

A47 Blofield to North Burlingham Dualling

Scheme Number: TR010040

Volume 6

6.2 Environmental Statement Appendices

Appendix 11.3 Baseline Noise Survey

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

September 2021~~December 2020~~

Deadline 4

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

A47 Blofield to North Burlingham
Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT APPENDICES
Appendix 11.3 Baseline Noise Survey

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010040
Application Document Reference	6.2
Author:	A47 Blofield to North Burlingham Dualling Project Team, Highways England

Version	Date	Status of Version
Rev 0	December 2020	Application Issue
<u>Rev 1</u>	<u>September 2021</u>	<u>Deadline 4</u>

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11 Baseline Noise Survey

11.1. Study area

- 11.1.1. The priority for undertaking measurements was given to residential properties considered to have the potential to be affected by the Proposed Scheme. The closest accessible position of each property was used.
- 11.1.2. All long-term (LT) measurements were conducted over a week from the 5 June 2018 to the 12 June 2018. Short-term (ST) measurements were conducted during the 6, 7 and 8 June 2018 during the daytime.
- 11.1.3. The positions used for the measurements are indicated in Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**).

11.2. Methodology

Measurement procedure

- 11.2.1. Table 11-1 presents details of the noise measurement equipment used. The sound level meters were designed to conform to:
 - Type 1 standard as defined within International Electro-technical Commission (1979) IEC 651:1979. Sound level meters
 - Class 1 standard as defined within International Electro-technical Commission (2002) IEC 61672-1:2002. Electroacoustics-Sound level meters: Specifications
- 11.2.2. All sound level meters were calibrated by an UKAS accredited laboratory, traceable to national and international standards and no more than two years before the period of all measurements.
- 11.2.3. The field calibrator used was designed to be in compliance with International Electro-technical Commission (2003) IEC 60942:2003 Electroacoustics-Sound calibrators. The field calibrator was calibrated by an UKAS accredited laboratory, traceable to national and international standards and no more than one year before the period of all measurements.
- 11.2.4. Before and after each measurement session, the reference calibration of all sound level meters was checked using the field calibrator. Variations of no greater than 0.2dB were noted over all the measurement periods.

Table 11-1: Summary of equipment used for surveys

Measurements type	Sound level meter	
	Model	Serial number
Long-term (1 week)	Rion NL-52	743137
	Rion NL-52	754168
	Rion NL-52	1176426
	Rion NL-52	1176427
	Rion NL-52	231672
	Rion NL-52	1143538
Short-term	Rion NL-52	1143539
Calibrator	Larson Davis CAL200	5132

- 11.2.5. For short-term and long-term measurements, the microphones were supported using a tripod at a height of 1.2 to 1.5m above the ground and fitted with a windshield suitable for outdoor use. Unless stated otherwise, measurements were conducted in the acoustic free field ie more than 3.5m away from any walls or vertical reflecting surfaces. Where measurements were undertaken in close proximity to buildings (a façade measurement), the horizontal distance between the microphone and the façade was 1m, where possible or otherwise stated.
- 11.2.6. For all the long-term measurements, the A-weighted equivalent continuous noise level ($L_{Aeq,8hr}$ and $L_{A10,18hr}$) were obtained along with a number of statistical indices (L_{AMax} , L_{A10} , L_{A90}) over contiguous one hour intervals.
- 11.2.7. Photographs, to allow repeatability of the measurement locations (from Figure 11.3.9 to 11.3.24) and descriptions of the site, noise climate and weather conditions were noted at each measurement position. Where possible, measurements were conducted under dry conditions. Wind speeds were checked using a hand-held anemometer to be within the guideline limit of 5m/s for noise monitoring.
- 11.2.8. Significant extraneous noise events were excluded from the attended measurements unless they were regular features of the noise climate in that area.
- 11.2.9. All measurements were undertaken by consultants competent in environmental noise monitoring and completed in accordance with the

principles of BS 7445-1: 2003 *Description and measurement of environmental noise. Guide to quantities and procedures.*

