32.4	76.7
06/12/2022	10:00:00	56.7	57.0	48.9	49.5	49.9	53.9	50.5	40.8	35.9	34.1	77.5
06/12/2022	10:05:00	55.2	52.9	47.9	46.9	48.5	51.7	49.9	40.3	35.3	34.6	76.5
06/12/2022	10:10:00	57.0	61.0	48.4	48.6	48.5	54.4	51.1	39.1	31.4	35.0	77.6
06/12/2022	10:15:00	44.3	51.7	39.5	38.7	42.1	40.9	34.7	30.6	27.2	34.4	58.4
06/12/2022	10:20:00	55.7	57.2	47.0	49.0	49.6	53.0	49.3	39.9	35.5	34.4	74.4
06/12/2022	10:25:00	55.1	54.0	49.4	49.4	48.3	52.3	48.9	37.8	30.5	35.2	78.1
06/12/2022	10:30:00	46.1	52.6	43.5	39.4	38.2	40.9	41.8	33.8	29.8	35.0	62.8
06/12/2022	10:35:00	51.8	55.4	46.9	44.8	45.2	48.8	45.4	37.0	36.4	33.5	71.9
06/12/2022	10:40:00	43.5	47.5	37.0	36.0	39.6	37.5	36.9	32.8	35.1	32.5	58.9
06/12/2022	10:45:00	54.5	55.6	47.4	48.7	49.9	51.6	47.5	38.9	33.3	33.4	72.8
06/12/2022	10:50:00	59.0	58.4	51.2	52.7	52.7	56.2	52.7	43.4	34.1	34.9	80.1
06/12/2022	10:55:00	44.3	49.3	42.1	39.8	38.9	41.5	36.1	28.2	32.6	33.7	62.3
06/12/2022	11:00:00	58.4	64.3	64.4	63.3	50.6	52.6	46.2	43.4	50.8	33.2	85.2

LT2, South Boundary Position

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	11:05:00	45.2	50.7	42.8	41.9	42.6	42.1	34.6	30.7	29.2	41.3	69.1
05/12/2022	11:10:00	44.3	52.0	44.8	40.2	41.5	41.2	34.4	30.8	25.2	41.5	59.0
05/12/2022	11:15:00	46.2	53.5	44.9	40.7	42.7	43.0	37.4	34.5	28.8	41.8	61.7
05/12/2022	11:20:00	48.0	52.1	45.5	40.9	42.6	43.1	40.3	40.5	37.3	41.5	69.2
05/12/2022	11:25:00	48.3	52.8	44.8	40.1	42.7	45.9	40.8	33.8	29.8	40.6	63.9
05/12/2022	11:30:00	42.3	50.3	41.2	34.7	39.1	39.7	30.4	30.4	29.3	40.4	52.4
05/12/2022	11:35:00	48.6	53.2	45.3	40.1	42.2	46.3	40.2	36.6	31.3	42.0	62.8
05/12/2022	11:40:00	49.8	62.0	49.0	42.5	43.5	46.8	43.1	37.5	32.3	41.2	65.6
05/12/2022	11:45:00	49.2	58.3	48.0	44.4	43.6	46.7	40.9	36.6	29.2	40.9	64.1
05/12/2022	11:50:00	45.9	56.0	45.3	38.4	40.8	43.7	37.4	26.8	28.4	41.5	62.1
05/12/2022	11:55:00	42.7	49.7	43.1	36.2	40.3	40.6	29.9	20.7	20.6	41.5	47.6
05/12/2022	12:00:00	53.1	52.9	43.9	41.5	48.0	51.4	44.0	37.2	32.5	41.1	73.1
05/12/2022	12:05:00	47.9	56.8	45.8	41.7	43.4	45.3	39.7	32.4	29.2	40.5	62.5
05/12/2022	12:10:00	46.8	52.2	44.1	38.7	41.7	43.5	38.1	37.4	33.6	41.5	63.2
05/12/2022	12:15:00	46.9	57.2	46.9	39.8	41.8	43.4	39.1	36.7	32.2	41.6	62.6
05/12/2022	12:20:00	43.4	50.4	42.2	36.3	41.0	41.1	30.9	27.0	23.0	41.2	54.7
05/12/2022	12:25:00	42.4	49.4	41.3	35.4	40.0	40.3	29.8	23.3	22.6	40.9	47.8
05/12/2022	12:30:00	42.4	49.2	40.7	35.3	39.1	39.6	30.7	31.8	28.4	39.9	55.6
05/12/2022	12:35:00	42.8	48.8	39.9	34.6	38.4	40.3	32.1	32.0	28.9	40.6	57.8

