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REPORT

Merkur Slots – 244-246 High Street, Ayr

Noise Assessment

Client: MERKUR Slots UK Limited

Reference: PR2001_163_FINAL

Date: 14/12/2023

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Executive Summary

- **Merkur Slots will be occupying a new venue at 244-246 High Street, Ayr. The venue will be operational 24-hours a day.**

- **A site survey and inspection has been undertaken at 244-246 High** Street**, Ayr of the existing condition and recommendations have been made to improve the sound insulation performance. Residential units exist directly above which are the closest noise sensitive receptors.**

- **Measurements of operational noise levels were made in an existing venue and used to undertake the noise impact assessment. All of this information gathered at the venue was used to undertaken noise assessments for internal impacts (i.e. through the separating floor) and external impacts (i.e. noise from outside to the closest window).**

- **Internal Noise Impact Assessment – an assessment of potential *internal* noise impacts from 24-hour operation to the residential units above was undertaken. The assessment demonstrated that, once all rectification works are complete, the separating floor can attenuate operational noise levels sufficiently so that Noise Rating (NR) 20 will be achieved in the first-floor unit above.**

- **External Noise Impact Assessment – an assessment of potential external noise impacts from 24-hour operation to the closest residential units (directly above) was undertaken. A series of case studies of patron behaviour have been undertaken for six different Merkur sites with 24-hour consent to assess if noise impacts could occur. Three of the sites had a residential unit directly above. The studies concluded that patrons are nearly always alone or in a pair, very quiet and do not behave in a way that would cause disturbance to others. The assessment demonstrated that the external building façade can attenuate operational noise levels sufficiently so that Noise Rating (NR) 20 will be achieved in the closest noise sensitive receptor and max levels at the window are below the BS8233 criteria.**

- **A worst-case scenario assessment of noise from patrons standing outside the venue was undertaken and demonstrates that noise impacts are not anticipated.**

- **Based on the outcome of the assessment, noise impacts are not anticipated and the site is considered suitable for 24-hour operation. An operational management plan for managing unpredictable noise events have been developed and presented within this report.**

1 Introduction

1.1 Background

Archo Consulting Ltd have been appointed to undertake an assessment of sound insulation performance and potential noise impacts from patron activity for a new Merkur Slots site at 244-246 High Street, Ayr. Planning permission is being sought for 24-hour operation and as such the assessment has been undertaken in accordance with the appropriate Noise Rating (NR) criteria and night-time internal noise criteria thresholds in accordance with BS8233:2014.

An onsite inspection has been undertaken of the existing condition of the separating ceiling and walls to identify the current configuration. The resulting sound insulation performance has been calculated using INSUL Sound Insulation Prediction Software to prove compliance.

1.2 Site Context

The site is located at ground-floor level facing out onto the High Street. Neighbouring commercial units exist on each side of the site. The closest noise sensitive receptors are the existing residential units which are directly above the site.

Predictions of the sound insulation performance are provided to ensure noise impacts do not occur. Measurements of operational noise levels from 10 existing operational sites have been made and the results are presented in **Appendix D**. The measurements made in Hull have been used to assess noise breakout as this represents the most stringent approach.

1.3 Legislation

Noise impacts to adjacent residential premises have been calculated and assessed in accordance with the following standards:

- *British Standard (BS) 8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings* (herein after referred to as BS 8233:2014).

In addition to BS8233:2014, reference has been made to The Royal Environmental Health Institute of Scotland Briefing Note 017 (herein after referred to as REHIS) which details methods for assessing noise impacts from industrial or commercial noise which is presented in **Appendix A**. Full details of all legislation, guidance and standards referenced for noise assessments are presented in **Appendix B**.

2 Assessment Criteria

The following guidance has been used to undertake the assessment for external noise impacts to the closest noise sensitive receptors. Full details of all guidance are presented in **Appendix B** and a description of acoustic terminology is presented in **Appendix C**. The noise impact assessment has been split into two sections: Internal noise impacts and external noise impacts.

NR Curves

The closest noise sensitive receptor to the site is the residential unit directly above. Residential units will typically experience very low internal noise levels, mostly from conversations and entertainment. In determining what NR criteria should be the limit to sufficiently protect the occupants, it was deemed prudent that a threshold of NR20 should be applied as this criterion will be sufficiently low to protect the amenity of residents. This criterion has been used for previous assessments of the same nature and provided adequate protection. The NR20 criterion applies to internal noise impacts (noise transmitting through the separating floor) and external noise impacts (noise from outside entering via a partially open window).

BS8233:2014

BS8233:2014 criteria for recommended internal noise levels (night-time) has also been referenced in order to provide a prudent assessment. BS8233:2014 specifies that, in order for the above thresholds to apply, the noise source in question must have "no specific character" i.e. no tones, strong low frequency component etc. Based on the measurements made within the active site, it was determined that noise levels were low and without specific character (predominantly people talking and low-level sounds from machines). The site will be operational 24-hours a day and the night-time (23:00 to 07:00) internal noise criteria represents the most stringent criterion. Therefore, **the threshold of 30 dB $L_{Aeq,8hour}$** representing the BS8233:2014 night-time criteria has also been referenced for this assessment. Furthermore it should be noted that the REHIS specifies that external night-time noise levels should not exceed 40dB. With regard to a partially open window the following is stated in REHIS: *Predictions of internal noise levels within noise sensitive premises must be calculated based on an open window scenario. The degree of sound reduction afforded by a partially open window should be taken as 10dB.*
Applying this correction results in the same 30dB night-time internal noise level and therefore the assessment has been undertaken using this threshold.

NANR116: 'Open / Closed Window Research

The Building Performance Centre – School of the Built Environment at Napier University published a research paper in April 2007 entitled *NANR116: 'Open/Closed Window Research' Sound Insulation Through Ventilated Domestic Windows* which detailed the measured sound attenuation which can be achieved by partially open windows with different opening areas. The attenuation values presented in **Appendix B** were used to assess potential noise impacts as this represents a prudent and worst-case scenario.

3 Assessment of Potential Noise Impacts – Internal Noise

3.1 Background

The following section deals with potential *internal* noise impacts exclusively.

In order to assess the current site conditions, an inspection and assessment was undertaken on the 9th December 2023. The assessment focused predominantly on the ceiling area, walls and shop front which will separate the premises from the adjacent spaces. Detailed site notes and accompanying photographs were taken to inform the assessment.

3.2 Onsite Observations

It was noted onsite that a suspended grid ceiling was present which incorporated mineral fibre ceiling tiles. The separating floor consisted of a timber joist structure with a double layer of 15mm thick fireboard affixed to the underside. The entrance consisted of a double-leaf glass door mounted in glazed frontal façade.

The key findings of the onsite investigation in relation to the sound insulation performance are listed below. Photos from the site are presented in **Appendix D**:

- ***Entrance Door***: It is recommended that acoustic perimeter seals are installed around the frame of the door and at the bottom to prevent unnecessary sound transmission to the outside. It is recommended that the door also incorporate an automatic closer system.

- ***Separating Floor***: The separating floor consisted of a timber joist structure with plasterboard layers affixed to the underside. Large gaps were present in many locations, exposing the floor to the flats above and joints were not sealed up. It is recommended that a new double layer of 15mm thick fireboard is affixed to the underside of the joists and all junctions are sealed with non-hardening sealant. Full details for recommendations and site photos are presented in **Appendix D**.

3.3 Operational Noise Levels within Existing Merkur Cashino

Measurements of internal noise levels within a representative range of ten operational Merkur sites have been made in order to assess operational noise levels. The levels measured in the Hull venue are considered the most representative for the purposes of this assessment due to the high levels of noise generated and therefore have been used to assess potential noise breakout from the new site. Measurements were made in various locations to obtain a representative spatial average within a fully operational 24-hour Merkur Cashino site at 106 Newland Avenue, Hull (made 17th March 2020). All details of the measurements and data are presented **in Appendix D**. For reference, internal source measurements made at other Merkur venues across the UK have also been presented in **Appendix D** to demonstrate how all venues have very similar operational noise levels.