Weather conditions

- 11.2.10. The weather conditions during the survey (short-term measurement and installation and collection of long-term) were considered suitable to undertake noise measurements. Historic meteorological data have been supplied by the Met Office © Crown copyright 2018, the Met Office, at <https://www.metoffice.gov.uk/> from Waybourne observation site. Actual wind speeds at the site would be expected to be less than those recorded at the meteorological station as the microphone was located closer to the ground.
- 11.2.11. On 5 June 2018, the weather was dry and overcast. Based on meteorological data collected at each location, wind speeds varied between 0.4m/s and 2.0m/s and direction was mainly to north east. Temperatures were between 11°C and 12°C.
- 11.2.12. On 6 June 2018, the weather was dry with variable cloud cover up to a maximum of 50%. Based on meteorological data collected at each location, wind speeds varied between 0.6m/s and 2.4m/s and direction was mainly to north east. Temperatures were between 11°C and 18°C.
- 11.2.13. On 7 June 2018, the weather was dry with variable cloud cover up to overcast and occasional sunny spells. Based on meteorological data collected at each location, wind speeds varied between 0.6m/s and 2.6m/s and direction was mainly to north. Temperatures were between 13°C and 17°C.
- 11.2.14. On 8 June 2018, historic meteorological data indicates that the weather was dry and cloudy. The wind speeds varied between 3.6m/s and 5.6m/s and direction was mainly to the north. Temperatures were between 12°C and 15°C.
- 11.2.15. On 9 June 2018, historic meteorological data indicates that the weather was dry and cloudy. The wind speeds varied between 3.0m/s and 4.4m/s direction was mainly to the north-north east. Temperatures were between 11°C and 14°C.
- 11.2.16. On 10 June 2018, historic meteorological data indicates that the weather was dry and cloudy. The wind speeds varied between 1.2m/s and 4.0m/s and direction was mainly to the north east. Temperatures were between 8°C and 14°C.

11.2.17. On 11 June 2018, historic meteorological data indicates that the weather was dry and cloudy. The wind speeds varied between 1.2m/s and 6.2m/s and direction was mainly to the east. Temperatures were between 8°C and 15°C.

11.2.18. On 12 June 2018, the weather was dry and overcast. Based on meteorological data collected at each location, wind speed was less than 2.0m/s and were mainly to north east. Temperatures were between 10°C and 14°C.

11.3. Results

11.3.1. A summary of all the results of the baseline noise measurements is provided in Table 11-2 for the short term and in Table 11-3 for the long term while the results of each position are within Table 11-4 to Table 11-18. Additionally, the results of the long-term noise measurement are presented graphically within Figure 11.3.1 to Figure 11.3.8 (TR010040/APP/6.3).

Summary results

11.3.2. Table 11-2 summarise the short-term data collected for each of the measurement positions. All levels have been rounded to the nearest whole number.

Table 11-2: Summary of all short-term noise measurement data

Position	Dates	Range of L _{Aeq} dB	Range of L _{Amax} dB	Range of L _{A10} dB
ST1	06-07/06/2018	65-66	80-88	68
ST2	06-07/06/2018	50-51	56-67	52
ST3	06-07/06/2018	56-59	63-68	58-62
ST4 H	07-08/06/2018	56-59	64-73	59-60
ST4 R	06-07-08/06/2018	54-58	70-82	53-56
ST5	06-07/06/2018	50-54	57-69	51-55
ST6	06-07/06/2018	51-58	63-83	41-43
ST7	06-07/06/2018	52-56	64-67	53-57
ST8	06-07/06/2018	60-61	66-67	62-64
ST9	06-07/06/2018	72-73	80-81	76

11.3.3. Table 11-3 summarise the free field values of the LT data per each of the measurement positions for representative weekdays only (5th, 6th, 7th and 8th June 2018). All levels have been rounded to the nearest whole number. The time range of each parameter is:

- LA_{10,18h} day time - between 06:00 and 24:00;
- LA_{eq,12h} day time - between 07:00 and 19:00;
- LA_{eq,4h} evening time - between 19:00 and 23:00;
- LA_{eq,8h} night time - between 23:00 and 07:00.

11.3.4. Partial measurements of periods at the start and end of the survey have not been included.

Table 11-3: Summary of free field LT data for representative weekdays only

Position	Location	LA _{10,18h} day time dB	LA _{eq,12h} day time dB	LA _{eq,4h} evening time dB	LA _{eq,8h} night time dB
LT1 *	Izola, North Street, Blofield, NR13 4RH	54	55	52	46
LT2	111 Yarmouth Road, Blofield, NR13 4LQ	72**	67	63	60
LT3	Brienz, Waterlow, Blofield, NR13 4LJ	54	54	51	49
LT4	Old Post Office, North Burlingham, NR13 4SU	75	73	70	68
LT5	The White House, Acle Road, North Burlingham, NR13 4EL	71	70	66	64
LT6 *	2 Hall Cottages, The Windle, Acle, NR13 3JT	71	69	66	62

* Data collected with façade measurement and subsequently corrected to free field values

**Estimated from Figure 11.4 LT2 plot of results

Short-term measurement results

11.3.5. The duration of each short-term measurement was 15 minutes.

11.3.6. Position ST1 was located on the grass at the junction of Yarmouth Road with an Unnamed Road (leading to Waterlow and Hemblington Road), approximately 45m to the south of the A47 carriageway towards Norwich. This is the closest access to the A47 to the east of Blofield (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)). There was a clear line of sight with the A47.

