



REPORT REFERENCE:

IMP4693-1

INDUSTRIAL NOISE IMPACT ASSESSMENT

ASSESSMENT OF KITCHEN EXTRACT

British Standard 4142:2014

CLIENT:

Sabbir Ahmed

SITE:

14 Market Parade, Havant
(Longitude: 50.51'11.02°, Latitude: 0.58'55.36°)

SURVEY DATES:

11th – 13th May 2016

Impact Acoustics Ltd

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1 EXECUTIVE SUMMARY

1.1 Instruction

Impact Acoustics have been instructed to undertake a background noise survey at 14 Market Parade, Havant to understand the level of impact at the proposed site due to the installation of Kitchen Extract System.

1.2 Scope of Report

The measurements have been undertaken in accordance with British Standard 4142:2014 and ISO 1996 – Part 2: 2007 to establish if the proposed site has a demonstrable adverse effect in terms of noise that outweigh the benefits of the development. This report aims to establish the following:

- Existing background noise levels at the closest residential façade to the site
- Assessment of the impact of the kitchen extract system on nearby residential properties.

1.3 Summary of Report

1.3.1 Measured Background Noise Levels

Continuous background noise measurements were undertaken between 11th – 13th May 2016 at Assessment Position 1. The modal 1 hour day time background noise levels between 12:00 – 23:00 was found to be $L_{A90,1 \text{ hour}}$ 42dB and the modal 15min night time background noise levels between 23:00 – 00:00 was found to be $L_{A90,1 \text{ hour}}$ 47dB. The range will not operate between 2300 and 0700 therefore no night time noise assessment has been undertaken.

Assessment Position	LA90 (Modal)	LA90 (Modal)
	Day	Night
	(12:00 – 23:00)	(23:00 – 00:00)
1	52 dB	47 dB

1.4 Operation of the Site

On the longest day the site is likely to be operational between 12:00 – 00:00 hours.

1.5 Criterion on Kitchen extract system

Below are the representative sound powers per plant:

Items of Equipment	Operating Hours	Sound Power Level
Extract	1400 - 2100	$L_{W(A)}$ 53 dB
Sound Power Level – British Standard 3744: 2010 (Engineering Grade 2 Accuracy)		

1.6 Assessment

1.6.1 Assessment Position 1

British Standard 4142:2014	Day	Night
	(12:00 – 23:00)	(23:00 – 00:00)
Rating Noise Levels	29	29
Background Noise Levels	52	47
Assessment	23dB below “low impact”	18dB below “low impact”

1.7 Conclusions

The operation of the kitchen extract system has been assessed to establish if the development will have a demonstrable adverse effect in terms of noise that outweigh the benefits of the development. Measurements have been undertaken in accordance with British Standard 4142:2014 and ISO 1996 – Part 2: 2007. This report aims to establish: the existing background noise levels at the closest residential façade to the site and the assessment of the impact of the site operation on nearby residential properties.

The resulting emissions from the site running on a worst case scenario results in a conclusion of below low impact and is inaudible at the assessment position.

2 SITE LOCATION

2.1 Position of Site in Wider Area

The site is located in Havant



2.2 Assessment Position and Background Position

Continuous measurement was undertaken at the assessment position between 11th – 13th May 2016. Measurement was undertaken in the free field in the absence of the kitchen Extract.

