KR06436

Tesco Express Russell Square

Noise Impact Assessment…

Standard: British Standard 4142: 2014

Site: Tesco Express Russell Square

Address: 40 Bernard Street
Russell Square
Saint Pancras
London

Postcode: WC1N 1QJ

Customer: Tesco Stores Ltd

Address: Shire Park
Kestral Way
Welwyn Garden City
Hertfordshire

Postcode: AL7 1GA

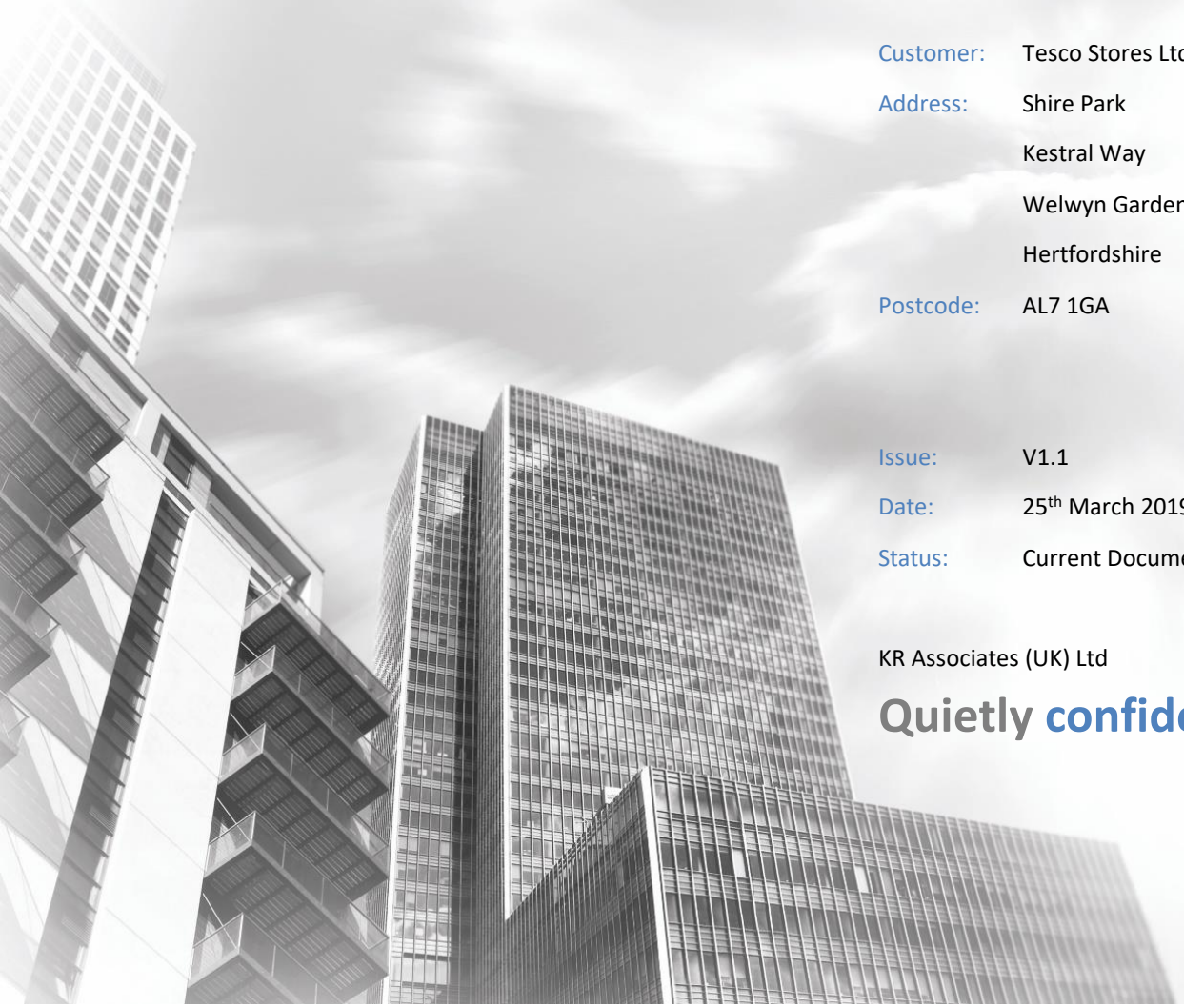
Issue: V1.1

Date: 25th March 2019

Status: Current Document

KR Associates (UK) Ltd

Quietly confident…



Revisions…

KR06436		Project	Tesco Express Russell Square		
		Title	Noise Impact Assessment - Proposed Additional Plant		
		Standard	British Standard 4142: 2014		
Issue	Date	Details of Revision			
V1.1	25/03/2019	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 Tesco Stores Ltd to undertake and environmental noise survey at the Tesco Express Russell Square located at 40 Bernard Street, Russell Square, Saint Pancras, 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 suspected offices at first floor level are located 10m from the gas cooler located at ground floor level at the rear of the site. The rear of the building provides a significant barrier effect which is included in the calculations.

1.2.2 Background Noise Measurements

