



Specialists in Noise and Vibration Control

Technical Report No: SA 4275-ENV-1C

22nd December 2017

Client: HOC Architects
Project: Extraction Fan Noise
Site: 27-28 Chalk Farm Rd, Camden, London,
Subject: Noise Levels from Kitchen Extract Plant.

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1.0 Brief

The brief was to carry out a further Acoustic Survey to establish the current minimum background noise level levels that are evident at the above site, and to assess noise from the Kitchen Extract Fan, already installed, and now fitted with remedial works to reduce the noise emitted.

2.0 Location

The site is at 27-28 Chalk Farm Rd, Camden, London, and the premises are indicated on the site plan as shown in Appendix A.

The current use is a Restaurant, and it is the noise from the operation of the Kitchen Extract Fan of the restaurant which is the subject of this report.

3.0 Instrumentation.

The following instrumentation and equipment was used during the testing:

Sound pressure level measurements were obtained using the following instrumentation complying with the Class 1 specification of BS EN 61672:2003
Svantek 977 Sound Level Meter S/N: 12232
Svantek pre-amplifier SV12L S/N: 13028 with GRAS microphone capsule 40AE S/N: 20859
Svantek pre-amplifier SV12L S/N: 33636 with GRAS microphone capsule 40AE S/N: 58002

Calibration checks were made prior to and after completion of measurements using a Svantek SV30A calibrator, S/N: 10801 complying with Class 1 specification of BS EN 60942:2003, calibration level 94.0 dB @ 1.0 kHz. All acoustic instrumentation carried current manufacturer's certificates of conformance.

4.0 Survey Conditions

The conditions measured throughout the period of the acoustic survey were mainly dry with some cloud, and wind was 3 – 11mph, and temperature 10-14°C.

5.0 Measurement Position

The meter microphones were located one at the end of the rear roof, approximately 1.5m above the flat roof, and 6m from the rear façade of the nearest residential property, and a second meter 1m from the fan discharge

The acoustic survey was taken from 08:16 hrs on Thursday 7th September to 08:13 hrs on Friday 8th September 2017, with the Kitchen Extract Fan turning OFF at 22:30hrs

Noise levels were taken to establish the lowest background level, during the proposed opening hours of 09:00hrs to 24:00 hrs Monday to Saturday, 09:00hrs to 23:00hrs on Sundays and Bank Holidays.

6.0 Results

The results of the measurements are shown in Appendix A, and indicate that the minimum background noise level during the proposed opening hours, was LA90 46dB, with no Kitchen Extract plant in operation, but with other plant associated with other premises operating normally.

A full copy of the measured results is given on the attached spreadsheet.

7.0 Evaluation of Design Criteria for the Extract System.

Residential Design Criterion

BS4142 and Local Authority

Guidance provided in BS4142:2014 indicates that in order to ensure the existing background noise level is not increased,

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. 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.

Therefore the noise emissions from any plant should be at least 5 dB below the background noise level at the receiver premises, which would result in a maximum overall level increase of 1.2 dB

Where mechanical plant is tonal or intermittent, the design criterion must be reduced by a further 5dB.

As the Kitchen Extract Fan will run continuously during the opening hours of the Restaurant, and the Sound Power data for the fan does not indicate any pure tone, no 5dB penalty has been applied in our calculations.

The rating level shall therefore be: -

Design Level = LAeq,T – 5 dB = 41dB
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8.0 Kitchen Extract System.

The installed design comprises the following main equipment.

Main system construction item		63	125	250	500	1k	2k	4k	8k	dB(A)	
Helios Gigabox Fan Unit 630/4/4	Lw dB(A)	77	77	81	82	82	80	75	69	88	dB
Two 1200L Circular attenuators	db Loss	6	14	26	44	42	26	22	22		dB
Cladding to fan and ductwork system	SRI	14	22	37	49	53	50	57	55		dB

9.0 Measurement Results.

The results indicate a level of L_{Aeq} 56 dB at 1m from the fan discharge as indicated in the measurement position photographs in Appendix A

A calculation of the resultant noise level at the nearest property, is done by the following method,

$$L_{p2} = L_{p1} - 20 \times \log(r)$$

L_{p1} = Measured sound pressure level at 1m (56dB(A))

L_{p2} = Level at receiver

r = distance from measuring point to receiver at the nearest neighbouring property,

This gives a level of 40dB(A) at the nearest property facade, which is compliant with the above design target.

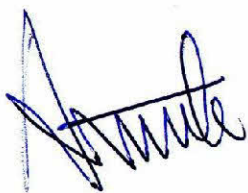
Calculations indicate that the proposed fan and silencer arrangement result in a level at the nearest property from the fan discharge of 40dB(A), and will comply with a requirement of 5dB below the lowest measured background.