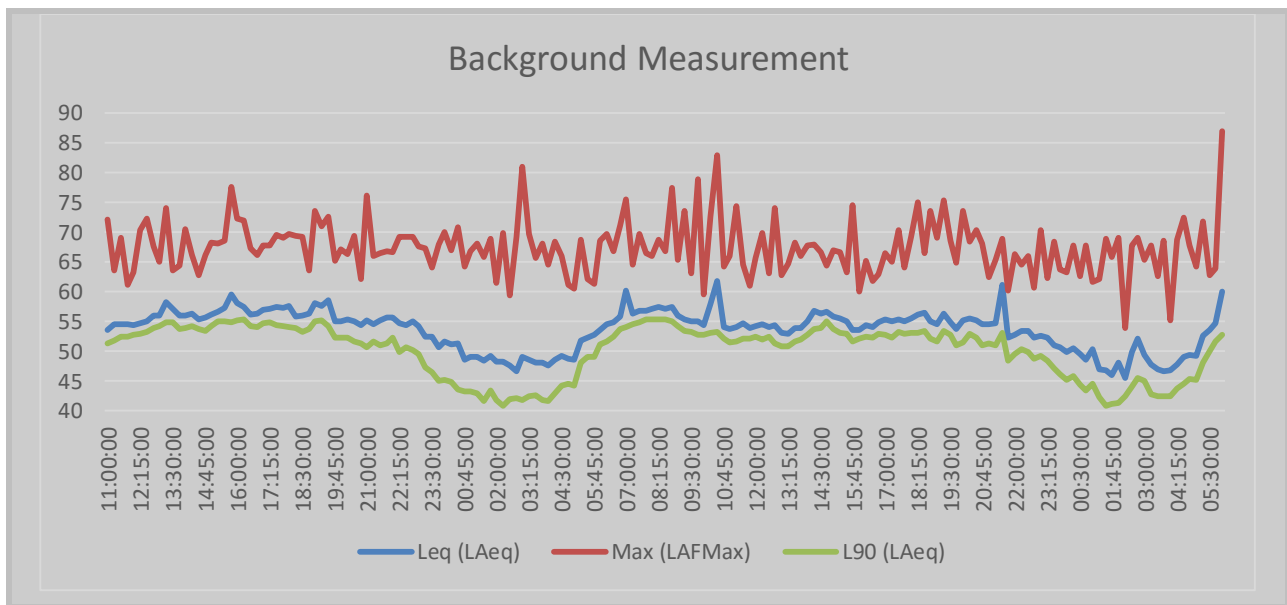


3 BACKGROUND NOISE LEVELS

3.1 Measured Background Noise Level Results Assessment Position

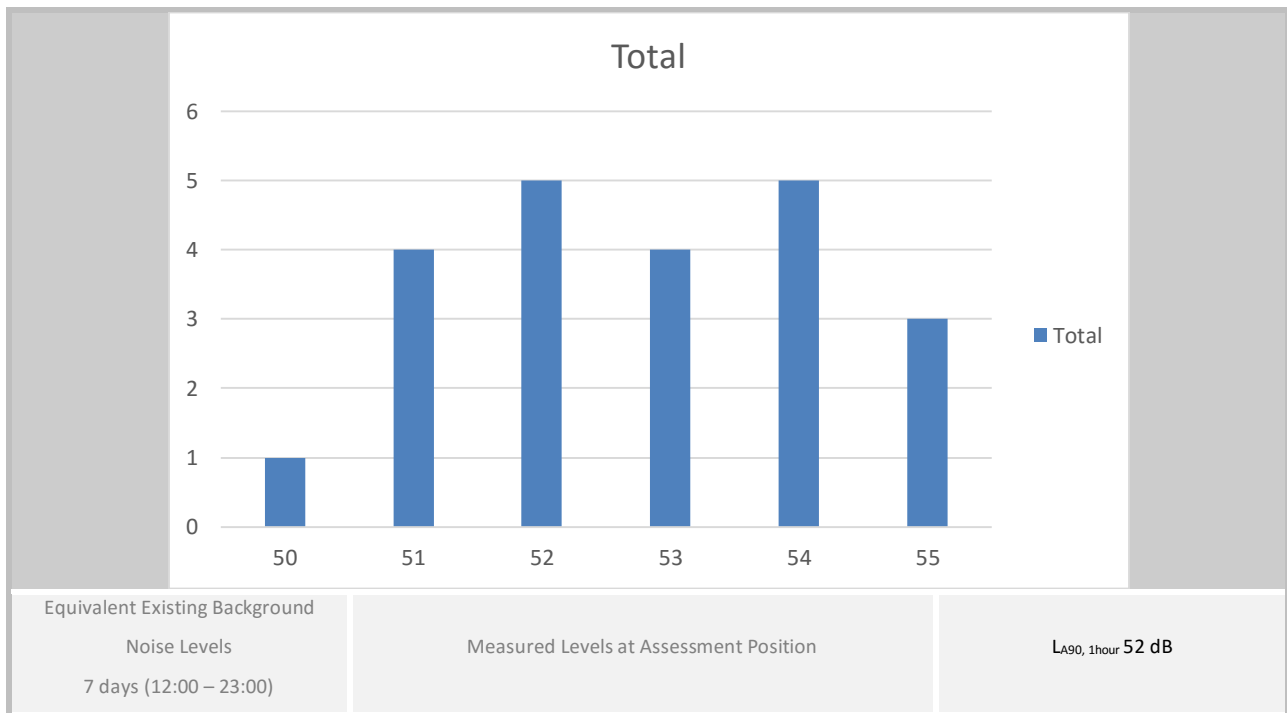
Full Data shown in Appendix B

3.1.1 Overall Measurement

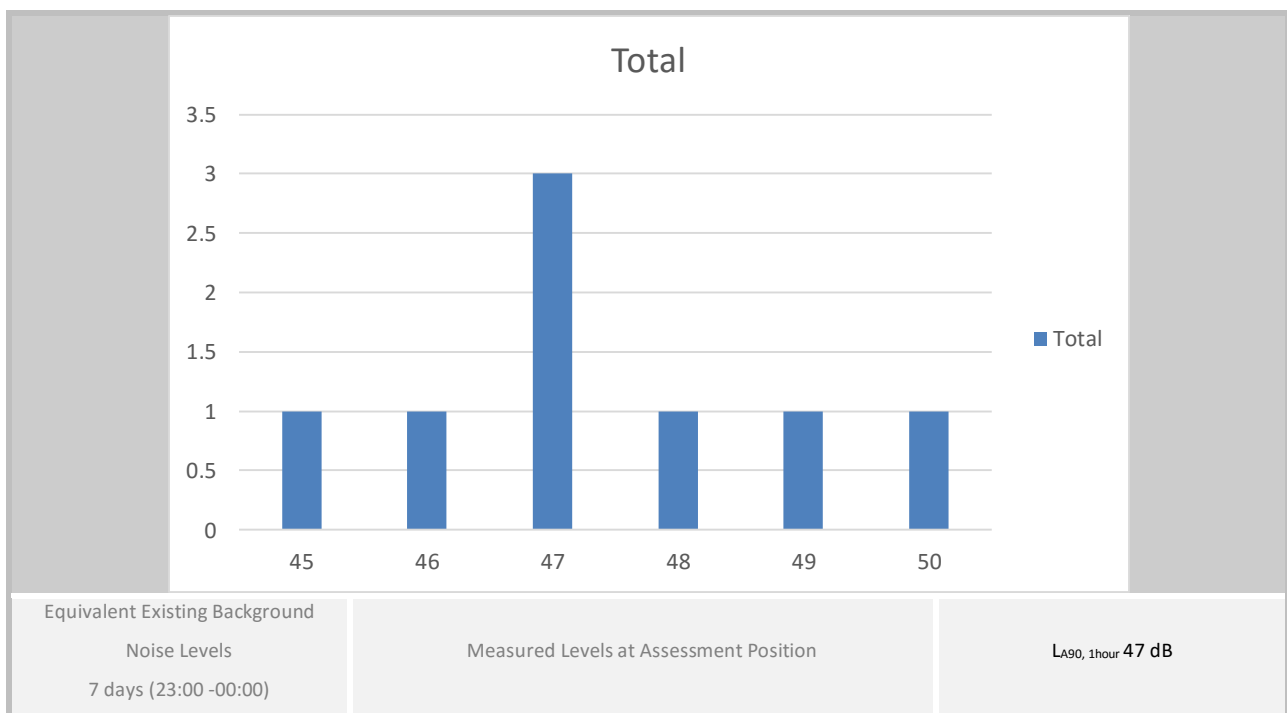


3.1.2 Modal Background Analysis during Operating Times Assessment Position 1

3.1.2.1 Day Time (12:00 – 23:00 Monday to Sunday)



3.1.2.2 Night Time (23:00 – 00:00 Monday to Sunday)



3.1.3 Comments on Residual Noise

Assessment Position	Notes
1	Road traffic noise dominant Other commercial noise present.

4 CRITERION

4.1 British Standard 4142:2014 ("BS4142")

4.1.1 Scope of BS 4142:2014

In the assessment of the site, consideration has been given to the scope of British Standard 4142:2014, which in section 1, details applicability of this standard to rating assessing sound of an industrial and/or commercial nature.

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

The standard is not intended to be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels."

It is considered appropriate that both the background noise levels and the rating noise levels obtained fall within the scope of British Standard 4142:2014 by using outdoor sound levels to assess the effect of sound on local residents.

4.1.2 Assessment Position(s)

The assessment positions were established as the residential property adjacent to the kitchen extract system.

4.1.3 Sound Power Levels

Measured on site

4.1.4 Calculations

