Noise Assessment for Permit Variation

Melton Foods, Melton Mowbray

August 2024






Experts in noise and vibration assessment and management

Document Control

Client	Melton Foods – A Division of Samworth Brothers Limited	**Principal Contact**	Jack Large

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Report Prepared By:	David Sproston (Associate Director)

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Noise Consultants Ltd
Patten House, Moulders Lane, Warrington, WA1 2BA Tel: 01925 937 195
contact@noiseconsultants.co.uk

Registered Office: 23 Coldharbour Road, Bristol, BS6 7JT
Companies House Registration No: 10853764

Contents

Tables

Figures

1 Introduction

1.1 This report describes the noise assessment for the Melton Foods manufacturing facility at 3 Samworth Way in Melton Mowbray (the 'Site'). Melton Foods holds an existing environmental permit (EPR/GP3548QT, dated 2nd May 2023) which requires a variation to reflect existing permitted operations, and additional operations brought into since the permit was issued

1.2 The assessment has been prepared to support an Environmental Permit variation application, which is made in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (EPR), as amended.

1.3 The assessment has been carried out by Noise Consultants Limited (NCL) on behalf of Melton Foods (a division of Samworth Brothers Limited). The site operates continuously and therefore the assessment has been carried out for the day (07:00-23:00) and night-time (23:00-07:00) periods.

1.4 This report details the results of a noise survey, noise modelling and assessment of operational noise in accordance with relevant standards and guidance.

Site Description and Environs

1.5 The Melton Foods manufacturing facility is located 2.2 km to the west of the centre of Melton Mowbray, a town in Leicestershire. The Site location is shown in **Figure 1.1**, and is located directly to the west of Kettleby Foods which also holds an environmental permit. Further west are open fields.

1.6 The Site manufactures a range of chilled and ambient foods, including sandwiches, wraps, and porridge. Samworth Brothers Supply Chain provides temperature-controlled distribution services to companies within the Samworth Brothers Group, external food manufacturers, retailers and other distributors. NCL understand that the Site is not subject to time restrictions and operates 24 hours a day, 7 days/week.

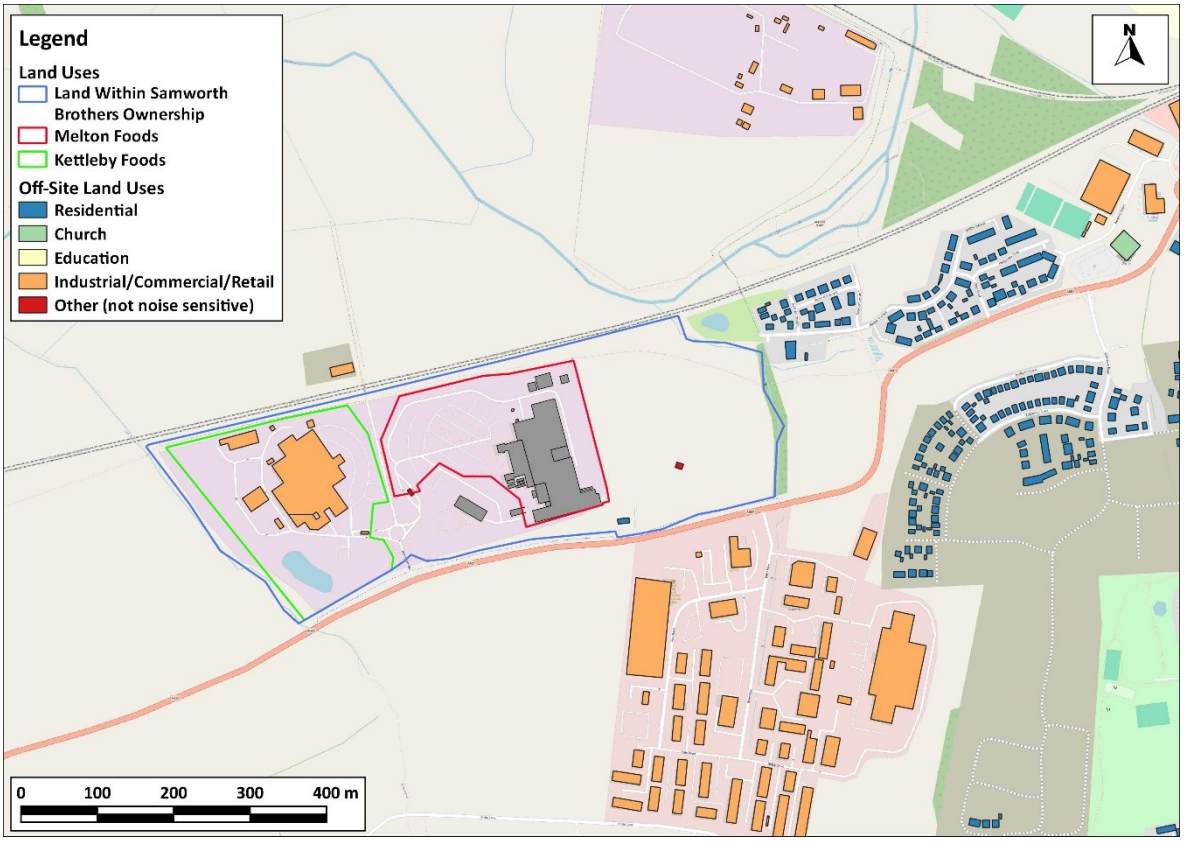
1.7 The Site has extant planning consent[1] for all existing operations, with access provided from the A607 to the south, beyond which are open fields and Leicester Road Industrial Estate.

1.8 The Birmingham to Peterborough railway runs along the northern boundary in a 5-6m deep cutting and carries both passenger and freight trains, day and night.

1.9 NCL understand that the Site has not received any significant noise complaints, directly or through the Environment Agency or Local Planning Authority.

[1] Melton Borough Council, Planning ref: 31/01054/FUL, Approved 8th April 2024

Figure 1.1: Site Location Plan



Existing Identified Noise Sensitive Receptors and Assessment Locations

1.10 The nearest existing noise-sensitive receptors (NSRs) to the Site have been identified as dwellings, details of which are summarised in **Table 1.1.**

1.11 Adjacent to the south-eastern corner of the Site, and within the ownership of Melton Foods, is one pair of semi-detached 2-storey dwellings that front Leicester Road. Their rear gardens overlook Melton Foods' intake yard.

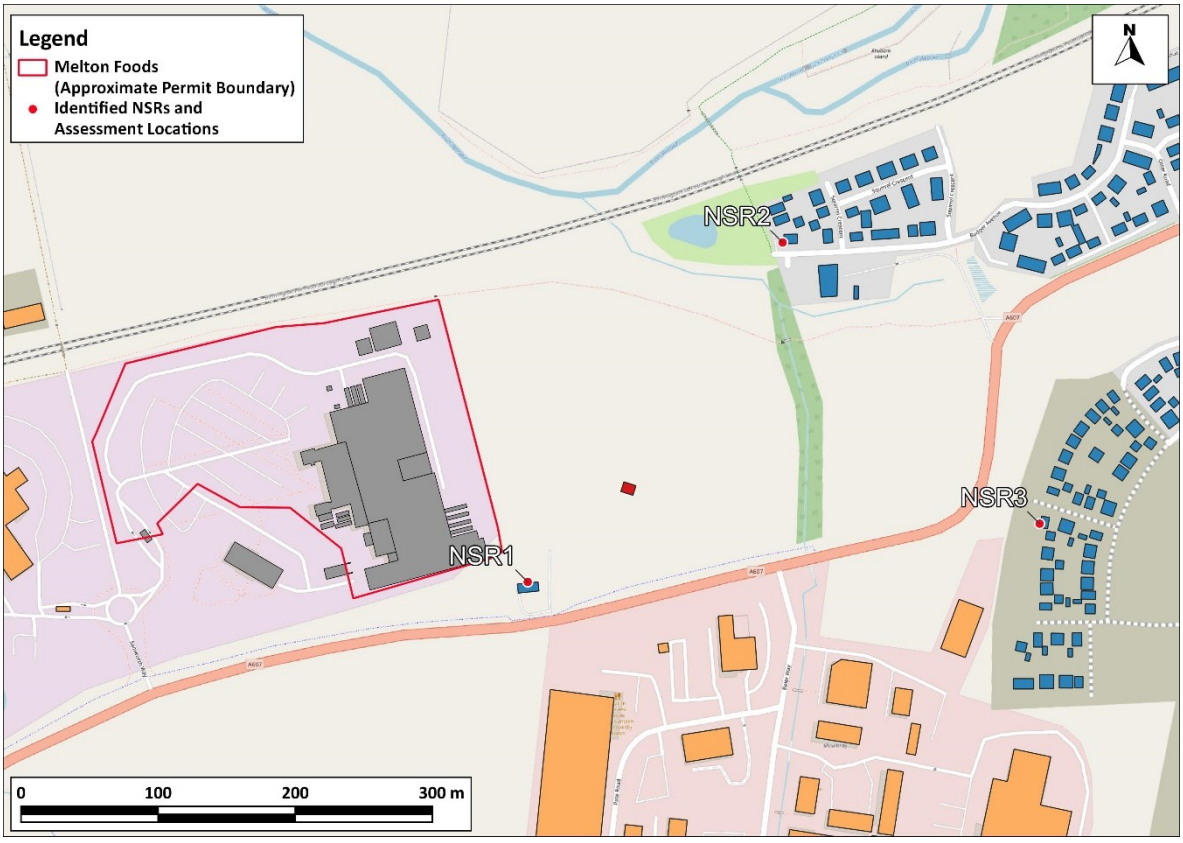
1.12 Around 250m to the east are existing dwellings on Badger Avenue. To the east is a new residential development, currently under construction.

1.13 The location of NSR3 is based upon the approved layout for the residential development currently under construction and is representative of the approved dwelling(s) closest and most exposed to operational noise from the Site.

Table 1.1: Nearest Identified NSRs and Assessment Locations

Assessment Location (NSR Ref)	Type	Adress / Description	OS Ref (easting, northing)	Assessment Condition	Intervening Ground Type
NSR1	Two-storey semi-detached dwelling	**Nos. 1 and 2 Leicester Road**	473551,317952	4.0m above local ground. Free-field.	Soft (predominantly grass)
NSR2	Two-storey dwelling	40 Badger Avenue	473738,318200	4.0m above local ground. Free-field.	
NSR3	Two-storey dwelling	Dwellings under construction to the east of the Site and south of the A607	473924,317995	4.0m above local ground. Free-field.	

Figure 1.2: Nearest Identified NSRs and Assessment Locations



Operational Noise

1.14 **Table 1.2** summarises the various operational sources of noise that are covered by the existing permit, and those which are to be added under the permit variation application, followed by a summary description of each source.

Table 1.2: Summary of Operational Noise Source Relative to Existing Permit and Permit Variation Application

Area / Source	Noise Sources Covered by Existing Permit	Noise Sources to be Added by Permit Variation Application
HV Compound	All existing plant	-
Rooftop Plant	Roof mounted plant on the main building	-
Noise Break-out	Noise breakout from the majority of production buildings	Noise breakout from new buildings close to the southern boundary
Dispatch Yard (Goods Out)	Idling HGVs and HGV movements	-
	Refrigerated trailer Carrier chiller packs	-
Intake Unloading area (Packaging)	All unloading activities including HGV and forklift truck movements	-
Intake Service Yard (Goods In)	Hydraulic vertical balers	-
	Idling HGVs and HGV movements at former Intake Service Yard, away from NSR1	Idling HGVs and HGV movements in the extended Intake Service Yard area, close to NSR1
	The operation of the DFU	-
Ammonia Plant	-	All plant
Effluent Plant	-	All plant

HV Compound, Roof Mounted Plant

1.15 Two chiller packs (ICS Cool energy AT/PH/k 4161) are located in the HV compound. Typically, at least 1no. pack operates continuously. There are approximately 7no. Searl air-cooled condensers located on the roof of the main manufacturing building towards the dispatch bay. Noise from these sources is very low at the eastern perimeter of the roof, and is not discernible at the nearest dwellings, either individually or collectively.

Noise Break-out

1.16 The external walls and roof of the manufacturing and food storage areas are designed to provide a high level of thermal insulation. Consequently, external walls comprise thermal cladding with a secondary internal independent thermal wall lining. The ceiling of all manufacturing and chilled storage areas comprises a thermal composite suspended ceiling with a large roof void above containing walkways for engineering and maintenance access and some relatively quiet items of plant. The roof is constructed from composite panels similar to that of the external walls.

1.17 Noise levels within manufacturing spaces are generally below the level at which hearing protection would be required under the current Control of Noise at Work Regulations (2005). Consequently, in combination with the building construction, the potential for significant levels of noise break-out is low.

