



Jack's Pill, Usk Way, Newport

Noise Assessment for S73 Planning Application

19th June 2026

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to assess the potential impact of noise at a site adjacent to Usk Way and Jack's Pill, Newport, in respect of the site's suitability for residential development and likely acoustic mitigation requirements.

The site at Usk Way, Newport benefits from an extant planning permission granted in December 2021, which is due to expire within the next year. Tai Hedyd (formerly Newport City Homes) are proposing to make amendments to the approved scheme in response to requirements arising from the Building Safety Act, including reductions in building heights and potential internal reconfiguration of residential units.

Due to the nature and extent of the proposed changes, Newport City Council has advised that the amendments should be regularised via a Section 73 application rather than a non-material amendment.

inacoustic previously undertook the Noise Assessment in support of the original planning application (Report Ref. 21-074). Given the passage of time since the original assessment and the proposed changes to the scheme, it was considered appropriate to undertake a new environmental baseline sound survey and subsequent planning-stage Noise Impact Assessment to support the Section 73 application.

The following technical noise assessment has been produced to provide supporting information to accompany a s73 planning application to Newport City Council and is based upon environmental noise measurements undertaken at the site.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A sound monitoring survey was undertaken at discrete locations around the Site;
- A detailed assessment of the suitability of the Site, in accordance with relevant standards in respect of sound from the existing sources; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of TAN11¹ and BS 8233:2014².

¹ Planning Guidance (Wales), Technical Advice Note (TAN) 11: Noise – October 1997.

² British Standard Institution. BS 8233:2014: Guidance on noise reduction and sound insulation for buildings.

2. LEGISLATION AND POLICY FRAMEWORK

The development proposals for the Site are guided by the following legislation, policy directives and guidance:

2.1. Legislation

2.1.1. Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations (Wales) Act 2015 has a number of wellbeing goals to achieve through implementing sustainable development. Changes in noise levels can have an impact on the health of habitat and humans, as such the goals to create 'a resilient Wales' and 'a healthier Wales' are applicable.

2.2. National Policy

2.2.1. Future Wales: The National Plan 2040

The National Plan states the following under the heading Developing infrastructure responsibly:

When proposing new transport infrastructure or new development, average population exposure to air and noise pollution should be reduced and soundscapes improved where it is practical and feasible to do so. At the very least, exposure to pollution should be minimised. This will include taking into account the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment arising as a result of proposals for transport infrastructure or development.

2.2.2. Planning Policy Wales

The Government's planning policies for Wales are contained in Planning Policy Wales (Edition 12, 7th February 2024). The policy provides overarching requirements for developments to adequately control noise pollution, to provide appropriate soundscapes and to incorporate good acoustic design.

The policy is supplemented by the Noise and Soundscape Action Plan 2018-2023, which provides more detailed guidance on planning for a new development, but does not set out specific assessment methods or criteria. The guidance in this document has been used to inform a qualitative assessment of the effect the proposed development could have on the local soundscape.

2.2.3. Technical Advice Note (Wales) 11 – Noise

Technical Advice Note (Wales) 11 (TAN11) has been referenced in determining the suitability of the Site for residential development. TAN11 sets out the Welsh Assembly Government's policies on noise-related planning issues. It sets out the overarching policy context for the management of noise within the planning system, in terms of how both noise-generating developments and noise-sensitive developments should be considered.

TAN11 gives guidance to local authorities in Wales on the use of their planning powers to minimise the adverse impact of noise. Specifically, TAN11:

- outlines the considerations to be taken into account when determining planning applications for both noise-sensitive developments and for those activities which will generate noise;
- sets out noise exposure categories for residential development, encourages their use and recommends appropriate levels for exposure to different sources of noise; and
- advises on the use of planning conditions to minimise the impact of noise.

The four noise exposure category bands set out in TAN11 (or NECs) are designed to assist local planning authorities in evaluating applications for residential development in noisy areas. Table 1 summarises the noise levels that correspond to each NEC band for mixed noise sources, which are the most relevant to this development.

TABLE 1: NOISE LEVELS CORRESPONDING TO NECs FOR NEW DWELLINGS – $L_{Aeq,T}$ DB

Time Period	Noise Exposure Category (NEC) – Road Traffic			
	A	B	C	D
07:00-23:00	<55	55 – 63	63 – 72	>72
23:00-07:00	<45	45 – 57	57 – 66	>66
N.B. Additionally, during night-time (2300 – 0700), sites where individual noise events exceed 82 dB L_{Amax} (slow time weighting) more than twice in any hour during this period 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).				

The relevant planning advice to the local authority with respect to each NEC is presented in Table 2.

TABLE 2: PLANNING ADVICE CORRESPONDING TO NECs FOR NEW DWELLINGS

NEC	Advice to Local Planning Authority
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.

In addition to the above, TAN11 also states that during the night, (23:00 to 07:00 hours):

“Sites where individual noise events regularly exceed 82dB L_{Amax} (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8hr}$ (except where the $L_{Aeq,8hr}$ already puts the site into NEC D).”

The advice within TAN 11 is useful as a planning tool; however, it is quite blunt, so reference is primarily made within this report to British Standards, which offer a greater degree of objective analysis.

2.3. British Standards

2.3.1. BS8233:2014

BS 8233:2014 draws on the results of research and experience to provide information on achieving internal acoustic environments appropriate to their functions. The guideline values provided are in terms of an average (L_{Aeq}) level.

The standard advises that, for steady external noise sources, it is desirable for internal ambient noise levels to not exceed the guidance values, as detailed below in Table 3.

TABLE 3: BS8233:2014 AMBIENT NOISE LEVELS

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS 8233:2014 goes on to suggest that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions will still be achieved.

With regard to maximum noise levels, the standard identifies that regular individual noise events (such as passing trains or scheduled aircraft etc) can cause sleep disturbance. The standard does not provide a guideline design target, but simply goes on to suggest that a guideline value may be set in terms of SEL or $L_{Amax,F}$, depending upon the character and number of events per night. It goes on to suggest that more sporadic noise events could require separate values.

In respect of external noise levels, the guidance in BS 8233:2014 suggests that *“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”*.

BS 8233:2014 provides a much more detailed narrative on noise levels in external amenity areas and acknowledges that it may not always be necessary or feasible to ensure that noise levels remain within these guideline values.

