



Neath Town Centre Leisure and Retail Development Noise Planning Report

For Kier

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Noise Planning Report

Neath Town Centre Retail and Leisure Development

1. INTRODUCTION

Hydrock Consultants have been appointed by Kier to provide acoustic consultancy services in relation to the proposed Neath Town Centre development.

Proposals have been made for the development of a commercial building comprising of a number of retail units (A1 and A3) as well as a Leisure Centre Facility.

Planning legislation and guidance documents have been consulted in order to undertake a noise measurement survey on the proposed development site.

It is understood that the tenants of the ground floor units will be A1 users and the 1st floor unit could be an A1 or A3 user (a library or restaurant).

A1 units could include: shops, retail warehouses, hairdressers, undertakers, travel and ticket agencies, post offices, pet shops, sandwich bars, showrooms, domestic hire shops, dry cleaners, funeral directors and internet cafes etc.

The Leisure Centre will comprise swimming facilities, a Spa, Café, Gym and Multi-Use Dance and Activity Studios.

Prevailing noise levels have been established in 2018 for use in the design development and Planning Application processes. There is further discussion regarding the current Covid-19 situation in Section 2 of this report.

This report presents details of the noise assessment method available to assess the acoustic impact of the proposed development on the neighbouring area and any potential noise impact on the surroundings of the proposed development itself.

2. COVID-19

1.1 Current Situation and Proposal

It was originally proposed to survey this site in mid-march 2020 prior to making this submission. However, given the current situation regarding Covid-19 it was not considered possible or appropriate to do so.

In addition, with the current situation developing daily and increasingly strict measures in place, it is apparent that current road traffic conditions are far from typical.

In addition to this, businesses are operating differently meaning commercial and industrial noise is atypical. Aviation noise is significantly different to usual, and even rail noise is reduced with far fewer trains running. The challenge presented by the current situation is that being unable to undertake representative noise surveys could delay validating planning applications.

In this instance Hydrock have used existing noise survey data previously captured at the site in 2018 for a previous application. Hydrock undertook the survey associated with this assessment and therefore have full access allowing for proper analysis.

This data has been used to provide a reasonable indication of the environmental noise climate under the assumption that changes have been minimal in a 2-year time frame.

Noting that data is circa 2 years old, in our experience many Local Authorities will accept survey data of this age, provided no major developments have had a significant impact on the local noise climate. Therefore, for this scheme, this is currently considered the best practice methodology given the current situation.

1.2 Future Work

When noise surveying can re-commence, i.e. following cessation of current national restrictions due to Covid-19, an addendum to this planning report can be submitted to the local authority. If this occurs during the planning consultation period this would hopefully be taken into consideration. Otherwise it is suggested that a condition requiring a verification noise survey is included with the planning approval.

1.3 Professional Practice Guidance -Covid-19

The IOA (Institute of Acoustics) and ANC (Association of Noise Consultants) has recently released a guidance document:

"Guidance on the practicality and reliability of baseline sound level surveying and related matters during the current COVID-19 pandemic"

Such that the planning process can still progress applications, it is considered that the approach summarised above and detailed in this document is "best practice" to achieve these goals in the absence of a noise survey in the immediate future.

3. DESCRIPTION - DEVELOPMENT SITE

The proposed development site is situated in Neath town centre in place of the now demolished multi-storey car park bound by Wind Street to the north, Old Market Street to the West, the B4434 to the East and a new Wilko building to the South.

Following a site visit it was determined that the prevailing environmental noise levels in the area are dominated by road traffic noise from the B4434.

The proposed development site is shown in red in Figure 1.



Figure 1: Outline of the development site

4. PLANNING POLICY WALES

4.1 Edition 9 Chapter 13

"13.3 Reducing Noise and Light Pollution

13.13.1 Noise can affect people's health and well-being and have a direct impact on wildlife and local amenity. Noise levels provide an indicator of local environmental quality. The objective of a policy for noise is to minimise emissions and reduce ambient noise levels to an acceptable standard. Noise Action Plans, drawn up by the Welsh Ministers in relation to Wales under the Environmental Noise Directive, and the Wales Regulations, aim to prevent and reduce environmental noise where necessary and preserve environmental noise quality where it is good. They are a planning consideration in the use and development of land."

" 13.14 Development Plans and Noise and Lighting

13.14.1 Development plan policies should be designed to ensure, as far as is practicable, that noise-sensitive developments, such as hospitals, schools and housing, that need to be located close to the existing transportation infrastructure to facilitate access, are designed in such a way as to limit noise levels within and around those developments. Such development should be located away from existing sources of significant noise including air transport and some industrial activities or programmed development such as improved or new roads. Policies should also be designed to ensure, as far as possible, that potentially noisy developments are located in areas where noise will not be such an important consideration or where its impact can be minimised. Local planning authorities should adopt policies to prevent potentially noisy developments in areas which have remained relatively undisturbed by noise. Development plan policies should have regard to any relevant Noise Action Plan, including the need to protect urban 'quiet areas' against an increase in noise."