The specific noise levels are calculated at the assessment position using the calculations detailed within ISO 9613 Part 1 and 2: 1996. These calculations take the manufacturers sound power levels, account for a variety of factors including source directivity, distance, atmospheric absorption, ground absorption and the effects of any barriers and determine the resultant noise levels at the assessment position.

4.1.5 Assessment Position

In line with the requirements of British Standard 4142:2014 the background noise levels should be measured at the assessment position.

4.1.6 Rating Levels (Character Corrections)

It is appropriate to add a character correction where there is a new source that cannot be measured in line with BS4142:2014. There are 3 methods for approaching this.

- a) Subjective method
- b) Objective method (for tonality)
- c) Reference method

For full details of how to utilise each method see Appendix C of this report.

4.2 ISO 1996 – Part 2:2007

4.2.1 Scope of ISO 1996 – Part 2:2007

Part 2 of ISO 1996 describes the determination and assessment of environmental noise levels through either direct measurement, by extrapolation of measurement results, or by means of calculation.

4.2.2 Measurement Time Interval and Instrumentation

The selection of the measurement time interval has been chosen in accordance to this standard. The measurements have been taken over a continuous period and includes both the day and night time period. The instrumentation and all components associated with the instrument used to measure the sound levels comply with the instrumentation system given in section 5.1 of this standard.

4.2.3 Calculation Methods

Although there are no internationally recognised calculation methods other national standards have been used for this assessment.