In respect of gardens and patios, BS 8233:2014 states;

“...it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable.”

BS 8233: 2014 goes on to state, for 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”.

In respect of balconies, roof gardens and terraces, BS 8233:2014 states; “Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses; however, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB L_{Aeq,T} or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space”.

It is clear from the narrative of BS 8233:2014, that proposed development within noisy environments should be designed to ensure that the recommended internal design standards are achieved, and that noise levels in external amenity areas are designed to effectively control and reduce noise levels, although it acknowledges that in certain circumstance meeting the external design recommendations may not be feasible, or necessary, especially where the provision of such spaces is desirable for other technical, planning or policy reasons.

2.4. Planning Conditions

2.4.1. Condition 6 – Sound Insulation Measures

The following condition has been stipulated by Newport City Council:

‘6 No development, other than demolition, shall commence until a scheme of sound insulation measures in accordance with the internal noise level limits identified in the approved noise assessment (inacoustic, July 2021) has been submitted to and approved in writing by the Local Planning Authority. The submitted scheme shall ensure that habitable rooms subject to sound insulation measures shall be able to be effectively ventilated without opening windows (see informative O3). No dwelling shall be occupied until the approved sound insulation and ventilation measures have been installed to that property in accordance with the approved details. The approved measures shall be retained thereafter in perpetuity.

Reason: To ensure that the amenities of future occupiers are protected, in accordance with policies GP2 and GP7 of the Newport Local Development Plan.’

3. SITE DESCRIPTION

3.1. Site and Surrounding Area

The Proposed Development site currently comprises a car park, to the south of Endeavour House; a large student accommodation block serving the University of South Wales.

The Proposed Development area can be seen in Figure 1.

The area surrounding the site comprises a mix of residential and employment uses, with the complex including Newport Magistrates Court being located to the west of the site, across Usk Way.

The site is bound to the east and south by the River Usk and a disused dock inlet, known as Jack's Pill; to the west by the A4042 Usk Way and to the north by Endeavour House, which provides effective screening between the site and George Street/George Street Bridge.

The site is entirely acoustically influenced by road traffic, primarily vehicles travelling along Usk Way, with less significant contributions arising from vehicles using George Street/George Street Bridge.

FIGURE 1: PROPOSED DEVELOPMENT SITE AND SURROUNDING AREA



3.2. Proposed Development Overview

The proposals comprise the redevelopment of the site to accommodate a 122-unit apartment complex, extending across five blocks each 5 to 6 storeys in height, as shown in the Figures below and over the subsequent pages.

The proposals will create a communal amenity space, within the courtyard area formed by the shape of the proposed building, which will be supplemented by balconies to some of the apartments.

It is understood that the entirety of the Proposed Development will be equipped with a Mechanical Ventilation Heat Recovery (MVHR) system, with openable windows for purge ventilation.

FIGURE 2: PROPOSED DEVELOPMENT



FIGURE 3: ELEVATIONS – BLOCK A



FIGURE 5: ELEVATIONS – BLOCK C



4. MEASUREMENT METHODOLOGY

4.1. General

The prevailing noise conditions in the area have been determined by an environmental noise survey conducted during both daytime and night-time periods between the Wednesday 25th and Friday 27th of February 2026.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445³.

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672⁴. A full inventory of this equipment is shown in Table 4 below.

TABLE 4: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

Measurement Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Due Date
MP1	Rion NL-52 Sound Level Meter	00175499	1174057	10/01/2027
	Rion NH-25 Preamplifier	22091		
	Rion UC-59 Microphone	21910		
MP2	Rion NL-52 Sound Level Meter	01009671	1141898	07/04/2027
	Rion NH-25 Preamplifier	9976		
	Rion UC-59 Microphone	18146		
All	Cirrus CR:515 Acoustic Calibrator	82506	1189815	28/10/2026

The noise measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.2 dB in the field calibration was found to have occurred on the sound level meter.

The weather conditions during the survey were conducive to environmental sound measurement; it being dry, with wind speeds typically below 5 ms⁻¹. When periods of inclement weather were noted to occur, they have been removed from the dataset used to derive the assessment levels. The microphone was fitted with a protective windshield for the measurements.

³ British Standard 7445: 2003: Description and measurement of environmental noise. BSI

⁴ British Standard 61672: 2013: Electroacoustics. Sound level meters. Part 1 Specifications. BSI.

The microphones were fitted with protective windshields for the measurements, which are described in Table 5, with an aerial photograph illustrating their locations shown on Figure 8.

TABLE 5: MEASUREMENT POSITION DESCRIPTIONS

Measurement Position	Description
MP1	A partially attended measurement of sound at the western boundary of the site. The microphone was located under free-field conditions, at a height of 2.5 metres above local ground level and 8 metres from the edge of the southbound carriageway of the A4042 Usk Way. The prevailing sound environment at the site was influenced by road traffic noise.
MP2	A partially attended measurement of sound at the eastern boundary of the site. The microphone was located under free-field conditions, at a height of 1.5 metres above local ground level with a direct line of site to George Street Bridge. The prevailing sound environment at the site was influenced by road traffic noise.

FIGURE 8: NOISE MEASUREMENT POSITIONS



4.3. Results Summary

The summarised results of the noise measurement exercise are presented in Table 6 and Table 7 with full, measured time histories presented under Appendix B.

TABLE 6: SUMMARY OF NOISE MEASUREMENT RESULTS

Measurement Position	Period	Noise Level, dB		
		L _{Aeq,T}	L _{A90}	L _{AMax}
MP1	Day	71	58	84
	Night	66	41	82
MP2	Day	55	51	66
	Night	50	39	61

TABLE 7: SPECTRAL MEASUREMENT RESULTS

Period	dB(A)	Octave Band (Hz) Sound Level (dB)							
		63	125	250	500	1000	2000	4000	8000
MP1									
L _{eq,T}									
Day	71	66	63	65	65	69	63	57	50
Night	66	60	57	59	59	63	58	50	44
L _{Fmax}									
Night	82	73	72	73	76	80	74	69	64

5. NOISE ASSESSMENT

5.1. Noise Modelling

The baseline noise measurement results for MP1, presented in Table 6 and Table 7 have been used to predict noise levels across the site.

