



PR HOMES DIRECT LTD

**1-3 BARCLAY COURT, MARKET PLACE
HAYWARDS HEATH**

NOISE IMPACT ASSESSMENT

TECHNICAL REPORT: RFE-0615-25-01-02

DATE: MARCH 2025



PROJECT TITLE: 1-3 BARCLAY COURT, MARKET PLACE, HAYWARDS HEATH

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1-3 BARCLAY COURT, MARKET PLACE, HAYWARDS HEATH NOISE IMPACT ASSESSMENT

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1 INTRODUCTION

RF Environmental Ltd (RFE) was commissioned by PR Homes Direct Ltd to undertake a noise and assessment of the proposed fixed plant associated with the proposed residential development at 1-3 Barclay Court, Haywards Heath, West Sussex, RH16 1DB.

This report has been prepared to assist with the discharge of a noise related planning condition. The condition is presented in full in Chapter 3.

The objective of this report is to assess the noise impact from the proposed operation of air source heat pumps (ASHP's) at the nearest noise sensitive receptors, in accordance with BS4142:2014+A1:2019. The requirement for any further noise mitigation measures will be assessed.

The findings of the assessment are reported herein.

The existing site and proposed development are described in the following section of this report, whilst the legislation and criteria used for the assessment are included within Section 3 of this report. The sound survey is presented in Section 4, whilst the noise impact assessment is addressed in Section 5. Finally, the conclusions of this study are summarised in Section 7. Figures and Tables are presented in Appendix A and B, respectively. A description of useful acoustic terms can be found in Appendix C.

The report has been produced by Jamie Pearson (MIOA) and reviewed by Richard Fenton (MIOA, MCIEH). Richard and Jamie are qualified and experienced in the production of noise impact assessments following the methodology provided in BS 4142 and have produced a considerable number of assessments in consultancy roles and reviewed them in local authority roles.



2 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 Site Description

The site is located in an urban area, surrounded primarily by commercial buildings in the immediate vicinity, with residential buildings in the broader surroundings.

Market Place borders the front of the building to the east.

To the south, across the car park access, is a vehicle repair shop.

The site is bordered to the west by an office block and to the north by Hayworth House, which is let out for commercial use.

Haywards Heath train station is approximately 25 meters east of the proposed development site.

The site location plan is presented in Figure A1 of Appendix A.

2.2 Development Description

The residential development will involve the extension and conversion of the existing building which has been operating as an education centre, to residential use comprising ten flats. The current building is three storeys plus a lower ground floor. An additional floor level (3rd floor) will be added to the building. Residential flats will be located on the ground to the third floor.

The floor plans are presented in Figures A2 to A8 of Appendix A.

The elevation drawings are presented in Figure A9 of Appendix A.

2.3 External Plant

10 no. ASHP units are to be installed at the rear of the development site.

The outdoor ASHP units to be installed are:

- 10 no. Samsung MONO 5 R32 outdoor units.

The sound pressure level given by the manufacturer for all the outdoor unit types is 45 dB (A) at 1m, as displayed in Figure A10 of Appendix A.

The units supply heating to the properties and where required, will operate during both the daytime and night-time periods.

The locations of the units are shown in Figure A9 of Appendix A.



3 ASSESSMENT CRITERIA

3.1 Local Authority Requirements

The planning condition to which this noise report relates are presented below.

Condition 18: *'Noise from plant: The development permitted shall not be occupied until a scheme has been submitted to the LPA demonstrating that the noise rating level ($L_{Ar,Tr}$) of plant and machinery within the build shall be at least 5dB below the background noise level ($L_{A90,T}$) at the nearest residential facades. All measurements shall be defined and derived in accordance with BS4142:2014+A1:2019. The approved measures shall be implemented before the development is occupied and thereafter be maintained in accordance with the approved details.'*¹

3.2 British Standard BS4142: 2014+A1 2019

Guidance on the rating and assessing of sound of an industrial and/or commercial nature is contained in British Standard (BS) 4142: 2014+A1 2019 'Methods for rating and assessing industrial and commercial sound'²

The standard states that:

This standard is applicable to the determination of the following levels at outdoor locations

- a) rating levels for sources of sound of an industrial and/or commercial nature; and*
- b) ambient, background and residual sound levels*

for the purposes of:

- 1. investigating complaints;*
- 2. assessing sound from proposed, new, modified or additional source(s) of sound of an industrial nature and/or commercial nature; and*
- 3. assessing sound at proposed new dwellings or premises used for residential purposes.*

The determination of noise amounting to a nuisance is beyond the scope of this British Standard.

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

¹ Draft Planning Permission. Ref: DM/23/3230. February 2025.

² British Standard BS4142: 2014+A1 2019. Methods for rating and assessing industrial and commercial sound



Typically, the greater the difference between rating level and background noise level, the greater the magnitude of the impact:

- a difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- a difference of around +5 dB is likely to be an indication of an adverse impact depending on context; and
- the lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Certain acoustic features can increase the significance of the impact of a specific sound source. These features include tonality and impulsivity, as well as additional characteristics and intermittency of the sound.

Where appropriate, a rating penalty for sound based on a subjective assessment of its characteristics should be established. In other circumstances an objective appraisal of tonal and/or impulsive characteristics may be appropriate.

4 ENVIRONMENTAL SOUND SURVEY

4.1 Unattended Baseline Sound Survey

Unattended continuous monitoring of existing sound levels was undertaken at the monitoring location shown as LT1 on Figure A1 of Appendix A. The equipment used during the survey is presented in Table 4.1 below.

Manufacturer	Model No.	Description	Serial No.	Calibration Due Date
Larson Davis	LxT	Sound Level Meter	0006489	January 2026
Larson Davis	CAL200	Acoustic Calibrator	12981	April 2025

TABLE 4.1: SOUND MONITORING EQUIPMENT

The sound level meter was powered by dry cell batteries and stored inside a weatherproof security box.

Measurements were obtained using the 'F' time weighting and A-weighting frequency network. The equipment was calibrated before and after the survey to generate a calibration level of 114.0 dB at 1 kHz, with the noted drift following within acceptable tolerances.

The measurement location was in the external rear courtyard, as shown in Figure 4.1 below.

15-minute measurements of $L_{Amax,F}$, $L_{Aeq,15min}$, and $L_{A90,15min}$ sound levels were obtained at this monitoring location between 09:30hrs on Thursday 23rd January 2025 and 09:30hrs on Monday 27th January 2025, with the microphone position set at a height of approximately 1.5m above ground level in free-field conditions.

4.2 Weather Conditions

Weather conditions during the site visits are presented below in Table 4.2.

Site Visit	Date and Time	Noted Weather
Setup	23/01/2025 09:30hrs	Light rain; 6°C; 98% humidity; Average windspeeds <1.2m/s
Collection	27/01/2025 09:30hrs	Dry; 7°C; 88% humidity; Average windspeeds <0.5m/s

TABLE 4.2: WEATHER CONDITIONS DURING SITE VISITS

A history of the weather conditions during the continuous survey period has been obtained from an internet source (www.wunderground.com).

Analysis of the data captured during the unattended monitoring shows a period of unsettled weather, with periods of rain on four of the days surveyed.

There were wind gusts over 5m/s between 03:30hrs and 09:15hrs on Friday 24th January 2025 and between 11:45hrs on Sunday 26th January 2025 and 01:15hrs on Monday 27th January 2025.

Analysis of the noise dataset indicates that the periods of high wind gusts may have influenced the measured sound levels during these periods and have therefore been discounted from the data analysis.

The weather conditions obtained for the survey period are summarised in Figure A11 of Appendix A.

4.3 Sound Survey Results

The results of the unattended sound measurement survey are presented graphically in Figure A12 of Appendix A, tabulated in Table B1 of Appendix B and summarised in Table 4.3 below.

Date	Measured Sound Levels, dB					
	Daytime (07:00 - 23:00)			Night-time (23:00 - 07:00)		
	L _{Amax,F}	L _{Aeq,16hr}	L _{A90,16hr}	L _{Amax,F}	L _{Aeq,8hr}	L _{A90,8hr}
Thu 18/07/24 ^[1]	66(56-86)	54	48	63(51-73)	53	46
Fri 19/07/24	66(53-91)	54	46	55(47-64)	41	36
Sat 20/07/24	65(54-76)	50	43	54(42-66)	40	36
Sun 21/07/24	66(56-83)	54	48	61(53-68)	50	42
Mon 22/07/24 ^[1]	72(63-92)	57	49	-	-	-
Average	67(65-72)	54	47	58(54-63)	46	40
Average (Excluding Adverse Weather)	67(65-70)	53	46	57(54-61)	44	38

TABLE 4.3: SUMMARY OF UNATTENDED SOUND MEASUREMENTS, LT1

Notes:

[1] indicates incomplete daytime period due to equipment installation.

The results of the unattended sound measurement show that with periods of adverse weather removed, ambient day time L_{Aeq,16hr} sound levels produced an arithmetic average of 53 dB L_{Aeq,16hr}. The night-time L_{Aeq,8hr} sound levels produced an arithmetic average of 44 dB L_{Aeq,8hr}.

During the daytime period, an arithmetic average of the background sound levels provides a sound level of 46 dB L_{A90,16hr}. The night-time L_{A90,8hr} sound levels provide an arithmetic average of 38 dB L_{A90,8hr}.