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	12:40:00	43.9	49.9	41.5	37.3	40.8	41.5	33.6	27.5	26.1	42.1	55.9
05/12/2022	12:45:00	49.3	51.6	42.6	36.7	39.5	42.7	46.3	34.3	33.4	41.1	70.7
05/12/2022	12:50:00	47.5	51.4	44.8	39.6	41.6	45.5	38.8	33.1	25.8	41.3	62.9
05/12/2022	12:55:00	50.5	56.5	47.5	46.9	47.7	47.4	42.2	35.8	26.6	40.9	68.3
05/12/2022	13:00:00	44.6	50.5	45.8	40.6	41.5	41.7	34.7	30.4	24.4	41.2	64.8
05/12/2022	13:05:00	43.8	51.0	47.1	43.6	42.1	40.2	30.1	26.2	22.4	40.7	57.3
05/12/2022	13:10:00	46.2	57.4	55.2	48.9	44.1	39.9	31.1	25.4	29.3	41.3	60.1
05/12/2022	13:15:00	44.8	52.3	44.8	41.1	41.6	42.2	34.8	27.0	23.0	40.5	59.2
05/12/2022	13:20:00	45.8	52.8	44.4	40.0	41.5	43.4	36.9	30.2	28.3	41.2	61.1
05/12/2022	13:25:00	45.9	52.5	43.5	38.9	41.7	43.6	37.1	26.1	23.5	41.4	61.6
05/12/2022	13:30:00	43.4	50.8	44.8	38.7	40.5	40.4	34.4	24.4	26.3	40.9	60.3
05/12/2022	13:35:00	47.4	54.7	46.6	39.7	41.5	45.0	39.5	32.1	29.6	40.1	64.9
05/12/2022	13:40:00	50.0	51.8	44.7	42.8	46.2	47.7	40.8	35.7	33.6	40.5	68.7
05/12/2022	13:45:00	42.4	49.2	41.3	35.0	39.7	40.0	30.2	28.6	27.3	40.2	55.2
05/12/2022	13:50:00	51.4	57.8	55.1	51.6	48.6	47.3	41.8	34.3	30.9	41.8	70.5
05/12/2022	13:55:00	50.7	53.9	44.6	43.1	45.2	47.6	42.6	40.9	38.6	40.4	67.7
05/12/2022	14:00:00	43.0	49.7	41.4	36.2	40.5	40.5	32.5	25.2	21.0	40.6	58.5
05/12/2022	14:05:00	48.5	57.6	48.0	41.9	43.8	45.7	40.4	35.2	28.9	41.2	63.7
05/12/2022	14:10:00	57.7	60.7	50.5	47.4	53.6	55.8	48.6	42.0	34.6	42.0	76.2
05/12/2022	14:15:00	46.0	51.7	43.6	39.3	40.4	42.5	34.5	39.1	35.1	40.6	60.5
05/12/2022	14:20:00	42.7	50.4	41.5	36.0	40.2	40.4	29.5	26.2	28.1	41.0	54.5
05/12/2022	14:25:00	47.0	52.0	44.4	39.2	41.9	45.3	38.1	27.0	22.5	41.1	64.2
05/12/2022	14:30:00	45.9	50.8	45.0	40.2	42.0	42.1	36.8	36.8	32.9	41.3	65.7
05/12/2022	14:35:00	52.4	59.3	48.8	46.4	49.5	48.7	44.7	37.4	38.5	41.9	68.0
05/12/2022	14:40:00	49.7	54.8	44.9	42.1	43.7	47.5	42.1	32.9	27.2	41.7	66.0
05/12/2022	14:45:00	53.1	54.6	44.9	41.7	48.5	49.8	46.4	41.1	36.9	43.4	69.3
05/12/2022	14:50:00	55.4	56.4	47.9	49.0	51.7	52.9	47.1	39.1	31.7	42.8	70.0
05/12/2022	14:55:00	52.8	56.2	52.1	49.7	49.6	48.5	45.2	41.4	40.1	43.2	73.0
05/12/2022	15:00:00	49.0	56.5	48.8	43.1	43.8	44.4	43.5	37.5	35.1	41.3	68.8
05/12/2022	15:05:00	52.4	55.3	47.3	46.0	47.3	49.6	45.5	39.1	31.0	40.1	68.6
05/12/2022	15:10:00	46.7	51.0	43.7	40.9	41.7	41.7	39.6	37.4	37.9	41.2	68.5
05/12/2022	15:15:00	48.7	56.3	45.1	41.4	43.2	46.5	40.8	30.6	24.6	42.0	63.7
05/12/2022	15:20:00	44.6	50.9	41.4	39.1	41.5	42.1	35.2	27.4	27.4	41.3	62.4
05/12/2022	15:25:00	44.2	50.9	47.2	39.0	41.3	41.6	33.9	25.1	21.8	42.0	58.4
05/12/2022	15:30:00	49.8	52.9	44.5	41.2	44.1	45.3	44.7	37.8	33.2	41.7	68.1
05/12/2022	15:35:00	48.0	51.9	46.1	38.5	41.1	42.9	43.5	36.2	34.4	42.0	69.0
05/12/2022	15:40:00	47.9	51.3	43.9	40.9	42.4	45.3	38.8	37.9	31.7	42.4	64.1
05/12/2022	15:45:00	46.0	56.7	44.6	37.8	41.7	43.9	36.4	28.6	27.7	41.6	61.0
05/12/2022	15:50:00	48.2	54.4	45.3	45.3	45.4	45.0	39.5	33.6	28.0	41.9	66.1
05/12/2022	15:55:00	45.1	52.7	41.4	37.8	40.4	43.1	34.7	32.4	28.1	41.6	58.4



Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	16:00:00	56.5	52.9	44.5	43.1	52.4	54.8	46.7	41.3	33.2	43.7	75.1
05/12/2022	16:05:00	46.4	54.4	54.1	43.9	42.8	42.4	35.1	35.7	29.2	43.9	62.7
05/12/2022	16:10:00	45.8	52.6	44.1	39.1	41.8	42.7	35.1	36.2	32.5	43.6	63.4
05/12/2022	16:15:00	49.9	54.8	47.4	43.7	44.7	45.9	42.2	41.1	37.1	44.1	73.3
05/12/2022	16:20:00	49.5	55.2	48.1	42.1	44.6	44.7	41.2	41.3	41.7	41.9	69.4
05/12/2022	16:25:00	51.2	56.5	46.7	42.2	45.6	47.0	42.4	43.9	41.0	43.1	78.4
05/12/2022	16:30:00	49.1	50.6	43.4	40.4	43.6	46.0	42.5	37.1	35.7	42.2	70.3
05/12/2022	16:35:00	47.4	56.3	50.5	46.0	42.9	42.8	38.6	37.2	32.3	42.3	70.6
05/12/2022	16:40:00	47.6	53.4	48.5	43.9	43.0	45.2	39.2	28.1	23.0	42.8	62.3
05/12/2022	16:45:00	50.7	58.1	46.7	42.8	46.5	47.2	44.2	38.0	34.6	43.1	70.4
05/12/2022	16:50:00	53.0	55.1	48.5	45.8	47.8	50.2	45.1	41.9	39.4	43.6	73.3
05/12/2022	16:55:00	49.1	50.6	42.5	40.2	43.5	47.1	41.2	28.3	22.8	42.5	64.9
05/12/2022	17:00:00	49.6	56.7	48.8	43.8	43.8	44.5	43.4	39.8	39.5	43.1	72.1
05/12/2022	17:05:00	46.9	52.3	46.7	40.2	43.0	45.0	36.6	26.1	21.9	43.7	60.6
05/12/2022	17:10:00	48.2	60.7	45.3	44.0	45.6	45.5	38.5	29.5	23.6	43.7	67.4
05/12/2022	17:15:00	47.6	51.9	45.8	41.7	42.5	44.9	39.6	33.7	29.6	42.8	65.7
05/12/2022	17:20:00	50.2	60.5	49.5	47.4	45.1	46.9	42.2	38.2	35.9	43.2	70.3
05/12/2022	17:25:00	50.3	56.5	50.9	43.3	43.5	48.2	42.9	28.7	22.7	41.8	67.5
05/12/2022	17:30:00	47.1	55.7	43.9	39.3	41.9	45.1	38.9	27.1	22.1	42.2	64.4
05/12/2022	17:35:00	47.6	52.8	46.1	41.2	42.5	43.9	39.9	37.1	36.6	42.4	68.6
05/12/2022	17:40:00	55.9	50.6	44.1	42.9	45.6	49.6	46.4	51.0	49.9	42.8	84.7
05/12/2022	17:45:00	47.4	53.0	45.0	40.0	42.5	45.3	39.1	29.3	23.8	42.2	63.3
05/12/2022	17:50:00	47.1	55.5	44.9	39.9	42.4	43.7	40.2	35.4	33.2	42.6	69.5
05/12/2022	17:55:00	52.0	59.6	53.2	44.9	47.0	49.5	44.0	38.1	28.0	42.0	75.7
05/12/2022	18:00:00	47.1	59.2	42.8	42.3	44.4	44.2	38.2	31.3	23.9	42.4	65.7
05/12/2022	18:05:00	52.1	64.6	50.9	44.4	45.9	48.6	45.2	39.7	38.8	42.0	71.9
05/12/2022	18:10:00	51.4	53.8	47.6	42.8	44.4	48.8	44.7	38.1	33.3	43.0	66.2
05/12/2022	18:15:00	45.4	50.7	49.8	44.8	41.6	42.6	34.4	22.6	20.9	41.9	56.4
05/12/2022	18:20:00	48.7	52.4	49.2	43.0	41.7	43.3	39.7	42.5	40.5	41.2	73.7
05/12/2022	18:25:00	48.9	50.5	57.6	42.0	42.3	45.8	40.5	34.6	33.2	40.9	69.2
05/12/2022	18:30:00	45.4	49.7	40.0	39.4	43.1	42.9	34.8	28.4	23.3	42.3	59.8
05/12/2022	18:35:00	45.2	49.5	41.4	38.4	42.1	43.3	33.7	25.6	22.0	43.1	59.3
05/12/2022	18:40:00	49.8	57.3	45.6	42.1	42.5	46.8	42.2	39.6	37.3	41.3	67.9
05/12/2022	18:45:00	53.2	50.2	43.0	42.2	48.0	51.2	45.6	37.8	25.5	41.0	71.9
05/12/2022	18:50:00	51.3	59.0	47.4	43.5	45.2	47.4	44.7	41.6	38.6	41.5	70.7
05/12/2022	18:55:00	48.3	55.3	43.2	39.4	41.5	45.8	41.8	29.0	22.7	41.0	67.1
05/12/2022	19:00:00	47.2	52.5	42.8	38.3	40.6	44.7	40.4	31.6	27.3	40.4	66.7
05/12/2022	19:05:00	44.4	47.6	40.7	35.1	38.9	41.6	38.0	26.0	21.7	40.3	66.4
05/12/2022	19:10:00	68.9	51.3	46.3	51.0	64.7	65.7	62.2	56.9	46.6	39.9	83.4
05/12/2022	19:15:00	49.1	48.4	41.4	38.8	40.1	43.3	41.3	41.2	43.9	39.5	76.0

Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	19:20:00	46.1	56.6	47.6	37.0	40.1	43.6	39.2	27.4	21.8	39.4	65.2
05/12/2022	19:25:00	47.3	50.8	45.2	42.7	40.5	44.1	40.5	35.2	33.6	38.2	65.2
05/12/2022	19:30:00	50.2	52.8	43.8	42.0	43.9	47.5	44.1	34.6	24.1	38.2	68.1
05/12/2022	19:35:00	43.3	48.1	42.3	37.1	38.7	39.5	33.9	35.1	31.8	38.8	66.5
05/12/2022	19:40:00	44.4	53.5	53.9	43.9	39.8	40.1	34.5	29.5	24.4	38.0	60.4
05/12/2022	19:45:00	53.7	48.7	41.8	40.8	49.6	51.7	45.5	36.9	25.1	38.6	73.6
05/12/2022	19:50:00	42.8	47.2	47.8	40.6	39.9	39.6	33.3	24.8	21.8	39.1	59.5
05/12/2022	19:55:00	47.7	53.5	42.6	40.1	43.4	44.8	41.0	29.1	24.1	38.8	66.5
05/12/2022	20:00:00	49.1	54.3	45.3	43.2	44.0	46.6	41.7	34.5	24.0	38.7	67.1
05/12/2022	20:05:00	43.1	43.4	38.2	34.6	40.2	40.1	34.9	26.8	23.9	38.5	69.0
05/12/2022	20:10:00	44.2	45.4	41.9	38.2	41.0	41.4	35.6	28.6	23.5	40.0	67.2
05/12/2022	20:15:00	41.1	44.4	38.4	33.5	37.5	38.9	31.7	24.4	21.5	38.9	59.1
05/12/2022	20:20:00	44.4	55.8	49.6	44.6	39.2	41.3	34.5	26.1	22.6	38.7	59.7
05/12/2022	20:25:00	43.2	50.0	50.8	45.6	40.0	39.2	28.8	19.9	20.2	39.5	54.4
05/12/2022	20:30:00	44.2	48.0	43.5	39.7	43.3	41.2	29.2	21.0	21.0	39.1	63.4
05/12/2022	20:35:00	51.6	57.0	48.5	43.1	43.6	45.5	43.8	44.5	46.2	39.7	75.9
05/12/2022	20:40:00	50.8	57.7	50.1	44.4	45.3	47.2	44.6	37.4	31.9	41.4	66.2
05/12/2022	20:45:00	43.4	46.3	44.7	42.3	41.2	39.5	34.4	25.3	21.6	41.4	51.9
05/12/2022	20:50:00	48.5	54.6	44.4	41.9	43.8	46.5	39.3	32.5	23.3	40.6	66.6
05/12/2022	20:55:00	52.5	46.5	39.0	42.5	50.1	50.4	42.2	34.9	22.7	39.5	72.8
05/12/2022	21:00:00	40.2	43.8	39.1	37.7	37.5	37.9	28.0	19.7	20.4	38.1	46.9
05/12/2022	21:05:00	39.8	43.9	38.0	33.3	37.0	37.8	27.7	19.6	20.4	38.4	43.8
05/12/2022	21:10:00	40.8	43.9	37.8	32.6	37.6	39.0	28.7	19.3	20.0	39.1	46.2
05/12/2022	21:15:00	60.2	63.8	63.6	59.0	55.0	54.2	54.2	50.8	40.5	39.5	76.9
05/12/2022	21:20:00	40.9	46.6	40.2	35.7	38.5	38.7	27.9	18.8	19.7	39.3	45.4
05/12/2022	21:25:00	40.8	45.8	37.6	32.9	38.5	38.7	28.2	19.2	19.7	38.7	44.8
05/12/2022	21:30:00	51.1	59.0	53.0	47.5	46.4	47.5	43.8	36.2	30.8	39.4	67.9
05/12/2022	21:35:00	40.4	50.3	41.5	35.2	37.3	38.1	29.2	20.7	19.9	37.1	50.1
05/12/2022	21:40:00	56.1	47.6	39.0	41.8	52.0	54.3	47.1	40.5	26.8	38.1	75.7
05/12/2022	21:45:00	42.7	48.2	41.7	39.6	40.3	40.1	31.5	22.7	20.2	36.2	58.7
05/12/2022	21:50:00	37.8	45.7	37.8	30.1	33.9	35.7	27.2	20.5	20.6	35.9	46.2
05/12/2022	21:55:00	39.3	43.3	39.6	34.3	36.7	37.0	27.6	20.5	20.7	37.7	50.4
05/12/2022	22:00:00	38.9	44.3	39.4	31.8	35.8	36.7	27.9	19.8	20.0	36.4	45.0
05/12/2022	22:05:00	43.2	52.9	38.1	34.8	36.2	41.0	36.4	23.5	20.9	36.0	59.4
05/12/2022	22:10:00	46.5	48.0	50.9	43.4	43.2	42.8	39.4	31.9	24.4	36.8	66.1
05/12/2022	22:15:00	40.9	44.0	43.0	43.2	39.9	35.6	29.0	21.8	21.1	36.0	58.2
05/12/2022	22:20:00	41.5	45.6	40.0	35.3	36.9	39.7	31.2	23.1	21.8	36.4	56.1
05/12/2022	22:25:00	37.5	41.9	36.4	30.2	33.5	35.4	27.4	20.5	20.4	35.9	43.1
05/12/2022	22:30:00	37.2	42.3	37.1	29.9	33.4	34.8	27.6	22.1	21.3	35.7	47.0
05/12/2022	22:35:00	37.8	42.2	36.0	30.5	35.7	35.2	26.6	19.0	19.7	35.6	47.4



Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
05/12/2022	22:40:00	44.4	45.9	42.5	35.7	36.9	41.5	38.9	26.1	20.2	36.0	61.2
05/12/2022	22:45:00	38.0	40.6	38.8	34.4	35.1	35.3	27.5	21.3	20.9	36.0	44.6
05/12/2022	22:50:00	39.2	41.8	42.2	39.5	36.4	35.2	29.1	25.2	23.5	36.2	49.9
05/12/2022	22:55:00	37.6	42.6	36.4	30.1	34.8	35.1	26.9	21.2	20.8	35.5	44.4
05/12/2022	23:00:00	48.4	58.4	43.1	40.4	46.5	45.7	39.4	31.4	23.0	34.4	68.1
05/12/2022	23:05:00	48.1	52.3	43.4	41.6	42.4	45.5	41.1	35.1	25.5	34.9	67.8
05/12/2022	23:10:00	38.7	42.0	38.5	31.8	34.9	35.9	29.8	25.3	23.5	35.7	49.9
05/12/2022	23:15:00	39.0	43.0	40.7	34.8	35.4	35.9	30.1	26.1	24.1	35.3	48.2
05/12/2022	23:20:00	36.2	39.7	36.4	30.6	33.1	33.1	27.2	21.6	21.1	33.8	47.9
05/12/2022	23:25:00	35.5	37.9	35.9	28.0	31.6	32.9	26.6	20.7	20.5	32.7	41.9
05/12/2022	23:30:00	35.9	39.8	35.6	28.9	31.8	33.5	26.8	19.8	20.0	33.3	44.0
05/12/2022	23:35:00	37.4	40.5	36.2	30.1	33.4	33.8	29.7	25.8	23.8	34.7	53.1
05/12/2022	23:40:00	63.3	55.6	48.2	51.7	60.2	59.6	56.2	51.5	38.5	38.5	80.6
05/12/2022	23:45:00	42.1	45.1	38.3	34.0	34.9	39.9	35.0	25.7	22.6	33.7	59.7
05/12/2022	23:50:00	37.6	38.7	40.5	39.8	34.8	32.2	26.6	26.6	22.9	33.7	48.5
05/12/2022	23:55:00	36.5	39.4	35.2	28.7	32.5	33.0	26.6	28.0	21.7	34.0	48.0
06/12/2022	00:00:00	42.3	43.7	38.7	33.7	34.6	39.8	36.3	24.6	20.9	33.8	59.7
06/12/2022	00:05:00	44.9	59.3	40.9	41.2	42.6	41.1	37.0	30.1	23.4	33.4	63.9
06/12/2022	00:10:00	35.7	39.9	35.2	29.3	32.6	33.0	25.9	19.4	19.9	34.0	42.2
06/12/2022	00:15:00	36.2	40.8	35.9	29.1	33.8	33.1	26.6	20.9	20.4	34.1	45.7
06/12/2022	00:20:00	37.4	40.7	37.8	31.7	35.1	34.4	27.8	20.2	20.0	33.3	49.0
06/12/2022	00:25:00	38.7	41.0	36.5	31.8	35.4	37.4	26.5	19.4	20.0	33.3	54.8
06/12/2022	00:30:00	35.6	44.7	37.0	32.4	32.3	31.6	25.6	19.6	27.6	33.4	44.7
06/12/2022	00:35:00	36.3	38.1	35.4	27.9	33.3	33.4	27.1	21.8	21.2	33.8	46.4
06/12/2022	00:40:00	36.2	39.3	35.5	31.6	32.7	31.9	28.7	24.7	22.7	33.3	58.8
06/12/2022	00:45:00	35.0	37.0	34.6	27.7	31.0	32.0	27.3	19.6	19.9	32.9	50.5
06/12/2022	00:50:00	37.1	40.4	36.3	30.2	35.5	33.9	26.9	19.6	20.0	34.0	52.0
06/12/2022	00:55:00	36.8	45.1	40.2	32.4	34.2	33.4	27.2	20.3	20.1	34.6	51.0
06/12/2022	01:00:00	37.4	44.9	41.8	38.2	35.1	33.2	26.1	19.5	20.0	33.4	57.9
06/12/2022	01:05:00	34.1	39.4	35.2	27.1	30.3	31.1	25.6	19.1	19.9	32.7	42.1
06/12/2022	01:10:00	35.8	39.6	36.4	29.3	32.5	33.0	26.9	19.4	19.8	32.9	47.1
06/12/2022	01:15:00	34.5	39.8	37.8	30.4	31.6	31.1	25.5	19.1	19.9	32.9	51.9
06/12/2022	01:20:00	34.7	40.9	36.5	28.7	31.4	31.4	25.7	19.6	21.6	33.1	46.3
06/12/2022	01:25:00	37.0	40.8	36.3	30.9	35.1	34.1	26.0	19.3	19.9	34.5	44.3
06/12/2022	01:30:00	36.6	42.1	37.4	30.3	35.0	33.5	25.6	19.0	19.9	34.1	46.4
06/12/2022	01:35:00	35.1	39.6	36.8	30.2	32.6	31.7	25.0	18.9	22.6	33.5	42.5
06/12/2022	01:40:00	35.1	39.4	37.9	32.7	31.8	31.6	25.4	20.8	22.1	33.4	43.1
06/12/2022	01:45:00	35.7	39.9	37.9	30.8	33.3	32.6	25.4	21.1	20.0	33.2	44.3
06/12/2022	01:50:00	37.5	42.8	36.7	32.0	34.7	33.0	25.5	26.5	30.4	33.6	49.3
06/12/2022	01:55:00	35.8	41.7	38.4	32.0	33.3	32.7	25.6	18.8	20.4	33.9	46.2



Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
06/12/2022	02:00:00	36.5	38.5	37.6	31.1	32.9	31.9	25.2	27.3	28.6	33.2	53.0
06/12/2022	02:05:00	43.8	38.2	36.0	31.6	32.7	31.9	27.0	41.0	37.6	33.6	59.5
06/12/2022	02:10:00	40.0	40.8	37.3	36.7	36.5	33.7	29.2	34.1	29.9	32.9	62.9
06/12/2022	02:15:00	42.5	35.4	35.2	30.3	29.9	30.8	28.2	40.1	35.1	32.2	60.5
06/12/2022	02:20:00	34.0	38.2	34.7	31.3	30.5	30.0	24.8	23.5	21.3	32.4	43.7
06/12/2022	02:25:00	39.1	36.1	35.4	39.0	39.5	32.6	26.6	21.0	20.0	32.1	66.2
06/12/2022	02:30:00	35.0	35.4	35.9	27.0	30.1	30.6	25.6	28.2	20.8	32.2	57.6
06/12/2022	02:35:00	34.2	35.5	35.0	27.3	30.1	31.1	26.3	19.6	19.7	32.7	55.1
06/12/2022	02:40:00	36.0	40.0	35.7	28.5	34.2	32.9	25.6	18.4	19.6	33.9	48.0
06/12/2022	02:45:00	35.6	39.1	36.4	28.3	33.2	32.7	25.5	18.9	19.7	33.6	46.8
06/12/2022	02:50:00	39.4	39.3	37.3	29.8	33.1	32.1	26.2	29.2	37.0	32.8	59.9
06/12/2022	02:55:00	35.4	39.1	36.0	28.4	33.0	32.2	25.2	18.4	23.2	33.3	42.9
06/12/2022	03:00:00	41.7	39.1	37.1	36.6	36.8	34.1	28.9	36.6	34.8	33.4	63.7
06/12/2022	03:05:00	35.9	40.8	37.6	28.9	33.4	31.9	25.1	23.4	26.8	33.0	49.9
06/12/2022	03:10:00	36.5	41.7	37.5	29.3	34.8	33.2	25.7	19.6	20.6	34.3	48.3
06/12/2022	03:15:00	37.5	40.2	35.9	28.6	34.2	32.9	26.3	20.6	32.6	33.9	50.9
06/12/2022	03:20:00	34.0	36.4	35.3	27.6	30.6	30.8	25.3	19.0	19.9	32.8	44.7
06/12/2022	03:25:00	34.2	36.8	36.3	28.9	30.9	31.4	24.6	18.4	19.9	32.7	41.8
06/12/2022	03:30:00	36.6	38.1	34.7	28.3	33.9	32.6	30.1	19.4	20.2	32.7	48.2
06/12/2022	03:35:00	36.0	38.7	34.6	28.0	34.3	32.9	25.1	19.1	21.2	33.9	44.8
06/12/2022	03:40:00	38.7	39.2	34.9	27.4	33.5	32.8	25.2	22.8	36.3	33.6	60.5
06/12/2022	03:45:00	42.1	50.7	55.7	40.2	38.5	36.3	30.5	23.2	20.5	34.4	69.1
06/12/2022	03:50:00	40.0	41.7	36.6	31.2	36.1	34.6	26.2	22.8	36.9	35.7	51.3
06/12/2022	03:55:00	40.5	40.5	38.9	38.9	37.4	35.5	32.3	24.8	32.8	34.4	64.1
06/12/2022	04:00:00	35.8	38.7	35.2	30.5	33.6	32.8	25.4	19.0	19.7	34.1	41.4
06/12/2022	04:05:00	38.9	40.0	35.5	31.7	36.5	34.7	25.9	27.1	31.8	35.5	54.5
06/12/2022	04:10:00	42.4	40.3	34.8	30.0	35.0	33.6	28.1	37.3	38.2	35.3	61.5
06/12/2022	04:15:00	43.9	43.0	35.4	39.2	39.8	37.9	30.6	38.5	35.7	37.0	67.6
06/12/2022	04:20:00	45.8	42.8	36.5	32.1	38.5	36.7	29.2	42.2	39.7	37.1	63.2
06/12/2022	04:25:00	42.7	40.6	35.4	31.5	37.4	35.3	26.7	38.8	34.3	35.2	63.1
06/12/2022	04:30:00	43.0	43.0	35.7	32.0	38.9	36.1	26.6	38.5	34.8	35.3	59.8
06/12/2022	04:35:00	41.6	39.8	35.3	34.5	38.5	36.4	27.4	35.7	31.7	35.2	59.7
06/12/2022	04:40:00	46.9	41.6	36.0	35.8	38.6	36.6	30.6	43.6	40.8	36.4	65.5
06/12/2022	04:45:00	43.7	43.5	36.4	31.6	35.7	35.7	27.5	40.7	35.2	35.0	58.7
06/12/2022	04:50:00	40.6	44.7	36.3	32.1	36.3	36.4	29.0	34.1	29.1	35.8	60.8
06/12/2022	04:55:00	44.0	42.7	37.1	31.9	37.1	36.6	27.6	40.0	37.3	36.4	62.9
06/12/2022	05:00:00	42.2	43.4	36.5	31.7	37.5	36.9	27.9	34.7	36.9	37.1	59.5
06/12/2022	05:05:00	44.5	44.9	38.5	35.5	39.5	38.7	30.2	39.6	36.3	37.7	64.0
06/12/2022	05:10:00	43.7	43.5	35.8	32.4	36.7	37.0	29.6	39.1	37.6	37.6	61.7
06/12/2022	05:15:00	44.9	42.5	35.9	33.3	38.5	37.5	29.6	41.4	36.8	38.6	61.1

