

MTR Corporation Limited

**Shatin to Central Link –  
Tai Wai to Hung Hom Section and  
Mong Kok East to Hung Hom Section**

Fixed Plant Noise Audit Report

(Updated Batch 7 –

Hung Hom Station and Hung Hom Siding (HUH& HHS))

(Feb 2021)



Certified by: Claudine Lee

Position: Independent Environmental Checker

Date: 3 / 2 / 2021

MTR Corporation Limited

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Certified by: Lisa Poon

Position: Environmental Team Leader

Date: 

**MTR Corporation Limited**

Consultancy Agreement No. C11033B

**Shatin to Central Link – Tai Wai to  
Hung Hom Section [SCL(TAW-HUH)]  
and Mong Kok East to Hung Hom  
Section [SCL(MKK – HUH)]****Fixed Plant Noise Audit Report  
(Updated Batch 7 - Hung Hom Station and  
Hung Hom Siding (HUH & HHS))**

February 2021

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## **1 INTRODUCTION**

### **1.1 Background**

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing 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 The SCL Tai Wai to Hung Hom Section [SCL (TAW-HUH)] included a total of 7 stations, including Hin Keng Station (HIK), Diamond Hill Station (DIH), Kai Tak Station (KAT), Sung Wong Toi Station (SUW) (formerly named as To Kwa Wan Station (TKW) in SCL(TAW-HUH) EIA), To Kwa Wan Station (formerly named as Ma Tau Wai Station (MTW) in SCL (TAW-HUH) EIA Report), Ho Man Tin Station (HOM) and Hung Hom Station (HUH).
- 1.1.3 Following the cessation of the operations of various freight facilities at Hung Hom in April 2011, MTR Corporation Limited started a detailed study to investigate the feasibility and environmental acceptability of utilizing the former freight yard to accommodate the train stabling requirements for SCL (TAW-HUH). To allow Stabling Sidings at Hung Hom Freight Yard (HHS) feasible for the use of stabling, in addition to providing siding tracks underneath the existing podium structure covering the freight yard, and launching/retrieval and emergency tracks and shunt neck extending outside the podium, appropriate changes were made to the design of SCL (TAW-HUH) and SCL Mong Kok East to Hung Hom Section [SCL (MKK-HUH)] at HUH, Kai Tak Station (KAT) and Diamond Hill Station (DIH) and its associated alignment and facilities.
- 1.1.4 Environmental Impact Assessment (EIA) Reports for SCL – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] (Register No. AEIAR-167/2012), SCL Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] (Register No. AEIAR-164/2012) and SCL - Mong Kok East to Hung Hom Section [SCL(MKK – HUH)] (Register No. AEIAR-165/2012) (hereinafter referred to as “the EIA Reports”) were approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). The alignment and associated facilities under SCL (TAW-HUH) at HUH, KAT and DIH, and SCL (MKK-HUH) at HUH were superseded by those proposed and assessed in SCL (HHS) EIA Report.
- 1.1.5 Following the approval of the EIA Reports, the Environmental Permits, EP-437/2012 and EP-438/2012 covering the construction of SCL (MKK-HUH), both SCL (TAW-HUH) and SCL (HHS) respectively (hereinafter referred to as “the SCL Project”) were granted on 22 March 2012. Variations of Environmental Permit (VEP) were subsequently applied for EP-437/2012 and EP-438/2012. EP-437/2012/A and EP-438/2012/K, which are the latest Environmental Permits, were issued by Director of Environmental Protection (DEP) on 27 November 2017 and 4 October 2016, respectively.
- 1.1.6 Pursuant to Condition 2.21 of EP No. EP-437/2012/A, 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(MKK-HUH) EIA Report and SCL(HHS) EIA Report, or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO) having due regard to the characteristics of tonality, impulsiveness and intermittency.
- 1.1.7 For EP No. EP-438/2012/K, according to Condition 2.32, 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 (TAW-HUH) EIA Report and SCL(HHS) EIA Report and all relevant documents in the Register, or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO) having due regard to the characteristics of tonality, impulsiveness and intermittency.

- 1.1.8 Since the installation of fixed plant and louvers for the HUH and HHS would be completed in stages, the fixed plant noise audit have been conducted in stages to audit the fixed plant noise under the operational conditions. The fixed plant noise audit for the fixed plant items at HHS was undertaken and the audit result was documented in the *Fixed Plant Noise Audit Report (Batch 7 – Hung Hom Station and Hung Hom Siding (HUH&HHS))* (**Appendix A1** refers) which was approved by EPD in October 2019.
- 1.1.9 Based on the latest design information, the maximum allowable Sound Power Levels (SWLs) of fixed plant items for the operation of HUH were updated to reflect the latest design of the Project, with consideration of cumulative noise impact from the fixed plant sources for HUH and HHS. Proposal for Updating Maximum Allowable Sound Power Levels of Fixed Plant Sources (Updated Batch 7 - Hung Hom Station (HUH) & Hung Hom Siding (HHS)) (hereinafter referred to as “the Proposal (Update Batch 7 - HUH & HHS)”) (**Appendix A2** refers), was prepared to present the updated maximum allowable SWLs of the fixed plant items at HUH under both EP-437/2012/A and EP-438/2012/K. The Proposal (Updated Batch 7 - HUH & HHS) was approved by DEP on 29 January 2021.
- 1.1.10 This Fixed Plant Noise Audit Report (Updated Batch 7 - Hung Hom Station and Hung Hom Siding) (hereinafter referred to as “the FPNAR (Updated Batch 7 - HUH and HHS)”) presents the noise measurement methodology and measurement results at the fixed plant noise sources of HUH and at the representative NSRs near HUH, for checking compliance with the maximum allowable SWLs determined in the Proposal (Updated Batch 7 - HUH and HHS).

## 1.2 Fulfilment of EP Submission Related to Fixed Plant Noise Audit Report

- 1.2.1 The SCL(TAW-HUH) will connect the West Rail Line and Ma On Shan Line to form Tuen Ma Line (TML). TML Phase 1 opened on 14 February 2020, commencing services at three new stations, namely Hin Keng Station, the expanded part of Diamond Hill Station and Kai Tak Station. TML full opening is expected to commence in 2021. **Table 1.1** presents the submission record of fixed plant noise audit report under relevant EP conditions. As shown in **Table 1.1**, EP submissions related to fixed plant noise are completed and fulfilled for TML full opening.

**Table 1.1 Summary of Submission Record of Fixed Plant Noise Audit Report**

Relevant EP Condition	Batch	Location	Submission Date
Condition 2.32 of EP-438/2012/K	Batch 1	TKW	15 Mar 2019
	Batch 2	FTA	16 Apr 2019
	Batch 3	DIH	24 Jun 2019
	Batch 4	TKA	
	Batch 5	KAT, MCV & SUW	2 Aug 2019
	Batch 6	HIK	27 Aug 2019
Condition 2.21 of EP-437/2012/A & Condition 2.32 of EP-438/2012/K	Batch 7	HHS / HUH	23 Sep 2019
	Updated Batch 7	HUH & HHS	3 Feb 2021

### **1.3 Purpose of This Report**

1.3.1 This Report presents the noise measurement methodology and measurement results at the fixed plant noise sources of HUH and at the representative NSRs near HUH.

1.3.2 This Report comprises the following sections:

- Section 1 presents the background information.
- Section 2 presents the Updated SWL of fixed plant noise sources.
- Section 3 presents the noise measurement methodology.
- Section 4 presents the noise measurement results.
- Section 5 presents the conclusions.

## 2 UPDATED SOUND POWER LEVELS OF FIXED PLANT NOISE SOURCES

- 2.1.1 As mentioned in **Section 1.1.9**, the fixed plant noise audit for the fixed plant items at HHS was undertaken and the result was documented in the FPNAR (Updated Batch 7 - HUH and HHS) which was approved by EPD in October 2019. The fixed plant noise audit for the fixed plant items at HHS extracted from the FPNAR (Updated Batch 7 - HUH and HHS) is provided in **Appendix A1**.
- 2.1.2 The updated maximum allowable SWLs of fixed plant noise sources at HUH are extracted from the Proposal (Updated Batch 7 - HUH and HHS) and are summarised in **Table 2.1**. The updated fixed plant noise sources locations at HUH and HHS are shown in **Figure No. C11033B/C/SCL/ACM/M52/011**. The measured noise level of fixed plant noise sources during the commissioning test shall comply with the maximum allowable SWLs as summarised in **Table 2.1**. 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.

**Table 2.1 Summary of Updated Maximum Allowable SWLs for Fixed Plant Noise Sources at HUH**

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)</sup>	
			Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
HUH	HUH-4-2	Station Ventilation Louvre	76	76
	HUH-7a <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-7b <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-8a <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-8b <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-8c <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-9a	Tunnel Ventilation Louvre	80	80
	HUH-9b	Tunnel Ventilation Louvre	82	82
	HUH-9c	Tunnel Ventilation Louvre	77	77
	HUH-10a	Tunnel Ventilation Louvre	78	78
	HUH-10b	Tunnel Ventilation Louvre	81	81
	HUH-10c	Tunnel Ventilation Louvre	70	70
	HUH-11a	Tunnel Ventilation Louvre	68	68
	HUH-11b	Tunnel Ventilation Louvre	70	70
	HUH-12a	Tunnel Ventilation Louvre	66	66
	HUH-12b	Tunnel Ventilation Louvre	68	68
	HUH-13a	Station Ventilation Louvre	64	64
	HUH-14-1-1	Station Ventilation Louvre	75	75
	HUH-14-1-2	Station Ventilation Louvre	88	88
	HUH-14-2	Station Ventilation Louvre	91	91
	HUH-14-3	Station Ventilation Louvre	87	87
	HUH-15	Tunnel Ventilation Louvre	84	84
	HUH-16a	Tunnel Ventilation Louvre	80	80
	HUH-16b	Tunnel Ventilation Louvre	85	85
	HUH-17 <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-18 <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-19a <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-19b <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)</sup>	
			Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
	HUH-20	Station Ventilation Louvre	71	71
	HUH-21a <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-21b <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-22a-1	Station Ventilation Louvre	83	83
	HUH-22a-2	Station Ventilation Louvre	83	83
	HUH-22b	Station Ventilation Louvre	85	85
	HUH-26H	Station Ventilation Louvre	88	88
	HUH-27H	Station Ventilation Louvre	81	81
	HUH-29	Station Ventilation Louvre	70	70
	HUH-30H	Station Ventilation Louvre	84	84
	HUH-32H	Station Ventilation Louvre	90	90
	HUH-33H	Station Ventilation Louvre	88	88
	HUH-37H	Station Ventilation Louvre	90	90
	HUH-80-1	Station Ventilation Louvre	103	103
	HUH-80-2	Station Ventilation Louvre	103	103
	HUH-80-3	Station Ventilation Louvre	103	103
	HUH-81	Station Ventilation Louvre	99	99
	HUH-82-1	Station Ventilation Louvre	76	76
	HUH-82-6	Station Ventilation Louvre	88	88
	HUH-85b	Station Ventilation Louvre	87	87
	HUH-86-4	Station Ventilation Louvre	67	67
	HUH-86-13	Station Ventilation Louvre	72	72
	HUH-95b	Station Ventilation Louvre	92	92
	HUH-103-1	Station Ventilation Louvre	70	70
	HUH-103-2	Station Ventilation Louvre	81	81
	HUH-103-3	Station Ventilation Louvre	76	76
	HUH-103-4	Station Ventilation Louvre	75	75
	HUH-103-5	Station Ventilation Louvre	74	74
	HUH-103-6	Station Ventilation Louvre	71	71
	HUH-103-7	Station Ventilation Louvre	74	74
	HUH-103-8	Station Ventilation Louvre	72	72
	HUH-103-9	Station Ventilation Louvre	73	73
	HUH-103-10	Station Ventilation Louvre	72	72
	HUH-103-11	Station Ventilation Louvre	73	73
	HUH-103-12	Station Ventilation Louvre	72	72
	HUH-103-13	Station Ventilation Louvre	70	70
	HUH-103-14	Station Ventilation Louvre	72	72
	HUH-104-1	Station Ventilation Louvre	65	65
	HUH-104-2	Station Ventilation Louvre	78	78
	HUH-104-3	Station Ventilation Louvre	76	76
	HUH-104-4	Station Ventilation Louvre	77	77
	HUH-104-5	Station Ventilation Louvre	69	69
	HUH-104-6	Station Ventilation Louvre	69	69
	HUH-104-7	Station Ventilation Louvre	78	78

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)</sup>	
			Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
	HUH-107b	Station Ventilation Louvre	94	94
	HUH-108	Station Ventilation Louvre	58	58
	HUH-109	Station Ventilation Louvre	75	75
	HUH-110	Station Ventilation Louvre	76	76
	HUH-111	Station Ventilation Louvre	76	76
	HUH-112	Station Ventilation Louvre	76	76
	HUH-113	Station Ventilation Louvre	75	75
	HUH-115	Station Ventilation Louvre	73	73
	HUH-116	Station Ventilation Louvre	70	70
	HUH-117	Station Ventilation Louvre	70	70
	HUH-118	Station Ventilation Louvre	68	68
	HUH-119	Station Ventilation Louvre	65	65
	HUH-120	Station Ventilation Louvre	71	71

**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.
- (3) The fixed plant item will be used for the operation of SCL(HUH-ADM) which is governed by EP-436/2012/F. Design of the fixed plant noise sources of SCL(HUH-ADM) at HUH is yet to be finalized and its maximum allowable SWLs have been calculated based on the latest available information. A separate proposal for updating Maximum SWL of fixed plant sources of SCL(HUH-ADM) at HUH will be submitted under EP-436/2012/F in case there are changes in the maximum allowable SWLs of the fixed plant noise sources of SCL(HUH-ADM) at HUH.

### 3 MEASUREMENT METHODOLOGY

#### 3.1 Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources at HUH

##### Measurement Methodology

- 3.1.1 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

- 3.1.2 The sound level meters and calibrators used for noise measurements are listed in the **Table 3.1**. 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 3.1 Noise Measurement Equipment**

Equipment	Model	Serial Number
Sound Level Meter	SVANTEK SVAN 958	28422
Sound Level Meter	SVANTEK SVAN 958A	59120
Acoustic Calibrator	SVANTEK SV30A	10814
Acoustic Calibrator	SVANTEK CAL200	10478

- 3.1.3 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

##### Measurement Date and Time

- 3.1.4 The noise measurements at HUH were all conducted during night-time period 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 3.2**.

**Table 3.2 Measurement Schedule**

Location	Date
HUH	17 & 18 April 2020, 30 November 2020, 1, 4, 5, 11, 12, 17 & 18 December 2020

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

##### Measurement Parameters

- 3.2.1  $L_{Aeq}$  (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.
- 3.2.2 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 (including HHS and HUH) 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 was determined in accordance with IND-TM. In addition, any noticeable characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources at HUH and HHS was recorded during the measurement.

#### Measurement Equipment

- 3.2.3 The sound level meters and calibrators used for noise measurements at representative NSRs are listed in **Table 3.3**. 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 3.3 Noise Measurement Equipment**

Equipment	Model	Serial Number
Sound Level Meter	B&K 2250	3001291
	B&K 2250-L	2681366
	B&K 2270	2644597
	Nti XL2	A2A-17440-EO
	Nti XL2	A2A-17788-EO
Acoustic Calibrator	B&K 4231	3006428
	MVI CAL21	34113610(2001)
	Rion NC-74	34246490

- 3.2.4 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

#### Measurement Locations

- 3.2.5 The measurement locations follow those adopted in the approved the FPNAR (Updated Batch 7 - HUH and HHS) (**Appendix A1** refers). The measurement locations are summarised in **Table 3.4** and shown in **Figure No. C11033B/C/SCL/ACM/M52/012**. Photographs of measurement locations are shown in **Appendix C2**.

**Table 3.4 Noise Measurement Locations**

Measurement Location ID	Representative NSR (NSR ID)	Type	Measurement Height
HUH-FN1	Royal Peninsula Block 2 (HUH-3-1 <sup>(3)</sup> )	Residential	Rooftop of Royal Peninsula Block 2 (1m from building façade)
HUH-FN2	The Metropolis Residence Tower 1 <sup>(1)</sup> (HUH-4-2)	Residential	On the footbridge near Harbour Plaza Metropolis (1m from the footbridge parapet wall)
HUH-FN3	Harbourfront Horizon <sup>(2)</sup> (HUH-10-1 <sup>(3)</sup> )	Residential	On the footbridge near HUH-10-1 (1.2m above the footbridge level in free-field condition)
HUH-FN4	University Student Halls of Residence (HUH-11-1) and Harbour Place Block	Residential	Rooftop of The Hong Kong Polytechnic University Student Halls of Residence (1m from building façade)

Measurement Location ID	Representative NSR (NSR ID)	Type	Measurement Height
	6 (HUH-12-1)		
HUH-FN5	The Metropolis Residence Tower 2 <sup>(1)</sup> (HUH-4-1 <sup>(3)</sup> )	Residential	On the footbridge near The Metropolis Tower 2 (1m from the footbridge parapet wall)

Notes:

- (1) Metropolis Residence is a service apartment and shall not rely on openable windows for ventilation. Nonetheless, for conservative consideration that occupier might open window under special circumstances, this premise has been considered as an assessment point.
- (2) Harbourfront Horizon shall not rely on openable windows for ventilation. Nonetheless, for conservative consideration that occupier might open window under special circumstances, this premise has been considered as an assessment point.
- (3) NSR HH9b, HH4 and HH7 as identified in SCL(MKK-HUH) EIA Report is same as the NSR HUH-10-1, HUH-3-1 and HUH-4-1 respectively as identified in SCL(HHS) EIA Report. To avoid confusion, NSR ID following SCL(HHS) EIA Report has been adopted in this assessment.

#### Measurement Date and Time

- 3.2.6 For daytime/evening and night-time operation modes, noise measurement at representative NSRs was conducted during evening and night-time periods. The measurement schedule is presented in **Table 3.5**.

**Table 3.5 Measurement Schedule**

Measurement Location ID	Date
HUH-FN1, HUH-FN2, HUH-FN3, HUH-FN4 & HUH-FN5	23 & 24 December 2020

## 4 MEASUREMENT RESULTS

### 4.1 Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources at HUH

4.1.1 The measured SWLs for daytime and evening, and night-time periods are presented in **Table 4.1**. Photographs showing the examples of noise measurement for fixed plant noise are shown in **Appendix B3**. Details of the measurement results are shown in **Appendix B4**.

**Table 4.1 Summary of Measured SWLs for Fixed Plants at HUH**

Plant Item	Measured SWL, dB(A)		Maximum allowable SWL, dB(A)		Compliance (Y/N)	
	Day / Evening-time <sup>(1)</sup>	Night-time <sup>(1)</sup>	Day / Evening - time <sup>(1)</sup>	Night-time <sup>(1)</sup>	Day / Evening - time <sup>(1)</sup>	Night-time <sup>(1)</sup>
HUH-4-2	76	76	76	76	Y	Y
HUH-7a <sup>(2)</sup>	- (2)	- (2)	100	90	Y	Y
HUH-7b <sup>(2)</sup>	- (2)	- (2)	100	90	Y	Y
HUH-8a <sup>(2)</sup>	- (2)	- (2)	100	90	Y	Y
HUH-8b <sup>(2)</sup>	- (2)	- (2)	100	90	Y	Y
HUH-8c <sup>(2)</sup>	- (2)	- (2)	100	90	Y	Y
HUH-9a	80	80	80	80	Y	Y
HUH-9b	82	82	82	82	Y	Y
HUH-9c	77	77	77	77	Y	Y
HUH-10a	78	78	78	78	Y	Y
HUH-10b	81	81	81	81	Y	Y
HUH-10c	70	70	70	70	Y	Y
HUH-11a	68	68	68	68	Y	Y
HUH-11b	70	70	70	70	Y	Y
HUH-12a	66	66	66	66	Y	Y
HUH-12b	68	68	68	68	Y	Y
HUH-13a	64	64	64	64	Y	Y
HUH-14-1-1	75	75	75	75	Y	Y
HUH-14-1-2	88	88	88	88	Y	Y
HUH-14-2	91	91	91	91	Y	Y
HUH-14-3	87	87	87	87	Y	Y
HUH-15	84	84	84	84	Y	Y
HUH-16a	80	80	80	80	Y	Y
HUH-16b	85	85	85	85	Y	Y
HUH-17 <sup>(2)</sup>	- (2)	- (2)	105	95	Y	Y
HUH-18 <sup>(2)</sup>	- (2)	- (2)	105	95	Y	Y
HUH-19a <sup>(2)</sup>	- (2)	- (2)	105	95	Y	Y
HUH-19b <sup>(2)</sup>	- (2)	- (2)	105	95	Y	Y
HUH-20	71	71	71	71	Y	Y
HUH-21a <sup>(2)</sup>	- (2)	- (2)	105	95	Y	Y
HUH-21b <sup>(2)</sup>	- (2)	- (2)	105	95	Y	Y
HUH-22a-1	83	83	83	83	Y	Y
HUH-22a-2	83	83	83	83	Y	Y
HUH-22b	85	85	85	85	Y	Y
HUH-26H	88	88	88	88	Y	Y
HUH-27H	81	81	81	81	Y	Y
HUH-29	70	70	70	70	Y	Y

Plant Item	Measured SWL, dB(A)		Maximum allowable SWL, dB(A)		Compliance (Y/N)	
	Day / Evening-time <sup>(1)</sup>	Night-time <sup>(1)</sup>	Day / Evening-time <sup>(1)</sup>	Night-time <sup>(1)</sup>	Day / Evening-time <sup>(1)</sup>	Night-time <sup>(1)</sup>
HUH-30H	84	84	84	84	Y	Y
HUH-32H	83	83	90	90	Y	Y
HUH-33H	88	88	88	88	Y	Y
HUH-37H	85	85	90	90	Y	Y
HUH-80-1	92	92	103	103	Y	Y
HUH-80-2	92	92	103	103	Y	Y
HUH-80-3	93	93	103	103	Y	Y
HUH-81	99	99	99	99	Y	Y
HUH-82-1	76	76	76	76	Y	Y
HUH-82-6	88	88	88	88	Y	Y
HUH-85b	87	87	87	87	Y	Y
HUH-86-4	67	67	67	67	Y	Y
HUH-86-13	72	72	72	72	Y	Y
HUH-95b	92	92	92	92	Y	Y
HUH-103-1	70	70	70	70	Y	Y
HUH-103-2	69	69	81	81	Y	Y
HUH-103-3	76	76	76	76	Y	Y
HUH-103-4	75	75	75	75	Y	Y
HUH-103-5	74	74	74	74	Y	Y
HUH-103-6	71	71	71	71	Y	Y
HUH-103-7	74	74	74	74	Y	Y
HUH-103-8	72	72	72	72	Y	Y
HUH-103-9	73	73	73	73	Y	Y
HUH-103-10	72	72	72	72	Y	Y
HUH-103-11	73	73	73	73	Y	Y
HUH-103-12	72	72	72	72	Y	Y
HUH-103-13	70	70	70	70	Y	Y
HUH-103-14	72	72	72	72	Y	Y
HUH-104-1	65	65	65	65	Y	Y
HUH-104-2	70	70	78	78	Y	Y
HUH-104-3	76	76	76	76	Y	Y
HUH-104-4	77	77	77	77	Y	Y
HUH-104-5	69	69	69	69	Y	Y
HUH-104-6	69	69	69	69	Y	Y
HUH-104-7	72	72	78	78	Y	Y
HUH-107b	94	94	94	94	Y	Y
HUH-108	58	58	58	58	Y	Y
HUH-109	75	75	75	75	Y	Y
HUH-110	76	76	76	76	Y	Y
HUH-111	76	76	76	76	Y	Y
HUH-112	76	76	76	76	Y	Y
HUH-113	75	75	75	75	Y	Y
HUH-115	73	73	73	73	Y	Y
HUH-116	70	70	70	70	Y	Y
HUH-117	70	70	70	70	Y	Y

Plant Item	Measured SWL, dB(A)		Maximum allowable SWL, dB(A)		Compliance (Y/N)	
	Day / Evening-time <sup>(1)</sup>	Night-time <sup>(1)</sup>	Day / Evening - time <sup>(1)</sup>	Night-time <sup>(1)</sup>	Day / Evening - time <sup>(1)</sup>	Night-time <sup>(1)</sup>
HUH-118	68	68	68	68	Y	Y
HUH-119	65	65	65	65	Y	Y
HUH-120	71	71	71	71	Y	Y

**Notes:**

- (1) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.  
(2) The fixed plant item will be used for the operation of SCL(HUH-ADM) which is governed by EP-436/2012/F. Fixed plant noise audit for this fixed plant item will be conducted in accordance with the requirements set out in EP-436/2012/F.

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

- 4.2.1 Noise measurement to confirm any characteristics of tonality, impulsiveness and intermittency at the representative NSRs were conducted during both evening and night-time periods. Measurement results are summarised in **Table 4.2** below. No characteristics of tonality, impulsiveness and intermittency was observed at the selected 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. Detailed noise measurements results are presented in **Appendix C3**.

**Table 4.2 Noise Measurement Results at Measurement Locations**

Measurement Location ID	Representing NSRs	Time Period <sup>(1)&amp;(2)</sup>	Measurement Results			Site Observation	Characteristics of Tonality, Impulsiveness and Intermittency at NSRs (Y/N)
			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) <sup>(3)</sup>		
HUH-FN1	Royal Peninsula Block 2 (HUH-3-1)	Daytime & Evening	65.9	65.8	0.1	Noise environment was dominated by traffic noise. Noise from SCL fixed plant was not noticeable at measurement locations	N
		Night-time	65.5	64.7	0.8		N
HUH-FN2	The Metropolis Residence Tower 1 (HUH-4-2)	Daytime & Evening	58.0	57.7	0.3		N
		Night-time	57.6	55.8	1.8		N
HUH-FN3	Harbourfront Horizon (HUH-10-1)	Daytime & Evening	61.7	62.5	-0.8		N
		Night-time	60.4	59.8	0.6		N
HUH-FN4	University Student Halls of Residence (HUH-11-1) and Harbour Place Block 6 (HUH-12-1)	Daytime & Evening	64.0	64.6	-0.6		N
		Night-time	63.4	61.8	1.6		N
HUH-FN5	The Metropolis Residence Tower 2 (HUH-4-1)	Daytime & Evening	66.8	66.9	-0.1		N
		Night-time	67.0	67.4	-0.4		N

Notes:

(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.

(3) The measured noise levels were dominated by background noise (i.e. road traffic noise from major roads nearby). Since traffic noise fluctuated during the daytime & evening measurement periods, leading to higher background noise levels than the measured noise levels of the fixed sources at few measurement locations.

## **5 CONCLUSION**

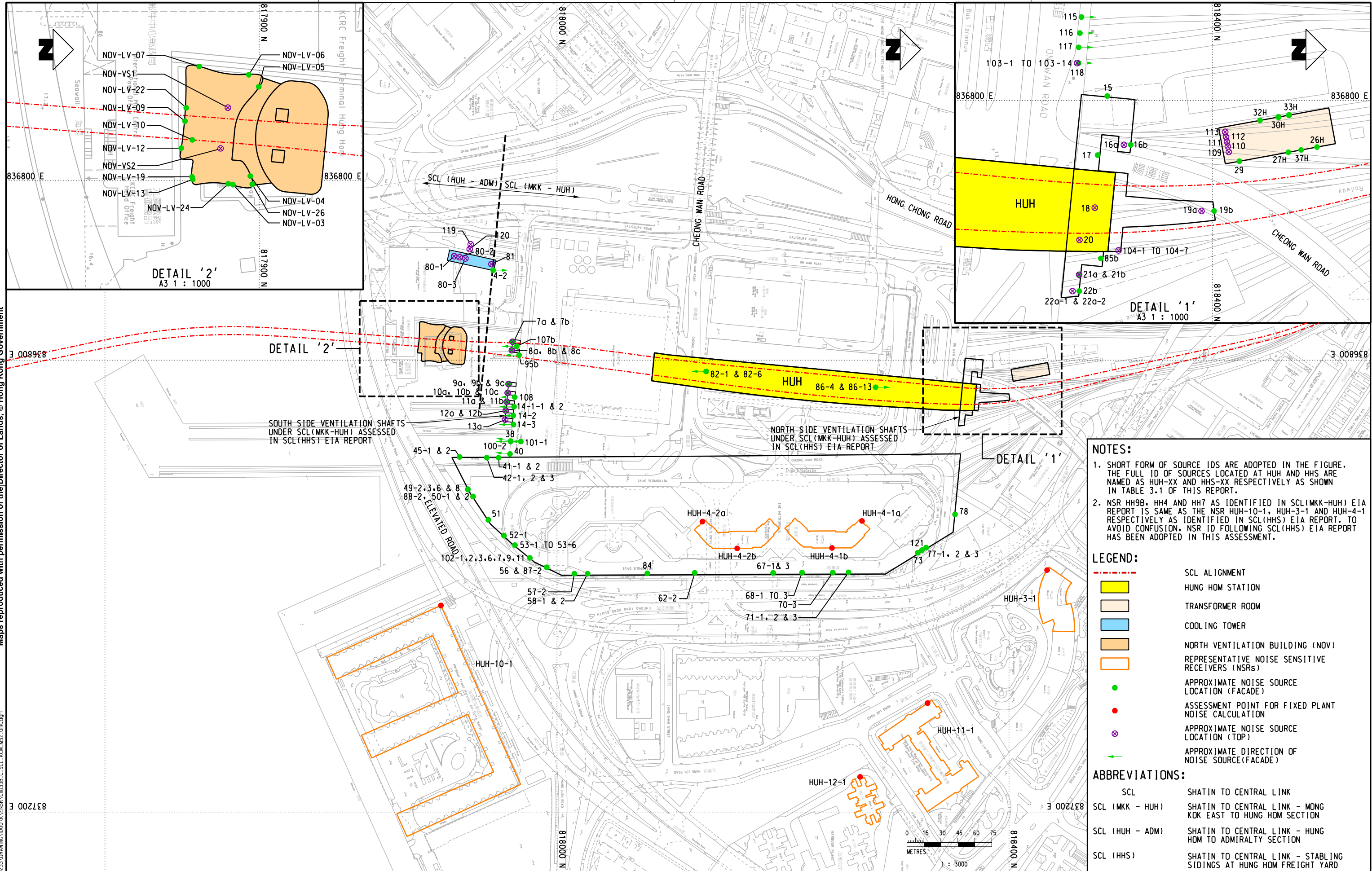
- 5.1.1 The fixed plant noise verification was undertaken and the measurement results indicated all the fixed plant noise levels in HUH and HHS comply with the updated maximum allowable SWLs. No characteristics of tonality, impulsiveness and intermittency was observed at the measurement locations. Result of data analysis also indicated no characteristics of tonality, impulsiveness and intermittency were found at the measurement locations.

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## Figures

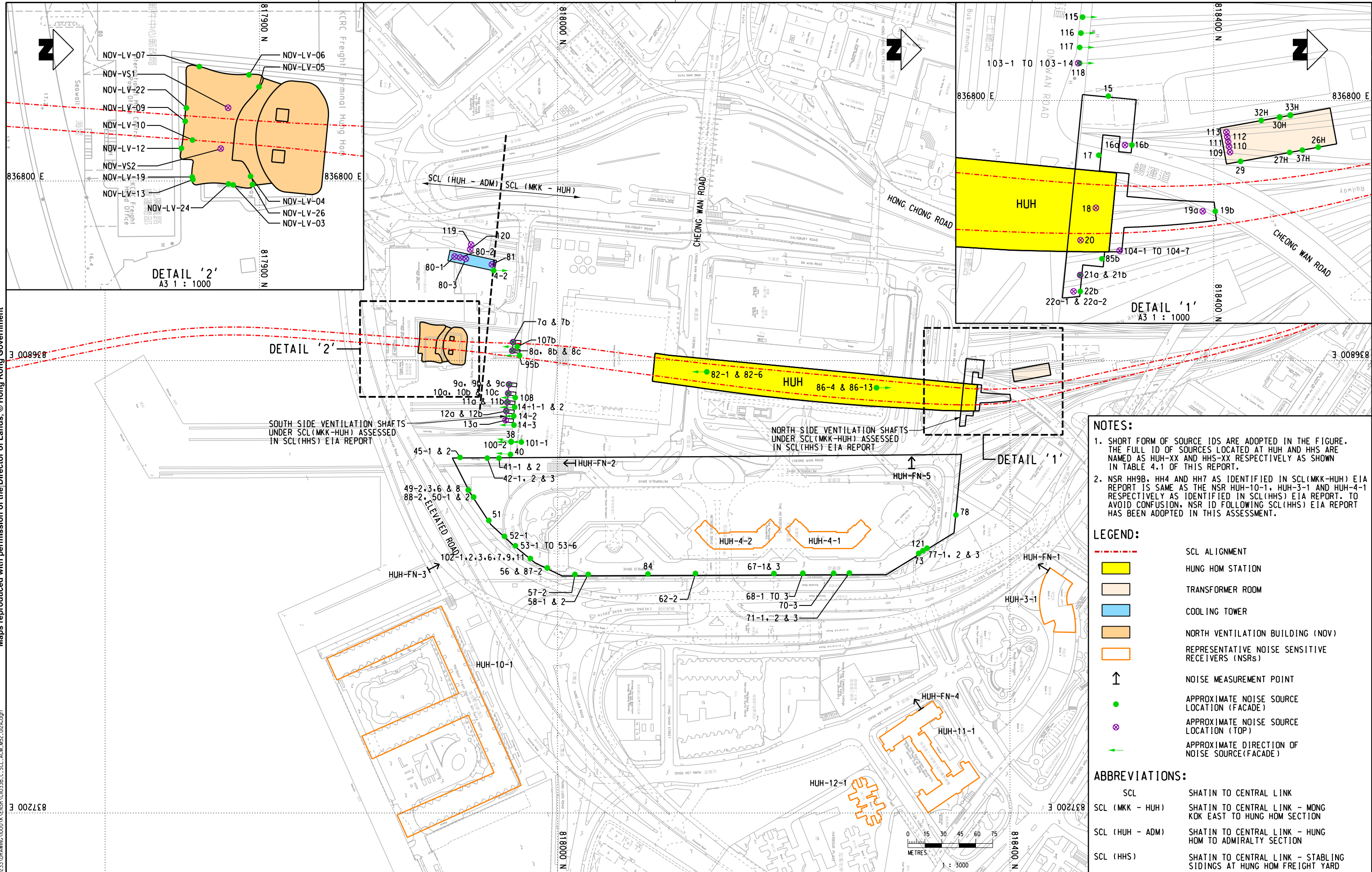
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DRAWN				ZFX	MTR				SHATIN TO CENTRAL LINK				TITLE			
DESIGNED				---	ORIGINATOR				AECOM				C11033B SCL (HUH - ADM) LOCATIONS OF NSRS AND FIXED PLANT NOISE SOURCES (HUNG HOM STATION AND STABLING SIDINGS AT HUNG HOM FREIGHT YARD)			
CHECKED				---												
APPROVED				---												
DATE				11/JUN/2019	CADD REF.				C11033B.C.SCL.ACM.M52.011A.dgn				SCALE			
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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED	SCALE	FIGURE NO.	FIGURE NO.	SCALE	FIGURE NO.	FIGURE NO.	FIGURE NO.
										1 : 3000 (A3)	C11033B/C/SCL/ACM/M52/011	C11033B/C/SCL/ACM/M52/011	1 : 3000 (A3)	C11033B/C/SCL/ACM/M52/011	C11033B/C/SCL/ACM/M52/011	A





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AECOM	
CADD REF. C11033B_C_SCL_ACM_M52_012A.dgn	

TITLE	
C11033B	
SCL (HUH - ADM)	
LOCATIONS OF NOISE MEASUREMENT POINTS (HUNG HOM STATION AND STABLING SIDINGS AT HUNG HOM FREIGHT YARD)	
SCALE	FIGURE NO.
1 : 3000 (A3)	C11033B/C/SCL/ACM/M52/012
REV.	A

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## **Appendix A1**

**Excerpt of Fixed Plant Noise Audit Report (Batch 7 - Hung  
Hom Station and Hung Hom Siding (HUH & HHS))**

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## 2 UPDATED SOUND POWER LEVELS OF FIXED PLANT NOISE SOURCES

2.1.1 The updated maximum allowable SWL of fixed plant noise sources at HUH and HHS are extracted from the Proposal (HUH and HHS) and are summarised in **Table 2.1**. The updated fixed plant noise sources locations at HUH and HHS are shown in **Figure No. C11033B/C/SCL/ACM/M52/011**. The measured noise level of fixed plant noise sources during the commissioning test shall comply with the maximum allowable SWLs as summarised in **Table 2.1**. 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.

**Table 2.1 Summary of Updated Maximum Allowable SWLs for Fixed Plant Noise Sources at HUH and HHS**

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)(2)</sup>	
			Daytime & Evening <sup>(3)</sup>	Night-time <sup>(3)</sup>
HHS	HHS-38	Siding Ventilation Louver	64	64
	HHS-40	Siding Ventilation Louver	88	-
	HHS-41-1	Siding Ventilation Louver	54	54
	HHS-41-2	Siding Ventilation Louver	66	66
	HHS-42-1	Siding Ventilation Louver	66	66
	HHS-42-2	Siding Ventilation Louver	64	64
	HHS-42-3	Siding Ventilation Louver	63	63
	HHS-45-1	Siding Ventilation Louver	85	85
	HHS-45-2	Siding Ventilation Louver	60	60
	HHS-49-2	Siding Ventilation Louver	78	78
	HHS-49-3	Siding Ventilation Louver	71	71
	HHS-49-6	Siding Ventilation Louver	67	67
	HHS-49-8	Siding Ventilation Louver	70	70
	HHS-50-1	Siding Ventilation Louver	75	75
	HHS-50-2	Siding Ventilation Louver	69	69
	HHS-51	Siding Ventilation Louver	86	85
	HHS-52-1	Siding Ventilation Louver	63	63
	HHS-53-1	Siding Ventilation Louver	68	68
	HHS-53-2	Siding Ventilation Louver	75	75
	HHS-53-3	Siding Ventilation Louver	59	59
	HHS-53-4	Siding Ventilation Louver	67	67
	HHS-53-5	Siding Ventilation Louver	69	69
	HHS-53-6	Siding Ventilation Louver	66	66
	HHS-56	Siding Ventilation Louver	73	73
	HHS-57-2	Siding Ventilation Louver	61	61
	HHS-58-1	Siding Ventilation Louver	68	68
	HHS-58-2	Siding Ventilation Louver	69	69
	HHS-62-2	Siding Ventilation Louver	69	69
	HHS-67-1	Siding Ventilation Louver	71	71
	HHS-67-3	Siding Ventilation Louver	73	73
	HHS-68-1	Siding Ventilation Louver	72	72
	HHS-68-2	Siding Ventilation Louver	71	71
	HHS-68-3	Siding Ventilation Louver	70	70

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)(2)</sup>	
			Daytime & Evening <sup>(3)</sup>	Night-time <sup>(3)</sup>
	HHS-70-3	Siding Ventilation Louver	59	59
	HHS-71-1	Siding Ventilation Louver	54	54
	HHS-71-2	Siding Ventilation Louver	56	56
	HHS-71-3	Siding Ventilation Louver	67	67
	HHS-73	Siding Ventilation Louver	53	53
	HHS-77-1	Siding Ventilation Louver	54	54
	HHS-77-2	Siding Ventilation Louver	55	55
	HHS-77-3	Siding Ventilation Louver	55	55
	HHS-78	Siding Ventilation Louver	87	79
	HHS-84	Siding Ventilation Louver	72	72
	HHS-87-2	Siding Ventilation Louver	75	75
	HHS-88-2	Siding Ventilation Louver	58	58
	HHS-100-2	Siding Ventilation Louver	62	62
	HHS-101-1	Siding Ventilation Louver	76	76
	HHS-102-1	Siding Ventilation Louver	69	69
	HHS-102-2	Siding Ventilation Louver	71	71
	HHS-102-3	Siding Ventilation Louver	75	75
	HHS-102-6	Siding Ventilation Louver	71	71
	HHS-102-7	Siding Ventilation Louver	73	73
	HHS-102-9	Siding Ventilation Louver	71	71
	HHS-102-11	Siding Ventilation Louver	72	72
	HHS-121	Siding Ventilation Louver	60	60
HUH <sup>(4)</sup>	Superseded by Fixed Plant Noise Audit Report (Updated Batch 7 - HUH & HHS)			

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)(2)</sup>	
			Daytime & Evening <sup>(3)</sup>	Night-time <sup>(3)</sup>
	Superseded by Fixed Plant Noise Audit Report (Updated Batch 7 - HUH & HHS)			

Notes:

- (1) The maximum allowable sound power levels have due regard to the characteristics of tonality, intermittency and impulsiveness.
- (2) As the louvre will not be under operation during night-time period, the maximum allowable SWL is presented as “-”.
- (3) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.
- (4) Design of fixed plant noise sources for HUH are yet to be finalized and their maximum allowable SWLs are calculated based on the latest information. The Proposal (HUH & HHS) will be updated in case there are changes in the maximum allowable SWLs for HUH fixed plant noise sources.

### 3 MEASUREMENT METHODOLOGY

#### 3.1 Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources

##### Measurement Methodology

- 3.1.1 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

- 3.1.2 The sound level meters and calibrators used for noise measurements are listed in the **Table 3.1**. 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 3.1 Noise Measurement Equipment**

Equipment	Model	Serial Number
Sound Level Meter	SVANTEK SVAN 955	15234
	SVANTEK SVAN 958	20890
	SVANTEK SVAN 958	28422
	SVANTEK SVAN 958A	59120
	SVANTEK SVAN 958A	59121
	SVANTEK SVAN 958A	69082
	SVANTEK SVAN 959	11228
Calibrator	SVANTEK SV30A	10814
	SVANTEK SV30A	29088

- 3.1.3 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

##### Measurement Date and Time

- 3.1.4 There will be daytime/evening and night-time operation modes for fixed plant sources at HHS. Nevertheless, the noise measurements at HHS were all conducted during night-time period 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 3.2**.