5 ASSESSMENT OF PLANT SOUND LEVELS

5.1 BS4142:2014+A1:2019

The method for predicting the significance of sound of an industrial and/or commercial nature in accordance with the principles of BS 4142:2014 is based on a comparison of the rating level, defined as the specific sound level plus any adjustment for the characteristic features of the sound, with the background sound level, $L_{A90,T}$.

The standard is applicable for assessing sound at proposed new dwellings or premises used for residential purposes.

5.2 Closest Residential Receptors

The closest residential receptors to the external plant is the flats located on the rear façade of the new development.

Four calculation receptors have been selected and are labelled as R1 and R4 on Figures A4 to A7 of Appendix A.

5.3 Background Sound Levels

The $L_{A90,T}$ background sound level is the sound level exceeded for 90 % of the time in the absence of any sound from the specific source of interest.

‘Typical’ background sound levels observed over the period of interest, as described in BS4142:2014, are usually established for the purposes of a noise assessment of this kind, with BS4142 stating that a ‘representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value’.

During the daytime operating periods (07:00hrs to 23:00hrs) background sound levels ranging from 36 dB to 57 dB $L_{A90,15min}$ have been recorded at the monitoring position LT1. The daytime background sound level adopted for the purposes of this assessment is 47 dB $L_{A90,15min}$ as this is considered a representative value and was most commonly recorded at 18% of the time, as presented in Figure A13 of Appendix A.

During the night-time operating periods (23:00hrs to 07:00hrs), background sound levels ranging from 35 dB to 45 dB $L_{A90,15min}$ have been recorded at the monitoring position LT1. The daytime background sound level adopted for the purposes of this assessment is 35 dB $L_{A90,15min}$ as this is considered a representative value and was most commonly recorded at 25% of the time, again as presented in Figure A13 of Appendix A.

Combined Specific Noise Level

A computer noise model of the site and plant, including all acoustically important surrounding buildings have been generated using SoundPlan Essential v5.0 to predict the specific noise

level at the site. This proprietary software implements the noise propagation calculations specified in ISO 9613-2 as follows:

$$L_{ft}(DW) = L_w + D_c - A$$

where

$L_{ft}(DW)$	=	equivalent continuous downwind octave-band sound pressure level at a receiver location
L_w	=	sound power level of the noise source
D_c	=	directivity correction
A	=	attenuation that occurs during propagation from the point sound source to the receiver. $A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{misc}$
A_{div}	=	attenuation due to geometrical divergence
A_{atm}	=	attenuation due to atmospheric absorption
A_{gr}	=	attenuation due to the ground effect
A_{bar}	=	attenuation due to a barrier
A_{misc}	=	attenuation due to miscellaneous other effects

A screenshot of the noise model, which has been used to predict the specific noise level for the existing plant at the nearest noise sensitive receptors is shown in Figure 5.1 below.

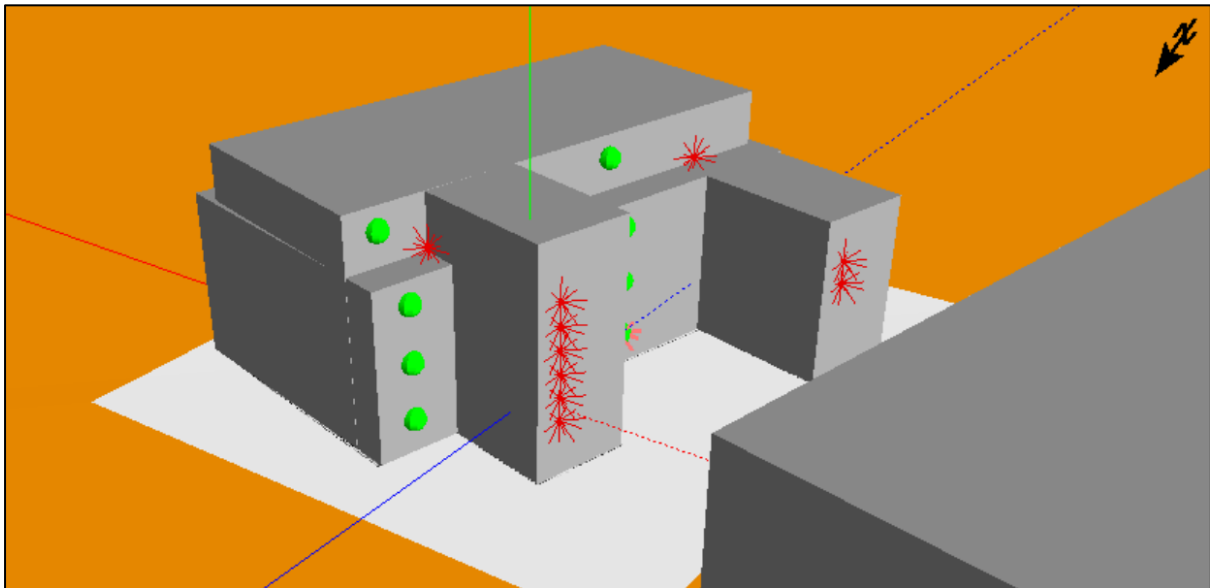


FIGURE 5.1: SCREENSHOT OF NOISE MODEL

The following assumptions have been made for the noise modelling exercise:

- All of the proposed plant is represented as a point source and has been modelled in the location shown in Figure A9 of Appendix A;
- Omnidirectional radiation assumed;



- For worst case assessment, all plant is assumed to operate continuously and simultaneously;
- Ground absorption has been modelled as hard ground;
- Ground elevation has been modelled as flat;
- The R1 and R2 receptors have been modelled in free-field conditions, 1.5m above local ground to represent ground floor level with 2.5m repeats for each floor (floors 1 and 2). The highest calculated floor has been adopted as the specific sound level to ensure a worst case assessment;
- The R3 and R4 receptors have been modelled in free-field conditions, 1.5m above the third floor terrace area;
- Review of the floor plans at the R3 receptor indicates that the window of the closest habitable room to the external ASHP is a bedroom located at third floor level at a distance of approximately 5m from the plant. As such, this position is where the R3 calculation receptor is placed in the model;
- Review of the floor plans at the R4 receptor indicates that the window of the closest habitable room to the external ASHP is a kitchen/dining area located a distance of approximately 2.5m from the plant. It is assumed that this habitable room is not occupied during the night-time period and has therefore only been considered during the daytime period; and
- The manufacturers data, shown in Figure A10 of Appendix A, indicates that the sound pressure level 1m from the unit is 45 dB (A). The sound power level of 53 dB (A) has been input into the noise model, which has been derived using the following equation:

$$SWL = SPL + 20\log(1)+8$$

5.4 Rating Level Assessment

The specific sound level was then used to determine the rating sound level at the closest noise sensitive receptor.

Where appropriate, a rating penalty for sound based on a subjective assessment of its characteristics should be established and added to the specific sound level.

The plant is not expected to be tonal or impulsive in nature.

It is unlikely that the plant noise, or any intermittent nature of the plant noise, will be considered discernible against typical ambient noise levels even. This is also supported by the relatively low specific sound levels, which fall below the lowest measured $L_{Aeq,15min}$ sound levels measured during the daytime and night-time periods at LT1.

Therefore, no penalty corrections have been applied to the specific sound levels.

The assessment for the daytime and night-time scenarios are set out in Tables 5.1 and 5.2 below.

Item	Nearest Noise Sensitive Receptors			
	R1	R2	R3	R4
Specific Sound Level (dB $L_{Aeq, Tr}$)	28	30	30	37
Rating Penalty (dB)	+0	+0	+0	+0
Rating Sound Level (dB $L_{Ar, Tr}$)	28	30	30	37
Relevant Background Sound Level (dB $L_{A90, T}$)	47			
BS4142 Assessment Level	-19	-17	-17	-10

TABLE 5.1: ASSESSMENT OF PLANT RATING LEVELS – DAYTIME PERIOD

The results presented in Table 5.1 indicate that the rating sound level of the proposed plant, at the closest residential windows, are estimated to be at least 10 dB below the existing background sound level, which indicates low noise impact, according to the criteria presented in BS4142:2014, depending on the context.

Item	Nearest Noise Sensitive Receptors		
	R1	R2	R3
Specific Sound Level (dB $L_{Aeq, Tr}$)	28	30	30
Rating Penalty (dB)	+0	+0	+0
Rating Sound Level (dB $L_{Ar, Tr}$)	28	30	30
Relevant Background Sound Level (dB $L_{A90, T}$)	35		
BS4142 Assessment Level	-7	-5	-5

TABLE 5.2: ASSESSMENT OF PLANT RATING LEVELS – NIGHT-TIME PERIOD

The results presented in Table 5.2 indicate that the rating sound level of the proposed plant, at the closest residential windows, are estimated to be at least 5 dB below the existing background sound level, which could be an indication of low noise impact, according to the criteria presented in BS4142:2014, depending on the context.

The assessment results show that the Planning Condition criteria of a rating level being 5 dB lower than the background sound level, is achieved during both the daytime and night-time assessment periods.

5.5 Context

When considering the significance of an impact, BS 4142:2014+A1:2019 advises that the context of the impact should be considered. The context of the impact should consider factors such as:



- the absolute level of sound; and
- the character and level of the residual sound compared to the character and level of the specific sound.

