

Appendix A9.1

Noise and Vibration Survey

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Appendix A9.1: Noise & Vibration Survey

1 BASELINE NOISE MONITORING

1.1 Introduction

This report includes the relevant survey details and results associated with baseline noise monitoring undertaken as part of the Galway Bus Connects Bus scheme (hereafter referred to as the Proposed Development). The survey has been undertaken to inform the noise and vibration chapter of the Proposed Development EIAR.

Survey details and results for each of the noise monitoring locations are included within this report.

1.2 Survey Methodology

1.2.1 Survey Locations

The assessment study area is split into two geographical zones for the purpose of the EIAR, Sections 1 and 2, defined as follows.

- Section 1: East of Moneenageisha Junction to Skerritt Junction
- Section 2: Skerritt Junction to Doughiska Road Junction

Baseline noise surveys have been conducted at locations representative of noise sensitive locations (NSLs) along the length of the Proposed Development that have the potential to be impacted during the Construction Phase works and those with potential to be impacted directly by the Proposed Development during the Operational Phase. The survey locations are chosen to provide an overview of baseline noise levels along the length of the Proposed Development. Baseline noise measurements were undertaken for both attended and unattended surveys to inform the assessment.

- Attended surveys (manned noise surveys in the field using noise meters that are moved for each survey position), were made at a total of twelve locations along the length of the Proposed Development.
- Unattended surveys (i.e. noise meters installed at a fixed location for a period of at least 72hrs in duration) were made at total of two secure locations along the length of the Proposed Development.

Table 1: Noise Monitoring Locations

Survey Type	Reference	Location
Attended	AT1	Attended position at residential properties along Wellpark Grove to the west of Kia Renmore, approximately 35m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT2	Attended position at residential properties along Wellpark Grove to the east of Kia Renmore, approximately 40m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT3	Attended position at residential properties on the corner of Renmore Park and Old Dublin Road, approximately 10m from the R338 Old

Survey Type	Reference	Location
		Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT4	Car Park area within The Connacht, approximately 50m from the R338 Old Dublin Road. Survey position represents baseline noise levels at this hotel building and at NSLs at similar distance from the Proposed Development.
Attended	AT5	Attended position at residential property along Old Dublin Road at the joining of Renmore Road, approximately 7m from the R338 Old Dublin Road.
Attended	AT6	Attended position at residential properties along Glenina Heights, approximately 15m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT7	Attended position at residential properties along Belmont, approximately 35m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT8	Attended position at GMIT Library, approximately 35m from the R338 Old Dublin Road. Survey position represents baseline noise levels at the closest building within the campus to the Proposed Development and at NSLs at similar distance from the R338 Old Dublin Road.
Attended	AT9	Attended position at residential properties at Woodhaven, approximately 20m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT10	Attended position at residential properties at Líos An Uisce, approximately 30m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Attended	AT11	Attended position at Units 5&6 Merlin Park University Hospital, approximately 150m from the R338 Old Dublin Road. Survey position represents baseline noise levels at the closest buildings within the campus to the Proposed Development and at NSLs at similar distance from the R338 Old Dublin Road.
Attended	AT12	Attended position at residential properties at Durabhán, approximately 15m from the R338 Old Dublin Road. Survey position represents baseline noise levels at residential properties in this estate closest to the Proposed Development and NSLs at similar distances from the Old Dublin Road.
Unattended	UN1	Unattended position at Brothers of Charity Services Galway, approximately 35m from the R338 Old Dublin Road. Survey position represents baseline noise at NSLs along the Proposed Development over day, evening and night-time periods.
Unattended	UN2	Unattended position at Irish Water land along R338 and Proposed Development route, approximately 25m from the R338 Old Dublin Road. Survey position represents baseline noise at NSLs along the

Survey Type	Reference	Location
		Proposed Development over day, evening and night-time periods.

1.2.2 Survey Periods

Attended noise surveys were undertaken between 30 May 2023 and 31 May 2023. Unattended noise surveys were carried out from 13:15 on the 30 May 2023 to 14:00 on 01 June 2023. The specific survey dates and times for each location are included in the survey results tables in Section 1.3.

