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London Heathrow Marriott Hotel Extension

Gold Diamond D Heathrow 2005 Ltd

Noise Impact Assessment

Revision 00

20/10/2020

Scotch Partners LLP

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Project Particulars

Client Name: Gold Diamond D Heathrow 2005 Ltd

Project Name: London Heathrow Marriott Hotel Extension

Disclaimer

Revision History

Revision	Date	Prepared By	Checked By
00	20 October 2020	Kial Jackson BSc MIET AMIOA	Jason Clouston BEng MSc MIOA

Contents

1 Introduction

1.1 Proposals are in place for the construction of a standalone 6-storey extension to the London Heathrow Marriott Hotel, providing 259 additional keys and associated restaurant/bar at ground floor level.

1.2 An external noise survey has been carried out at the site to determine the prevailing external acoustic environment. The noise level data have been used to assist with the façade design so as to control external noise intrusion into guestrooms and to assess external noise emission from building services plant associated with the development.

1.3 Chapter 2 describes the external noise survey and the assessments of noise intrusion and emission are presented in Chapters 3 and 4 respectively.

1.4 A selection of the noise level and weather data from the survey and definitions of some of the terminology used have been appended to this document.

2 External noise survey

2.1 Site description

2.1.1 The proposed extension is to sit within the site boundary of the existing London Heathrow Marriott Hotel, occupying the guest carpark to the west.

2.1.2 The hotel is located on the Bath Road (A4), which forms part of the northern Heathrow Airport Perimeter. Neighbouring buildings are predominantly used for commercial purposes (offices, hotels, car rental etc) however, there is a pocket of residential properties on New Road and Triumph Close immediately to the west.

2.2 Measurement methodology

2.2.1 Continuous, unattended noise level measurements were conducted at two positions; one to the south, overlooking Bath Road; and one to the north, overlooking the neighbouring residential properties.

2.2.2 Statistical and spectral data were recorded in 10-minute samples between 12:20 on Tuesday 12th September and 12:40 on Thursday 14th September 2019.

2.2.3 Details of the measurement positions are provided below. The locations are also shown on a satellite image of the site in Figure 2-1.

Measurement position 1, Bath Road (A4)

2.2.4 The microphone was installed within the hotel car park in a position representative of the southern façade line of the proposed extension. The microphone was placed some 3 metres above the local ground and is considered to have been under free-field conditions.

2.2.5 Data recorded at this position are considered representative of the maximum noise levels anticipated against the facades of the hotel exposed to road traffic on Bath Road.

Measurement position 2, Triumph Close/Comet House

2.2.6 The microphone was installed on the north-western boundary of the site and extended above the fence shared with Triumph Close and the private parking for Comet House. The microphone is considered to have been under free-field conditions with a direct line of sight to the residential properties on Triumph Close.

2.2.7 Data recorded at this position are considered representative of the maximum noise levels anticipated against the hotel facades shielded from Bath Road and the lowest background noise levels experienced at the neighbouring residential properties.

2.2.8 The following equipment was used to carry out the survey:

Type	Model	Serial No.	Position
Class 1 Sound level meter	Norsonic 139	1392774	1
Environmental microphone	Norsonic 1218	12182517	
Class 1 Sound level meter	Norsonic 131	1313605	2
Environmental microphone	Norsonic 1218	12182559	
Portable sound calibrator	Norsonic 1215	34926	N/A

Table 2-1 Noise level measurement equipment

2.2.9 The calibration of the sound level meters, and associated microphones were checked prior to and on completion of the measurement periods in accordance with recommended practice. No meaningful drift in calibration occurred during the survey. The accuracy of the calibrator can be traced to National Physical Laboratory Standards.

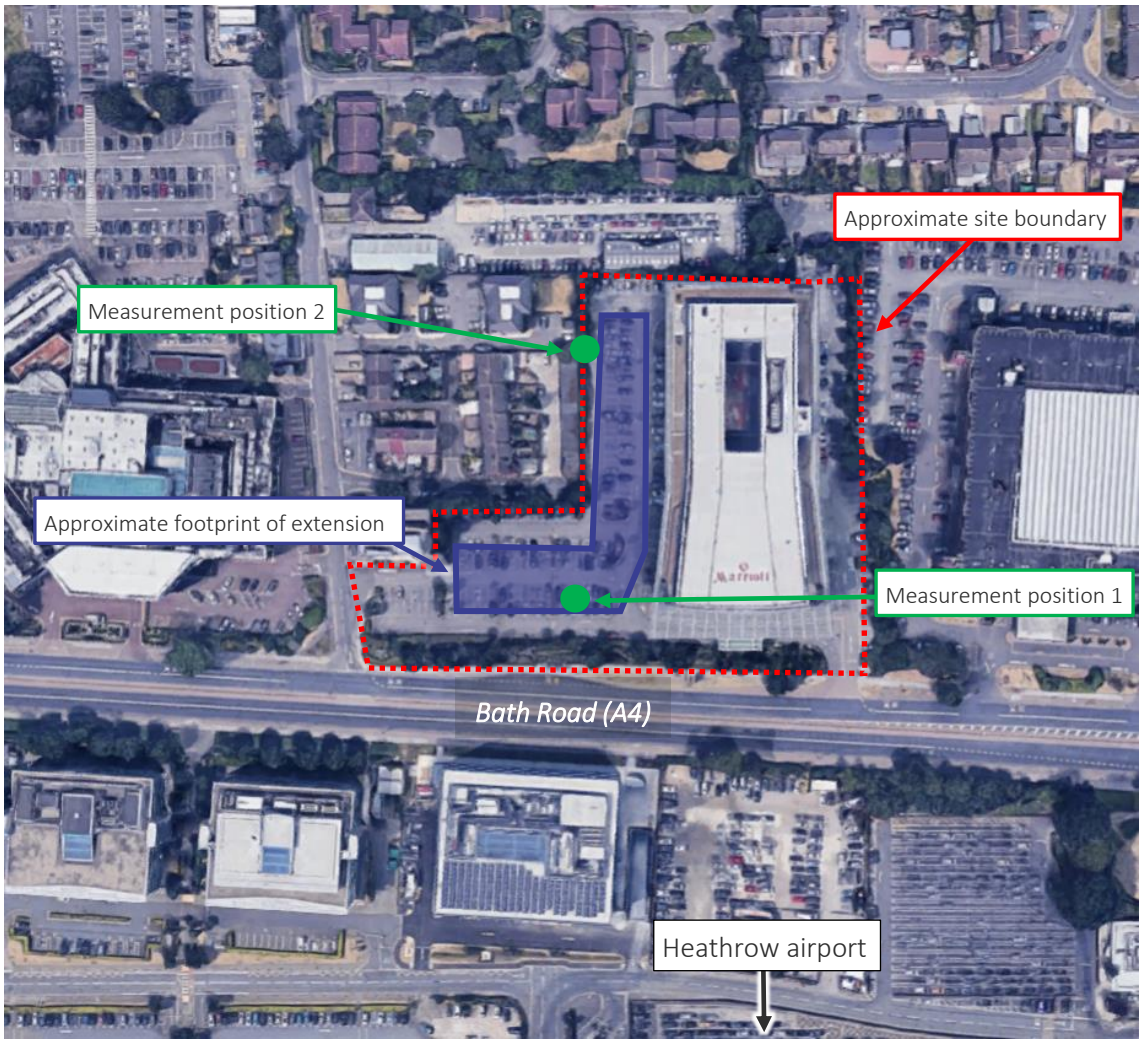

Figure 2-1 Satellite image of the site showing the measurement positions

2.3 Weather

2.3.1 Local weather data recorded during the survey have been obtained from the London Heathrow Airport weather station[1] just to the south of the site and are presented in Appendix B.

2.3.2 Weather conditions throughout the survey were generally calm and overcast with the temperature ranging between 3°C to 10°C. Wind speeds in excess of 5m/s (18km/h) were recorded throughout most of the afternoon on the 12th, however, no significant uplifts in noise levels were recorded and the measurement data are not believed to have been adversely affected.

[1]London Heathrow Airport Station EGLL, Available at: https://www.wunderground.com, Accessed: 21st November 2019

2.4 Measurement results

2.4.1 A selection of the measurement data are provided in Appendix A. Graphs showing the noise level histories are presented below.