4.3 Night Noise Guidelines (“NNGL”)

The European Union and the World Health Organisation jointly published a document entitled “Night Noise Guidelines” in 2009 (“NNGL”). The overall goal of the document was detailed within the summary pages:

“The goal of the NNGL project was to provide and expand scientific advice to the European Commission and its Member States in developing future legislation in the area of night noise exposure, control and surveillance. The key objective of the project was to reach a consensus of experts and key stakeholders on the following subjects:

- a) Guideline values for night noise to protect the public from adverse health effects.....”*

4.3.1 No Observed Adverse Effect Level (NOAEL)

The section entitled “*Threshold for Observed Effects*” within the executive summary of the NNGL a list of the absolute level at which there is sufficient evidence available for the no observed adverse effect level (NOAEL):

Effect of Noise	Description	Indicator	Threshold (NOAEL)
Biological Effects	EEG awakening	L _{Amax,inside}	35 dB
	Motility, onset of motility	L _{Amax,inside}	32 dB
	Changes in duration of various stages of sleep, in sleep structure and fragmentation of sleep	L _{Amax,inside}	35 dB
Sleep Quality	Waking up in the night and / or too early in the morning	L _{Amax,inside}	42 dB

4.3.2 Vulnerable Groups

In setting the LOAEL and the SOAEL within the scope of the NPSE consideration has been made for the statement made under the title “*Vulnerable Groups*” which indicates that young children, elderly adults and shift workers should be considered vulnerable groups and more likely to be effected by unwanted noise.

4.3.3 Attenuation of an Open Window

The NNGL indicates an attenuation of around 10 – 15 dB(A) through an open window. It could therefore be appropriate to consider an overall reduction of 10 dB(A) through a partially open window.

5 OPERATION OF SITE

5.1 Relative Distances

The below relative distances are assumed:

Source	GF Habitable Window
Kitchen Extract	6.5m

5.2 Sources

Items of Equipment	Operating Hours	Sound Power Level
Kitchen Extract	12:00 – 00:00	L _{w(A)} 53 dB
Sound Power Level established: Internal reverberant level @ 1m: 42dB		

5.3 Mitigation Measures Installed

Mitigation measures have been installed. At the time of this report; exact details are unknown.

6 ASSESSMENT OF OPERATION OF SITE

6.1 Measurement on/off

Measurements were made switching the range on and off and measuring at the assessment position. The change in level was inaudible and the difference in measured LAeq, 5min was between -0.5 and +1dB on 3 separate measurements. It was therefore concluded to measure at the source and extrapolate to the assessment position making corrections for mitigation, reflections and geometric divergence in accordance with ISO9613-2.

6.2 Calculation Formulas - ISO 9613:1996

6.2.1 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)
No Reflective Surfaces	+0 dB
1 Reflective Surface	+3 dB
2 Reflective Surfaces	+6 dB
3 Reflective Surfaces	+9 dB

6.2.2 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)

6.3 Summary of Calculations

6.3.1 Assessment Position due to outlet

Calculation Element			Commentary
A	Fan Sound Power LwA	53	Fan Sound Power Outlet
B	Directivity Correction (+dB)	3	1 reflection
C	Distance correction (6.5m)	28	$20 \cdot \log(6.5) + 11$
Resulting LpA		29	A + B - C

6.4 Noise Map



6.5 Assessments

6.5.1 Assessment Position

6.5.1.1 Day Time Levels 12:00 – 23:00 hours

Source	Operating Times		Source Position
Case Breakout	12:00 – 23:00	7 days per week Worst case scenario	14 Market Parade
Outlet			
Assessment Position	Residential Habitable Window GF		
Background Position	At the assessment position		
Item	Calculation	Clause	Commentary
Specific Noise Level $L_{Aeq,1\text{ hour}}$	29dB	7	Calculated using ISO 9613:1996 _[3] .
Rating Level	29 dB	9.1	The acoustic feature correction is added to the specific noise level
Background Noise Level $L_{A90,1\text{ hour}}$	52 dB	8.1	Modal Background Noise Level (12:00 – 23:00)
Assessment Level	-23 dB	11	The background level is subtracted from the rating level.
Conclusion BS 4142:2014 _[1]	+10 dB Significant Adverse Effects, +5 dB Adverse Effects,+0 dB Low Impact		
Assessment	-23 dB		
Conclusion	The assessment level is below ‘Low Impact’		

6.5.1.2 Night Time 23:00 – 00:00 hours

Source	Operating Times		Source Position
Case Breakout	23:00 – 00:00		14 Market Parade
Outlet	7 days per week Worst case scenario		
Assessment Position	Residential Habitable Window GF		
Background Position	At the assessment position		
Item	Calculation	Clause	Commentary
Specific Noise Level $L_{Aeq,1\text{ hour}}$	29 dB	7	Calculated using ISO 9613:1996 _[3] .
Rating Level	29 dB	9.1	The acoustic feature correction is added to the specific noise level
Background Noise Level $L_{A90,1\text{ hour}}$	47 dB	8.1	Modal Background Noise Level (23:00 – 00:00)
Assessment Level	-18 dB	11	The background level is subtracted from the rating level.
Conclusion BS 4142:2014 _[1]	+10 dB Significant Adverse Effects, +5 dB Adverse Effects,+0 dB Low Impact		
Assessment	-18 dB		
Conclusion	The assessment level is below ‘Low Impact’		

6.5.2 Justification of subjective penalty.

The is no audible level at the assessment position. Residual noise is dominant.