Dispatch Yard (Goods Out)

1.18 The Dispatch Yard (**Figure 1.3**) contains 3 docking bays. Finished products are moved internally using an electric or manual pallet truck into a docked Samworth Brothers Supply Chain refrigerated trailer. Several refrigerated trailers were inspected whilst on site. All were found to utilise a diesel-powered Carrier Vector 1550 chiller pack at the front of the trailer, positioned around 3m above ground level. Typically, the chiller packs operate continuously whilst on Site.

1.19 No noise from the Dispatch Yard was discernible at the nearest dwellings, either individually or collectively, at any time. During the survey however, only one refrigerated trailer was noted as being present at any one time. Consequently, chiller pack noise emissions from 3no. trailers parked in this area of the Site have the potential to be audible at the identified NSRs.

Intake Unloading Area (Packaging)

1.20 Packaging and other nonperishable supplies are unloaded from up to 2no. trailers within the intake unloading area (**Figure 1.3**) by one of a fleet of electric forklift trucks, to the storage area at the north-eastern corner of the main building. Unloading can take place at any time of the day or night, although night-time unloading is understood to be atypical.

1.21 Noise from the Intake Unloading Area is limited to occasional HGV movements and faint forklift truck warning alarms. Other than

Intake Service Yard (Goods In)

1.22 Palletised imports (e.g. bread, salad, cheese, packaging, etc) are brought to the Site by HGVs throughout the day and infrequently at night. Imported foodstuffs are unloaded from within the trailer at one of four docking bays on the western elevation of the main building (**Figure 1.3**) and moved to storage by electric or manual pallet truck. In the majority of instances, chiller packs on the front of trailers are turned off to minimise overall noise emissions of this area of the Site.

1.23 Frozen food products are periodically moved from storage (within the building) to a defrosting unit (DFU) docked in Bay 1 of the intake yard (**Figure 1.3**), previously located to the north. The DFU has a large compressor pack on the opposing end to the docking bay, around 3m above ground level. The DFU is primarily operated at night when the ambient temperature is low. Whilst movable, it is assumed that the DFU will remain in this location for the foreseeable future.

1.24 HGV dwell time (between docking and departure) varies and is dependent upon a range of actors, including the number of pallets to be unloaded.

1.25 Two Selco hydraulic vertical balers are located close to the external wall of the production area immediately to the north of the docking bays (**Figure 1.3**) and can be used during the day or at night.

1.26 In principle, noise from HGVs, Balers, etc. is covered under the existing permit, although some of these sources are now located slightly close to NSR1 under the current site layout, recently extending the Intake Service Yard southward.

1.27 Noise from the Intake Service Yard is occasionally discernible in the daytime at NSR1 only and limited to HGV movements, and faint noise from the DFU at night.

HGV and Forklift Truck Movements

1.28 Where no docking bay or space within the intake unloading area is available, HGVs are made to wait at one of several holding bays to the north of the Site car park by the yard marshal.

1.29 Therefore, when busy, HGV movements to/from the Site are well staggered. This is demonstrated by the Goods In booking schedule for Week 8, provided by Melton Foods, and summarised in **Appendix A2**. This shows that typically:

- HGV flows are:
    - lowest on a Saturday and Sunday
    - comparable on weekdays
- 1no. HGV arrival or departure to the Intake Service Yard occurs at night (23:00-07:00)
- Daytime (07:00-23:00) flows are generally highest between 08:00-12:00, typically 6 arrivals/departures to the intake docking bays.

1.30 There are between 5 to 15 packaging deliveries to the Intake Unloading Area per day, which occur in the daytime only. Given the time needed to unload a packaging trailer, this equates to up to 2no. HGVs per hour.

1.31 There are around 20no. refrigerated trailers brought to and taken from the Dispatch Yard per day, with typically 2no. trailers taken from the Site during the night. Typically, this equates to 2no. per hour in the day, and 1no. in any 15mintue period at night.

1.32 Electric forklift trucks typically operate in the Intake Unloading Area during the day, with very limited movements at night.

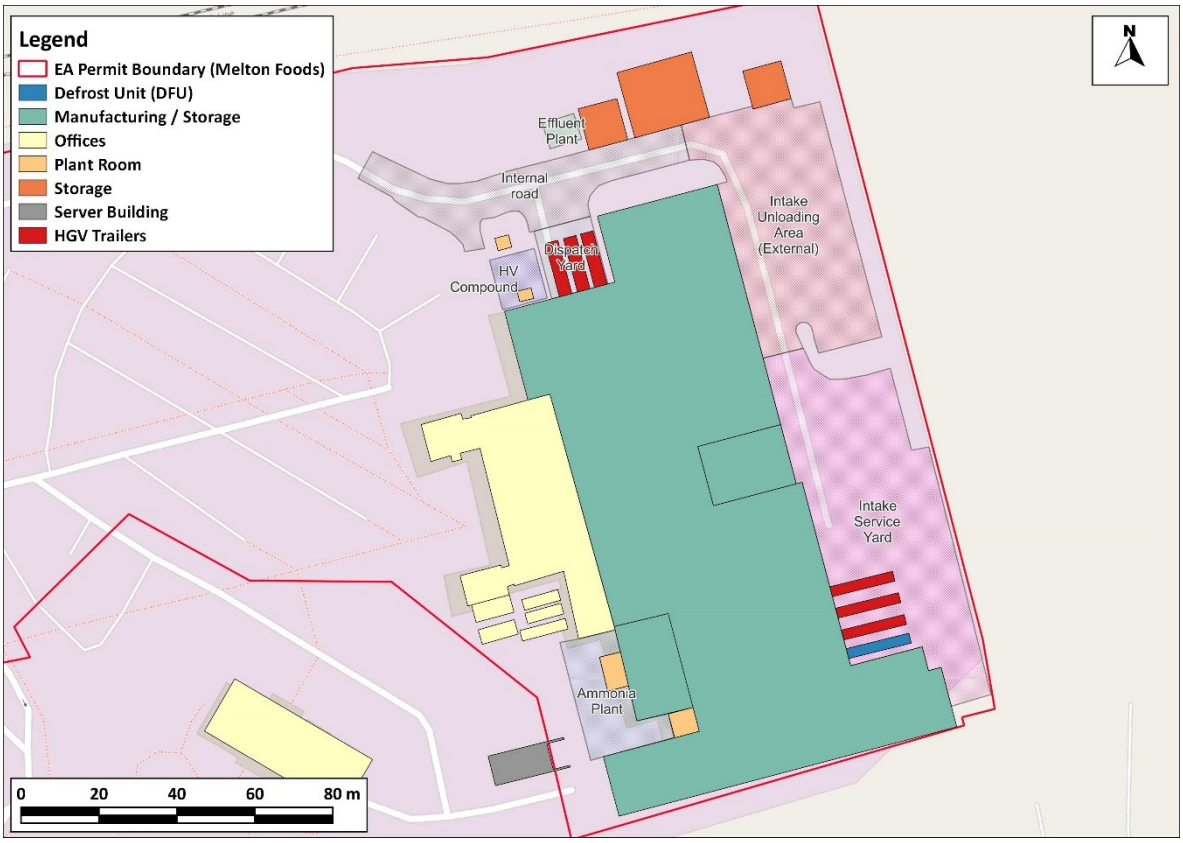
Ammonia Plant

1.33 The ammonia plant area of the Site comprises several fixed plant items, including chiller packs. An extraction ventilation louvre is located just below eaves level, around 6.5m above ground and is the nosiest source in this area of the Site. All plant operates continuously throughout the day and night.

Effluent Plant

1.34 The effluent plant area consists of several items of equipment including a screen and water pump operating continuously throughout the day and night, and in close proximity is fairly quiet in absolute terms.

Figure 1.3: Site Layout



Notes

1.35 A glossary of acoustic terminology used in this report is provided in **Section 7**.

1.36 Any recommendations presented within this report are based on acoustic considerations only and the assumptions stated.

2 Assessment Approach

Assessment Scope

2.1 This assessment considers operational noise impacts from the Site on humans in residential premises.

Assessment Methodology

2.2 The assessment of operational noise has been undertaken by reference to British Standard 4142:2014+A1:2019 '*Methods for Rating and Assessing Industrial and Commercial Sound*' (BS 4142:2019, summarised in **Appendix A1**).

2.3 The assessment has incorporated the Environment Agency Method Implementation Document (MID) for BS 4142:2014. The MID supplements BS 4142:2014 and ensures consistent application of the standard for regulatory monitoring, and must be followed when

- Applying for a new environmental permit from the environment agencies;
- Applying to vary an existing permit; or,
- Sending sound monitoring and assessments to the environment agencies

2.4 BS 4142:2019 states that *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night".* The first note to the Scope of the previous version of BS 4142 (BS 4142:1997) stated that *"*[external] *background noise levels below about 30 dB, and Rating Levels below about 35 dB are considered to be very low".*

2.5 For further context, absolute internal noise levels at the identified NSRs are considered with respect to BS 8233:2014, reproduced in **Table A2.1**, with any corrections that ought to be applied to account for the character of noise from the proposed scheme (i.e. where operational noise contains tonal noise, lower internal noise levels may be appropriate).

Determination of Existing Baseline Noise Levels

2.6 A baseline noise survey has been undertaken at locations representative of the identified NSRs to understand the existing noise climate at these NSRs, using proxy locations that were not affected by operational noise from the Site where necessary.

2.7 The results of the baseline noise survey have been analysed to determine typical background ($L_{A90,T}$) noise levels which have then been used in the assessment.

Potentially Significant Sources of Operational Noise

2.8 There are a significant number of individual sources of operational noise within the Site. However, it is not practicable to include every noise source in the assessment. Furthermore, not all sources have the potential to result in noise impacts at the NSRs as factors such as the proximity to the NSRs,

acoustic screening by intervening land and buildings, and source noise emission level influence the levels and audibility of noise at each receptor.

2.9 Therefore, an inspection of the Site has been undertaken and where necessary or beneficial to the assessment, noise measurements of potentially significant sources of noise, and new sources of noise not covered by the existing permit (i.e. the Effluent Plant), have been measured. Other sources of noise that were not discernible at any receptor at any time and would not result in any noise impact have not been included in the assessment.

Calculation and Assessment of Operational Noise

2.10 To determine future operational noise levels from the Development external to the identified NSRs, a sound propagation model has been developed using Softnoise Predictor-LimA® modelling software. The modelling has used source noise levels obtained from the on-site measurements.

2.11 The results of the modelling have then been used to undertake the noise assessment.

3 Noise Survey

Baseline Noise Survey Details

3.1 A part-attended baseline noise survey was carried out in February 2024. A weather station was deployed during the noise survey at a secure and open location within the Site that is considered representative of the prevailing weather conditions in the vicinity of the Site and identified NSRs.

3.2 **Figure 3.1** present the noise and weather monitoring locations, which are described in **Table 3.1**. Photos of the baseline noise survey locations are provided in **Appendix A4**.

3.3 Full details of the baseline survey are provided in **Appendix A3**. Temperature and wind speeds during the survey are summarised in **Appendix A3** and show that the prevailing weather conditions were cold/cool (1.5 - 8.5 °C) and calm with maximum wind speeds not exceeding 2ms^{-1} and wind gusts generally not exceeding 5ms^{-1}. No rain was observed during the measurement period whilst on site, cloud cover was observed as ranging between 50-100% coverage (4-8 Okta).

3.4 All noise measurements were conducted, where possible, in accordance with BS 7445-1:2003 *'Description and measurement of environmental noise. Guide to quantities and procedures'* (BS 7445, 2003), BS 4142:2014 and the MID.

Table 3.1: Summary of Survey Locations

Survey Location		Assessment Location (NSR Ref)	Survey Period	Observations
Ref.	**Description**			
Baseline Noise Monitoring				
LT1	Free-field, behind earth bund between Site building and A607 (proxy location for NSR1 / NSR3)	NSR1 NSR3	28/02/2024 01:30 to 13:00	Road traffic. No discernible operational noise from the Site at any time.
ST1	Free-field on footpath at turning head of Badger Avenue	NSR2	27/02/2024 16:00 to17:00 and 28/02/204 03:19 to 04:24	Road traffic. No discernible operational noise from the Site in the daytime. Noise is limited to one very faint metal impact and employee shouting (once) at night.
Weather Monitoring				
WML1	Close to existing Middle Town Treated Water Storage site	To measure the local meteorological conditions during the noise survey. Representative of all NSRs	27/07/2024 13:45 to 28/07/2024 13:00	Calm, dry, cool. Acceptable for the purpose of the assessment.