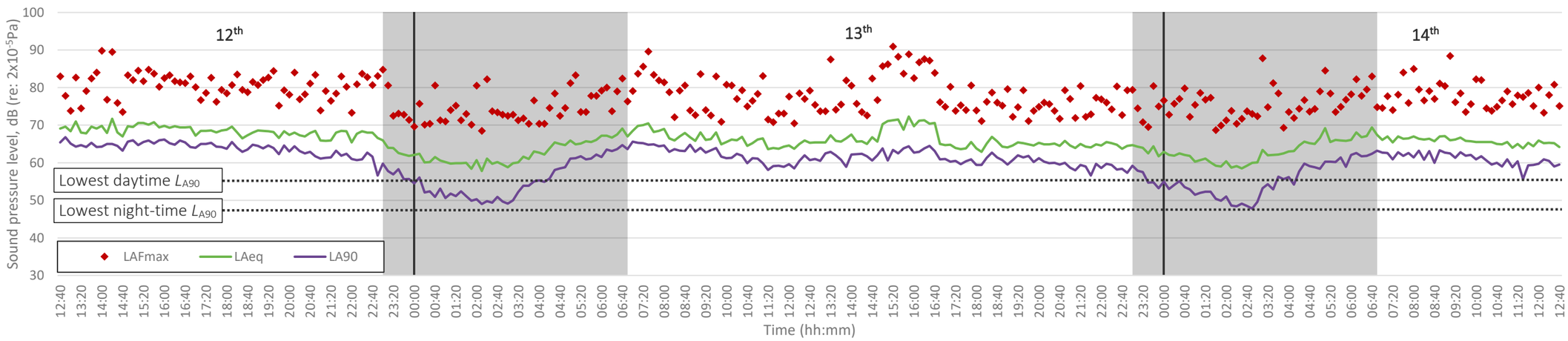

Figure 2-2 Noise level history, Measurement position 1

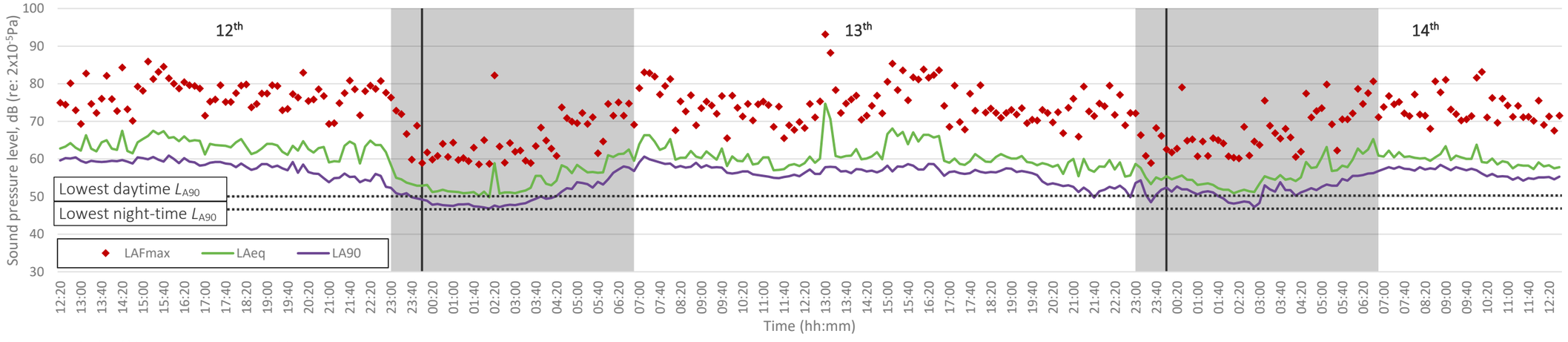

Figure 2-3 Noise level history, Measurement position 2

2.4.2 The lowest measured background noise levels during the daytime, evening and night-time are set down in Table 2-2 and shown on the graphs above.

	Lowest measured background noise level	
Time	Position 1	Position 2
Daytime (07:00-23:00)	56dB $L_{A90,10min}$	50dB $L_{A90.10min}$
Night (23:00-07:00)	48dB $L_{A90,10min}$	47dB $L_{A90,10min}$

Table 2-2 Lowest measured background noise levels

2.5 Commentary

2.5.1 The acoustic climate across the site is predominantly influenced by road traffic on Bath Road and aircraft operations associated with Heathrow airport. This is reflected by the noise level data which remain fairly consistent throughout the day and reduce at night, in line with local traffic flows and Heathrow's daily cessation of flights between 23:00 and 04:45.

2.5.2 The proposed development site and the surrounding area is mostly affected by aircraft noise from the northern runway. Heathrow usually operates an alternating runway scheme which sees aircraft using the runway for either departures or arrivals before switching to the other at 15:00 however, if there is an easterly wind the runway is solely used for landings. This is due to the Cranford Agreement which prohibits easterly take offs from the northern runway.

2.5.3 Based on flight[2] and weather data available online, it is understood that the following use was made of the northern runway during the survey:

Date	Time	
	04:45 - 15:00	15:00 – 23:00
12th Nov.	Arrivals	Departures
13th Nov.	Arrivals	Arrivals*
14th Nov.	Arrivals	Arrivals**

**Departures occurred between 15:00 and 16:00 at which point, the wind direction switched to the east*
***Easterly winds are understood to have occurred all day*

Table 2-3 Heathrow northern runway schedule

2.5.4 When comparing the noise data against the runway schedule, it can be seen that there is a noticeable uplift in the ambient and maximum noise levels measured during periods when aircraft used the northern runway for departures. Noise intrusion and emission associated with the proposed development have been assessed against the loudest and quietest periods of the survey respectively, and as such, any changes to the runway operations are unlikely to have any meaningful impact upon the findings of this report.

2.5.5 Maximum noise events have generally been attributed to vehicles accelerating past the site and aircraft making use of Heathrow's northern runway. Vehicles on Bath Road are limited to 40mph and typically comprise cars, motorcycles, busses, heavy goods vehicles and the occasional emergency vehicle. The errant peak measured at Position 2 between 13:00 and 13:10 on the 13th has a strong tonal component at 1kHz and has been attributed to a car alarm in either the hotel or private residential carpark.

[2] PlaneFinder live flight tracker, Available at: https://planefinder.net/airport/LHR, Accessed 25th November 2019

3 Noise intrusion assessment

3.1 Criteria

3.1.1 The internal acoustic environment of a commercial hotel is typically a concern for the hotel operator rather than the Local Planning Authority and all new hotels operating under the Marriott brand are expected to adhere to Marriott International's *Hotel Design Standards*.

3.1.2 Module 1 of the document presents the performance standards usually prescribed for the building envelope of a Marriott Hotel however, it is noted that these standards are only applicable to traffic noise and it is advised that project specific criteria be put forward for noise sources such as airports, trains or industrial activity.

3.1.3 Drawing upon good practice documents such as BS 8233: 2014 and ProPG: Planning and Noise, the following internal noise limits are proposed within the hotel guestrooms.

Time period	Noise level
Daytime (07:00-23:00 hrs)	≤ 35dB $L_{Aeq,1hr}$
Night-time (23:00-07:00 hrs)	≤ 30dB $L_{Aeq,1hr}$ ≤ 45dB* L_{AFmax}

**No more than 10 exceedances per night*

Table 3-1 Recommended internal noise levels for guestrooms

3.1.4 Compliance with these limits can be expected to satisfy any reasonable planning requirements the Local Authority may choose to impose.

3.2 Reference noise levels

3.2.1 The following free-field reference noise levels have been derived from the measurement data for use in façade calculations. The façade classifications are shown in Figure 3-1.