"13.15 Development Management and Noise

13.15.1 Noise can be a material planning consideration, for example in proposals to use or develop land near an existing source of noise or where a proposed new development is likely to generate noise. Local planning authorities should make a careful assessment of likely noise levels and have regard to any relevant Noise Action Plan before determining such planning applications and in some circumstances, it will be necessary for a technical noise assessment to be provided by the developer

13.15.2 Special consideration is required where noise-generating development is likely to affect a protected species, or is proposed in or near statutorily designated areas, including urban 'quiet areas' designated in Noise Action Plans. The effect of noise on the enjoyment of other areas of landscape, wildlife and historic value should also be taken into account."

4.2 Local policy

The Local Planning Authority applicable to the proposed development is Neath Port Talbot Council. The local Core Strategy refers to the Welsh Planning Policy 13 Technical Advice Note (TAN) 11.

4.3 NPTCBC Adopted Local Development Plan 2011-2016

4.3.1 Policy EN8 Pollution and Land Stability

"Proposals which would be likely to have an unacceptable adverse effect on health, biodiversity and/or local amenity or would expose people to unacceptable risk due to the following will not be permitted:

- Air pollution;*
- Noise pollution;*
- Light pollution;*
- Contamination;*
- Land instability;*
- Water (including groundwater) pollution.*

Proposals which would create new problems or exacerbate existing problems detailed above will not be acceptable unless mitigation measures are included to reduce the risk of harm to public health, biodiversity and/or local amenity to an acceptable level"

5. GUIDANCE DOCUMENTS

In order to establish satisfactory noise parameters for design purposes and assessment, other guidance sources are necessary to be considered as there is nothing specific in the Planning Legislation.

5.1 British Standard 8233:2014

To address noise control in and around different types of buildings, appropriate guidance and criteria can be taken from:

‘BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (British Standards Institution)’ (BS 8233:2014).

The criteria are primarily intended to guide the design of new buildings and are flexible depending on the situational circumstances.

Tables 1 to 3 provide the BS 8233:2014 guidance criteria for indoor ambient noise levels in commercial properties when they are unoccupied.

Table 1: BS 8233 Internal Noise Limits - Offices

Typical situation	Design range $L_{Aeq,T}$
Restaurant	40-55
Open plan office	45-50
Night club, public house	40-45
Ballroom, Banqueting hall	35-40
Living room	35-40

Table 2: Typical noise levels in non-domestic buildings

Activity	Location	Design Range $dBL_{Aeq,T}$
Speech or telephone communications	Department store	50-55
	Cafeteria, canteen, kitchen	
	Concourse	45-55
Study and work requiring concentration	Corridor, circulation space	
	Library, gallery, museum	40-50
	Staff/ meeting room, training room	35-45
Listening	Executive office	35-40
	Place of worship, counselling, meditation, relaxation	30-35

Hydrock recommends the following targets:

- 50 - 55dB $L_{Aeq,T}$ for the A1 units
- 40 - 55dB $L_{Aeq,T}$ for Restaurant/Cafe
- 40 - 50 dB $L_{Aeq,T}$ for Library

Table 3: Typical noise levels in Leisure Centre

Location	Design Range $dBL_{Aeq,T}$
Swimming Pool	<50
Multi-Purpose Room	<40
Gym	<40
Changing/WC	<50

5.2 British Standard 4142:2014

Guidance on measurement of prevailing background noise and rating methods of external building services noise can be taken from:

‘British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound’

The methods described in BS4142:2014 provide an objective method for assessing the likelihood of disturbance caused by industrial or commercial noise. It can be used to determine the following levels at external locations:

1. rating levels for sources of sound of an industrial and/or commercial nature; and
2. ambient, background and residual sound levels,

for the purposes of:

3. investigating complaints;
4. assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
5. assessing sound at proposed new dwellings or premises used for residential purposes.

Certain acoustic features can increase the perceived impact of a specific noise source. Where such features are present at the assessment location, a character correction is added to the specific sound level to obtain the rating level.

The significance of noise impact is initially estimated for the specific sound by subtracting the measured background sound level from the rating level, and the following considered.

- a. Typically, the greater this difference, the greater the magnitude of the impact.
- b. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be taken into consideration.

6. NOISE SURVEY

To enable an assessment of the baseline ambient noise levels in the area, environmental noise measurements were undertaken on site between Friday 16th November 2018 and Monday 19th November 2018.

6.1 Methodology

The measurement locations were selected on the proposed development site in order to quantify the necessary noise levels for the Planning Application stage.

Figure 2 shows the noise measurement positions.

