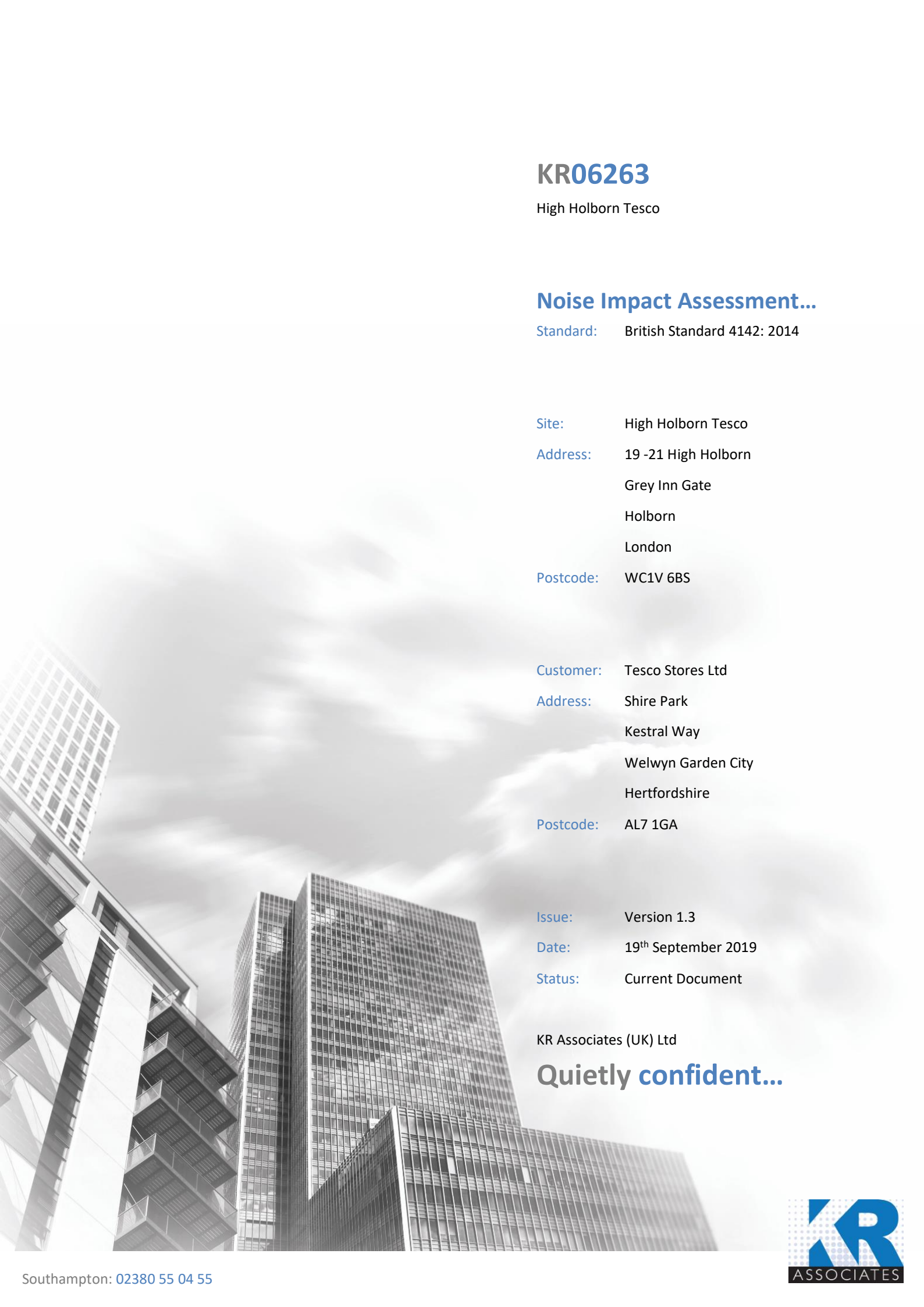




KR06263

High Holborn Tesco

Noise Impact Assessment...

Standard: British Standard 4142: 2014

Site: High Holborn Tesco

Address: 19 -21 High Holborn
Grey Inn Gate
Holborn
London

Postcode: WC1V 6BS

Customer: Tesco Stores Ltd

Address: Shire Park
Kestral Way
Welwyn Garden City
Hertfordshire

Postcode: AL7 1GA

Issue: Version 1.3

Date: 19th September 2019

Status: Current Document

KR Associates (UK) Ltd

Quietly confident...

Revisions...

KR06263		Project	High Holborn Tesco		
		Title	Noise Impact Assessment - Proposed Additional Plant		
		Standard	British Standard 4142: 2014		
Issue	Date	Details of Revision			
V1.3	19/09/19	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

Disclaimer...