Table 11-4: ST1 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	9:13	65.6	88.4	67.7	59.0
06/06/2018	15:42	64.9	80.2	68.0	59.2
07/06/2018	12:28	65.0	81.9	67.6	59.1

11.3.7. Position ST2 was located at the edge of a field behind Violet Bank Lingwood Road, Blofield, Norwich, NR13 4LL (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)).

Table 11-5: ST2 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	10:39	50.4	67.3	52.1	47.5
06/06/2018	16:36	50.0	55.9	51.6	48.0
07/06/2018	13:54	50.5	64.0	52.2	48.4

11.3.8. Position ST3 was located at the entrance of the field to the west of Lingwood Road, North Burlingham, Norwich, NR13 4ST. This field is also to the south of the A47 and to the north of Hornbeam Cottage, Lingwood Road, North Burlingham, Norwich, NR13 4ST (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)). There was a clear line of sight with the A47.

Table 11-6: ST3 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	11:11	56.4	63.0	58.4	53.5
06/06/2018	16:08	58.3	64.4	60.2	55.6
07/06/2018	08:42	59.1	68.2	61.7	54.9

11.3.9. Position ST4 H (home) was located in the back garden of no. 6 Main Road, North Burlingham, Norwich, NR13 4TA. The back garden has clear line of sight with the A47 (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)).

Table 11-7: ST4 H data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
07/06/2018	11:01	56.9	71.3	59.2	51.6
07/06/2018	14:25	56.1	64.3	58.5	51.2

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
07/06/2018	17:31	58.6	72.5	60.4	54.9
08/06/2018	08:03	57.9	65.9	59.8	54.5

11.3.10. Position ST4 R (road) was located on the pavement at the entrance on the field in Main Road, North Burlingham, Norwich, NR13 4TA; adjacent to house no. 16 and in front of house no. 7. There was a clear line of sight with the A47 (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)).

Table 11-8: ST4 R data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	15:05	56.0	79.3	56.0	48.4
07/06/2018	10:37	55.3	80.2	53.1	47.8
07/06/2018	17:50	53.7	69.7	55.0	50.8
08/06/2018	08:23	57.7	82.4	55.8	50.8

11.3.11. Position ST5 was located along the driveway to the north of the house of View Farm, Lingwood Lane, North Burlingham, Norwich, NR13 4TB (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)).

Table 11-9: ST5 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	12:01	50.3	61.3	52.1	47.4
06/06/2018	12:16	49.8	68.5	51.2	46.5
07/06/2018	09:13	53.5	59.5	55.0	51.6
07/06/2018	14:50	51.1	57.1	52.8	49.3

11.3.12. Position ST6 was located in the orchard to the south of the house of Nelson Place, South Walsham Road, Norwich, NR13 4EH (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)).

Table 11-10: ST6 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	12:46	50.6	64.9	54.9	41.7
07/06/2018	09:39	52.2	66.2	56.4	43.3
07/06/2018	15:15	57.6	82.6	55.8	40.9

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
07/06/2018	15:30	50.2	63.2	54.7	42.5

11.3.13. Position ST7 was located in the field adjacent to Mustard House, Coxhill Road, North Burlingham, Norwich, NR13 4EN (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)).

Table 11-11: ST7 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	13:16	51.1	63.8	53.0	48.1
07/06/2018	10:08	53.5	67.2	55.4	50.6
07/06/2018	15:55	55.7	66	57.4	53.1

11.3.14. Position ST8 was located behind the embankment at the end of North Street, Blofield, NR13 4RA (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)).

Table 11-12: ST8 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	10:03	59.8	66.4	62.3	55.6
06/06/2018	17:44	61.4	65.7	63.5	58.1
07/06/2018	13:18	60.7	67.2	63.1	56.7

11.3.15. Position ST9 was located on a public footpath half way of the embankment facing the A47, behind no. 9 Highview Close, Blofield, NR13 4RA, close to the A47 carriageway towards Norwich (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)). There was a clear line of sight with the A47.

