Shatin to Central Link – Hung Hom to Admiralty Section

Fixed Plant Noise Audit Report

(Batch 1 – Admiralty Station (ADM) and Hong Kong Park Ventilation Building (HKB))

(March 2022)

Verified by:	Claudine Lee
Position:	Independent Environmental Checker
Date:	11 March 2022

Shatin to Central Link – Hung Hom to Admiralty Section

Fixed Plant Noise Audit Report

(Batch 1 – Admiralty Station (ADM) and Hong Kong Park Ventilation Building (HKB))

(March 2022)

Certified by:	Lisa Poon
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Date:	11 March 2022



Consultancy Agreement No. C11033B

Shatin to Central Link – Hung Hom to Admiralty

[SCL (HUH-ADM)]

Fixed Plant Noise Audit Report (Batch 1 – Admiralty Station (ADM) & Hong Kong Park Ventilation Building (HKB))

March 2022

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1 INTRODUCTION

1.1 Background

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the EAL at Hung Hom across the harbour to Admiralty Station (ADM).
- 1.1.2 EIA Report for SCL Hung Hom to Admiralty (HUH-ADM) Section (Register No.: AEIAR 166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, the Environmental Permit (EP) (EP No: EP-436/2012), covering the construction and operation of SCL (HUH-ADM), was granted on 22 March 2012. Variations of Environmental Permit (VEP) were subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/F) was issued by Director of Environmental Protection (DEP) on 29 January 2019.
- 1.1.3 Pursuant to EP Condition 2.31, at least one month before commencement of operation of the Project, the Permit Holder, MTR Corporation Ltd (MTR), shall carry out fixed plant noise audit and deposit with the Director four hardcopies and one electronic copy of an audit report showing the design of the fixed plant noise sources associated with the Project complies with the maximum sound power levels determined in the approved SCL(HUH-ADM) EIA Report (Register No. AEIAR-166/2012) or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) having due regard to the characteristics of tonality, impulsiveness and intermittency.
- 1.1.4 Since the installation of fixed plant along the SCL (HUH ADM) would be completed in stages, the fixed plant noise audit will be conducted in stages according to the testing and commissioning programmes in each area.
- 1.1.5 This Fixed Plant Noise Audit Report (Batch 1 Admiralty Station (ADM) and Hong Kong Park Ventilation Building (HKB)) (hereinafter referred to as "the Report") specifies the noise measurement methodology and measurement results at the fixed plant noise sources at ADM and HKB, and at the representative Noise Sensitive Receivers (NSRs) near ADM and HKB.
- 1.1.6 AECOM Asia Co. Ltd has been commissioned by the MTR to prepare this Report and to conduct noise measurement at the identified NSRs for investigation of any characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources associated with the Project.

1.2 Purpose of This Report

- 1.2.1 This Report presents the noise measurement methodology and measurement results at the fixed plant noise sources at ADM and HKB, and at the representative NSRs near ADM and HKB.
- 1.2.2 This Report comprises the following sections:
 - Section 1 presents the background information.
 - Section 2 presents the noise criteria and the representative NSRs.
 - Section 3 presents the latest information of fixed plant noise sources.
 - Section 4 presents the noise measurement methodology.
 - Section 5 presents the noise measurement results.
 - Section 6 presents the conclusion.

2 NOISE CRITERIA AND REPRESENTATIVE NOISE SENSITIVE RECEIVERS

2.1 Environmental Legislation, Standard and Guidelines

- 2.1.1 The Noise Control Ordinance, Cap. 400 (NCO) and Environmental Impact Assessment Ordinance, Cap. 499 (EIAO) provide the statutory framework for noise control. Operational noise from fixed noise sources is controlled by Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM) under NCO. To plan for a better environment, the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) under EIAO has specified the following requirements:
 - 5 dB below the appropriate ANLs in the IND-TM; or
 - the prevailing background noise levels (for quiet areas with level 5dB or more below the ANL).
- 2.1.2 The Acceptable Noise Levels (ANLs) for different Area Sensitivity Ratings (ASRs) during different periods are summarized in the **Table 2.1**.

Time Period	ANL, dB(A)					
	ASR "A"	ASR "B"	ASR "C"			
Day (0700 to 1900 hours)	60	65	70			
Evening (1900 to 2300 hours)	60	65	70			
Night (2300 to 0700 hours)	50	55	60			

Table 2.1 ANLs for Assessment of Noise from Fixed Sources

2.2 Assessment Criteria and Representative Noise Sensitive Receivers

2.2.1 Table 9.7 of the approved SCL (HUH-ADM) EIA Report presents the identified Noise Sensitive Receivers (NSRs) and the adopted noise assessment criteria for fixed plant noise assessment. The assessment criteria at the NSRs selected for assessing the fixed plant noise impact from ADM are summarised in **Table 2.2**.

Table 2.2 Summary of Noise Criteria at Representative NSRs for Fixed Noise Sources (Reference from Table 9.7 of the approved EIA Report)

Description (NSR No.)	Time Period ⁽¹⁾	Time Period ⁽¹⁾ Background Noise Levels, dB(A) ⁽²⁾		ANL-5, dB(A) ⁽³⁾	Criteria, dB(A) ⁽⁴⁾	
ADM						
Ching Yi To Barracks	Day & evening	> 70	С	65	59	
Paget House (AD1)	Night	> 60	С	55	49	
НКВ						
Regent on the Park (AD2)	Day & evening	> 70	В	60	57	
Regent on the Fark (ABZ)	Night	> 60	В	50	47	
Roberts Block (formerly	Day & evening	> 70	В	60	57	
New Life Hostel) ⁽⁵⁾ (AD3)	Night	> 60	-	-	-	

Notes:

(1) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.

(2) Prevailing background noise levels for areas near ADM are extracted from Table 9.6 of approved EIA Report.

(3) A 5 dB(A) is deducted from ANL as specified in requirement of EIAO-TM.

- (4) The minimum of prevailing background noise level & ANL-5 is adopted. In accordance with Section 9.34 of the approved EIA Report for SCL(HUH-ADM), "noise criteria -6 dB(A)" (i.e. ANL-5-6 dB(A)) and "noise criteria -3 dB(A)" (i.e. ANL-5-3 dB(A)) were adopted at NSRs near ADM and HKB respectively to account the cumulative impact from the fixed plants of SCL and SIL(E).
- (5) Roberts Block (ROB) had been occupied as the Jockey Club New Life Hostel from 1986 to 2013, and left vacant since 2013. ROB was planned to be revitalised into a creative arts and play therapy centre for providing psychological and emotional health care services (https://www.legco.gov.hk/yr20-21/english/fc/pwsc/papers/p21-28e.pdf refers). It is anticipated that there would be no sensitive use during the night-time period.

2.3 Review of Area Sensitivity Rating

- 2.3.1 Area Sensitive Ratings (ASR) as defined in the approved EIA Report were determined by the existence of any influencing factors (IFs) (e.g. major road, industrial area) according to IND-TM at the time of preparation of the EIA Report. During the preparation of this Report, it is revealed that there was no major change on the land use in the vicinity of representative NSRs, and thus only the existence of any major road (i.e. annual average daily traffic flow in excess of 30,000) has been reviewed.
- 2.3.2 Based on best available information (i.e. The Annual Traffic Census 2020) during the preparation of this Report, Queenways remains as an IF to the NSR located in the vicinity of ADM, while there was no major road affecting the NSRs located in the vicinity of HKB. Therefore, the ASR defined in **Table 2.2** remains unchanged.

3 LATEST INFORMATION OF FIXED PLANT NOISE SOURCES

3.1.1 Based on the latest design information, the fixed plant sources including ventilation louvres, cooling towers and Packaged Condenser Unit (PCU) at ADM and HKB are shown in **Figure Nos. C11033B/C/SCL/ACM/M52/061** and **C11033B/C/SCL/ACM/M52/061** respectively. The updated maximum allowable SWLs of fixed plant noise sources are presented in **Table 3.1** and the predicted fixed plant noise levels are presented in **Appendix A**. Appropriate corrections in tonal, impulsive or intermittent characteristics should be applied, where applicable, in accordance with the IND-TM during the commissioning test conducted at the representative NSRs.

Location	Eixed Blant ID	Fixed Plant Source	Maximum Allowable SWL, dB(A) ⁽¹⁾		
Location	Fixed Plant ID	Fixed Plant Source	Daytime & Evening ⁽²⁾	Night-time ⁽²⁾	
	ADM VS1-1	Ventilation Louver	94	84	
	ADM VS1-2	Ventilation Louver	86	76	
	ADM VS1-3	Ventilation Louver	87	77	
	ADM VS1-7	Ventilation Louver	93	83	
	ADM VS2-1	Ventilation Louver	88	78	
	ADM VS2-2	Ventilation Louver	91	81	
	ADM VS3-1	Ventilation Louver	96	73	
	ADM VS3-2	Ventilation Louver	102	82	
	ADM VS3-3	Ventilation Louver	106	96	
	ADM VS4-1	Ventilation Louver	83	73	
	ADM VS4-2	Ventilation Louver	83	73	
	ADM VS4-4	Ventilation Louver	84	74	
	ADM VS4-5	Ventilation Louver	93	83	
	ADM VS5	Ventilation Louver	98	88	
	ADM VS6-1	Ventilation Louver	84	74	
	ADM VS6-2	Ventilation Louver	88	78	
7.01	ADM VS6-3	Ventilation Louver	84	74	
	ADM VS6-4	Ventilation Louver	89	79	
	ADM VS6-7	Ventilation Louver	95	85	
	ADM VS6-8	Ventilation Louver	95	85	
	ADM VS7	Ventilation Louver	98	88	
	ADM VS8	Ventilation Louver	102	92	
	ADM VS14-1	Ventilation Louver	91	81	
	COT-4004	Cooling Tower	102	92	
	COT-4005	Cooling Tower	101	91	
	PCU-4203A	Packaged Condenser Unit	91	81	
	PCU-4203B	Packaged Condenser Unit	92	82	
	PCU-4101	Packaged Condenser Unit	96	86	
	PCU-4102	Packaged Condenser Unit	92	82	

Table 3.1 Updated Maximum Allowable SWLs for Fixed Plant Noise Sources at ADM and HKB

Location	Fixed Plant ID	Fixed Plant Source	Maximum Allowable SWL, dB(A) ⁽¹⁾		
Location		Fixed Flant Source	Daytime & Evening ⁽²⁾	Night-time ⁽²⁾	
	PCU-4103	Packaged Condenser Unit	88	78	
	PCU-4204	Packaged Condenser Unit	92	82	
	PCU-4205	Packaged Condenser Unit	92	82	
	PCU-4206	Packaged Condenser Unit	90	80	
	PCU-4501	Packaged Condenser Unit	97	87	
	HKB VS1-1	Ventilation Louver	95	85	
	HKB VS1-2	Ventilation Louver	92	82	
нкв	HKB VS2-1	Ventilation Louver	93	83	
	HKB VS2-2	Ventilation Louver	93	83	
	PCU 101	Packaged Condenser Unit	88	78	

Notes:

(1) The maximum allowable sound power levels have due regard to the characteristics of tonality, intermittency and impulsiveness.

Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours. The transformer bay at ADM substation is managed by Hong Kong Electric Company and therefore was excluded in this fixed plant noise prediction. (2) (3)

Table 4 1

4 MEASUREMENT METHODOLOGY

Noise Measurement to Obtain the SWLs of Fixed Plant Noise Sources 4.1

Measurement Methodology

Details of measurement methodology for SCL are presented in Appendix B1. 4.1.1 Noise measurements to obtain the SWLs of the fixed plant noise sources followed Appendix B1 and were conducted by Wilson Acoustics Limited.

Measurement Equipment

4.1.2 The sound level meters and calibrators used for noise measurements are listed in the Table 4.1. The instruments used for the noise measurements complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The calibration certificates of equipment are provided in Appendix B2.

Equipment		Model	

Noise Measurement Equipment

Equipment	Model	Serial Number	
	SVANTEK 958	59120	
Sound Loval Motor	SVANTEK 958	59121	
Souria Level Meter	SVANTEK 959	11228	
	SVANTEK 977	69787	
Colibrator	Larson Davis CAL200	17867	
Calibrator	SVANTEK SV30A	10814	

4.1.3 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. The difference between the readings made before and after each series of measurements shall be less than or equal to 1.0 dB.

Measurement Date and Time

There will be daytime/evening and night-time operation modes for fixed plant sources at ADM, 4.1.4 and the operation of fixed plant sources at HKB are identical during both daytime and nighttime periods. Nevertheless, the noise measurements at ADM and HKB were all conducted during night-time periods at the fixed plant noise sources in order to minimise influence from background noise on measurement data. Details of the noise measurement schedule are shown in Table 4.2.

Table 4.2 Measure	ment Schedule
-------------------	---------------

Location	Date		
ADM	22, 23, 26 & 27 July 2021		
	26 August 2021		
	3, 9, 10 & 11 September 2021		
НКВ	28 Aug 2020		
	15 July 2021		

4.2 Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs

Measurement Parameters

- 4.2.1 L_{Aeq} (30min) was measured at each designated measurement location. 1/3 octave band spectrum and time history over the measurement period was also be logged for determination of tonal, impulsiveness and intermittency characteristic.
- 4.2.2 Background noise level was measured at the same measurement location in term of L_{Aeq} (5 min) immediate before or after the noise measurement when all Project's fixed plant equipment shut down. To minimise the measurement data being influenced by background noise, noise data obtained at an instance of minimal or no traffic on the road was used to evaluate the tonal characteristic. The corrections for tonality, impulsiveness or intermittency at the representative NSRs were determined in accordance with IND-TM. In addition, any noticeable characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources was recorded during the measurement.

Measurement Equipment

4.2.3 The sound level meters and calibrators used for noise measurements at representative NSRs are listed in the **Table 4.3**. The instruments used for the noise measurements complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The calibration certificates of equipment are shown in **Appendix C1**.

Table 4.3Noise Measurement Equipment

Equipment	Model	Serial Number	
Sound Lovel Motor	B&K 2250L	2681366	
Sound Level Meter	B&K 2270	2644597	
Calibrator	B&K 4231	3006428	
	Rion NC-74	34246490	

4.2.4 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. The difference between the readings made before and after each series of measurements shall be less than or equal to 1.0 dB.

Measurement Locations

4.2.5 The proposed noise measurement locations were selected at the representative NSRs where have direct line of sight to the noise sources and were accessible for noise measurement. These measurement locations had been agreed with EPD prior to noise measurement. The measurement locations are summarised in Table 4.4 and shown in Figure Nos. C11033B/C/SCL/ACM/M52/061 and C11033B/C/SCL/ACM/M52/062. Photographs of measurement locations are shown in Appendix C2.

Table 4.4Noise Measurement Locations

NSR ID	Description	Туре	Measurement Location and Height
ADM			
AD1	Ching Yi To Barracks Paget House	Residential	Public area near Ching Yi To Barrack Paget House (5m above ground) (free-field condition)
НКВ			

NSR ID	Description	Туре	Measurement Location and Height	
AD2	Regent on the Park	Residential	Pedestrian near British Council (free-field condition) ⁽¹⁾	
AD3	Roberts Block (formerly named as Jockey Club New Life Hostel)	Government, Institution and Community	1/F of Roberts Block (5m above ground and 1m from building façade) (façade condition)	

Note:

Measurement Date and Time

4.2.6 There will be daytime/evening and night-time operation modes for ADM and the operation of fixed plant sources at HKB are identical during both daytime and night-time periods. To minimise the influence from background noise in measurement data, noise measurements at representative NSRs were therefore only conducted during night-time period. The measurement schedule is presented in **Table 4.5**.

Table 4.5Measurement Schedule

Location	NSR ID	Date
ADM	AD1	19 Feb 2022
НКВ	AD2 & AD3	18 Feb 2022

⁽¹⁾ The management office of Regent on the Park refused to provide access for measurement due to the recent pandemic situation. An alternative location had been identified in accordance with selection criteria presented in Section 4.4.3 of the Fixed Plant Noise Measurement Plan (Batch 1 – ADM & HKB).

5 MEASUREMENT RESULTS

5.1 Noise Measurement to Obtain the SWLs of Fixed Plant Noise Sources

5.1.1 The measured SWLs under conservative approach during daytime and evening, and night-time periods are presented in **Table 5.1**. The measurement results indicated all the fixed plant noise levels in ADM and HKB comply with the updated maximum allowable SWLs. Details of the measurement results are shown in **Appendix B4**.

	Measured SV	NL, dB(A) ⁽²⁾	Maximum allo	owable SWL,	Compliance (Y/N)	
Plant Item	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾
ADM					<u> </u>	
ADM VS1-1	84	84	94	84	Y	Y
ADM VS1-2	76	76	86	76	Y	Y
ADM VS1-3	77	77	87	77	Y	Y
ADM VS1-7	83	83	93	83	Y	Y
ADM VS2-1	78	78	88	78	Y	Y
ADM VS2-2	81	81	91	81	Y	Y
ADM VS3-1	96	73	96	73	Y	Y
ADM VS3-2	102	82	102	82	Y	Y
ADM VS3-3	96	96	106	96	Y	Y
ADM VS4-1	73	73	83	73	Y	Y
ADM VS4-2	73	73	83	73	Y	Y
ADM VS4-4	74	74	84	74	Y	Y
ADM VS4-5	83	83	93	83	Y	Y
ADM VS5	88	88	98	88	Y	Y
ADM VS6-1	74	74	84	74	Y	Y
ADM VS6-2	78	78	88	78	Y	Y
ADM VS6-3	74	74	84	74	Y	Y
ADM VS6-4	79	79	89	79	Y	Y
ADM VS6-7	85	85	95	85	Y	Y
ADM VS6-8	85	85	95	85	Y	Y
ADM VS7	88	88	98	88	Y	Y
ADM VS8	92	92	102	92	Y	Y
ADM VS14-1	81	81	91	81	Y	Y
COT-4004	92	92	102	92	Y	Y
COT-4005	91	91	101	91	Y	Y
PCU-4203A	81	81	91	81	Y	Y
PCU-4203B	82	82	92	82	Y	Y
PCU-4101	86	86	96	86	Y	Y
PCU-4102	82	82	92	82	Y	Y
PCU-4103	78	78	88	78	Y	Y
PCU-4204	82	82	92	82	Y	Y
PCU-4205	82	82	92	82	Y	Y
PCU-4206	80	80	90	80	Y	Y
PCU-4501	87	87	97	87	Y	Y
НКВ			1		· ·	

Diant Itam	Measured SWL, dB(A) ⁽²⁾		Maximum allowable SWL, dB(A)		Compliance (Y/N)	
Plant Item	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾
HKB VS1-1	85	85	95	85	Y	Y
HKB VS1-2	82	82	92	82	Y	Y
HKB VS2-1	83	83	93	83	Y	Y
HKB VS2-2	83	83	93	83	Y	Y
PCU 101	78	78	88	78	Y	Y

Notes:

(1) Day: 0700 to 1900 hours; Evening: 1900 to 2300 hours; Night: 2300 to 0700 hours.

(2) As discussed in Section 4.1.4, some plants will be operated in different modes, namely daytime/evening and night-time operation modes. Therefore, the measured SWLs for these plants will be different at different operation modes. For those plants operating in the same mode during both daytime/evening and night-time periods, the measured SWL is same for both daytime/evening and night-time periods.

5.2 Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at NSRs

5.2.1 Noise measurements to confirm any characteristics of tonality, impulsiveness and intermittency at the representative NSRs were conducted during night-time period. Measurement results are summarised in **Table 5.2** below. No characteristics of tonality, impulsiveness and intermittency was observed at the selected NSR. Data analysis has been carried out to determine the characteristics of tonality, impulsiveness and intermittency by assessing the logged 1/3 octave band spectra and time history profile. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency is found at the representative NSRs. Based on site observation and findings of data analysis, it is concluded that no characteristics of tonality, impulsiveness and intermittency are expected from the fixed plant sources. Detailed noise measurements results are presented in **Appendix C3**.

Table 5.2 **Noise Measurement Results at Measurement Locations**

		Time Period ⁽¹⁾⁽²⁾	Г	Measurement Re	sult	Site Observation	Characteristics of Tonality, Impulsiveness and Intermittency at NSRs (Y/N)
NSR ID	Description		Measured Noise Level L _{Aeq(30mins)} , dB(A)	Background Noise Level L _{Aeq(5mins)} , dB(A)	Difference between Measured Noise Level and Background Level, dB(A)		
ADM							
AD1 Ching Yi To Barracks Paget House	Daytime & Evening	61.8	61.9	-0.1	Noise environment was dominated by traffic noise. Noise from SCL	Ν	
	Night-time	61.6	61.5	0.1	fixed plant was not noticeable at measurement location.	ĨŇ	
HKB							
AD2	Regent on the Park $^{(3)}$		50.7	49.3	1.4	Noise from SCL fixed plant was barely noticeable at measurement location.	Ν
AD3	Roberts Block (formerly named as Jockey Club New Life Hostel)	Daytime & Evening / Night-time	52.6	52.4	0.2	Noise environment was dominated by traffic noise. Noise from SCL fixed plant was not noticeable at measurement location.	Ν

Notes:

All noise measurement was conducted during night-time period (2300 to 0700 hours). (1)

(2)

Fixed plant noise operation during daytime/evening and night-time periods have been included according to corresponding fixed plant noise measurement. The management office of Regent on the Park refused to provide access for measurement due to the recent pandemic situation. Noise measurement was conducted at an alternative location where is located at the Pedestrian near British Council. (3)

6 CONCLUSION

6.1.1 The fixed plant noise verifications were undertaken and the measurement results indicated all the fixed plant noise levels in ADM and HKB comply with the updated maximum allowable SWLs. No characteristics of tonality, impulsiveness and intermittency were observed at the representative NSRs. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency is found at the representative NSRs. It is therefore concluded that no characteristics of tonality, impulsiveness and intermittency are expected from the fixed plant sources.

Figures





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			*:**
	AD2 RECEIVER FOR HKB - O AD2 RECENT ON THE PAI AD3 ROBERT BLOCKS (FI JOCKEY CLUB NEW	RRE NOISE SENSITIVE PERATIONAL PHASE RK ORMERLY NAMED AS LIFE HOSTEL)	
	LEGEND:	PROPOSED SCL ALIGNMENT REPRESENTATIVE NOISE SE RECEIVER (NSR) APPROXIMATE NOISE SOUR LOCATION (FACADE) APPROXIMATE NOISE SOUR LOCATION (TOP) NOISE MEASUREMENT LOCA	ENSITIVE CE CE TION
³ 6. 0	ABBREVIATIONS:	SHATIN TO CENTRAL LINK	
15 20 25	HKB SIL(E) SCL (HUH - ADM)	HONG KONG PARK VENTILAT BUILDING SOUTH ISLAND LINE (EAST SHATIN TO CENTRAL LINK HOM TO ADMIRALTY SECTIO	[] ION []) _ HUNG DN
	D33B (HUH - ADM) IONS OF NSRS AND FIXED KONG PARK VENTILATION	PLANT NOISE SOURCES BUILDING)	PEV
1:1000	(A3) C11033B/C	/SCL/ACM/M52/062	Α

Appendix A

Detailed Calculation of Fixed Plant Noise Assessment

Appendix A Detail Calculation of Fixed Plant Noise Assessment

Fixed Plant Noise Calculation - ADM (Daytime & Evening Period)

Daymany subsect Addmarks Subsect Subsect	Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance, m	Vertical Distance, m	Slant Distance, m	SWL, dB(A)	Correction for line of sight ^[1] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	Daytime Noise Criterion under EIAO-TM ^[2] , dB(A)
AD1 ADM VS1-1 East 233 21 234 94 -10 -66 3 22 AD1 ADM VS1-1 North 235 21 227 86 -10 -66 3 22 ADM VS1-1 West 235 21 226 87 -10 -65 3 22 ADM VS1-1 West 235 21 226 87 -10 -65 3 23 21 ADM VS2-1 South 223 20 224 88 0 -55 3 38 ADM VS2-1 South 217 19 218 96 0 -55 3 44 ADM VS3-1 South 212 20 213 83 0 -55 3 31 ADM VS4-1 South 212 20 213 83 0 -55 3 31 ADM VS4-1 South 216 19 217 93 </th <th>Daytime</th> <th></th>	Daytime													
AD1 Chag IV To Barracts Paget House ADM VS1-1 East 233 21 234 94 -10 -55 3 32 ADM VS1-2 North 226 21 237 96 -10 -56 3 23 ADM VS1-3 West 235 21 236 93 -10 -55 3 25 ADM VS1-7 North 223 20 223 91 0 -55 3 36 ADM VS2-1 South 223 20 223 91 0 -55 3 36 ADM VS2-2 East 222 20 223 102 -10 -55 3 44 ADM VS3-3 West 220 19 221 106 -10 -55 3 31 ADM VS4-2 South 212 20 213 83 0 -55 3 31 ADM VS4-4 South 211 20 213	AD1													
ADM VS1-2 North 226 21 237 86 -10 -56 3 23 ADM VS1-3 West 235 21 236 87 -10 -56 3 25 ADM VS1-7 North 225 20 224 88 0 -55 3 36 ADM VS2-1 South 222 20 223 91 0 -55 3 36 ADM VS3-1 South 212 20 223 102 -10 -55 3 44 ADM VS3-3 West 200 19 221 106 -10 -55 3 44 ADM VS3-4 East 213 21 214 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 93 -10 -55 3 </td <td>AD1</td> <td>Ching Yi To Barracks</td> <td>ADM VS1-1</td> <td>East</td> <td>233</td> <td>21</td> <td>234</td> <td>94</td> <td>-10</td> <td>-55</td> <td>3</td> <td>32</td> <td></td> <td></td>	AD1	Ching Yi To Barracks	ADM VS1-1	East	233	21	234	94	-10	-55	3	32		
ADM VS1-3 West 235 21 236 87 -10 -55 3 25 ADM VS1-7 North 235 27 236 93 -10 -55 3 31 ADM VS2-1 South 223 20 224 88 0 -55 3 36 ADM VS2-2 East 222 20 223 91 0 -55 3 44 ADM VS3-1 South 217 19 218 96 0 -55 3 44 ADM VS3-2 North 220 122 100 -10 -55 3 44 ADM VS4-1 South 211 20 212 83 0 -55 3 31 ADM VS4-4 South 211 20 212 83 0 -55 3 31 ADM VS4-4 East 213 211 84 0 -55 3 36	101	Paget House	ADM VS1-2	North	236	21	237	86	-10	-56	3	23		
ADM VS1-7 North 235 27 236 93 -10 -55 3 31 ADM VS2-1 East 222 20 223 91 0 -55 3 36 ADM VS2-2 East 222 20 223 91 0 -55 3 34 ADM VS3-2 North 222 20 223 102 -10 -55 3 44 ADM VS3-2 North 222 20 221 106 -10 -55 3 44 ADM VS4-1 South 212 20 213 83 0 -55 3 31 ADM VS4-2 South 211 20 212 83 0 -55 3 31 ADM VS4-5 North 216 19 217 93 -10 -55 3 34 ADM VS4-5 North 216 19 217 93 -10 -55 3 34 ADM VS6-4 North 216 19 217 93			ADM VS1-3	West	235	21	236	87	-10	-55	3	25		
ADM VS2-1 South 223 20 224 88 0 -55 3 36 ADM VS2-2 East 222 20 223 91 0 -55 3 39 ADM VS3-1 South 217 19 218 96 0 -55 3 44 ADM VS3-2 North 222 20 223 102 -10 -55 3 44 ADM VS3-3 West 220 19 221 106 -10 -55 3 44 ADM VS4-1 South 211 20 213 83 0 -55 3 31 ADM VS4-4 South 211 20 212 83 0 -55 3 32 ADM VS4-4 North 216 19 217 93 -10 -55 3 33 ADM VS5-5 Top 202 23 201 84 0 -54 3 33 ADM VS6-1 Southeast 207 23 201 84 <			ADM VS1-7	North	235	27	236	93	-10	-55	3	31		
ADM VS2-2 East 222 20 223 91 0 -55 3 39 ADM VS3-1 South 217 19 218 96 0 -55 3 44 ADM VS3-2 North 222 20 223 102 -10 -55 3 44 ADM VS3-2 West 220 19 221 106 -10 -55 3 44 ADM VS4-1 South 211 20 213 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 83 -0 -55 3 32 ADM VS5-1 Southeast 202 23 211 96 0 -54 3 37 ADM VS6-5 Southeast 203 23 206 86 0 -54 3 33 ADM VS6-6 Southeast 207 23 218 89			ADM VS2-1	South	223	20	224	88	0	-55	3	36		
ADM VS3-1 South 217 19 218 96 0 -55 3 44 ADM VS3-3 West 220 102 102 -10 -55 3 40 ADM VS3-3 West 220 19 221 106 -10 -55 3 44 ADM VS4-1 South 211 20 213 83 0 -55 3 31 ADM VS4-2 South 211 20 212 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 31 ADM VS4-4 East 213 21 19 217 93 -10 -55 3 31 ADM VS5 Top 210 23 203 84 0 -54 3 33 ADM VS6-2 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 <			ADM VS2-2	East	222	20	223	91	0	-55	3	39		
ADM VS3-2 North 222 20 223 102 -10 -55 3 40 ADM VS3-1 South 212 10 10 -55 3 44 ADM VS4-1 South 212 20 213 83 0 -55 3 31 ADM VS4-2 South 211 20 212 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 93 -10 -55 3 32 ADM VS6-1 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-1 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-3 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-3 Southeast 210 23 211 89 0 -55<			ADM VS3-1	South	217	19	218	96	0	-55	3	44		
ADM VS3-3 West 220 19 221 106 -10 -55 3 44 ADM VS4-1 South 212 20 213 83 0 -55 3 31 ADM VS4-2 South 211 20 212 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 93 -10 -56 3 31 ADM VS4-5 North 216 19 217 93 -10 -56 3 31 ADM VS6-4 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-4 Southeast 207 23 206 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-7 Northeast 210 23 198 98			ADM VS3-2	North	222	20	223	102	-10	-55	3	40		
ADM VS4-1 South 211 20 213 83 0 -55 3 31 ADM VS4-2 South 211 20 212 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 93 -10 -55 3 46 ADM VS6-5 Northeast 202 23 203 84 0 -55 3 46 ADM VS6-1 Southeast 203 23 205 88 0 -54 3 37 ADM VS6-2 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-3 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-7 Northeast 223 24 227 <t< td=""><td></td><td></td><td>ADM VS3-3</td><td>West</td><td>220</td><td>19</td><td>221</td><td>106</td><td>-10</td><td>-55</td><td>3</td><td>44</td><td></td><td></td></t<>			ADM VS3-3	West	220	19	221	106	-10	-55	3	44		
ADM VS4-2 South 211 20 212 83 0 -55 3 31 ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 93 -10 -55 3 31 ADM VS5-1 Southeast 202 23 203 84 0 -56 3 46 ADM VS6-1 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-2 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-3 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-7 Northeast 223 24 227 95 -10 -55 3 33 ADM VS6-8 North 216 23 198			ADM VS4-1	South	212	20	213	83	0	-55	3	31		
ADM VS4-4 East 213 21 214 84 0 -55 3 32 ADM VS4-5 North 216 19 217 93 -10 -55 3 31 ADM VS5-5 Top 210 23 211 98 0 -55 3 46 ADM VS6-1 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-2 Southeast 200 23 205 88 0 -54 3 33 ADM VS6-3 Southeast 207 23 206 84 0 -54 3 33 ADM VS6-3 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-7 Northeast 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98			ADM VS4-2	South	211	20	212	83	0	-55	3	31		
ADM VS4-5 North 216 19 217 93 -10 -55 3 31 ADM VS5 Top 210 23 211 98 0 -55 3 46 ADM VS6-1 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-2 Southeast 207 23 205 88 0 -54 3 33 ADM VS6-3 Southeast 207 23 206 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-3 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-7 Northeast 223 24 224 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 1			ADM VS4-4	East	213	21	214	84	0	-55	3	32		
ADM VS5 Top 210 23 211 98 0 -55 3 46 ADM VS6-1 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-2 Southeast 203 23 205 88 0 -54 3 33 ADM VS6-3 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-3 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-3 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-4 Southeast 123 214 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 102			ADM VS4-5	North	216	19	217	93	-10	-55	3	31		
ADM VS6-1 Southeast 202 23 203 84 0 -54 3 33 ADM VS6-2 Southeast 203 23 205 88 0 -54 3 37 ADM VS6-3 Southeast 207 23 206 88 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -55 3 33 ADM VS6-4 Southeast 223 24 224 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS7 Top 196 23 198 98 0 -55 3 42 ADM VS14-1 East 237 29 239 91<			ADM VS5	Тор	210	23	211	98	0	-55	3	46		
ADM VS6-2 Southeast 203 23 205 88 0 -54 3 37 ADM VS6-3 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 33 ADM VS6-7 Northeast 223 24 224 95 -10 -55 3 33 ADM VS6-7 Northeast 223 24 227 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 102 -10 -55 3 50 COT-4004 All 214 17 212 101 0 -55 3 50 COT-4005 All 211 17 212 1			ADM VS6-1	Southeast	202	23	203	84	0	-54	3	33		
ADM VS6-3 Southeast 207 23 208 84 0 -54 3 33 ADM VS6-4 Southeast 210 23 211 89 0 -54 3 38 ADM VS6-7 Northeast 223 24 224 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS7 Top b 196 23 198 98 0 -54 3 47 ADM VS14-1 East 184 18 185 102 -10 -56 3 28 COT-4004 All 211 17 215 102 0 -55 3 49 PCU-4203A All 221 18 222 91			ADM VS6-2	Southeast	203	23	205	88	0	-54	3	37		
ADM VS6-4 Southeast 210 23 211 89 0 -54 3 38 ADM VS6-7 Northeast 223 24 224 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 102 -10 -53 3 42 ADM VS14-1 East 237 29 239 91 -10 -56 3 50 COT-4004 All 214 17 215 102 0 -55 3 49 PCU-4203A All 221 18 222 91 0 -55 3 40 PCU-4203B All 221 18 222 91			ADM VS6-3	Southeast	207	23	208	84	0	-54	3	33		
ADM VS6-7 Northeast 223 24 224 95 -10 -55 3 33 ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 102 -10 -53 3 42 ADM VS14-1 East 237 29 239 91 -10 -56 3 28 COT-4004 All 214 17 215 102 0 -55 3 99 PCU-4203A All 221 18 222 91 0 -55 3 40 PCU-4203B All 221 18 221 92 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 40 PCU-4102 All 233 24 234 92 0			ADM VS6-4	Southeast	210	23	211	89	0	-54	3	38		
ADM VS6-8 North 226 24 227 95 -10 -55 3 33 ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 102 -10 -53 3 42 ADM VS14-1 East 237 29 239 91 -10 -56 3 28 COT-4004 All 214 17 215 102 0 -55 3 50 COT-4005 All 211 17 212 101 0 -55 3 49 PCU-4203A All 221 18 222 91 0 -55 3 40 PCU-4203B All 221 18 221 92 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 40 PCU-4102 All 233 24 234 92 0 <			ADM VS6-7	Northeast	223	24	224	95	-10	-55	3	33		
ADM VS7 Top 196 23 198 98 0 -54 3 47 ADM VS8 Northeast 184 18 185 102 -10 -53 3 42 ADM VS14-1 East 237 29 239 91 -10 -56 3 28 COT-4004 All 214 17 215 102 0 -55 3 50 COT-4005 All 211 17 212 101 0 -55 3 49 PCU-4203A All 221 18 222 91 0 -55 3 49 PCU-4203B All 221 18 222 91 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 40 PCU-4102 All 233 24 234 96 0 -55 3 40 PCU-4102 All 233 24 234 92 0 -5			ADM VS6-8	North	226	24	227	95	-10	-55	3	33		
ADM VS8 Northeast 184 18 185 102 -10 -53 3 42 ADM VS14-1 East 237 29 239 91 -10 -56 3 28 COT-4004 All 214 17 215 102 0 -55 3 50 COT-4005 All 211 17 212 101 0 -55 3 49 PCU-4203A All 221 18 222 91 0 -55 3 49 PCU-4203B All 221 18 222 91 0 -55 3 49 PCU-4203B All 221 18 222 91 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 40 PCL-4102 All 233 24 234 92 0			ADM VS7	Тор	196	23	198	98	0	-54	3	47		
ADM VS14-1 East 237 29 239 91 -10 -56 3 28 COT-4004 All 214 17 215 102 0 -55 3 50 COT-4005 All 211 17 212 101 0 -55 3 50 PCU-4203A All 221 18 222 91 0 -55 3 39 PCU-4203B All 221 18 222 91 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4102 All 233 24 234 92 0 -55 3 44 PCU-4103 All 237 24 238 88 0 -55 3 40			ADM VS8	Northeast	184	18	185	102	-10	-53	3	42		
COT-4004 All 214 17 215 102 0 -55 3 50 COT-4005 All 211 17 212 101 0 -55 3 49 PCU-4203A All 221 18 222 91 0 -55 3 39 PCU-4203B All 221 18 221 92 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4102 All 233 24 234 92 0 -55 3 40			ADM VS14-1	East	237	29	239	91	-10	-56	3	28		
CO1-4005 All 211 17 212 101 0 -55 3 49 PCU-4203A All 221 18 222 91 0 -55 3 39 PCU-4203B All 221 18 222 91 0 -55 3 39 PCU-4203B All 221 18 221 92 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4103 All 237 24 238 88 0 -55 3 40			COT-4004	All	214	17	215	102	0	-55	3	50		
PCU-4203A All 221 18 222 91 0 -55 3 39 PCU-4203B All 221 18 221 92 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 44 PCU-4103 All 233 24 234 92 0 -55 3 40			COT-4005	All	211	17	212	101	0	-55	3	49		
PCU-4203B All 221 18 221 92 0 -55 3 40 PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 44 PCU-4103 All 233 24 234 92 0 -55 3 40			PCU-4203A	All	221	18	222	91	0	-55	3	39		
PCU-4101 All 233 24 234 96 0 -55 3 44 PCU-4102 All 233 24 234 92 0 -55 3 40 PCU-4103 All 237 24 228 88 0 -55 3 40			PCU-4203B	All	221	18	221	92	0	-55	3	40		
PCU-4102 All 237 24 234 32 U -33 3 40			PCU-4101	All	233	24	234	90	0	-55	3	44	-	
			PCU-4102	All	200	24	234	92	0	-33	3	40	1	
			PCU-4103	All	221	24	220	00	0	-55	3	30	•	
POLL4205 All 232 24 233 32 0 -33 3 40			PCU-4204		232	24	233	92	0	-55	3	40	•	
			PCU-4205		232	24	234	92	0	-55	3	38	-	
PCL-4501 All 230 24 232 97 0 -55 3 45 57 59			PCU-4200		230	24	223	97	0	-55	3	45	57	59

Remark:

[1] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver. [2] In accordance with Section 9.34 of the approved SCL(HUH-ADM) EIA report, a design target of "noise criteria – 6 dB(A)" i.e. ANL – 5 – 6 dB(A) is applied for NSRs near ADM due to the cumulative impact from the fixed plants of existing ADM, SCL and SIL(E).