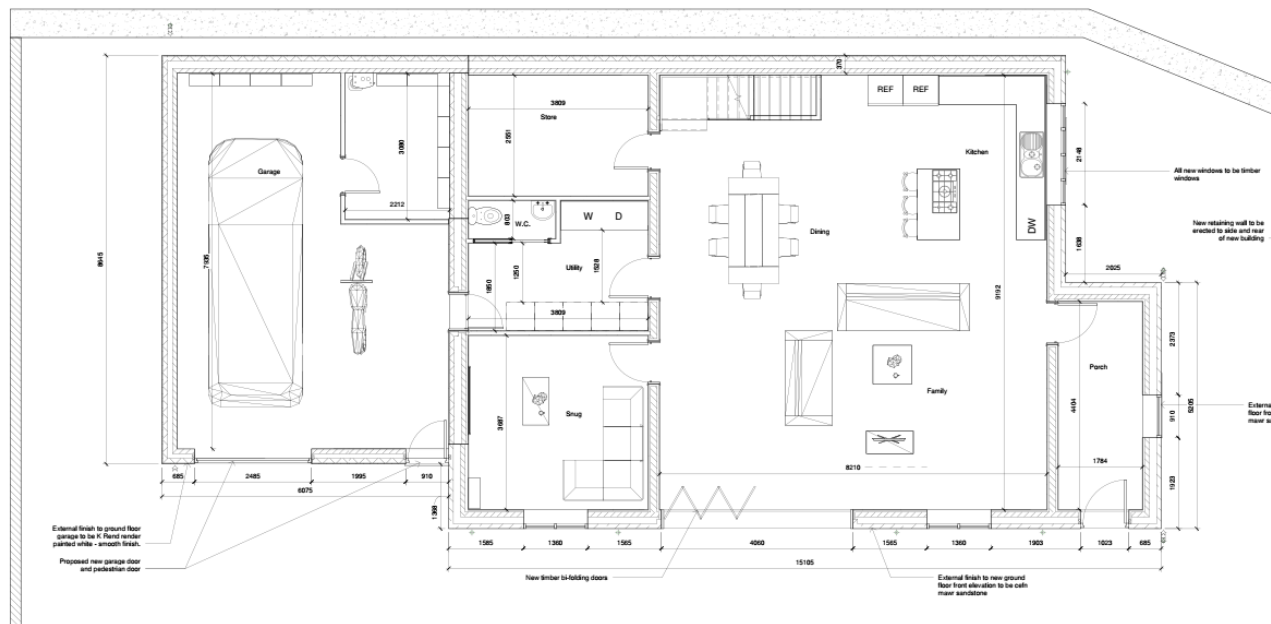


Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
06/12/2022	05:20:00	41.9	45.2	37.5	34.3	38.7	37.9	28.6	34.5	30.9	38.7	58.2
06/12/2022	05:25:00	44.8	44.9	38.0	34.8	39.5	38.2	28.7	40.5	36.6	39.1	60.0
06/12/2022	05:30:00	45.0	43.9	38.5	36.1	39.4	38.5	31.2	40.6	36.6	39.2	63.7
06/12/2022	05:35:00	45.0	43.6	35.9	32.9	37.9	36.9	29.8	41.4	38.0	38.2	61.7
06/12/2022	05:40:00	40.2	44.8	35.8	33.4	37.7	37.0	27.7	29.6	28.4	38.1	55.7
06/12/2022	05:45:00	43.8	45.3	41.7	35.6	40.4	38.6	27.9	28.0	40.2	38.8	59.7
06/12/2022	05:50:00	40.7	44.0	36.2	32.8	38.5	37.4	29.4	22.2	31.9	37.5	52.6
06/12/2022	05:55:00	56.5	52.9	44.6	45.7	51.3	54.8	48.0	40.7	33.3	39.1	75.3
06/12/2022	06:00:00	44.7	44.7	37.1	33.6	38.2	37.5	29.5	40.4	38.5	38.5	61.0
06/12/2022	06:05:00	40.4	44.8	37.5	32.7	37.6	37.3	28.2	27.7	30.8	38.6	56.4
06/12/2022	06:10:00	40.8	45.2	37.0	32.9	38.4	38.1	28.5	21.6	30.3	38.8	48.9
06/12/2022	06:15:00	44.0	49.8	43.9	41.1	39.9	38.7	33.0	35.4	37.1	39.0	64.9
06/12/2022	06:20:00	51.4	60.9	47.0	44.2	44.6	48.4	44.4	40.4	37.9	38.7	67.9
06/12/2022	06:25:00	42.3	51.0	40.9	36.9	38.6	38.7	31.2	33.0	30.8	38.7	56.4
06/12/2022	06:30:00	43.9	45.7	37.9	34.8	37.8	38.0	28.9	39.1	36.5	38.9	60.2
06/12/2022	06:35:00	51.4	55.2	58.6	51.9	48.8	44.9	43.1	39.2	38.0	39.4	76.4
06/12/2022	06:40:00	50.4	55.6	43.2	42.4	48.4	47.5	40.9	35.8	33.5	40.1	69.9
06/12/2022	06:45:00	49.2	50.0	39.7	40.1	45.2	41.8	38.3	44.2	40.2	39.3	73.9
06/12/2022	06:50:00	44.7	48.6	39.8	36.9	40.3	39.4	30.4	39.1	36.2	39.7	59.4
06/12/2022	06:55:00	48.0	47.4	41.1	37.2	44.1	43.6	42.4	35.0	30.4	39.3	74.4
06/12/2022	07:00:00	44.5	46.8	41.0	36.6	38.4	41.5	35.1	35.7	32.8	39.0	59.1
06/12/2022	07:05:00	52.4	50.9	43.8	42.1	45.7	50.2	45.0	38.6	33.0	40.2	78.1
06/12/2022	07:10:00	43.2	50.3	39.0	35.2	38.4	38.8	35.8	28.4	36.5	39.7	56.5
06/12/2022	07:15:00	53.8	56.6	48.0	43.0	46.4	48.2	47.5	46.5	43.6	40.0	77.1
06/12/2022	07:20:00	54.8	61.7	52.3	47.2	49.4	48.8	47.7	47.5	45.2	53.7	76.1
06/12/2022	07:25:00	55.2	62.2	52.6	48.1	49.6	50.4	47.9	47.1	44.7	53.4	67.8
06/12/2022	07:30:00	54.4	61.8	52.3	47.0	48.4	49.2	47.7	46.2	44.9	53.1	67.0
06/12/2022	07:35:00	52.8	60.4	49.9	44.8	46.1	47.9	47.2	43.4	41.2	39.9	69.1
06/12/2022	07:40:00	50.8	57.8	45.4	42.2	47.1	48.1	43.5	33.8	29.9	39.2	68.6
06/12/2022	07:45:00	51.3	55.0	48.5	42.0	44.1	48.4	45.4	36.1	30.4	38.4	72.5
06/12/2022	07:50:00	49.0	56.2	47.0	42.5	43.0	43.6	42.2	40.0	41.0	37.2	70.7
06/12/2022	07:55:00	49.3	52.7	46.0	45.8	44.9	44.9	43.8	36.2	27.0	38.3	68.6
06/12/2022	08:00:00	52.6	50.5	43.0	43.2	48.6	50.7	43.4	38.3	29.7	38.0	71.4
06/12/2022	08:05:00	50.2	54.3	50.6	44.2	45.3	44.0	44.4	40.7	38.0	38.1	71.8
06/12/2022	08:10:00	52.4	61.8	49.7	46.5	46.5	49.5	45.5	37.1	31.8	37.9	72.7
06/12/2022	08:15:00	50.2	59.1	49.5	44.9	44.4	45.7	43.8	39.6	38.2	38.4	70.9
06/12/2022	08:20:00	50.1	60.2	51.4	43.6	44.5	44.2	45.2	38.9	34.9	38.0	73.0
06/12/2022	08:25:00	50.8	52.4	47.5	44.0	46.0	45.1	44.3	42.8	39.8	38.2	72.1
06/12/2022	08:30:00	52.1	58.7	48.0	44.1	45.5	46.1	47.8	41.0	39.0	39.8	69.4
06/12/2022	08:35:00	47.4	50.9	43.5	41.5	44.7	42.5	41.3	34.5	33.7	38.3	65.7