Table 11-13: ST9 data summary

Date	Start time	L _{Aeq,T} dB	L _{Amax} dB	L _{A10,T} dB	L _{A90,T} dB
06/06/2018	09:42	72.1	79.9	75.5	63.9
06/06/2018	17:26	73.4	80.4	76.4	68
07/06/2018	13:00	72.4	80.9	75.5	65.5

Long-term measurement results

11.3.16. Highways England undertook road works from the 11 June 2018 for approximately four weeks during weekdays between 20:00 and 06:00 along the A47 between the east of Blofield and North Burlingham. This section was closed in both direction and traffic was diverted to the north of this area. Therefore, although included in the tables and graphs below, measurements from the night of 11 June 2018 are not considered representative.

11.3.17. $L_{Aeq,8h}$ night time is between 23:00-07:00, whilst $L_{A10,18h}$ day time is 06:00-24:00. Partial measurements of periods at the start and end of the survey have not been included.

11.3.18. Position LT1 was located in the back garden of Izola, North Street, Blofield, NR13 4RH (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)). This is a façade measurement.

Table 11-14: LT1 data summary (façade measurement)

Date	$L_{Aeq,8h}$ night time dB	$L_{A10,18h}$ day time dB
06/06/2018	49.0	57.6
07/06/2018	49.1	56.0
08/06/2018	48.8	57.2
09/06/2018	48.2	55.9
10/06/2018	47.9	56.3
11/06/2018	51.3	54.9
12/06/2018	47.8	---

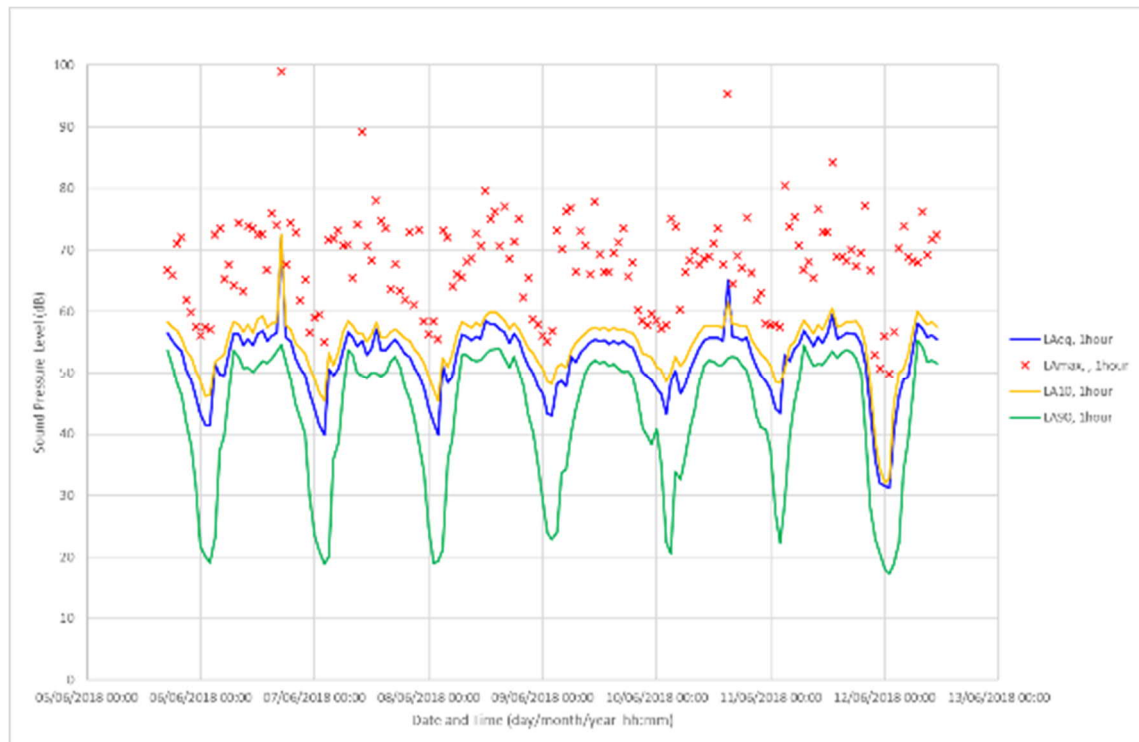


Figure 11.3.1 LT1 plot of results (façade measurement)

11.3.19. Position LT2 was located in the back garden of no. 111 Yarmouth Road, Blofield, NR13 4LQ, close to the A47 carriageway towards Norwich (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)). There was a clear line of sight with the A47.