Appendix A Detail Calculation of Fixed Plant Noise Assessment

Fixed Plant Noise Calculation - ADM (Night-time Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance, m	Vertical Distance, m	Slant Distance, m	SWL, dB(A)	Correction for line of sight ^[1] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	Nighttime Noise Criterion under EIAO-TM ^[2] , dB(A)
Night-time Admiralty Station													
AD1													
AD1	Ching Yi To Barracks	ADM VS1-1	East	233	21	234	84	-10	-55	3	22		
	Paget House	ADM VS1-2	North	236	21	237	76	-10	-56	3	13		
		ADM VS1-3	West	235	21	236	77	-10	-55	3	15		
		ADM VS1-7	North	235	27	236	83	-10	-55	3	21		
		ADM VS2-1	South	223	20	224	78	0	-55	3	26		
		ADM VS2-2	East	222	20	223	81	0	-55	3	29		
		ADM VS3-1	South	217	19	218	73	0	-55	3	21		
		ADM VS3-2	North	222	20	223	82	-10	-55	3	20		
		ADM VS3-3	West	220	19	221	96	-10	-55	3	34		
		ADM VS4-1	South	212	20	213	73	0	-55	3	21		
		ADM VS4-2	South	211	20	212	73	0	-55	3	21		
		ADM VS4-4	East	213	21	214	74	0	-55	3	22		
		ADM VS4-5	North	216	19	217	83	-10	-55	3	21		
		ADM VS5	Тор	210	23	211	88	0	-55	3	36		
		ADM VS6-1	Southeast	202	23	203	74	0	-54	3	23		
		ADM VS6-2	Southeast	203	23	205	78	0	-54	3	27		
		ADM VS6-3	Southeast	207	23	208	74	0	-54	3	23		
		ADM VS6-4	Southeast	210	23	211	79	0	-54	3	28		
		ADM VS6-7	Northeast	223	24	224	85	-10	-55	3	23		
		ADM VS6-8	North	226	24	227	85	-10	-55	3	23		
		ADM VS7	Тор	196	23	198	88	0	-54	3	37		
		ADM VS8	Northeast	184	18	185	92	-10	-53	3	32		
		ADM VS14-1	East	237	29	239	81	-10	-56	3	18		
		COT-4004	All	214	17	215	92	0	-55	3	40		
		COT-4005	All	211	17	212	91	0	-55	3	39		
		PCU-4203A	All	221	18	222	81	0	-55	3	29		
		PCU-4203B	All	221	18	221	82	0	-55	3	30		
		PCU-4101	All	233	24	234	86	0	-55	3	34		
		PCU-4102	All	233	24	234	82	0	-55	3	30		
		PCU-4103	All	227	24	228	78	0	-55	3	26		
		PCU-4204	All	232	24	233	82	0	-55	3	30		
		PCU-4205	All	232	24	234	82	0	-55	3	30		
		PCU-4206	All	228	24	229	80	0	-55	3	28		
		PCU-4501	All	230	24	232	87	0	-55	3	35	47	49

Remark:

[1] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver. [2] In accordance with Section 9.34 of the approved SCL(HUH-ADM) EIA report, a design target of "noise criteria – 6 dB(A)" i.e. ANL – 5 – 6 dB(A) is applied for NSRs near ADM due to the cumulative impact from the fixed plants of existing ADM, SCL and SIL(E).

Appendix A Detail Calculation of Fixed Plant Noise Assessment

Fixed Plant Noise Calculation - HKB (Davtime & Evening Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance, m	Vertical Distance, m	Slant Distance, m	SWL, dB(A)	Correction for line of sight ^[1] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	Daytime Noise Criterion under the EIAO-TM, dB(A) ^[2]
Daytime	•							•					
Hong Kong Park V	entilation Building												
AD2													
AD2	Regent on the Park	HKB VS1-1	Northeast	74	25	79	95	-10	-46	3	42		
	-	HKB VS1-2	Southeast	70	25	74	92	0	-45	3	50		
		HKB VS2-1	Northeast	82	26	86	93	-10	-47	3	39		
		HKB VS2-2	Northwest	84	26	88	93	-10	-47	3	39		
		PCU101	Тор	61	32	69	88	0	-45	3	46	52	57
AD3													
AD3	Roberts Block (formerly	HKB VS1-1	Northeast	130	42	137	95	-10	-51	3	37		
	named as Jockey Club	HKB VS1-2	Southeast	134	42	140	92	-10	-51	3	34		
	New Life Hostel)	HKB VS2-1	Northeast	118	42	125	93	-10	-50	3	36		
		HKB VS2-2	Northwest	113	42	121	93	0	-50	3	46		
		PCU101	Тор	125	48	134	88	0	-51	3	40	48	57

Remark: [1] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver. [2] In accordance with Section 9.34 of the approved SCL(HUH-ADM) EIA report, a design target of "noise criteria – 3 dB(A)" i.e. ANL – 5 – 3 dB(A), is applied for NSRs near HKB due to the cumulative impact from the fixed plants of SCL and SIL(E).

Fixed Plant Noise Calculation - HKB (Night-time Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance, m	Vertical Distance, m	Slant Distance, m	SWL, dB(A)	Correction for line of sight ^[1] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	Nighttime Noise Criterion under the EIAO- TM, dB(A) ^[2]
Night-time													
Hong Kong Park Ve	entilation Building												
AD2													
AD2	Regent on the Park	HKB VS1-1	Northeast	74	25	79	85	-10	-46	3	32		
	-	HKB VS1-2	Southeast	70	25	74	82	0	-45	3	40		
		HKB VS2-1	Northeast	82	26	86	83	-10	-47	3	29		
		HKB VS2-2	Northwest	84	26	88	83	-10	-47	3	29		
		PCU101	Тор	61	32	69	78	0	-45	3	36	42	47
AD2	Regent on the Park	HKB VS1-1 HKB VS1-2 HKB VS2-1 HKB VS2-2 PCU101	Northeast Southeast Northeast Northwest Top	74 70 82 84 61	25 25 26 26 32	79 74 86 88 69	85 82 83 83 78	-10 0 -10 -10 0	-46 -45 -47 -47 -45	3 3 3 3 3 3	32 40 29 29 36	42	47

Remark:

[1] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver.
 [2] In accordance with Section 9.34 of the approved SCL(HUH-ADM) EIA report, a design target of "noise criteria – 3 dB(A)" i.e. ANL – 5 – 3 dB(A), is applied for NSRs near HKB due to the cumulative impact from the fixed plants of SCL and SIL(E).

Appendix B

Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources

Appendix B1

Measurement Methodology

Method 1: Far-Field Testing Method for Louver



a: Short side of the louver

b: Long side of the louver

D: Measurement distance (separation between louver and microphone), where D must be greater than (2b) and rounded up to interger.

Louver opening

Proposed measurement point (microphone pointing perpendicular to the center of the louvre)

For method 1,

- "D" must be greater than 2b and round up to integer.
- The microphone must point to the center of the louver.
- At least 3 sets of LAeq, 1 min should be obtained.
- Background noise measurement should be obtained for determination of background correction factor.
- Any reason causing this method cannot be performed, noise measurement should then be conducted at near field in accordance with Method 2.
- If results of measurement reveal that difference in noise levels measured at far field with and without operation of fixed plant item is less than 3.0dB(A), noise measurement should then be conducted at near field in accordance with Method 2.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ measured \ L_{Aeq, \ 1 \ min} + 20log(D) + 8 + background \ noise \ correction \ factor$

Method 2: Near-Field Testing Method for Louver



D: Measurement distance

- Louver opening
- Measurement box
- Proposed measurement point (microphone pointing perpendicular to the louvre)

For method 2 (developed based on the principle of ISO3746:2010),

- First step is to determine a hypothetical measurement surfaces with at least 1m separation (D, measured from the centre of the louvre or its nearest edges as appropriate) from the louver.
- For louvre with largest dimension ≤3D, at least one measurement at the centre of the measurement surface parallel to the louvre should be conducted.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- Extra localized microphone positions on the measurement surfaces in the region of high radiation should be considered. In this case follow the procedures of ISO3744.
- For louver with largest dimension > 3D, measurement surface and measurement position should follow ISO3746.
- Background noise level should be taken at each measurement point for determining the background correction (K1A).
- If the difference between the background noise and the measured noise level is less than 3.0dB, K1A should be capped to 3.0dB.
- If necessary to obtain less conservative results, D should be reduced according to ISO3746 to obtain higher measured noise levels.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ LAeq \ over \ all \ measurement \ points + 10 \ log \ (total surface \ area \ over \ the \ measurement \ box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection

Method 3 - Far Field Testing Method for Plant Item



"L" is the longest side of the plant item

"D, Center" is the separation between center of the plant item and microphone

"D, Surface" is the separation between surface of the plant item and microphone

- "D, Surface" must be greater than twice of L (2L) and roundup to integer (e.g 6m, 7m, 8m...).
- The microphone must be pointing to the center of the plant.
- Measurement should be carried out at the direction toward all NSRs.
- At least 3 sets of $L_{Aeq, 1}$ min should be obtained at each the measurement point.
- Background noise measurement should be obtained for determination of background correction factor.
- Any reason causing this method cannot be performed, noise measurement should then be conducted at near field in accordance with latest edition of ISO3746 (Method 4).
- If results of measurement reveal that difference in noise levels measured at far field with and without operation of fixed plant item is less than 3.0 dB(A), noise measurement should then be conducted at near field in accordance with latest edition of ISO3746 (Method 4).
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

SWL = Mean measured $L_{Aeq, 1 min} + 20 \log (D,Center) + 8 + background noise correction factor$

Method 4 – Near Field Testing Method for Plant Item

Kev

For Method 4 (based on ISO3746:2010),

- Please refer to latest edition of ISO3746 for measurement requirement.
- The locations of measurement points are depended on the size of the plant, which cannot be easily generalized (see figure for example)
- Background noise measurement should be obtained for determination of background correction factor (K1A). According to ISO3746, if the source under test radiates noise predominantly in one direction or if the noise from a large source is emitted only from a small portion of the source, the usage of extra localized microphone positions on the measurement surface in the region of high radiation should be considered. In this case, follow the procedures specified in ISO3744.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- Detail calculation of the SWL should refer to the latest edition of ISO3746.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean L_{Aeq} \text{ over all measurement points} + 10 \log (total surface area over the measurement box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection

Method 5 – Near Field Testing Method for Plant Room or other source



For Method 5 (developed based on the principle of ISO3746 -2010),

- First step is to determine a measurement box with at least 1m separation (measured from the centre of the louvre or its nearest edges as appropriate) from the louver.
- Secondly, is to determine the location of measurement points on the measurement surface of the hypothetical box.
- Extra localized microphone positions on the measurement surface in the region of high radiation should be considered. In this case follow the procedures of ISO 3744.
- Background noise level should be taken for determination of background correction (K1A.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- If the difference between the BGL and the measured noise level (MNL) is less than 3.0dB, K1A should be capped to 3.0dB.
- If necessary to obtain less conservative results. D should be reduced according to ISO3746 to obtain higher MNLs.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ L_{Aeq} \ over \ all \ measurement \ points + 10 \ log \ (total \ surface area \ over \ the \ measurement \ box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection Appendix B2

Calibration Certificates – Noise Measurement for Fixed Plant Noise

Appendix B2 Calibration Certificates – Noise Measurement for Fixed Plant Noise

Cert B1: Calibration Certificate of Sound Level Meter SVAN958 (SN: 59120)



CALIBRATION CERTIFICATE

Certificate Informati	on	The second second			
Date of Issue	17-Nov-2020]	(Certificate Number	MLCN203076S
Customer Informatio	m	Man State Real		a sant angela	
Company Name Address	Wilson Accousti Unit 601, Block Yuen Shun Circu Shatin, N. T., Hong Kong	ics Limited A, Shatin Industrial C uit,	Centre,		
Equipment-under-To	est (EUT)	and the second second		A State of the State	
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibrati Svantek SVAN 958 59120 	ion Analyser			
Calibration Particul	ar	and the sale of the second second			The states
Date of Calibration Calibration Equipment	17-Nov-2020 4231(MLTE008	3) / AV200063 / 23-Ju	in-2023		
Calibration Procedure	MLCG00, MLC	CG15			
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	$23 \text{ °C} \pm 555\% \pm 250\% \pm 250\%$	s °C 9% ours es aattery	
Calibration Results	Calibration data	a were detailed in the o	continuatio	n pages.	
Approved By & Date	?		10	K.O. Lo	17-Nov-2020
Statements Calibration equipment uses The results on this Calibration not include allowance for to overloading, mishandling, MaxLab Calibration Centra The copy of this Certificat prior written approval of N	d for this calibration i ion Certificate only n he EUT long term dr misuse, and the capa e Limited shall not b e is owned by MaxLa faxLab Calibration C	are traceable to national / relate to the values measu rift, variation with environ city of any other laborator liable for any loss or dar ab Calibration Centre Lim ?entre Limited.	international red at the tim mental chang ry to repeat th nage resultin ited. No part	standards. e of the calibration and the ges, vibration and shock du he measurement. g from the use of the EUT. t of this Certificate may be	uncertainties quoted will ing transportation, reproduced without the

Page 1 of 2

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Certificate No. MLCN203076S

Calibration	Data								No.		-
Channel / Mode	Filter / Detector	Range		EUT Reading		Standard Reading		EUT Error		Calibration Uncertainty	
CH4 / Sound	A / FAST	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	94.0	dB	94.0	dB	0.0	dB	0.2	dB
				114.0	dB	114.0	dB	0.0	dB	0.2	dB
	C / FAST	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	94.0	dB	94.0	dB	0.0	dB	0.2	dB
				114.0	dB	114.0	dB	0.0	dB	0.2	dB
	LIN / FAST	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	94.0	dB	94.0	dB	0.0	dB	0.2	dB
				114.0	dB	114.0	dB	0.0	dB	0.2	dB
	A / SLOW	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0	dB	114.0	dB	0.0	dB	0.2	dB
	C / SLOW	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0	dB	114.0	dB	0.0	dB	0.2	dB
	LIN / SLOW	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0	dB	114.0	dB	0.0	dB	0.2	dB
	A / IMPULSE	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0	dB	114.0	dB	0.0	dB	0.2	dB
	C / IMPULSE	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0	dB	114.0	dB	0.0	dB	0.2	dB
	LIN / IMPULSE	105	dB	93.9	dB	94.0	dB	-0.1	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0	dB	114.0	dB	0.0	dB	0.2	dB

- END -

Calibrated By : Date :

Dan 17-Nov-2020 Checked By : Date :

17-Nov-2020 Page 2 of 2

K.O. Lo

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Cert B2: Calibration Certificate of Sound Level Meter SVANTEK 958 (SN: 59121)



CALIBRATION CERTIFICATE

Certificate Informati	ion				at the second second
Date of Issue	31-Oct-2020		С	ertificate Number	MLCN202867S
Customer Informatio	on				a children frankrigen og
Company Name	Wilson Accous	tics Limited			
Address	Unit 601, Block	A, Shatin Industrial	Centre,		
	Yuen Shun Cire	cuit,			
	Shatin, N. T.,				
	Hong Kong				
Equipment-under-To	est (EUT)				
Description	Sound & Vibra	tion Analyser			
Manufacturer	Svantek				
Model Number	SVAN 958				
Serial Number	59121				
Equipment Number					
Calibration Particul	ar	and the second s			The same provident and the
Date of Calibration	31-Oct-2020	0) / AN2000(2 / 22 L	2022		
Calibration Equipment	4231(ML1E00	8) / AV 200063 / 23-Ju	in-2023		
	NU COOD NU	0015			
Calibration Procedure	MLCG00, ML	2615	-		
Calibration Conditions	Laboratory	Temperature	$23 \circ C \pm 5 \circ$	°C	
		Relative Humidity	$55\% \pm 25\%$	0	
	EUT	Stabilizing Time	Over 3 hou	ITS	
		Warm-up Time	10 minutes		
		Power Supply	Internal ba	ttery	
Calibration Results	Calibration dat	a were detailed in the	continuation	pages.	
Approved By & Date				Section of the	CANER TANK
			1	KOL	21 0 + 2020
			6	K.O. L0	31-Oct-2020
Statements	Charles a long the second	With Property and the second	with the second second	Construction of the second second	And the second second second
 Calibration equipment used The results on this Calibrat 	for this calibration	are traceable to national /	international sta	andards.	uncertainties quoted will
not include allowance for t	he EUT long term d	rift, variation with environ	mental changes	vibration and shock dur	ing transportation.
overloading, mishandling,	misuse, and the capa	icity of any other laborator	y to repeat the	measurement.	0
* MaxLab Calibration Centre	Limited shall not b	e liable for any loss or dar	nage resulting f	rom the use of the EUT.	
 The copy of this Certificate prior written approval of M 	is owned by MaxL	ab Calibration Centre Lim	ited. No part o	f this Certificate may be r	eproduced without the
prior written approval of M	axisab Canoration C	senue Linnied.			
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Certificate No. MLCN202867S

Calibration	Data	Star Barris				a state of the sta
Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A / FAST	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / FAST	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / FAST	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / SLOW	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / SLOW	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / SLOW	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / IMPULSE	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / IMPULSE	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / IMPULSE	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB

- END -

Calibrated By : Date :

Dan 31-Oct-2020 Checked By : Date :

31-Oct-2020 Page 2 of 2

K.O. Lo

萬儀校正中心有限公司 MaxLab Calibration Centre Limited 香港新界葵蒲華星街 16-18 號保盈工業大廈 9 樓 B 室 Unit B, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk .

Cert B3: Calibration Certificate of Sound Level Meter SVANTEK 959 (SN: 11228)



CALIBRATION CERTIFICATE

Certificate Information									
Date of Issue	12-May-2020		Certificate Number	MLCN201166S					
Customer Informatio	Customer Information								
Company Name Address	Wilson Accoustics Limited Unit 601, Block A, Shatin Indu Yuen Shun Circuit, Shatin, N. T., Hong Kong	istrial Centre,							
Equipment-under-Te	est (EUT)	A STATE							
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibration Analyser Svantek SVAN 959 11228 								
Calibration Particula	ır								
Date of Calibration Calibration Equipment	12-May-2020 4231(MLTE008) / AV180068	/ 13-May-2020							
Calibration Procedure	MLCG00, MLCG15								
Calibration Conditions	Laboratory Temperature Relative Hur EUT Stabilizing T Warm-up Ti Power Suppl	nidity 23 °C 55% ± ime Over 3 ne 10 mir y Intern	± 5 °C 25% 8 hours nutes al battery						
Calibration Results	Calibration Results Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.								
Approved By & Date									
		10	K.O. Lo	12-May-2020					
Statements Calibration equipment used The results on this Calibrat not include allowance for t overloading, mishandling, MaxLab Calibration Centre The copy of this Certificat prior written approval of M	I for this calibration are traceable to n ion Certificate only relate to the value he EUT long term drift, variation with misuse, and the capacity of any other e Limited shall not be liable for any le is owned by MaxLab Calibration Ce laxLab Calibration Centre Limited.	ational / internatio es measured at the environmental ch laboratory to reper ss or damage resu ntre Limited. No	nal standards. time of the calibration and the anges, vibration and shock du at the measurement. Iting from the use of the EUT. part of this Certificate may be	uncertainties quoted will ring transportation, reproduced without the					

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Certificate No. MLCN201166S

Calibration Dat	a	the state of the state	Sulta Sulta Santa		and the second second	
Weighting / Time	Range	EUT Reading	Standard Reading	EUT Error	Calibration EUT Uncertainty Specificatio	
A / FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
		114.0 dB	114.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
C / FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Z / FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
	HIGH	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	114.0 dB	114.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
C / SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Z / SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
A / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	114.0 dB	114.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
C / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Z / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB

- END -

Calibrated	By	:	
Date :			

Dan 12-May-2020

K.O. Lo Checked By : 12-May-2020 Date :

Page 2 of 2

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Cert B4: Calibration Certificate of Acoustic Calibrator SVANTEK 977A (SN: 69787)



CALIBRATION CERTIFICATE

Certificate Informati	ion	
Date of Issue	11-Dec-2020	Certificate Number MLCN203353S
Customer Informatio	on	
Company Name Address	Wilson Accoustics Limited Unit 601, Block A, Shatin Industrial (Yuen Shun Circuit, Shatin, N. T., Hong Kong	Centre,
Equipment-under-Te	est (EUT)	And the second second second second
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibration Analyser Svantek SVAN 977 69787 	
Calibration Particula	ar	
Date of Calibration Calibration Equipment	11-Dec-2020 4231(MLTE008) / AV200063 / 23-Ju	un-2023
Calibration Procedure	MLCG00, MLCG15	
Calibration Conditions	Laboratory Temperature Relative Humidity EUT Stabilizing Time Warm-up Time Power Supply	23 °C ± 5 °C 55% ± 25% Over 3 hours 10 minutes Internal battery
Calibration Results	Calibration data were detailed in the	continuation pages.
Approved By & Date	2	
		К.О. Lo 11-Dec-2020
Statements Calibration equipment used The results on this Calibrat not include allowance for th overloading, mishandling, 1 MaxLab Calibration Centre The copy of this Certificate prior written approval of M	I for this calibration are traceable to national / ion Certificate only relate to the values measu he EUT long term drift, variation with environ misuse, and the capacity of any other laborator e Limited shall not be liable for any loss or dar is owned by MaxLab Calibration Centre Lim faxLab Calibration Centre Limited.	international standards. red at the time of the calibration and the uncertainties quoted will mental changes, vibration and shock during transportation, ry to repeat the measurement. mage resulting from the use of the EUT. nited. No part of this Certificate may be reproduced without the

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Certificate No. MLCN203353S

Calibration Dat	a				12100				
Weighting / Time	Range	EUT Readin	g	Standar Readin	-d g	EUT E	rror	Calibrati Uncertai	ion nty
A / FAST	LOW	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)		114.0	dB	114.0	dB	0.0	dB	0.2	dB
	HIGH	94.0	dB	94.0	dB	0.0	dB	0.2	dB
		114.0	dB	114.0	dB	0.0	dB	0.2	dB
C / FAST	LOW	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)		114.0	dB	114.0	dB	0.0	dB	0.2	dB
	HIGH	94.0	dB	94.0	dB	0.0	dB	0.2	dB
		114.0	dB	114.0	dB	0.0	dB	0.2	dB
Z / FAST	LOW	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)		114.0	dB	114.0	dB	0.0	dB	0.2	dB
	HIGH	94.0	dB	94.0	dB	0.0	dB	0.2	dB
		114.0	dB	114.0	dB	0.0	dB	0.2	dB
A / SLOW	LOW (22-123)	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)	HIGH (30-140)	114.0	dB	114.0	dB	0.0	dB	0.2	dB
C / SLOW	LOW (22-123)	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)	HIGH (30-140)	114.0	dB	114.0	dB	0.0	dB	0.2	dB
Z / SLOW	LOW (22-123)	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)	HIGH (30-140)	114.0	dB	114.0	dB	0.0	dB	0.2	dB
A / IMPULSE	LOW (22-123)	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)	HIGH (30-140)	114.0	dB	114.0	dB	0.0	dB	0.2	dB
C / IMPULSE	LOW (22-123)	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)	HIGH (30-140)	114.0	dB	114.0	dB	0.0	dB	0.2	dB
Z / IMPULSE	LOW (22-123)	94.0	dB	94.0	dB	0.0	dB	0.2	dB
(1 kHz Input)	HIGH (30-140)	114.0	dB	114.0	dB	0.0	dB	0.2	dB

- END -

Calibrated By :	Dan
Date :	11-Dec-2020

Checked By : Date :

11-Dec-2020 Page 2 of 2

K.O. Lo

萬儀校正中心有限公司 MaxLab Calibration Centre Limited 香港新界葵蒲華星街 16-18 號保盈工業大廈 9 樓 B 室 Unit B, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

Cert B5: Calibration Certificate of Acoustic Calibrator Larson Davis CAL200 (SN: 17867)



CALIBRATION CERTIFICATE

Certificate Informati	on				
Date of Issue	24-May-2021		Ce	ertificate Number	MLCN211224S
Customer Informatio	on				
Company Name Address	Wilson Ho and Unit 601, Block Yuen Shun Circ Shatin, NT	Associates Limited : A, Shatin Industrial C cuit,	Centre,		
Eauinment-under-Te	est (EUT)				
Description Manufacturer Model Number Serial Number Equipment Number	Precision Acou: Larson Davis CAL200 17867 	stic Calibrator			
Calibration Particul	ar				
Date of Calibration Calibration Equipment	24-May-2021 4231(MLTE00 1357(MLTE19	8) / AV200063 / 23-Ju 0) / MLEC20/05/02 / 2	nn-23 26-May-21		
Calibration Procedure	MLCG00, MLC	CG15			
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	$23 \text{ °C} \pm 5 \text{ °}$ $55\% \pm 25\%$ Over 3 hou Not applica Internal bat	C s sble ttery	
Calibration Results	Calibration data All calibration	a were detailed in the results were within El	continuation JT specificati	pages. ion.	
Approved By & Date		A CONTRACTOR			
			10	K.O. Lo	24-May-2021
Statements Calibration equipment usee The results on this Calibrat not include allowance for t overloading, mishandling, MaxLab Calibration Centre MaxLab Calibration Centre The copy of this Certificat prior written approval of M	I for this calibration ion Certificate only he EUT long term dh misuse, and the capa c Limited shall not b c is owned by MaxL faxLab Calibration C	are traceable to national / relate to the values measu rift, variation with environ city of any other laborator lable for any loss or dar ab Calibration Centre Lim Zentre Limited.	international sta red at the time of mental changes y to repeat the nage resulting f ited. No part of	undards. of the calibration and the vibration and shock dur measurement. rom the use of the EUT. f this Certificate may be r	uncertainties quoted will ing transportation, eproduced without the





Certificate No. MLCN211224S

alibration Data	and the second second		A REAL PROPERTY.	VER ALL PROPERTY
EUT Setting	Standard Reading	EUT Error from Setting	Calibration Uncertainty	EUT Specification
94 dB	94.0 dB	0.0 dB	0.15 dB	± 0.2 dB
114 dB	114.0 dB	0.0 dB	0.15 dB	± 0.2 dB

- END -

Calibrated By :	Dan	Checked By :	K.O. Lo
Date :	24-May-21	Date :	24-May-21
			Page 2 of 2



萬儀校正中心有限公司 MaxLab Calibration Centre Limited 香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B 室 Unit B, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tei: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

Cert B6: Calibration Certificate of Acoustic Calibrator SVANTEK SV30A (SN: 10814)



CALIBRATION CERTIFICATE

Date of Issue	21-440-2020		Certificate Numb	er MLCN2021278
Date of issue	[21-Aug-2020		Certificate ritanis	
Customer Informatio	on -			
Company Name	Wilson Accous	tics Limited		
Address	Unit 601, Block	k A, Shatin Industrial C	'entre,	
	Yuen Shun Cire	cuit,		
	Shatin, N. T.,			
	Hong Kong			
Fauipment-under-Te	est (EUT)		The state of the second se	
Description	Acoustic Calib	rator		
Manufacturar	Svantek	rator.		
Madal Number	SV 30A			
Social Number	10814			
Equipment Number	10014			
Equipment Aumoer		a fill a sea in a sea in a sea of the		
Calibration Particul	ar	A REAL PROPERTY.	the star of the start of the start	
Date of Calibration	21-Aug-2020			
Calibration Equipment	4231(MLTE00	08) / AV200063 / 23-Ju	in-23	
	1351(MLTE04	19) / MLEC20/06/02 / :	5-Jun-21	
Calibration Procedure	MLCG00, ML	CG15		
Calibration Procedure	Laboratory	Tamparatura	[23 °C + 5 °C	
Calibration Conditions	Laboratory	Relative Humidity	55% + 25%	
	FUT	Stabilizing Time	Over 3 hours	
	LOI	Warm-un Time	Not applicable	
		Power Supply	Internal battery	
C III C D III	Calibratian da	to ware detailed in the	continuation pages	
Calibration Results	All calibration	results were within FI	IT specification	
	All canoration	results were within i.s.	1 spectrearon.	
Approved By & Date	ρ		A BOX & BALLER	
inproved by a basis		1		
		160	K.O. Lo	21-Aug-20
Statements	State of the state of		State of the second second	the satisfiers
* Calibration equipment use	d for this calibration	n are traceable to national /	international standards.	the uncertainties susted a
 The results on this Calibra net include allowance for l 	tion Certificate only	relate to the values measu drift variation with enviror	mental changes vibration and shock	during transportation.
overloading, mishandling,	misuse, and the car	pacity of any other laborato	ry to repeat the measurement.	anning manufactured
* MaxLab Calibration Centr	e Limited shall not	be liable for any loss or dat	mage resulting from the use of the El	JT.
* The copy of this Certificat	e is owned by Maxl	Lab Calibration Centre Lim	ited. No part of this Certificate may	be reproduced without the
prior written approval of M	naxLab Cambration	Centre Limited.		

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Appendix B2 - Page 11



Certificate No. MLCN202127S

Checked By :

Date :

Calibration Data									
EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification					
94 dB	94.1 dB	-0.1 dB	0.15 dB	\pm 0.3 dB					
114 dB	114.0 dB	0.0 dB	0.15 dB	\pm 0.3 dB					

- END -

Calibrated By : Date :

Kenneth 21-Aug-20

K.O. Lo 21-Aug-20 Page 2 of 2

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Appendix B3

Photographs showing the Examples of Noise Measurement for Fixed Plant Noise



Appendix B3 Photographs showing the Examples of Noise Measurement for Fixed Plant Noise











Appendix B4

Noise Measurement Results

				Louvre/Co	oling Tower S	Size (mm)					
Location	Fixed Plant Source ID	Plant Type	Method	Height	Width	Length	Averaged Measured L _{Aeq} ,dB(A) ^(a)	Background L _{Aeq} ,dB(A)	Difference L _{Aeq} ,dB(A)	Background Corrected L _{Aeq} ,dB(A) ^(b)	Calculated SWL, dB(A)
	ADM VS1-1	Ventilation Louver	2	5300	4420	N/A	68.5	67.6	0.9	65.5	84
	ADM VS1-2	Ventilation Louver	2	5300	4420	N/A	62.8	61.2	1.6	59.8	76
	ADM VS1-3	Ventilation Louver	2	5300	4600	N/A	60.9	58.4	2.5	57.9	77
	ADM VS1-7	Ventilation Louver	2	1050	1100	N/A	71.4	67.5	3.9	69.2	83
	ADM VS2-1	Ventilation Louver	2	3000	10120	N/A	61.1	59.9	1.2	58.1	78
	ADM VS2-2	Ventilation Louver	2	3700	3500	N/A	65.7	60.5	5.2	64.2	81
	ADM VS2 1 (c)	Ventilation Louver	2	2000	4650	N/A	58.9	56.5	2.4	55.9	73
	ADM V33-1	Ventilation Eduver	2	2000	4000	14/11	79.2	57.3	21.9	79.2	96
	ADM VS2 2 (c)	Ventilation Louver	2	5300	5100	N/A	66.4	64.8	1.6	63.4	82
	ADIVI V55-2	Ventilation Louver	2 3300 3100 10/14 82.9	62.9	20.0	82.9	102				
	ADM VS3-3	Ventilation Louver	2	2000	3450	N/A	80.3	62.7	17.6	80.3	96
	ADM VS4-1	Ventilation Louver	2	2000	5200	N/A	58.9	57.3	1.6	55.9	73
	ADM VS4-2	Ventilation Louver	2	2000	5200	N/A	58.7	56.6	2.1	55.7	73
	ADM VS4-4	Ventilation Louver	2	2000	3450	N/A	60.8	57.8	3.0	57.9	74
	ADM VS4-5	Ventilation Louver	2	10400	1900	N/A	64.6	58.0	6.6	63.6	83
	ADM VS5	Ventilation Louver	2	N/A	5000	7650	70.8	67.0	3.8	68.4	88
	ADM VS6-1	Ventilation Louver	2	4650	2110	N/A	60.5	58.5	2.0	57.5	74
	ADM VS6-2	Ventilation Louver	2	4650	2890	N/A	62.5	58.2	4.3	60.4	78
ADM	ADM VS6-3	Ventilation Louver	2	4650	3230	N/A	59.5	58.5	1.0	56.5	74
	ADM VS6-4	Ventilation Louver	2	4450	12200	N/A	60.2	56.5	3.7	57.7	79
	ADM VS6-7	Ventilation Louver	2	6000	5680	N/A	66.1	58.3	7.8	65.3	85
	ADM VS6-8	Ventilation Louver	2	6000	5800	N/A	68.2	65.5	2.7	65.2	85
	ADM VS7	Ventilation Louver	2	N/A	8000	5800	69.1	63.2	5.9	67.8	88
	ADM VS8	Ventilation Louver	2	7625	3650	N/A	72.9	61.0	11.9	72.9	92
	ADM VS14-1	Ventilation Louver	2	400	250	N/A	70.1	62.6	7.5	69.3	81
	COT-4004	Cooling Tower	4	5000	4200	6800	73.4	61.5	11.9	73.4	92
	COT-4005	Cooling Tower	4	5000	4200	6800	72.5	59.7	12.8	72.5	91
	PCU-4203A	Packaged Condenser Unit	4	1650	920	740	66.7	61.3	5.4	65.2	81
	PCU-4203B	Packaged Condenser Unit	4	1650	920	740	67.7	61.1	6.6	66.6	82
	PCU-4101	Packaged Condenser Unit	4	1900	920	740	70.9	65.2	5.7	69.5	86
	PCU-4102	Packaged Condenser Unit	4	1900	920	740	68.2	64.2	4.0	66.1	82
	PCU-4103	Packaged Condenser Unit	4	1350	1000	350	65.9	64.9	1.0	62.9	78
	PCU-4204	Packaged Condenser Unit	4	1900	920	740	68.0	63.1	4.9	66.3	82
	PCU-4205	Packaged Condenser Unit	4	1900	920	740	67.9	63.2	4.7	66.1	82
	PCU-4206	Packaged Condenser Unit	4	1350	1000	350	68.2	65.0	3.2	65.4	80
	PCU-4501	Packaged Condenser Unit	4	760	2440	1710	71.5	65.2	6.3	70.3	87
	HKB VS1-1	Ventilation Louver	2	6750	7580	N/A	64.0	53.0	11.0	64.0	85
	HKB VS1-2	Ventilation Louver	2	6750	2100	N/A	64.2	54.7	9.5	63.7	82
HKB	HKB VS2-1	Ventilation Louver	2	6750	6260	N/A	62.8	52.9	9.9	62.4	83
	HKB VS2-2	Ventilation Louver	2	6750	2750	N/A	64.9	55.0	9.9	64.4	83
	PCU 101	Packaged Condenser Unit	4	1530	765	1680	68.3	59.7	8.6	67.7	78

Appendix B4 Noise Measurement Results

Remarks:

a) Results are averaged from number of points in accordance with ISO3746.

b) If the difference between the background and the measured noise level is less than 3.0 dB, background noise correction factor should be capped to 3.0dB

c) There will be two operation modes, namely daytime/evening and night-time modes.