The predictions have been carried out using the noise-modelling suite Cadna/A, in accordance with the CRTN prediction methodology for road traffic noise. The overall results have been processed to determine appropriate noise emission rates for the road affecting the site. The $L_{Aeq,16\text{hour}}$ daytime (07:00 to 23:00) and $L_{Aeq,8\text{hour}}$ night-time (23:00 to 07:00) noise levels at a distance of 10 metres from the road have been derived, as required to populate the noise model.

In addition to the derived road traffic source noise levels used in the predictions, the model also considers the effects of the topographical conditions throughout the area, ground absorption, atmospheric absorption, acoustic reflections, acoustic screening as well as applying a light downwind propagation correction to represent worst case.

The model has been used to determine the daytime $L_{Aeq,16\text{-hour}}$ (07:00 to 23:00) and night-time $L_{Aeq,8\text{-hour}}$ (23:00 to 07:00) noise levels across the site.

To allow determination of the suitability of the Site for residential development, the output from the daytime and night-time baseline noise models has been presented in the form of noise contours overlaid on a plan of the Proposed Development, as presented below.

5.2. Assessment

Figure 9 and Figure 10 identify the predicted site-wide noise levels for the 16-hour (07:00 to 23:00) daytime, at ground level and 8-hour night-time (23:00 to 07:00) at first floor levels respectively.

Figure 11 and Figure 12 identify the predicted site-wide noise levels for the 16-hour (07:00 to 23:00) daytime, at ground level and 8-hour night-time (23:00 to 07:00) at first floor levels respectively, in the context of the TAN11 Noise Exposure Categories (NECs).

Figure 13 and Figure 14 identify the site-wide L_{Aeq} noise levels in the context of key amenity benchmarking criteria, as set out in BS 8233:2014 for the daytime and night-time at ground floor level.

To place the levels in Figure 8 and Figure 9 in context, they accord to the following factors:

- **Daytime levels of below 50 dB(A) and 45 dB(A) by night** (NEC A) are the threshold for BS8233-compliant internal noise levels achieved with windows open for ventilation. External amenity criteria comfortably met;
- **50 to 55 dB(A) by day and 45 to 50 dB(A) by night** (NEC B) are the threshold for BS8233 plus 5dB relaxation internal noise levels achieved with windows open for ventilation. External amenity criteria met;
- **55 to 60 dB(A) by day and 50 to 55 dB(A) by night** (NEC B) identify BS8233-compliant internal noise levels achieved with standard thermally insulating windows shut and ventilation provided by an alternative means to an open window. External amenity criteria marginally exceeded; and
- **60 to 65 dB(A) by day and 55 to 60 dB(A) by night** (NEC B and higher) requires detailed consideration. Detailed facade consideration and design may be required in order to achieve BS8233-compliant internal noise levels and Part F (UK Building Regulations) compliance.