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
62 - 93 dB	53 - 72 dB	42 - 57 dB	60 - 84 dB	49 - 67 dB	38 - 44 dB	46 - 84 dB	40 - 62 dB	34 - 44 dB
Modal $L_{A90, 1 hour}$		42 dB	Modal $L_{A90, 1 hour}$		37 dB	Modal $L_{A90, 15 minutes}$		32 dB

1.2.3 Criterion at Assessment Position

Camden Council will require the assessment to British Standard 4142: 2014 to have a conclusion of -5 dB 1m from the centre of Tehran office window to comply with the requirements of their Local Plan.

1.2.4 Mitigation Measures

No speicifc mitigation measures will be required.

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
35 dB	42 dB	-7 dB	31 dB	37 dB	-6 dB	19 dB	32 dB	-13 dB

1.2.6 Conclusions

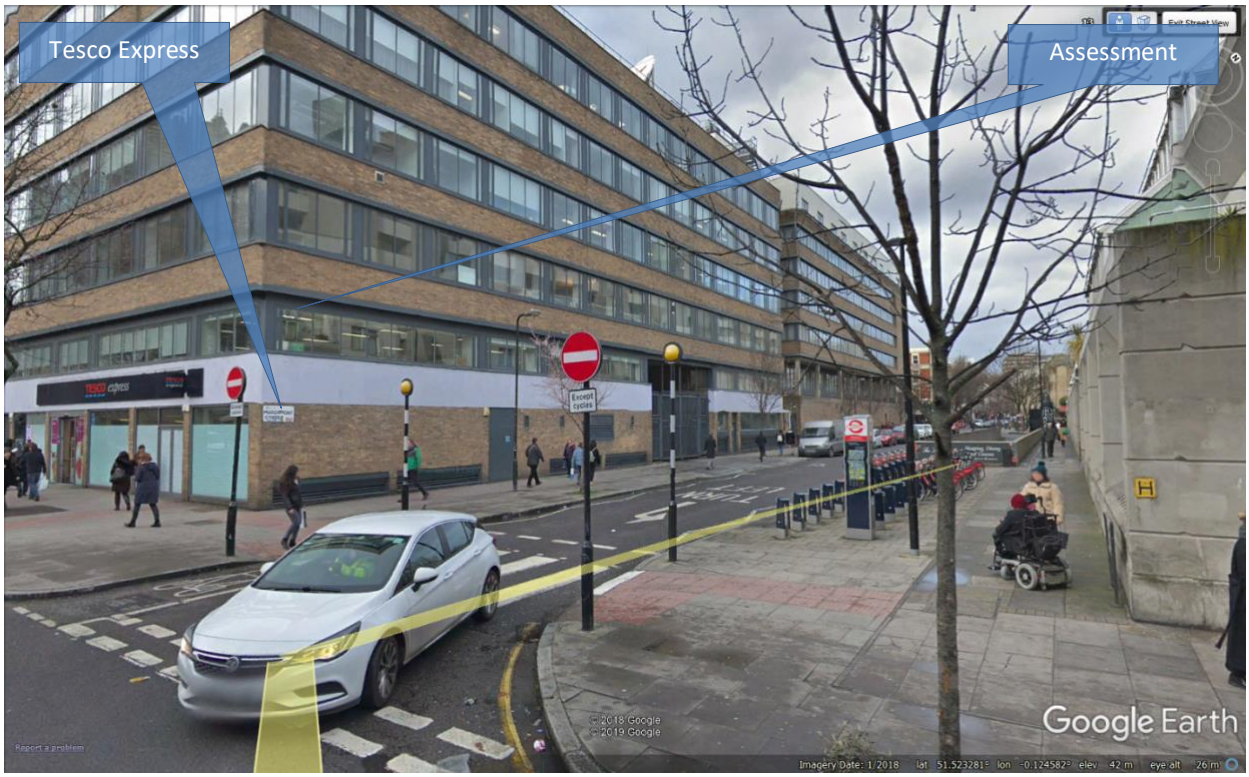
The resultant noise levels at the nearest noise sensitive façade are very unlikely to give rise to complaints and therefore in accordance with the general principle of the National Planning Policy Framework and the Local plan it would be recommended that planning permission is granted for this sustainable development. The resultant noise levels also comply with the absolute criterion within Annex B of the Camden Local Plan i.e. BS4142: 2014 -5 dB conclusion.