Baseline Noise Survey Observations

LT1 (NSR1 / NRS3)

3.5 It was not possible to gain access to the dwellings at NSR1. Therefore, a proxy baseline noise measurement location (LT1) was chosen, set back from the A607, with a direct line of sight to the road removed by intervening land, which is considered representative of the underlying noise levels to the rear of dwellings at NSR1. Noise levels were measured on a part-attended basis between 01:30-13:00. The main source of noise was road traffic at all times.

3.6 No noise from the Site was audible at LT1 at any time. Therefore, the measured background noise levels at this proxy location are considered representative of those that would prevail at NSR1 during the day and night-time periods in the absence of operational noise from the Site.

3.7 It was not possible to gain access to land close to NSR3. However, for this assessment, baseline noise levels measured at LT1 are considered representative as this location is broadly the same distance from the A607 as dwellings at NSR3. Observations made on the road side in the day and night found that at no time was noise from the Site discernible.

ST1 (NSR2)

3.8 It was not possible to carry out long-term noise monitoring close to NRS2. Therefore, noise levels were measured on an attended basis in both the day (16:00-17:00) and night (03:19-04:24) to the west of this NSR on publicly accessible land.

3.9 The main source of noise in both the day and night was distant road traffic. Occasional passing trains increased noise levels considerably and were the dominant source of maximum (L_{AFmax}) noise levels. No noise from the Site was audible in the daytime. At night, the only source of noise attributable to the Site was a very faint and distant impact noise and an employee shouting in the intake yard.

Baseline Noise Survey Results

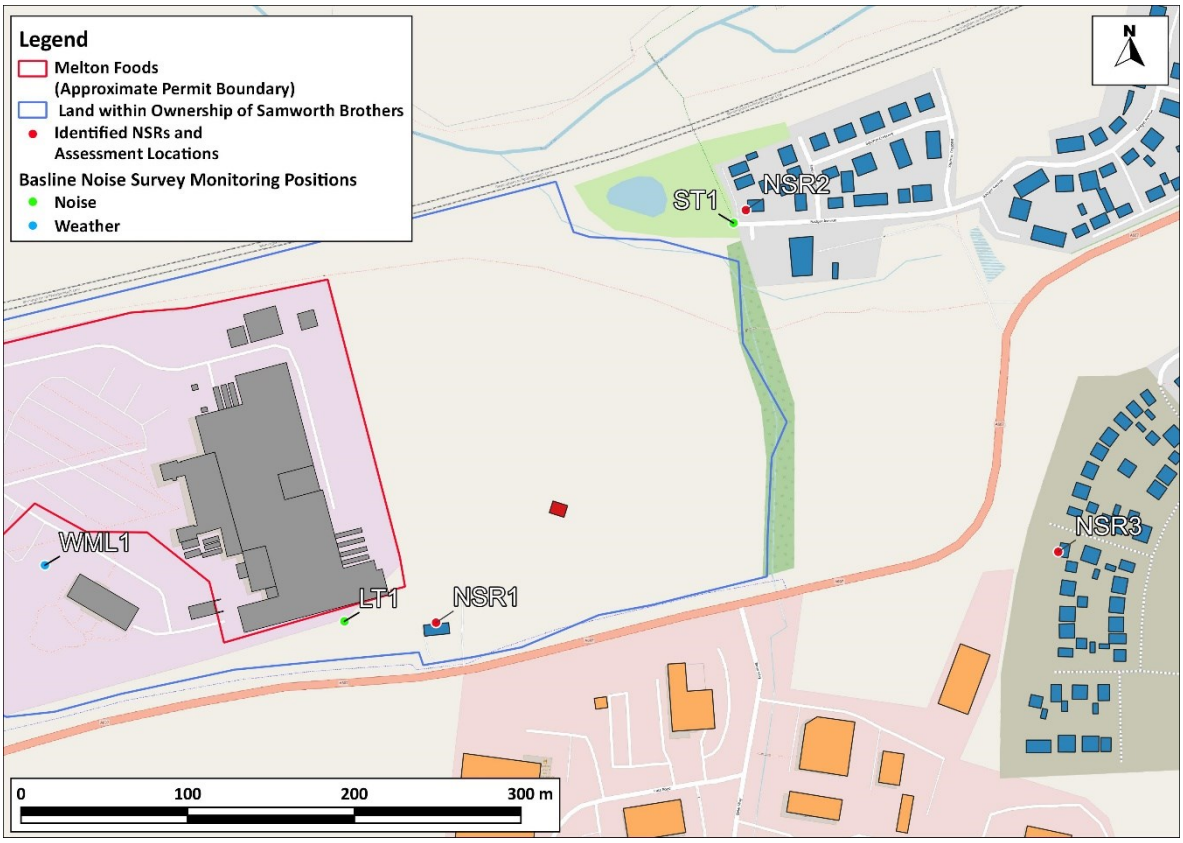
3.10 Due to the large amount of data, the full baseline sound survey data at LT1 are presented as time histories in **Appendix A3**. Survey results at ST1 is provided in **Appendix A3** in tabular form.

3.11 BS 4142:2014 does not specify a precise method for establishing a typical background sound level for any period of interest. Therefore, typical background sound levels (L_{A90}) used in this assessment have been adopted based on an analysis of the mode, mean, and median background sound levels measured in the daytime (07:00-23:00) and night-time (23:00-07:00hrs) periods. The adopted background sound levels are summarised in **Table 3.2** and as a conservative approach, are based on the lowest of the derived mean, mode and median values.

Table 3.2: Summary of Measured Sound Levels

Survey Location		Period	L_{AFmax}	$L_{Aeq,T}$	Background Sound Level, $L_{A90,T}$			
Ref	Associated NSR(s)				Mean	Mode	Median	Adopted
LT1	NSR1 NSR3	Day	58-73	55	51	51	51	51
		Night	50-65	50	42	37	40	37
ST1	NSR2	Day	57-71	57-71	48	48	48	48
		Night	44-75	50	39	40	39	39

Figure 3.1: Baseline Noise Survey Locations and NSRs (Assessment Locations)



Operational Noise

3.12 **Table 3.3** summarises the various elements of operational noise within the Site, and their audibility at the identified NSRs.

Table 3.3: Summary of Operational Noise Sources: Audibility and Noise Model Inclusion

Area / Source	Source Detail	Audibility at NSR(s)	Included in Noise Model
HV Compound	All existing plant	Inaudible at all NSRs	-
Rooftop Plant	Roof mounted plant on the main building		-
Noise Break-out	Noise breakout from production buildings		-
Dispatch Yard (Goods Out)	Idling HGVs and HGV movements		Yes
	Refrigerated trailer Carrier chiller packs		Yes
Intake Unloading area (Packaging)	All unloading activities including HGV and forklift truck movements	Infrequently audible at NSR1	Yes
Intake Service Yard (Goods In)	Hydraulic vertical balers	Inaudible at all NSRs	-
	Idling HGVs and HGV movements	Occasionally audible at NSR1	Yes – the model includes these sources to reflect current operating conditions close to NSR1
	DFU	Faintly audible at night at NSR1 only	Yes
Ammonia Plant	All plant	Inaudible at all NSRs	-
Effluent Plant	All plant	Inaudible at all NSRs	Yes

Source Noise Survey

3.13 Noise emissions of sources identified in **Table 3.3** as being audible outside at least one NSR and the effluent plant have been measured directly under carefully controlled conditions, as far as practicably safe to do so.

3.14 Noise from one refrigerated trailer chiller pack was inaudible at the identified NSRs. However, there may occasionally be more than one chiller park operating, and therefore sample noise measurements of chiller packs have been undertaken.

3.15 Other noise sources noted as being inaudible at the NSRs are not included in the assessment as these sources will neither result in unacceptable noise impacts nor influence the outcome of the assessment.

3.16 The results of the source noise measurements have then been used in the noise modelling and subsequent assessment. In the interest of accuracy, distances from the measurement microphone to each source were measured using a handheld laser distance meter. Full details of the noise measurements carried out for sources included in the noise model are provided in **Appendix A5.**

4 Operational Noise Modelling, Calculations and Assessment

4.1 To determine operational noise levels from the Site outside of the identified NSRs, a sound propagation model has been developed using the Softnoise Predictor-LimA® modelling software.

General Calculation Parameters

4.2 The following parameters were used in the noise modelling. Geospatial data for the noise model was informed by publicly available mapping data, drawings and site observations. Digital terrain model obtained from the Environment Agency's National LIDAR Programme has been used and modified where necessary to ensure ground heights reflect changes since the LIDAR data was obtained in 2022.

Table 4.1: Noise Modelling Calculation Parameters– External Sources

Modelling Parameter	Input Parameter
Calculation Methodology	ISO 9613 2:1996 'Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation'
Topography	Obtained from Environment Agency's National LIDAR Programme (2022), 1m resolution, 1.0m intervals. Terrain modified to account for some changes in local topography since 2022
Order of reflections	1
Ground absorption, G	On-site yards and service roads – 0.0 (hard ground) All other ground - 0.5 (mixed ground)
Temperature / Humidity	10 °C / 70%
Adverse weather conditions	No
Building Heights	Existing on-site buildings – measured using laser distance measurement tool/based on observations Existing off-site buildings based on observations, typically – 7.5-10.0m Existing two-storey dwellings - 7.5m Single-storey dwellings and garages - 3.0m
Off-Site Receivers	Receivers for off-site NSRs modelled at 4.0 m (first floor) and 1 m from the building façade. Receivers located on the façade orientated towards the Site. Predicted noise levels are free-field.

Source Emission Levels

4.3 In the interests of accuracy and to minimise uncertainty, noise emission levels for the DFU, trailer chiller packs, and electric forklift truck reverse warning alarm have been first modelled as a point source and calibrated to the measured on-site level. Noise emission levels for HGV movements are based upon the measured L_{AFmax} noise level and measurement distance, and result in a slight (up to 3dB) overestimation of the source noise emission level.

4.4 The adopted source noise emission levels used in the noise model are summarised in **Table 4.2**.

Table 4.2: Source Noise Modelling Inputs – Noise Emission Sound Power Levels

Noise Source	Octave-band Centre Sound Power Level (Hz, dB L_w)								Broadband (dB L_{WA})
	63	125	250	500	1K	2K	4K	8K	
Intake Service Yard Defrost Unit (DFU)	89	89	80	78	78	66	61	57	92
Dispatch Yard Trailer Chill Packs (Carrier type)	110	110	96	94	92	89	86	82	114
Effluent Plant	83	86	83	77	73	67	64	59	79
Electric Forklift Truck (with reverse warning alarm)	86	80	76	73	70	75	63	51	88
Idling HGV	96	87	83	84	86	84	79	71	97
HGV slowly reversing into Docking Bay	99	89	87	89	88	89	88	91	101
HGV Arriving/Departing at slow speed (10mph, site speed limit)	95	90	90	87	90	87	84	87	98

Ammonia Plant

4.5 There are numerous individual items of plant located within the Ammonia Plant area each with varying levels of noise emission, making accurate measurement of individual plant noise emission exceptionally challenging. However, as noted previously, collective noise from the Ammonia Plant was inaudible at all times at all receptors and therefore cannot result in unacceptable noise impact at the identified NSRs. Therefore, it is unnecessary to include noise emissions from this area of the site in the noise modelling.

Modelled Source Noise Parameters

4.6 The modelled source noise attributes are summarised in **Table 4.3**. Source locations and HGV flow routes used in the modelling are shown in **Figure 4.1.**

Figure 4.1: Location of Modelled Noise Sources

Table 4.3: Source Noise Modelling Inputs - Attributes

Noise Source	Source Attributes					
	Speed (km/h)	Quantity	Type	Height Above Local (m)	On-Time	
					Day	Night
Intake Service Yard Defrost Unit (DFU)	-	1	Point	2.3	100%	100%
Dispatch yard Carrier Chill Packs	-	3		3.0	100%	100%
Electric forklift truck (with reverse warning alarm)	-	3		1.0	20%	20%
Effluent Plant	-	1		1.4	100%	100%
Idling HGV	-	Varies - See Table 4.4		1.5	5%	5%
HGV slowly reversing into Docking Bay	5		Moving Point	1.5	-	-
HGV Arriving/Departing at slow speed (10mph, site speed limit)	16			1.5	-	-

4.7 HGV flow rates used in the modelling have been determined from information provided by Melton Foods, including the Goods In Booking In schedule (**Appendix A2**), and are summarised in **Table 4.4**.