FIGURE 9: DAYTIME $L_{Aeq,16-HOUR}$ NOISE LEVELS



FIGURE 10: NIGHT-TIME $L_{Aeq,8-HOUR}$ NOISE LEVELS



FIGURE 11: DAYTIME TAN11 NECs

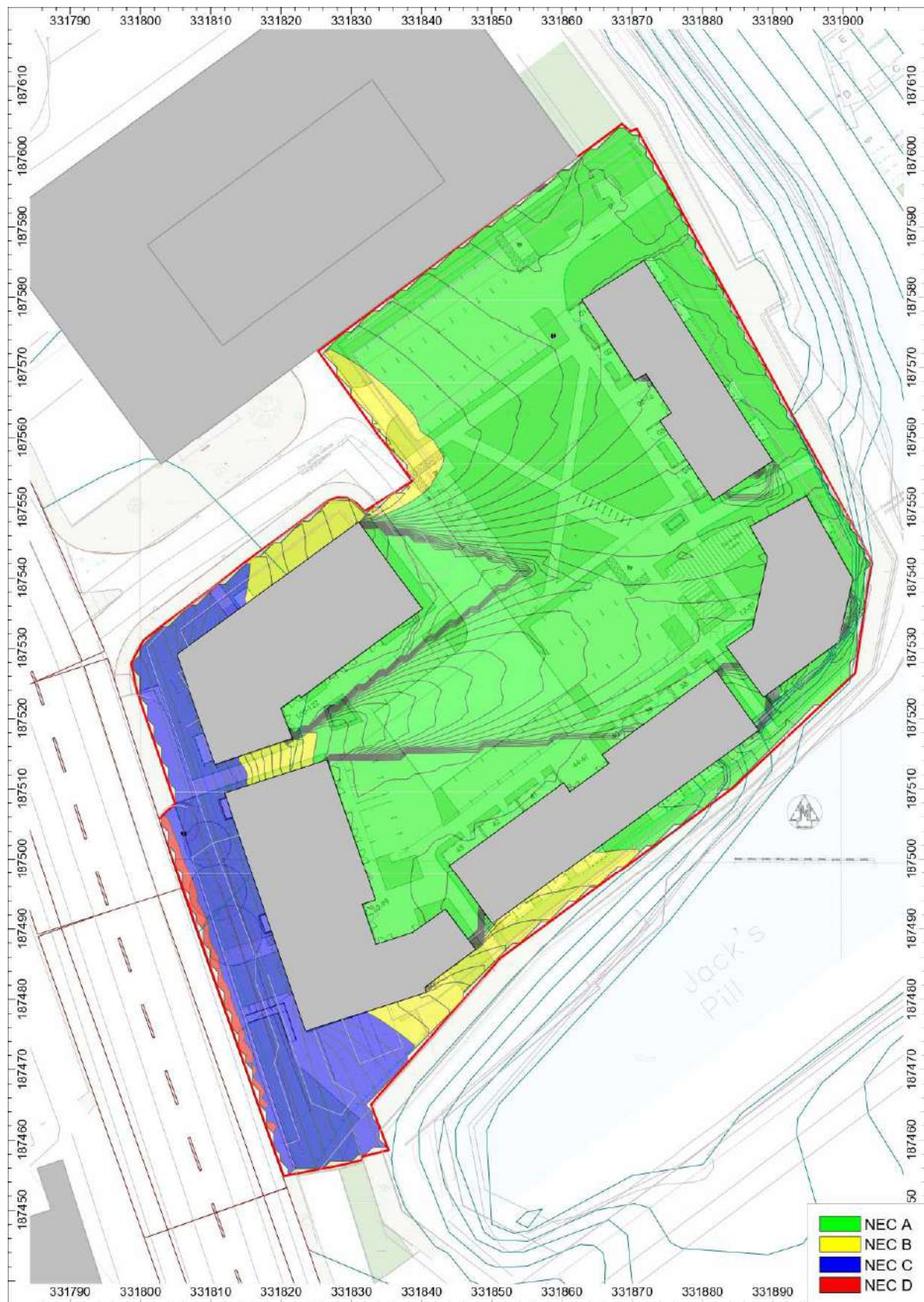


FIGURE 12: NIGHT-TIME TAN11 NECs

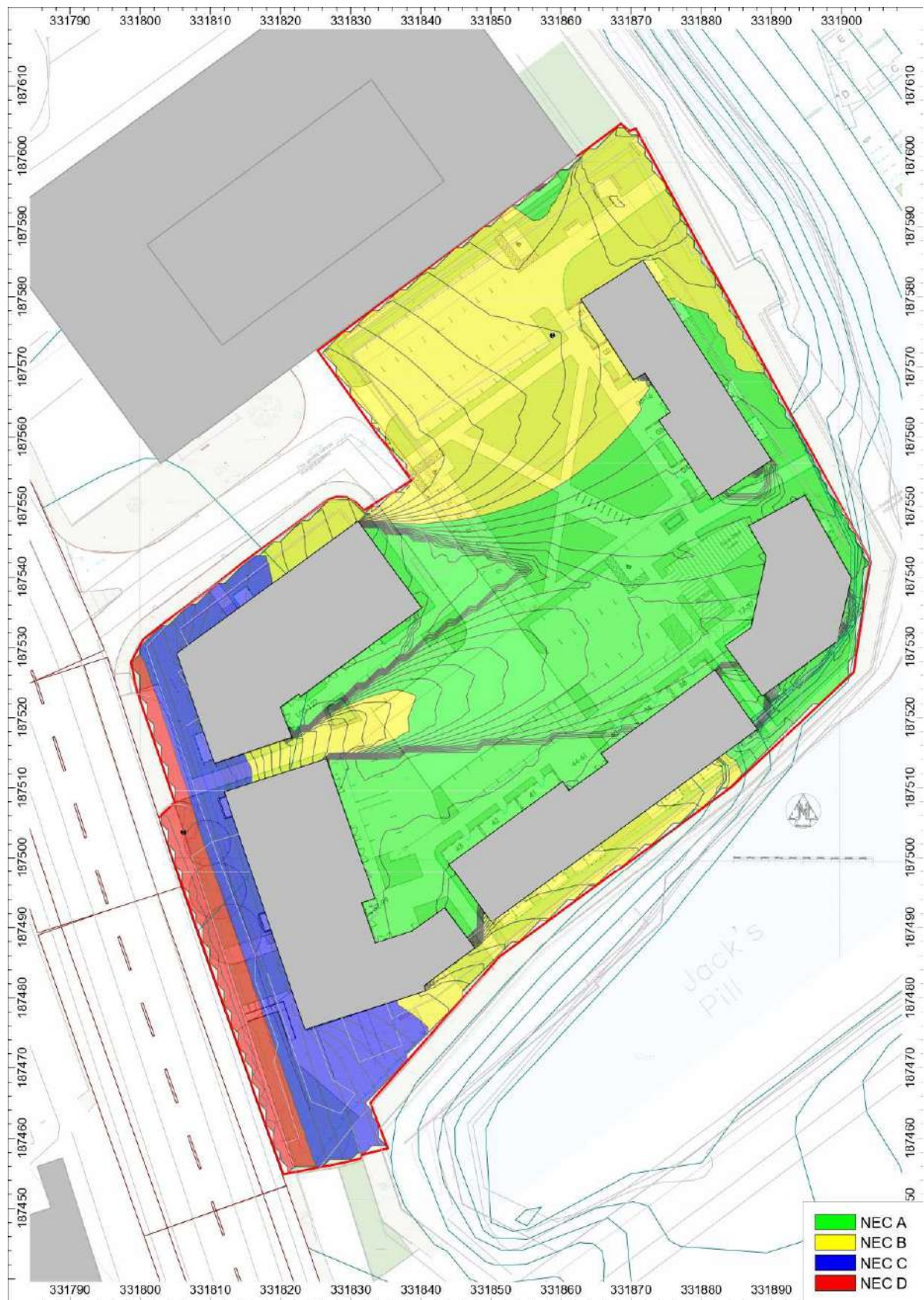


FIGURE 13: DAYTIME $L_{Aeq,16-HOUR}$ BS8233: 2014 AMENITY CONSTRAINTS

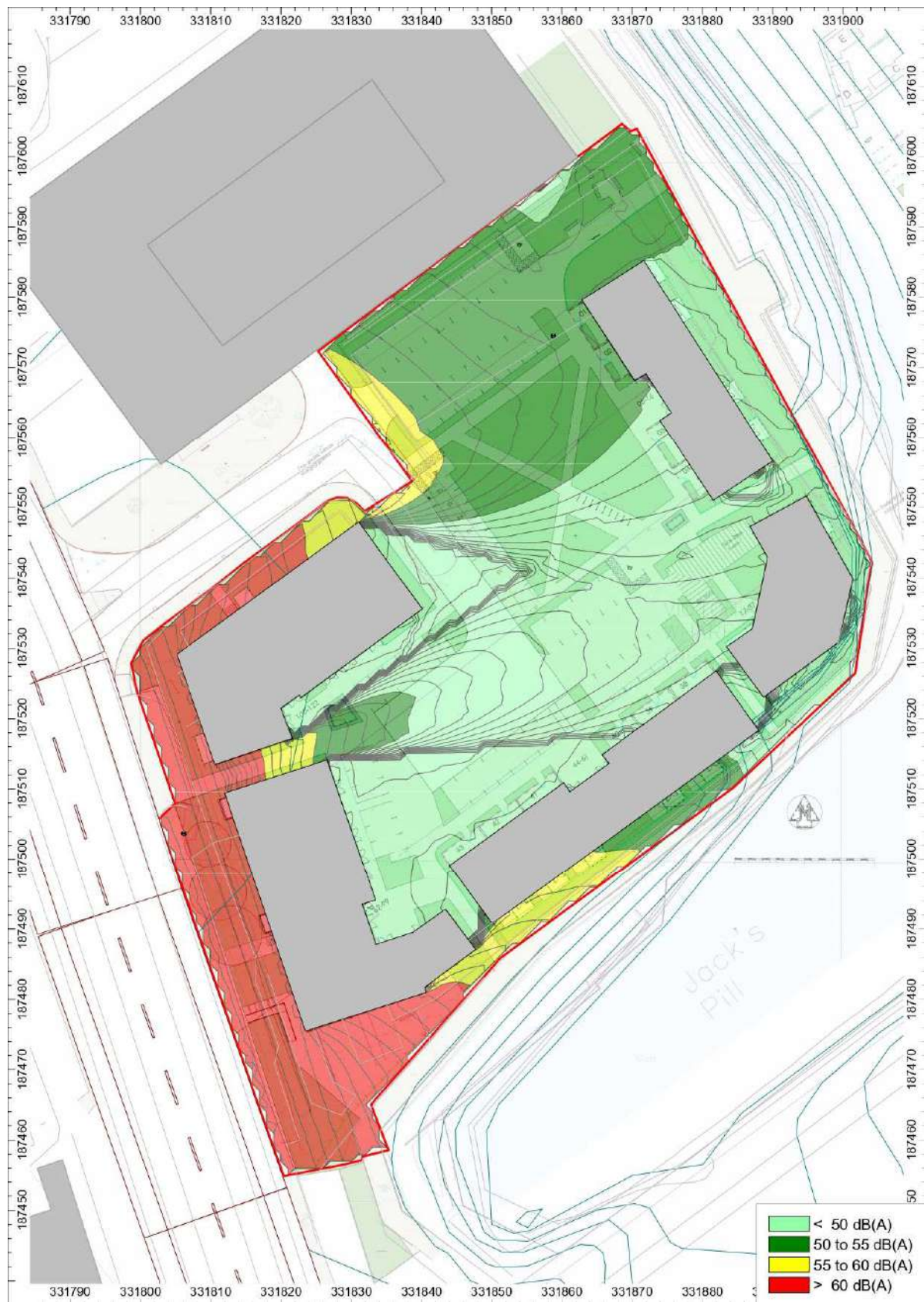
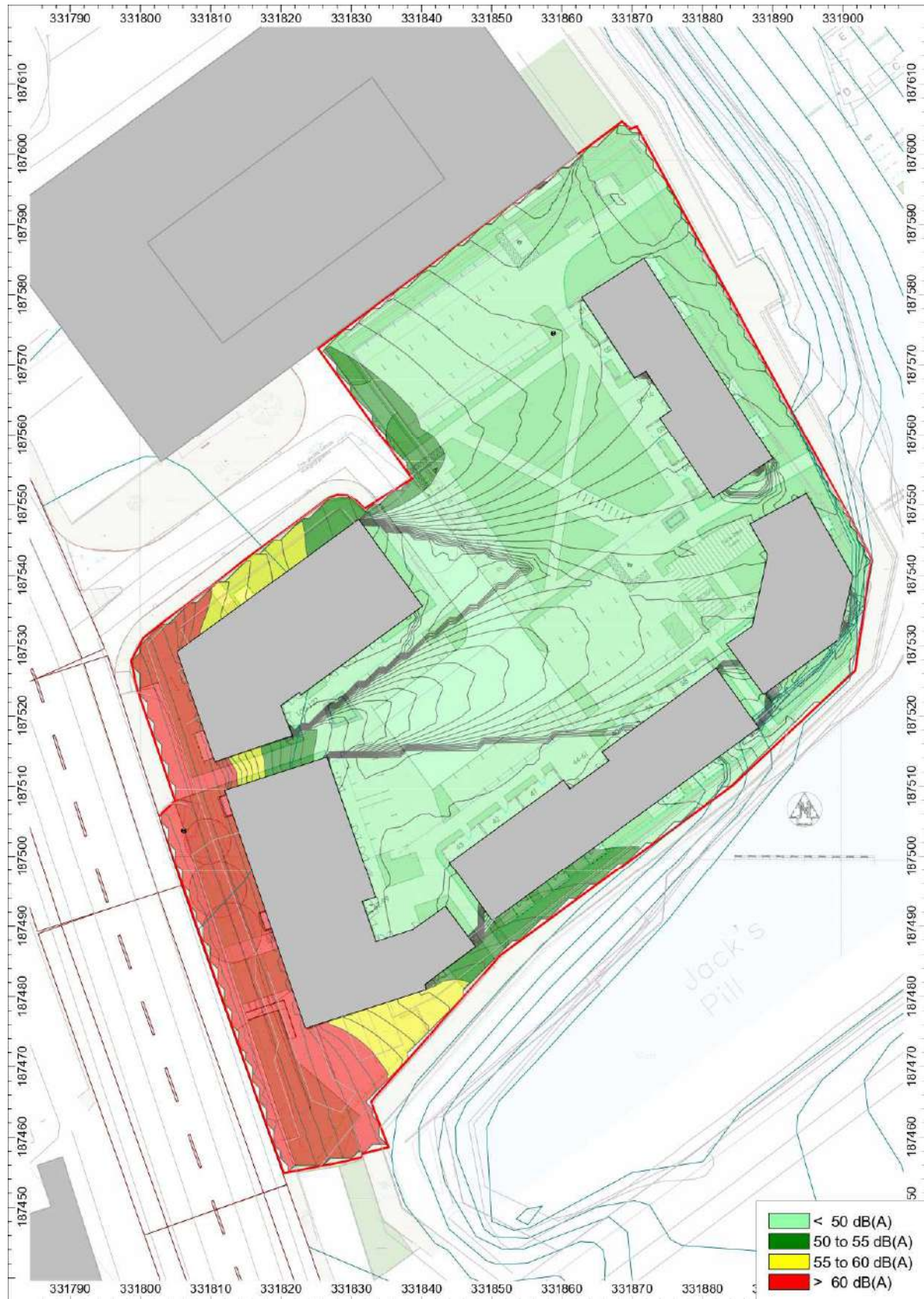


FIGURE 14: NIGHT-TIME $L_{Aeq,8-HOUR}$ BS8233: 2014 AMENITY CONSTRAINTS



5.3. Results Analysis

In summary the data presented in Figure 9 to Figure 12 can be interpreted as follows:

- The site is largely categorised as NEC A to B of TAN11, with only the facades directly overlooking the A4042 Usk Way experiencing a higher level of exposure, equating to NEC C, with the spaces between reducing the NEBC B;
- Large areas of the site will broadly achieve the internal amenity criteria set out in BS8233:2014 with windows partially open; and
- The entire communal amenity area of the Proposed Development and balconies located away from the A4042 Usk Way corridor will comply with the <55 dB(A) criterion for external amenity space, set out in BS8233:2014, with the higher criterion of <50 dB(A) also being achieved in many areas.