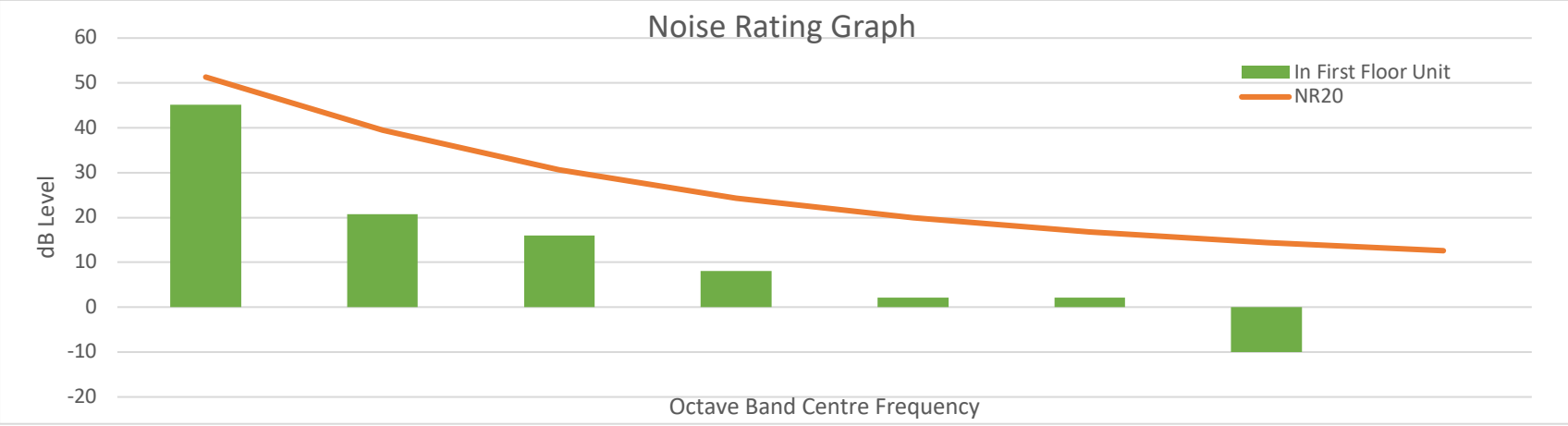
It was noted during the site visit in which source noise levels were measured that the venue was very typical of others across the country with no discernible difference in operational sound or patron behaviour / frequency. The following contextual factors were noted with relation to noise which are typical for all Merkur venues:

- No sound was audible outside of the premises to the front or rear during peak operation;
- Internal noise levels were not high with normal conversations clearly audible and perceptible at normal speech level;
- Max levels were infrequent and short in duration;
- Patrons observed entering and leaving the premises during peak operation were always alone or in a pair with no loud conversation or behaviour that might cause disturbance; and,
- Patrons enter and leave quickly without loitering.

3.4 Noise Impact Assessment – Internal

It was deemed appropriate that the limit of **NR20** can be applied for the residential receptors situated directly above. The sound insulation performance of the separating floor was calculated using INSUL sound insulation prediction software and, using the measured noise levels within the site, the subsequent noise impacts to the first-floor residential units above has been predicted. All calculation procedures, methodology and data used for the assessment of internal noise impacts is presented in **Appendix E**. Only the outcome of the assessment is presented in this section. **Figure 1** below presents the predicted NR curve within the first-floor residential unit directly above plotted against the NR20 curve:

Figure 1: Predicted NR curve against NR20



3.5 Analysis of Results

It can be observed from **Figure 1** above that the predicted NR curve within the closest residential receptors will be below the **NR20** curve values. Therefore, the limit of NR20 is predicted to be achieved. This is also significantly below the criteria stipulated within REHIS.

4 Assessment of Potential Noise Impacts – External Noise

4.1 Background

The following section deals with potential *external* noise impacts exclusively.

In order to assess the current site conditions, an inspection and assessment was undertaken on the 9th December 2023. The assessment focused predominantly on the ceiling area, walls and shop front which will separate the premises from the adjacent spaces. Detailed site notes and accompanying photographs were taken to inform the assessment.

In order to assess potential noise impacts from patrons, a series of six case studies of patron behaviour during the night-time at existing Merkur sites with 24-hour consent has been presented to demonstrate the passive and quiet nature of patrons of AGC's across the UK. An assessment of potential noise impacts to the closest noise sensitive receptor (NSR) from noise breakout and also from people smoking on the street has also been performed.

4.2 Assessment of a 24-Hour Merkur Site (Cashino)

In order to determine what potential noise impacts could arise from patrons during the early hours of the morning, a series of surveys have been undertaken at existing operational Merkur Sites which have 24-hour consent. The surveys aimed to determine the typical behaviour of patrons during the most noise sensitive period of the night (after midnight) and identify if noise impacts could occur. The first three assessments were conducted during covid times and a further three have been conducted post-covid when restrictions have been fully lifted. **Table 1** below presents the outcome of the assessments in relation to noise.

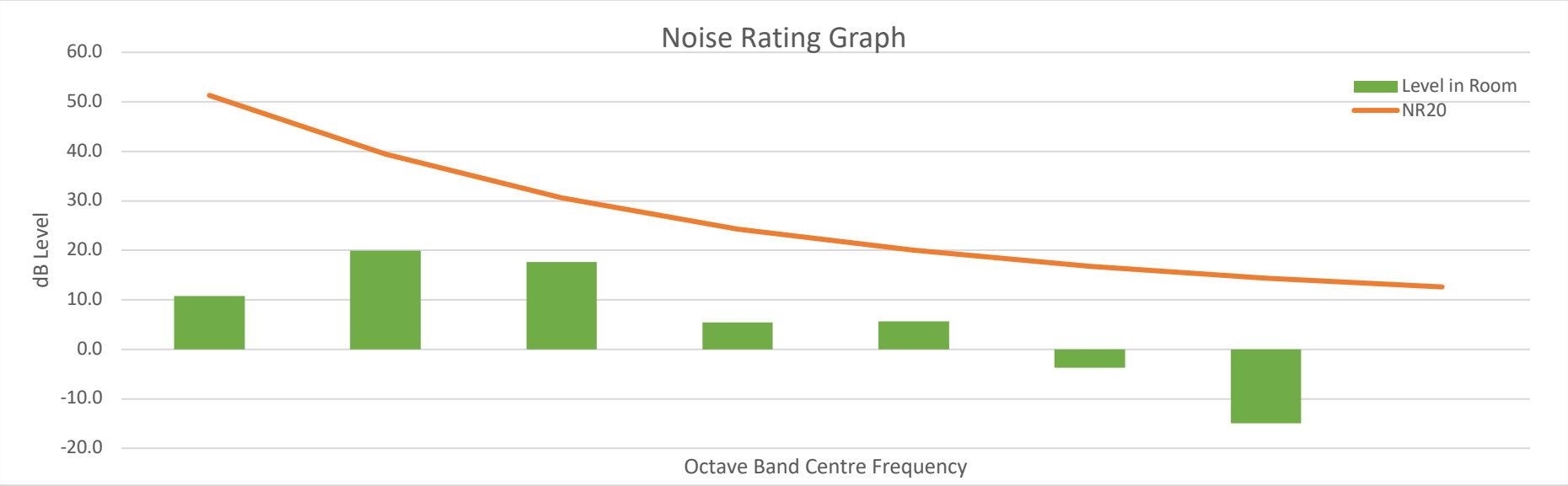
Table 1: Patron Survey Assessment Results

Venue	Date & Time of Visit	Town or District Centre	Residential Directly Above (Y/N)	No. Customers In	No. Customers out	Analysis of Observation (Patron behaviour)
302-304 Hessle Road, Hull – 11th September 2020	11th September 2020 01:45-02:45	District Centre	No	10	4	Patrons generated little sound from brief conversation. Barely discernible against noise from the road.
48-50 Camberwell Church Street, Camberwell, London – 15th July 2021	15th July 2021 01:00-02:00	District Centre	Yes	2	4	On three occasions patrons came outside for a cigarette. On one occasion patrons talked at low level briefly.
45 West Street, Boston – 29th July 2021	29th July 2021 00:00-01:00	Town Centre	No	2	0	No sound was generated by patrons. One patron came outside to smoke but made no sound.
22 The Market, Wrythe Lane, Carshalton, SM5 1AG	16th March 2023 01:00-02:30	District Centre	Yes	1	1	Staff came out at 02.29 but made no noise and one patron is heard talking briefly. No other sound.
122 Kingsland High Street, Hackney, London, E8 2NS	15th March 2023 01:00-02:30	Town Centre	Yes	2	2	No sound from any of the patrons. Only sound is from cars on the road.
222-223 High Street, Dudley, DY1 1PD	22nd March 2023 01:00-02:00	Town Centre	No	5	3	Two instances occurred were patrons came out to smoke but no sound was generated. No other patron noise.