This report is strictly confidential and is designed to meet the requirements of the customer. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party. No Liability is accepted outside the scope of this report in strict accordance with the standard terms and conditions.

KR Associates...

KR Associates (UK) Ltd (Company No. 04813349) registered office at 56 Bassett Green Road, Southampton. SO16 3DX.

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1. Executive Summary....

1.1. Instruction

KR Associates (UK) Ltd have been instructed by Tesco Stores Ltd to undertake an environmental noise survey at the High Holborn Tesco located at 19 -21 High Holborn, Grey Inn Gate, Holborn, London to determine if the installation of the proposed plant will have a significant adverse impact in terms of noise on the local noise sensitive properties.

1.2. Executive Summary (Repeated at Section 7)

1.2.1 Assessment Position

The Residential flats over 4 to 13 High Holborn are located 24 m from the plant area in the light well of the building.

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}
56 - 81 dB	47 - 62 dB	44 - 54 dB	56 - 77 dB	46 - 62 dB	41 - 46 dB	42 - 78 dB	40 - 58 dB	36 - 47 dB

1.2.3 Criterion at Assessment Position

NPPF Policy Aim (p 123)	Action	Night Noise Guidelines	ISO 1996: 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

1.2.4 Mitigation Measures

No mitigation measures will be required (Dependent on nearest residential dwellings).

1.2.5 Assessment of Noise Levels

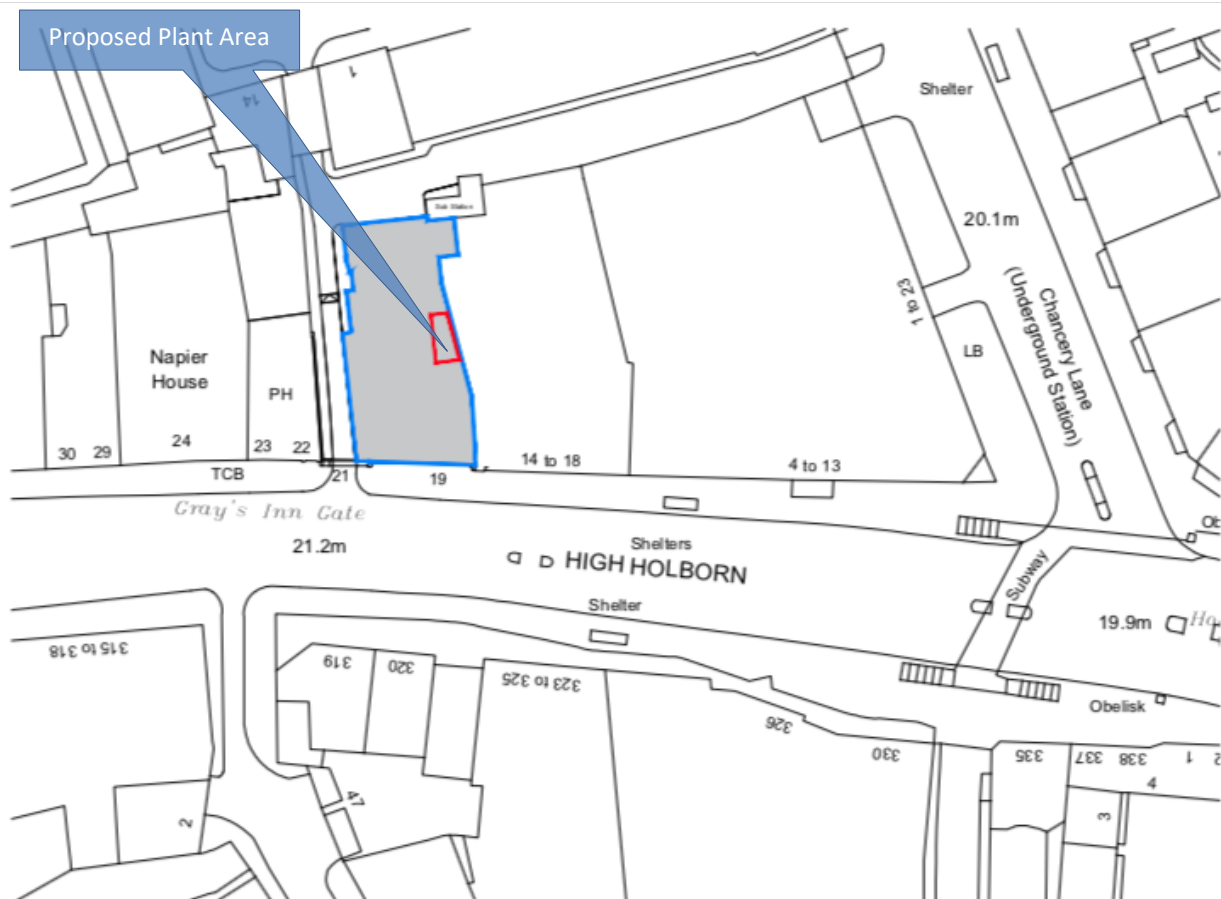
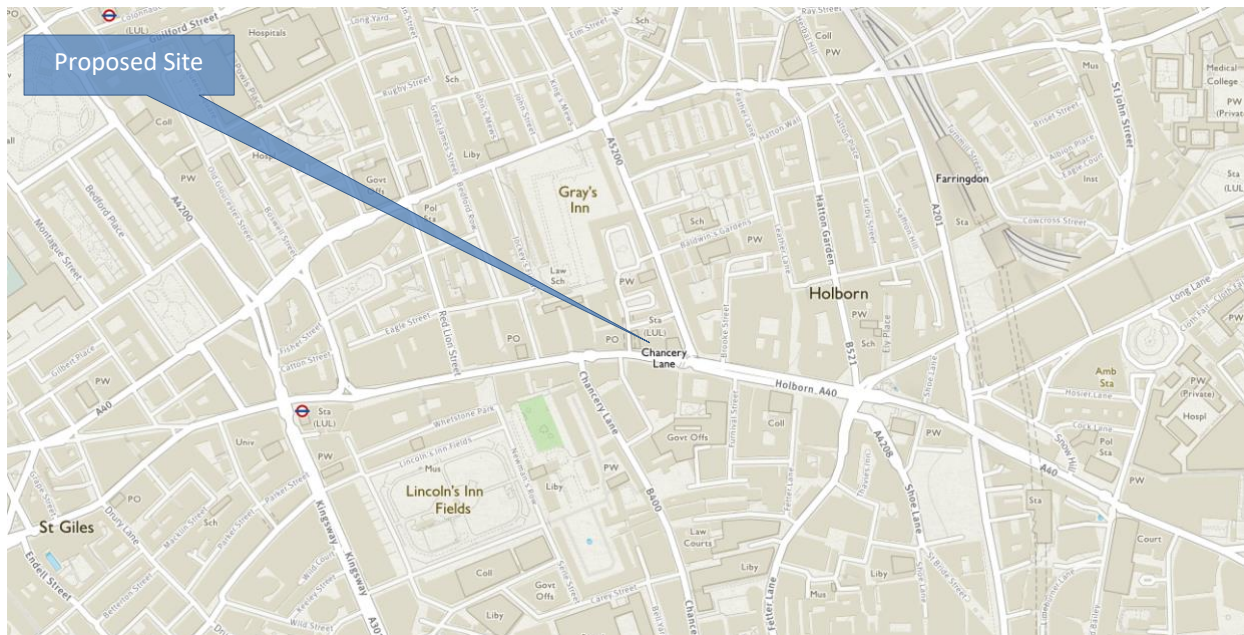
Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
L _{Aeq,1h}	L _{A90,1h}	BS4142	L _{Aeq,1h}	L _{A90,1h}	BS4142	L _{Aeq,1h}	L _{A90,1h}	BS4142
36 dB	46 dB	-10 dB	31 dB	43 dB	-12 dB	13 dB	37 dB	-24 dB