Appendix C

Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs Appendix C1

Calibration Certificates – Noise Measurement at Representative NSRs



综合試驗 有限公司 SOILS & MATERIALS ENGINEERING CO., LTD. 香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0319 01-01		Page 1 of 2			2	2	
Item tested							
Description:	Sound Level Mete	er (Type 1)	Microphone		Preamn		
Manufacturer:	B & K	(.)]/	B&K		B&K		
Type/Model No.:	2250-L		4950		ZC0032		
Serial/Equipment No .:	2681366		2665582		17190		
Adaptors used:	-		-		-		
Item submitted by							
Customer Name:	AECOM ASIA CO	LTD					
Address of Customer:	-						
Request No.:	-						
Date of receipt:	19-Mar-2021						
Date of test:	23-Mar-2021						
Reference equipment	used in the calib	ration					
Description:	Model:	Serial No.	Expiry Date:		Traceah	le to:	
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021		CIGISME	0.	
Signal generator	DS 360	33873	19-May-2021		CEPREI		
Ambient conditions							
Temperature:	22 ± 1 °C						
Relative humidity:	55 ± 10 %						
Air pressure:	1005 ± 5 hPa						
Test specifications							

1, 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
- 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 security activation of the test of tes
- 3. 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:

Feng Junai

24-Mar-2021 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. The results apply to the item as received.

Date:

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



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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0319 01-01

2 of

Page

2

1, **Electrical Tests**

The electrical tests were perfomed 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.

			Expanded	Coverage
Test:	Subtest:	Status:	Uncertanity (dB)	Factor
		100.0		
Self-generated noise	A	Pass	0.3	
	С	Pass	0.8	
	Lin	Pass	1.6	
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	A	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 1/10 ⁴ 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	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, 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.



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.

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



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Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.:	21CA0309 02		Page 1 of		2		
Item tested							
Description:	Sound Level Mete	r (Type 1)		Microphone		Pream	
Manufacturer:	B&K	. (.) /	,	B&K		R&K	
Type/Model No.:	2270		,	4950		ZC0032	
Serial/Equipment No.:	2644597		,	2879980		29398	
Adaptors used:	-		,	-		-	
Item submitted by							
Customer Name:	AECOM ASIA CO	LTD					
Address of Customer:	-						
Request No.:	-						
Date of receipt:	09-Mar-2021						
Date of test:	22-Mar-2021						
Reference equipment	used in the calib	ration					
Description:	Model:	Serial No.		Expiry Date:		Traceah	le to:
Multi function sound calibrator	B&K 4226	2288444		23-Aug-2021		CIGISME	C.
Signal generator	DS 360	33873		19-May-2021		CEPREI	0
Ambient conditions							
Temperature:	22 ± 1 °C						
Relative humidity:	55 ± 10 %						
Air pressure:	1005 ± 5 hPa						
Test specifications							

- 1, 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.
- 2, 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 <u>+</u>20%.
- 3. 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:

Feng Junai

24-Mar-2021 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. The results apply to the item as received.

Date:

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Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



2

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0309 02

2 of

Page

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:	Uncertanity (dB) / Co	overage Factor
Self-generated noise	A	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	A	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 1/10 ⁴ 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) / Coverage Factor
Acoustic response	Weighting A at 125 Hz Weighting A at 8000 Hz	Pass	0.3

3, Response to associated sound calibrator

The 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: Checked by Fung Chi Yip Chan Yuk Yiu Date: 22-Mar-2021 Date: 24-Mar-2021

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.

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

N/A





CERTIFICATE OF CALIBRATION

Certificate No.:	21CA0401 02		Page:	1	of	2
Item tested						
Description:	Acoustical Calibr	ator (Class 1)				
Manufacturer:	B & K					
Type/Model No.:	4231					
Serial/Equipment No.:	3006428					
Adaptors used:						
Item submitted by						
Curstomer:	AECOM					
Address of Customer:	-					
Request No .:	-					
Date of receipt:	01-Apr-2021					
Date of test:	05-Apr-2021					
Reference equipment	used in the cali	bration				
Description:	Model:	Serial No.	Expiry Date:	т	raceable	to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	S	CL	
Preamplifier	B&K 2673	2743150	03-Jun-2021	C	EPREI	
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	C	EPREI	
Signal generator	DS 360	33873	19-May-2021	C	EPREI	
Digital multi-meter	34401A	US36087050	19-May-2021	C	EPREI	
Audio analyzer	8903B	GB41300350	18-May-2021	C	EPREI	
Universal counter	53132A	MY40003662	18-May-2021	C	EPREI	

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

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

Approved Signatory:

07-Apr-2021 Company Chop:



Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument. The results apply to the item as received.

Date:

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Form No.CARP156-1/Issue 1/Rev.D/01/03/2007



综合試驗有限公司 SOILS & MATERIALS ENGINEERING CO., LTD.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0401 02

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of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency	Output Sound Pressure	Measured Output	Estimated Expanded
Shown	Level Setting	Sound Pressure Level	Uncertainty
Hz	dB	dB	dB
1000	94.00	94.23	

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz	STF = 0.016 dB
Estimated expanded uncertainty	0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz	Actual Frequency = 999.95 Hz

Estimated expanded uncertainty	0.1 Hz	Coverage factor k = 2.2
--------------------------------	--------	-------------------------

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz	TND = 0.3 %
Estimated expanded uncertainty	0.7 %

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.

	1	- End -	A 1	
Calibrated by:	1	Checked by:	Jack	
	Fung Chi Yip		Chan Yuk Yiu	
Date:	05-Apr-2021	Date:	07-Apr-2021	

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.

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Form No.CARP156-2/Issue 1/Rev.C/01/05/2005





CERTIFICATE OF CALIBRATION

Certificate No.:	21CA1019 03-02	2	Page:	1 of	2
Item tested					
Description: Manufacturer: Type/Model No.: Serial/Equipment No.: Adaptors used:	Acoustical Calibr Rion Co., Ltd. NC-74 34246490 / N.00 -	ator (Class 1) 4.10			
Item submitted by					
Curstomer: Address of Customer: Request No.: Date of receipt:	AECOM ASIA CO - - 19-Oct-2021	DLIMITED			
Date of test:	21-Oct-2021				
Reference equipment	used in the calil	bration			
Description: Lab standard microphone Preamplifier Measuring amplifier Signal generator Digital multi-meter Audio analyzer Universal counter	Model: B&K 4180 B&K 2673 B&K 2610 DS 360 34401A 8903B 53132A	Serial No. 2341427 2239857 2346941 33873 US36087050 GB41300350 MY40003662	Expiry Date: 04-May-2022 31-May-2022 01-Jun-2022 27-May-2022 28-May-2022 02-Jun-2022	Trace SCL CEPR CEPR CEPR CEPR CEPR	able to: El El El El El
Ambient conditions					
Temperature: Relative humidity:	22 ± 1 °C 55 ± 10 %				

Test specifications

1005 ± 5 hPa

Air pressure:

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate. Approved Signatory: Date: 22-Oct-2021 Company Chop: Feng Junqi

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument. The results apply to the item as received.

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Form No.CARP156-1/Issue 1/Rev.D/01/03/2007



综合試驗有限公司 SOILS & MATERIALS ENGINEERING CO., LTD. 香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



2

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

Page:

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1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency	Output Sound Pressure	Measured Output	Estimated Expanded
Shown	Level Setting	Sound Pressure Level	Uncertainty
Hz	dB	dB	dB
1000	94.00	94.00	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

21CA1019 03-02

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz	STF = 0.012 dB
Estimated expanded uncertainty	0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz	Actual Frequency = 1002.1	
Estimated expanded uncertainty	0.1 Hz	Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz	TND = 1.7 %
Estimated expanded uncertainty	0.7 %

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.



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.

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Appendix C2

Photographs – Noise Measurement at Representative NSRs





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Appendix C3

Measurement Results at Representative NSRs

			Fixed Plant	Noise	Backgroun	d Noise	Difference between
				Measured Noise		Background Noise	Measured Noise Level
Measurement				Level, L _{Aeq 30mins} ,		Level, L _{Aeq 5mins} ,	and Background Level,
Location ID	Measurement Date	Operation Scenario ⁽¹⁾⁽²⁾	Measurement Time	dB(A)	Measurement Time	dB(A)	dB(A)
ADM							
1 م		Daytime and Evening	01:50:00 - 02:20:00	61.8	01:03:40 - 01:08:40	61.9	-0.1
ADI	2/19/2022	Night-time	02:36:00 - 03:06:00	61.6	03:12:15 - 03:17:15	61.5	0.1
НКВ							
AD2		Night-time	02:53:16 - 03:23:15	50.7	03:30:00 - 03:35:00	49.3	1.4
AD3	2/18/2022	Night-time	01:50:00 - 02:20:00	52.6	01:35:30 - 01:40:30	52.4	0.2

Note:

(1) Day: 0700 to 1900 hours; Evening: 1900 to 2300 hours; Night: 2300 to 0700 hours.

(2) Fixed plant noise operation during daytime/evening and night-time periods have been included according to corresponding fixed plant noise measurement.

MTR Corporation Limited

Shatin to Central Link – Hung Hom to Admiralty Section

Fixed Plant Noise Audit Report

(Batch 2 – South Ventilation Building (SOV) and Exhibition Centre Station (EXC))

(March 2022)

Verified by:	Claudine Lee
Position:	Independent Environmental Checker
Date:	11 March 2022

MTR Corporation Limited

Shatin to Central Link – Hung Hom to Admiralty Section

Fixed Plant Noise Audit Report (Batch 2 – South Ventilation Building (SOV) and Exhibition Centre Station (EXC))

(March 2022)

Certified by:	Lisa Poon
Position:	Environmental Team Leader
Date:	11 March 2022



MTR Corporation Limited

Consultancy Agreement No. C11033B

Shatin to Central Link – Hung Hom to Admiralty

[SCL (HUH-ADM)]

Fixed Plant Noise Audit Report (Batch 2 – South Ventilation Building (SOV) & Exhibition Centre Station (EXC))

March 2022

	Name	Signature		
Prepared & Checked:	Isaac Chu	Jun		
Reviewed & Approved:	Freeman Cheung	Angel		
Version:	A Date:	10 March 2022		
This Report is prepared for MTR Corporation Limited and is given for its sole benefit in relation to and pursuant to Consultancy Agreement No. C11033B and may not be disclosed to, quoted to or relied upon by any person other than MTR Corporation Limited without our prior written consent. No person (other than MTR Corporation Limited) into whose possession a copy of this Report comes may rely on this Report without our express written consent and MTR Corporation Limited may not rely on it for any purpose other than as described above.				

AECOM Asia Co. Ltd. 8/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong Tel: (852) 3922 9000 Fax: (852) 3922 9797 www.aecom.com
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- Appendix C Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs
 - Appendix C1 Calibration Certificates Noise Measurement at Representative NSRs
 - Appendix C2 Photographs Noise Measurement at Representative NSRs
 - Appendix C3 Noise Measurement Results at Representative NSRs

1 INTRODUCTION

1.1 Background

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the EAL at Hung Hom across the harbour to Admiralty Station (ADM).
- 1.1.2 EIA Report for SCL Hung Hom to Admiralty (HUH-ADM) Section (Register No.: AEIAR 166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, the Environmental Permit (EP) (EP No: EP-436/2012), covering the construction and operation of SCL (HUH-ADM), was granted on 22 March 2012. Variations of Environmental Permit (VEP) were subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/F) was issued by Director of Environmental Protection (DEP) on 29 January 2019.
- 1.1.3 Pursuant to EP Condition 2.31, at least one month before commencement of operation of the Project, the Permit Holder, MTR Corporation Ltd (MTR), shall carry out fixed plant noise audit and deposit with the Director four hardcopies and one electronic copy of an audit report showing the design of the fixed plant noise sources associated with the Project complies with the maximum sound power levels determined in the approved SCL(HUH-ADM) EIA Report (Register No. AEIAR-166/2012) or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) having due regard to the characteristics of tonality, impulsiveness and intermittency.
- 1.1.4 Since the installation of fixed plant along the SCL (HUH ADM) would be completed in stages, the fixed plant noise audit will be conducted in stages according to the testing and commissioning programmes in each area.
- 1.1.5 This Fixed Plant Noise Audit Report (Batch 2 South Ventilation Building (SOV) and Exhibition Centre Station (EXC)) (hereinafter referred to as "the Report") specifies the noise measurement methodology and measurement results at the fixed plant noise sources at SOV and EXC, and at the representative Noise Sensitive Receivers (NSRs) near SOV and EXC.
- 1.1.6 AECOM Asia Co. Ltd has been commissioned by the MTR to prepare this Report and to conduct noise measurement at the identified NSRs for investigation of any characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources associated with the Project.

1.2 Purpose of This Report

- 1.2.1 This Report presents the noise measurement methodology and measurement results at the fixed plant noise sources at SOV and EXC, and at the representative NSRs near SOV and EXC.
- 1.2.2 This Report comprises the following sections:
 - Section 1 presents the background information.
 - Section 2 presents the noise criteria and the representative NSRs.
 - Section 3 presents the latest information of fixed plant noise sources.
 - Section 4 presents the noise measurement methodology.
 - Section 5 presents the noise measurement results.
 - Section 6 presents the conclusion.

2 NOISE CRITERIA AND REPRESENTATIVE NOISE SENSITIVE RECEIVERS

2.1 Environmental Legislation, Standard and Guidelines

- 2.1.1 The Noise Control Ordinance, Cap. 400 (NCO) and Environmental Impact Assessment Ordinance, Cap. 499 (EIAO) provide the statutory framework for noise control. Operational noise from fixed noise sources is controlled by Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM) under NCO. To plan for a better environment, the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) under EIAO has specified the following requirements:
 - 5 dB below the appropriate ANLs in the IND-TM; or
 - the prevailing background noise levels (for quiet areas with level 5dB or more below the ANL).
- 2.1.2 The Acceptable Noise Levels (ANLs) for different Area Sensitivity Ratings (ASRs) during different periods are summarized in the **Table 2.1**.

Time Deried	ANL, dB(A)		
	ASR "A"	ASR "B"	ASR "C"
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	50	55	60

Table 2.1 ANLs for Assessment of Noise from Fixed Sources

2.2 Assessment Criteria and Representative Noise Sensitive Receivers

2.2.1 Table 9.7 of the approved SCL (HUH-ADM) EIA Report presents the identified Noise Sensitive Receivers (NSRs) and the adopted noise assessment criteria for fixed plant noise assessment. The assessment criteria at the NSRs selected for assessing the fixed plant noise impact from SOV and EXC are summarised in **Table 2.2**.

Table 2.2 Summary of Noise Criteria at Representative NSRs for Fixed Noise Sources (Reference from Table 9.7 of the approved EIA Report)

Description (NSR No.)	Time Period ⁽¹⁾	Prevailing Background Noise Levels, dB(A) ⁽²⁾	ASR	ANL-5, dB(A) ⁽³⁾	Criteria, dB(A) ⁽⁴⁾
SOV					
Hoi Deen Court (CH1)	Day & evening	> 70	C	65	65
Hor Deen Court (CITT)	Night	> 60	0	55	55
Hei Kung Court (CH2)	Day & evening	> 70	C	65	65
Hol Kung Court (CH2)	Night	> 60	U	55	55
Elizabeth House, Block C	Day & evening	> 70	C	65	65
(CH3)	Night	> 60	U	55	55
EXC					
Causeway Centre, Block A	Day & evening	> 65	В	60	60
(EX1)	Night	> 55	В	50	50

Notes:

(2) Prevailing background noise levels are extracted from Table 9.6 of approved EIA Report.

(3) A 5 dB(A) is deducted from ANL as specified in requirement of EIAO-TM.

(4) The minimum of prevailing background noise level & ANL-5 is adopted.

⁽¹⁾ Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.

2.3 Review of Area Sensitivity Rating

- 2.3.1 Area Sensitive Ratings (ASR) as defined in the approved EIA Report were determined by the existence of any influencing factors (IFs) (e.g. major road, industrial area) according to IND-TM at the time of preparation of the EIA Report. During the preparation of this Report, it is revealed that there was no major change on the land use in the vicinity of representative NSRs, and thus only the existence of any major road (i.e. annual average daily traffic flow in excess of 30,000) has been reviewed.
- 2.3.2 Based on best available information (i.e. The Annual Traffic Census 2020) during the preparation of this Report, Gloucester Road, Victoria Park Road and Cross Harbour Tunnel remain as IFs to the NSRs located in the vicinity of SOV, while there was no major road affecting the NSR located in the vicinity of EXC. Therefore, the ASRs defined in **Table 2.2** remain unchanged.

3 LATEST INFORMATION OF FIXED PLANT NOISE SOURCES

3.1.1 Based on the latest design information, the fixed plant sources including ventilation louvres, cooling towers and Packaged Condenser Unit (PCU) at SOV and EXC are shown in **Figure Nos. C11033B/C/SCL/ACM/M52/063** and **C11033B/C/SCL/ACM/M52/064** respectively. The information of the fixed plant sources and the associated updated maximum allowable Sound Power Levels (SWLs) are presented in **Table 3.1** and the predicted fixed plant noise levels are presented in **Appendix A**. Appropriate corrections in tonal, impulsive or intermittent characteristics should be applied, where applicable, in accordance with the IND-TM during the commissioning test conducted at the representative NSRs.

Location	Fixed Plant ID	Fixed Plant Source	Maximum Allowable SWL, dB(A) ⁽¹⁾	
Location		Fixed Flant Source	Daytime & Evening ⁽²⁾	Night-time ⁽²⁾
	SOV-01	Ventilation Louver	92	82
	SOV-02	Ventilation Louver	89	79
	SOV-04	Ventilation Louver	89	79
	SOV-05	Ventilation Louver	89	79
	SOV-06	Ventilation Louver	86	76
	SOV-08	Ventilation Louver	98	88
	SOV-10	Ventilation Louver	94	84
	SOV-11	Ventilation Louver	94	84
	SOV-12	Ventilation Louver	93	83
	SOV-13	Ventilation Louver	94	84
SOV	SOV-21	Ventilation Louver	91	81
300	SOV-22	Ventilation Louver	80	70
	SOV-23	Ventilation Louver	82	72
	SOV-24	Ventilation Louver	80	70
	SOV-25	Ventilation Louver	84	74
	SOV-26	Ventilation Louver	84	74
	SOV-27	Ventilation Louver	82	72
	SOV-28	Ventilation Louver	84	74
	SOV-29A	Ventilation Louver	80	70
	SOV-29B	Ventilation Louver	80	70
	SOV-30	Ventilation Louver	80	70
	SOV-31	Ventilation Louver	85	75
	EXH VS1	Ventilation Louver	76	66
	EXH VS2	Ventilation Louver	98	88
	EXH VS3	Ventilation Louver	117	108
	EXH VS4	Ventilation Louver	82	73
EXC	EXH VS5	Ventilation Louver	74	64
	EXH VS6	Ventilation Louver	75	65
	EXH VS7	Cooling Tower	94	84
	EXH VS8	Cooling Tower	92	82
	EXH VS12	Ventilation Louver	95	85

Table 3.1 Updated Maximum Allowable SWLs for Fixed Plant Noise Sources at SOV and EXC

			Maximum Allowable SWL, dB(A) ⁽¹⁾		
Location	Fixed Plant ID	Fixed Plant Source	Daytime & Evening ⁽²⁾	Night-time ⁽²⁾	
	EXH VS15	Ventilation Louver	84	74	
	EXH VS16	Ventilation Louver	79	69	
	EXH VS20	Ventilation Louver	88	79	
	EXH VS21	Ventilation Louver	85	75	
	EXH VS22	Ventilation Louver	80	70	
	EXH VS23	Ventilation Louver	77	68	
	EXH VS25	Ventilation Louver	103	94	
	EXH VS26	Ventilation Louver	99	90	
	EXH VS28	Ventilation Louver	92	83	
	EXH VS29	Ventilation Louver	94	85	
	EXH VS30	Ventilation Louver	87	78	
	EXH VS32	Ventilation Louver	88	79	
	EXH VS35	Ventilation Louver	84	74	
	EXH VS36	Ventilation Louver	84	75	
	EXH VS37	Ventilation Louver	79	70	
	EXH VS38	Ventilation Louver	83	74	
	EXH VS39	Ventilation Louver	83	74	
	EXH VS40	Ventilation Louver	82	73	
	EXH VS41	Ventilation Louver	77	68	
	EXH VS42	Ventilation Louver	81	72	
	EXH VS43	Ventilation Louver	91	82	
	EXH VS44	Ventilation Louver	78	69	
	EXH VS45	Ventilation Louver	80	71	
	EXH VS46	Ventilation Louver	100	91	
	EXH VS47	Ventilation Louver	99	90	
	EXH VS48	Ventilation Louver	82	73	
	EXH VS49	Ventilation Louver	98	89	
	EXH VS50	Ventilation Louver	87	78	
	EXH VS51	Ventilation Louver	103	_ (3)	
	EXH VS52	Ventilation Louver	83	73	
	EXH VS53	Ventilation Louver	71	61	
	EXH VS54	Ventilation Louver	67	57	
	EXH VS55	Ventilation Louver	78	68	
	EXH VS56	Ventilation Louver	80	70	
	EXH VS57	Ventilation Louver	71	61	
	EXH VS58	Ventilation Louver	72	62	
	EXH VS59	Ventilation Louver	81	71	
	EXH VS60	Packaged Condenser Unit	77	67	
	EXH VS66	Ventilation Louver	69	59	
	EXH VS68	Ventilation Louver	74	64	

Notes:

The maximum allowable sound power levels have due regard to the characteristics of tonality, intermittency and (1) impulsiveness.

(2) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.
(3) This plant will not be operated during night-time period.

(4) The transformer room at SOV is managed by Hong Kong Electric Company and therefore was excluded in this fixed plant noise audit report.

4 MEASUREMENT METHODOLOGY

4.1 Noise Measurement to Obtain the SWLs of Fixed Plant Noise Sources

Measurement Methodology

4.1.1 Details of measurement methodology for SCL are presented in **Appendix B1**. Noise measurements to obtain the SWLs of the fixed plant noise sources followed **Appendix B1** and were conducted by Wilson Acoustics Limited and BeeXergy Consulting Limited.

Measurement Equipment

4.1.2 The sound level meters and calibrators used for noise measurements are listed in the Table 4.1. The instruments used for the noise measurements complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The calibration certificates of equipment are provided in Appendix B2.

Equipment	Model	Serial Number
	SVANTEK 958	20890
	SVANTEK 958	28422
	SVANTEK 958	59120
Sound Level Meter	SVANTEK 958	59121
	SVANTEK 959	11228
	SVANTEK 979	46199
	Cirrus CR171B	G071909
Colibrator	SVANTEK SV30A	10814
Calibrator	SVANTEK SV35A	58708

Table 4.1 Noise Measurement Equipment

4.1.3 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. The difference between the readings made before and after each series of measurements shall be less than or equal to 1.0 dB.

Measurement Date and Time

4.1.4 The operation of fixed plant sources at SOV and EXC are identical during both daytime and night-time periods, except that there is one plant at EXC operating in daytime/evening period only. Nevertheless, the noise measurements at SOV and EXC were all conducted during night-time periods at the fixed plant noise sources in order to minimise influence from background noise on measurement data. Details of the noise measurement schedule are shown in **Table 4.2**.

Table 4.2	Measurement	Schedule

Location	Date
SOV	3 August 2021
307	8, 9, 12, 22 & 25 Nov 2021
FVO	29 Dec 2021
EXC	4, 6, 11, 12 & 13 Jan 2022

4.2 Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs

Measurement Parameters

- 4.2.1 L_{Aeq} (30min) was measured at each designated measurement location. 1/3 octave band spectrum and time history over the measurement period was also be logged for determination of tonal, impulsiveness and intermittency characteristic.
- 4.2.2 Background noise level was measured at the same measurement location in term of L_{Aeq} (5 min) immediate before or after the noise measurement when all Project's fixed plant equipment shut down. To minimise the measurement data being influenced by background noise, noise data obtained at an instance of minimal or no traffic on the road was used to evaluate the tonal characteristic. The corrections for tonality, impulsiveness or intermittency at the representative NSRs were determined in accordance with IND-TM. In addition, any noticeable characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources was recorded during the measurement.

Measurement Equipment

4.2.3 The sound level meters and calibrators used for noise measurements at representative NSRs are listed in the **Table 4.3**. The instruments used for the noise measurements complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The calibration certificates of equipment are shown in **Appendix C1**.

Table 4.3Noise Measurement Equipment

Equipment	Model	Serial Number	
Sound Level Meter	B&K 2250L	2681366	
Calibrator	B&K 4231	3006428	

4.2.4 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. The difference between the readings made before and after each series of measurements shall be less than or equal to 1.0 dB.

Measurement Locations

4.2.5 The proposed noise measurement locations which have direct line of sight to the noise sources and were accessible for noise measurement were selected to represent the representative NSRs. These measurement locations had been agreed with EPD prior to noise measurement. The measurement locations are summarised in Table 4.4 and shown in Figure Nos. C11033B/C/SCL/ACM/M52/063 and C11033B/C/SCL/ACM/M52/064. Photographs of measurement locations are shown in Appendix C2.

	Table 4.4	Noise Measurem	ent Locations
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Measurement Location ID	NSR (NSR No.)	Туре	Measurement Location and Height
SOV			
CH2	Hoi Kung Court (CH2)	Residential	Public area, pedestrian near Hoi Kung Court (1m from building façade)
EXC			
FN1	Causeway Centre, Block A (EX1)	Residential	Public area, pedestrian bridge near Great Eagle Centre and Harbour Centre (1m from the pedestrian bridge parapet wall)

Measurement Date and Time

4.2.6 The operation of fixed plant sources at SOV and EXC are identical during both daytime and night-time periods, except that there is one plant at EXC operating in daytime/evening period only. To minimise the influence from background noise in measurement data, noise measurements at representative NSRs were therefore only conducted during night-time period. The measurement schedule is presented in **Table 4.5**.

Table 4.5 Measurement Schedule

Location	Measurement Location ID	Date
SOV	CH2	24 Feb 2022
EXC	FN1	25 Feb 2022

5 MEASUREMENT RESULTS

5.1 Noise Measurement to Obtain the SWLs of Fixed Plant Noise Sources

5.1.1 The measured SWLs under conservative approach during daytime and evening, and night-time periods are presented in **Table 5.1**. The measurement results indicated all the fixed plant noise levels in SOV and EXC comply with the updated maximum allowable SWLs. Details of the measurement results are shown in **Appendix B4**.

	Measured	SWI dB(A)	Maximum allo	wable SWL,	Complian	ce (Y/N)
	Destines		dB(A)		
Plant Item	t Item & Night- Evening time ⁽¹⁾		Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾
SOV	·					
SOV-01	82	82	92	82	Y	Y
SOV-02	79	79	89	79	Y	Y
SOV-04	79	79	89	79	Y	Y
SOV-05	79	79	89	79	Y	Y
SOV-06	76	76	86	76	Y	Y
SOV-08	88	88	98	88	Y	Y
SOV-10	84	84	94	84	Y	Y
SOV-11	84	84	94	84	Y	Y
SOV-12	83	83	93	83	Y	Y
SOV-13	84	84	94	84	Y	Y
SOV-21	81	81	91	81	Y	Y
SOV-22	70	70	80	70	Y	Y
SOV-23	72	72	82	72	Y	Y
SOV-24	70	70	80	70	Y	Y
SOV-25	74	74	84	74	Y	Y
SOV-26	74	74	84	84 74		Y
SOV-27	72	72	82	72	Y	Y
SOV-28	74	74	84	74	Y	Y
SOV-29A	70	70	80	70	Y	Y
SOV-29B	70	70	80	70	Y	Y
SOV-30	80	70	80	70	Y	Y
SOV-31	85	75	85	75	Y	Y
EXC						
EXH VS1	66	66	76	66	Y	Y
EXH VS2	88	88	98	88	Y	Y
EXH VS3	108	108	117	108	Y	Y
EXH VS4	73	73	82	73	Y	Y
EXH VS5	64	64	74	64	Y	Y
EXH VS6	65	65	75	65	Y	Y
EXH VS7	84	84	94	84	Y	Y
EXH VS8	82	82	92	82	Y	Y
EXH VS12	85	85	95	85	Y	Y
EXH VS15	74	74	84	74	Y	Y
EXH VS16	69	69	79	69	Y	Y

 Table 5.1
 Summary of Measured SWLs for Fixed Plants

	Measured	SWL, dB(A)	Maximum allo dB(owable SWL,	Complian	ce (Y/N)
Plant Item	Daytime & Evening (1)	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾
EXH VS20	79	79	88	79	Y	Y
EXH VS21	75	75	85	75	Y	Y
EXH VS22	70	70	80	70	Y	Y
EXH VS23	68	68	77 68		Y	Y
EXH VS25	94	94	103	94	Y	Y
EXH VS26	90	90	99	90	Y	Y
EXH VS28	83	83	92	83	Y	Y
EXH VS29	85	85	94	85	Y	Y
EXH VS30	78	78	87	78	Y	Y
EXH VS32	79	79	88	79	Y	Y
EXH VS35	74	74	84	74	Y	Y
EXH VS36	75	75	84	75	Y	Y
EXH VS37	70	70	79	70	Y	Y
EXH VS38	74	74	83	74	Y	Y
EXH VS39	74	74	83	74	Y	Y
EXH VS40	73	73	82	73	Y	Y
EXH VS41	68	68	77 68		Y	Y
EXH VS42	72	72	81	81 72		Y
EXH VS43	82	82	91 82		Y	Y
EXH VS44	69	69	78	69	Y	Y
EXH VS45	71	71	80	71	Y	Y
EXH VS46	91	91	100	91	Y	Y
EXH VS47	90	90	99	90	Y	Y
EXH VS48	73	73	82	73	Y	Y
EXH VS49	89	89	98	89	Y	Y
EXH VS50	78	78	87	78	Y	Y
EXH VS51 (2)	103	-	103	-	Y	Y
EXH VS52	73	73	83	73	Y	Y
EXH VS53	61	61	71	61	Y	Y
EXH VS54	57	57	67	57	Y	Y
EXH VS55	68	68	78	68	Y	Y
EXH VS56	70	70	80	70	Y	Y
EXH VS57	61	61	71	61	Y	Y
EXH VS58	62	62	72	62	Y	Y
EXH VS59	71	71	81	71	Y	Y
EXH VS60	67	67	77	67	Y	Y
EXH VS66	59	59	69	59	Y	Y
EXH VS68	64	64	74	64	Y	Y

Notes:(1)Day: 0700 to 1900 hours; Evening: 1900 to 2300 hours; Night: 2300 to 0700 hours.(2)This plant will not be operated during night-time period.

5.2 Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at NSRs

5.2.1 Noise measurements to confirm any characteristics of tonality, impulsiveness and intermittency at the representative NSRs were conducted during night-time period. Measurement results are summarised in **Table 5.2** below. No characteristics of tonality, impulsiveness and intermittency was observed at the representative NSRs. Data analysis has been carried out to determine the characteristics of tonality, impulsiveness and intermittency by assessing the logged 1/3 octave band spectra and time history profile. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency is found at the representative NSRs. Based on site observation and findings of data analysis, it is concluded that no characteristics of tonality, impulsiveness and intermittency are expected from the fixed plant sources. Detailed noise measurements results are presented in **Appendix C3**.

Table 5.2 Noise Measurement Results at Measurement Locations

			Г	Measurement Re	sult			
Measurement Location ID	Representing NSRs	Time Period ⁽¹⁾⁽²⁾	Measured Noise Level L _{Aeq(30mins)} , dB(A)	Background Noise Level L _{Aeq(5mins)} , dB(A)	Difference between Measured Noise Level and Background Level, dB(A)	Site Observation	Tonality, Impulsiveness and Intermittency at NSRs (Y/N)	
SOV								
CH2	Hoi Kung Court (CH2)	Daytime & Evening / Night-time	71.3	71.5	-0.2	Noise environment was dominated by traffic noise. Noise from SCL fixed plant was not noticeable at measurement location.	Ν	
EXC								
EN1	Causeway	Daytime & Evening	51.7	50.4	1.3	Noise environment was dominated by traffic noise. Noise from SCL	N	
	(EX1)	Night-time	50.4	49.4	1.0	fixed plant was not noticeable at measurement location.	IN IN	

Notes:

All noise measurement was conducted during night-time period (2300 to 0700 hours).
 Fixed plant noise operation during daytime/evening and night-time periods have been included according to corresponding fixed plant noise measurement.

6 CONCLUSION

6.1.1 The fixed plant noise verifications were undertaken and the measurement results indicated all the fixed plant noise levels in SOV and EXC comply with the updated maximum allowable SWLs. No characteristics of tonality, impulsiveness and intermittency were observed at the representative NSRs. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency is found at the representative NSRs. It is therefore concluded that no characteristics of tonality, impulsiveness and intermittency are expected from the fixed plant sources.

Figures







Appendix A

Detailed Calculation of Fixed Plant Noise Assessment

Fixed Plant Noise Calculation - SOV (Daytime & Evening Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontial Distance , m	Vertical Distance relative to the assessment point, m	Slant Distance,m	SWL, dB(A)	Correction for line of sight ^[1] , dB(A)	Distance Correction of Point Source ^[2] , dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	NCO Day-time Noise Criteria, dB(A)
SCL(HUH-ADM) -	SOV												
CH1													
CH1	Hoi Deen Court 276 -	SOV-01	South	105	3	105	92	0	-48	3	47	[1
0	279. Gloucester Road.	SOV-02	South	110	3	110	89	0	-49	3	43		
	.,	SOV-04	South	91	3	91	89	0	-47	3	45		
		SOV-05	North	96	4	96	89	-10	-48	3	34		
		SOV-06	Southeast	98	1	98	86	0	-48	3	41		
		SOV-08	East	93	1	93	98	0	-47	3	54		
		SOV-10	South	121	3	121	94	0	-50	3	47		
		SOV-11	West	127	3	127	94	-10	-50	3	37		
		SOV-12	Top	130	3	130	93	-10	-50	3	30		
		SOV-13	South	97	4	97	94	0	-30	3	47		
		SOV-22	South	88	5	89	80	0	-47	3	36		
		SOV-23	North	93	1	93	82	-10	-47	3	28		
		SOV-24	North	119	1	119	80	-10	-50	3	23		
		SOV-25	North	120	0	120	84	-10	-50	3	27		
		SOV-26	North	99	0	99	84	-10	-48	3	29		
		SOV-27	North	93	2	93	82	-10	-47	3	28		
		SOV-28	South	89	0	89	84	0	-47	3	40		
		SOV-29A	North	88	0	88	80	-10	-47	3	26		
		SOV-29B	North	90	0	90	80	-10	-47	3	20		
		SOV-31	North	109	9	109	85	-10	-49	3	29	57	65
CH2		00101	Horar	100		100	00	10	10		20		
CH2	Hoi Kung Court, 264 -	SOV-01	South	62	3	62	92	0	-44	3	51		
	268, Gloucester Road,	SOV-02	South	64	3	65	89	0	-44	3	48		
		SOV-04	South	55	3	55	89	0	-43	3	49		
		SOV-05	North	64	4	64	89	-10	-44	3	38		
		SOV-06	Southeast	86	1	86	86	0	-47	3	42		
		SOV-08	East	79	1	79	98	0	-46	3	55		
		SOV-10	Wost	73	3	73	94	0	-45	3	52		
		SOV-12	West	82	3	83	94	-10	-40	3	41		
		SOV-13	Top	79	4	79	94	0	-46	3	51		
		SOV-21	South	57	1	57	91	0	-43	3	51		
		SOV-22	South	54	5	54	80	0	-43	3	40		
		SOV-23	North	63	1	63	82	-10	-44	3	31		
		SOV-24	North	76	1	76	80	-10	-46	3	27		
		SOV-25	North	76	0	76	84	-10	-46	3	31		
		SOV-26	North	65	0	65	84	-10	-44	3	33		
		SOV-27	North	63	2	63	82	-10	-44	3	31		
		SOV-28	North	55	0	55	84	-10	-43	3	44		
		SOV-29B	North	62	1	62	80	-10	-44	3	29		
		SOV-30	North	75	0	75	80	-10	-46	3	27		
		SOV-31	North	69	9	70	85	-10	-45	3	33	60	65
CH3													
СНЗ	Elizabeth House, Block	SOV-01	South	131	18	133	92	0	-50	3	45		
1	C, 250 - 254,	SOV-02	South	127	18	129	89	0	-50	3	42	1	
	Gloucester Road,	SOV-04	South	145	18	146	89	0	-51	3	41		
		SOV-05	North	150	18	151	89	-10	-52	3	30		
		SOV-06	Southeast	184	20	185	86	0	-53	3	30		
		SOV-08	South	110	20	179	90	0	-53	3	40		
		SOV-11	West	124	19	125	94	0	-50	3	47		
		SOV-12	West	119	19	121	93	0	-50	3	46		
		SOV-13	Тор	124	17	125	94	0	-50	3	47		
		SOV-21	South	139	20	140	91	0	-51	3	43		
1		SOV-22	South	147	17	148	80	0	-51	3	32		
		SOV-23	North	154	22	156	82	-10	-52	3	23		
		SOV-24	North	130	22	132	80	-10	-50	3	23		
		SOV-25	North	129	22	131	84	-10	-50	3	27		
		SOV-26	North	147	22	149	84	-10	-51	3	26		
1		SUV-27	North	154	23	156	82	-10	-52	3	23	1	
		SOV-28	South	148	22	150	84	-10	-51	3	36		
		SOV-298	North	159	22	158	80	-10	-02	3	21	1	
		SOV-30	North	131	22	133	80	-10	-50	3	23		
1		SOV-31	North	139	31	142	85	-10	-51	3	27	56	65

Remark:

[1] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver. [2] As a conservative approach, only horizontal distance has been considered in the calculation of distance correction.