4.3 Noise Impact Assessment – External

All calculations, methodology and technical details are presented in **Appendix E**. With reference to **Section 2** it was deemed appropriate that the limit of **NR20** can be applied for the closest residential receptor directly above the site denoted NSR1. The noise rating curve within NSR1 was calculated using the attenuation values presented in NANR116 and reproduced in **Appendix B**. The sound insulation performance of the glazed shop front was calculated using INSUL Sound Insulation Prediction Software and is presented in **Appendix E**. The octave band noise level incident at the window of NSR1 was calculated over a 3-metre distance and the NR curve inside the room predicted. **Figure 2** below presents the calculated NR curve plotted against the NR20 curve:

Figure 2: Predicted NR curve against NR20



It can be observed from **Figure 2** above that the calculated NR curve within NSR1 will be well below both the **NR20** curve values and the night-time threshold of 30 dB stipulated within BS8233:2014 and REHIS.

Assessment of Max Levels

Previous versions of BS8233:2014 stated that noise levels should not regularly exceed 45dB within bedrooms during the night-time. BS8233:2014 states that a partially open window can achieve a reduction of -15 dB and combining this with the internal threshold of 45 dB provides a façade limit of 60 dB.

To provide a prudent and worst-case approach, an assessment of potential noise impacts from measured L_{Amax} levels has been undertaken for the scenario when the entrance door is briefly open for customers to enter and leave. The highest measured L_{Amax} levels presented in **Appendix D** were used and, assuming the partially open door achieves the same attenuation values as a partially open window, the predicted L_{Amax} level at NSR1 (3-metres away) was calculated. **Table 2** below presents the results of the assessment:

Table 2: Predicted L_{Amax} Level Incident at Closest Resiential Window

Element	63	125	250	500	1000	2000	4000	Single Figure L_{Aeq}, dB
Level at Window	40.8	54.7	54.1	47.8	50.9	40.5	36.5	58.8

It can be seen in **Table 2** above that, assuming an absolute and unlikely worst-case scenario, predicted max levels at the closest residential window are below the criteria stipulated by BS8233. It should be noted that machines generating the max levels are never located near the door but further inside the venues and therefore, max levels emanating from the periodically open door will realistically be much lower.

Based on the results of the noise breakout assessment and the worst-case assessment of max levels it can be concluded that noise impacts to NSR1 are considered highly unlikely to occur.

Assessment of Patron Noise – Smoking

Based on the site observations undertaken at different active Merkur sites with 24-hour consent detailed in **Section 4.2** it was observed that, at each of the sites, patrons were very quiet when entering and leaving the site and were typically alone or in a pair. It should be noted that the sites in Camberwell, Carshalton & Hackney had a residential unit directly above, the occupants of which have never complained about the AGC. When patrons who chose to smoke were observed coming out of the venue they generated little to no sound which was imperceptible against the ambient noise level of the area.

However, to provide a prudent and worst-case scenario approach to assessing potential noise impacts, an assessment of potential noise from patrons who choose to smoke talking loudly outside the front of the site has been undertaken. The methodology for the assessment of potential noise impacts from patrons outside it presented in **Appendix E**. During the initial site visit to a Merkur Cashino venue in Hull (pre-covid) two patrons were recorded talking moderately to loudly outside the venue for a duration of around 1 minute. This level was measured to be 69.4 dBA which is representative of a louder conversation. Using this measured level an assessment was undertaken of potential noise impacts at the closest residential window NSR1. To assess a worst-case scenario, it was assumed that 3 patrons were outside and all talking at the same time and same level i.e. 69.4 dBA. Using the information detailed in **Appendix E**, an assessment was undertaken of potential noise impacts to NSR1 at night-time. **Table 3** below presents the results of the assessment:

Table 3: Predicted Noise Levels

Source Noise Level of Each Patron (dBA)	No. of Patrons Talking	Distance (Metres)	Predicted Level at NSR1	Comment
69.4	3	3	59.3	Below 60 dBA threshold

4.4 Analysis of Results

Operational Noise

The predicted noise levels at the closest noise sensitive receptor NSR1 are below NR20 and BS8233:2014 criteria for internal habitable rooms during the night-time. It should be noted that this assessment represents a worst-case scenario and in practise noise levels will likely be lower. The worst-case scenario assessment of max levels when the front door is open demonstrates that predicted noise levels at NSR1 are below BS8233 criteria. It can be concluded that, given the measured internal operational noise levels and noted construction of the site, noise impacts at NSR1 are considered highly unlikely to occur.

Patrons Noise

Section 4.2 demonstrates that patrons of these venues showed no tendency towards shouting or other behaviour that might cause disturbance when outside, entering or leaving the venue. Therefore, noise impacts from patrons are considered highly unlikely to occur.

Notwithstanding, the OMP for this site presented in **Appendix F** should be followed.

Patrons Smoking

It can be observed from **Table 3** above that predicted worst-case scenario levels at NSR1 are below the external criteria of 60 dBA for the night-time.

Given that these events were observed at different Merkur sites across the country to occur infrequently (if at all) and combined with the worst-case predicted level being lower than this threshold it can be concluded that noise impacts from patrons who choose to smoke outside the venue are considered very unlikely to occur.

5 Unpredictable Noise Events, Recommended Control Measures and OMP

Observations at Other Merkur Sites

Based on observations at other active Merkur sites with 24-hour consent and the similar procedures that have been implemented, random noise events are considered unlikely to occur and the chance of such an event occurring from other people in the area unrelated to the site is equal.

It was observed at other Merkur sites and noted from conversations with the management that the venues normally have a strong circle of regulars who are known to the staff. This means they are unlikely to disobey house rules or go against staff requests.

Operational Management Plan - Control Measures

Notwithstanding, **Appendix F** presents the operational management plan which will be implemented to control, among other things, potential noise incidents. The main points are summarized below:

- Background music only will be played in the premises and there will not be any tannoy systems.
- The main entrance doors will not be fixed or propped open at any time whilst the premises is trading and there are customers in the venue.
- Customers wishing to smoke will be asked to do so as quickly as possible and in a responsible and quiet manner.
- Individuals who are deemed to be under the influence of excessive alcohol shall not be allowed to enter the premises.
- A notice will be placed that is visible from the exterior of the premises stating that drinking of alcohol directly outside the premises is forbidden and that those who do so will be banned from the premises.
- Customers will be reminded to respect neighbours when they leave.
- Staff, on request, will provide relevant information to customers who require a taxi or directions to the nearest station or bus stop.

6 Conclusion

Internal Noise

A site inspection and assessment of sound insulation performance has been undertaken at 244-246 High Street, Ayr. The inspection has identified the current configuration and the results presented within this report. Based on the configuration of the separating elements and the identified areas of improvement, the sound insulation performance was calculated using INSUL Sound Insulation Prediction Software. An assessment of noise breakout was undertaken using source noise measurements made within an operational Merkur site during peak operation and is presented in **Section 3**. The assessment showed that, once all rectification works have been completed, the separating elements will attenuate noise levels sufficiently to comply with the criteria of NR20. The assessment concludes that internal noise impacts are considered highly unlikely to occur and, based on the outcome of the assessment, the site is suitable for 24-hour operation.

