Appendix A15.2: Detailed Baseline Noise Survey Results and Notes

1.1 Introduction

1.1.1 This appendix provides additional details of the baseline noise surveys which were undertaken as part of the noise assessment of the proposed route options.

1.1.2 Noise monitoring was undertaken between 30 January 2025 and 13 February 2025 and consisted of noise level measurements at the following locations:

- Measurement location 1 – Rowan Cottage, Birnam;
- Measurement location 2 – Hollybank, Perth Road, Birnam;
- Measurement location 3 – St. Catherine's Cottage, Birnam;
- Measurement location 4 – Oakbank, Birnam;
- Measurement location 5 – The Old Bakehouse, 12 Birnam Terrace, Birnam;
- Measurement location 6 – 6 King Duncan's Place, Birnam;
- Measurement location 7 – Braeknowe, Birnam;
- Measurement location 8 – Caileagan, Little Dunkeld; and
- Measurement location 9 – Craigview, Inver.

1.1.3 The noise monitoring locations are presented in Figure 15.2.

1.1.4 The following pieces of equipment were used when undertaking noise measurements. Calibration certificates for this equipment are provided at the end of this appendix:

- Rion NC-75 calibrator serial number (s/n 35292145);
- Rion NL-52 Class 1 sound level meter (s/n 00620807);
- Rion NL-52 Class 1 sound level meter (s/n 00620871);
- Rion NL-52 Class 1 sound level meter (s/n 00620964);
- Rion NL-52 Class 1 sound level meter (s/n 00710288);
- Rion NL-52 Class 1 sound level meter (s/n 00410085); and
- Lufft WS600-UMB weather station (s/n 189.0724.0701.251).

1.1.5 For each measurement location, two tables have been provided to detail the measured daily noise levels for the following time periods:

- the 18-hour daytime period (between 06:00 and 00:00), which is the time period that is used to describe road traffic noise in CRTN;
- the 16-hour daytime period (between 07:00 and 23:00), which corresponds to the time period used in World Health Organisation (WHO) guidance when describing the daytime period; and
- the eight-hour night-time period (between 23:00 and 07:00), which corresponds to the time period used in WHO guidance when describing the night-time noise period.

1.1.6 The measured daily noise levels, both with and without periods of precipitation and high wind speeds, are presented for each monitoring location. To address potential elevations in the measured noise levels due to non-conducive weather, the weather conditions were monitored using a weather station and the noise levels recorded during periods of high wind speeds and/or precipitation were removed from the data set. It should be noted that the weather data was logged in one-minute periods, while the noise data was logged in 15-minute periods.

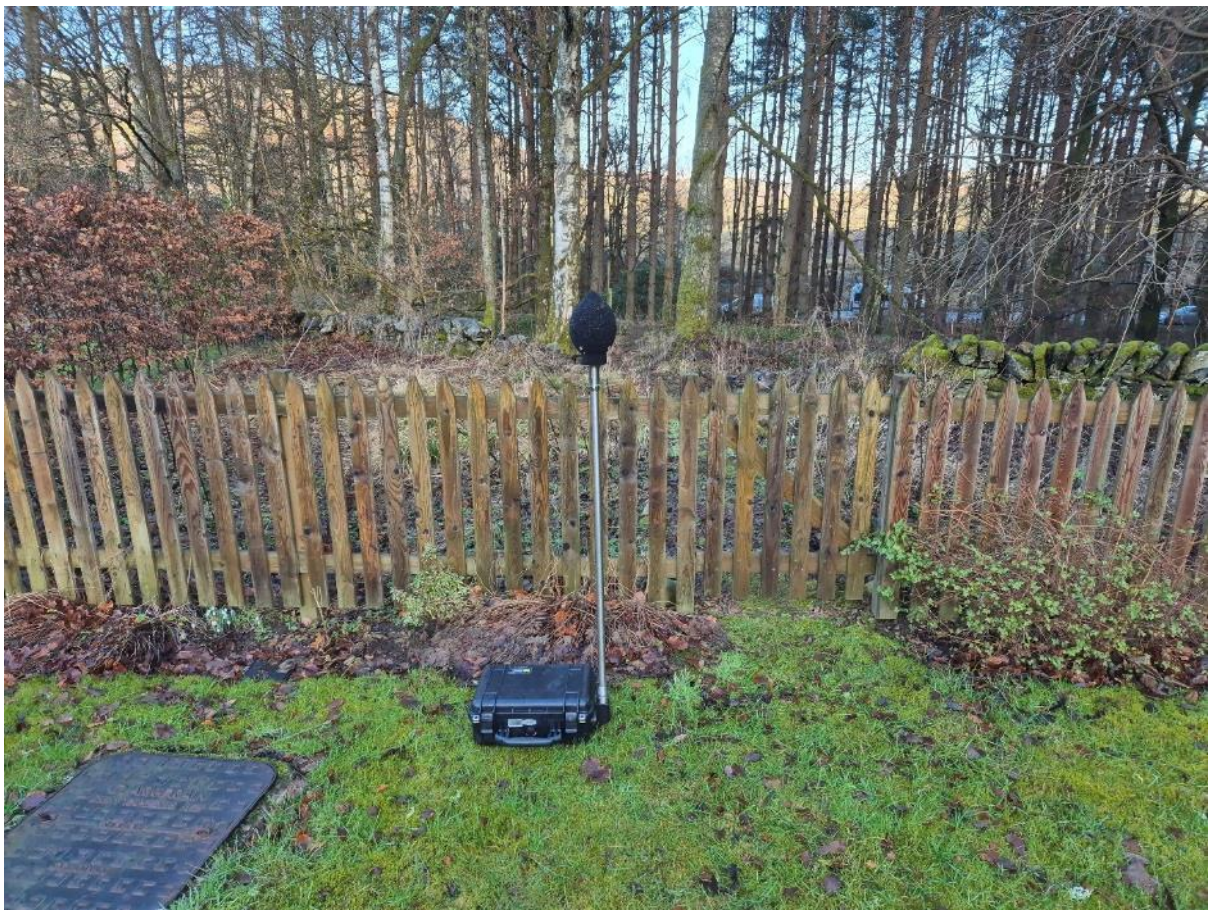
1.1.7 To minimise the effects of wind-generated noise, for each one-minute interval during which peak wind speeds of $5ms^{-1}$ or greater were logged, the noise measurements for the 15-minute period containing the one-minute interval were discarded. Moreover, to mitigate potential increases in traffic noise levels due to standing water or snow on nearby roads, for each one-minute interval during which precipitation was logged, the noise measurements for the subsequent 60 minutes, were discarded.

1.1.8 Daily noise levels are presented only for periods where noise levels were measured for the full duration of the period, i.e. the full 18 hours (06:00 to 00:00), 16 hours (07:00 to 23:00) or eight hours (23:00 to 07:00). The exception to this is where data for the full 18-hour period (06:00 to 00:00) was not available. In these instances, where possible, the shortened measurement procedure (defined in CRTN) has been used to calculate the $L_{A10,18hr}$. It should be noted that the measurement locations do not necessarily meet the CRTN shortened measurement procedure requirements in terms of microphone position relative to roads and therefore the $L_{A10,18hr}$ levels calculated using this method should be considered as estimates. The shortened measurement procedure has been used where there was available data for three consecutive hours, between 10:00 and 17:00, with each of the consecutive hours having at least one 15-minute period not needing to be excluded due to precipitation or high wind speeds, as described above.

1.2 Summary of Noise Measurements

Measurement location 1 – Rowan Cottage, Birnam, Dunkeld, PH8 0DW

1.2.1 The measurement location is shown in Photograph A15.2-1. A Rion NL-52 Class 1 sound level meter (s/n 00710288) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was approximately 14m from the north-eastern façade of the building, at the boundary of the property line.



Photograph A15.2-1: Noise monitoring equipment at Rowan Cottage

1.2.2 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no shift in the observed calibration level.