**Table 3.2 Measurement Schedule**

Location	Date
HHS	20 November 2017
	19, 20 and 21 June 2018
	3 July 2018
	4, 5, 6, 12 and 13 December 2018
	5 June 2019

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

#### Measurement Parameters

- 3.2.1  $L_{Aeq}$  (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.
- 3.2.2 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 was 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

- 3.2.3 The sound level meters and calibrators used for noise measurements at representative NSRs are listed in **Table 3.3**. 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 3.3 Noise Measurement Equipment**

Equipment	Model	Serial Number
Sound Level Meter	SVANTEK SVAN 958	20890
	SVANTEK SVAN 958A	69082
	SVANTEK SVAN 958A	59120
	SVANTEK SVAN 958A	59121
	SVANTEK SVAN 959	11228
Acoustic Calibrator	SVANTEK SVAN SV30A	29088

- 3.2.4 Before and after each series of measurements, a calibration check was carried out on the sound level meter by the calibrator. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

#### Measurement Locations

- 3.2.5 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 were agreed with EPD prior to noise measurement. However, the rooftop of the Metropolis Tower 1 was under renovation during the noise measurement and hence not available to carry out noise measurement. Considering that the footbridge near Harbour Plaza Metropolis is located closer to the noise sources as compared with Metropolis Tower 1 and also have direct line of sight to the noise sources, the measurement location HUH-FN2 was shifted to the footbridge. The measurement locations are summarised in **Table 3.4** and shown in **Figure No. C11033B/C/SCL/ACM/M52/012**. Photographs of measurement locations are shown in **Appendix C2**.



**Table 3.4 Noise Measurement Locations**

Measurement Location ID	Representative NSR (NSR ID)	Type	Measurement Height
HUH-FN1	Royal Peninsula Block 2 (HUH-3-1 <sup>(3)</sup> )	Residential	Rooftop of Royal Peninsula Block 2 (1m from building façade)
HUH-FN2	The Metropolis Residence Tower 1 <sup>(1)</sup> (HUH-4-2)	Residential	On the footbridge near Harbour Plaza Metropolis (1m from the footbridge parapet wall)
HUH-FN3	Harbourfront Horizon <sup>(2)</sup> (HUH-10-1 <sup>(3)</sup> )	Residential	On the footbridge near HUH-10-1 (1.2m above the footbridge level in free-field condition)
HUH-FN4	University Student Halls of Residence (HUH-11-1) and Harbour Place Block 6 (HUH-12-1)	Residential	Rooftop of The Hong Kong Polytechnic University Student Halls of Residence (1m from building façade)
HUH-FN5	The Metropolis Residence Tower 2 <sup>(1)</sup> (HUH-4-1 <sup>(3)</sup> )	Residential	On the footbridge near The Metropolis Tower 2 (1m from the footbridge parapet wall)

Notes:

- (1) Metropolis Residence is a service apartment and shall not rely on openable windows for ventilation. Nonetheless, for conservative consideration that occupier might open window under special circumstances, this premise has been considered as an assessment point.
- (2) Harbourfront Horizon shall not rely on openable windows for ventilation. Nonetheless, for conservative consideration that occupier might open window under special circumstances, this premise has been considered as an assessment point.
- (3) NSR HH9b, HH4 and HH7 as identified in SCL(MKK-HUH) EIA Report is same as the NSR HUH-10-1, HUH-3-1 and HUH-4-1 respectively as identified in SCL(HHS) EIA Report. To avoid confusion, NSR ID following SCL(HHS) EIA Report has been adopted in this assessment.

Measurement Date and Time

- 3.2.6 For daytime/evening and night-time operation modes, noise measurement at representative NSRs was conducted during evening and night-time periods. The measurement schedule is presented in **Table 3.5**.

**Table 3.5 Measurement Schedule**

Measurement Location ID	Date
HUH-FN1, HUH-FN2, HUH-FN3, HUH-FN4 & HUH-FN5	10 & 11 June 2019

## 4 MEASUREMENT RESULTS

### 4.1 Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources

4.1.1 The measured SWLs for daytime and evening, and night-time periods are presented in **Table 4.1**. Photographs showing the examples of noise measurement for fixed plant noise are shown in **Appendix B3**. Details of the measurement results are shown in **Appendix B4**.

**Table 4.1 Summary of Measured SWLs for Fixed Plants**

Plant Item <sup>(4)</sup>	Measured SWL <sup>(1)(2)</sup> , dB(A)		Maximum allowable SWL <sup>(1)</sup> , dB(A)		Compliance (Y/N)	
	Day / Evening-time <sup>(3)</sup>	Night-time <sup>(3)</sup>	Day / Evening-time <sup>(3)</sup>	Night-time <sup>(3)</sup>	Day / Evening-time <sup>(3)</sup>	Night-time <sup>(3)</sup>
HHS-38	64	64	64	64	Y	Y
HHS-40	88	-	88	-	Y	Y
HHS-41-1	54	54	54	54	Y	Y
HHS-41-2	66	66	66	66	Y	Y
HHS-42-1	66	66	66	66	Y	Y
HHS-42-2	64	64	64	64	Y	Y
HHS-42-3	63	63	63	63	Y	Y
HHS-45-1	85	85	85	85	Y	Y
HHS-45-2	60	60	60	60	Y	Y
HHS-49-2	78	78	78	78	Y	Y
HHS-49-3	71	71	71	71	Y	Y
HHS-49-6	67	67	67	67	Y	Y
HHS-49-8	70	70	70	70	Y	Y
HHS-50-1	75	75	75	75	Y	Y
HHS-50-2	69	69	69	69	Y	Y
HHS-51	86	85	86	85	Y	Y
HHS-52-1	63	63	63	63	Y	Y
HHS-53-1	68	68	68	68	Y	Y
HHS-53-2	75	75	75	75	Y	Y
HHS-53-3	59	59	59	59	Y	Y
HHS-53-4	67	67	67	67	Y	Y
HHS-53-5	69	69	69	69	Y	Y
HHS-53-6	66	66	66	66	Y	Y
HHS-56	73	73	73	73	Y	Y
HHS-57-2	61	61	61	61	Y	Y
HHS-58-1	68	68	68	68	Y	Y
HHS-58-2	69	69	69	69	Y	Y
HHS-62-2	69	69	69	69	Y	Y
HHS-67-1	71	71	71	71	Y	Y
HHS-67-3	73	73	73	73	Y	Y
HHS-68-1	72	72	72	72	Y	Y
HHS-68-2	71	71	71	71	Y	Y
HHS-68-3	70	70	70	70	Y	Y
HHS-70-3	59	59	59	59	Y	Y
HHS-71-1	54	54	54	54	Y	Y
HHS-71-2	56	56	56	56	Y	Y

Plant Item <sup>(4)</sup>	Measured SWL <sup>(1)(2)</sup> , dB(A)		Maximum allowable SWL <sup>(1)</sup> , dB(A)		Compliance (Y/N)	
	Day / Evening-time <sup>(3)</sup>	Night-time <sup>(3)</sup>	Day / Evening - time <sup>(3)</sup>	Night-time <sup>(3)</sup>	Day / Evening - time <sup>(3)</sup>	Night-time <sup>(3)</sup>
HHS-71-3	67	67	67	67	Y	Y
HHS-73	53	53	53	53	Y	Y
HHS-77-1	54	54	54	54	Y	Y
HHS-77-2	55	55	55	55	Y	Y
HHS-77-3	55	55	55	55	Y	Y
HHS-78	87	79	87	79	Y	Y
HHS-84	72	72	72	72	Y	Y
HHS-87-2	75	75	75	75	Y	Y
HHS-88-2	58	58	58	58	Y	Y
HHS-100-2	62	62	62	62	Y	Y
HHS-101-1	76	76	76	76	Y	Y
HHS-102-1	69	69	69	69	Y	Y
HHS-102-2	71	71	71	71	Y	Y
HHS-102-3	75	75	75	75	Y	Y
HHS-102-6	71	71	71	71	Y	Y
HHS-102-7	73	73	73	73	Y	Y
HHS-102-9	71	71	71	71	Y	Y
HHS-102-11	72	72	72	72	Y	Y
HHS-121	60	60	60	60	Y	Y

Notes:

- (1) As discussed in S3.1.4, some plants would be operated in different modes, namely daytime/evening and night-time operation modes. For those plants operating in the same mode during daytime/evening and night-time periods, the measured SWL is same for both daytime/evening and night-time periods.
- (2) As the louvre will not be under operation during night-time period, the maximum allowable SWL is presented as “-”.
- (3) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours
- (4) For HUH, after the completion of HUH fixed plant noise measurements, the results and compliance status will be reported in a revised Fixed Plant Noise Audit Report to be deposited under both EP-437/2012/A and EP-438/2012/K.

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

- 4.2.1 Noise measurement to confirm any characteristics of tonality, impulsiveness and intermittency at the representative NSRs were conducted during both evening and night-time periods. Measurement results are summarised in **Table 4.2** below. No characteristics of tonality, impulsiveness and intermittency was observed at the selected 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. Detailed noise measurements results are presented in **Appendix C3**.

**Table 4.2 Noise Measurement Results at Measurement Locations**

Measurement Location ID	Representing NSRs	Time Period <sup>(1)&amp;(2)</sup>	Measurement Results			Site Observation	Characteristics of Tonality, Impulsiveness and Intermittency at NSRs (Y/N)
			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) <sup>(3)</sup>		
HUH-FN1	Royal Peninsula Block 2 (HUH-3-1)	Daytime & Evening	67.7	68.0	-0.3	Noise environment was dominated by traffic noise. Noise from SCL fixed plant was not noticeable at measurement locations	N
		Night-time	66.8	65.6	1.2		N
HUH-FN2	The Metropolis Residence Tower 1 (HUH-4-2)	Daytime & Evening	61.5	60.5	1.0		N
		Night-time	60.3	58.2	2.1		N
HUH-FN3	Harbourfront Horizon (HUH-10-1)	Daytime & Evening	64.3	63.0	1.3		N
		Night-time	62.3	60.7	1.6		N
HUH-FN4	University Student Halls of Residence (HUH-11-1) and Harbour Place Block 6 (HUH-12-1)	Daytime & Evening	65.8	65.7	0.1		N
		Night-time	64.4	62.4	2.0		N
HUH-FN5	The Metropolis Residence Tower 2 (HUH-4-1)	Daytime & Evening	69.5	69.9	-0.4		N
		Night-time	68.2	68.0	0.2		N

Notes:

(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

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- (3) The measured noise levels were dominated by background noise (i.e. road traffic noise from major roads nearby). Since traffic noise fluctuated during the daytime & evening measurement periods, leading to higher background noise levels than the measured noise levels of the fixed sources at few measurement locations.

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## **Appendix B2**

### **Calibration Certificates – Noise Measurement for Fixed Plant Noise**

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## Appendix B2 Calibration Certificates – Noise Measurement for Fixed Plant Noise

### Cert B1: Calibration Certificate of Sound Level Meter SVANTEK 955 (SN: 15234)

  
**MAXLAB**


### CALIBRATION CERTIFICATE

Certificate Information	
Date of Issue	6-Feb-2018
Certificate Number	MLCN180200S

Customer Information	
Company Name	Wilson Acoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T.

Equipment-under-Test (EUT)	
Description	Sound Level Meter
Manufacturer	SvanteK
Model Number	SVAN 955
Serial Number	15234
Equipment Number	--

Calibration Particular																
Date of Calibration	6-Feb-2018															
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-2018															
Calibration Procedure	MLCG00, MLCG15															
Calibration Conditions	<table border="1"><tbody><tr><td>Laboratory</td><td>Temperature</td><td>23 °C ± 5 °C</td></tr><tr><td></td><td>Relative Humidity</td><td>55% ± 25%</td></tr><tr><td>EUT</td><td>Stabilizing Time</td><td>Over 3 hours</td></tr><tr><td></td><td>Warm-up Time</td><td>10 minutes</td></tr><tr><td></td><td>Power Supply</td><td>Internal battery</td></tr></tbody></table>	Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	10 minutes		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C														
	Relative Humidity	55% ± 25%														
EUT	Stabilizing Time	Over 3 hours														
	Warm-up Time	10 minutes														
	Power Supply	Internal battery														
Calibration Results	Calibration data were detailed in the continuation pages.															

Approved By & Date	
	K.O. Lo
	6-Feb-2018

Statements	
<ul style="list-style-type: none"><li>• Calibration equipment used for this calibration are traceable to national / international standards.</li><li>• The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>• MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>• The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>	

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Unit B2, 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



Certificate No. MLCN180200S

Calibration Data							
Parameter	Frequency Weighting	Range (dB)	Time Weighting	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
SPL	A (1 kHz Input)	25 - 130	F	94 dB	94.0 dB	0.0 dB	0.2 dB
			S	94 dB	94.0 dB	0.0 dB	0.2 dB
			I	94 dB	94.0 dB	0.0 dB	0.2 dB
	C (1 kHz Input)	25 - 130	F	94 dB	94.0 dB	0.0 dB	0.2 dB
			S	94 dB	94.0 dB	0.0 dB	0.2 dB
			I	94 dB	94.0 dB	0.0 dB	0.2 dB
	Z (1 kHz Input)	25 - 130	F	94 dB	94.0 dB	0.0 dB	0.2 dB
			S	94 dB	94.0 dB	0.0 dB	0.2 dB
			I	94 dB	94.0 dB	0.0 dB	0.2 dB
	A (1 kHz Input)	25 - 130	F	114 dB	114.0 dB	0.0 dB	0.2 dB
			S	114 dB	114.0 dB	0.0 dB	0.2 dB
			I	114 dB	114.0 dB	0.0 dB	0.2 dB
	C (1 kHz Input)	25 - 130	F	114 dB	114.0 dB	0.0 dB	0.2 dB
			S	114 dB	114.0 dB	0.0 dB	0.2 dB
			I	114 dB	114.0 dB	0.0 dB	0.2 dB
	Z (1 kHz Input)	25 - 130	F	114 dB	114.0 dB	0.0 dB	0.2 dB
			S	114 dB	114.0 dB	0.0 dB	0.2 dB
			I	114 dB	114.0 dB	0.0 dB	0.2 dB

- END -

Calibrated By :  
Date :

Patrick  
6-Feb-2018

Checked By :  
Date :

K.O. Lo  
6-Feb-2018

Page 2 of 2

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**Cert B2: Calibration Certificate of Sound Level Meter SVANTEK 958 (SN: 20890)**



**CALIBRATION CERTIFICATE**

Certificate Information	
Date of Issue	23-Jun-2017
Certificate Number	MLCN171137S
Customer Information	
Company Name	Wilson Acoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong
Equipment-under-Test (EUT)	
Description	Sound & Vibration Analyser
Manufacturer	Svantek
Model Number	SVAN 958
Serial Number	20890
Equipment Number	--
Calibration Particular	
Date of Calibration	23-Jun-2017
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-2018
Calibration Procedure	MLCG00, MLCG15
Calibration Conditions	Laboratory      Temperature      23 °C ± 5 °C Relative Humidity      55% ± 25% EUT                      Stabilizing Time      Over 3 hours Warm-up Time      10 minutes Power Supply      Internal battery
Calibration Results	Calibration data were detailed in the continuation pages.
Approved By & Date	
 K.O. Lo      23-Jun-2017	
Statements	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>	

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Certificate NoMLCN171137S


Calibration Data						
Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB
			114.1 dB	114.0 dB	0.1 dB	0.2 dB
	C / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB
			114.1 dB	114.0 dB	0.1 dB	0.2 dB
	LIN / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB
			114.1 dB	114.0 dB	0.1 dB	0.2 dB
	A / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	C / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	LIN / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	A / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	C / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	LIN / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB

- END -


Calibrated By : Patrick  
Date : 23-Jun-2017

Checked By : K.O. Lo  
Date : 23-Jun-2017  
Page 2 of 2

**Cert B3: Calibration Certificate of Sound Level Meter SVANTEK 958 (SN: 28422)**

  
**MAXLAB**

### CALIBRATION CERTIFICATE

<b>Certificate Information</b>			
Date of Issue		7-May-2018	Certificate Number
			MLCN180788S
<b>Customer Information</b>			
Company Name		Wilson Acoustics Limited	
Address		Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong	
<b>Equipment-under-Test (EUT)</b>			
Description		Sound & Vibration Analyser	
Manufacturer		Svantek	
Model Number		SVAN 958	
Serial Number		28422	
Equipment Number		--	
<b>Calibration Particular</b>			
Date of Calibration		7-May-2018	
Calibration Equipment		4231(MLTE008) / PA160059 / 20-May-2018	
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.	
<b>Approved By &amp; Date</b>			
			K.O. Lo
			7-May-2018
<b>Statements</b>			
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>			

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Certificate No. MLCN180788S

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

- END -

Calibrated By :  
Date :

Dan  
7-May-2018

Checked By :  
Date :

K.O. Lo  
7-May-2018  
Page 2 of 2

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ISO9001 certified

**FACTORY CALIBRATION DATA OF THE SVAN 958 No. 59120**

**SOUND LEVEL METER**

**1. CALIBRATION** (electrical)

LEVEL METER; Filter: LIN; Input signal =114.0dB,  $f_{in}=1\text{kHz}$

	Range 105dB		Range 130dB	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	113.99	-0.01	114.02	0.02
Channel 2	113.98	-0.02	114.03	0.03
Channel 3	113.98	-0.02	114.03	0.03
Channel 4	113.98	-0.02	114.02	0.02

**2. CALIBRATION\*** (acoustical)

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

Filter	LIN		A		C	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	114.0	0.0	114.0	0.0	114.0	0.0
Channel 2	114.0	0.0	114.0	0.0	114.0	0.0
Channel 3	114.0	0.0	114.0	0.0	114.0	0.0
Channel 4	114.0	0.0	114.0	0.0	114.0	0.0

Calibration measured with the microphone SVANTEK type SV22 No. 4013604. Calibration factor: -0.4dB

**3. LINEARITY TEST\*** (electrical)

LEVEL METER; Range: 105 dB; Filter: A;  $f_{in}=1000\text{ Hz}$

	Input [dB]	24.0	30.0	40.0	60.0	80.0	100.0	114.0
Channel 1	Error [dB]	0.24	0.11	0.04	-0.01	0.00	0.01	0.01
Channel 2	Error [dB]	0.28	0.10	0.04	-0.01	0.00	0.01	0.01
Channel 3	Error [dB]	0.20	0.10	0.04	-0.01	0.00	0.01	0.01
Channel 4	Error [dB]	0.21	0.09	0.04	-0.01	0.00	0.01	0.01

LEVEL METER; Range: 130 dB; Filter: A;  $f_{in}=1000\text{ Hz}$

	Input [dB]	45.0	50.0	60.0	80.0	100.0	120.0	135.0
Channel 1	Error [dB]	0.09	0.07	0.03	0.00	0.01	0.00	0.01
Channel 2	Error [dB]	0.10	0.06	0.03	0.00	0.01	0.00	0.01
Channel 3	Error [dB]	0.03	0.05	0.02	0.01	0.01	0.01	0.02
Channel 4	Error [dB]	0.00	0.04	0.02	0.00	0.01	0.00	0.01

1/3 OCTAVE (1kHz); Range: 130 dB; Filter: A;  $f_{in}=1000\text{ Hz}$

	Input [dB]	35.0	40.0	60.0	80.0	100.0	120.0	135.0
Channel 1	Error [dB]	0.39	0.15	0.03	0.01	0.01	0.00	0.01
Channel 2	Error [dB]	0.37	0.14	0.03	0.01	0.01	-0.00	0.02
Channel 3	Error [dB]	0.23	0.05	0.03	0.00	0.01	0.00	0.01
Channel 4	Error [dB]	0.23	0.03	0.02	0.01	0.01	0.01	0.02

\*\*\* SVAN958 No. 59120 page 1 \*\*\*



#### 4. TONEBURST RESPONSE\* (electrical)

LEVEL METER, Characteristic: A;  $f_{\text{am}} = 4000 \text{ Hz}$ ; 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
MAX	Fast	1	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
		2	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
			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
		3	Indication [dB]	112.0	111.9	111.0	109.4	107.1	103.7	100.8	97.9	93.9	90.9	87.9	84.8
			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
		4	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
	Slow	1	Indication [dB]	109.9	108.0	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	-	-	-
		2	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	-	-	-
		3	Indication [dB]	109.9	107.9	104.5	101.7	98.8	94.9	91.9	88.9	84.9	-	-	-
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		4	Indication [dB]	109.9	108.0	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	-	-	-
SEL	-	1	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
		2	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
			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
		3	Indication [dB]	111.8	108.9	105.0	102.0	98.9	95.0	92.0	88.9	84.9	81.9	78.9	75.8
			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	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

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

Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5
MAX	Fast	1	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.8	37.9
			Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	0.0
		2	Indication [dB]	52.0	51.9	51.0	49.4	47.1	43.7	40.8	37.9
			Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
		3	Indication [dB]	51.9	51.9	51.0	49.3	47.1	43.6	40.8	37.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	0.0	-0.1	0.0
		4	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.8	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	0.0	-0.1	-0.0
	Slow	1	Indication [dB]	49.9	47.9	44.6	41.8	38.9	35.0	32.0	29.0
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
		2	Indication [dB]	49.9	47.9	44.6	41.8	38.9	34.9	31.9	29.1
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.1
		3	Indication [dB]	49.9	47.9	44.5	41.7	38.8	34.9	31.9	29.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	0.1
		4	Indication [dB]	49.9	47.9	44.6	41.8	38.9	35.0	32.1	29.0
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	0.0	0.1	0.0
SEL	-	1	Indication [dB]	51.8	49.0	45.0	42.0	39.0	35.1	32.1	29.2
			Error [dB]	-0.2	-0.0	0.0	0.0	0.0	0.1	0.1	0.2
		2	Indication [dB]	51.8	49.0	45.0	42.0	39.0	35.0	32.0	29.2
			Error [dB]	-0.2	-0.0	0.0	0.0	0.0	0.1	0.1	0.2
		3	Indication [dB]	51.8	48.9	45.0	41.9	38.9	35.0	32.0	29.1
			Error [dB]	-0.2	-0.0	0.0	0.0	0.0	0.1	0.1	0.1
		4	Indication [dB]	51.8	49.0	45.0	42.0	39.0	35.1	32.1	29.1
			Error [dB]	-0.2	0.0	0.0	-0.0	0.0	0.1	0.1	0.1

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

Result	Detector	Ch.	Duration [ms]	1000	500
MAX	Fast	1	Indication [dB]	34.1	34.0
			Error [dB]	0.0	0.0
		2	Indication [dB]	34.1	33.9
			Error [dB]	0.0	-0.0
		3	Indication [dB]	34.0	33.9
			Error [dB]	0.0	0.0
		4	Indication [dB]	34.0	33.9
			Error [dB]	-0.0	-0.1
	Slow	1	Indication [dB]	32.0	30.1
			Error [dB]	-0.1	0.1
		2	Indication [dB]	32.0	30.0
			Error [dB]	-0.1	0.1
		3	Indication [dB]	31.9	29.9
			Error [dB]	-0.1	0.1
		4	Indication [dB]	31.9	30.0
			Error [dB]	-0.1	0.0
SEL		1	Indication [dB]	33.9	31.2
			Error [dB]	-0.1	0.1
		2	Indication [dB]	33.9	31.1
			Error [dB]	-0.1	0.1
		3	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.1
		4	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.0

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
MAX	Fast	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
			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
		2	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
			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
		3	Indication [dB]	134.0	133.9	133.0	131.4	129.1	125.7	122.8	119.9	115.9	112.9	109.9	106.8
			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
		4	Indication [dB]	134.0	133.9	133.0	131.4	129.2	125.7	122.9	119.9	116.0	113.0	109.9	106.9
			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
	Slow	1	Indication [dB]	131.9	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		2	Indication [dB]	131.9	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	131.9	129.9	126.5	123.8	120.8	116.9	113.9	110.9	106.9	-	-	-
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		4	Indication [dB]	131.9	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL		1	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
			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
		2	Indication [dB]	133.8	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	103.9	100.9	97.9
			Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
		3	Indication [dB]	133.8	130.9	127.0	124.0	121.0	117.0	114.0	110.9	107.0	103.9	100.9	97.8
			Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.1
		4	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
			Error [dB]	-0.2	-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
MAX	Fast	1	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.8	59.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.0
		2	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.8	59.9
			Error [dB]	0.0	0.0	73.0	0.0	-0.0	-0.0	-0.0	0.0
		3	Indication [dB]	73.9	73.9	73.0	71.3	69.1	65.6	62.8	59.9
			Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0
		4	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.8	59.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
	Slow	1	Indication [dB]	71.9	69.9	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
		2	Indication [dB]	71.9	69.9	66.5	63.8	60.9	56.9	54.0	51.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	0.0
		3	Indication [dB]	71.9	69.9	66.5	63.7	60.8	56.9	54.0	51.0
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.1
		4	Indication [dB]	71.9	69.9	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	0.1
SEL	-	1	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.1	51.1
			Error [dB]	-0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1
		2	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.0	51.1
			Error [dB]	-0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1
		3	Indication [dB]	73.8	70.9	67.0	63.9	61.0	57.0	54.0	51.0
			Error [dB]	-0.2	-0.0	0.0	-0.0	0.0	0.0	0.0	0.0
		4	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.0	51.1
			Error [dB]	-0.2	-0.0	0.0	0.0	-0.0	0.0	0.0	0.1

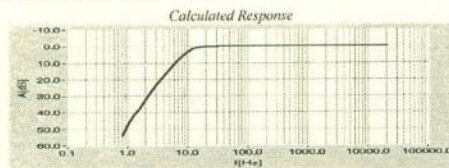
Range: 130dB, Equivalent input steady level = 54dB

Result	Detector	Ch.	Duration [ms]	1000	500
MAX	Fast	1	Indication [dB]	54.1	53.9
			Error [dB]	0.0	-0.0
		2	Indication [dB]	54.0	53.9
			Error [dB]	-0.0	-0.0
		3	Indication [dB]	54.0	53.9
			Error [dB]	0.1	0.1
		4	Indication [dB]	54.0	54.0
			Error [dB]	0.0	0.1
	Slow	1	Indication [dB]	52.0	50.0
			Error [dB]	-0.1	0.1
		2	Indication [dB]	51.9	50.0
			Error [dB]	-0.1	0.1
		3	Indication [dB]	51.9	49.9
			Error [dB]	-0.0	0.1
		4	Indication [dB]	51.9	50.0
			Error [dB]	-0.1	0.1
SEL	-	1	Indication [dB]	53.9	51.1
			Error [dB]	-0.1	0.1
		2	Indication [dB]	53.9	51.1
			Error [dB]	-0.2	0.1
		3	Indication [dB]	53.8	51.0
			Error [dB]	-0.1	0.1
		4	Indication [dB]	53.9	51.1
			Error [dB]	-0.1	0.1



## 6. FREQUENCY RESPONSE (electrical)

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



Measured Response with Preamplifier SV12 (f-frequency, A<sub>n</sub>-attenuation in channel n)

f [Hz]	A1[dB]	A2[dB]	A3[dB]	A4[dB]	f [Hz]	A1[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	-0.1

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 1 Level [dB]	14.7	13.3	12.6
Channel 2 Level [dB]	17.4	13.0	12.3
Channel 3 Level [dB]	17.8	11.7	11.1
Channel 4 Level [dB]	14.9	11.8	12.4

\* measured with preamplifier SVANTEK type SV12 No. 1771.

## VIBRATION LEVEL METER

### 1. CALIBRATION (electrical)

LEVEL METER, Filter: HP10; Input signal = 140.0dB (10.0 m/s<sup>2</sup>), f<sub>m</sub>=79.6Hz

	Range 145dB		Range 170dB	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	139.98	-0.02	140.03	0.03
Channel 2	139.99	-0.01	140.04	0.04
Channel 3	139.98	-0.02	140.04	0.04
Channel 4	139.98	-0.02	140.03	0.03

### 2. CALIBRATION (vibrational)

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

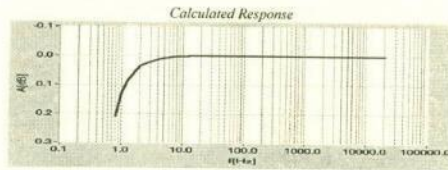
Filter	HP1		HP10		Wd		Wm		Wh	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.2	0.1	110.7	0.1
Channel 2	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.2	0.1	110.7	0.1
Channel 3	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.1	0.1	110.7	0.1
Channel 4	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.2	0.1	110.7	0.1

Calibration measured with the accelerometer DYTRAN type 3185D No. 2975. Calibration factor: -0.3dB

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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	0.21	0.21	0.20	0.21	5	0.01	0.01	0.01	0.02	500	0.00	0.00	0.00	0.00
1	0.12	0.12	0.12	0.12	6.3	0.01	0.01	0.01	0.01	1000	0.00	0.00	0.00	0.00
1.25	0.09	0.09	0.09	0.09	8	0.01	0.01	0.01	0.01	2000	0.00	0.00	0.00	0.00
1.6	0.04	0.04	0.04	0.05	16	0.00	0.00	0.00	0.00	4000	0.01	0.02	0.02	0.01
2	0.04	0.04	0.03	0.04	31.5	-0.01	0.00	-0.01	0.00	8000	0.04	0.04	0.05	0.02
2.5	0.02	0.02	0.02	0.03	63	0.00	0.00	0.00	0.00	16000	0.02	0.02	0.04	-0.04
3.15	0.03	0.03	0.03	0.03	125	0.00	0.00	0.00	0.00	20000	-0.01	0.00	0.02	-0.07
4	0.03	0.03	0.03	0.03	250	0.00	0.00	-0.01	0.00					

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 1	Indication [dB]	54.4	52.1	42.2	39.0	36.5
Channel 2	Indication [dB]	55.0	52.5	42.5	39.0	36.5
Channel 3	Indication [dB]	53.2	50.2	42.7	38.8	36.8
Channel 4	Indication [dB]	54.9	52.7	42.9	39.4	37.1

#### ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
22 °C	31 %	1004 hPa

#### TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	15900	Sound & Vibration Analyser
3.	KEITHLEY	2000	0910165	Digital multimeter
4.	SVANTEK	SV30A	24563	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)
6.	DYTRAN	3233A	747	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: Paweł Bednarczyk

*P. Bednarczyk*

Test date: 2016-09-20

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ISO9001 certified

**FACTORY CALIBRATION DATA OF THE SVAN 958 No. 59121**

**SOUND LEVEL METER**

**1. CALIBRATION** (electrical)

LEVEL METER; Filter: LIN; Input signal =114.0dB,  $f_{in}$ =1kHz

	Range 105dB		Range 130dB	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	113.98	-0.02	114.02	0.02
Channel 2	113.97	-0.03	114.02	0.02
Channel 3	113.97	-0.03	114.02	0.02
Channel 4	113.97	-0.03	114.02	0.02

**2. CALIBRATION\*** (acoustical)

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

Filter	LIN		A		C	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	114.0	0.0	114.0	0.0	114.0	0.0
Channel 2	114.0	0.0	114.0	0.0	114.0	0.0
Channel 3	114.0	0.0	114.0	0.0	114.0	0.0
Channel 4	114.0	0.0	114.0	0.0	114.0	0.0

Calibration measured with the microphone SVANTEK type SV22 No. 4013604. Calibration factor: -0.4dB

**3. LINEARITY TEST\*** (electrical)

LEVEL METER; Range: 105 dB; Filter: A;  $f_{in}$ = 1000 Hz

	Input [dB]	24.0	30.0	40.0	60.0	80.0	100.0	114.0
Channel 1	Error [dB]	0.32	0.13	0.04	-0.01	0.00	0.01	0.01
Channel 2	Error [dB]	0.29	0.11	0.04	-0.01	0.00	0.01	0.01
Channel 3	Error [dB]	0.25	0.09	0.04	-0.01	0.00	0.01	0.01
Channel 4	Error [dB]	0.35	0.11	0.03	-0.01	-0.00	0.01	0.01

LEVEL METER; Range: 130 dB; Filter: A;  $f_{in}$ = 1000 Hz

	Input [dB]	45.0	50.0	60.0	80.0	100.0	120.0	135.0
Channel 1	Error [dB]	0.07	0.09	0.04	0.01	0.01	0.00	0.01
Channel 2	Error [dB]	0.09	0.10	0.04	0.01	0.01	0.00	0.01
Channel 3	Error [dB]	0.00	0.01	0.00	0.01	0.01	0.00	0.01
Channel 4	Error [dB]	-0.02	0.00	0.01	0.01	0.01	0.00	0.01

1/3 OCTAVE (1kHz); Range: 130 dB; Filter: A;  $f_{in}$ = 1000 Hz

	Input [dB]	35.0	40.0	60.0	80.0	100.0	120.0	135.0
Channel 1	Error [dB]	0.32	0.11	0.03	0.00	0.00	-0.01	0.00
Channel 2	Error [dB]	0.34	0.11	0.03	0.00	0.01	0.00	0.01
Channel 3	Error [dB]	0.30	0.07	0.03	0.00	0.01	0.00	0.01
Channel 4	Error [dB]	0.28	0.08	0.04	0.00	0.01	-0.01	-0.00

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#### 4. TONEBURST RESPONSE\* (electrical)

LEVEL METER, Characteristic: A;  $f_{\text{sin}} = 4000 \text{ Hz}$ ; 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
MAX	Fast	1	Indication [dB]	111.9	111.9	111.0	109.3	107.1	103.6	100.8	97.9	93.9	90.9	87.8	84.8
			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
		2	Indication [dB]	111.9	111.8	110.9	109.3	107.1	103.6	100.8	97.8	93.9	90.9	87.8	84.8
			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
		3	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
			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
		4	Indication [dB]	111.9	111.9	111.0	109.3	107.1	103.6	100.8	97.9	93.9	90.9	87.8	84.8
			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
	Slow	1	Indication [dB]	109.9	107.9	104.5	101.7	98.8	94.9	91.9	88.9	84.9	-	-	-
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		2	Indication [dB]	109.9	107.9	104.5	101.7	98.8	94.9	91.9	88.9	84.9	-	-	-
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	110.0	107.9	104.6	101.8	98.9	95.0	92.0	89.0	85.0	-	-	-
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		4	Indication [dB]	109.9	107.9	104.5	101.7	98.8	94.9	91.9	88.9	84.9	-	-	-
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL	-	1	Indication [dB]	111.9	108.9	104.9	101.9	98.9	94.9	91.9	88.9	84.9	81.9	78.8	75.8
			Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.1
		2	Indication [dB]	111.9	108.9	104.9	101.9	98.9	94.9	91.9	88.9	84.9	81.9	78.8	75.8
			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
		3	Indication [dB]	112.0	109.0	105.0	102.0	99.0	95.0	92.0	89.0	85.0	81.9	78.9	75.9
			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
		4	Indication [dB]	111.9	108.9	105.0	101.9	98.9	94.9	91.9	88.9	84.9	81.9	78.8	75.8
			Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1

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

Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5
MAX	Fast	1	Indication [dB]	51.9	51.8	50.9	49.3	47.1	43.6	40.8	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	0.0
		2	Indication [dB]	51.9	51.8	50.9	49.3	47.1	43.6	40.7	37.8
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	0.0	-0.1	0.0
		3	Indication [dB]	52.0	51.9	51.0	49.4	47.1	43.7	40.8	37.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	0.0	-0.1	0.0
		4	Indication [dB]	51.9	51.8	50.9	49.3	47.1	43.6	40.8	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	0.0
	Slow	1	Indication [dB]	49.9	47.9	44.5	41.7	38.8	34.9	31.9	28.9
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	0.0	-0.0	0.0
		2	Indication [dB]	49.9	47.9	44.5	41.7	38.8	34.9	31.9	28.9
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	0.0	-0.0	-0.0
		3	Indication [dB]	50.0	47.9	44.6	41.8	38.8	35.0	31.9	29.0
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	0.0	-0.0	0.0
		4	Indication [dB]	49.9	47.9	44.5	41.7	38.8	34.9	31.9	29.2
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	0.3
SEL	-	1	Indication [dB]	51.9	48.9	44.9	41.9	38.9	35.0	32.0	29.1
			Error [dB]	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
		2	Indication [dB]	51.9	48.9	44.9	41.9	38.9	35.0	32.0	29.0
			Error [dB]	0.0	-0.0	0.0	0.0	0.0	0.1	0.1	0.1
		3	Indication [dB]	52.0	49.0	45.0	42.0	39.0	35.0	32.0	29.1
			Error [dB]	0.0	-0.0	0.0	0.0	0.0	0.1	0.1	0.2
		4	Indication [dB]	51.9	48.9	44.9	41.9	38.9	35.0	32.0	29.1
			Error [dB]	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2

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

Result	Detector	Ch.	Duration [ms]	1000	500
MAX	Fast	1	Indication [dB]	34.0	33.9
			Error [dB]	0.0	-0.0
		2	Indication [dB]	34.0	33.9
			Error [dB]	-0.0	0.0
		3	Indication [dB]	34.0	33.9
			Error [dB]	0.0	0.0
		4	Indication [dB]	34.0	33.9
			Error [dB]	0.0	0.0
	Slow	1	Indication [dB]	32.0	30.0
			Error [dB]	0.0	0.1
		2	Indication [dB]	32.0	30.0
			Error [dB]	0.0	0.1
		3	Indication [dB]	32.0	29.9
			Error [dB]	0.0	0.1
		4	Indication [dB]	31.9	30.1
			Error [dB]	0.0	0.3
SEL		1	Indication [dB]	34.0	31.1
			Error [dB]	0.0	0.1
		2	Indication [dB]	34.0	31.1
			Error [dB]	0.0	0.1
		3	Indication [dB]	34.0	31.1
			Error [dB]	0.0	0.1
		4	Indication [dB]	34.0	31.0
			Error [dB]	0.0	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
MAX	Fast	1	Indication [dB]	133.9	133.8	132.9	131.3	129.1	125.6	122.8	119.8	115.9	112.9	109.8	106.8
			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
		2	Indication [dB]	133.9	133.8	132.9	131.3	129.1	125.6	122.8	119.8	115.9	112.9	109.8	106.8
			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
		3	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
			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
		4	Indication [dB]	133.9	133.9	133.0	131.3	129.1	125.6	122.8	119.9	115.9	112.9	109.8	106.8
			Error [dB]	0.0	0.0	0.0	0.0	129.1	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	1	Indication [dB]	131.9	129.9	126.5	123.7	120.8	116.9	113.9	110.9	106.9	-	-	-
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		2	Indication [dB]	131.9	129.9	126.5	123.7	120.8	116.9	113.9	110.9	106.9	-	-	-
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	132.0	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		4	Indication [dB]	131.9	129.9	126.5	123.7	120.8	116.9	113.9	110.9	106.9	-	-	-
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL		1	Indication [dB]	133.9	130.9	126.9	123.9	120.9	116.9	113.9	110.9	106.9	103.9	100.8	97.8
			Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
		2	Indication [dB]	133.9	130.9	126.9	123.9	120.9	116.9	113.9	110.9	106.9	103.9	100.8	97.8
			Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
		3	Indication [dB]	134.0	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	103.9	100.9	97.9
			Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
		4	Indication [dB]	133.9	130.9	127.0	123.9	120.9	116.9	113.9	110.9	106.9	103.9	100.8	97.8
			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

Range: 130dB, Equivalent input steady level = 74dB

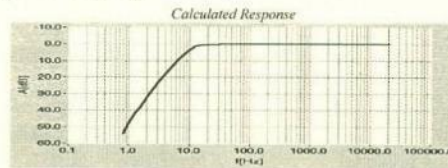
Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5
MAX	Fast	1	Indication [dB]	73.9	73.8	72.9	71.3	69.1	65.6	62.8	59.8
			Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
		2	Indication [dB]	73.9	73.8	72.9	71.3	69.1	65.6	62.8	59.8
			Error [dB]	-0.0	0.0	72.9	0.0	-0.0	-0.0	-0.0	0.0
		3	Indication [dB]	74.0	73.9	73.0	71.4	69.1	65.7	62.8	59.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
		4	Indication [dB]	73.9	73.9	72.9	71.3	69.1	65.6	62.8	59.8
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
	Slow	1	Indication [dB]	71.9	69.9	66.5	63.7	60.8	56.9	54.0	50.9
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
		2	Indication [dB]	71.9	69.9	66.5	63.7	60.8	56.9	53.9	51.0
			Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.1
		3	Indication [dB]	72.0	69.9	66.5	63.8	60.9	56.9	54.0	50.9
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
		4	Indication [dB]	71.9	69.9	66.5	63.7	60.8	56.9	53.9	50.9
			Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
SEL	-	1	Indication [dB]	73.9	70.9	66.9	63.9	60.9	56.9	54.0	51.0
			Error [dB]	-0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	0.1
		2	Indication [dB]	73.9	70.9	66.9	63.9	60.9	56.9	54.0	51.0
			Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	0.0	0.0	0.1
		3	Indication [dB]	74.0	71.0	67.0	64.0	61.0	57.0	54.0	51.0
			Error [dB]	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.1
		4	Indication [dB]	73.9	70.9	66.9	63.9	60.9	56.9	54.0	51.0
			Error [dB]	0.0	-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
MAX	Fast	1	Indication [dB]	54.0	53.9
			Error [dB]	0.0	0.1
		2	Indication [dB]	54.0	53.8
			Error [dB]	0.1	-0.0
		3	Indication [dB]	54.0	53.9
			Error [dB]	0.0	-0.0
		4	Indication [dB]	53.9	53.9
			Error [dB]	-0.0	0.0
	Slow	1	Indication [dB]	52.0	49.9
			Error [dB]	0.0	0.1
		2	Indication [dB]	52.0	49.9
			Error [dB]	0.0	0.1
SEL	-	1	Indication [dB]	54.0	51.0
			Error [dB]	0.0	0.1
		2	Indication [dB]	54.0	51.0
			Error [dB]	0.0	0.0
		3	Indication [dB]	54.0	51.0
			Error [dB]	0.0	0.0
		4	Indication [dB]	54.0	51.0
			Error [dB]	-0.0	0.0

## 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]	A1[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	0.1	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 1	Level [dB]	14.2	11.6
Channel 2	Level [dB]	13.2	10.7
Channel 3	Level [dB]	13.9	11.2
Channel 4	Level [dB]	14.0	11.4

\* measured with preamplifier SVANTEK type SV12 No. 1771.