External Noise

A series of case studies of patron behaviour have been undertaken for six different Merkur sites with 24-hour consent to assess if noise impacts could occur. Three of the sites had a residential unit directly above. The studies concluded that patrons are nearly always alone or in a pair, very quiet and do not behave in a way that would cause disturbance to others. An assessment of potential noise breakout to the closest residential premises NSR1 located directly above was undertaken using source noise measurements made within an existing site during peak operation and is presented. The assessment showed that the front façade will attenuate noise levels sufficiently to comply with the criteria of NR20 and BS8233:2014 criteria for internal habitable rooms at NSR1. An assessment of max levels has demonstrated that under a worst-case and unlikely scenario, when the door is periodically open, predicted levels at NSR1 are below the criteria prescribed in BS8233 and REHIS.

An assessment of potential noise impacts from patrons smoking outside has been undertaken. The study concluded that predicted worst-case noise levels are significantly below the external 60 dBA threshold during the night-time stipulated in WHO and referenced within BS8233. The OMP presented in **Appendix F** will be followed which has proven highly effective in other venues for control of noise. The assessment concludes that external noise impacts are considered highly unlikely to occur and, based on the outcome of the assessment, the site is suitable for 24-hour operation.

Unpredictable Noise Events

Based on the site assessments of patron behaviour at six sites during the most noise sensitive period of the night detailed in **Section 4.2,** it is considered highly unlikely that noise impacts will occur due to patrons leaving and entering the site. Patrons are typically regulars from the local area and are unlikely to be inclined to disobey the rules or staff members.

The assessment concludes that noise impacts from patrons are considered very unlikely to occur and the OMP presented in **Appendix F** will be implemented to ensure control.

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Appendix A – The Royal Environmental Health Institute of Scotland (REHIS) Briefing Note 017 – Noise Guidance for New Developments

The Royal Environmental Health Institute of Scotland
BRIEFING

REHIS Briefing Note 017

Noise Guidance for New Developments

October 2020

This Briefing Note, BN017 Noise Guidance for New Developments, contains very useful guidance for both Environmental Health Professionals and developers in relation to the planning process and developments where noise is a concern. It should be noted that the Briefing Note is currently subject to review and until that review is complete it is recommended it is not used as a basis for specific Policy on Planning and Noise Controls. The contents continue to be very relevant but require to be reviewed to reflect the most up to date guidance on specific noise levels in different situations.

1. Introduction

1.1 Unwanted sound can have a significant impact upon environmental quality, public health and amenity (Planning Advice Note 1/2011 (PAN 1/2011), Scottish Government, 2011). This guidance is to provide developers and Environmental Health Professionals with information on dealing with the planning process where noise sensitive developments are planned near to existing noise sources, or where potentially noisy developments are introduced into existing noise sensitive areas.

1.2 This guidance has been developed in response to Planning Advice Note (PAN) 1/2011 and should be read in conjunction with this document and the accompanying Technical Advice Note (TAN) 'Assessment of Noise'. It takes into account current policy in relation to planning and noise and provides guidance on undertaking noise assessments which may be required for any potential development in determining planning applications. The briefing note proposes rating levels and criteria that can be used when applying the principals of PAN 1/2011, however it will be for each local planning authority, often on the advice offered by Environmental Health Professionals, to establish their own criteria.

1.3 Where noise is a consideration in a planning application, planning officers consult with the local authority Environmental Health Officer (EHO). In the first instance, the EHO will advise whether a noise impact assessment (NIA) is required and review any noise information submitted by the applicant. The EHO considers whether the information provided is sufficient to accurately characterise the noise impact of the proposed development.

1.4 The EHO may advise the planning officer that noise is not a significant issue or that mitigation measures will be required. In some cases, the noise impact may be so significant that the EHO will recommend against the granting of planning permission.

1.5 The developer should liaise with the local authority's Environmental Health Officer in the early stages of the planning process. Pre-planning application discussions can be very useful to determine the risk of noise being a significant consideration and to identify the supporting information and detail on noise likely to be required. Prior to commencing any noise impact assessment, the appointed noise consultant should contact Environmental Health to agree the relevant noise assessment methodology and establish appropriate noise assessment criteria to avoid unnecessary delay in the planning process.

2. When Noise Should Be Considered in the Planning Process

2.1 There are two types of development for which noise impact assessments will be required. These are:

i) Proposed Noise Generating Development (NGD) (noise brought to people)
ii) Proposed Noise Sensitive Development (NSD) (people brought to noise)

2.2 Where it is not possible to separate noisy and noise sensitive land uses, developers will have to incorporate good acoustic design and a sensitive approach to any new development proposals.

2.3 Where areas already have an unacceptable noise level it may not be possible to mitigate the adverse effects of noise. In such circumstances noise sensitive development may not be appropriate. In some cases there is a need to protect existing commerce and industry from complaints from residents of new housing developments.

3. Noise Policy

3.1 Scottish Government Policy on Noise

The Environmental Noise (Scotland) Regulations, 2006 required the production of strategic noise maps for large urban area, transport corridors and large airports within Scotland. From these strategic maps, action plans were drawn up which identified areas where residents were likely to be exposed to the highest levels of noise. These areas are known as Noise Management Areas [NMAs]. These

action plans also identified areas where individuals were likely to experience relatively low levels of noise and these were known as Quiet Areas [QAs]. The Scottish Government Action Plans aim to identify noise abatement measures designed to manage, avoid, prevent or reduce the harmful effects of noise exposure in NMA's. These Action Plans also aim to maintain and protect environmental noise quality in QAs. Similarly through the planning process local authorities are required to ensure that new development does not result in increasing numbers of people exposed to adverse noise impacts in both NMAs and QAs.

3.2 Local Authority Policy and Guidelines

Under the Town and Country Planning (Scotland) Act 1997 (as amended by the Planning etc (Scotland) Act 2006 and its associated regulations), local authorities must produce a local plan, setting out the Council's detailed policies and proposals for the use, development, protection and improvement of land.

4. Noise Assessment and Methodology

4.1 Before undertaking assessment, agreement requires to be reached between developers and the local authority on all relevant noise generating sources and noise sensitive receptors (NSRs), methodology of assessment and noise targets. These details should be confirmed in writing.

4.2 Where a noise impact assessment is required, these must be undertaken by a suitably qualified and competent person. Noise reports must be comprehensive and contain sufficient information for the local authority to assess the likely noise impact of the proposed development. Failure to produce sufficient detail with regard to methodology and calculations will result in a delay in the planning process. Noise measurements will generally be required to establish the noise environment at the site of proposed development. Noise monitoring should be conducted in accordance with BS7445-1:2003.

4.3 Any assumptions used in the prediction of noise levels must be clearly stated in the noise report. The submitted report must also provide a sample calculation in order to demonstrate how the noise figures have been attained.

4.4 The following table outlines the relevant assessment methodology and target noise levels for the most common noise sources.

Table 1 Main Noise Targets and Methodology

Noise Sources	Relevant Standard for Assessment	Target Levels	Standard from which target levels are derived
Road Traffic	Calculation of Road Traffic Noise 1998 [CRTN] Design Manual for Roads and Bridges 1994	Day time: $LA_{eq[16hours]}$=50 - 55dB [to achieve internal noise levels of 40-45 dB] Night time: $LA_{eq[8hours]}$= 40 - 45dB [to achieve internal noise levels of 30 - 35 dB]	World Health Organisation Guidelines for Community Noise 1999 BS8233:2014 Sound insulation and noise reduction for buildings
Rail Traffic	Calculation of Railway Noise 1995 [CRN]		World Health Organisation Guidelines for Community Noise 1999 BS8233:2014 Sound insulation and noise reduction for buildings
Industrial or Commercial Noise	BS4142:2014 is a method of rating industrial or commercial sound.	Assessments of impacts (Section 11) The greater the difference between the background level and the rating level, the greater the impact of the specific sound. >= +5dB is likely to be an adverse impact depending on the context	BS4142: 2014 Method for rating industrial and commercial sound
Construction/ Demolition Sites	The Control of Pollution Act 1974 BS5228:Code of practice for noise and vibration control	Generally construction site noise is controlled by controlling the hours of operation of the site. However if necessary, noise levels will be determined by Annex E of the code of practice.	BS5228:2009 Code of practice for noise and vibration control

Noise Sources	Relevant Standard for Assessment	Target Levels	Standard from
Wind Turbines	ETSU-R- 97		*Not covered by this guidance. However you may wish to refer to the Institute of Acoustics Guidance Notes on ETSU-R-97
Fan, air conditioning units, ventilation systems etc.	Noise Rating Curves	Internal Noise levels: NR25	BS8233:2014 Sound insulation and noise reduction for buildings

Note: New commercial developments where amplified music or any broadcasting is a likely, activity should be designed to ensure that this noise is contained within the development boundary and is inaudible within any neighbouring noise sensitive property.