The lowest daytime and night-time baseline ambient $L_{Aeq,15min}$ sound levels measured at LT1 were 42 dB $L_{Aeq,15min}$ and 36 dB $L_{Aeq,15min}$, respectively.

The highest calculated specific sound levels during the daytime and night-time periods of 37 dB and 30 dB falls 5 dB and 6 dB below the lowest measured daytime and night-time $L_{Aeq,15min}$ noise levels at LT1 during the daytime and night-time periods, respectively.

Internal plant sound levels at residential receptors, when assessed with windows open for ventilation would be lower by approximately 13dB³, are estimated to fall below the desirable guideline values set out in BS8233:2014: Guidance on sound insulation and noise reduction for buildings⁴.

Furthermore, the assessment has been based on a worst case scenario with all plant operating continuously and simultaneous during the daytime and night-time periods. In reality, not all spaces will require heating at any one time and the sound generated as a result of the plant may reduce further.

When considered in context, the risk of an adverse noise impact is considered to be low.

5.6 Uncertainty

Uncertainty in the measurements and calculations needs to be taken into account when assessing the validity of these conclusions.

The level of uncertainty in the baseline sound survey is minimised by measuring over a 5-day period, in a location representative of the closest noise sensitive receptors.

Rounding has been used in the derivation of the background sound level and calculations, to avoid an impression of precision to decimal places. Rounding has been to integer values with 0.5 being rounded up on completion of the statistical analysis.

³ Acoustics Ventilation and Overheating: Residential Design Guide. Version 1.0. January 2020.

⁴ British Standard BS 8233: 2014. Guidance on sound insulation and noise reduction in buildings.



6 CONCLUSIONS

RF Environmental Ltd (RFE) was commissioned by PR Homes Direct Ltd to undertake a noise and assessment of the proposed fixed plant associated with the proposed residential development at 1-3 Barclay Court, Haywards Heath, West Sussex, RH16 1DB.

This report has been prepared to assist with the discharge of a noise related planning condition..

A computer noise model was used to estimate the combined specific sound levels from the proposed external plant.

Following methodology set out in BS4142:2014+A1:2019, an assessment of the rating sound level for the external plant was undertaken. The assessment indicates that the Rating sound Level at the nearest residential receptors will be at least 5dB below the relevant background sound level during the operating periods, which indicates a low impact, when considered in context and meets the Planning Condition criteria of a rating level being 5 dB lower than the background sound level.

As such, no further noise mitigation measures are required and on the basis of this report, Planning Condition 18 can be discharged.