## VIBRATION LEVEL METER

### 1. CALIBRATION (electrical)

LEVEL METER, Filter: HP10; Input signal =140.0dB (10.0 m/s<sup>2</sup>), f<sub>0</sub>=79.6Hz

	Range 145dB		Range 170dB	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	139.99	-0.01	140.03	0.03
Channel 2	139.98	-0.02	140.02	0.02
Channel 3	139.98	-0.02	140.03	0.03
Channel 4	139.98	-0.02	140.02	0.02

### 2. CALIBRATION (vibrational)

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

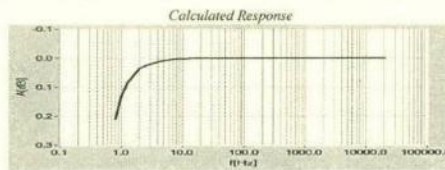
Filter	HP1		HP10		Wd		Wm		Wh	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	119.8	-0.2	119.8	-0.2	106.0	-0.2	102.2	0.1	110.7	0.1
Channel 2	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.1	0.1	110.7	0.1
Channel 3	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.1	0.1	110.6	0.1
Channel 4	119.8	-0.2	119.8	-0.2	105.9	-0.2	102.1	0.1	110.7	0.1

Calibration measured with the accelerometer DYTRAN type 3185D No. 2975 Calibration factor: -0.3dB

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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	0.18	0.19	0.18	0.18	5	0.01	0.01	0.01	0.01	500	-0.01	-0.01	-0.01	-0.01
1	0.13	0.13	0.13	0.13	6.3	-0.00	-0.00	-0.00	-0.00	1000	-0.01	-0.00	-0.01	-0.00
1.25	0.08	0.08	0.07	0.08	8	-0.00	-0.00	-0.00	-0.00	2000	-0.01	-0.00	-0.01	-0.00
1.6	0.06	0.07	0.06	0.06	16	-0.01	-0.00	-0.01	-0.00	4000	-0.00	0.01	-0.00	0.01
2	0.04	0.05	0.04	0.05	31.5	-0.01	-0.01	-0.01	-0.01	8000	0.03	0.04	0.03	0.03
2.5	0.01	0.02	0.01	0.02	63	-0.01	-0.00	-0.01	-0.00	16000	0.01	0.02	0.03	0.02
3.15	-0.00	-0.00	-0.00	-0.00	125	-0.01	-0.01	-0.01	-0.01	20000	0.01	0.02	0.04	0.03
4	-0.00	0.01	-0.00	0.01	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 1	Indication [dB]	53.7	51.0	42.4	39.4	36.2
Channel 2	Indication [dB]	54.8	52.5	42.5	38.5	36.3
Channel 3	Indication [dB]	53.0	50.3	42.7	39.4	36.9
Channel 4	Indication [dB]	54.8	52.6	42.7	39.1	36.7

#### ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
22 °C	31 %	1004 hPa

#### TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	15900	Sound & Vibration Analyser
3.	KEITHLEY	2000	0910165	Digital multimeter
4.	SVANTEK	SV30A	24563	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)
6.	DYTRAN	3233A	747	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: Paweł Bednarczyk

*Pm*

Test date: 2016-09-20

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ISO9001 certified

**FACTORY CALIBRATION DATA OF THE SVAN 958 No. 69082**

**SOUND LEVEL METER**

**1. CALIBRATION** (electrical)

LEVEL METER; Filter: LIN; Input signal =114.0dB,  $f_{in}=1\text{kHz}$

	Range 105dB		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		C	
	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;  $f_{in}=1000\text{ Hz}$

	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;  $f_{in}=1000\text{ Hz}$

	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]	0.08	0.07	0.03	-0.00	-0.00	-0.01	0.01

1/3 OCTAVE (1kHz); Range: 130 dB; Filter: A;  $f_{in}=1000\text{ Hz}$

	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;  $f_{\text{sin}} = 4000 \text{ Hz}$ ; 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
MAX	Fast	1	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
		2	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
		3	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
		4	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
			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
	Slow	1	Indication [dB]	109.9	107.9	104.6	101.8	98.9	95.0	92.0	89.0	85.0	-	-	-
			Error [dB]	-0.1	0.0	-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	-	-	-
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	109.9	108.0	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	-	-	-
		4	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	-	-	-
SEL	-	1	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
		2	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
		3	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
		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
			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
MAX	Fast	1	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.9	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
		2	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.8	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
		3	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.9	38.0
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	0.0	-0.0	0.0
		4	Indication [dB]	52.0	51.9	51.0	49.4	47.1	43.7	40.8	37.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
	Slow	1	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
		2	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
		3	Indication [dB]	49.9	48.0	44.6	41.8	38.9	35.0	32.0	29.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	0.0
		4	Indication [dB]	49.8	47.9	44.6	41.8	38.9	34.9	32.0	29.0
			Error [dB]	-0.2	0.1	-0.0	-0.0	-0.0	-0.0	0.0	0.0
SEL	-	1	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
		2	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.0	29.1
			Error [dB]	-0.3	-0.0	0.0	-0.0	0.0	0.0	0.1	0.1
		3	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.1	32.1	29.1
			Error [dB]	-0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		4	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.0	29.1
			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
MAX	Fast	1	Indication [dB]	34.1	34.0
			Error [dB]	0.0	0.1
		2	Indication [dB]	34.0	34.0
			Error [dB]	0.0	0.0
		3	Indication [dB]	34.0	34.0
			Error [dB]	-0.0	0.0
		4	Indication [dB]	34.0	33.9
			Error [dB]	0.0	0.1
	Slow	1	Indication [dB]	31.9	30.1
			Error [dB]	-0.1	0.1
		2	Indication [dB]	31.9	30.0
			Error [dB]	-0.1	0.1
		3	Indication [dB]	31.9	30.1
			Error [dB]	-0.1	0.1
		4	Indication [dB]	31.8	30.0
			Error [dB]	-0.1	0.1
SEL		1	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.1
		2	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.1
		3	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.0
		4	Indication [dB]	33.8	31.1
			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
MAX	Fast	1	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
			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
		2	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
			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
		3	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
			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
		4	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
			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
	Slow	1	Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		2	Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	131.9	130.0	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		4	Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL		1	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
			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
		2	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
			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
		3	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
			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
		4	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
			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

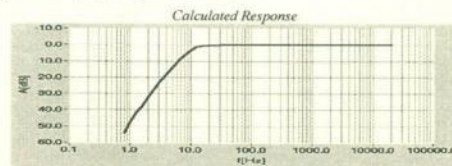
Result	Detector	Ch.	Duration [ms]	1000	500	200	100	50	20	10	5
MAX	Fast	1	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	59.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
		2	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	59.9
			Error [dB]	0.0	0.0	73.0	0.0	-0.0	-0.0	-0.0	-0.0
		3	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	60.0
			Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
		4	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.8	59.9
			Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
	Slow	1	Indication [dB]	71.9	70.0	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
		2	Indication [dB]	71.8	69.9	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
		3	Indication [dB]	71.9	70.0	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
		4	Indication [dB]	71.8	69.9	66.6	63.8	60.9	56.9	54.0	51.0
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0
SEL		1	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.0	51.1
			Error [dB]	-0.2	-0.0	0.0	0.0	0.0	0.0	0.0	0.1
		2	Indication [dB]	73.7	71.0	67.0	64.0	61.0	57.0	54.1	51.0
			Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	0.1	0.0
		3	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.1	51.1
			Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	0.0	0.1
		4	Indication [dB]	73.7	71.0	67.0	64.0	61.0	57.0	54.0	51.1
			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
MAX	Fast	1	Indication [dB]	54.1	54.0
			Error [dB]	0.0	0.0
		2	Indication [dB]	54.1	54.0
			Error [dB]	0.0	0.0
		3	Indication [dB]	54.1	54.0
			Error [dB]	0.0	0.1
		4	Indication [dB]	54.0	53.9
			Error [dB]	0.0	0.0
	Slow	1	Indication [dB]	52.0	50.1
			Error [dB]	-0.1	0.1
		2	Indication [dB]	51.9	50.0
			Error [dB]	-0.1	0.1
		3	Indication [dB]	51.9	50.0
			Error [dB]	-0.1	0.1
		4	Indication [dB]	51.9	50.0
			Error [dB]	-0.1	0.1
SEL		1	Indication [dB]	53.9	51.1
			Error [dB]	-0.2	0.1
		2	Indication [dB]	53.8	51.1
			Error [dB]	-0.2	0.1
		3	Indication [dB]	53.8	51.1
			Error [dB]	-0.2	0.1
		4	Indication [dB]	53.8	51.0
			Error [dB]	-0.2	0.0

## 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]	A1[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 1	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/s<sup>2</sup>), f<sub>0</sub>=79.6Hz

	Range 145dB		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)

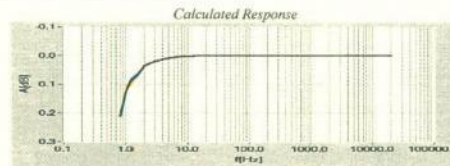
LEVEL METER; Range: 145dB; Input signal: 120dB;

Filter	HP1		HP10		Wd		Wm		Wh	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	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

### 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	-0.01	-0.01	-0.01	20000	0.02	0.01	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 1	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.	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

*Kubel*

Test date: 2018-08-13

\*\*\* 8174N958 No. 69082 page 6 \*\*\*

**Cert B7: Calibration Certificate of Sound Level Meter SVANTEK 959 (SN: 11228)**

 <b>CALIBRATION CERTIFICATE</b>																		
<b>Certificate Information</b>																		
Date of Issue		7-May-2018																
Certificate Number		MLCN180789S																
<b>Customer Information</b>																		
Company Name		Wilson Acoustics Limited																
Address		Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																
<b>Equipment-under-Test (EUT)</b>																		
Description		Sound & Vibration Analyser																
Manufacturer		Svantek																
Model Number		SVAN 959																
Serial Number		11228																
Equipment Number		--																
<b>Calibration Particular</b>																		
Date of Calibration		7-May-2018																
Calibration Equipment		4231(MLTE008) / PA160059 / 20-May-2018																
Calibration Procedure		MLCG00, MLCG15																
Calibration Conditions		<table border="1"><tr><td>Laboratory</td><td>Temperature</td><td>23 °C ± 5 °C</td></tr><tr><td></td><td>Relative Humidity</td><td>55% ± 25%</td></tr><tr><td>EUT</td><td>Stabilizing Time</td><td>Over 3 hours</td></tr><tr><td></td><td>Warm-up Time</td><td>10 minutes</td></tr><tr><td></td><td>Power Supply</td><td>Internal battery</td></tr></table>		Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	10 minutes		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C																
	Relative Humidity	55% ± 25%																
EUT	Stabilizing Time	Over 3 hours																
	Warm-up Time	10 minutes																
	Power Supply	Internal battery																
Calibration Results		Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.																
<b>Approved By &amp; Date</b>																		
		K.O. Lo 7-May-2018																
<b>Statements</b>																		
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>																		

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Certificate No. MLCN180789S

Calibration Data						
Weighting / Time	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
A / FAST (1 kHz Input)	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	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
C / FAST (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / FAST (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / SLOW (1 kHz Input)	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
C / SLOW (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / SLOW (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / IMPULSE (1 kHz Input)	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
C / IMPULSE (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / IMPULSE (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB

- END -

Calibrated By :  
Date :

Dan  
7-May-2018

Checked By :  
Date :

K.O. Lo  
7-May-2018

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 B2 室


Unit B2, 9/F., Baldwin 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 B8: Calibration Certificate of Acoustic Calibrator SV30A (SN: 10814)**



**CALIBRATION CERTIFICATE**

<b>Certificate Information</b>	
Date of Issue	15-Jun-2017
Certificate Number	MLCN171088S
<b>Customer Information</b>	
Company Name	Wilson Acoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong
<b>Equipment-under-Test (EUT)</b>	
Description	Acoustic Calibrator
Manufacturer	Svantek
Model Number	SV 30A
Serial Number	10814
Equipment Number	--
<b>Calibration Particular</b>	
Date of Calibration	15-Jun-2017
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-18 1351(MLTE049) / MLEC17/06/02 / 6-Jun-18
Calibration Procedure	MLCG00, MLCG15
Calibration Conditions	Laboratory      Temperature      23 °C ± 5 °C Relative Humidity      55% ± 25% EUT              Stabilizing Time      Over 3 hours Warm-up Time      Not applicable Power Supply      Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.
<b>Approved By &amp; Date</b>	
 K.O. Lo      15-Jun-2017	
<b>Statements</b>	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>	

Page 1 of 2



Certificate No. MLCN171088S

Calibration Data					
EUT Setting		Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94	dB	94.0 dB	0.0 dB	0.15 dB	$\pm 0.3$ dB
114	dB	113.9 dB	0.1 dB	0.15 dB	$\pm 0.3$ dB

- END -

Calibrated By : Patrick  
Date : 15-Jun-17

Checked By : K.O. Lo  
Date : 15-Jun-17  
Page 2 of 2



## CALIBRATION CERTIFICATE

Certificate Information																		
Date of Issue	21-Jul-2018	Certificate Number	MLCN181526S															
Customer Information																		
Company Name	Wilson Accoustics Limited																	
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																	
Equipment-under-Test (EUT)																		
Description	Acoustic Calibrator																	
Manufacturer	Svantek																	
Model Number	SV 30A																	
Serial Number	10814																	
Equipment Number	--																	
Calibration Particular																		
Date of Calibration	21-Jul-2018																	
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-20 1351(MLTE049) / MLEC18/06/02 / 6-Jun-19																	
Calibration Procedure	MLCG00, MLCG15																	
Calibration Conditions	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Laboratory</td> <td style="width: 30%;">Temperature</td> <td style="width: 40%;">23 °C ± 5 °C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>55% ± 25%</td> </tr> <tr> <td>EUT</td> <td>Stabilizing Time</td> <td>Over 3 hours</td> </tr> <tr> <td></td> <td>Warm-up Time</td> <td>Not applicable</td> </tr> <tr> <td></td> <td>Power Supply</td> <td>Internal battery</td> </tr> </table>			Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	Not applicable		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C																
	Relative Humidity	55% ± 25%																
EUT	Stabilizing Time	Over 3 hours																
	Warm-up Time	Not applicable																
	Power Supply	Internal battery																
Calibration Results	<p>Calibration data were detailed in the continuation pages.</p> <p>All calibration results were within EUT specification.</p>																	
Approved By & Date																		
		K.O. Lo	21-Jul-2018															
Statements																		
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>																		

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Certificate No. MLCN181526S

Calibration Data					
EUT Setting		Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94	dB	94.0 dB	0.0 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 : Dan  
Date : 21-Jul-18


Checked By : K.O. Lo  
Date : 21-Jul-18  
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 B2 室

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**Cert B9: Calibration Certificate of Acoustic Calibrator SV30A (SN: 29088)**

  
**MAXLAB**

**CALIBRATION CERTIFICATE**

<b>Certificate Information</b>	
Date of Issue	5-Mar-2018
Certificate Number	MLCN180297S
<b>Customer Information</b>	
Company Name	Wilson Acoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong
<b>Equipment-under-Test (EUT)</b>	
Description	Acoustic Calibrator
Manufacturer	Svantek
Model Number	SV 30A
Serial Number	29088
Equipment Number	--
<b>Calibration Particular</b>	
Date of Calibration	5-Mar-2018
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-18 1351(MLTE049) / MLEC17/06/02 / 6-Jun-18
Calibration Procedure	MLCG00, MLCG15
Calibration Conditions	Laboratory      Temperature      23 °C ± 5 °C Relative Humidity      55% ± 25% EUT              Stabilizing Time      Over 3 hours Warm-up Time      Not applicable Power Supply      Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.
<b>Approved By &amp; Date</b>	
 K.O. Lo      5-Mar-2018	
<b>Statements</b>	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>	

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MaxLab Calibration Centre Limited  
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B2 室

Unit B2, 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



Certificate No. MLCN180297S

Calibration Data				
EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94 dB	93.7 dB	0.3 dB	0.15 dB	$\pm 0.3$ dB
114 dB	113.7 dB	0.3 dB	0.15 dB	$\pm 0.3$ dB

- END -

Calibrated By :  
Date :

Patrick  
5-Mar-18

Checked By :  
Date :

K.O. Lo  
5-Mar-18

Page 2 of 2

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MaxLab Calibration Centre Limited

香港新界葵涌華星街16-18號保盈工業大廈9樓B2室

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## CALIBRATION CERTIFICATE

<b>Certificate Information</b>			
<b>Date of Issue</b>	18-Mar-2019	<b>Certificate Number</b>	MLCN190639S
<b>Customer Information</b>			
<b>Company Name</b>	Wilson Accoustics Limited		
<b>Address</b>	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong		
<b>Equipment-under-Test (EUT)</b>			
<b>Description</b>	Acoustic Calibrator		
<b>Manufacturer</b>	Svantek		
<b>Model Number</b>	SV 30A		
<b>Serial Number</b>	29088		
<b>Equipment Number</b>	--		
<b>Calibration Particular</b>			
<b>Date of Calibration</b>	18-Mar-2019		
<b>Calibration Equipment</b>	4231(MLTE008) / AV180068 / 13-May-20 1351(MLTE049) / MLEC18/06/02 / 6-Jun-19		
<b>Calibration Procedure</b>	MLCG00, MLCG15		
<b>Calibration Conditions</b>	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
<b>Calibration Results</b>	Calibration data were detailed in the continuation pages. All calibration results exceeded the EUT error limit.		
<b>Approved By &amp; Date</b>			
		K.O. Lo	18-Mar-2019
<b>Statements</b>			
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>			

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Certificate No. MLCN190639S

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

- END -

Calibrated By :  
Date :

Dan  
18-Mar-19

Checked By :  
Date :

K.O. Lo  
18-Mar-19

Page 2 of 2



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### **Appendix B3**

**Photographs showing the Examples of Noise Measurement  
for Fixed Plant Noise**

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

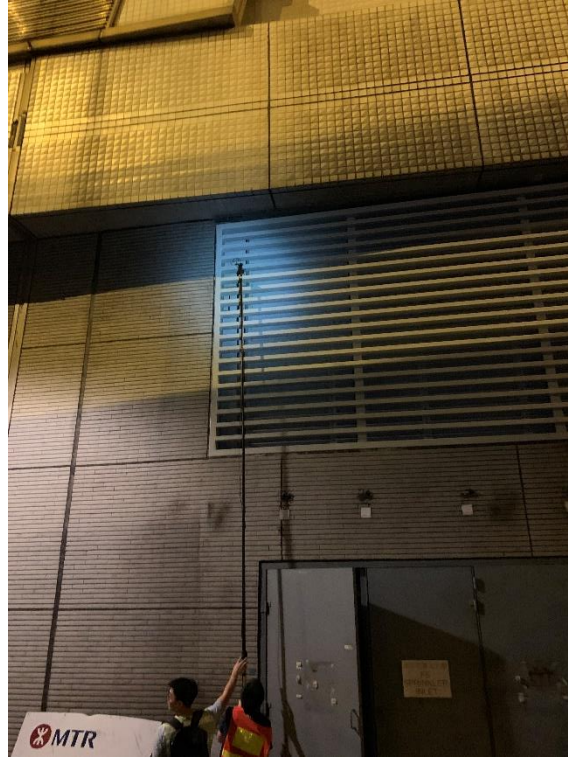
**SWL Measurement Location for HHS-62-2**



**SWL Measurement Location for HHS-67-1**



**SWL Measurement Location for HHS-71-1**



**SWL Measurement Location for HHS-84**



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## **Appendix B4**

### **Noise Measurement Results**

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## Appendix B4 Noise Measurement Results

Fixed Plant Source ID	Plant Type	Method	Size of Louvre (mm)			Measurement Distance (m) D <sup>(a)</sup> & (e)	Averaged Measured L <sub>Aeq</sub> , dB(A) <sup>(b)</sup>	Background L <sub>Aeq</sub> , dB(A)	Difference L <sub>Aeq</sub> , dB(A)	Background Corrected L <sub>Aeq</sub> , dB(A) <sup>(c)</sup>	Calculated SWL, dB(A)
			Length	Width	Height						
HHS-38	Louvre	2	800	800	N/A	1.00	54.6	53.8	0.8	51.6	64
HHS-40	Louvre	2	1500	8800	N/A	1.00	71.7	56.0	15.7	71.7	88
HHS-41-1	Louvre	2	500	500	N/A	0.25	54.1	51.4	2.7	51.1	54
HHS-41-2	Louvre	2	1000	2950	N/A	0.50	57.6	55.7	1.9	54.6	66
HHS-42-1	Louvre	2	1350	900	N/A	0.50	59.1	55.6	3.5	56.6	66
HHS-42-2	Louvre	2	400	400	N/A	0.25	62.7	57.5	5.2	61.2	64
HHS-42-3	Louvre	2	1200	900	N/A	0.50	57.2	54.7	2.5	54.2	63
HHS-45-1	Louvre	2	850	900	N/A	1.00	71.7	56.6	15.1	71.7	85
HHS-45-2	Louvre	2	350	350	N/A	0.25	60.5	58.4	2.1	57.5	60
HHS-49-2	Louvre	2	800	800	N/A	1.00	66.7	61.4	5.3	65.2	78
HHS-49-3	Louvre	2	800	800	N/A	0.50	64.2	57.8	6.4	63.0	71
HHS-49-6	Louvre	2	600	1100	N/A	0.50	62.0	55.9	6.1	60.8	67
HHS-49-8	Louvre	2	800	800	N/A	0.50	63.7	59.9	3.8	61.3	70
HHS-50-1	Louvre	2	1600	500	N/A	0.25	69.4	56.4	13.0	69.4	75
HHS-50-2	Louvre	2	600	1800	N/A	1.00	58.7	57.3	1.4	55.7	69
HHS-51	Louvre	2	2450	12450	N/A	0.50	67.3	55.8	11.5	67.3	85
HHS-51 <sup>(d)</sup>	Louvre	2	2450	12450	N/A	0.50	68.0	53.8	14.2	68.0	86
HHS-52-1	Louvre	2	800	850	N/A	1.00	53.2	50.8	2.4	50.2	63
HHS-53-1	Louvre	2	800	500	N/A	1.00	58.4	55.5	2.9	55.4	68
HHS-53-2	Louvre	2	2450	800	N/A	1.00	62.0	57.0	5.0	60.3	75
HHS-53-3	Louvre	2	250	250	N/A	0.25	60.8	57.3	3.5	58.2	59
HHS-53-4	Louvre	2	800	600	N/A	1.00	57.5	56.7	0.8	54.5	67
HHS-53-5	Louvre	2	800	650	N/A	1.00	59.1	56.6	2.5	56.1	69
HHS-53-6	Louvre	2	800	400	N/A	1.00	57.0	55.7	1.3	54.0	66
HHS-56	Louvre	2	650	650	N/A	0.50	68.4	67.0	1.4	65.4	73
HHS-57-2	Louvre	2	200	200	N/A	0.25	63.5	62.1	1.4	60.5	61
HHS-58-1	Louvre	2	1200	1350	N/A	0.50	60.9	58.3	2.6	57.9	68
HHS-58-2	Louvre	2	2500	1100	N/A	0.50	60.6	59.3	1.3	57.6	69
HHS-62-2	Louvre	2	1000	1100	N/A	0.25	66.4	65.4	1.0	63.4	69
HHS-67-1	Louvre	2	600	3900	N/A	0.50	61.4	57.4	4.0	59.2	71
HHS-67-3	Louvre	2	570	1770	N/A	1.00	61.3	57.5	3.8	59.0	73
HHS-68-1	Louvre	2	1200	650	N/A	1.00	61.0	56.8	4.2	59.0	72
HHS-68-2	Louvre	2	900	1800	N/A	0.50	64.0	61.0	3.0	61.1	71
HHS-68-3	Louvre	2	1450	1800	N/A	0.50	61.8	60.5	1.3	58.8	70
HHS-70-3	Louvre	2	500	300	N/A	0.25	59.6	57.8	1.8	56.6	59
HHS-71-1	Louvre	2	200	300	N/A	0.25	55.8	55.2	0.6	52.8	54
HHS-71-2	Louvre	2	250	200	N/A	0.25	58.3	56.7	1.6	55.3	56
HHS-71-3	Louvre	2	1200	7000	N/A	0.50	55.2	54.6	0.6	52.2	67
HHS-73	Louvre	2	500	850	N/A	0.25	52.4	51.8	0.6	49.4	53
HHS-77-1	Louvre	2	250	250	N/A	0.25	56.1	54.4	1.7	53.1	54
HHS-77-2	Louvre	2	250	250	N/A	0.25	56.7	55.5	1.2	53.7	55
HHS-77-3	Louvre	2	250	250	N/A	0.25	56.5	55.1	1.4	53.5	55
HHS-78	Louvre	2	3200	9500	N/A	1.00	62.1	60.6	1.5	59.1	79
HHS-78 <sup>(d)</sup>	Louvre	2	3200	9500	N/A	1.00	67.8	59.3	8.5	67.1	87
HHS-84	Louvre	2	1750	1100	N/A	1.00	61.4	59.3	2.1	58.4	72
HHS-87-2	Louvre	2	1200	1000	N/A	0.50	68.4	67.9	0.5	65.4	75
HHS-88-2	Louvre	2	300	300	N/A	0.25	59.1	56.9	2.2	56.1	58
HHS-100-2	Louvre	2	1730	1000	N/A	1.00	51.2	48.8	2.4	48.2	62
HHS-101-1	Louvre	2	1730	2470	N/A	0.50	64.7	54.8	9.9	64.2	76
HHS-102-1	Louvre	2	1300	1050	N/A	0.50	62.7	61.3	1.4	59.7	69
HHS-102-2	Louvre	2	1300	1500	N/A	0.50	63.9	63.5	0.4	60.9	71
HHS-102-3	Louvre	2	1300	5300	N/A	0.50	64.1	60.2	3.9	61.8	75
HHS-102-6	Louvre	2	1300	1050	N/A	0.50	64.7	64.4	0.3	61.7	71
HHS-102-7	Louvre	2	1300	1500	N/A	0.50	65.8	64.4	1.4	62.8	73
HHS-102-9	Louvre	2	1300	1050	N/A	0.50	64.7	61.8	2.9	61.7	71
HHS-102-11	Louvre	2	1300	1050	N/A	0.50	65.1	63.8	1.3	62.1	72
HHS-121	Louvre	2	150	300	N/A	0.25	62.0	59.1	2.9	59.0	60

Remarks:

- Measurement Distance between louvre and microphone.
- Results are averaged from number of points in accordance with ISO3746.
- 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.
- Operation scenario during daytime/evening period only and the measured SWL will be checked against the respective noise criterion.
- Measurement distance of 1 m was generally adopted. However, the impact noise at 1m from some louvers was not noticeably higher than the background noise. In accordance with Section 7.2.1 of ISO3746-2010, for a noise source located in a space having unfavourable acoustical conditions (e.g. being subject to high levels of background noise), the selection of a small measurement distance is appropriate. Therefore shorter measurement distance of at least 0.15m was adopted in accordance with Section 7.2.4 of ISO3746-2010 to determine the parallelepiped measurement surface to increase the measurement accuracy.

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## **Appendix C**

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

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**Appendix C1**  
**Calibration Certificates –**  
**Noise Measurement at Representative NSRs**

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## Appendix C1 Calibration Certificates – Noise Measurement at Representative NSRs

### Cert C1: Calibration Certificate of Sound Level Meter SVANTEK 958 (SN: 20890)



#### CALIBRATION CERTIFICATE

Certificate Information	
Date of Issue	23-Jun-2017
Certificate Number	MLCN171137S
Customer Information	
Company Name	Wilson Accoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong
Equipment-under-Test (EUT)	
Description	Sound & Vibration Analyser
Manufacturer	Svantek
Model Number	SVAN 958
Serial Number	20890
Equipment Number	--
Calibration Particular	
Date of Calibration	23-Jun-2017
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-2018
Calibration Procedure	MLCG00, MLCG15
Calibration Conditions	Laboratory      Temperature      23 °C ± 5 °C Relative Humidity      55% ± 25% EUT              Stabilizing Time      Over 3 hours Warm-up Time      10 minutes Power Supply      Internal battery
Calibration Results	Calibration data were detailed in the continuation pages.
Approved By & Date	
	K.O. Lo      23-Jun-2017
Statements	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>	

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Certificate No MLCN171137S

Calibration Data							
Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty	
CH4 / Sound	A / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB	
			114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	C / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB	
			114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	LIN / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB	
			114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	A / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	C / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	LIN / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	A / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	C / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB	
	LIN / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB	
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB	

- END -

Calibrated By :  
Date :

Patrick  
23-Jun-2017

Checked By :  
Date :

K.O. Lo  
23-Jun-2017  
Page 2 of 2

**Cert C2: Calibration Certificate of Sound Level Meter SVANTEK 958A (SN: 69082)**



ISO9001 certified

**FACTORY CALIBRATION DATA OF THE SVAN 958 No. 69082**

**SOUND LEVEL METER**

**1. CALIBRATION** (electrical)

LEVEL METER; Filter: LIN; Input signal =114.0dB,  $f_{in}=1\text{kHz}$

	Range 105dB		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		C	
	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;  $f_{in}=1000\text{ Hz}$

	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;  $f_{in}=1000\text{ Hz}$

	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]	0.08	0.07	0.03	-0.00	-0.00	-0.01	0.01

1/3 OCTAVE (1kHz); Range: 130 dB; Filter: A;  $f_{in}=1000\text{ Hz}$

	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

\*\*\* SVAN958 No. 69082 page 1 \*\*\*

#### 4. TONEBURST RESPONSE\* (electrical)

LEVEL METER; Characteristic: A;  $f_{sin}$  = 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
MAX	Fast	1	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
		2	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
		3	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
		4	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
			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
	Slow	1	Indication [dB]	109.9	107.9	104.6	101.8	98.9	95.0	92.0	89.0	85.0	-	-	-
			Error [dB]	-0.1	0.0	-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	-	-	-
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	109.9	108.0	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	-	-	-
		4	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	-	-	-
SEL		1	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
		2	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
		3	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
		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
			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
MAX	Fast	1	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.9	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
		2	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.8	37.9
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
		3	Indication [dB]	52.0	51.9	51.0	49.4	47.2	43.7	40.9	38.0
			Error [dB]	0.0	0.0	0.0	-0.0	-0.0	0.0	-0.0	0.0
		4	Indication [dB]	52.0	51.9	51.0	49.4	47.1	43.7	40.8	37.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
	Slow	1	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
		2	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
SEL		1	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
		2	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.0	29.1
			Error [dB]	-0.3	-0.0	0.0	-0.0	0.0	0.0	0.1	0.1
		3	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.1	32.1	29.1
			Error [dB]	-0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		4	Indication [dB]	51.7	49.0	45.0	42.0	39.0	35.0	32.0	29.1
			Error [dB]	-0.3	-0.0	0.0	0.0	0.0	0.0	0.1	0.1



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

Result	Detector	Ch.	Duration [ms]	1000	500
MAX	Fast	1	Indication [dB]	34.1	34.0
			Error [dB]	0.0	0.1
		2	Indication [dB]	34.0	34.0
			Error [dB]	0.0	0.0
		3	Indication [dB]	34.0	34.0
			Error [dB]	-0.0	0.0
		4	Indication [dB]	34.0	33.9
			Error [dB]	0.0	0.1
	Slow	1	Indication [dB]	31.9	30.1
			Error [dB]	-0.1	0.1
		2	Indication [dB]	31.9	30.0
			Error [dB]	-0.1	0.1
		3	Indication [dB]	31.9	30.1
			Error [dB]	-0.1	0.1
		4	Indication [dB]	31.8	30.0
			Error [dB]	-0.1	0.1
SEL		1	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.1
		2	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.1
		3	Indication [dB]	33.8	31.1
			Error [dB]	-0.2	0.0
		4	Indication [dB]	33.8	31.1
			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
MAX	Fast	1	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
			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
		2	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
			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
		3	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
			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
		4	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
			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
	Slow	1	Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		2	Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		3	Indication [dB]	131.9	130.0	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
		4	Indication [dB]	131.8	129.9	126.6	123.8	120.9	117.0	114.0	111.0	107.0	-	-	-
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL		1	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
			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
		2	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
			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
		3	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
			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
		4	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
			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
MAX	Fast	1	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	59.9
			Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0
		2	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	59.9
			Error [dB]	0.0	0.0	73.0	0.0	-0.0	-0.0	-0.0	-0.0
		3	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.9	60.0
			Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0
		4	Indication [dB]	74.0	73.9	73.0	71.4	69.2	65.7	62.8	59.9
			Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0
	Slow	1	Indication [dB]	71.9	70.0	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.1	0.1	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
		2	Indication [dB]	71.8	69.9	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
		3	Indication [dB]	71.9	70.0	66.6	63.8	60.9	57.0	54.0	51.0
			Error [dB]	-0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
		4	Indication [dB]	71.8	69.9	66.6	63.8	60.9	56.9	54.0	51.0
			Error [dB]	-0.1	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0
SEL	-	1	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.0	51.1
			Error [dB]	-0.2	-0.0	0.0	0.0	0.0	0.0	0.0	0.1
		2	Indication [dB]	73.7	71.0	67.0	64.0	61.0	57.0	54.1	51.0
			Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	0.1	0.0
		3	Indication [dB]	73.8	71.0	67.0	64.0	61.0	57.0	54.1	51.1
			Error [dB]	-0.3	-0.0	0.0	0.0	-0.0	0.0	0.0	0.1
		4	Indication [dB]	73.7	71.0	67.0	64.0	61.0	57.0	54.0	51.1
			Error [dB]	-0.3	-0.0	0.0	0.0	0.0	0.0	0.0	0.1

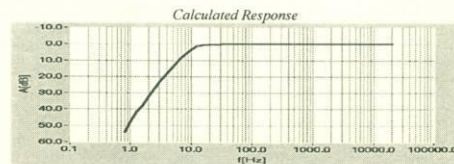
Range: 130dB; Equivalent input steady level = 54dB

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



## 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]	A1[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 1	Level [dB]	14.4	11.2
Channel 2	Level [dB]	15.0	10.9
Channel 3	Level [dB]	13.9	11.2
Channel 4	Level [dB]	13.3	10.2

\* 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/s<sup>2</sup>), f<sub>0</sub>=79.6Hz

	Range 145dB		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;

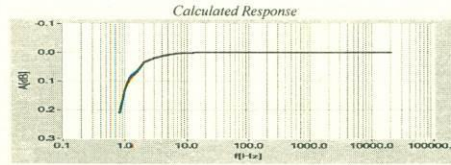
Filter	HP1		HP10		Wd		Wm		Wh	
	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]	Indication [dB]	Error [dB]
Channel 1	120.0	0.0	120.0	0.0	106.1	0.0	102.0	-0.0	110.5	-0.0
Channel 2	120.0	0.0	120.0	0.0	106.1	0.0	102.0	-0.0	110.5	-0.0
Channel 3	120.0	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; A<sub>n</sub>: 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	-0.01	-0.01	-0.01	20000	0.02	0.01	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 1	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.	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

- 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.
- Traceability of the calibration is guaranteed by the above mentioned ISO9001 procedures.
- 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.
- This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Kubel

*Kubel*

Test date: 2018-08-13

\*\*\*SVAN958 No. 69082 page 6 \*\*\*

**Cert C3: Calibration Certificate of Sound Level Meter SVANTEK 958A (SN: 59120)**



**CALIBRATION CERTIFICATE**

Certificate Information			
Date of Issue		7-Nov-2018	
Certificate Number		MLCN182746S	
Customer Information			
Company Name		Wilson Accoustics Limited	
Address		Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong	
Equipment-under-Test (EUT)			
Description		Sound & Vibration Analyser	
Manufacturer		Svantek	
Model Number		SVAN 958A	
Serial Number		59120	
Equipment Number		--	
Calibration Particular			
Date of Calibration		7-Nov-2018	
Calibration Equipment		4231(MLTE008) / AV180068 / 13-May-2020	
Calibration Procedure		MLCG00, MLCG15	
Calibration Conditions		Laboratory      Temperature      23 °C ± 5 °C Relative Humidity      55% ± 25% EUT      Stabilizing Time      Over 3 hours Warm-up Time      10 minutes Power Supply      Internal battery	
Calibration Results		Calibration data were detailed in the continuation pages.	
Approved By & Date			
		K.O. Lo      7-Nov-2018	
Statements			
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>			

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Certificate No. MLCN182746S

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

- END -

Calibrated By :  
Date :

Dan  
7-Nov-2018

Checked By :  
Date :

K.O. Lo  
7-Nov-2018

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 B2 室  
Unit B2, 9/F., Baldwin 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 C4: Calibration Certificate of Sound Level Meter SVANTEK 958A (SN: 59121)**



**CALIBRATION CERTIFICATE**

<b>Certificate Information</b>																	
Date of Issue	4-Oct-2018	Certificate Number															
MLCN182370S																	
<b>Customer Information</b>																	
Company Name	Wilson Accoustics Limited																
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																
<b>Equipment-under-Test (EUT)</b>																	
Description	Sound & Vibration Analyser																
Manufacturer	Svantek																
Model Number	SVAN 958A																
Serial Number	59121																
Equipment Number	--																
<b>Calibration Particular</b>																	
Date of Calibration	4-Oct-2018																
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-2020																
Calibration Procedure	MLCG00, MLCG15																
Calibration Conditions	<table border="1"><tr><td>Laboratory</td><td>Temperature</td><td>23 °C ± 5 °C</td></tr><tr><td></td><td>Relative Humidity</td><td>55% ± 25%</td></tr><tr><td>EUT</td><td>Stabilizing Time</td><td>Over 3 hours</td></tr><tr><td></td><td>Warm-up Time</td><td>10 minutes</td></tr><tr><td></td><td>Power Supply</td><td>Internal battery</td></tr></table>		Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	10 minutes		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C															
	Relative Humidity	55% ± 25%															
EUT	Stabilizing Time	Over 3 hours															
	Warm-up Time	10 minutes															
	Power Supply	Internal battery															
Calibration Results	Calibration data were detailed in the continuation pages.																
<b>Approved By &amp; Date</b>																	
		K.O. Lo															
		4-Oct-2018															
<b>Statements</b>																	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>																	

Page 1 of 2



Certificate No. MLCN182370S

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

- END -

Calibrated By :  
Date :

Dan  
4-Oct-2018

Checked By :  
Date :

K.O. Lo  
4-Oct-2018

Page 2 of 2



**Cert C5: Calibration Certificate of Sound Level Meter SVANTEK 959 (SN: 11228)**



## CALIBRATION CERTIFICATE

<i>Certificate Information</i>																		
<b>Date of Issue</b>		7-May-2018																
		<b>Certificate Number</b> MLCN180789S																
<i>Customer Information</i>																		
<b>Company Name</b>		Wilson Accoustics Limited																
<b>Address</b>		Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																
<i>Equipment-under-Test (EUT)</i>																		
<b>Description</b>		Sound & Vibration Analyser																
<b>Manufacturer</b>		Svantek																
<b>Model Number</b>		SVAN 959																
<b>Serial Number</b>		11228																
<b>Equipment Number</b>		--																
<i>Calibration Particular</i>																		
<b>Date of Calibration</b>		7-May-2018																
<b>Calibration Equipment</b>		4231(MLTE008) / PA160059 / 20-May-2018																
<b>Calibration Procedure</b>		MLCG00, MLCG15																
<b>Calibration Conditions</b>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Laboratory</td> <td style="width: 30%;">Temperature</td> <td style="width: 40%;">23 °C ± 5 °C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>55% ± 25%</td> </tr> <tr> <td>EUT</td> <td>Stabilizing Time</td> <td>Over 3 hours</td> </tr> <tr> <td></td> <td>Warm-up Time</td> <td>10 minutes</td> </tr> <tr> <td></td> <td>Power Supply</td> <td>Internal battery</td> </tr> </table>		Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	10 minutes		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C																
	Relative Humidity	55% ± 25%																
EUT	Stabilizing Time	Over 3 hours																
	Warm-up Time	10 minutes																
	Power Supply	Internal battery																
<b>Calibration Results</b>		Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.																
<i>Approved By &amp; Date</i>																		
		<div style="text-align: right;">                           K.O. Lo                     </div>																
		7-May-2018																
<i>Statements</i>																		
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>																		

Page 1 of 2



Certificate No. MLCN180789S

Calibration Data						
Weighting / Time	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
A / FAST (1 kHz Input)	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	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
C / FAST (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / FAST (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
		113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / SLOW (1 kHz Input)	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
C / SLOW (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / SLOW (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
A / IMPULSE (1 kHz Input)	LOW	93.9 dB	94.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
C / IMPULSE (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB
Z / IMPULSE (1 kHz Input)	LOW	94.0 dB	94.0 dB	0.0 dB	0.2 dB	± 0.7 dB
	HIGH	113.9 dB	114.0 dB	-0.1 dB	0.2 dB	± 0.7 dB

- END -

Calibrated By :  
Date :

Dan  
7-May-2018

Checked By :  
Date :

K.O. Lo  
7-May-2018  
Page 2 of 2

**Cert C6: Calibration Certificate of Acoustic Calibrator SV30A (SN: 29088)**



**CALIBRATION CERTIFICATE**

<b>Certificate Information</b>																	
Date of Issue	18-Mar-2019	Certificate Number															
MLCN190639S																	
<b>Customer Information</b>																	
Company Name	Wilson Acoustics Limited																
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																
<b>Equipment-under-Test (EUT)</b>																	
Description	Acoustic Calibrator																
Manufacturer	Svantek																
Model Number	SV 30A																
Serial Number	29088																
Equipment Number	--																
<b>Calibration Particular</b>																	
Date of Calibration	18-Mar-2019																
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-20 1351(MLTE049) / MLEC18/06/02 / 6-Jun-19																
Calibration Procedure	MLCG00, MLCG15																
Calibration Conditions	<table border="1"><tr><td>Laboratory</td><td>Temperature</td><td>23 °C ± 5 °C</td></tr><tr><td></td><td>Relative Humidity</td><td>55% ± 25%</td></tr><tr><td>EUT</td><td>Stabilizing Time</td><td>Over 3 hours</td></tr><tr><td></td><td>Warm-up Time</td><td>Not applicable</td></tr><tr><td></td><td>Power Supply</td><td>Internal battery</td></tr></table>		Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	Not applicable		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C															
	Relative Humidity	55% ± 25%															
EUT	Stabilizing Time	Over 3 hours															
	Warm-up Time	Not applicable															
	Power Supply	Internal battery															
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results exceeded the EUT error limit.																
<b>Approved By &amp; Date</b>																	
K.O. Lo		18-Mar-2019															
<b>Statements</b>																	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>																	



Certificate No. MLCN190639S

Calibration Data					
EUT Setting		Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94	dB	93.5 dB	0.5 dB *	0.15 dB	$\pm$ 0.3 dB
114	dB	113.6 dB	0.4 dB *	0.15 dB	$\pm$ 0.3 dB