As we understand that the fan will run continually throughout the opening hours of the restaurant, we have not applied a 5dB increase on the calculated noise levels for intermittent operation.

10.0 Conclusion

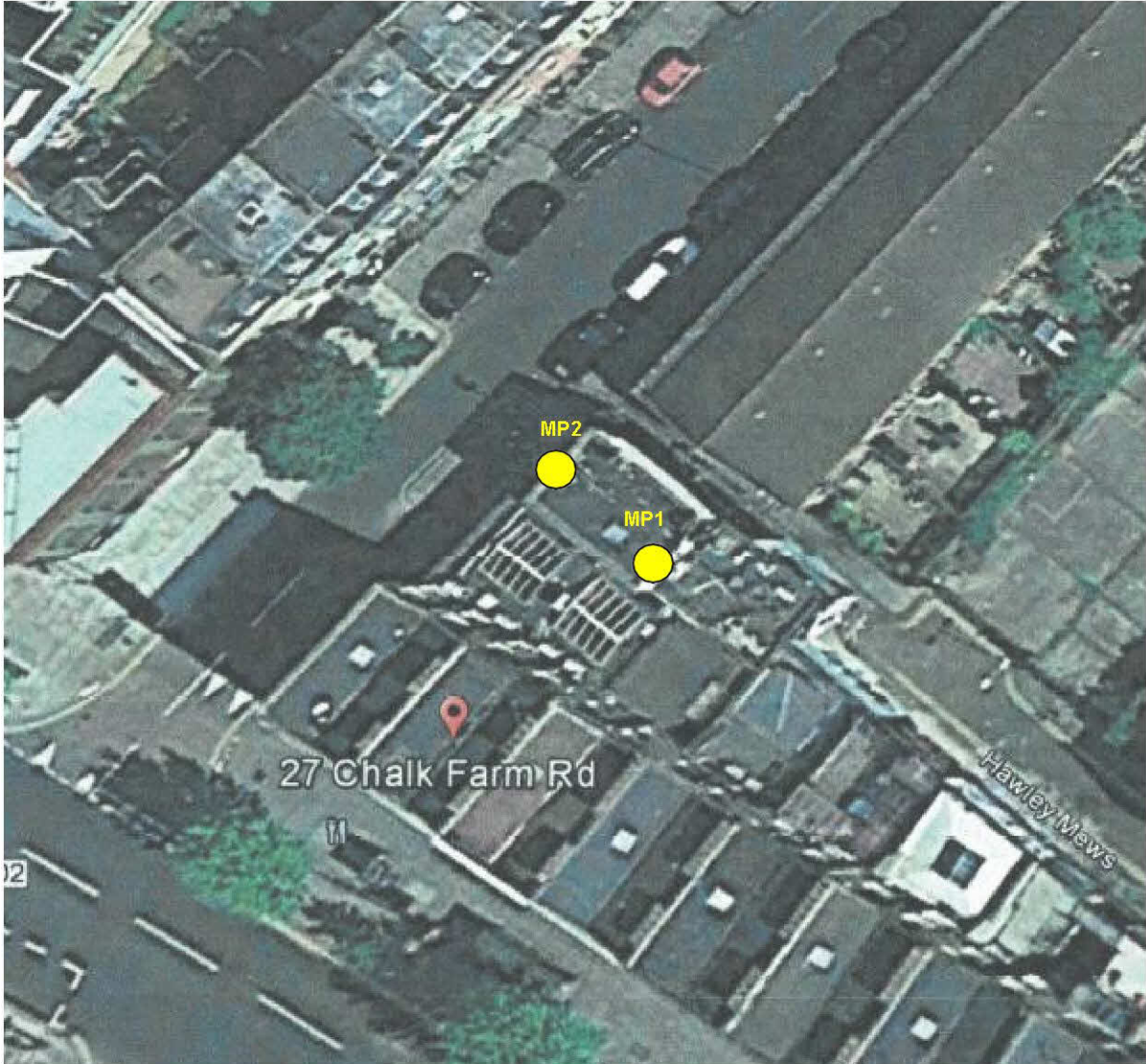
The remedial works that have been undertaken have reduced the noise level that is radiated from the Kitchen Extract Fan to a level compatible with the design target set in section 7 of this report.