Fixed Plant Noise Calculation - SOV (Night-time Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontial Distance , m	Vertical Distance relative to the assessment point, m	Slant Distance,m	SWL, dB(A)	Correction for line of sight ^[1] , dB(A)	Distance Correction of Point Source ^[2] , dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	NCO Night-time Noise Criteria, dB(A)
SCL(HUH-ADM) -	SOV												
CH1													
CH1	Hoi Deen Court, 276 -	SOV-01	South	105	3	105	82	0	-48	3	37		
	279, Gloucester Road,	SOV-02	South	110	3	110	79	0	-49	3	33		
		SOV-04	South	91	3	91	79	0	-47	3	35		
		SOV-05	Southeast	96	4	90	79	-10	-48	3	24		
		SOV-08	East	93	1	93	88	0	-47	3	44		
		SOV-10	South	121	3	121	84	0	-50	3	37		
		SOV-11	West	127	3	127	84	-10	-50	3	27		
		SOV-12	West	130	3	130	83	-10	-50	3	26		
		SOV-13	South	97	1	97	81	0	-30	3	36		
		SOV-22	South	88	5	89	70	0	-47	3	26		
		SOV-23	North	93	1	93	72	-10	-47	3	18		
		SOV-24	North	119	1	119	70	-10	-50	3	13		
		SOV-25	North	120	0	120	74	-10	-50	3	17		
		SOV-26	North	99	2	99	74	-10	-48	3	19		
		SOV-28	South	89	0	89	74	0	-47	3	30		
		SOV-29A	North	88	0	88	70	-10	-47	3	16		
		SOV-29B	North	90	1	90	70	-10	-47	3	16		
		SOV-30	North	118	0	118	70	-10	-49	3	14		
CH2		SOV-31	North	109	9	109	75	-10	-49	3	19	47	55
CH2	Hoi Kung Court, 264 -	SOV-01	South	62	3	62	82	0	-44	3	41	1	
	268, Gloucester Road,	SOV-02	South	64	3	65	79	0	-44	3	38		
		SOV-04	South	55	3	55	79	0	-43	3	39		
		SOV-05	North	64	4	64	79	-10	-44	3	28		
		SOV-06	Fast	86 79	1	80 79	76	0	-47	3	32	-	
		SOV-10	South	73	3	73	84	0	-45	3	43		
		SOV-11	West	82	3	82	84	-10	-46	3	31		
		SOV-12	West	83	3	83	83	-10	-46	3	30		
		SOV-13	Тор	79	4	79	84	0	-46	3	41		
		SOV-21	South	57	5	54	81 70	0	-43	3	41		
		SOV-22 SOV-23	North	63	1	63	72	-10	-43	3	21		
		SOV-24	North	76	1	76	70	-10	-46	3	17		
		SOV-25	North	76	0	76	74	-10	-46	3	21		
		SOV-26	North	65	0	65	74	-10	-44	3	23		
		SOV-27	North	63	2	63	72	-10	-44	3	21	-	
		SOV-29A	North	62	0	62	74	-10	-43	3	19		
		SOV-29B	North	62	1	62	70	-10	-44	3	19		
		SOV-30	North	75	0	75	70	-10	-46	3	17		
0110		SOV-31	North	69	9	70	75	-10	-45	3	23	50	55
CH3	Elizabeth House Block	SOV-01	South	131	18	133	82	0	-50	3	35	1	
0110	C, 250 - 254,	SOV-02	South	127	18	129	79	0	-50	3	32	1	
	Gloucester Road,	SOV-04	South	145	18	146	79	0	-51	3	31		
		SOV-05	North	150	18	151	79	-10	-52	3	20		
		SOV-06	Southeast	184	20	185	76	0	-53	3	26		
		SOV-08	East	1/8	20	179	88	0	-53	3	38		
		SOV-10	West	124	19	125	84	0	-50	3	37		
		SOV-12	West	119	19	121	83	0	-50	3	36		
		SOV-13	Тор	124	17	125	84	0	-50	3	37		
		SOV-21	South	139	20	140	81	0	-51	3	33		
		SOV-22	South	147	1/	148	70	-10	-51	3	22	-	
		SOV-23	North	134	22	130	70	-10	-52 -50	3	13	1	
		SOV-25	North	129	22	131	74	-10	-50	3	17	1	
		SOV-26	North	147	22	149	74	-10	-51	3	16		
		SOV-27	North	154	23	156	72	-10	-52	3	13	4	
		SOV-28	South	148	22	150	74	0	-51	3	26	-	
		SOV-29A SOV-29B	North	159	22	158	70	-10	-52	3	11	1	
		SOV-30	North	131	22	133	70	-10	-50	3	13	1	
		SOV-31	North	139	31	142	75	-10	-51	3	17	46	55

Remark:

[1] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver. [2] As a conservative approach, only horizontal distance has been considered in the calculation of distance correction.

Fixed Plant Noise Calculation - EXC (Daytime & Evening Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m ^[1]	SWL, dB(A)	Correction for line of sight ^[2] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	NCO Daytime Noise Criteria, dB(A)
Exhibition Station											
EX 1											
Daytime											
X 1	Causeway Centre, Block	EXH VS1	South	116	76	0	-49	3	30		
	A	EXH VS2	Тор	294	98	-10	-57	3	34		
		EXH VS3	Тор	287	117	-10	-57	3	53		
		EXH VS4	Тор	273	82	-10	-57	3	18		
		EXH VS5	North	136	74	-10	-51	3	16		
		EXH VS6	North	131	75	-10	-50	3	18		
		EXH VS7	Тор	124	94	0	-50	3	47		
		EXH VS8	Тор	117	92	0	-49	3	46		
		EXH VS12	East	125	95	-10	-50	3	38		
		EXH VS15	Тор	128	84	0	-50	3	37		
		EXH VS16	East	117	79	-10	-49	3	23		
		EXH VS20	South	103	88	0	-48	3	43		
		EXH VS21	South	95	85	0	-48	3	40		
		EXH VS22	South	93	80	0	-47	3	36		
		EXH VS23	West	93	77	0	-47	3	33		
		EXH VS25	Тор	274	103	-10	-57	3	39		
		EXH VS26	Тор	264	99	-10	-56	3	36		
		EXH VS28	South	205	92	-10	-54	3	31		
		EXH VS29	South	205	94	-10	-54	3	33		
		EXH VS30	West	209	87	-10	-54	3	26		
		EXH VS32	North	196	88	-10	-54	3	27		
		EXH VS35	South	184	84	-10	-53	3	24		
		EXH VS36	North	190	84	-10	-54	3	23		
		EXH VS37	East	187	79	-10	-53	3	19		
		EXH VS38	South	188	83	-10	-53	3	23		
		EXH VS39	South	188	83	-10	-53	3	23		
		EXH VS40	East	184	82	-10	-53	3	22		
		EXH VS41	East	166	77	-10	-52	3	18		
		EXH VS42	East	166	81	-10	-52	3	22		
		EXH VS43	North	177	91	-10	-53	3	31		
		EXH VS44	South	166	78	-10	-52	3	19		
		EXH VS45	South	167	80	-10	-52	3	21		
		EXH VS46	East	140	100	-10	-51	3	42		
		EXH VS47	Тор	140	99	0	-51	3	51		
		EXH VS48	Тор	131	82	0	-50	3	35		
		EXH VS49	East	122	98	-10	-50	3	41		
		EXH VS50	South	174	87	-10	-53	3	27		
		EXH VS51	South	102	103	0	-48	3	58		
		EXH VS52	North	225	83	-10	-55	3	21		
		EXH VS53	North	135	71	-10	-51	3	13		
		EXH VS54	North	133	67	0	-50	3	20		
		EXH VS55	West	191	78	0	-54	3	27		
		EXH VS56	West	189	80	0	-54	3	29		
		EXH VS57	West	103	71	0	-48	3	26		
		EXH VS58	West	98	72	0	-48	3	27		
		EXH VS59	North	208	81	0	-54	3	30		
		EXH VS60	Lop	280	77	-10	-57	3	13		
		EXH VS66	North	138	69	-10	-51	3	11		
		EXH VS68	North	210	74	-10	-54	3	13	60	60

Remark:

[1] As a conservative approach, only horizontal distance has been considered in the calculation of distance correction.

[2] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver.

Fixed Plant Noise Calculation - EXC (Night-time Period)

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m ^[1]	SWL, dB(A)	Correction for line of sight ^[2] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A)	Total SPL, dB(A)	NCO Daytime Noise Criteria, dB(A)
Exhibition Station											
EX 1											
Night-time											
EX 1	Causeway Centre, Block	EXH VS1	South	116	66	0	-49	3	20		
	A	EXH VS2	Тор	294	88	-10	-57	3	24		
		EXH VS3	Тор	287	108	-10	-57	3	44		
		EXH VS4	Тор	273	73	-10	-57	3	9		
		EXH VS5	North	136	64	-10	-51	3	6		
		EXH VS6	North	131	65	-10	-50	3	8		
		EXH VS7	Тор	124	84	0	-50	3	37		
		EXH VS8	Тор	117	82	0	-49	3	36		
		EXH VS12	East	125	85	-10	-50	3	28		
		EXH VS15	Тор	128	74	0	-50	3	27		
		EXH VS16	East	117	69	-10	-49	3	13		
		EXH VS20	South	103	79	0	-48	3	34		
		EXH VS21	South	95	75	0	-48	3	30		
		EXH VS22	South	93	70	0	-47	3	26		
		EXH VS23	West	93	68	0	-47	3	24		
		EXH VS25	Тор	274	94	-10	-57	3	30		
		EXH VS26	Тор	264	90	-10	-56	3	27		
		EXH VS28	South	205	83	-10	-54	3	22		
		EXH VS29	South	205	85	-10	-54	3	24		
		EXH VS30	West	209	78	-10	-54	3	17		
		EXH VS32	North	196	79	-10	-54	3	18		
		EXH VS35	South	184	74	-10	-53	3	14		
		EXH VS36	North	190	75	-10	-54	3	14		
		EXH VS37	East	187	70	-10	-53	3	10		
		EXH VS38	South	188	74	-10	-53	3	14		
		EXH VS39	South	188	74	-10	-53	3	14		
		EXH VS40	East	184	73	-10	-53	3	13		
		EXH VS41	East	166	68	-10	-52	3	9		
		EXH VS42	East	166	72	-10	-52	3	13		
		EXH VS43	North	177	82	-10	-53	3	22		
		EXH VS44	South	166	69	-10	-52	3	10		
		EXH VS45	South	167	/1	-10	-52	3	12		
		EXH VS46	East	140	91	-10	-51	3	33		
		EXH VS47	Тор	140	90	0	-51	3	42		
			Тор	131	73	0	-50	3	26		
			East	122	89	-10	-50	3	32		
			South	174	78	-10	-53	3	18		
			South	102	-	0	-48	3	-		
			North	220	73	-10	-00	3	2		
			North	130	57	-10	-51	3	3		
		EXI 1 V 304	NUITI West	101	69	0	-50	3	10		
		EXH V956	West	191	70	0	-04	3	10		
		EXH VS50	West	109	61	0	-04	3 2	19		
		EXH VS58	West	98	62	0	-40	3	17		
		EXH VS59	North	208	71	0	+0	3	20		
		EXH VS60	Top	280	67	-10	-57	3	20		
		EXH VS66	North	138	59	-10	-51	3	1		
		EXH VS68	North	210	64	-10	-54	3	3	48	50

Remark:

[1] As a conservative approach, only horizontal distance has been considered in the calculation of distance correction.

[2] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings and negative correction of 5 dB(A) for NSR do not have direct line of sight to the louver.

Appendix B

Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources

Appendix B1

Measurement Methodology

Method 1: Far-Field Testing Method for Louver



a: Short side of the louver

b: Long side of the louver

D: Measurement distance (separation between louver and microphone), where D must be greater than (2b) and rounded up to interger.

Louver opening

Proposed measurement point (microphone pointing perpendicular to the center of the louvre)

For method 1,

- "D" must be greater than 2b and round up to integer.
- The microphone must point to the center of the louver.
- At least 3 sets of LAeq, 1 min should be obtained.
- Background noise measurement should be obtained for determination of background correction factor.
- Any reason causing this method cannot be performed, noise measurement should then be conducted at near field in accordance with Method 2.
- If results of measurement reveal that difference in noise levels measured at far field with and without operation of fixed plant item is less than 3.0dB(A), noise measurement should then be conducted at near field in accordance with Method 2.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ measured \ L_{Aeq, \ 1 \ min} + 20log(D) + 8 + background \ noise \ correction \ factor$

Method 2: Near-Field Testing Method for Louver



D: Measurement distance

- Louver opening
- Measurement box
- Proposed measurement point (microphone pointing perpendicular to the louvre)

For method 2 (developed based on the principle of ISO3746:2010),

- First step is to determine a hypothetical measurement surfaces with at least 1m separation (D, measured from the centre of the louvre or its nearest edges as appropriate) from the louver.
- For louvre with largest dimension ≤3D, at least one measurement at the centre of the measurement surface parallel to the louvre should be conducted.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- Extra localized microphone positions on the measurement surfaces in the region of high radiation should be considered. In this case follow the procedures of ISO3744.
- For louver with largest dimension > 3D, measurement surface and measurement position should follow ISO3746.
- Background noise level should be taken at each measurement point for determining the background correction (K1A).
- If the difference between the background noise and the measured noise level is less than 3.0dB, K1A should be capped to 3.0dB.
- If necessary to obtain less conservative results, D should be reduced according to ISO3746 to obtain higher measured noise levels.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ LAeq \ over \ all \ measurement \ points + 10 \ log \ (total surface \ area \ over \ the \ measurement \ box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection

Method 3 - Far Field Testing Method for Plant Item



"L" is the longest side of the plant item

"D, Center" is the separation between center of the plant item and microphone

"D, Surface" is the separation between surface of the plant item and microphone

- "D, Surface" must be greater than twice of L (2L) and roundup to integer (e.g 6m, 7m, 8m...).
- The microphone must be pointing to the center of the plant.
- Measurement should be carried out at the direction toward all NSRs.
- At least 3 sets of $L_{Aeq, 1}$ min should be obtained at each the measurement point.
- Background noise measurement should be obtained for determination of background correction factor.
- Any reason causing this method cannot be performed, noise measurement should then be conducted at near field in accordance with latest edition of ISO3746 (Method 4).
- If results of measurement reveal that difference in noise levels measured at far field with and without operation of fixed plant item is less than 3.0 dB(A), noise measurement should then be conducted at near field in accordance with latest edition of ISO3746 (Method 4).
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

SWL = Mean measured $L_{Aeq, 1 min} + 20 \log (D,Center) + 8 + background noise correction factor$

Method 4 – Near Field Testing Method for Plant Item

Kev

For Method 4 (based on ISO3746:2010),

- Please refer to latest edition of ISO3746 for measurement requirement.
- The locations of measurement points are depended on the size of the plant, which cannot be easily generalized (see figure for example)
- Background noise measurement should be obtained for determination of background correction factor (K1A). According to ISO3746, if the source under test radiates noise predominantly in one direction or if the noise from a large source is emitted only from a small portion of the source, the usage of extra localized microphone positions on the measurement surface in the region of high radiation should be considered. In this case, follow the procedures specified in ISO3744.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- Detail calculation of the SWL should refer to the latest edition of ISO3746.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean L_{Aeq} \text{ over all measurement points} + 10 \log (total surface area over the measurement box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection

Method 5 – Near Field Testing Method for Plant Room or other source



For Method 5 (developed based on the principle of ISO3746 -2010),

- First step is to determine a measurement box with at least 1m separation (measured from the centre of the louvre or its nearest edges as appropriate) from the louver.
- Secondly, is to determine the location of measurement points on the measurement surface of the hypothetical box.
- Extra localized microphone positions on the measurement surface in the region of high radiation should be considered. In this case follow the procedures of ISO 3744.
- Background noise level should be taken for determination of background correction (K1A.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- If the difference between the BGL and the measured noise level (MNL) is less than 3.0dB, K1A should be capped to 3.0dB.
- If necessary to obtain less conservative results. D should be reduced according to ISO3746 to obtain higher MNLs.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ L_{Aeq} \ over \ all \ measurement \ points + 10 \ log \ (total \ surface area \ over \ the \ measurement \ box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection Appendix B2

Calibration Certificates – Noise Measurement for Fixed Plant Noise

Appendix B2 Calibration Certificates – Noise Measurement for Fixed Plant Noise

Cert B1: Calibration Certificate of Sound Level Meter SVAN958 (SN: 20890)



CALIBRATION CERTIFICATE

Certificate Number MLCN211814S ntre,
ntre, 2023 $23 \circ C \pm 5 \circ C$ $55\% \pm 25\%$ Over 3 hours 10 minutes nternal battery
ntre, 2023 23 °C ± 5 °C 55% ± 25% 2ver 3 hours 10 minutes nternal battery
2023 23 °C ± 5 °C 55% ± 25% 20 minutes nemal battery
2023 23 °C ± 5 °C 55% ± 25% 2ver 3 hours 10 minutes nemal battery
2023 23 °C ± 5 °C 55% ± 25% Over 3 hours 10 minutes niemal battery
2023 23 °C ± 5 °C 55% ± 25% Over 3 hours 10 minutes nternal battery
23 °C \pm 5 °C 55% \pm 25% Dver 3 hours 10 minutes nternal battery
23 °C ± 5 °C 55% ± 25% Over 3 hours 10 minutes nernal battery
inimation pages.
77 KOLO 23-Jul-2021
ernational standards. at the time of the calibration and the uncertainties quoted will ntal changes, vibration and shock during transportation, o repeat the measurement. te resulting from the use of the EUT. 1. No part of this Certificate may be reproduced without the Page 1 of 2

MaxLab Calibration Centre Limited 香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B 室 Unit B, 9/F., Boldwin Industrial Bidg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tei: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk



CALIBRATION CERTIFICATE

_

	23-Jul-2021		Certificate Num	MLCN2118148
Customer Informatio	0 n		Part Children And Andrews	and the second
Company Name Address	Wilson Ho and Unit 601, Bloc Yuen Shun Cir Shatin, NT	Associates Limited k A, Shatin Industrial (cuit,	Centre,	
Equipment-under-To	est (EUT)			
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibra Svantek SVAN 958 20890	ation Analyser		
Calibration Particul	ar			
Date of Calibration Calibration Equipment	23-Jul-2021 4231(MLTE00	08) / AV200063 / 23-Ju	m-2023	
Calibration Procedure	MLCG00, ML	CG15		
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	23 °C \pm 5 °C 55% \pm 25% Over 3 hours 10 minutes Internal battery	
Calibration Results	Calibration dat	a were detailed in the	continuation pages.	
Calibration Results Approved By & Date	Calibration dat	a were detailed in the	continuation pages.	
Calibration Results Approved By & Data Statements	Calibration dat	a were detailed in the	Continuation pages.	23-Jul-202
Calibration Results Approved By & Data Statements Calibration equipment usee The results on this Calibrat not include allowance for t overloading, mishandling, MaxLab Calibration Centre The copy of this Certificat prior written approval of M	d for this calibration d for this calibration tion Certificate only he EUT long term d misuse, and the cap e Limited shall not t e is owned by MaxL faxLab Calibration (a were detailed in the are traceable to national / relate to the values measu rift, variation with environ acity of any other laboraton be liable for any loss or dar ab Calibration Centre Lim Centre Limited.	K.O, Lo K.O, Lo Mernational standards. ed at the time of the calibration and mental changes, vibration and shock y to repeat the measurement. nage resulting from the use of the E ted. No part of this Certificate may	23-Jul-202 the uncertainties quoted wi c during transportation, UT. be reproduced without the
Calibration Results Approved By & Date Statements Calibration equipment usee The results on this Calibrat not include allowance for t overloading, mishandling, MaxLab Calibration Centr The copy of this Certificate prior written approval of M	Calibration dat Calibration dat d for this calibration tion Certificate only he EUT long term d misuse, and the cap e Limited shall not t e is owned by MaxL faxLab Calibration (a were detailed in the are traceable to national / relate to the values measu rift, variation with environ acity of any other laborator be lable for any loss or dar ab Calibration Centre Lim Centre Limited.	K.O. Lo K.O. Lo Meriational standards. ed at the time of the calibration and shock y to repeat the measurement. Tage resulting from the use of the E tted. No part of this Certificate may	23-Jul-202 the uncertainties quoted wi c during transportation, UT. be reproduced without the Page 1 of
Calibration Results Approved By & Data Statements * Calibration equipment used * Calibration equipment used * The results on this Calibrat not include allowance for t overloading, mishandling, * MaxLab Calibration Centre * The copy of this Certificate prior written approval of M	Calibration dat Calibration dat d for this calibration ion Certificate only he EUT long term d misuse, and the cap e Limited shall not t is owned by MaxL faxLab Calibration (a were detailed in the of a second se	K.O. Lo K.O. Lo Mermational standards. ed at the time of the calibration and mental changes, vibration and shock y to repeat the measurement. nage resulting from the use of the E ted. No part of this Certificate may	23-Jul-202 the uncertainties quoted wi during transportation, UT. be reproduced without the Page 1 of
Calibration Results Approved By & Data Statements * Calibration equipment usee * The results on this Calibrat not include allowance for t overloading, mishandling, * MaxLab Calibration Centre * The copy of this Certificat prior written approval of M	Calibration dat Calibration dat d for this calibration tion Certificate only he EUT long term d misuse, and the cap e Limited shall not t is owned by MaxL faxLab Calibration of	a were detailed in the are traceable to national / relate to the values measu trift, variation with environ acity of any other laboraton se liable for any loss or dan ab Calibration Centre Lim Centre Limited.	K.O. Lo K.O. Lo Mernational standards. ed at the time of the calibration and mental changes, vibration and shock y to repeat the measurement. nage resulting from the use of the E ted. No part of this Certificate may	23-Jul-202 the uncertainties quoted wi a during transportation, UT. be reproduced without the Page 1 of

Cert B2: Calibration Certificate of Sound Level Meter SVAN958 (SN: 28422)



CALIBRATION CERTIFICATE

Certificate Information	911		
Date of Issue	12-May-2020	Certificate Number	MLCN201165S
Customer Informatio	n	and the second second	
Company Name Address	Wilson Accoustics Limited Unit 601, Block A, Shatin Industrial C Yuen Shun Circuit, Shatin, N. T., Hong Kong	entre.	
Equipment-under-Te	est (EUT)		
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibration Analyser Svantek SVAN 958 28422 		
Calibration Particula	ar		
Date of Calibration Calibration Equipment	12-May-2020 4231(MLTE008) / AV180068 / 13-Ma	ay-2020	
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory Temperature Relative Humidity EUT Stabilizing Time Warm-up Time Power Supply	$23 \circ C \pm 5 \circ C$ $55\% \pm 25\%$ Over 3 hours 10 minutes Internal battery	
Calibration Results	Calibration data were detailed in the o	continuation pages.	
	/	6 K.O. Lo	12-May-2020
Statements Calibration equipment uses The results on this Calibrat not include allowance for t overloading, mishandling, MaxLab Calibration Centr The copy of this Certificat prior written approval of M	d for this calibration are traceable to national / tion Certificate only relate to the values measur he EUT long term drift, variation with environ misuse, and the capacity of any other laborator e Limited shall not be liable for any loss or dar e is owned by MaxLab Calibration Centre Lim faxLab Calibration Centre Limited.	international standards. red at the time of the calibration and the mental changes, vibration and shock du y to repeat the measurement. nage resulting from the use of the EUT. ited. No part of this Certificate may be	uncertainties quoted will ring transportation, reproduced without the

Page 1 of 2





Certificate No. MLCN201165S

Calibration	Data							1000			
Channel / Mode	Filter / Detector	Range		EUT Reading		Stand: Read	ard ing	EUT Er	ror	Calibrati Uncertaii	on nty
CH4 / Sound	A / FAST	105	dB	94.0 dl	B	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	94.1 dI	B	94.0	dB	0.1	dB	0.2	dB
				114.0 dl	B	114.0	dB	0.0	dB	0.2	dB
	C / FAST	105	dB	94.0 dl	B	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	94.1 dl	В	94.0	dB	0.1	dB	0.2	dB
				114.0 dl	B	114.0	dB	0.0	dB	0.2	dB
	LIN / FAST	105	dB	94.0 dl	B	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	94.1 dl	B	94.0	dB	0.1	dB	0.2	dB
			1	114.0 d	B	114.0	dB	0.0	dB	0.2	dB
	A / SLOW	105	dB	94.0 d	B	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0 d	В	114.0	dB	0.0	dB	0.2	dB
	C / SLOW	105	dB	94.0 d	В	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0 d	В	114.0	dB	0.0	dB	0.2	dB
	LIN / SLOW	105	dB	94.0 d	В	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0 d	B	114.0	dB	0.0	dB	0.2	dB
	A / IMPULSE	105	dB	94.0 d	B	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0 d	B	114.0	dB	0.0	dB	0.2	dB
	C / IMPULSE	105	dB	94.0 d	IB	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0 d	B	114.0	dB	0.0	dB	0.2	dB
	LIN / IMPULSE	105	dB	94.0 d	IB	94.0	dB	0.0	dB	0.2	dB
	(1 kHz Input)	130	dB	114.0 d	IB .	114.0	dB	0.0	dB	0.2	dB

- END -

Calibrated By : Date :

Dan 12-May-2020 Checked By : Date :

12-May-2020 Page 2 of 2

K.O. Lo

萬儀校正中心有限公司 MaxLab Calibration Centre Limited 香港新界葵蒲華星街 16-18 號保盈工業大厦 9 樓 B 室 Unit B, 9/F., Boldwin Industrial Bidg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tei: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk
Cert B3: Calibration Certificate of Sound Level Meter SVAN958 (SN: 59120)



CALIBRATION CERTIFICATE

Date of Issue	17-Nov-2020		C	1122 11 12/27 21	The second se
			Cert	ificate Number	MLCN203076S
Customer Informatic	on and a start st				18 Martine Cha
Company Name	Wilson Accous	tics Limited			
Address	Unit 601, Block	A, Shatin Industrial C	Centre,		
	Yuen Shun Cire	cuit.			
	Shatin, N. T.,				
	Hong Kong				
Equipment-under-Te	est (EUT)				
Description	Sound & Vibra	tion Analyser			
Manufacturer	Svantek				
Model Number	SVAN 958				
Serial Number	59120				
Equipment Number					
Calibration Particul	ar				Statistics of the second
Data of Calibration	17 Nov 2020				
Date of Calibration	4231/MI TE00	8) / AV200063 / 23-Iu	in-2023		
canbration Equipment	4231(141211200	8/1 / 1 2000051 25-50	11-2020		
C. III. J. D. J.	MLCCOO ML	0015			
Calibration Procedure	INILCOUD, MIL				
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C		
		Relative Humidity	55% ± 25%		
	EUI	Stabilizing Time	Over 3 nours		
		Power Supply	Internal batter	CV.	
	[C.11]	Tower supply	Internal batter		
Calibration Results	Calibration dat	a were detailed in the	continuation pa	ges.	
Approved By & Date	e		1	AND THE REAL PROPERTY.	
		-	lo	K.O. Lo	17-Nov-202
C		A CONTRACTOR OF THE OWNER	States of the local division in the	and the second	
Statements * Calibration conjument use	d for this calibration	are traceable to national /	international stand	ards.	
 The results on this Calibra 	tion Certificate only	relate to the values measu	red at the time of t	he calibration and the	uncertainties quoted wi
not include allowance for t	the EUT long term of	Irift, variation with environ	mental changes, v	ibration and shock dur	ing transportation,
overloading, mishandling,	misuse, and the cap	acity of any other laborato	ry to repeat the me	asurement.	
 MaxLab Calibration Central The copy of this Certificat prior written approval of M 	e is owned by MaxI AaxLab Calibration	ab Calibration Centre Lim Centre Limited.	ited. No part of th	is Certificate may be	reproduced without the



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Certificate No. MLCN203076S

Calibration	Data					
Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A / FAST	105 dE	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dE	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / FAST	105 dE	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dE	94.0 dB	94,0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / FAST	105 dE	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dE	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / SLOW	105 dE	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dF	3 114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C/SLOW	105 dF	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / SLOW	105 dI	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / IMPULSE	105 dI	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / IMPULSE	105 dI	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / IMPULSE	105 dI	3 93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dB	114.0 dB	0.0 dB	0.2 dB

- END -

Calibrated By : Date :

Dan 17-Nov-2020 Checked By : Date :

17-Nov-2020 Page 2 of 2

K.O. Lo

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Cert B4: Calibration Certificate of Sound Level Meter SVAN958 (SN: 59121)



CALIBRATION CERTIFICATE

Certificate Informati	ion	CAL Production of the		
Date of Issue	31-Oct-2020		Certificate Number	MLCN202867S
Customer Informatio	on			
Company Name	Wilson Accoust	ics Limited		
Address	Unit 601, Block	A, Shatin Industrial G	Centre,	
	Yuen Shun Circ	uit,		
	Shatin, N. T.,			
	Hong Kong			
Equipment-under-Te	est (EUT)			CALL MARKING ST
Description	Sound & Vibrat	ion Analyser		
Manufacturer	Svantek			
Model Number	SVAN 958			
Serial Number	59121			
Equipment Number				
Calibration Particul	ar			
Date of Calibration	31-Oct-2020			
Calibration Equipment	4231(MLTE008	3) / AV200063 / 23-Ju	n-2023	
		0.15		
Calibration Procedure	MLCG00, MLC	.615	F	
Calibration Conditions	Laboratory	Temperature	$23 °C \pm 5 °C$	
	THE PP	Relative Humidity	55% ± 25%	
	EUI	Stabilizing Time	Over 5 hours	
		Power Supply	Internal battery	
C-lib-stine D-sector	Calibertian data	rower suppry	Internal battery	
L'andration Results	Calibration data	were detailed in the o	continuation pages.	
Approved By & Date				Children and Children of the
			1	
			- L K.O. Lo	31-Oct-2020
Statements	Contraction of the local division of the loc		The second second second	And the second
Calibration equipment used	for this calibration a	are traceable to national / i	nternational standards.	
 The results on this Calibrati not include allowance for the 	ton Certificate only r	elate to the values measur	ed at the time of the calibration and the i	incertainties quoted will
overloading, mishandling, r	misuse, and the capar	city of any other laborator	y to repeat the measurement.	ing transportation,
	Limited shall not be	liable for any loss or dan	hage resulting from the use of the EUT.	
 MaxLab Calibration Centre 	is owned by MaxLa	b Calibration Centre Limi	ted. No part of this Certificate may be r	eproduced without the
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Appendix B2 - Page 7



Certificate No. MLCN202867S

Calibration	Data	The second second				The second second
Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A / FAST	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / FAST	105 dB	94.0 dB	94.0 dB	0,0 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / FAST	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / SLOW	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C/SLOW	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / SLOW	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / IMPULSE	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / IMPULSE	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / IMPULSE	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB

- END -

Calibrated By : Date :

. .

Dan 31-Oct-2020 Checked By : Date :

31-Oct-2020 Page 2 of 2

K.O. Lo

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Cert B5: Calibration Certificate of Sound Level Meter SVAN959 (SN: 11228)



CALIBRATION CERTIFICATE

Certificate Information	on		a sur a star in the second	Kar and Kara
Date of Issue	12-May-2020]	Certificate Number	MLCN201166S
Customer Informatio	on and a second s	The Part of the Party of the Pa	C. S. C. S.	a contract data
Company Name	Wilson Accoust	ics Limited		
Address	Unit 601, Block	A, Shatin Industrial C	Centre,	
	Yuen Shun Circ	uit,		
	Shatin, N. T.,			
	Hong Kong			
Equipment-under-Te	est (EUT)			1. The States
Description	Sound & Vibrat	ion Analyser		
Manufacturer	Svantek			
Model Number	SVAN 959			
Serial Number	11228			
Equipment Number				
Calibration Particul	ar			And subscription in the sub-
Data of Calibratia=	12-May-2020			
Date of Calibration	12-May-2020	8) / AV180068 / 13-M	av-2020	
Calibration Equipment	4231(MIL1E000	5) / 24 / 100000 / 15-14	ay-2020	
Calibration Procedure	MLCG00, MLC	CG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C	
Cultor actions		Relative Humidity	55% ± 25%	
	EUT	Stabilizing Time	Over 3 hours	
		Warm-up Time	10 minutes	
		Power Supply	Internal battery	
Calibration Results	Calibration data	a were detailed in the	continuation pages.	
	All calibration	results were within EU	JT specification.	
Approved By & Date	2			
			ROLO	12-May-2020
			K.U. LU	12-Willy=2020
Statements		are traceable to national /	international standards	Contraction of the local diversity of the
 Calibration equipment used The results on this Calibrat 	tion Certificate only	relate to the values measu	red at the time of the calibration and	he uncertainties quoted wil
not include allowance for t	he EUT long term di	rift, variation with environ	mental changes, vibration and shock	during transportation,
overloading, mishandling,	misuse, and the capa	city of any other laborator	y to repeat the measurement.	
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prior written approval of w	nastao canoration (CHILD LITTING.		
				Page 1 of 2

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Certificate No. MLCN201166S

Calibration Dat	a	the state of the state	Sulta Sulta Santa		and the second second	
Weighting / Time	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
A / FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
		114.0 dB	114.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
C / FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Z / FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
	HIGH	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	114.0 dB	114.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
C / SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Z / SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
A / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	114.0 dB	114.0 dB	0.0 dB	0.2 dB	\pm 0.7 dB
C / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Z / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB

- END -

Calibrated	By	:	
Date :			

Dan 12-May-2020

K.O. Lo Checked By : 12-May-2020 Date :

Page 2 of 2

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Cert B6: Calibration Certificate of Sound Level Meter SVANTEK979 (SN: 46199)



Calibration Certificate

Certificate No	. 110716		Page	1 of 4 Pages
Customer :	Beexergy Consulting Limited	1		
Address :	Unit 2001-05, Apec Plaza, 4	9 Hoi Yuen Road, Kwu	n Tong, Kowloon,	Hona Kona
Order No. :	Q14208	5 11 M S 6 19 19 19 19 19 19 19 19 19 19 19 19 19	Date of receipt	t : 1-Nov-21
Item Tested	1			
Description	: Sound Level Mater & Volumi	on Mater with Misseline	Canada	
Manufacturer	: SVANTEK	on meter with vibration	Sensor	
Model	: SVAN 979, SV 80		Serial No.	: 46199
Test Condit	lons			10100
Date of Test :	16-Nov-21		Gunnhi Valles	2 100
Amblent Tem	perature : (23 + 3)*C		Belether Hurst	
Test Specifi	ications			
	328			
Calibration che	ck,			
Ref. Document	/Procedure: Z01, IEC 61672,	M41, JJG 676-2000.		
Test Result	5			
All results were	wilhin the IEC 61672 Type 1	or manufacturer's spec	ification tuthers a	annicable)
The results are	shown in the attached page(s).	Anderson (Antique e	(ppicalite)
Upin Test anuis	manlurad			
Fauloment No.	Description	0		Enclosed P
2017	Multi-Europhics Connection	Cart. No.		Traceable to
240	Sound Level Celevator	C211339		SCL-HKSAR
5012	Eucline Constator	100440		NIM-PRC & SCL-HKSAR
187A	SM Vibration Mater	01124		SCL-HKSAR
187B	Sid. Acceleromater	011344		NIM-PRC
5.85 8 .0		011345		SCLORKSAR, NIM-PRC
The values given in ill not include allov verloading, mis-ha or any loss or dam	this Colloration Certificate only relate nance for the equipment long term of inding, or the capability of any other 1 age resulting from the use of the equi	t to the values measured at Ift, variations with environme aboratory to repeat the mea pment.	the time of the test an ontar changes, vibratio summent. Hong Kon	nd any uncertaingles quoted M and shock during transportation. Ig Cellbration Ltd. shall not be liable
he lest equipment	used for cellbration are traceable to I by to the above Unit-Under-Test code	meenational System of Unit	s (SI), or by reference	to a natural constant.

