KR06434

Montague Hotel

Noise Impact Assessment…

Standard: British Standard 4142: 2014

Site: Montague Hotel

Address: 15 Montague Street
London

Postcode: WC1B 5BJ

Customer: Skuddair Ltd

Address: 34 Hatley Road
Longfield
Kent

Postcode: DA3 7PP

Issue: Version 1.1

Date: 4th January 2019

Status: Current Document

KR Associates (UK) Ltd

Quietly confident…

Revisions…

KR06434		Project	Montague Hotel		
		Title	Noise Impact Assessment - Proposed Additional Plant		
		Standard	British Standard 4142: 2014		
Issue	Date	Details of Revision			
v1.1	04/01/19	Description	Report issue for submission to Local Authority		
		Signature			
		Name	Mr. R. Scrivener	Miss N Truman	Mr R Scrivener
		Position	Technical Director	Project Manager	Technical Director

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KR Associates…

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1. Executive Summary….

1.1. Instruction

KR Associates (UK) Ltd have been instructed by Skuddair Ltd to undertake and environmental noise survey at the Montague Hotel located at 15 Montague Street, London to determine if the installation of the proposed two additional Daikin air conditioning units will have a significant adverse impact in terms of noise on the local residents.

1.2. Executive Summary (Repeated at Section 7)

1.2.1 Assessment Position

The located at the adjacent residential is located between 24 m from the 2 No Daikin air conditioning units located on the rear of the hotel on the flat roof.

1.2.2 Background Noise Measurements

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
60 - 84 dB	52 - 62 dB	42 - 54 dB	61 - 84 dB	52 - 62 dB	39 - 50 dB	49 - 71 dB	39 - 55 dB	32 - 44 dB

1.2.3 Criterion at Assessment Position

It would be recommended that to comply with revised version of the National Planning Policy Framework (“NPPF”) and the requirements of Policy A4 and Appendix 3 of the Camden Local Plan 2017 the Local Plan the resultant noise levels at the nearest residential dwellings is at least 15 dB below the underlying background noise levels when assessed in accordance with British Standard 4142: 2014. This assumes there is a tonal content to the air conditioning noise. Furthermore, the resultant noise levels complies with the noise rating curve NR35 as a defined in Appendix B of British Standard 8233: 2014.

1.2.4 Assessment of Noise Levels

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142
32 dB	46 dB	-14 dB	32 dB	44 dB	-12 dB	Not Operating		

1.2.5 Conclusions

In accordance with paragraph 14 of the National Planning Policy Framework (2018) planning permission should be granted for the proposal as the benefits outweigh any significant adverse impacts in terms of noise from the installation of the proposed additional two Daikin air conditioning units.

2. Site Location…

2.1. General Location of Site

Site Plan (Imagery © Google 2016)

The Montague hotel is located in a large Victorian terrace around a centre garden square. There are residential dwellings adjacent to the hotel on either side and on the opposite side of the garden square.