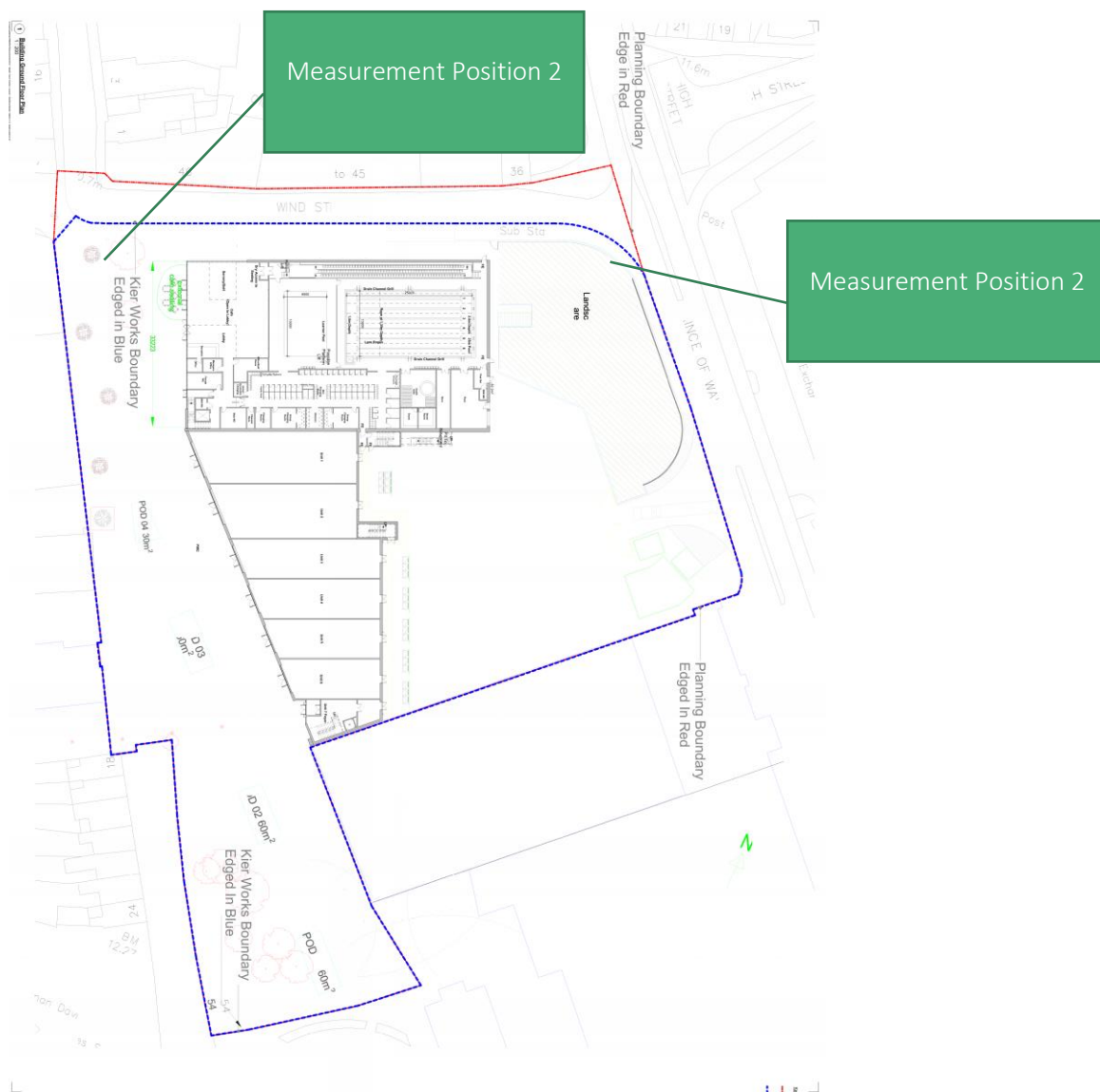


Figure 2: Measurement Positions

6.2 Environmental Noise Monitoring

During the site visit an assessment of the noise climate of the proposed development location and its surroundings was conducted.

The positions were selected in order to acquire prevailing background noise levels around the development area in particular noise emissions emanating from Old Market Street and the B4434.

Measurements were undertaken in accordance with the guidance outlined in the relevant British Standards, BS 4142:2014 and BS 7445-1:2003.

The monitoring procedure followed the guidance outlined in BS7445:2003 Part 1, Section 5.2.3 and section 5.2.2. Measurements were undertaken within a 'free field' environment.

A wind shield was fitted to the monitoring equipment at all times.

The microphone was located at a height of approximately 1.5m above ground floor level.

6.3 Equipment

Details of the sound monitoring equipment used for the acquisition of the prevailing noise levels are provided in Table 4.

Table 4: Survey Equipment

Monitoring Location	Manufacturer	Instrument	Type	Serial No. / Version	Calibration Certificate Number
Position 1	Rion	Sound Level Meter	NL-52	01254312	No.C11030502
Position 1	Rion	Pre-Amplifier	NH-25	54394	No.C11030502
Position 1	Rion	Microphone	UC-59	08770	No.C11030502
Position 1	Rion	Acoustic Calibrator	NC-74	35157400	No.CO2040201
Position 2	Rion	Sound Level Meter	NL-52	01254313	No.C11030502
Position 2	Rion	Pre-Amplifier	NH-25	54395	No.C11030502
Position 2	Rion	Microphone	UC-59	08771	No.C11030502
Position 2	Rion	Acoustic Calibrator	NC-74	35157400	No.CO2040201

6.4 Weather Conditions

A record of the weather conditions as published by www.timeanddate.com was kept during the measurement survey period from Friday 16th November 2018 and Monday 19th November 2018.