Table 4.4: Source Noise Modelling Inputs – Assumed HGV Flows

Area	Daytime (1hr period)	Night-time (15-min period)
Intake Service Yard (Goods In)	6 arrivals and 6 departures	1 arrival
Intake Unloading Area (Packaging)	2 arrivals 2 departures	-
Dispatch Yard (Goods Out)	2 arrivals 2 departures	1 arrival
Note: Each arrival/departure includes one idling HGV		

5 Results and Assessment

Results

5.1 The predicted external free-field operational noise levels at the off-site NSRs are presented in **Table 5.1.** The table also summarises the results of the initial assessment carried out in accordance with BS 4142:2014.

Table 5.1: Initial BS 4142:2014+A1:2019 Assessment

Parameter	Daytime (07:00-23:00, 1hr period)			Night-time (23:00-07:00, 15min period)		
	NSR1	NSR2	NSR3	NSR1	NSR2	NSR3
Predicted Cumulative Specific Sound Level dB $L_{Aeq,T}$	42	33	27	39	32	26
Acoustic Feature Correction[2]	+4	+2	+2	+4	+2	+2
BS 4142:2104 Sound Rating Level, rounded to nearest dB, dB $L_{Ar,Tr}$	46	35	29	43	35	28
Adopted background sound level $L_{A90,T}$	51	48	51	37	39	37
Excess of Rating Level over Background Sound Level (dB)[3]	-5	-13	-22	+6	-4	-9
Initial Assessment Outcome Before Consideration of Context	Low Impact			Adverse Impact	Low Impact	

Ammonia Plant

5.2 Noise from the Ammonia Plant was inaudible at all times at all receptors and therefore cannot result in unacceptable noise impact at the identified NSRs.

Effluent Plant

5.3 Noise from the Effluent Plant was not audible at any receptor at any time during the noise survey. The results of the noise modelling show that noise from the Effluent Plant is ≤10 dB $L_{Aeq,T,}$ which. is exceptionally low, and well below the lowest background sound levels measured during the baseline noise survey at any time. Therefore, the effluent does result in unacceptable noise impact at the identified NSRs.

Initial Assessment

5.4 In the absence of any additional noise mitigation measures the initial assessments indicate that;

- In daytime, cumulative operational noise results in a low impact at all NSRs;

[2] An acoustic feature correction, sometimes referred to as an 'acoustic penalty' has been applied for tonality to account for tonal reverse warning alarms (+2 or +4 dB).
[3] The rating level minus the background sound level.

- At night, cumulative operational noise would;
    - result in a low impact at NSR2 and NSR3; and,
    - an adverse impact at NSR1.

Contextual Analysis, Assessment Outcome

5.5 As required by BS 4142:2014, it is necessary to consider the contextual elements of noise immission from the Site to provide a balanced and reasoned assessment. This is, in part, captured by the use of character corrections. In addition to the contextual considerations below, it is noted that the Site has not received any significant noise complaints regarding its current or part operating conditions.

NSR1

5.6 NSR1 is within the ownership of Melton Foods, and the residents are well aware that the occupation of the dwelling is subject to some noise from the Site under its current use.

5.7 The assessment covers the very limited period during which an HGV would arrive at the Site. During the remainder of the night, audible operational noise (32 dB $L_{Aeq,T}$), would be limited to that from the Chiller Packs in the Dispatch Yard (28 dB $L_{Aeq,T}$), electric forklift trucks (30 dB $L_{Aeq,T}$), and effluent plant (7 dB $L_{Aeq,T}$), which is very low.

5.8 It is appropriate to also consider resulting internal noise levels, particularly at night when external amenity is not considered important.

5.9 Assuming a 13dB reduction in noise ingress through a partially open window at NSR1 the resulting ($L_{Aeq,T}$) internal noise levels (including the applied acoustic character corrections) are at or below the guideline noise criteria from BS 8233:2014 for the day and night-time periods.

5.10 Furthermore, in principle, HGV movements within the Site are permitted under the existing permit, although their proximity is appreciably closer to NSR1, and is expected to be greater in number given recent changes to the Site layout.

5.11 Therefore, when considering both context and the outcome of the initial assessment in the absence of any additional noise mitigation, it is concluded that operational noise from the Site will not result in unacceptable noise impact NSR1.

NSR2 and NSR3

5.12 A NSR2 and NSR3, noise from the site was not typically audible or discernible above the prevailing noise climate, and the predicted sound rating noise levels are very low.

5.13 Assuming a 13dB reduction in noise ingress through a partially open window at each NSR, the resulting ($L_{Aeq,T}$) internal noise levels (including the applied acoustic character corrections) are well below the guideline noise criteria from BS 8233:2014 for the day and night-time periods.

5.14 Therefore, when considering both context and the outcome of the initial assessment in the absence of any additional noise mitigation, it is concluded that operational noise from the Site will not result in unacceptable noise impact at any NSR well away from the Site.

Uncertainty

5.15 The baseline survey has been undertaken at locations considered representative of the closest and most exposed NSRs to the Site and the magnitude of uncertainty is considered to be low in this regard and is unlikely to change the outcome of the assessment.

5.16 Noise emissions of potentially significant sources have been measured directly under controlled conditions, and the modelled source noise emissions calibrated in the noise model to those measured on site. Therefore, the noise modelling inputs are considered reasonably robust, and any uncertainly unlikely to change the outcome of the assessment.

5.17 The noise modelling and assessment of operational noise from the plots has been undertaken for a typical busy period for both the day and night, which is unlikely to be the case for the vast majority of the wider assessment periods. Therefore, operational noise is likely to be lower for the majority of the time and would likely result in lower noise impacts overall to those considered in this assessment.

5.18 Consequently, the assessment is considered reasonably robust and conservative, and uncertainty would not significantly change the outcome of the assessment.

6 Conclusion

6.1 Noise Consultants Ltd (NCL) has assessed the potential effects of operational noise from the Melton Foods Site at the nearest and most exposed existing noise sensitive receptors (NSRs).

6.2 An inspection of the Site and a baseline noise survey have found that several sources of noise were inaudible at the NSRs, including both the Ammonia and Effluent Plant that are not covered under the existing permit and would, therefore, not result in noise impact.

6.3 Where other potentially significant sources of noise have been identified, such as HGV, electric forklift truck movements, unloading and fixed plant, noise emissions have been measured directly under controlled conditions.

6.4 Operational noise has been predicted at the NSRs through a noise modelling exercise, which indicates that some of the identified sources would be at a level likely to be audible.

6.5 An initial assessment of the results of the noise modelling undertaken in accordance with BS 4142:2014 in the absence of any new noise mitigation indicates a ‘low impact’ at all NSRs in the daytime. At night, the assessment again indicates a ‘low impact’ at NSRs to the east (NSR2) and well away from the Site (NSR3). However, the initial assessment indicates that operational noise levels, when rated in accordance with BS 4142:2014, would give rise to an ‘adverse’ impact at night at the closest dwellings (NSR1).

6.6 When considering important contextual factors, including the fact that dwellings at NSR1 are within the ownership of Melton Foods, and the likely noise levels within dwellings assuming open windows, it is considered appropriate to modify the outcome of the assessment, which indicates that operational noise would result in ‘low impact’ at all NSRs. Therefore, it is concluded that operational noise from the Site is not at a level that would result in adverse noise impacts on nearby noise-sensitive properties and their occupants.

7 Glossary

dB	Decibel. The logarithmically scaled measurement unit of sound.
A-weighting	Frequency weighting applied to measured sound in order to account for the relative loudness perceived by the human ear.
$L_{Aeq,T}$	A-weighted equivalent continuous sound level over a given time period. It is the sound level of a steady sound that has the same energy as a fluctuating sound over the same time period.
$L_{A90,T}$	The A-weighted sound level exceeded for 90% of the measurement period. Often referred to as the background sound level.
L_{AFmax}	The A-weighted maximum recorded noise level during a measurement period, with a 'fast' time weighting.
Ambient sound level, $L_a = L_{Aeq,T}$	The A-weighted equivalent continuous sound level of the totally encompassing sound for a given situation and time interval, T.
Residual sound level	The A-weighted equivalent continuous ambient sound level remaining when the specific sound level has decreased to a degree in which it does not contribute to the ambient sound level.
Specific sound level, $L_s = L_{Aeq,Tr}$	The A-weighted equivalent continuous sound pressure level produced by the specific sound source at the reference location over a reference time interval, T
Rating level, $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.

8 Appendices

A1 Operational Sound Assessment Standards and Guidance

BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'*

A1.1 BS 4142:2014+A1:2019 (BS 4142) is used to rate and assess sound of an industrial nature including but not limited to assessing sound from proposed, new, modified or additional sources of industrial sound. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting sensitive receptors.

A1.2 The methodology relies on comparing the operational rating level, $L_{Ar,Tr}$, with the background sound level, $L_{A90,T}$ (i.e. the level that would be present without the development) over a representative time period. BS 4142 provides guidance on the measurement of background sound, the determination of specific sound and calculation of the rating level.

A1.3 Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. A character correction should be added to the specific sound level to obtain the rating level, where such features are present at the assessment location. This can be approached in three ways however the subjective method is considered appropriate for this assessment. This states that the specific sound level should be corrected if a tone, impulse or other characteristic occurs, or is expected to be present for new sound sources.

Reference Time Periods

A1.4 The appropriate reference time interval for assessing a sound source is dependent upon when it operates i.e. during the daytime or night-time. BS 4142 determines the reference time interval as 1 hour during the daytime (07:00-23:00) and 15 minutes at night (23:00-07:00).

Character Correction Considerations

Tonality

A1.5 A tonal correction between 0 and +6 dB can be applied for sounds that range from not tonal to prominently tonal. Several methodologies are presented in BS 4142 in order to determine the appropriate correction to be applied. **Table A2.2** presents the subjective assessment method corrections for tonal sounds.

Table A2.2: Subjective Method – Rating Level Corrections for Tonal Sounds

Subjective Assessment of Sound at the Receptor	Correction
The tone is just perceptible at the receptor	+2 dB
The tone is clearly perceptible at the receptor	+4 dB
The tone is highly perceptible at the receptor	+6 dB

Impulsivity

A1.6 An impulsivity correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. **Table A2.3** presents the subjective method corrections for impulsive sounds.

Table A2.3: Subjective Method – Rating Level Corrections for Impulsive Sounds

Subjective Assessment of Sound at the Receptor	Correction
Impulsivity is just perceptible at the receptor	+3 dB
Impulsivity is clearly perceptible at the receptor	+6 dB
Impulsivity is highly perceptible at the receptor	+9 dB

Intermittency

A1.7 A +3 dB correction can be applied where the specific sound has identifiable on/off conditions (intermittent operation) which are readily distinctive against the residual acoustic environment.

Other Sound Characteristics

A1.8 Where the specific sound level features characteristics that do not fall into the tonal, impulsive or intermittent categories, but are otherwise readily distinguishable against the residual acoustic environment, a correction of +3 dB can be applied.

BS 4142:2014 Assessment Methodology and Contextual Analysis

A1.9 The assessment is performed by comparing the rating level of the noise source(s), $L_{Ar,Tr}$, against the background sound level, $L_{A90,T}$. Guidance is provided on how to monitor and determine the background sound level, specific sound level and rating level.

A1.10 BS 4142:2014 assessment methodology states that:

- *"Typically, the higher the rating level is above the background sound level the greater the magnitude of impact;*

- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and*
- *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."*

A1.11 As required by BS 4142:2014, it is necessary to consider the context of noise immission from the Site to provide a balanced and reasoned assessment. BS 4142:2014 states that where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including;

- The magnitude of the noise;
- The existing ambient environment;
- The sensitivity of the receptor and any existing measures present to secure good external/internal acoustic conditions;
- The type of effect, including its intermittency;
- How effective the measures employed to mitigate the effect are, including best practicable means (BPM);
- The duration of effect; and,
- Any other relevant matters.

British Standard BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

A1.12 BS 8233:2014 provides guidance for the control of noise in and around buildings. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use.

A1.13 BS 8233 carries the full weight of an adopted British Standard and is supported by other guidance. It provides acoustic design criteria guidance for the control of noise in and around buildings, and applies to new buildings, or refurbished buildings undergoing a change of use.

A1.14 BS 8233:2014 Section 7 provides internal guideline noise design criteria for to external noise '*without a specific character*' (previously and sometimes termed or referred to as 'anonymous noise') such as that associated with road and states that it under these conditions, it is desirable that the internal ambient noise level does not exceed the guideline values shown in **Table A2.1**.

Table A2.1: Indoor Ambient Noise Levels for Spaces in Residential Domestic Buildings

Building Use	Internal Space	Daytime Guideline (07:00-23:00hrs)	Night-time Guideline (07:00-23:00hrs)
Residential	Living Room	35 dB $L_{Aeq, 16hr}$	-
	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 16hr}$

A1.15 Where external noise levels do exhibit specific characteristics, then lower criteria may be appropriate.