4.5 In the case of NSD brought to an existing noise source developers will need to demonstrate that all mitigation methods have been considered to achieve both satisfactory internal noise levels within any noise sensitive property and protect external amenity areas.

4.6 Only in exceptional circumstances should satisfactory internal noise levels only be achievable with windows closed and other means of ventilation provided. Predictions of internal noise levels within noise sensitive premises must be calculated based on an open window scenario. The degree of sound reduction afforded by a partially open window should be taken as 10dB.

For the purposes of this guidance exceptional circumstances are considered to be proposals which aim to promote sustainable development and transport within the local authority area and which would provide benefits such as:

(a) reducing urban sprawl
(b) reducing uptake of greenfield sites
(c) promoting higher levels of density near transport hubs, town and local centres
(d) meeting specific needs identified in the local development plan

Exceptional circumstances will, therefore, generally apply only to sites, which are small to medium in scale, within urban areas. This may include sites in established residential areas; brownfield sites; town and village centres, and sites near public transport hubs.

4.7 It must be noted that the Scottish Environmental Protection Agency (SEPA) regulate noise from certain prescribed industrial processes. Despite this regulatory role by SEPA, the local authority will determine whether any noise impact on residential developments from such industrial processes is significant. Liaison between SEPA and the local authority must be undertaken

5 Determining the Magnitude of Noise Impact

5.1 For steady continuous noise, The World Health Organisation (WHO) document 'Guidelines for Community Noise' (1999) recommends an indoor guideline value for bedrooms of 30dB $LA_{eq\ (8h),}$ to prevent sleep disturbance (45 dB LA_{max} for single sound events). To protect the majority of people from being moderately annoyed during the daytime, 50 dB $LA_{eq(16h)}$ should not be exceeded on balconies, terraces and outdoor living areas. WHO also states that an outdoor, daytime level above 55 dB $LA_{eq(16h),}$ will result in the majority of people being seriously annoyed. Therefore levels predicted to be above 55 dB $LA_{eq(16h),}$ are likely to have a major impact. Table 2 below illustrates the use of these external target noise levels to determine the magnitude of noise impact, as described in PAN 1/2011.

Table 2: Describing the Magnitude of Noise Impact

Noise Sources	Target Levels [1]	Change in Noise Level [predicted/existing noise - target]	Magnitude of Impact
Road Traffic	Day time: $LA_{eq[16hours]}$= 50 dB[2] Night time: $LA_{eq[8hours]}$= 40 dB[3]	> 5	Major Adverse
		≤5 but ≥3	Moderate Adverse
		<3 but ≥1	Minor Adverse
		<1 but ≥0	Negligible Adverse
		0	No Change
Rail Traffic	Day time: $LA_{eq[16hours]}$= 50 dB[2] Night time: $LA_{eq[8hours]}$= 40 dB[3]	> 5	Major Adverse
		≤5 but ≥3	Moderate Adverse
		<3 but ≥1	Minor Adverse
		<1 but ≥0	Negligible Adverse
		0	No Change
Industrial or Commercial Noise	Rating Level - Background Noise Level [LA90] < 5dB	≥ 5	Major Adverse
		<5 but ≥3	Moderate Adverse
		<3 but ≥1	Minor Adverse
		<1 but ≥0	Negligible Adverse
		0	No Change

Notes:
1. External free field level at the proposed façade
2. To achieve internal daytime noise levels of 40 dB_A
3. To achieve internal night-time noise levels in bedrooms of 30 dB_A

6. Qualitative Assessment

6.1 Following the quantitative determination of the magnitude of noise impact, a qualitative assessment should be undertaken to assess the effect on the amenity value of the existing or proposed noise sensitive receptor. The qualitative assessment will either confirm the quantitative assessment or indicate that additional factors need to be taken into account when describing the magnitude of impact. The additional factors to be taken into account will depend on the type of the noise sensitive receptor e.g. the potential for sleep disturbance, effects on ability to relax, concentrate or converse or use of outdoor space. Examples of descriptors for qualitative impact of noise are given in Table 2.5 of Technical Advice Note (TAN): Assessment of Noise.

6.2 Once the magnitude of noise impact has been appropriately described, the level of significance of the impact can be determined. The significance of the impact will depend on the sensitivity of the existing or proposed noise receptor(s). TAN advises that noise assessments should include a Summary Table of Significance to show the number of NSRs likely to be subjected to significant noise impacts. Although the overall number of NSRs which will be affected is obviously important, the EHO reviewing the noise assessment will also pay heed to the effect on individual NSRs. A large negative noise impact on any one individual NSR will be of concern to the EHO and this will be reflected in the advice the EHO gives to the Planning Officer.

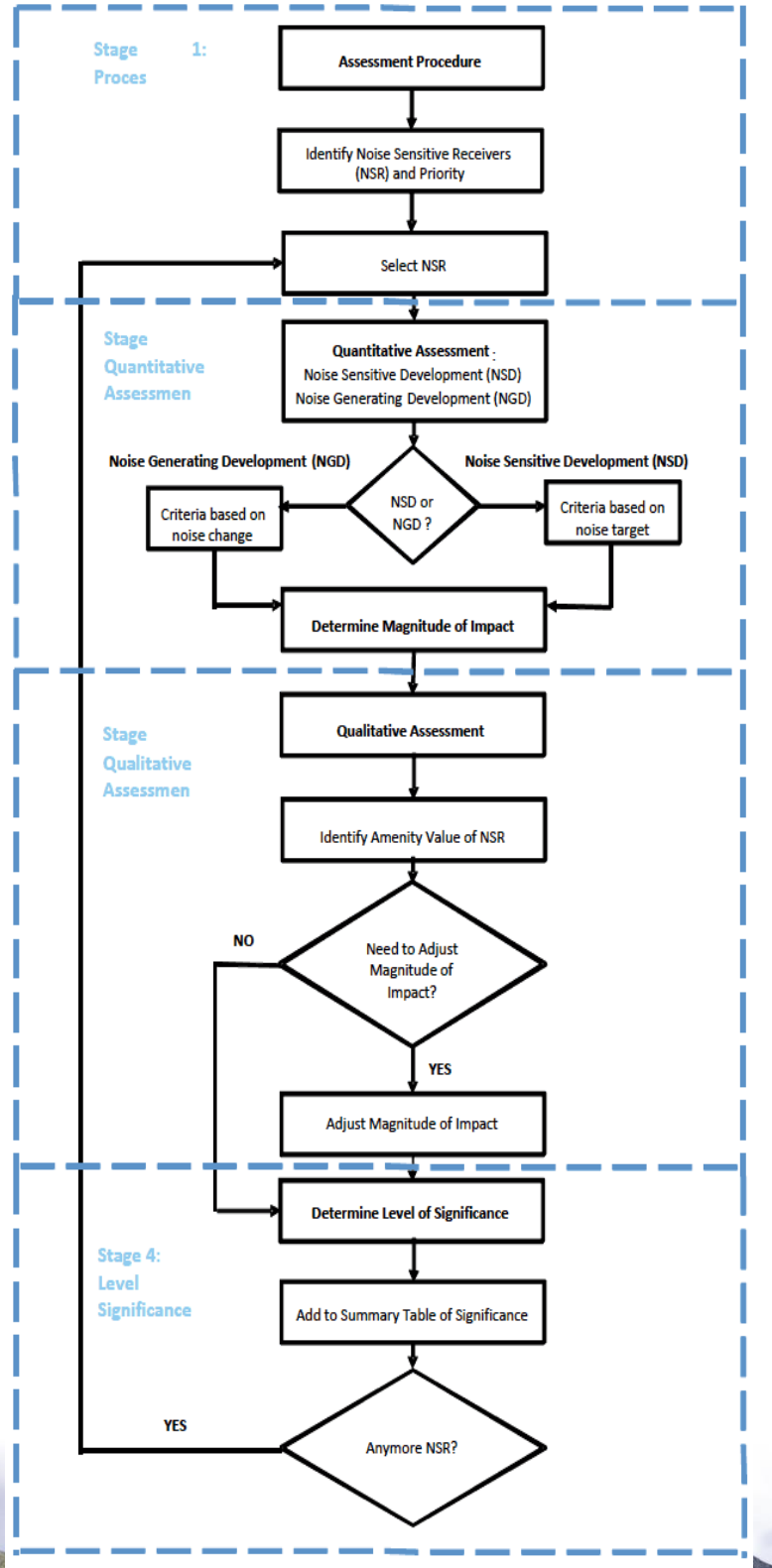
6.3 In some circumstances, it may also be appropriate to consider the cumulative impact of the proposed development. Such circumstances may arise where other developments in the surrounding area have received consent but have not yet been completed. The developer or their noise consultant should discuss this with the EHO/planning officer during the pre-application discussions.