1.2.3 At this location the noise climate primarily consisted of road traffic noise from the A9 (north-east of the measurement position), a constant hum from residential sewage treatment equipment in the adjacent property's garden, and occasional birdsong.

1.2.4 Throughout the monitoring period, one-minute average wind speeds did not exceed 1.3ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.06mm. No precipitation was recorded on 6 and 13 February.

1.2.5 Table A15.21 and Table A15.2-2 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.6 It should be noted that in Table A15.2-1 and Table A15.2-2 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-1: Daily summarised noise levels at Rowan Cottage, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	-	-	-	-	-	50.4	54.0	40.5
07/02/2025	Friday	56.9	59.5	48.9	57.3	60.0	50.0	49.3	52.3	38.8
08/02/2025	Saturday	56.5	59.0	47.2	56.9	59.5	48.3	47.8	50.7	37.9
09/02/2025	Sunday	56.5	59.0	47.5	56.9	59.6	48.6	50.7	53.5	39.1
10/02/2025	Monday	56.6	59.4	48.1	56.9	59.7	48.8	51.1	53.7	40.6
11/02/2025	Tuesday	57.7	59.6	47.8	58.1	60.0	48.5	50.7	53.8	39.0
12/02/2025	Wednesday	56.6	59.3	47.5	56.9	59.5	48.2	50.7	54.2	40.2
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

Table A15.2-2: Daily summarised noise levels at Rowan Cottage, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	-	-	-	-	-	50.4	54.0	40.5
07/02/2025	Friday	57.6	60.3	51.0	57.8	60.5	51.5	49.2	51.8	38.8
08/02/2025	Saturday	56.1	58.7	46.1	56.5	59.1	48.3	47.8	50.7	37.9
09/02/2025	Sunday	56.5	59.0	47.5	56.9	59.6	48.6	50.7	53.5	39.1
10/02/2025	Monday	57.4	60.4	50.5	57.7	60.6	51.3	-	-	-
11/02/2025	Tuesday	58.6	60.1	48.5	58.6	60.1	48.5	50.7	53.8	39.0
12/02/2025	Wednesday	56.6	59.3	47.5	56.9	59.5	48.2	50.7	54.2	40.2
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

Measurement location 2 – Hollybank, Perth Road, Birnam, Dunkeld, PH8 0DN

1.2.7 The measurement location is shown in Photograph A15.2-2. A Rion NL-52 Class 1 sound level meter (s/n 00620807) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was approximately 20m from the south-eastern façade of the building, in the back garden.

Photograph A15.2-2: Noise Monitoring Equipment at Hollybank

1.2.8 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no significant shift in the observed calibration level.

1.2.9 At this location the noise climate primarily consisted of road traffic noise from the A9 and Perth Road (south and north of the measurement position, respectively) and consistent birdsong.

1.2.10 Throughout the monitoring period, one-minute average wind speeds did not exceed 1.3ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.06mm. No precipitation was recorded on 6 and 13 February.

1.2.11 Table A15.2-3 and Table A15.2-4 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.12 It should be noted that in Table A15.2-3 and Table A15.2-4 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-3: Daily summarised noise levels at Hollybank, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	57.6*	-	-	-	-	47.0	50.4	30.9
07/02/2025	Friday	53.7	55.4	44.2	54.0	55.9	45.5	46.7	49.3	28.1
08/02/2025	Saturday	53.0	54.9	42.3	53.4	55.3	43.6	46.3	48.9	27.6
09/02/2025	Sunday	53.1	54.7	42.5	53.5	55.4	44.1	48.3	50.4	29.7
10/02/2025	Monday	53.1	55.3	43.0	53.5	55.8	44.2	47.7	50.1	32.3
11/02/2025	Tuesday	55.7	55.2	43.5	56.1	55.7	44.5	46.4	49.3	31.8
12/02/2025	Wednesday	52.8	54.6	41.9	53.2	55.0	43.0	46.3	49.7	29.0
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

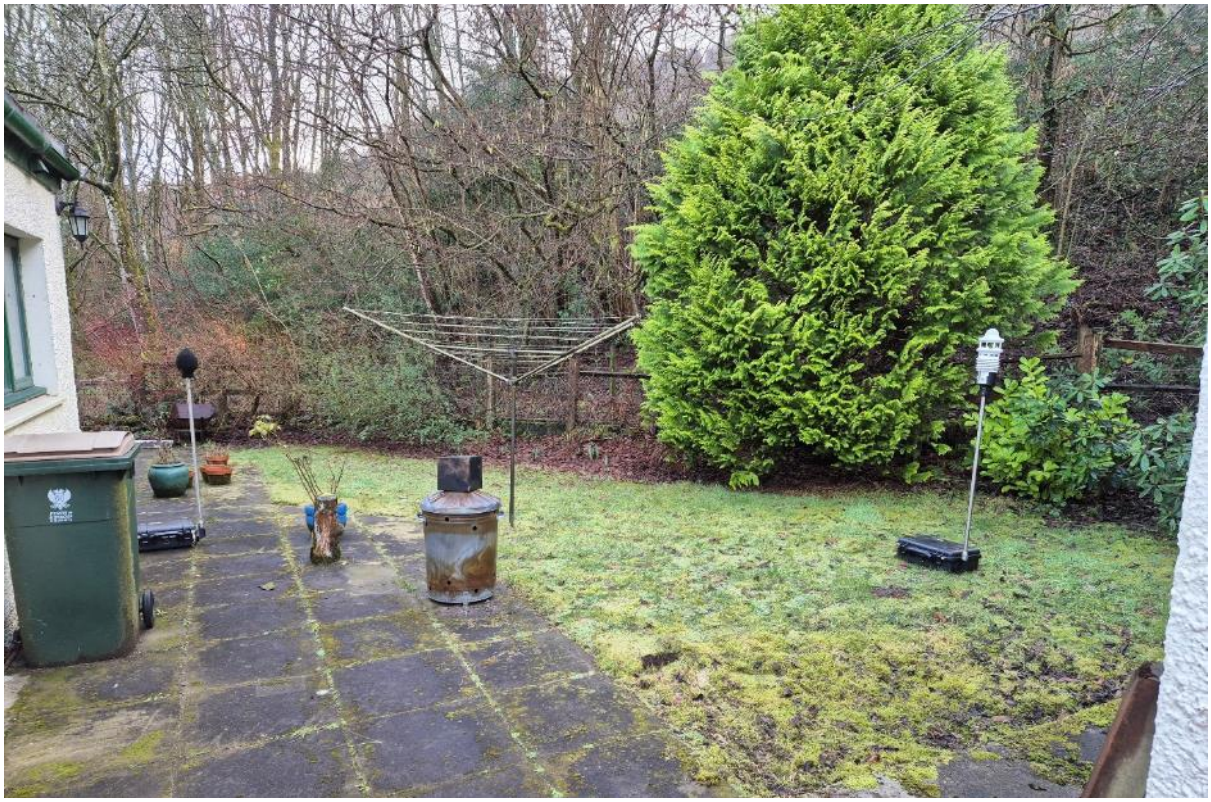
Table A15.2-4: Daily summarised noise levels at Hollybank, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	57.6*	-	-	-	-	47.0	50.4	30.9
07/02/2025	Friday	54.5	56.7	47.1	54.7	56.9	47.6	47.3	49.7	28.7
08/02/2025	Saturday	52.2	54.3	40.6	52.4	54.6	43.6	46.3	48.9	27.6
09/02/2025	Sunday	53.1	54.7	42.5	53.5	55.4	44.1	48.3	50.4	29.7
10/02/2025	Monday	54.1	56.7	46.7	54.4	57.1	47.7	-	-	-
11/02/2025	Tuesday	56.8	55.4	44.0	56.8	55.4	44.5	46.4	49.3	31.8
12/02/2025	Wednesday	52.8	54.6	41.9	53.2	55.0	43.0	46.3	49.7	29.0
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 3 – St. Catherine's Cottage, Gladstone Terrace, Birnam, Dunkeld, PH8 0DP

1.2.13 The measurement location is shown in Photograph A15.2-3. A Rion NL-52 Class 1 sound level meter (s/n 00620964) was positioned at a height of approximately 1.5m in façade conditions. The equipment was approximately 1m from the south-western façade of the building.