2.2. Key Positions (Source, Assessment & Background)

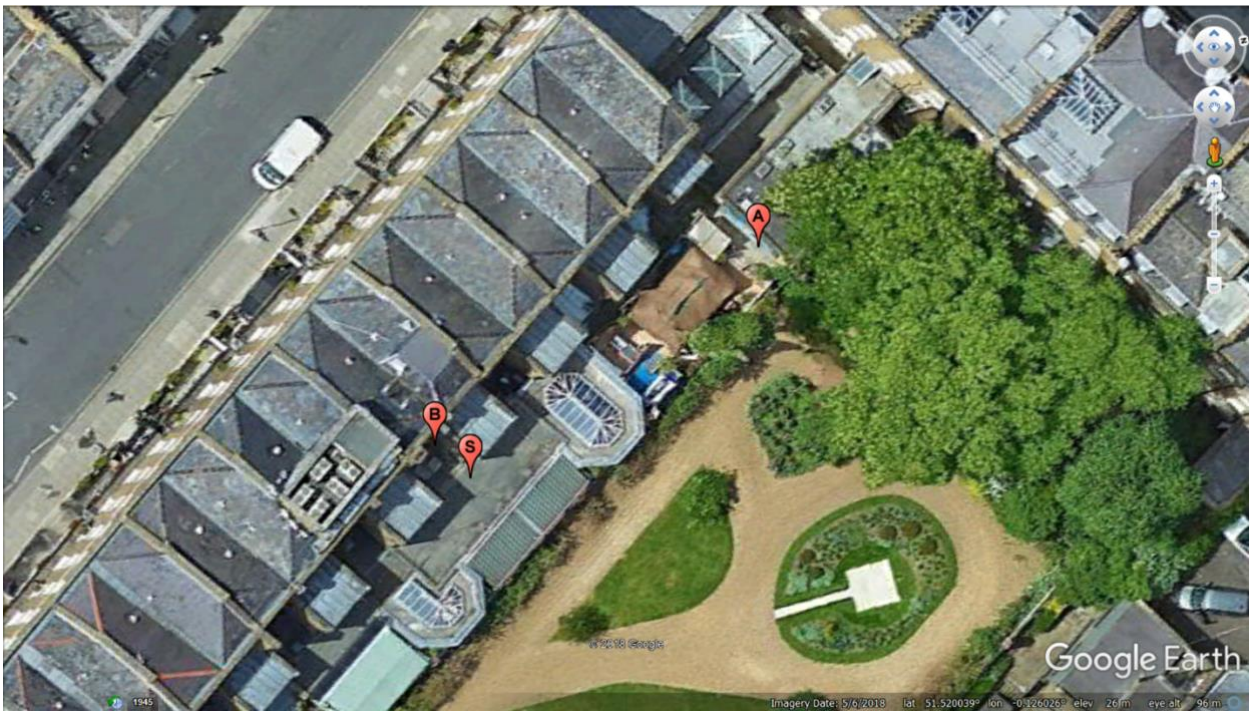
Position	Description	Latitude	Longitude	Elevation
Sources	2 No Daikin air conditioning units	51.520245^0	-0.125507^0	5 m
Assessment	Located at the adjacent residential	51.520438^0	-0.125661^0	4 m
Background	On the rear façade of the hotel	51.520229^0	-0.125544^0	5 m

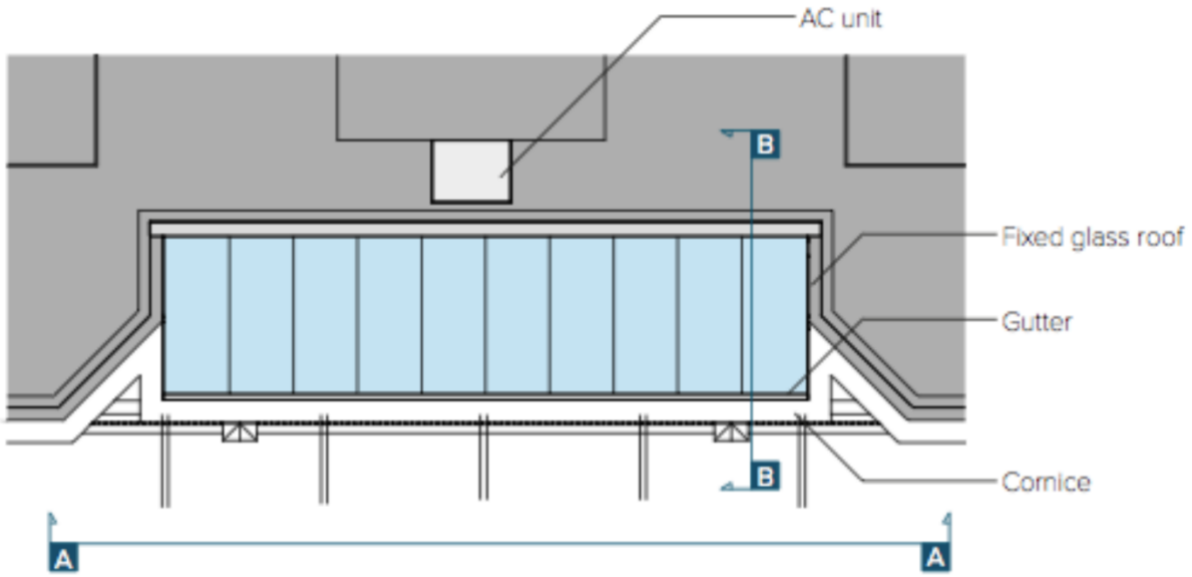
Site Plan (Imagery © Google 2016)