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Sound Analysis Ltd

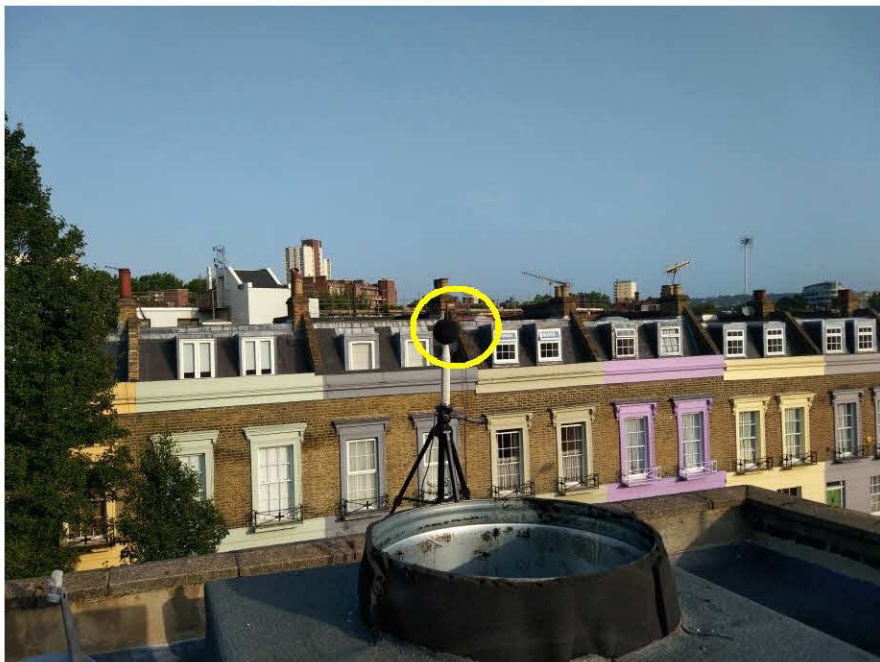
Appendix A: Site Plan and Measuring locations.



