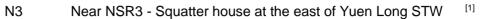
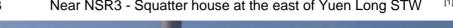
Appendix 4.1 Background Noise Survey

Noise Measurement Points

Near NSR1 - Squatter house at the north of Yuen Long STW [1] N1









Near NSR2 - Squatter house at the west of Yuen Long STW N2



Remarks: [1] Due to access problems, background noise measurements are conducted near the entrances of the NSRs.

Measi	ireme	nt Re	sult	N1

Measurement	.10136		N1	ment Points	,(^)
Start Time	LAeq	LA10	LA90	LAMax	LAMin
21/Mar/2017 10:30 21/Mar/2017 11:00	55.1	57.5	51.0	69.4	43.2
21/Mar/2017 11:30	56.2 53.0	58.0 55.0	51.5 48.0	75.1 63.2	43.6 42.8
21/Mar/2017 12:00	53.2	54.0	48.0	71.0	42.9
21/Mar/2017 12:30	53.6	55.5	49.5	66.4	44.4
21/Mar/2017 13:00	54.6	57.0	50.5	67.4	44.1
21/Mar/2017 13:30 21/Mar/2017 14:00	55.2 55.1	57.5 57.5	51.0 51.0	72.4 67.4	44.4 44.5
21/Mar/2017 14:30	54.5	56.5	49.5	71.0	44.9
21/Mar/2017 15:00	53.7	55.5	49.0	69.6	41.4
21/Mar/2017 15:30	52.4	53.5	48.5	61.9	45.3
21/Mar/2017 16:00 21/Mar/2017 16:30	55.9 56.9	58.0 60.0	48.0 49.0	70.6 72.0	44.1 44.2
21/Mar/2017 17:00	57.7	60.5	49.0	74.4	44.6
21/Mar/2017 17:30	59.1	59.5	48.5	75.7	44.2
21/Mar/2017 18:00	53.8	53.5	48.0	74.5	44.1
21/Mar/2017 18:30 21/Mar/2017 19:00	52.4	53.0	48.0	66.7	44.9 45.6
21/Mar/2017 19:30	55.4 52.1	53.5 53.0	48.0 48.5	89.3 59.9	46.3
21/Mar/2017 20:00	48.0	51.0	44.5	72.4	43.5
21/Mar/2017 20:30	46.9	48.0	45.0	67.3	43.2
21/Mar/2017 21:00 21/Mar/2017 21:30	56.7 47.4	49.5 48.0	46.0 45.5	91.3 62.7	44.8 44.1
21/Mar/2017 21:30 21/Mar/2017 22:00	51.8	53.0	47.5	59.8	44.1
21/Mar/2017 22:30	52.3	53.5	49.0	59.6	46.7
21/Mar/2017 23:00	52.4	53.5	49.0	58.7	46.9
21/Mar/2017 23:30	52.2	53.0	48.5	61.3	46.6
22/Mar/2017 00:00 22/Mar/2017 00:30	52.1 52.1	53.0 53.0	48.5 48.5	58.4 55.8	46.4 46.7
22/Mar/2017 00:30 22/Mar/2017 01:00	52.1	53.0	49.0	58.7	46.7
22/Mar/2017 01:30	52.2	53.5	49.0	61.5	46.7
22/Mar/2017 02:00	52.2	53.5	49.0	55.2	46.4
22/Mar/2017 02:30 22/Mar/2017 03:00	52.3 52.2	53.5 53.5	49.0 49.0	56.7 55.5	46.9 46.7
22/Mar/2017 03:30	52.2	53.5	49.0	55.5	46.7
22/Mar/2017 04:00	52.5	53.5	49.5	57.4	46.9
22/Mar/2017 04:30	52.3	53.5	49.0	58.9	46.6
22/Mar/2017 05:00 22/Mar/2017 05:30	52.3	53.5 53.5	49.0	61.5	46.7
22/Mar/2017 05:30 22/Mar/2017 06:00	53.3 58.0	55.5	49.5 50.0	74.9 77.1	46.8 46.8
22/Mar/2017 06:30	54.7	56.5	50.0	73.4	46.4
22/Mar/2017 07:00	55.6	58.0	51.0	68.3	47.1
22/Mar/2017 07:30	55.4	57.5	50.0	72.4	44.9
22/Mar/2017 08:00 22/Mar/2017 08:30	54.8 57.9	56.5 60.5	49.5 52.0	74.8 74.3	43.5 44.6