2.3. Free Field Source Sound Pressure Levels at 10m

Source	Description of Source	Sound Pressure at 10m – Annex C 13487: 2003		
		07:00 – 19:00	19:00 – 23:00	23:00 – 07:00
Source 1	AC Unit 1 – Daikin RZAG 71 MV1 AC Unit	$L_{p(10)}$ 36 dB	$L_{p(10)}$ 36 dB	$L_{p(10)}$ 26 dB
Source 2	AC Unit 2 – Daikin RZAG 71 MV1 AC Unit	$L_{p(10)}$ 36 dB	$L_{p(10)}$ 36 dB	$L_{p(10)}$ 26 dB
Combined Sound Pressure Level at 10m (1 Reflective Surface)		$L_{p(10)}$ 39 dB	$L_{p(10)}$ 39dB	$L_{p(10)}$ 39 dB

2.4. Locations and Distances of Individual Source Positions



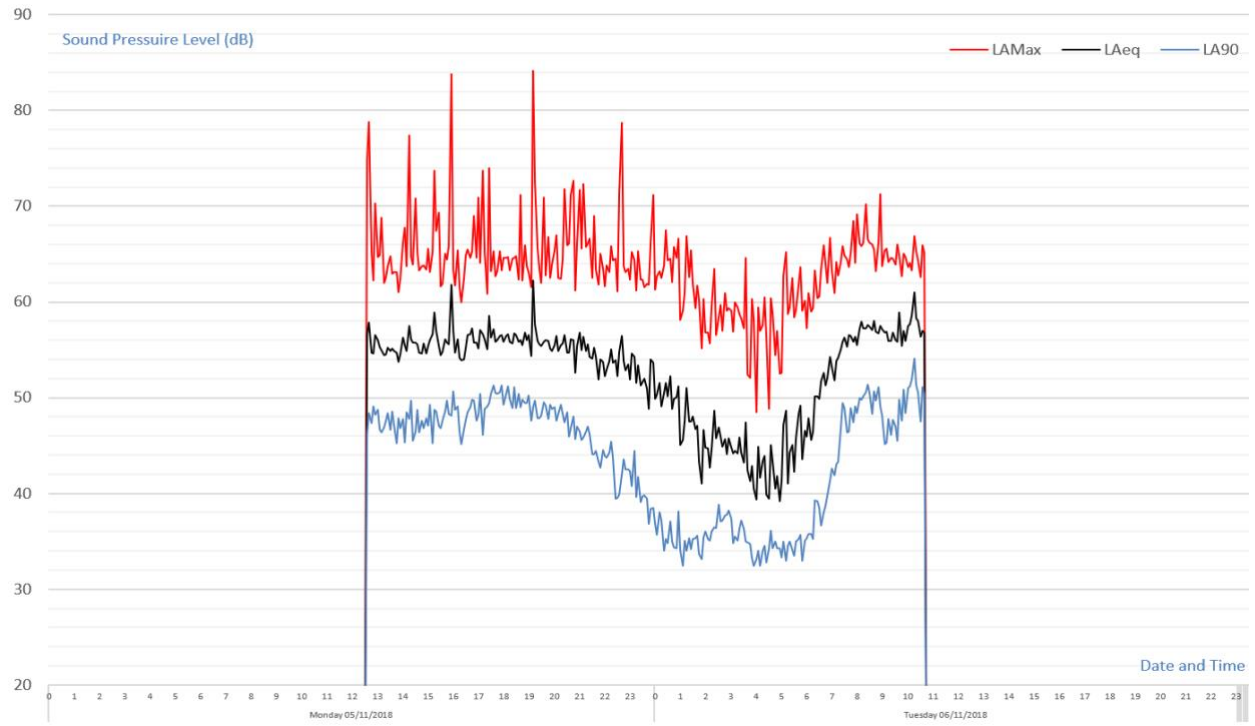


Position	Relative Distance	Latitude	Longitude	Elevation
Source 1	24 m to assessment position	51.520245^0	-0.125507^0	5 m
Source 1	24 m to assessment position	51.520245^0	-0.125507^0	5 m