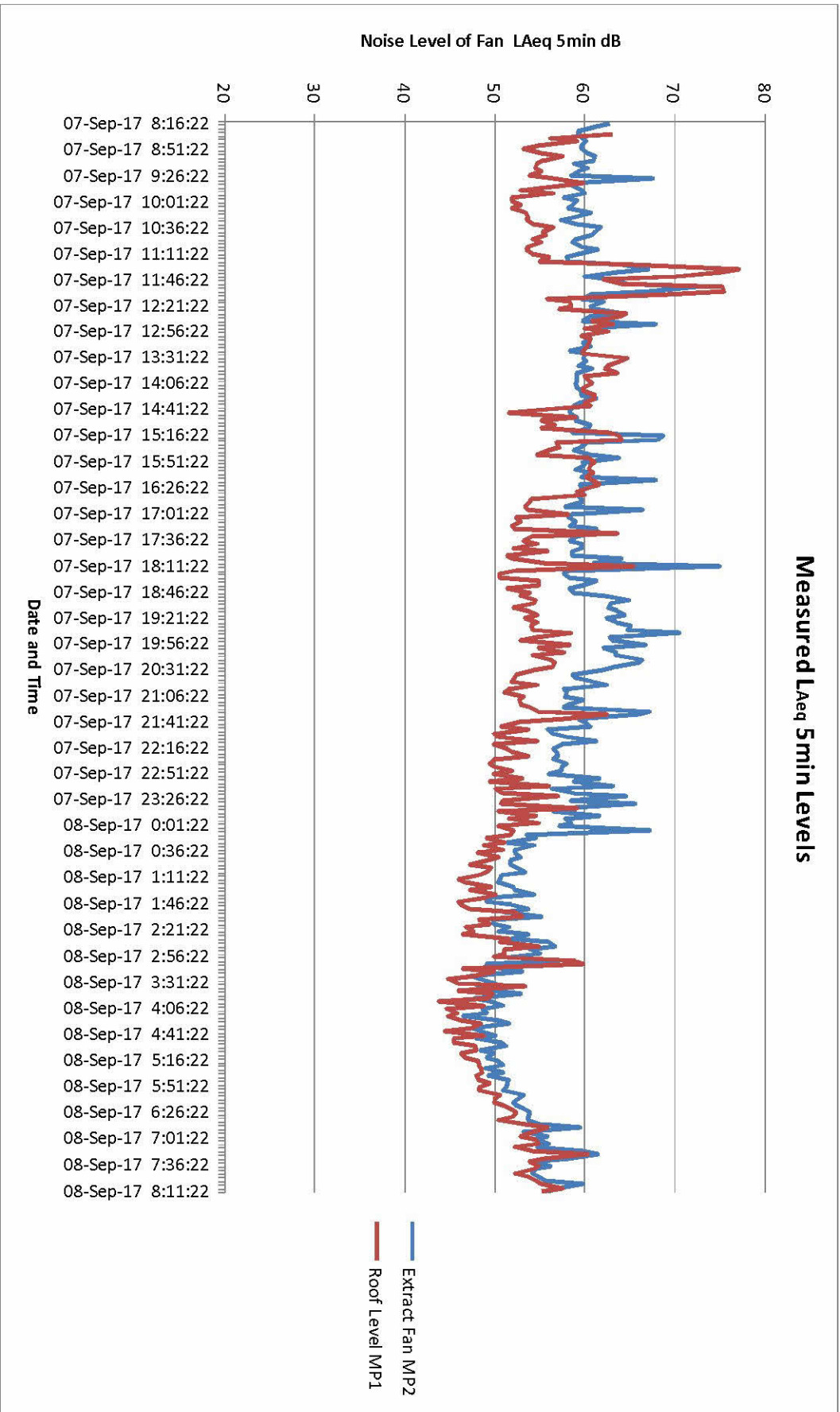
Microphone Position MP1



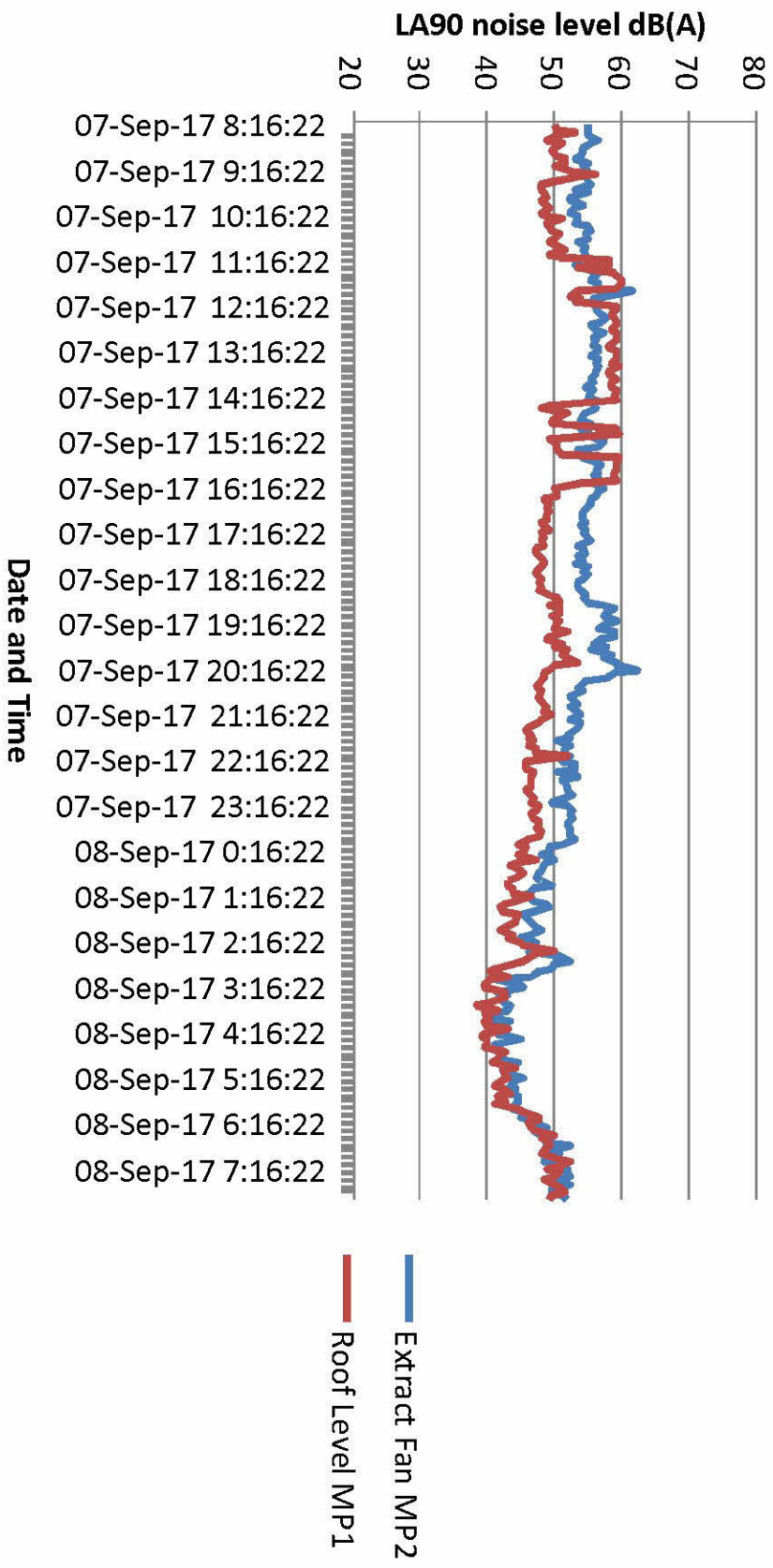
Microphone Position MP2



Appendix B: Measured LAeq Noise Levels



Measured LA90 5min noise levels





Full results of measurements take on 7th and 8th September 2017

Date & time	Max	Min	63	125	250	500	1k	2k	4k	8k	L _{Aeq}	63	125	250	500	1k	2k	4k	8k	L ₉₀
07-Sep-17 8:16:22	80	51	63	59	60	60	58	56	51	44	63	57	54	52	51	51	47	40	33	55
07-Sep-17 8:21:22	86	52	65	60	59	57	57	54	49	48	61	56	54	52	51	51	47	39	32	55
07-Sep-17 8:26:22	66	53	63	58	57	55	55	52	48	43	59	57	54	53	51	51	48	40	34	55
07-Sep-17 8:31:22	68	54	62	58	57	55	55	53	48	43	59	56	54	53	51	51	47	40	33	55
07-Sep-17 8:36:22	69	54	64	59	57	55	55	53	48	42	60	58	54	53	52	52	49	42	35	56
07-Sep-17 8:41:22	75	54	64	59	57	56	56	53	49	42	60	59	55	53	51	51	48	40	33	55
07-Sep-17 8:46:22	70	52	64	59	58	55	56	53	47	41	60	59	55	53	50	50	46	38	32	54
07-Sep-17 8:51:22	68	51	66	60	58	55	55	53	49	48	60	59	55	53	50	50	46	39	32	54
07-Sep-17 8:56:22	82	53	65	60	58	55	56	53	50	44	60	58	54	53	50	49	46	39	32	54
07-Sep-17 9:01:22	72	51	66	63	62	58	56	53	48	42	61	56	55	52	49	48	45	40	33	53
07-Sep-17 9:06:22	72	53	66	61	60	58	57	53	48	42	61	59	55	53	51	50	47	39	33	55
07-Sep-17 9:11:22	71	53	65	59	57	55	54	51	47	42	59	61	55	52	50	49	46	40	33	54
07-Sep-17 9:16:22	70	53	64	58	57	56	55	54	51	45	60	60	55	52	50	51	48	41	35	55
07-Sep-17 9:21:22	75	54	66	58	56	54	55	52	49	46	59	60	54	52	50	50	47	43	36	55
07-Sep-17 9:26:22	69	53	65	59	56	54	54	52	48	44	59	60	55	52	50	50	47	41	35	55
07-Sep-17 9:31:22	91	54	67	61	58	54	63	62	60	57	68	61	55	52	50	50	47	42	37	55
07-Sep-17 9:36:22	68	54	64	60	56	55	55	52	46	40	59	59	55	52	50	51	48	41	33	55
07-Sep-17 9:41:22	78	51	64	60	57	54	54	52	47	41	59	60	54	51	49	49	45	38	32	53
07-Sep-17 9:46:22	79	54	67	61	59	55	56	51	46	41	60	60	55	53	51	50	46	39	33	55