Table 11-15: LT2 data summary

Date	L _{Aeq,8h} night time dB	L _{A10,18h} day time dB
06/06/2018	60.4	69-73*
07/06/2018	60.2	69-73*
08/06/2018	60.1	69-73*
09/06/2018	58.0	68-70*
10/06/2018	58.5	69-72*
11/06/2018	61.1	69-73*
12/06/2018	59.7	---

* Estimated from Figure 11.3.4 LT2 plot of results

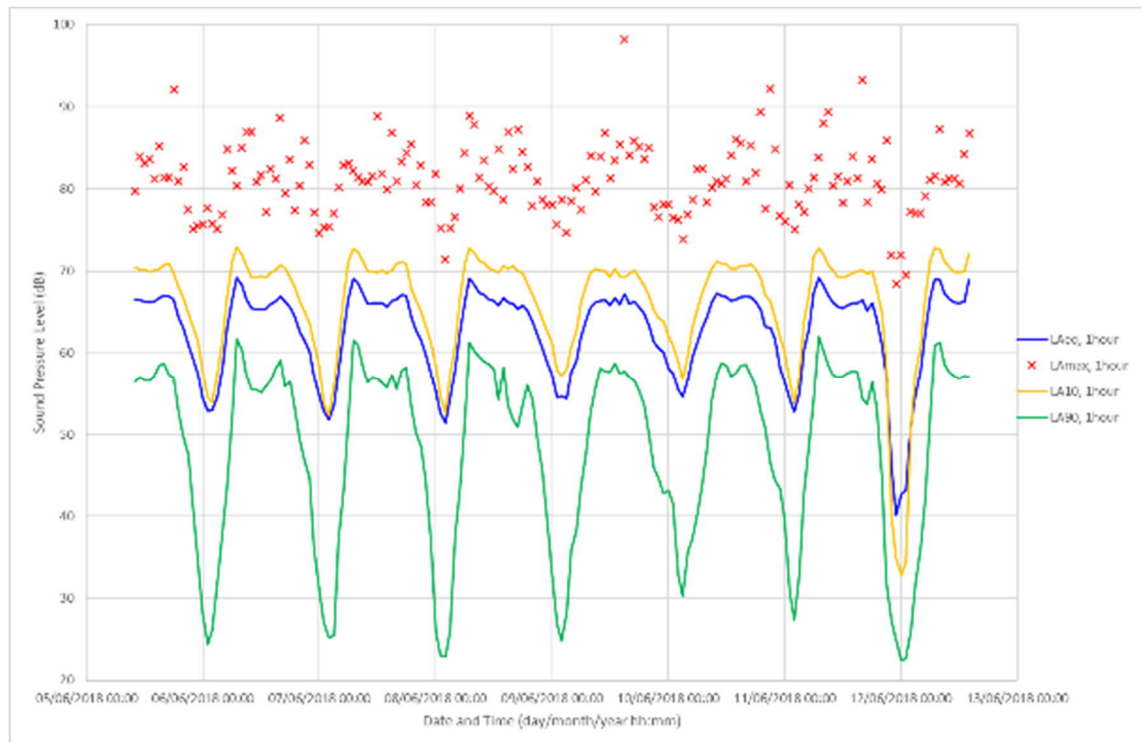


Figure 11.3.2 LT2 plot of results

11.3.20. Position LT3 was located in the back garden of Brienz, Waterlow, Blofield, NR13 4LJ (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)).

Table 11-16: LT3 data summary

Date	L _{Aeq,8h} night time dB	L _{A10,18h} day time dB
06/06/2018	48.4	53.4
07/06/2018	49.8	54.6
08/06/2018	48.6	54.4
09/06/2018	49.6	53.4
10/06/2018	49.0	53.4
11/06/2018	52.1	52.1
12/06/2018	48.9	---