- END -

Calibrated By : Dan  
Date : 18-Mar-19

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

---

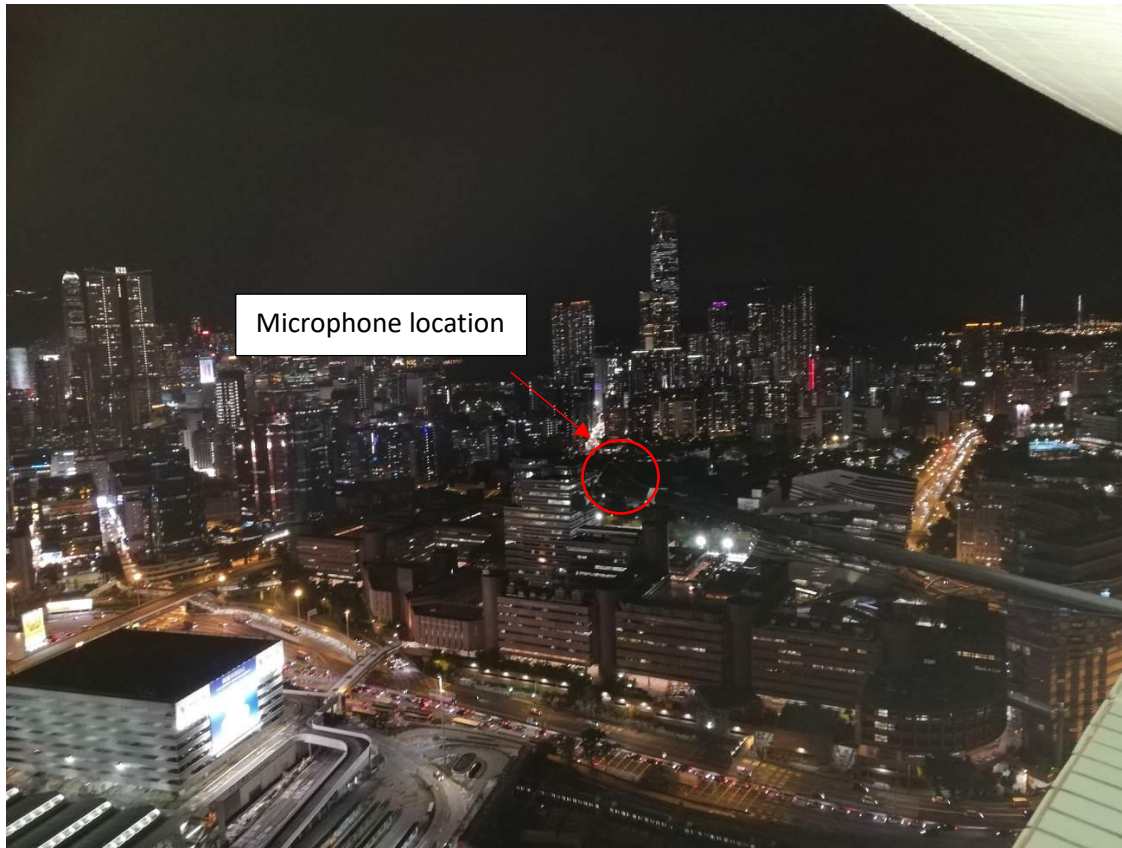
## **Appendix C2**

### **Photographs – Noise Measurement at Representative NSRs**

---

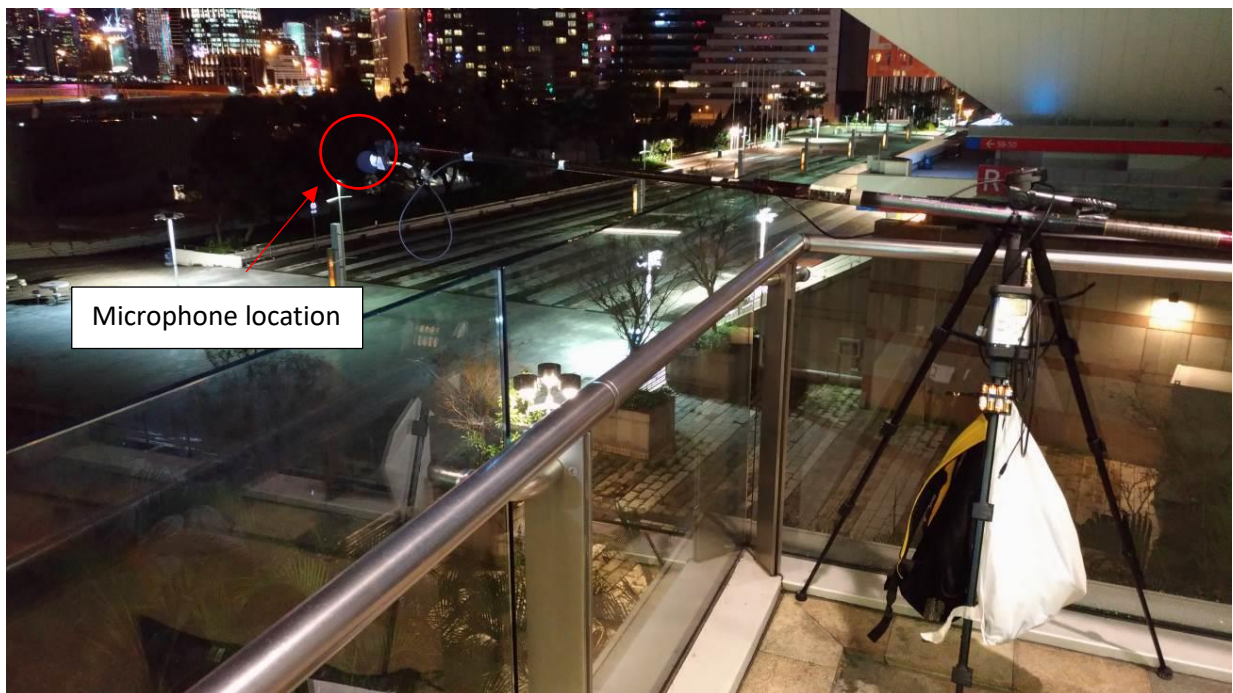


## Appendix C2 Photographs – Noise Measurement at Representative NSRs



Microphone location

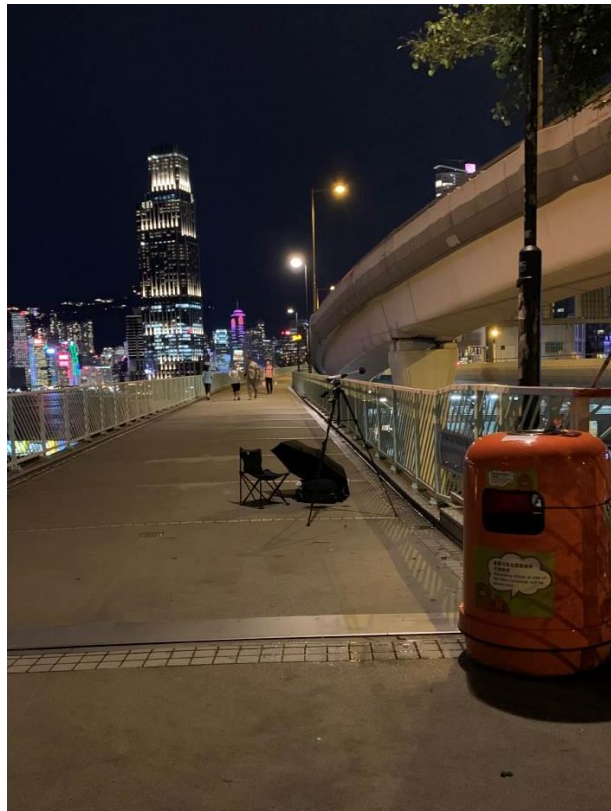
**NSR Measurement Location at HUH-FN1**



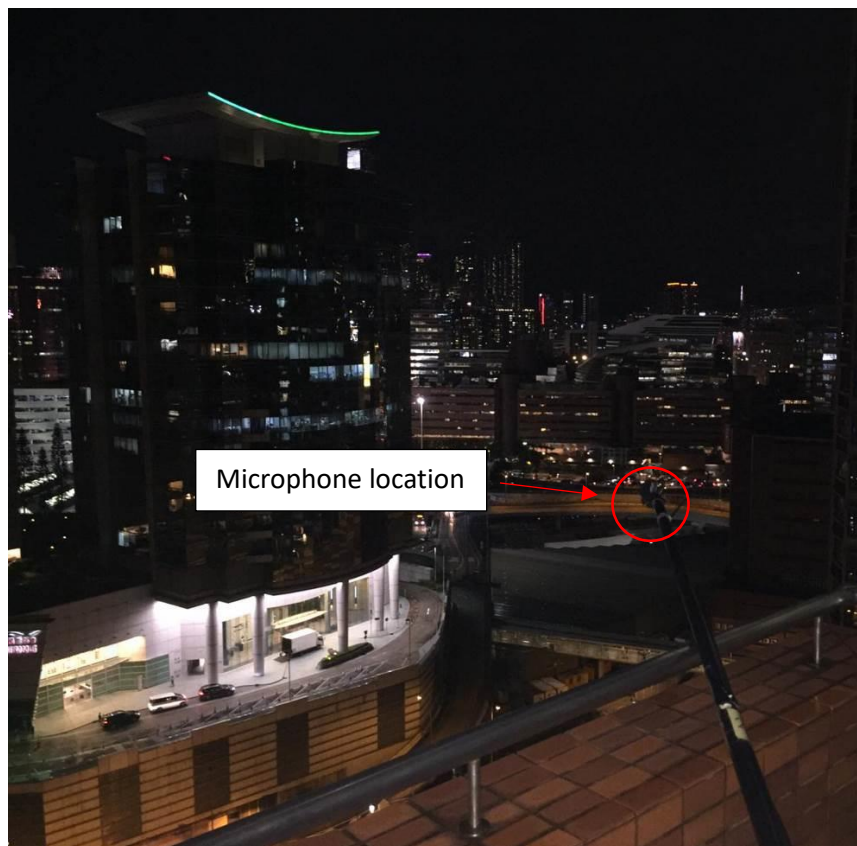
Microphone location

**NSR Measurement Location at HUH-FN2**

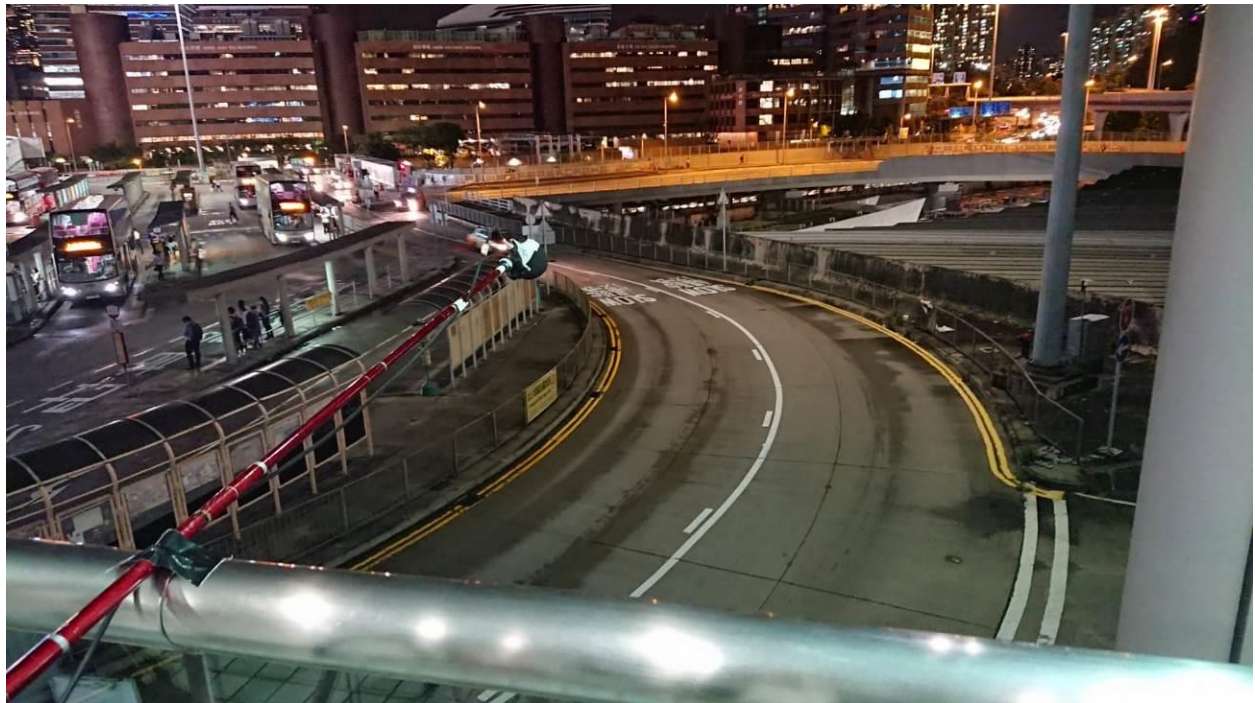




**NSR Measurement Location at HUH-FN3**



**NSR Measurement Location at HUH-FN4**



**NSR Measurement Location at HUH-FN5**

---

## **Appendix C3**

### **Measurement Results at Representative NSRs**

---

## Appendix C3 Noise Measurement Results at Measurement Locations

Measurement Location ID	Measurement Date	Operation Scenario <sup>(1)(2)</sup>	Fixed Plant Noise		Background Noise		Difference between Measured Noise Level and Background Level, dB(A) <sup>(3)</sup>
			Measurement Time	Measured Noise Level, $L_{Aeq\ 30mins}$ , dB(A)	Measurement Time	Background Noise Level, $L_{Aeq\ 5mins}$ , dB(A)	
HUH-FN1	10/6/2019 - 11/6/2019	Daytime and Evening	2100-2130 hours	67.7	2025-2030 hours	68.0	-0.3
		Night-time	2300-2330 hours	66.8	0000-0005 hours	65.6	1.2
HUH-FN2	10/6/2019 - 11/6/2019	Daytime and Evening	2100-2130 hours	61.5	2025-2030 hours	60.5	1.0
		Night-time	2300-2330 hours	60.3	0000-0005 hours	58.2	2.1
HUH-FN3	10/6/2019 - 11/6/2019	Daytime and Evening	2100-2130 hours	64.3	2025-2030 hours	63.0	1.3
		Night-time	2300-2330 hours	62.3	0000-0005 hours	60.7	1.6
HUH-FN4	10/6/2019 - 11/6/2019	Daytime and Evening	2100-2130 hours	65.8	2025-2030 hours	65.7	0.1
		Night-time	2300-2330 hours	64.4	0000-0005 hours	62.4	2.0
HUH-FN5	10/6/2019 - 11/6/2019	Daytime and Evening	2100-2130 hours	69.5	2025-2030 hours	69.9	-0.4
		Night-time	2300-2330 hours	68.2	0000-0005 hours	68.0	0.2

Notes:

(1) Daytime and evening period (i.e 0700 to 2300 hours) and night-time period (i.e. 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.

(3) The measured noise levels were dominated by background noise (i.e. road traffic noise from major roads nearby). Since traffic noise fluctuated during the daytime & evening measurement periods, leading to higher background noise levels than the measured noise levels of the fixed sources at few measurement locations.

---

## **Appendix A2**

**Proposal for Updating Maximum Allowable Sound Power  
Levels of Fixed Plant Sources (Updated Batch 7 – Hung Hom  
Station (HUH) & Hung Hom Siding (HHS))**

---

**MTR Corporation Limited**

Consultancy Agreement No. C11033B

**Shatin to Central Link – Mong Kok East  
to Hung Hom [SCL(MKK – HUH)]****Proposal for Updating Maximum Allowable  
Sound Power Levels of Fixed Plant Sources  
(Updated Batch 7 - Hung Hom Station (HUH) &  
Hung Hom Siding (HHS))**

December 2020

	Name	Signature
Prepared & Checked:	Isaac Chu	
Reviewed & Approved:	Josh Lam	

Version:	A	Date:	28 December 2020
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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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Annex B	Detail Calculation of Fixed Plant Noise Assessment



## **1 INTRODUCTION**

### **1.1 Background**

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing 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 East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).
- 1.1.2 The SCL Tai Wai to Hung Hom Section [SCL (TAW-HUH)] included a total of 7 stations, including Hin Keng Station (HIK), Diamond Hill Station (DIH), Kai Tak Station (KAT), Sung Wong Toi Station (SUW) (formerly named as To Kwa Wan Station (TKW) in SCL(TAW-HUH) EIA), To Kwa Wan Station (formerly named as Ma Tau Wai Station (MTW) in SCL (TAW-HUH) EIA Report), Ho Man Tin Station (HOM) and Hung Hom Station (HUH).
- 1.1.3 Following the cessation of the operations of various freight facilities at Hung Hom in April 2011, MTR Corporation Limited started a detailed study to investigate the feasibility and environmental acceptability of utilizing the former freight yard to accommodate the train stabling requirements for SCL (TAW-HUH). To allow Stabling Sidings at Hung Hom Freight Yard (HHS) feasible for the use of stabling, in addition to providing siding tracks underneath the existing podium structure covering the freight yard, and launching/retrieval and emergency tracks and shunt neck extending outside the podium, appropriate changes were made to the design of SCL (TAW-HUH) and SCL Mong Kok East to Hung Hom Section [SCL (MKK-HUH)] at HUH, Kai Tak Station (KAT) and Diamond Hill Station (DIH) and its associated alignment and facilities.
- 1.1.4 Environmental Impact Assessment (EIA) Reports for SCL – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] (Register No. AEIAR-167/2012), SCL Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] (Register No. AEIAR-164/2012) and SCL - Mong Kok East to Hung Hom Section [SCL(MKK – HUH)] (Register No. AEIAR-165/2012) (hereinafter referred to as “the EIA Reports”) were approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). The alignment and associated facilities under SCL (TAW-HUH) at HUH, KAT and DIH, and SCL (MKK-HUH) at HUH were superseded by those proposed and assessed in SCL (HHS) EIA Report.
- 1.1.5 Following the approval of the EIA Reports, the Environmental Permits, EP-437/2012 and EP-438/2012 covering the construction of SCL (MKK-HUH), both SCL (TAW-HUH) and SCL (HHS) respectively (hereinafter referred to as “the SCL Project”) were granted on 22 March 2012. Variations of Environmental Permit (VEP) were subsequently applied for EP-437/2012 and EP-438/2012. EP-437/2012/A and EP-438/2012/K, which are the latest Environmental Permits, were issued by Director of Environmental Protection (DEP) on 27 November 2017 and 4 October 2016, respectively.
- 1.1.6 Pursuant to Condition 2.21 of EP No. EP-437/2012/A, 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(MKK-HUH) EIA Report and SCL(HHS) EIA Report, or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO) having due regard to the characteristics of tonality, impulsiveness and intermittency.
- 1.1.7 For EP No. EP-438/2012/K, according to Condition 2.32, 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 (TAW-HUH) EIA Report and SCL(HHS) EIA Report and all relevant documents in the Register, or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process (TM-EIAO) having due regard to the characteristics of tonality, impulsiveness and intermittency.

- 1.1.8 The SWLs of the fixed plant items for the operation of HHS have been measured and the result was documented in the *Fixed Plant Noise Audit Report (Batch 7 – Hung Hom Station and Hung Hom Siding (HUH&HHS))* which was approved by EPD in October 2019.
- 1.1.9 Based on the latest design information, the maximum allowable SWLs of fixed plant items for the operation of HUH has been further updated to reflect the latest design of the Project, with consideration of cumulative noise impact from the fixed plant sources at HUH and HHS. This updated Proposal presents the updated maximum allowable sound power levels (SWLs) of the fixed plant items at HUH for both EP-437/2012/A and EP-438/2012/K, while the maximum allowable SWLs of fixed plant items for the operation of HHS as stated in *Proposal for Updating Maximum Allowable Sound Power Levels of Fixed Plant Sources (Batch 7 – Hung Hom Station and Hung Hom Siding (HUH & HHS) (July 2019))* remain valid (**Annex A** refers).
- 1.1.10 Design of the fixed plant noise source at HUH under Shatin to Central Link - Hung Hom to Admiralty Section (SCL(HUH-ADM)) as governed by EP-436/2012/F is yet to be finalized and its maximum allowable SWLs have been calculated based on the latest available information. A separated proposal for updating Maximum SWL of fixed plant sources under SCL(HUH-ADM) at HUH will be submitted under SCL (HUH-ADM) in case there are changes in the maximum allowable SWLs of the fixed plant noise sources at HUH under SCL(HUH-ADM).

## **1.2 Purpose of This Proposal**

- 1.2.1 As discussed in **Section 1.1.9**, the maximum allowable SWLs of fixed plant items has been updated to reflect the latest design of the Project. This Proposal presents the updated maximum allowable SWLs of the fixed plant noise sources at HUH.

## 2 NOISE CRITERIA AND 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 (TM-EIAO) 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**.

**Table 2.1 ANLs for Assessment of Noise from Fixed Sources**

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

### 2.2 Representative Noise Sensitive Receivers

2.2.1 Table 8.8 of the approved SCL (HHS) 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 HUH and HHS are summarised in **Table 2.2**.

**Table 2.2 Summary of noise criteria at representative NSRs for fixed noise sources (Reference from Table 8.8 of the approved EIA Report)**

Area (NSR No.)	Time Period <sup>(1)</sup>	Prevailing Background Noise Levels, dB(A) <sup>(2)</sup>	ASR	ANL-5, dB(A) <sup>(3)</sup>	Criteria, dB(A) <sup>(4)</sup>
<b>Stabling Sidings at Hung Hom Freight Yard</b>					
Royal Peninsula Block 2 (HUH-3-1 <sup>(7)</sup> )	Day & evening	68	C	65	65
	Night	62	C	55	55
The Metropolis Residence <sup>(5)</sup> Tower 2 (HUH-4-1 <sup>(7)</sup> )	Day & evening	72	B	60	60
	Night	65	B	50	50
The Metropolis Residence <sup>(5)</sup> Tower 1 (HUH-4-2)	Day & evening	72	B	60	60
	Night	65	B	50	50
Harbourfront Horizon <sup>(6)</sup> (HUH-10-1 <sup>(7)</sup> )	Day & evening	64	B	60	60
	Night	64	B	50	50
University Student Halls of Residence (HUH-11-1)	Day & evening	65	C	65	65
	Night	61	C	55	55
Harbour Place Block 6	Day & evening	65	C	65	65

Area (NSR No.)	Time Period <sup>(1)</sup>	Prevailing Background Noise Levels, dB(A) <sup>(2)</sup>	ASR	ANL-5, dB(A) <sup>(3)</sup>	Criteria, dB(A) <sup>(4)</sup>
(HUH-12-1)	Night	61	C	55	55

Notes:

- (1) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.
- (2) Prevailing background noise levels are extracted from Table 8.8 of SCL(HHS) EIA Report.
- (3) A 5 dB(A) has been deducted from ANL as specified in requirement of TM-EIAO.
- (4) The minimum of prevailing background noise level & ANL-5 is adopted.
- (5) Metropolis Residence is a service apartment and shall not rely on openable windows for ventilation. Nonetheless, for conservative consideration that occupier might open window under special circumstances, this premise has been considered as an assessment point.
- (6) Harbourfront Horizon shall not rely on openable windows for ventilation. Nonetheless, for conservative consideration that occupier might open window under special circumstances, this premise has been considered as an assessment point.
- (7) NSR HH9b, HH4 and HH7 as identified in SCL(MKK-HUH) EIA Report is same as the NSR HUH-10-1, HUH-3-1 and HUH-4-1 respectively as identified in SCL(HHS) EIA Report. To avoid confusion, NSR ID following SCL(HHS) EIA Report has been adopted in this assessment.

## 2.3 Review of Area Sensitivity Rating and Assessment Criteria

- 2.3.1 Area Sensitive Ratings (ASR) as defined in the approved EIA Reports 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 Reports. During the preparation of this Proposal, 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 2019) during the preparation of this Proposal, two major roads (i.e. Influencing Factor) have been identified in the vicinity of the NSRs near HUH and HHS and are listed in **Table 2.3** below.

**Table 2.3 Major Roads in the Vicinity of HUH and HHS**

Area	Road Name	From	To	A.A.D.T. <sup>(1)</sup> (2019)
HUH & HHS	Hung Hom Bypass	Mody Lane	Slip Roads to/from Princess Margaret Road Link	31,000
	Cross Harbour Tunnel N Approach	Toll Plaza	Hong Chong Road	110,780
	Hong Chong Road	Salisbury Road	Chatham Rd N	141,400
	Princess Margaret Rd Link	Hung Luen Road	Chatham Road South	30,910

Note:

- (1) Annual average daily traffic (A.A.D.T.) as extracted from The Annual Traffic Census 2019 ([https://www.td.gov.hk/filemanager/en/content\\_5018/annual%20traffic%20census%202019.pdf](https://www.td.gov.hk/filemanager/en/content_5018/annual%20traffic%20census%202019.pdf)).

- 2.3.3 Site inspection has also been conducted to determine the degree to which NSR is affected by IF. Based on site observation, it was revealed that HUH-10-1 is indirectly affected by the Hung Hom Bypass, Princess Margaret Rd Link, Cross Harbour Tunnel N Approach and Hong Chong Road, while HUH-4-1 and HUH-4-2 are directly affected by the Princess Margaret Rd Link and indirectly affected by Cross Harbour Tunnel N Approach and Hong Chong Road. As HUH-4-1, HUH-4-2 and HUH-10-1 are located in "Urban Area", the ASR for these NSRs is identified as ASR"C" in accordance with the IND-TM. The noise criteria for HUH-4-1 and HUH-4-2 are 65 dB(A) and 55 dB(A) for Day & Evening period and night-time period respectively. The noise criteria for HUH-10-1 is 64 dB(A) (i.e. the prevailing background noise level) and 55 dB(A) for Day & Evening period and night-time period respectively. A summary of updated ASR and the assessment criteria for each NSR are presented in **Table 2.4** below.

**Table 2.4 Review of ASRs and Assessment Criteria**

Area (NSR No.)	Type of Area <sup>(1)</sup>	Influencing Factor (IF)	Degree to which NSR is affected by IF	ASR	Time Period <sup>(2)</sup>	Prevailing Background Noise Levels, dB(A) <sup>(3)</sup>	ANL-5, dB(A) <sup>(4)</sup>	Criteria, dB(A) <sup>(5)</sup>	
<b><i>Stabling Sidings at Hung Hum Freight Yard</i></b>									
Royal Peninsula Block 2 (HUH-3-1)	Urban Area	Princess Margaret Road Link	Directly Affected	C	Day & evening	68	65	65	
					Night	62	55	55	
The Metropolis Residence Tower 2 (HUH-4-1) <sup>(6)</sup>	Urban Area	Princess Margaret Road Link, Cross Harbour Tunnel N Approach & Hong Chong Road	Directly Affected(Princess Margaret Road Link)	C	Day & evening	72	65	65	
					Night	65	55	55	
The Metropolis Residence Tower 1 (HUH-4-2) <sup>(6)</sup>	Urban Area		Indirectly Affected (Cross Harbour Tunnel N Approach & Hong Chong Road)	C	Day & evening	72	65	65	
					Night	65	55	55	
Harbourfront Horizon (HUH-10-1)	Urban Area		Hung Hom Bypass & Princess Margaret Road Link	Indirectly Affected	C	Day & evening	64	65	64
						Night	64	55	55
University Student Halls of Residence (HUH-11-1)	Urban Area	Princess Margaret Road Link	Directly Affected	C	Day & evening	65	65	65	
					Night	61	55	55	
Harbour Place Block 6 (HUH-12-1)	Urban Area	Princess Margaret Road Link	Directly Affected	C	Day & evening	65	65	65	
					Night	61	55	55	

## Notes:

(1) Reference is made from Appendix 8.2 of the approved SCL(HHS) EIA report.

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

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

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

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

(6) Cross Harbour Tunnel N Approach and Hong Chong Road are located less than 300m from HUH-4-2 and HUH-4-1. Based on the site observation at HUH-4-1 and HUH-4-2, they have direct line of sight to a section of Hong Chong Road and Cross Harbour Tunnel N Approach. The traffic noise was noticeable at these NSRs due to heavy traffic on these roads but is not a dominant feature of the noise climate of these NSRs.

### 3 UPDATE OF FIXED PLANT SOURCES AND PREDICTION OF FIXED PLANT NOISE LEVELS

#### 3.1 Update of Fixed Plant Sources

- 3.1.1 The locations of updated fixed plant noise sources at HUH and HHS are shown in **Figure No. C11033B/C/SCL/ACM/M52/011**. Based on latest design information, the maximum allowable SWLs for ventilation louvers of HUH are updated and summarized in **Table 3.1**.

**Table 3.1 Summary of Updated Maximum Allowable SWLs for Fixed Plant Sources**

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)</sup>	
			Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
HUH	HUH-4-2	Station Ventilation Louvre	76	76
	HUH-7a <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-7b <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-8a <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-8b <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-8c <sup>(3)</sup>	Tunnel Ventilation Louvre	100	90
	HUH-9a	Tunnel Ventilation Louvre	80	80
	HUH-9b	Tunnel Ventilation Louvre	82	82
	HUH-9c	Tunnel Ventilation Louvre	77	77
	HUH-10a	Tunnel Ventilation Louvre	78	78
	HUH-10b	Tunnel Ventilation Louvre	81	81
	HUH-10c	Tunnel Ventilation Louvre	70	70
	HUH-11a	Tunnel Ventilation Louvre	68	68
	HUH-11b	Tunnel Ventilation Louvre	70	70
	HUH-12a	Tunnel Ventilation Louvre	66	66
	HUH-12b	Tunnel Ventilation Louvre	68	68
	HUH-13a	Station Ventilation Louvre	64	64
	HUH-14-1-1	Station Ventilation Louvre	75	75
	HUH-14-1-2	Station Ventilation Louvre	88	88
	HUH-14-2	Station Ventilation Louvre	91	91
	HUH-14-3	Station Ventilation Louvre	87	87
	HUH-15	Tunnel Ventilation Louvre	84	84
	HUH-16a	Tunnel Ventilation Louvre	80	80
	HUH-16b	Tunnel Ventilation Louvre	85	85
	HUH-17 <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-18 <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-19a <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-19b <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-20	Station Ventilation Louvre	71	71
	HUH-21a <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-21b <sup>(3)</sup>	Tunnel Ventilation Louvre	105	95
	HUH-22a-1	Station Ventilation Louvre	83	83
	HUH-22a-2	Station Ventilation Louvre	83	83
	HUH-22b	Station Ventilation Louvre	85	85



Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)</sup>	
			Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
	HUH-26H	Station Ventilation Louvre	88	88
	HUH-27H	Station Ventilation Louvre	81	81
	HUH-29	Station Ventilation Louvre	70	70
	HUH-30H	Station Ventilation Louvre	84	84
	HUH-32H	Station Ventilation Louvre	90	90
	HUH-33H	Station Ventilation Louvre	88	88
	HUH-37H	Station Ventilation Louvre	90	90
	HUH-80-1	Station Ventilation Louvre	103	103
	HUH-80-2	Station Ventilation Louvre	103	103
	HUH-80-3	Station Ventilation Louvre	103	103
	HUH-81	Station Ventilation Louvre	99	99
	HUH-82-1	Station Ventilation Louvre	76	76
	HUH-82-6	Station Ventilation Louvre	88	88
	HUH-85b	Station Ventilation Louvre	87	87
	HUH-86-4	Station Ventilation Louvre	67	67
	HUH-86-13	Station Ventilation Louvre	72	72
	HUH-95b	Station Ventilation Louvre	92	92
	HUH-103-1	Station Ventilation Louvre	70	70
	HUH-103-2	Station Ventilation Louvre	81	81
	HUH-103-3	Station Ventilation Louvre	76	76
	HUH-103-4	Station Ventilation Louvre	75	75
	HUH-103-5	Station Ventilation Louvre	74	74
	HUH-103-6	Station Ventilation Louvre	71	71
	HUH-103-7	Station Ventilation Louvre	74	74
	HUH-103-8	Station Ventilation Louvre	72	72
	HUH-103-9	Station Ventilation Louvre	73	73
	HUH-103-10	Station Ventilation Louvre	72	72
	HUH-103-11	Station Ventilation Louvre	73	73
	HUH-103-12	Station Ventilation Louvre	72	72
	HUH-103-13	Station Ventilation Louvre	70	70
	HUH-103-14	Station Ventilation Louvre	72	72
	HUH-104-1	Station Ventilation Louvre	65	65
	HUH-104-2	Station Ventilation Louvre	78	78
	HUH-104-3	Station Ventilation Louvre	76	76
	HUH-104-4	Station Ventilation Louvre	77	77
	HUH-104-5	Station Ventilation Louvre	69	69
	HUH-104-6	Station Ventilation Louvre	69	69
	HUH-104-7	Station Ventilation Louvre	78	78
	HUH-107b	Station Ventilation Louvre	94	94
	HUH-108	Station Ventilation Louvre	58	58
	HUH-109	Station Ventilation Louvre	75	75
	HUH-110	Station Ventilation Louvre	76	76
	HUH-111	Station Ventilation Louvre	76	76

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)</sup>	
			Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
	HUH-112	Station Ventilation Louvre	76	76
	HUH-113	Station Ventilation Louvre	75	75
	HUH-115	Station Ventilation Louvre	73	73
	HUH-116	Station Ventilation Louvre	70	70
	HUH-117	Station Ventilation Louvre	70	70
	HUH-118	Station Ventilation Louvre	68	68
	HUH-119	Station Ventilation Louvre	65	65
	HUH-120	Station Ventilation Louvre	71	71

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.
- (3) The fixed plant item will be used for the operation of SCL(HUH-ADM) which is governed by EP-436/2012/F. Design of the fixed plant noise source under SCL(HUH-ADM) is yet to be finalized and its maximum allowable SWLs have been calculated based on the latest available information. A separated proposal for updating Maximum SWL of fixed plant sources under SCL(HUH-ADM) at HUH will be submitted under SCL (HUH-ADM) in case there are changes in the maximum allowable SWLs of the fixed plant noise sources at HUH under SCL(HUH-ADM).

### 3.2 Prediction of Fixed Plant Noise

- 3.2.1 With the updated maximum allowable SWLs presented in **Table 3.1**, the predicted noise levels at the representative NSRs comply with both daytime/evening and night-time criteria as presented in **Table 2.4**. The predicted cumulative noise levels from fixed plant noise sources for HUH and HHS are summarised in **Table 3.2** with details of calculation shown in **Annex A**.

**Table 3.2 Predicted Fixed Plant Noise Levels at Representative NSRs**

NSR ID	Description	Criteria, dB(A)		Predicted Sound Pressure Level, Leq,30mins, dB(A) <sup>(1)</sup>	
		Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>	Daytime & Evening <sup>(2)</sup>	Night-time <sup>(2)</sup>
HUH-3-1	Royal Peninsula Block 2	65	55	64	55
HUH-4-1a	The Metropolis Residence Tower 2	65	55	62	53
HUH-4-1b	The Metropolis Residence Tower 2	65	55	53	44
HUH-4-2a	The Metropolis Residence Tower 1	65	55	56	49
HUH-4-2b	The Metropolis Residence Tower 1	65	55	51	43
HUH-10-1	Harbourfront Horizon	64	55	56	50
HUH-11-1	University Student Halls of Residence	65	55	59	49
HUH-12-1	Harbour Place Block 6	65	55	34	27

Notes:

- (1) The predicted fixed plant noise 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.

#### **4 CONCLUSION**

- 4.1.1 The maximum allowable SWLs of fixed plant noise sources at HUH has been updated based on the latest design information. The predicted noise levels at representative NSRs comply with the noise criteria based on the updated maximum allowable SWLs of fixed plant noise sources.
- 4.1.2 The measured SWLs at each fixed plant noise source during the fixed plant noise audit shall comply with the maximum allowable SWLs as stated in the **Table 3.1**. Appropriate corrections in tonal, impulsive or intermittent characteristics should be applied, where applicable, in accordance with the IND-TM during the commissioning test.

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Figure

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## **Annex A**

**Excerpt of Proposal for Updating Maximum Allowable Sound  
Power Levels of Fixed Plant Sources (Batch 7 – Hung Hom  
Station and Hung Hom Siding (HUH & HHS) (July 2019)**

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### 3 UPDATE OF FIXED PLANT SOURCES AND PREDICTION OF FIXED PLANT NOISE LEVELS

#### 3.1 Update of Fixed Plant Sources

- 3.1.1 The locations of updated fixed plant noise sources at HUH and HHS are shown in **Figure No. C11033B/C/SCL/ACM/M52/011**. Based on latest design information, the maximum allowable SWLs for ventilation louvers are updated and summarized in **Table 3.1**.

**Table 3.1 Summary of Updated Maximum Allowable SWLs for Fixed Plant Sources**

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)(2)(4)</sup>	
			Daytime & Evening <sup>(3)</sup>	Night-time <sup>(3)</sup>
HHS	HHS-38	Siding Ventilation Louvre	64	64
	HHS-40	Siding Ventilation Louvre	88	-
	HHS-41-1	Siding Ventilation Louvre	54	54
	HHS-41-2	Siding Ventilation Louvre	66	66
	HHS-42-1	Siding Ventilation Louvre	66	66
	HHS-42-2	Siding Ventilation Louvre	64	64
	HHS-42-3	Siding Ventilation Louvre	63	63
	HHS-45-1	Siding Ventilation Louvre	85	85
	HHS-45-2	Siding Ventilation Louvre	60	60
	HHS-49-2	Siding Ventilation Louvre	78	78
	HHS-49-3	Siding Ventilation Louvre	71	71
	HHS-49-6	Siding Ventilation Louvre	67	67
	HHS-49-8	Siding Ventilation Louvre	70	70
	HHS-50-1	Siding Ventilation Louvre	75	75
	HHS-50-2	Siding Ventilation Louvre	69	69
	HHS-51	Siding Ventilation Louvre	86	85
	HHS-52-1	Siding Ventilation Louvre	63	63
	HHS-53-1	Siding Ventilation Louvre	68	68
	HHS-53-2	Siding Ventilation Louvre	75	75
	HHS-53-3	Siding Ventilation Louvre	59	59
	HHS-53-4	Siding Ventilation Louvre	67	67
	HHS-53-5	Siding Ventilation Louvre	69	69
	HHS-53-6	Siding Ventilation Louvre	66	66
	HHS-56	Siding Ventilation Louvre	73	73
	HHS-57-2	Siding Ventilation Louvre	61	61
	HHS-58-1	Siding Ventilation Louvre	68	68
	HHS-58-2	Siding Ventilation Louvre	69	69
	HHS-62-2	Siding Ventilation Louvre	69	69
	HHS-67-1	Siding Ventilation Louvre	71	71
	HHS-67-3	Siding Ventilation Louvre	73	73
	HHS-68-1	Siding Ventilation Louvre	72	72
	HHS-68-2	Siding Ventilation Louvre	71	71
	HHS-68-3	Siding Ventilation Louvre	70	70
	HHS-70-3	Siding Ventilation Louvre	59	59

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)(2)(4)</sup>	
			Daytime & Evening <sup>(3)</sup>	Night-time <sup>(3)</sup>
	HHS-71-1	Siding Ventilation Louvre	54	54
	HHS-71-2	Siding Ventilation Louvre	56	56
	HHS-71-3	Siding Ventilation Louvre	67	67
	HHS-73	Siding Ventilation Louvre	53	53
	HHS-77-1	Siding Ventilation Louvre	54	54
	HHS-77-2	Siding Ventilation Louvre	55	55
	HHS-77-3	Siding Ventilation Louvre	55	55
	HHS-78	Siding Ventilation Louvre	87	79
	HHS-84	Siding Ventilation Louvre	72	72
	HHS-87-2	Siding Ventilation Louvre	75	75
	HHS-88-2	Siding Ventilation Louvre	58	58
	HHS-100-2	Siding Ventilation Louvre	62	62
	HHS-101-1	Siding Ventilation Louvre	76	76
	HHS-102-1	Siding Ventilation Louvre	69	69
	HHS-102-2	Siding Ventilation Louvre	71	71
	HHS-102-3	Siding Ventilation Louvre	75	75
	HHS-102-6	Siding Ventilation Louvre	71	71
	HHS-102-7	Siding Ventilation Louvre	73	73
	HHS-102-9	Siding Ventilation Louvre	71	71
	HHS-102-11	Siding Ventilation Louvre	72	72
	HHS-121	Siding Ventilation Louvre	60	60
HUH <sup>(4)</sup>	Superseded by Proposal for Updating Maximum Allowable Sound Power Levels of Fixed Plant Sources (Updated Batch 7 - HUH & HHS)			

Location	Fixed Plant ID.	Fixed Plant Source	Maximum Allowable SWL, dB(A) <sup>(1)(2)(4)</sup>	
			Daytime & Evening <sup>(3)</sup>	Night-time <sup>(3)</sup>
	Superseded by Proposal for Updating Maximum Allowable Sound Power Levels of Fixed Plant Sources (Updated Batch 7 - HUH & HHS)			

Notes:

- (1) The maximum allowable sound power levels have due regard to the characteristics of tonality, intermittency and impulsiveness.
- (2) As the louvre will not be under operation during night-time period, the maximum allowable SWL is presented as “-”.
- (3) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.
- (4) Design of fixed plant noise sources for HUH are yet to be finalized and their maximum allowable SWLs are calculated based on the latest information. This proposal will be updated in case there are changes in the maximum allowable SWLs for HUH fixed plant noise sources.