Photograph A15.2-3: Noise monitoring equipment at St. Catherine's Cottage

1.2.14 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no shift in the observed calibration level.

1.2.15 At this location the noise climate primarily consisted of road traffic noise from the A9 (south of the measurement location). Additionally, birdsong and human activity were occasionally audible.

1.2.16 Throughout the monitoring period, one-minute average wind speeds did not exceed 1.3ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.06mm. No precipitation was recorded on 6 and 13 February.

1.2.17 Table A15.2-5 and Table A15.2-6 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.18 It should be noted that in Table A15.2-5 and Table A15.2-6 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-5: Daily summarised noise levels at St. Catherine's Cottage, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	65.4*	-	-	-	-	55.6	58.0	37.1
07/02/2025	Friday	61.3	64.5	46.2	61.6	65.0	47.3	53.6	54.3	33.6
08/02/2025	Saturday	60.3	63.5	44.0	60.6	64.1	44.8	52.2	51.9	39.3
09/02/2025	Sunday	60.5	63.6	45.1	61.0	64.4	45.9	55.4	56.6	38.8
10/02/2025	Monday	61.2	64.3	45.9	61.5	64.8	46.8	56.3	57.1	40.8
11/02/2025	Tuesday	61.7	64.7	47.2	62.0	65.1	47.8	55.7	57.8	39.9
12/02/2025	Wednesday	60.8	64.2	45.4	61.1	64.5	46.1	55.5	58.0	38.8
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

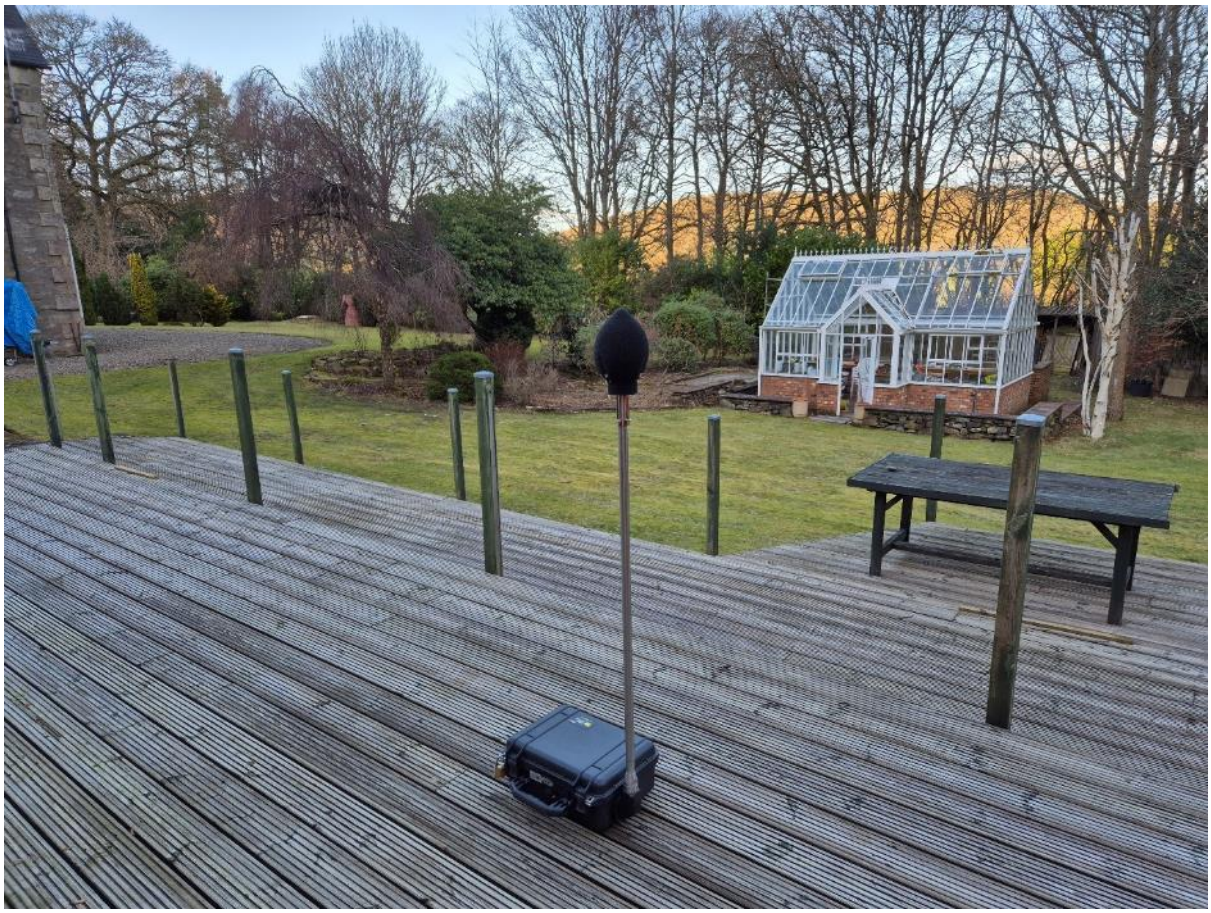
Table A15.2-6: Daily summarised noise levels at St. Catherine's Cottage, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	65.4*	-	-	-	-	55.6	58.0	37.1
07/02/2025	Friday	62.0	65.4	48.6	62.2	65.6	49.3	53.3	53.4	34.7
08/02/2025	Saturday	59.5	63.1	42.5	59.8	63.6	44.8	52.2	51.9	39.3
09/02/2025	Sunday	60.5	63.6	45.1	61.0	64.4	45.9	55.4	56.6	38.8
10/02/2025	Monday	61.9	65.6	47.7	62.2	65.7	49.0	-	-	-
11/02/2025	Tuesday	62.1	65.1	47.5	62.1	65.1	47.8	55.7	57.8	39.9
12/02/2025	Wednesday	60.8	64.2	45.4	61.1	64.5	46.1	55.5	58.0	38.8
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 4 – Oakbank, Birnam, Dunkeld, PH8 0BW

1.2.19 The measurement location is shown in Photograph A15.2-4. A Rion NL-52 Class 1 sound level meter (s/n 00710288) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was approximately 6m from the north-eastern façade of the building.



Photograph A15.2-4: Noise monitoring equipment at Oakbank

1.2.20 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no significant shift in the observed calibration level.

1.2.21 At this location the noise climate primarily consisted of road traffic noise from the A9 (north-east of the measurement position) and birdsong.

1.2.22 Throughout the monitoring period, one-minute average wind speeds did not exceed 2.4ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.13mm. No precipitation was recorded on 30 January, 1 February and 6 February.