07-Sep-17 9:51:22	71	50	65	62	60	55	55	52	48	42	60	59	54	51	48	48	44	37	31	52
07-Sep-17 9:56:22	72	50	65	59	57	53	53	50	46	44	58	59	54	51	48	47	44	38	32	52
07-Sep-17 10:01:22	75	52	65	59	58	55	55	52	46	42	59	59	54	52	50	50	46	39	33	54
07-Sep-17 10:06:22	74	51	65	59	56	54	54	51	48	42	59	59	54	52	49	49	44	36	31	53
07-Sep-17 10:11:22	69	49	65	58	55	54	54	51	46	42	58	59	54	51	49	48	44	38	32	52
07-Sep-17 10:16:22	75	50	66	60	58	56	56	54	50	46	61	60	54	52	49	49	45	38	33	53
07-Sep-17 10:21:22	76	51	64	59	57	54	55	52	47	43	59	58	54	51	49	49	45	38	32	53
07-Sep-17 10:26:22	66	51	66	60	56	53	53	50	45	40	57	59	54	51	48	48	44	37	32	53
07-Sep-17 10:31:22	70	53	65	58	57	55	55	52	47	42	59	60	54	53	51	50	47	41	34	55
07-Sep-17 10:36:22	80	53	64	59	59	57	57	55	52	47	62	59	55	53	51	51	48	41	35	55
07-Sep-17 10:41:22	85	53	63	63	60	57	56	54	51	47	61	58	54	53	51	50	46	40	34	55
07-Sep-17 10:46:22	83	53	63	58	57	56	53	50	48	46	61	59	54	52	50	49	46	44	40	55
07-Sep-17 10:51:22	76	51	62	57	60	55	54	51	48	46	59	57	53	52	50	48	45	41	34	54
07-Sep-17 10:56:22	69	52	64	59	57	54	53	51	49	48	59	58	55	52	50	48	45	42	37	55
07-Sep-17 11:01:22	80	52	63	58	57	56	55	52	49	46	60	56	53	51	49	49	46	41	35	54
07-Sep-17 11:06:22	83	52	65	60	59	57	57	55	51	47	61	59	55	53	51	50	47	40	34	55
07-Sep-17 11:11:22	77	53	64	58	57	55	54	52	47	51	59	58	54	52	50	49	46	39	33	54
07-Sep-17 11:16:22	69	51	65	58	57	54	53	50	47	42	58	59	55	53	50	49	46	40	35	54
07-Sep-17 11:21:22	71	52	65	58	56	54	53	51	48	42	58	59	54	52	49	48	45	38	33	53
07-Sep-17 11:26:22	81	50	66	61	57	56	59	58	56	55	64	59	55	52	51	49	45	39	34	54
07-Sep-17 11:31:22	83	54	68	63	58	56	62	60	60	59	67	65	61	54	52	51	47	41	36	56
07-Sep-17 11:36:22	72	54	67	64	57	56	57	55	57	58	64	64	62	54	52	51	47	41	34	56
07-Sep-17 11:41:22	73	53	68	65	62	57	54	51	45	40	60	63	57	54	52	50	46	40	34	55
07-Sep-17 11:46:22	76	56	71	65	62	60	58	55	51	45	63	67	63	55	53	51	47	41	35	57