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## **Annex B**

### **Detail Calculation of Fixed Plant Noise Assessment**

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Fixed Plant Noise Calculation - HUH-3-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-3-1											
Daytime											
HUH-3-1	Royal Peninsula Block 2	HUH-4-2	North	557	76	0	-63	3	N/A		
		HUH-7a	Top	514	100	0	-62	3	N/A		
		HUH-7b	South	514	100	-10	-62	3	N/A		
		HUH-8a	Top	512	100	0	-62	3	N/A		
		HUH-8b	South	512	100	-10	-62	3	N/A		
		HUH-8c	East	512	100	-10	-62	3	N/A		
		HUH-9a	Top	504	80	0	-62	3	N/A		
		HUH-9b	South	504	82	-10	-62	3	N/A		
		HUH-9c	East	504	77	0	-62	3	N/A		
		HUH-10a	Top	502	78	0	-62	3	N/A		
		HUH-10b	South	502	81	-10	-62	3	N/A		
		HUH-10c	East	502	70	0	-62	3	N/A		
		HUH-11a	Top	501	68	0	-62	3	N/A		
		HUH-11b	South	501	70	-10	-62	3	N/A		
		HUH-12a	Top	499	66	0	-62	3	N/A		
		HUH-12b	South	499	68	-10	-62	3	N/A		
		HUH-13a	Top	498	64	0	-62	3	N/A		
		HUH-14-1-1	South	493	75	-10	-62	3	N/A		
		HUH-14-1-2	South	493	88	-10	-62	3	N/A		
		HUH-14-2	South	492	91	-10	-62	3	N/A		
		HUH-14-3	South	489	87	-10	-62	3	N/A		
		HUH-15	West	198	84	-10	-54	3	23		
		HUH-16a	Top	183	80	0	-53	3	30		
		HUH-16b	East	183	85	0	-53	3	35		
		HUH-17	North	182	105	0	-53	3	55		
		HUH-18	Top	168	105	0	-53	3	55		
		HUH-19a	Top	157	105	0	-52	3	56		
		HUH-19b	North	157	105	0	-52	3	56		
		HUH-20	Top	162	71	0	-52	3	22		
		HUH-21a	Top	153	105	0	-52	3	56		
		HUH-21b	North	153	105	0	-52	3	56		
		HUH-22a-1	Top	149	83	0	-51	3	35		
		HUH-22a-2	North	149	83	0	-51	3	35		
		HUH-22b	North	149	85	0	-51	3	37		
		HUH-26H	East	172	88	0	-53	3	38		
		HUH-27H	East	171	81	0	-53	3	31		
		HUH-29	East	170	70	0	-53	3	20		
		HUH-30H	West	181	84	-10	-53	3	24		
		HUH-32H	West	181	90	-10	-53	3	30		
		HUH-33H	West	182	88	-10	-53	3	28		
		HUH-37H	East	171	90	0	-53	3	40		
		HHS-38	South	488	64	-10	-62	3	N/A		
		HHS-40	South	486	88	-10	-62	3	N/A		
		HHS-41-1	West	495	54	-10	-62	3	N/A		
		HHS-41-2	West	495	66	-10	-62	3	N/A		
		HHS-42-1	West	506	66	-10	-62	3	N/A		
		HHS-42-2	West	506	64	-10	-62	3	N/A		
		HHS-42-3	West	506	63	-10	-62	3	N/A		
		HHS-45-1	West	529	85	-10	-62	3	N/A		
		HHS-45-2	West	529	60	-10	-62	3	N/A		
		HHS-49-2	East	518	78	-10	-62	3	N/A		
		HHS-49-3	East	518	71	-10	-62	3	N/A		
		HHS-49-6	East	518	67	-10	-62	3	N/A		
		HHS-49-8	East	518	70	-10	-62	3	N/A		
		HHS-50-1	East	512	75	-10	-62	3	N/A		
		HHS-50-2	East	512	69	-10	-62	3	N/A		
		HHS-51	East	496	86	-10	-62	3	N/A		
		HHS-52-1	East	482	63	-10	-62	3	N/A		
		HHS-53-1	East	471	68	-10	-61	3	N/A		
		HHS-53-2	East	471	75	-10	-61	3	N/A		
		HHS-53-3	East	471	59	-10	-61	3	N/A		
		HHS-53-4	East	471	67	-10	-61	3	N/A		
		HHS-53-5	East	471	69	-10	-61	3	N/A		
		HHS-53-6	East	471	66	-10	-61	3	N/A		
		HHS-56	East	443	73	-10	-61	3	N/A		
		HHS-57-2	East	418	61	0	-60	3	N/A		
		HHS-58-1	East	407	68	0	-60	3	N/A		
		HHS-58-2	East	407	69	0	-60	3	N/A		
		HHS-62-2	East	312	69	0	-58	3	N/A		
		HHS-67-1	East	242	71	0	-56	3	18		
		HHS-67-3	East	242	73	0	-56	3	20		
		HHS-68-1	East	217	72	0	-55	3	20		
		HHS-68-2	East	217	71	0	-55	3	19		
		HHS-68-3	East	217	70	0	-55	3	18		
		HHS-70-3	East	190	59	0	-54	3	8		
		HHS-71-1	East	176	54	0	-53	3	4		
		HHS-71-2	East	176	56	0	-53	3	6		
		HHS-71-3	East	176	67	0	-53	3	17		
		HHS-73	East	115	53	0	-49	3	7		
		HHS-77-1	East	109	54	0	-49	3	8		
		HHS-77-2	East	109	55	0	-49	3	9		
		HHS-77-3	East	109	55	0	-49	3	9		
		HHS-78	North	95	87	0	-48	3	42		
		HUH-80-1	Top	594	103	0	-63	3	N/A		
		HUH-80-2	Top	589	103	0	-63	3	N/A		
		HUH-80-3	Top	584	103	0	-63	3	N/A		
		HUH-81	Top	561	99	0	-63	3	N/A		
		HUH-82-1	South	349	76	-10	-59	3	N/A		
		HUH-82-6	South	349	88	-10	-59	3	N/A		
		HHS-84	East	354	72	0	-59	3	N/A		
		HUH-85b	North	154	87	0	-52	3	38		
		HUH-86-4	North	222	67	0	-55	3	15		
		HUH-86-13	North	222	72	0	-55	3	20		
		HHS-87-2	East	443	75	-10	-61	3	N/A		
		HHS-88-2	East	512	58	-10	-62	3	N/A		
		HUH-95b	South	504	92	-10	-62	3	N/A		
		HHS-100-2	Top	488	62	-10	-62	3	N/A		
		HHS-101-1	Top	479	76	-10	-62	3	N/A		
		HHS-102-1	Top	458	69	-10	-61	3	N/A		
		HHS-102-2	Top	458	71	-10	-61	3	N/A		
		HHS-102-3	Top	458	75	-10	-61	3	N/A		
		HHS-102-6	Top	458	71	-10	-61	3	N/A		
		HHS-102-7	Top	458	73	-10	-61	3	N/A		
		HHS-102-9	Top	458	71	-10	-61	3	N/A		
		HHS-102-11	Top	458	72	-10	-61	3	N/A		
		HUH-103-1	Top	210	70	-10	-54	3	9		
		HUH-103-2	Top	210	81	-10	-54	3	20		
		HUH-103-3	Top	210	76	-10	-54	3	15		
		HUH-103-4	Top	210	75	-10	-54	3	14		
		HUH-103-5	Top	210	74	-10	-54	3	13		
		HUH-103-6	Top	210	71	-10	-54	3	10		
		HUH-103-7	Top	210	74	-10	-54	3	13		
		HUH-103-8	Top	210	72	-10	-54	3	11		
		HUH-103-9	Top	210	73	-10	-54	3	12		
		HUH-103-10	Top	210	72	-10	-54	3	11		
		HUH-103-11	Top	210	73	-10	-54	3	12		
		HUH-103-12	Top	210	72	-10	-54	3	11		
		HUH-103-13	Top	210	70	-10	-54	3	9		
		HUH-103-14	Top	210	72	-10	-54	3	11		
		HUH-104-1	Top	154	65	0	-52	3	16		
		HUH-104-2	Top	154	78	0	-52	3	29		
		HUH-104-3	Top	154	76	0	-52	3	27		
		HUH-104-4	Top	154	77	0	-52	3	28		
		HUH-104-5	Top	154	69	0	-52	3	20		
		HUH-104-6	Top	154	69	0	-52	3	20		
		HUH-104-7	Top	154	78	0	-52	3	29		
		HUH-107b	South	509	94	-10	-62	3	N/A		
		HUH-108	South	495	58	-10	-62	3	N/A		
		HUH-109	Top	173	75	0	-53	3	25		
		HUH-110	Top	174	76	0	-53	3	26		
		HUH-111	Top	176	76	0	-53	3	26		
		HUH-112	Top	177	76	0	-53	3	26		
		HUH-113	Top	179	75	0	-53	3	25		
		HUH-115	North	222	73	0	-55	3	21		
		HUH-116	North	218	70	0	-55	3	18		
		HUH-117	North	214	70	0	-55	3	18		
		HUH-118	North	210	68	0	-54	3	17		
		HUH-119	Top	586	65	-10	-63	3	N/A		
HUH-120	Top	584	71	-10	-63	3	N/A				
HHS-121	East	112	60	0	-49	3	14				
NOV-VS1	Top	581	97	0	-63	3	N/A				
NOV-VS2	Top	579	97	0	-63	3	N/A				
NOV-LV-03	East	572	68	0	-63	3	N/A				
NOV-LV-04	North	568	68	0	-63	3	N/A				
NOV-LV-05	North	575	66	0	-63	3	N/A				
NOV-LV-06	West	579	72	-10	-63	3	N/A				
NOV-LV-07	West	593	71	-10	-63	3	N/A				
NOV-LV-09	South	592	78	-10	-63	3	N/A				
NOV-LV-10	North	588	79	0	-63	3	N/A				
NOV-LV-12	South	590	71	-10	-63	3	N/A				
NOV-LV-13	South-East	584	67	0	-63	3					

Fixed Plant Noise Calculation - HUH-3-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-3-1											
Night-time											
HUH-3-1	Royal Peninsula Block 2	HUH-4-2	North	557	76	0	-63	3	N/A		
		HUH-7a	Top	514	90	0	-62	3	N/A		
		HUH-7b	South	514	90	-10	-62	3	N/A		
		HUH-8a	Top	512	90	0	-62	3	N/A		
		HUH-8b	South	512	90	-10	-62	3	N/A		
		HUH-8c	East	512	90	-10	-62	3	N/A		
		HUH-9a	Top	504	80	0	-62	3	N/A		
		HUH-9b	South	504	82	-10	-62	3	N/A		
		HUH-9c	East	504	77	0	-62	3	N/A		
		HUH-10a	Top	502	78	0	-62	3	N/A		
		HUH-10b	South	502	81	-10	-62	3	N/A		
		HUH-10c	East	502	70	0	-62	3	N/A		
		HUH-11a	Top	501	68	0	-62	3	N/A		
		HUH-11b	South	501	70	-10	-62	3	N/A		
		HUH-12a	Top	499	66	0	-62	3	N/A		
		HUH-12b	South	499	68	-10	-62	3	N/A		
		HUH-13a	Top	498	64	0	-62	3	N/A		
		HUH-14-1-1	South	493	75	-10	-62	3	N/A		
		HUH-14-1-2	South	493	88	-10	-62	3	N/A		
		HUH-14-2	South	492	91	-10	-62	3	N/A		
		HUH-14-3	South	489	87	-10	-62	3	N/A		
		HUH-15	West	198	84	-10	-54	3	23		
		HUH-16a	Top	183	80	0	-53	3	30		
		HUH-16b	East	183	85	0	-53	3	35		
		HUH-17	North	182	95	0	-53	3	45		
		HUH-18	Top	168	95	0	-53	3	45		
		HUH-19a	Top	157	95	0	-52	3	46		
		HUH-19b	North	157	95	0	-52	3	46		
		HUH-20	Top	162	71	0	-52	3	22		
		HUH-21a	Top	153	95	0	-52	3	46		
		HUH-21b	North	153	95	0	-52	3	46		
		HUH-22a-1	Top	149	83	0	-51	3	35		
		HUH-22a-2	North	149	83	0	-51	3	35		
		HUH-22b	North	149	85	0	-51	3	37		
		HUH-26H	East	172	88	0	-53	3	38		
		HUH-27H	East	171	81	0	-53	3	31		
		HUH-29	East	170	70	0	-53	3	20		
		HUH-30H	West	181	84	-10	-53	3	24		
		HUH-32H	West	181	90	-10	-53	3	30		
		HUH-33H	West	182	88	-10	-53	3	28		
		HUH-37H	East	171	90	0	-53	3	40		
		HHS-38	South	488	64	-10	-62	3	N/A		
		HHS-40	South	486	-	-10	-62	3	-		
		HHS-41-1	West	495	54	-10	-62	3	N/A		
		HHS-41-2	West	495	66	-10	-62	3	N/A		
		HHS-42-1	West	506	66	-10	-62	3	N/A		
		HHS-42-2	West	506	64	-10	-62	3	N/A		
		HHS-42-3	West	506	63	-10	-62	3	N/A		
		HHS-45-1	West	529	85	-10	-62	3	N/A		
		HHS-45-2	West	529	60	-10	-62	3	N/A		
		HHS-49-2	East	518	78	-10	-62	3	N/A		
		HHS-49-3	East	518	71	-10	-62	3	N/A		
		HHS-49-6	East	518	67	-10	-62	3	N/A		
		HHS-49-8	East	518	70	-10	-62	3	N/A		
		HHS-50-1	East	512	75	-10	-62	3	N/A		
		HHS-50-2	East	512	69	-10	-62	3	N/A		
		HHS-51	East	496	85	-10	-62	3	N/A		
		HHS-52-1	East	482	63	-10	-62	3	N/A		
		HHS-53-1	East	471	68	-10	-61	3	N/A		
		HHS-53-2	East	471	75	-10	-61	3	N/A		
		HHS-53-3	East	471	59	-10	-61	3	N/A		
		HHS-53-4	East	471	67	-10	-61	3	N/A		
		HHS-53-5	East	471	69	-10	-61	3	N/A		
		HHS-53-6	East	471	66	-10	-61	3	N/A		
		HHS-56	East	443	73	-10	-61	3	N/A		
		HHS-57-2	East	418	61	0	-60	3	N/A		
		HHS-58-1	East	407	68	0	-60	3	N/A		
		HHS-58-2	East	407	69	0	-60	3	N/A		
		HHS-62-2	East	312	69	0	-58	3	N/A		
		HHS-67-1	East	242	71	0	-56	3	18		
		HHS-67-3	East	242	73	0	-56	3	20		
		HHS-68-1	East	217	72	0	-55	3	20		
		HHS-68-2	East	217	71	0	-55	3	19		
		HHS-68-3	East	217	70	0	-55	3	18		
		HHS-70-3	East	190	59	0	-54	3	8		
		HHS-71-1	East	176	54	0	-53	3	4		
		HHS-71-2	East	176	56	0	-53	3	6		
		HHS-71-3	East	176	67	0	-53	3	17		
		HHS-73	East	115	53	0	-49	3	7		
		HHS-77-1	East	109	54	0	-49	3	8		
		HHS-77-2	East	109	55	0	-49	3	9		
		HHS-77-3	East	109	55	0	-49	3	9		
		HHS-78	North	95	79	0	-48	3	34		
		HUH-80-1	Top	594	103	0	-63	3	N/A		
		HUH-80-2	Top	589	103	0	-63	3	N/A		
		HUH-80-3	Top	584	103	0	-63	3	N/A		
		HUH-81	Top	561	99	0	-63	3	N/A		
		HUH-82-1	South	349	76	-10	-59	3	N/A		
		HUH-82-6	South	349	88	-10	-59	3	N/A		
		HHS-84	East	354	72	0	-59	3	N/A		
		HUH-85b	North	154	87	0	-52	3	38		
		HUH-86-4	North	222	67	0	-55	3	15		
		HUH-86-13	North	222	72	0	-55	3	20		
		HHS-87-2	East	443	75	-10	-61	3	N/A		
		HHS-88-2	East	512	58	-10	-62	3	N/A		
		HUH-95b	South	504	92	-10	-62	3	N/A		
		HHS-100-2	Top	488	62	-10	-62	3	N/A		
		HHS-101-1	Top	479	76	-10	-62	3	N/A		
		HHS-102-1	Top	458	69	-10	-61	3	N/A		
		HHS-102-2	Top	458	71	-10	-61	3	N/A		
		HHS-102-3	Top	458	75	-10	-61	3	N/A		
		HHS-102-6	Top	458	71	-10	-61	3	N/A		
		HHS-102-7	Top	458	73	-10	-61	3	N/A		
		HHS-102-9	Top	458	71	-10	-61	3	N/A		
		HHS-102-11	Top	458	72	-10	-61	3	N/A		
		HUH-103-1	Top	210	70	-10	-54	3	9		
		HUH-103-2	Top	210	81	-10	-54	3	20		
		HUH-103-3	Top	210	76	-10	-54	3	15		
		HUH-103-4	Top	210	75	-10	-54	3	14		
		HUH-103-5	Top	210	74	-10	-54	3	13		
		HUH-103-6	Top	210	71	-10	-54	3	10		
		HUH-103-7	Top	210	74	-10	-54	3	13		
		HUH-103-8	Top	210	72	-10	-54	3	11		
		HUH-103-9	Top	210	73	-10	-54	3	12		
		HUH-103-10	Top	210	72	-10	-54	3	11		
		HUH-103-11	Top	210	73	-10	-54	3	12		
		HUH-103-12	Top	210	72	-10	-54	3	11		
		HUH-103-13	Top	210	70	-10	-54	3	9		
		HUH-103-14	Top	210	72	-10	-54	3	11		
		HUH-104-1	Top	154	65	0	-52	3	16		
		HUH-104-2	Top	154	78	0	-52	3	29		
		HUH-104-3	Top	154	76	0	-52	3	27		
		HUH-104-4	Top	154	77	0	-52	3	28		
		HUH-104-5	Top	154	69	0	-52	3	20		
		HUH-104-6	Top	154	69	0	-52	3	20		
		HUH-104-7	Top	154	78	0	-52	3	29		
		HUH-107b	South	509	94	-10	-62	3	N/A		
		HUH-108	South	495	58	-10	-62	3	N/A		</



Fixed Plant Noise Calculation - HUH-4-1a

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-1a											
Daytime											
HUH-4-1a	The Metropolis Residence Tower 2	HUH-4-2	North	397	76	-10	-60	3	N/A		
		HUH-7a	Top	350	100	-10	-59	3	N/A		
		HUH-7b	South	350	100	-10	-59	3	N/A		
		HUH-8a	Top	347	100	-10	-59	3	N/A		
		HUH-8b	South	347	100	-10	-59	3	N/A		
		HUH-8c	East	347	100	-10	-59	3	N/A		
		HUH-9a	Top	338	80	-10	-59	3	N/A		
		HUH-9b	South	338	82	-10	-59	3	N/A		
		HUH-9c	East	338	77	-10	-59	3	N/A		
		HUH-10a	Top	335	78	-10	-59	3	N/A		
		HUH-10b	South	335	81	-10	-59	3	N/A		
		HUH-10c	East	335	70	-10	-59	3	N/A		
		HUH-11a	Top	334	68	-10	-58	3	N/A		
		HUH-11b	South	334	70	-10	-58	3	N/A		
		HUH-12a	Top	332	66	-10	-58	3	N/A		
		HUH-12b	South	332	68	-10	-58	3	N/A		
		HUH-13a	Top	330	64	-10	-58	3	N/A		
		HUH-14-1-1	South	326	75	-10	-58	3	N/A		
		HUH-14-1-2	South	326	88	-10	-58	3	N/A		
		HUH-14-2	South	324	91	-10	-58	3	N/A		
		HUH-14-3	South	322	87	-10	-58	3	N/A		
		HUH-15	West	175	84	-10	-53	3	24		
		HUH-16a	Top	166	80	0	-52	3	31		
		HUH-16b	East	166	85	0	-52	3	36		
		HUH-17	North	159	105	-10	-52	3	46		
		HUH-18	Top	146	105	0	-51	3	57		
		HUH-19a	Top	167	105	0	-52	3	56		
		HUH-19b	North	167	105	-10	-52	3	46		
		HUH-20	Top	136	71	0	-51	3	23		
		HUH-21a	Top	128	105	0	-50	3	58		
		HUH-21b	North	128	105	-10	-50	3	48		
		HUH-22a-1	Top	123	83	0	-50	3	36		
		HUH-22a-2	North	123	83	-10	-50	3	26		
		HUH-22b	North	123	85	-10	-50	3	28		
		HUH-26H	East	205	88	0	-54	3	37		
		HUH-27H	East	198	81	0	-54	3	30		
		HUH-29	East	185	70	0	-53	3	20		
		HUH-30H	West	203	84	-10	-54	3	23		
		HUH-32H	West	198	90	-10	-54	3	29		
		HUH-33H	West	205	88	-10	-54	3	27		
		HUH-37H	East	201	90	0	-54	3	39		
		HHS-38	South	321	64	-10	-58	3	N/A		
		HHS-40	South	319	88	-10	-58	3	N/A		
		HHS-41-1	West	328	54	-10	-58	3	N/A		
		HHS-41-2	West	328	66	-10	-58	3	N/A		
		HHS-42-1	West	339	66	-10	-59	3	N/A		
		HHS-42-2	West	339	64	-10	-59	3	N/A		
		HHS-42-3	West	339	63	-10	-59	3	N/A		
		HHS-45-1	West	362	85	-10	-59	3	N/A		
		HHS-45-2	West	362	60	-10	-59	3	N/A		
		HHS-49-2	East	352	78	-10	-59	3	N/A		
		HHS-49-3	East	352	71	-10	-59	3	N/A		
		HHS-49-6	East	352	67	-10	-59	3	N/A		
		HHS-49-8	East	352	70	-10	-59	3	N/A		
		HHS-50-1	East	347	75	-10	-59	3	N/A		
		HHS-50-2	East	347	69	-10	-59	3	N/A		
		HHS-51	East	332	86	-10	-58	3	N/A		
		HHS-52-1	East	319	63	-10	-58	3	N/A		
		HHS-53-1	East	309	68	-10	-58	3	N/A		
		HHS-53-2	East	309	75	-10	-58	3	N/A		
		HHS-53-3	East	309	59	-10	-58	3	N/A		
		HHS-53-4	East	309	67	-10	-58	3	N/A		
		HHS-53-5	East	309	69	-10	-58	3	N/A		
		HHS-53-6	East	309	66	-10	-58	3	N/A		
		HHS-56	East	284	73	-10	-57	3	9		
		HHS-57-2	East	260	61	-10	-56	3	negligible*		
		HHS-58-1	East	249	68	-10	-56	3	5		
		HHS-58-2	East	249	69	-10	-56	3	6		
		HHS-62-2	East	156	69	-10	-52	3	10		
		HHS-67-1	East	92	71	-10	-47	3	17		
		HHS-67-3	East	92	73	-10	-47	3	19		
		HHS-68-1	East	70	72	-10	-45	3	20		
		HHS-68-2	East	70	71	-10	-45	3	19		
		HHS-68-3	East	70	70	-10	-45	3	18		
		HHS-70-3	East	52	59	-10	-42	3	10		
		HHS-71-1	East	46	54	-10	-41	3	6		
		HHS-71-2	East	46	56	-10	-41	3	8		
		HHS-71-3	East	46	67	-10	-41	3	19		
		HHS-73	East	55	53	-10	-43	3	3		
		HHS-77-1	East	59	54	-10	-43	3	4		
		HHS-77-2	East	59	55	-10	-43	3	5		
		HHS-77-3	East	59	55	-10	-43	3	5		
		HHS-78	North	81	87	-10	-46	3	34		
		HUH-80-1	Top	433	103	0	-61	3	N/A		
		HUH-80-2	Top	428	103	0	-61	3	N/A		
		HUH-80-3	Top	423	103	0	-61	3	N/A		
		HUH-81	Top	401	99	0	-60	3	N/A		
		HUH-82-1	South	193	76	-10	-54	3	15		
		HUH-82-6	South	193	88	-10	-54	3	27		
		HHS-84	East	197	72	-10	-54	3	11		
		HUH-85b	North	136	87	-10	-51	3	29		
		HUH-86-4	North	120	67	0	-50	3	20		
		HUH-86-13	North	120	72	0	-50	3	25		
		HHS-87-2	East	284	75	-10	-57	3	11		
		HHS-88-2	East	347	58	-10	-59	3	N/A		
		HUH-95b	South	339	92	-10	-59	3	N/A		
		HHS-100-2	Top	321	62	-10	-58	3	N/A		
		HHS-101-1	Top	312	76	-10	-58	3	N/A		
		HHS-102-1	Top	297	69	-10	-57	3	5		
		HHS-102-2	Top	297	71	-10	-57	3	7		
		HHS-102-3	Top	297	75	-10	-57	3	11		
		HHS-102-6	Top	297	71	-10	-57	3	7		
		HHS-102-7	Top	297	73	-10	-57	3	9		
		HHS-102-9	Top	297	71	-10	-57	3	7		
		HHS-102-11	Top	297	72	-10	-57	3	8		
		HUH-103-1	Top	178	70	-10	-53	3	10		
		HUH-103-2	Top	178	81	-10	-53	3	21		
		HUH-103-3	Top	178	76	-10	-53	3	16		
		HUH-103-4	Top	178	75	-10	-53	3	15		
		HUH-103-5	Top	178	74	-10	-53	3	14		
		HUH-103-6	Top	178	71	-10	-53	3	11		
		HUH-103-7	Top	178	74	-10	-53	3	14		
		HUH-103-8	Top	178	72	-10	-53	3	12		
		HUH-103-9	Top	178	73	-10	-53	3	13		
		HUH-103-10	Top	178	72	-10	-53	3	12		
		HUH-103-11	Top	178	73	-10	-53	3	13		
		HUH-103-12	Top	178	72	-10	-53	3	12		
		HUH-103-13	Top	178	70	-10	-53	3	10		
		HUH-103-14	Top	178	72	-10	-53	3	12		
		HUH-104-1	Top	141	65	0	-51	3	17		
		HUH-104-2	Top	141	78	0	-51	3	30		
		HUH-104-3	Top	141	76	0	-51	3	28		
		HUH-104-4	Top	141	77	0	-51	3	29		
		HUH-104-5	Top	141	69	0	-51	3	21		
		HUH-104-6	Top	141	69	0	-51	3	21		
		HUH-104-7	Top	141	78	0	-51	3	30		
		HUH-107b	South	345	94	-10	-59	3	N/A		
		HUH-108	South	328	58	-10	-58	3	N/A		
		HUH-109	Top	185	75	0	-53	3	25		
		HUH-110	Top	186	76	0	-53	3	26		
		HUH-111	Top	187	76	0	-53	3	26		
		HUH-112	Top	188	76	0	-53	3	26		
		HUH-113	Top	188	75	0	-54	3	24		
		HUH-115	North	191	73	0	-54	3	22		
		HUH-116	North	186	70	0	-53	3	20		
		HUH-117	North	182	70	0	-53	3	20		
		HUH-118	North	178	68	0	-53	3	18		
HUH-119	Top	426	65	-10	-61	3	N/A				
HUH-120	Top	425	71	-10	-61	3	N/A				
HHS-121	East	57	60	-10	-43	3	10				
NOV-VS1	Top	415	97	-10	-60	3	N/A				
NOV-VS2	Top	413	97	-10	-60	3	N/A				
NOV-LV-03	East	405	68	-10	-60	3	N/A				
NOV-LV-04	North	401	68	-10	-60	3	N/A				
NOV-LV-05	North	409	66	-10	-60	3	N/A				
NOV-LV-06	West	414	72	-10	-60	3	N/A				
NOV-LV-07	West	428	71	-10	-61	3	N/A				
NOV-LV-09	South	425	78	-10	-61	3	N/A				
NOV-LV-10	North	421	79	-10	-60	3	N/A				
NOV-LV-12	South	423	71	-10	-61	3	N/A</				

Fixed Plant Noise Calculation - HUH-4-1a

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-1a											
Night-time											
HUH-4-1a	The Metropolis Residence Tower 2	HUH-4-2	North	397	76	-10	-60	3	N/A		
		HUH-7a	Top	350	90	-10	-59	3	N/A		
		HUH-7b	South	350	90	-10	-59	3	N/A		
		HUH-8a	Top	347	90	-10	-59	3	N/A		
		HUH-8b	South	347	90	-10	-59	3	N/A		
		HUH-8c	East	347	90	-10	-59	3	N/A		
		HUH-9a	Top	338	80	-10	-59	3	N/A		
		HUH-9b	South	338	82	-10	-59	3	N/A		
		HUH-9c	East	338	77	-10	-59	3	N/A		
		HUH-10a	Top	335	78	-10	-59	3	N/A		
		HUH-10b	South	335	81	-10	-59	3	N/A		
		HUH-10c	East	335	70	-10	-59	3	N/A		
		HUH-11a	Top	334	68	-10	-58	3	N/A		
		HUH-11b	South	334	70	-10	-58	3	N/A		
		HUH-12a	Top	332	66	-10	-58	3	N/A		
		HUH-12b	South	332	68	-10	-58	3	N/A		
		HUH-13a	Top	330	64	-10	-58	3	N/A		
		HUH-14-1-1	South	326	75	-10	-58	3	N/A		
		HUH-14-1-2	South	326	88	-10	-58	3	N/A		
		HUH-14-2	South	324	91	-10	-58	3	N/A		
		HUH-14-3	South	322	87	-10	-58	3	N/A		
		HUH-15	West	175	84	-10	-53	3	24		
		HUH-16a	Top	166	80	0	-52	3	31		
		HUH-16b	East	166	85	0	-52	3	36		
		HUH-17	North	159	95	-10	-52	3	36		
		HUH-18	Top	146	95	0	-51	3	47		
		HUH-19a	Top	167	95	0	-52	3	46		
		HUH-19b	North	167	95	-10	-52	3	36		
		HUH-20	Top	136	71	0	-51	3	23		
		HUH-21a	Top	128	95	0	-50	3	48		
		HUH-21b	North	128	95	-10	-50	3	38		
		HUH-22a-1	Top	123	83	0	-50	3	36		
		HUH-22a-2	North	123	83	-10	-50	3	26		
		HUH-22b	North	123	85	-10	-50	3	28		
		HUH-26H	East	205	88	0	-54	3	37		
		HUH-27H	East	198	81	0	-54	3	30		
		HUH-29	East	185	70	0	-53	3	20		
		HUH-30H	West	203	84	-10	-54	3	23		
		HUH-32H	West	198	90	-10	-54	3	29		
		HUH-33H	West	205	88	-10	-54	3	27		
		HUH-37H	East	201	90	0	-54	3	39		
		HHS-38	South	321	64	-10	-58	3	N/A		
		HHS-40	South	319	-	-10	-58	3	-		
		HHS-41-1	West	328	54	-10	-58	3	N/A		
		HHS-41-2	West	328	66	-10	-58	3	N/A		
		HHS-42-1	West	339	66	-10	-59	3	N/A		
		HHS-42-2	West	339	64	-10	-59	3	N/A		
		HHS-42-3	West	339	63	-10	-59	3	N/A		
		HHS-45-1	West	362	85	-10	-59	3	N/A		
		HHS-45-2	West	362	60	-10	-59	3	N/A		
		HHS-49-2	East	352	78	-10	-59	3	N/A		
		HHS-49-3	East	352	71	-10	-59	3	N/A		
		HHS-49-6	East	352	67	-10	-59	3	N/A		
		HHS-49-8	East	352	70	-10	-59	3	N/A		
		HHS-50-1	East	347	75	-10	-59	3	N/A		
		HHS-50-2	East	347	69	-10	-59	3	N/A		
		HHS-51	East	332	85	-10	-58	3	N/A		
		HHS-52-1	East	319	63	-10	-58	3	N/A		
		HHS-53-1	East	309	68	-10	-58	3	N/A		
		HHS-53-2	East	309	75	-10	-58	3	N/A		
		HHS-53-3	East	309	59	-10	-58	3	N/A		
		HHS-53-4	East	309	67	-10	-58	3	N/A		
		HHS-53-5	East	309	69	-10	-58	3	N/A		
		HHS-53-6	East	309	66	-10	-58	3	N/A		
		HHS-56	East	284	73	-10	-57	3	9		
		HHS-57-2	East	260	61	-10	-56	3	negligible*		
		HHS-58-1	East	249	68	-10	-56	3	5		
		HHS-58-2	East	249	69	-10	-56	3	6		
		HHS-62-2	East	156	69	-10	-52	3	10		
		HHS-67-1	East	92	71	-10	-47	3	17		
		HHS-67-3	East	92	73	-10	-47	3	19		
		HHS-68-1	East	70	72	-10	-45	3	20		
		HHS-68-2	East	70	71	-10	-45	3	19		
		HHS-68-3	East	70	70	-10	-45	3	18		
		HHS-70-3	East	52	59	-10	-42	3	10		
		HHS-71-1	East	46	54	-10	-41	3	6		
		HHS-71-2	East	46	56	-10	-41	3	8		
		HHS-71-3	East	46	67	-10	-41	3	19		
		HHS-73	East	55	53	-10	-43	3	3		
		HHS-77-1	East	59	54	-10	-43	3	4		
		HHS-77-2	East	59	55	-10	-43	3	5		
		HHS-77-3	East	59	55	-10	-43	3	5		
		HHS-78	North	81	79	-10	-46	3	26		
		HUH-80-1	Top	433	103	0	-61	3	N/A		
		HUH-80-2	Top	428	103	0	-61	3	N/A		
		HUH-80-3	Top	423	103	0	-61	3	N/A		
		HUH-81	Top	401	99	0	-60	3	N/A		
		HUH-82-1	South	193	76	-10	-54	3	15		
		HUH-82-6	South	193	88	-10	-54	3	27		
		HHS-84	East	197	72	-10	-54	3	11		
		HUH-85b	North	136	87	-10	-51	3	29		
		HUH-86-4	North	120	67	0	-50	3	20		
		HUH-86-13	North	120	72	0	-50	3	25		
		HHS-87-2	East	284	75	-10	-57	3	11		
		HHS-88-2	East	347	58	-10	-59	3	N/A		
		HUH-95b	South	339	92	-10	-59	3	N/A		
		HHS-100-2	Top	321	62	-10	-58	3	N/A		
		HHS-101-1	Top	312	76	-10	-58	3	N/A		
		HHS-102-1	Top	297	69	-10	-57	3	5		
		HHS-102-2	Top	297	71	-10	-57	3	7		
		HHS-102-3	Top	297	75	-10	-57	3	11		
		HHS-102-6	Top	297	71	-10	-57	3	7		
		HHS-102-7	Top	297	73	-10	-57	3	9		
		HHS-102-9	Top	297	71	-10	-57	3	7		
		HHS-102-11	Top	297	72	-10	-57	3	8		
		HUH-103-1	Top	178	70	-10	-53	3	10		
		HUH-103-2	Top	178	81	-10	-53	3	21		
		HUH-103-3	Top	178	76	-10	-53	3	16		
		HUH-103-4	Top	178	75	-10	-53	3	15		
		HUH-103-5	Top	178	74	-10	-53	3	14		
		HUH-103-6	Top	178	71	-10	-53	3	11		
		HUH-103-7	Top	178	74	-10	-53	3	14		
		HUH-103-8	Top	178	72	-10	-53	3	12		
		HUH-103-9	Top	178	73	-10	-53	3	13		
		HUH-103-10	Top	178	72	-10	-53	3	12		
		HUH-103-11	Top	178	73	-10	-53	3	13		
		HUH-103-12	Top	178	72	-10	-53	3	12		
		HUH-103-13	Top	178	70	-10	-53	3	10		
		HUH-103-14	Top	178	72	-10	-53	3	12		
		HUH-104-1	Top	141	65	0	-51	3	17		
		HUH-104-2	Top	141	78	0	-51	3	30		
		HUH-104-3	Top	141	76	0	-51	3	28		
		HUH-104-4	Top	141	77	0	-51	3	29		
		HUH-104-5	Top	141	69	0	-51	3	21		
		HUH-104-6	Top	141	69	0	-51	3	21		
		HUH-104-7	Top	141	78	0	-51	3	30		
		HUH-107b	South	345	94	-10	-59	3	N/A		
		HUH-108	South	328	58	-10	-58	3	N/A		
		HUH-109	Top	185	75	0	-53	3	25		
		HUH-110	Top	186	76	0	-53	3	26		
		HUH-111	Top	187	76	0	-53	3	26		
		HUH-112	Top	188	76	0	-53	3	26		
		HUH-113	Top	188	75	0	-54	3	24		
		HUH-115	North	191	73	0	-54	3	22		
		HUH-116	North	186	70	0	-53	3	20		
		HUH-117	North	182	70	0	-53	3	20		
		HUH-118	North	178	68	0	-53	3	18		
		HUH-119	Top	426	65	-10	-61	3	N/A		
HUH-120	Top	425	71	-10	-61	3	N/A				
HHS-121	East	57	60	-10	-43	3	10				
NOV-VS1	Top	415	87	-10	-60	3	N/A				
NOV-VS2	Top	413	87	-10	-60	3	N/A				
NOV-LV-03	East	405	68	-10	-60	3	N/A				
NOV-LV-04	North	401	68	-10	-60	3	N/A				
NOV-LV-05	North	409	66	-10	-60	3	N/A				
NOV-LV-06	West	414	72	-10	-60	3	N/A				
NOV-LV-07	West	428	71	-10	-61	3	N/A				
NOV-LV-09	South	425	78	-10	-61	3	N/A				
NOV-LV-10	North	421	79	-10	-60	3	N/A				
NOV-LV-12	South	423	71	-10	-61						

Fixed Plant Noise Calculation - HUH-4-1b

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-1b											
Daytime											
HUH-4-1b	The Metropolis Residence Tower 2	HUH-4-2	North	384	76	-10	-60	3	N/A		
		HUH-7a	Top	333	100	-10	-58	3	N/A		
		HUH-7b	South	333	100	-10	-58	3	N/A		
		HUH-8a	Top	329	100	-10	-58	3	N/A		
		HUH-8b	South	329	100	-10	-58	3	N/A		
		HUH-8c	East	329	100	-10	-58	3	N/A		
		HUH-9a	Top	317	80	-10	-58	3	N/A		
		HUH-9b	South	317	82	-10	-58	3	N/A		
		HUH-9c	East	317	77	-10	-58	3	N/A		
		HUH-10a	Top	314	78	-10	-58	3	N/A		
		HUH-10b	South	314	81	-10	-58	3	N/A		
		HUH-10c	East	314	70	-10	-58	3	N/A		
		HUH-11a	Top	312	68	-10	-58	3	N/A		
		HUH-11b	South	312	70	-10	-58	3	N/A		
		HUH-12a	Top	309	66	-10	-58	3	N/A		
		HUH-12b	South	309	68	-10	-58	3	N/A		
		HUH-13a	Top	307	64	-10	-58	3	N/A		
		HUH-14-1-1	South	304	75	-10	-58	3	N/A		
		HUH-14-1-2	South	304	88	-10	-58	3	N/A		
		HUH-14-2	South	301	91	-10	-58	3	N/A		
		HUH-14-3	South	298	87	-10	-57	3	23		
		HUH-15	West	212	84	-10	-55	3	22		
		HUH-16a	Top	204	80	-10	-54	3	19		
		HUH-16b	East	204	85	-10	-54	3	24		
		HUH-17	North	197	105	-10	-54	3	44		
		HUH-18	Top	185	105	-10	-53	3	45		
		HUH-19a	Top	207	105	-10	-54	3	44		
		HUH-19b	North	207	105	-10	-54	3	44		
		HUH-20	Top	175	71	-10	-53	3	11		
		HUH-21a	Top	167	105	-10	-52	3	46		
		HUH-21b	North	167	105	-10	-52	3	46		
		HUH-22a-1	Top	163	83	-10	-52	3	24		
		HUH-22a-2	North	163	83	-10	-52	3	24		
		HUH-22b	North	163	85	-10	-52	3	26		
		HUH-26H	East	245	88	-10	-56	3	25		
		HUH-27H	East	237	81	-10	-56	3	18		
		HUH-29	East	225	70	-10	-55	3	8		
		HUH-30H	West	242	84	-10	-56	3	21		
		HUH-32H	West	237	90	-10	-56	3	27		
		HUH-33H	West	245	88	-10	-56	3	25		
		HUH-37H	East	241	90	-10	-56	3	27		
		HHS-38	South	296	64	-10	-57	3	negligible*		
		HHS-40	South	293	88	-10	-57	3	24		
		HHS-41-1	West	302	54	-10	-58	3	N/A		
		HHS-41-2	West	302	66	-10	-58	3	N/A		
		HHS-42-1	West	312	66	-10	-58	3	N/A		
		HHS-42-2	West	312	64	-10	-58	3	N/A		
		HHS-42-3	West	312	63	-10	-58	3	N/A		
		HHS-45-1	West	335	85	-10	-59	3	N/A		
		HHS-45-2	West	335	60	-10	-59	3	N/A		
		HHS-49-2	East	322	78	-10	-58	3	N/A		
		HHS-49-3	East	322	71	-10	-58	3	N/A		
		HHS-49-6	East	322	67	-10	-58	3	N/A		
		HHS-49-8	East	322	70	-10	-58	3	N/A		
		HHS-50-1	East	317	75	-10	-58	3	N/A		
		HHS-50-2	East	317	69	-10	-58	3	N/A		
		HHS-51	East	301	86	-10	-58	3	N/A		
		HHS-52-1	East	286	63	-10	-57	3	negligible*		
		HHS-53-1	East	276	68	-10	-57	3	4		
		HHS-53-2	East	276	75	-10	-57	3	11		
		HHS-53-3	East	276	59	-10	-57	3	negligible*		
		HHS-53-4	East	276	67	-10	-57	3	3		
		HHS-53-5	East	276	69	-10	-57	3	5		
		HHS-53-6	East	276	66	-10	-57	3	2		
		HHS-56	East	249	73	-10	-56	3	10		
		HHS-57-2	East	225	61	-10	-55	3	negligible*		
		HHS-58-1	East	213	68	-10	-55	3	6		
		HHS-58-2	East	213	69	-10	-55	3	7		
		HHS-62-2	East	119	69	-10	-50	3	12		
		HHS-67-1	East	53	71	-10	-42	3	22		
		HHS-67-3	East	53	73	-10	-42	3	24		
		HHS-68-1	East	31	72	-10	-38	3	27		
		HHS-68-2	East	31	71	-10	-38	3	26		
		HHS-68-3	East	31	70	-10	-38	3	25		
		HHS-70-3	East	22	59	-10	-35	3	17		
		HHS-71-1	East	29	54	-10	-37	3	10		
		HHS-71-2	East	29	56	-10	-37	3	12		
		HHS-71-3	East	29	67	-10	-37	3	23		
		HHS-73	East	80	53	-10	-46	3	negligible*		
		HHS-77-1	East	88	54	-10	-47	3	0		
		HHS-77-2	East	88	55	-10	-47	3	1		
		HHS-77-3	East	88	55	-10	-47	3	1		
		HHS-78	North	117	87	-10	-49	3	31		
		HUH-80-1	Top	419	103	-10	-60	3	N/A		
		HUH-80-2	Top	415	103	-10	-60	3	N/A		
		HUH-80-3	Top	410	103	-10	-60	3	N/A		
		HUH-81	Top	389	99	-10	-60	3	N/A		
		HUH-82-1	South	190	76	-10	-54	3	15		
		HUH-82-6	South	190	88	-10	-54	3	27		
		HHS-84	East	161	72	-10	-52	3	13		
		HUH-85b	North	175	87	-10	-53	3	27		
		HUH-86-4	North	149	67	-10	-51	3	9		
		HUH-86-13	North	149	72	-10	-51	3	14		
		HHS-87-2	East	249	75	-10	-56	3	12		
		HHS-88-2	East	317	58	-10	-58	3	N/A		
		HUH-95b	South	321	92	-10	-58	3	N/A		
		HHS-100-2	Top	296	62	-10	-57	3	negligible*		
		HHS-101-1	Top	287	76	-10	-57	3	12		
		HHS-102-1	Top	263	69	-10	-56	3	6		
		HHS-102-2	Top	263	71	-10	-56	3	8		
		HHS-102-3	Top	263	75	-10	-56	3	12		
		HHS-102-6	Top	263	71	-10	-56	3	8		
		HHS-102-7	Top	263	73	-10	-56	3	10		
		HHS-102-9	Top	263	71	-10	-56	3	8		
		HHS-102-11	Top	263	72	-10	-56	3	9		
		HUH-103-1	Top	215	70	-10	-55	3	8		
		HUH-103-2	Top	215	81	-10	-55	3	19		
		HUH-103-3	Top	215	76	-10	-55	3	14		
		HUH-103-4	Top	215	75	-10	-55	3	13		
		HUH-103-5	Top	215	74	-10	-55	3	12		
		HUH-103-6	Top	215	71	-10	-55	3	9		
		HUH-103-7	Top	215	74	-10	-55	3	12		
		HUH-103-8	Top	215	72	-10	-55	3	10		
		HUH-103-9	Top	215	73	-10	-55	3	11		
		HUH-103-10	Top	215	72	-10	-55	3	10		
		HUH-103-11	Top	215	73	-10	-55	3	11		
		HUH-103-12	Top	215	72	-10	-55	3	10		
		HUH-103-13	Top	215	70	-10	-55	3	8		
		HUH-103-14	Top	215	72	-10	-55	3	10		
		HUH-104-1	Top	181	65	-10	-53	3	5		
		HUH-104-2	Top	181	78	-10	-53	3	18		
		HUH-104-3	Top	181	76	-10	-53	3	16		
		HUH-104-4	Top	181	77	-10	-53	3	17		
		HUH-104-5	Top	181	69	-10	-53	3	9		
		HUH-104-6	Top	181	69	-10	-53	3	9		
		HUH-104-7	Top	181	78	-10	-53	3	18		
		HUH-107b	South	328	94	-10	-58	3	N/A		
		HUH-108	South	307	58	-10	-58	3	N/A		
		HUH-109	Top	224	75	-10	-55	3	13		
		HUH-110	Top	225	76	-10	-55	3	14		
		HUH-111	Top	226	76	-10	-55	3	14		
		HUH-112	Top	227	76	-10	-55	3	14		
		HUH-113	Top	228	75	-10	-55	3	13		
		HUH-115	North	227	73	-10	-55	3	11		
		HUH-116	North	222	70	-10	-55	3	8		
		HUH-117	North	219	70	-10	-55	3	8		
		HUH-118	North	215	68	-10	-55	3	6		
HUH-119	Top	414	65	-10	-60	3	N/A				
HUH-120	Top	412	71	-10	-60	3	N/A				
HHS-121	East	84	60	-10	-46	3	7				
NOV-VS1	Top	396	97	-10	-60	3	N/A				
NOV-VS2	Top	392	97	-10	-60	3	N/A				
NOV-LV-03	East	384	68	-10	-60	3	N/A				
NOV-LV-04	North	381	68	-10	-60	3	N/A				
NOV-LV-05	North	391	66	-10	-60	3	N/A				
NOV-LV-06	West	395	72	-10	-60	3	N/A				
NOV-LV-07	West	409	71	-10	-60	3	N/A				
NOV-LV-09	South	405	78	-10	-60	3	N/A				
NOV-LV-10	North	401	79	-10	-60	3	N/A				
NOV-LV-12	South										