5.4. Internal Noise Level Guidelines

This assessment follows BS 8233:2014 guidance, which provides a method for calculating internal noise levels based on external free-field levels. To determine the necessary glazing and ventilation performance for mitigating external noise intrusion, the following metrics have been evaluated at the building façade:

- Daytime: $L_{Aeq,16-hour}$ (07:00–23:00)
- Night-time: $L_{Aeq,8-hour}$ (23:00–07:00)
- Night-time Typical L_{AFMax} levels (23:00–07:00)

BS 8233:2014 (Appendix G) outlines how internal noise levels can be calculated assuming either a partially open or closed window. A partially open window is assumed to provide 15 dB of sound insulation.

Since glazing and ventilation are typically the weakest acoustic elements in a building façade, their performance is the primary focus when assessing sound insulation.

Windows do not attenuate noise uniformly across all frequencies; thus, the frequency content of external noise affects overall sound reduction performance. Glazing manufacturers test products using road traffic noise frequency spectrums, and results are expressed using the $R_w + C_{tr}$ (R_{tra}) performance index, which provides a useful indication of in-situ noise reduction where road traffic noise dominates.

Building Regulations (Approved Document F) require habitable rooms to have whole-dwelling ventilation. Where target internal noise levels can only be met with closed windows, an alternative ventilation system is required for compliance.

For this Proposed Development, the default glazing choice is thermal double glazing, while the default ventilation system consists of an MVHR system, with openable windows provided for purge ventilation.

Please note that this scope does not include an acoustic assessment during overheating conditions. If, required, then an additional acoustic assessment in accordance with The ANC/IOA '*Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O*' is undertaken.

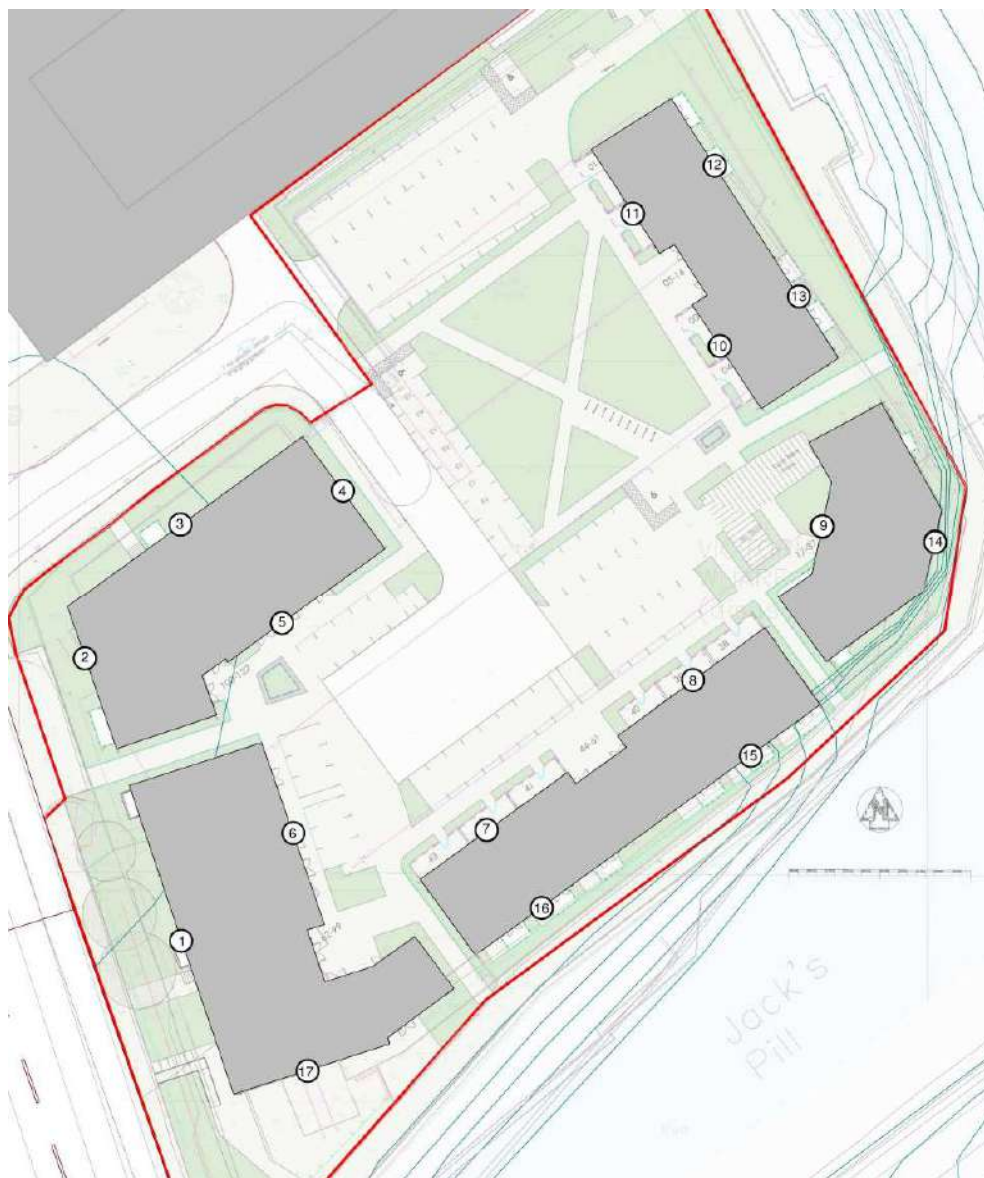
5.4.1. Façade Performance Specifications

As already stated; in order to provide a robust assessment and a high quality living environment for future residents, providing internal noise levels of <35 dB $L_{Aeq,16\text{-hour}}$ by day and <30 dB $L_{Aeq,8\text{-hour}}$ by night, as well as <45 dB typical L_{AFMax} by night, as defined in BS 8233:2014 has been adopted as the design target for the Proposed Development.