1.2.23 Table A15.2-7 and Table A15.2-8 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.24 It should be noted that in Table A15.2-7 and Table A15.2-8 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-7: Daily summarised noise levels at Oakbank, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	-	-	-	-	-	49.2	53.0	38.9
31/01/2025	Friday	54.6	56.2	46.1	55.0	56.6	47.6	46.1	50.5	28.4
01/02/2025	Saturday	53.3	55.7	45.0	53.7	56.0	46.2	48.0	51.8	36.8
02/02/2025	Sunday	54.1	56.1	46.2	54.5	56.6	47.7	49.4	52.9	39.3
03/02/2025	Monday	54.3	56.7	47.7	54.6	57.1	48.3	50.3	54.0	41.0
04/02/2025	Tuesday	54.6	56.7	47.4	54.8	57.0	48.0	50.1	53.9	39.2
05/02/2025	Wednesday	54.7	56.9	47.4	54.9	57.1	48.0	48.9	52.7	36.2
06/02/2025	Thursday	-	58.0*	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

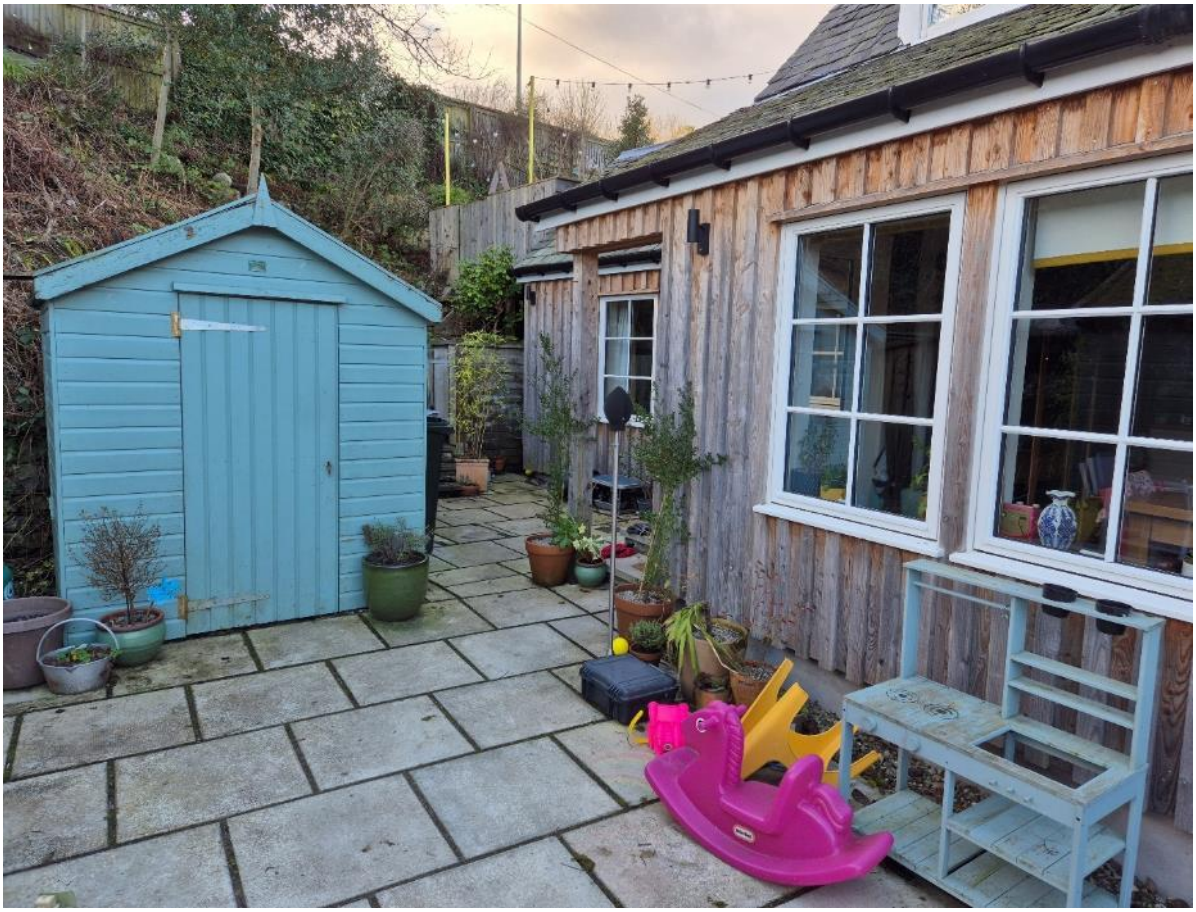
Table A15.2-8: Daily summarised noise levels at Oakbank, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	-	-	-	-	-	49.5	53.3	38.6
31/01/2025	Friday	54.6	56.2	46.1	55.0	56.6	47.6	46.1	50.5	28.4
01/02/2025	Saturday	53.3	55.7	45.0	53.7	56.0	46.2	49.7	53.3	41.6
02/02/2025	Sunday	54.5	56.6	47.9	54.7	56.8	48.5	49.4	52.9	39.3
03/02/2025	Monday	54.9	57.2	49.3	55.0	57.4	49.5	-	-	-
04/02/2025	Tuesday	53.5	55.8	43.9	53.7	56.0	44.5	50.4	54.2	39.1
05/02/2025	Wednesday	54.7	56.9	47.4	54.9	57.1	48.0	48.9	52.7	36.2
06/02/2025	Thursday	-	58.0*	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 5 – The Old Bakehouse, 12 Birnam Terrace, Birnam, Dunkeld, PH8 0DR

1.2.26 The measurement location is shown in Photograph A15.2-5. A Rion NL-52 Class 1 sound level meter (s/n 00620807) was positioned at a height of approximately 1.5m in façade conditions. The equipment was approximately 1m from the south-eastern façade of the building.



Photograph A15.2-5: Noise monitoring equipment at The Old Bakehouse, 12 Birnam Terrace

1.2.27 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no shift in the observed calibration level.

1.2.28 At this location the noise climate primarily consisted of road traffic noise from the A9 (south-west of the measurement position) and birdsong. Additionally, human activity was occasionally audible.

1.2.29 Throughout the monitoring period, one-minute average wind speeds did not exceed 2.4ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.13mm. No precipitation was recorded on 30 January, 1 February and 6 February.

1.2.30 Table A15.2-9 and Table A15.2-10 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.31 It should be noted that in Table A15.2-7 and Table A15.2-8 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-9: Daily summarised noise levels at The Old Bakehouse, 12 Birnam Terrace, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	51.6*	-	-	-	-	43.3	46.9	32.4
31/01/2025	Friday	50.4	51.5	41.8	50.8	52.1	43.2	40.8	44.4	26.8
01/02/2025	Saturday	50.0	51.4	41.9	50.3	51.8	43.0	42.8	46.0	33.5
02/02/2025	Sunday	50.3	52.0	42.4	50.7	52.4	43.6	44.8	47.5	34.9
03/02/2025	Monday	53.6	54.1	44.7	54.0	54.6	45.2	47.0	49.7	39.6
04/02/2025	Tuesday	52.4	53.3	43.3	52.6	53.5	43.7	45.8	48.4	34.3
05/02/2025	Wednesday	52.5	52.6	42.9	52.8	53.0	43.6	44.4	46.6	33.0
06/02/2025	Thursday	-	54.0*	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