Fixed Plant Noise Calculation - HUH-4-1b

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-1b											
Night-time											
HUH-4-1b	The Metropolis Residence Tower 2	HUH-4-2	North	384	76	-10	-60	3	N/A		
		HUH-7a	Top	333	90	-10	-58	3	N/A		
		HUH-7b	South	333	90	-10	-58	3	N/A		
		HUH-8a	Top	329	90	-10	-58	3	N/A		
		HUH-8b	South	329	90	-10	-58	3	N/A		
		HUH-8c	East	329	90	-10	-58	3	N/A		
		HUH-9a	Top	317	80	-10	-58	3	N/A		
		HUH-9b	South	317	82	-10	-58	3	N/A		
		HUH-9c	East	317	77	-10	-58	3	N/A		
		HUH-10a	Top	314	78	-10	-58	3	N/A		
		HUH-10b	South	314	81	-10	-58	3	N/A		
		HUH-10c	East	314	70	-10	-58	3	N/A		
		HUH-11a	Top	312	68	-10	-58	3	N/A		
		HUH-11b	South	312	70	-10	-58	3	N/A		
		HUH-12a	Top	309	66	-10	-58	3	N/A		
		HUH-12b	South	309	68	-10	-58	3	N/A		
		HUH-13a	Top	307	64	-10	-58	3	N/A		
		HUH-14-1-1	South	304	75	-10	-58	3	N/A		
		HUH-14-1-2	South	304	88	-10	-58	3	N/A		
		HUH-14-2	South	301	91	-10	-58	3	N/A		
		HUH-14-3	South	298	87	-10	-57	3	23		
		HUH-15	West	212	84	-10	-55	3	22		
		HUH-16a	Top	204	80	-10	-54	3	19		
		HUH-16b	East	204	85	-10	-54	3	24		
		HUH-17	North	197	95	-10	-54	3	34		
		HUH-18	Top	185	95	-10	-53	3	35		
		HUH-19a	Top	207	95	-10	-54	3	34		
		HUH-19b	North	207	95	-10	-54	3	34		
		HUH-20	Top	175	71	-10	-53	3	11		
		HUH-21a	Top	167	95	-10	-52	3	36		
		HUH-21b	North	167	95	-10	-52	3	36		
		HUH-22a-1	Top	163	83	-10	-52	3	24		
		HUH-22a-2	North	163	83	-10	-52	3	24		
		HUH-22b	North	163	85	-10	-52	3	26		
		HUH-26H	East	245	88	-10	-56	3	25		
		HUH-27H	East	237	81	-10	-56	3	18		
		HUH-29	East	225	70	-10	-55	3	8		
		HUH-30H	West	242	84	-10	-56	3	21		
		HUH-32H	West	237	90	-10	-56	3	27		
		HUH-33H	West	245	88	-10	-56	3	25		
		HUH-37H	East	241	90	-10	-56	3	27		
		HHS-38	South	296	64	-10	-57	3	negligible*		
		HHS-40	South	293	-	-10	-57	3	-		
		HHS-41-1	West	302	54	-10	-58	3	N/A		
		HHS-41-2	West	302	66	-10	-58	3	N/A		
		HHS-42-1	West	312	66	-10	-58	3	N/A		
		HHS-42-2	West	312	64	-10	-58	3	N/A		
		HHS-42-3	West	312	63	-10	-58	3	N/A		
		HHS-45-1	West	335	85	-10	-59	3	N/A		
		HHS-45-2	West	335	60	-10	-59	3	N/A		
		HHS-49-2	East	322	78	-10	-58	3	N/A		
		HHS-49-3	East	322	71	-10	-58	3	N/A		
		HHS-49-6	East	322	67	-10	-58	3	N/A		
		HHS-49-8	East	322	70	-10	-58	3	N/A		
		HHS-50-1	East	317	75	-10	-58	3	N/A		
		HHS-50-2	East	317	69	-10	-58	3	N/A		
		HHS-51	East	301	85	-10	-58	3	N/A		
		HHS-52-1	East	286	63	-10	-57	3	negligible*		
		HHS-53-1	East	276	68	-10	-57	3	4		
		HHS-53-2	East	276	75	-10	-57	3	11		
		HHS-53-3	East	276	59	-10	-57	3	negligible*		
		HHS-53-4	East	276	67	-10	-57	3	3		
		HHS-53-5	East	276	69	-10	-57	3	5		
		HHS-53-6	East	276	66	-10	-57	3	2		
		HHS-56	East	249	73	-10	-56	3	10		
		HHS-57-2	East	225	61	-10	-55	3	negligible*		
		HHS-58-1	East	213	68	-10	-55	3	6		
		HHS-58-2	East	213	69	-10	-55	3	7		
		HHS-62-2	East	119	69	-10	-50	3	12		
		HHS-67-1	East	53	71	-10	-42	3	22		
		HHS-67-3	East	53	73	-10	-42	3	24		
		HHS-68-1	East	31	72	-10	-38	3	27		
		HHS-68-2	East	31	71	-10	-38	3	26		
		HHS-68-3	East	31	70	-10	-38	3	25		
		HHS-70-3	East	22	59	-10	-35	3	17		
		HHS-71-1	East	29	54	-10	-37	3	10		
		HHS-71-2	East	29	56	-10	-37	3	12		
		HHS-71-3	East	29	67	-10	-37	3	23		
		HHS-73	East	80	53	-10	-46	3	negligible*		
		HHS-77-1	East	88	54	-10	-47	3	0		
		HHS-77-2	East	88	55	-10	-47	3	1		
		HHS-77-3	East	88	55	-10	-47	3	1		
		HHS-78	North	117	79	-10	-49	3	23		
		HUH-80-1	Top	419	103	-10	-60	3	N/A		
		HUH-80-2	Top	415	103	-10	-60	3	N/A		
		HUH-80-3	Top	410	103	-10	-60	3	N/A		
		HUH-81	Top	389	99	-10	-60	3	N/A		
		HUH-82-1	South	190	76	-10	-54	3	15		
		HUH-82-6	South	190	88	-10	-54	3	27		
		HHS-84	East	161	72	-10	-52	3	13		
		HUH-85b	North	175	87	-10	-53	3	27		
		HUH-86-4	North	149	67	-10	-51	3	9		
		HUH-86-13	North	149	72	-10	-51	3	14		
		HHS-87-2	East	249	75	-10	-56	3	12		
		HHS-88-2	East	317	58	-10	-58	3	N/A		
		HUH-95b	South	321	92	-10	-58	3	N/A		
		HHS-100-2	Top	296	62	-10	-57	3	negligible*		
		HHS-101-1	Top	287	76	-10	-57	3	12		
		HHS-102-1	Top	263	69	-10	-56	3	6		
		HHS-102-2	Top	263	71	-10	-56	3	8		
		HHS-102-3	Top	263	75	-10	-56	3	12		
		HHS-102-6	Top	263	71	-10	-56	3	8		
		HHS-102-7	Top	263	73	-10	-56	3	10		
		HHS-102-9	Top	263	71	-10	-56	3	8		
		HHS-102-11	Top	263	72	-10	-56	3	9		
		HUH-103-1	Top	215	70	-10	-55	3	8		
		HUH-103-2	Top	215	81	-10	-55	3	19		
		HUH-103-3	Top	215	76	-10	-55	3	14		
		HUH-103-4	Top	215	75	-10	-55	3	13		
		HUH-103-5	Top	215	74	-10	-55	3	12		
		HUH-103-6	Top	215	71	-10	-55	3	9		
		HUH-103-7	Top	215	74	-10	-55	3	12		
		HUH-103-8	Top	215	72	-10	-55	3	10		
		HUH-103-9	Top	215	73	-10	-55	3	11		
		HUH-103-10	Top	215	72	-10	-55	3	10		
		HUH-103-11	Top	215	73	-10	-55	3	11		
		HUH-103-12	Top	215	72	-10	-55	3	10		
		HUH-103-13	Top	215	70	-10	-55	3	8		
		HUH-103-14	Top	215	72	-10	-55	3	10		
		HUH-104-1	Top	181	65	-10	-53	3	5		
		HUH-104-2	Top	181	78	-10	-53	3	18		
		HUH-104-3	Top	181	76	-10	-53	3	16		
		HUH-104-4	Top	181	77	-10	-53	3	17		
		HUH-104-5	Top	181	69	-10	-53	3	9		
		HUH-104-6	Top	181	69	-10	-53	3	9		
		HUH-104-7	Top	181	78	-10	-53	3	18		
		HUH-107b	South	328	94	-10	-58	3	N/A		
		HUH-108	South	307	58	-10	-58	3	N/A		
		HUH-109	Top	224	75	-10	-55	3	13		
		HUH-110	Top	225	76	-10	-55	3	14		
		HUH-111	Top	226	76	-10	-55	3	14		
		HUH-112	Top	227	76	-10	-55	3	14		
		HUH-113	Top	228	75	-10	-55	3	13		
		HUH-115	North	227	73	-10	-55	3	11		
		HUH-116	North	222	70	-10	-55	3	8		
		HUH-117	North	219	70	-10	-55	3	8		
		HUH-118	North	215	68	-10	-55	3	6		
HUH-119	Top	414	65	-10	-60	3	N/A				
HUH-120	Top	412	71	-10	-60	3	N/A				
HHS-121	East	84	60	-10	-46	3	7				
NOV-VS1	Top	396	87	-10	-60	3	N/A				
NOV-VS2	Top	392	87	-10	-60	3	N/A				
NOV-LV-03	East	384	68	-10	-60	3	N/A				
NOV-LV-04	North	381	68	-10	-60	3	N/A				
NOV-LV-05	North	391	66	-10	-60	3	N/A				
NOV-LV-06	West	395	72	-10	-60	3	N/A				
NOV-LV-07	West	409	71	-10	-60	3	N/A				
NOV-LV-09	South	405	78	-10	-60	3	N/A				
NOV-LV-10	North	401	79	-10	-60	3	N/A	</			

Fixed Plant Noise Calculation - HUH-4-2a

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-2a											
Daytime											
HUH-4-2a	The Metropolis Residence Tower 1	HUH-4-2	North	287	76	0	-57	3	22		
		HUH-7a	Top	229	100	0	-55	3	48		
		HUH-7b	South	229	100	-10	-55	3	38		
		HUH-8a	Top	224	100	0	-55	3	48		
		HUH-8b	South	224	100	-10	-55	3	38		
		HUH-8c	East	224	100	0	-55	3	48		
		HUH-9a	Top	207	80	0	-54	3	29		
		HUH-9b	South	207	82	-10	-54	3	21		
		HUH-9c	East	207	77	0	-54	3	26		
		HUH-10a	Top	203	78	0	-54	3	27		
		HUH-10b	South	203	81	-10	-54	3	20		
		HUH-10c	East	203	70	0	-54	3	19		
		HUH-11a	Top	200	68	0	-54	3	17		
		HUH-11b	South	200	70	-10	-54	3	9		
		HUH-12a	Top	197	66	0	-54	3	15		
		HUH-12b	South	197	68	-10	-54	3	7		
		HUH-13a	Top	193	64	0	-54	3	13		
		HUH-14-1-1	South	192	75	-10	-54	3	14		
		HUH-14-1-2	South	192	88	-10	-54	3	27		
		HUH-14-2	South	189	91	-10	-54	3	30		
		HUH-14-3	South	185	87	-10	-53	3	27		
		HUH-15	West	283	84	-10	-57	3	20		
		HUH-16a	Top	280	80	-10	-57	3	16		
		HUH-16b	East	280	85	-10	-57	3	21		
		HUH-17	North	272	105	-10	-57	3	41		
		HUH-18	Top	264	105	-10	-56	3	42		
		HUH-19a	Top	293	105	-10	-57	3	41		
		HUH-19b	North	293	105	-10	-57	3	41		
		HUH-20	Top	256	71	-10	-56	3	8		
		HUH-21a	Top	252	105	-10	-56	3	42		
		HUH-21b	North	252	105	-10	-56	3	42		
		HUH-22a-1	Top	248	83	-10	-56	3	20		
		HUH-22a-2	North	248	83	-10	-56	3	20		
		HUH-22b	North	248	85	-10	-56	3	22		
		HUH-26H	East	331	88	-10	-58	3	N/A		
		HUH-27H	East	323	81	-10	-58	3	N/A		
		HUH-29	East	308	70	-10	-58	3	N/A		
		HUH-30H	West	324	84	-10	-58	3	N/A		
		HUH-32H	West	319	90	-10	-58	3	N/A		
		HUH-33H	West	327	88	-10	-58	3	N/A		
		HUH-37H	East	327	90	-10	-58	3	N/A		
		HHS-38	South	181	64	-10	-53	3	4		
		HHS-40	South	177	88	-10	-53	3	28		
		HHS-41-1	West	186	54	-10	-53	3	negligible*		
		HHS-41-2	West	186	66	-10	-53	3	6		
		HHS-42-1	West	196	66	-10	-54	3	5		
		HHS-42-2	West	196	64	-10	-54	3	3		
		HHS-42-3	West	196	63	-10	-54	3	2		
		HHS-45-1	West	219	85	-10	-55	3	23		
		HHS-45-2	West	219	60	-10	-55	3	negligible*		
		HHS-49-2	East	206	78	-10	-54	3	17		
		HHS-49-3	East	206	71	-10	-54	3	10		
		HHS-49-6	East	206	67	-10	-54	3	6		
		HHS-49-8	East	206	70	-10	-54	3	9		
		HHS-50-1	East	201	75	-10	-54	3	14		
		HHS-50-2	East	201	69	-10	-54	3	8		
		HHS-51	East	186	86	-10	-53	3	26		
		HHS-52-1	East	173	63	-10	-53	3	3		
		HHS-53-1	East	164	68	-10	-52	3	9		
		HHS-53-2	East	164	75	-10	-52	3	16		
		HHS-53-3	East	164	59	-10	-52	3	negligible*		
		HHS-53-4	East	164	67	-10	-52	3	8		
		HHS-53-5	East	164	69	-10	-52	3	10		
		HHS-53-6	East	164	66	-10	-52	3	7		
		HHS-56	East	141	73	-10	-51	3	15		
		HHS-57-2	East	120	61	-10	-50	3	4		
		HHS-58-1	East	109	68	-10	-49	3	12		
		HHS-58-2	East	109	69	-10	-49	3	13		
		HHS-62-2	East	46	69	-10	-41	3	21		
		HHS-67-1	East	80	71	-10	-46	3	18		
		HHS-67-3	East	80	73	-10	-46	3	20		
		HHS-68-1	East	102	72	-10	-48	3	17		
		HHS-68-2	East	102	71	-10	-48	3	16		
		HHS-68-3	East	102	70	-10	-48	3	15		
		HHS-70-3	East	127	59	-10	-50	3	2		
		HHS-71-1	East	140	54	-10	-51	3	negligible*		
		HHS-71-2	East	140	56	-10	-51	3	negligible*		
		HHS-71-3	East	140	67	-10	-51	3	9		
		HHS-73	East	196	53	-10	-54	3	negligible*		
		HHS-77-1	East	203	54	-10	-54	3	negligible*		
		HHS-77-2	East	203	55	-10	-54	3	negligible*		
		HHS-77-3	East	203	55	-10	-54	3	negligible*		
		HHS-78	North	227	87	-10	-55	3	25		
		HUH-80-1	Top	319	103	0	-58	3	N/A		
		HUH-80-2	Top	315	103	0	-58	3	N/A		
		HUH-80-3	Top	311	103	0	-58	3	N/A		
		HUH-81	Top	292	99	0	-57	3	45		
		HUH-82-1	South	132	76	0	-50	3	29		
		HUH-82-6	South	132	88	0	-50	3	41		
		HHS-84	East	65	72	-10	-44	3	21		
		HUH-85b	North	260	87	-10	-56	3	24		
		HUH-86-4	North	196	67	-10	-54	3	6		
		HUH-86-13	North	196	72	-10	-54	3	11		
		HHS-87-2	East	141	75	-10	-51	3	17		
		HHS-88-2	East	201	58	-10	-54	3	negligible*		
		HUH-95b	South	216	92	-10	-55	3	30		
		HHS-100-2	Top	181	62	-10	-53	3	2		
		HHS-101-1	Top	172	76	-10	-53	3	16		
		HHS-102-1	Top	153	69	-10	-52	3	10		
		HHS-102-2	Top	153	71	-10	-52	3	12		
		HHS-102-3	Top	153	75	-10	-52	3	16		
		HHS-102-6	Top	153	71	-10	-52	3	12		
		HHS-102-7	Top	153	73	-10	-52	3	14		
		HHS-102-9	Top	153	71	-10	-52	3	12		
		HHS-102-11	Top	153	72	-10	-52	3	13		
		HUH-103-1	Top	280	70	-10	-57	3	6		
		HUH-103-2	Top	280	81	-10	-57	3	17		
		HUH-103-3	Top	280	76	-10	-57	3	12		
		HUH-103-4	Top	280	75	-10	-57	3	11		
		HUH-103-5	Top	280	74	-10	-57	3	10		
		HUH-103-6	Top	280	71	-10	-57	3	7		
		HUH-103-7	Top	280	74	-10	-57	3	10		
		HUH-103-8	Top	280	72	-10	-57	3	8		
		HUH-103-9	Top	280	73	-10	-57	3	9		
		HUH-103-10	Top	280	72	-10	-57	3	8		
		HUH-103-11	Top	280	73	-10	-57	3	9		
		HUH-103-12	Top	280	72	-10	-57	3	8		
		HUH-103-13	Top	280	70	-10	-57	3	6		
		HUH-103-14	Top	280	72	-10	-57	3	8		
		HUH-104-1	Top	265	65	-10	-56	3	2		
		HUH-104-2	Top	265	78	-10	-56	3	15		
		HUH-104-3	Top	265	76	-10	-56	3	13		
		HUH-104-4	Top	265	77	-10	-56	3	14		
		HUH-104-5	Top	265	69	-10	-56	3	6		
		HUH-104-6	Top	265	69	-10	-56	3	6		
HUH-104-7	Top	265	78	-10	-56	3	15				
HUH-107b	South	223	94	-10	-55	3	32				
HUH-108	South	196	58	-10	-54	3	negligible*				
HUH-109	Top	307	75	0	-58	3	N/A				
HUH-110	Top	307	76	0	-58	3	N/A				
HUH-111	Top	308	76	0	-58	3	N/A				
HUH-112	Top	308	76	0	-58	3	N/A				
HUH-113	Top	308	75	0	-58	3	N/A				
HUH-115	North	289	73	0	-57	3	19				
HUH-116	North	286	70	0	-57	3	16				
HUH-117	North	283	70	0	-57	3	16				
HUH-118	North	280	68	0	-57	3	14				
HUH-119	Top	317	65	-10	-58	3	N/A				
HUH-120	Top	314	71	-10	-58	3	N/A				
HHS-121	East	199	60	-10	-54	3	negligible*				
NOV-VS1	Top	286	97	0	-57	3	43				
NOV-VS2	Top	281	97	0	-57	3	43				
NOV-LV-03	East	272	68	0	-57	3	14				
NOV-LV-04	North	269	68	0	-57	3	14				
NOV-LV-05	North	282	66	0	-57	3	12				
NOV-LV-06	West	287	72	-10	-57	3	8				
NOV-LV-07	West	300	71	-10	-58	3	N/A				
NOV-LV-09	South	294	78	-10	-57	3	14				
NOV-LV-10	North	290	79	0	-57	3	25				
NOV-LV-12	South	291	71	-10	-57	3	7				
NOV-LV-13	South-East	283	67	0	-57	3	13				
NOV-LV-19	South	284	68	-10	-57	3	4				
NOV-LV-22	South	296	78	-10	-57	3	14				
NOV-LV-24	East	274	65	0	-57	3	11				
NOV-LV-26	North	268	69	0	-57	3	15				
										56	65

Fixed Plant Noise Calculation - HUH-4-2a

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-2a											
Night-time											
HUH-4-2a	The Metropolis Residence Tower 1	HUH-4-2	North	287	76	0	-57	3	22		
		HUH-7a	Top	229	90	0	-55	3	38		
		HUH-7b	South	229	90	-10	-55	3	28		
		HUH-8a	Top	224	90	0	-55	3	38		
		HUH-8b	South	224	90	-10	-55	3	28		
		HUH-8c	East	224	90	0	-55	3	38		
		HUH-9a	Top	207	80	0	-54	3	29		
		HUH-9b	South	207	82	-10	-54	3	21		
		HUH-9c	East	207	77	0	-54	3	26		
		HUH-10a	Top	203	78	0	-54	3	27		
		HUH-10b	South	203	81	-10	-54	3	20		
		HUH-10c	East	203	70	0	-54	3	19		
		HUH-11a	Top	200	68	0	-54	3	17		
		HUH-11b	South	200	70	-10	-54	3	9		
		HUH-12a	Top	197	66	0	-54	3	15		
		HUH-12b	South	197	68	-10	-54	3	7		
		HUH-13a	Top	193	64	0	-54	3	13		
		HUH-14-1-1	South	192	75	-10	-54	3	14		
		HUH-14-1-2	South	192	88	-10	-54	3	27		
		HUH-14-2	South	189	91	-10	-54	3	30		
		HUH-14-3	South	185	87	-10	-53	3	27		
		HUH-15	West	283	84	-10	-57	3	20		
		HUH-16a	Top	280	80	-10	-57	3	16		
		HUH-16b	East	280	85	-10	-57	3	21		
		HUH-17	North	272	95	-10	-57	3	31		
		HUH-18	Top	264	95	-10	-56	3	32		
		HUH-19a	Top	293	95	-10	-57	3	31		
		HUH-19b	North	293	95	-10	-57	3	31		
		HUH-20	Top	256	71	-10	-56	3	8		
		HUH-21a	Top	252	95	-10	-56	3	32		
		HUH-21b	North	252	95	-10	-56	3	32		
		HUH-22a-1	Top	248	83	-10	-56	3	20		
		HUH-22a-2	North	248	83	-10	-56	3	20		
		HUH-22b	North	248	85	-10	-56	3	22		
		HUH-26H	East	331	88	-10	-58	3	N/A		
		HUH-27H	East	323	81	-10	-58	3	N/A		
		HUH-29	East	308	70	-10	-58	3	N/A		
		HUH-30H	West	324	84	-10	-58	3	N/A		
		HUH-32H	West	319	90	-10	-58	3	N/A		
		HUH-33H	West	327	88	-10	-58	3	N/A		
		HUH-37H	East	327	90	-10	-58	3	N/A		
		HHS-38	South	181	64	-10	-53	3	4		
		HHS-40	South	177	-	-10	-53	3	-		
		HHS-41-1	West	186	54	-10	-53	3	negligible*		
		HHS-41-2	West	186	66	-10	-53	3	6		
		HHS-42-1	West	196	66	-10	-54	3	5		
		HHS-42-2	West	196	64	-10	-54	3	3		
		HHS-42-3	West	196	63	-10	-54	3	2		
		HHS-45-1	West	219	85	-10	-55	3	23		
		HHS-45-2	West	219	60	-10	-55	3	negligible*		
		HHS-49-2	East	206	78	-10	-54	3	17		
		HHS-49-3	East	206	71	-10	-54	3	10		
		HHS-49-6	East	206	67	-10	-54	3	6		
		HHS-49-8	East	206	70	-10	-54	3	9		
		HHS-50-1	East	201	75	-10	-54	3	14		
		HHS-50-2	East	201	69	-10	-54	3	8		
		HHS-51	East	186	85	-10	-53	3	25		
		HHS-52-1	East	173	63	-10	-53	3	3		
		HHS-53-1	East	164	68	-10	-52	3	9		
		HHS-53-2	East	164	75	-10	-52	3	16		
		HHS-53-3	East	164	59	-10	-52	3	negligible*		
		HHS-53-4	East	164	67	-10	-52	3	8		
		HHS-53-5	East	164	69	-10	-52	3	10		
		HHS-53-6	East	164	66	-10	-52	3	7		
		HHS-56	East	141	73	-10	-51	3	15		
		HHS-57-2	East	120	61	-10	-50	3	4		
		HHS-58-1	East	109	68	-10	-49	3	12		
		HHS-58-2	East	109	69	-10	-49	3	13		
		HHS-62-2	East	46	69	-10	-41	3	21		
		HHS-67-1	East	80	71	-10	-46	3	18		
		HHS-67-3	East	80	73	-10	-46	3	20		
		HHS-68-1	East	102	72	-10	-48	3	17		
		HHS-68-2	East	102	71	-10	-48	3	16		
		HHS-68-3	East	102	70	-10	-48	3	15		
		HHS-70-3	East	127	59	-10	-50	3	2		
		HHS-71-1	East	140	54	-10	-51	3	negligible*		
		HHS-71-2	East	140	56	-10	-51	3	negligible*		
		HHS-71-3	East	140	67	-10	-51	3	9		
		HHS-73	East	196	53	-10	-54	3	negligible*		
		HHS-77-1	East	203	54	-10	-54	3	negligible*		
		HHS-77-2	East	203	55	-10	-54	3	negligible*		
		HHS-77-3	East	203	55	-10	-54	3	negligible*		
		HHS-78	North	227	79	-10	-55	3	17		
		HUH-80-1	Top	319	103	0	-58	3	N/A		
		HUH-80-2	Top	315	103	0	-58	3	N/A		
		HUH-80-3	Top	311	103	0	-58	3	N/A		
		HUH-81	Top	292	99	0	-57	3	45		
		HUH-82-1	South	132	76	0	-50	3	29		
		HUH-82-6	South	132	88	0	-50	3	41		
		HHS-84	East	65	72	-10	-44	3	21		
		HUH-85b	North	260	87	-10	-56	3	24		
		HUH-86-4	North	196	67	-10	-54	3	6		
		HUH-86-13	North	196	72	-10	-54	3	11		
		HHS-87-2	East	141	75	-10	-51	3	17		
		HHS-88-2	East	201	58	-10	-54	3	negligible*		
		HUH-95b	South	216	92	-10	-55	3	30		
		HHS-100-2	Top	181	62	-10	-53	3	2		
		HHS-101-1	Top	172	76	-10	-53	3	16		
		HHS-102-1	Top	153	69	-10	-52	3	10		
		HHS-102-2	Top	153	71	-10	-52	3	12		
		HHS-102-3	Top	153	75	-10	-52	3	16		
		HHS-102-6	Top	153	71	-10	-52	3	12		
		HHS-102-7	Top	153	73	-10	-52	3	14		
		HHS-102-9	Top	153	71	-10	-52	3	12		
		HHS-102-11	Top	153	72	-10	-52	3	13		
		HUH-103-1	Top	280	70	-10	-57	3	6		
		HUH-103-2	Top	280	81	-10	-57	3	17		
		HUH-103-3	Top	280	76	-10	-57	3	12		
		HUH-103-4	Top	280	75	-10	-57	3	11		
		HUH-103-5	Top	280	74	-10	-57	3	10		
		HUH-103-6	Top	280	71	-10	-57	3	7		
		HUH-103-7	Top	280	74	-10	-57	3	10		
		HUH-103-8	Top	280	72	-10	-57	3	8		
		HUH-103-9	Top	280	73	-10	-57	3	9		
		HUH-103-10	Top	280	72	-10	-57	3	8		
		HUH-103-11	Top	280	73	-10	-57	3	9		
		HUH-103-12	Top	280	72	-10	-57	3	8		
		HUH-103-13	Top	280	70	-10	-57	3	6		
		HUH-103-14	Top	280	72	-10	-57	3	8		
		HUH-104-1	Top	265	65	-10	-56	3	2		
		HUH-104-2	Top	265	78	-10	-56	3	15		
		HUH-104-3	Top	265	76	-10	-56	3	13		
		HUH-104-4	Top	265	77	-10	-56	3	14		
		HUH-104-5	Top	265	69	-10	-56	3	6		
		HUH-104-6	Top	265	69	-10	-56	3	6		
		HUH-104-7	Top	265	78	-10	-56	3	15		
		HUH-107b	South	223	94	-10	-55	3	32		
		HUH-108	South	196	58	-10	-54	3	negligible*		
		HUH-109	Top	307	75	0	-58	3	N/A		
		HUH-110	Top	307	76	0	-58	3	N/A		
		HUH-111	Top	308	76	0	-58	3	N/A		
		HUH-112	Top	308	76	0	-58	3	N/A		
		HUH-113	Top	308	75	0	-58	3	N/A		
		HUH-115	North	289	73	0	-57	3	19		
		HUH-116	North	286	70	0	-57	3	16		
		HUH-117	North	283	70	0	-57	3	16		
		HUH-118	North	280	68	0	-57	3	14		
HUH-119	Top	317	65	-10	-58	3	N/A				
HUH-120	Top	314	71	-10	-58	3	N/A				
HHS-121	East	199	60	-10	-54	3	negligible*				
NOV-VS1	Top	286	87	0	-57	3	33				
NOV-VS2	Top	281	87	0	-57	3	33				
NOV-LV-03	East	272	68	0	-57	3	14				
NOV-LV-04	North	269	68	0	-57	3	14				
NOV-LV-05	North	282	66	0	-57	3	12				
NOV-LV-06	West	287	72	-10	-57	3	8				
NOV-LV-07	West	300	71	-10	-58	3	N/A				
NOV-LV-09	South	294	78	-10	-57	3	14				
NOV-LV-10	North	290	79	0	-57						



Fixed Plant Noise Calculation - HUH-4-2b

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-2b											
Daytime											
HUH-4-2b	The Metropolis Residence Tower 1	HUH-4-2	North	326	76	-10	-58	3	N/A		
		HUH-7a	Top	269	100	-10	-57	3	36		
		HUH-7b	South	269	100	-10	-57	3	36		
		HUH-8a	Top	264	100	-10	-56	3	37		
		HUH-8b	South	264	100	-10	-56	3	37		
		HUH-8c	East	264	100	-10	-56	3	37		
		HUH-9a	Top	248	80	-10	-56	3	17		
		HUH-9b	South	248	82	-10	-56	3	19		
		HUH-9c	East	248	77	-10	-56	3	14		
		HUH-10a	Top	244	78	-10	-56	3	15		
		HUH-10b	South	244	81	-10	-56	3	18		
		HUH-10c	East	244	70	-10	-56	3	7		
		HUH-11a	Top	240	68	-10	-56	3	5		
		HUH-11b	South	240	70	-10	-56	3	7		
		HUH-12a	Top	237	66	-10	-55	3	4		
		HUH-12b	South	237	68	-10	-55	3	6		
		HUH-13a	Top	233	64	-10	-55	3	2		
		HUH-14-1-1	South	232	75	-10	-55	3	13		
		HUH-14-1-2	South	232	88	-10	-55	3	26		
		HUH-14-2	South	229	91	-10	-55	3	29		
		HUH-14-3	South	225	87	-10	-55	3	25		
		HUH-15	West	270	84	-10	-57	3	20		
		HUH-16a	Top	265	80	-10	-56	3	17		
		HUH-16b	East	265	85	-10	-56	3	22		
		HUH-17	North	257	105	-10	-56	3	42		
		HUH-18	Top	247	105	-10	-56	3	42		
		HUH-19a	Top	274	105	-10	-57	3	41		
		HUH-19b	North	274	105	-10	-57	3	41		
		HUH-20	Top	238	71	-10	-56	3	8		
		HUH-21a	Top	233	105	-10	-55	3	43		
		HUH-21b	North	233	105	-10	-55	3	43		
		HUH-22a-1	Top	229	83	-10	-55	3	21		
		HUH-22a-2	North	229	83	-10	-55	3	21		
		HUH-22b	North	229	85	-10	-55	3	23		
		HUH-26H	East	313	88	-10	-58	3	N/A		
		HUH-27H	East	305	81	-10	-58	3	N/A		
		HUH-29	East	291	70	-10	-57	3	6		
		HUH-30H	West	307	84	-10	-58	3	N/A		
		HUH-32H	West	302	90	-10	-58	3	N/A		
		HUH-33H	West	310	88	-10	-58	3	N/A		
		HUH-37H	East	308	90	-10	-58	3	N/A		
		HHS-38	South	220	64	-10	-55	3	2		
		HHS-40	South	216	88	-10	-55	3	26		
		HHS-41-1	West	224	54	-10	-55	3	negligible*		
		HHS-41-2	West	224	66	-10	-55	3	4		
		HHS-42-1	West	234	66	-10	-55	3	4		
		HHS-42-2	West	234	64	-10	-55	3	2		
		HHS-42-3	West	234	63	-10	-55	3	1		
		HHS-45-1	West	257	85	-10	-56	3	22		
		HHS-45-2	West	257	60	-10	-56	3	negligible*		
		HHS-49-2	East	242	78	-10	-56	3	15		
		HHS-49-3	East	242	71	-10	-56	3	8		
		HHS-49-6	East	242	67	-10	-56	3	4		
		HHS-49-8	East	242	70	-10	-56	3	7		
		HHS-50-1	East	236	75	-10	-55	3	13		
		HHS-50-2	East	236	69	-10	-55	3	7		
		HHS-51	East	220	86	-10	-55	3	24		
		HHS-52-1	East	205	63	-10	-54	3	2		
		HHS-53-1	East	195	68	-10	-54	3	7		
		HHS-53-2	East	195	75	-10	-54	3	14		
		HHS-53-3	East	195	59	-10	-54	3	negligible*		
		HHS-53-4	East	195	67	-10	-54	3	6		
		HHS-53-5	East	195	69	-10	-54	3	8		
		HHS-53-6	East	195	66	-10	-54	3	5		
		HHS-56	East	168	73	-10	-52	3	14		
		HHS-57-2	East	144	61	-10	-51	3	3		
		HHS-58-1	East	133	68	-10	-50	3	11		
		HHS-58-2	East	133	69	-10	-50	3	12		
		HHS-62-2	East	42	69	-10	-40	3	22		
		HHS-67-1	East	40	71	-10	-40	3	24		
		HHS-67-3	East	40	73	-10	-40	3	26		
		HHS-68-1	East	63	72	-10	-44	3	21		
		HHS-68-2	East	63	71	-10	-44	3	20		
		HHS-68-3	East	63	70	-10	-44	3	19		
		HHS-70-3	East	89	59	-10	-47	3	5		
		HHS-71-1	East	102	54	-10	-48	3	negligible*		
		HHS-71-2	East	102	56	-10	-48	3	1		
		HHS-71-3	East	102	67	-10	-48	3	12		
		HHS-73	East	162	53	-10	-52	3	negligible*		
		HHS-77-1	East	169	54	-10	-53	3	negligible*		
		HHS-77-2	East	169	55	-10	-53	3	negligible*		
		HHS-77-3	East	169	55	-10	-53	3	negligible*		
		HHS-78	North	197	87	-10	-54	3	26		
		HUH-80-1	Top	359	103	-10	-59	3	N/A		
		HUH-80-2	Top	355	103	-10	-59	3	N/A		
		HUH-80-3	Top	350	103	-10	-59	3	N/A		
		HUH-81	Top	331	99	-10	-58	3	N/A		
		HUH-82-1	South	159	76	-10	-52	3	17		
		HUH-82-6	South	159	88	-10	-52	3	29		
		HHS-84	East	81	72	-10	-46	3	19		
		HUH-85b	North	241	87	-10	-56	3	24		
		HUH-86-4	North	189	67	-10	-54	3	6		
		HUH-86-13	North	189	72	-10	-54	3	11		
		HHS-87-2	East	168	75	-10	-52	3	16		
		HHS-88-2	East	236	58	-10	-55	3	negligible*		
		HUH-95b	South	256	92	-10	-56	3	29		
		HHS-100-2	Top	220	62	-10	-55	3	0		
		HHS-101-1	Top	212	76	-10	-55	3	14		
		HHS-102-1	Top	182	69	-10	-53	3	9		
		HHS-102-2	Top	182	71	-10	-53	3	11		
		HHS-102-3	Top	182	75	-10	-53	3	15		
		HHS-102-6	Top	182	71	-10	-53	3	11		
		HHS-102-7	Top	182	73	-10	-53	3	13		
		HHS-102-9	Top	182	71	-10	-53	3	11		
		HHS-102-11	Top	182	72	-10	-53	3	12		
		HUH-103-1	Top	269	70	-10	-57	3	6		
		HUH-103-2	Top	269	81	-10	-57	3	17		
		HUH-103-3	Top	269	76	-10	-57	3	12		
		HUH-103-4	Top	269	75	-10	-57	3	11		
		HUH-103-5	Top	269	74	-10	-57	3	10		
		HUH-103-6	Top	269	71	-10	-57	3	7		
		HUH-103-7	Top	269	74	-10	-57	3	10		
		HUH-103-8	Top	269	72	-10	-57	3	8		
		HUH-103-9	Top	269	73	-10	-57	3	9		
		HUH-103-10	Top	269	72	-10	-57	3	8		
		HUH-103-11	Top	269	73	-10	-57	3	9		
		HUH-103-12	Top	269	72	-10	-57	3	8		
		HUH-103-13	Top	269	70	-10	-57	3	6		
		HUH-103-14	Top	269	72	-10	-57	3	8		
		HUH-104-1	Top	247	65	-10	-56	3	2		
		HUH-104-2	Top	247	78	-10	-56	3	15		
		HUH-104-3	Top	247	76	-10	-56	3	13		
		HUH-104-4	Top	247	77	-10	-56	3	14		
		HUH-104-5	Top	247	69	-10	-56	3	6		
		HUH-104-6	Top	247	69	-10	-56	3	6		
		HUH-104-7	Top	247	78	-10	-56	3	15		
		HUH-107b	South	263	94	-10	-56	3	31		
		HUH-108	South	237	58	-10	-55	3	negligible*		
		HUH-109	Top	290	75	-10	-57	3	11		
		HUH-110	Top	290	76	-10	-57	3	12		
		HUH-111	Top	291	76	-10	-57	3	12		
		HUH-112	Top	291	76	-10	-57	3	12		
		HUH-113	Top	292	75	-10	-57	3	11		
		HUH-115	North	279	73	-10	-57	3	9		
		HUH-116	North	276	70	-10	-57	3	6		
		HUH-117	North	272	70	-10	-57	3	6		
		HUH-118	North	269	68	-10	-57	3	4		
HUH-119	Top	357	65	-10	-59	3	N/A				
HUH-120	Top	354	71	-10	-59	3	N/A				
HHS-121	East	165	60	-10	-52	3	1				
NOV-VS1	Top	327	97	-10	-58	3	N/A				
NOV-VS2	Top	322	97	-10	-58	3	N/A				
NOV-LV-03	East	313	68	-10	-58	3	N/A				
NOV-LV-04	North	310	68	-10	-58	3	N/A				
NOV-LV-05	North	323	66	-10	-58	3	N/A				
NOV-LV-06	West	327	72	-10	-58	3	N/A				
NOV-LV-07	West	341	71	-10	-59	3	N/A				
NOV-LV-09	South	335	78	-10	-58	3	N/A				
NOV-LV-10	North	330	79	-10	-58	3	N/A				