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Certificate No. 110716

Page 2 of 4 Pages

Results :

- 1. Sound Level Meter
- 1.1 Self-generated noise: 16.0 dBA
- 1.2 Acoustical signal test

	UUT Set	tting			
Level Range	Octave Filter	Weight	Response	Applied Value (dB)	UUT Reading (dB)
Low	OFF	A	Fast	94.0	94.0
			Slow		94.0
		С	Fast		94.0
		Z	1.		94.0
	OFF	OFF A	Fast	114.0	114.0
1			Slow		114.0
-		C	Fast		114.0
		Z			114.0
	1/1	Α			114.1
	1/3				114.1

IEC 61672 Type 1 Spec. : ± 1.1 dB Uncertainty : ± 0.1 dB

1.3 Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.5	- 39.4 dB. + 2 dB
63 Hz	-26.2	- 26.2 dB, ±1.5 dB
125 Hz	-16.2	- 16.1 dB, ± 1.5 dB
250 Hz	-8.7	- 8.6 dB, ±1 dB
500 Hz	-3.3	- 3.2 dB, ±1.4 dB
1 kHz	0.0 (Ref)	0 dB ± 1.1 dB
2 kHz	+1.2	+ 12 dB + 16 dB
4 kHz	+1.0	+ 1.0 dB ± 1.6 dB
8 kHz	-1.0	- 1.1 dB. + 2.1 dB ~ -3.1 dB
16 kHz	-6.9	· 6.6 dB. + 3.5 dB 17.0 dB

Uncertainty : ± 0.1 dB

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Certificate No. 110716

Page 3 of 4 Pages

1.4 Frequency & Time weightings at 1 kHz

1.4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec
A	94.0	94.0 (Ref.)		+ 0.4 dB
¢	94.0	94.0	0.0	10.405
Z.	94.0	94.0	0.0	

1.4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	TEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)		+03dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	1

Uncertainty : ± 0.1 dB

2. Vibration Meter (Sensitivity Setting : 10.28 mV/m/s²)

2.1 Acceleration (159.2 Hz, RMS, HP 10)

UUT Range	Applied Value (m/s ²)	UUT Reading (m/s2)	Mfr's Spec	
Low	5,00	4.98	± 5 %.	
	10.00	9.98		
	20.00	19.91		
	50.0	49.8		
	90.0	89.6		
High	100.0	99.5		

2.2 Velocity (159.2 Hz, RMS, Vel 10)

Applied Value (mm/s)	UUT Reading (mm/s)
5.00	4,97
10.00	9.94
20.00	19.88
50.0	49.8
90.0	89.6

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Page 4 of 4 Pages

2.3 Displacement (40 Hz, P-P, Dil 10)

Applied Value	UUT Reading
200 µm	203 µm
500 µm	509 µm
1.000 mm	1.015 mm

2.4 Frequency Response (10 m/s2, HP 10)

Frequency (Hz)	UUT Reading (m/s ²)	Mfr's Spec.
10	9.2	± 3 dB
20	10.1	(0.5 Hz ~ 14 kHz)
40	10,1	(
80 (Ref.)	10.0 (Ref.)	
160	9.9	
500	9.7	
1 000	9.7	

Remarks : 1. UUT : Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. Atmospheric Pressure : 1 009 hPa.
- 4. Preamplifier model : SV 17 , S/N : 57845.
- 5. Microphone model: PCB 377B02, S/N: 308202.
- Firmware Version: 3.03.1
- 7. Power Supply Check: OK
- The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.
- 9. Accelerometer type : Svantek SV80, S/N : E3662.

----- END ------

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Cert B7: Calibration Certificate of Sound Level Meter Cirrus CR171B (SN: G071909)



Calibration Certificate

Certificate No.	011566		Page 1 of 4	Pages
Customer :	Beexergy Consulting Limited			
Address :	Unit 2001-05, Apec Plaza, 49	Hoi Yuan Road, Kwu	n Tang, Kowloon, Hong Kong	
Order No. :	Q04316		Date of receipt :	17-Nov-20
Item Tested				
Description :	Sound Level Meter			
Manufacturer :	Cirrus		LD. :	
Model :	CR:171B		Sorial No. : G071909	9
Test Conditi	ions			
Date of Teat :	25-Nov-20		Supply Voltage :	
Amblent Temp	erature : (23 ± 3)°C		Relative Humidity : (50 ± 25)	1%
Test Specifi	cations			
Calibration cher	ck.			
Ref. Document/	Procudure: Z01, IEC 61672, I	EC 61260.		
Test Results	8			
All recuits were	within the IEC 61672 class 1 c	r IEC 61260 Class 1	specification. (where applicable)	
The results are	shown in the attached page(s)			
Main Test equip	pment used:		To a state to	
Equipment No.	Description	Cert. No.	Traceable to	
S017	Multi-Function Generator	C190926	SUL-HRSAR	CI HKSAD
\$240	Sound Level Calibrator	003053	NIM-CPUC OL	JOE-HNOMN
The values given in will not include allor	this Galibration Certificate only relate wance for the equipment long term on	to the values measured s A, variations with environm	I the time of the test and any uncertaint nentsi changes, vibration and shock dur	es quotes ing transportation,
overloading, mis-ha	andling, or the capability of any other is	aboratory to repeat the me	rasurement. Hong Kong Calibration Ltd	shall not be liable
for any loss of data	age restang from the one of the ode	privatine.		
The test equipment The test coulds acc	t used for calibration are traceable to t sky to the above Unit-Under-Test only	riternational System of Un	its (SI), or by reference to a natural con	elent.
	A			
Calibrated by	40	Ap	proved by :	
	Elvá Chong	-	Nin wong	
This Certificate is issued. Here Kene Calibration 1.4	by d	Det	9: 25-reby-20	
United SHE, Visit Fung	Industral Centry, No. 56-76, Ta Cruex Ping Street	K, Kirei Chung, NT, Kong Kong		

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Certificate No. 011566

Page 2 of 4 Pages

Results :

Acoustical signal test

- 1. Self-generated noise: 19.7dBA
- 2. Reference Sound Pressure Level

UUT Setting					
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter	Applied Value (dB)	UUT Reading (dB)
20-140	A	F	OFF	94.0	94.0
		S	OFF		94.0
	C	F	OFF		94.0
	Z	F	OFF		94.0
	A	F	OFF	114.0	114.0
-		S	OFF		114.0
	C	F	OFF		114.0
	2	F	OFF		114.0

IEC 61672 Type | Spec. : ± 1.1 dB Uncertainty : ± 0.1 dB

Electrical signal tests

3. Frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.2	- 39.4 dB, ± 2 dB
63 Hz	-25.9	- 26.2 dB, ± 1.5 dB
125 Hz	-15.9	- 16.1 dB, ± 1.5 dB
250 Hz	-8.4	- 8.6 dB, ± 1 dB
500 Hz	-3.1	- 3.2 dB, ± 1.4 dB
l kHz	0.0 (Ref)	0 dB, ± 1.1 dB
2 kHz	+1.1	+ 1.2 dB, ± 1.6 dB
4 kHz	+0.7	+ 1.0 dB, ± 1.6 dB
8 kHz	-1.6	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-6.4	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : ± 0.1 dB

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Page 3 of 4 Pages

4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
٨	94.0	94.0 (Ref.)		± 0.4 dB
C	94.0	94.0	0.0	
7.	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)		± 0.3 dB
Slow	94.0	94.0	0.0]
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

5. Filter Characteristics

5.1 1/1 - Octave Filter

Frequency	Attenuation (dB)	IEC 61260 Class I Spec. (dB)
125 Hz	-61.0	< - 61
250 Hz	-56.2	< - 42
500 Hz	-52.2	<- 17.5
707 Hz	-3.3	- 2 5
kHz (Ref)		**
1.414 kHz	-3.8	- 2 5
2 kJ iz	-64.5	<- 17.5
4 kHz	-69.4	< - 42
8 kHz	-68.8	< - 61

Uncertainty : ± 0.25 dB

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Certificate No. 011566

Page 4 of 4 Pages

5.2 1/3 - Octave Filter

Frequency	Attenuation (dB)	IEC 61260 Class 1 Spec.(dB)
326 Hz	-65.6	< - 61
530 Hz	-\$5.1	<- 42
772 Hz	-28.8	< . 17.5
891 Hz	-3.3	+ 0.3 ~ - 5.0
1 kHz (Ref)	-	
1.122 kHz	-3.7	+ 0.3 - + 5.0
1.296 kHz	-27.9	<- 17.5
1.887 kHz	-66.3	< - 42
3.070 kHz	-74.3	<- 61

Uncertainty : ± 0.25 dB

Remarks : 1. UUT : Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not loss than 95%.
- 3. Atmospheric Pressure : 1 009hPa.
- 4. Preamplifler model : MV200F, S/N :5332F
- 5. Microphone model: MK224 , S/N : 608035B
- 6. Power Supply Check: OK
- 7. Firmware : V2.4.1569 (1529)
- The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END -----

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Cert B8: Calibration Certificate of Acoustic Calibrator SVANTEK SV30A (SN: 10814)



CALIBRATION CERTIFICATE

Certificate Information	on	State of the state of the			
Date of Issue	28-Sep-2021		С	ertificate Number	MLCN212726S
Customer Informatio	n				
Company Name Address	Wilson Accousti Unit 601, Block Yuen Shun Circu Shatin, N. T., Hong Kong	cs Limited A, Shatin Industrial C iit,	'entre,		
Equipment-under-Te	est (EUT)				
Description Manufacturer Model Number Serial Number Equipment Number	Acoustic Calibra Svantek SV 30A 10814 	tor			
Calibration Particula	ar				THE PARTY OF THE PARTY OF
Date of Calibration Calibration Equipment	28-Sep-2021 4231(MLTE008 1351(MLTE049) / AV200063 / 23-Ju) / MLEC21/06/02 / 5	in-23 5-Jun-22		
Calibration Procedure	MLCG00, MLC	G15			
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	$23 \text{ °C} \pm 5$ $55\% \pm 25$ Over 3 ho Not applie Internal b	°C % cable attery	
Calibration Results	Calibration data All calibration r	were detailed in the esults were within EU	continuation JT specifica	n pages. ation.	
Approved By & Date	e		1		the second second
		/	6	K.O. Lo	28-Sep-2021
Statements Calibration equipment use The results on this Calibra not include allowance for overloading, mishandling, MaxLab Calibration Centi The copy of this Certificat prior written approval of M	d for this calibration tion Certificate only the EUT long term dr misuse, and the capa re Limited shall not b to is owned by MaxLa daxLab Calibration C	are traceable to national / relate to the values measu ift, variation with environ city of any other laborato e liable for any loss or da ab Calibration Centre Lim entre Limited.	international red at the time amental chang ry to repeat th mage resulting itted. No part	standards. e of the calibration and the es, vibration and shock du e measurement. g from the use of the EUT of this Certificate may be	e uncertainties quoted will uring transportation, , reproduced without the
					Page 1 of



Certificate No. MLCN212726S

Calibration Data							
EUT Setting	Standard Reading	EUT Error from Setting	Calibration Uncertainty	EUT Specification			
94 dB	94.0 dB	0.0 dB	0.15 dB	± 0.3 dB			
114 dB	114.0 dB	0.0 dB	0.15 dB	± 0.3 dB			

- END -

Calibrated By :	Dan	Checked By :	K.O. Lo
	28-Sep-21	Date :	28-Sep-21
Date			Page 2 of 2



萬儀校正中心有限公司 MaxLab Calibration Centre Limited 香港新界莫涌華星街 16-18 號保盈工業大廈 9 樓 B 室 Unit B, 9/F., Boldwin Industrial Bidg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

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Cert B9: Calibration Certificate of Acoustic Calibrator SVANTEK SV35A (SN: 58708)

● Hong Kong Calibration Ltd。 費港校正 貿易公司

Calibration Certificate

Certificate No.	104111		Page	1	of	2	Pages
Customer :	Beexergy Consulting Limited						
Address :	Unit 2001-05, Apec Plaza, 49	Hoi Yuen Road, Kwur	n Tong, Kowloon,	Hon	g Ko	ng	
Order No. :	Q11504		Date of receipt	:			30-Apr-21
Item Tested							
Description :	Acoustic Calibrator						
Manufacturer :	Svantek		I.D.	:	217	598	
Model :	SV35A		Serial No.	:	587	08	
Test Conditi	ons						
Date of Test :	12-May-21		Supply Voltage	e :			
Amblent Temp	erature : (23 ± 3)*C		Relative Humk	dity :	(50	± 25	5) %
Test Specifi	cations						
Calibration char							
Ref. Document	Procedure: F21_Z02_IEC.60	942					
ner Docario	10000010. 121, 202, 120 00						
Test Results	5						
All results were	within the IEC 60942 Class 1	specifications.					
The results are	shown in the attached page(s	i).					
Test equipment	used:						
Equipment No.	Description	Cert. No.		Ira	ceab	he la	2
S014	Spectrum Analyzer	005018		NIN	I-PR	C &	SCL-HKSAR
S240	Sound Level Calibrator	003053		NIN	I-PR	C 8	SCL-HKSAR
S041	Universal Counter	101743		SC	L-HK	SAP	R
S206	Sound Level Meter	007031		SC	L-HK	SAP	R
The values along a	this Coloration Cortificate only relation	e to the values measured a	I the time of the test a	and an	y unc	ertal	nties guoted
will not include allo overloading, mis-hi for any loss of dam	wance for the equipment long term of andling, or the capability of any other age resulting from the use of the equi	rift, variations with environm laboratory to repeat the me apment.	vental changes, vibrat assurement. Hong Ko	ng Ca	id sho librati	ick di Ion Li	uring transportation, td, shall not be liable
The test equipment The test results ap	used for calibration are traceable to ply to the above Unit-Under-Test only	International System of Uni /	ts (SI), or by referenc	to a	natur	al co	astent.
				V	1		

Calibrated by	. H	Approved by :	(m	
	Elva Chong		Kin Wong	
This Certificate is Insued Hung Kong Calibration () Une 46, 349 I. Weil Fung Tel: 2425 6601 - Fair 240	ty d Industriel Canim, No. 58-76, Te Chuen Ping Statel Kive 5 8545	Date: 12-May-21 Chung.Nf.Hung Keng		

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Certificate No. 104111

Page 2 of 2 Pages

Results :

1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94.0	94.1	± 0.4 dB
114.0	114.1	

Uncertainty : ± 0.2 dB

 Short-term Level Fluctuation : 0.0 dB IEC 60942 Class I Spec. : ± 0.1 dB Uncertainty : ± 0.01 dB

3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	1.000	±1%

Uncertainty : ± 3.6 x 10⁻⁶

 Total Distortion : < 0.3% IEC 60942 Class 1 Spec. : < 4 % Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%-
- 3. Atmospheric Pressure : 996hPa.

----- END -----

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Appendix B3

Photographs showing the Examples of Noise Measurement for Fixed Plant Noise



Appendix B3 Photographs showing the Examples of Noise Measurement for Fixed Plant Noise



Appendix B4

Noise Measurement Results

Appendix B4 Noise Measurement Results

				Louvre/Co	oling Tower S	Size (mm)					
Location	Fixed Plant Source ID	Plant Type	Method	Height	Width	Length	Averaged Measured L _{Aeq} ,dB(A) ^(a)	Background L _{Aeq,} dB(A)	Difference L _{Aeq} ,dB(A)	Background Corrected L _{Aeq} ,dB(A) ^(b)	Calculated SWL _, dB(A)
	SOV-01	Ventilation Louver	2	N/A	3650	6210	65.8	63.3	2.5	62.8	82
	SOV-02	Ventilation Louver	2	N/A	3650	2990	65.5	63.3	2.2	62.5	79
	SOV-04	Ventilation Louver	2	N/A	3440	3440	65.1	63.8	1.3	62.1	79
	SOV-05	Ventilation Louver	2	N/A	3950	3500	63.1	61.3	1.8	60.1	79
	SOV-06	Ventilation Louver	2	N/A	1500	1600	67.7	64.3	3.4	65.1	76
	SOV-08	Ventilation Louver	2	N/A	4000	5310	70.1	63.7	6.4	69.0	88
	SOV-10	Ventilation Louver	2	5650	10950	N/A	65.2	64.2	1.0	62.2	84
	SOV-11	Ventilation Louver	2	5650	3900	N/A	66.3	59.5	6.8	65.3	84
	SOV-12	Ventilation Louver	2	5650	4450	N/A	66.9	66.6	0.3	63.9	83
	SOV-13	Ventilation Louver	2	N/A	6000	4650	65.5	58.7	6.8	64.4	84
SOV	SOV-21	Ventilation Louver	2	N/A	1800	1400	69.2	66.2	3.0	66.2	81
501	SOV-22	Ventilation Louver	2	N/A	500	250	64.0	60.0	4.0	61.8	70
	SOV-23	Ventilation Louver	2	N/A	400	400	63.0	62.1	0.9	60.0	72
	SOV-24	Ventilation Louver	2	N/A	400	400	61.3	60.8	0.5	58.3	70
	SOV-25	Ventilation Louver	2	N/A	400	400	67.0	60.0	7.0	66.0	74
	SOV-26	Ventilation Louver	2	N/A	400	400	65.2	62.4	2.8	62.2	74
	SOV-27	Ventilation Louver	2	N/A	500	900	62.0	58.6	3.4	59.4	72
	SOV-28	Ventilation Louver	2	N/A	400	400	66.3	64.5	1.8	63.3	74
	SOV-29A	Ventilation Louver	2	N/A N/A	500	500	61.2	58.8	2.4	58.2	70
	50V-29B	Ventilation Louver	2	IN/A NI/A	400	500	60.5	61.2	-0.7	57.5	70
	50V-30 FOV 21	Ventilation Louver	2	IN/A NI/A	400	400 5420	62.1	60.8 E8 2	2.0	56.2	70
	50V-51 EVH VS1	Ventilation Louver	2	N/A N/A	5600	600	56.0	54.2	3.9	53.0	66
	EXH VS2	Ventilation Louver	2	N/A N/A	1720	1530	74.1	62.7	11.0	74.1	88
	EXH VS2	Ventilation Louver	2	N/A	3250	4620	90.7	57.6	33.1	90.7	108
	EXH VS4	Ventilation Louver	2	N/A	2000	2000	59.9	55.8	41	57.8	73
	EXH VS5	Ventilation Louver	2	N/A	300	1400	54.5	51.8	2.7	51.5	64
	EXH VS6	Ventilation Louver	2	N/A	550	4000	52.1	47.3	4.8	50.3	65
	EXH VS7	Cooling Tower	4	3650	2990	4890	64.5	57.8	6.7	63.5	84
	EXH VS8	Cooling Tower	4	3650	2990	4890	62.3	57.8	4.5	60.3	82
	EXH VS12	Ventilation Louver	2	4600	9700	N/A	65.3	54.9	10.4	64.9	85
	EXH VS15	Ventilation Louver	2	N/A	5100	2900	56.8	49.3	7.5	56.0	74
	EXH VS16	Ventilation Louver	2	N/A	5600	2400	56.6	54.2	2.4	53.6	69
	EXH VS20	Ventilation Louver	2	N/A	1580	6400	61.3	49.0	12.3	61.3	79
	EXH VS21	Ventilation Louver	2	N/A	4330	6900	58.1	55.9	2.2	55.1	75
	EXH VS22	Ventilation Louver	2	N/A	4330	2090	55.9	54.2	1.7	52.9	70
	EXH VS23	Ventilation Louver	2	N/A	4330	3530	53.4	54.2	-0.8	50.4	68
	EXH VS25	Ventilation Louver	2	N/A	6000	6000	73.8	49.9	23.9	73.8	94
	EXH VS26	Ventilation Louver	2	N/A	6000	6000	70.1	49.9	20.2	70.0	90
	EXH VS28	Ventilation Louver	2	1600	6630	N/A	65.7	50.8	14.9	65.5	83
	EXH VS29	Ventilation Louver	2	2700	7530	N/A	66.4	50.8	15.6	66.2	85
	EXH VS30	Ventilation Louver	2	2400	2600	N/A	62.8	50.8	12.0	62.5	78
	EXH VS32	Ventilation Louver	2	2430 NI/A	2400	6050	58.4	54.8	3.6	55.9	79
	EXH VS36	Ventilation Louver	2	N/A N/A	2400	7080	58.6	53.2	5.0	57.1	74
	EXH VS37	Ventilation Louver	2	N/A N/A	2400	2450	56.9	55.2	17	53.9	70
EXC	EXH VS38	Ventilation Louver	2	N/A	3130	5780	58.4	55.5	2.9	55.4	70
	EXH VS39	Ventilation Louver	2	N/A	2400	6080	59.0	55.8	3.2	56.2	74
	EXH VS40	Ventilation Louver	2	N/A	2400	8400	57.1	55.8	1.3	54.1	73
	EXH VS41	Ventilation Louver	2	N/A	3000	2900	54.0	50.9	3.1	51.1	68
	EXH VS42	Ventilation Louver	2	N/A	1800	7830	56.0	52.5	3.5	53.5	72
	EXH VS43	Ventilation Louver	2	N/A	1800	10330	63.5	55.3	8.2	62.8	82
	EXH VS44	Ventilation Louver	2	N/A	1600	2180	56.6	52.9	3.7	54.3	69
	EXH VS45	Ventilation Louver	2	N/A	1800	4930	56.2	51.8	4.4	54.3	71
	EXH VS46	Ventilation Louver	2	6240	8600	N/A	70.2	54.9	15.3	70.2	91
	EXH VS47	Ventilation Louver	2	N/A	9700	4600	69.0	49.3	19.7	69.0	90
	EXH VS48	Ventilation Louver	2	N/A	5900	1500	57.1	49.3	7.8	56.4	73
	EXH VS49	Ventilation Louver	2	N/A	3100	2740	77.4	55.7	21.7	77.7	89
	EXH VS50	Ventilation Louver	2	N/A	1800	1800	63.4	50.9	12.5	63.4	78
	EXH VS51 (c)	Ventilation Louver	2	N/A	1050	3300	89.5	51.1	38.4	89.5	103
	EXH VS52	Ventilation Louver	2	N/A	730	3200	62.7	54.7	8.0	62.0	73
	EXH VS53	Ventilation Louver	2	N/A	730	730	53.6	51.8	1.8	50.6	61
	EXH VS54	Ventilation Louver	2	N/A	600	700	50.3	47.3	3.0	47.3	5/
	EXTL V555	Ventilation Louver	2	N/A	480	980	56.7	57.6	1.1	55./	08 70
	EXH V550	Ventilation Louver	2	N/A	480	980	51.5	51.0	2.0	48.5	61
	EXH VS58	Ventilation Louver	2	N/A	480	980	52.1	51.0	11	40.5	62
	EXH VS59	Ventilation Louver	2	N/A	760	800	59.8	54.4	5.4	58.3	71
	EXH VS60	Packaged Condenser Unit	4	930	770	1660	57.6	54.9	2.7	54.6	67
	EXH VS66	Ventilation Louver	2	N/A	710	1800	48.1	47.3	0.8	45.1	59
	EXH VS68	Ventilation Louver	2	N/A	710	2600	54.5	51.5	3.0	51.6	64

Remarks:
(a) Results are averaged from number of points in accordance with ISO3746.
(b) If the difference between the background and the measured noise level is less than 3.0 dB, background noise correction factor should be capped to 3.0dB
(c) This plant will only operate during night-time period.

Appendix C

Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs Appendix C1

Calibration Certificates – Noise Measurement at Representative NSRs



综合試驗 有限公司 SOILS & MATERIALS ENGINEERING CO., LTD. 香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.:	21CA0319 01-01		Page	1	of	2	
Item tested							
Description:	Sound Level Mete	er (Type 1)	Microphone		Preamn		
Manufacturer:	B & K		B&K		B&K		
Type/Model No.:	2250-L		4950		ZC0032		
Serial/Equipment No .:	2681366		2665582		17190		
Adaptors used:	-		-		-		
Item submitted by							
Customer Name:	AECOM ASIA CO	LTD					
Address of Customer:	-						
Request No.:	-						
Date of receipt:	19-Mar-2021						
Date of test:	23-Mar-2021						
Reference equipment	used in the calib	ration					
Description:	Model:	Serial No.	Expiry Date:		Traceah	le to:	
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021		CIGISME	0.	
Signal generator	DS 360	33873	19-May-2021		CEPREI	0	
Ambient conditions							
Temperature:	22 ± 1 °C						
Relative humidity:	55 ± 10 %						
Air pressure:	1005 ± 5 hPa						
Test specifications							

1, 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
- 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 security activation of the test of tes
- 3. 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:

Feng Junai

24-Mar-2021 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. The results apply to the item as received.

Date:

© Soils & Materials Engineering Co., Ltd.

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

HKAS has accredited this laboratory (Reg. No. HOKLAS 028) under HOKLAS for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Units (SI) or recognised measurement standards. The results relate only to the item(s) calibrated. This certificate shall not be reproduced except in full without approval of the laboratory.



試驗有限公司 SOILS & MATERIALS ENGINEERING CO., LTD.

香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0319 01-01

2 of

Page

2

1, **Electrical Tests**

The electrical tests were perfomed 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.

			Expanded	Coverage
Test:	Subtest:	Status:	Uncertanity (dB)	Factor
		100.0		
Self-generated noise	A	Pass	0.3	
	С	Pass	0.8	
	Lin	Pass	1.6	
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	A	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 1/10 ⁴ 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	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3. 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.



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.

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

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CERTIFICATE OF CALIBRATION

Certificate No.:	21CA0401 02	Page:	1	of	2	
Item tested						
Description:	Acoustical Calibr	ator (Class 1)				
Manufacturer:	B & K					
Type/Model No.:	4231					
Serial/Equipment No.:	3006428					
Adaptors used:						
Item submitted by						
Curstomer:	AECOM					
Address of Customer:	-					
Request No .:	-					
Date of receipt:	01-Apr-2021					
Date of test:	05-Apr-2021					
Reference equipment	used in the cali	bration				
Description:	Model:	Serial No.	Expiry Date:	т	raceable	to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	S	CL	
Preamplifier	B&K 2673	2743150	03-Jun-2021	C	EPREI	
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	C	EPREI	
Signal generator	DS 360	33873	19-May-2021	C	EPREI	
Digital multi-meter	34401A	US36087050	19-May-2021	C	EPREI	
Audio analyzer	8903B	GB41300350	18-May-2021	С	EPREI	
Universal counter	53132A	MY40003662	18-May-2021	C	EPREI	

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

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

Approved Signatory:

07-Apr-2021 Company Chop:



Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument. The results apply to the item as received.

Date:

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Form No.CARP156-1/Issue 1/Rev.D/01/03/2007

HKAS has accredited this laboratory (Reg. No. HOKLAS 028) under HOKLAS for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Units (SI) or recognised measurement standards. The results relate only to the item(s) calibrated. This certificate shall not be reproduced except in full without approval of the laboratory.



综合試驗有限公司 SOILS & MATERIALS ENGINEERING CO., LTD.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0401 02

Page: 2 of

of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency	Output Sound Pressure	Measured Output	Estimated Expanded
Shown	Level Setting	Sound Pressure Level	Uncertainty
Hz	dB	dB	dB
1000	94.00	94.23	

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz	STF = 0.016 dB
Estimated expanded uncertainty	0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz	Actual Frequency = 999.95 Hz

Estimated expanded uncertainty	0.1 Hz	Coverage factor k = 2.2
--------------------------------	--------	-------------------------

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz	TND = 0.3 %
Estimated expanded uncertainty	0.7 %

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.

1		- End -		
Calibrated by:	1	Checked by:	Jack	
	Fung Chi Yip		Chan Yuk Yiu	
Date:	05-Apr-2021	Date:	07-Apr-2021	

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.

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Form No.CARP156-2/Issue 1/Rev.C/01/05/2005

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Appendix C2

Photographs – Noise Measurement at Representative NSRs





Appendix C3

Measurement Results at Representative NSRs

Appendix C3 Noise Measurement Results at Measurement Locations

			Fixed Plant	Noise	Backgroun	d Noise	Difference between
				Measured Noise		Background Noise	Measured Noise Level
Measurement				Level, L _{Aeq 30mins} ,		Level, L _{Aeq 5mins} ,	and Background Level,
Location ID	Measurement Date	Operation Scenario (1)(2)	Measurement Time	dB(A)	Measurement Time	dB(A)	dB(A)
SOV							
CH2	2/24/2022	Daytime & Evening / Night-time	02:30:00 - 02:59:59	71.3	01:29:20 - 01:34:19	71.5	-0.2
EXC							
EV1	2/25/2022	Daytime & Evening	01:58:00 - 02:27:59	51.7	01:20:10 - 01:25:09	50.4	1.3
	212312022	Night-time	03:17:00 - 03:46:59	50.4	04:01:00 - 04:05:59	49.4	1.0

Note:

(2) Fixed plant noise operation during daytime/evening and night-time periods have been included according to corresponding fixed plant noise measurement.

⁽¹⁾ Day: 0700 to 1900 hours; Evening: 1900 to 2300 hours; Night: 2300 to 0700 hours.

MTR Corporation Limited

Shatin to Central Link – Hung Hom to Admiralty Section

Fixed Plant Noise Audit Report

(Batch 3 – North Ventilation Building (NOV))

(March 2022)

Verified by:	Claudine Lee		
Position:	Independent Environmental Checker		
Date:	11 March 2022		

MTR Corporation Limited

Shatin to Central Link – Hung Hom to Admiralty Section

Fixed Plant Noise Audit Report (Batch 3 – North Ventilation Building (NOV))

(March 2022)

Certified by:	Lisa Poon
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Position:

Environmental Team Leader

Date:

11 March 2022



MTR Corporation Limited

Consultancy Agreement No. C11033B

Shatin to Central Link – Hung Hom to Admiralty

[SCL (HUH-ADM)]

Fixed Plant Noise Audit Report (Batch 3 – North Ventilation Building (NOV))

March 2022

	Name	Signature		
Prepared & Checked:	Isaac Chu	Cun		
Reviewed & Approved:	Freeman Cheung	Angel		
	$\int dt$			
Version:	A Date:	10 March 2022		
This Report is prepared for MTR Corporation Limited and is given for its sole benefit in relation to and pursuant to Consultancy Agreement No. C11033B and may not be disclosed to, quoted to or relied upon by any person other than MTR Corporation Limited without our prior written consent. No person (other than MTR Corporation Limited) into whose possession a copy of this Report comes may rely on this Report without our express written consent and MTR Corporation Limited may not rely on it for any purpose other than as described above.				

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1 INTRODUCTION

1.1 Background

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the EAL at Hung Hom across the harbour to Admiralty Station (ADM).
- 1.1.2 EIA Report for SCL Hung Hom to Admiralty (HUH-ADM) Section (Register No.: AEIAR 166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, the Environmental Permit (EP) (EP No: EP-436/2012), covering the construction and operation of SCL (HUH-ADM) (hereinafter referred to as "the Project"), was granted on 22 March 2012. Variations of Environmental Permit (VEP) were subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/F) was issued by Director of Environmental Protection (DEP) on 29 January 2019.
- 1.1.3 Pursuant to EP Condition 2.31, at least one month before commencement of operation of the Project, the Permit Holder, MTR Corporation Ltd (MTR), shall carry out fixed plant noise audit and deposit with the Director four hardcopies and one electronic copy of an audit report showing the design of the fixed plant noise sources associated with the Project complies with the maximum sound power levels determined in the approved SCL(HUH-ADM) EIA Report (Register No. AEIAR-166/2012) or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) having due regard to the characteristics of tonality, impulsiveness and intermittency.
- 1.1.4 Since the installation of fixed plant along the SCL (HUH ADM) would be completed in stages, the fixed plant noise audit will be conducted in stages according to the testing and commissioning programmes in each area.
- 1.1.5 This Fixed Plant Noise Audit Report (Batch 3 North Ventilation Building (NOV) (hereinafter referred to as "the Report")) specifies the noise measurement methodology and measurement results at the fixed plant noise sources of the Project at NOV and HUH, and at the representative Noise Sensitive Receivers (NSRs) near NOV and HUH.
- 1.1.6 AECOM Asia Co. Ltd has been commissioned by the MTR to prepare this Report and to conduct noise measurement at the identified NSRs for investigation of any characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources associated with the Project.

1.2 Purpose of This Report

- 1.2.1 This Report presents the noise measurement methodology and measurement results at the fixed plant noise sources at NOV and HUH, and at the representative NSRs near NOV and HUH.
- 1.2.2 This Report comprises the following sections:
 - Section 1 presents the background information.
 - Section 2 presents the noise criteria and the representative NSRs.
 - Section 3 presents the latest information of fixed plant noise sources.
 - Section 4 presents the noise measurement methodology.
 - Section 5 presents the noise measurement results.
 - Section 6 presents the conclusion.

2 NOISE CRITERIA AND REPRESENTATIVE NOISE SENSITIVE RECEIVERS

2.1 Environmental Legislation, Standard and Guidelines

- 2.1.1 The Noise Control Ordinance, Cap. 400 (NCO) and Environmental Impact Assessment Ordinance, Cap. 499 (EIAO) provide the statutory framework for noise control. Operational noise from fixed noise sources is controlled by Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM) under NCO. To plan for a better environment, the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) under EIAO has specified the following requirements:
 - 5 dB below the appropriate ANLs in the IND-TM; or
 - the prevailing background noise levels (for quiet areas with level 5dB or more below the ANL).
- 2.1.2 The Acceptable Noise Levels (ANLs) for different Area Sensitivity Ratings (ASRs) during different periods are summarized in the **Table 2.1**.

Time Devied	ANL, dB(A)			
	ASR "A"	ASR "B"	ASR "C"	
Day (0700 to 1900 hours)	60	65	70	
Evening (1900 to 2300 hours)	60	65	70	
Night (2300 to 0700 hours)	50	55	60	

Table 2.1 ANLs for Assessment of Noise from Fixed Sources

2.2 Assessment Criteria and Representative Noise Sensitive Receivers

2.2.1 Harbourfront Horizon was identified as a representative NSR for fixed plant noise assessment of NOV in the approved SCL (HUH – ADM) EIA Report. Other than Harbourfront Horizon, The Metropolis Residence Tower 2, as identified in SCL(HHS) EIA Report, is also considered as a representative NSR for the fixed plant sources installed at the north of HUH. The assessment criteria at the NSRs selected for assessing the fixed plant noise impact from NOV and HUH are summarised in **Table 2.2**.

Table 2.2 Summary of Noise Criteria at Representative NSRs for Fixed Noise Sources

NSR (NSR No.)	Time Period ⁽¹⁾	Prevailing Background Noise Levels, dB(A)	ASR	ANL-5, dB(A) (2)	Criteria, dB(A)
Harbourfront Harizon (HH0b)	Day & Evening	> 70 ⁽³⁾	В	60	60
	Night	> 60 ⁽³⁾		50	50
The Metropolis Residence	Day & Evening	72 (4)	C (5)	65	65
Tower 2 (HUH-4-1)	Night	65 ⁽⁴⁾		55	55

Notes:

(2) A 5 dB(A) has been deducted from ANL as specified in requirement of EIAO-TM.

⁽¹⁾ Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.

⁽³⁾ Prevailing background noise levels are extracted from Table 9.6 of approved SCL (HUH-ADM) EIA Report.

⁽⁴⁾ Prevailing background noise levels are extracted from Table 8.8 of approved SCL(HHS) EIA Report.

⁽⁵⁾ HUH-4-1 are indirectly affected by major roads (i.e. Cross Harbour Tunnel N Approach and Hong Chong Road with annual average daily traffic exceeding 30,000). As HUH-4-1 is located in "Urban Area", the ASR for these NSRs is identified as ASR "C" in accordance with the IND-TM.

2.3 Review of Area Sensitivity Rating

- 2.3.1 Area Sensitive Ratings (ASRs) as defined in the approved SCL(HUH-ADM) and SCL(HHS) EIA Reports were determined by the existence of any influencing factors (e.g. major road, industrial area) according to IND-TM at the time of preparation of the EIA Reports. During the preparation of this Report, it is revealed that there was no major change on the land use in the vicinity of representative NSRs, and thus only the existence of any major road (i.e. annual average daily traffic (AADT) flow in excess of 30,000) has been reviewed.
- 2.3.2 Based on latest information (i.e. Annual Traffic Census 2020) during the preparation of this Plan, no IF is located in the vicinity of HH9b, while IFs (Cross Harbour Tunnel N Approach and Hong Chong Road with AADT exceeding 30,000) are located in the vicinity of HUH-4-1. Therefore, the ASRs defined in **Table 2.2** remain unchanged.

3 LATEST INFORMATION OF FIXED PLANT NOISE SOURCES

3.1.1 Based on the latest design information, the fixed plant sources including ventilation louvres and Packaged Condenser Unit (PCU) at NOV and HUH are shown in **Figure No. C11033B/C/SCL/ACM/M52/065**. The information of the fixed plant sources and the associated updated maximum allowable Sound Power Levels (SWLs) are presented in **Table 3.1** and the predicted fixed plant noise levels are presented in **Appendix A**. Appropriate corrections in tonal, impulsive or intermittent characteristics should be applied, where applicable, in accordance with the IND-TM during the commissioning test conducted at the representative NSRs.