22/Mar/2017 08:30 22/Mar/2017 09:00	58.9	59.0	51.0	80.6	45.3
22/Mar/2017 09:30	60.0	63.0	52.5	75.1	45.8
22/Mar/2017 10:00	58.3	61.0	50.5	75.4	45.3
2/Apr/2017 00:00	48.2	46.0	43.0	72.9	42.3
2/Apr/2017 00:30 2/Apr/2017 01:00	43.7 43.1	45.0 44.0	42.0 42.0	52.6 48.6	41.0
2/Apr/2017 01:30	44.0	44.5	42.5	53.7	41.7
2/Apr/2017 02:00	43.8	44.5	43.0	50.8	41.8
2/Apr/2017 02:30	43.6	44.5	42.0	56.8	41.1
2/Apr/2017 03:00 2/Apr/2017 03:30	43.3 43.1	44.0 43.5	42.5 42.0	46.7 60.2	41.2
2/Apr/2017 03:30	42.6	43.0	41.5	52.2	40.7
2/Apr/2017 04:30	43.8	44.0	42.0	61.3	40.8
2/Apr/2017 05:00	43.4	44.5	42.0	54.2	41.1
2/Apr/2017 05:30 2/Apr/2017 06:00	47.2 61.6	49.0 66.5	44.5 45.5	57.3 76.7	42.1 43.1
2/Apr/2017 06:30	57.7	58.5	46.0	74.5	42.6
2/Apr/2017 07:00	57.2	55.5	42.5	75.1	40.1
2/Apr/2017 07:30	54.2	56.5	43.5	70.5	40.2
2/Apr/2017 08:00 2/Apr/2017 08:30	54.4 53.9	57.0	43.0	72.4	37.8
2/Apr/2017 08:30 2/Apr/2017 09:00	57.5	56.5 60.0	46.0 46.5	72.3 72.7	39.0 37.2
2/Apr/2017 09:30	55.3	58.0	45.5	79.0	37.9
2/Apr/2017 10:00	53.8	56.5	47.5	66.8	38.9
2/Apr/2017 10:30 2/Apr/2017 11:00	51.1	54.0	44.0	72.2 64.2	38.1
2/Apr/2017 11:00 2/Apr/2017 11:30	52.2 54.3	55.0 57.0	45.5 48.0	76.9	39.8 40.8
2/Apr/2017 12:00	53.3	56.5	46.0	69.0	38.4
2/Apr/2017 12:30	52.8	56.0	46.0	69.7	40.5
2/Apr/2017 13:00	52.6	55.5	45.5 45.0	67.1	39.2
2/Apr/2017 13:30 2/Apr/2017 14:00	51.8 53.5	55.0 57.0	45.0 46.0	69.1 70.1	38.3 37.2
2/Apr/2017 14:30	54.2	57.5	46.5	68.8	38.2
2/Apr/2017 15:00	50.2	53.0	43.0	68.4	38.6
2/Apr/2017 15:30	52.8	56.0	45.5	65.7	39.8
2/Apr/2017 16:00 2/Apr/2017 16:30	55.5 55.3	59.0 54.0	47.0 46.0	71.0 76.9	40.7
2/Apr/2017 17:00	56.6	55.0	41.5	78.4	37.6
2/Apr/2017 17:30	58.3	58.5	40.0	80.2	37.9
2/Apr/2017 18:00	67.4	69.0	42.0	90.6	37.8
2/Apr/2017 18:30 2/Apr/2017 19:00	62.9 50.8	65.5 49.5	43.0 41.5	84.0 81.4	40.0 39.8
2/Apr/2017 19:30	43.7	49.5	41.5	64.8	39.8
2/Apr/2017 20:00	64.3	56.5	42.5	94.7	40.7
2/Apr/2017 20:30	44.9	45.0	43.5	62.3	41.5
2/Apr/2017 21:00	44.4	45.0	43.5	56.7	42.2
2/Apr/2017 21:30 2/Apr/2017 22:00	45.9 45.5	45.5 46.5	43.5 44.5	65.7 54.0	42.3 43.1
2/Apr/2017 22:30	45.8	46.5	44.5	60.3	43.1
2/Apr/2017 23:00	45.8	46.5	44.5	51.0	43.5
	46.9	47.5	45.5	72.7	44.1
2/Apr/2017 23:30			40	62	07
	E۷	EO			37
Day time Minimum	50 44	53 45	40 42	54	40
		53 45 43			
Day time Minimum Evening time Minimum light time Minimum	44 43	45 43	42 42	54 47	40 41
Day time Minimum Evening time Minimum	44	45	42	54	40