A1.16 The internal noise requirements are not intended to be met with open windows, although BS 8223:2014 states that the internal noise levels should take the ventilation strategy into account. If partially open windows were relied upon for background ventilation, the standard states that the noise ingress would be reduced by approximately 15 dB, but can *'vary significantly depending on the window type and the frequency content of the external noise. If the specific details of the window and external noise are known the value for insulation may be adjusted accordingly*[4].

A1.17 BS 8233:2014 does not provide specific guidance on noise levels for regular individual noise events, such as passing trains, which can cause sleep disturbance. Guidance on suitable noise levels for individual events is provided in ProPG, which states:

'In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax, F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as source, number, distribution, predictability and regularity of noise events'.

[4] BS 8233:2014 Annex G.1 Note 3

A2 Goods In Booking Schedule Analysis, Week 8

Sunday

Period	Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Hourly Count	Hourly Deps.
Night-time	23:00	23:15	0	0	0	0	0	0	0	0	0	0
	23:15	23:30	0	0	0	0	0	0	0	0	0	0
	23:30	23:45	0	0	0	0	0	0	0	0	0	0
	23:45	23:59	0	0	0	0	0	0	0	0	0	0
	23:59	00:15	0	0	0	0	0	0	0	0	0	0
	00:15	00:30	0	0	0	0	0	0	0	0	0	0
	00:30	00:45	0	0	0	0	0	0	0	0	0	0
	00:45	01:00	0	0	0	0	0	0	0	0	0	0
	01:00	01:15	0	0	0	0	0	0	0	0	0	0
	01:15	01:30	0	0	0	0	0	0	0	0	0	0
	01:30	01:45	0	0	0	0	0	0	0	0	0	0
	01:45	02:00	0	0	0	0	0	0	0	0	0	0
	02:00	02:15	0	0	0	0	0	0	0	0	0	0
	02:15	02:30	0	0	0	0	0	0	0	0	0	0
	02:30	02:45	0	0	0	0	0	0	0	0	0	0
	02:45	03:00	0	0	0	0	0	0	0	0	0	0
	03:00	03:15	0	0	0	0	0	0	0	0	0	0
	03:15	03:30	0	0	0	0	0	0	1	0	1	0
	03:30	03:45	0	0	1	0	0	0	0	0	1	0
	03:45	04:00	0	0	0	0	0	0	0	0	0	0
	04:00	04:15	0	0	0	0	0	0	0	0	0	0
	04:15	04:30	0	0	0	1	0	0	0	1	2	2
	04:30	04:45	0	0	0	0	0	0	0	0	0	0
	04:45	05:00	1	0	0	0	0	0	0	0	1	0
	05:00	05:15	0	0	0	0	0	0	0	0	0	0
	05:15	05:30	0	0	0	0	0	0	0	0	0	0
	05:30	05:45	0	1	0	0	0	0	0	0	1	1
	05:45	06:00	0	0	0	0	0	0	0	0	0	0
	06:00	06:15	0	0	0	0	0	0	0	0	0	0
	06:15	06:30	0	0	0	0	0	0	0	0	0	0
	06:30	06:45	0	0	0	0	0	0	0	0	0	0
	06:45	07:00	0	0	0	0	0	0	0	0	0	0
Daytime	07:00	08:00	0	0	0	0	0	0	1	1	2	1
	08:00	09:00	1	1	0	0	0	0	0	0	2	1
	09:00	10:00	0	0	1	0	1	0	0	0	2	0
	10:00	11:00	0	0	0	1	0	1	1	0	3	2
	11:00	12:00	1	0	1	0	0	0	0	1	3	1
	12:00	13:00	0	1	0	1	0	0	0	0	2	2
	13:00	14:00	0	0	0	0	0	0	0	0	0	0
	14:00	15:00	0	0	0	0	0	0	1	0	1	0
	15:00	16:00	0	0	0	0	0	0	0	1	1	1
	16:00	17:00	0	0	0	0	1	0	0	0	1	0
	17:00	18:00	0	0	0	0	0	1	0	0	1	1
	18:00	19:00	1	1	0	0	0	0	0	0	2	1
	19:00	20:00	0	0	1	0	0	0	0	0	1	0
	20:00	21:00	0	0	0	1	0	0	0	0	1	1
	21:00	22:00	0	0	0	0	0	0	0	0	0	0
	22:00	23:00	0	0	0	0	0	0	1	1	2	1
	Total		4	4	4	4	2	2	5	5		15
	Day		3	3	3	3	2	2	4	4		12
	Night		1	1	1	1	0	0	1	1		3

Monday

Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Hourly Count	Hourly Deps.
23:00	23:15	0	0	0	0	0	0	0	0	0	0
23:15	23:30	0	0	0	0	0	0	0	0	0	0
23:30	23:45	0	0	0	0	0	0	0	0	0	0
23:45	23:59	0	0	0	0	0	0	0	0	0	0
23:59	00:15	0	0	0	0	0	0	0	0	0	0
00:15	00:30	1	0	0	0	0	0	0	0	1	0
00:30	00:45	0	0	0	0	0	0	0	0	0	0
00:45	01:00	0	1	0	0	0	0	0	0	1	1
01:00	01:15	0	0	0	0	0	0	0	0	0	0
01:15	01:30	0	0	0	0	0	0	0	0	0	0
01:30	01:45	0	0	0	0	0	0	0	0	0	0
01:45	02:00	0	0	0	0	0	0	0	0	0	0
02:00	02:15	0	0	0	0	0	0	0	0	0	0
02:15	02:30	0	0	0	0	0	0	0	0	0	0
02:30	02:45	0	0	0	0	0	0	1	0	1	0
02:45	03:00	0	0	0	0	0	0	0	0	0	0
03:00	03:15	0	0	0	0	0	0	0	1	1	1
03:15	03:30	0	0	0	0	0	0	0	0	0	0
03:30	03:45	0	0	0	0	0	0	0	0	0	0
03:45	04:00	0	0	0	0	0	0	0	0	0	0
04:00	04:15	0	0	0	0	0	0	0	0	0	0
04:15	04:30	0	0	1	0	0	0	0	0	1	0
04:30	04:45	0	0	0	1	0	0	0	0	1	1
04:45	05:00	0	0	0	0	0	0	0	0	0	0
05:00	05:15	0	0	0	0	1	0	0	0	1	0
05:15	05:30	0	0	0	0	0	0	0	0	0	0
05:30	05:45	0	0	0	0	0	0	0	0	0	0
05:45	06:00	0	0	0	0	0	1	0	0	1	1
06:00	06:15	0	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	0	0	0	0
06:30	06:45	0	0	0	0	1	0	0	0	1	0
06:45	07:00	0	0	0	0	0	0	0	0	0	0
07:00	08:00	0	0	0	0	0	1	1	1	3	2
08:00	09:00	1	0	0	0	0	0	0	0	1	0
09:00	10:00	0	1	2	1	3	1	2	0	10	3
10:00	11:00	0	0	0	1	3	3	0	2	9	6
11:00	12:00	0	0	0	0	0	2	0	0	2	2
12:00	13:00	0	0	0	0	0	0	1	1	2	1
13:00	14:00	0	0	1	1	1	1	0	0	4	2
14:00	15:00	0	0	0	0	0	0	1	0	1	0
15:00	16:00	0	0	0	0	1	0	0	1	2	1
16:00	17:00	0	0	1	0	0	1	0	0	2	1
17:00	18:00	1	0	0	1	0	0	0	0	2	1
18:00	19:00	0	1	0	0	0	0	0	0	1	1
19:00	20:00	0	0	1	0	0	0	0	0	1	0
20:00	21:00	0	0	0	1	0	0	0	0	1	1
21:00	22:00	0	0	0	0	0	0	1	0	1	0
22:00	23:00	0	0	0	0	0	0	0	1	1	1
Total		3	3	6	6	10	10	7	7		26
Day		2	2	5	5	8	9	6	6		22
Night		1	1	1	1	2	1	1	1		4

Tuesday

Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Hourly Count	Hourly Deps.
23:00	23:15	0	0	0	0	0	0	0	0	0	0
23:15	23:30	0	0	0	0	0	0	0	0	0	0
23:30	23:45	0	0	1	0	0	0	0	0	1	0
23:45	23:59	0	0	0	0	0	0	0	0	0	0
23:59	00:15	0	0	0	1	0	0	0	0	1	1
00:15	00:30	0	0	0	0	0	0	0	0	0	0
00:30	00:45	0	0	1	0	0	0	0	0	1	0
00:45	01:00	1	0	0	0	0	0	0	0	1	0
01:00	01:15	0	1	0	0	0	0	0	0	1	1
01:15	01:30	0	0	0	0	0	0	0	0	0	0
01:30	01:45	0	0	0	1	0	0	0	0	1	1
01:45	02:00	0	0	0	0	0	0	0	0	0	0
02:00	02:15	0	0	0	0	0	0	1	0	1	0
02:15	02:30	0	0	0	0	0	0	0	0	0	0
02:30	02:45	0	0	0	0	0	0	0	0	0	0
02:45	03:00	0	0	0	0	0	0	0	1	1	1
03:00	03:15	0	0	0	0	0	0	0	0	0	0
03:15	03:30	0	0	0	0	0	0	0	0	0	0
03:30	03:45	0	0	0	0	0	0	0	0	0	0
03:45	04:00	0	0	1	0	0	0	0	0	1	0
04:00	04:15	0	0	1	1	0	0	0	0	2	1
04:15	04:30	0	0	0	0	0	0	0	0	0	0
04:30	04:45	1	0	0	1	0	0	0	0	2	1
04:45	05:00	0	0	0	0	0	0	0	0	0	0
05:00	05:15	0	0	0	0	0	0	0	0	0	0
05:15	05:30	0	1	0	0	0	0	0	0	1	1
05:30	05:45	1	0	0	0	0	0	0	0	1	0
05:45	06:00	0	0	0	0	0	0	0	0	0	0
06:00	06:15	0	1	1	0	1	0	0	0	3	1
06:15	06:30	0	0	0	0	0	0	0	0	0	0
06:30	06:45	0	0	0	1	0	1	0	0	2	2
06:45	07:00	0	0	0	0	0	0	0	0	0	0
07:00	08:00	0	0	1	0	1	1	0	0	3	1
08:00	09:00	0	0	1	2	0	0	3	1	7	3
09:00	10:00	0	0	1	0	0	0	1	2	4	2
10:00	11:00	1	0	0	1	1	0	0	1	4	2
11:00	12:00	3	1	1	0	1	2	0	0	8	3
12:00	13:00	0	3	1	1	1	1	1	1	9	6
13:00	14:00	0	0	0	1	0	0	0	0	1	1
14:00	15:00	0	0	0	0	0	0	0	0	0	0
15:00	16:00	0	0	0	0	1	0	1	0	2	0
16:00	17:00	0	0	0	0	0	1	0	1	2	2
17:00	18:00	0	0	0	0	0	0	0	0	0	0
18:00	19:00	1	1	1	0	0	0	0	0	3	1
19:00	20:00	0	0	0	0	0	0	0	0	0	0
20:00	21:00	0	0	0	1	0	0	0	0	1	1
21:00	22:00	0	0	0	0	0	0	1	0	1	0
22:00	23:00	1	1	0	0	0	0	0	1	3	2
Total		9	9	11	11	6	6	8	8		34
Day		6	6	6	6	5	5	7	7		24
Night		3	3	5	5	1	1	1	1		10