2. General Location of Site

Site Plan (Imagery © Google 2016)

The Tesco Express is to be located on the ground floor of the building adjoining Great Ormand Street Hospital and facades onto Marchmont Street. The plant is located on the ground floor within the rear service yard and the nearest residential façade is located opposite on the opposite side of Marchmont Street. There are offices located above the rear of the site and there is currently a large amount of mechanical equipment on a flat roof directly outside the office window which does not comply with the current Camden Local Plan.

2.1. Key Positions (Source, Assessment & Background)



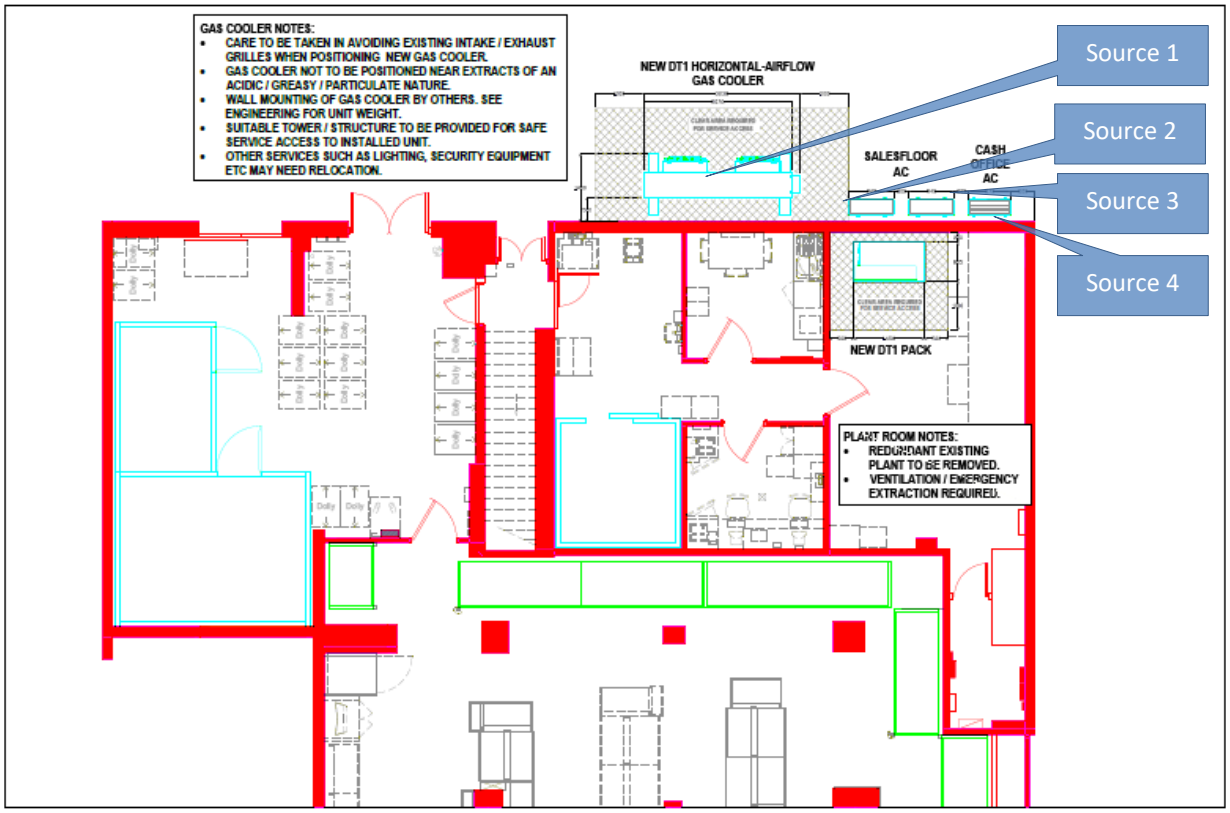
Position	Description	Latitude	Longitude	Elevation
Sources	Located at ground floor level at the rear of the site	51.523462^0	-0.124708^0	2 m
Assessment	Offices above the rear of the site	51.523312^0	-0.125223^0	4 m
Background	Entrance of the service road	51.523385^0	-0.125035^0	3 m