Facade		Frequency (Hz)					
		125	250	500	1000	2000	4000
Facades exposed to Bath Road	Daytime $L_{eq,1hr}$	66	68	69	68	63	49
	Night-time $L_{eq,1hr}$	63	65	64	65	59	50
	Night-time L_{Fmax}	84	84	83	80	74	71
Facades shielded from Bath Road	Daytime $L_{eq,1hr}$	63	64	67	64	61	55
	Daytime L_{Fmax}	65	62	61	59	55	43
	Night-time L_{Fmax}	75	76	77	74	72	65

All values are sound pressure levels in dB (ref: $2x10^{-5}$Pa)

Table 3-2 Reference noise levels for use in façade calculations

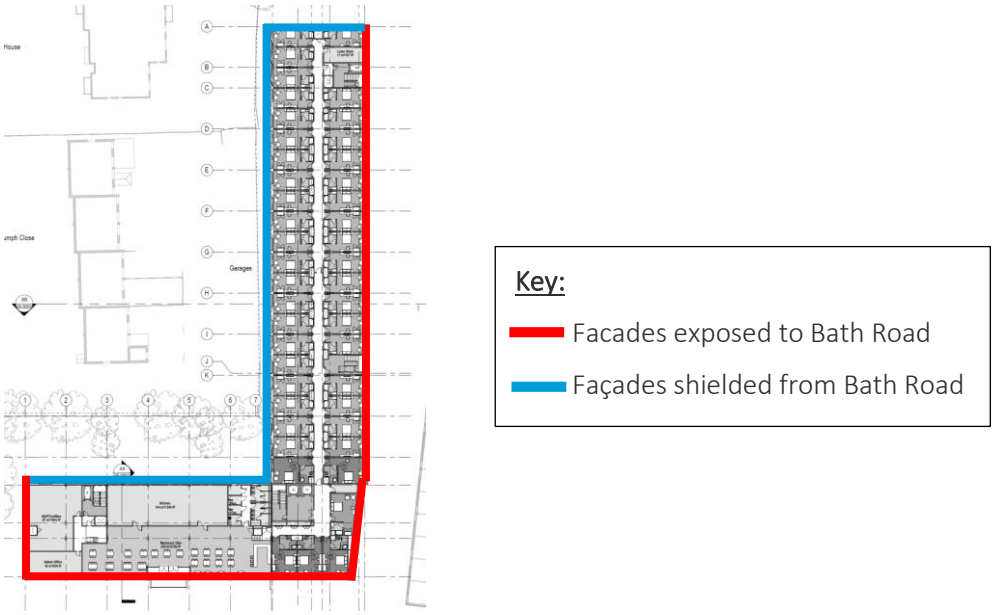

Figure 3-1 Façade classifications

3.3 Recommended façade constructions

3.3.1 The minimum recommended sound reduction indices within each octave band are set down in Table 3-3.

Facade	Element	Frequency (Hz)					
		125	250	500	1000	2000	4000
Facades exposed to Bath Road	Walls	36	46	51	53	50	50
	Glazing	25	32	41	47	46	54
Façades shielded from Bath Road	Walls	36	46	51	53	50	50
	Glazing	26	25	33	44	46	52

All values are sound reduction indices in dB, measured in accordance with BS EN ISO 10140-2

Table 3-3 Recommended acoustic specification for the proposed façades

3.3.2 The acoustic performance required for the external walls should be readily achievable with either fair-faced masonry or a render carrier system supplemented by internal linings comprising 2 layers of plasterboard backed with mineral wool insulation.

3.3.3 The following glazing configurations can be expected to satisfy the performance specifications for windows:

Windows exposed to Bath Road	8mm float glass/16mm airgap/10mm laminated glass
Windows shielded from Bath Road	6mm float glass/12mm airgap/7mm laminated glass

3.3.4 Alternative constructions and glazing configurations may also be suitable.

4 Noise emission assessment

4.1 Local planning policy

4.1.1 The Local Authority have set out the planning policies for new development within the Borough of Hillingdon in the *Local Plan: Part 1 – Strategic Policies*. Policy EM8 specifically relates to the control of noise pollution and states:

> *"Policy EM8 – Land, water, air and noise*
>
> *Noise:*
>
> *The Council will investigate Hillingdon's target areas identified in the DEFRA Noise Action Plans, promote the maximum possible reduction in noise levels and will minimise the number of people potentially affected.*
>
> *The Council will seek to identify and protect Quiet Areas in accordance with Government Policy on sustainable development and other Local Plan policies.*
>
> *The Council will seek to ensure that noise sensitive development and noise generating development are only permitted if* ***noise impacts*** *can be* ***adequately controlled*** *and mitigated.*

4.1.2 It is acknowledged that the *Local Plan Part 2,* which comprises Development Management Policies, has recently undergone a public review and may have been adopted by the time this application has been submitted. As such, consideration has also been given to the incoming Policy DME *5* which is considered pertinent to the proposals. It reads:

> *"Policy DME 5: Hotels and visitor accommodation*
>
> *The council will support a range of visitor accommodation, conference and related uses in accessible sustainable locations, as specified in Policy E2: Location of Employment Growth of the Local Plan Part 1 and defined in the Site Allocations and Designations document, subject to:*
>
> - *No* ***adverse impact*** *on nearby land uses or on the amenity of either adjoining occupants or proposed occupants by virtue of* ***noise****, lighting, emissions, privacy, overlooking, any other potential nuisance, parking or traffic congestion"*

4.1.3 Neither policy imposes objective design limits for plant noise, but instead refer to *adequately controlling* any impact and avoiding an *adverse impact* upon existing noise sensitive uses. The impact assessment methodology of British Standard 4142: 2014 *Methods for rating and assessing industrial and commercial sound* has therefore been adopted for the purposes of reviewing noise emission from the proposed development.

4.2 BS 4142: 2014

4.2.1 The methodology set down within BS 4142: 2014 is commonly used throughout the UK to assess the impact of a new noise source by comparing its noise level (the *specific sound level*) with that of the existing background noise level in the area in the absence of the new source (the *background sound level*). Consideration must to be given to all aspects of the assessment process and any unusual acoustic features such as tonal, impulsive, or intermittency characteristics of the noise should be accounted for by the addition of various decibel corrections to the specific sound level. The corrected specific sound level is the *rating level*.

4.2.2 The background sound level is then arithmetically subtracted from the rating level. The greater the positive difference between the rating level and the background sound level, the greater the magnitude of the impact.

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending upon the context.
- A difference of around +5dB or more is likely to be an indication of an adverse impact, depending upon the context.
- Where the rating level does not exceed the background sound level, this is an indication of a low impact, depending upon the context.

4.2.3 It is proposed that limiting noise emission from building services plant so as to achieve a *low impact* in accordance with BS 4142 would satisfy Policies EM8 and DME5 and demonstrate that an adverse impact upon the neighbouring noise sensitive uses has been adequately controlled.

4.3 Plant proposals

4.3.1 External plant associated with the hotel is understood to comprise 21 Nº VRF condensers serving the hotel and 1 Nº extract fan serving the restaurant kitchen which are to be installed within a screened compound on the fifth-floor rooftop. The screen should obstruct any direct line of sight to the residential properties and be solid and imperforate with a minimum mass of 10kg/m^2.

4.3.2 A summary of the indicative noise data for the equipment is presented in Table 4-1. These levels may be subject to change as the design progresses, but every effort should be made to avoid selecting noisier equipment.

Equipment	No.	Noise level
Air source heat pumps	21	64dB L_{pA} at 1 metre
Extract fan	1	Exhaust: 65dB L_{pA} at 1 metre Breakout: 75dB L_{wA}

Table 4-1 Indicative noise data for building services plant

4.3.3 It is expected that the fan shall be selected and installed with appropriate atmosphere side attenuation so as to comply with the levels in Table 4-1.

4.4 Nearest noise-sensitive receivers

4.4.1 The nearest noise sensitive receivers, most exposed to plant items, have been identified as the residential properties on Triumph Close some 30 metres the west. The locations of the noise-sensitive receivers in relation to the proposed plant items are shown on a site plan in Figure 4-1.