7 CONCLUSIONS

7.1 Summary of Report

7.1.1 Measured Background Noise Levels

Continuous background noise measurements were undertaken between 11th – 13th May 2016 at Assessment Position 1. The modal 1 hour day time background noise levels between 12:00 – 23:00 was found to be $L_{A90,1 \text{ hour}}$ 42dB and the modal 15min night time background noise levels between 23:00 – 00:00 was found to be $L_{A90,1 \text{ hour}}$ 47dB. The range will not operate between 2300 and 0700 therefore no night time noise assessment has been undertaken.

Assessment Position	LA90 (Modal)	LA90 (Modal)
	Day	Night
	(12:00 – 23:00)	(23:00 – 00:00)
1	52 dB	47 dB

7.2 Operation of the Site

On the longest day the site is likely to be operational between 12:00 – 00:00 hours.

7.3 Criterion on Kitchen extract system

Below are the representative sound powers per plant:

Items of Equipment	Operating Hours	Sound Power Level
Extract	1400 - 2100	$L_{w(A)}$ 53 dB
Sound Power Level – British Standard 3744: 2010 (Engineering Grade 2 Accuracy)		

7.4 Assessment

7.4.1 Assessment Position 1

British Standard 4142:2014	Day	Night
	(12:00 – 23:00)	(23:00 – 00:00)
Rating Noise Levels	29	29
Background Noise Levels	52	47
Assessment	23dB below “low impact”	18dB below “low impact”

7.5 Conclusions

The operation of the kitchen extract system has been assessed to establish if the development will have a demonstrable adverse effect in terms of noise that outweigh the benefits of the development. Measurements have been undertaken in accordance with British Standard 4142:2014 and ISO 1996 – Part 2: 2007. This report aims to establish: the existing background noise levels at the closest residential façade to the site and the assessment of the impact of the site operation on nearby residential properties.

The resulting emissions from the site running on a worst case scenario results in a conclusion of below low impact and is inaudible at the assessment position.

8 APPENDIX A – INFORMATION TO BE REPORTED

8.1 a) Competency

1)	Name	Role	Competency
	I.Broom	Noise Consultant	IoA Diploma Acoustics Noise Control Associate Member of the Institute of Acoustics (AMIOA)

8.2 b) Source under Investigation

1)	Description of Source	Type	Manufacturer	Model
	Kitchen extract system	--	--	--
	Description of Source	Source Location	Hours of Operation	Mode of Operation
	Case Breakout and Outlet	Roof Mounted	12:00 – 00:00	Continuous
	Description of Premises	Site is at 14 Market Parade Havant		

8.3 c) Subjective Impression of Source at Assessment Position

1)	Dominance	The sources will not be the dominant noise source at the assessment positions
	Audibility	The source will not be audible at the assessment position
2)	Residual Noise Sources	Traffic Noise / Commercial Noise

8.4 d) Existing Contexts

1)	Type of Receptor	Period	Sensitivity	Description
	Residential	Day	Moderate	Noise can disturb outside amenity space Noise can disturb inside living space
		Night	High	Noise can disturb sleeping

8.5 e) Relative Positions

1)	Assessment Position	Residential property to rear of site		
		BS 4142:2014 Criteria	Details	Compliance with Criteria
		Section 6	1.0m from façade (external)	Assessment position is valid
2)	Source Measurement	1m from installed plant		
	Justification	Plant was installed and inaudible from assessment position.		
3)	Background Measurement	At assessment positions in report		
	Justification	BS 4142:2014 Criteria	Details	Compliance with Criteria
		Section 6.2	3.5m to any reflecting surface	Does comply with Criteria
		Section 6.2	Height 1.2m to 1.5m	Does comply with Criteria
		Section 6.2	1 st floor 1m to facade	Does comply with Criteria
		Section 6.2	Measurement Height	1.5
			Distance to Reflecting Surface	3.5
4)	Topography, surfaces etc.	Hard		
5)	Relative Distances	See Report		

8.6 f) Noise Measurement Equipment Calibration

8.6.1 Continuous Measurement

1)	Type	Sound Level Meter	Microphone	Calibrator
		CR:171C	MK:224	CR:515
2)	Manufacturer	Cirrus	Cirrus	Cirrus
3)	Serial Number	G067012	1920791	67239
4)	Verification Date	7 th August 2015	7 th August 2015	7 th August 2015

8.7 g) Noise Measurement Equipment Operation Test

1)	Ref. Level of Calibrator	94 dB@1000Hz
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)	Weather Conditions	Dry
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8.9 i) Date and Time of Measurements

1)	Background Measurements	11 th – 13 th May 2016
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8.10 j) Measurement Time Interval

1)	Source Measurements	$T_m = 1 \text{ hour}$	$T_m = 15\text{min}$
	Background Measurements	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		$T_m = 11 \text{ hours}$	$T_m = 1 \text{ hours}$

8.11 k) Reference Time Interval

1)	Reference Time Interval	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		$T_r = 1 \text{ hour}$	$T_r = 15\text{min}$