Fixed Plant Noise Calculation - HUH-4-2b

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-4-2b											
Night-time											
HUH-4-2b	The Metropolis Residence Tower 1	HUH-4-2	North	326	76	-10	-58	3	N/A		
		HUH-7a	Top	269	90	-10	-57	3	26		
		HUH-7b	South	269	90	-10	-57	3	26		
		HUH-8a	Top	264	90	-10	-56	3	27		
		HUH-8b	South	264	90	-10	-56	3	27		
		HUH-8c	East	264	90	-10	-56	3	27		
		HUH-9a	Top	248	80	-10	-56	3	17		
		HUH-9b	South	248	82	-10	-56	3	19		
		HUH-9c	East	248	77	-10	-56	3	14		
		HUH-10a	Top	244	78	-10	-56	3	15		
		HUH-10b	South	244	81	-10	-56	3	18		
		HUH-10c	East	244	70	-10	-56	3	7		
		HUH-11a	Top	240	68	-10	-56	3	5		
		HUH-11b	South	240	70	-10	-56	3	7		
		HUH-12a	Top	237	66	-10	-55	3	4		
		HUH-12b	South	237	68	-10	-55	3	6		
		HUH-13a	Top	233	64	-10	-55	3	2		
		HUH-14-1-1	South	232	75	-10	-55	3	13		
		HUH-14-1-2	South	232	88	-10	-55	3	26		
		HUH-14-2	South	229	91	-10	-55	3	29		
		HUH-14-3	South	225	87	-10	-55	3	25		
		HUH-15	West	270	84	-10	-57	3	20		
		HUH-16a	Top	265	80	-10	-56	3	17		
		HUH-16b	East	265	85	-10	-56	3	22		
		HUH-17	North	257	95	-10	-56	3	32		
		HUH-18	Top	247	95	-10	-56	3	32		
		HUH-19a	Top	274	95	-10	-57	3	31		
		HUH-19b	North	274	95	-10	-57	3	31		
		HUH-20	Top	238	71	-10	-56	3	8		
		HUH-21a	Top	233	95	-10	-55	3	33		
		HUH-21b	North	233	95	-10	-55	3	33		
		HUH-22a-1	Top	229	83	-10	-55	3	21		
		HUH-22a-2	North	229	83	-10	-55	3	21		
		HUH-22b	North	229	85	-10	-55	3	23		
		HUH-26H	East	313	88	-10	-58	3	N/A		
		HUH-27H	East	305	81	-10	-58	3	N/A		
		HUH-29	East	291	70	-10	-57	3	6		
		HUH-30H	West	307	84	-10	-58	3	N/A		
		HUH-32H	West	302	90	-10	-58	3	N/A		
		HUH-33H	West	310	88	-10	-58	3	N/A		
		HUH-37H	East	308	90	-10	-58	3	N/A		
		HHS-38	South	220	64	-10	-55	3	2		
		HHS-40	South	216	-	-10	-55	3	-		
		HHS-41-1	West	224	54	-10	-55	3	negligible*		
		HHS-41-2	West	224	66	-10	-55	3	4		
		HHS-42-1	West	234	66	-10	-55	3	4		
		HHS-42-2	West	234	64	-10	-55	3	2		
		HHS-42-3	West	234	63	-10	-55	3	1		
		HHS-45-1	West	257	85	-10	-56	3	22		
		HHS-45-2	West	257	60	-10	-56	3	negligible*		
		HHS-49-2	East	242	78	-10	-56	3	15		
		HHS-49-3	East	242	71	-10	-56	3	8		
		HHS-49-6	East	242	67	-10	-56	3	4		
		HHS-49-8	East	242	70	-10	-56	3	7		
		HHS-50-1	East	236	75	-10	-55	3	13		
		HHS-50-2	East	236	69	-10	-55	3	7		
		HHS-51	East	220	85	-10	-55	3	23		
		HHS-52-1	East	205	63	-10	-54	3	2		
		HHS-53-1	East	195	68	-10	-54	3	7		
		HHS-53-2	East	195	75	-10	-54	3	14		
		HHS-53-3	East	195	59	-10	-54	3	negligible*		
		HHS-53-4	East	195	67	-10	-54	3	6		
		HHS-53-5	East	195	69	-10	-54	3	8		
		HHS-53-6	East	195	66	-10	-54	3	5		
		HHS-56	East	168	73	-10	-52	3	14		
		HHS-57-2	East	144	61	-10	-51	3	3		
		HHS-58-1	East	133	68	-10	-50	3	11		
		HHS-58-2	East	133	69	-10	-50	3	12		
		HHS-62-2	East	42	69	-10	-40	3	22		
		HHS-67-1	East	40	71	-10	-40	3	24		
		HHS-67-3	East	40	73	-10	-40	3	26		
		HHS-68-1	East	63	72	-10	-44	3	21		
		HHS-68-2	East	63	71	-10	-44	3	20		
		HHS-68-3	East	63	70	-10	-44	3	19		
		HHS-70-3	East	89	59	-10	-47	3	5		
		HHS-71-1	East	102	54	-10	-48	3	negligible*		
		HHS-71-2	East	102	56	-10	-48	3	1		
		HHS-71-3	East	102	67	-10	-48	3	12		
		HHS-73	East	162	53	-10	-52	3	negligible*		
		HHS-77-1	East	169	54	-10	-53	3	negligible*		
		HHS-77-2	East	169	55	-10	-53	3	negligible*		
		HHS-77-3	East	169	55	-10	-53	3	negligible*		
		HHS-78	North	197	79	-10	-54	3	18		
		HUH-80-1	Top	359	103	-10	-59	3	N/A		
		HUH-80-2	Top	355	103	-10	-59	3	N/A		
		HUH-80-3	Top	350	103	-10	-59	3	N/A		
		HUH-81	Top	331	99	-10	-58	3	N/A		
		HUH-82-1	South	159	76	-10	-52	3	17		
		HUH-82-6	South	159	88	-10	-52	3	29		
		HHS-84	East	81	72	-10	-46	3	19		
		HUH-85b	North	241	87	-10	-56	3	24		
		HUH-86-4	North	189	67	-10	-54	3	6		
		HUH-86-13	North	189	72	-10	-54	3	11		
		HHS-87-2	East	168	75	-10	-52	3	16		
		HHS-88-2	East	236	58	-10	-55	3	negligible*		
		HUH-95b	South	256	92	-10	-56	3	29		
		HHS-100-2	Top	220	62	-10	-55	3	0		
		HHS-101-1	Top	212	76	-10	-55	3	14		
		HHS-102-1	Top	182	69	-10	-53	3	9		
		HHS-102-2	Top	182	71	-10	-53	3	11		
		HHS-102-3	Top	182	75	-10	-53	3	15		
		HHS-102-6	Top	182	71	-10	-53	3	11		
		HHS-102-7	Top	182	73	-10	-53	3	13		
		HHS-102-9	Top	182	71	-10	-53	3	11		
		HHS-102-11	Top	182	72	-10	-53	3	12		
		HUH-103-1	Top	269	70	-10	-57	3	6		
		HUH-103-2	Top	269	81	-10	-57	3	17		
		HUH-103-3	Top	269	76	-10	-57	3	12		
		HUH-103-4	Top	269	75	-10	-57	3	11		
		HUH-103-5	Top	269	74	-10	-57	3	10		
		HUH-103-6	Top	269	71	-10	-57	3	7		
		HUH-103-7	Top	269	74	-10	-57	3	10		
		HUH-103-8	Top	269	72	-10	-57	3	8		
		HUH-103-9	Top	269	73	-10	-57	3	9		
		HUH-103-10	Top	269	72	-10	-57	3	8		
		HUH-103-11	Top	269	73	-10	-57	3	9		
		HUH-103-12	Top	269	72	-10	-57	3	8		
		HUH-103-13	Top	269	70	-10	-57	3	6		
		HUH-103-14	Top	269	72	-10	-57	3	8		
		HUH-104-1	Top	247	65	-10	-56	3	2		
		HUH-104-2	Top	247	78	-10	-56	3	15		
		HUH-104-3	Top	247	76	-10	-56	3	13		
		HUH-104-4	Top	247	77	-10	-56	3	14		
		HUH-104-5	Top	247	69	-10	-56	3	6		
		HUH-104-6	Top	247	69	-10	-56	3	6		
		HUH-104-7	Top	247	78	-10	-56	3	15		
		HUH-107b	South	263	94	-10	-56	3	31		
		HUH-108	South	237	58	-10	-55	3	negligible*		
		HUH-109	Top	290	75	-10	-57	3	11		
		HUH-110	Top	290	76	-10	-57	3	12		
		HUH-111	Top	291	76	-10	-57	3	12		
		HUH-112	Top	291	76	-10	-57	3	12		
		HUH-113	Top	292	75	-10	-57	3	11		
		HUH-115	North	279	73	-10	-57	3	9		
		HUH-116	North	276	70	-10	-57	3	6		
		HUH-117	North	272	70	-10	-57	3	6		
		HUH-118	North	269	68	-10	-57	3	4		
HUH-119	Top	357	65	-10	-59	3	N/A				
HUH-120	Top	354	71	-10	-59	3	N/A				
HHS-121	East	165	60	-10	-52	3	1				
NOV-VS1	Top	327	87	-10	-58	3	N/A				
NOV-VS2	Top	322	87	-10	-58	3	N/A				
NOV-LV-03	East	313	68	-10	-58	3	N/A				
NOV-LV-04	North	310	68	-10	-58	3	N/A				
NOV-LV-05	North	323	66	-10	-58	3	N/A				
NOV-LV-06	West	327	72	-10	-58	3	N/A				
NOV-LV-07	West	341	71	-10	-59	3	N/A				
NOV-LV-08	South	335	78	-10	-58	3	N/A				
NOV-LV-10	North	330	79								

Fixed Plant Noise Calculation - HUH-10-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-10-1											
Daytime											
HUH-10-1	Harbourfront Horizon	HUH-4-2	North	304	76	0	-58	3	N/A		
		HUH-7a	Top	246	100	0	-56	3	47		
		HUH-7b	South	246	100	0	-56	3	47		
		HUH-8a	Top	238	100	0	-56	3	47		
		HUH-8b	South	238	100	0	-56	3	47		
		HUH-8c	East	238	100	0	-56	3	47		
		HUH-9a	Top	209	80	0	-54	3	29		
		HUH-9b	South	209	82	0	-54	3	31		
		HUH-9c	East	209	77	0	-54	3	26		
		HUH-10a	Top	201	78	0	-54	3	27		
		HUH-10b	South	201	81	0	-54	3	30		
		HUH-10c	East	201	70	0	-54	3	19		
		HUH-11a	Top	194	68	0	-54	3	17		
		HUH-11b	South	194	70	0	-54	3	19		
		HUH-12a	Top	186	66	0	-53	3	16		
		HUH-12b	South	186	68	0	-53	3	18		
		HUH-13a	Top	178	64	0	-53	3	14		
		HUH-14-1-1	South	192	75	0	-54	3	24		
		HUH-14-1-2	South	192	88	0	-54	3	37		
		HUH-14-2	South	184	91	0	-53	3	41		
		HUH-14-3	South	177	87	0	-53	3	37		
		HUH-15	West	528	84	-10	-62	3	N/A		
		HUH-16a	Top	526	80	-10	-62	3	N/A		
		HUH-16b	East	526	85	-10	-62	3	N/A		
		HUH-17	North	518	105	-10	-62	3	N/A		
		HUH-18	Top	511	105	-10	-62	3	N/A		
		HUH-19a	Top	540	105	-10	-63	3	N/A		
		HUH-19b	North	540	105	-10	-63	3	N/A		
		HUH-20	Top	504	71	-10	-62	3	N/A		
		HUH-21a	Top	500	105	-10	-62	3	N/A		
		HUH-21b	North	500	105	-10	-62	3	N/A		
		HUH-22a-1	Top	497	83	-10	-62	3	N/A		
		HUH-22a-2	North	497	83	-10	-62	3	N/A		
		HUH-22b	North	497	85	-10	-62	3	N/A		
		HUH-26H	East	579	88	-10	-63	3	N/A		
		HUH-27H	East	570	81	-10	-63	3	N/A		
		HUH-29	East	556	70	-10	-63	3	N/A		
		HUH-30H	West	571	84	-10	-63	3	N/A		
		HUH-32H	West	566	90	-10	-63	3	N/A		
		HUH-33H	West	575	88	-10	-63	3	N/A		
		HUH-37H	East	574	90	-10	-63	3	N/A		
		HHS-38	South	163	64	0	-52	3	15		
		HHS-40	South	152	88	-10	-52	3	29		
		HHS-41-1	West	145	54	-10	-51	3	negligible*		
		HHS-41-2	West	145	66	-10	-51	3	8		
		HHS-42-1	West	141	66	-10	-51	3	8		
		HHS-42-2	West	141	64	-10	-51	3	6		
		HHS-42-3	West	141	63	-10	-51	3	5		
		HHS-45-1	West	135	85	-10	-51	3	27		
		HHS-45-2	West	135	60	-10	-51	3	2		
		HHS-49-2	East	109	78	0	-49	3	32		
		HHS-49-3	East	109	71	0	-49	3	25		
		HHS-49-6	East	109	67	0	-49	3	21		
		HHS-49-8	East	109	70	0	-49	3	24		
		HHS-50-1	East	105	75	0	-48	3	30		
		HHS-50-2	East	105	69	0	-48	3	24		
		HHS-51	East	92	86	0	-47	3	42		
		HHS-52-1	East	90	63	0	-47	3	19		
		HHS-53-1	East	92	68	0	-47	3	24		
		HHS-53-2	East	92	75	0	-47	3	31		
		HHS-53-3	East	92	59	0	-47	3	15		
		HHS-53-4	East	92	67	0	-47	3	23		
		HHS-53-5	East	92	69	0	-47	3	25		
		HHS-53-6	East	92	66	0	-47	3	22		
		HHS-56	East	107	73	0	-49	3	27		
		HHS-57-2	East	129	61	0	-50	3	14		
		HHS-58-1	East	141	68	0	-51	3	20		
		HHS-58-2	East	141	69	0	-51	3	21		
		HHS-62-2	East	234	69	0	-55	3	17		
		HHS-67-1	East	303	71	0	-58	3	N/A		
		HHS-67-3	East	303	73	0	-58	3	N/A		
		HHS-68-1	East	329	72	0	-58	3	N/A		
		HHS-68-2	East	329	71	0	-58	3	N/A		
		HHS-68-3	East	329	70	0	-58	3	N/A		
		HHS-70-3	East	356	59	0	-59	3	N/A		
		HHS-71-1	East	370	54	0	-59	3	N/A		
		HHS-71-2	East	370	56	0	-59	3	N/A		
		HHS-71-3	East	370	67	0	-59	3	N/A		
		HHS-73	East	433	53	-10	-61	3	N/A		
		HHS-77-1	East	440	54	-10	-61	3	N/A		
		HHS-77-2	East	440	55	-10	-61	3	N/A		
		HHS-77-3	East	440	55	-10	-61	3	N/A		
		HHS-78	North	470	87	-10	-61	3	N/A		
		HUH-80-1	Top	311	103	0	-58	3	N/A		
		HUH-80-2	Top	311	103	0	-58	3	N/A		
		HUH-80-3	Top	310	103	0	-58	3	N/A		
		HUH-81	Top	308	99	0	-58	3	N/A		
		HUH-82-1	South	320	76	0	-58	3	N/A		
		HUH-82-6	South	320	88	0	-58	3	N/A		
		HHS-84	East	193	72	0	-54	3	21		
		HUH-85b	North	508	87	-10	-62	3	N/A		
		HUH-86-4	North	438	67	-10	-61	3	N/A		
		HUH-86-13	North	438	72	-10	-61	3	N/A		
		HHS-87-2	East	107	75	0	-49	3	29		
		HHS-88-2	East	105	58	0	-48	3	13		
		HUH-95b	South	236	92	0	-55	3	40		
		HHS-100-2	Top	162	62	-10	-52	3	3		
		HHS-101-1	Top	166	76	-10	-52	3	17		
		HHS-102-1	Top	97	69	0	-48	3	24		
		HHS-102-2	Top	97	71	0	-48	3	26		
		HHS-102-3	Top	97	75	0	-48	3	30		
		HHS-102-6	Top	97	71	0	-48	3	26		
		HHS-102-7	Top	97	73	0	-48	3	28		
		HHS-102-9	Top	97	71	0	-48	3	26		
		HHS-102-11	Top	97	72	0	-48	3	27		
		HUH-103-1	Top	524	70	-10	-62	3	N/A		
		HUH-103-2	Top	524	81	-10	-62	3	N/A		
		HUH-103-3	Top	524	76	-10	-62	3	N/A		
		HUH-103-4	Top	524	75	-10	-62	3	N/A		
		HUH-103-5	Top	524	74	-10	-62	3	N/A		
		HUH-103-6	Top	524	71	-10	-62	3	N/A		
		HUH-103-7	Top	524	74	-10	-62	3	N/A		
		HUH-103-8	Top	524	72	-10	-62	3	N/A		
		HUH-103-9	Top	524	73	-10	-62	3	N/A		
		HUH-103-10	Top	524	72	-10	-62	3	N/A		
		HUH-103-11	Top	524	73	-10	-62	3	N/A		
		HUH-103-12	Top	524	72	-10	-62	3	N/A		
		HUH-103-13	Top	524	70	-10	-62	3	N/A		
		HUH-103-14	Top	524	72	-10	-62	3	N/A		
		HUH-104-1	Top	513	65	-10	-62	3	N/A		
		HUH-104-2	Top	513	78	-10	-62	3	N/A		
		HUH-104-3	Top	513	76	-10	-62	3	N/A		
		HUH-104-4	Top	513	77	-10	-62	3	N/A		
		HUH-104-5	Top	513	69	-10	-62	3	N/A		
		HUH-104-6	Top	513	69	-10	-62	3	N/A		
		HUH-104-7	Top	513	78	-10	-62	3	N/A		
		HUH-107b	South	243	94	0	-56	3	41		
		HUH-108	South	200	58	0	-54	3	7		
		HUH-109	Top	554	75	-10	-63	3	N/A		
		HUH-110	Top	554	76	-10	-63	3	N/A		
		HUH-111	Top	555	76	-10	-63	3	N/A		
		HUH-112	Top	555	76	-10	-63	3	N/A		
		HUH-113	Top	555	75	-10	-63	3	N/A		
		HUH-115	North	531	73	-10	-62	3	N/A		
		HUH-116	North	528	70	-10	-62	3	N/A		
		HUH-117	North	526	70	-10	-62	3	N/A		
		HUH-118	North	524	68	-10	-62	3	N/A		
		HUH-119	Top	323	65	-10	-58	3	N/A		
HUH-120	Top	319	71	-10	-58	3	N/A				
HHS-121	East	436	60	-10	-61	3	N/A				
NOV-VS1	Top	240	97	0	-56	3	44				
NOV-VS2	Top	228	97	0	-55	3	45				
NOV-LV-03	East	218	68	0	-55	3	16				
NOV-LV-04	North	220	68	-10	-55	3	6				
NOV-LV-05	North	247	66	0	-56	3	13				
NOV-LV-06	West	250	72	-10	-56	3	9				
NOV-LV-07	West	253	71	-10	-56	3	8				
NOV-LV-09	South	237	78	0	-55	3	26				
NOV-LV-10	North	231	79	0	-55	3	27				
NOV-LV-12	South	229	71	0	-55	3	19				
NOV-LV-13	South-East	219	67								

Fixed Plant Noise Calculation - HUH-10-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-10-1											
Night-time											
HUH-10-1	Harbourfront Horizon	HUH-4-2	North	304	76	0	-58	3	N/A		
		HUH-7a	Top	246	90	0	-56	3	37		
		HUH-7b	South	246	90	0	-56	3	37		
		HUH-8a	Top	238	90	0	-56	3	37		
		HUH-8b	South	238	90	0	-56	3	37		
		HUH-8c	East	238	90	0	-56	3	37		
		HUH-9a	Top	209	80	0	-54	3	29		
		HUH-9b	South	209	82	0	-54	3	31		
		HUH-9c	East	209	77	0	-54	3	26		
		HUH-10a	Top	201	78	0	-54	3	27		
		HUH-10b	South	201	81	0	-54	3	30		
		HUH-10c	East	201	70	0	-54	3	19		
		HUH-11a	Top	194	68	0	-54	3	17		
		HUH-11b	South	194	70	0	-54	3	19		
		HUH-12a	Top	186	66	0	-53	3	16		
		HUH-12b	South	186	68	0	-53	3	18		
		HUH-13a	Top	178	64	0	-53	3	14		
		HUH-14-1-1	South	192	75	0	-54	3	24		
		HUH-14-1-2	South	192	88	0	-54	3	37		
		HUH-14-2	South	184	91	0	-53	3	41		
		HUH-14-3	South	177	87	0	-53	3	37		
		HUH-15	West	528	84	-10	-62	3	N/A		
		HUH-16a	Top	526	80	-10	-62	3	N/A		
		HUH-16b	East	526	85	-10	-62	3	N/A		
		HUH-17	North	518	95	-10	-62	3	N/A		
		HUH-18	Top	511	95	-10	-62	3	N/A		
		HUH-19a	Top	540	95	-10	-63	3	N/A		
		HUH-19b	North	540	95	-10	-63	3	N/A		
		HUH-20	Top	504	71	-10	-62	3	N/A		
		HUH-21a	Top	500	95	-10	-62	3	N/A		
		HUH-21b	North	500	95	-10	-62	3	N/A		
		HUH-22a-1	Top	497	83	-10	-62	3	N/A		
		HUH-22a-2	North	497	83	-10	-62	3	N/A		
		HUH-22b	North	497	85	-10	-62	3	N/A		
		HUH-26H	East	579	88	-10	-63	3	N/A		
		HUH-27H	East	570	81	-10	-63	3	N/A		
		HUH-29	East	556	70	-10	-63	3	N/A		
		HUH-30H	West	571	84	-10	-63	3	N/A		
		HUH-32H	West	566	90	-10	-63	3	N/A		
		HUH-33H	West	575	88	-10	-63	3	N/A		
		HUH-37H	East	574	90	-10	-63	3	N/A		
		HHS-38	South	163	64	0	-52	3	15		
		HHS-40	South	152	-	-10	-52	3	-		
		HHS-41-1	West	145	54	-10	-51	3	negligible*		
		HHS-41-2	West	145	66	-10	-51	3	8		
		HHS-42-1	West	141	66	-10	-51	3	8		
		HHS-42-2	West	141	64	-10	-51	3	6		
		HHS-42-3	West	141	63	-10	-51	3	5		
		HHS-45-1	West	135	85	-10	-51	3	27		
		HHS-45-2	West	135	60	-10	-51	3	2		
		HHS-49-2	East	109	78	0	-49	3	32		
		HHS-49-3	East	109	71	0	-49	3	25		
		HHS-49-6	East	109	67	0	-49	3	21		
		HHS-49-8	East	109	70	0	-49	3	24		
		HHS-50-1	East	105	75	0	-48	3	30		
		HHS-50-2	East	105	69	0	-48	3	24		
		HHS-51	East	92	85	0	-47	3	41		
		HHS-52-1	East	90	63	0	-47	3	19		
		HHS-53-1	East	92	68	0	-47	3	24		
		HHS-53-2	East	92	75	0	-47	3	31		
		HHS-53-3	East	92	59	0	-47	3	15		
		HHS-53-4	East	92	67	0	-47	3	23		
		HHS-53-5	East	92	69	0	-47	3	25		
		HHS-53-6	East	92	66	0	-47	3	22		
		HHS-56	East	107	73	0	-49	3	27		
		HHS-57-2	East	129	61	0	-50	3	14		
		HHS-58-1	East	141	68	0	-51	3	20		
		HHS-58-2	East	141	69	0	-51	3	21		
		HHS-62-2	East	234	69	0	-55	3	17		
		HHS-67-1	East	303	71	0	-58	3	N/A		
		HHS-67-3	East	303	73	0	-58	3	N/A		
		HHS-68-1	East	329	72	0	-58	3	N/A		
		HHS-68-2	East	329	71	0	-58	3	N/A		
		HHS-68-3	East	329	70	0	-58	3	N/A		
		HHS-70-3	East	356	59	0	-59	3	N/A		
		HHS-71-1	East	370	54	0	-59	3	N/A		
		HHS-71-2	East	370	56	0	-59	3	N/A		
		HHS-71-3	East	370	67	0	-59	3	N/A		
		HHS-73	East	433	53	-10	-61	3	N/A		
		HHS-77-1	East	440	54	-10	-61	3	N/A		
		HHS-77-2	East	440	55	-10	-61	3	N/A		
		HHS-77-3	East	440	55	-10	-61	3	N/A		
		HHS-78	North	470	79	-10	-61	3	N/A		
		HUH-80-1	Top	311	103	0	-58	3	N/A		
		HUH-80-2	Top	311	103	0	-58	3	N/A		
		HUH-80-3	Top	310	103	0	-58	3	N/A		
		HUH-81	Top	308	99	0	-58	3	N/A		
		HUH-82-1	South	320	76	0	-58	3	N/A		
		HUH-82-6	South	320	88	0	-58	3	N/A		
		HHS-84	East	193	72	0	-54	3	21		
		HUH-85b	North	508	87	-10	-62	3	N/A		
		HUH-86-4	North	438	67	-10	-61	3	N/A		
		HUH-86-13	North	438	72	-10	-61	3	N/A		
		HHS-87-2	East	107	75	0	-49	3	29		
		HHS-88-2	East	105	58	0	-48	3	13		
		HUH-95b	South	236	92	0	-55	3	40		
		HHS-100-2	Top	162	62	-10	-52	3	3		
		HHS-101-1	Top	166	76	-10	-52	3	17		
		HHS-102-1	Top	97	69	0	-48	3	24		
		HHS-102-2	Top	97	71	0	-48	3	26		
		HHS-102-3	Top	97	75	0	-48	3	30		
		HHS-102-6	Top	97	71	0	-48	3	26		
		HHS-102-7	Top	97	73	0	-48	3	28		
		HHS-102-9	Top	97	71	0	-48	3	26		
		HHS-102-11	Top	97	72	0	-48	3	27		
		HUH-103-1	Top	524	70	-10	-62	3	N/A		
		HUH-103-2	Top	524	81	-10	-62	3	N/A		
		HUH-103-3	Top	524	76	-10	-62	3	N/A		
		HUH-103-4	Top	524	75	-10	-62	3	N/A		
		HUH-103-5	Top	524	74	-10	-62	3	N/A		
		HUH-103-6	Top	524	71	-10	-62	3	N/A		
		HUH-103-7	Top	524	74	-10	-62	3	N/A		
		HUH-103-8	Top	524	72	-10	-62	3	N/A		
		HUH-103-9	Top	524	73	-10	-62	3	N/A		
		HUH-103-10	Top	524	72	-10	-62	3	N/A		
		HUH-103-11	Top	524	73	-10	-62	3	N/A		
		HUH-103-12	Top	524	72	-10	-62	3	N/A		
		HUH-103-13	Top	524	70	-10	-62	3	N/A		
		HUH-103-14	Top	524	72	-10	-62	3	N/A		
		HUH-104-1	Top	513	65	-10	-62	3	N/A		
		HUH-104-2	Top	513	78	-10	-62	3	N/A		
		HUH-104-3	Top	513	76	-10	-62	3	N/A		
		HUH-104-4	Top	513	77	-10	-62	3	N/A		
		HUH-104-5	Top	513	69	-10	-62	3	N/A		
		HUH-104-6	Top	513	69	-10	-62	3	N/A		
		HUH-104-7	Top	513	78	-10	-62	3	N/A		
		HUH-107b	South	243	94	0	-56	3	41		
		HUH-108	South	200	58	0	-54	3	7		
		HUH-109	Top	554	75	-10	-63	3	N/A		
		HUH-110	Top	554	76	-10	-63	3	N/A		
		HUH-111	Top	555	76	-10	-63	3	N/A		
		HUH-112	Top	555	76	-10	-63	3	N/A		
		HUH-113	Top	555	75	-10	-63	3	N/A		
		HUH-115	North	531	73	-10	-62	3	N/A		
		HUH-116	North	528	70	-10	-62	3	N/A		
		HUH-117	North	526	70	-10	-62	3	N/A		
		HUH-118	North	524	68	-10	-62	3	N/A		
		HUH-119	Top	323	65	-10	-58	3	N/A		
HUH-120	Top	319	71	-10	-58	3	N/A				
HHS-121	East	436	60	-10	-61	3	N/A				
NOV-VS1	Top	240	87	0	-56	3	34				
NOV-VS2	Top	228	87	0	-55	3	35				
NOV-LV-03	East	218	68	0	-55	3	16				
NOV-LV-04	North	220	68	-10	-55	3	6				
NOV-LV-05	North	247	66	0	-56	3	13				
NOV-LV-06	West	250	72	-10	-56	3	9				
NOV-LV-07	West	253	71	-10	-56	3	8				
NOV-LV-09	South	237	78	0	-55	3	26				
NOV-LV-10	North	231	79	0	-55	3	27				
NOV-LV-12	South	229	71	0	-55	3	19				

Fixed Plant Noise Calculation - HUH-11-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-11-1											
Daytime											
HUH-11-1	University Student Halls of Residence	HUH-4-2	North	541	76	-10	-63	3	N/A		
		HUH-7a	Top	485	100	-10	-62	3	N/A		
		HUH-7b	South	485	100	-10	-62	3	N/A		
		HUH-8a	Top	480	100	-10	-62	3	N/A		
		HUH-8b	South	480	100	-10	-62	3	N/A		
		HUH-8c	East	480	100	-10	-62	3	N/A		
		HUH-9a	Top	464	80	-10	-61	3	N/A		
		HUH-9b	South	464	82	-10	-61	3	N/A		
		HUH-9c	East	464	77	-10	-61	3	N/A		
		HUH-10a	Top	459	78	-10	-61	3	N/A		
		HUH-10b	South	459	81	-10	-61	3	N/A		
		HUH-10c	East	459	70	-10	-61	3	N/A		
		HUH-11a	Top	455	68	-10	-61	3	N/A		
		HUH-11b	South	455	70	-10	-61	3	N/A		
		HUH-12a	Top	451	66	-10	-61	3	N/A		
		HUH-12b	South	451	68	-10	-61	3	N/A		
		HUH-13a	Top	447	64	-10	-61	3	N/A		
		HUH-14-1-1	South	448	75	-10	-61	3	N/A		
		HUH-14-1-2	South	448	88	-10	-61	3	N/A		
		HUH-14-2	South	443	91	-10	-61	3	N/A		
		HUH-14-3	South	439	87	-10	-61	3	N/A		
		HUH-15	West	313	84	-10	-58	3	N/A		
		HUH-16a	Top	299	80	0	-58	3	25		
		HUH-16b	East	299	85	0	-58	3	30		
		HUH-17	North	295	105	0	-57	3	51		
		HUH-18	Top	280	105	0	-57	3	51		
		HUH-19a	Top	285	105	0	-57	3	51		
		HUH-19b	North	285	105	0	-57	3	51		
		HUH-20	Top	270	71	0	-57	3	17		
		HUH-21a	Top	259	105	0	-56	3	52		
		HUH-21b	North	259	105	0	-56	3	52		
		HUH-22a-1	Top	254	83	0	-56	3	30		
		HUH-22a-2	North	254	83	0	-56	3	30		
		HUH-22b	North	254	85	0	-56	3	32		
		HUH-26H	East	314	88	0	-58	3	N/A		
		HUH-27H	East	309	81	0	-58	3	N/A		
		HUH-29	East	303	70	0	-58	3	N/A		
		HUH-30H	West	318	84	-10	-58	3	N/A		
		HUH-32H	West	316	90	-10	-58	3	N/A		
		HUH-33H	West	320	88	-10	-58	3	N/A		
		HUH-37H	East	311	90	0	-58	3	N/A		
		HHS-38	South	433	64	-10	-61	3	N/A		
		HHS-40	South	427	88	-10	-61	3	N/A		
		HHS-41-1	West	434	54	-10	-61	3	N/A		
		HHS-41-2	West	434	66	-10	-61	3	N/A		
		HHS-42-1	West	443	66	-10	-61	3	N/A		
		HHS-42-2	West	443	64	-10	-61	3	N/A		
		HHS-42-3	West	443	63	-10	-61	3	N/A		
		HHS-45-1	West	464	85	-10	-61	3	N/A		
		HHS-45-2	West	464	60	-10	-61	3	N/A		
		HHS-49-2	East	445	78	-10	-61	3	N/A		
		HHS-49-3	East	445	71	-10	-61	3	N/A		
		HHS-49-6	East	445	67	-10	-61	3	N/A		
		HHS-49-8	East	445	70	-10	-61	3	N/A		
		HHS-50-1	East	438	75	-10	-61	3	N/A		
		HHS-50-2	East	438	69	-10	-61	3	N/A		
		HHS-51	East	417	86	-10	-60	3	N/A		
		HHS-52-1	East	399	63	-10	-60	3	N/A		
		HHS-53-1	East	387	68	-10	-60	3	N/A		
		HHS-53-2	East	387	75	-10	-60	3	N/A		
		HHS-53-3	East	387	59	-10	-60	3	N/A		
		HHS-53-4	East	387	67	-10	-60	3	N/A		
		HHS-53-5	East	387	69	-10	-60	3	N/A		
		HHS-53-6	East	387	66	-10	-60	3	N/A		
		HHS-56	East	353	73	-10	-59	3	N/A		
		HHS-57-2	East	328	61	-10	-58	3	N/A		
		HHS-58-1	East	317	68	-10	-58	3	N/A		
		HHS-58-2	East	317	69	-10	-58	3	N/A		
		HHS-62-2	East	233	69	0	-55	3	17		
		HHS-67-1	East	177	71	0	-53	3	21		
		HHS-67-3	East	177	73	0	-53	3	23		
		HHS-68-1	East	159	72	0	-52	3	23		
		HHS-68-2	East	159	71	0	-52	3	22		
		HHS-68-3	East	159	70	0	-52	3	21		
		HHS-70-3	East	143	59	0	-51	3	11		
		HHS-71-1	East	136	54	0	-51	3	6		
		HHS-71-2	East	136	56	0	-51	3	8		
		HHS-71-3	East	136	67	0	-51	3	19		
		HHS-73	East	138	53	0	-51	3	5		
		HHS-77-1	East	142	54	0	-51	3	6		
		HHS-77-2	East	142	55	0	-51	3	7		
		HHS-77-3	East	142	55	0	-51	3	7		
		HHS-78	North	174	87	0	-53	3	37		
		HUH-80-1	Top	574	103	-10	-63	3	N/A		
		HUH-80-2	Top	570	103	-10	-63	3	N/A		
		HUH-80-3	Top	566	103	-10	-63	3	N/A		
		HUH-81	Top	546	99	-10	-63	3	N/A		
		HUH-82-1	South	353	76	-10	-59	3	N/A		
		HUH-82-6	South	353	88	-10	-59	3	N/A		
		HHS-84	East	269	72	-10	-57	3	8		
		HUH-85b	North	265	87	0	-56	3	34		
		HUH-86-4	North	287	67	-10	-57	3	3		
		HUH-86-13	North	287	72	-10	-57	3	8		
		HHS-87-2	East	353	75	-10	-59	3	N/A		
		HHS-88-2	East	438	58	-10	-61	3	N/A		
		HUH-95b	South	473	92	-10	-61	3	N/A		
		HHS-100-2	Top	432	62	-10	-61	3	N/A		
		HHS-101-1	Top	425	76	-10	-61	3	N/A		
		HHS-102-1	Top	370	69	-10	-59	3	N/A		
		HHS-102-2	Top	370	71	-10	-59	3	N/A		
		HHS-102-3	Top	370	75	-10	-59	3	N/A		
		HHS-102-6	Top	370	71	-10	-59	3	N/A		
		HHS-102-7	Top	370	73	-10	-59	3	N/A		
		HHS-102-9	Top	370	71	-10	-59	3	N/A		
		HHS-102-11	Top	370	72	-10	-59	3	N/A		
		HUH-103-1	Top	321	70	-10	-58	3	N/A		
		HUH-103-2	Top	321	81	-10	-58	3	N/A		
		HUH-103-3	Top	321	76	-10	-58	3	N/A		
		HUH-103-4	Top	321	75	-10	-58	3	N/A		
		HUH-103-5	Top	321	74	-10	-58	3	N/A		
		HUH-103-6	Top	321	71	-10	-58	3	N/A		
		HUH-103-7	Top	321	74	-10	-58	3	N/A		
		HUH-103-8	Top	321	72	-10	-58	3	N/A		
		HUH-103-9	Top	321	73	-10	-58	3	N/A		
		HUH-103-10	Top	321	72	-10	-58	3	N/A		
		HUH-103-11	Top	321	73	-10	-58	3	N/A		
		HUH-103-12	Top	321	72	-10	-58	3	N/A		
		HUH-103-13	Top	321	70	-10	-58	3	N/A		
		HUH-103-14	Top	321	72	-10	-58	3	N/A		
		HUH-104-1	Top	269	65	0	-57	3	11		
		HUH-104-2	Top	269	78	0	-57	3	24		
		HUH-104-3	Top	269	76	0	-57	3	22		
		HUH-104-4	Top	269	77	0	-57	3	23		
		HUH-104-5	Top	269	69	0	-57	3	15		
		HUH-104-6	Top	269	69	0	-57	3	15		
		HUH-104-7	Top	269	78	0	-57	3	24		
		HUH-107b	South	480	94	-10	-62	3	N/A		
		HUH-108	South	452	58	-10	-61	3	N/A		
		HUH-109	Top	304	75	0	-58	3	N/A		
		HUH-110	Top	306	76	0	-58	3	N/A		
		HUH-111	Top	307	76	0	-58	3	N/A		
		HUH-112	Top	308	76	0	-58	3	N/A		
		HUH-113	Top	310	75	0	-58	3	N/A		
		HUH-115	North	335	73	0	-58	3	N/A		
		HUH-116	North	330	70	0	-58	3	N/A		
		HUH-117	North	326	70	0	-58	3	N/A		
		HUH-118	North	321	68	0	-58	3	N/A		
		HUH-119	Top	572	65	-10	-63	3	N/A		
HUH-120	Top	569	71	-10	-63	3	N/A				
HHS-121	East	140	60	0	-51	3	12				
NOV-VS1	Top	542	97	-10	-63	3	N/A				
NOV-VS2	Top	537	97	-10	-63	3	N/A				
NOV-LV-03	East	528	68	-10	-62	3	N/A				
NOV-LV-04	North	525	68	-10	-62	3	N/A				
NOV-LV-05	North	539	66	-10	-63	3	N/A				
NOV-LV-06	West	543	72	-10	-63	3	N/A				
NOV-LV-07	West	556	71	-10	-63	3	N/A				
NOV-LV-09	South	550	78	-10	-63	3	N/A				
NOV-LV-10	North	545	79	-10	-63	3	N/A				
NOV-LV-12	South	546	71	-10	-63	3	N/A				

Fixed Plant Noise Calculation - HUH-11-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-11-1											
Night-time											
HUH-11-1	University Student Halls of Residence	HUH-4-2	North	541	76	-10	-63	3	N/A		
		HUH-7a	Top	485	90	-10	-62	3	N/A		
		HUH-7b	South	485	90	-10	-62	3	N/A		
		HUH-8a	Top	480	90	-10	-62	3	N/A		
		HUH-8b	South	480	90	-10	-62	3	N/A		
		HUH-8c	East	480	90	-10	-62	3	N/A		
		HUH-9a	Top	464	80	-10	-61	3	N/A		
		HUH-9b	South	464	82	-10	-61	3	N/A		
		HUH-9c	East	464	77	-10	-61	3	N/A		
		HUH-10a	Top	459	78	-10	-61	3	N/A		
		HUH-10b	South	459	81	-10	-61	3	N/A		
		HUH-10c	East	459	70	-10	-61	3	N/A		
		HUH-11a	Top	455	68	-10	-61	3	N/A		
		HUH-11b	South	455	70	-10	-61	3	N/A		
		HUH-12a	Top	451	66	-10	-61	3	N/A		
		HUH-12b	South	451	68	-10	-61	3	N/A		
		HUH-13a	Top	447	64	-10	-61	3	N/A		
		HUH-14-1-1	South	448	75	-10	-61	3	N/A		
		HUH-14-1-2	South	448	88	-10	-61	3	N/A		
		HUH-14-2	South	443	91	-10	-61	3	N/A		
		HUH-14-3	South	439	87	-10	-61	3	N/A		
		HUH-15	West	313	84	-10	-58	3	N/A		
		HUH-16a	Top	299	80	0	-58	3	25		
		HUH-16b	East	299	85	0	-58	3	30		
		HUH-17	North	295	95	0	-57	3	41		
		HUH-18	Top	280	95	0	-57	3	41		
		HUH-19a	Top	285	95	0	-57	3	41		
		HUH-19b	North	285	95	0	-57	3	41		
		HUH-20	Top	270	71	0	-57	3	17		
		HUH-21a	Top	259	95	0	-56	3	42		
		HUH-21b	North	259	95	0	-56	3	42		
		HUH-22a-1	Top	254	83	0	-56	3	30		
		HUH-22a-2	North	254	83	0	-56	3	30		
		HUH-22b	North	254	85	0	-56	3	32		
		HUH-26H	East	314	88	0	-58	3	N/A		
		HUH-27H	East	309	81	0	-58	3	N/A		
		HUH-29	East	303	70	0	-58	3	N/A		
		HUH-30H	West	318	84	-10	-58	3	N/A		
		HUH-32H	West	316	90	-10	-58	3	N/A		
		HUH-33H	West	320	88	-10	-58	3	N/A		
		HUH-37H	East	311	90	0	-58	3	N/A		
		HHS-38	South	433	64	-10	-61	3	N/A		
		HHS-40	South	427	-	-10	-61	3	-		
		HHS-41-1	West	434	54	-10	-61	3	N/A		
		HHS-41-2	West	434	66	-10	-61	3	N/A		
		HHS-42-1	West	443	66	-10	-61	3	N/A		
		HHS-42-2	West	443	64	-10	-61	3	N/A		
		HHS-42-3	West	443	63	-10	-61	3	N/A		
		HHS-45-1	West	464	85	-10	-61	3	N/A		
		HHS-45-2	West	464	60	-10	-61	3	N/A		
		HHS-49-2	East	445	78	-10	-61	3	N/A		
		HHS-49-3	East	445	71	-10	-61	3	N/A		
		HHS-49-6	East	445	67	-10	-61	3	N/A		
		HHS-49-8	East	445	70	-10	-61	3	N/A		
		HHS-50-1	East	438	75	-10	-61	3	N/A		
		HHS-50-2	East	438	69	-10	-61	3	N/A		
		HHS-51	East	417	85	-10	-60	3	N/A		
		HHS-52-1	East	399	63	-10	-60	3	N/A		
		HHS-53-1	East	387	68	-10	-60	3	N/A		
		HHS-53-2	East	387	75	-10	-60	3	N/A		
		HHS-53-3	East	387	59	-10	-60	3	N/A		
		HHS-53-4	East	387	67	-10	-60	3	N/A		
		HHS-53-5	East	387	69	-10	-60	3	N/A		
		HHS-53-6	East	387	66	-10	-60	3	N/A		
		HHS-56	East	353	73	-10	-59	3	N/A		
		HHS-57-2	East	328	61	-10	-58	3	N/A		
		HHS-58-1	East	317	68	-10	-58	3	N/A		
		HHS-58-2	East	317	69	-10	-58	3	N/A		
		HHS-62-2	East	233	69	0	-55	3	17		
		HHS-67-1	East	177	71	0	-53	3	21		
		HHS-67-3	East	177	73	0	-53	3	23		
		HHS-68-1	East	159	72	0	-52	3	23		
		HHS-68-2	East	159	71	0	-52	3	22		
		HHS-68-3	East	159	70	0	-52	3	21		
		HHS-70-3	East	143	59	0	-51	3	11		
		HHS-71-1	East	136	54	0	-51	3	6		
		HHS-71-2	East	136	56	0	-51	3	8		
		HHS-71-3	East	136	67	0	-51	3	19		
		HHS-73	East	138	53	0	-51	3	5		
		HHS-77-1	East	142	54	0	-51	3	6		
		HHS-77-2	East	142	55	0	-51	3	7		
		HHS-77-3	East	142	55	0	-51	3	7		
		HHS-78	North	174	79	0	-53	3	29		
		HUH-80-1	Top	574	103	-10	-63	3	N/A		
		HUH-80-2	Top	570	103	-10	-63	3	N/A		
		HUH-80-3	Top	566	103	-10	-63	3	N/A		
		HUH-81	Top	546	99	-10	-63	3	N/A		
		HUH-82-1	South	353	76	-10	-59	3	N/A		
		HUH-82-6	South	353	88	-10	-59	3	N/A		
		HHS-84	East	269	72	-10	-57	3	8		
		HUH-85b	North	265	87	0	-56	3	34		
		HUH-86-4	North	287	67	-10	-57	3	3		
		HUH-86-13	North	287	72	-10	-57	3	8		
		HHS-87-2	East	353	75	-10	-59	3	N/A		
		HHS-88-2	East	438	58	-10	-61	3	N/A		
		HUH-95b	South	473	92	-10	-61	3	N/A		
		HHS-100-2	Top	432	62	-10	-61	3	N/A		
		HHS-101-1	Top	425	76	-10	-61	3	N/A		
		HHS-102-1	Top	370	69	-10	-59	3	N/A		
		HHS-102-2	Top	370	71	-10	-59	3	N/A		
		HHS-102-3	Top	370	75	-10	-59	3	N/A		
		HHS-102-6	Top	370	71	-10	-59	3	N/A		
		HHS-102-7	Top	370	73	-10	-59	3	N/A		
		HHS-102-9	Top	370	71	-10	-59	3	N/A		
		HHS-102-11	Top	370	72	-10	-59	3	N/A		
		HUH-103-1	Top	321	70	-10	-58	3	N/A		
		HUH-103-2	Top	321	81	-10	-58	3	N/A		
		HUH-103-3	Top	321	76	-10	-58	3	N/A		
		HUH-103-4	Top	321	75	-10	-58	3	N/A		
		HUH-103-5	Top	321	74	-10	-58	3	N/A		
		HUH-103-6	Top	321	71	-10	-58	3	N/A		
		HUH-103-7	Top	321	74	-10	-58	3	N/A		
		HUH-103-8	Top	321	72	-10	-58	3	N/A		
		HUH-103-9	Top	321	73	-10	-58	3	N/A		
		HUH-103-10	Top	321	72	-10	-58	3	N/A		
		HUH-103-11	Top	321	73	-10	-58	3	N/A		
		HUH-103-12	Top	321	72	-10	-58	3	N/A		
		HUH-103-13	Top	321	70	-10	-58	3	N/A		
		HUH-103-14	Top	321	72	-10	-58	3	N/A		
		HUH-104-1	Top	269	65	0	-57	3	11		
		HUH-104-2	Top	269	78	0	-57	3	24		
		HUH-104-3	Top	269	76	0	-57	3	22		
		HUH-104-4	Top	269	77	0	-57	3	23		
		HUH-104-5	Top	269	69	0	-57	3	15		
		HUH-104-6	Top	269	69	0	-57	3	15		
		HUH-104-7	Top	269	78	0	-57	3	24		
		HUH-107b	South	480	94	-10	-62	3	N/A		
		HUH-108	South	452	58	-10	-61	3	N/A		
		HUH-109	Top	304	75	0	-58	3	N/A		
		HUH-110	Top	306	76	0	-58	3	N/A		
		HUH-111	Top	307	76	0	-58	3	N/A		
		HUH-112	Top	308	76	0	-58	3	N/A		
		HUH-113	Top	310	75	0	-58	3	N/A		
		HUH-115	North	335	73	0	-58	3	N/A		
		HUH-116	North	330	70	0	-58	3	N/A		
		HUH-117	North	326	70	0	-58	3	N/A		
		HUH-118	North	321	68	0	-58	3	N/A		
		HUH-119	Top	572	65	-10	-63	3	N/A		
HUH-120	Top	569	71	-10	-63	3	N/A				
HHS-121	East	140	60	0	-51	3	12				
NOV-VS1	Top	542	87	-10	-63	3	N/A				
NOV-VS2	Top	537	87	-10	-63	3	N/A				
NOV-LV-03	East	528	68	-10	-62	3	N/A				
NOV-LV-04	North	525	68	-10	-62	3	N/A				
NOV-LV-05	North	539	66	-10	-63	3	N/A				
NOV-LV-06	West	543	72	-10	-63	3	N/A				
NOV-LV-07	West	556	71	-10	-63	3	N/A				
NOV-LV-09	South	550	78	-10	-63	3	N/A				
NOV-LV-10	North	545	79	-10	-63	3	N/A				
NOV-LV-12	South	546	71	-10	-63	3	N/A				
NOV-LV-13											