To determine the glazing and ventilation requirements in order to provide an adequate level of protection against external noise intrusion, $L_{Aeq,16\text{hour}}$ daytime, $L_{Aeq,8\text{hour}}$ and typical L_{AFMax} night-time noise levels have been determined at the building façade.

Accordingly, the required composite $R_w + C_{tr}$ sound reduction performance for the building façade locations identified in Figure 15, to provide appropriate internal noise levels during both daytime and night-time periods, as described, is identified in Table 8.

FIGURE 15: FAÇADE ASSESSMENT LOCATIONS



Each location was assessed at various floor heights, with the worst-case level presented in the table below. Broadly speaking, first floor height was found to be most onerous in terms of façade level and thus requiring the greatest sound level difference to ensure internal acoustic amenity.

TABLE 8: REQUIRED SOUND LEVEL DIFFERENCE OUTSIDE TO INSIDE

Location	Predicted Free-field Noise Level, $L_{Aeq,T}$ dB		Target Internal Noise Level - dB		Required Sound Level Difference, dB
	Day	Night	Day	Night	
1	69	64	35	30	34
2	69	64	35	30	34
3	63	58	35	30	28
4	40	36	35	30	6
5	38	33	35	30	3
6	39	36	35	30	6
7	38	33	35	30	3
8	42	37	35	30	7
9	45	40	35	30	10
10	49	44	35	30	14
11	51	47	35	30	17
12	49	46	35	30	16
13	48	45	35	30	15
14	33	30	35	30	0
15	54	49	35	30	19
16	56	51	35	30	21
17	64	59	35	30	29
Location	Derived Free-field Noise Level, $L_{Amax,T}$ dB		Target Internal Noise Level - dB		Required Sound Level Difference, dB
	Day	Night	Day	Night	
1	-	82	-	45	37
2	-	82	-	45	37
3	-	82	-	45	37
17	-	82	-	45	37

Table 8 identifies that the sound reduction requirements for the proposed development are driven by meeting the adopted target night-time $L_{Aeq,8-hour}$ internal noise level limit of 30 dB for habitable rooms and, in areas overlooking Usk Way, by meeting the adopted target night-time L_{Amax} internal noise level limit of 45 dB.

It should also be noted that the sound reductions detailed in Table 8 apply to habitable rooms such as living rooms, dining rooms and bedrooms only. For non-habitable rooms such as kitchens, bathrooms, stairways, halls, landings, lower performance standards would be permissible.

Based upon the latest layout proposals and robust assumptions of up to 40% of a room façade being glazed and a room volume of 30m³, calculations have been carried out to determine the likely required acoustic performances for the external façade elements, in order to provide appropriate internal noise levels in rooms during both the daytime and night-time periods.

The outline performance requirements are presented in Table 9.

TABLE 9: MINIMUM ACOUSTIC PERFORMANCES FOR GLAZING AND VENTILATION

Example Glazing	Octave Band (Hz) Sound Level (dB)							
	63	125	250	500	1000	2000	4000	R _w
	Sound Reduction Performance, R dB							
Facades 1, 2, 3 and 17								
4/12/8 Double Glazing	19	26	22	28	38	41	42	34
All Other Facades								
4/12/4 Double Glazing	20	24	20	25	35	38	35	31
Example Ventilation	Octave Band (Hz) Sound Level (dB)							
	63	125	250	500	1000	2000	4000	D _{n,e,w}
	Element Normalised Level Difference (D _{n,e}) dB							
All Facades								
MVHR System								
Example Walls	Octave Band (Hz) Sound Level (dB)							
	63	125	250	500	1000	2000	4000	R _w
	Sound Reduction Performance, R dB							
All Facades								
Lightweight/Composite Facade	21	32	45	55	55	55	55	53
*Unite modular external wall								

The above façade components are conducive with those typically required for thermal insulation and represent no uplift in design beyond that required to achieve the required thermal standards.

Other units may be suitable and it is the responsibility of the glazing manufacturer to recommend and provide appropriate systems. The above analysis is provided to demonstrate that a design solution is feasible at the site for the purposes of a planning application and not necessarily for the purposes of detailed design or glazing procurement.

The detailed design of the proposed properties may affect both the required sound reduction performance and the appropriate selection of glazing units. The aspects of the detailed design that are important are the room dimensions, room finishes, window dimensions and the sound reduction performance of non-glazing elements

5.5. External Amenity Spaces

Noise levels throughout the majority of the site will achieve either the <55 dB(A) criterion, or the higher requirement of <50 dB(A) at façade locations including balconies. Those locations close to and with a direct line of sight to the A4042 Usk Way are predicted to exceed this requirement.

BS8233:2014 states the following, for 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”.

In respect of balconies, roof gardens and terraces, BS8233:2014 states; *“Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses; however, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space”.*

It is clear from the narrative of BS8233:2014, that proposed development within noisy environments should ensure external amenity areas are designed to effectively control and reduce noise levels, although it acknowledges that in certain circumstance meeting the external design recommendations may not be feasible, or necessary, especially where the provision of such spaces is desirable for other technical, planning or policy reasons.

The principle of offsetting is often adopted in such circumstances, where, although the private external space may be exposed to higher noise levels, that access to a quieter alternative external area is readily available. In the case of this development, an extensive communal external amenity space is being provided, so although residents of those apartments with balconies overlooking Usk Way will experience higher noise levels in those private areas, they will also be able to experience quietude within the heart of the development while still having the utilitarian benefit of a private balcony.

6. CONCLUSION

inacoustic has been commissioned to assess the impact of noise at a site adjacent to Usk Way and Jack's Pill, Newport, in respect of the site's suitability for residential development and likely acoustic mitigation requirements.

This technical noise assessment has been produced to provide supporting information to accompany an S73 planning application to Newport City Council and is based upon environmental noise measurements undertaken at the site.

The suitability of the site for residential development has been assessed, based on the current development proposals, the measured and predicted noise levels. Where the levels indicate that noise may be a determining factor in the granting of planning permission, mitigation measures have been proposed to ensure satisfactory acoustic conditions are met.