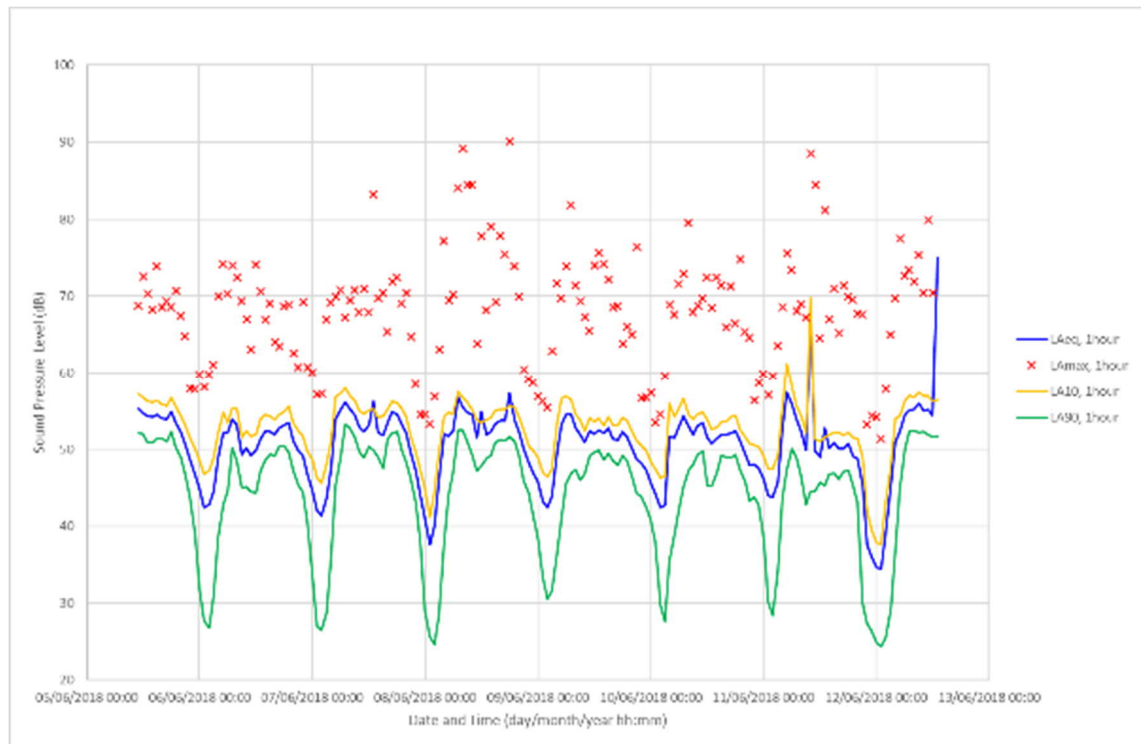


Figure 11.3.3 LT3 plot of results

11.3.21. Position LT4 was located in the front garden of the Old Post Office, North Burlingham, Norwich, NR13 4SU, close to the A47 carriageway towards Acle. There was a clear line of sight with the A47 (refer to Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**)).

Table 11-17: LT4 data summary

Date	L _{Aeq,8h} night time dB	L _{A10,18h} day time dB
06/06/2018	67.6	75.2
07/06/2018	67.4	75.1
08/06/2018	67.5	75.3
09/06/2018	66.4	75.1
10/06/2018	66.1	75.0
11/06/2018	67.9	72.4
12/06/2018	66.5	---