1.2.3 Survey Equipment and Personnel

The attended surveys were undertaken using a RION NL-52 sound level meter. The Unattended surveys were undertaken using a RION NL-52 and Larson Davis LxTI sound level meters. The specific equipment details are summarised in Table 2.

Table 2: Noise Monitoring Equipment

Survey Type	Equipment	Serial Number	Calibration Date
Attended	RION NL-52	575782	12/07/2021
Unattended	RION NL-52	564808	05/09/2022
Unattended	Larson Davis LxTI	0006122	29/03/2023

The calibration certificate of the monitoring equipment is included within Section 1.4.

The surveys were conducted by AWN Consulting.

1.2.4 Survey Parameters

The following noise parameters were measured and are discussed within this report.

L_{Aeq,T} is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value of the defined measurement period, T.

L_{Aeq,16hr} refers to the ambient daytime period between 07:00 and 23:00hrs.

L_{A10,T} is the A-weighted sound level that is exceeded for 10% of the sample period; this parameter gives an indication of the upper limit of fluctuating noise such as that from road traffic. The T is the sample period the parameter is measured over.

L_{A10,18hr} is the L_{A10} parameter between 06:00 and 00:00hrs as defined within the Calculation of Road Traffic Noise (hereafter referred to as CRTN) (UK Department of Transport 1988).

L_{A90,T} is the A-weighted sound level that is exceeded for 90% of the sample period; generally used to quantify background noise. The T is the sample period the parameter is measured over.

L_{A90,16hr}, refers to the background daytime noise level between 07:00 and 23:00hrs

L_{A90,8hr}, refers to the background night-time noise level between 23:00 and 07:00hrs

The L_{den} parameter is also discussed within the report. For long-term survey locations, this parameter is derived from the L_{Aeq} data over each 24 hour period as is defined as follows:

L_{den} is the 24hour noise rating level determined by the averaging of the L_{day} with the $L_{evening}$ (plus a 5dB penalty) and the L_{night} (plus a 10dB penalty). L_{den} is calculated using the following formula, L_{den} is calculated using the following formula, as set out in the European Communities (Environmental Noise) Regulations 2018 (SI No 549/2018):

$$L_{den} = 10 \log \left(\frac{1}{24} \right) \left(12 * \left(10^{\frac{L_{day}}{10}} \right) + 4 * \left(10^{\frac{L_{evening}+5}{10}} \right) + 8 * \left(10^{\frac{L_{night}+10}{10}} \right) \right)$$

Where:

L_{day} is the A-weighted long-term average sound level as defined in ISO 1996-2:2017 Part 2: Determination of sound pressure levels (hereafter referred to as ISO 1996-2) (ISO 2017), determined over all the day periods of a year. The 12hr daytime period is between 07:00 to 19:00hrs.

$L_{evening}$ is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the evening periods of a year. The 4hr evening period is between 19:00 to 23:00hrs.

L_{night} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the night periods of a year. The 8hr night-time period is between 23:00 to 07:00hrs.

1.2.5 Survey Procedure

Noise measurements were conducted in general accordance with the guidance contained in ISO 1996-1:2016 Acoustics – Description measurement and assessment and environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996-1) (ISO 2016) and ISO 1996-2 (ISO 2017).

1.2.5.1 Attended Measurements

Attended noise surveys were undertaken at public locations at positions representative of the adjacent noise sensitive locations (e.g. on green areas in residential areas, footpaths, parks etc.). For all attended surveys, the microphone was positioned at height of approximately 1.2m above ground.

The attended surveys were undertaken in accordance with the shortened measurement procedure described in CRTN (UK Department of Transport 1988) and Transport Infrastructure Ireland's (TII) document Guidelines for the Treatment of Noise and Vibration on National Road (TII 2004).