Remarks: Free field noise measurements Equipment Serial No.: 2800927

easurement art Time	LAeq	LA10	N1 LA90	LAMax	LAMin
5/Aug/2018 00:00	53.3	54.0	47.5	67.0	44.6
5/Aug/2018 00:30 5/Aug/2018 01:00	52.3 52.3	53.5 53.5	47.0 47.0	64.8 56.8	44.6
5/Aug/2018 01:30	52.2	53.5	46.5	56.6	44.2
5/Aug/2018 02:00	52.2	53.5	46.5	56.1	44.2
5/Aug/2018 02:30 5/Aug/2018 03:00	52.2 52.2	53.5 53.5	47.0 47.0	56.5 56.6	44.0
5/Aug/2018 03:30	52.3	53.5	47.0	62.6	44.3
5/Aug/2018 04:00 5/Aug/2018 04:30	52.2 52.1	53.5 53.5	47.0 46.5	56.2 56.8	44.5 44.2
5/Aug/2018 05:00	52.1	53.5	46.5	56.0	44.0
5/Aug/2018 05:30	52.2	53.5	47.0	59.7	43.8
5/Aug/2018 06:00 5/Aug/2018 06:30	52.1 54.1	53.5 58.0	46.5 47.0	56.7 62.8	43.9 43.9
5/Aug/2018 07:00	58.0	60.5	52.0	71.1	44.4
5/Aug/2018 07:30 5/Aug/2018 08:00	53.1 52.8	54.5 54.0	48.0 47.0	64.1 71.5	43.5 43.8
5/Aug/2018 08:30	54.3	55.5	49.5	75.2	44.8
5/Aug/2018 09:00 5/Aug/2018 09:30	58.5	62.0	53.0 53.0	65.7	47.8
5/Aug/2018 10:00	57.4 58.6	59.5 60.5	56.5	65.3 61.9	50.1 54.6
5/Aug/2018 10:30	57.9	59.5	54.0	64.8	47.7
5/Aug/2018 11:00 5/Aug/2018 11:30	52.7 52.7	54.0 54.0	47.5 47.5	63.2 63.0	44.1
5/Aug/2018 12:00	57.4	58.0	53.5	73.4	52.4
5/Aug/2018 12:30	53.8	55.5	48.5	72.6	44.9
5/Aug/2018 13:00 5/Aug/2018 13:30	53.0 54.1	54.0 54.5	48.5 49.0	67.8 79.0	45.5 45.3
5/Aug/2018 14:00	54.5	54.5	48.5	75.0	45.3
5/Aug/2018 14:30 5/Aug/2018 15:00	65.9 56.3	66.5	49.5	97.9 72.4	45.5
5/Aug/2018 15:30	57.7	59.0 60.0	51.0 54.5	75.1	45.5 45.9
5/Aug/2018 16:00	54.3	56.0	49.5	68.9	45.2
5/Aug/2018 16:30 5/Aug/2018 17:00	53.0 53.0	54.0 54.0	48.5 48.5	65.6 64.2	45.0 44.5
5/Aug/2018 17:30	53.3	54.5	48.5	67.7	44.6
5/Aug/2018 18:00	53.2	54.5	48.5	71.7	45.0
5/Aug/2018 18:30 30/Sep/2018 19:00	53.8 52.8	55.0 54.0	49.5 46.5	70.3 66.3	45.3 44.2
30/Sep/2018 19:30	53.1	54.0	47.0	71.8	44.5
30/Sep/2018 20:00 30/Sep/2018 20:30	52.6 52.5	54.0 54.0	47.0 47.0	61.3 60.2	44.6 44.6
30/Sep/2018 21:00	52.6	54.0	47.0	62.3	44.3
30/Sep/2018 21:30	52.4	54.0	47.0	56.8	44.3
30/Sep/2018 22:00 30/Sep/2018 22:30	52.7 52.4	54.0 54.0	47.0 47.0	70.7 60.2	44.1
30/Sep/2018 23:00	52.4	54.0	47.0	56.6	44.2
30/Sep/2018 23:30 5/Sep/2018 07:30	52.4	54.0	47.0	56.9	44.3
5/Sep/2018 07:30	46.9 48.1	49.5 49.0	42.5 42.5	69.0 70.0	41.0
5/Sep/2018 08:30	49.9	52.0	44.0	69.3	42.0
5/Sep/2018 09:00 5/Sep/2018 09:30	50.0 48.3	52.0 49.5	47.0 46.5	71.5 61.1	45.5 45.7
5/Sep/2018 10:00	49.1	50.5	47.0	67.8	46.2
5/Sep/2018 10:30 5/Sep/2018 11:00	49.0	49.0	47.0	73.2	46.1
5/Sep/2018 11:30	50.3 47.3	51.0 48.0	47.0 44.5	68.7 62.9	46.1 42.8
5/Sep/2018 12:00	46.2	47.0	43.5	66.6	41.8
5/Sep/2018 12:30 5/Sep/2018 13:00	48.3 47.1	55.0 49.5	42.0 43.5	67.4 66.8	41.1
5/Sep/2018 13:30	48.6	51.0	43.5	68.9	42.4
5/Sep/2018 14:00	45.7	47.0	43.0	63.5	42.1
5/Sep/2018 14:30 5/Sep/2018 15:00	46.7 48.4	48.5 50.5	42.5 44.0	73.4 66.4	41.6 42.6
5/Sep/2018 15:30	51.7	50.0	43.5	80.6	42.2
5/Sep/2018 16:00 5/Sep/2018 16:30	51.3 51.8	52.5 51.5	43.0 42.5	76.0 75.7	41.8
5/Sep/2018 17:00	47.5	48.0	43.0	65.4	41.6
5/Sep/2018 17:30	50.1	52.0	47.5	61.4	47.0
5/Sep/2018 18:00 5/Sep/2018 18:30	53.0 50.7	53.5 53.0	46.0 44.0	75.2 70.7	43.3 42.4
5/Sep/2018 19:00	45.4	45.5	43.0	63.1	41.3
5/Sep/2018 19:30 5/Sep/2018 20:00	45.7 46.3	45.5 46.5	43.5 43.0	65.9 67.2	42.1
5/Sep/2018 20:30	44.8	45.5	43.0	57.0	41.8
5/Sep/2018 21:00	45.3	44.5	43.0	67.0	41.7
5/Sep/2018 21:30 5/Sep/2018 22:00	43.6 44.4	44.0 44.5	42.0 42.0	62.3 68.1	41.0
5/Sep/2018 22:30	45.3	45.0	43.0	63.5	42.0
5/Sep/2018 23:00 5/Sep/2018 23:30	43.8	44.5 44.5	42.5	54.8	41.5
6/Sep/2018 23:30	43.8 42.3	43.0	42.5 41.5	54.3 50.4	41.1
6/Sep/2018 00:30	43.4	44.0	42.0	62.4	40.3
6/Sep/2018 01:00 6/Sep/2018 01:30	41.3	42.0 41.0	40.0 39.5	54.0 50.7	39.0 38.9
6/Sep/2018 02:00	40.8	41.0	40.0	54.0	39.1
6/Sep/2018 02:30	46.7	45.0	41.0	69.3	39.7
6/Sep/2018 03:00 6/Sep/2018 03:30	42.3 41.7	42.0 42.5	39.5 40.0	63.9 54.4	38.8 38.5
6/Sep/2018 04:00	41.4	42.5	39.5	54.1	38.5
6/Sep/2018 04:30	40.0	40.5	39.0	60.3	38.1
6/Sep/2018 05:00 6/Sep/2018 05:30	42.4 46.3	42.5 48.5	39.5 40.5	75.9 67.0	38.1
6/Sep/2018 06:00	44.6	47.5	39.5	66.1	38.1
6/Sep/2018 06:30 6/Sep/2018 07:00	45.7 47.2	46.0 47.0	39.5 42.0	68.4 65.7	37.3 40.8
-, 500, 2010 07.00	77.4		-72.U	55.7	70.0
ay time Minimum	46	47	42	61	41
ening time Minimum	44	44	42	57	41

Day time Maximum 55 45 45 66 67 Evening time Maximum 50 48 75 76 54 55 Night time Maximum 54 58