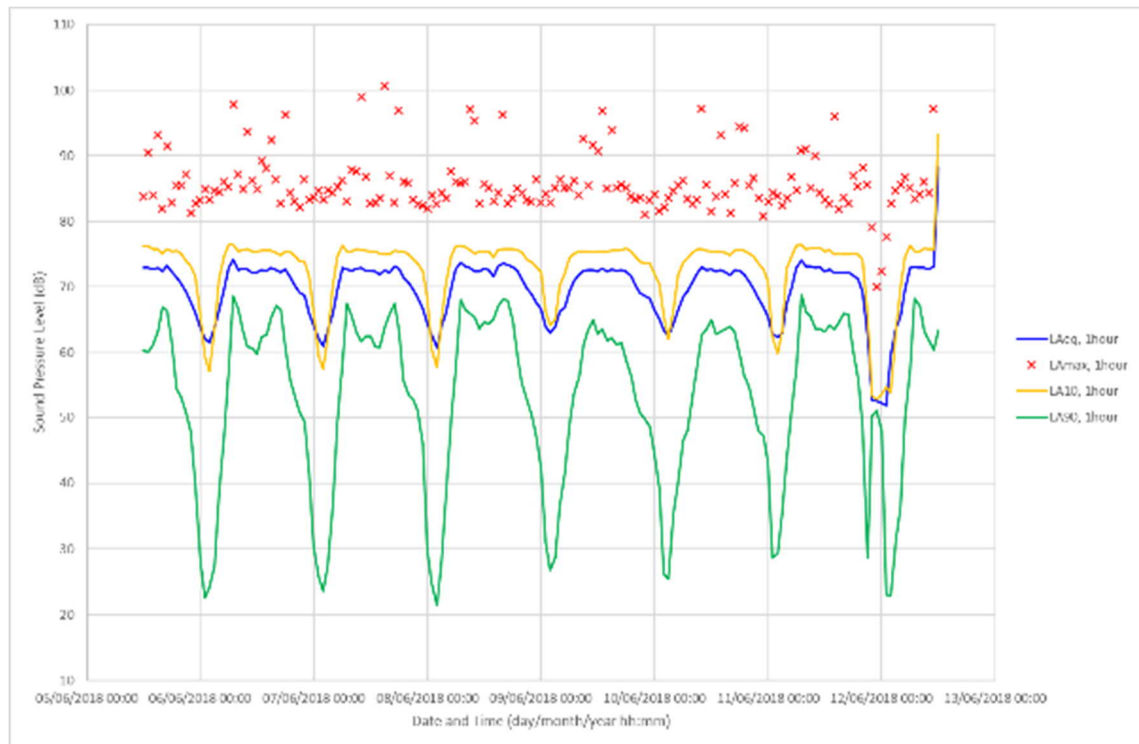


Figure 11.3.4 LT4 plot of results

11.3.22. Position LT5 was located in the lateral garden of The White House, Acle Road, North Burlingham, Norwich, NR13 4EL, close to the A47 carriageway towards Norwich (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3)). There was a clear line of sight with the A47.

Table 11-18: LT5 data summary

Date	L _{Aeq,8h} night time dB	L _{A10,18h} day time dB
06/06/2018	64.4	71.1
07/06/2018	64.4	71.5
08/06/2018	64.1	71.6
09/06/2018	62.4	71.0
10/06/2018	62.4	70.7
11/06/2018	64.7	69.3
12/06/2018	64.0	---

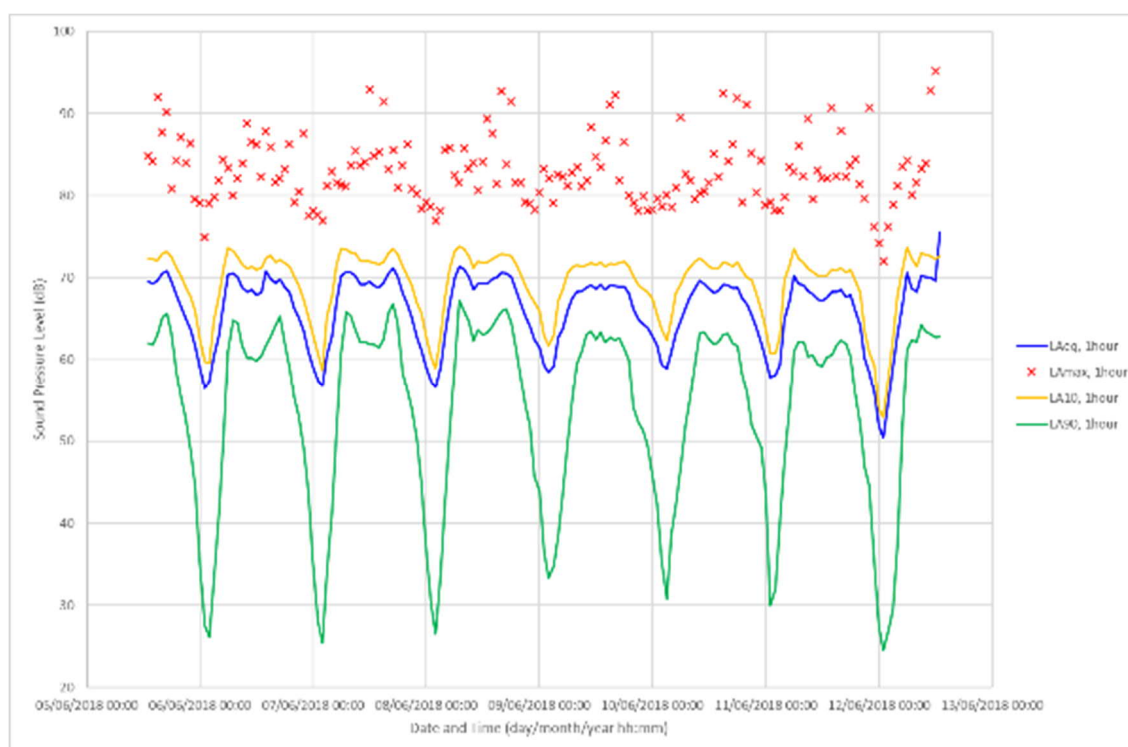


Figure 11.3.5 LT5 plot of results

11.3.23. Position LT6 was located in the back garden of no. 2 Hall Cottages, The Windle, Acle, Norwich, NR13 3JT, close to the A47 carriageway towards Acle (refer to Figure 11.1 (Noise location plan) (TR010040/APP/6.3). This is a façade measurement.