Wedneday

Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Hourly Count	Hourly Deps.
23:00	23:15	0	0	0	0	0	0	0	0	0	0
23:15	23:30	0	0	0	0	0	0	0	0	0	0
23:30	23:45	0	0	0	0	0	0	0	0	0	0
23:45	23:59	1	0	0	0	0	0	0	0	1	0
23:59	00:15	0	0	0	0	0	0	0	0	0	0
00:15	00:30	0	0	0	0	0	0	0	0	0	0
00:30	00:45	0	0	0	0	0	0	0	0	0	0
00:45	01:00	0	1	0	0	0	0	0	0	1	1
01:00	01:15	0	0	0	0	0	0	0	0	0	0
01:15	01:30	0	0	0	0	0	0	0	0	0	0
01:30	01:45	1	0	0	0	0	0	0	0	1	0
01:45	02:00	0	1	0	0	0	0	1	0	2	1
02:00	02:15	0	0	0	0	0	0	0	0	0	0
02:15	02:30	0	0	0	0	0	0	0	0	0	0
02:30	02:45	0	0	0	0	0	0	0	0	0	0
02:45	03:00	0	0	0	0	0	0	0	1	1	1
03:00	03:15	0	0	0	0	0	0	0	0	0	0
03:15	03:30	0	0	0	0	0	0	0	0	0	0
03:30	03:45	0	0	0	0	0	0	0	0	0	0
03:45	04:00	1	0	2	0	0	0	0	0	3	0
04:00	04:15	0	0	0	0	0	0	0	0	0	0
04:15	04:30	0	1	0	1	0	0	0	0	2	2
04:30	04:45	0	0	0	0	0	0	0	0	0	0
04:45	05:00	0	0	0	1	1	0	0	0	2	1
05:00	05:15	0	0	0	0	0	0	0	0	0	0
05:15	05:30	0	0	0	0	0	1	0	0	1	1
05:30	05:45	0	0	0	0	0	0	0	0	0	0
05:45	06:00	0	0	0	0	0	0	0	0	0	0
06:00	06:15	0	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	1	0	0	0	0	0	1	0
06:30	06:45	1	0	0	0	1	0	0	0	2	0
06:45	07:00	0	0	0	1	0	0	0	0	1	1
07:00	08:00	0	1	0	0	0	1	1	1	4	3
08:00	09:00	1	0	2	1	1	1	0	0	6	2
09:00	10:00	0	1	2	1	2	0	0	0	6	2
10:00	11:00	1	1	0	1	0	1	0	0	4	3
11:00	12:00	0	0	0	1	0	1	2	1	5	3
12:00	13:00	0	0	0	0	1	0	0	1	2	1
13:00	14:00	0	0	0	0	1	2	0	0	3	2
14:00	15:00	0	0	0	0	0	0	2	0	2	0
15:00	16:00	0	0	0	0	1	0	0	1	2	1
16:00	17:00	0	0	0	0	0	1	0	1	2	2
17:00	18:00	0	0	0	0	0	0	0	0	0	0
18:00	19:00	1	0	0	0	0	0	0	0	1	0
19:00	20:00	0	1	0	0	0	0	0	0	1	1
20:00	21:00	0	0	0	0	0	0	0	0	0	0
21:00	22:00	0	0	1	0	0	0	1	0	2	0
22:00	23:00	0	0	1	2	0	0	0	1	4	3
Total		7	7	9	9	8	8	7	7	62	31
Day		3	4	6	6	6	7	6	6	44	23
Night		4	3	3	3	2	1	1	1	18	8

Thursday

Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Hourly Count	Hourly Deps.
23:00	23:15	0	0	0	0	0	0	0	0	0	0
23:15	23:30	0	0	0	0	0	0	0	0	0	0
23:30	23:45	0	0	0	0	0	0	0	0	0	0
23:45	23:59	0	0	0	0	0	0	0	0	0	0
23:59	00:15	1	0	0	0	0	0	0	0	1	0
00:15	00:30	0	0	0	0	0	0	0	0	0	0
00:30	00:45	0	1	0	0	0	0	0	0	1	1
00:45	01:00	0	0	0	0	0	0	0	0	0	0
01:00	01:15	0	0	1	0	0	0	0	0	1	0
01:15	01:30	0	0	0	0	0	0	0	0	0	0
01:30	01:45	0	0	0	0	0	0	0	0	0	0
01:45	02:00	0	0	0	1	0	0	1	0	2	1
02:00	02:15	0	0	0	0	0	0	0	0	0	0
02:15	02:30	0	0	0	0	0	0	0	0	0	0
02:30	02:45	0	0	0	0	0	0	0	0	0	0
02:45	03:00	0	0	0	0	0	0	0	0	0	0
03:00	03:15	0	0	0	0	0	0	0	1	1	1
03:15	03:30	0	0	1	0	0	0	0	0	1	0
03:30	03:45	0	0	0	1	0	0	0	0	1	1
03:45	04:00	1	0	0	0	0	0	0	0	1	0
04:00	04:15	0	0	1	0	0	0	0	0	1	0
04:15	04:30	0	0	0	1	0	0	0	0	1	1
04:30	04:45	0	0	0	0	0	0	0	0	0	0
04:45	05:00	0	1	0	0	0	0	0	0	1	1
05:00	05:15	0	0	1	0	0	0	0	0	1	0
05:15	05:30	0	0	0	0	0	0	0	0	0	0
05:30	05:45	0	0	0	0	0	0	0	0	0	0
05:45	06:00	0	0	0	1	0	0	0	0	1	1
06:00	06:15	0	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	1	0	1	0
06:30	06:45	0	0	0	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0	1	1	1
07:00	08:00	0	0	0	0	1	0	0	0	1	0
08:00	09:00	0	0	0	0	0	1	0	0	1	1
09:00	10:00	0	0	1	0	0	0	0	0	1	0
10:00	11:00	1	0	3	1	0	0	1	0	6	1
11:00	12:00	0	1	1	2	1	0	0	1	6	4
12:00	13:00	0	0	0	2	0	1	0	0	3	3
13:00	14:00	1	1	0	0	1	0	0	0	3	1
14:00	15:00	0	0	0	0	0	1	1	0	2	1
15:00	16:00	1	0	0	0	0	0	0	1	2	1
16:00	17:00	0	1	0	0	1	0	0	0	2	1
17:00	18:00	0	0	0	0	0	1	0	0	1	1
18:00	19:00	0	0	0	0	0	0	0	0	0	0
19:00	20:00	1	0	0	0	0	0	0	0	1	0
20:00	21:00	0	1	1	0	0	0	0	0	2	1
21:00	22:00	0	0	0	0	0	0	0	0	0	0
22:00	23:00	0	0	0	1	0	0	1	1	3	2
Total		6	6	10	10	4	4	5	5	50	25
Day		4	4	6	6	4	4	3	3	34	17
Night		2	2	4	4	0	0	2	2	16	8

Friday

Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Hourly Count	Hourly Deps.
23:00	23:15	0	0	0	0	0	0	0	0	0	0
23:15	23:30	0	0	0	0	0	0	0	0	0	0
23:30	23:45	0	0	0	1	0	0	0	0	1	1
23:45	23:59	0	0	0	0	0	0	0	0	0	0
23:59	00:15	0	0	0	0	0	0	0	0	0	0
00:15	00:30	1	0	0	0	0	0	0	0	1	0
00:30	00:45	0	1	0	0	0	0	0	0	1	1
00:45	01:00	0	0	0	0	0	0	0	0	0	0
01:00	01:15	0	0	0	0	0	0	0	0	0	0
01:15	01:30	0	0	0	0	0	0	1	0	1	0
01:30	01:45	0	0	0	0	0	0	0	0	0	0
01:45	02:00	0	0	0	0	1	0	0	1	2	1
02:00	02:15	0	0	0	0	0	0	0	0	0	0
02:15	02:30	0	0	0	0	0	1	0	0	1	1
02:30	02:45	0	0	0	0	0	0	0	0	0	0
02:45	03:00	0	0	1	0	0	0	0	0	1	0
03:00	03:15	0	0	0	1	0	0	0	0	1	1
03:15	03:30	0	0	0	0	0	0	0	0	0	0
03:30	03:45	0	0	0	0	0	0	1	0	1	0
03:45	04:00	1	0	0	0	0	0	0	1	2	1
04:00	04:15	0	0	1	0	0	0	0	0	1	0
04:15	04:30	0	0	0	0	0	0	0	0	0	0
04:30	04:45	0	1	0	1	1	0	0	0	3	2
04:45	05:00	0	0	0	0	0	0	0	0	0	0
05:00	05:15	0	0	0	0	1	1	0	0	2	1
05:15	05:30	0	0	0	0	0	0	0	0	0	0
05:30	05:45	0	0	0	0	0	0	0	0	0	0
05:45	06:00	0	0	1	0	0	1	0	0	2	1
06:00	06:15	0	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	0	0	0	0
06:30	06:45	0	0	1	1	0	0	0	0	2	1
06:45	07:00	0	0	0	1	0	0	0	0	1	1
07:00	08:00	0	0	1	0	1	1	0	0	3	1
08:00	09:00	1	0	0	1	1	0	1	1	5	2
09:00	10:00	0	1	0	0	0	1	0	0	2	2
10:00	11:00	0	0	1	1	0	0	0	0	2	1
11:00	12:00	0	0	2	1	0	0	0	0	3	1
12:00	13:00	0	0	1	1	0	0	0	0	2	1
13:00	14:00	0	0	0	1	1	0	0	0	2	1
14:00	15:00	1	1	0	0	0	1	1	0	4	2
15:00	16:00	0	0	0	0	1	0	0	1	2	1
16:00	17:00	0	0	0	0	0	1	1	0	2	1
17:00	18:00	0	0	0	0	0	0	0	0	0	0
18:00	19:00	0	0	0	0	0	0	0	1	1	1
19:00	20:00	0	0	1	0	0	0	0	0	1	0
20:00	21:00	0	0	0	0	0	0	0	0	0	0
21:00	22:00	1	0	0	1	0	0	1	0	3	1
22:00	23:00	0	1	1	0	0	0	0	1	3	2
Total		5	5	11	11	7	7	6	6		29
Day		3	3	7	6	4	4	4	4		17
Night		2	2	4	5	3	3	2	2		12

Saturday

Start	End	Bay 1 Arr.	Bay 1 Dep.	Bay 2 Arr.	Bay 2 Dep.	Bay 3 Arr.	Bay 3 Dep.	Bay 4 Arr.	Bay 4 Dep.	Count	Dep. Only
23:00	23:15	0	0	0	0	0	0	0	0	0	0
23:15	23:30	0	0	0	0	0	0	0	0	0	0
23:30	23:45	0	0	0	0	0	0	0	0	0	0
23:45	23:59	0	0	0	0	0	0	0	0	0	0
23:59	00:15	0	0	0	0	0	0	0	0	0	0
00:15	00:30	0	0	0	0	0	0	0	0	0	0
00:30	00:45	1	0	0	0	0	0	0	0	1	0
00:45	01:00	1	0	0	0	0	0	0	0	1	0
01:00	01:15	0	1	0	0	0	0	0	0	1	1
01:15	01:30	0	1	0	0	0	0	0	0	1	1
01:30	01:45	0	0	0	0	0	0	0	0	0	0
01:45	02:00	0	0	0	0	0	0	0	0	0	0
02:00	02:15	0	0	0	0	0	0	0	0	0	0
02:15	02:30	0	0	0	0	0	0	0	0	0	0
02:30	02:45	0	0	0	0	0	0	0	0	0	0
02:45	03:00	0	0	0	0	0	0	0	0	0	0
03:00	03:15	0	0	0	0	0	0	0	0	0	0
03:15	03:30	0	0	1	0	0	0	0	0	1	0
03:30	03:45	1	1	0	1	0	0	0	0	3	2
03:45	04:00	0	0	0	0	0	0	0	0	0	0
04:00	04:15	0	0	1	0	0	0	0	0	1	0
04:15	04:30	0	0	0	0	0	0	0	0	0	0
04:30	04:45	0	0	0	1	0	0	0	0	1	1
04:45	05:00	0	0	0	0	0	0	0	0	0	0
05:00	05:15	0	0	0	0	0	0	0	0	0	0
05:15	05:30	0	0	0	0	0	0	0	0	0	0
05:30	05:45	0	0	0	0	0	0	0	0	0	0
05:45	06:00	0	0	0	0	0	0	0	0	0	0
06:00	06:15	0	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	0	0	0	0
06:30	06:45	0	0	0	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0	0	0	0
07:00	08:00	0	0	0	0	0	0	0	0	0	0
08:00	09:00	0	0	0	0	0	0	0	0	0	0
09:00	10:00	0	0	0	0	0	0	0	0	0	0
10:00	11:00	0	0	0	0	0	0	1	0	1	0
11:00	12:00	0	0	0	0	0	0	0	1	1	1
12:00	13:00	0	0	0	0	0	0	0	0	0	0
13:00	14:00	1	0	0	0	0	0	0	0	1	0
14:00	15:00	0	1	0	0	0	0	0	0	1	1
15:00	16:00	0	0	0	0	0	0	1	0	1	0
16:00	17:00	0	0	0	0	0	0	0	0	0	0
17:00	18:00	1	1	0	0	1	1	0	1	5	3
18:00	19:00	0	0	0	0	0	0	0	0	0	0
19:00	20:00	0	0	1	1	0	0	0	0	2	1
20:00	21:00	0	0	0	0	0	0	0	0	0	0
21:00	22:00	0	0	0	0	0	0	0	0	0	0
22:00	23:00	0	0	0	0	0	0	1	1	2	1
Total		5	5	3	3	1	1	3	3		12
Day		2	2	1	1	1	1	3	3		7
Night		3	3	2	2	0	0	0	0		5

A3 Baseline Noise Survey Instrumentation and Results

Survey Details and Equipment

A3.1 To quantify existing levels of environmental noise at the identified NSRs in the daytime (07:00 – 23:00) and night-time (23:00-07:00) periods for this assessment, a part-attended noise survey has been undertaken.