The outline details of which are presented in Table 5.

Table 5: Weather Data

Period	Mean Temperature Degrees Celsius	Events	Wind Speed m/s	Prominent Wind Direction
Friday 16/11/2018	13	Dry	> 5	W
Saturday 17/11/2018	10	Dry	> 5	W
Sunday 18/11/2018	11	Dry	> 5	W
Monday 19/11/2018	8	Dry	> 5	SW

BS 4142:2014 provides the following guidance with regards to the acquisition of environmental noise measurements and weather conditions:

‘An effective windshield should be used to minimize turbulence at the microphone.’

‘NOTE Windshields are generally effective up to wind speeds of 5 m/s’ and. ‘exercise caution when making measurements in poor weather conditions such as wind speeds greater than 5 m/s.’

Average recorded wind speeds during the environmental noise measurement process marginally exceeded the monitoring threshold level 5 m/s however, as shown in the results wind speeds did not have a detrimental impact on measured noise levels.

Measurements are therefore considered to adhere to the guidance of the relevant British Standard and no correction has been applied to prevailing noise levels.

7. RESULTS

7.1 Environmental Noise Survey

Two environmental noise surveys were undertaken at Position 1 and 2 on the proposed development site.

A noise level time history over the full measurement period of Positions 1 is presented in Figure 3, and in Figure 4 for Position 2, which demonstrates the variability of noise on the proposed development site.

The period of measurement was between Friday 16th November 2018 and Monday 19th November 2018.

Three main acoustic parameters were measured using a time interval of 5 minutes as described below.

- $L_{Aeq,T}$ dB, defined as the 'A' weighted equivalent continuous sound pressure level. Over a defined time period 'T', it is the sound pressure level equivalent to the acoustic energy of the fluctuating sound signal. It is often referred to as the 'ambient noise level'.
- $L_{Amax,F,T}$ dB, defined as the 'A' weighted maximum sound pressure level that occurred during the time period 'T' acquired using a 'fast' time weighting (i.e. a sample every 125ms). It is commonly used to describe the highest noise level that occurred during an event such as a vehicle pass-by.
- $L_{A90,T}$ dB, defined as the 'A' weighted sound pressure level exceeded for 90% of the measurement period 'T'. It is a statistical parameter and cannot be directly combined with other acoustic parameters. It is generally used to describe the prevailing background noise level.

Figure 3 show graphical representations of the variations of the noise levels in time for Position 1.