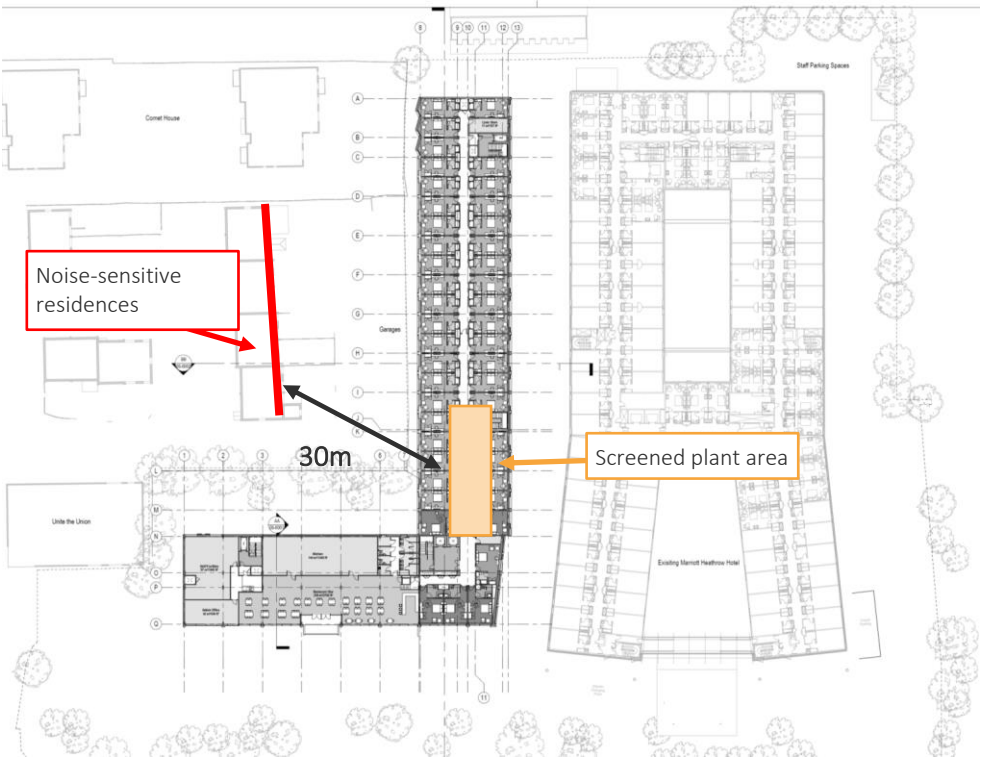

Figure 4-1 Site plan highlighting plant locations and the nearest noise-sensitive receivers

4.4.2 Other potentially noise sensitive properties will benefit from greater attenuation owing to geometric spreading and screening provided by the development itself. Noise levels at these receivers can be expected to be lower and have therefore, not been considered further within this assessment.

4.5 Background sound levels

4.5.1 When selecting suitable background noise levels for the purpose of this assessment, consideration has been given to which measurement position best represents the residential properties and the lowest measured background noise levels presented in Table 2-2 have been chosen. For reference these are:

- 50dB L_{A90} during the daytime (07:00-23:00)
- 47dB L_{A90} during the night (23:00-07:00)

4.5.2 It is acknowledged that BS 4142 recommends assessing noise levels over a 15-minute reference time interval however, this survey has been conducted with 10-minute samples as it is believed to provide a good balance between detail and quantity of data. It should be noted that while the quietest noise levels measured over a shorter sample period can be expected to be lower, any difference between the $L_{A90,15min}$ and $L_{A90,10min}$ is expected to be negligible.

4.6 Predicted noise level

4.6.1 The level of plant noise at the residential properties highlighted in Figure 4-1 has been predicted as 41dB L_{Aeq} based on the plant proposals outlined in Section 4.3.

4.6.2 As previously mentioned in point 4.2.1, penalty corrections should be applied to the specific sound levels if readily identifiable acoustic characteristics are considered present. A description of the noise output from the equipment and the resulting penalty corrections applied in accordance with BS 4142's subjective methodology is provided below.

4.6.3 Noise associated with the proposed equipment is predominantly associated with fans and while this can be expected to be fairly broadband, there is possibility that it may contain a slight tonal component. A +2dB correction has therefore been applied to account for any tonal features which may just be perceptible at the receivers.

4.6.4 Plant items are expected to operate with a fairly continuous noise level which would not be considered impulsive, with a "*soft start*" mode which would avoid obvious on-off conditions and without any other characteristics which would warrant further penalties.

4.6.5 The rating level can therefore be expected to be some 2dB greater than the specific sound level at 43dB $L_{Ar,T}$.

4.7 Assessment of impact

4.7.1 Comparing the predicted plant noise against the survey data demonstrates that the rating levels are expected to be some 4-7dB below prevailing background sound levels. This would indicate that the proposed plant can be expected to have a low impact upon the neighbouring noise-sensitive receivers.

4.7.2 It should be noted that this assessment is considered representative of a worst-case scenario as it assumes that all equipment will be operating at full duty simultaneously, which is likely to be limited to the hottest and coldest days of the years, and compares it against the lowest measured background noise level. Plant noise can typically be expected to be lower than predicted, which further reduces the risk of an adverse impact.

4.7.3 It has been concluded that the proposed plant will readily satisfy any reasonable planning requirements that the London Borough of Hillingdon may choose to impose.

Appendix A – Survey noise level data

A selection of the measured noise level data over a representative 24-hour period are presented in the tables in this appendix. The full set of data are available in electronic form on request.

All values are sound pressure levels in dB re $2x10^{-5}$ Pa.

Time	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A90}
12:40	69.1	83.0	60.4	65.4
12:50	69.6	77.8	63.8	66.8
13:00	68.4	73.8	61.4	65.1
13:10	71.0	82.7	61.1	64.3
13:20	68.0	74.5	58.8	64.7
13:30	67.8	79.1	58.9	64.2
13:40	69.6	82.4	59.2	65.3
13:50	69.1	84.0	60.3	64.2
14:00	69.8	89.8	61.2	64.3
14:10	67.9	76.8	62.9	65.0
14:20	71.7	89.5	60.6	65.0
14:30	68.1	75.9	59.7	64.5
14:40	67.0	73.5	58.2	63.2
14:50	69.7	83.3	61.9	65.6
15:00	69.5	82.0	61.8	66.0
15:10	70.6	84.5	62.0	64.7
15:20	70.6	81.7	60.9	65.5
15:30	70.1	84.8	62.2	65.9
15:40	70.8	83.7	60.5	65.1
15:50	69.4	80.2	62.9	66.0
16:00	69.8	82.5	62.6	66.2
16:10	69.3	83.3	61.2	65.2
16:20	69.7	81.7	60.9	64.8
16:30	69.4	81.4	63.7	65.9
16:40	69.4	81.2	61.0	65.4
16:50	69.5	83.0	59.3	64.2
17:00	67.2	80.1	61.2	64.0
17:10	68.5	76.7	61.0	65.0
17:20	68.5	78.6	62.4	65.0
17:30	68.6	82.6	61.3	65.3
17:40	68.1	76.2	59.5	64.3
17:50	68.6	79.4	60.2	64.2
18:00	68.8	78.5	60.5	63.7
18:10	69.6	80.7	63.0	65.5
18:20	68.1	83.5	59.7	64.0
18:30	66.5	79.4	60.1	62.9
18:40	67.3	78.8	59.8	63.5
18:50	68.0	81.5	61.2	64.8
19:00	68.6	80.7	62.4	64.5
19:10	68.5	82.0	57.8	63.8
19:20	68.4	82.7	60.7	64.6
19:30	68.2	84.4	60.1	63.9
19:40	66.6	75.2	58.3	62.3
19:50	68.4	79.3	58.8	64.6
20:00	67.4	78.1	58.4	63.0
20:10	68.0	84.0	61.2	64.4
20:20	67.3	76.9	59.1	63.1
20:30	67.0	78.2	58.2	62.5
20:40	67.9	81.1	60.2	62.9
20:50	68.5	83.4	58.8	61.7
21:00	65.9	73.9	57.4	61.1
21:10	65.8	79.1	57.3	61.3
21:20	65.9	76.5	57.1	61.4
21:30	68.0	78.4	57.9	63.2
21:40	68.5	83.0	58.2	61.9
21:50	68.4	80.2	59.0	62.4
22:00	65.4	73.3	57.8	61.0
22:10	67.7	80.9	57.9	60.7
22:20	68.4	83.7	56.0	60.9
22:30	68.0	82.8	58.7	62.7
22:40	68.0	80.7	55.4	61.6
22:50	66.6	83.1	51.7	56.6
23:00	66.0	84.8	54.9	59.8
23:10	64.0	80.6	54.0	57.8
23:20	63.9	72.5	51.4	56.9
23:30	62.6	73.1	52.4	58.3
23:40	62.2	72.8	51.1	55.6
23:50	61.8	71.4	51.9	55.7