Leastion	Fixed Plant ID	Fixed Diant Course	Maximum Allowable SWL, dB(A) ⁽¹⁾	
Location	Fixed Plant ID	Fixed Plant Source	Daytime & Evening ⁽²⁾	Night-time ⁽²⁾
	NOV-VS1	Ventilation Louver	93	79
	NOV-VS2	Ventilation Louver	98	85
	NOV-LV-03	Ventilation Louver	78	68
	NOV-LV-04	Ventilation Louver	78	68
	NOV-LV-05	Ventilation Louver	76	66
	NOV-LV-06	Ventilation Louver	82	72
	NOV-LV-07	Ventilation Louver	81	71
	NOV-LV-09	Ventilation Louver	88	78
	NOV-LV-10	Ventilation Louver	89	79
	NOV-LV-12	Ventilation Louver	81	71
NOV	NOV-LV-13	Ventilation Louver	77	67
	NOV-LV-19	Ventilation Louver	77	67
	NOV-LV-22	Ventilation Louver	88	78
	NOV-LV-24	Ventilation Louver	75	65
	NOV-LV-26	Ventilation Louver	79	69
	NOV-VCU-001	Packaged Condenser Unit	77	67
	NOV-VCU-002	Packaged Condenser Unit	80	70
	NOV-VCU-003	Packaged Condenser Unit	79	69
	NOV-VCU-004	Packaged Condenser Unit	72	62
	HUH-7a	Ventilation Louver	100 ⁽³⁾	90 ⁽³⁾
	HUH-7b	Ventilation Louver	100 ⁽³⁾	90 ⁽³⁾
HUH	HUH-8a	Ventilation Louver	100 ⁽³⁾	90 ⁽³⁾
	HUH-8b	Ventilation Louver	100 ⁽³⁾	90 ⁽³⁾
	HUH-17	Ventilation Louver	105 ⁽³⁾	95 ⁽³⁾
	HUH-18	Ventilation Louver	105 ⁽³⁾	95 ⁽³⁾
	HUH-19a	Ventilation Louver	105 ⁽³⁾	95 ⁽³⁾
	HUH-19b	Ventilation Louver	105 (3)	95 ⁽³⁾
	HUH-21a	Ventilation Louver	105 ⁽³⁾	95 ⁽³⁾
	HUH-21b	Ventilation Louver	105 (3)	95 ⁽³⁾

Table 3.1 Updated Maximum Allowable SWLs for Fixed Plant Noise Sources at NOV and HUH

Notes:

- (1) The maximum allowable sound power levels have due regard to the characteristics of tonality, intermittency and impulsiveness.
- (2)
- Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours. Reference has been made to the approved Fixed Plant Noise Audit Report (Updated Batch 7 Hung Hom Station and Hung Hom Siding (HUH & HHS)) for SCL (TAW-HUH) & SCL (MKK-HUH). (3)

4 MEASUREMENT METHODOLOGY

4.1 Noise Measurement to Obtain the SWLs of Fixed Plant Noise Sources

Measurement Methodology

4.1.1 Details of measurement methodology for SCL are presented in **Appendix B1**. Noise measurements to obtain the SWLs of the fixed plant noise sources followed **Appendix B1** and were conducted by Wilson Acoustics Limited.

Measurement Equipment

4.1.2 The sound level meters and calibrators used for noise measurements are listed in the Table 4.1. The instruments used for the noise measurements complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The calibration certificates of equipment are provided in Appendix B2.

Table 4.1 Noise Measurement Equipment

Equipment	Model	Serial Number	
	SVANTEK 958	69082	
	SVANTEK 958	28422	
Sound Level Meter	SVANTEK 959	11228	
	SVANTEK 959A	59120	
	SVANTEK 959A	59121	
Colibrator	SVANTEK SV30A	29088	
Calibrator	SVANTEK SV30A	10814	

4.1.3 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. The difference between the readings made before and after each series of measurements shall be less than or equal to 1.0 dB.

Measurement Date and Time

4.1.4 There will be daytime/evening and night-time operation modes for fixed plant sources at NOV, and the operation of fixed plant sources at HUH are identical during both daytime and night-time periods. Nevertheless, the noise measurements at NOV and HUH were all conducted during night-time periods at the fixed plant noise sources in order to minimise influence from background noise on measurement data. Details of the noise measurement schedule are shown in **Table 4.2**.

Table 4.2 Measurement Schedule

Location	Date
NOV & HUH	27, 28 & 29 November 2019 6, 10, 11 & 20 January 2022

4.2 Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs

Measurement Parameters

- 4.2.1 L_{Aeq} (30min) was measured at each designated measurement location. 1/3 octave band spectrum and time history over the measurement period was also be logged for determination of tonal, impulsiveness and intermittency characteristic.
- 4.2.2 Background noise level was measured at the same measurement location in term of L_{Aeq} (5 min) immediate before or after the noise measurement when all Project's fixed plant equipment shut down. To minimise the measurement data being influenced by background noise, noise data obtained at an instance of minimal or no traffic on the road was used to evaluate the tonal characteristic. The corrections for tonality, impulsiveness or intermittency at the representative NSRs were determined in accordance with IND-TM. In addition, any noticeable characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources was recorded during the measurement.

Measurement Equipment

4.2.3 The sound level meters and calibrators used for noise measurements at representative NSRs are listed in the **Table 4.3**. The instruments used for the noise measurements complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The calibration certificates of equipment are shown in **Appendix C1**.

Table 4.3	Noise Measurement Equipment
-----------	-----------------------------

Equipment	Model	Serial Number
Sound Loval Mator	B&K 2250L	2681366
Sound Level Meter	B&K 2250	3001291
Calibrator	B&K 4231	3006428
Calibrator	Rion NC-74	34246490

4.2.4 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. The difference between the readings made before and after each series of measurements shall be less than or equal to 1.0 dB.

Measurement Locations

4.2.5 The proposed noise measurement locations, which have direct line of sight to the noise sources and were accessible for noise measurement, were selected to represent the representative NSRs. These measurement locations had been agreed with EPD prior to noise measurement. The measurement locations are summarised in Table 4.4 and shown in Figure No. C11033B/C/SCL/ACM/M52/065. Photographs of measurement locations are shown in Appendix C2.

Table 4.4 Noise Measurement Locati	ons
------------------------------------	-----

Measurement Location ID	NSR (NSR No.)	Туре	Measurement Location and Height
FN1	Harbourfront Horizon (HH9b)	Residential	On the footbridge near HH9b (1.2m above the footbridge level in free-field condition)
FN2	The Metropolis Residence Tower 2	Residential	On the footbridge near The Metropolis Tower (1m from the footbridge parapet

Measurement Location ID	NSR (NSR No.)	Туре	Measurement Location and Height
	(HUH-4-1)		wall)

Measurement Date and Time

4.2.6 There will be daytime/evening and night-time operation modes for fixed plant sources at NOV, and the operation of fixed plant sources of the Project at HUH are identical during both daytime and night-time periods. To minimise the influence from background noise in measurement data, noise measurements at representative NSRs were therefore only conducted during night-time period. The measurement schedule is presented in **Table 4.5**.

Table 4.5Measurement Schedule

Location	NSR ID	Date
NOV & HUH	FN1 & FN2	2 March 2022

5 MEASUREMENT RESULTS

5.1 Noise Measurement to Obtain the SWLs of Fixed Plant Noise Sources

5.1.1 The measured SWLs under conservative approach during daytime and evening, and night-time periods are presented in **Table 5.1**. The measurement results indicated the fixed plant noise levels in NOV and HUH comply with the updated maximum allowable SWLs. Details of the measurement results are shown in **Appendix B4**.

	Measured	SWL, dB(A)	Maximum allo dB(wable SWL, A)	Complian	ce (Y/N)
Plant Item	Daytime & Evening (1)	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾	Daytime & Evening ⁽¹⁾	Night- time ⁽¹⁾
NOV						
NOV-VS1 ⁽²⁾	93	79	93	79	Y	Y
NOV-VS2 (2)	98	85	98	85	Y	Y
NOV-LV-03	68	68	78	68	Y	Y
NOV-LV-04	68	68	78	68	Y	Y
NOV-LV-05	66	66	76	66	Y	Y
NOV-LV-06	72	72	82	72	Y	Y
NOV-LV-07	71	71	81	71	Y	Y
NOV-LV-09	78	78	88	78	Y	Y
NOV-LV-10	79	79	89	79	Y	Y
NOV-LV-12	71	71	81	71	Y	Y
NOV-LV-13	67	67	77	67	Y	Y
NOV-LV-19	67	67	77	67	Y	Y
NOV-LV-22	78	78	88	78	Y	Y
NOV-LV-24	65	65	75	65	Y	Y
NOV-LV-26	69	69	79	69	Y	Y
NOV-VCU-001	67	67	77	67	Y	Y
NOV-VCU-002	70	70	80	70	Y	Y
NOV-VCU-003	69	69	79	69	Y	Y
NOV-VCU-004	62	62	72	62	Y	Y
нин						
HUH-7a	77	77	100	90	Y	Y
HUH-7b	78	78	100	90	Y	Y
HUH-8a	70	70	100	90	Y	Y
HUH-8b	69	69	100	90	Y	Y
HUH-17	93	93	105	95	Y	Y
HUH-18	88	88	105	95	Y	Y
HUH-19a	83	83	105	95	Y	Y
HUH-19b	79	79	105	95	Y	Y
HUH-21a	73	73	105	95	Y	Y
HUH-21b	85	85	105	95	Y	Y

Table 5.1	Summarv	of Measured SWLs for Fixed F	Plants
	•••••••••		

Notes:

(1) Day: 0700 to 1900 hours; Evening: 1900 to 2300 hours; Night: 2300 to 0700 hours.

(2) As discussed in Section 4.1.4, some plants will be operated in different modes, namely daytime/evening and night-time operation modes. Therefore, the measured SWLs for these plants will be different at different operation modes. For those plants operating in the same mode during both daytime/evening and night-time periods, the measured SWL is same for both daytime/evening and night-time periods.

5.2 Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at NSRs

5.2.1 Noise measurements to confirm any characteristics of tonality, impulsiveness and intermittency at the representative NSRs were conducted during night-time period. Measurement results are summarised in **Table 5.2** below. No characteristics of tonality, impulsiveness and intermittency was observed at the representative NSR. Data analysis has been carried out to determine the characteristics of tonality, impulsiveness and intermittency by assessing the logged 1/3 octave band spectra and time history profile. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency is found at the representative NSRs. Based on site observation and findings of data analysis, it is concluded that no characteristics of tonality, impulsiveness and intermittency are expected from the fixed plant sources. Detailed noise measurements results are presented in **Appendix C3**.

Table 5.2 Noise Measurement Results at Measurement Locations

			l I	Measurement Re	sult			
NSR ID	Description	Time Period ⁽¹⁾⁽²⁾	Measured Noise Level L _{Aeq(30mins)} , dB(A)	Background Noise Level L _{Aeq(5mins)} , dB(A)	Difference between Measured Noise Level and Background Level, dB(A)	Site Observation	Tonality, Impulsiveness and Intermittency at NSRs (Y/N)	
ENI1	On the footbridge near Harbourfront Horizon	Daytime & Evening	62.8	62.6	0.2	Noise environment was dominated by traffic noise. Noise from SCL	N	
		Night-time	63.1	63.6	-0.5	fixed plant was not noticeable at measurement location.	Ň	
	On the factbridge near	Daytime & Evening	57.9	56.9	1.0	Noise environment was dominated by traffic noise. Noise from SCI		
FN2	The Metropolis Tower	Night-time	58.8	58.2	0.6	fixed plant was not noticeable at measurement location	N	

Notes:

(1) All noise measurement was conducted during night-time period (2300 to 0700 hours).

(2) Fixed plant noise operation during daytime/evening and night-time periods have been included according to corresponding fixed plant noise measurement.

6 CONCLUSION

6.1.1 The fixed plant noise verifications were undertaken and the measurement results indicated all the fixed plant noise levels in NOV and HUH comply with the updated maximum allowable SWLs, No characteristics of tonality, impulsiveness and intermittency were observed at the representative NSRs. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency is found at the representative NSRs. It is therefore concluded that no characteristics of tonality, impulsiveness and intermittency are expected from the fixed plant sources.

Figure



Appendix A

Detailed Calculation of Fixed Plant Noise Assessment

Fixed Plant Noise Calculation - HH9b

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m ^[1]	SWL, dB(A)	Correction for line of sight ^[2] , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) ^[3]	Total SPL, dB(A)	Daytime / Evening Noise Criteria, dB(A)
NOV HH9b											
Daytime and Eveni HH9b	Ing Harbourfront Horizon	HUH-4-2	North	304	76	0	-58	3	N/A		
		HUH-7b HUH-8a	South Top	246 246 238	100 100 100	0	-56 -56 -56	3	47 47 47		
		HUH-8b HUH-9a	South Top	238 209	100 80	0	-56 -54	3	47 29		
		HUH-96 HUH-9c HUH-10a	East Top	209 209 201	82 77 78	0	-54 -54 -54	3 3 3	31 26 27		
		HUH-10b HUH-10c	South East	201 201 201	81 70	0	-54 -54	3	30 19		
		HUH-11a HUH-11b HUH-12a	Top South Top	194 194 186	68 70 66	0	-54 -54	3	17 19 16		
		HUH-12b HUH-13a	South Top	186 178	68 64	0	-53 -53	3	18 14		
		HUH-14-1-1 HUH-14-1-2	South South	192 192	75 88	0	-54 -54	3	24 37		
		HUH-14-3 HUH-15	South West	177 528	87 84	0	-53 -53 -62	3	37 N/A		
		HUH-16a HUH-16b	Top East	526 526	80 85	-10 -10	-62 -62	3	N/A N/A		
		HUH-17 HUH-18 HUH-19a	North Top Top	518 511 540	105 105 105	-10 -10 -10	-62 -62 -63	3 3 3	N/A N/A N/A		
		HUH-19b HUH-20	North Top	540 504	105 71	-10 -10	-63 -62	3	N/A N/A		
		HUH-21a HUH-21b HUH-22a-1	Top North Top	500 500 497	105 105 83	-10 -10 -10	-62 -62	3	N/A N/A		
		HUH-22a-2 HUH-22b	North North	497 497 497	83 85	-10 -10	-62 -62	3	N/A N/A		
		HUH-26H HUH-27H	East East	579 570	88 81	-10 -10	-63 -63	3	N/A N/A		
		HUH-30H HUH-32H	West	571 566	84 83	-10 -10 -10	-63 -63	3	N/A N/A N/A		
		HUH-33H HUH-37H	West East	575 574	88 85	-10 -10	-63 -63	3	N/A N/A		
		HHS-40 HHS-41-1	South South West	163 152 145	64 88 54	0 -10 -10	-52 -52 -51	3 3 3	15 29 nealiaible*	1	
		HHS-41-2 HHS-42-1	West West	145 141	66 66	-10 -10	-51 -51	3	8]	
		HHS-42-2 HHS-42-3 HHS-45-1	West West	141 141 135	64 63 85	-10 -10 -10	-51 -51 -51	3	6 5 27		
		HHS-45-2 HHS-49-2	West	135 109	60 78	-10	-51 -49	3	2 32	1	
		HHS-49-3 HHS-49-6	East East	109 109	71 67	0	-49 -49	3 3	25 21	1	
		HHS-50-1 HHS-50-2	East	105	75 69	0	-49 -48	3	30 24	1	
		HHS-51 HHS-52-1	East East	92 90	86 63	0 0	-47 -47	3 3	42 19		
		HHS-53-1 HHS-53-2 HHS-53-3	East East East	92 92 92	75 59	0	-47 -47 -47	3	24 31 15		
		HHS-53-4 HHS-53-5	East East	92 92	67 69	0	-47 -47	3	23 25		
		HHS-56 HHS-57-2	East East	92 107 129	73 61	0	-47 -49 -50	3	22 27 14		
		HHS-58-1 HHS-58-2	East East	141 141	68 69	0	-51 -51	3 3	20 21		
		HHS-67-1 HHS-67-3	East East	303 303	71 73	0	-55 -58 -58	3	N/A N/A		
		HHS-68-1 HHS-68-2	East East	329 329	72 71	0 0	-58 -58	3 3	N/A N/A		
		HHS-70-3 HHS-71-1	East	329 356 370	59 54	0	-58 -59 -59	3	N/A N/A N/A		
		HHS-71-2 HHS-71-3	East East	370 370	56 67	0	-59 -59	3	N/A N/A		
		HHS-77-1 HHS-77-2	East East	433 440 440	54 55	-10 -10 -10	-61 -61	3	N/A N/A		
		HHS-77-3 HHS-78	East North	440 470	55 87	-10 -10	-61 -61	3	N/A N/A		
		HUH-80-2 HUH-80-3	Тор Тор Тор	311 310	92 93	0	-58	3	N/A N/A		
		HUH-81 HUH-82-1	Top South	308 320	99 76	0	-58 -58	3	N/A N/A		
		HHS-84 HUH-85b	East	193 508	72 87	0 -10	-54 -62	3	21 N/A		
		HUH-86-4 HUH-86-13 HHS-87-2	North North East	438 438 107	67 72 75	-10 -10	-61 -61 -49	3 3 3	N/A N/A 29		
		HHS-88-2 HUH-95b	East South	105 236	58 92	0	-48 -55	3	13 40		
		HHS-100-2 HHS-101-1 HHS-102-1	Top Top Top	162 166 97	62 76	-10 -10	-52 -52 -48	3	3 17 24		
		HHS-102-2 HHS-102-3	Тор Тор	97 97	71 75	0	-48 -48	3	26 30		
		HHS-102-6 HHS-102-7 HHS-102-9	Тор Тор Тор	97 97 97	71 73 71	0 0 0	-48 -48 -48	3 3 3	26 28 26	1	
		HHS-102-11 HUH-103-1	Тор	97 524	72 70	0-10	-48 -62	3	27 N/A]	
		HUH-103-2 HUH-103-3 HUH-103-4	Top Top Top	524 524 524	69 76 75	-10 -10 -10	-62 -62 -62	3	N/A N/A N/A		
		HUH-103-5 HUH-103-6	Тор Тор	524 524	74 71	-10 -10	-62 -62	3	N/A N/A		
		HUH-103-7 HUH-103-8 HUH-103-9	Top Top Top	524 524 524	74 72 73	-10 -10 -10	-62 -62 -62	3 3 3	N/A N/A N/A		
		HUH-103-10 HUH-103-11	Тор	524 524	72 73	-10 -10	-62 -62	3	N/A N/A	1	
		HUH-103-12 HUH-103-13 HUH-103-14	Top Top Top	524 524 524	72 70 72	-10 -10 -10	-62 -62 -62	3 3 3	N/A N/A N/A	1	
		HUH-104-1 HUH-104-2	Тор	513 513	65 70	-10 -10	-62 -62	3	N/A N/A	1	
		HUH-104-3 HUH-104-4 HUH-104-5	Top Top Top	513 513 513	76 77 69	-10 -10 -10	-62 -62 -62	3 3 3	N/A N/A N/A		
		HUH-104-6 HUH-104-7	Тор Тор	513 513	69 72	-10 -10	-62 -62	3	N/A N/A		
		HUH-107b HUH-108 HUH-109	South South Top	243 200 554	94 58 75	0	-56 -54 -63	3	41 7 N/A		
		HUH-110 HUH-111	Тор Тор Тор	554 555	76 76	-10 -10	-63 -63	3	N/A N/A		
		HUH-112 HUH-113 HUH-115	Top Top North	555 555 531	76 75 73	-10 -10 -10	-63 -63 -62	3	N/A N/A		
		HUH-116 HUH-117	North	528 526	70 70	-10 -10	-62 -62	3	N/A N/A		
		HUH-118 HUH-119 HUH-120	North Top Top	524 323 319	68 65 71	-10 -10 -10	-62 -58 -58	3	N/A N/A	•	
		HHS-121 NOV-VS1	East Top	436	60 93	-10 0	-61 -56	3	N/A 40	1	
		NOV-VS2 NOV-LV-03 NOV-LV-04	Top East	228 218 220	98 78 78	0	-55 -55 -55	3	46 26	•	
		NOV-LV-05 NOV-LV-06	North West	247 250	76 82	0 -10	-56	3	23 19	1	
		NOV-LV-07 NOV-LV-09 NOV-LV-10	West South	253 237 231	81 88	-10 0	-56 -55	3	18 36 37	•	
		NOV-LV-12 NOV-LV-13	South South-East	229 219	81 77	0	-55 -55	3	29 25	1	
		NOV-LV-19 NOV-LV-22 NOV-LV-24	South South East	220 241 218	77 88 75	0	-55 -56 -55	3 3 3	25 35 23		
		NOV-LV-26 NOV-VCU-001	North South	218 238	79 77	0	-55 -56	3	27 24	1	
		NOV-VCU-002 NOV-VCU-003 NOV-VCU-004	South South South	235 233 232	80 79 72	0 0 0	-55 -55 -55	3 3 3	28 27 20	56	60

Fixed Plant Noise Calculation - HH9b

Noise Assessment	Description	Plant item	Direction Facing	Horizontal	SWL,	Correction for line of	Distance Correction of Point	Façade	Predicted SPL,	Total SPL, dB(A)	Night-time Noise
Points Hung Hom Station	Ventilation Shaft			Distance, m ⁺⁺	UB(A)	Sight ⁻ , dB(A)	Source, dB(A)	Correction, dB(A)	dB(A)		Chiena, db(A)
HH9b Night-time	1		1			1		1		1	1
HH9b	Harbourfront Horizon	HUH-4-2 HUH-7a	North Top	304 246	76 90	0	-58 -56	3	N/A 37	-	
		HUH-8a HUH-8b	Top South	238 238	90 90 90	0	-56 -56	3	37 37 37	-	
		HUH-9a HUH-9b	Top South	209 209	80 82	0	-54 -54	3	29 31		
		HUH-9c HUH-10a HUH-10b	Top South	209 201 201	77 78 81	0	-54 -54 -54	3 3 3	26 27 30	-	
		HUH-10c HUH-11a	East Top	201 194	70 68	0	-54 -54	3	19 17		
		HUH-11b HUH-12a HUH-12b	South Top South	194 186	70 66 68	0	-54 -53	3	19 16	-	
		HUH-13a HUH-14-1-1	Top South	178 192	64 75	0	-53 -53 -54	3	14 24		
		HUH-14-1-2 HUH-14-2	South South	192 184	88 91	0	-54 -53	3	37 41		
		HUH-14-3 HUH-15 HUH-16a	South West Top	177 528 526	87 84 80	0 -10 -10	-53 -62 -62	3	37 N/A N/A	-	
		HUH-16b HUH-17	East	526 518	85 95	-10 -10 -10	-62 -62	3	N/A N/A		
		HUH-18 HUH-19a	Top Top	511 540	95 95	-10 -10	-62 -63	3 3	N/A N/A		
		HUH-19b HUH-20 HUH-21a	North Top Top	540 504 500	95 71 95	-10 -10 -10	-63 -62 -62	3	N/A N/A N/A	-	
		HUH-21b HUH-22a-1	North Top	500 497	95 83	-10 -10	-62 -62	3	N/A N/A		
		HUH-22a-2 HUH-22b	North North	497 497 570	83 85	-10 -10	-62 -62	3	N/A N/A	-	
		HUH-27H HUH-29	East East East	579 570 556	81 70	-10 -10 -10	-63 -63	3	N/A N/A N/A	-	
		HUH-30H HUH-32H	West West	571 566	84 83	-10 -10	-63 -63	3	N/A N/A		
		HUH-33H HUH-37H HHS-38	East South	575 574 163	88 85	-10 -10	-63 -63	3	N/A N/A 15	-	
		HHS-40 HHS-41-1	South West	152 145	- 54	-10 -10	-52 -52 -51	3	- negligible*		
		HHS-41-2 HHS-42-1	West West	145 141	66 66	-10 -10	-51 -51	3	8		
		HHS-42-2 HHS-42-3 HHS-45-1	West West	141 141 135	64 63 85	-10 -10 -10	-51 -51 -51	3 3 3	6 5 27	1	
		HHS-45-2 HHS-49-2	West East	135 109	60 78	-10	-51	3	2 32	1	
		HHS-49-3 HHS-49-6	East East	109	71 67	0	-49 -49	3	25 21	1	
		HHS-49-8 HHS-50-1 HHS-50-2	East East East	109 105 105	70 75 69	0 0 0	-49 -48 -48	3 3 3	24 30 24	1	
I		HHS-51 HHS-52-1	East	92	85 63	0	-47 -47	3	41		
		HHS-53-1 HHS-53-2	East East	92 92	68 75	0	-47 -47	3	24 31		
		HHS-53-3 HHS-53-4 HHS-53-5	East East East	92 92 92	59 67 69	0	-47 -47 -47	3 3 3	15 23 25	-	
		HHS-53-6 HHS-56	East	92 107	66 73	0	-47 -49	3	23 22 27		
		HHS-57-2 HHS-58-1	East East	129 141	61 68	0	-50 -51	3	14 20		
		HHS-58-2 HHS-62-2 HHS-67-1	East East East	141 234 303	69 69 71	0	-51 -55 -58	3	17 N/A	-	
		HHS-67-3 HHS-68-1	East East	303 329	73 72	0	-58 -58	3	N/A N/A		
		HHS-68-2 HHS-68-3 HHS-70-3	East East Fast	329 329 356	71 70 59	0	-58 -58	3	N/A N/A	-	
		HHS-71-1 HHS-71-2	East	370 370	54 56	0	-59 -59	3	N/A N/A		
		HHS-71-3 HHS-73	East East	370 433	67 53	0 -10	-59 -61	3	N/A N/A		
		HHS-77-1 HHS-77-2 HHS-77-3	East East East	440 440 440	54 55 55	-10 -10 -10	-61 -61	3	N/A N/A N/A	-	
1		HHS-78 HUH-80-1	North Top	470 311	79 92	-10 0	-61 -58	3	N/A N/A		
		HUH-80-2 HUH-80-3	Top Top	311 310	92 93	0	-58 -58	3	N/A N/A	-	
1		HUH-82-1 HUH-82-6	South	308 320 320	76 88	0	-58	3	N/A N/A	•	
		HHS-84 HUH-85b	East North	193 508	72 87	0 -10	-54 -62	3	21 N/A		
		HUH-86-13 HUS-87-2	North East	438 438 107	72 75	-10 -10 0	-61 -61 -49	3	N/A N/A 29	-	
		HHS-88-2 HUH-95b	East South	105 236	58 92	0	-48 -55	3	13 40		
		HHS-100-2 HHS-101-1	Тор Тор Тор	162 166	62 76	-10 -10	-52 -52	3	3 17 24	-	
		HHS-102-2 HHS-102-3	Тор Тор Тор	97 97 97	71 75	0	-48 -48 -48	3	24 26 30		
		HHS-102-6 HHS-102-7	Тор Тор	97 97	71 73	0	-48 -48	3	26 28	1	
		HHS-102-9 HHS-102-11 HUH-103-1	Тор Тор Тор	97 97 524	71 72 70	0 0 -10	-48 -48 -62	3	26 27 N/A	-	
		HUH-103-2 HUH-103-3	Тор Тор Тор	524 524	69 76	-10 -10	-62 -62	3	N/A N/A		
		HUH-103-4 HUH-103-5	Тор Тор Тор	524 524	75 74 71	-10 -10	-62 -62	3	N/A N/A	-	
		HUH-103-7 HUH-103-8	Тор Тор Тор	524 524 524	74	-10 -10 -10	-62 -62 -62	3	N/A N/A N/A	-	
		HUH-103-9 HUH-103-10	Тор Тор	524 524	73 72	-10 -10	-62 -62	3	N/A N/A		
		HUH-103-11 HUH-103-12 HUH-103-13	Тор Тор Тор	524 524 524	73 72 70	-10 -10 -10	-62 -62 -62	3	N/A N/A	-	
		HUH-103-14 HUH-104-1	Тор Тор Тор	524 513	72 65	-10 -10	-62 -62	3	N/A N/A		
		HUH-104-2 HUH-104-3	Top Top	513 513	70 76	-10 -10	-62 -62	3	N/A N/A		
		HUH-104-4 HUH-104-5 HUH-104-6	Top Top Top	513 513 513	77 69 69	-10 -10 -10	-62 -62 -62	3 3 3	N/A N/A	-	
		HUH-104-7 HUH-107b	Top South	513 243	72 94	-10 -10 0	-62 -56	3	N/A 41		
		HUH-108 HUH-109	South Top	200 554	58 75	0 -10	-54 -63	3	7 N/A		
		HUH-110 HUH-111 HUH-112	Тор Тор Тор	554 555 555	76 76 76	-10 -10 -10	-63 -63 -63	3 3 3	N/A N/A N/A	1	
		HUH-113 HUH-115	Top North	555 531	75 73	-10 -10	-63 -62	3	N/A N/A]	
		HUH-116 HUH-117 HUH-119	North North	528 526	70	-10 -10	-62 -62	3	N/A N/A	1	
		HUH-119 HUH-120	Top	524 323 319	65 71	-10 -10 -10	-₀∠ -58 -58	3 3 3	N/A N/A N/A	1	
		HHS-121 NOV-VS1	East Top	436 240	60 79	-10 0	-61 -56	3	N/A 26]	
		NOV-VS2 NOV-LV-03	Top East	228 218	85 68	0	-55 -55	3	33 16	1	
		NOV-LV-04 NOV-LV-05 NOV-LV-06	North North West	220 247 250	68 66 72	-10 0 -10	-55 -56 -56	3 3 3	6 13 9	1	
		NOV-LV-07 NOV-LV-09	West South	253 237	71 78	-10	-56	3	8 26	1	
		NOV-LV-10 NOV-LV-12	North South	231 229	79 71	0	-55 -55	3	27 19	1	
		NOV-LV-13 NOV-LV-19 NOV-LV-22	South-East South South	219 220 241	67 67 78	0 0 0	-55 -55 -56	3 3 3	15 15 25	1	
		NOV-LV-24 NOV-LV-26	East North	218 218	65 69	0	-55 -55	3	13 17]	
1		NOV-VCU-001 NOV-VCU-002	South South	238 235	67 70	0	-56 -55	3	14 18	1	
		NOV-VCU-003 NOV-VCU-004	South South	233 232	69 62	0	-55 -55	3	<u>17</u> 10	50	50

Remark: [1] As a conservative approach, only horizontal distance has been considered in the calculation of distance correction. [2] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings. [3] Only noise sources within 300m from the NSRs are included in the assessment. *The sum of correction factor is larger than the measured SWL, therefore, the predicted sound pressure level is consider negligible.

Fixed Plant Noise Calculation - HUH-4-1a

Noise Assessment	Description	Plant item	Direction Facing	Horizontal Distance , m ^[1]	SWL, dB(A)	Correction for line of sight ^[2] , dB(A)	Distance Correction of Point	Façade Correction, dB(A)	Predicted SPL, dB(A) ^[3]	Total SPL, dB(A)	Daytime / Evening Noise Criteria,
Points NOV				Distance , m	u=(;;;)	Signi , dD(A)	Source, dB(A)				dB(A)
Daytime and Eveni	ing	HUH-4-2	North	307	76	-10	-60	3	N/A		
non-4-1a	Residence Tower 2	HUH-7a HUH-7b	Top South	350 350	100 100	-10 -10 -10	-59 -59	3	N/A N/A	•	
		HUH-8a HUH-8b HUH-9a	Top South Top	347 347 338	100 100 80	-10 -10 -10	-59 -59 -59	3 3 3	N/A N/A N/A	-	
		HUH-9b HUH-9c	South East	338 338	82 77	-10 -10	-59 -59	3	N/A N/A		
		HUH-10a HUH-10b HUH-10c	Top South East	335 335 335	78 81 70	-10 -10 -10	-59 -59 -59	3	N/A N/A	-	
		HUH-11a HUH-11b	Top South	334 334	68 70	-10 -10 -10	-58 -58	3	N/A N/A		
		HUH-12a HUH-12b	Top South	332 332	66 68	-10 -10	-58 -58	3	N/A N/A		
		HUH-14-1-1 HUH-14-1-2	South	326 326	75 88	-10 -10 -10	-58 -58	3	N/A N/A N/A	•	
		HUH-14-2 HUH-14-3	South South	324 322	91 87	-10 -10	-58 -58	3	N/A N/A		
		HUH-16a HUH-16b	Top East	175 166 166	80 85	0	-52 -52	3	31 36	•	
		HUH-17 HUH-18	North Top	159 146	105 105	-10 0	-52 -51	3	46 57		
		HUH-19a HUH-19b HUH-20	North Top	167 167 136	105 105 71	-10 0	-52 -52 -51	3	46 23	•	
		HUH-21a HUH-21b	Top North	128 128	105 105	0 -10	-50 -50	3	58 48		
		HUH-22a-1 HUH-22a-2 HUH-22b	Top North North	123 123	83 83 85	0 -10 -10	-50 -50	3	36 26 28	-	
		HUH-26H HUH-27H	East	205 198	88 81	0	-54 -54	3	37 30		
		HUH-29 HUH-30H	East West	185 203	70 84	0 -10	-53 -54	3	20 23		
		HUH-33H HUH-37H	West East	205 201	83 88 85	-10 -10 0	-54 -54 -54	3	22 27 34	•	
		HHS-38 HHS-40	South South	321 319	64 88	-10 -10	-58 -58	3	N/A N/A		
		HHS-41-1 HHS-41-2	West West	328 328 339	54 66	-10 -10	-58 -58	3	N/A N/A	•	
		HHS-42-2 HHS-42-3	West	339 339	64 63	-10 -10 -10	-59 -59	3	N/A N/A		
		HHS-45-1 HHS-45-2	West West	362 362	85 60	-10 -10	-59 -59	3	N/A N/A	-	
		HHS-49-2 HHS-49-3 HHS-49-6	East East East	352 352 352	78 71 67	-10 -10 -10	-59 -59 -59	3	N/A N/A N/A	•	
		HHS-49-8 HHS-50-1	East	352 347	70 75	-10 -10	-59 -59	3	N/A N/A		
		HHS-50-2 HHS-51 HHS-52-1	East East	347 332 319	69 86	-10 -10	-59 -58	3	N/A N/A	-	
		HHS-53-1 HHS-53-2	East	309 309	68 75	-10 -10 -10	-58 -58	3	N/A N/A		
		HHS-53-3 HHS-53-4	East East	309 309	59 67	-10 -10	-58 -58	3	N/A N/A	-	
		HHS-53-6 HHS-56 HHS-56	East	309 309 284	66 73	-10 -10 -10	-58 -58 -57	3	N/A N/A 9	-	
		HHS-57-2 HHS-58-1	East East	260 249	61 68	-10 -10	-56 -56	3	negligible* 5		
		HHS-58-2 HHS-62-2 HHS-67-1	East East East	249 156 92	69 69 71	-10 -10 -10	-56 -52 -47	3	10 17	•	
		HHS-67-3 HHS-68-1	East	92 70	73 72	-10 -10	-47 -45	3	19 20		
		HHS-68-2 HHS-68-3 HHS-70-3	East East East	70 70 52	71 70 59	-10 -10 -10	-45 -45 -42	3 3 3	19 18 10	•	
		HHS-71-1 HHS-71-2	East East	46 46	54 56	-10 -10	-41 -41	3	6 8		
		HHS-71-3 HHS-73 HHS-77-1	East East Fast	46 55 59	67 53 54	-10 -10 -10	-41 -43 -43	3	19 3 4	-	
		HHS-77-2 HHS-77-3	East East	59 59	55 55	-10 -10	-43 -43	3	5	-	
		HHS-78 HUH-80-1 HUH-80-2	North Top	81 433 428	87 92	-10 0	-46 -61	3	34 N/A	-	
		HUH-80-3 HUH-81	Тор Тор Тор	423 401	93 99	0	-61 -60	3	N/A N/A	-	
		HUH-82-1 HUH-82-6 HHS-84	South South	193 193 197	76 88 72	-10 -10 -10	-54 -54	3	15 27 11	-	
		HUH-85b HUH-86-4	North	136 120	87 67	-10 0	-51 -50	3	29 20	-	
		HUH-86-13 HHS-87-2 HHS-88-2	North East	120 284 247	72 75	0 -10	-50 -57	3	25 11	-	
		HUH-95b HHS-100-2	South	339 321	92 62	-10 -10 -10	-59 -59 -58	3	N/A N/A		
		HHS-101-1 HHS-102-1	Top Top	312 297	76 69	-10 -10	-58 -57	3	N/A 5		
		HHS-102-2 HHS-102-3 HHS-102-6	Тор Тор	297 297 297	75	-10 -10 -10	-57 -57 -57	3	/ 11 7	-	
		HHS-102-7 HHS-102-9	Тор Тор	297 297	73 71	-10 -10	-57 -57	3	9 7		
		HHS-102-11 HUH-103-1 HUH-103-2	Top Top Top	297 178 178	72 70 69	-10 -10 -10	-57 -53 -53	3	8 10 9	-	
		HUH-103-3 HUH-103-4	Тор	178 178	76 75	-10 -10	-53 -53	3	16 15		
		HUH-103-5 HUH-103-6 HUH-103-7	Top Top	178 178 178	74 71 74	-10 -10	-53 -53	3	14 11		
		HUH-103-8 HUH-103-9	Тор	178	72 73	-10 -10	-53	3	12	1	
		HUH-103-10 HUH-103-11	Top Top	178 178	72 73	-10 -10	-53 -53	3	12 13	-	
		HUH-103-12 HUH-103-13 HUH-103-14	Тор Тор Тор	178 178 178	72 70 72	-10 -10 -10	-53 -53 -53	3	12 10 12	•	
		HUH-104-1 HUH-104-2	Тор Тор	141 141	65 70	0	-51 -51	3	17 22		
		HUH-104-3 HUH-104-4 HUH-104-5	Top Top Top	141 141 141	76 77 69	0	-51 -51 -51	3 3 3	28 29 21	-	
		HUH-104-6 HUH-104-7	Тор Тор	141 141	69 72	0	-51 -51	3	21 24		
		HUH-107b HUH-108 HUH-109	South South	345 328	94 58 75	-10 -10	-59 -58	3	N/A N/A 25	-	
		HUH-110 HUH-111	Тор Тор Тор	185 186 187	76 76	0	-53 -53	3	26 26	-	
		HUH-112 HUH-113 HUH-115	Top Top	188 188	76 75	0	-53 -54	3	26 24		
		HUH-116 HUH-117	North North North	186 182	70	0	-54 -53 -53	3 3 3	20 20 20		
		HUH-118 HUH-119	North Top	178 426	68 65	0	-53 -61	3	18 N/A		
		HUH-120 HHS-121 NOV-VS1	East Top	425 57 415	71 60 93	-10 -10 -10	-61 -43 -60	3 3 3	N/A 10 N/A	•	
		NOV-VS2 NOV-LV-03	Top East	413 405	98 78	-10 -10	-60 -60	3	N/A N/A		
		NOV-LV-04 NOV-LV-05	North North	401 409	78 76	-10 -10	-60 -60	3	N/A N/A	 	
		NOV-LV-07 NOV-LV-09	West South	414 428 425	81 88	-10 -10 -10	-60 -61 -61	3	N/A N/A	1	
		NOV-LV-10 NOV-LV-12	North South	421 423	89 81	-10 -10	-60 -61	3	N/A N/A	-	
		NOV-LV-13 NOV-LV-19 NOV-LV-22	South South	417 417 427	77 88	-10 -10 -10	-60 -61	3	N/A N/A N/A	- -	
		NOV-LV-24 NOV-LV-26	East North	407 400	75 79	-10 -10	-60 -60	3	N/A N/A		
		NOV-VCU-001 NOV-VCU-002 NOV-VCU-003	South South South	422 421 420	77 80 79	-10 -10 -10	-60 -60 -60	3 3 3	N/A N/A N/A	4	
	1	NOV-VCU-004	South	420	72	-10	-60	3	N/A	62	65