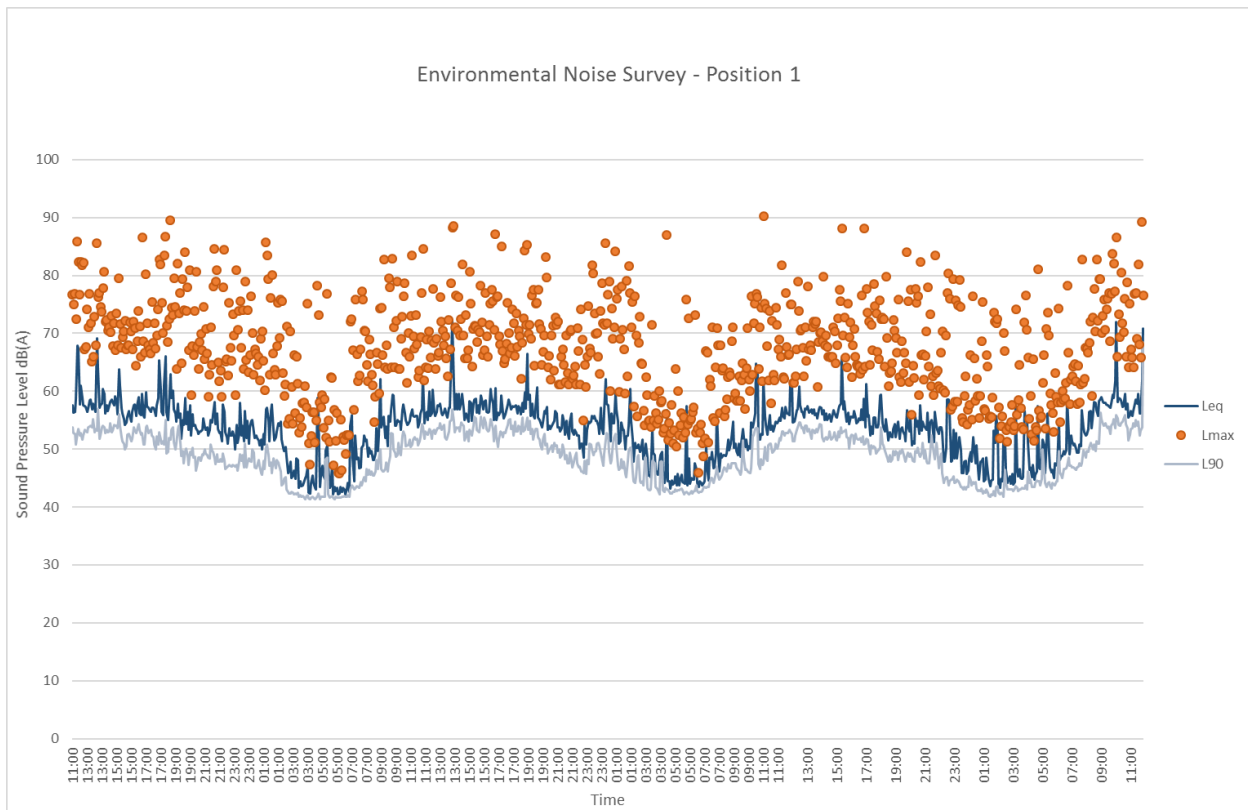


Figure 3: Environmental Noise Survey Measurement Graph - Position 1

A summary of the 16-hour daytime (0700hrs to 2300hrs) and 8-hour night time (2300hrs to 0700hrs) $L_{Aeq,T}$ and L_{A90} parameters for Position 1 are presented in Table 6.

Table 6: Summary Noise Levels – Position 1

Period	16-Nov	17-Nov	18-Nov	19-Nov	Average
Daytime L _{Aeq} (16hour) dB	58	57	56	60	58
Night time L _{Aeq} (8hour) dB	51	52	50	-	51

Figure 4 show graphical representations of the variations of the noise levels in time for positions 2.