Site Plan (Imagery © Google 2016)

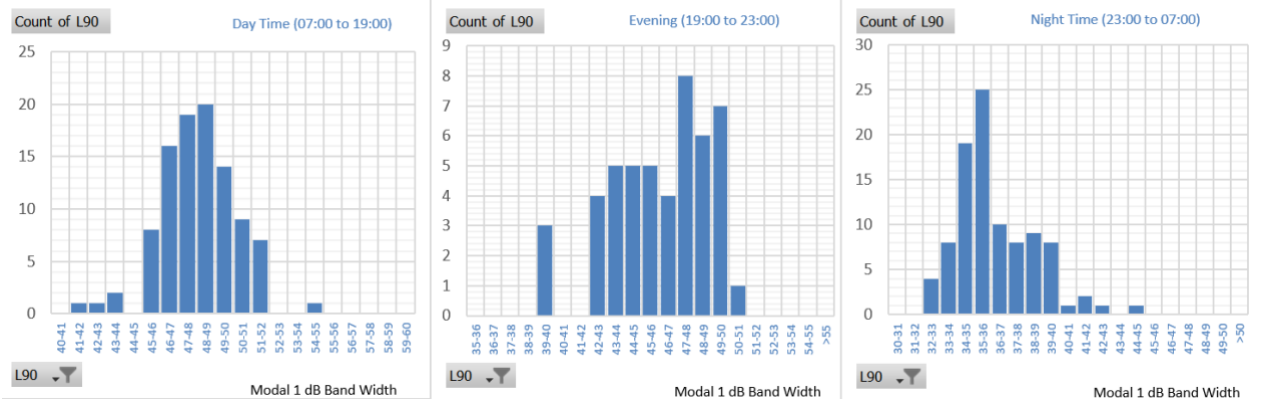
3. Background Noise Measurements…

3.1. 24-hour Background Measurements



Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
60 - 84 dB	52 - 62 dB	42 - 54 dB	61 - 84 dB	52 - 62 dB	39 - 50 dB	49 - 71 dB	39 - 55 dB	32 - 44 dB

3.2. Modal Analysis of Background Data



Day Time (07:00 to 19:00)		Evening (19:00 to 23:00)		Night Time (23:00 to 07:00)	
Standard Deviation (σ)	2.03	Standard Deviation (σ)	2.76	Standard Deviation (σ)	2.37
Geometric Average	48 dB	Geometric Average	46 dB	Geometric Average	36 dB
Modal Value	46 dB	Modal Value	44 dB	Modal Value	34 dB

4. Criterion…

4.1. National Planning Policy Framework 2012

4.1.1 Scope of Standard

The revised National Planning Policy Framework published in 2018 provides an assumption in favour of sustainable development that meets the three overarching objectives: economic, social and environmental. Paragraph 11 provides guidance for decision makers:

> *"For decision-taking means:…*
> *c) approving development proposals that accord with an up-to-date development without delay; or*
> *d) …granting planning permission…*
> *i) the application of polies in this Framework… provides a clear reason for refusing development proposal; or*
> *ii) any adverse impacts of doing so would significantly and demonstrably outweigh the benefits.*

4.1.2 Conserving and Enhancing the Natural Environment

Paragraph 170 of the NPPF provides the following guidance on noise:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of …noise pollution…"*

4.1.3 Appropriate Development

Paragraph 180 of the NPPF requires the development to be appropriate for its location:

> *"Planning… decisions should also ensure that new development is appropriate for its location…*
> *a) mitigate and reduce to a minimum potential adverse impact resulting from noise form new development and avoid noise giving rise to significant adverse impacts on health and quality of life [60]*
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for the recreational and amenity value…*
>
> *60 See Explanatory Note to the Noise Policy Statement for England: 2010"*

4.2. Noise Policy Statement for England: 2010

4.2.1 Scope of Standard

The Noise Policy Statement for England was published in 2010 defines three aims:

> *"**Avoid** significant adverse impact on health and the quality of life;*
> ***Mitigate** and minimise adverse impacts on health and quality of life; and*
> ***Contribute** to the improvement of health and the quality of life."*

4.2.2 Criterion

The NPSE defines significant adverse and adverse impact in terms of noise:

> *"LOAEL – Lowest Observed Adverse Effect Level*
>
> *This is the level above which adverse effects on health and quality of life can be detected.*
>
> ***SOAEL** – Significant Observed Adverse Effect Level*
>
> *This is the level above which significant adverse effects on health and quality of life occur."*

4.3. Night Noise Guidelines ("NNG")

The European Union and the World Health Organisation published the document *"Night Noise Guidelines for Europe"* in 2009.