APPENDIX A: FIGURES

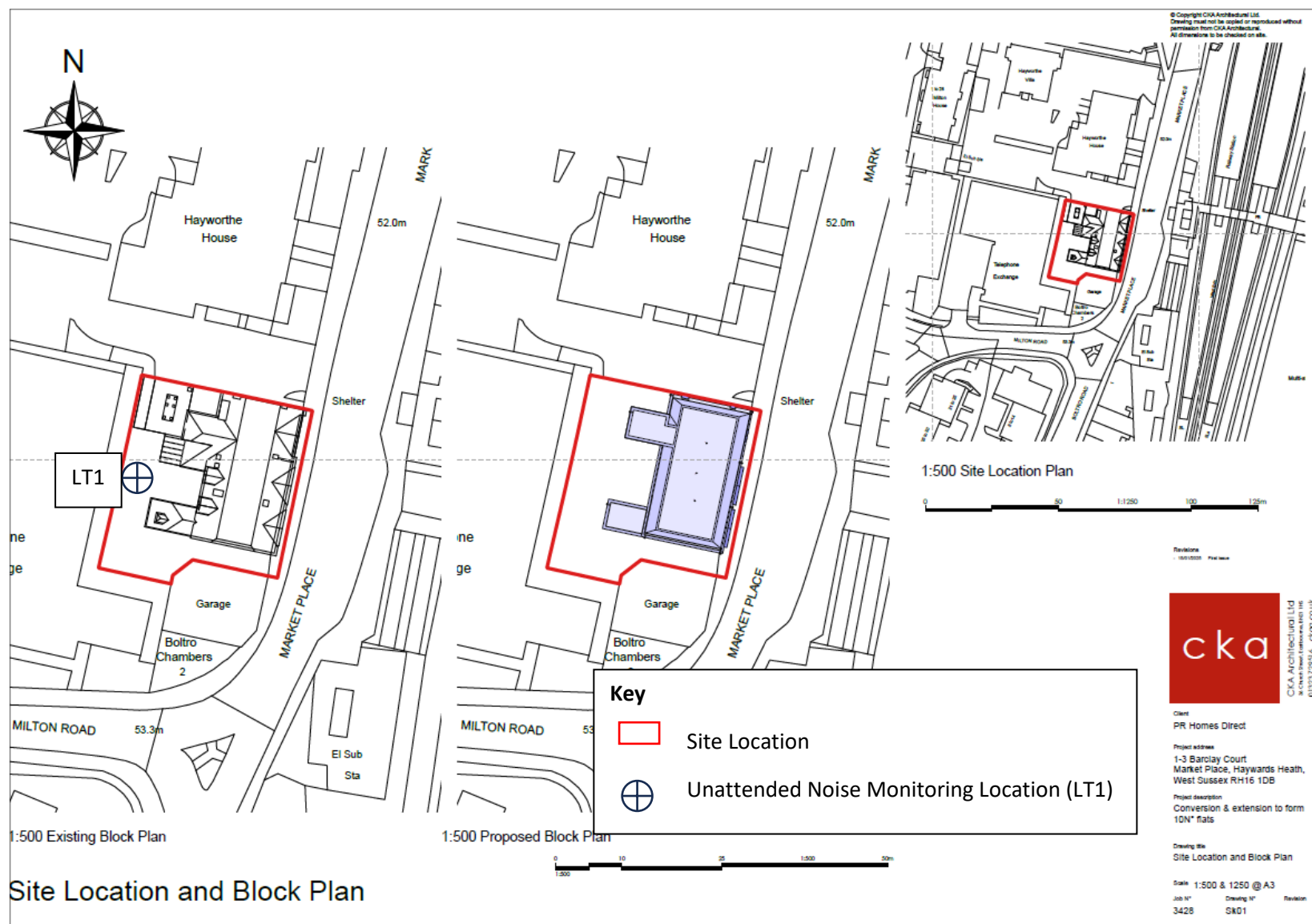
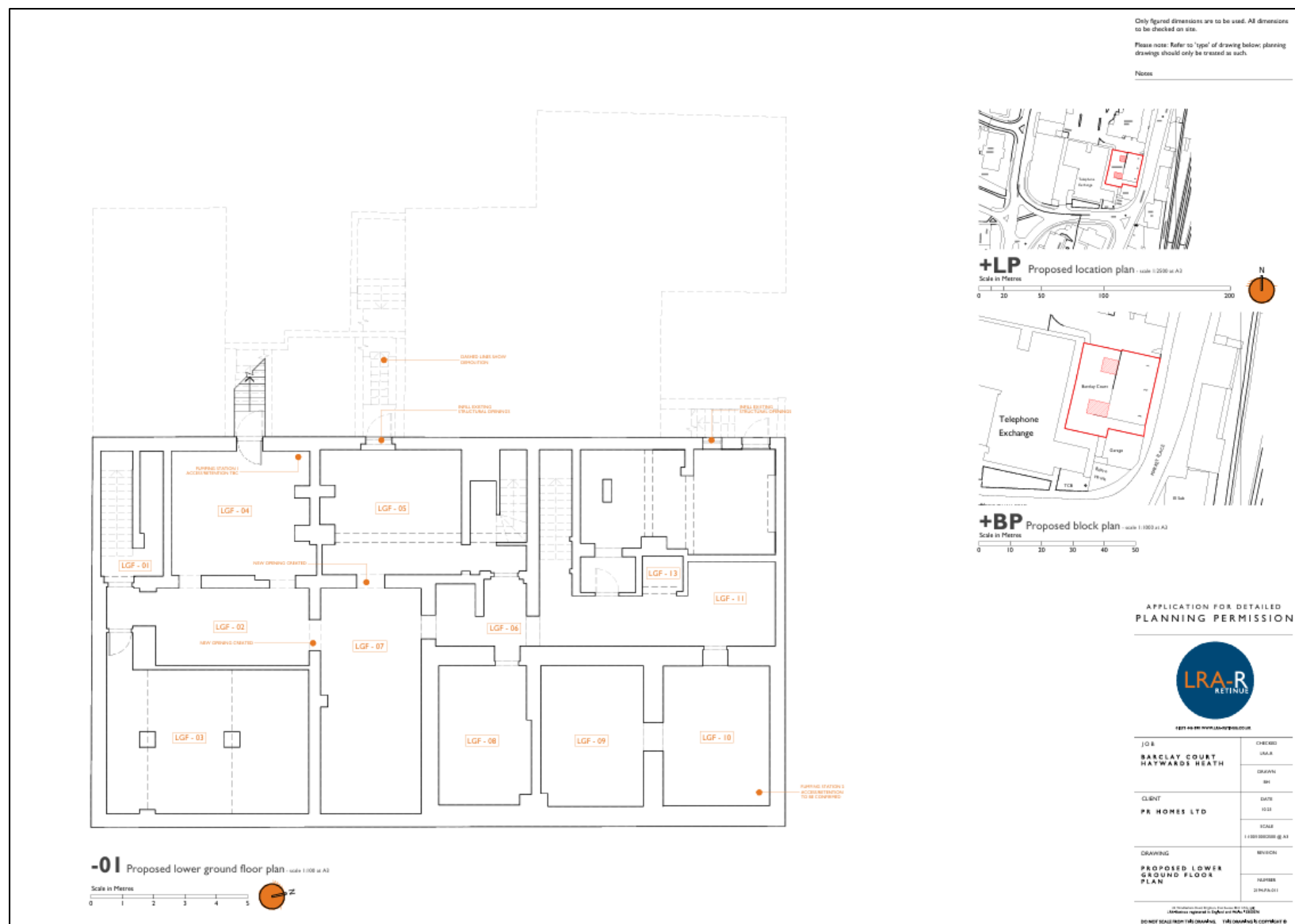
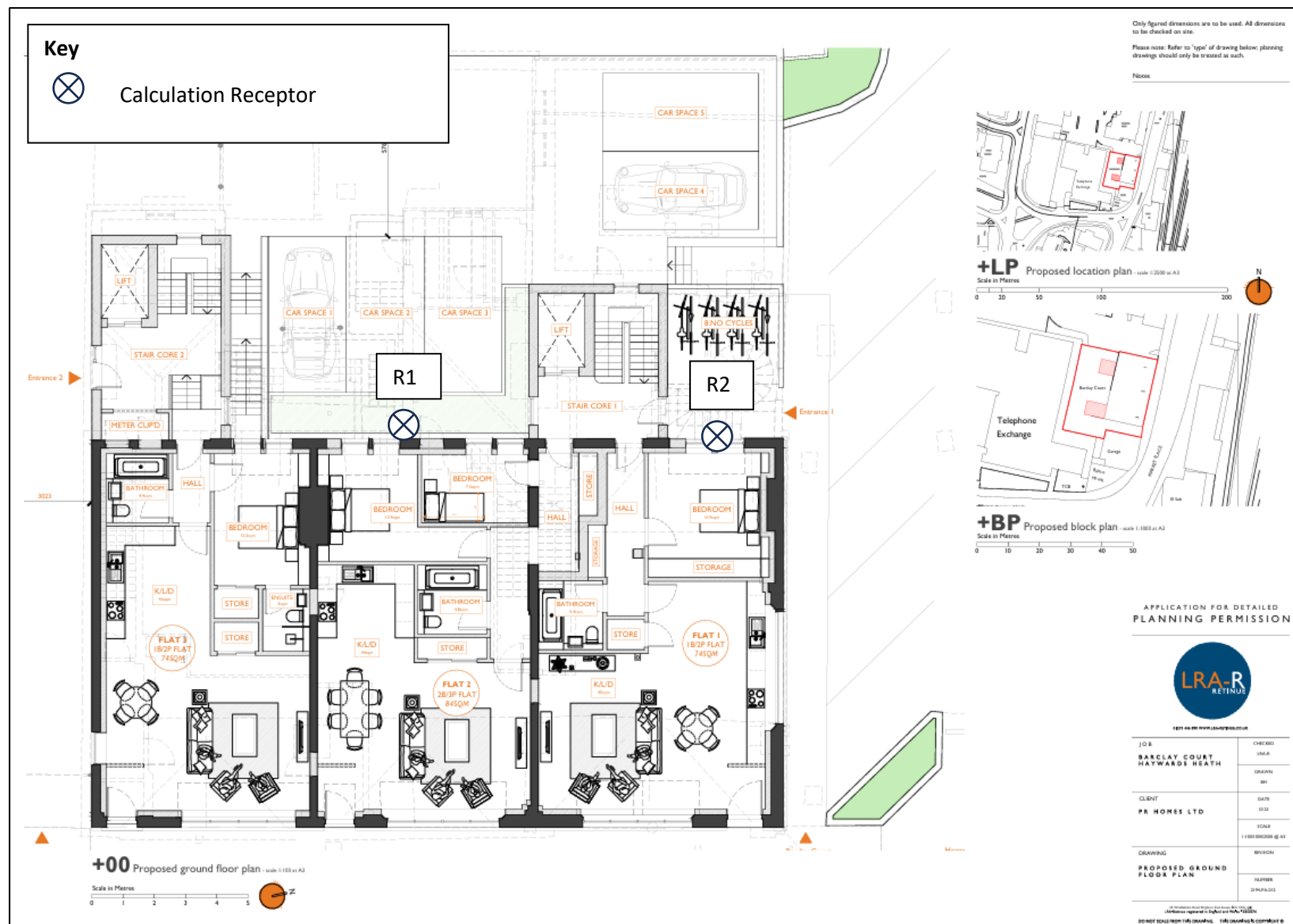
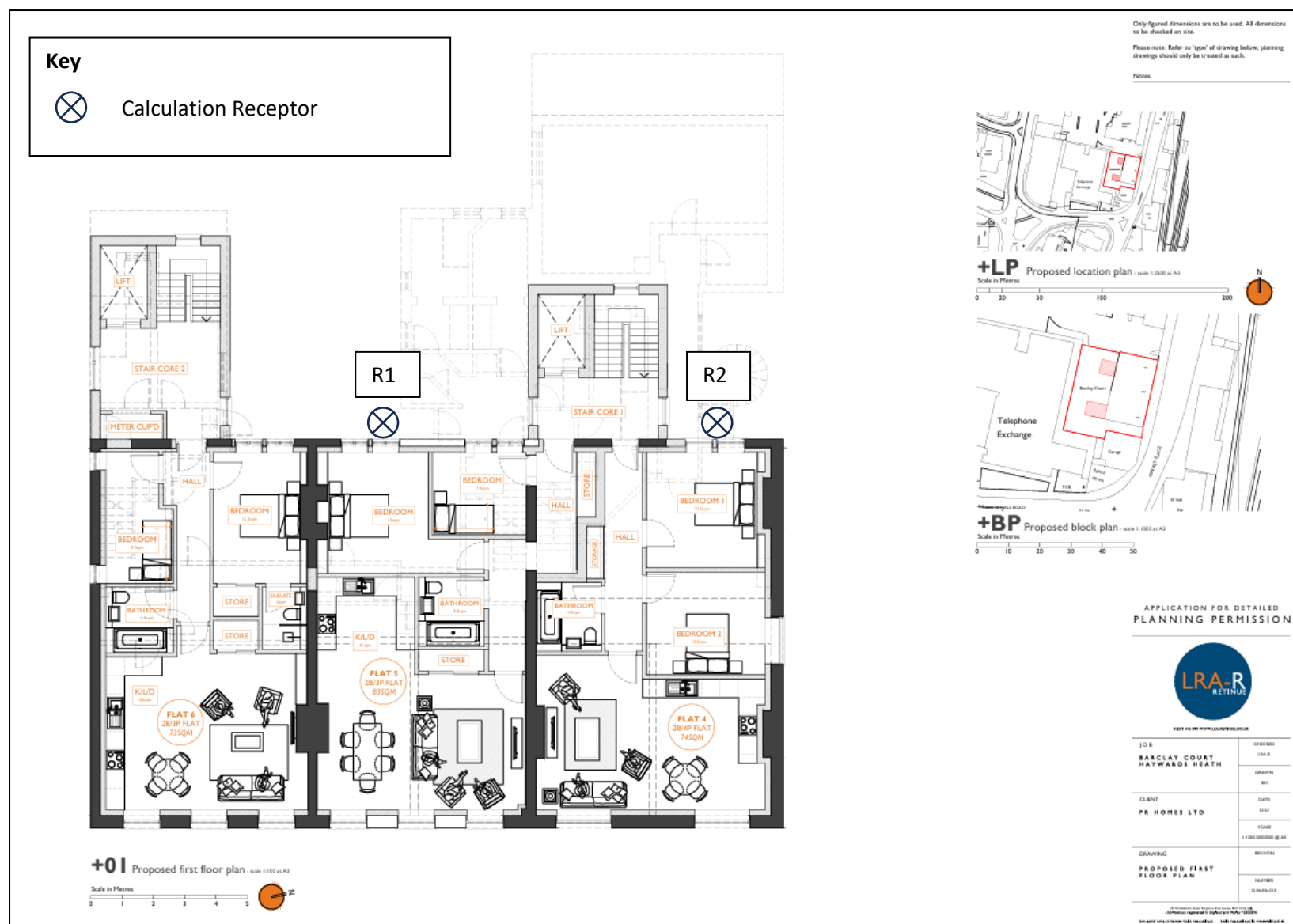