1.2.6 Conclusions

The proposed gas cooler and air conditioning units are unlikely to cause an issue to residents in terms of excessive noise as the resultant conclusion is -10 dB(A) when assessed in accordance with British Standard 4142: 2014. The assessment complies with the details within the Camden Local Plan and the requirements for a British Standards 4142: 2014 assessment of -10 dB(A).

2. Site Location...

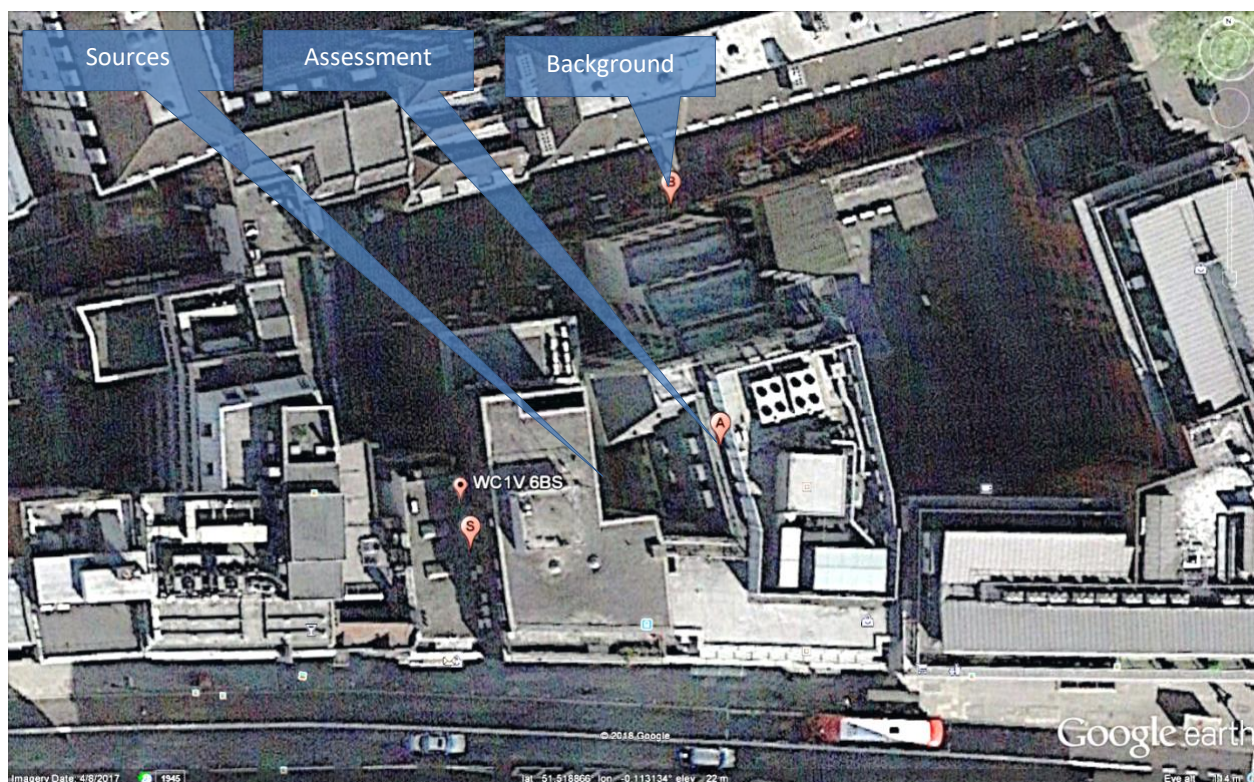
2.1. General Location of Site



Site Plan (Imagery © Google 2016)

The proposed plant will be located at first floor level (ground floor roof) within an enclosure.