6.4 The noise assessment should detail any mitigation measures necessary to achieve satisfactory noise levels.

7. Summary

7.1 PAN 1/2011 introduced a new approach to the assessment of noise. It is strongly recommended that developers and/or their noise consultants contact the local authority prior to conducting any noise assessment to agree the assessment methodology and relevant noise sensitive receptors. The local authority will also advise on the relevant noise targets.

7.2 Only in exceptional circumstances will it be acceptable for satisfactory internal noise levels only to be achievable with the windows closed.



CHECKLIST

1 Contact Planning/ Environmental Health

2 Identify [NSR]

3 Where NI (NIA) required instruct a suitably qualified and competent person.

4 Determine NSR and NGD in area and agree in writing with Environmental Health.

5 In consultation with Environmental Health determine appropriate noise criteria and targets for assessment.

6 Carry out assessment in adherence with BS 7445 and other relevant standards as determined by noise criteria agreed for assessment.

7 Determine Magnitude of Noise Impact using table 2.

8 Carry out qualitative assessment.

9 Determine level of significance

Note on Origins of Briefing Note

The release of Planning and Noise guidelines (PAN 1/2011) early in 2011 brought about a change in the way Environmental Health services within local authorities were required to deal with Planning Applications.
Together with the associated Technical Advice Note (TAN), the PAN document appeared to give contractors and consultants an opportunity to create their own criteria and limits. Subsequent Scottish Government training appeared to support this idea, creating a situation of different approaches across the country. This training did however recommend each local authority produce a Planning Advisory Document for consultants to refer to during the planning process.

A meeting of the REHIS working group the Scottish Pollution Control and Co-ordinating Committee (SPCCC) in September 2011 suggested that some local authorities get together to produce guidance to allow some uniformity across country in the approach Environmental Health would take to assessing noise impacts for new applications.

Whilst it is appreciated that different criteria are required for different situations (e.g. rural as opposed to city centre), it was hoped that all local authorities will use this as a starting point, hopefully bringing a degree of uniformity of approach to noise issues within planning consultations across Scotland, for the benefit of local authorities, consultants and applicants alike.

Sub Group Members

Moira Cartwright (North Lanarkshire Council),
Lorraine Darling (East Dunbartonshire Council),
Fiona Grant (South Ayrshire Council),
Stewart Mackenzie (Inverclyde Council)
Claire Reid (East Renfrewshire Council).
David Duffy (South Lanarkshire Council)

Ref: CX/Briefing Notes/ 21/9/15; Temp Revision October 2020

Appendix B – Legislation

Legislative Framework and Planning Policy

National Legislation Environmental Protection Act 1990

Section 79 of the Act defines statutory nuisance with regard to noise and determines that local planning authorities have a duty to detect such nuisances in their area.

The Act also defines the concept of "Best Practicable Means" (BPM):

> *" 'practicable' means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications;*
> *the means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and structures;*
>
> *the test is to apply only so far as compatible with any duty imposed by law; and*
> *the test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances."*

Section 80 of the Act provides local planning authorities with powers to serve an abatement notice requiring the abatement of a nuisance or requiring works to be executed to prevent their occurrence.

The Control of Pollution Act 1974

Section 60 of the Act provides powers to Local Authority Officers to serve an abatement notice in respect of noise nuisance from construction works.

Section 61 provides a method by which a contractor can apply for 'prior consent' for construction activities before commencement of works. The 'prior consent' is agreed between the Local Authority and the contractor and may contain a range of agreed working conditions, noise limits and control measures designed to minimise or prevent the occurrence of noise nuisance from construction activities. Application for a 'prior consent' is a commonly used control measure in respect of potential noise impacts from major construction works.

National Planning Practice Guidance for Noise

The National Planning Practice Guidance for Noise (NPPG Noise, December 2014), issued under the NPPF, states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Guidance

The following guidance has been used for the purpose of the noise and vibration assessment:

British Standard (BS) 7445: Parts 1 and 2 - Description and measurement of environmental noise
This Standard provides details of the instrumentation and measurement techniques to be used when assessing environmental noise, and defines the basic noise quantity as the continuous A-weighted sound pressure level (LAeq). Part 2 of BS 7445 replicates ISO standard 1996-2.

BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

BS8233:2014 criteria for recommended internal noise levels (night-time) has also been referenced in order to provide a prudent assessment.

Guidance on suitable internal noise levels is provided in BS 8233:2014 (Section 7.7.2, Table 4) derived from the guidance provided by the WHO. These details recommended internal noise levels to ensure that adequate noise reduction occurs to reduce direct and flanking transmission across facade elements. Recommended internal noise levels are reproduced in **Table 4** below:

Table 4: Recommended Internal Noise Levels – BS 8233:2014

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

BS8233:2014 specifies that, in order for the above thresholds to apply, the noise source in question must have "no specific character" i.e. no tones, strong low frequency component etc. Based on the measurements made within an active Cashino / Merkur Slots sites it was determined that noise levels were low and without specific character (predominantly people talking and low-level sounds from machines). The site will be operational 24-hours a day. It can be observed from **Table 4** above that the night-time (23:00 to 07:00) internal noise criteria is more stringent. Therefore, the threshold of 30 dB LAeq,8hour presented in **Table 4** above representing the BS8233:2014 night-time criteria has also been referenced for this assessment.

NANR116: 'Open / Closed Window Research

The Building Performance Centre – School of the Built Environment at Napier University published a research paper in April 2007 entitled NANR116: 'Open/Closed Window Research' Sound Insulation Through Ventilated Domestic Windows which detailed the measured sound attenuation which can be achieved by partially open windows with different opening areas. Different types of window were tested and the window which is common in residential buildings and achieved the lowest performance in the tests is the side swing reversable (denoted Type B in the paper). It was determined that with an opening of 200,000 mm2 (representative of a large opening) a sound reduction value of Dn,e,W (C;Ctr) 16 (-1; -2) was achieved. **Table 5** below reproduces the octave band attenuation values for this type of window.

Table 5: Measured Attenuation for Partially Open Window

Window	Attenuation at Octave Band Centre Frequencies							Dn,e,W (C;Ctr)
	63	125	250	500	1k	2k	4k	
Side Swing Reversable (B)	20.8	13.3	12.9	18.1	12.0	18.3	20.5	16 (-1; -2)

The attenuation values presented in **Table 5** above were used to assess potential noise impacts as this represents a prudent and worst-case scenario.

Noise Rating (NR) Curves

Noise rating curves provide a method of measuring, specifying and controlling noise levels within buildings. They consist of single figure values corresponding to individual mid-frequency octave bands. The overall single figure NR value is determined by examining which curve the highest of the individual NR values for the frequency bands falls onto. **Table 6** reproduced from 'The Little Red Book of Acoustics: A Practical Guide (Second Edition)', (published by Blue Tree Acoustics) below provides examples of typical noise levels within different buildings and spaces.