07-Sep-17 11:51:22	80	54	70	65	62	61	58	56	57	57	65	66	62	55	52	50	46	41	35	56
07-Sep-17 11:56:22	83	59	73	73	71	71	67	63	58	57	72	68	63	59	57	55	53	46	39	61
07-Sep-17 12:01:22	87	56	70	64	60	57	62	61	60	58	67	67	62	55	53	52	50	44	38	58
07-Sep-17 12:06:22	71	54	69	62	58	55	55	53	52	51	61	66	56	54	51	50	48	43	38	56
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07-Sep-17 12:16:22	90	54	69	63	59	56	60	53	49	44	62	66	57	54	52	50	48	42	37	56
07-Sep-17 12:21:22	77	54	68	59	58	55	55	54	50	46	61	65	55	54	51	51	48	44	38	56
07-Sep-17 12:26:22	72	56	70	63	58	56	56	54	51	47	61	67	58	55	53	52	49	44	39	57
07-Sep-17 12:31:22	79	56	70	63	58	56	60	58	56	51	64	67	61	55	53	52	50	45	39	58
07-Sep-17 12:36:22	69	56	70	63	60	57	55	53	49	44	61	67	61	55	54	51	48	43	37	57
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07-Sep-17 12:56:22	76	55	70	63	58	56	55	58	54	44	62	67	60	55	53	50	47	41	35	56
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07-Sep-17 13:06:22	75	55	70	62	58	56	55	54	51	45	61	67	61	55	53	50	46	40	34	56
07-Sep-17 13:11:22	71	56	69	63	58	56	55	52	47	43	60	66	60	55	53	51	48	41	35	57
07-Sep-17 13:16:22	74	56	69	63	59	57	55	53	50	47	61	67	61	55	53	51	48	41	35	56
07-Sep-17 13:21:22	70	55	68	63	57	55	53	50	45	40	58	66	61	54	53	49	46	39	33	55
07-Sep-17 13:26:22	73	56	68	63	59	56	55	52	50	45	60	65	61	55	53	51	48	42	35	57
07-Sep-17 13:31:22	69	54	68	64	58	56	55	52	49	46	60	65	61	55	53	50	47	41	34	56
07-Sep-17 13:36:22	68	55	68	63	58	57	55	52	50	48	60	65	61	55	53	50	47	42	35	57
07-Sep-17 13:41:22	70	54	68	63	57	56	54	51	47	45	59	65	61	54	53	50	48	41	35	56
07-Sep-17 13:46:22	75	54	70	64	59	58	56	52	49	45	61	66	61	55	53	50	47	40	34	56
07-Sep-17 13:51:22	71	54	68	63	57	56	54	52	48	46	59	65	61	55	52	49	46	39	33	55
07-Sep-17 13:56:22	66	54	68	63	57	56	54	51	47	43	59	65	61	54	52	50	47	40	34	56
07-Sep-17 14:01:22	74	53	67	63	57	55	54	52	47	43	59	65	61	53	51	49	45	39	33	55