This methodology involves a method whereby $L_{A10(18hour)}$ and L_{den} values are obtained through a combination of measurement and calculation as follows:

- Noise level measurements are undertaken at the chosen location over three consecutive hours between 10:00 and 17:00hrs.
- Each sample period was measured over a 15 minute duration.
- The $L_{A10(18hour)}$ for the location is derived by subtracting 1 dB from the arithmetic average of the three hourly sample values, i.e.

$$L_{A10(18hour)} = ((\sum L_{A10(15 minutes)}) \div 3) - 1 \text{ dB.}$$
- The derived L_{den} value is calculated from the $L_{A10(18hour)}$ value, i.e.

$$L_{den} = 0.86 \times L_{A10(18hr)} + 9.86 \text{ dB.}$$

1.2.5.2 Unattended Measurements

For unattended noise surveys, the monitoring equipment was installed within the private grounds of properties. For single story buildings, the microphone was installed at the height of ground floor windows (typically 1.5m above ground). For all other locations, the microphone was extended to a height of approximately 3.8m above ground. The equipment was set to log for intervals on a continual basis over a 72 hour period.

1.2.6 Survey Results

1.2.6.1 Attended Surveys

The attended noise survey results recorded during the baseline surveys within this study area are presented in Table 3.

Table 3: Attended Noise Survey Results

Attended Location	Date	Start Time	Measured Noise Levels (dB re.2x10 ⁻⁵ Pa)			Derived L _{den}	Survey Notes
			L _{Aeq}	L _{A10}	L _{A90}		
AT1	30/05/2023	10:21	52	54	48	56	The noise environment was made up of Road traffic from the R338, pedestrians passing and bird noise.
		11:20	52	55	49		
		12:19	53	54	49		
		Average	52	54	49		
AT2	30/05/2023	10:44	50	53	47	55	The noise environment was made up of Road traffic from the R338, pedestrians passing, wind noise and bird noise.
		11:40	53	55	47		
		12:40	51	53	47		
		Average	52	54	47		
AT3	30/05/2023	11:02	67	70	59	70	The noise environment was made up of Road traffic from the R338 and Renmore Park Road.
		11:58	68	71	60		
		12:58	68	71	61		
		Average	68	71	60		
AT4	30/05/2023	14:34	56	58	48	58	The noise environment was made up of car park activities in relation to The Connacht Hotel.
		15:31	56	56	48		
		16:22	57	58	49		
		Average	56	57	48		
AT5	30/05/2023	14:51	65	64	51	66	The noise environment was made up of Road traffic from the
		15:46	63	66	54		
		16:37	65	69	55		

Attended Location	Date	Start Time	Measured Noise Levels (dB re.2x10 ⁻⁵ Pa)			Derived L _{den}	Survey Notes
			L _{Aeq}	L _{A10}	L _{A90}		
		Average	65	66	54		R338 and pedestrians passing.
AT6	30/05/2023	15:09	66	71	53	67	The noise environment was made up of Road traffic from the R338 and pedestrians passing.
		16:03	60	63	54		
		16:54	67	69	53		
		Average	65	67	53		
AT7	31/05/2023	10:08	52	55	46	55	The noise environment was made up of Road traffic from the R338, pedestrians passing and intermittent aircraft.
		11:18	51	53	46		
		12:29	51	54	46		
		Average	51	54	46		
AT8	31/05/2023	10:28	54	54	50	56	The noise environment was made up of Road traffic from the R338 and vehicles at Skerritt Roundabout
		11:37	53	55	51		
		12:49	53	54	50		
		Average	53	54	50		
AT9	31/05/2023	10:54	57	60	53	60	The noise environment was made up of Road traffic from the R338 and local traffic within the Woodhaven residential area.
		12:04	58	60	55		
		13:17	57	59	53		
		Average	57	60	54		
AT10	31/05/2023	13:39	58	61	52	61	The noise environment was made up of Road traffic from the R338.
		15:01	58	61	54		
		16:00	57	60	52		
		Average	58	60	52		
AT11	31/05/2023	14:06	54	56	47	56	The noise environment was made up of car park activity within the hospital car park, road traffic along the R338 and construction noise to the east of the measurement position.
		15:20	60	55	48		
		16:18	52	54	48		
		Average	56	55	48		