Table A-1 Statistical measurement data, Measurement position 1, Tuesday 12th November 2019

Time	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A90}
12:20	62.8	74.9	57.2	59.6
12:30	63.3	74.4	58.1	60.2
12:40	64.2	80.1	58.4	60.1
12:50	63.0	72.9	58.1	60.4
13:00	62.2	69.3	57.6	59.5
13:10	66.3	82.7	56.7	59.0
13:20	62.7	74.6	57.2	59.5
13:30	62.0	72.2	56.7	59.3
13:40	64.4	76.0	57.0	59.2
13:50	65.0	82.1	56.5	59.3
14:00	62.7	75.9	56.9	59.5
14:10	62.4	72.7	57.7	59.4
14:20	67.5	84.3	57.0	59.7
14:30	62.1	73.2	56.9	59.3
14:40	61.5	70.1	56.5	58.8
14:50	64.4	79.2	59.0	60.4
15:00	65.3	78.1	58.6	60.2
15:10	66.1	85.9	58.4	59.9
15:20	67.5	81.2	58.4	60.5
15:30	66.6	83.1	57.9	59.8
15:40	67.4	84.5	56.9	59.3
15:50	65.6	81.4	59.4	60.9
16:00	65.8	80.0	57.0	60.0
16:10	64.7	78.7	56.6	58.9
16:20	66.0	80.4	58.0	60.2
16:30	64.7	79.6	57.9	59.3
16:40	65.0	79.4	56.2	59.1
16:50	64.8	78.7	56.0	58.2
17:00	61.2	71.5	55.8	58.4
17:10	64.0	75.2	56.8	59.0
17:20	63.7	75.8	57.5	59.2
17:30	63.6	79.6	55.9	59.2
17:40	63.5	75.1	56.9	58.8
17:50	63.1	75.1	56.4	58.6
18:00	64.4	77.5	56.3	57.8
18:10	65.3	79.5	57.0	58.8
18:20	63.3	79.8	55.2	57.9
18:30	61.3	73.7	55.4	57.1
18:40	61.8	74.6	55.7	57.5
18:50	62.8	77.4	55.9	58.6
19:00	64.0	77.4	56.6	58.6
19:10	64.0	79.6	56.0	57.8
19:20	63.6	79.4	56.3	58.2
19:30	61.9	72.9	55.6	57.5
19:40	61.1	73.3	55.4	57.0
19:50	63.5	77.2	55.8	59.2
20:00	62.2	76.3	54.2	56.3
20:10	64.7	82.9	56.0	58.5
20:20	62.6	75.4	53.5	56.5
20:30	61.7	75.8	53.0	56.1
20:40	62.9	78.5	53.8	56.0
20:50	63.2	76.7	52.2	54.9
21:00	59.1	69.3	51.9	53.8
21:10	59.4	69.5	51.8	54.9
21:20	59.3	74.8	52.6	55.0
21:30	63.5	77.5	53.4	56.1
21:40	64.6	80.8	52.2	55.2
21:50	63.9	78.5	51.8	55.3
22:00	58.8	71.6	51.9	53.8
22:10	63.3	78.0	52.1	54.5
22:20	64.9	79.5	51.6	54.1
22:30	63.7	78.6	53.0	56.0
22:40	63.7	80.7	51.0	55.5
22:50	61.8	77.6	49.1	52.6
23:00	58.4	76.3	49.9	52.3
23:10	55.0	72.8	48.5	50.9
23:20	54.6	71.9	48.4	50.5
23:30	53.7	66.6	48.1	50.9
23:40	53.3	59.8	48.1	49.8
23:50	52.9	68.8	47.6	49.5

Table A-2 Statistical measurement data, Measurement position 2, Tuesday 12th November 2019

Time	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A90}
00:00	62.1	69.6	50.1	54.5
00:10	62.4	75.7	51.2	56.1
00:20	60.1	70.1	48.2	52.1
00:30	60.2	70.4	48.7	52.4
00:40	61.5	80.6	48.1	50.9
00:50	60.6	71.3	49.1	53.1
01:00	60.2	71.0	47.5	50.6
01:10	59.8	74.0	48.9	51.8
01:20	59.9	75.2	48.4	51.1
01:30	59.9	71.3	49.6	52.4
01:40	60.0	73.0	47.0	51.1
01:50	58.4	70.1	47.6	49.9
02:00	60.7	80.5	47.5	50.3
02:10	57.8	68.5	46.9	49.0
02:20	61.1	82.2	47.2	49.8
02:30	59.7	73.7	46.4	49.4
02:40	60.2	73.4	48.3	50.9
02:50	59.5	72.8	47.8	49.7
03:00	58.8	72.5	47.2	49.1
03:10	59.9	72.8	46.7	50.0
03:20	60.1	71.3	48.5	52.2
03:30	61.6	71.8	50.3	53.9
03:40	61.0	70.4	50.8	53.9
03:50	63.0	76.6	51.1	55.0
04:00	62.7	70.4	51.8	55.3
04:10	62.2	70.4	52.1	54.9
04:20	63.8	74.6	51.9	55.8
04:30	65.4	78.4	55.2	58.1
04:40	65.0	72.5	54.5	58.5
04:50	64.7	74.6	54.6	58.8
05:00	65.9	81.2	56.4	61.1
05:10	64.9	83.3	57.7	61.2
05:20	65.1	73.5	58.9	61.7
05:30	65.7	73.5	55.2	60.9
05:40	65.5	77.8	57.4	61.1
05:50	66.1	77.8	60.2	62.2
06:00	67.2	79.2	57.3	61.5
06:10	67.2	80.0	59.9	63.5
06:20	66.7	73.7	60.0	63.1
06:30	67.5	79.0	61.4	63.6
06:40	69.1	82.4	61.8	64.7
06:50	67.0	76.3	60.7	63.6
07:00	68.5	79.1	61.6	65.6
07:10	69.8	83.7	62.3	65.3
07:20	70.0	85.6	61.6	65.2
07:30	70.5	89.6	62.2	64.8
07:40	68.2	83.4	63.0	64.9
07:50	68.5	81.9	62.0	64.4
08:00	69.0	81.4	61.2	64.6
08:10	66.5	78.8	60.0	62.9
08:20	65.9	72.1	61.2	63.6
08:30	67.0	79.2	60.7	63.2
08:40	67.9	80.6	59.1	63.1
08:50	66.8	73.9	61.6	64.8
09:00	65.8	72.7	58.7	62.9
09:10	68.1	83.6	61.1	64.0
09:20	66.1	74.0	58.2	62.7
09:30	66.3	72.6	58.7	63.3
09:40	68.1	83.0	61.0	63.9
09:50	64.9	70.9	57.1	61.6
10:00	65.5	80.8	58.0	61.2
10:10	66.2	80.6	57.6	61.3
10:20	66.0	77.0	58.7	62.4
10:30	66.9	79.3	58.5	61.9
10:40	64.5	75.0	55.5	59.9
10:50	65.2	76.5	57.1	61.2
11:00	66.2	78.3	55.3	61.1
11:10	66.5	83.1	53.9	59.9
11:20	63.6	71.5	53.1	58.1
11:30	63.9	70.8	55.9	59.1
11:40	63.7	73.1	53.3	59.2
11:50	64.3	73.1	53.6	58.9
12:00	64.6	77.6	56.4	59.6
12:10	63.7	70.5	55.5	58.5
12:20	65.0	78.5	55.7	60.5
12:30	65.9	77.0	59.2	62.0
12:40	65.3	79.2	56.4	60.7
12:50	65.4	75.4	55.7	61.0
13:00	65.4	73.7	55.4	60.5
13:10	65.4	73.7	58.2	62.5
13:20	67.3	87.5	59.3	62.9
13:30	65.8	74.1	57.0	62.0
13:40	65.6	75.5	58.0	60.8
13:50	66.5	81.9	55.5	58.9
14:00	67.5	80.5	57.1	62.2
14:10	65.6	75.7	56.6	62.3
14:20	65.7	73.5	59.8	62.4
14:30	65.0	72.6	58.4	61.7
14:40	66.8	82.4	57.2	60.6
14:50	65.6	76.7	59.2	62.0
15:00	70.3	85.7	60.4	63.8
15:10	71.1	86.2	56.5	60.6
15:20	71.3	90.9	60.7	63.4
15:30	71.5	88.2	57.1	62.5
15:40	68.8	83.7	61.2	63.8
15:50	72.3	88.9	60.8	64.4
16:00	69.7	82.5	59.4	62.7
16:10	71.2	86.7	58.6	62.9
16:20	71.3	87.6	60.7	63.8
16:30	70.4	87.2	61.7	64.5
16:40	70.6	83.9	58.6	63.1
16:50	65.0	76.1	55.5	60.9
17:00	64.7	74.9	56.5	61.0
17:10	64.8	80.2	56.9	60.3
17:20	63.9	73.8	55.3	60.5
17:30	63.6	75.3	54.9	59.6
17:40	63.8	74.0	56.4	60.4
17:50	65.5	80.6	57.5	60.9
18:00	63.8	73.9	56.4	59.4
18:10	62.9	71.1	57.0	59.4
18:20	65.1	76.2	58.0	61.3
18:30	66.9	78.7	59.6	62.7
18:40	65.7	76.0	58.5	61.4
18:50	64.3	75.2	57.1	60.7
19:00	64.1	79.6	56.2	59.5
19:10	64.6	72.2	57.5	60.7
19:20	65.4	74.8	58.5	62.0
19:30	65.2	79.3	57.6	61.4
19:40	64.9	71.1	55.7	61.8
19:50	64.6	73.8	55.9	60.2
20:00	65.3	74.9	56.7	61.2
20:10	64.9	76.0	54.9	60.3
20:20	64.9	75.6	55.2	59.9
20:30	65.1	73.8	55.4	60.0
20:40	64.5	71.7	56.4	59.5
20:50	65.8	79.3	56.5	60.0
21:00	64.6	77.0	54.3	58.7
21:10	63.9	71.9	53.3	58.0
21:20	65.0	80.4	54.0	59.4
21:30	64.3	72.2	51.7	59.0
21:40	64.1	72.9	51.7	56.6
21:50	64.9	77.3	55.2	59.7
22:00	64.6	76.9	53.8	58.6
22:10	65.5	76.0	54.0	59.7
22:20	65.2	74.2	54.1	59.4
22:30	64.8	80.3	54.6	58.2
22:40	63.7	72.7	54.4	58.4
22:50	64.5	79.3	52.9	57.3
23:00	64.7	79.4	53.6	59.2
23:10	64.3	74.5	52.8	57.9
23:20	64.0	70.8	53.3	57.5
23:30	62.5	69.5	49.0	54.7
23:40	64.4	80.4	49.4	54.8
23:50	61.7	75.0	50.9	53.2