Remarks: Free field noise measurements Equipment Serial No.: 2285692

loacuroment T	Noise Levels at Noise Measurement Points, dB(A)								
leasurement tart Time	LAeq	LA10	N1 LA90	LAMax	c LAMin				
25/Aug/2018 00:00	61.2	58.0	55.5	91.7	54.8				
25/Aug/2018 00:30	61.6	59.0	56.0	91.6	54.2				
25/Aug/2018 01:00 25/Aug/2018 01:30	57.2 57.3	58.0 58.0	56.0 56.5	67.4 68.2	55.6 55.7				
25/Aug/2018 02:00	57.6	58.5	56.5	70.8	55.6				
25/Aug/2018 02:30	57.3	57.5	56.0	72.8	55.7				
25/Aug/2018 03:00 25/Aug/2018 03:30	57.5 58.7	58.0 59.0	56.5 57.0	65.6 87.2	56.0 56.2				
25/Aug/2018 04:00	58.2	59.0	57.0	66.4	56.4				
25/Aug/2018 04:30	57.6	58.0	56.5	66.2	56.0				
25/Aug/2018 05:00	58.2	59.0	57.0	67.7	56.1				
25/Aug/2018 05:30 25/Aug/2018 06:00	57.8 57.8	58.5 58.0	57.0 57.0	66.2 75.1	56.3 56.2				
25/Aug/2018 06:30	57.6	58.0	57.0	66.0	56.5				
25/Aug/2018 07:00	57.4	57.5	56.0	77.9	55.3				
25/Aug/2018 07:30 25/Aug/2018 08:00	56.2 54.4	55.5 54.5	53.5 52.5	81.9 76.5	52.7 51.7				
25/Aug/2018 08:30	54.5	54.0	52.0	74.6	50.8				
25/Aug/2018 09:00	52.4	53.0	49.0	72.1	45.7				
25/Aug/2018 09:30 25/Aug/2018 10:00	52.1 53.3	51.0 53.5	46.5 48.5	76.3 75.6	44.8 46.5				
25/Aug/2018 10:30	52.5	53.5	48.5	71.7	44.8				
25/Aug/2018 11:00	58.2	57.5	49.0	90.4	46.5				
25/Aug/2018 11:30 26/Aug/2018 12:00	52.9 54.8	53.5	49.0	73.0	46.0				
26/Aug/2018 12:30	56.8	54.5 53.0	49.0 47.0	85.3 81.5	46.8 43.8				
26/Aug/2018 13:00	54.8	53.0	47.0	87.1	44.5				
26/Aug/2018 13:30	65.3	59.5	46.5	92.7	43.8				
26/Aug/2018 14:00 26/Aug/2018 14:30	52.1 53.8	51.5 51.5	45.0 46.0	74.4 79.7	42.8 44.3				
26/Aug/2018 15:00	53.6	53.5	48.5	74.2	46.0				
26/Aug/2018 15:30	55.3	56.0	50.0	79.1	47.9				
26/Aug/2018 16:00 26/Aug/2018 16:30	57.7 58.7	58.5 57.0	51.0	78.5 85.5	48.6				
26/Aug/2018 16:30 26/Aug/2018 17:00	58.7 55.2	57.0 55.5	51.0 51.0	85.5 78.4	49.7 48.8				
26/Aug/2018 17:30	56.5	57.0	51.0	75.8	49.4				
26/Aug/2018 18:00 26/Aug/2018 18:30	56.6	56.5	51.0	80.8	50.0				
26/Aug/2018 19:00 26/Aug/2018 19:00	54.4 56.6	55.0 55.0	51.5 51.0	71.7 83.6	50.7 49.5				
26/Aug/2018 19:30	68.2	54.0	50.0	94.8	49.4				
26/Aug/2018 20:00	59.4	52.0	49.0	86.3	48.5				
26/Aug/2018 20:30 26/Aug/2018 21:00	55.9 58.4	60.0 62.0	49.0 50.0	76.2 88.4	48.1 48.8				
26/Aug/2018 21:30	57.6	61.0	52.5	78.2	51.0				
26/Aug/2018 22:00	57.2	55.0	52.0	88.6	51.5				
26/Aug/2018 22:30	61.1	61.5	52.5	91.6	50.9				
26/Aug/2018 23:00 26/Aug/2018 23:30	55.9 55.0	59.0 59.0	52.0 52.0	72.5 71.5	51.4 51.4				
20/Sep/2018 08:00	60.5	57.0	52.0	90.3	46.8				
20/Sep/2018 08:30	56.1	57.0	53.5	74.9	52.3				
20/Sep/2018 09:00 20/Sep/2018 09:30	56.2 57.6	57.0 58.5	54.5 55.5	72.1 76.0	52.9 54.2				
20/Sep/2018 10:00	58.4	59.0	55.5	80.0	53.8				
20/Sep/2018 10:30	58.6	59.5	55.5	81.6	53.9				
20/Sep/2018 11:00 20/Sep/2018 11:30	59.4 59.3	60.5 59.5	55.0 54.5	80.2 80.9	52.9 52.0				
20/Sep/2018 12:00	56.6	57.5	54.5	71.5	52.3				
20/Sep/2018 12:30	56.4	57.5	54.5	65.0	52.2				
20/Sep/2018 13:00 20/Sep/2018 13:30	57.8 60.5	58.0	55.0	80.0	53.3				
20/Sep/2018 14:00	61.8	62.0 63.0	56.0 57.5	85.0 82.1	54.0 55.6				
20/Sep/2018 14:30	58.9	60.0	56.5	76.0	54.6				
20/Sep/2018 15:00	59.7	60.5	56.0	79.8	54.2				
20/Sep/2018 15:30 20/Sep/2018 16:00	60.5 59.2	62.5 60.5	56.0 56.5	78.5 77.8	54.6 54.7				
20/Sep/2018 16:30	61.5	63.0	56.0	83.1	53.8				
20/Sep/2018 17:00	59.2	60.5	55.5	77.9	54.2				
20/Sep/2018 17:30 20/Sep/2018 18:00	59.2 57.8	61.0 58.5	55.5 56.0	78.2 78.9	53.9 53.9				
20/Sep/2018 18:30	57.7	58.5	55.5	74.4	54.2				
20/Sep/2018 19:00	56.4	57.0	55.0	65.6	54.3				
20/Sep/2018 19:30 20/Sep/2018 20:00	56.8 57.8	58.0 58.5	55.0 55.5	67.4 71.8	54.2 54.2				
20/Sep/2018 20:30	58.8	59.5	56.0	71.8	54.2				
20/Sep/2018 21:00	58.7	60.0	56.0	76.8	54.8				
20/Sep/2018 21:30 20/Sep/2018 22:00	62.3 57.0	62.0 58.0	55.5 55.5	95.2 65.5	53.1 54.1				
20/Sep/2018 22:30	57.4	58.0	55.5	74.1	54.1				
20/Sep/2018 23:00	56.4	57.0	55.0	76.4	53.7				
20/Sep/2018 23:30 21/Sep/2018 00:00	56.9	58.0 57.5	55.0	69.6	53.6				
21/Sep/2018 00:00 21/Sep/2018 00:30	56.5 55.5	57.5 57.0	55.0 53.5	65.3 65.5	53.8 53.0				
21/Sep/2018 01:00	54.7	55.5	53.5	66.1	52.8				
21/Sep/2018 01:30	54.7	56.0	53.5	64.5	52.5				
21/Sep/2018 02:00 21/Sep/2018 02:30	54.6 54.0	55.0 54.5	53.5 53.0	66.8 64.1	52.6 52.3				
21/Sep/2018 03:00	54.8	56.5	53.0	70.8	51.8				
21/Sep/2018 03:30	52.4	53.0	51.5	64.9	50.8				
21/Sep/2018 04:00 21/Sep/2018 04:30	51.7	52.0 52.0	51.0 50.5	61.2	50.5				
21/Sep/2018 04:30 21/Sep/2018 05:00	51.6 51.4	52.0 51.5	50.5 49.5	60.5 79.8	49.6 48.7				
21/Sep/2018 05:30	50.7	51.0	50.0	67.2	48.9				
21/Sep/2018 06:00	50.9	51.5	49.5	68.6	49.1				
21/Sep/2018 06:30 21/Sep/2018 07:00	50.1 56.3	51.5 55.5	47.0 46.5	66.6 81.0	45.9 45.4				
21/Sep/2018 07:30	79.7	81.5	52.0	96.9	48.9				
ay time Minimum vening time Minimum	52 54	51 52	45	65 66	43				
orning arrise Millimitation	54	52	49	66	48				
ght time Minimum	50	51	47	61	46				