4.3.1 Recommendation for Health Protection

> *"Below the level of 30 dB $L_{night,\ outside}$ no effects on sleep are observed except for a slight increase in the frequency of body movements during sleep due to night noise.*
>
> *…. 40 dB $L_{night,\ outside}$ is equivalent to the lowest observed adverse effect level (LOAEL) for night noise.*
>
> *Above 55 dB the cardiovascular effects become the major public health concern."*

For reference the $L_{night,\ outside}$ is the average outside noise level over 8 hour calculated over a year (EU: 2002/49/EC).

4.3.2 Description of Effect of Change in Noise Level

Noise Level Change (dB)	Subjective Response	Significance
0.1 – 2.9	Barely perceptible	Minor Impact
3.0 – 5.9	Noticeable	Moderate Impact
6.0 – 9.9	Up to a doubling of loudness	Substantial Impact
10.0 or more	More than a doubling of loudness	Major Impact

4.4. British Standard 4142: 2014…

4.4.1 Testing Standard…

British Standard 4142: 2014 provides a method for assessing the likely effects of sound from industrial or commercial nature on *"people who might be inside or outside a dwelling used for residential purposes"*.

4.4.2 Criterion

The standard provides 3-levels of impact based on the calculated Rating Levels:

> *"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 +5dB is likely to be an indication of an adverse impact, depending on the context.*
> *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."*

4.4.3 British Standard 4142: 2014 Feature Correction

It is appropriate to add a character correction where there is a new source that cannot be measured in line with BS4142:2014. The 3 methods for approaching this are the subjective, objective, and reference methods. In this report the subjective method is used.

Section 9.2 Subjective Method	Perceptibility to noise sensitive façades	Correction
Tonality Ranging from not tonal to prominently tonal	Not tonal	+0
	Just perceptible	+2
	Clearly perceptible	+4
	Highly perceptible	+6
Impulsivity Considering both the rapidity and any overall change in sound levels	Not impulsive	+0
	Just impulsive	+3
	Clearly impulsive	+6
	Highly impulsive	+9
Readily Distinctive Characteristic is neither tonal nor impulsive	Is not present	+0
	Is present	+3
Intermittency Identifiable "on/off" conditions	Is not present	+0
	Is present	+3

4.5. Local Authority Requirements

The Camden Local Plan 2017 has policy A4 which relates to noise.

> *"Policy A4 Noise and vibration The Council will seek to ensure that noise and vibration is controlled and managed. Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for: a. development likely to generate unacceptable noise and vibration impacts; or b. development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses. We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development."*

Appendix 3 of the Local Plan provides a criterion within table C for commercial or industrial noise sources including air conditioning units located near existing residential dwellings:

> *"Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)*

Existing Noise sensitive receptor	*Assessment Location*	*Design Period*	*LOAEL (Green)*	*LOAEL to SOAEL (Amber)*	*SOAL (Red)*
*Dwellings***	*Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)*	*Day*	*'Rating level' 10dB* below background*	*'Rating level' between 9dB below and 5dB above background*	*'Rating level' greater than 5dB above background and/or events exceeding 88dBLAmax*
*Dwellings***	*Outside bedroom window (façade)*	*Night*	*'Rating level' 10dB* below background and no events exceeding 57dBLAmax*	*'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB LAmax*	*'Rating level' greater than 5dB above background and/or events exceeding 88dBLAmax*

5. Calculations of Noise Levels…

5.1. ISO 9613 – Part 2:1996

The International Standards Organisation ("ISO") published ISO 9613 – Part 2: 1996 entitled *"Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculations"* which details the corrections that are required to established the resultant noise levels of the existing and proposed plant at the assessment position.