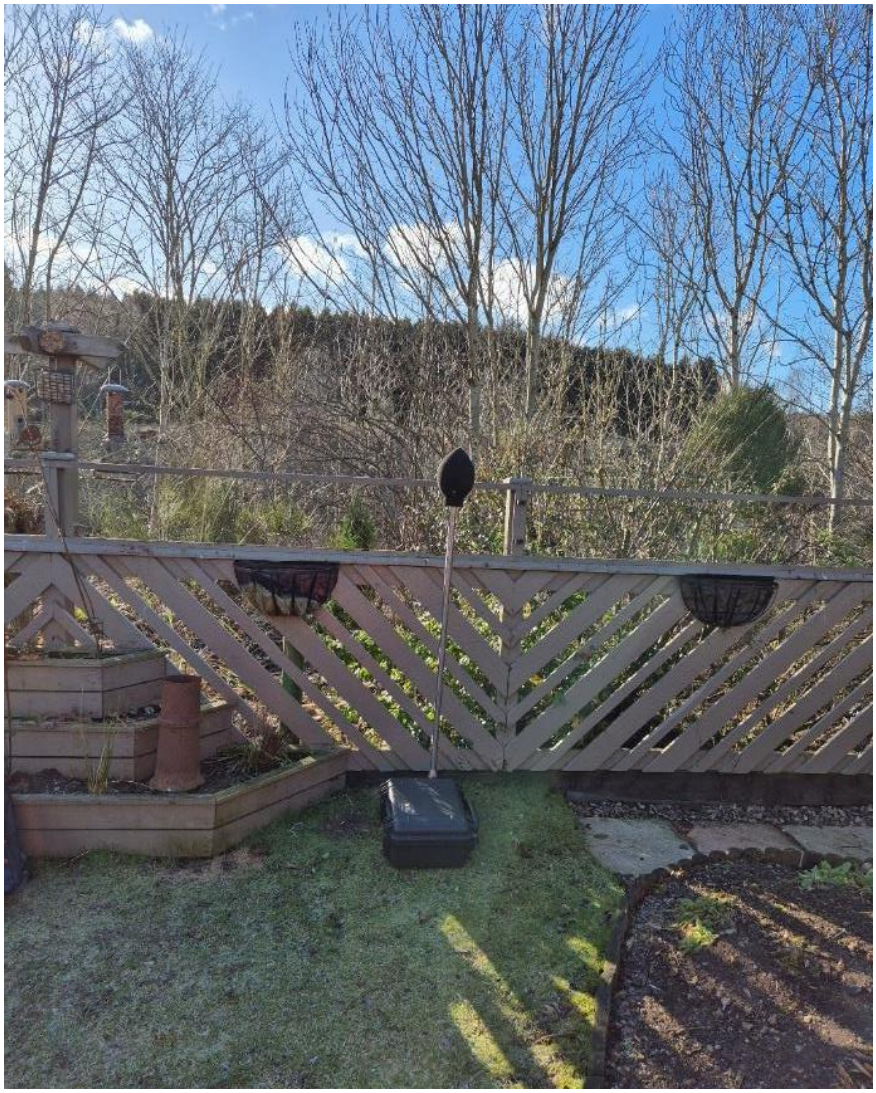
Table A15.2-10: Daily summarised noise levels at The Old Bakehouse, 12 Birnam Terrace, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	51.6*	-	-	-	-	43.7	47.3	32.2
31/01/2025	Friday	50.4	51.5	41.8	50.8	52.1	43.2	40.8	44.4	26.8
01/02/2025	Saturday	50.0	51.4	41.9	50.3	51.8	43.0	42.8	46.3	35.4
02/02/2025	Sunday	50.5	52.0	43.4	50.8	52.3	44.1	44.8	47.5	34.9
03/02/2025	Monday	54.7	55.4	45.8	54.9	55.6	46.1	-	-	-
04/02/2025	Tuesday	51.1	50.6	39.6	51.4	50.9	40.1	46.0	48.5	34.2
05/02/2025	Wednesday	52.5	52.6	42.9	52.8	53.0	43.6	44.4	46.6	33.0
06/02/2025	Thursday	-	54.0*	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 6 – 6 King Duncan's Place, Birnam, Dunkeld, PH8 0QD

1.2.33 The measurement location is shown in Photograph A15.2-6. A Rion NL-52 Class 1 sound level meter (s/n 00751323) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was approximately 6m from the south-western façade of the building, in the back garden.



Photograph A15.2-6: Noise monitoring equipment at 6 King Duncan's Place

1.2.34 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no shift in the observed calibration level.

1.2.35 At this location the noise climate primarily consisted of road traffic noise from the A9 (south-west of the measurement position), birdsong and murmuring from a small garden stream.

1.2.36 Throughout the monitoring period, one-minute average wind speeds did not exceed 2.4ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.13mm. No precipitation was recorded on 30 January, 1 February and 6 February.

1.2.37 Table A15.2-11 and Table A15.2-12 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.38 It should be noted that in Table A15.2-11 and Table A15.2-12 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-11: Daily summarised noise levels at 6 King Duncan's Place, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	61.4*	-	-	-	-	56.0	59.3	45.8
31/01/2025	Friday	60.9	63.5	52.2	61.2	63.9	52.9	53.7	56.3	45.4
01/02/2025	Saturday	59.8	62.4	51.0	60.1	62.8	51.5	53.8	55.9	45.9
02/02/2025	Sunday	60.5	63.1	52.1	60.9	63.6	52.9	56.3	58.7	46.6
03/02/2025	Monday	61.6	64.6	51.9	61.8	64.9	52.4	58.2	60.4	47.2
04/02/2025	Tuesday	62.8	65.4	52.3	63.0	65.8	52.8	57.4	59.8	46.4
05/02/2025	Wednesday	61.8	64.2	52.6	62.1	64.6	53.1	55.7	58.3	46.1
06/02/2025	Thursday	-	64.2*	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

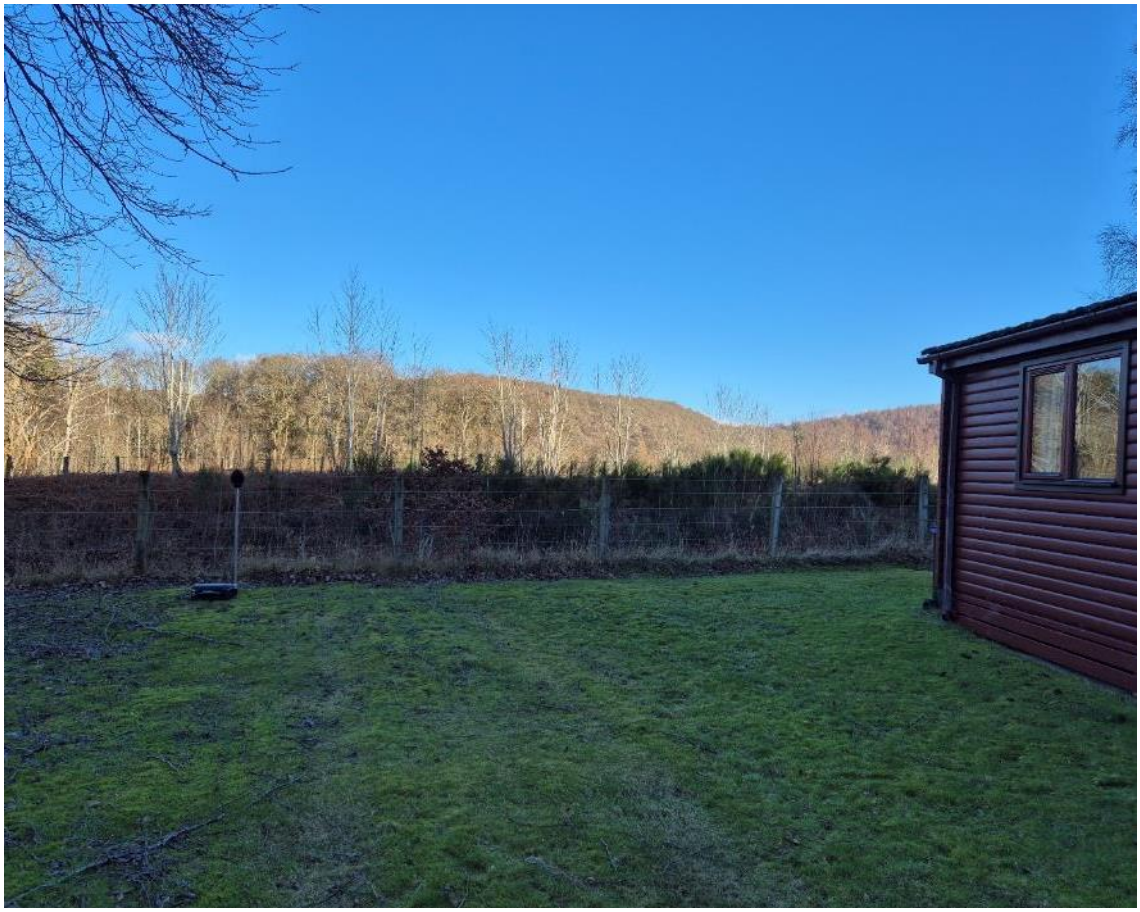
Table A15.2-12: Daily summarised noise levels at 6 King Duncan's Place, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	61.4*	-	-	-	-	56.7	60.2	46.0
31/01/2025	Friday	60.9	63.5	52.2	61.2	63.9	52.9	53.7	56.3	45.4
01/02/2025	Saturday	59.8	62.4	51.0	60.1	62.8	51.5	53.5	57.4	46.2
02/02/2025	Sunday	60.8	63.4	52.8	61.0	63.7	53.3	56.3	58.7	46.6
03/02/2025	Monday	62.1	65.3	53.2	62.2	65.3	53.5	-	-	-
04/02/2025	Tuesday	60.3	63.3	49.8	60.5	63.6	50.1	57.5	59.9	46.4
05/02/2025	Wednesday	61.8	64.2	52.6	62.1	64.6	53.1	55.7	58.3	46.1
06/02/2025	Thursday	-	64.2*	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 7 – Braeknowe, Birnam, Dunkeld, PH8 0DU

1.2.39 The measurement location is shown in Photograph A15.2-7. A Rion NL-52 Class 1 sound level meter (s/n 00410085) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was approximately 7m from the north-western façade of the building.