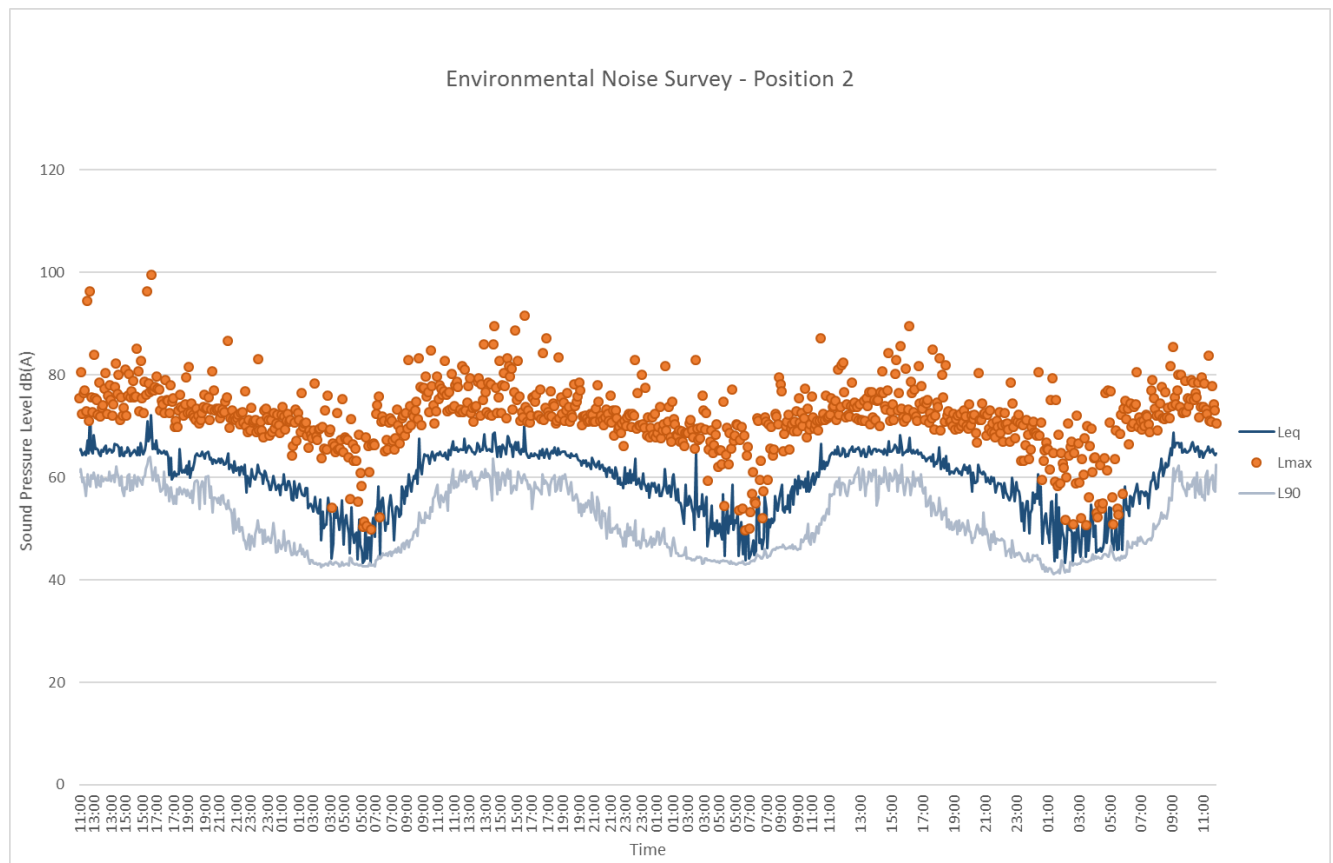


Figure 4: Environmental Noise Survey Measurement Graph - Position 2

A summary of the 16-hour daytime (0700hrs to 2300hrs) and 8-hour night time (2300hrs to 0700hrs) L_{Aeq,T} and L_{A90} parameters for Position 1 are presented in Table 7.

Table 7: Summary Noise Levels – Position 2

Period	16-Nov	17-Nov	18-Nov	19-Nov	Average
Daytime L _{Aeq} (16hour) dB	65	64	63	64	64
Night time L _{Aeq} (8hour) dB	55	56	53	-	55

7.2 Typical Background Noise Levels

A statistical approach has been adopted in line with the guidance of BS 4142:2014 in determining the typical background noise levels.

The approach is to undertake a statistical analysis of the resulting daytime (0700-2300) and night time (2300-0700) measurement periods in order to determine the representative and most commonly occurring values to determine the typical background noise level.

The figures outlined in Table 8 should be adopted for use in the noise impact assessment.

Table 8: Typical Measured Background Noise Level L_{A90}

Period	16-Nov	17-Nov	18-Nov	19-Nov	Average
Position 1					
Day time L_{A90} Typical (16hour) dB	53	53	52	54	53
Night time L_{A90} Typical (16hour) dB	42	43	43	-	43
Position 2					
Day time L_{A90} Typical (16hour) dB	60	60	46	56	59
Night time L_{A90} Typical (16hour) dB	43	44	44	-	44

8. ENVIRONMENTAL NOISE AFFECTING THE PROPOSED DEVELOPMENT

In order to protect the amenity of future tenants, it will be necessary to assess the noise intrusion due to all external sources against the appropriate British Standards and relevant guidance.

Noise exposure criteria policy details are contained in the planning policy section of this report. The requirements of BS 8233:2014 are detailed in the guidance documents section and provide appropriate guidance on both internal and external noise levels.

8.1 Sources of Noise

Based on the results of the noise survey it is seen that the main sources of noise are the B4434 and Old Market Street. However, the road traffic on B4434 is seen more dominant compared to Old Market Street and hence is generally the dominant source of noise over the site.

8.2 Noise levels at Facades

Based on the noise levels shown in Table 6 and Table 7 noise levels at the proposed building will be 58 dB $L_{Aeq, 16 \text{ hour}}$ at the West elevation and 64 dB $L_{Aeq, 16 \text{ hour}}$ at the East elevation during the daytime

8.3 Outline Guidance for Building Envelope and Ventilation Strategy

The sound insulation requirements of the building envelope depend upon the external noise levels present at each façade.

We would advise that the development be designed to ensure internal noise levels in accordance with the guidance of BS 8233:2014.

A computer noise model has been used to predict noise levels at each proposed façade based on the measurements of identified sources, i.e. the A4059.

Figure 5 below present the predicted noise levels across the proposed development site during the daytime, in terms of dB $L_{Aeq, 16 \text{ hour}}$

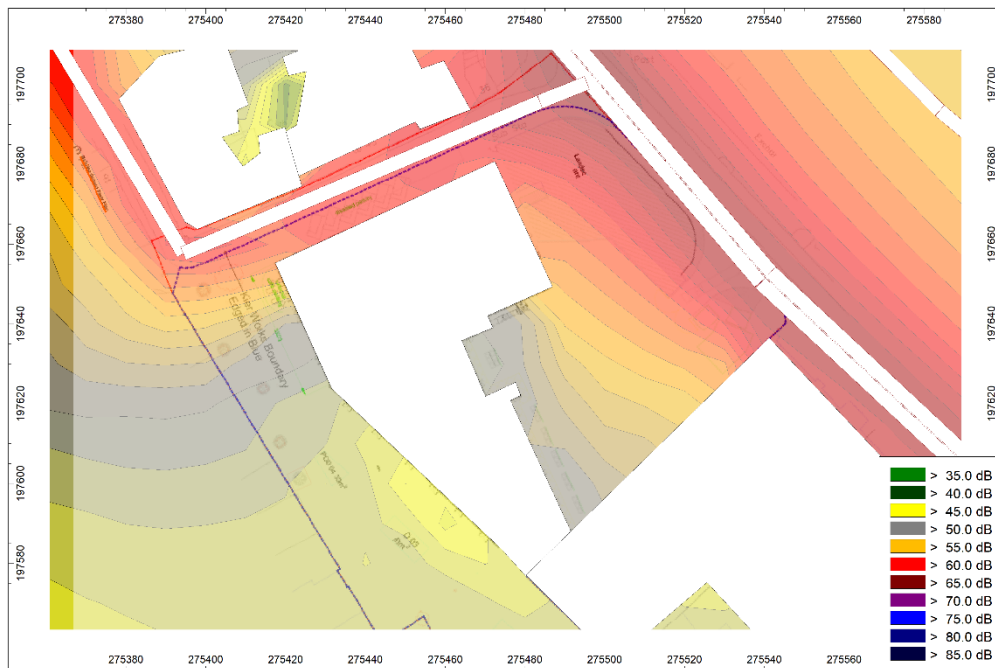


Figure 5: Noise Mapping dB $L_{Aeq, T}$.