8.12 l) Specific Noise Levels

1)	Measured Sound Levels	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		Measured on site	Measured on site
2)	Residual Noise Level	Not required	Not required
	Method of Determination	Not Applicable	Not Applicable
3)	Ambient Noise Level	Not required	Not required
	Method of Determination	Not Applicable	Not Applicable
4)	Specific Noise Level (highest)	$L_{Aeq, 1 \text{ hour}} 29 \text{ dB}$	$L_{Aeq, 1 \text{ hour}} 29 \text{ dB}$
	Method of Determination	Calculated using the sound power levels and noise modelling in accordance with ISO9613-2	Calculated using the sound power levels and noise modelling in accordance with ISO9613-2
4)	Justification	On / off assessment was within 3dB	On / off assessment was within 3dB
5)	Correction Applied	Not Applicable	Not Applicable

8.13 m) Background Noise Levels

1)	Background Noise Levels	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		L _{A90,1hour} 52 dB	L _{A90,15min} 47 dB
	Background Position	Assessment Position	Assessment Position

8.14 n) Rating Levels

1)	Specific Noise Level	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		L _{Aeq, 1 hour} 29 dB	L _{Aeq, 1 hour} 29 dB
2)	Acoustic feature correction	0	0
	Justification	inaudible	inaudible
3)	Rating Level	L _{Aeq, 1 hour} 29 dB	L _{Aeq, 1 hour} 29 dB

8.15 o) Excess of Rating over Background Level

1)	Assessment	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		-23 dB	-18 dB
2)	Estimate of Impact	below low impact	below low impact

8.16 p) Conclusions

1)	Conclusion	Day Time	Night Time
		(12:00 – 23:00)	(23:00 – 00:00)
		The British Standard 4142:2014 assessments indicate that the installed plant is unlikely to have an adverse impact on the local residents	

9 APPENDIX B – BACKGROUND MEASUREMENT

Start Time	Start Time	Leq (LAeq)	Max (LAFMax)	L90 (LAeq)
11/05/2016	11:00:00	53.57	72.13	51.3
11/05/2016	11:15:00	54.6	63.56	51.8
11/05/2016	11:30:00	54.63	69.09	52.4
11/05/2016	11:45:00	54.53	61.21	52.4
11/05/2016	12:00:00	54.4	63.21	52.8
11/05/2016	12:15:00	54.79	70.3	52.9
11/05/2016	12:30:00	55.03	72.34	53.2
11/05/2016	12:45:00	56.01	67.66	53.9
11/05/2016	13:00:00	56.08	65.08	54.2
11/05/2016	13:15:00	58.23	74.12	54.8
11/05/2016	13:30:00	57.08	63.54	54.8
11/05/2016	13:45:00	55.99	64.37	53.7
11/05/2016	14:00:00	56.05	70.53	53.9
11/05/2016	14:15:00	56.26	66.09	54.3
11/05/2016	14:30:00	55.28	62.72	53.7
11/05/2016	14:45:00	55.69	66.1	53.5
11/05/2016	15:00:00	56.17	68.31	54.3
11/05/2016	15:15:00	56.69	68.13	55.1
11/05/2016	15:30:00	57.23	68.5	55.1
11/05/2016	15:45:00	59.56	77.55	54.9
11/05/2016	16:00:00	58.1	72.36	55.2
11/05/2016	16:15:00	57.44	71.99	55.3
11/05/2016	16:30:00	56.16	67.29	54.3
11/05/2016	16:45:00	56.26	66.18	54
11/05/2016	17:00:00	56.89	67.74	54.7
11/05/2016	17:15:00	57.21	67.7	54.9
11/05/2016	17:30:00	57.4	69.62	54.4
11/05/2016	17:45:00	57.26	69.1	54.3
11/05/2016	18:00:00	57.59	69.68	54
11/05/2016	18:15:00	55.89	69.34	53.9
11/05/2016	18:30:00	56.05	69.27	53.3
11/05/2016	18:45:00	56.27	63.51	53.7
11/05/2016	19:00:00	58.05	73.57	55.1
11/05/2016	19:15:00	57.66	70.92	55.2
11/05/2016	19:30:00	58.51	72.63	54.3
11/05/2016	19:45:00	54.99	65.15	52.3
11/05/2016	20:00:00	55.05	67.14	52.3
11/05/2016	20:15:00	55.29	66.29	52.3
11/05/2016	20:30:00	55.03	69.43	51.7
11/05/2016	20:45:00	54.31	62.15	51.3