2.2. Key Positions (Source, Assessment & Background)



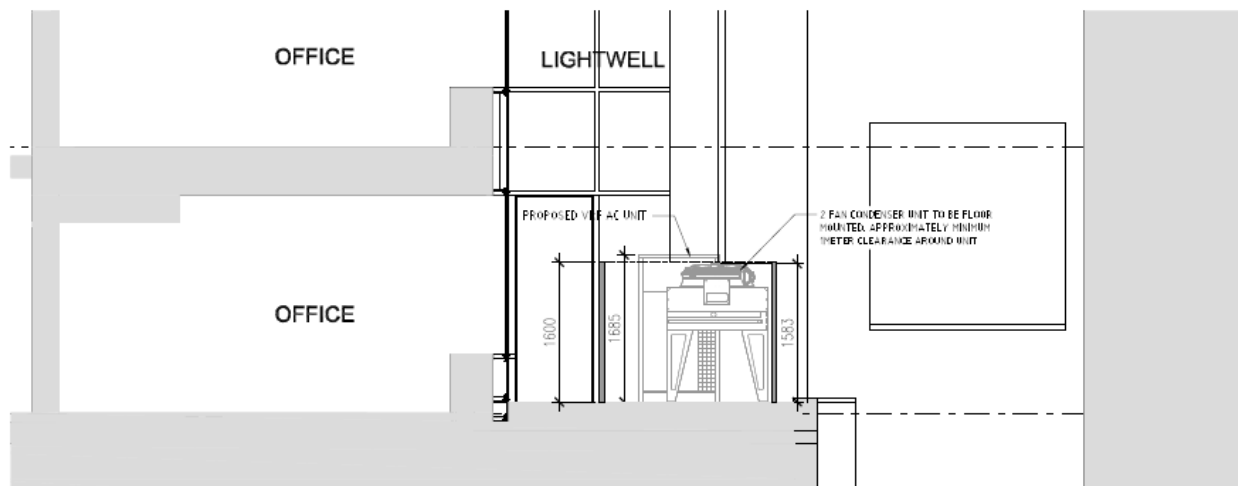
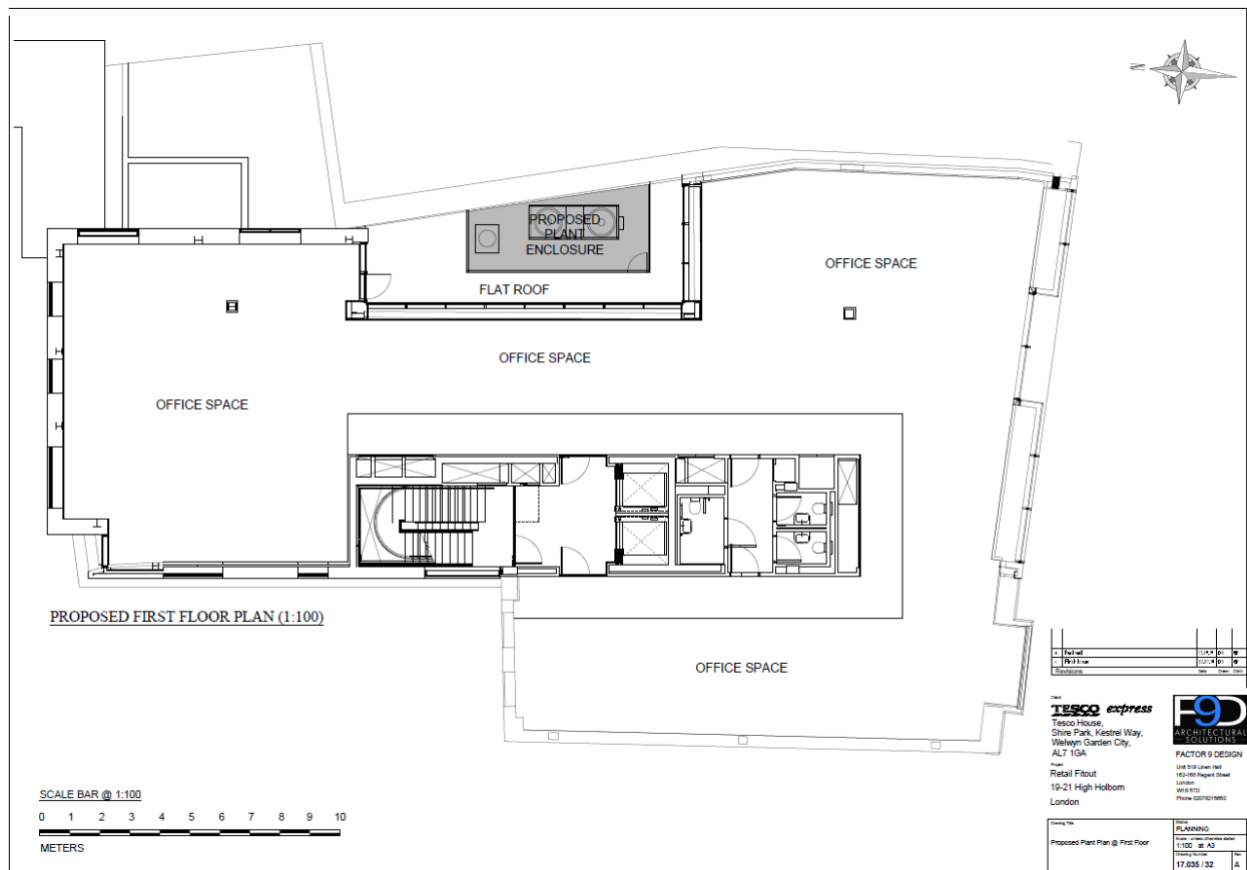
Position	Description	Latitude	Longitude	Elevation
Sources	within the well at the centre of the building	51.518447°	-0.112601°	12 m
Assessment	Residential flats over 4 to 13 High Holborn	51.518519°	-0.112290°	20 m
Background	at the rear of the site in the access road	51.518705°	-0.112340°	4 m

Site Plan (Imagery © Google 2016)

2.3. Free Field Source Sound Pressure Levels at 10m

Source	Description of Source	Sound Pressure Level at 10m – Annex C 13487: 2003		
		07:00 – 19:00	19:00 – 23:00	23:00 – 07:00
Source 1	CO2 Gas Cooler	$L_{p(10)}$ 35 dB	$L_{p(10)}$ 30 dB	$L_{p(10)}$ 25 dB
Source 2	Mitsubishi Sales Office AC Unit	$L_{p(10)}$ 46 dB	$L_{p(10)}$ 41 dB	$L_{p(10)}$ -28 dB
Source 3	Mitsubishi Sales Office AC Unit	$L_{p(10)}$ 46 dB	$L_{p(10)}$ 41 dB	$L_{p(10)}$ -28 dB
Source 4	Mitsubishi Cash Office AC Unit	$L_{p(10)}$ 36 dB	$L_{p(10)}$ 36 dB	$L_{p(10)}$ -28 dB
Combined Sound Pressure Level at 10m (1 Reflective Surface)		$L_{p(10)}$ 49 dB	$L_{p(10)}$ 45 dB	$L_{p(10)}$ 25 dB