Day time Minimum	52	51	45	65	43
Evening time Minimum	54	52	49	66	48
Night time Minimum	50	51	47	61	46
Day time Maximum	80	82	58	97	56
Evening time Maximum	68	62	56	95	55
Night time Maximum	62	59	57	92	57
Remarks: Free field noise	measuremen	te			

ks: Free field noise measurements Equipment Serial No.: 2285692

Appendix 4.1 Background Noise Survey

List of Noise Measurement Locations

ID	Noise Sensitive Receiver	Туре	Measurement Location
N1	NSR 1 - Squatter house at the north of Yuen Long STW		The nearest open area to the squatter house
N2	NSR 2 - Squatter house at the west of Yuen Long STW	Residential	Near the entrance gate of the squatter house
N3	NSR 3 - Squatter house at the east of Yuen Long STW		Beside Nam Sang Wai Rd near the entrance gate of the squatter house

Noise Measurement Parameters and Duration

Time Period	Parameters	Duration
Normal Working Day	L _{eq (30 min)} , L _{max} , L _{min} , L ₁₀	Continous 24 hours
Sunday / Public Holiday	and L ₉₀	Continous 24 nours

Noise Measurement Results

Measurement	Description	Mini	mum LAeq, d	B(A)	Measurement Method
Location	Description	Day	Evening	Night	Weasurement Wethou
N1	Squatter house at the north of Yuen Long STW	53	47	46	
N2	Squatter house at the west of Yuen Long STW	49	47	43	Free-field ^[1]
N3	Squatter house at the east of Yuen Long STW	55	57	53	

Assumed Fixed Plant Noise Criteria

NSR	Description	Area Sensitive Rating		ANL, dB(A)	ANL-5, dB(A) Measurement Location	Mini	mum LAeq , d	B(A)	Fixed Pla	nt Noise Crite	ria, dB(A)				
NOK	Description	Area Sensitive Rating	Day	Evening	Night	Day	Evening	Night	- Measurement Location -	Day	Evening	Night	Day	Evening	Night
NSR1	Squatter house at the north of Yuen Long STW	$A^{[2]}$	60	60	50	55	55	45	N1	53	47	46	53	47	45
NSR2	Squatter house at the west of Yuen Long STW	C ^[3]	70	70	60	65	65	55	N2	49	47	43	49	47	43
NSR3	Squatter house at the east of Yuen Long STW	B ^[2]	65	65	55	60	60	50	N3	55	57	53	55	57	50

Remarks:

- [1] Façade corrections of 3 dB(A) have been added for free-field measurements.
- [2] The NSR is located in Rural area and is not affected by any influencing factor.
- [3] The NSR is situated within 100m of a designated industrial area.
- [4] The NSR is located between 100m and 250m from industrial area.

Appendix 4.1 Background Noise Survey

Note on measurement date:

Background noise measurement for N1 has been conducted in March – April 2017, while measurement for N2 and N3 were conducted in August – September 2018.

With reference to information from gazette Outline Zoning Plan (OZP) No. S/YL-LFS/9 - Lau Fau Shan & Tsim Bei Tsui and the findings of the site visit during August — September 2018, there is no major development and no land use changes for the Conservation Area at the north of the existing Yuen Long Sewage Treatment Works and west of Shan Pui River, where N1 is located. Since there is no change to the noise environment in the period of March 2017 to September 2018, the background noise measurement results in 2017 is considered still valid.



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Fax: (852) 2555 7533



CERTIFICATE OF CALIBRATION

Certificate No.:

16CA0704 03-01

Microphone

B&K

Item tested

Description: Manufacturer: Type/Model No.

Sound Level Meter (Type 1)

B&K 2238

Serial/Equipment No.: 2800927 / N.009.06 Adaptors used:

4188 2791211

Item submitted by

Customer Name: Address of Customer: AECOM ASIA CO., LTD.

Request No .: Date of receipt:

04-Jul-2016

Date of test:

07-Jul-2016

Reference equipment used in the calibration

Description: Multi function sound calibrator Signal generator Signal generator

Model: B&K 4226 DS 360 DS 360

Serial No. 2288444 33873

61227

Expiry Date: 18-Jun-2017 18-Apr-2017 18-Apr-2017

Traceable to: CIGISMEC CEPREI CEPREI

Ambient conditions

Temperature: Relative humidity: Air pressure:

22 ± 1 °C 60 ± 10 % 1000 ± 5 hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets

Approved Signatory:

Date:

09-Jul-2016

Company Chop:

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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Form No.CARP152-1/Issue 1/Rev.C/01/02/2007

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. 028 - CAL) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation. Such terms of accreditation stipulate that the results shall be traceable to the International System of Units (S.I.) or recognised measurement standards. This certificate shall not be reproduced except in full.