11/05/2016	21:00:00	55.13	76.23	50.7
11/05/2016	21:15:00	54.51	65.93	51.6
11/05/2016	21:30:00	55.16	66.53	51
11/05/2016	21:45:00	55.69	66.79	51.4
11/05/2016	22:00:00	55.63	66.6	52.3
11/05/2016	22:15:00	54.77	69.2	49.9
11/05/2016	22:30:00	54.46	69.2	50.7
11/05/2016	22:45:00	54.97	69.29	50.2
11/05/2016	23:00:00	54.15	67.65	49.5
11/05/2016	23:15:00	52.49	67.23	47.3
11/05/2016	23:30:00	52.45	64.1	46.5
11/05/2016	23:45:00	50.73	67.87	45.1
12/05/2016	00:00:00	51.66	69.95	45.2
12/05/2016	00:15:00	51.14	66.92	44.8
12/05/2016	00:30:00	51.39	70.91	43.6
12/05/2016	00:45:00	48.51	64.21	43.3
12/05/2016	01:00:00	48.99	66.84	43.2
12/05/2016	01:15:00	49.01	68.15	42.9
12/05/2016	01:30:00	48.43	65.78	41.7
12/05/2016	01:45:00	49.26	68.91	43.5
12/05/2016	02:00:00	48.27	61.44	41.8
12/05/2016	02:15:00	48.28	69.83	40.9
12/05/2016	02:30:00	47.63	59.37	42
12/05/2016	02:45:00	46.73	69.17	42.2
12/05/2016	03:00:00	48.99	80.98	41.8
12/05/2016	03:15:00	48.58	69.72	42.5
12/05/2016	03:30:00	48.06	65.64	42.6
12/05/2016	03:45:00	48.07	68.09	41.8
12/05/2016	04:00:00	47.65	64.53	41.7
12/05/2016	04:15:00	48.54	68.41	42.9
12/05/2016	04:30:00	49.19	65.97	44.3
12/05/2016	04:45:00	48.79	61.18	44.5
12/05/2016	05:00:00	48.61	60.57	44.3
12/05/2016	05:15:00	51.83	68.7	48.1
12/05/2016	05:30:00	52.35	62.13	49.1
12/05/2016	05:45:00	52.79	61.27	49
12/05/2016	06:00:00	53.57	68.58	51.1
12/05/2016	06:15:00	54.53	69.72	51.6
12/05/2016	06:30:00	54.88	66.87	52.5
12/05/2016	06:45:00	55.91	71.23	53.8
12/05/2016	07:00:00	60.15	75.45	54.1
12/05/2016	07:15:00	56.32	64.55	54.5

12/05/2016	07:30:00	56.78	69.77	54.8
12/05/2016	07:45:00	56.85	66.54	55.3
12/05/2016	08:00:00	57.09	66	55.4
12/05/2016	08:15:00	57.45	68.66	55.4
12/05/2016	08:30:00	57.14	66.87	55.4
12/05/2016	08:45:00	57.44	77.48	55.1
12/05/2016	09:00:00	56.03	65.43	54.2
12/05/2016	09:15:00	55.41	73.54	53.4
12/05/2016	09:30:00	55.08	63.15	53.2
12/05/2016	09:45:00	55.03	78.88	52.7
12/05/2016	10:00:00	54.44	59.51	52.7
12/05/2016	10:15:00	57.93	72.63	53.1
12/05/2016	10:30:00	61.8	82.95	53.2
12/05/2016	10:45:00	54.05	64.21	52.2
12/05/2016	11:00:00	53.82	66.01	51.5
12/05/2016	11:15:00	54.12	74.35	51.6
12/05/2016	11:30:00	54.65	64.55	52.2
12/05/2016	11:45:00	53.92	61.06	52.1
12/05/2016	12:00:00	54.23	65.63	52.4
12/05/2016	12:15:00	54.49	69.87	52
12/05/2016	12:30:00	54.13	63.05	52.4
12/05/2016	12:45:00	54.36	74.08	51.4
12/05/2016	13:00:00	53.06	62.77	50.8
12/05/2016	13:15:00	52.98	64.7	50.9
12/05/2016	13:30:00	53.9	68.24	51.6
12/05/2016	13:45:00	53.93	65.93	52
12/05/2016	14:00:00	55.07	67.73	52.7
12/05/2016	14:15:00	56.77	68.01	53.8
12/05/2016	14:30:00	56.29	66.57	53.9
12/05/2016	14:45:00	56.64	64.34	55
12/05/2016	15:00:00	55.81	66.99	53.8
12/05/2016	15:15:00	55.53	66.71	53.1
12/05/2016	15:30:00	55.05	63.28	53
12/05/2016	15:45:00	53.62	74.48	51.7
12/05/2016	16:00:00	53.61	60	52.1
12/05/2016	16:15:00	54.31	65.23	52.4
12/05/2016	16:30:00	54.03	61.85	52.3
12/05/2016	16:45:00	54.87	63.01	52.9
12/05/2016	17:00:00	55.28	66.53	52.7
12/05/2016	17:15:00	54.96	65.09	52.3
12/05/2016	17:30:00	55.39	70.42	53.3
12/05/2016	17:45:00	54.98	64.12	53