Fixed Plant Noise Calculation - HUH-4-1a

Noise Assessment	Description	Plant item	Direction Facing	Horizontal	SWL,	Correction for line of	Distance Correction of Point	Façade	Predicted SPL,	Total SPL, dB(A)	Night-time Noise
Points	Ventilation Shoft	r lant nem	Direction Facing	Distance , m ^[1]	dB(A)	sight ^[2] , dB(A)	Source, dB(A)	Correction, dB(A)	dB(A) ^[3]		Criteria, dB(A)
Hung Hom Station HUH-4-1a	Ventilation Shaft										
Night-time HUH-4-1a	The Metropolis	HUH-4-2	North	397	76	-10	-60	3	N/A		
	Residence Tower 2	HUH-7a HUH-7b	Top South	350 350	90 90	-10 -10	-59 -59	3	N/A N/A		
		HUH-8a HUH-8b	Top South	347 347	90 90	-10 -10	-59 -59	3	N/A N/A		
		HUH-9a HUH-9b	South	338	80 82	-10 -10	-59 -59	3	N/A N/A		
		HUH-90 HUH-10a	East Top	338	77	-10 -10	-59 -59	3	N/A N/A		
		HUH-100 HUH-10c	East	335	81 70	-10 -10	-59 -59	3	N/A N/A		
		HUH-11b	South	334	68 70	-10 -10	-58 -58	3	N/A N/A		
		HUH-12b	South	332	68	-10 -10	-58 -58	3	N/A N/A		
		HUH-13a HUH-14-1-1	South	330	64 75	-10 -10	-58 -58	3	N/A N/A		
		HUH-14-1-2 HUH-14-2	South	326	91 97	-10 -10	-58	3	N/A N/A		
		HUH-15	West	175	84	-10	-58	3	24		
		HUH-16b	East	166	85	0	-52	3	36		
		HUH-18	Тор	146	95	0	-52 -51	3	47		
		HUH-19b HUH-20	North	167	95 71	-10	-52	3	36		
		HUH-21a HUH-21b	Top	128	95 95	0	-50	3	48		
		HUH-22a-1 HUH-22a-2	Top	123	83 83	0	-50	3	36		
		HUH-22b HUH-26H	North East	123 205	85 88	-10 0	-50 -54	3	28 37		
		HUH-27H HUH-29	East East	198 185	81 70	0	-54 -53	3	30 20		
		HUH-30H HUH-32H	West West	203 198	84 83	-10 -10	-54 -54	3	23		
		HUH-33H HUH-37H	West East	205	88 85	-10	-54 -54	3	27 34		
		HHS-38 HHS-40	South South	321 319	64	-10 -10	-58 -58	3	N/A		
		HHS-41-1 HHS-41-2	West West	328 328	54 66	-10 -10	-58 -58	3	N/A N/A		
		HHS-42-1 HHS-42-2	West West	339 339	66 64	-10 -10	-59 -59	3	N/A N/A		
		HHS-42-3 HHS-45-1	West West	339 362	63 85	-10 -10	-59 -59	3	N/A N/A		
		HHS-45-2 HHS-49-2	West East	362 352	60 78	-10 -10	-59 -59	3	N/A N/A		
		HHS-49-3 HHS-49-6	East East	352 352	71 67	-10 -10	-59 -59	3	N/A N/A		
		HHS-49-8 HHS-50-1	East East	352 347	70 75	-10 -10	-59 -59	3	N/A N/A		
		HHS-50-2 HHS-51	East East	347 332	69 85	-10 -10	-59 -58	3	N/A N/A		
		HHS-52-1 HHS-53-1	East East	319 309	63 68	-10 -10	-58 -58	3	N/A N/A		
		HHS-53-2 HHS-53-3	East East	309 309	75 59	-10 -10	-58 -58	3	N/A N/A		
		HHS-53-4 HHS-53-5	East East	309 309	67 69	-10 -10	-58 -58	3	N/A N/A		
		HHS-53-6 HHS-56	East East	309 284	66 73	-10 -10	-58 -57	3	N/A 9		
		HHS-57-2 HHS-58-1	East East	260 249	61 68	-10 -10	-56 -56	3 3	negligible* 5		
		HHS-58-2 HHS-62-2	East East	249 156	69 69	-10 -10	-56 -52	3 3	6 10		
		HHS-67-1 HHS-67-3	East East	92 92	71 73	-10 -10	-47 -47	3	17 19		
		HHS-68-1 HHS-68-2	East	70 70	72	-10 -10	-45 -45	3	20 19		
		HHS-68-3 HHS-70-3	East	70 52	70 59	-10 -10	-45 -42	3	18 10		
		HHS-71-1 HHS-71-2	East	46	54 56	-10 -10	-41 -41	3	6 8		
		HHS-71-3 HHS-73	East	46 55	67 53	-10 -10	-41 -43	3	19		
		HHS-77-1 HHS-77-2	East	59 59	54 55	-10 -10	-43 -43	3	4 5		
		HHS-77-3 HHS-78	North	59 81	79	-10 -10	-43 -46	3	26 N/A		
		HUH-80-2	Тор	433 428 422	92	0	-61 -61	3	N/A N/A		
		HUH-81	Top	423	93 99 76	0	-60	3	N/A N/A		
		HUH-82-6 HHS-84	South	193	88	-10	-54	3	27		
		HUH-85b HUH-86-4	North	136	87	-10	-51	3	29		
		HUH-86-13 HHS-87-2	North	120	72	0	-50	3	25		
		HHS-88-2 HUH-95b	East	347	58 92	-10	-59	3	N/A N/A		
		HHS-100-2 HHS-101-1	Тор	321 312	62 76	-10	-58	3	N/A N/A		
		HHS-102-1 HHS-102-2	Тор	297	69 71	-10	-57 -57	3	5		
		HHS-102-3 HHS-102-6	Top Top	297	75 71	-10 -10	-57 -57	3	11]	
		HHS-102-7 HHS-102-9	Тор Тор	297	73 71	-10 -10	-57 -57	3	9		
		HHS-102-11 HUH-103-1	Top Top	297 178	72 70	-10 -10	-57 -53	3	8 10]	
		HUH-103-2 HUH-103-3	Тор Тор	178 178	69 76	-10 -10	-53 -53	3	9 16		
		HUH-103-4 HUH-103-5	Тор Тор	178 178	75 74	-10 -10	-53 -53	3	15 14		
		HUH-103-6 HUH-103-7	Тор Тор	178 178	71 74	-10 -10	-53 -53	3	11 14		
		HUH-103-8 HUH-103-9	Тор Тор	178 178	72 73	-10 -10	-53 -53	3	12 13		
		HUH-103-10 HUH-103-11	Тор Тор	178 178	72 73	-10 -10	-53 -53	3	12 13		
		HUH-103-12 HUH-103-13	Тор Тор	178 178	72 70	-10 -10	-53 -53	3	12 10		
		HUH-103-14 HUH-104-1	Тор Тор	178 141	72 65	-10 0	-53 -51	3	12		
		HUH-104-2 HUH-104-3	Тор Тор	141 141	70 76	0	-51 -51	3	22 28		
		HUH-104-4 HUH-104-5	Тор Тор	141 141	77 69	0	-51 -51	3	29 21		
		HUH-104-6 HUH-104-7	Тор Тор	141 141	69 72	0 0	-51 -51	3	21 24		
		HUH-107b HUH-108	South South	345 328	94 58	-10 -10	-59 -58	3	N/A N/A		
		HUH-109 HUH-110	Тор Тор	185 186	75 76	0	-53 -53	3	25 26		
		HUH-111 HUH-112	Тор Тор	187 188	76 76	0	-53 -53	3	26 26		
		HUH-113 HUH-115	Top North	188 191	75 73	0 0	-54 -54	3	24 22		
		HUH-116 HUH-117	North North	186 182	70 70	0	-53 -53	3	20 20		
		HUH-118 HUH-119	North Top	178 426	68 65	0 -10	-53 -61	3	18 N/A		
		HUH-120 HHS-121	Top East	425 57	71 60	-10 -10	-61 -43	3	N/A 10		
		NOV-VS1 NOV-VS2	Тор Тор	415 413	79 85	-10 -10	-60 -60	3	N/A N/A		
		NOV-LV-03 NOV-LV-04	East North	405 401	68 68	-10 -10	-60 -60	3	N/A N/A		
		NOV-LV-05 NOV-LV-06	North West	409 414	66 72	-10 -10	-60 -60	3	N/A N/A		
		NOV-LV-07 NOV-LV-09	West South	428 425	71 78	-10 -10	-61 -61	3	N/A N/A		
		NOV-LV-10 NOV-LV-12	North South	421 423	79 71	-10 -10	-60 -61	3	N/A N/A		
		NOV-LV-13 NOV-LV-19	South-East South	417 417	67 67	-10 -10	-60 -60	3	N/A N/A		
		NOV-LV-22 NOV-LV-24	South East	427 407	78 65	-10 -10	-61 -60	3	N/A N/A		
		NOV-LV-26 NOV-VCU-001	North South	400 422	69 67	-10 -10	-60 -60	3	N/A N/A		
		NOV-VCU-002 NOV-VCU-003	South South	421 420	70 69	-10 -10	-60 -60	3	N/A N/A		
	1	NOV-VCU-004	South	420	62	-10	-60	3	N/A	53	55

Remark: [1] As a conservative approach, only horizontal distance has been considered in the calculation of distance correction. [2] A negative correction of 10 dB(A) has been adopted to the direction facing of the louver totally screened by buildings. [3] Only noise sources within 300m from the NSRs are included in the assessment. *The sum of correction factor is larger than the measured SWL, therefore, the predicted sound pressure level is consider negligible.



Appendix B

Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources

Appendix B1

Measurement Methodology

Method 1: Far-Field Testing Method for Louver



a: Short side of the louver

b: Long side of the louver

D: Measurement distance (separation between louver and microphone), where D must be greater than (2b) and rounded up to interger.

Louver opening

Proposed measurement point (microphone pointing perpendicular to the center of the louvre)

For method 1,

- "D" must be greater than 2b and round up to integer.
- The microphone must point to the center of the louver.
- At least 3 sets of LAeq, 1 min should be obtained.
- Background noise measurement should be obtained for determination of background correction factor.
- Any reason causing this method cannot be performed, noise measurement should then be conducted at near field in accordance with Method 2.
- If results of measurement reveal that difference in noise levels measured at far field with and without operation of fixed plant item is less than 3.0dB(A), noise measurement should then be conducted at near field in accordance with Method 2.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ measured \ L_{Aeq, \ 1 \ min} + 20log(D) + 8 + background \ noise \ correction \ factor$

Method 2: Near-Field Testing Method for Louver



D: Measurement distance

- Louver opening
- Measurement box
- Proposed measurement point (microphone pointing perpendicular to the louvre)

For method 2 (developed based on the principle of ISO3746:2010),

- First step is to determine a hypothetical measurement surfaces with at least 1m separation (D, measured from the centre of the louvre or its nearest edges as appropriate) from the louver.
- For louvre with largest dimension ≤3D, at least one measurement at the centre of the measurement surface parallel to the louvre should be conducted.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- Extra localized microphone positions on the measurement surfaces in the region of high radiation should be considered. In this case follow the procedures of ISO3744.
- For louver with largest dimension > 3D, measurement surface and measurement position should follow ISO3746.
- Background noise level should be taken at each measurement point for determining the background correction (K1A).
- If the difference between the background noise and the measured noise level is less than 3.0dB, K1A should be capped to 3.0dB.
- If necessary to obtain less conservative results, D should be reduced according to ISO3746 to obtain higher measured noise levels.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ LAeq \ over \ all \ measurement \ points + 10 \ log \ (total surface \ area \ over \ the \ measurement \ box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection

Method 3 - Far Field Testing Method for Plant Item



"L" is the longest side of the plant item

"D, Center" is the separation between center of the plant item and microphone

"D, Surface" is the separation between surface of the plant item and microphone

- "D, Surface" must be greater than twice of L (2L) and roundup to integer (e.g 6m, 7m, 8m...).
- The microphone must be pointing to the center of the plant.
- Measurement should be carried out at the direction toward all NSRs.
- At least 3 sets of $L_{Aeq, 1}$ min should be obtained at each the measurement point.
- Background noise measurement should be obtained for determination of background correction factor.
- Any reason causing this method cannot be performed, noise measurement should then be conducted at near field in accordance with latest edition of ISO3746 (Method 4).
- If results of measurement reveal that difference in noise levels measured at far field with and without operation of fixed plant item is less than 3.0 dB(A), noise measurement should then be conducted at near field in accordance with latest edition of ISO3746 (Method 4).
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

SWL = Mean measured $L_{Aeq, 1 min} + 20 \log (D,Center) + 8 + background noise correction factor$

Method 4 – Near Field Testing Method for Plant Item

Kev

For Method 4 (based on ISO3746:2010),

- Please refer to latest edition of ISO3746 for measurement requirement.
- The locations of measurement points are depended on the size of the plant, which cannot be easily generalized (see figure for example)
- Background noise measurement should be obtained for determination of background correction factor (K1A). According to ISO3746, if the source under test radiates noise predominantly in one direction or if the noise from a large source is emitted only from a small portion of the source, the usage of extra localized microphone positions on the measurement surface in the region of high radiation should be considered. In this case, follow the procedures specified in ISO3744.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- Detail calculation of the SWL should refer to the latest edition of ISO3746.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean L_{Aeq} \text{ over all measurement points} + 10 \log (total surface area over the measurement box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection

Method 5 – Near Field Testing Method for Plant Room or other source



For Method 5 (developed based on the principle of ISO3746 -2010),

- First step is to determine a measurement box with at least 1m separation (measured from the centre of the louvre or its nearest edges as appropriate) from the louver.
- Secondly, is to determine the location of measurement points on the measurement surface of the hypothetical box.
- Extra localized microphone positions on the measurement surface in the region of high radiation should be considered. In this case follow the procedures of ISO 3744.
- Background noise level should be taken for determination of background correction (K1A.
- Minimum 10 seconds of measurement interval should be obtained at each measurement point.
- If the difference between the BGL and the measured noise level (MNL) is less than 3.0dB, K1A should be capped to 3.0dB.
- If necessary to obtain less conservative results. D should be reduced according to ISO3746 to obtain higher MNLs.
- Noise measurement to confirm any tonal, impulsive and intermittent characheristics at representative NSRs.

 $SWL = Mean \ L_{Aeq} \ over \ all \ measurement \ points + 10 \ log \ (total \ surface area \ over \ the \ measurement \ box) + K1A + K2A$

K1A refers to background noise correction factor K2A refers to environmental correction for sound absorption and reflection Appendix B2

Calibration Certificates – Noise Measurement for Fixed Plant Noise

Appendix B2 Calibration Certificates – Noise Measurement for Fixed Plant Noise

Cert B1: Calibration Certificate of Sound Level Meter SVAN958 (SN: 69082)



ISO9001 certified

FACTORY CALIBRATION DATA OF THE SVAN 958 No. 69082

SOUND LEVEL METER

I. CALIBRATION (electrical)

LEVEL METER, P	ilter: LIN, Input signal =114.0dB, fan=1kHz
	Range 105dB

	Range 1	05dB	Range 130dB			
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]		
Channel 1	113.98	-0.02	114.03	0.03		
Channel 2	113.98	-0.02	114.02	0.02		
Channel 3	113.98	-0.02	114.02	0.02		
Channel 4	113.98	-0.02	114.02	0.02		

2. CALIBRATION' (acoustical)

LEVEL METER; Range: 130 dB; Reference frequency: 1000Hz;

Filter	LIN	a sub- sub- sub-	A		С		
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	
Channel 1	113.8	-0.2	113.8	-0.2	113.8	-0.2	
Channel 2	113.8	-0.2	113.8	-0.2	113.8	-0.2	
Channel 3	113.8	-0.2	113.8	-0.2	113.8	-0.2	
Channel 4	113.8	-0.2	113.8	-0.2	113.8	-0.2	

Calibration measured with the microphone SVANTEK type SV 22 No. 4010479. Calibration factor: 0.6dB

3. LINEARITY TEST' (electrical)

LEVEL METER; Range: 105 dB; Filter: A; f an = 1000 Hz

	Input [dB]	24.0	30.0	40.0	60.0	80.0	100.0	114.0
Channel 1	Error.[dB]	0.19	0.10	0.05	0.00	0.00	0.00	0.00
Channel 2	Error [dB]	0.21	0.11	0.04	-0.01	0.00	0.00	0.00
Channel 3	Error [dB]	0.14	0.08	0.03	0.00	0.00	0.01	0.01
Channel 4	Error [dB]	0.11	0.07	0.03	0.00	0.00	0.00	0.01

LEVEL METER; Range: 130 dB; Filter: A; f an= 1000 Hz

	Input [dB]	45.0	50.0	60.0	80.0	100.0	120.0	135.0
Channel 1	Error [dB]	0.11	0.15	0.06	0.00	0.00	0.00	0.01
Channel 2	Error [dB]	0.13	0.14	0.05	0.00	0.00	-0.01	0.01
Channel 3	Error [dB]	0.07	0.07	0.04	-0.00	0.01	-0.00	0.02
Channel 4	Error [dB]	80.0	0.07	0.03	-0.00	-0.00	-0.01	0.01

1/3 OCTAVE (1kHz); Range: 130 dB; Filter: A; f ... = 1000 Hz

	Input [dB]	35.0	40.0	60.0	80.0	100.0	120.0	135.0
Channel 1	Error [dB]	0.44	0.11	0.07	0.00	0.00	-0.01	0.01
Channel 2	Error [dB]	0.42	0.12	0.07	-0.00	-0.00	-0.00	0.01
Channel 3	Error [dB]	0.34	0.11	0.04	-0.00	-0.00	-0.01	0.01
Channel 4	Error [dB]	0.35	0.12	0.04	0.00	0.01	0.00	0.01

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4. TONEBURST RESPONSE' (electrical)

LEVEL METER; Characteristic: A; f sim= 4000 Hz; Burst duration: 2s;

Range: 105dB; Equivalent input steady level = 112dB

Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
			Indication [dB]	112.0	111.9	111.0	109.4	107.2	103.7	100.8	97.9	94.0	91.0	87.9	84.9
			Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.1	-0.1
		10	Indication [dB]	112.0	111.9	111.0	109.4	107.2	103.7	100.8	97.9	94.0	91.0	87.9	84.9
	Fort	2	Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.1	-0.1
	1.924	2	Indication [dB]	112.0	111.9	111.0	109.4	107.2	103.7	100.9	97.9	94.0	91.0	87.9	84.9
			Error (dB)	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
			Indication [dB]	112.0	111.9	111.0	109.4	107.2	103.7	100.8	97.9	94.0	90.9	87.9	84.9
MAY		-	Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
PUAA			Indication [dB]	109.9	107.9	104.6	101.8	98.9	95.0	92.0	89.0	85.0		+2	
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0		-	
		2	Indication [dB]	109.9	107.9	104.6	101.8	98.9	95.0	92.0	89.0	85.0			
	Claur		Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0		-	
	510W	1	Indication [dB]	109.9	108.0	104,6	101.8	98.9	95.0	92.0	89.0	85.0			
		3	Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0		-	
			Indication [dB]	109.9	107.9	104.6	101.8	98.9	95.0	92.0	89.0	85.0			
_			Error (dB)	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	
		140	Indication [dB]	111.8	109.0	105.0	102.0	99.0	95.0	92.0	89.0	85.0	82.0	78.9	75.9
			Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1
		1.00	Indication [dB]	111.8	109.0	105.0	102.0	99.0	95.0	92.0	89.0	85.0	82.0	78.9	75.9
CEL	1.000	2	Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1
SEL			Indication [dB]	111.8	109.0	105.0	102.0	99.0	95.0	92.0	89.0	85.0	82.0	78.9	75.9
		3	Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1
		4	Indication [dB]	111.8	109.0	105.0	102.0	99.0	95.0	92.0	89.0	85.0	81.9	78.9	75.9
		- 4	Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1

Range: 105dB; Equivalent input steady level = 52dB

Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5
			Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.9	37.9
		1	Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
			Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.8	37.9
	2	Z	Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
	Fast	-	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.9	38.0
		3	Error [dB]	0.0	0.0	0.0	-0.0	-0.0	0.0	-0.0	0.0
			Indication [dB]	52.0	51.9	51.0	49.4	47.1	43.7	40.8	37.9
		4	Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
MAX			Indication [dB]	49.8	47.9	44.6	41.8	38.9	35.0	32.0	29.0
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
			Indication [dB]	49.8	47.9	44.6	41.8	38.9	35.0	32.0	29.0
		2	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0
	Slow		Indication [dB]	49.9	48.0	44.6	41.8	38.9	35.0	32.0	29.0
		3	Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	0.0
			Indication [dB]	49.8	47.9	44.6	41.8	38.9	34.9	32.0	29.0
		4	Error [dB]	-0.2	0.1	-0.0	-0.0	-0.0	-0.0	0.0	0.0
			Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.1	29.1
			Error [dB]	-0.3	-0.0	0.0	0.0	0.0	0.0	0.1	0.1
		-	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.0	29.1
0.01		1.2	Error [dB]	-0.3	-0.0	0.0	-0.0	0.0	0.0	0.1	0.1
SEL			Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.1	32.1	29.1
		3	Error [dB]	-0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.1
			Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.0	29.1
		4	Error [dB]	-0.3	-0.0	0.0	0.0	0.0	0.0	0.1	0.1

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Range: 105dB, Equivalent input steady level = 34dB

Result	Detector	Ch.	Duration [ms]	1000	500
-			Indication [dB]	34.1	34.0
		- 1	Error [dB]	0.0	0.1
			Indication [dB]	34.0	34.0
	6.4	- 4	Error [dB]	0,0	0.0
	Past	1	Indication [dB]	34.0	34.0
		3	Error [dB]	-0.0	0.0
			Indication [dB]	34.0	33.9
MAX		4	Error [dB]	0.0	0.1
MAX			Indication [dB]	31.9	30.1
			Error [dB]	-0.1	0.1
		2	Indication [dB]	31.9	30.0
		4	Error [dB]	-0.1	0.1
	Slow		Indication [dB]	31.9	30.1
		,	Error [dB]	-0.1	0.1
			Indication [dB]	31.8	30.0
		4	Error [dB]	-0.1	0.1
			Indication [dB]	33.8	31.1
			Error [dB]	-0.2	.0.1
			Indication [dB]	33.8	31.1
SEL		2	Error [dB]	-0.2	0.1
		-	Indication [dB]	33.8	31.1
		3	Error [dB]	-0.2	0.0
			Indication [dB]	33.8	31.1
		4	Error [dB]	-0.2	0.1

Range: 130dB; Equivalent input steady level = 134dB

Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
			Indication [dB]	134.0	133.9	133.0	131.4	129.2	125.7	122.8	119.9	116.0	113.0	109.9	106.9
		1	Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.1	-0.1
			Indication [dB]	134.0	133.9	133.0	131.4	129.2	125.7	122.8	119.9	116.0	112.9	109.9	106.9
	2	2	Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.1	-0.1	-0.1
	Fast	-	Indication [dB]	134.0	133.9	133.1	131.4	129.2	125.7	122.9	119.9	116.0	113.0	109.9	106.9
		3	Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.1	-0.1	-0.1
			Indication [dB]	134.0	133.9	133.0	131.4	129.2	125.7	122.8	119.9	116.0	112.9	109.9	106.9
		. 4	Error [dB]	0.0	0.0	0.0	0.0	129.2	-0.0	-0.1	0.0	-0.0	-0.1	-0.1	-0.1
MAX			Indication (dB)	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0		-	**
		1	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0		-	-
			Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0			
	C1	4	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-		
	Slow		Indication [dB]	131.9	130.0	126.6	123.8	120.9	117.0	114.0	111.0	107.0		- 12	
		3	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0		14	1.2
			Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	- i -	1.
		4	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0		-	
			Indication [dB]	133.7	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	104.0	100.9	97.9
		1	Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1
			Indication [dB]	133.7	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	103.9	100.9	97.9
	1.00	4	Error [dB]	-0.3	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
SEL	· *		Indication [dB]	133.8	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	104.0	100.9	.97.9
		3	Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1
			Indication [dB]	133.7	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	103.9	100.9	97.9
		4	Error [dB]	-0.3	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1

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Range 130dB; Equivalent input steady level = 74dB

Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5
	-	1	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	59.9
		1	Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
			Indication [dB]	74,0	73.9	73.0	71.4	69.2	65.7	62.9	59.9
		2	Error [dB]	0.0	0.0	73.0	0.0	-0.0	-0.0	-0.0	-0.0
	Fast		Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	60.0
		3	Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
			Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.8	59.9
		4	Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
MAX			Indication [dB]	71.9	70.0	66.6	63.8	60.9	57.0	54.0	51.0
		1	Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
			Indication [dB]	71.8	69.9	66.6	63.8	60.9	57.0	54.0	51.0
		2	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
	Slow		Indication [dB]	71.9	70.0	66.6	63.8	60.9	57.0	54.0	51.0
		3	Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
			Indication [dB]	71.8	69.9	66.6	63.8	60.9	56.9	54.0	51.0
		4	Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0
			Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.0	51.1
		1	Error [dB]	-0.2	-0.0	0.0	0.0	0.0	0.0	0.0	0.1
			Indication [dB]	73.7	71.0	67.0	64.0	61.0	57.0	54.1	51.0
222		Z	Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	0.1	0.0
SEL			Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.1	51.1
		3	Error (dB)	-0.3	-0.0	0.0	0.0	-0.0	0.0	0.0	0.1
			Indication [dB]	73.7	71.0	67.0	64.0	61.0	57.0	54.0	51.1
		4	Error [dB]	-0.3	-0.0	0.0	0.0	0.0	0.0	0.0	0.1

Range: 130dB; Equivalent input steady level = 54dB

Result	Detector	Ch.	Duration [ms]	1000	500
			Indication [dB]	54.1	54.0
			Error [dB]	0.0	0.0
			Indication [dB]	54.1	54.0
		2	Error [dB]	0.0	0.0
	Fast		Indication [dB]	54.1	54.0
		2	Error [dB]	0.0	0.1
			Indication [dB]	54.0	53.9
		*	Error [dB]	0.0	0.0
MAX			Indication [dB]	52.0	50.1
		1	Error [dB]	-0.1	0.1
	Slow	-	Indication [dB]	51.9	50,0
		- 2	Error [dB]	-0.1	0.1
			Indication [dB]	51.9	50.0
		3	Error [dB]	-0.1	0.1
			Indication [dB]	51.9	50.0
		4	Error [dB]	-0.1	0.1
			Indication [dB]	53.9	51.1
		1	Error [dB]	-0.2	0.1
		-	Indication [dB]	53.8	51.1
SEL		4	Error [dB]	-0.2	0.1
			Indication [dB]	53.8	51.1
		3	Error [dB]	-0.2	0.1
			Indication [dB]	53.8	51.0
		4	Error [dB]	-0.2	0.0

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6. FREQUENCY RESPONSE (electrical)

LEVEL METER, Filter Z, Range 130 dB; Input signal =135 dB;



Measured Response with Preamplifier SV12 (f-frequency, An-attenuation in channel n)

f [Hz]	A1[dB]	A2[dB]	A3[dB]	A4[dB]	f [Hz]	AI[dB]	A2[dB]	A3[dB]	A4[dB]
10	3.2	3.2	3.2	3.2	250	-0.0	0.0	0.0	-0.0
12.5	1.4	1.4	1.4	1.4	500	-0.0	0.0	0.0	0.0
16	0.5	0.5	0.5	0.5	1000	0.0	0.0	0.0	0.0
20	0.1	0.1	0.1	0.1	2000	0.0	0.0	0.0	0.0
25	-0.0	0.0	0.0	-0.0	4000	0.0	0.0	0.0	0.0
31.5	-0.0	-0.0	-0.0	-0.0	8000	0.0	0.0	0.0	0.0
63	-0.0	-0.0	-0.0	-0.0	16000	0.0	0.0	0.0	-0.0
125	-0.0	0.0	0.0	-0.0	20000	0.0	0.0	0.0	-0.0

All frequencies are nominal center values for the 1/3 octave bands

7. INTERNAL NOISE LEVEL' (electrical)

LEVEL METER; Range: 105 dB; Back-light - off; Calibration factor: 0dB

	Filter	Z	A	C
Channel I	Level [dB]	14.4	11.2	12.0
Channel 2	Level [dB]	15.0	10.9	11.1
Channel 3	Level [dB]	13.9	10.6	11.2
Channel 4	Level [dB]	13.3	10.2	11.3

* measured with preamplifier SVANTEK type SV 12L No. 17701.

VIBRATION LEVEL METER

1. CALIBRATION (electrical)

LEVEL METER; Filter: HP10; Input signal =140.0dB (10.0 m/s²), f_{un}=79,6Hz

3 T	Range 1	45dB	Range 170dB			
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]		
Channel 1	139.98	-0.02	140.04	0.04		
Channel 2	139.98	-0.02	140.03	0.03		
Channel 3	139.98	-0.02	140.03	0.03		
Channel 4	139.98	-0.02	140.03	0.03		

2. CALIBRATION (vibrational)

LEVEL METER; Range: 145dB; Input signal: 120dB;

Filter	HPI		HP10		Wd	Sec. 2. 1	Wm		Wh	
	Indication [dB]	Error [dB]								
Channel 1	120.0	0.0	120.0	0.0	106.1	0.0	102.0	-0.0	110.5	-0.0
Channel 2	120.0	0.0	120.0	0.0	106.1	0.0	102.0	-0.0	110.5	-0.0
Channel 3	120.0	0.0	120.0	0.0	106.1	0.0	102.0	-0.0	110.5	-0.0
Channel 4	120.0	0.0	120.0	0.0	106.2	0.0	102.0	-0.0	110.5	-0.0

Calibration measured with the accelerometer SVANTEK type SV80 No. H0413. Calibration factor: -0.56dB

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3. FREQUENCY RESPONSE (electrical)

1/3 OCTAVE; Filter: HP; Range: 170 dB; input=175 dB;



Measured Response (f-frequency, An-attenuation in channel n)

f [Hz]	A1[dB]	A2[dB]	A3[dB]	A4[dB]	f [Hz]	A1[dB]	A2 [dB]	A3[dB]	A4[dB]	f[Hz]	A1[dB]	A2[dB]	A3[dB]	A4[dB]
0.8	0.19	0.19	0.19	0.19	5	0.02	0.01	0.01	0.01	500	-0.01	-0.01	-0.01	-0.01
1	0.10	0.10	0.10	0.10	6.3	0.00	-0.00	-0.00	-0.00	1000	0.00	-0.00	-0.00	-0.01
1.25	0.08	0.08	0.08	0.08	8	-0.01	-0.01	-0.01	-0.01	2000	0.00	-0.00	-0.00	-0.00
1.6	0.06	0.06	0.06	0.06	16	-0.02	-0.02	-0.02	-0.02	4000	0.01	0.01	-0.00	-0.00
2	0.02	0.02	0.02	0.02	31.5	0.00	-0.00	-0.00	-0.00	8000	0.03	0.04	0.02	0.02
2.5	0.01	0.01	0.01	0.01	63	-0.01	-0.01	-0.01	-0.01	16000	0.02	0.02	-0.01	-0.02
3.15	-0.01	-0.01	-0.01	-0.01	125	-0.01	10.0-	-0.01	-0.01	20000	0.02	10.0	0.01	-0.01
4	0.02	0.02	0.02	0.02	250	-0.01	-0.01	-0.01	-0.01					

All frequencies are nominal center values for the 1/3 octave bands

4. INTERNAL NOISE LEVEL (electrical)

LEVEL METER func ; Range: 145 dB; Back-light - off

	Filter	HP1	HP10	Wd	Wm	Wh
Channel I	Indication [dB]	54.8	52.0	42.6	38.8	36.2
Channel 2	Indication [dB]	55.0	52.4	42.6	39.0	36.8
Channel 3	Indication [dB]	55.5	53.3	42.8	39.1	36.1
Channel 4	Indication [dB]	54.8	52.4	42.4	39.0	36.2

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
26 °C	47 %	1000 hPa

	TEST EQUIPMENT							
Item	Manufacturer	Model	Serial no.	Description				
1.	SVANTEK	SVAN 401	127	Signal generator				
2.0	SVANTEK	SVAN 912A	4369	Sound & Vibration Analyser				
3.	KEITHLEY	2000	0910165	Digital multimeter				
4.	SVANTEK	SV33	48878	Acoustic calibrator				
5.	SVANTEK	ST02		Microphone equivalent electrical impedance (18pF)				
6.	DYTRAN	3233A	1376	Reference accelerometer				

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.

2. Traceability of the calibration is guaranteed by the above mentioned ISO9001 procedures.

3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.