FIGURE A1: SITE LOCATION PLAN







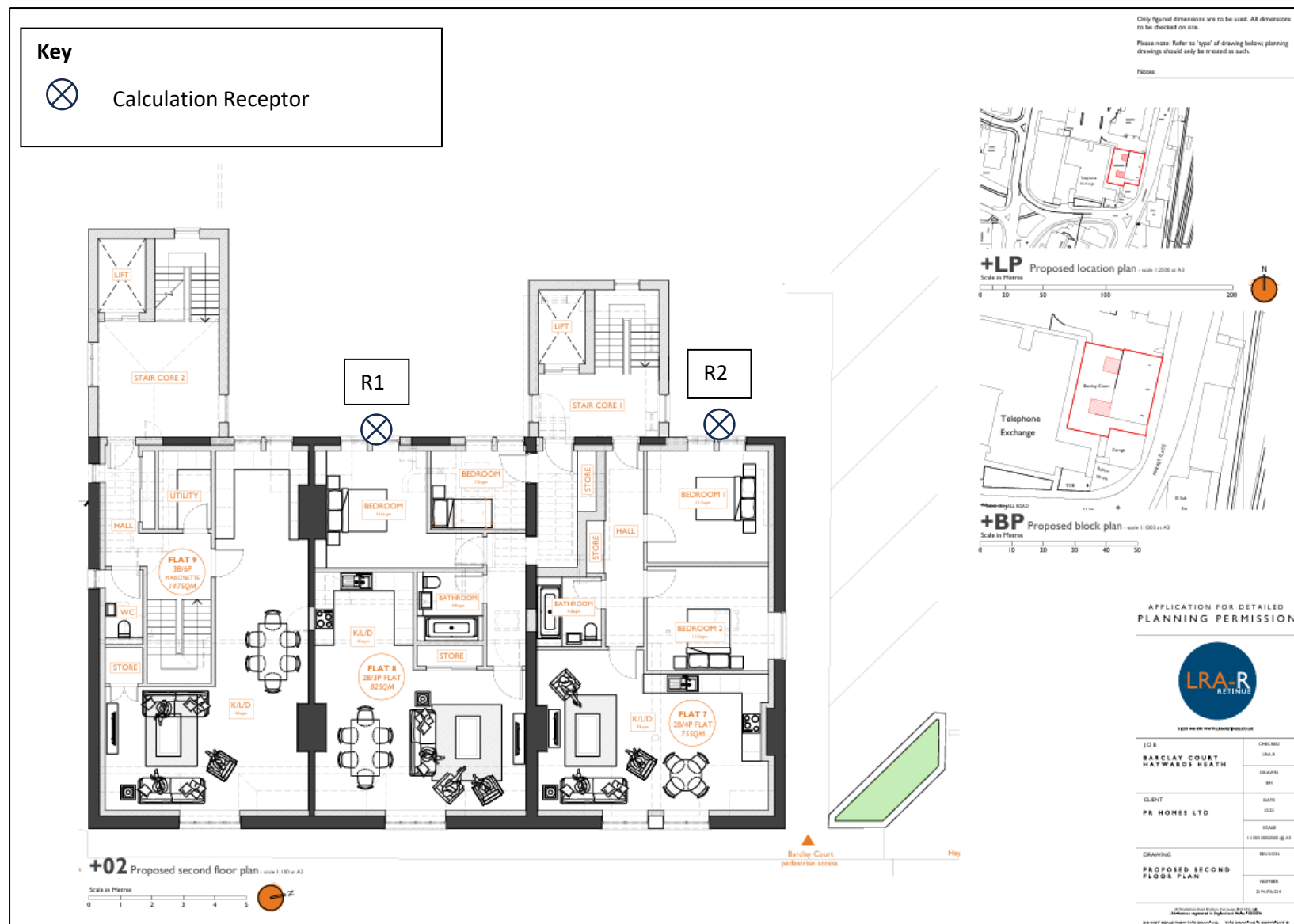


FIGURE A6: SECOND FLOOR PLAN

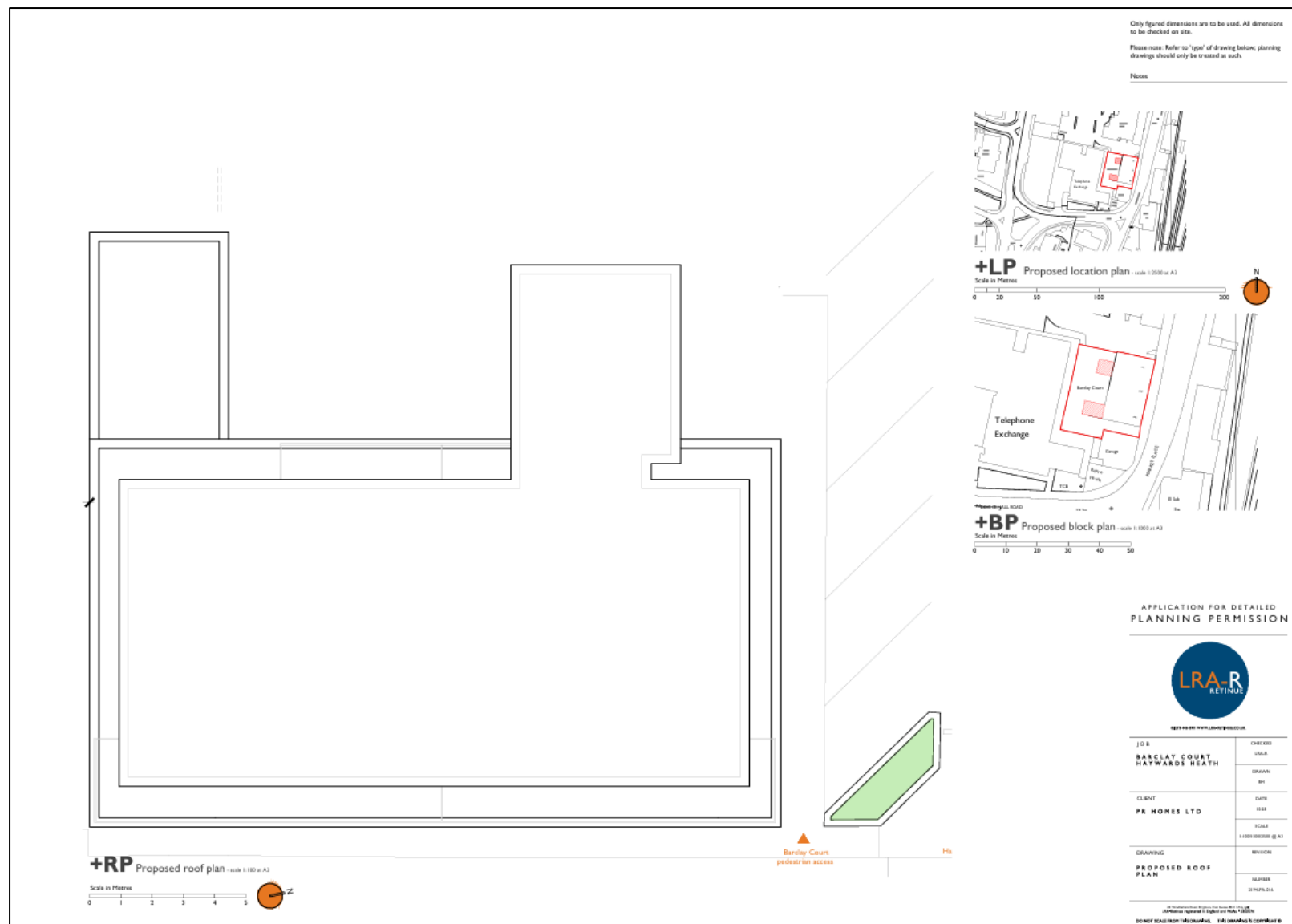


FIGURE A8: ROOF PLAN



FIGURE A9: ELEVATIONS AND PROPOSED OUTDOOR ASHP LOCATIONS

Samsung 5kW Monobloc Air Source Heat Pump

Samsung ASHP Indoor Unit:

- SCOP: Best on MCS Database – 4.85
- 65°C Hot Water
- <45dB(A) – Quietest System on the Market
- 5Kw Outputs
- Low GWP Refrigerant – R32
- RHI eligible (subject to conditions)

Samsung ASHP Outdoor Unit:

- Sound Pressure Level at 1M: 45 DBA
- Low maintenance and quiet operation
- ErP: A+++ (35°C)
- Breaker: 20 Amp
- Recommended Pipe Size: 28mm
- Nominal Flow Rate: 25L/min