Site Plan (Imagery © Google 2016)

2.2. 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	2 Fan Gas Cooler	$L_{p(10)}$ 36 dB	$L_{p(10)}$ 34 dB	$L_{p(10)}$ 31 dB
Source 2	Sales Floor AC Unit	$L_{p(10)}$ 44 dB	$L_{p(10)}$ 40 dB	$L_{p(10)}$ -28 dB
Source 3	Sales Floor AC Unit	$L_{p(10)}$ 44 dB	$L_{p(10)}$ 40 dB	$L_{p(10)}$ -28 dB
Source 4	Cash Office AC Unit	$L_{p(10)}$ 31 dB	$L_{p(10)}$ 27 dB	$L_{p(10)}$ -28 dB
Combined Sound Pressure Level at 10m (1 Reflective Surface)		$L_{p(10)}$ 48 dB	$L_{p(10)}$ 44 dB	$L_{p(10)}$ 31 dB

2.3. Locations and Distances of Individual Source Positions



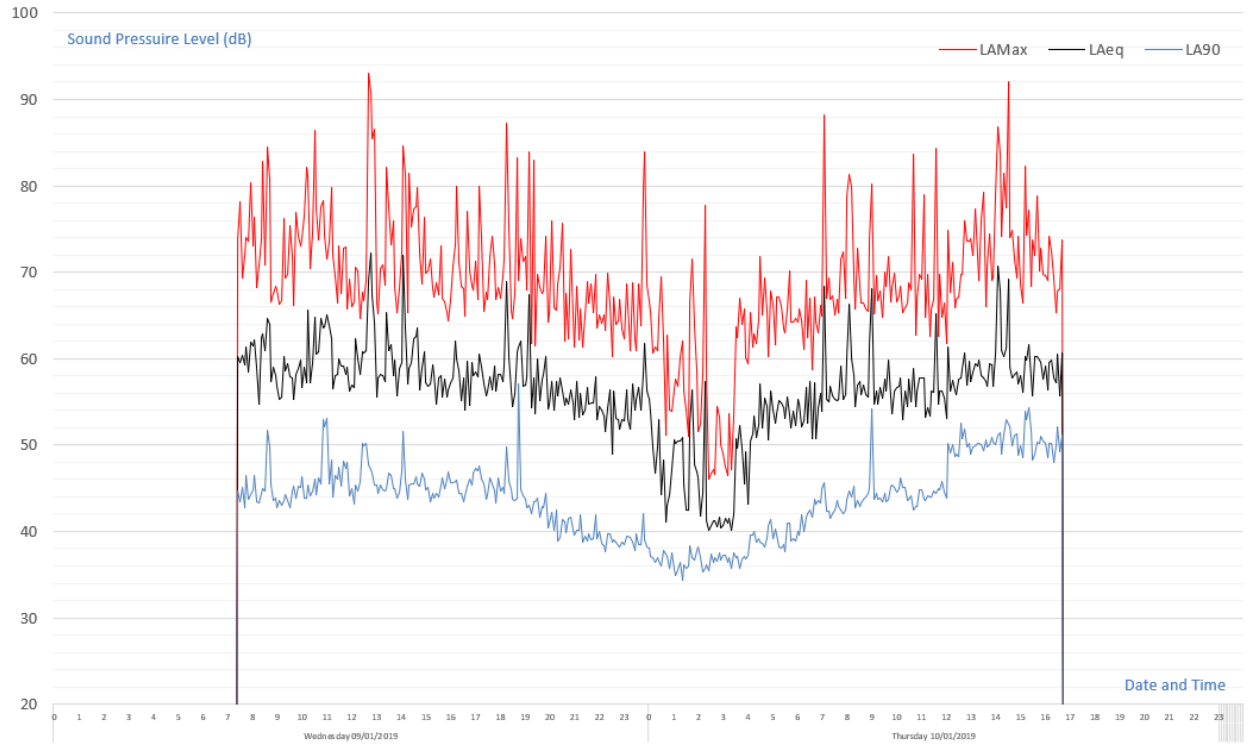
Position	Relative Distance	Latitude	Longitude	Elevation