5.1.1 Source Directivity (D_c)

A correction is made to account for the location of the source and the effect of additional reflective surfaces excluding the ground and is contained within section 6 of ISO 9613 - Part 2:1996.

Number of Surfaces	Correction in dB (D_c)
1 Reflective Surface	+3 dB
2 Reflective Surfaces	+6 dB
3 Reflective Surfaces	+9 dB

5.1.2 Geometric Divergence (A_{div})

A correction is made for the distance between the source and assessment position using the following formula defined in section 7.1 of ISO 9613-Part 2:1996.

Formula	Symbols
$A_{div} = 20 . Log_{10} (d/d_0) +11$	A_{div} = Reduction due to Geometric Divergence (dB) d = Distance from source to receiver (m) d_0 = reference distance (1m)

5.1.3 Ground Absorption (A_{gr})

A correction is made for the effect of the ground between the source and receiver depending on whether it is considered hard or soft ground.

Type of ground	Correction in dB (A_{gr})
Hard Ground	+ 3 dB
Soft Ground	+ 0 dB

5.1.4 Atmospheric Absorption (A_{atm})

As the source was less than 100m from the receiver position (assessment position) no correction was made for atmospheric absorption.

5.1.5 Barrier Effect (A_{bar})

A correction is made for any barrier in the direct line of site between the source and the assessment position and is detailed in section 7.4 of ISO 9613-Part 2:1996. For clarity the K_{met} meteorological correction has been ignored and C_2 equals 40 and C_3 equals 1.

Formula	Symbols
$A_{bar} = 10 . Log_{10} [3 + (40 . \delta / \lambda) - A_g]$ *Note 1 where $\delta = a + b – r$ and $\lambda = c / f$	A_{bar} = Effective barrier attenuation (dB) A_{gr} = Total Ground Absorption (dB) *Note 1: Only apply the A_{gr} correction if $A_{gr} > 0$ δ = Path difference (m) a = Distance from source to barrier head (m) b = Distance from barrier head to assessment position (m) r = Distance from source to assessment position (m) λ = Wavelength of sound (m) c = Speed of sound – Assumed to be 342 ms^{-1} f = Octave band centre frequency (Hz)

5.2. British Standard 4142: 2014 Feature Correction

It is appropriate to add a character correction where there is a new source that cannot be measured in line with BS4142:2014. The 3 methods for approaching this are the subjective, objective, and reference methods. In this report the subjective method is used.

Section 9.2 Subjective Method	Perceptibility to noise sensitive façades	Correction
Tonality Ranging from not tonal to prominently tonal	Not tonal	+0
	Just perceptible	+2
	Clearly perceptible	+4
	Highly perceptible	+6
Impulsivity Considering both the rapidity and any overall change in sound levels	Not impulsive	+0
	Just impulsive	+3
	Clearly impulsive	+6
	Highly impulsive	+9
Readily Distinctive Characteristic is neither tonal nor impulsive	Is not present	+0
	Is present	+3
Intermittency Identifiable “on/off” conditions	Is not present	+0
	Is present	+3

5.3. Calculation of Plant Noise Levels

5.3.1 Day Time (Day Time: 07:00 to 19:00)

		Source	ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	Daikin RZAG 71 MV1 AC Unit	64 dB	+6 dB	-39 dB	+3 dB	-0 dB	-5 dB	29 dB
2	Daikin RZAG 71 MV1 AC Unit	64 dB	+6 dB	-39 dB	+3 dB	-0 dB	-5 dB	29 dB
TOT	Total Noise Levels	67 dB	-35 dB					32 dB

5.3.2 Evening (19:00 to 23:00)

		Source	ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	Daikin RZAG 71 MV1 AC Unit	64 dB	+6 dB	-39 dB	+3 dB	-0 dB	-5 dB	29 dB
2	Daikin RZAG 71 MV1 AC Unit	64 dB	+6 dB	-39 dB	+3 dB	-0 dB	-5 dB	29 dB
TOT	Total Noise Levels	67 dB	-35 dB					32 dB

5.3.3 Night Time (23:00 to 07:00)

The units will not operate between 23:00 and 07:00 as there will be no requirement for air conditioning during these periods. The units will be fitted with time-clock to ensure the units do not operate during these periods.