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Tel: (852) 2873 6860



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

16CA0704 03-01

Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertanity (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
•	C	Pass		0.4
	Lin	Pass	1.0	2.1
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	2.0	2.2
,34	Reference SPL on all other ranges		0.3	
	2 dB below upper limit of each range	Pass	0.3	
		Pass	0.3	
Linearity range for SPL	2 dB above lower limit of each range	Pass	0.3	
Frequency weightings	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
requericy weightings	C	Pass	0.3	
		Pass	0.3	
Time a sucialistic su	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
5 .	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/103 at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/104 at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties

Test:	Subtest	Status	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz Weighting A at 8000 Hz	Pass Pass	0.3 0.5	

Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End

Calibrated by:

Date:

Fung Chi Yip 07-Jul-2016

calibrated on a schedule to maintain the required accuracy level.

Checked by

Date:

Iam Tze Wa 09-Jul-2016

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are

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Form No.CARP152-2/Issue 1/Rev.C/01/02/2007

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Test Data for Sound Level Meter

Page 1 of 5

Sound level meter type: Microphone type:

2238 4188 Serial No. Serial No.

2791211

2800927 / N.009.06 Date 07-Jul-2016

Report: 16CA0704 03-01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting

dB 13.4 dB

Noise level in C weighting Noise level in Lin

17.5 22.3

dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actua	l level	Tolerance	Deviation		
Notoronoo/Expeditod level	non-integrated	integrated		non-integrated	integrated	
dB	dB	dB	+/- dB	dB	dB	
94.0	94.0	94.0	0.7	0.0	0.0	
99.0	99.0	99.0	0.7	0.0	0.0	
104.0	104.0	104.0	0.7	0.0	0.0	
109.0	109.0	109.0	0.7	0.0	0.0	
114.0	114.0	114.0	0.7	0.0	0.0	
119.0	119.0	119.0	0.7	0.0	0.0	
124.0	123.9	123.9	0.7	-0.1	-0.1	
125.0	124.9	124.9	0.7	-0.1	-0.1	
126.0	125.9	125.9	0.7	-0.1	-0.1	
127.0	126.9	126.9	0.7	-0.1	-0.1	
128.0	127.9	127.9	0.7	-0.1	-0.1	
129.0	128.9	128.9	0.7	-0.1	-0.1	
130.0	129.8	129.8	0.7	-0.2	-0.2	
89.0	89.0	89.0	0.7	0.0	0.0	
84.0	84.0	84.0	0.7	0.0	0.0	
79.0	79.0	79.0	0.7	0.0	0.0	
74.0	74.0	74.0	0.7	0.0	0.0	
69.0	69.1	69.1	0.7	0.1	0.1	
64.0	64.1	64.1	0.7	0.1	0.1	
59.0	59.1	59.1	0.7	0.1	0.1	
54.0	54.2	54.2	0.7	0.2	0.2	
53.0	53.1	53.1	0.7	0.1	0.1	
52.0	52.1	52.1	0.7	0.1	0.1	
51.0	51.1	51.1	0.7	0.1	0.1	
50.0	50.2	50.2	0.7	0.2	0.2	

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
60-140	94.0	94.0	0.7	0.0

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Test Data for Sound Level Meter

Page 2 of 5

Sound level m	eter type:	2238		Serial No.	2800927 / N.009.06	Date	07-Jul-2016
Microphone	type:	4188		Serial No.	2791211		0, 04, 2010
						Report:	16CA0704 03-01
50-130		94.0	94.0	0.7	0.0		
40-120		94.0	94.0	0.7	0.0		
30-110		94.0	94.0	0.7	0.0		
20-100		94.0	93.9	0.7	-0.1		

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
60-140	62.0	62.1	0.7	0.1
00 110	138.0	137.9	0.7	-0.1
50-130	52.0	52.1	0.7	0.1
00 100	128.0	127.9	0.7	-0.1
40-120	42.0	42.0	0.7	0.0
10 120	118.0	117.9	0.7	-0.1
30-110	32.0	32.0	0.7	0.0
00 110	108.0	107.9	0.7	-0.1
20-100	30.0	30.0	0.7	0.0
20 100	98.0	97.9	0.7	-0.1
10-90	30.0	30.0	0.7	0.0
	88.0	87.9	0.7	-0.1
0-80	30.0	30.0	0.7	0.0
	78.0	77.9	0.7	-0.1

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL

Frequency weighting A:

Frequency	Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.8	1.5	1.5	0.2
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.3	1.0	1.0	-0.1
501.2	94.0	90.8	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	95.1	1.0	1.0	-0.1
3981.0	94.0	95.0	94.9	1.0	1.0	-0.1
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.6	3.0	6.0	-0.1

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerar	nce(dB)	Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.1	1.5	1.5	0.1
63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.8	1.0	1.0	0.0

Form No.: CAWS 152/Issue 1/Rev. B/01/02/2007

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Test Data for Sound Level Meter

Page 3 of 5

Sound level me Microphone	eter type: type:	2238 4188		Serial No. Serial No.		0927 / N.009 1211	9.06 Date	07-Jul-2016
							Report:	16CA0704 03-01
251.2	94.0		94.0	93.9	1.0	1.0	-0.1	
501.2	94.0		94.0	94.0	1.0	1.0	0.0	
1995.0	94.0		93.8	93.8	1.0	1.0	0.0	
3981.0	94.0		93.2	93.1	1.0	1.0	-0.1	
7943.0	94.0		91.0	90.9	1.5	3.0	-0.1	
12590.0	94.0		87.8	87.7	3.0	6.0	-0.1	

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	93.9	1.5	1.5	-0.1
63.1	94.0	94.0	93.9	1.5	1.5	-0.1
125.9	94.0	94.0	93.9	1.0	1.0	-0.1
251.2	94.0	94.0	93.9	1.0	1.0	-0.1
501.2	94.0	94.0	93.9	1.0	1.0	-0.1
1995.0	94.0	94.0	93.9	1.0	1.0	-0.1
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.1	1.5	3.0	0.1
12590.0	94.0	94.0	94.2	3.0	6.0	0.2

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
dB	dB	dB	+	-	dB
109.0	108.0	108.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
dB	dB	dB	+	-	dB
109.0	104.9	104.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range. Positive polarities: (Weighting Z set the generator signal to single 1 zpmay)

. contre polaritico.	(vvcigitting 2, set the ger	lerator signal to sin	gie, Lzpmax)	
Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
112.0	112.0	112.0	2.0	0.0
Negative polarities:				
Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
112.0	112.0	112.0	2.0	0.0

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Test Data for Sound Level Meter

Page 4 of 5

Sound level meter type Microphone type: 2238 4188

Serial No. Serial No.