Specific consideration has been given to the internal noise criteria for the proposed residential properties, as quoted within BS 8233:2014, with additional consideration given to recent precedents set by Newport City Council for similar developments within similar acoustic environments.

In light of the above, which demonstrates that the site is predicted to meet the requirements of the relevant British Standard and planning guidance, it is considered that noise does not present a constraint to the residential development of the site.

7. APPENDICES

7.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s ₁ and s ₂ is given by 20 log ₁₀ (s ₁ / s ₂). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L _{eq,T}	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L _{max,T}	A noise level index defined as the maximum noise level during the period T. L _{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L _{90,T}	A noise level index. The noise level exceeded for 90% of the time over the period T. L ₉₀ can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L _{10,T}	A noise level index. The noise level exceeded for 10% of the time over the period T. L ₁₀ can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 10: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10} , the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq} .

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1\text{hour}}$ dB and $L_{A90,15\text{mins}}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

7.2. Appendix B – Measurement Results

FIGURE 16: MEASURED TIME HISTORY – MP1

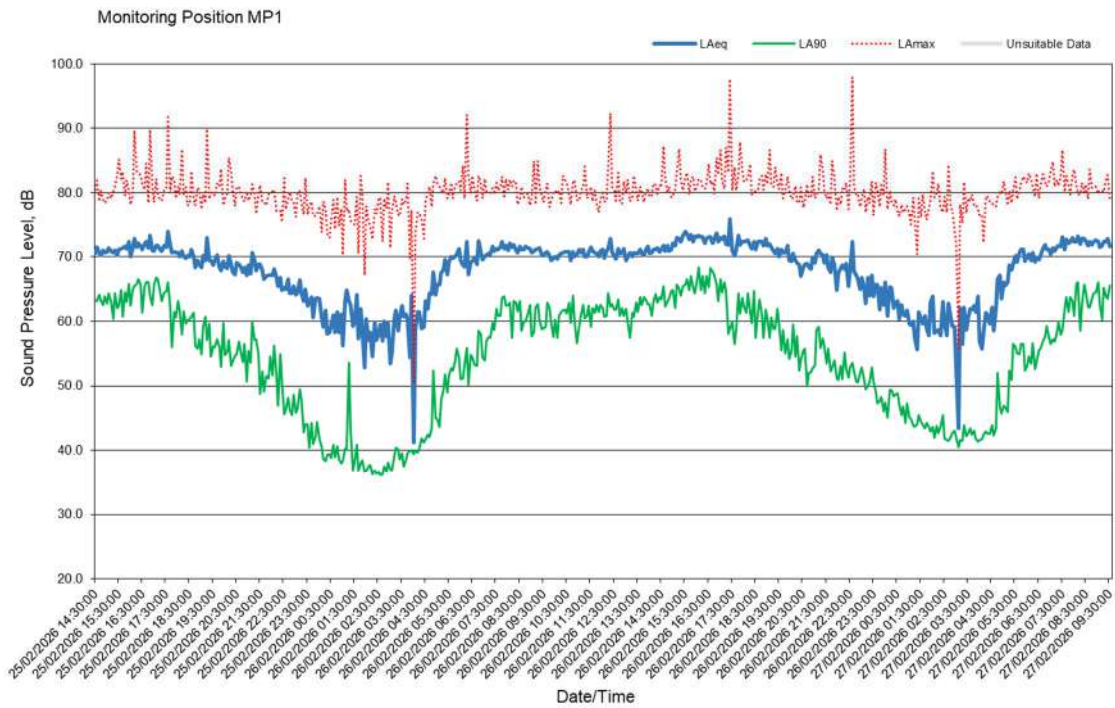
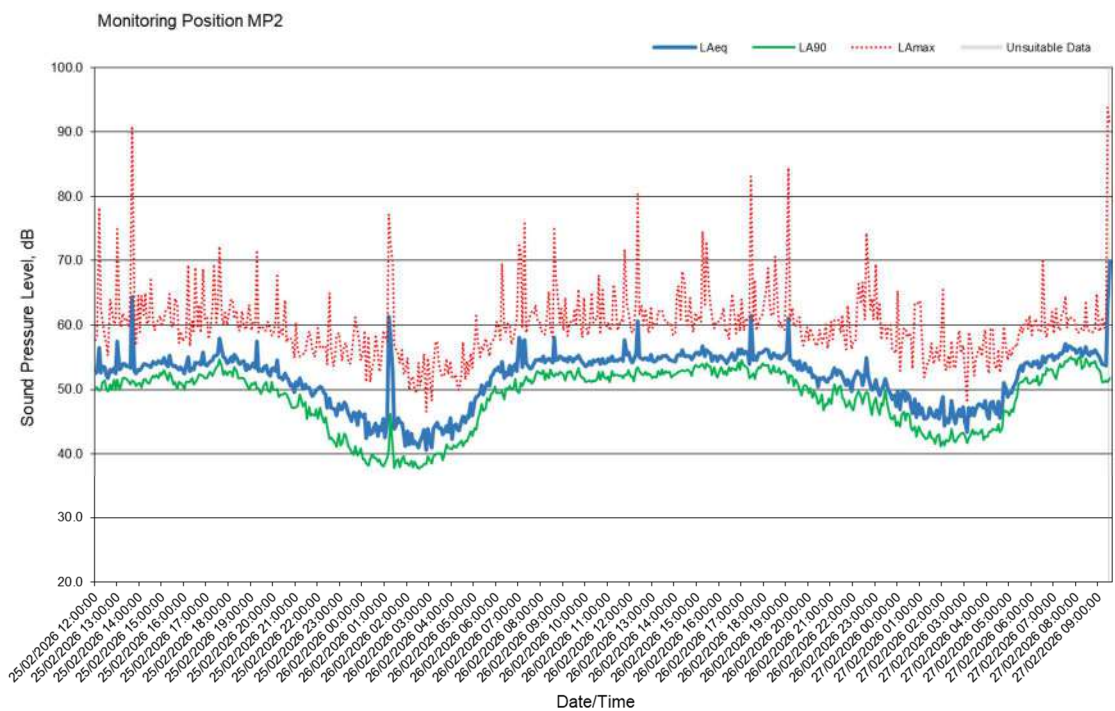


FIGURE 17: MEASURED TIME HISTORY – MP2



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