Source 1	10 m to assessment position	51.523462^0	-0.124708^0	2 m
Source 2	10 m to assessment position	51.523464^0	-0.124694^0	1 m
Source 3	10 m to assessment position	51.523464^0	-0.124688^0	1 m
Source 4	10 m to assessment position	51.523464^0	-0.124681^0	0 m

Site Plan (Imagery © Google 2016)

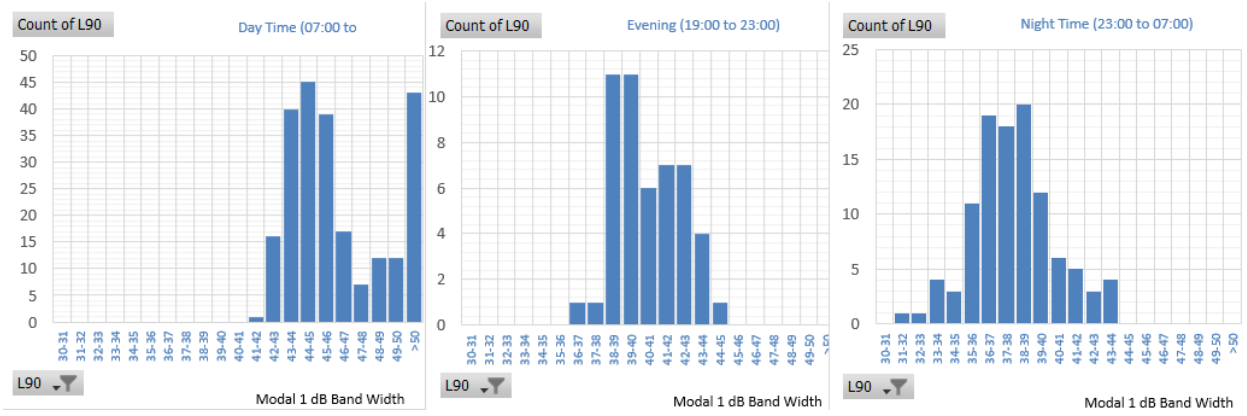
3. Background Noise Measurements…

3.1. 24-hour Background Measurements



Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
62 - 93 dB	53 - 72 dB	42 - 57 dB	60 - 84 dB	49 - 67 dB	38 - 44 dB	46 - 84 dB	40 - 62 dB	34 - 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)	2.96	Standard Deviation (σ)	1.78	Standard Deviation (σ)	2.07
Geometric Average	46 dB	Geometric Average	41 dB	Geometric Average	38 dB
Modal Value	42 dB	Modal Value	37 dB	Modal Value	32 dB

4. Criterion…

4.1. National Planning Policy Framework 2018

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

The proposed plant noise levels will need to comply with specific criterion within Annex B of the Local Plan which requires a BS 4142: 2014 assessment of -10 dB.

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. Calculation of Plant Noise Levels

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

Source Details			ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	2 Fan Gas Cooler	64 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	24 dB
2	Sales Floor AC Unit	72 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	32 dB
3	Sales Floor AC Unit	72 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	32 dB
4	Cash Office AC Unit	59 dB	+3 dB	-31 dB	+3 dB	-0 dB	- 15 dB	19 dB
TOT	Total Noise Levels	76 dB	-47 dB					35 dB

5.2.2 Evening (19:00 to 23:00)

Source Details			ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	2 Fan Gas Cooler	62 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	22 dB
2	Sales Floor AC Unit	68 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	28 dB
3	Sales Floor AC Unit	68 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	28 dB
4	Cash Office AC Unit	55 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	15 dB
TOT	Total Noise Levels	72 dB	-47 dB					31 dB