6. Assessment of Noise Levels…

6.1. Assessment of Average Noise Levels (BS 4142: 2014)

BS 4142: 2014	Day Time - 07:00 to 19:00	Evening – 19:00 to 23:00	Night Time – 23:00 to 07:00
Residual Noise Levels	$L_{Aeq,1\ hours}$ 56 dB	$L_{Aeq,1\ hours}$ 55 dB	$L_{Aeq,15\ minutes}$ 47 dB
Specific Noise Levels	$L_{Aeq,1\ hours}$ 32 dB	$L_{Aeq,1\ hours}$ 32 dB	Not Operating
Impulsivity Feature	+0 dB	+0 dB	+0 dB
Tonality Feature	+0 dB	+0 dB	+0 dB
Rating Noise Levels	$L_{Aeq,1\ hours}$ 32 dB	$L_{Aeq,1\ hours}$ 32 dB	--
Background Noise Levels	$L_{A90,1\ hours}$ 46 dB	$L_{A90,1\ hours}$ 44 dB	$L_{A90,\ 15\ minutes}$ 34 dB
BS 4142 Assessment	-14 dB	-12 dB (Low Impact)	--
NPPF – Paragraph 123	-0 dB (Low Impact)	-0 dB (Low Impact)	--
Uncertainty (95% Confidence, k=2)	+- 1.80 dB	+- 1.88 dB	--

7. Conclusions…

7.1. Assessment Position

The nearest assessment position is the located at the adjacent residential which is located between 24 m from the 2 No Daikin air conditioning units located at the rear of the hotel on the 1st floor flat roof.

7.2. Background Noise Measurements

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
60 - 84 dB	52 - 62 dB	42 - 54 dB	61 - 84 dB	52 - 62 dB	39 - 50 dB	49 - 71 dB	39 - 55 dB	32 - 44 dB

7.3. Criterion at Assessment Position

NPPF Policy Aim (p 123)	Action	Night Noise Guidelines	ISO 9613: 2016 / IEMA	BS 4142: 2014
Significant Adverse Impact	Avoid	L_{night} 55 dB or more	$L_{Aeq,\,t}$ +10 dB or more	+10 dB
Adverse Impact	Mitigate	L_{night} 40 – 55 dB	$L_{Aeq,\,t}$ +3 to +9 dB	+5 dB
Improved Quality of Life	Ideal if Possible	L_{night} 40 dB or less	$L_{Aeq,\,t}$ +2 dB or less	+0 dB

7.4. Mitigation Measures

No specific mitigation measures will be required.

7.5. Assessment of Noise Levels

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142
32 dB	46 dB	-14 dB	32 dB	44 dB	-12 dB	Not Operating		

7.6. Conclusions

In accordance with paragraph 14 of the National Planning Policy Framework (2012) planning permission should be granted for the proposal as the benefits outweigh any significant adverse impacts from the installation of the proposed additional mechanical equipment.

7.7. Uncertainty

Day Time (07:00 – 19:00)	Evening (19:00 – 23:00)	Night Time (23:00 – 07:00)
+-1.80 dB (k=2, 95% Confidence)	+-1.88 dB (k=2, 95% Confidence)	+-1.84 dB (k=2, 95% Confidence)

8. Appendix A - BS 4142:2014 Information to Be Reported…

8.1. a) Competency

	Name	Role	Competency
1)	Mr. R. Scrivener	Director	Master of Science Degree in Acoustics and Noise Control (MSc) Member of the Institute of Acoustics (MIOA)

8.2. b) Source Under Investigation

1)	Source Number	Description		
	Source 1 and 2	2 No Daikin RZAG 71 MV1 AC Unit		
2) 3) 4) 5)	Description of Source	Source Location	Hours of Operation	Mode of Operation
	Source 1	2 No Daikin air conditioning units	07:00 to 23:00 only	Continuously on Demand
	Description of Operation	Period	Conditions	Load
	All Sources	Day Time (07:00 to 19:00)	Ambient Temp 32°C	Maximum Load (100%)
		Evening (19:00 to 23:00)	Ambient Temp 28°C	Part Load (60%)
		Night Time (23:00 to 07:00)	Ambient Temp 24°C	Part Load (40%)
	Description of Premises	The Montague hotel is located in a large Victorian terrace around a centre garden square.. There are residential dwellings adjacent to the hotel on either side and on the opposite side of the garden square.		