Table 6: Typical Noise Levels for Different Spaces

Location	NR Value at Octave Band Centre Frequencies							dB(A)
	63	125	250	500	1k	2k	4k	
Quiet Restaurant	60	60	60	65	65	55	50	67
Busy Restaurant	60	70	75	75	75	75	70	80
Busy Pub/Bar	80	85	85	85	85	80	70	88
Music Bar/Nightclub	110	110	100	100	95	90	85	101
Classroom	55	55	55	60	60	60	55	65

Table 7 below presents typical NR curves for different spaces:

Table 7: NR Curves for Different Spaces

Noise Rating (NR) Curve	Application
NR 25	Concert halls, broadcasting and recording studios, churches
NR 30	Private dwellings, hospitals, theatres, cinemas, conference rooms
NR 35	Libraries, museums, court rooms, schools, hospitals operating theatres and wards, flats, hotels, executive offices
NR 40	Halls, corridors, cloakrooms, restaurants, night clubs, offices, shops
NR 45	Department stores, supermarkets, canteens, general offices
NR 50	Typing pools, offices with business machines
NR 60	Light engineering works
NR 70	Foundries, heavy engineering works

In determining what NR criteria should be the limit to sufficiently protect the occupants, it was deemed prudent that a threshold of NR20 should be applied as this criterion will be sufficiently low to protect the amenity of residents. This criterion has been used for previous assessments of the same nature and provided adequate protection.

Table 8 below presents the values associated with the NR20 curve:

Table 8: NR20 Octave-band Values

Noise Rating	Octave Band Mid-Frequency Levels (dB)							
	63	125	250	500	1000	2000	4000	8000
NR20	51.3	39.4	30.6	24.3	20	16.8	14.4	12.6

World Health Organisation (WHO) (1999) Guidelines for community noise

These guidelines present health-based noise limits intended to protect the population from exposure to excess noise. They present guideline limit values at which the likelihood of particular effects, such as sleep disturbance or annoyance, may increase. The guideline values are 50 or 55dB LAeq during the day, related to annoyance, and 45 dB LAeq or 60dB LAmax at night, related to sleep disturbance.

British Standard (BS) 4142:2014 – Method for rating and assessing industrial and commercial sound

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

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Appendix C – Description of Acoustic Terms

Term	Description
Noise sensitive receptors	People, property or designated sites for nature conservation that may be at risk from exposure to noise and vibration that could potentially arise as a result of the proposed development/project
Noise and Vibration study area	The area assessed for noise and vibration impacts during this assessment
Baseline scenario	Scenarios with the proposed development/project not in operation
Decibel (dB)	A unit of noise level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 µPa, the threshold of normal hearing is 0dB, and 140dB is the threshold of pain. A change of 1dB is only perceptible under controlled conditions. Under normal conditions a change in noise level of 3dB(A) is the smallest perceptible change.
dB(A)	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
LAeq,T	The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). LAeq,T is used to describe many types of noise and can be measured directly with an integrating sound level meter.
LA10,T	The A weighted noise level exceeded for 10% of the specified measurement period (T). LA10 is the index generally adopted to assess traffic noise
LA90, T	The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014 it is used to define the 'background' noise level.
LAmax	The maximum A-weighted sound pressure level recorded during a measurement.
Rw	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies.
Sound Reduction Index (SRI)	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

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Appendix D – Site Photos and Measurements

Site Photo	Comment
	
Location: *Entrance Doors* It is recommended that acoustic perimeter seals are installed around the frame of the door and at the bottom to prevent unnecessary sound transmission to the outside. It is recommended that the door also incorporate an automatic closer system.	Location: *Separating Floor* Separating floor is primarily timber joist and wood, however various loose cables and holes are apparent across the entire site. Recommend checking entire area and sealing holes with sealant or mortar to prevent flanking paths.

Site Photo	Comment
	
Large holes exposing the timber joist structure behind were visible. It is recommended that all of these are filled with mineral fibre insulation and covered with a double layer of 15mm thick fire board.	All joints in plasterboard layers must be sealed with non-hardening sealant.

Measured Noise Levels – Internal Operational Noise

Measurements of internal noise levels within an operational Merkur site have been made in various locations in order to assess potential noise breakout. **Table 9** below presents the measured operational noise levels within a fully operational 24-hour Merkur Cashino site at 106 Newland Avenue, Hull (made 17th March 2020).

Measurements were made during particularly busy periods when the machines were in operation and noise levels were at the highest. Measurements were made for 5-minutes at each measurement position (MP) which were at opposite ends of the venues to gain representative operational levels.

Table 9: Source Level Noise Measurements within the Operational Site

Site	Measurement Position	L_{Aeq}	L_{Amax}	Octave Band Levels (dB)							
				63	125	250	500	1kHz	2kHz	4kHz	8kHz
Hull	MP1	65.7	77.4	57.6	65.8	66.1	62.8	61.5	56.1	52.0	49.3
	MP2	63.1	74.2	60.3	59.9	63.6	61.1	58.3	53.9	46.5	41.0

Table 10 below presents the details of the equipment used at the time of the measurements:

Table 10: Instrumentation

Instrument	Serial No.	Calibration Due Date at Time of Survey
Norsonic 140 Class 1 Sound Level Meter	1406433	October 2023
Norsonic 1209 Preamplifier	21318	October 2023
Norsonic 1225 Microphone	226973	October 2023
Nor 1252 Acoustic Calibrator	31717	October 2023

For reference, **Table 11** below presents source level measurements made within 10 other active Merkur Slots to demonstrate how operational noise levels within Merkur Slots venues across the UK do not change in any significant way with location:

Table 11: Source Noise Level Measurements from Other Merkur Venues Across the UK

Merkur Slots Venue Address	L_{Aeq}	L_{Amax}	Octave Band Levels (dB)							
			63	125	250	500	1kHz	2kHz	4kHz	8kHz
4-4a Holmeside, Sunderland	60.8	73.6	51.1	46.8	59.2	59.2	47.6	38.7	37.6	27.5
48 King Street, South Shields	67.2	72.7	53.3	62.3	61.2	65.1	59.8	57.2	60.3	56.6
1076 Warwick Road, Acocks Green, Birmingham	65.8	74.7	56.1	64.2	67.7	62.3	59.6	58.0	54.0	50.6
62 East Street, Barking	60.0	79.4	52.0	60.4	60.7	57.5	53.0	52.3	49.3	44.4
37 High Street, Hornchurch	62.3	83.5	55.4	58.3	57.4	60.7	58.1	53.4	49.0	43.8
37-39 King Street, Southall	64.0	78.6	62.3	64.5	62.6	61.8	58.6	56.8	50.8	41.5
76 London Road, North End, Portsmouth	68.9	78.4	55.9	62.1	62.8	68.7	59.7	62.6	56.9	53.3
55 High Street, Aylesbury	57.8	71.9	52.0	49.8	49.5	51.4	56.9	45.4	39.3	33.8
159 Trongate, Glasgow	65.7	74.7	64.3	66.2	62.9	54.7	50.8	48.2	45.0	37.7
26A Upper Tooting Road, London	62.1	69.3	59.4	44.3	53.1	51.6	52.4	47.6	49.0	34.3

Appendix E – Technical Methodology, Calculations and Data

Internal Noise Impact Assessment methodology

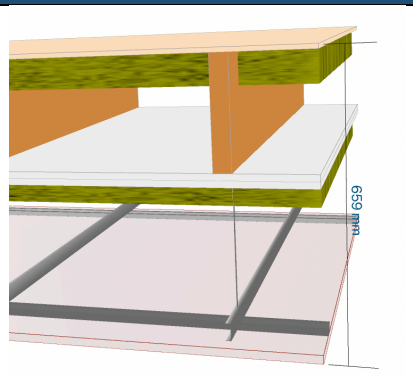
Since the closest noise sensitive receptors to the site are the residential flats above, the separating floor is the focus of the internal noise impact assessment. With reference to the site observations detailed in **Section 3** INSUL Sound Insulation Prediction Software was used to calculate the sound reduction to be achieved by the separating floor. The following details were used to calculate the predicted performance which represents a conservative approach:

Separating Floor:

- 250mm deep timber joists;
- 2 x 15mm thick layer of plasterboard;
- Layer of 100mm thick mineral fibre insulation; and,
- Suspended grid mineral fibre ceiling (19mm thick).