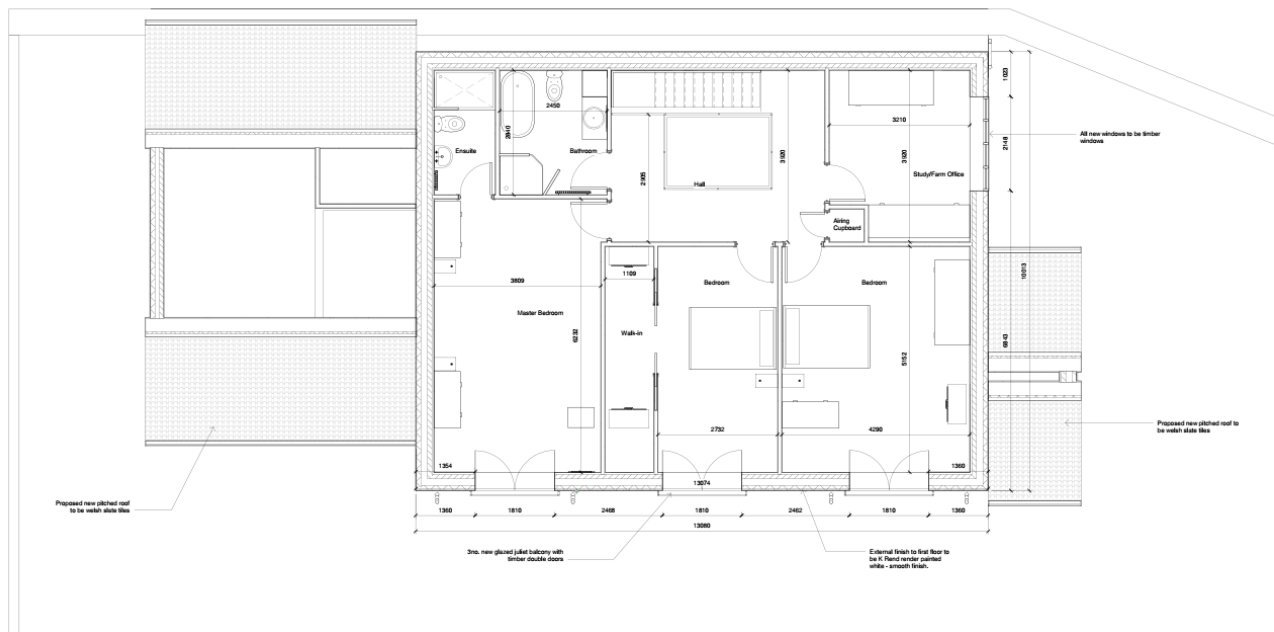


Date	Time	L _{Aeq} dBA	L _{eq} Octave Band Centre Frequency								L _{A90} dBA	L _{Amax} dBA
			63	125	250	500	1k	2k	4k	8k		
06/12/2022	08:40:00	55.0	55.3	49.5	44.0	46.7	50.5	47.7	47.5	47.3	38.5	79.8
06/12/2022	08:45:00	51.2	58.3	49.0	47.5	46.6	47.6	44.6	38.6	33.9	38.5	70.6
06/12/2022	08:50:00	50.6	51.9	43.9	44.3	45.9	47.0	44.3	38.1	32.9	38.1	69.1
06/12/2022	08:55:00	55.6	51.3	42.7	43.6	49.8	53.4	47.8	43.1	40.7	38.6	78.2
06/12/2022	09:00:00	54.8	53.5	47.7	47.0	49.2	51.7	47.4	43.8	41.2	40.0	78.0
06/12/2022	09:05:00	41.0	46.7	40.7	37.8	37.9	38.1	30.1	25.5	28.4	38.9	55.0
06/12/2022	09:10:00	49.6	53.1	46.4	42.7	41.8	47.8	41.8	32.6	28.2	38.8	65.8
06/12/2022	09:15:00	49.3	61.7	44.3	45.4	45.9	45.7	40.8	38.6	29.6	37.9	68.0
06/12/2022	09:20:00	45.3	51.8	44.3	42.7	40.3	42.3	36.7	33.2	29.0	37.1	62.7
06/12/2022	09:25:00	45.3	48.4	44.8	45.6	41.7	40.7	36.7	33.2	34.1	37.3	64.6
06/12/2022	09:30:00	56.0	60.9	55.3	53.3	53.8	52.2	48.1	40.7	30.4	37.5	73.8
06/12/2022	09:35:00	53.7	58.5	49.4	44.5	46.1	48.2	46.1	47.3	45.0	37.0	79.3
06/12/2022	09:40:00	38.9	46.4	37.5	31.0	34.9	34.8	31.1	27.5	28.3	35.5	54.9
06/12/2022	09:45:00	43.9	49.6	47.3	39.9	36.4	40.3	37.8	26.1	21.3	35.9	59.1
06/12/2022	09:50:00	56.2	51.0	45.2	43.1	52.3	54.5	46.9	38.9	28.3	34.2	74.7
06/12/2022	09:55:00	46.7	53.0	42.4	37.4	38.0	44.0	41.1	28.2	25.4	33.9	64.9
06/12/2022	10:00:00	50.3	54.8	46.3	41.8	40.7	45.1	45.4	41.4	34.6	36.0	64.4
06/12/2022	10:05:00	45.7	50.8	43.7	37.6	38.5	43.2	39.3	27.5	24.0	36.7	64.2
06/12/2022	10:10:00	47.3	58.6	45.2	38.8	39.4	45.3	40.1	27.7	24.4	37.9	63.4
06/12/2022	10:15:00	41.8	54.8	42.4	33.7	37.9	36.7	29.2	35.6	30.2	37.8	59.5
06/12/2022	10:20:00	46.0	53.7	43.0	39.8	40.0	43.4	38.8	31.8	23.4	37.3	60.2
06/12/2022	10:25:00	45.4	53.6	43.4	41.1	39.1	42.9	37.8	28.9	27.1	37.7	63.0
06/12/2022	10:30:00	42.7	53.1	42.2	36.1	36.6	39.6	36.5	27.4	23.5	37.3	60.4
06/12/2022	10:35:00	39.8	54.5	40.1	32.2	34.9	37.3	31.0	21.7	21.1	36.3	56.6
06/12/2022	10:40:00	38.8	53.1	38.3	30.1	34.9	34.5	31.3	26.4	28.5	35.4	53.7
06/12/2022	10:45:00	54.2	60.1	51.8	49.6	47.2	47.9	48.2	46.0	45.5	36.7	78.1
06/12/2022	10:50:00	55.2	60.8	51.6	50.0	49.8	51.9	48.4	42.8	36.4	37.0	69.8