2.4. Locations and Distances of Individual Source Positions

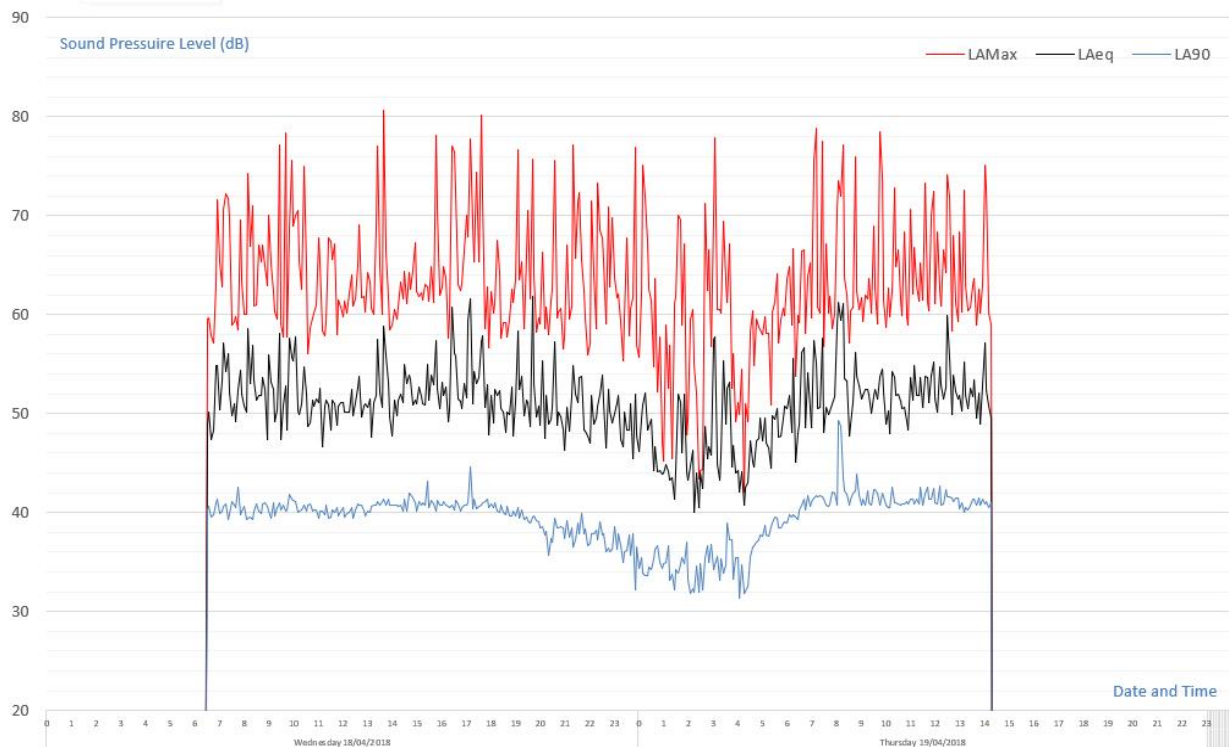


PROPOSED SOUTHERN SECTION THROUGH PLANT ENCLOSURE (1:50)

position	Relative Distance	Latitude	Longitude	Elevation
Source 1	24 m to assessment position	51.518447 ⁰	-0.112601 ⁰	12 m
Source 2	24 m to assessment position	51.518447 ⁰	-0.112601 ⁰	12 m
Source 3	24 m to assessment position	51.518447 ⁰	-0.112601 ⁰	12 m
Source 4	24 m to assessment position	51.518447 ⁰	-0.112601 ⁰	12 m

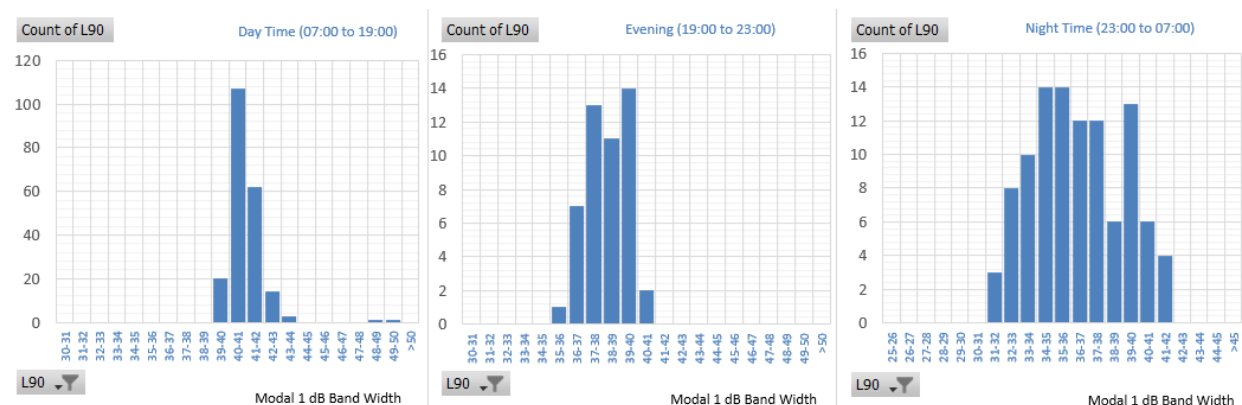
3. Background Noise Measurements...