Photograph A15.2-7: Noise monitoring equipment at Braeknowe

1.2.40 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no significant shift in the observed calibration level.

1.2.41 At this location the noise climate primarily consisted of road traffic noise from the A9 and infrequent train movement on the railway line, north of the measurement position.

1.2.42 Throughout the monitoring period, one-minute average wind speeds did not exceed 2.4ms^{-1} and gusts remained below 5ms^{-1}. The total amount of precipitation for any one-minute period did not exceed 0.13mm. No precipitation was recorded on 30 January, 1 February and 6 February.

1.2.43 Table A15.2-13 and Table A15.2-14 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.44 It should be noted that in Table A15.2-13 and Table A15.2-14 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-13: Daily summarised noise Levels at Braeknowe, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	55.7*	-	-	-	-	53.6	52.9	32.8
31/01/2025	Friday	57.5	58.5	46.0	57.4	59.0	47.6	53.2	50.4	28.0
01/02/2025	Saturday	56.1	57.0	45.7	56.3	57.5	47.0	47.3	50.3	32.3
02/02/2025	Sunday	56.0	57.4	46.4	56.4	58.1	47.8	52.0	52.2	36.8
03/02/2025	Monday	57.0	58.5	47.8	57.0	58.9	48.4	54.0	54.2	42.1
04/02/2025	Tuesday	59.1	59.2	48.0	59.2	59.6	48.5	53.8	54.1	38.0
05/02/2025	Wednesday	57.6	58.6	47.7	57.5	59.0	48.5	54.6	52.5	34.8
06/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

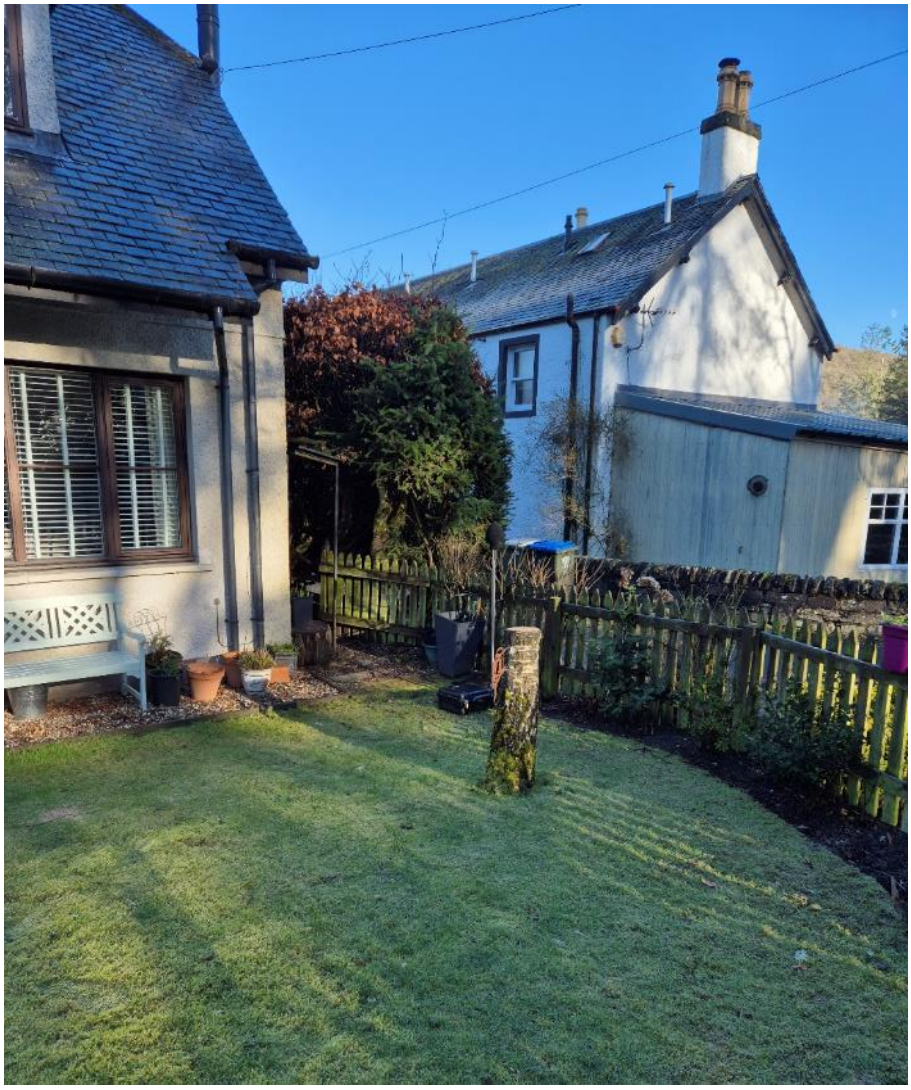
Table A15.2-14: Daily summarised noise levels at Braeknowe, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	55.7*	-	-	-	-	55.0	53.7	33.2
31/01/2025	Friday	57.5	58.5	46.0	57.4	59.0	47.6	53.2	50.4	28.0
01/02/2025	Saturday	56.1	57.0	45.7	56.3	57.5	47.0	48.4	52.0	35.1
02/02/2025	Sunday	56.4	57.9	47.7	56.7	58.3	48.4	52.0	52.2	36.8
03/02/2025	Monday	57.5	59.4	49.0	57.3	59.5	49.3	-	-	-
04/02/2025	Tuesday	56.3	57.3	44.6	56.3	57.7	45.1	54.4	54.3	38.4
05/02/2025	Wednesday	57.6	58.6	47.7	57.5	59.0	48.5	54.6	52.5	34.8
06/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 8 – Caileagan, Little Dunkeld, Dunkeld, PH8 0AD

1.2.45 The measurement location is shown in Photograph A15.2-8. A Rion NL-52 Class 1 sound level meter (s/n 00410085) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was slightly more than 3m away from the southern façade of the building.



Photograph A15.2-8: Noise monitoring equipment at Caileagan

1.2.46 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no shift in the observed calibration level.

1.2.47 At this location the noise climate primarily consisted of road traffic noise from the A9 to (south-west of the measurement position) and from surrounding local roads. Additionally, birdsong and the sounds of children playing in the nearby school yard were occasionally audible.

1.2.48 Throughout the monitoring period, one-minute average wind speeds did not exceed 1.3ms^{-1} and gusts exceeded 5ms^{-1} only once. The total amount of precipitation for any one-minute period did not exceed 0.06mm. No precipitation was recorded on 6 and 13 February.