07-Sep-17 14:06:22	68	54	68	63	57	55	54	51	48	42	59	65	60	54	52	50	47	40	34	56
07-Sep-17 14:11:22	67	54	67	62	57	56	54	52	46	42	59	64	60	54	52	49	46	40	34	55
07-Sep-17 14:16:22	71	54	68	62	57	56	54	52	50	45	60	65	60	54	52	49	46	39	33	55
07-Sep-17 14:21:22	74	54	67	61	57	56	55	52	48	44	60	64	59	54	53	50	48	41	35	56
07-Sep-17 14:26:22	75	54	70	67	63	58	56	52	48	44	61	65	60	54	52	50	46	40	34	56
07-Sep-17 14:31:22	69	54	68	61	57	56	55	52	46	42	59	64	59	54	53	50	47	40	34	56
07-Sep-17 14:36:22	67	54	67	62	57	55	54	51	47	42	59	63	57	54	52	49	46	39	33	55
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07-Sep-17 15:06:22	77	53	67	61	61	59	54	51	48	48	60	61	55	53	51	50	47	40	34	55
07-Sep-17 15:11:22	66	55	69	63	57	55	54	51	46	45	59	65	61	55	53	50	47	41	35	56
07-Sep-17 15:16:22	87	55	69	67	60	57	66	63	54	49	69	65	62	56	53	51	48	42	36	57
07-Sep-17 15:21:22	92	53	68	63	58	56	64	61	61	53	68	63	58	55	53	51	48	42	36	57
07-Sep-17 15:26:22	77	52	64	59	56	55	56	53	48	43	60	59	55	53	50	49	45	39	32	53
07-Sep-17 15:31:22	74	54	67	62	58	55	55	52	48	43	59	61	55	53	52	50	47	40	34	55
07-Sep-17 15:36:22	70	53	65	59	57	55	55	51	45	40	59	60	55	53	50	49	46	39	33	54
07-Sep-17 15:41:22	75	55	66	60	58	56	56	54	50	43	61	61	55	54	52	52	48	41	35	56
07-Sep-17 15:46:22	83	55	68	63	58	56	59	58	54	47	64	64	61	55	53	51	48	42	35	57
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07-Sep-17 16:01:22	69	54	68	63	59	56	54	51	45	40	59	65	61	56	53	50	46	40	34	56
07-Sep-17 16:06:22	70	55	68	64	59	57	55	53	49	45	60	65	61	56	53	51	48	41	35	57
07-Sep-17 16:11:22	70	55	69	64	59	56	54	52	48	43	60	65	61	55	52	50	47	40	34	56
07-Sep-17 16:16:22	95	57	68	63	59	57	63	61	62	56	68	65	61	56	54	52	49	43	37	57
07-Sep-17 16:21:22	71	56	70	66	60	56	54	51	45	40	59	65	61	56	53	51	47	40	34	56
07-Sep-17 16:26:22	68	54	66	61	59	56	55	52	49	44	60	61	56	54	52	51	47	41	34	56
07-Sep-17 16:31:22	70	55	67	63	59	56	54	52	48	44	60	62	58	55	52	50	47	41	35	56
07-Sep-17 16:36:22	75	54	64	59	57	56	55	52	46	41	59	59	55	54	52	51	47	40	33	55
07-Sep-17 16:41:22	73	53	67	59	56	55	55	52	50	45	60	59	55	53	52	50	47	40	34	55
07-Sep-17 16:46:22	73	53	64	58	57	55	55	52	48	42	60	58	54	53	50	50	46	39	32	54
07-Sep-17 16:51:22	65	53	64	58	56	55	53	50	45	38	58	59	55	53	51	49	46	39	33	54
07-Sep-17 16:56:22	89	52	65	62	62	64	62	59	54	48	66	58	55	53	51	49	45	39	32	54
07-Sep-17 17:01:22	74	52	65	58	57	55	54	51	47	42	59	60	55	53	51	49	46	39	33	54
07-Sep-17 17:06:22	72	52	64	60	58	55	53	50	45	40	58	59	55	53	50	49	45	38	32	54
07-Sep-17 17:11:22	71	52	65	59	58	55	54	52	49	43	59	60	55	53	50	49	46	39	33	54
07-Sep-17 17:16:22	67	52	65	59	56	54	54	51	47	42	58	59	55	53	50	49	46	39	33	54
07-Sep-17 17:21:22	75	54	66	60	58	56	59	53	47	45	61	60	55	53	51	50	47	41	36	55
07-Sep-17 17:26:22	70	54	68	65	62	57	55	52	48	42	60	60	56	54	52	51	47	40	35	56
07-Sep-17 17:31:22	72	51	65	63	60	55	53	51	48	44	59	59	54	52	49	49	45	38	32	53
07-Sep-17 17:36:22	68	53	64	58	56	55	54	51	46	41	58	59	54	53	51	49	46	39	33	54
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08-Sep-17 6:36:22	65	46	62	57	53	50	49	46	39	34	54	55	51	48	44	43	39	32	28	48
08-Sep-17 6:41:22	71	46	63	59	56	53	50	45	38	33	55	56	51	48	46	44	39	31	28	49
08-Sep-17 6:46:22	67	49	66	60	60	59	54	48	41	35	59	59	54	51	49	47	43	36	30	52
08-Sep-17 6:51:22	61	46	63	57	53	50	49	45	38	34	53	57	52	49	46	45	39	32	28	50
08-Sep-17 6:56:22	65	48	66	60	57	53	51	46	40	34	56	59	54	51	47	46	41	35	29	51
08-Sep-17 7:01:22	61	47	64	57	54	51	50	47	40	35	55	57	52	49	45	44	40	34	30	49
08-Sep-17 7:06:22	79	47	64	58	54	50	52	49	43	37	56	57	52	50	44	43	39	34	30	49
08-Sep-17 7:11:22	62	49	64	58	55	51	50	47	41	36	55	58	52	50	46	46	43	37	32	51
08-Sep-17 7:16:22	73	50	65	60	61	59	54	49	42	38	60	59	53	50	48	47	43	36	31	52
08-Sep-17 7:21:22	74	48	65	60	62	61	56	49	43	38	61	58	53	51	49	47	41	34	28	52
08-Sep-17 7:26:22	74	50	67	66	61	55	51	48	42	39	58	59	54	50	48	47	44	38	33	52
08-Sep-17 7:31:22	70	49	63	57	54	50	50	46	39	34	54	58	53	49	46	45	40	34	29	50