8.3. c) Subjective Impression of Source at Assessment Position

1)	Dominance	Source will not be dominant at residential facade
	Audibility	Source will not be audible at residential facade
2)	Residual Noise Sources	Residual noise due to local road traffic

8.4. d) Existing Contexts

	Type of Receptor	Period	Sensitivity	Description
1)	Residential	Day Time (07:00 to 19:00)	Low	Noise can disturb outside amenity space and internal living space
		Evening (19:00 to 23:00)	Moderate	Noise can interrupt people trying to get to sleep
		Night Time (23:00 to 07:00)	High	Noise can disturb sleeping

8.5. e) Relative Positions

1)	Assessment Position	Located at the adjacent residential		
		BS 4142:2014 Criteria	Details	Compliance with Criteria
		Section 6	1.0m from façade (external)	Position is valid
2)	Source Measurement	The source sound power levels were supplied by the client. It is believed the sound power levels were established in accordance with BS EN 13487:2003		
	Justification	The client supplied the noise levels for the proposed plant		
3)	Background Position	On the rear façade of the hotel		
	Justification	BS 4142:2014 Criteria	Details	Compliance with Criteria
		Section 6.2	3.5m to any reflecting surface	Complies
		Section 6.2	Height 1.2m to 1.5m	Complies
		Section 6.2	1st floor 1m to facade	Not applicable
		Section 6.2	Measurement Height	3.5
			Distance to Reflecting Surface	1.0
		In order to record remote background levels the noise meter had to be left in a secure position. The position represented the assessment position with the constraints of the site.		
4)	Topography, surfaces etc.	Hard and Flat		
5)	Relative Distances	The plant is located approximately 24.1 m to 24.1 m from the assessment position.		
6)	Dimensioned sketch	See maps and images		

8.6. f) Noise Measurement Equipment Calibration

1)	Type	Sound Level Meter	Microphone	Calibrator
		KRE/087/01 - 633.C1	KE/087/04 - 251	KRE/087/02 - 120/1
2)	Manufacturer	Casella	Casella	Casella
3)	Serial Number	2145327	00663	5231047
4)	Certificate Number	Certificate: U24423	Certificate: 24422	Certificate: U27853
	Calibration Date=	13/01/2017	12/01/2017	21/02/2018

8.7. g) Noise Measurement Equipment Operation Test

1)	Ref. Level of Calibrator	94 dB
2)	Meter Reading Before	94 dB – Meter operation checked. Meter in good working order.
	Meter Reading After	94 dB - Meter operation checked. Meter in good working order.

8.8. h) Weather Conditions

1)	Wind Speed	See weather information
	Wind Direction	variable
2)	Temperature Inversion	Unlikely to have occurred
3)	Precipitation	None – See Appendix B
4)	Fog	None
5)	Wet Ground	Not within the measurement period – See Appendix B
6)	Frozen Ground or Snow	Not within the measurement period – See Appendix B
7)	Temperature	See Appendix B
8)	Cloud Cover	Partly Cloudy

8.9. i) Date and Time of Measurements

1)	Source Measurements	Unknown
	Background Measurements	06/12/2018

8.10. j) Measurement Time Interval

1)	Source Measurements	T_m = 15 minutes	
	Background Measurements	Day Time (07:00 to 19:00)	T_m = 12 hours
		Evening (19:00 to 23:00)	T_m = 4 hours
		Night Time (23:00 to 07:00)	T_m = 8 hours

8.11. k) Reference Time Interval

1)	Reference Time Interval	Day Time (07:00 to 19:00)	T_r = 1 hour
		Evening (19:00 to 23:00)	T_r = 1 hour
		Night Time (23:00 to 07:00)	T_r = 15 minutes

8.12. l) Specific Noise / m) Background Noise / n) Rating / o) Assessment / p) Conclusions

These details are all included within the body of the report and are not replicated within this section.

END OF REPORT (1st and last page not numbered)

KR Associates (UK) Ltd

Quietly confident…

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