Attended Location	Date	Start Time	Measured Noise Levels (dB re.2x10 ⁻⁵ Pa)			Derived L _{den}	Survey Notes
			L _{Aeq}	L _{A10}	L _{A90}		
AT12	31/05/2023	14:31	51	54	47	57	The noise environment was made up of Road traffic from the R338, bird song and intermittent aircraft.
		15:41	60	55	47		
		16:48	57	58	47		
		Average	57	55	47		

1.2.6.2 Unattended Surveys

The Unattended noise survey results recorded during the baseline surveys within this study area are presented in Table 4 and Table 5.

Table 4: Unattended Noise Survey Results at UN1

Date	Period	Measured Noise Levels (dB re.2x10 ⁻⁵ Pa)				Derived L _{den}
		L _{Aeq}	L _{A10}	L _{Amax}	L _{A90}	
30/05/2023	Day	56	58	68	51	61
	Evening	57	67	67	49	
	Night	53	56	65	41	
31/05/2023	Day	57	58	68	53	61
	Evening	57	60	67	50	
	Night	53	57	65	41	
01/06/2023	Day	58	61	68	54	--
	Evening	--	--	--	--	
	Night	--	--	--	--	
Average	Day	57	60	68	53	61
	Evening	57	58	65	48	
	Night	53	57	65	41	

Table 5: Unattended Noise Survey Results at UN2

Date	Period	Measured Noise Levels (dB re.2x10 ⁻⁵ Pa)				Derived L _{den}
		L _{Aeq}	L _{A10}	L _{Amax}	L _{A90}	
30/05/2023	Day	59	61	79	52	62

Date	Period	Measured Noise Levels (dB re.2x10 ⁻⁵ Pa)				Derived L _{den}
		L _{Aeq}	L _{A10}	L _{Amax}	L _{A90}	
	Evening	58	61	80	49	
	Night	54	56	73	39	
31/05/2023	Day	59	61	80	52	62
	Evening	59	60	83	49	
	Night	54	56	73	40	
01/06/2023	Day	59	62	82	52	--
	Evening	--	--	--	--	
	Night	--	--	--	--	
Average	Day	59	61	80	52	62
	Evening	59	59	80	47	
	Night	54	56	73	40	

1.3 References

ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (ISO 2016)

ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017)

Transport Infrastructure Ireland (TII) (previously National Roads Authority (NRA)) Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1 (TII 2004)

The UK Department of Transport Calculation of Road Traffic Noise (UK Department of Transport 1988)

1.4 Calibration Certificates for Monitoring Equipment

1.4.1 RION NL-52 (S/N 575782)



CERTIFICATE OF CALIBRATION



Date of Issue: 12 July 2021

Certificate Number: UCRT21/1841

Calibrated at & Certificate 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

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Approved Signatory

B. Giles

Customer AWN Consulting Ltd
The Tecpro Building
IDA Business and Technology Park
Clonshaugh
Dublin
D17

Order No. DOD/21/Cal034

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00575782
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	65810
	Rion	Microphone	UC-59	19108
	Rion	Calibrator	NC-74	34536109
		Calibrator adaptor type if applicable		NC-74-002

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 08 July 2021

ANV Job No. UKAS21/07450

Date Calibrated 12 July 2021

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
	26 November 2020	UCRT20/2149	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION	Certificate Number UCRT21/1841
UKAS Accredited Calibration Laboratory No. 0653	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				Lab Calibrator					
Calibrator adaptor type if applicable				NC-74-002					
Calibrator cal. date				28 June 2021					
Calibrator cert. number				UCRT21/1792					
Calibrator cal cert issued by Lab				0653					
Calibrator SPL @ STP				94.02		dB		Calibration reference sound pressure level	
Calibrator frequency				1002.00		Hz		Calibration check frequency	
Reference level range				Single		dB			
Accessories used or corrected for during calibration -				Extension Cable & Wind Shield WS-15					
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.									