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

Source Details			ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	2 Fan Gas Cooler	59 dB	+3 dB	-31 dB	+3 dB	-0 dB	-15 dB	19 dB
TOT	Total Noise Levels	59 dB	-46 dB					19 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	$L_{Aeq,1\ hour}$ 35 dB	$L_{Aeq,1\ hours}$ 31 dB	$L_{Aeq,15\ minutes}$ 19 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	$L_{Aeq,1\ hour}$ 35 dB	$L_{Aeq,1\ hours}$ 31 dB	$L_{Aeq,15\ minutes}$ 19 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	$L_{Aeq,1\ hour}$ 35 dB	$L_{Aeq,1\ hours}$ 31 dB	$L_{Aeq,15\ minutes}$ 19 dB
Residual Sound Levels	$L_{Aeq,1\ hour}$ 59 dB	$L_{Aeq,1\ hours}$ 55 dB	$L_{Aeq,15\ minutes}$ 50 dB
Rating + Residual	$L_{Aeq,1\ hour}$ 59.0 dB	$L_{Aeq,1\ hours}$ 55.0 dB	$L_{Aeq,15\ minutes}$ 50.0 dB
Increase in Residual Noise	+ 0.0 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	$L_{Aeq,1\ hours}$ 59 dB	$L_{Aeq,1\ hours}$ 55 dB	$L_{Aeq,15\ minutes}$ 50 dB
Specific Noise Levels	$L_{Aeq,1\ hours}$ 35 dB	$L_{Aeq,1\ hours}$ 31 dB	$L_{Aeq,\ 15\ minutes}$ 19 dB
Impulsivity Feature	+0 dB	+0 dB	+0 dB
Tonality Feature	+0 dB	+0 dB	+0 dB
Rating Noise Levels	$L_{Aeq,1\ hours}$ 35 dB	$L_{Aeq,1\ hours}$ 31 dB	$L_{Aeq,\ 15\ minutes}$ 19 dB
Background Noise Levels	$L_{A90,1\ hours}$ 42 dB	$L_{A90,1\ hours}$ 37 dB	$L_{A90,\ 15\ minutes}$ 32 dB
BS 4142 Assessment	-7 dB	-6 dB (Low Impact)	-13dB (Low Impact)
NPPF – Paragraph 123	-0 dB (Low Impact)	-0 dB (Low Impact)	-0 dB (Low Impact)
Uncertainty (95% Confidence, k=2)	+- 1.90 dB	+- 1.78 dB	+- 1.81 dB

7. Conclusions…

7.1. Assessment Position

The nearest assessment position is on the opposite side of Marchmont Street which is located between 40 m and 42 m from the plant located at ground floor level at the rear of the site.

7.2. Background Noise Measurements

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
62 - 93 dB	53 - 72 dB	42 - 57 dB	60 - 84 dB	49 - 67 dB	38 - 44 dB	46 - 84 dB	40 - 62 dB	34 - 44 dB
Modal $L_{A90,\ 1\ hour}$		42 dB	Modal $L_{A90,\ 1\ hour}$		37 dB	Modal $L_{A90,\ 15\ minutes}$		32 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 speicifc 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
35 dB	42 dB	-7 dB	31 dB	37 dB	-6 dB	19 dB	32 dB	-13 dB

7.6. 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 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)
+-1.90 dB (k=2, 95% Confidence)	+-1.78 dB (k=2, 95% Confidence)	+-1.81 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

	Source Number	Description		
1)	Source 1	2 Fan Gas Cooler		
	Source 2	Sales Floor AC Unit		
	Source 3	Sales Floor AC Unit		
	Source 4	Cash Office AC Unit		
2)	Description of Source	Source Location	Hours of Operation	Mode of Operation
	Source 1	lcoated at ground floor level at the rear of the site	24-hour	Continuously on Demand
	Source 2		07:00 - 23:00	
	Source 3		07:00 - 23:00	
	Source 4		07:00 - 23:00	
3)	Description of Operation	Period	Conditions	Load
4)	All Sources	Day Time (07:00 to 19:00)	Ambient Temp 32°C	Maximum Load (100%)
5)		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 Tesco Express is to be located on the ground floor of the building adjoining Great Ormand Street Hospital building and faces onto Marchmont Street. The plant is located on the ground floor within the rear service yard and the nearest noise sensitive facades located opposite on the opposite side of Marchmont Street.		

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	On the opposite side of Marchmont Street		
		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	Entrance of the service 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	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 10m 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/087/03 - 251	KRE/087/04 - 120/1
2)	Manufacturer	Casella	Casella	Casella
3)	Serial Number	2145360	00709	5231003
4)	Certificate Number	Certificate: U24417	Certificate: U24416	Certificate: U27850
	Calibration Date=	12/01/2017	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	13th December 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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