FIGURE A10: DETAILS OF OUTDOOR SAMSUNG ASHP OUTDOOR UNIT

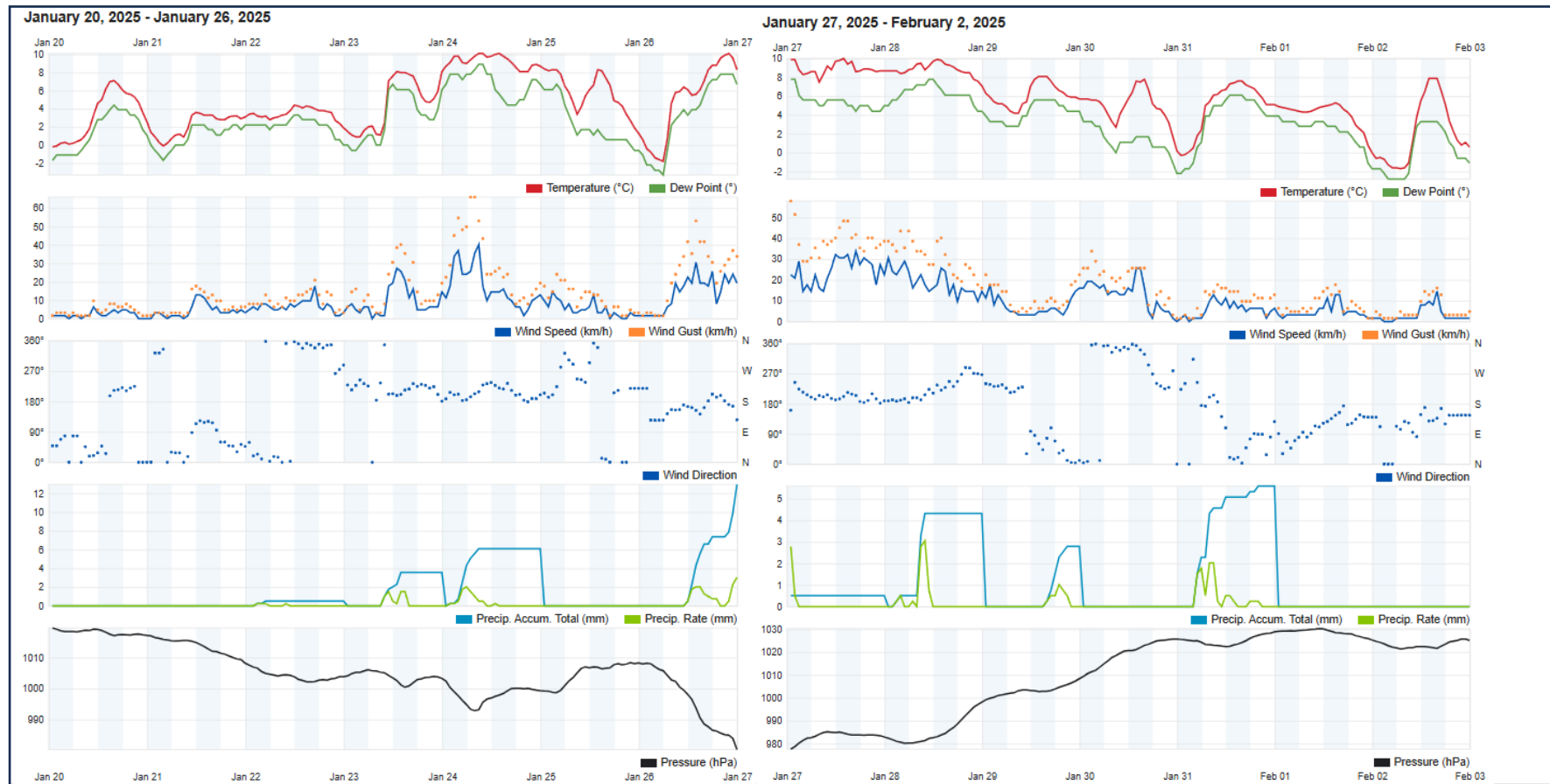


FIGURE A11: WEATHER DATA DURING MONITORING PERIOD

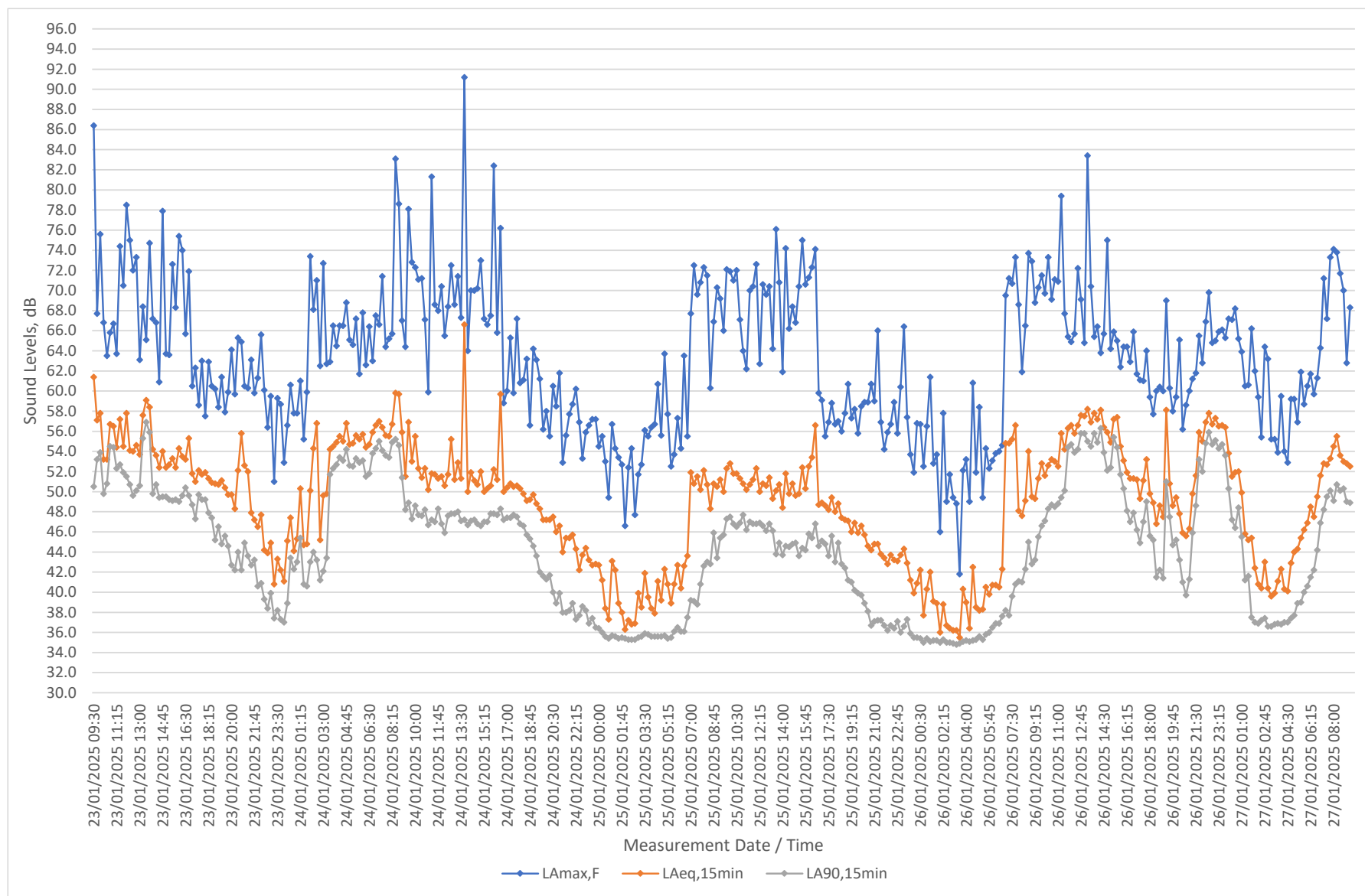


FIGURE A12: TIME HISTORY OF CONTINUOUS SOUND MONITORING DATA, LT1

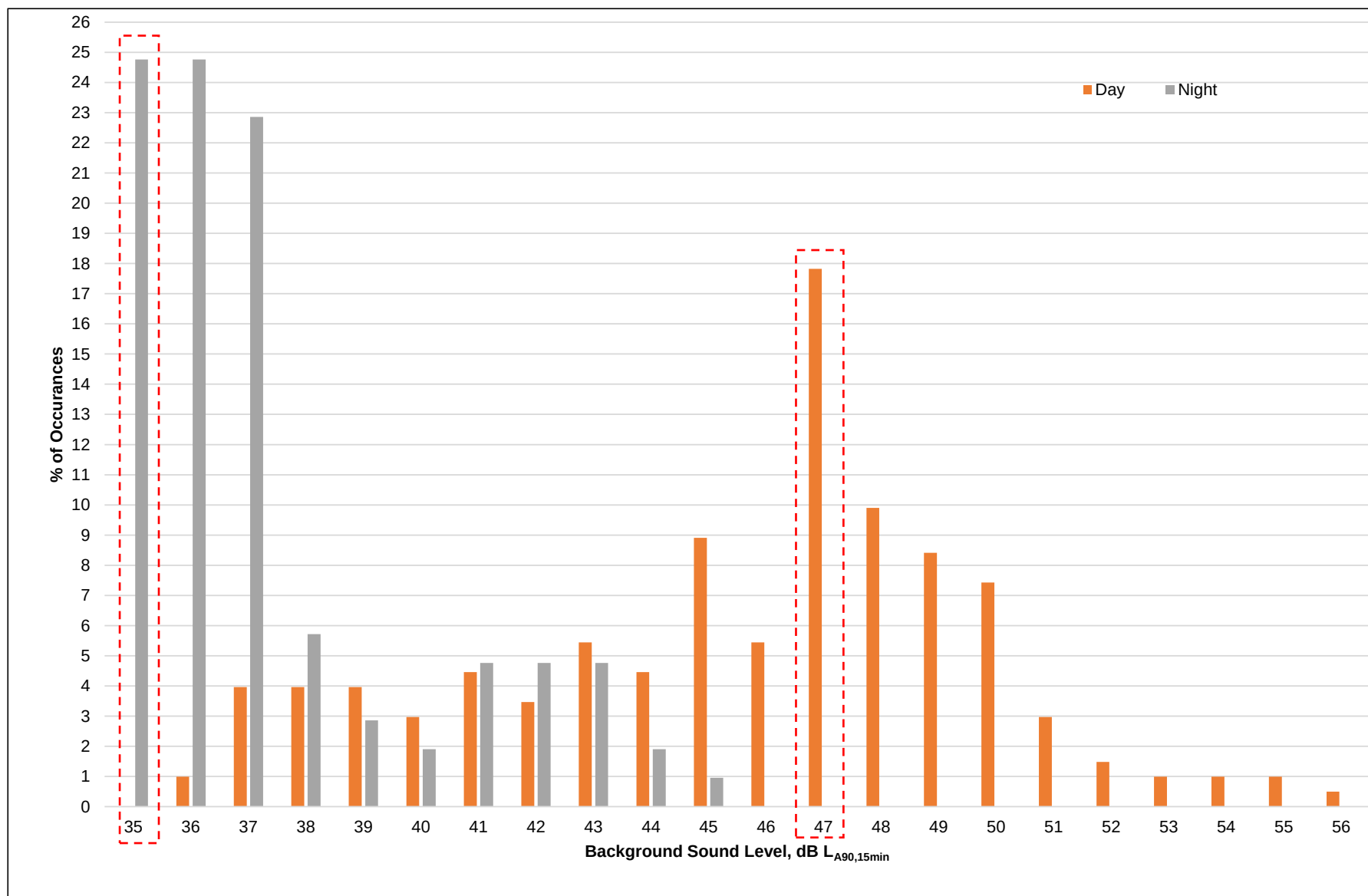


FIGURE A13: DERIVATION OF BACKGROUND SOUND LEVELS

APPENDIX B: TABLES

Date of Meas.	Start Time	Measured Sound Levels, dB		
		L _{Amax,F}	L _{Aeq,15min}	L _{A90,15min}
Thursday 23 rd January 2025	09:30	86.4	61.4	50.5
	09:45	67.7	57.1	53.2
	10:00	75.6	57.8	53.9
	10:15	66.8	53.2	49.8
	10:30	63.5	53.2	50.8
	10:45	65.8	56.7	54.5
	11:00	66.7	56.5	54.4
	11:15	63.7	54.4	52.3
	11:30	74.4	57.2	52.7
	11:45	70.5	54.5	51.9
	12:00	78.5	57.8	51.5
	12:15	75.0	54.1	50.7
	12:30	72.0	54.0	49.6
	12:45	73.3	54.6	50.1
	13:00	63.1	53.7	50.6
	13:15	68.4	57.6	55.3
	13:30	65.1	59.1	56.9
	13:45	74.7	58.4	55.9
	14:00	67.2	54.2	49.8
	14:15	66.8	53.6	50.7
	14:30	60.9	52.4	49.4
	14:45	77.9	54.0	49.5
	15:00	63.7	52.4	49.5
	15:15	63.6	52.7	49.2
	15:30	72.6	53.3	49.1
	15:45	68.3	52.4	49.2
	16:00	75.4	54.3	49.0
	16:15	74.0	53.5	49.6
	16:30	65.7	53.2	50.4
	16:45	71.9	55.3	49.6
	17:00	60.5	51.8	48.7
	17:15	62.3	51.0	47.3
	17:30	58.6	52.1	49.7
	17:45	63.0	51.7	49.2
	18:00	57.5	51.9	49.2
	18:15	62.9	51.3	47.9
	18:30	60.5	50.9	47.4
	18:45	60.2	50.8	45.2
	19:00	58.4	50.7	46.5
	19:15	61.4	51.1	44.8
	19:30	57.9	50.4	45.6
	19:45	59.9	49.7	44.6
	20:00	64.1	49.7	42.7
	20:15	59.7	48.3	42.2
	20:30	65.3	52.1	44.0

Friday 24 th January 2025	20:45	64.9	55.8	42.2
	21:00	60.5	52.6	44.9
	21:15	60.3	52.0	43.6
	21:30	63.1	47.9	42.7
	21:45	59.8	47.2	43.2
	22:00	61.3	46.5	40.6
	22:15	65.6	47.7	40.9
	22:30	60.1	44.2	39.3
	22:45	56.4	43.9	38.4
	23:00	59.5	44.9	39.9
	23:15	51.0	40.8	37.4
	23:30	59.3	43.3	38.2
	23:45	58.7	42.2	37.3
	00:00	52.9	41.1	37.0
	00:15	56.6	45.1	38.9
	00:30	60.6	47.4	43.4
	00:45	57.8	44.1	42.3
	01:00	57.8	45.3	43.0
	01:15	61.0	50.3	45.4
	01:30	55.2	44.7	40.8
	01:45	59.9	44.8	40.6
	02:00	73.4	50.1	43.0
	02:15	68.1	54.3	44.0
	02:30	71.0	56.8	43.2
	02:45	62.5	45.2	41.2
	03:00	72.7	49.6	42.1
	03:15	62.7	49.8	43.4
	03:30	62.9	54.2	51.7
	03:45	66.5	54.5	52.3
	04:00	64.5	54.9	52.7
	04:15	66.5	55.5	53.4
	04:30	66.5	55.0	53.1
	04:45	68.8	56.8	54.2
	05:00	65.1	54.7	52.6
	05:15	64.6	54.8	52.5
	05:30	67.2	55.6	53.3
	05:45	61.7	55.2	52.9
	06:00	67.8	55.7	53.1