08-Sep-17 7:36:22	66	50	66	61	57	53	51	47	40	35	56	59	54	51	48	47	43	36	31	52
08-Sep-17 7:41:22	64	48	63	60	55	51	50	46	39	34	54	57	53	50	46	45	40	33	29	50
08-Sep-17 7:46:22	66	47	62	57	54	51	50	45	38	33	54	57	53	49	46	45	40	33	29	50
08-Sep-17 7:51:22	72	49	64	58	54	51	51	47	41	37	55	59	53	50	47	47	43	38	33	51
08-Sep-17 7:56:22	62	50	67	59	55	52	51	47	40	35	56	59	54	51	48	47	42	35	30	52
08-Sep-17 8:01:22	79	48	67	64	63	58	54	48	41	36	60	59	54	51	47	46	42	35	29	51
08-Sep-17 8:06:22	67	49	67	61	57	54	53	48	41	36	57	59	54	51	48	46	42	34	29	51
08-Sep-17 8:11:22	68	49	67	62	58	53	50	47	40	35	56	59	55	50	47	45	41	35	30	51

Appendix C: Glossary of Terms.

An explanation of the recorded environmental noise measurements is as follows,

LAeq.

This is the notional equivalent continuous sound level that has the same energy as the fluctuating sound that has occurred over the measurement period.

The LAeq T value can be considered as the ambient noise level experienced by the Residents in the area.

LA90.

This is the measure of the A weighted sound level that has been exceeded for 90% of the measurement period.

LA10.

This is the measure of the A weighted sound level that has been exceeded for 10% of the measurement period.

The LA10 value can be considered as the traffic noise in the area.

LAmx

This is the measure of the maximum A weighted sound level that has occurred during the measurement period.

LAmn.

This is the measure of the minimum A weighted sound level that has occurred during the measurement period.

National noise criteria.

Community response to unwanted sound in the environment is dependent on several factors including, the type of noise source, the absolute noise levels and the changes in noise levels. Additional and other non-acoustic parameters also effect individual response to noise

and contribute to differences in subjective reactions to similar noise exposures.

Changes in LAeq T ambient noise levels are widely used for the determination of noise impact. The following semantic scale provides a basis for the description of noise impact associated with the introduction of any new noise source into the environment.

Ambient noise change.

1 to 3 dB LAeq T
3 to 5 dB LAeq T
5 to 10 dB LAeq T
10 to 15 dB LAeq T
15dB plus LAeq T

Community Reaction.

minimal.
slight.
moderate.
substantial.
severe.