1.2.49 Table A15.2-15 and Table A15.2-16 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.50 It should be noted that in Table A15.2-15 and Table A15.2-16 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-15: Daily summarised noise levels at Caileagan, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	55.2*	-	-	-	-	49.4	51.3	32.0
07/02/2025	Friday	56.9	58.6	45.7	57.2	59.1	46.8	49.5	51.4	31.6
08/02/2025	Saturday	56.3	57.9	44.0	56.6	58.4	45.2	49.3	49.1	29.2
09/02/2025	Sunday	55.7	57.5	44.1	56.0	57.9	45.4	49.8	49.6	32.0
10/02/2025	Monday	56.5	58.3	45.0	56.7	58.7	46.0	51.2	52.2	34.3
11/02/2025	Tuesday	57.2	58.6	45.0	57.6	59.1	45.8	50.7	51.7	32.7
12/02/2025	Wednesday	55.8	57.8	44.0	56.1	58.1	44.9	47.6	50.2	31.0
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

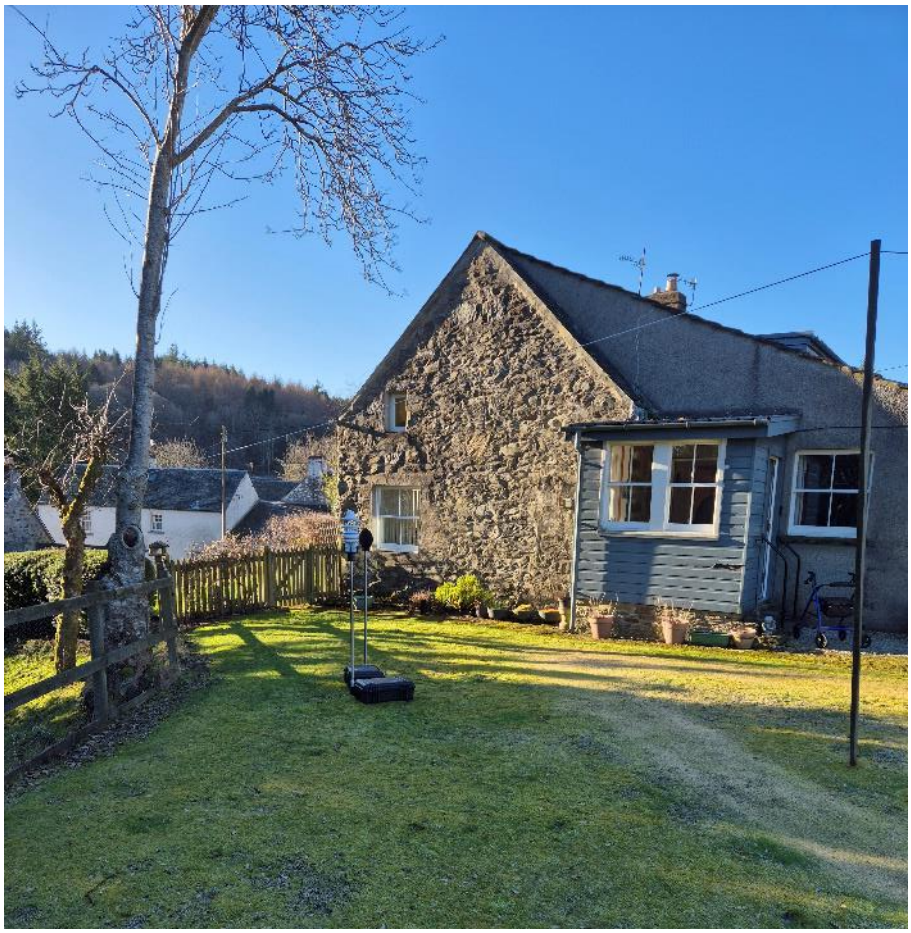
Table A15.2-16: Daily summarised noise levels at Caileagan, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
06/02/2025	Thursday	-	55.2*	-	-	-	-	49.4	51.3	32.0
07/02/2025	Friday	57.8	60.0	48.2	58.0	60.1	48.6	50.1	51.5	31.7
08/02/2025	Saturday	55.8	57.4	42.6	56.1	57.7	45.2	49.3	49.1	29.2
09/02/2025	Sunday	55.7	57.5	44.1	56.0	57.9	45.4	49.8	49.6	32.0
10/02/2025	Monday	57.1	59.8	48.0	57.2	59.7	48.9	-	-	-
11/02/2025	Tuesday	57.4	58.8	45.5	57.4	58.8	45.8	50.7	51.7	32.7
12/02/2025	Wednesday	55.8	57.8	44.0	56.1	58.1	44.9	47.6	50.2	31.0
13/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Measurement location 9 – Craigview, Inver, Dunkeld, PH8 0JR

1.2.51 The measurement location is shown in Photograph A15.2-9. A Rion NL-52 Class 1 sound level meter (s/n 00620964) was positioned at a height of approximately 1.5m in free-field conditions. The equipment was approximately 6m from the eastern façade of the building.



Photograph A15.2-9: Noise monitoring equipment at Craigview

1.2.52 The monitoring equipment was calibrated both before and after the measurement period using a Rion NC-75 acoustic calibrator (s/n 35292145), which has itself been calibrated against a reference set traceable to National and International Standards. There was no shift in the observed calibration level.

1.2.53 At this location the noise climate primarily consisted of road traffic noise from the A9 (north of the measurement location). Additionally, birdsong was audible when traffic was sparse.

1.2.54 Throughout the monitoring period, one-minute average wind speeds did not exceed 2.4ms^{-1} and gusts exceeded 5ms^{-1} only once. The total amount of precipitation for any one-minute period did not exceed 0.13mm. No precipitation was recorded on 30 January, 1 February and 6 February.

1.2.55 Table A15.2-17 and Table A15.2-18 provide the measured daily noise levels at this location, with and without noise levels measured during periods of precipitation and high wind speeds.

1.2.56 It should be noted that in Table A15.2-17 and Table A15.2-18 the reported $L_{Aeq,T}$ level is the logarithmically averaged noise level, whereas the $L_{A10,T}$ and $L_{A90,T}$ levels are the arithmetically averaged noise levels.

Table A15.2-17: Daily summarised noise levels at Craigview, including periods of precipitation and high wind speeds

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	62.2*	45.4	61.6	64.8	46.3	55.7	59.5	35.4
31/01/2025	Friday	62.5	64.9	48.0	62.8	65.4	49.2	53.4	56.3	33.7
01/02/2025	Saturday	61.2	64.1	46.9	61.5	64.6	48.2	53.2	55.5	35.8
02/02/2025	Sunday	61.6	64.5	47.7	62.0	65.2	49.0	56.0	59.3	39.6
03/02/2025	Monday	61.5	64.8	48.5	61.8	65.2	49.1	57.3	60.0	41.4
04/02/2025	Tuesday	62.0	65.4	48.8	62.2	65.8	49.3	56.6	59.6	40.5
05/02/2025	Wednesday	62.3	65.5	48.3	62.6	66.0	49.1	56.1	59.1	37.7
06/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

Table A15.2-18: Daily summarised noise levels at Craigview, with periods of precipitation and high wind speeds removed

Date	Day	18-hour daytime period (between 06:00 and 00:00)			16-hour daytime period (between 07:00 and 23:00)			8-hour night-time period (between 23:00 and 07:00)		
		$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
30/01/2025	Thursday	-	62.2*	-	-	-	-	56.4	60.5	36.2
31/01/2025	Friday	62.5	64.9	48.0	62.8	65.4	49.2	53.4	56.3	33.7
01/02/2025	Saturday	61.2	64.1	46.9	61.5	64.6	48.2	54.6	59.2	36.2
02/02/2025	Sunday	62.0	65.0	48.9	62.2	65.4	49.6	56.0	59.3	39.6
03/02/2025	Monday	62.1	65.6	50.1	62.2	65.7	50.3	-	-	-
04/02/2025	Tuesday	60.4	63.9	45.4	60.6	64.3	45.9	56.8	59.7	40.6
05/02/2025	Wednesday	62.3	65.5	48.3	62.6	66.0	49.1	56.1	59.1	37.7
06/02/2025	Thursday	-	-	-	-	-	-	-	-	-

* Estimated level using CRTN shortened measurement procedure period

2. Calibration Certificates

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 30 May 2024

Certificate Number: UCRT24/1792

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

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL
Order No.	ANV MS HIRE
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00620807
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	20867
Rion	Microphone	UC-59	03633
Rion	Calibrator	NC-75	34334830
	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 29 May 2024 ANV Job No. UKAS24/05404

Date Calibrated 30 May 2024

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*
	05 April 2023	UCRT23/1480	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT24/1792

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	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	30 April 2024		
Calibrator cert. number	UCRT24/1668		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.01	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 - Extension Cable & Wind Shield WS-15
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	23.78	23.91	± 0.30	°C
Humidity	50.0	48.9	± 3.00	%RH
Ambient Pressure	100.03	100.05	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.2	dB	Adjusted indicated level	94.0	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		
	12.9	dB	UR	16.7	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 UKAS requirements.