Simple natural ventilation through the use of opening windows will provide a level difference (D) in the order of 10-15 dB.

8.4 Commercial/Library Areas

As shown in Figure 5, the external noise levels incident on the building varies between 45-51 dB $L_{Aeq, T}$.

Commercial A1 and the potential future Library type spaces have recommended internal noise limits ranging from 50-55 dB $L_{Aeq, T}$.

Incident noise levels on the Leisure Centre areas range from 49-59dB $L_{Aeq, T}$. The most sensitive spaces would be considered to be office type spaces for staff (with a recommended internal noise limit of 35 dB $L_{Aeq, T}$). Office areas with external facades (not internalised within the building) are exposed to lower noise levels (Circa 49-50 dB $L_{Aeq, T}$).

It is considered that the majority of fitness, swimming, changing and multi-use type spaces within the leisure centre will be mechanically ventilated with windows normally remaining closed, thus providing suitable sound insulation from the outset.

No particular façade design is required to mitigate external noise levels and any typical double glazing or monolithic curtain glazing as required for thermal performance would be sufficient.

9. NOISE LIMITS FOR PLANT AND SERVICES

The proposed development will incorporate building services plant which will vent externally or have externally located plant items. These will generate noise and may require noise control measures (and potentially vibration control dependent on location).

The nearest noise sensitive properties have been identified in red in Figure 6.

A statistical assessment of background sound levels measured in 2018 has been undertaken in accordance with BS4142:2014.

The typical background daytime and night-time noise levels at the long-term monitoring location are shown below:

Typical background noise levels at Position 1:

- L_{A90} 53 dB daytime (0700hrs to 2300hrs)
- L_{A90} 43 dB night time (2300hrs to 0700hrs)

Typical background noise levels at Position 2:

- L_{A90} 59 dB daytime (0700hrs to 2300hrs)
- L_{A90} 44 dB night time (2300hrs to 0700hrs)

9.1 Overall combined noise limit

Typically, a plant noise limit of the prevailing background sound level minus 5 dB(A) is advised at residential receptors in accordance with the procedures of BS 4142: 2014. The proposed plant noise limits are presented in Table 9, below.

Table 9: Proposed External Fixed Services and Plant Noise Limit

Parameter	Period	Noise Levels, dB
$L_{Ar,1hour}$	Daytime (0700hrs to 2300hrs)	48 dBA
$L_{Ar,15mins}$	Night Time (2300hrs to 0700hrs)	38 dBA

The noise limits above are ‘free-field’ levels at any height above ground and 1.0m from the nearest noise sensitive property façade. They apply to the overall combined noise of all building services plant without any specific tone or character.

If the plant noise will contain specific tones, impulsivity, intermittent character, or other specific acoustic features then a further 2-21 dB(A) penalty should be applied depending on sound characteristic type and subjective or objective magnitude.

10. NOISE IMPACT FROM INTERNAL SPORT OR LEISURE ACTIVITY.

It has been considered that there is a potential for noise breakout from multipurpose rooms, pool and gym areas.

The most likely source of potential noise impact would be from the gym area to the west and multipurpose rooms within the east of the leisure centre building.

The predominant source of noise would be music. Typically, this will be highest from dance or fitness classes, which would be in the region of 85 dBA $L_{Aeq, T}$.

Hydrock have estimated the potential noise impact at sensitive receptors on the basis of the calculation methodology found in BS EN ISO 12354-4:2017.

The gym has been assessed on the basis it is in closer proximity to sensitive receptors, and has a less substantial façade construction than other areas being predominantly glazed to the western façade.

The assessment of noise egress from the gym assumes a nominal façade sound insulation performance of 31 dB R_w , typical for standard thermal double glazing. The northern façade element has been considered to comprise metal cladding, thermal insulation and plasterboard inner linings with a sound insulation performance of circa 58 dB R_w .

It is considered the roof is screened such that it does not contribute significantly to the noise levels at receptors.

The nearest sensitive receptors are properties on the corner of Old Market Street and Wind Street, approximately 40m northwest of the centre of the western façade of the leisure centre with the gym internally adjacent.

It is found, on the basis of the above assumptions, gym music noise levels will be at least 8dB below background noise levels during the daytime. No night-time operation is expected. This can therefore be considered a "low impact".