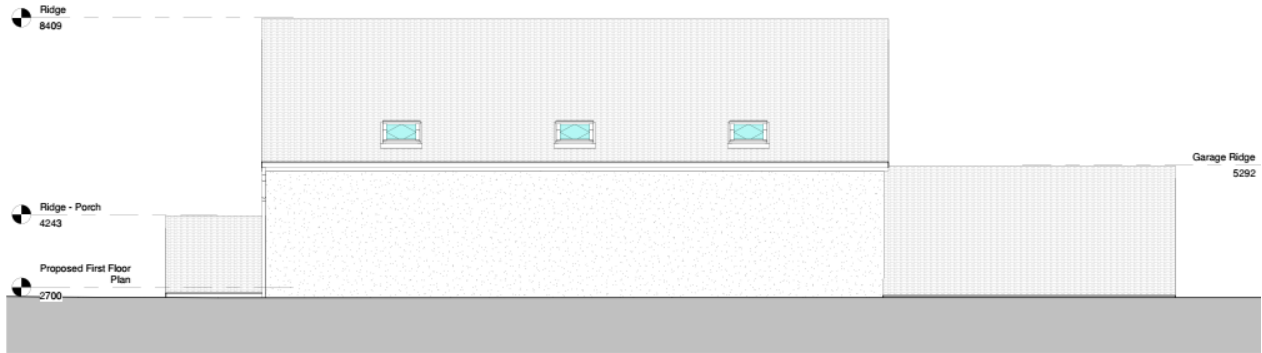
APPENDIX II – FLOOR PLANS & EXTERNAL FACADES



Ground Floor

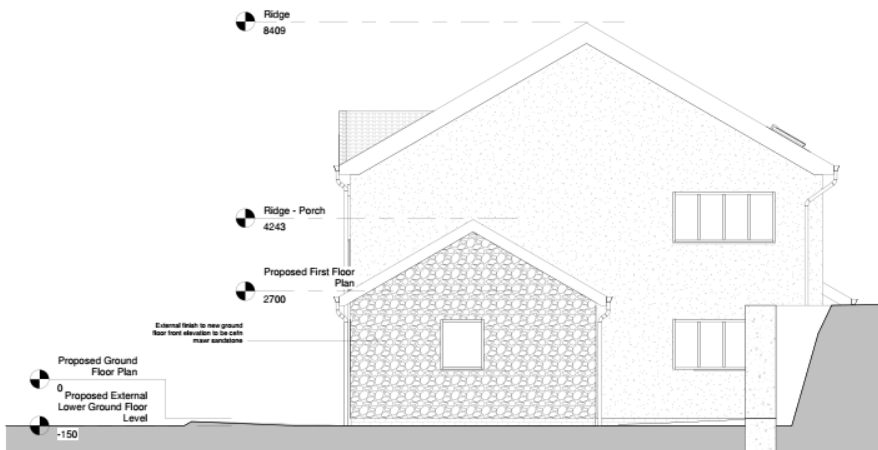


First Floor



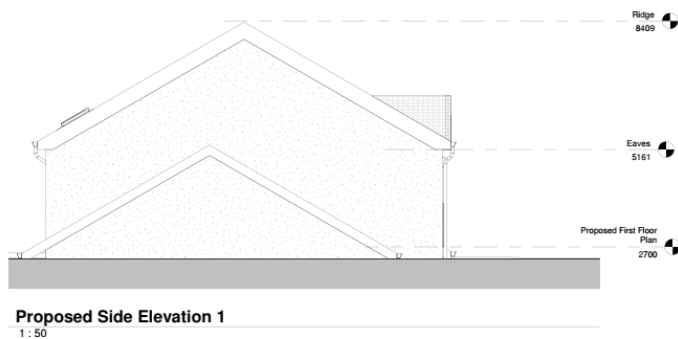
Proposed Rear Elevation

1 : 50



Proposed Side Elevation 2

1 : 50



Facades

APPENDIX III – NOTES FOR QUALITY CONTROL

1. Blockwork

All blockwork is to be mortared to an almost fair faced standard both horizontally and vertically. Only perfect blocks may be used with no pitting or cracks. The blockwork must seal effectively to the underside of the soffit.

Where blockwork walls form a cavity wall, care should be taken to avoid rubble and snots from bridging the cavity. This is especially important where one or more of the leaves is floating.

2. Plasterboard

All plasterboard joints are to be butted tight. The rule of thumb is that the joint should be tight enough over its entire length to prevent a normal business card from being inserted. Multiple layers should be fitted with staggered joints.

Base details and deflection heads are to be as per the British Gypsum White Book unless otherwise stated, and copious amounts of mastic to be used when fitting to the walls, floor and ceiling respectively.

3. Mineral Fibre

Mineral fibre slabs are to be butted tightly together and to boundary structures, to form a homogeneous layer.

4. Windows

All window frames are to be a good tight fit into the building structure with any gaps to be filled both internally and externally with a non-setting mastic in addition to the usual weather proofing seal to the exterior. Any gaps between the frame and building that are greater than 5 mm are to be packed with a dense mineral fibre prior to mastic sealing.

5. Electrical Sockets

Electrical sockets must not be fitted back to back and removed areas of blockwork and plasterboard should be kept to an absolute minimum.

6. Water Pipes

All water pipes (and any other pipework) are to be resiliently mounted to avoid “water hammer”. This is particularly important for plasterboard walls.

7. Penetrations

Penetrations are to be dealt with as described in this report. Details for specific services penetrations may be supplied upon request.

8. Approved Samples and Inspections

Samples of each individual acoustic element should be provided for inspection at the beginning of its installation. Once approved, the Clerk of Works must ensure that the same level of quality continues throughout construction.

APPENDIX IV – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB L_{Aeq} . Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq} . It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB L_{An} . It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max} , dB L_{Amax} , etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq} , L_{90} , L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.