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}
56 - 81 dB	47 - 62 dB	44 - 54 dB	56 - 77 dB	46 - 62 dB	41 - 46 dB	42 - 78 dB	40 - 58 dB	36 - 47 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)	1.09	Standard Deviation (σ)	1.18	Standard Deviation (σ)	2.66
Geometric Average	46 dB	Geometric Average	43 dB	Geometric Average	41 dB
Modal Value	46 dB	Modal Value	43 dB	Modal Value	37 dB

4. Criterion...

4.1. National Planning Policy Framework 2019

4.1.1 Scope of Standard

The revised National Planning Policy Framework published in 2019 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 this means:...

c) approving development proposals that accord with an up-to-date development without delay; or

d) ...granting planning permission...

i) the application of policies in this Framework... provides a clear reason for refusing development proposed; 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 from 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 their 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 $L_{\text{night, outside}}$ 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 $L_{\text{night, outside}}$ 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 $L_{\text{night, outside}}$ 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

Camden Council will require the plant to be at least 10 dB(A) below the background level when assessed in accordance with BS4142: 2014 to comply with their Local Plan requirements

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
$A_{div} = 20 \cdot \log_{10} (d/d_0) + 11$	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
$A_{bar} = 10 \cdot \log_{10} [3 + (40 \cdot \delta / \lambda) - A_g]$ *Note 1 where $\delta = a + b - r$ and $\lambda = c / f$	A_{bar} = Effective barrier attenuation (dB) A_g = Total Ground Absorption (dB) *Note 1: Only apply the A_g correction if $A_g > 0$ 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 (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}	L _p
1	CO2 Gas Cooler	63 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	21 dB
2	Mitsubishi Sales Office AC Unit	74 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	32 dB
3	Mitsubishi Sales Office AC Unit	74 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	32 dB
4	Mitsubishi Cash Office AC Unit	64 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	22 dB
TOT	Total Noise Levels	77 dB	-41 dB					36 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}	L _p
1	CO2 Gas Cooler	58 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	16 dB
2	Mitsubishi Sales Office AC Unit	69 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	27 dB
3	Mitsubishi Sales Office AC Unit	69 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	27 dB
4	Mitsubishi Cash Office AC Unit	64 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	22 dB
TOT	Total Noise Levels	73 dB	-42 dB					31 dB

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

		Source	ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L _w	D _c	A _{div}	A _{gr}	A _{atm}	A _{bar}	L _p
1	CO2 Gas Cooler	53 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	-11 dB
2	Mitsubishi Sales Office AC Unit	0 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	--42 dB
3	Mitsubishi Sales Office AC Unit	0 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	--42 dB
4	Mitsubishi Cash Office AC Unit	0 dB	+6 dB	-39 dB	+3 dB	-0 dB	--12 dB	--42 dB
TOT	Total Noise Levels	53 dB	-42 dB					11 dB

6. Assessment of Noise Levels...

6.1. Night Noise Guidelines

Night Noise Guidelines	Day Time - 07:00 to 19:00	Evening – 19:00 to 23:00	Night Time – 23:00 to 07:00
Specific Sound	L _{Aeq,1 hour} 36 dB	L _{Aeq,1 hours} 31 dB	L _{Aeq,15 minutes} 11 dB
NPPF – Improve Quality of Life	Less than L _{Aeq,1 hour} 40 dB	Less than L _{Aeq,1 hour} 40 dB	Less than L _{Aeq,1 hour} 40 dB
NPPF – Paragraph 123	Complies	Complies	Complies