2800927 / N.009.06 Date 07-Jul-2016 2791211

Report: 16CA0704 03-01

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: Amplitude:

2000 Hz

2 dB below the upper limit of the primary indicator range.

Burst repetition frequency: Tone burst signal:

11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	111.0+6.6	111.0	110.9	0.5	-0.1

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency:

Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms

Ref. Level	Single burs	Single burst indication		Deviation	
dB	Expected (dB)	Actual (dB)	+/- dB	dB	
113.0	104.2	104.1	2.0	-0.1	

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
113.0	110.3	110.1	1.0	-0.2

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst:

4000 Hz

1 ms

Duration of tone burst:

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	83.0	83.0	82.5	1.0	-0.5	60s integ.
10000	73.0	73.0	72.6	1.0	-0.4	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency:

4000 Hz

Integration time: 10 sec The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	116.0	86.0	85.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	116.0	96.0	95.9	1.7	-0.1

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Test Data for Sound Level Meter

Page 5 of 5

Sound level meter type: Microphone type:

2238 4188 Serial No. Serial No.

2800927 / N.009.06 Date 07-Jul-2016

2791211

Report: 16CA0704 03-01

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency:

2000 Hz

Amplitude:

2 dB below the upper limit of the primary indicator range.

Burst repetition frequency:

Tone burst signal.		Tricycles of a sine			
Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
124.8	123.8	120.8	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as following: The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

4000 Hz

10 sec Integration time: Single burst duration: 1 msec

Onigio barot					
Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
130.5	129.5	89.5	89.4	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerar	nce (dB)	Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.0	1.0	1.0	0.1
8000	92.9	93.1	1.5	3.0	0.2

-----END-----



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Tel: (852) 2873 6860 Fax: (852) 2555 7533



CERTIFICATE OF CALIBRATION

Certificate No.:

18CA0406 02-01A

Microphone

B & K

of

Item tested

Description: Manufacturer: Sound Level Meter (Type 1) 2238

Type/Model No.: Serial/Equipment No.: 2285692 Adaptors used:

4188

2250455

Item submitted by

Customer Name:

AECOM ASIA CO., LTD.

Address of Customer Request No.:

06-Apr-2018

Date of test:

Date of receipt:

10-Apr-2018

Reference equipment used in the calibration

Description: Multi function sound calibrator

Signal generator

Model: B&K 4226 DS 360

Serial No. 2288444 33873

Expiry Date: 08-Sep-2018 25-Apr-2018

Traceable to: CIGISMEC

CEPREI

Ambient conditions

Temperature:

21 ± 1 °C 50 ± 10 %

Relative humidity: Air pressure:

1005 ± 5 hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580; Part 1; 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Fend Juno

Date: 13-Apr-2018

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

18CA0406 02-01A

Page

of

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertanity (dB)	Coverage Factor
		2200		
Self-generated noise	Α	Pass	0.3	
	С	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	Α	Pass	0.3	
	С	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
•	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/104 at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Uncertanity (dB)	Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
·	Weighting A at 8000 Hz	Pass	0.5	
	3 0			

Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

4, Remark: This calibration certificate supersedes the last certificate 18CA0406 02-01.

Calibrated by:

Fung Chi Yip

Date: 0-Apr-2018

Checked by:

Date:

Shek Kwong Tat 13-Apr-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

- End

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Test Data for Sound Level Meter

Page 1 of 5

Sound level meter type: Microphone type:

2238 4188 Serial No. Serial No. 2285692 2250455 te 10-Apr-2018

Report: 18CA0406 02-01A

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	13.9	dΒ
Noise level in C weighting	17.5	dΒ
Noise level in Lin	22.6	dΒ

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actua	ıl level	Tolerance	Devia	Deviation	
Treference/Expedice fever	non-integrated	integrated		non-integrated	integrated	
dB	dB	dB	+/- dB	dB	dB	
94.0	94.0	94.0	0.7	0.0	0.0	
99.0	99.0	99.0	0.7	0.0	0.0	
104.0	104.0	104.0	0.7	0.0	0.0	
109.0	109.0	109.0	0.7	0.0	0.0	
114.0	114.0	114.0	0.7	0.0	0.0	
119.0	118.9	118.9	0.7	-0.1	-0.1	
124.0	123.9	123.9	0.7	-0.1	-0.1	
125.0	124.9	124.9	0.7	-0.1	-0.1	
126.0	125.8	125.8	0.7	-0.2	-0.2	
127.0	126.8	126.8	0.7	-0.2	-0.2	
128.0	127.8	127.8	0.7	-0.2	-0.2	
129.0	128.8	128.8	0.7	-0.2	-0.2	
130.0	129.8	129.8	0.7	-0.2	-0.2	
89.0	89.0	89.0	0.7	0.0	0.0	
84.0	84.0	84.0	0.7	0.0	0.0	
79.0	79.0	79.0	0.7	0.0	0.0	
74.0	74.0	74.0	0.7	0.0	0.0	
69.0	69.0	69.0	0.7	0.0	0.0	
64.0	64.0	64.0	0.7	0.0	0.0	
59.0	59.0	59.0	0.7	0.0	0.0	
54.0	54.1	54.1	0.7	0.1	0.1	
53.0	53.1	53.1	0.7	0.1	0.1	
52.0	52.1	52.1	0.7	0.1	0.1	
51.0	51.1	51.1	0.7	0.1	0.1	
50.0	50.2	50.2	0.7	0.2	0.2	

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
60-140	94.0	94.0	0.7	0.0

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Test Data for Sound Level Meter