A3.2 Noise monitoring was undertaken using fully calibrated Class 1 integrating-averaging that conforms with BS EN 61672-1:2013[5] calibrated to traceable standards within 2 years of the surveys. Details of the instrumentation used is summarised in **Table A3.1.** Calibration certificates for acoustic instrumentation are provided in **Appendix A6**.

Table A3.1: Baseline Survey Instrumentation

Type	Make	Model / Type	Serial	Date of Last Calibration
Sound Level Meter	RION	NL52	01009670	26/01/2023
			01009667	10/03/2023
Acoustic Calibrator	RION	NC52	34291339	31/07/2023
Weather Station	Davis	Vantage Vue	MQ171107088	n/a

A3.3 All noise measurements were conducted, where possible, in accordance with BS 7445:2003[6] and supplemented by detailed observations of the sound climate at each monitoring location.

A3.4 Prior to and following the noise measurements, acoustic field calibration of the sound level meters and microphones used in the survey was performed using an acoustic calibrator that itself had been calibrated within the preceding 12 months. No significant drift (i.e. >0.1dB) in the field-calibrated noise level was observed. Measurement microphones were fitted with suitable windshields for the duration of the noise monitoring and were time-synchronised.

A3.5 The sound level meters were set to record several noise parameters, including the ambient (L_{Aeq}), maximum (L_{AFmax}), and background (L_{A90}) sound levels, both in terms of broadband an one-third octave bands.

A3.6 **Figure 3.1** presents the survey locations which are considered representative of the nearest NSRs, as described in **Table 1.1.**

A3.7 The dates and times of the baseline noise survey, and observations of the prevailing noise climate were made during measurements to obtain a more detailed understanding of noise levels at the NSRs are summarised in **Table 3.1.**

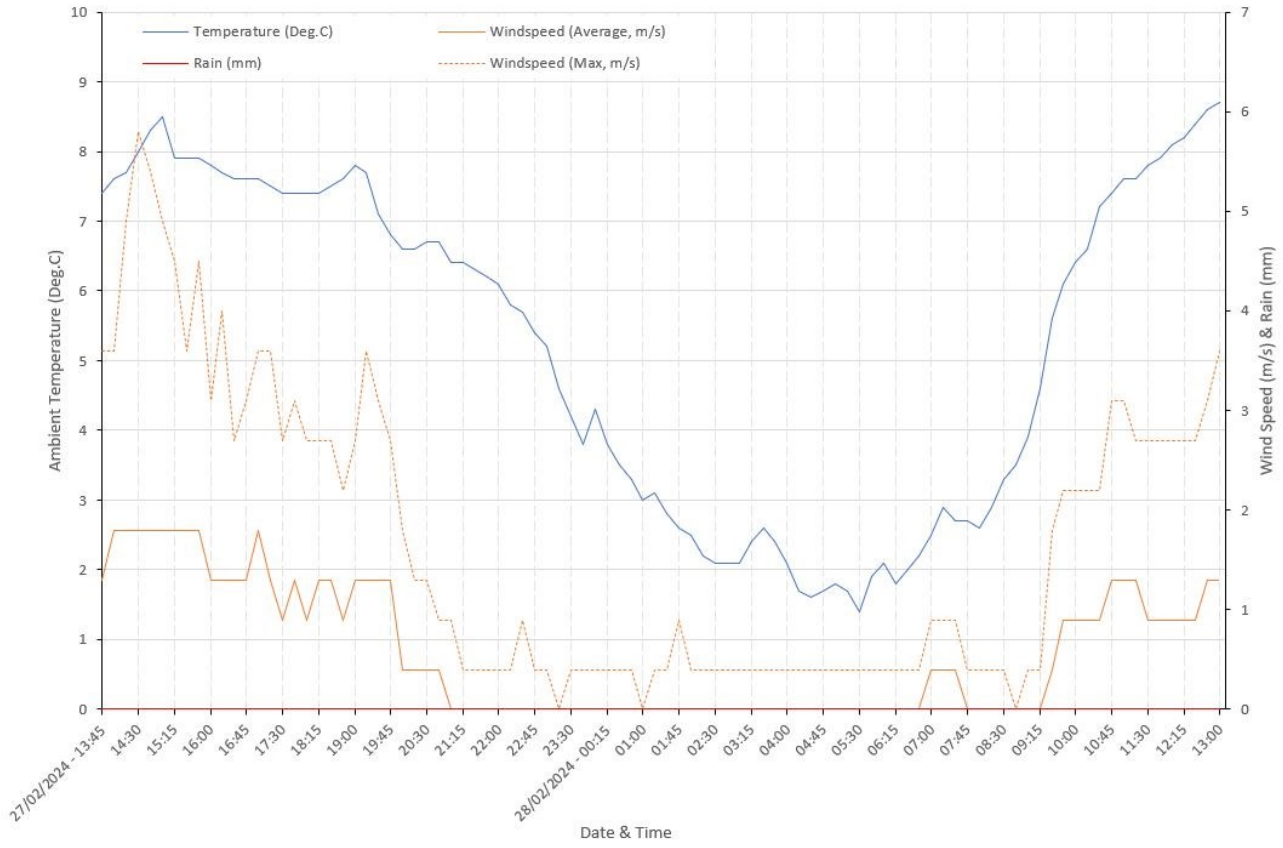
[5] BS EN 61672-1:2013 'Electroacoustics. Sound level meters Specifications' (2013)
[6] BS EN 7445:2003 'Description and measurement of environmental noise. Guide to quantities and procedures' (2003)

Meteorological Conditions during Survey

A3.1 Noise monitoring was supplemented by continuous weather monitoring at a location chosen as being relatively well exposed to the prevailing weather conditions (**WML1**, **Figure 3.1**), and representative of land within the cavity of the Site, particularly LT1. The time history of the measured temperature, and wind speeds before and during the survey is shown in **Figure A3.1**.

A3.2 Attended noise monitoring at ST1 was supplemented by weather observations using a handheld anemometer which found both the average windspeeds and wind gusts were low (<1ms^{-1})

Figure A3.1: Weather Data



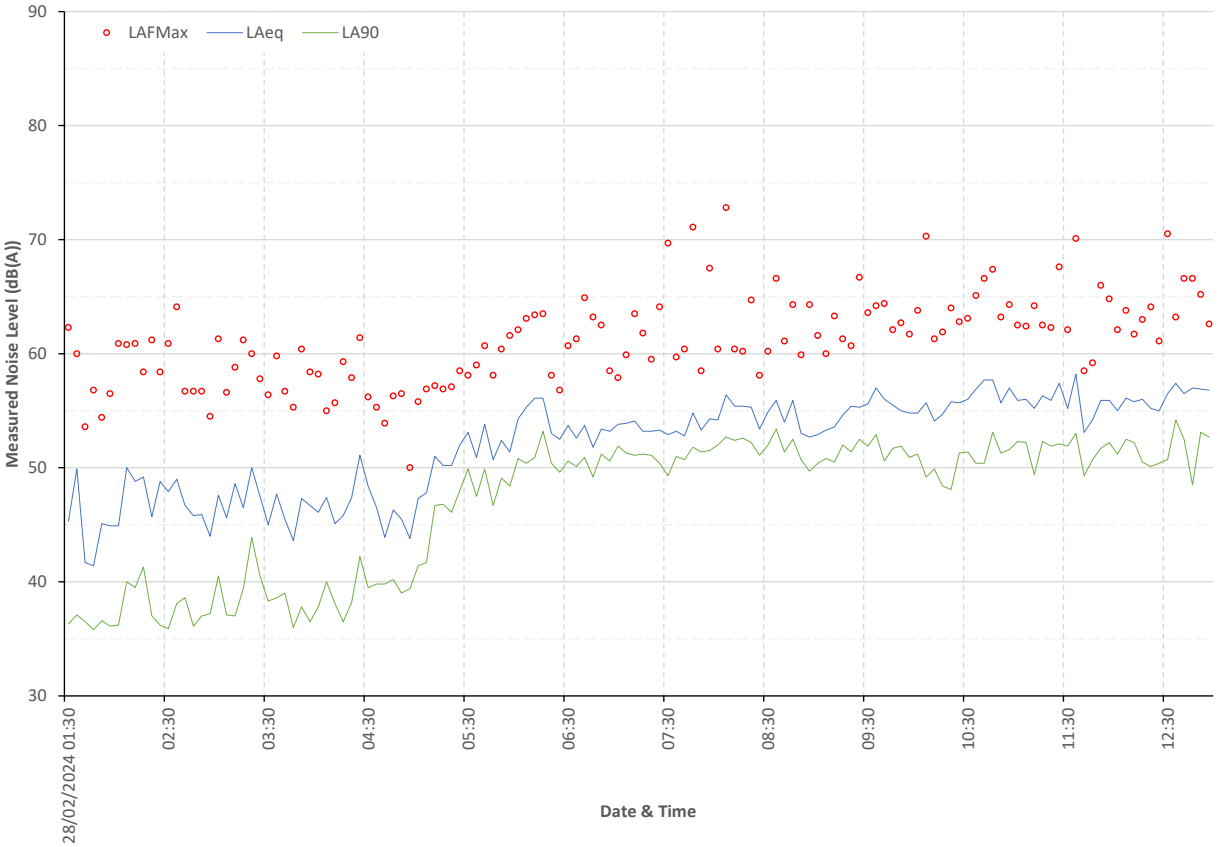
A3.3 The prevailing weather was dry, cool (1.5-8.5°C) and calm with average wind speeds below 2ms^{-1}, and wind gusts below 5ms^{-1} during the period in which noise data was used in the assessment. There were no periods of rain. Therefore, no noise data has been excluded from the assessment due to unacceptable weather.

A3.4 There were no construction works or traffic control measures in place during the survey. The local conditions were, therefore, judged to be acceptable for the survey and subsequent assessment.

Survey Results – LT1

A3.5 A time history of the measured noise levels at LT1 is shown in **Figure A3.2**, which exhibit the diurnal change in noise levels expected at a site exposed to transportation noise.

Figure A3.2: Noise Level History, Location LT1



Survey Results – ST1

A3.6 The results of the baseline noise levels measured at ST1 are summarised in **Table A3.2**.

Table A3.2: Baseline Noise Survey Results – ST1 (dB)

Start Time	$L_{AFmax,T}$	$L_{Aeq,\ T}$	$L_{A90\ T}$	Comment
Daytime				
16:00	58.7	50.9	48.6	Distant road traffic and aircraft.
16:05	60.7	49.6	47.5	Distant road traffic.
16:10	66.5	50.8	48.1	Distant road traffic. Very faint impact noise from Samworth Brothers.
16:15	56.8	50.3	48.1	Distant road traffic.
16:20	58.5	50	47.4	Distant road traffic.

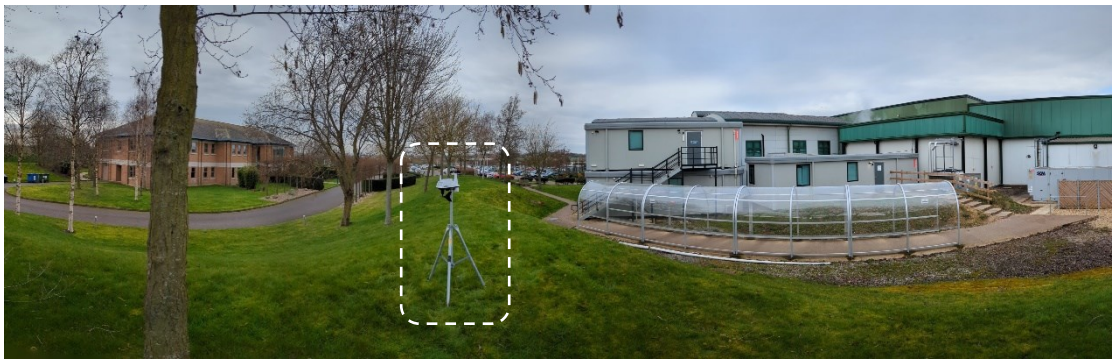
Start Time	$L_{AFmax,T}$	$L_{Aeq,T}$	$L_{A90,T}$	Comment
16:25	63.4	50.2	47.4	Distant road traffic. Car arrival and park nearby.
16:30	67.3	51.5	47.2	Distant road traffic. Railway crossing alarm and fast moving passing train (eastbound, diesel, 3 carriages).
16:35	70.2	55	48.4	Distant road traffic. Tesco delivery can arrive and park. Railway crossing alarm and fast moving passing train (westbound, diesel, 3 carriages).
16:40	56.6	50.6	48.3	Distant road traffic.
16:45	70.9	57	49.4	Distant road traffic. Railway crossing alarm and fast moving passing train (westbound, diesel, 20 carriage freight).
16:50	61.7	51.8	49.6	Distant road traffic. Car arrival and park nearby.
16:55	57	50.5	48.1	Distant road traffic.
Night-time				
03:19	54.0	45.6	39.8	Distant road traffic.
03:24	53.2	44.2	39.5	Distant road traffic.
03:29	48.4	40.9	37.2	Distant road traffic.
03:34	75.4	59.7	39.5	Distant road traffic. Railway crossing alarm and fast moving passing train (L_{AFmax}, westbound, diesel, 13 carriage freight).
03:39	55.5	43.5	38.3	Distant road traffic.
03:44	49.3	40.4	37.7	Distant road traffic.
03:49	53.1	43.6	39.2	Distant road traffic.
03:54	52.6	42.2	37.6	Distant road traffic. Very faint impact sound from Samworth Brothers
03:59	54.4	43.4	39.6	Distant road traffic. Faint shout at Samworth Brothers
04:04	52.9	44.3	41.2	Distant road traffic.
04:09	53.1	41.6	38.5	Distant road traffic and aircraft.
04:14	49.8	42.1	38.7	Distant road traffic.
04:19	44.2	40.9	37.4	Distant road traffic.