6.2. ISO 1996 Part 1: 2016

ISO 1996 – Part 1: 2016	Day Time - 07:00 to 19:00	Evening – 19:00 to 23:00	Night Time – 23:00 to 07:00
Specific Sound	L _{Aeq,1 hour} 36 dB	L _{Aeq,1 hours} 31 dB	L _{Aeq,15 minutes} 11 dB
Adjustment - Regular Impulsive	+0 dB	+0 dB	+3 dB
Adjustment – Tonal	+0 dB	+ 0 dB	+ 5 dB
Adjustment - Time Period	+0 dB (Day Time)	+5 dB (Evening)	+10 dB (Night Time)
Rating Levels	L _{Aeq,1 hour} 36 dB	L _{Aeq,1 hours} 31 dB	L _{Aeq,15 minutes} 19 dB
Residual Sound Levels	L _{Aeq,1 hour} 52 dB	L _{Aeq,1 hours} 51 dB	L _{Aeq,15 minutes} 48 dB
Rating + Residual	L _{Aeq,1 hour} 52.1 dB	L _{Aeq,1 hours} 51.0 dB	L _{Aeq,15 minutes} 48.0 dB
Increase in Residual Noise	+ 0.1 dB	+ 0.0 dB	+ 0.0 dB
IEMA Significance	+2 dB (No Impact)	2 dB (No Impact)	2 dB (No Impact)
NPPF – Paragraph 123	Complies	Complies	Complies

6.3. 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} 52 dB	L _{Aeq,1 hours} 51 dB	L _{Aeq,15 minutes} 48 dB
Specific Noise Levels	L _{Aeq,1 hours} 36 dB	L _{Aeq,1 hours} 31 dB	L _{Aeq, 15 minutes} 11 dB
Impulsivity Feature	+0 dB	+0 dB	+2 dB
Tonality Feature	+0 dB	+0 dB	+0 dB
Rating Noise Levels	L _{Aeq,1 hours} 36 dB	L _{Aeq,1 hours} 31 dB	L _{Aeq, 15 minutes} 13 dB
Background Noise Levels	L _{A90,1 hours} 46 dB	L _{A90,1 hours} 43 dB	L _{A90, 15 minutes} 37 dB
BS 4142 Assessment	-10 dB	-12 dB (Low Impact)	-24 dB (Low Impact)
NPPF – Paragraph 123	-0 dB (Low Impact)	-0 dB (Low Impact)	-0 dB (Low Impact)
Uncertainty (95% Confidence, k=2)	+/- 1.71 dB	+/- 1.72 dB	+/- 1.87 dB

7. Conclusions...

7.1. Assessment Position

The nearest assessment position is the Residential flats over 4 to 13 High Holborn which is located between 24 m from the plant area in the light well of the building.

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}
56 - 81 dB	47 - 62 dB	44 - 54 dB	56 - 77 dB	46 - 62 dB	41 - 46 dB	42 - 78 dB	40 - 58 dB	36 - 47 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 mitigation measures will be required (Dependent on nearest residential dwellings)

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
36 dB	46 dB	-10 dB	31 dB	43 dB	-12 dB	13 dB	37 dB	-24 dB

7.6. Conclusions

The proposed gas cooler and air conditioning units are unlikely to cause an issue to residents in terms of excessive noise as the resultant conclusion is -10 dB(A) when assessed in accordance with British Standard 4142: 2014. The assessment complies with the details within the Camden Local Plan and the requirements for a British Standards 4142: 2014 assessment of -10 dB(A).

7.7. Uncertainty

Day Time (07:00 – 19:00)	Evening (19:00 – 23:00)	Night Time (23:00 – 07:00)
+1.71 dB (k=2, 95% Confidence)	+1.72 dB (k=2, 95% Confidence)	+1.87 dB (k=2, 95% Confidence)

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

8.1. a) Competency

	Name	Role	Competency
1)	Ms. E. Samphier	Trainee Consultant	Currently undertaking the IOA Diploma
	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

	Source Number	Description		
1)	Source 1	CO2 Gas Cooler		
	Source 2	Mitsubishi Sales Office AC Unit		
	Source 3	Mitsubishi Sales Office AC Unit		
	Source 4	Mitsubishi Cash Office AC Unit		
	Description of Source	Source Location	Hours of Operation	Mode of Operation
2) 3) 4) 5)	Source 1	within the well at the centre of the building	24-hour	Continuously on Demand
	Source 2		07:00 - 23:00	
	Source 3		07:00 - 23:00	
	Source 4		07:00 - 23:00	
	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 proposed plant will be located at first floor level (ground floor roof) within an enclosure.		

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	Residential flats over 4 to 13 High Holborn		
		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	at the rear of the site in the access road		
	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	1 st 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 24.4 m to 24.4 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/086/01 - 633.C1	KE/086/03 - 251	KRE/086/04 - 120/1
2)	Manufacturer	Casella	Casella	Casella
3)	Serial Number	2145356	00598	5231002
4)	Certificate Number	Certificate: 5107	Certificate: 5107	Certificate: 5107
	Calibration Date=	15/12/2015	15/12/2015	15/12/2015

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	18/04/2018

8.10. j) Measurement Time Interval

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

8.11. k) Reference Time Interval

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

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...**



Southampton: 02380 55 04 55