12/05/2016	18:00:00	55.5	69.17	53.1
12/05/2016	18:15:00	56.19	74.95	53.1
12/05/2016	18:30:00	56.41	66.41	53.4
12/05/2016	18:45:00	55.03	73.6	52.2
12/05/2016	19:00:00	54.63	69.04	51.7
12/05/2016	19:15:00	56.34	75.38	53.4
12/05/2016	19:30:00	54.85	68.57	52.7
12/05/2016	19:45:00	53.76	64.82	51
12/05/2016	20:00:00	55.16	73.63	51.5
12/05/2016	20:15:00	55.52	68.36	52.9
12/05/2016	20:30:00	55.19	70.39	52.3
12/05/2016	20:45:00	54.48	68.17	51
12/05/2016	21:00:00	54.51	62.46	51.4
12/05/2016	21:15:00	54.78	65.38	51
12/05/2016	21:30:00	61.17	68.94	53.1
12/05/2016	21:45:00	52.33	60.2	48.5
12/05/2016	22:00:00	52.85	66.29	49.6
12/05/2016	22:15:00	53.45	64.48	50.4
12/05/2016	22:30:00	53.36	65.94	49.9
12/05/2016	22:45:00	52.29	60.62	48.8
12/05/2016	23:00:00	52.6	70.4	49.3
12/05/2016	23:15:00	52.36	62.34	48.4
12/05/2016	23:30:00	51.05	68.35	47.1
12/05/2016	23:45:00	50.74	63.81	46.2
13/05/2016	00:00:00	49.94	63.25	45.2
13/05/2016	00:15:00	50.51	67.75	45.9
13/05/2016	00:30:00	49.6	62.65	44.4
13/05/2016	00:45:00	48.52	67.85	43.4
13/05/2016	01:00:00	50.36	61.63	44.6
13/05/2016	01:15:00	46.9	62.14	42.3
13/05/2016	01:30:00	46.84	68.87	40.9
13/05/2016	01:45:00	46.06	65.76	41.1
13/05/2016	02:00:00	48.11	69.09	41.4
13/05/2016	02:15:00	45.55	53.96	42.4
13/05/2016	02:30:00	49.88	67.82	44.1
13/05/2016	02:45:00	52.09	69.06	45.5
13/05/2016	03:00:00	49.37	65.33	45
13/05/2016	03:15:00	47.79	67.85	42.8
13/05/2016	03:30:00	46.99	62.55	42.5
13/05/2016	03:45:00	46.66	68.58	42.4
13/05/2016	04:00:00	46.85	55.24	42.4
13/05/2016	04:15:00	47.8	68.79	43.8

13/05/2016	04:30:00	49.13	72.45	44.6
13/05/2016	04:45:00	49.38	67.71	45.4
13/05/2016	05:00:00	49.25	64.19	45.2
13/05/2016	05:15:00	52.63	71.87	48.1
13/05/2016	05:30:00	53.62	62.79	50.1
13/05/2016	05:45:00	54.69	63.88	51.6
13/05/2016	06:00:00	60.09	86.88	52.7

10 APPENDIX C – BRITISH STANDARD 4142:2014 FEATURE CORRECTION

10.1 Subjective Method

The subjective method establishes a rating penalty that is added to the specific noise level if any of the following is present at the assessment position.

If a tone is expected to be present a character correction of 0 dB to 6 dB is added depending on how perceptible it is at noise sensitive locations.

BS4142:2014 – Section 9.2 Subjective Method	Perceptibility to noise sensitive facades	Correction
Tonality Ranging from not tonal to prominently tonal	Not tonal	+0
	Just perceptible	+2
	Clearly perceptible	+4
	Highly perceptible	+6

If the source is expected to be impulsive a character correction of 0 dB to 9 dB is added depending on how perceptible it is at noise sensitive locations.

BS4142:2014 – Section 9.2 Subjective Method	Perceptibility to noise sensitive facades	Correction
Impulsivity Considering both the rapidity and any overall change in sound levels	Not impulsive	+0
	Just perceptible	+3
	Clearly perceptible	+6
	Highly perceptible	+9

When the sound features are neither tonal nor impulsive, a character correction of +3 is added for the readily distinctive quality against the acoustic environment or for the intermittency of the source.

BS4142:2014 – Section 9.2 Subjective Method	Perceptibility to noise sensitive facades	Correction
Readily Distinctive	Is not present	+0
	Is present	+3
Intermittency	Is not present	+0
	Is present	+3

10.2 Objective Method

The objective method is used if the subjective method is not sufficient. This identifies tones from the one-third octave bands and adds a character correction of 6 dB if the tone is present.

According to BS4142:2014 (Annex C):

“For a prominent, discrete tone to be identified as present, the time-averaged sound pressure level in the one-third octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third octave bands by some constant level difference.”

BS4142:2014 – Section 9.3 Objective Method	One – Third Octave Band	Difference
The level differences between adjacent one-third octave bands that identify a tone	25 Hz to 125 Hz	15 dB
	160 Hz to 400 Hz	8 dB
	500 Hz to 10,000 Hz	5 dB

10.3 Reference Method

The reference method is used if using one-third octave bands is not sufficient. This provides a method for assessing how audible a tone will be or how prominent the impulsive sounds will be and produces a penalty of up to 6 dB.

For full details of how to utilise the reference method see British Standard 4142:2014 Annexes D and E.

##End of Report##