Page 2 of 5

Sound level me Microphone	eter type: type:	2238 4188		Serial No. Serial No.	2285692 2250455	Date Report:	10-Apr-2018 18CA0406 02-01A
50-130		94.0	94.0	0.7	0.0		
40-120		94.0	94.0	0.7	0.0		
30-110		94.0	93.9	0.7	-0.1		
20-100		94.0	93.9	0.7	-0.1		

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
60-140	62.0	62.0	0.7	0.0
00-140	138.0	137.8	0.7	-0.2
50-130	52.0	52.1	0.7	0.1
30-130	128.0	127.8	0.7	-0.2
40-120	42.0	42.0	0.7	0.0
40-120	118.0	117.8	0.7	-0.2
30-110	32.0	32.0	0.7	0.0
30-110	108.0	107.8	0.7	-0.2
20-100	30.0	30.1	0.7	0.1
20-100	98.0	97.8	0.7	-0.2
10-90	30.0	30.1	0.7	0.1
10-90	88.0	87.8	0.7	-0.2
0-80	30.0	30.3	0.7	0.3
0-00	78.0	77.8	0.7	-0.2

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
Hz	dB	dB	dB	+	i=:	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.7	1.5	1.5	0.1
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.3	1.0	1.0	-0.1
501.2	94.0	90.8	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	95.0	1.0	1.0	0.0
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.6	3.0	6.0	-0.1

Frequency weighting C:

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Frequency	Ref. level	Expected level	Actual level	Tolerar	nce(dB)	Deviation
Hz	dB	dB	dB	+	340	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.0	1.5	1.5	0.0
63.1	94.0	93.2	93.1	1.5	1.5	-0.1
125.9	94.0	93.8	93.8	1.0	1.0	0.0

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Test Data for Sound Level Meter

Page 3 of 5

Sound level me Microphone	ter type: type:	2238 4188		Serial No. Serial No.		5692 0455	Date Report:	10-Apr-2018 18CA0406 02-01A
251.2	94.0		94.0	93.9	1.0	1.0	-0.1	
501.2	94.0	4	94.0	94.0	1.0	1.0	0.0	
1995.0	94.0		93.8	93.8	1.0	1.0	0.0	
3981.0	94.0		93.2	93.1	1.0	1.0	-0.1	
7943.0	94.0		91.0	90.9	1.5	3.0	-0.1	
12590.0	94.0		87.8	87.7	3.0	6.0	-0.1	

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Actual level	Tolerar	ice(dB)	Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	94.0	1.5	1.5	0.0
63.1	94.0	94.0	93.9	1.5	1.5	-0.1
125.9	94.0	94.0	93.9	1.0	1.0	-0.1
251.2	94.0	94.0	93.9	1.0	1.0	-0.1
501.2	94.0	94.0	93.9	1.0	1.0	-0.1
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.2	1.5	3.0	0.2
12590.0	94.0	94.0	94.2	3.0	6.0	0.2

Note: No corrections for the frequency response of the microphone, instrument case and windshield are made to the sound level meter.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

WITCH	Title bigital to continuous.	(Troighter i I III artin	raiti iioio)			
	Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
	dB	dB	dB	+	-	dB
	109.0	108.0	108.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolera	nce(dB)	Deviation
dB	dB	dB	+	-	dB
109.0	104.9	104.9	1.0	1.0	0.0

PEAK RESPONSE TEST

Ref. level

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The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
112.0	112.0	112.0	2.0	0.0

Response to 10 ms Response to 100 us

Positive polarities: (Weighting 7 set the generator signal to single 1 zpmax)

Deviation

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Test Data for Sound Level Meter

Page 4 of 5

Sound level me	eter type:	2238	
Microphone	type:	4188	

 Serial No.
 2285692

 Serial No.
 2250455

Date 10-Apr-2018

Report: 18CA0406 02-01A

dB	dB	dB	+/- dB	dB
112.0	112.0	112.0	2.0	0.0

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: Amplitude:

2000 Hz

2 dB below the upper limit of the primary indicator range

Burst repetition frequency: 40 H

40 Hz

11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

TOTIC DUTCE US	1150016				
	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	111.0+6.6	111.0	110.6	0.5	-0.4

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz

Amplitude: The upper lim

The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation	
dB	Expected (dB)	Actual (dB)	+/- dB	dB	
113.0	104.2	104.1	2.0	-0.1	

Repeated at 100 Hz

Ref. Level	Repeated bu	rst indication	Tolerance	Deviation	
dB	Expected (dB)	Actual (dB)	+/- dB	dB	
113.0	110.3	110.2	1.0	-0.1	

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst:

4000 Hz

Duration of tone burst:

Duration of tone burst.	1 1113					
Repetition Time	Level of	Expected	Actual	Tolerance	Deviation	Remarks
	tone burst	Leq	Leq			
msec	dB	dB	dB	+/- dB	dB	
1000	83.0	83.0	82.5	1.0	-0.5	60s integ.
10000	73.0	73.0	72.5	1.0	-0.5	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency:

4000 Hz

Integration time:

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10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation	
msec	tone burst (dB)	dB	dB	+/- dB	dB -0.1	
10	116.0	86.0	85.9	1.7		

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation

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Test Data for Sound Level Meter

Page 5 of 5

Form No.: CAWS 152/Issue 1/Rev_B/01/02/2007

Sound level meter type: 2238 Serial No. 2285692 Date 10-Apr-2018 Microphone 4188 Serial No. 2250455 Report: 18CA0406 02-01A +/- dB msec tone burst (dB) dB dB dΒ 10.0 116.0 96.0 95.9 1.7 -0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: Amplitude: 2000 Hz

2 dB below the upper limit of the primary indicator range.

Burst repetition frequency:

Tone burst signal:

ncy: 40 Hz

11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
125.2	124.2	121.2	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leg.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as following: The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency:

4000 Hz

Integration time: Single burst duration: 10 sec 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
130.6	129.6	89.6	89.5	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency Expected level Hz dB		equency Expected level Actual level		Tolerance (dB)	
		Measured (dB)	+	+ -	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.0	1.0	1.0	0.1
8000	92.9	93.2	1.5	3.0	0.3

-----END-----

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