A4 Survey Photos

Figure A4.3: Noise Monitoring Location LT1

Figure A4.4: Noise Monitoring Location ST1

Figure A4.5: Weather Monitoring Location WML1



A5 Source Noise Survey and Results

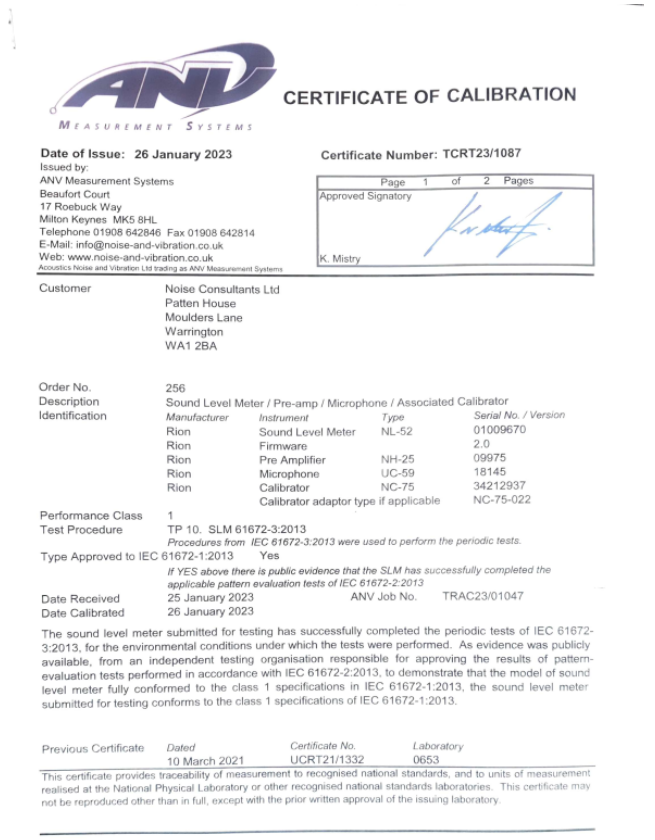
A5.1 Noise emissions from potentially significant sources that are audible at one or more NSRs, and the Effluent Plant have been measured on-site.

A5.2 The noise measurements were undertaken in the daytime on 27 February 2024 using noise instrumentation summarised in **Table A3.1**. Measurements were taken under controlled conditions, with distances between the source and measurement microphone determined using a laser-distance measurement tool measured using. The results of the measurements are summarised in **Table A5.1**.

Table A5.1: Summary of Measured Source Noise Levels

Source	Measurement Duration (mm:ss)	Measurement Distance (m)	Measurement Condition	Source Condition	Comment	L_{AFmax} (dB)	L_{Aeq} (dB)
Idling HGV	00:17	10.0	Free-field,1.4m above local hard ground	Free-field, 1.5m off ground	In line with the front of the cab/engine	65.8	62.8
	00:17					61.7	60.9
	01:04					63.9	59.0
DFU	00:50	17.2		Free-field, 3.4m off ground	Steady, continuous	54.0	48.7
	00:12	17.2				57.5	48.7
	01:06	17.2				53.6	48.2
Effluent Plant	03:06	4.0		Free-field, 1.4m off ground	Steady, continuous	63.0	59.5
	01:09					65.8	59.7
	01:12					60.4	57.9
HGV Departure	00:33	10.5			From stationary to ~10mph	65.9	60.4
HGV slowly reversing into Bay 2	01:07	10.0			Slow, several attempts to dock with correct alignment.	67.8	60.7
Electric Forklift Truck Tonal Warning Alarm	00:09	10.0			Stationary	52.2	48.4
Diesel-Powered Trailer Chiller Packs (Carrier type)	06:00	9.0		Free-field, 3.0m off ground	Steady, continuous	81.2	71.0
	03:16	9.0				77.7	67.0
	01:01	21.0				69.9	68.2

A6 Survey Instrumentation Calibration Certificates



ANV MEASUREMENT SYSTEMS

CERTIFICATE OF CALIBRATION

Date of Issue: 26 January 2023 — **Certificate Number: TCRT23/1087**

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

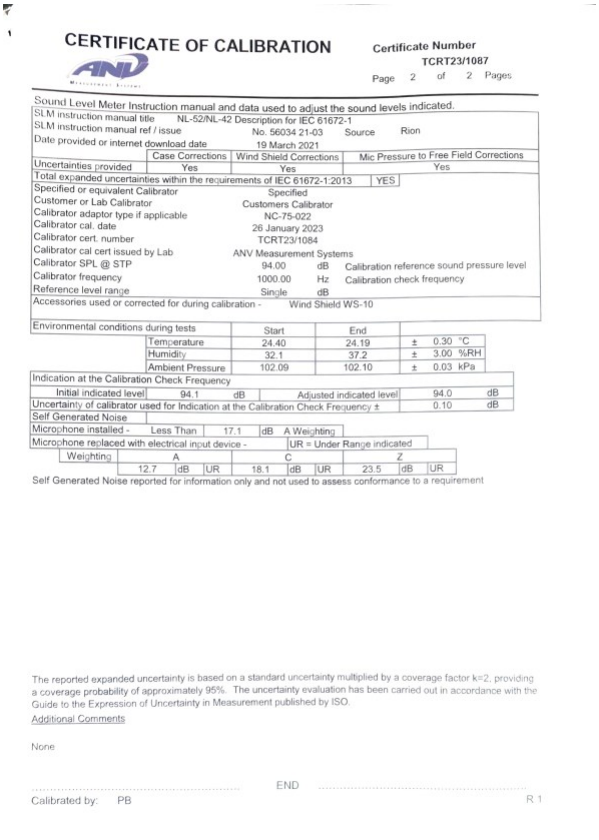
Customer	Noise Consultants Ltd Patten House Moulders Lane Warrington WA1 2BA
Order No.	256
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	01009670
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	09975
	Rion	Microphone	UC-59	18145
	Rion	Calibrator	NC-75	34212937
		Calibrator adaptor type if applicable		NC-75-022

Performance Class 1
Test Procedure TP 10. SLM 61672-3:2013
Procedures from IEC 61672-3:2013 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2013 Yes
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013
Date Received 25 January 2023 ANV Job No. TRAC23/01047
Date Calibrated 26 January 2023

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	10 March 2021	UCRT21/1332	0653



CERTIFICATE OF CALIBRATION — **Certificate Number TCRT23/1087**

Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013 YES

Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	26 January 2023		
Calibrator cert. number	TCRT23/1084		
Calibrator cal cert issued by Lab	ANV Measurement Systems		
Calibrator SPL @ STP	94.00	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Wind Shield WS-10

Environmental conditions during tests	Start	End		
Temperature	24.40	24.19	± 0.30	°C
Humidity	32.1	37.2	± 3.00	%RH
Ambient Pressure	102.09	102.10	± 0.03	kPa

Indication at the Calibration Check Frequency			
Initial indicated level	94.1 dB	Adjusted indicated level	94.0 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±			0.10 dB

Self Generated Noise
Microphone installed - Less Than 17.1 dB A Weighting
Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	12.7	dB	UR	18.1	dB	UR	23.5	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

Additional Comments

None

END

Calibrated by: PB R 1

CERTIFICATE OF CALIBRATION

Date of Issue: 10 March 2023 **Certificate Number: TCRT23/1232**

Page 1 of 2 Pages

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory
K. Mistry

Customer	Noise Consultants Ltd First Floor Patten House Moulders Lane Warrington WA1 2BA
Order No.	263
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01009667
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	09972
Rion	Microphone	UC-59	18142
Rion	Calibrator	NC-75	35281145
	Calibrator adaptor type if applicable		NC-75-022

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 09 March 2023 ANV Job No. TRAC23/03134
Date Calibrated 10 March 2023

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	10 March 2021	UCRT21/1331	0653

CERTIFICATE OF CALIBRATION

Certificate Number TCRT23/1232

Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52	
SLM instruction manual ref / issue		11-03	
SLM instruction manual source		Manufacturer	
Internet download date if applicable		N/A	
Case corrections available		Yes	
Uncertainties of case corrections		Yes	
Source of case data		Manufacturer	
Wind screen corrections available		Yes	
Uncertainties of wind screen corrections		Yes	
Source of wind screen data		Manufacturer	
Mic pressure to free field corrections		Yes	
Uncertainties of Mic to F.F. corrections		Yes	
Source of Mic to F.F. corrections		Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes	
Specified or equivalent Calibrator		Specified	
Customer or Lab Calibrator		Customers Calibrator	
Calibrator adaptor type if applicable		NC-75-022	
Calibrator cal. date		10 March 2023	
Calibrator cert. number		TCRT23/1231	
Calibrator cal cert issued by		ANV Measurement Systems	
Calibrator SPL @ STP	94.06	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Wind Shield WS-10
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	22.07	22.94	± 0.30 °C
Humidity	39.7	41.4	± 3.00 %RH
Ambient Pressure	99.55	99.54	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.1	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than		N/A	dB A Weighting
Uncertainty of the microphone installed self generated noise ±		N/A	dB

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	10.3	dB	UR	15.2	dB	UR	22.7	dB	UR
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: B. Bogdan R 2

Additional Comments
None

CERTIFICATE OF CALIBRATION

Date of Issue: 31 July 2023 **Certificate Number: TCRT23/1556**

Page 1 of 2 Pages

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory
K. Mistry

Customer	Noise Consultants Ltd Patten House Moulders Lane Warrington WA1 2BA
Order No.	NCL2019
Test Procedure	Procedure TP 14 Calibration of Sound Calibrators (60942:2017)
Description	Acoustic Calibrator

Identification

Manufacturer	*Instrument*	*Model*	*Serial No.*
Rion	Calibrator	NC-75	34291339

Public evidence of Type Approval Yes Approved by PTB

The calibrator has been tested as specified in Annex B of IEC 60942:2017. As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2017, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2017.

ANV Job No.	TRAC23/07336
Date Received	28 July 2023
Date Calibrated	31 July 2023
Previous Certificate	*Dated* 25 July 2022 *Certificate No.* TCRT22/1468 *Laboratory* ANV Measurement Systems

CERTIFICATE OF CALIBRATION

Certificate Number TCRT23/1556

Page 2 of 2 Pages

Measurements

The sound pressure level generated by the calibrator (averaged over a 20 to 25 second period) in its WS2 configuration was measured five times (rotating the calibrator on the microphone each time) by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below.

The frequency of the sound from the calibrator was measured five times over a 20 to 25 second period and the average frequency calculated.

The total distortion + noise of the sound from the calibrator was measured, using a rejection filter distortion factor meter, five times over a 20 to 25 second period and the average distortion + noise calculated.

Test Microphone

Manufacturer	*Type*
Brüel & Kjær	4134

Nominal Setting dB / Hz	Mean Level dB rel 20 µPa	Frequency	Distortion + Noise
94 / 1000	94.05 ± 0.10	1000.00 ± 0.12Hz	(0.17 ± 0.03) %

Environmental conditions during tests	Start	End	
Temperature	22.93	22.94	± 0.30 °C
Humidity	39.9	39.3	± 3.0 %RH
Ambient Pressure	99.308	99.320	± 0.030 kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

Note: Calibrator adjusted prior to calibration? NO

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

Calibrated by: K. Zablocki R 1

END