Table A-3 Statistical measurement data, Measurement position 1, Tuesday 13th November 2019

Time	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A90}
00:00	52.9	58.9	46.8	49.2
00:10	53.1	61.7	47.2	48.9
00:20	51.2	59.8	45.9	47.8
00:30	51.4	60.8	46.2	48.0
00:40	51.8	64.0	46.5	47.7
00:50	51.4	60.5	45.7	47.6
01:00	51.3	64.3	46.3	47.5
01:10	51.2	59.7	46.6	47.9
01:20	50.9	60.2	46.0	47.9
01:30	51.0	59.4	46.3	48.0
01:40	51.2	63.0	45.6	47.4
01:50	50.2	58.5	46.1	47.3
02:00	51.3	65.0	45.7	47.1
02:10	49.8	58.7	45.2	46.8
02:20	58.9	82.2	45.9	47.6
02:30	50.8	63.3	46.1	47.2
02:40	51.1	59.0	45.9	47.6
02:50	51.1	64.2	46.7	47.8
03:00	50.9	61.9	46.6	47.7
03:10	51.3	62.2	46.5	48.0
03:20	51.6	59.5	46.6	48.2
03:30	52.3	58.9	47.3	48.9
03:40	55.5	63.4	47.7	49.4
03:50	55.5	68.3	47.6	50.0
04:00	53.4	64.9	47.7	49.4
04:10	53.0	62.7	47.9	49.6
04:20	54.2	60.8	48.0	50.1
04:30	58.3	73.7	49.1	51.3
04:40	57.7	70.8	50.2	52.2
04:50	56.2	69.9	50.2	52.0
05:00	58.4	69.5	51.3	53.8
05:10	57.4	72.2	50.9	53.6
05:20	56.4	69.3	50.9	53.3
05:30	56.5	71.1	50.5	52.4
05:40	56.3	61.5	52.1	53.9
05:50	56.4	64.6	51.2	53.2
06:00	61.0	74.6	53.1	54.6
06:10	60.5	71.5	54.3	56.3
06:20	61.3	75.0	54.6	57.2
06:30	61.4	71.5	56.5	58.0
06:40	62.5	74.7	54.5	57.7
06:50	59.5	69.1	54.9	56.8
07:00	63.9	78.8	57.1	59.1
07:10	66.3	83.0	58.9	60.6
07:20	66.3	82.8	57.6	59.9
07:30	64.6	81.9	57.7	59.5
07:40	62.4	77.1	57.6	59.1
07:50	63.0	79.4	57.3	58.7
08:00	65.3	81.2	57.2	58.8
08:10	59.8	67.6	56.2	57.7
08:20	60.3	75.3	56.3	58.1
08:30	60.3	72.6	56.4	57.7
08:40	62.1	76.9	56.0	57.9
08:50	60.6	68.9	57.8	59.0
09:00	60.2	73.5	56.2	57.7
09:10	62.0	75.2	56.8	58.3
09:20	60.9	74.2	56.2	57.7
09:30	59.8	72.0	56.3	57.8
09:40	62.8	76.7	55.7	57.7
09:50	58.1	65.5	54.8	56.3
10:00	60.7	76.8	54.7	56.1
10:10	59.5	73.6	54.6	56.3
10:20	59.4	71.3	55.3	56.7
10:30	61.3	74.6	55.4	56.7
10:40	58.5	70.2	54.2	55.9
10:50	58.8	74.5	54.0	55.7
11:00	60.4	75.2	53.4	55.5
11:10	60.4	74.3	54.0	55.3
11:20	57.0	68.5	53.2	55.0
11:30	57.1	73.9	53.2	54.9
11:40	57.3	65.5	53.1	55.2
11:50	58.3	68.9	53.3	55.4
12:00	58.6	67.7	53.9	55.8
12:10	58.1	69.8	53.9	55.4
12:20	58.9	68.2	55.0	56.3
12:30	60.6	74.6	55.6	57.2
12:40	59.0	71.0	54.5	56.0
12:50	60.1	75.3	54.4	56.0
13:00	74.7	93.1	54.5	57.8
13:10	70.6	88.2	55.5	57.9
13:20	60.8	78.3	56.0	57.8
13:30	60.4	72.2	55.1	56.7
13:40	60.8	74.7	55.0	56.8
13:50	60.9	75.8	54.6	56.2
14:00	62.6	76.8	55.4	57.3
14:10	59.9	70.4	55.8	57.2
14:20	60.1	71.5	55.2	56.7
14:30	60.7	74.1	54.7	56.9
14:40	61.8	76.8	54.9	56.4
14:50	59.9	72.1	55.1	57.0
15:00	66.6	80.5	56.0	58.2
15:10	68.1	85.3	54.7	56.7
15:20	66.1	78.3	56.3	58.0
15:30	67.2	83.5	56.1	57.9
15:40	63.9	75.6	56.9	58.6
15:50	67.1	81.7	56.6	58.2
16:00	64.6	81.1	55.4	57.2
16:10	66.4	83.8	54.4	57.2
16:20	66.4	81.6	56.7	58.7
16:30	65.7	82.3	57.3	58.6
16:40	66.1	83.6	54.5	57.2
16:50	59.5	74.1	53.9	55.5
17:00	59.0	68.5	54.5	56.5
17:10	60.1	79.5	54.6	56.7
17:20	58.7	69.8	54.2	56.2
17:30	58.4	67.8	54.5	56.0
17:40	59.4	77.3	54.6	56.2
17:50	61.3	72.8	54.5	57.1
18:00	60.3	79.6	54.8	56.6
18:10	59.3	72.3	54.7	56.3
18:20	59.2	73.4	54.6	56.5
18:30	60.5	72.2	54.8	56.4
18:40	61.3	70.9	55.1	56.9
18:50	60.6	72.2	56.1	57.5
19:00	60.1	73.0	55.0	57.4
19:10	60.1	71.8	54.8	56.5
19:20	60.8	73.5	54.8	56.8
19:30	59.2	69.5	54.7	56.5
19:40	59.0	70.4	54.7	56.2
19:50	58.3	70.2	54.1	55.7
20:00	58.9	73.0	50.2	54.0
20:10	58.5	72.2	50.5	53.2
20:20	57.9	69.7	50.5	53.5
20:30	58.4	72.4	49.8	53.2
20:40	56.0	66.8	49.8	52.8
20:50	59.1	73.6	50.8	53.0
21:00	60.0	76.0	50.0	52.6
21:10	55.4	65.9	49.0	51.2
21:20	60.0	79.2	50.2	52.4
21:30	57.2	72.6	48.6	51.4
21:40	56.6	71.4	47.7	49.7
21:50	58.0	74.7	48.6	51.4
22:00	57.9	74.0	49.3	51.8
22:10	59.7	79.5	48.7	52.6
22:20	57.2	71.7	49.6	52.1
22:30	59.1	77.0	51.2	52.9
22:40	55.3	68.9	49.8	51.8
22:50	55.6	72.2	46.5	49.8
23:00	58.7	72.1	51.5	53.6
23:10	57.6	66.3	50.8	54.3
23:20	55.1	60.8	47.6	50.5
23:30	53.3	58.9	45.7	48.5
23:40	55.1	68.2	46.0	50.5
23:50	54.5	66.1	50.1	51.8