4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Kubel _____/hubel

Test date: 2018-08-13

*** STAN955 No. 69082 page 6 ***
Cert B2: Calibration Certificate of Sound Level Meter SVANTEK 958 (SN: 28422)



CALIBRATION CERTIFICATE

Certificate Information	on	Contraction of the second	- MARTINE PARTY	
Date of Issue	12-May-2020]	Certificate Number	MLCN201165S
Customer Informatio	л	and the second states	CHERT PROLING	14-10-10 - 10-10 - 10-10
Company Name Address	Wilson Accoust Unit 601, Block Yuen Shun Circ Shatin, N. T., Hong Kong	ies Limited A, Shatin Industrial C uit,	'entre,	
Equipment-under-Te	est (EUT)	HIRO & R. C. S.	a line a serie of the	
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibrat Svantek SVAN 958 28422 	ion Analyser		
Calibration Particul	ar	MELECCIC CO.	And a state of the	and the second second second
Date of Calibration Calibration Equipment	12-May-2020 4231(MLTE00	8) / AV180068 / 13-M	ay-2020	
Calibration Procedure	MLCG00, ML	CG15		
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	23 °C ± 5 °C 55% ± 25% Over 3 hours 10 minutes Internal battery	
Calibration Results	Calibration dat	a were detailed in the	continuation pages.	
Annroved By & Date	p	Statistics of the local division of the		The section and
Approved by & Dan		-	KO. LO	12-May-2020
Statements Calibration equipment use The results on this Calibra not include allowance for i everloading, mishandling, Mask ab Calibration Centr The copy of this Certificat prior written approval of h	d for this calibration tion Certificate only the EUT long term d misuse, and the cap re Limited shall not l ie is owned by Maxd dacLab Calibration	are traceable to national / relate to the values measu fuff, variation with environ acity of any other laborato be liable for any loss or da .ab Calibration Centre Lin Centre Limited.	international standards. red at the time of the calibration and th smental changes, vibration and shock d ty to repeat the measurement. mage resulting from the use of the EUT rited. No part of this Certificate may b	ie uncertainties quoted will uring transportation, F. e reproduced without the

Page 1 of 2



萬儀校正中心有麗公司 MaxLab Calibration Centre Limited 香港朝野芸浦華嶽16-18 號保營工業大震9 樓 B室 Unit 8, 9/F., Brittwin Industrial Bidg. 16-18 Wah Sing Street, Kasel Chung, N.T., Hong Kong Tel: (852) 216 1380 Fasc (852) 2264 6480 Email: Info@maxlab.com.hk



Calibration Data Calibration Standard EUT Channel / EUT Error Filter / Detector Range Uncertainty Reading Reading Mode 0.0 dB 0.2 dB 94.0 dB 94.0 dB CH4 / Sound A/FAST 105 dB 130 94.1 dB 94.0 dB 0.1dB 0.2 dB (1 kHz Input) dB dB dB 0.2 0.0 114.0 dB 114.0 dB dB 0.2 dB dB C/FAST dB 94.0 105 dB 94.0 0.2 dB 94.0 dB 0.1 dB (1 kHz Input) 130 dB 94.1 dB dB 0.2 dB 114.0 dB 114.094.0 dB 0.0 dB 0.2 dB dB 94.0 dB 0.2dB (1 kHz Input) 94.1 dB 94.0 dB 0.1 dB 130 dB dB 0.0 0,2114.0 dB 114.0 dB. dB 94.0 dB 0.0 dB 0.2 dB 94.0 A/SLOW 105 dB 0.2 dB 0.0 dB (1 kHz Input) dB 114.0 dB 114.0 dB 130 0.0 dB 0.2 dB 94.0 dB C/SLOW 105 dB 94.0 dB 114.0 dB dB 0.0 dB 0.2 dB 130 dB 114.0 (1 kHz Input) dB dB 0.0 0.2 LIN / SLOW 105 dB 94.0 dB 94.0 dB 114.0 dB 0.2 dB 0.0 dB dB (1 kHz Input) 130 dB 114.0 dB A / IMPULSE dB 94.0 dB 94.0 dB 0.0dB 0.0 dB 0.2 dB (1 kHz Input) C / IMPULSE 130 dB 114.0 dB 114.0 dB 94.0 dB 94.0 dB 0.0dB 0.2 dB (1 kHz Input) 0.0 dB dB 0.2 130 dB 114.0 dB 114.0dB 0.0 dB 0.2 dB 94.0 dB 94.0 dB LIN / IMPULSE 105 dB 0.2 (1 kHz Input) 0.0 dB dB 114.0 dB dB dB

Certificate No. MLCN2011655

114.0 - END -

Calibrated By : Date :

Dan 12-May-2020

130

K.O. Lo Checked By : 12-May-2020 Date :

Page 2 of 2

Cert B3: Calibration Certificate of Sound Level Meter SVANTEK 959 (SN: 11228)



CALIBRATION CERTIFICATE

Certificate Informati	on		1000		
Date of Issue	12-May-2020		(Certificate Numbe	r MLCN201166S
Customer Informatio		Land of The Local Land	1201	COLUMN TWO IS NOT	Constanting of the local division of the loc
Company Name Address	Wilson Account Unit 601, Bloc Yuen Shun Cir Shatin, N. T., Hong Kong	stics Limited k A, Shatin Industrial (reuit,	Centre,		
Equipment-under-Te	est (EUT)		State of the local division of the local div	and the second of the	1
Description Manufacturer Model Number Serial Number Equipment Number	Sound & Vibr Svantek SVAN 959 11228	ation Analyser			
Calibration Particul	ar	Carlos Carlos Pres	100	States in the	A DESCRIPTION OF THE OWNER OF THE
Date of Calibration Calibration Equipment	12-May-2020 4231(MLTE0	08) / AV180068 / 13-M	tay-2020		
Calibration Procedure	MLCG00, MI	.CG15			
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	23 °C ± 5 55% ± 25 Over 3 h 10 minut Internal b	5 °C 9% ours es nattery	
Calibration Results	Calibration da All calibration	ta were detailed in the a results were within El	continuatio UT specific	n pages. ation,	
Approved By & Date	;		1	and some of the	
			16	K.O. Lo	12-May-2020
Statements Calibration equipment uses The results on this Calibrat not include allowance for 1 overfloading, mishandling, MaxLab Calibration Centr MaxLab Calibration Centr The copy of this Certificat prior written approval of N	d for this calibratio tion Certificate only the EUT long term misuse, and the ca- e Limited shall not e is owned by Max faxLab Calibration	n are traceable to national / y relate to the values measu drift, variation with environ pacity of any other laboratio be liable for any loss or da Lab Calibration Centre Lin (Centre Limited.	international red at the tim mental chang ry to repeat it mage resultin nited. No par	standards. e of the calibration and th ges, vibration and shock of the measurement. g from the use of the EU t of this Certificate may b	he uncertainties quoted will during transportation, T. he reproduced without the

Page 1 of 2



富備校正中心有限公司 MaxLab Calibration Centre Limited 愛得新界發演業詳述16-18 號保設工業大厦9 樓 B 室 Unit 8, 9/F_Boldwin Industrial Bidg., 16-18 Web Sing Street, Kwai Chung, N.T. Hong Kong Tell (852) 2116 1380 Fax (852) 2264 5480 Email: Info@maxlab.com.hk



d'and	Read and	S	5.45	128.129	233110
Certi	neate	10.	CV1L	1.19.60	011003

Weighting / Time	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
A/FAST	LOW	93.9 dB	94.0 dB	=0.1 dB	0.2 dB	± 0.7 dB
1 kHz input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
Contraction and the second	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		114.0 dB	114.0 dB	0.0 dB	0.2 dB	± 0.7 dB
C/FAST	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
(1 kHz Input)		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
in manufactory.	HIGH	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / FAST LOW (1 kHz Input) HIGE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	\pm 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A/SLOW LOV	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
(1 kHz Input)	HIGH	114.0 dB	114.0 dB	0.0 dB	0.2 dB	± 0.7 dB
C/SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
(I kHz Input)	HIGH	113.9 dB	114.0 dB	+0.1 dB	0.2 dB	± 0.7 dB
Z/SLOW	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
(1 kHz Input)	HIGH	114.0 dB	114.0 dB	0.0 dB	0.2 dB	± 0.7 dl
C/IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
(1 kHz Input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z/IMPULSE	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dE
(1 kHz input)	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dE

- END -

Calibrated By : Date :

Dan 12-May-2020

K.O. Lo 12-May-2020 Checked By :

Date :

Page 2 of 2

業債校正中心有限公司 MaxLabi Galibration Centre Limited 香港就界交通草星世16-18 號保登工業大変 9 権日室 Linit 8, 567, Bakows Industrial Bidg., 16-18 Woh Seg Street, Kwai Chang, N.T. Hong Xong, Tel. (852) 216 1380 Fax: (852) 2264 6480 Email: info@modeb.com/tek

Cert B4: Calibration Certificate of Acoustic Calibrator SVANTEK SV30A (SN: 29088)



CALIBRATION CERTIFICATE

cernificate injormatio	10.14		Castlense No. 1	MI Chiloneane
Date of Issue	18-Mar-2019		Certificate Number	MLCN1906398
Customer Informatio	n	Section of the sectio		
Company Name	Wilson Accoust	tics Limited		
Address	Unit 601, Block	A, Shatin Industrial Co	mtre,	
	Yuen Shun Cire	cuót,		
	Shatin, N. T.,			
	Hong Kong			
Equipment-under-Te	st (EUT)			
Description	Acoustic Calibr	rator		
Manufacturer	Svantek			
Model Number	SV 30A			
Serial Number	29088			
Equipmeni Number	10			
Calibration Particula	ır			
Date of Calibration	18-Mar-2019			
Calibration Equipment	4231(MLTE00	8) / AV180068 / 13-Ma	y-20	
	1351(MLTE04	9) / MLEC18/06/02 / 6-	Jun-19	
Calibration Procedure	MLCG00, MLC	CG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C	
		Relative Humidity	55% ± 25%	
	EUT	Stabilizing Time	Over 3 hours	
		Wann-up Time	Not applicable	
		Power Supply	Internal battery	
Calibration Results	Calibration data	a were detailed in the co	ntinuation pages.	
	All calibration	results exceeded the EU	T error limit.	
Approved By & Date				1
			12.27.275	1201-1210
			K.O. Lo	18-Mar-2019
Statements	and a second second second	and the second states of the	TANK TO A CONTRACTOR	
 Calibration equipment used 	for this calibration a	re traceable to national / inte	mational standards.	testing and soft and
include allowance for the E	UT long term drift, va	riation with environmental	hanges, vibration and shock during transpo	etation, overloading,
mishandling, misuse, and th	ic capacity of any oth	er laboratory to repeat the m	casurement.	
* MaxLab Calibration Centre	Limited shall not be	liable for any loss or damage	resulting from the use of the EUT.	
 The copy of this Certificate unittee encoural of MayLa) 	is owned by MaxLab Calibration Centre I	Calibration Centre Limited	No part of this Certificate may be reprodu-	ced without the prior
within approvation watches	Carronando Centre L	and the second se		



高橋校正中心有限公司 MiceLab Calibration Centre Limited 各港教育新潮星型 16-18 破保道工業大厦日桂日2 室 Linit B2, SF, Boldwin Industrial Bidg, 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Nong, 16: (MS2) 216 1388 Fina: (MS2) 2284 6480 Email: info@maxiab.com.tw



Certificate No. MLCN1906395

EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94 dB	93.5 dB	0.5 d8 *	0.15 dB	± 0.3 dB
114 dB	113.6 dB	0.4 dB *	0.15 dB	± 0.3 dB

Calibrated By :	Dan	Checked By :	K.O. Lo
Date :	18-Mar-19	Date :	18-Mar-19
			Page 2 of 2

Cert B5: Calibration Certificate of Acoustic Calibrator SVANTEK SV30A (SN: 10814)



CALIBRATION CERTIFICATE

-

Date of Issue	21-Aug-2020		Certificate Number	MLCN202127S	
Customer Informatio	m	100 States and	Contractor water the loss	AND IN COMPANY	
Company Name	Wilson Accou	stics Limited			
Adress	Unit 601, Bloc	k A. Shatin Industrial C	Centre,		
Refer to a	Yuen Shun Cir	cuit.			
	Shatin, N. T.,				
	Hong Kong				
Eauipment-under-Te	est (EUT)	Constant of the	A DATE OF THE OWNER	100 100000	
Description	Acoustic Calif	rator			
Manufacturer	Svantek				
Model Number	SV 30A				
Serial Number	10814				
Equipment Number					
Calibration Particul	ar	A DESCRIPTION OF TAXABLE PARTY.			
Data of Calibration	21. Aug. 2020				
Calibration Equipment	4231(MI TEO	08) / AV200063 / 23-Ju	m-23		
Cambration Equipment	1351(MLTE0	49) / MLEC20/06/02 / 5	5-Jun-21		
Calibration Procedure	MLCG00, MLCG15				
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C		
Canto anon Continuos	time to meet 2	Relative Humidity	55% ± 25%		
	EUT	Stabilizing Time	Over 3 hours		
		Warm-up Time	Not applicable		
		Power Supply	Internal battery		
Calibration Results	Calibration da	ta were detailed in the	continuation pages.		
	All calibration	n results were within EU	JT specification.		
Approved By & Date	p		A CONTRACTOR OF THE OWNER OF THE		
		1			
		10	K.O. Lo	21-Aug-20.	
Statements				No. of Concession, Name	
 Calibration equipment use 	d for this calibratio	n are traceable to national /	international standards.	uncertainties quoted as	
 The results on this Calibra not include allowance for t 	the EUT long term	drift, variation with environ	mental changes, vibration and shock dur	ing transportation,	
overloading, mishandling,	misuse, and the ca	pacity of any other laborator	ry to repeat the measurement.		
 MaxLab Calibration Centr 	e Limited shall not	be liable for any loss or dat	mage resulting from the use of the EUT.	mentioned without the	
 The copy of this Certificat 	e is owned by Max dayl ab Calibration	Lab Calibration Centre Lim Centre Limited	ited. No part of this Certificate may be	reproduced without the	
being weithen although of a	and the substitution				
				2.1	
				Page Lot	





Certificate No. MLCN202127S

EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification	
94 dB	94.1 dB	-0.1 dB	0.15 dB	± 0.3 dB	
114 dB	114.0 dB	0.0 dB	0.15 dB	± 0.3 dB	

Checked By : K.O. Lo. Kenneth Calibrated By : 21-Aug-20 21-Aug-20 Date : Date :

Page 2 of 2

夏·儀 校 正 中 心 有 限 公 司 Maxi, ab Calibration Centre Limited 音楽的作音演算是前 16-19 披保政工家大演 9 樽 日 定 Unit B. U.P., Boldwin Induited Didg., 18-18 Wesh Sing Street, Kesk Chung, N.T., Hang Kong, Tat: (852) 2716 1388 Fax; (852) 2764 6488 Email initia@mailut.com.hk

Cert B6: Calibration Certificate of Sound Level Meter SVANTEK 958A (SN: 59120)



CALIBRATION CERTIFICATE

	17 Nov 2020		Car	tificate Number	MI CN2030765		
Date of Issue	17-NOV-2020		Ce	tificate (vulifber	MILCIN2050705		
Customer Informatio	m	THE APPROX PARTY OF	and the	to an			
Company Name	Wilson Accoust	tics Limited					
Address	Unit 601, Bloc	k A, Shatin Industrial C	centre,				
	Yuen Shun Circuit,						
	Shatin, N. T.,						
	Hong Kong						
Equipment-under-To	est (EUT)			State of the	A COLOR		
Description	Sound & Vibra	ation Analyser					
Manufacturer	Svantek						
Model Number	SVAN 958						
Serial Number	59120	59120					
Equipment Number							
Calibration Particul	ar	A STREET WATER	and the second division of the second divisio		And in case of the local division of the loc		
Date of Calibration	17-Nov-2020						
Calibration Equipment	4231(MLTE008) / AV200063 / 23-Jun-2023						
Calibratian Provadura	MLCG00 MI	C015					
Calibration Procedure	Tangantura 22.00 + 5.00						
Calibration Conditions	Laboratory	Polatica Humidity	5505 + 2505				
	FUT	Stabilizing Time	Over 3 hour				
	LUI	Warm-un Time	10 minutes	2			
		Power Supply	Internal batt	erv			
Calibration Basults	Calibertion da	to were detailed in the	continuation n	aves			
Canoration Results	Canorinou da	in white detailed in the	continuation p	-64-11			
Approved By & Date	e	A STREET STREET	-	and the second second			
		-	1	P.O.L.	17 Nov-202		
			00	K.O. L0	17-1401-202		
Statements			Contractor in the local sector	a barde			
 Campration equipment use The results on this Calibra 	tion Certificate only	v relate to the values measu	red at the time of	the calibration and the	uncertainties quoted w		
not include allowance for t	the EUT long term	drift, variation with environ	mental changes,	vibration and shock du	ring transportation,		
	misuse, and the cap	pacity of any other laborato	ry to repeat the n	seasurement.			
overloading, mishandling,	The second	be liable for any loss or day	mage resulting fr	om the use of the EUT. this Certificate may be	reproduced without the		
 overloading, mishandling, MaxLab Calibration Centre The corry of this Certificat 	e Limited shall not	Lab Calibration Centre Lim	and the second sec	and the second s			
 overloading, mishandling, MaxLab Calibration Centr The copy of this Certificat prior written approval of N 	e is owned by Max faxLab Calibration	Lab Calibration Centre Lim Centre Limited	inter the part of				
 overloading, mishandling, MaxLab Calibration Centr The copy of this Certificat prior written approval of N 	e is owned by Max AaxLab Calibration	Lab Calibration Centre Lim Centre Limited	inter the part of				
overloading, mishandling, * MaxLab Calibration Centz * The copy of this Certificat prior written approval of N	e Limited shall not e is owned by Max AaxLab Calibration	Lab Calibration Centre Lim Centre Limited.			D		



Certificate No. MLCN2030768

Calibration	Data	1000	the state of			
Channel/ Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4/Sound	A/FAST	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 dB
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dE
	Construction of		114.0 dB	114.0 dB	0.0 dB	0.2 df
	C/FAST	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 dE
	(1 kHz Input)	130 dB	94.0 dB	94,0 dB	0.0 dB	0.2 dF
			114.0 dB	114.0 dB	0.0 dB	0.2 dI
	LIN/FAST	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 df
	(1 kHz Input)	130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 di
			114.0 dB	114.0 dB	0.0 dB	0.2 dF
	A/SLOW	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 dł
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	-0.2 dE
	C/SLOW	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 dl
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dE
	LIN / SLOW	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 dž
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0,0 dB	0.2 di
	A / IMPULSE	105 dB	93.9 dB	94,0 dB	+0.1 dB	0.2 dł
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dl
	C/IMPULSE	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 dl
	(1 kHz Input)	130 dB	114,0 dB	114.0 dB	0.0 dB	0.2 dl
	LIN / IMPULSE	105 dB	93.9 dB	94.0 dB	-0.1 dB	0.2 di
	(1 kHz Input)	130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dE

- END -

Calibrated By :	Dan	Checked By :	K.O. Lo
Date :	17-Nov-2020	Date :	17-Nov-2020
			Page 2 of 2

置 債 役 正 中 心 有 服 公 司 MaxLab Calibration Centre Umited 香港新界技通享星街 16-18 號保殿工業大賞 9 樽 日室 Unit B, 8F, Bottwin Veluatrial Biog, 16-19 Wait Sing Street, Kwei Chung, N.T. Hong Kung, Tat. (852) 2116 1380. Fax. (852) 2264 6460. Email.inte@mail.ab.com.Hk

Cert B7: Calibration Certificate of Sound Level Meter SVANTEK 958A (SN: 59121)



CALIBRATION CERTIFICATE

rtificate Informatic	m		AND INCOMENDATION OF	100	
e of Issue	31-Oct-2020		Certificate Nu	mber	MLCN202867S
stomer Informatio	n	ALL DOOR TO DO	Charles and		and the second second
npany Name Iress	Wilson Accous Unit 601, Bloc Yuen Shun Cir Shatin, N. T., Hong Kong	tics Limited k A, Shatin Industrial (cuit,	Centre,		
uipment-under-Te	st (EUT)			1 mail	
cription nufacturer del Number ial Number ripment Number	Sound & Vibra Svantek SVAN 958 59121	tion Analyser			
libration Particula	r				A LOUIS COL
e of Calibration ibration Equipment	31-Oct-2020 4231(MLTE00	18) / AV200063 / 23-Ju	n-2023		
ibration Procedure	MLCG00, ML	CG15			
ibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	23 °C ± 5 °C 55% ± 25% Over 3 hours 10 minutes Internal battery		
ibration Results	Calibration dat	a were detailed in the	continuation pages.		
proved By & Date			-	-	
			- KOLO		31-Oct-202
proved By & Date (terments alibration equipment used the results on this Calibratio ot include allowance for the vertoading, mishandling, m wac.ab Calibration Centre (the copy of this Certificate rior written approval of Ma	for this calibration n Certificate only c EUT long term d isase, and the cap Limited shall not is owned by MaxL schibration	are traceable to national / relate to the values measur http://ariation.with.environ acity of any other laborator be liable for any loss or dar ab Calibration Centre Lim Centre Limited	K.O. Lo nternational standards. ed at the time of the calibration mental changes, vibration and sl y to repeat the measurement. mage resulting from the use of th ted. No part of this Certificate	and the t hock duri ne EUT. may be r	31-Oc incertainties quo ing transportation eproduced withou

Page 1 of 2



業保校正中心有限公司 MaxLab Calibration Centre Limited 香港新界資源華星街 16-18 就保登工業大廈 9 樓 B 室 Unit B. 9/F., Boldwin Industrial Bidg., 15-18 Wah-Sing Street, Kwai Chung, N.T., Hong Kong, Teit (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk



Certificate No. MLCN202867S

Calibration	Data		Sec			10. ma 10. m
Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A/FAST	105 dE	94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dE	94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
			114.0 dl	3 114.0 d	B 0.0 dB	0.2 dB
	C/FAST	105 dF	94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dE	94.0 dl	3. 94.0 d	B 0.0 dB	0.2 dB
			114.0 dl	3 114.0 d	B 0.0 dB	0.2 dB
	LIN / FAST	105 dE	3 94,0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dE	94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
			114.0 dl	3 114.0 d	B 0.0 dB	0.2 dB
	A / SLOW	105 dF	3 94.0 dl	3 94.0 d	B 0,0 dB	0.2 dB
	(1 kHz Input)	130 dE	3 114.0 di	3 114.0 d	B 0.0 dB	0.2 dB
	C/SLOW	105 dE	3 94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dł	3 114.0 dl	3 114.0 d	B 0.0 dB	0.2 dB
	LIN/SLOW	105 di	3 94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dl	3 114.0 d	B 0,0 dB	0.2 dB
	A / IMPULSE	105 dI	94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dł	3 114.0 dl	3 114.0 d	B 0.0 dB	0.2 dB
	C/IMPULSE	105 dI	3 94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 dl	3 114.0 d	B 0.0 dB	0.2 dB
	LIN / IMPULSE	105 dI	94.0 dl	3 94.0 d	B 0.0 dB	0.2 dB
	(1 kHz Input)	130 dI	3 114.0 di	3 114.0 d	B 0.0 dB	0.2 dB

- END -

Calibrated By : Date :

Dan 31-Oct-2020 Checked By : Date :

31-Oct-2020 Page 2 of 2

K.O. Lo



 董 儀 校 正 中心 有 眼 公 司 MaxLab Calibration Centre Limited 香港新券英酒華星街 16-18 號保發工業大廈 9 楼 B 室 Unit 8, 9/F., Boldwin Industrial Bidg., 16-18 Wah Sing Street, Kwai Chung, N T, Hong Kong, Teir (852) 2116 1380 Fax (852) 2264 6480 Email: info@maxab.com.hk

Cert B8: Calibration Certificate of Acoustic Calibrator SVANTEK SV30A (SN: 10814)



CALIBRATION CERTIFICATE

Certificate Information	on	Brought and a	A REAL PROPERTY AND A REAL PROPERTY A REAL PROPERTY A REAL PROPERTY AND A REAL PROPERTY AND A REAL PROPERTY AND A REAL PROPERTY AND A REAL PROPERTY A REAL PROPERTY AND A REAL PROPERTY A REAL PROPERTY AND A REAL PROPERTY A	
Date of Issue	28-Sep-2021		Certificate Number	MLCN2127268
Customer Informatio	"	OWNERS AND ADDRESS		
Company Name Address	Wilson Accoust Unit 601, Block Yuen Shun Ciro Shatin, N. T., Hong Kong	ties Limited , A, Shatin Industrial C zuit,	'entre,	
Equipment-under-Te	st (EUT)			£ 2, 120, 21, 21
Description Manufacturer Model Number Serial Number Equipment Number	Acoustic Calib Svantek SV 30A 10814 	rator		
Calibration Particul	ar	Contraction of the local of the		and the local division of the local division
Date of Calibration Calibration Equipment	28-Sep-2021 4231(MLTE00 1351(MLTE04	8) / AV200063 / 23-Ju 9) / MLEC21/06/02 / 3	m-23 5-Jun-22	
Calibration Procedure	MLCG00, ML	CG15		
Calibration Conditions	Laboratory EUT	Temperature Relative Humidity Stabilizing Time Warm-up Time Power Supply	23 °C ± 5 °C 55% ± 25% Over 3 hours Not applicable Internal battery	
Calibration Results	Calibration da All calibration	ta were detailed in the results were within Et	continuation pages. JT specification.	
Approved By & Date	e e	and the second second	A REAL PROPERTY AND INCOME.	
			K.O. Lo	28-Sep-2021
Statements		Contraction of the last	A CONTRACTOR OF THE OWNER	a state of the state of the
 Calibration equipment use The results on this Calibra not include allowance for overloading, mishandling, MaxLab Calibration Cent The copy of this Certificat prior written approval of M 	d for this calibratio tion Certificate only the EUT long term misuse, and the car e Limited shall not e is owned by Max daxLab Calibration	n are traceable to national / relate to the values measu drift, variation with environ accity of any other laborato be liable for any loss or dat Lab Calibration Centre Lin Centre Limited.	international standards red at the time of the calibration and it umental changes, vibration and shock d ey to repeat the measurement. mage resulting from the use of the EU sited. No part of this Certificate may b	e uncertainties quoted will arring transportation, f, e reproduced without the
				Page 1 of 2

Appendix B2 - Page 19



Certificate No. MLCN2127268

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EUT Setting	Standard Reading	EUT Error from Setting	Calibration Uncertainty	Spe	EUT eificatio	n
94 dB	94.0 dB	0.0 dB	0.15 dB	±	0.3	dB
114 dB	114.0 dB	0.0 dB	0.15 dB	±	0.3	dB
		- END -				
alibrated By :	Dan		Checked By	:	K.O.	Lo
late :	28-Sep-21		Date :		28-Sep	-21

産儀校正中心有限公司 MaxLab Calibration Centre Limited 香港鉄界英浦葉星街 16-18 號保發工業大厦 9 標 B 室 Unit 8, 9年, Boldwin Industrial Bidg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tek: (852) 2116 1380 Fax: (852) 2264 6480 Email: Info@maxlab.com.tk Appendix B3

Photographs showing the Examples of Noise Measurement for Fixed Plant Noise

Appendix B3 Photographs showing the Examples of Noise Measurement for Fixed Plant Noise





Appendix B4

Noise Measurement Results

				Size of	Louvre/PCU	(mm)					
Location	Fixed Plant Source ID	Plant Type	Method	Height	Width	Length	Averaged Measured L _{Aeq} ,dB(A) ^(a)	Background L _{Aeq} ,dB(A)	Difference L _{Aeq} ,dB(A)	Background Corrected L _{Aeq} ,dB(A) ^(b)	Calculated SWL _, dB(A)
	NOV-VS1 (c)	Ventilation Louver	2	N/A	10230	5780	72.1	51.3	20.8	72.1	93
				N/A	10230	5780	58.7	52.3	6.4	57.6	79
	NOV-VS2 (c)	Ventilation Louver	2	N/A N/A	7000	7000	77.5	50.9	26.6	77.5 64.0	98 85
	NOV-LV-03	Ventilation Louver	2	1250	2400	N/A	56.3	53.2	31	53.4	68
	NOV-LV-04	Ventilation Louver	2	1250	2600	N/A	55.8	54.0	1.8	52.8	68
	NOV-LV-05	Ventilation Louver	2	1250	2250	N/A	54.2	53.2	1.0	51.2	66
	NOV-LV-06	Ventilation Louver	2	1250	2500	N/A	59.6	55.4	4.2	57.5	72
	NOV-LV-07	Ventilation Louver	2	1800	3900	N/A	57.7	54.9	2.8	54.7	71
	NOV-LV-09	Ventilation Louver	2	3063	1628	N/A	65.5	63.3	2.2	62.5	78
NOV	NOV-LV-10	Ventilation Louver	2	2950	1350	N/A	65.3	45.9	19.4	65.3	79
	NOV-LV-12	Ventilation Louver	2	1000	2950	N/A	59.0	56.3	2.7	56.0	71
	NOV-LV-13	Ventilation Louver	2	500	4950	N/A	54.5	52.9	1.6	51.5	67
	NOV-LV-19	Ventilation Louver	2	500	900	N/A	60.1	57.1	3.0	57.1	67
	NOV-LV-22	Ventilation Louver	2	1478	6850	N/A	62.9	59.3	3.6	60.4	78
	NOV-LV-24	Ventilation Louver	2	650	700	N/A	55.2	53.8	1.4	52.2	65
	NOV-LV-26	Ventilation Louver	2	700	650	N/A	58.4	53.8	4.6	56.6	69
	NOV-VCU-001	Packaged Condenser Unit	4	1675	1080	480	54.7	47.0	7.7	53.9	67
	NOV-VCU-002	Packaged Condenser Unit	4	1675	1080	480	57.2	45.4	11.8	57.2	70
	NOV-VCU-003	Packaged Condenser Unit	4	1675	1080	480	56.6	44.5	12.1	56.6	69
	NOV-VCU-004	Packaged Condenser Unit	4	845	970	370	52.5	45.5	7.0	51.5	62
	HUH-7a	Ventilation Louver	2	6520	2850	N/A	58.7	47.8	10.9	58.7	77
	HUH-7b	Ventilation Louver	2	N/A	2850	2090	62.2	47.8	14.4	62.2	78
	HUH-8a	Ventilation Louver	2	6520	2850	N/A	53.4	47.8	5.6	52.0	70
	HUH-8b	Ventilation Louver	2	N/A	2850	2090	54.1	47.8	6.3	52.9	69
HUH	HUH-17	Ventilation Louver	2	3550	9900	N/A	73.3	55.0	18.3	73.3	93
11011	HUH-18	Ventilation Louver	2	N/A	8540	6020	66.8	54.2	12.6	66.8	88
	HUH-19a	Ventilation Louver	2	N/A	6500	7500	63.0	54.8	8.2	62.3	83
	HUH-19b	Ventilation Louver	2	4100	5310	N/A	61.6	54.8	6.8	60.6	79
	HUH-21a	Ventilation Louver	2	N/A	6000	1350	57.7	52.0	5.7	56.3	73
	HUH-21b	Ventilation Louver	2	5100	6000	N/A	66.5	52.0	14.5	66.5	85

Appendix B4 Noise Measurement Results

Remarks:

a) Results are averaged from number of points in accordance with ISO3746.

b) If the difference between the background and the measured noise level is less than 3.0 dB, background noise correction factor should be capped to 3.0dB

c) There will be two operation modes, namely daytime/evening and night-time modes.

Appendix C

Noise Measurement to Confirm any Tonal, Impulsive and Intermittent Characteristics from the Fixed Plant Nose Sources at Representative NSRs Appendix C1

Calibration Certificates – Noise Measurement at Representative NSRs



綜合試驗有限公司 SOILS & MATERIALS ENGINEERING CO., LTD.

香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.:	21CA1019 03-01		Page	1 of 2
Item tested				
Description: Manufacturer: Type/Model No.: Serial/Equipment No.: Adaptors used:	Sound Level Mete B & K 2250 3001291 -	er (Class 1)	Microphone B & K 4950 3005374 -	Preamp B & K ZC0032 23853
Item submitted by				
Customer Name: Address of Customer: Request No.: Date of receipt:	AECOM ASIA CC - - 19-Oct-2021	LIMITED		
Date of test:	21-Oct-2021			
Reference equipment	used in the calib	ration		
Description: Multi function sound calibrator Signal generator	Model: B&K 4226 DS 360	Serial No. 2288444 61227	Expiry Date: 23-Aug-2022 31-Dec-2021	Traceable to: CIGISMEC CEPREI
Ambient conditions				
Temperature: Relative humidity: Air pressure:	22 ± 1 °C 55 ± 10 % 1005 ± 5 hPa			
Test specifications				

- 1, 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.
- 2, 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%.
- 3, 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: Feng Junqi

Date: 22-Oct-2021

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. The results apply to the item as received.

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



試驗有限公司 SOIL

S & MATERIALS ENGINEERING CO., LTD.

香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



2

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA1019 03-01

2 of

Page

1, **Electrical Tests**

> The electrical tests were perfomed 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.

			Expanded	Coverage
Test:	Subtest:	Status:	Uncertanity (dB)	Factor
Self-generated noise	A	Pass	0.3	
	С	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leg	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	A	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 1/10 ⁴ 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	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, 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.



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.

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



综合試驗 有限公司 SOILS & MATERIALS ENGINEERING CO., LTD. 香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.:	21CA0319 01-01		Page	1	of	2	
Item tested							
Description:	Sound Level Mete	er (Type 1)	Microphone		Preamn		
Manufacturer:	B & K	(.)]/	B&K		B&K		
Type/Model No.:	2250-L		4950		ZC0032		
Serial/Equipment No.:	2681366		2665582		17190		
Adaptors used:	-		-		-		
Item submitted by							
Customer Name:	AECOM ASIA CO	LTD					
Address of Customer:	-						
Request No.:	-						
Date of receipt:	19-Mar-2021						
Date of test:	23-Mar-2021						
Reference equipment	used in the calib	ration					
Description:	Model:	Serial No.	Expiry Date:		Traceah	le to:	
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021		CIGISME	0.	
Signal generator	DS 360	33873	19-May-2021		CEPREI		
Ambient conditions							
Temperature:	22 ± 1 °C						
Relative humidity:	55 ± 10 %						
Air pressure:	1005 ± 5 hPa						
Test specifications							

1, 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
- 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 security activation of the test of tes
- 3. 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:

Feng Junai

24-Mar-2021 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. The results apply to the item as received.

Date:

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



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香港新界葵涌永基路22-24號好爸爸創科大廈 Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



2

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0319 01-01

2 of

Page

1, **Electrical Tests**

> The electrical tests were perfomed 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.

			Expanded	Coverage
Test:	Subtest:	Status:	Uncertanity (dB)	Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	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 1/10 ⁴ 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	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3. 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.



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.

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CERTIFICATE OF CALIBRATION

Certificate No.:	21CA0401 02		Page:	1	of 2
Item tested					
Description:	Acoustical Calibr	ator (Class 1)			
Manufacturer:	B & K				
Type/Model No.:	4231				
Serial/Equipment No.:	3006428				
Adaptors used:	-				
Item submitted by					
Curstomer:	AECOM				
Address of Customer:	-				
Request No.:	-				
Date of receipt:	01-Apr-2021				
Date of test:	05-Apr-2021				
Reference equipment	used in the cali	bration			
Description:	Model:	Serial No.	Expiry Date:	Tra	aceable to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	SC	Ľ
Preamplifier	B&K 2673	2743150	03-Jun-2021	CE	PREI
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	CE	PREI
Signal generator	DS 360	33873	19-May-2021	CE	PREI
Digital multi-meter	34401A	US36087050	19-May-2021	CE	PREI
Audio analyzer	8903B	GB41300350	18-May-2021	CE	PREI
Universal counter	53132A	MY40003662	18-May-2021	CE	PREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

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

Approved Signatory:

07-Apr-2021 Company Chop:



Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument. The results apply to the item as received.

Date:

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Form No.CARP156-1/Issue 1/Rev.D/01/03/2007



综合試驗有限公司 SOILS & MATERIALS ENGINEERING CO., LTD.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

21CA0401 02

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of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency	Output Sound Pressure	Measured Output	Estimated Expanded
Shown	Level Setting	Sound Pressure Level	Uncertainty
Hz	dB	dB	dB
1000	94.00	94.23	

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz	STF = 0.016 dB
Estimated expanded uncertainty	0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz	Actual Frequency = 999.95 Hz

Estimated expanded uncertainty 0.1 Hz	Z Coverage factor k = 2.2
---------------------------------------	---------------------------

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz	TND = 0.3 %
Estimated expanded uncertainty	0.7 %

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.

	1	- End -	A 1	
Calibrated by:	1	Checked by:	Jack	
	Fung Chi Yip		Chan Yuk Yiu	
Date:	05-Apr-2021	Date:	07-Apr-2021	

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.

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CERTIFICATE OF CALIBRATION

Certificate No.:	21CA1019 03-02		Page:	1 o	of 2
Item tested					
Description: Manufacturer: Type/Model No.: Serial/Equipment No.: Adaptors used:	Acoustical Calibrat Rion Co., Ltd. NC-74 34246490 / N.004. -	tor (Class 1) 10			
Item submitted by					
Curstomer: Address of Customer: Request No.: Date of receipt:	AECOM ASIA CO - - 19-Oct-2021	LIMITED			
Date of test:	21-Oct-2021				
Reference equipment	used in the calib	ration			
Description: Lab standard microphone Preamplifier Measuring amplifier Signal generator Digital multi-meter Audio analyzer Universal counter	Model: B&K 4180 B&K 2673 B&K 2610 DS 360 34401A 8903B 53132A	Serial No. 2341427 2239857 2346941 33873 US36087050 GB41300350 MY40003662	Expiry Date: 04-May-2022 31-May-2022 01-Jun-2022 27-May-2022 27-May-2022 28-May-2022 02-Jun-2022	Tra SCI CEF CEF CEF CEF CEF	ceable to: - PREI PREI PREI PREI PREI PREI
Ambient conditions					
Temperature: Relative humidity:	22 ± 1 °C 55 ± 10 %				

Test specifications

1005 ± 5 hPa

Air pressure:

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate. Approved Signatory: Date: 22-Oct-2021 Company Chop: Feng Junqi

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument. The results apply to the item as received.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

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1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency	Output Sound Pressure	Measured Output	Estimated Expanded
Shown	Level Setting	Sound Pressure Level	Uncertainty
Hz	dB	dB	dB
1000	94.00	94.00	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

21CA1019 03-02

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz	STF = 0.012 dB
Estimated expanded uncertainty	0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz	Actual Frequency = 1002.1	
Estimated expanded uncertainty	0.1 Hz	Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz	TND = 1.7 %
Estimated expanded uncertainty	0.7 %

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.



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.

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Appendix C2

Photographs – Noise Measurement at Representative NSRs



Appendix C2 Photographs – Noise Measurement at Representative NSRs

Appendix C3

Measurement Results at Representative NSRs

Appendix C3 Noise Measurement Results at Measurement Locations

			Fixed Plant Noise		Background Noise		Difference between
				Measured Noise		Background Noise	Measured Noise Level
Measurement				Level, L _{Aeq 30mins} ,		Level, L _{Aeq 5mins} ,	and Background Level,
Location ID	Measurement Date	Operation Scenario ⁽¹⁾⁽²⁾	Measurement Time	dB(A)	Measurement Time	dB(A)	dB(A)
ENI1		Daytime and Evening	03:05:00 - 03:35:00	62.8	03:55:00 - 04:00:00	62.6	0.2
FINI	3/2/2022	Night-time	01:59:00 - 02:29:00	63.1	01:23:00 - 01:28:00	63.6	-0.5
		Daytime and Evening	03:05:00 - 03:35:00	57.9	03:55:00 - 04:00:00	56.9	1.0
FN2	3/3/2022	Night-time	01:59:00 - 02:29:00	58.8	01:23:00 - 01:28:00	58.2	0.6

Note:

(1) Day: 0700 to 1900 hours; Evening: 1900 to 2300 hours; Night: 2300 to 0700 hours.

(2) Fixed plant noise operation during daytime/evening and night-time periods have been included according to corresponding fixed plant noise measurement.