	06:15	62.6	54.4	51.5
	06:30	66.4	54.7	51.8
	06:45	63.0	55.9	53.8
	07:00	67.5	56.6	54.3
	07:15	66.6	57.0	55.0
	07:30	71.4	56.4	54.1
	07:45	64.4	55.6	53.6
	08:00	65.2	55.5	53.4
	08:15	65.7	56.7	54.9
	08:30	83.1	59.8	55.2

	08:45	78.6	59.7	54.6
	09:00	67.0	55.9	51.4
	09:15	64.4	51.5	48.2
	09:30	78.1	56.9	48.9
	09:45	72.8	53.0	47.3
	10:00	72.3	55.5	48.6
	10:15	71.1	52.3	47.7
	10:30	71.2	51.4	47.6
	10:45	67.1	52.3	48.2
	11:00	59.9	50.2	46.7
	11:15	81.3	51.8	47.2
	11:30	68.6	51.7	47.0
	11:45	68.0	51.3	48.3
	12:00	70.4	51.5	46.8
	12:15	65.5	50.6	45.9
	12:30	68.4	51.7	47.6
	12:45	72.5	55.2	47.8
	13:00	68.6	51.2	47.8
	13:15	71.4	52.9	48.0
	13:30	67.3	51.3	47.1
	13:45	91.2	66.6	47.2
	14:00	64.0	50.0	46.7
	14:15	70.0	51.9	47.1
	14:30	70.0	51.1	47.2
	14:45	70.2	50.7	46.8
	15:00	73.0	52.0	46.6
	15:15	67.2	50.0	47.0
	15:30	66.6	50.3	47.0
	15:45	67.5	50.6	47.8
	16:00	82.4	52.2	47.8
	16:15	65.8	51.2	47.7
	16:30	76.2	59.7	48.3
	16:45	58.8	50.0	47.2
	17:00	60.0	50.4	47.4
	17:15	65.3	50.8	47.4
	17:30	59.8	50.5	47.7
	17:45	67.2	50.6	47.5
	18:00	60.8	50.3	46.8
	18:15	61.1	49.8	46.6
	18:30	63.2	49.1	45.7
	18:45	56.6	49.2	45.3
	19:00	64.2	49.7	44.6
	19:15	63.1	48.8	43.6
	19:30	61.2	48.3	42.0
	19:45	56.2	47.2	41.6
	20:00	58.0	47.2	41.3
	20:15	55.5	47.2	41.7
	20:30	60.5	47.5	40.0

Saturday 25 th January 2025	20:45	58.5	46.0	38.9
	21:00	61.8	46.6	39.9
	21:15	52.9	44.0	38.0
	21:30	55.6	45.4	38.0
	21:45	57.7	45.4	38.2
	22:00	58.7	45.7	38.9
	22:15	60.2	44.3	37.3
	22:30	56.9	42.2	37.7
	22:45	53.3	43.7	38.6
	23:00	55.9	44.4	38.2
	23:15	56.6	43.2	36.9
	23:30	57.2	42.7	37.4
	23:45	57.2	42.8	36.5
	00:00	54.5	42.7	36.4
	00:15	55.5	41.2	36.0
	00:30	53.0	38.4	35.6
	00:45	49.4	37.3	35.4
	01:00	56.7	43.1	35.7
	01:15	54.3	42.2	35.6
	01:30	53.4	38.9	35.4
	01:45	52.7	38.0	35.5
	02:00	46.6	36.3	35.4
	02:15	52.4	37.2	35.3
	02:30	54.3	36.8	35.3
	02:45	47.7	36.9	35.3
	03:00	51.7	39.9	35.5
	03:15	52.7	38.5	35.6
	03:30	56.1	41.9	35.9
	03:45	55.5	39.5	35.8
	04:00	56.4	38.4	35.6
	04:15	56.7	37.9	35.6
	04:30	60.7	41.1	35.6
	04:45	55.6	39.2	35.6
	05:00	63.7	42.3	35.7
	05:15	57.7	40.8	35.4
	05:30	52.5	38.9	35.5
	05:45	53.7	40.8	36.1
	06:00	57.3	42.7	36.5
	06:15	54.3	40.4	36.1
	06:30	63.5	42.6	36.1
	06:45	55.5	43.6	37.5
	07:00	67.7	51.9	39.2
	07:15	72.5	50.8	39.1
	07:30	69.6	51.5	38.8
	07:45	70.8	50.2	40.8
	08:00	72.3	52.1	42.6
	08:15	71.5	50.7	43.0
	08:30	60.3	48.3	42.8