Using these configurations described above, INSUL Sound Insulation Prediction Software was used to calculate the performance once all defects have been rectified and is presented below:

Table 12: Separating Floor

Illustration

63 125 250 500 1k 2k 4k 14 43 49 54 58 53 60 Rw 56 dB C -2 Ctr -3 Rw+Ctr 53 dB 100-3150 Hz

With reference to **Section 2** it was deemed appropriate that the limit of **NR20** can be applied for the closest residential receptors. Using the predicted sound reduction achieved by the separating floor presented in **Table 12** and using the measured noise data from the site the NR curve inside the closest residential flats was predicted. This was undertaken by logarithmically averaging the measured noise data.

External Noise Impact Assessment methodology

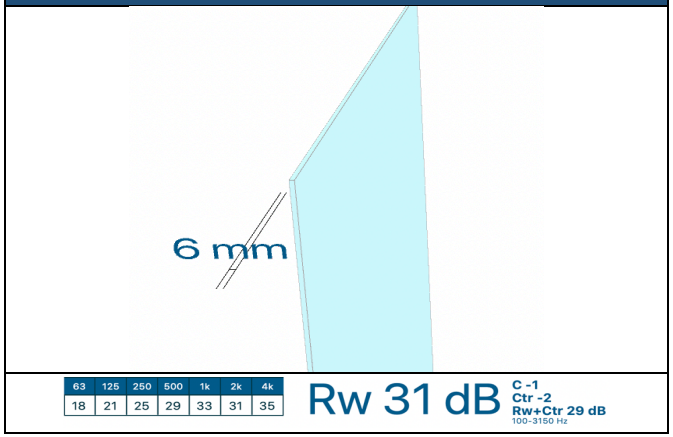
With reference to **Section 4.4** it was deemed appropriate that the limit of **NR20** can be applied for the closest residential receptors. **Table 13** below presents the values associated with the NR20 curve:

Table 13: NR20 Octave-band Values

Noise Rating	Octave Band Mid-Frequency Levels (dB)							
	63	125	250	500	1000	2000	4000	8000
NR20	51.3	39.4	30.6	24.3	20	16.8	14.4	12.6

To provide a prudent and detailed approach to assessment the noise rating within the assumed closest residential unit was calculated using the attenuation values presented in NANR116. The sound insulation performance of the glazed shop front was calculated using the details provided below and is presented below:

Table 14: Shop Front

Illustration


The octave band noise level incident at the window was calculated over a 3-metre distance and the NR curve inside the room predicted. **Table 15** below presents the results of the assessment:

Table 15: Predicted NR level at Closest Receptor

Element	63	125	250	500	1k	2k	4k	Single Figure LAeq, dB
Predicted Noise Level at Window	31.6	33.2	30.5	23.5	17.6	14.6	5.5	-
Attenuation of Partially Open Window	20.8	13.3	12.9	18.1	12.0	18.3	20.5	-
Calculated NR in Room	**10.8**	**19.9**	**17.6**	**5.4**	**5.6**	**-3.7**	**-15.0**	**22.4**

Assessment of Max Levels

Previous versions of BS8233:2014 stated that noise levels should not regularly exceed 45dB within bedrooms during the night-time. BS8233:2014 states that a partially open window can achieve a reduction of -15 dB and combining this with the internal threshold of 45 dB provides a façade limit of 60 dB.

To provide a prudent and worst-case approach, an assessment of potential noise impacts from measured L_{Amax} levels has been undertaken for the scenario when the entrance door is briefly open for customers to enter and leave. The highest measured L_{Amax} levels were used and, assuming the partially open door achieves the same attenuation values as a partially open window, the predicted L_{Amax} level at NSR1 (3 metres away) was calculated. **Table 16** below presents the results of the assessment:

Table 16: Predicted L_{Amax} Level Incident at Closest Residential Window

Element	63	125	250	500	1000	2000	4000	Single Figure L_{Aeq}, dB
Source Noise L_{Amax} Levels	71.1	77.5	76.6	75.5	72.4	68.3	66.5	77.4
Shop front Attenuation (door open)	20.8	13.3	12.9	18.1	12.0	18.3	20.5	-
Level Outside	50.3	64.2	63.7	57.4	60.4	50.0	46.0	-
Level at Window	**40.8**	**54.7**	**54.1**	**47.8**	**50.9**	**40.5**	**36.5**	**58.8**

It can be seen in **Table 16** above that, assuming an absolute and unlikely worst-case scenario, predicted max levels at the closest residential window are below the criteria stipulated by BS8233. It should be noted that machines generating the max levels are never located near the door but further inside the venues and therefore, max levels emanating from the periodically open door will realistically be much lower.

Assessment of Patron Noise – Smoking

During the initial site visit to a Merkur Cashino venue in Hull (pre-covid) two patrons were recorded talking moderate to loudly outside the venue for a duration of around 1 minute. This level was measured to be 69.4 dBA which is representative of loud conversation. Using this measured level an assessment was undertaken of potential noise impacts at the closest residential window. To assess a worst-case scenario, it was assumed that 3 patrons were outside using the shelter and all talking at the same time and same level i.e. 69.4 dBA. **Table 17** below presents measured octave band noise levels from the speech event:

Table 17: Measured Patron Speech Noise Event

Noise Event	Octave Band Mid-Frequency Levels (dB)								
	63	125	250	500	1k	2k	4k	8k	dB(A)
People Talking Loudly	80.6	79.3	69.2	67.0	62.5	58.2	50.8	44.1	69.4

The distance from the front of the unit where the patrons who choose to smoke will congregate to the closest noise sensitive window (NSR1) was determined to be 40 metres away. Previous versions of BS8233:2014 stated that noise levels should not regularly exceed 45dB within bedrooms during the night-time. BS8233:2014 states that a partially open window can achieve a reduction of -15 dB and combining this with the internal threshold of 45 dB provides a façade limit of 60 dB. Using the information detailed above, an assessment was undertaken of potential noise impacts to the closest residential window at night-time.

Appendix F – Merkur Slots Operational Management Plan

Merkur Slots UK Ltd is an experienced and responsible Adult Gaming Centre operator. As with all our premises, we will operate a 'good neighbour' policy and will ensure that all neighbours are respected. All staff will be provided with a copy of this Operational Management Plan. All members of the management team will have full training with regard to the management plan. Refresher training will be held with all management members every 6 months.
The Operational Management Plan in the first year will be reviewed on a 6 monthly basis in order to react to any changes in our initial trading pattern and then annually thereafter.

General
The premises shall install and maintain a comprehensive CCTV system. All entry and exit points will be covered enabling frontal identification of every person entering in a light condition including customer facing areas. The CCTV system shall continually record whilst the premises are open. All recordings shall be stored for a minimum period of 31 days with date and time stamping.

Subject to Data Protection guidance and legislation, the management of the premises will ensure that key staff are fully trained in the operation of the CCTV. We will only play background music in the premises and there will not be any tannoy systems.

The main entrance doors will not be fixed or propped open at any time whilst the premises is trading and there are customers in the venue.
Customers wishing to smoke will be asked to do so as quickly as possible and in a responsible and quiet manner.
Individuals who are deemed to be under the influence of excessive alcohol shall not be allowed to enter the premises.

We will place a notice visible from the exterior of the premises stating that drinking of alcohol directly outside the premises is forbidden and that those who do so will be banned from the premises.

Dispersal Policy
Our premises attract individuals and couples rather than large groups, and our customer base beyond midnight is predominantly the local entertainment workforce and shift workers who like to relax after their busy shifts. It is also unusual for our customers to loiter outside the premises. As such we do not have formal dispersal policies in place at our premises. However, the following steps will be taken:

- Customers will be reminded to respect our neighbours when they leave.
- Customers found to be loitering near the building will be politely asked by staff to move on.
- Staff, on request, will provide relevant information to customers who require a taxi or directions to the nearest station or bus stop.