Table A-4 Statistical measurement data, Measurement position 2, Wednesday 13th November 2019

Time	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A90}
00:00	62.9	76.6	51.7	55.0
00:10	62.1	72.8	50.5	53.0
00:20	61.9	75.7	52.6	54.1
00:30	62.5	77.0	52.6	55.1
00:40	62.1	79.8	51.6	53.5
00:50	61.8	72.2	49.5	52.9
01:00	60.3	75.4	49.5	51.5
01:10	60.7	78.6	50.2	52.0
01:20	61.1	76.8	50.3	52.3
01:30	60.1	77.3	50.5	52.3
01:40	59.2	68.7	48.8	50.4
01:50	59.0	69.9	48.6	49.9
02:00	60.4	71.3	48.6	51.0
02:10	58.7	73.8	47.0	48.6
02:20	59.1	70.4	45.5	48.4
02:30	58.5	71.7	46.2	49.1
02:40	59.2	73.7	47.2	48.5
02:50	60.0	73.0	45.1	47.8
03:00	60.1	72.4	46.1	49.6
03:10	63.4	87.8	51.7	53.2
03:20	62.0	74.8	51.8	54.3
03:30	62.1	81.2	51.2	52.9
03:40	62.2	78.5	54.1	56.3
03:50	62.5	69.3	52.6	55.6
04:00	63.0	73.5	52.3	56.2
04:10	63.1	71.9	51.5	54.2
04:20	64.6	74.4	52.8	57.7
04:30	65.6	76.7	53.0	59.8
04:40	65.2	73.6	54.8	59.1
04:50	65.0	74.3	53.6	58.8
05:00	66.6	79.0	53.7	58.4
05:10	69.2	84.5	55.5	60.3
05:20	65.5	78.4	54.6	60.3
05:30	66.1	73.5	57.2	60.2
05:40	65.9	74.9	56.9	61.4
05:50	65.8	76.8	55.5	58.9
06:00	66.1	78.2	55.8	62.1
06:10	68.1	82.2	57.6	62.6
06:20	66.8	77.8	57.2	61.7
06:30	67.1	79.5	56.0	61.8
06:40	69.4	83.0	58.6	62.4
06:50	67.4	74.8	57.1	63.2
07:00	66.1	74.6	60.1	62.7
07:10	67.0	77.7	58.3	62.6
07:20	65.4	74.0	55.9	60.9
07:30	67.0	78.1	58.3	62.8
07:40	66.4	84.0	58.0	61.8
07:50	66.5	75.9	58.2	62.6
08:00	67.0	85.0	55.8	61.4
08:10	66.4	79.5	58.1	63.2
08:20	66.2	76.6	55.8	60.8
08:30	66.4	79.1	59.9	63.1
08:40	65.7	77.0	55.8	60.0
08:50	67.0	81.1	57.3	63.3
09:00	67.1	80.4	56.1	62.7
09:10	66.0	88.4	55.6	62.5
09:20	66.2	76.1	56.8	61.3
09:30	66.7	78.5	59.7	62.8
09:40	65.8	73.5	55.6	61.9
09:50	65.7	75.6	58.8	62.1
10:00	65.5	82.2	56.7	60.9
10:10	65.5	82.0	56.3	61.7
10:20	65.5	74.5	56.1	60.6
10:30	65.5	73.8	52.0	59.5
10:40	65.0	74.9	54.3	60.0
10:50	64.9	76.6	53.8	59.0
11:00	65.5	79.0	55.9	60.9
11:10	64.0	75.6	54.8	58.8
11:20	65.0	77.9	55.0	60.4
11:30	63.8	77.5	49.6	55.6
11:40	65.3	78.6	52.1	59.3
11:50	64.4	75.1	53.9	59.4
12:00	65.9	80.0	55.0	59.7
12:10	65.2	73.3	56.4	60.9
12:20	65.3	78.0	52.6	60.5
12:30	65.2	80.8	52.5	59.0
12:40	64.2	75.1	55.1	59.5

Table A-5 Statistical measurement data, Measurement position 1, Thursday 14th September 2019

Time	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A90}
00:00	55.4	62.5	50.8	52.4
00:10	54.6	61.7	49.9	51.3
00:20	55.1	62.7	51.0	52.7
00:30	55.6	79.0	50.4	51.9
00:40	54.5	64.8	50.3	51.9
00:50	54.4	65.2	49.3	51.2
01:00	53.1	60.7	49.2	50.6
01:10	53.3	64.6	49.3	51.2
01:20	53.5	60.8	50.1	51.4
01:30	53.1	65.5	50.0	51.1
01:40	52.2	65.0	48.9	50.1
01:50	51.8	64.1	48.5	49.5
02:00	51.8	60.7	46.9	48.4
02:10	50.9	60.3	46.8	48.1
02:20	51.4	60.1	46.9	48.4
02:30	51.8	68.5	47.1	48.7
02:40	51.4	60.9	47.4	48.5
02:50	51.2	64.6	46.0	47.2
03:00	53.4	63.7	46.0	48.3
03:10	55.4	75.5	51.2	53.0
03:20	54.9	68.8	50.4	51.9
03:30	54.5	66.8	50.0	51.3
03:40	55.7	65.4	52.0	53.8
03:50	54.5	68.0	50.0	51.7
04:00	54.8	65.7	50.1	51.7
04:10	54.1	60.5	49.0	50.2
04:20	55.1	61.9	48.6	51.1
04:30	59.2	77.4	49.6	51.6
04:40	57.6	71.0	49.8	52.2
04:50	57.8	72.7	49.2	51.7
05:00	60.3	73.5	49.1	52.6
05:10	63.2	79.8	51.4	53.2
05:20	56.8	69.2	50.1	52.9
05:30	57.0	62.2	50.6	52.9
05:40	58.2	70.5	51.1	54.7
05:50	57.8	70.5	50.4	54.2
06:00	59.8	72.1	53.2	55.5
06:10	62.8	78.6	52.4	55.5
06:20	61.4	74.6	53.3	55.7
06:30	62.5	77.5	53.4	56.1
06:40	65.3	80.6	53.4	56.2
06:50	60.9	71.1	54.0	56.8
07:00	60.6	73.8	54.9	57.3
07:10	62.2	76.7	56.1	57.8
07:20	60.4	74.5	55.1	57.4
07:30	61.8	75.1	56.0	57.9
07:40	60.5	72.1	55.7	57.4
07:50	60.7	71.4	55.9	57.3
08:00	60.3	77.1	55.3	56.9
08:10	60.1	71.8	55.5	57.8
08:20	60.2	71.5	55.3	57.2
08:30	59.5	68.0	55.6	57.5
08:40	60.4	80.6	55.2	57.3
08:50	61.3	77.7	55.3	58.4
09:00	63.4	81.0	54.6	57.7
09:10	59.7	73.1	54.0	57.0
09:20	60.9	71.9	55.5	57.8
09:30	60.4	70.2	55.4	57.4
09:40	60.0	70.5	54.5	57.0
09:50	60.0	71.4	55.5	57.4
10:00	63.8	81.6	54.7	57.0
10:10	59.2	83.1	54.3	56.1
10:20	59.0	71.0	53.7	55.4
10:30	60.1	76.2	53.5	56.0
10:40	58.5	69.6	53.2	55.3
10:50	59.4	76.0	53.6	55.4
11:00	59.1	74.2	53.5	55.3
11:10	57.5	71.2	53.1	54.5
11:20	58.4	74.1	53.5	55.1
11:30	58.2	71.1	52.7	54.2
11:40	58.2	71.2	53.0	54.9
11:50	57.3	70.1	53.1	54.7
12:00	59.1	75.5	53.3	55.1
12:10	58.0	69.0	53.0	55.1
12:20	58.3	71.3	52.7	55.2
12:30	57.5	67.5	52.3	54.6
12:40	57.8	71.5	53.6	55.3