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: K. Zablocki R 1

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

MEASUREMENT SYSTEMS

CERTIFICATE OF CALIBRATION

ilac-MRA UKAS CALIBRATION 0653

Date of Issue: 17 October 2024 **Certificate Number: UCRT24/2372**

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

Page 1 of 2 Pages

Approved Signatory

B. Bogdan

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL			
Order No.	ANV MS HIRE			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00620871
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	20931
	Rion	Microphone	UC-59	04569
	Rion	Calibrator	NC-75	34334830
		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	16 October 2024	ANV Job No.	UKAS24/10740	
Date Calibrated	17 October 2024			

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*
	30 March 2022	UCRT22/1467	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT24/2372

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	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	17 September 2024		
Calibrator cert. number	UCRT24/2234		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.02	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 - Extension Cable & Wind Shield WS-15
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	23.00	23.10	± 0.30	°C
Humidity	47.9	50.8	± 3.00	%RH
Ambient Pressure	99.96	99.96	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	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		
	12.1	dB	UR	15.7	dB	UR	21.4	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 UKAS requirements.

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: K. Zablocki R 1

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

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 16 February 2024 **Certificate Number: UCRT24/1267**

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

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL
Order No.	ANV MS HIRE
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00620964
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	21005
	Rion	Microphone	UC-59	03884
	Rion	Calibrator	NC-75	34334830
		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	15 February 2024 ANV Job No. UKAS24/02141
Date Calibrated	16 February 2024

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*
	29 March 2023	UCRT23/1443	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT24/1267

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	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	22 January 2024		
Calibrator cert. number	UCRT24/1118		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.00	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 - Extension Cable & Wind Shield WS-15
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	22.90	23.01	± 0.30	°C
Humidity	47.2	51.2	± 3.00	%RH
Ambient Pressure	100.58	100.61	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	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		
	11.8	dB	UR	15.2	dB	UR	21.2	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 UKAS requirements.

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: K. Zablocki R 1

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

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 17 October 2024

Certificate Number: UCRT24/2374

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
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Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL
Order No.	ANV MS HIRE
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00710288
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	10282
Rion	Microphone	UC-59	02726
Rion	Calibrator	NC-75	34334830
	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 16 October 2024 ANV Job No. UKAS24/10740

Date Calibrated 17 October 2024

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*
	26 January 2023	UCRT23/1134	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT24/2374

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	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	17 September 2024		
Calibrator cert. number	UCRT24/2234		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.02	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 - Extension Cable & Wind Shield WS-15
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	23.40	23.70	± 0.30	°C
Humidity	49.4	48.1	± 3.00	%RH
Ambient Pressure	100.01	100.03	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.2	dB	Adjusted indicated level	94.0	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		
	13.0	dB	UR	16.4	dB	UR	22.3	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 UKAS requirements.

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: K. Zablocki R 1

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

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 17 January 2025 **Certificate Number: UCRT25/1114**

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

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL			
Order No.	ANV MS HIRE			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00410085
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	10078
	Rion	Microphone	UC-59	02436
	Rion	Calibrator	NC-75	34334830
		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	14 January 2025	ANV Job No.	UKAS25/01042	
Date Calibrated	17 January 2025			

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*
	08 February 2024	UCRT24/1218	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653	**Certificate Number** UCRT25/1114
	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	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	18 December 2024		
Calibrator cert. number	UCRT24/2700		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.04	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 - Extension Cable & Wind Shield WS-15
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	22.96	22.99	± 0.30	°C
Humidity	37.0	43.1	± 3.00	%RH
Ambient Pressure	102.52	102.54	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	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		
	12.8	dB	UR	16.9	dB	UR	23.4	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 UKAS requirements.

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

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 19 February 2025 **Certificate Number: UCRT25/1283**

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

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL			
Order No.	ANV MS HIRE			
Test Procedure	Procedure TP 14 Calibration of Sound Calibrators (60942:2017)			
Description	Acoustic Calibrator			
Identification	*Manufacturer*	*Instrument*	*Model*	*Serial No.*
	Rion	Calibrator	NC-75	35292145
	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.	UKAS25/02141	
Date Received	18 February 2025	
Date Calibrated	19 February 2025	
Previous Certificate	*Dated*	13 March 2024
	Certificate No.	UCRT24/1405
	Laboratory	0653

CERTIFICATE OF CALIBRATION	Certificate Number UCRT25/1283
UKAS Accredited Calibration Laboratory No. 0653	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*: Brüel & Kjær — *Type*: 4134

Nominal Setting dB / Hz	Mean Level dB rel 20 µPa	Frequency	Distortion + Noise
94 / 1000	94.10 ± 0.10	1000.00 ± 0.12Hz	(0.15 ± 0.03) %

Environmental conditions during tests	Start	End		
Temperature	22.62	22.31	± 0.30	°C
Humidity	36.2	37.6	± 3.0	%RH
Ambient Pressure	100.429	100.431	± 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 UKAS requirements.

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: B. Bogdan R 2

..... END .....

EFFECTIVE
16 SEP 2024
DATE

OTT HydroMet Fellbach GmbH | Gutenbergstraße 20 | 70736 Fellbach | Deutschland | +49 711 51822 0 | met-info@otthydromet.com | www.otthydromet.com

FAT Certificate & Protocol – Smart Weather Sensor

Model type	**WS600-UMB**
Serial number	**189.0724.0701.251**

This is to certify, that this Lufft branded product has been tested according to the QM of the OTT HydroMet Fellbach GmbH manual in accordance with DIN EN ISO 9001. Ordering specifications are complied with. Execution of instruments / systems as well as testing of accuracy was carried out following OTT HydroMet quality assurance procedures. Quality inspection was successfully passed. This Lufft product has been calibrated according to specifications using references traceable to international standard units administrated by the national metrology institutes like PTB, NIST, NPL or other recognized national standard laboratories.

Measurements

	Reference value	*Observed value*	*Error*	*Status*
Relative humidity	**15.0 % RH**	**15.0 % RH**	**0.0 % RH**	✓
Relative humidity	**75.0 % RH**	**75.0 % RH**	**0.0 % RH**	✓
Temperature	**0.01 °C**	**0.01 °C**	**0.00 °C**	✓
Air pressure	**985.7 hPa**	**985.7 hPa**	**0.0 hPa**	✓

Precipitation

	Reference value	*Observed value*	*Status*
Drop size small	**0.115 mm**	**0.116 mm**	✓
Drop size medium	**0.670 mm**	**0.671 mm**	✓
Drop size large	**2.730 mm**	**2.793 mm**	✓

Wind direction and speed

Angular deviation (0° ... 360° in steps of 22.5°)

	2.0 m/s	*5.0 m/s*	*10.0 m/s*	*20.0 m/s*	*50.0 m/s*	*Status*
RMSE	**0.6°**	**0.3°**	**0.5°**	**0.6°**	**0.7°**	✓

Wind speed

	2.0 m/s	*5.0 m/s*	*10.0 m/s*	*20.0 m/s*	*50.0 m/s*	*Status*
RMS	**2.0 m/s**	**5.0 m/s**	**10.0 m/s**	**19.9 m/s**	**49.8 m/s**	✓

EFFECTIVE
16 SEP 2024
DATE

Fellbach, 10.07.2024

Qualitätssicherung
Quality control
i. A. Hartmut Schneider

Bearbeiter
Person in charge
i. A. Annemarie Galetzka