Although BS4142 is not strictly applicable to music noise emanating from the gym, an assessment against the background sound level does provide an indication of the prominence of gym noise at receptors.

Music and gym noise 8 dB below the background sound level is unlikely to be significant compared to the residual acoustic environment.

A calculation summary is provided in Appendix 1 to this report.

11. RETAIL/COMMERCIAL DELIVERY NOISE

11.1 Overview

Ultimately applications for commercial deliveries will be the responsibility of future tenants. However, Hydrock provides “best practice” commentary to minimise potential disturbance as a result of noise impact from these activities.

It is advised in the first instance that deliveries are only permitted during the day time period 07:00-23:00, unless a further tenant specific noise impact assessment is undertaken by the relevant party for the night-time period 23:00-07:00 in relation to their specific delivery practices and activities.

If night-time deliveries are required by a tenant, it is recommended that this is assessed separately. Ideally, measurements of tenant delivery practices at an active site would be assessed, and then considered in the context of Neath Town Centre and the sensitive receptors in the vicinity. A delivery noise assessment report would then be submitted to the local authority by tenants wishing to operate with night-time delivery cycles.

This could be achieved by appending conditions to future tenancies.

11.2 Quiet Delivery Methodology

The Department for Transport issued guidance in 2014 for “Quiet Deliveries-Good Practice Guidance” on the basis of which proposals are provided below for a “quiet delivery methodology” (QDM) which will further assist to mitigate delivery noise at sensitive receptors. These details may be included in tenancy documentation.

11.2.1 Vehicle Movement

The following measures should be considered when developing a scheme of site vehicle movement:

- » Site access should be selected at an appropriate location as far from the identified existing receivers as practicable. (as is currently proposed)
- » Deliveries should be programmed to arrive during daytime hours only (recommended for inclusion in the proposed tenancy agreement).
- » Delivery vehicles should be prohibited from waiting within the site with their engines running.
- » Road surface should be maintained in good order.

11.2.2 Reversing Alarms

As far as reasonably practicable the noise from reversing alarms should be controlled and limited.

This will be managed through the following hierarchy of techniques:

- » The site layout will be designed to limit and where reasonably practicable, avoid the need for the reversing of vehicles. Drivers will be familiar with the delivery zone layout.
- » Banksman provided by tenants will be utilised to avoid, as far as reasonably practicable, the use of reversing alarms.
- » If reversing alarms cannot be avoided, “white noise” type reversing alarms are recommended these are less distinguishable from day to day noise sources internal to sensitive receptors.

12. SUMMARY AND CONCLUSION

Hydrock Consultants have been appointed by Kier to provide acoustic consultancy services in relation to the proposed Neath Town Centre Leisure and Retail development.

Guidance documents and national standards, including Welsh National and Neath Local Planning Policy guidelines, have been used to assess the site for suitability and provide noise limits for fixed plant and services.

A noise survey of the site has been undertaken.

Noise risk assessments have been undertaken to inform the proposed master planning outcomes by incorporating good acoustic design where possible.

Preliminary design advice relating to the sound insulation and ventilation design of the façades has been provided based on measured noise levels. It is seen that no particular façade design is required to mitigate external noise levels and any standard double glazing would be sufficient to mitigate external noise levels.

Suitable maximum noise limits have also been given for plant noise from the proposed development.

An indicative assessment of potential commercial/gym noise has been undertaken to the nearest receptors.

Consideration has also been given to the control of noise impact resulting from retail and commercial deliveries to the site. Noise mitigation recommendations have been put in place which could be incorporated in future tenancy agreements.

In conclusion, assuming the measures outlined in this report are implemented, the development will meet the requirements of the local authority including relevant Local Policy item EN8 of the NPTCBC Local Development Plan 2011-2026 as well as complying with other relevant acoustic design guidance and technical standards.

Appendix 1: Gym Noise Breakout Calculation

Calculation Method: BS EN ISO 12354-4:2017

Project: NTCRLD

Date: 15/04/2020

Source: Music Noise

Source:	Music Noise	Octave Band Centre Frequency, Hz											
		63	125	250	500	1000	2000	4000		R _w	dB(A)		
<u>Internal Noise level</u>													
Wedding Music/Rock Band	L _{p inside} , dB	95	90	84	83	79	76	73			85		
<u>Sound Power of Building Side</u>													
L _{receptor} = L _{int} + C _d - R' + 10 log S - 20 log d - 11 + D _c + A _s													
Element	S, m ²	C _d	D _c	d, m	A _s								
Glazed Curtain Walling (South/East)	R', dB	191.5	-6	0	40	18	24	20	25	35	38	35	31
Sound Pressure Level	L _w , dB	51	40	38	32	18	12	12					
Metal Cladding Northern Facade	R', dB	96.0	-6	0	38	27	32	47	61	69	75	58	
Sound Pressure Level	L _w , dB	39	29	8	-7	-19	-22	-31					
<u>Total Sound Pressure Level at Receptor</u>													