Table 11-19: LT6 data summary

Date	<u>L_{Aeq,9h} night time dB</u>	<u>L_{A10,18h} day time dB</u>
<u>06/06/2018</u>	<u>64.8</u>	<u>74.5</u>
<u>07/06/2018</u>	<u>64.5</u>	<u>74.7</u>
<u>08/06/2018</u>	<u>65.0</u>	<u>75.2</u>
<u>09/06/2018</u>	<u>63.8</u>	<u>74.4</u>
<u>10/06/2018</u>	<u>63.4</u>	<u>73.8</u>
<u>11/06/2018</u>	<u>65.4</u>	<u>74.4</u>
<u>12/06/2018</u>	<u>64.3</u>	-

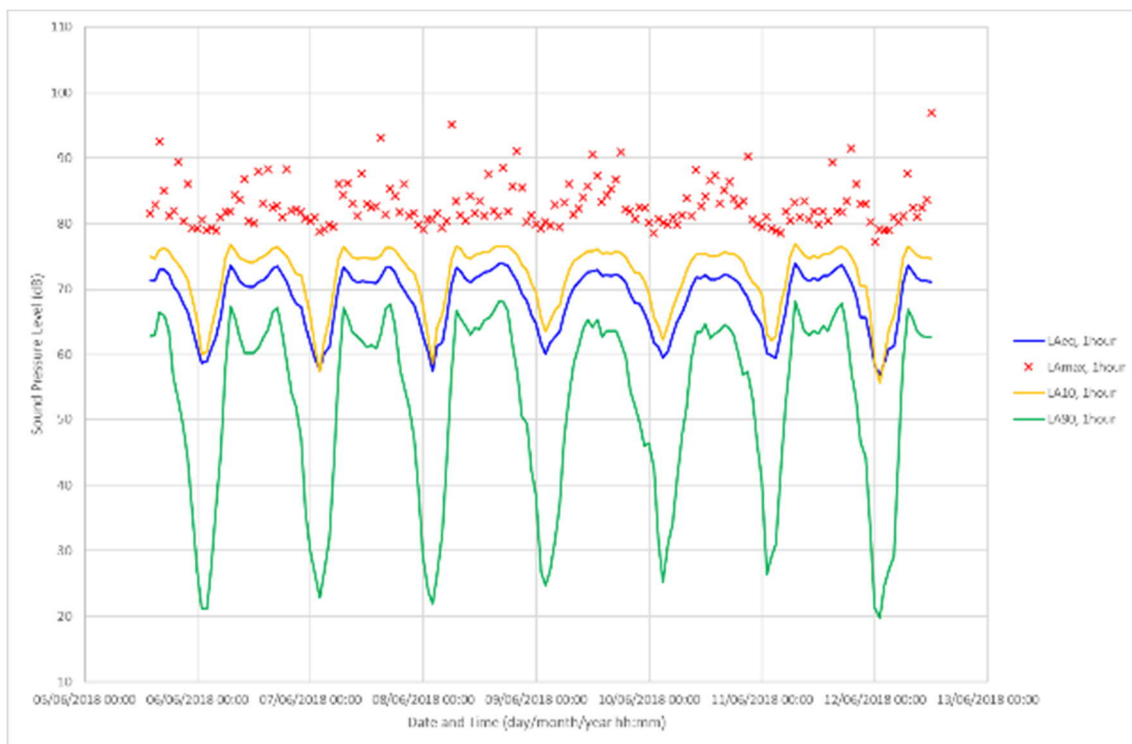


Figure 11.3.6 LT6 plot of results (façade measurement)

Photographs

Short-term measurement positions



Figure 11.3.7: ST1



Figure 11.3.8: ST2 (photo taken towards west)



Figure 11.3.9: ST3 (photo taken towards south)



Figure 11.3.10: ST4 H



Figure 11.3.11: ST4 R (photo taken towards east)



Figure 11.3.12: ST5 (photo taken towards north)



Figure 11.3.13: ST6 (photo taken towards east)



Figure 11.3.14: ST7 (photo taken towards south-east)



Figure 11.3.15: ST8 (photo taken towards north)



Figure 11.3.16: ST9 (photo taken towards east)

Long-term measurement positions



Figure 11.3.17: LT1 (façade measurement)



Figure 11.3.18: LT2 (photo taken towards north-east)



Figure 11.3.19: LT3



Figure 11.3.20: LT4



Figure 11.3.21: LT5



Figure 11.3.22: LT6 (façade measurement)