	08:45	66.9	50.8	45.9
	09:00	70.3	50.5	43.4
	09:15	69.2	51.2	45.4
	09:30	66.0	50.0	45.7
	09:45	72.1	52.3	47.3
	10:00	71.9	52.8	47.5
	10:15	71.0	51.8	46.8
	10:30	72.0	51.8	46.5
	10:45	67.1	51.3	46.9
	11:00	64.0	50.8	47.7
	11:15	62.2	50.2	46.2
	11:30	70.0	50.7	47.0
	11:45	70.4	51.2	46.8
	12:00	72.6	52.3	46.8
	12:15	62.7	50.0	46.9
	12:30	70.6	50.8	46.6
	12:45	69.6	50.6	46.1
	13:00	70.4	51.4	46.8
	13:15	64.2	49.3	46.1
	13:30	76.1	50.1	43.8
	13:45	70.8	50.7	44.9
	14:00	61.9	48.4	43.7
	14:15	74.2	51.8	44.6
	14:30	66.2	49.8	44.5
	14:45	68.4	50.8	44.8
	15:00	66.8	49.6	44.9
	15:15	70.4	49.8	43.6
	15:30	75.0	52.4	44.4
	15:45	70.6	50.3	44.2
	16:00	71.3	52.5	45.8
	16:15	72.3	53.4	45.4
	16:30	74.1	56.6	46.8
	16:45	59.8	48.7	44.6
	17:00	59.1	48.9	45.1
	17:15	55.5	48.6	44.8
	17:30	56.9	48.2	43.6
	17:45	58.8	49.4	45.6
	18:00	56.7	48.0	43.0
	18:15	57.0	48.8	44.9
	18:30	56.0	47.4	42.8
	18:45	57.8	47.2	42.4
	19:00	60.7	47.1	41.2
	19:15	57.3	46.0	41.0
	19:30	58.2	46.9	40.2
	19:45	55.8	45.9	39.9
	20:00	58.5	46.6	39.7
	20:15	58.9	45.7	38.9
	20:30	58.9	44.6	38.1

Sunday 26 th January 2025	20:45	60.7	44.2	36.7
	21:00	59.0	44.8	37.1
	21:15	66.0	44.8	37.2
	21:30	56.9	43.8	37.2
	21:45	54.2	43.4	36.7
	22:00	55.9	42.8	36.2
	22:15	56.7	43.7	36.7
	22:30	58.9	43.2	36.4
	22:45	55.8	43.1	37.1
	23:00	60.4	43.7	36.0
	23:15	66.4	44.3	36.6
	23:30	57.4	42.9	37.3
	23:45	53.7	41.2	35.9
	00:00	51.9	39.9	35.5
	00:15	56.8	40.9	35.5
	00:30	56.7	42.2	35.4
	00:45	52.5	37.7	35.0
	01:00	56.5	40.3	35.4
	01:15	61.4	42.0	35.1
	01:30	52.8	39.1	35.2
	01:45	53.7	38.9	35.2
	02:00	46.0	36.0	35.0
	02:15	57.8	38.8	35.3
	02:30	49.0	36.7	35.0
	02:45	51.7	36.4	35.0
	03:00	49.4	36.2	34.9
	03:15	48.8	36.2	34.8
	03:30	41.8	35.5	34.9
	03:45	52.1	40.3	35.1
	04:00	53.2	39.0	35.2
	04:15	49.0	36.4	35.1
	04:30	60.8	42.5	35.2
	04:45	51.9	38.5	35.3
	05:00	58.4	38.2	35.6
	05:15	49.4	38.3	35.3
	05:30	54.3	40.5	35.8
	05:45	52.3	39.8	36.0
	06:00	53.1	40.7	36.5
	06:15	53.8	40.7	36.9
	06:30	54.0	40.5	36.9
	06:45	54.6	42.3	37.6
	07:00	69.5	54.8	38.2
	07:15	71.2	54.8	37.7
	07:30	70.7	55.2	39.6
	07:45	73.3	56.6	40.8
	08:00	68.6	48.1	41.1
	08:15	61.9	47.6	41.0
	08:30	66.5	49.1	42.3

	08:45	73.7	54.0	45.0
	09:00	72.9	49.5	42.8
	09:15	68.8	49.3	43.2
	09:30	70.3	51.3	45.5
	09:45	71.5	52.8	46.6
	10:00	69.7	51.6	47.1
	10:15	73.3	52.6	48.3
	10:30	69.1	53.2	48.7
	10:45	71.1	53.0	48.5
	11:00	70.9	52.5	48.8
	11:15	79.4	55.8	49.4
	11:30	67.7	54.2	50.1
	11:45	65.4	56.3	54.4
	12:00	64.9	56.6	54.7
	12:15	65.7	55.8	53.9
	12:30	72.2	56.6	54.2
	12:45	69.1	57.6	55.8
	13:00	64.8	57.5	55.8
	13:15	83.4	58.2	55.0
	13:30	70.4	56.9	54.5
	13:45	65.4	57.8	55.8
	14:00	66.4	57.2	54.9
	14:15	63.8	58.1	56.3
	14:30	65.7	56.4	53.9
	14:45	75.0	55.9	52.1
	15:00	64.2	54.9	52.4
	15:15	65.9	57.2	55.4
	15:30	65.0	57.4	54.4
	15:45	62.4	54.5	51.7
	16:00	64.4	53.1	50.3
	16:15	64.4	51.9	48.1
	16:30	62.9	51.3	47.0
	16:45	65.9	51.3	47.9
	17:00	61.7	51.2	46.2
	17:15	61.1	49.3	44.9
	17:30	61.0	51.1	47.0
	17:45	64.0	53.2	49.0
	18:00	59.4	49.8	45.6
	18:15	57.7	48.9	45.2
	18:30	60.0	46.8	41.5
	18:45	60.4	48.6	42.2
	19:00	60.0	47.5	41.4
	19:15	69.0	58.1	51.0
	19:30	60.3	50.8	47.5
	19:45	58.0	48.6	44.7
	20:00	59.4	49.4	45.2
	20:15	65.1	47.8	43.2
	20:30	56.2	45.9	41.0

Monday 27 th January 2025	20:45	58.6	45.6	39.7
	21:00	60.0	46.3	41.3
	21:15	61.2	49.8	45.9
	21:30	61.8	51.6	48.6
	21:45	65.5	55.9	53.2
	22:00	62.8	55.0	52.0
	22:15	66.9	56.9	54.8
	22:30	69.8	57.8	55.9
	22:45	64.8	56.7	54.7
	23:00	65.0	57.3	55.1
	23:15	65.9	56.5	54.3
	23:30	66.1	56.6	54.7
	23:45	65.3	56.4	53.6
	00:00	67.2	53.8	50.3
	00:15	67.1	51.5	47.2
	00:30	68.2	51.9	46.4
	00:45	65.2	52.0	48.4
	01:00	63.9	49.9	45.5
	01:15	60.5	45.8	41.2
	01:30	60.6	45.2	41.6
	01:45	66.2	45.4	37.5
	02:00	62.0	42.4	37.0
	02:15	59.4	40.8	36.9
	02:30	55.4	40.4	37.2
	02:45	64.4	43.0	37.4
	03:00	63.2	40.4	36.6
	03:15	55.2	39.6	36.6
	03:30	55.2	39.9	36.8
	03:45	53.9	41.1	36.9
	04:00	59.5	42.3	36.8
	04:15	54.0	40.3	37.0
	04:30	52.9	40.1	37.0
	04:45	59.2	42.9	37.4
	05:00	59.2	44.0	37.7
	05:15	56.9	44.3	38.9
	05:30	61.9	45.4	39.0
	05:45	58.7	46.2	40.0
	06:00	60.5	46.9	40.6
	06:15	61.7	48.5	41.5
	06:30	59.7	47.5	42.2
	06:45	61.3	49.5	44.2
	07:00	64.3	51.6	46.9
	07:15	71.2	52.8	48.2
	07:30	67.2	52.7	49.5
	07:45	73.3	53.3	50.1
	08:00	74.1	54.5	49.1
	08:15	73.8	55.5	50.7
	08:30	71.7	53.6	50.1

	08:45	70.0	53.0	50.3
	09:00	62.8	52.8	49.0
	09:15	68.3	52.5	48.9

TABLE B1: SOUND DATA FOR UNATTENDED MONITORING PERIOD – LT1

APPENDIX C: GLOSSARY OF ACOUSTIC TERMS

Noise

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness. Noise is measured on a logarithmic scale in decibels (dB) because of the ears' sensitivity to a wide range of pressure changes. The sound pressure level (SPL) of a signal is denoted by the symbol L_p and defined by the equation $L_p = 10 \log (p/p_0)^2$ where p is the root mean square pressure of the signal and p_0 is the reference sound pressure (2×10^{-5} Pa).

An indication of the range of sound pressure levels commonly found in the environment is given below:

Location	$L_{pAdB}(A)$
Normal threshold of hearing	-10 to 20
Music halls and theatres	20 to 30
Living rooms and offices	30 to 50
Inside motor vehicles	50 to 70
Industrial premises	70 to 100
Burglar alarms at 1 m	100 to 110
Jet aircraft on take-off	110 to 130
Threshold of pain	130 to 140

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is “equivalent continuous A-weighted sound pressure level, in decibels” and is defined in British Standard BS 7445 as the “value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time”.

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

Community response to environmental noise sources is dependent on both acoustic and non-acoustic factors. The acoustic factors include absolute noise level, changes or exceedances of background and ambient levels as well as the characteristics, time, duration and frequency of noise.