Environmental conditions during tests	Start	End	
Temperature	21.60	23.23	± 0.30 °C
Humidity	62.3	46.8	± 3.00 %RH
Ambient Pressure	100.10	100.07	± 0.03 kPa

Indication at the Calibration Check Frequency			
Initial indicated level	94.0	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	16.6	dB A Weighting
Microphone replaced with electrical input device -		UR = Under Range indicated	
Weighting	A	C	Z
	11.5 dB UR	15.8 dB UR	21.1 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 UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

Prior to calibration, the instrument's microphone was replaced and the meter was realigned.

..... END
Calibrated by: C. Hirlav R 3



CERTIFICATE OF CALIBRATION

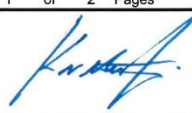


Date of Issue: 05 September 2022

Certificate Number: UCRT22/2064

Calibrated at & Certificate issued by:
ANV Measurement Systems
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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages
Approved Signatory

K. Mistry

Customer AWN Consulting Limited
The Tecpro Building
IDA Business and Technology Park
Clonsaugh
Dublin, D17 XD90
Ireland

Order No. 2243

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00564808
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	64933
	Rion	Microphone	UC-59	21306
	Rion	Calibrator	NC-75	34313057
		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 01 September 2022 ANV Job No. UKAS22/09555

Date Calibrated 05 September 2022

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
	15 September 2020	UCRT20/1867	0653

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CERTIFICATE OF CALIBRATION



Date of Issue: 05 September 2022

Certificate Number: UCRT22/2064

Calibrated at & Certificate issued by:

ANV Measurement Systems

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer AWN Consulting Limited
The Tecpro Building
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Order No. 2243

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00564808
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	64933
	Rion	Microphone	UC-59	21306
	Rion	Calibrator	NC-75	34313057
		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 01 September 2022

ANV Job No.

UKAS22/09555

Date Calibrated 05 September 2022

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
	15 September 2020	UCRT20/1867	0653

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MTS Calibration Ltd,
The Grange Business Centre,
Belasis Avenue,
Billingham TS23 1LG,
England
Telephone: 01642 876 410

CERTIFICATE OF CALIBRATION

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Issued by: **MTS Calibration Ltd**

Approved Signatory:



Date of Issue: **29 March 2023**

Certificate Number: **38226**

Tony Sherris

Sound Level Meter

Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis
Instrument Model: LxT1
Serial Number: 0006122

3A

Associated Equipment	Make	Model	Serial number
Preamplifier	Larson Davis	PRMLxT1	056010
Microphone	PCB	377B02	322753
Calibrator	Larson Davis	CAL200	9175
Calibrator supplied by	the Client, with the SLM		

The measurements were performed at The Grange Business Centre, Belasis Avenue, TS23 1LD. The results only apply to the items tested.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1

Test results summary, detailed results are shown on subsequent pages.

Tests performed	Section	Results of test	Page	Comments
Calibration Certificate	22		1	
Additional information			2	
Indication with Calibrator Supplied	10	No Limit	3	
Self-Generated Noise	11	No Limit	3	
Frequency and Time-weightings at 1kHz	14	Complies	3	
Long term stability	15	Complies	3	
High stability	21	Complies	3	
Acoustic Tests	12	Complies	4	
Frequency Weighting A	13	Complies	5	
Frequency Weighting C	13	Complies	6	
Frequency Weighting Z	13	Complies	7	
Level Linearity	16	Complies	8	
Level Linearity Range Control	17		n/a	SLM only has one range
Tone-burst Response	18	Complies	9	
Peak C sound level	19	Complies	10	
Overload indication	20	Complies	11	

The instrument was within the above specification as received - no modifications were made

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

Additional tests performed

Reference

Microphone full frequency response
Filter calibration, third octave or octave

38228
38226F

See additional certificate
See additional certificate

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