Table A-6 Statistical measurement data, Measurement position 2, Thursday 14th September 2019

Appendix B – Weather data

Presented below are a selection of graphs detailing local weather conditions during the survey. The measurement period has been highlighted on each graph.

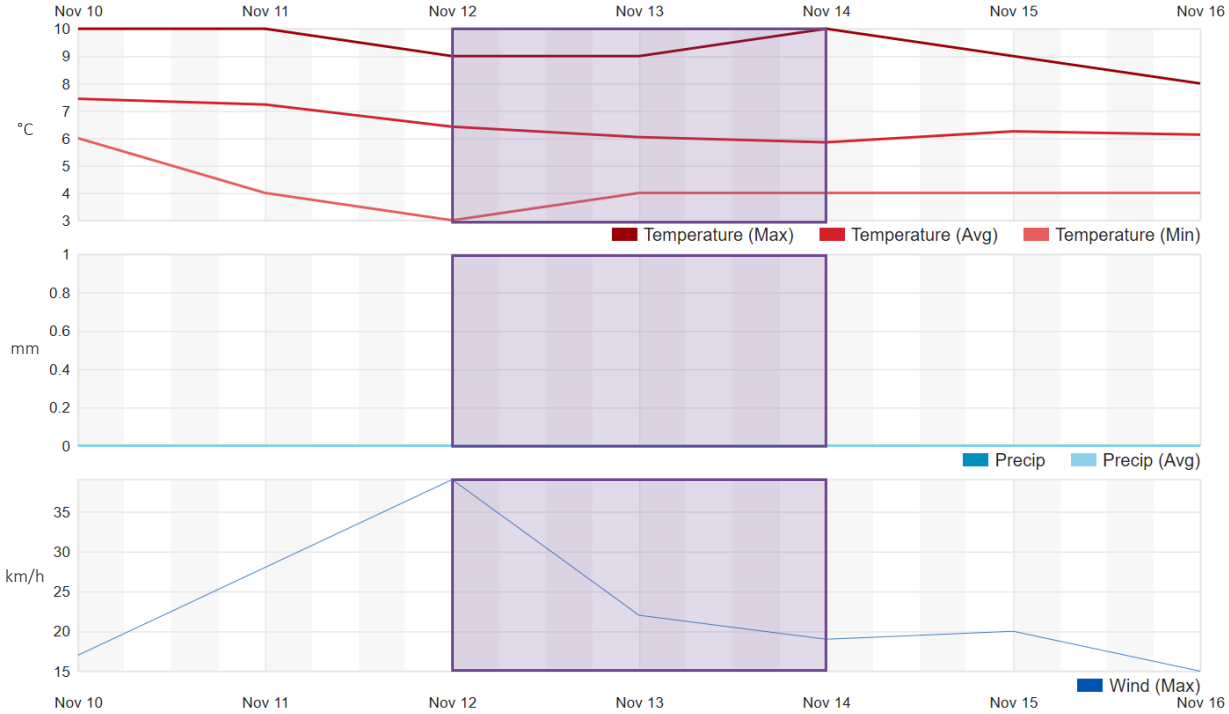

Figure B-1 Local weather data, 12th – 14th November 2019

Appendix C – Terminology

This appendix provides an explanation of some of the terms used in this report.

	The human ear does not sense all frequencies of sound equally. Our sensitivity is at a maximum at around 2 kHz and steadily decreases above and below. Below 20 Hz and above about 20 kHz we can't hear at all.
A-weighting **L_A or L_{pA}, L_{WA},**	Within its operating limits a precision measurement microphone measures all frequencies the same so the output it produces does not reflect what we would actually hear. The A-weighting is an electronic filter that matches the response of a sound level meter to that of the human ear. When A-weighted the Sound Pressure Level L_p becomes L_{pA} (or L_A) and the Sound Power Level L_W becomes L_{WA}.
L_p	*The instantaneous sound pressure level* (L_p)
L_{pA} (or L_A)	*The A-weighted instantaneous sound pressure level* (L_{pA} or L_A)
	This is the root mean square size of the pressure fluctuations in the air. This level can fluctuate wildly even for seemingly steady sounds. To make sound level meters easier to read the values on the display are smoothed or damped out. This is effectively done by taking a rolling average of the previous 0.125 s (FAST time constant) or the previous 1 s (SLOW time constant).
L_{AF}, L_{AS}	The letters F or S are added to the subscripts in the notation to indicate when the FAST or SLOW time constant has been used. These are often omitted but it is good practice to include them.
L_{max}	*The maximum instantaneous sound pressure level* (L_{max}),
L_{Amax}	*The A-weighted maximum instantaneous sound pressure level* (L_{Amax})
L_{AFmax}	*The A-weighted maximum instantaneous sound pressure level with a FAST time constant* (L_{AFmax}).
L_{min} , L_{Fmin}	The opposite of the L_{max} is the *minimum instantaneous sound pressure level* or L_{min} etc. It is good practice to include the letter which identifies the time constant used as this can make a significant difference to the value.

$L_{N,T}$	*The percentage exceedance sound pressure level ($L_{N,T}$),*
$L_{AN,T}$ $L_{AFN,T}$ $_N$ = %age value, 0-100 $_T$ = measurement time eg. L_{A90}, L_{A10}, $L_{AF90,\ 5\ min}$	*The A-weighted percentage exceedance sound pressure level ($L_{AN,T}$), the A-weighted percentage exceedance sound pressure level with a FAST time constant ($L_{AFN,T}$).*
	This is the sound pressure level exceeded for *N*% of time period *T*. eg. If an A-weighted level of x dB is exceeded for a total of 6 minutes within one hour, the level will have been above x dB for 10% of the measurement period. This is written as $L_{A10,1hr}$ = x dB.
	L_{A0} (the level exceeded for 0 % of the time) is equivalent to the L_{Amax} and L_{A100} (the level exceeded for 100 % of the time) is equivalent to the L_{Amin}.
	It is good practice to include the letter which identifies the time constant used as this can make a significant difference to the value.
$L_{eq,T}$	The *equivalent continuous sound pressure level over period T ($L_{eq,T}$),*
$L_{Aeq,T}$ $_T$ = measurement time eg. $L_{Aeq,5min}$	*The A-weighted equivalent continuous sound pressure level over period T ($L_{Aeq,T}$).*
	This is effectively the average sound pressure level over a given period. As the decibel is a logarithmic quantity the L_{eq} is not a simple arithmetic mean value.
	The L_{eq} is calculated from the raw sound pressure data. It is not appropriate to include a reference to the FAST and SLOW time constants in the notation

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