Fixed Plant Noise Calculation - HUH-12-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Daytime Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-12-1											
Daytime											
HUH-12-1	Harbour Place Block 6	HUH-4-2	North	553	76	-10	-63	3	N/A		
		HUH-7a	Top	492	100	-10	-62	3	N/A		
		HUH-7b	South	492	100	-10	-62	3	N/A		
		HUH-8a	Top	487	100	-10	-62	3	N/A		
		HUH-8b	South	487	100	-10	-62	3	N/A		
		HUH-8c	East	487	100	-10	-62	3	N/A		
		HUH-9a	Top	466	80	-10	-61	3	N/A		
		HUH-9b	South	466	82	-10	-61	3	N/A		
		HUH-9c	East	466	77	-10	-61	3	N/A		
		HUH-10a	Top	461	78	-10	-61	3	N/A		
		HUH-10b	South	461	81	-10	-61	3	N/A		
		HUH-10c	East	461	70	-10	-61	3	N/A		
		HUH-11a	Top	455	68	-10	-61	3	N/A		
		HUH-11b	South	455	70	-10	-61	3	N/A		
		HUH-12a	Top	450	66	-10	-61	3	N/A		
		HUH-12b	South	450	68	-10	-61	3	N/A		
		HUH-13a	Top	445	64	-10	-61	3	N/A		
		HUH-14-1-1	South	448	75	-10	-61	3	N/A		
		HUH-14-1-2	South	448	88	-10	-61	3	N/A		
		HUH-14-2	South	443	91	-10	-61	3	N/A		
		HUH-14-3	South	437	87	-10	-61	3	N/A		
		HUH-15	West	384	84	-10	-60	3	N/A		
		HUH-16a	Top	371	80	0	-59	3	N/A		
		HUH-16b	East	371	85	0	-59	3	N/A		
		HUH-17	North	366	105	0	-59	3	N/A		
		HUH-18	Top	351	105	0	-59	3	N/A		
		HUH-19a	Top	360	105	0	-59	3	N/A		
		HUH-19b	North	360	105	0	-59	3	N/A		
		HUH-20	Top	341	71	0	-59	3	N/A		
		HUH-21a	Top	331	105	0	-58	3	N/A		
		HUH-21b	North	331	105	0	-58	3	N/A		
		HUH-22a-1	Top	325	83	0	-58	3	N/A		
		HUH-22a-2	North	325	83	0	-58	3	N/A		
		HUH-22b	North	325	85	0	-58	3	N/A		
		HUH-26H	East	391	88	0	-60	3	N/A		
		HUH-27H	East	386	81	0	-60	3	N/A		
		HUH-29	East	378	70	0	-60	3	N/A		
		HUH-30H	West	394	84	-10	-60	3	N/A		
		HUH-32H	West	391	90	-10	-60	3	N/A		
		HUH-33H	West	396	88	-10	-60	3	N/A		
		HUH-37H	East	388	90	0	-60	3	N/A		
		HHS-38	South	428	64	-10	-61	3	N/A		
		HHS-40	South	421	88	-10	-60	3	N/A		
		HHS-41-1	West	426	54	-10	-61	3	N/A		
		HHS-41-2	West	426	66	-10	-61	3	N/A		
		HHS-42-1	West	434	66	-10	-61	3	N/A		
		HHS-42-2	West	434	64	-10	-61	3	N/A		
		HHS-42-3	West	434	63	-10	-61	3	N/A		
		HHS-45-1	West	453	85	-10	-61	3	N/A		
		HHS-45-2	West	453	60	-10	-61	3	N/A		
		HHS-49-2	East	430	78	-10	-61	3	N/A		
		HHS-49-3	East	430	71	-10	-61	3	N/A		
		HHS-49-6	East	430	67	-10	-61	3	N/A		
		HHS-49-8	East	430	70	-10	-61	3	N/A		
		HHS-50-1	East	422	75	-10	-61	3	N/A		
		HHS-50-2	East	422	69	-10	-61	3	N/A		
		HHS-51	East	399	86	-10	-60	3	N/A		
		HHS-52-1	East	380	63	-10	-60	3	N/A		
		HHS-53-1	East	367	68	-10	-59	3	N/A		
		HHS-53-2	East	367	75	-10	-59	3	N/A		
		HHS-53-3	East	367	59	-10	-59	3	N/A		
		HHS-53-4	East	367	67	-10	-59	3	N/A		
		HHS-53-5	East	367	69	-10	-59	3	N/A		
		HHS-53-6	East	367	66	-10	-59	3	N/A		
		HHS-56	East	333	73	-10	-58	3	N/A		
		HHS-57-2	East	310	61	-10	-58	3	N/A		
		HHS-58-1	East	300	68	-10	-58	3	N/A		
		HHS-58-2	East	300	69	-10	-58	3	N/A		
		HHS-62-2	East	232	69	-10	-55	3	7		
		HHS-67-1	East	196	71	-10	-54	3	10		
		HHS-67-3	East	196	73	-10	-54	3	12		
		HHS-68-1	East	188	72	-10	-53	3	12		
		HHS-68-2	East	188	71	-10	-53	3	11		
		HHS-68-3	East	188	70	-10	-53	3	10		
		HHS-70-3	East	182	59	-10	-53	3	negligible*		
		HHS-71-1	East	181	54	-10	-53	3	negligible*		
		HHS-71-2	East	181	56	-10	-53	3	negligible*		
		HHS-71-3	East	181	67	-10	-53	3	7		
		HHS-73	East	205	53	0	-54	3	2		
		HHS-77-1	East	211	54	0	-54	3	3		
		HHS-77-2	East	211	55	0	-54	3	4		
		HHS-77-3	East	211	55	0	-54	3	4		
		HHS-78	North	247	87	0	-56	3	34		
		HUH-80-1	Top	584	103	-10	-63	3	N/A		
		HUH-80-2	Top	580	103	-10	-63	3	N/A		
		HUH-80-3	Top	576	103	-10	-63	3	N/A		
		HUH-81	Top	558	99	-10	-63	3	N/A		
		HUH-82-1	South	383	76	-10	-60	3	N/A		
		HUH-82-6	South	383	88	-10	-60	3	N/A		
		HHS-84	East	260	72	-10	-56	3	9		
		HUH-85b	North	337	87	0	-59	3	N/A		
		HUH-86-4	North	345	67	-10	-59	3	N/A		
		HUH-86-13	North	345	72	-10	-59	3	N/A		
		HHS-87-2	East	333	75	-10	-58	3	N/A		
		HHS-88-2	East	422	58	-10	-61	3	N/A		
		HUH-95b	South	479	92	-10	-62	3	N/A		
		HHS-100-2	Top	428	62	-10	-61	3	N/A		
		HHS-101-1	Top	422	76	-10	-60	3	N/A		
		HHS-102-1	Top	350	69	-10	-59	3	N/A		
		HHS-102-2	Top	350	71	-10	-59	3	N/A		
		HHS-102-3	Top	350	75	-10	-59	3	N/A		
		HHS-102-6	Top	350	71	-10	-59	3	N/A		
		HHS-102-7	Top	350	73	-10	-59	3	N/A		
		HHS-102-9	Top	350	71	-10	-59	3	N/A		
		HHS-102-11	Top	350	72	-10	-59	3	N/A		
		HUH-103-1	Top	391	70	-10	-60	3	N/A		
		HUH-103-2	Top	391	81	-10	-60	3	N/A		
		HUH-103-3	Top	391	76	-10	-60	3	N/A		
		HUH-103-4	Top	391	75	-10	-60	3	N/A		
		HUH-103-5	Top	391	74	-10	-60	3	N/A		
		HUH-103-6	Top	391	71	-10	-60	3	N/A		
		HUH-103-7	Top	391	74	-10	-60	3	N/A		
		HUH-103-8	Top	391	72	-10	-60	3	N/A		
		HUH-103-9	Top	391	73	-10	-60	3	N/A		
		HUH-103-10	Top	391	72	-10	-60	3	N/A		
		HUH-103-11	Top	391	73	-10	-60	3	N/A		
		HUH-103-12	Top	391	72	-10	-60	3	N/A		
		HUH-103-13	Top	391	70	-10	-60	3	N/A		
		HUH-103-14	Top	391	72	-10	-60	3	N/A		
		HUH-104-1	Top	341	65	0	-59	3	N/A		
		HUH-104-2	Top	341	78	0	-59	3	N/A		
		HUH-104-3	Top	341	76	0	-59	3	N/A		
		HUH-104-4	Top	341	77	0	-59	3	N/A		
		HUH-104-5	Top	341	69	0	-59	3	N/A		
		HUH-104-6	Top	341	69	0	-59	3	N/A		
		HUH-104-7	Top	341	78	0	-59	3	N/A		
		HUH-107b	South	487	94	-10	-62	3	N/A		
		HUH-108	South	454	58	-10	-61	3	N/A		
		HUH-109	Top	379	75	0	-60	3	N/A		
		HUH-110	Top	381	76	0	-60	3	N/A		
		HUH-111	Top	382	76	0	-60	3	N/A		
		HUH-112	Top	383	76	0	-60	3	N/A		
		HUH-113	Top	384	75	0	-60	3	N/A		
		HUH-115	North	404	73	0	-60	3	N/A		
		HUH-116	North	400	70	0	-60	3	N/A		
		HUH-117	North	395	70	0	-60	3	N/A		
		HUH-118	North	391	68	0	-60	3	N/A		
		HUH-119	Top	583	65	-10	-63	3	N/A		
HUH-120	Top	580	71	-10	-63	3	N/A				
HHS-121	East	208	60	0	-54	3	9				
NOV-VS1	Top	542	97	-10	-63	3	N/A				
NOV-VS2	Top	535	97	-10	-63	3	N/A				
NOV-LV-03	East	525	68	-10	-62	3	N/A				
NOV-LV-04	North	523	68	-10	-62	3	N/A				
NOV-LV-05	North	541	66	-10	-63	3	N/A				
NOV-LV-06	West	545	72	-10	-63	3	N/A				
NOV-LV-07	West	557	71	-10	-63	3	N/A				
NOV-LV-09	South	548	78	-10	-63	3	N/A				
NOV-LV-10	North	543	79	-10	-63	3	N/A				
NOV-LV-12	South	544	71	-10	-63	3	N/A				
NOV-LV-13	South-East	535	67	-10	-63	3	N				



Fixed Plant Noise Calculation - HUH-12-1

Noise Assessment Points	Description	Plant item	Direction Facing	Horizontal Distance , m <sup>[1]</sup>	SWL, dB(A)	Correction for line of sight <sup>[2]</sup> , dB(A)	Distance Correction of Point Source, dB(A)	Façade Correction, dB(A)	Predicted SPL, dB(A) <sup>[3]</sup>	Total SPL, dB(A)	Night-time Noise Criteria, dB(A)
Hung Hom Station Ventilation Shaft											
HUH-12-1											
Night-time											
HUH-12-1	Harbour Place Block 6	HUH-4-2	North	553	76	-10	-63	3	N/A		
		HUH-7a	Top	492	90	-10	-62	3	N/A		
		HUH-7b	South	492	90	-10	-62	3	N/A		
		HUH-8a	Top	487	90	-10	-62	3	N/A		
		HUH-8b	South	487	90	-10	-62	3	N/A		
		HUH-8c	East	487	90	-10	-62	3	N/A		
		HUH-9a	Top	466	80	-10	-61	3	N/A		
		HUH-9b	South	466	82	-10	-61	3	N/A		
		HUH-9c	East	466	77	-10	-61	3	N/A		
		HUH-10a	Top	461	78	-10	-61	3	N/A		
		HUH-10b	South	461	81	-10	-61	3	N/A		
		HUH-10c	East	461	70	-10	-61	3	N/A		
		HUH-11a	Top	455	68	-10	-61	3	N/A		
		HUH-11b	South	455	70	-10	-61	3	N/A		
		HUH-12a	Top	450	66	-10	-61	3	N/A		
		HUH-12b	South	450	68	-10	-61	3	N/A		
		HUH-13a	Top	445	64	-10	-61	3	N/A		
		HUH-14-1-1	South	448	75	-10	-61	3	N/A		
		HUH-14-1-2	South	448	88	-10	-61	3	N/A		
		HUH-14-2	South	443	91	-10	-61	3	N/A		
		HUH-14-3	South	437	87	-10	-61	3	N/A		
		HUH-15	West	384	84	-10	-60	3	N/A		
		HUH-16a	Top	371	80	0	-59	3	N/A		
		HUH-16b	East	371	85	0	-59	3	N/A		
		HUH-17	North	366	95	0	-59	3	N/A		
		HUH-18	Top	351	95	0	-59	3	N/A		
		HUH-19a	Top	360	95	0	-59	3	N/A		
		HUH-19b	North	360	95	0	-59	3	N/A		
		HUH-20	Top	341	71	0	-59	3	N/A		
		HUH-21a	Top	331	95	0	-58	3	N/A		
		HUH-21b	North	331	95	0	-58	3	N/A		
		HUH-22a-1	Top	325	83	0	-58	3	N/A		
		HUH-22a-2	North	325	83	0	-58	3	N/A		
		HUH-22b	North	325	85	0	-58	3	N/A		
		HUH-26H	East	391	88	0	-60	3	N/A		
		HUH-27H	East	386	81	0	-60	3	N/A		
		HUH-29	East	378	70	0	-60	3	N/A		
		HUH-30H	West	394	84	-10	-60	3	N/A		
		HUH-32H	West	391	90	-10	-60	3	N/A		
		HUH-33H	West	396	88	-10	-60	3	N/A		
		HUH-37H	East	388	90	0	-60	3	N/A		
		HHS-38	South	428	64	-10	-61	3	N/A		
		HHS-40	South	421	-	-10	-60	3			
		HHS-41-1	West	426	54	-10	-61	3	N/A		
		HHS-41-2	West	426	66	-10	-61	3	N/A		
		HHS-42-1	West	434	66	-10	-61	3	N/A		
		HHS-42-2	West	434	64	-10	-61	3	N/A		
		HHS-42-3	West	434	63	-10	-61	3	N/A		
		HHS-45-1	West	453	85	-10	-61	3	N/A		
		HHS-45-2	West	453	60	-10	-61	3	N/A		
		HHS-49-2	East	430	78	-10	-61	3	N/A		
		HHS-49-3	East	430	71	-10	-61	3	N/A		
		HHS-49-6	East	430	67	-10	-61	3	N/A		
		HHS-49-8	East	430	70	-10	-61	3	N/A		
		HHS-50-1	East	422	75	-10	-61	3	N/A		
		HHS-50-2	East	422	69	-10	-61	3	N/A		
		HHS-51	East	399	85	-10	-60	3	N/A		
		HHS-52-1	East	380	63	-10	-60	3	N/A		
		HHS-53-1	East	367	68	-10	-59	3	N/A		
		HHS-53-2	East	367	75	-10	-59	3	N/A		
		HHS-53-3	East	367	59	-10	-59	3	N/A		
		HHS-53-4	East	367	67	-10	-59	3	N/A		
		HHS-53-5	East	367	69	-10	-59	3	N/A		
		HHS-53-6	East	367	66	-10	-59	3	N/A		
		HHS-56	East	333	73	-10	-58	3	N/A		
		HHS-57-2	East	310	61	-10	-58	3	N/A		
		HHS-58-1	East	300	68	-10	-58	3	N/A		
		HHS-58-2	East	300	69	-10	-58	3	N/A		
		HHS-62-2	East	232	69	-10	-55	3	7		
		HHS-67-1	East	196	71	-10	-54	3	10		
		HHS-67-3	East	196	73	-10	-54	3	12		
		HHS-68-1	East	188	72	-10	-53	3	12		
		HHS-68-2	East	188	71	-10	-53	3	11		
		HHS-68-3	East	188	70	-10	-53	3	10		
		HHS-70-3	East	182	59	-10	-53	3	negligible*		
		HHS-71-1	East	181	54	-10	-53	3	negligible*		
		HHS-71-2	East	181	56	-10	-53	3	negligible*		
		HHS-71-3	East	181	67	-10	-53	3	7		
		HHS-73	East	205	53	0	-54	3	2		
		HHS-77-1	East	211	54	0	-54	3	3		
		HHS-77-2	East	211	55	0	-54	3	4		
		HHS-77-3	East	211	55	0	-54	3	4		
		HHS-78	North	247	79	0	-56	3	26		
		HUH-80-1	Top	584	103	-10	-63	3	N/A		
		HUH-80-2	Top	580	103	-10	-63	3	N/A		
		HUH-80-3	Top	576	103	-10	-63	3	N/A		
		HUH-81	Top	558	99	-10	-63	3	N/A		
		HUH-82-1	South	383	76	-10	-60	3	N/A		
		HUH-82-6	South	383	88	-10	-60	3	N/A		
		HHS-84	East	260	72	-10	-56	3	9		
		HUH-85b	North	337	87	0	-59	3	N/A		
		HUH-86-4	North	345	67	-10	-59	3	N/A		
		HUH-86-13	North	345	72	-10	-59	3	N/A		
		HHS-87-2	East	333	75	-10	-58	3	N/A		
		HHS-88-2	East	422	58	-10	-61	3	N/A		
		HUH-95b	South	479	92	-10	-62	3	N/A		
		HHS-100-2	Top	428	62	-10	-61	3	N/A		
		HHS-101-1	Top	422	76	-10	-60	3	N/A		
		HHS-102-1	Top	350	69	-10	-59	3	N/A		
		HHS-102-2	Top	350	71	-10	-59	3	N/A		
		HHS-102-3	Top	350	75	-10	-59	3	N/A		
		HHS-102-6	Top	350	71	-10	-59	3	N/A		
		HHS-102-7	Top	350	73	-10	-59	3	N/A		
		HHS-102-9	Top	350	71	-10	-59	3	N/A		
		HHS-102-11	Top	350	72	-10	-59	3	N/A		
		HUH-103-1	Top	391	70	-10	-60	3	N/A		
		HUH-103-2	Top	391	81	-10	-60	3	N/A		
		HUH-103-3	Top	391	76	-10	-60	3	N/A		
		HUH-103-4	Top	391	75	-10	-60	3	N/A		
		HUH-103-5	Top	391	74	-10	-60	3	N/A		
		HUH-103-6	Top	391	71	-10	-60	3	N/A		
		HUH-103-7	Top	391	74	-10	-60	3	N/A		
		HUH-103-8	Top	391	72	-10	-60	3	N/A		
		HUH-103-9	Top	391	73	-10	-60	3	N/A		
		HUH-103-10	Top	391	72	-10	-60	3	N/A		
		HUH-103-11	Top	391	73	-10	-60	3	N/A		
		HUH-103-12	Top	391	72	-10	-60	3	N/A		
		HUH-103-13	Top	391	70	-10	-60	3	N/A		
		HUH-103-14	Top	391	72	-10	-60	3	N/A		
		HUH-104-1	Top	341	65	0	-59	3	N/A		
		HUH-104-2	Top	341	78	0	-59	3	N/A		
		HUH-104-3	Top	341	76	0	-59	3	N/A		
		HUH-104-4	Top	341	77	0	-59	3	N/A		
		HUH-104-5	Top	341	69	0	-59	3	N/A		
		HUH-104-6	Top	341	69	0	-59	3	N/A		
		HUH-104-7	Top	341	78	0	-59	3	N/A		
		HUH-107b	South	487	94	-10	-62	3	N/A		
		HUH-108	South	454	58	-10	-61	3	N/A		
		HUH-109	Top	379	75	0	-60	3	N/A		
		HUH-110	Top	381	76	0	-60	3	N/A		
		HUH-111	Top	382	76	0	-60	3	N/A		
		HUH-112	Top	383	76	0	-60	3	N/A		
		HUH-113	Top	384	75	0	-60	3	N/A		
		HUH-115	North	404	73	0	-60	3	N/A		
		HUH-116	North	400	70	0	-60	3	N/A		
		HUH-117	North	395	70	0	-60	3	N/A		
		HUH-118	North	391	68	0	-60	3	N/A		
		HUH-119	Top	583	65	-10	-63	3	N/A		

---

## **Appendix B**

### **Noise Measurement to obtain the SWLs of Fixed Plant Noise Sources**

---

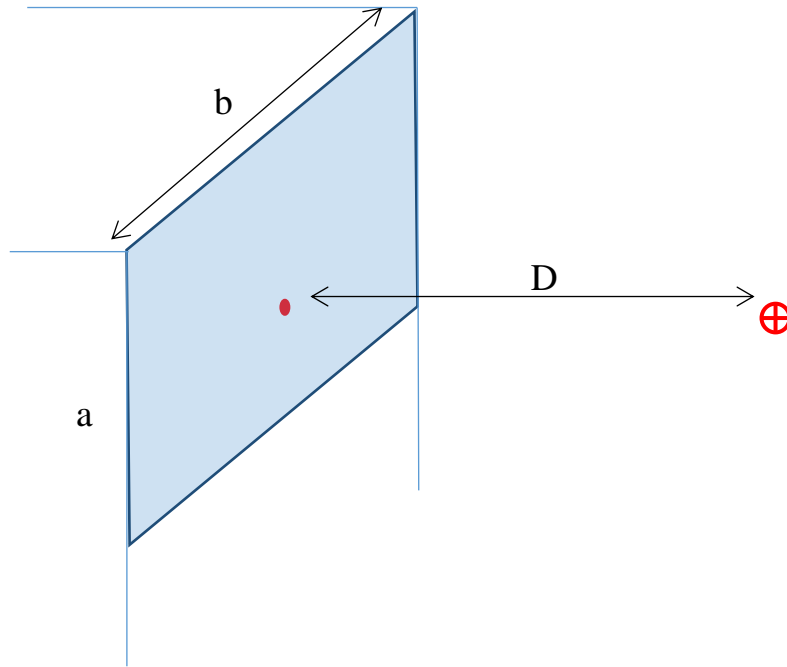
---

## **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 integer.

 Louver opening

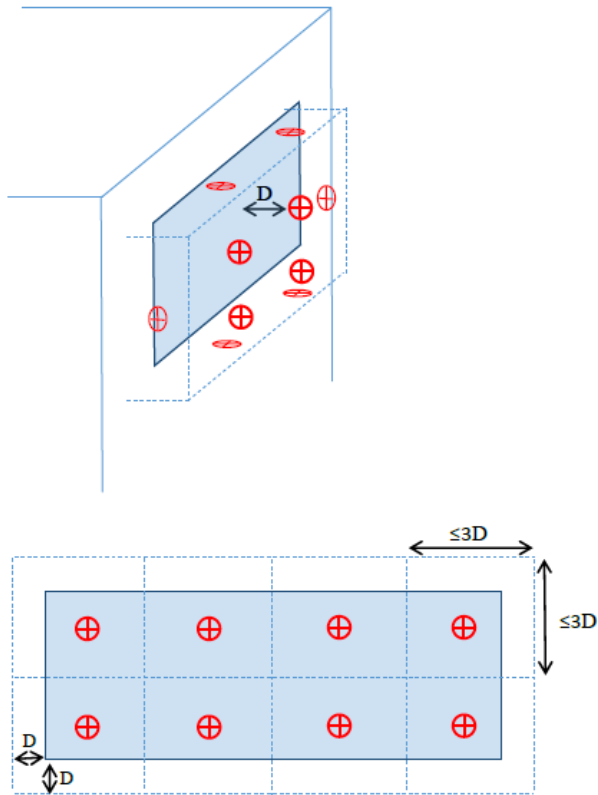
 Proposed measurement point (microphone pointing perpendicular to the center of the louver)

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  $L_{Aeq, 1 \text{ min}}$  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 characteristics at representative NSRs.

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

## Method 2: Near-Field Testing Method for Louver



D: Measurement distance

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

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

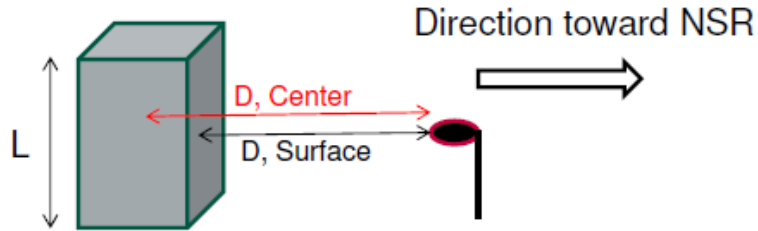
- First step is to determine a hypothetical measurement surfaces with at least 1m separation (D, measured from the centre of the louver or its nearest edges as appropriate) from the louver.
- For louver with largest dimension  $\leq 3D$ , at least one measurement at the centre of the measurement surface parallel to the louver 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 characteristics 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  $L_{Aeq, 1 \text{ min}}$  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 characteristics at representative NSRs.

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

#### Method 4 – Near Field Testing Method for Plant Item

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 characteristics at representative NSRs.

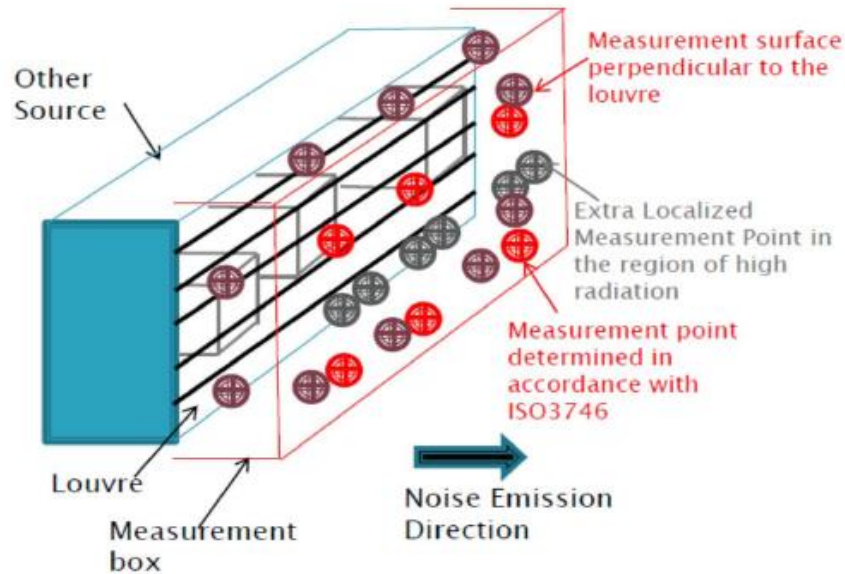
$SWL = \text{Mean } L_{Aeq} \text{ over all measurement points} + 10 \log (\text{total surface area over the measurement box}) + K1A + K2A$

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 louvre.
- 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 characteristics at representative NSRs.

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

K1A refers to background noise correction factor

K2A refers to environmental correction for sound absorption and reflection

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## **Appendix B2**

### **Calibration Certificates – Noise Measurement for Fixed Plant Noise**


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## Appendix B2 Calibration Certificates – Noise Measurement for Fixed Plant Noise

### Calibration Certificate for SVAN 958 S.N. 28422 (2018-2020)



#### CALIBRATION CERTIFICATE

<b>Certificate Information</b>																	
Date of Issue	7-May-2018	Certificate Number															
		MLCN180788S															
<b>Customer Information</b>																	
Company Name	Wilson Accoustics Limited																
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																
<b>Equipment-under-Test (EUT)</b>																	
Description	Sound & Vibration Analyser																
Manufacturer	Svantek																
Model Number	SVAN 958																
Serial Number	28422																
Equipment Number	--																
<b>Calibration Particular</b>																	
Date of Calibration	7-May-2018																
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-2018																
Calibration Procedure	MLCG00, MLCG15																
Calibration Conditions	<table border="1"><tr><td>Laboratory</td><td>Temperature</td><td>23 °C ± 5 °C</td></tr><tr><td></td><td>Relative Humidity</td><td>55% ± 25%</td></tr><tr><td>EUT</td><td>Stabilizing Time</td><td>Over 3 hours</td></tr><tr><td></td><td>Warm-up Time</td><td>10 minutes</td></tr><tr><td></td><td>Power Supply</td><td>Internal battery</td></tr></table>		Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	10 minutes		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C															
	Relative Humidity	55% ± 25%															
EUT	Stabilizing Time	Over 3 hours															
	Warm-up Time	10 minutes															
	Power Supply	Internal battery															
Calibration Results	Calibration data were detailed in the continuation pages.																
<b>Approved By &amp; Date</b>																	
		K.O. Lo															
		7-May-2018															
<b>Statements</b>																	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>																	

Page 1 of 2

# Calibration Certificate for SVAN 958 S.N. 28422 (2019-2020)



Certificate No. MLCN180788S

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

- END -

Calibrated By :  
Date :

Dan  
7-May-2018

Checked By :  
Date :

K.O. Lo  
7-May-2018


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 B2 室  
Unit B2, 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

# Calibration Certificate for SVAN 958 S.N. 28422 (2020-2022)



## CALIBRATION CERTIFICATE

<b>Certificate Information</b>																	
Date of Issue	12-May-2020	Certificate Number															
MLCN201165S																	
<b>Customer Information</b>																	
Company Name	Wilson Accoustics Limited																
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong																
<b>Equipment-under-Test (EUT)</b>																	
Description	Sound & Vibration Analyser																
Manufacturer	Svantek																
Model Number	SVAN 958																
Serial Number	28422																
Equipment Number	--																
<b>Calibration Particular</b>																	
Date of Calibration	12-May-2020																
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-2020																
Calibration Procedure	MLCG00, MLCG15																
Calibration Conditions	<table border="1"><tr><td>Laboratory</td><td>Temperature</td><td>23 °C ± 5 °C</td></tr><tr><td></td><td>Relative Humidity</td><td>55% ± 25%</td></tr><tr><td>EUT</td><td>Stabilizing Time</td><td>Over 3 hours</td></tr><tr><td></td><td>Warm-up Time</td><td>10 minutes</td></tr><tr><td></td><td>Power Supply</td><td>Internal battery</td></tr></table>		Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	10 minutes		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C															
	Relative Humidity	55% ± 25%															
EUT	Stabilizing Time	Over 3 hours															
	Warm-up Time	10 minutes															
	Power Supply	Internal battery															
Calibration Results	Calibration data were detailed in the continuation pages.																
<b>Approved By &amp; Date</b>																	
		K.O. Lo															
		12-May-2020															
<b>Statements</b>																	
<ul style="list-style-type: none"><li>* Calibration equipment used for this calibration are traceable to national / international standards.</li><li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li><li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li><li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li></ul>																	

Page 1 of 2



# Calibration Certificate for SVAN 958 S.N. 28422 (2020-2022)



Certificate No. MLCN2011655

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

- END -

Calibrated By :  
Date :

Dan  
12-May-2020


Checked By :  
Date :

K.O. Lo  
12-May-2020

Page 2 of 2



## CALIBRATION CERTIFICATE

Certificate Information																
Date of Issue	24-Oct-2019															
Certificate Number	MLCN192831S															
Customer Information																
Company Name	Wilson Acoustics Limited															
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong															
Equipment-under-Test (EUT)																
Description	Precision Acoustic Calibrator															
Manufacturer	Larson Davis															
Model Number	CAL200															
Serial Number	10478															
Equipment Number	--															
Calibration Particular																
Date of Calibration	24-Oct-2019															
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-20 1357(MLTE190) / MLEC19/05/02 / 26-May-20															
Calibration Procedure	MLCG00, MLCG15															
Calibration Conditions	<table border="1"> <tr> <td>Laboratory</td> <td>Temperature</td> <td>23 °C ± 5 °C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>55% ± 25%</td> </tr> <tr> <td>EUT</td> <td>Stabilizing Time</td> <td>Over 3 hours</td> </tr> <tr> <td></td> <td>Warm-up Time</td> <td>Not applicable</td> </tr> <tr> <td></td> <td>Power Supply</td> <td>Internal battery</td> </tr> </table>	Laboratory	Temperature	23 °C ± 5 °C		Relative Humidity	55% ± 25%	EUT	Stabilizing Time	Over 3 hours		Warm-up Time	Not applicable		Power Supply	Internal battery
Laboratory	Temperature	23 °C ± 5 °C														
	Relative Humidity	55% ± 25%														
EUT	Stabilizing Time	Over 3 hours														
	Warm-up Time	Not applicable														
	Power Supply	Internal battery														
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.															
Approved By & Date																
 K.O. Lo 24-Oct-2019																
Statements																
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>																

Page 1 of 2



# Calibration Certificate for CAL200 S.N. 10478 (2019-2020)



Certificate No. MLCN192831S

Calibration Data					
EUT Setting		Standard Reading	EUT Error from Setting	Calibration Uncertainty	EUT Specification
94	dB	93.9 dB	-0.1 dB	0.15 dB	$\pm 0.2$ dB
114	dB	114.0 dB	0.0 dB	0.15 dB	$\pm 0.2$ dB

- END -

Calibrated By : Dan  
Date : 24-Oct-19

Checked By : K.O. Lo  
Date : 24-Oct-19  
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 B2 室  
Unit B2, 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

# Calibration Certificate for CAL200 S.N. 10478 (2020-2021)



Certificate No. MLCN202866S

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	$\pm 0.2$ dB
114 dB	114.0 dB	0.0 dB	0.15 dB	$\pm 0.2$ dB

- END -

Calibrated By : Dan  
Date : 31-Oct-20

Checked By : K.O. Lo  
Date : 31-Oct-20

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., Baldwin 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

# Calibration Certificate for CAL200 S.N. 10478 (2020-2021)



## CALIBRATION CERTIFICATE

Certificate Information			
Date of Issue	31-Oct-2020		Certificate Number
MLCN202866S			
Customer Information			
Company Name	Wilson Accoustics Limited		
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong		
Equipment-under-Test (EUT)			
Description	Precision Acoustic Calibrator		
Manufacturer	Larson Davis		
Model Number	CAL200		
Serial Number	10478		
Equipment Number	--		
Calibration Particular			
Date of Calibration	31-Oct-2020		
Calibration Equipment	4231(MLTE008) / AV200063 / 23-Jun-23 1357(MLTE190) / MLEC20/05/02 / 26-May-21		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.		
Approved By & Date			
			K.O. Lo 31-Oct-2020
Statements			
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>			

Page 1 of 2

# Calibration Certificate for SVAN 958A S.N. 59120 (2020-2022)



## CALIBRATION CERTIFICATE

<b>Certificate Information</b>			
Date of Issue	17-Nov-2020	Certificate Number	MLCN203076S
<b>Customer Information</b>			
Company Name	Wilson Accoustics Limited		
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong		
<b>Equipment-under-Test (EUT)</b>			
Description	Sound & Vibration Analyser		
Manufacturer	Svantek		
Model Number	SVAN 958		
Serial Number	59120		
Equipment Number	--		
<b>Calibration Particular</b>			
Date of Calibration	17-Nov-2020		
Calibration Equipment	4231(MLTE008) / AV200063 / 23-Jun-2023		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	10 minutes
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages.		
<b>Approved By &amp; Date</b>			
		K.O. Lo	17-Nov-2020
<b>Statements</b>			
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>			

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# Calibration Certificate for SVAN 958A S.N. 59120 (2020-2022)



Certificate No. MLCN203076S

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

K.O. Lo  
17-Nov-2020  
Page 2 of 2

# Calibration Certificate for SV30A S.N. 10814 (2020-2021)



## CALIBRATION CERTIFICATE

Certificate Information			
Date of Issue	21-Aug-2020		Certificate Number
MLCN202127S			
Customer Information			
Company Name	Wilson Accoustics Limited		
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong		
Equipment-under-Test (EUT)			
Description	Acoustic Calibrator		
Manufacturer	Svantek		
Model Number	SV 30A		
Serial Number	10814		
Equipment Number	--		
Calibration Particular			
Date of Calibration	21-Aug-2020		
Calibration Equipment	4231(MLTE008) / AV200063 / 23-Jun-23 1351(MLTE049) / MLEC20/06/02 / 5-Jun-21		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.		
Approved By & Date			
		K.O. Lo	21-Aug-2020
Statements			
<ul style="list-style-type: none"> <li>* Calibration equipment used for this calibration are traceable to national / international standards.</li> <li>* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.</li> <li>* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.</li> <li>* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.</li> </ul>			

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# Calibration Certificate for SV30A S.N. 10814 (2020-2021)



Certificate No. MLCN202127S

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 : Kenneth  
Date : 21-Aug-20

Checked By : K.O. Lo  
Date : 21-Aug-20  
Page 2 of 2



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### **Appendix B3**

**Photographs showing the Examples of Noise Measurement  
for Fixed Plant Noise**

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



**SWL Measurement Location for HUH-103-3**



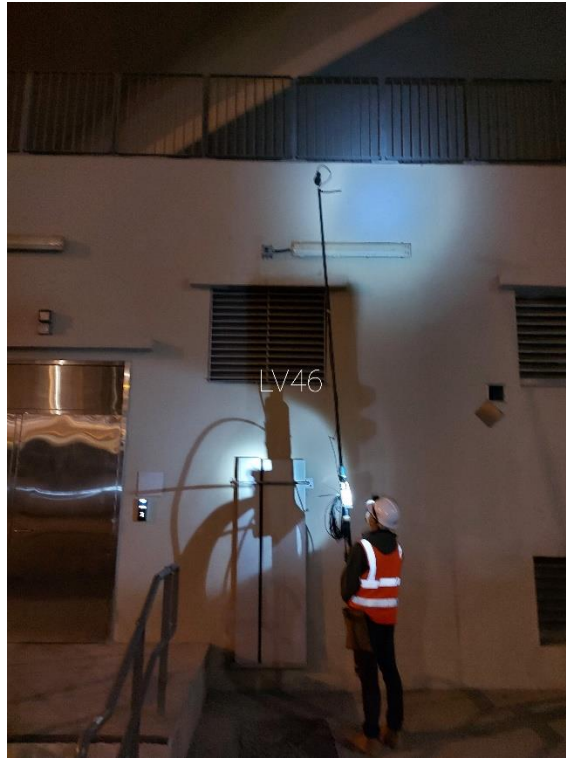
**SWL Measurement Location for HUH-108**



**SWL Measurement Location for HUH-103-9**



**SWL Measurement Location for HUH-95b**



**SWL Measurement Location for HUH-33H**



**SWL Measurement Location for HUH-27H**

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## **Appendix B4**

### **Noise Measurement Results**

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Appendix B4 Noise Measurement Results

Fixed Plant Source ID	Plant Type	Method	Size of Louvre / Plant (mm)			Measurement Distance (m) D <sup>(a)</sup> & (d)	Averaged Measured L <sub>Aeq</sub> ,dB(A) <sup>(b)</sup>	Background L <sub>Aeq</sub> ,dB(A)	Difference L <sub>Aeq</sub> ,dB(A)	Background Corrected L <sub>Aeq</sub> ,dB(A) <sup>(c)</sup>	Calculated SWL, dB(A)
			Length	Width	Height						
HUH-4-2	Louvre	2	700	1500	N/A	1.0	62.7	52.9	9.8	62.2	76
HUH-9a	Louvre	2	2850	2000	N/A	1.0	64.1	54.0	10.1	64.1	80
HUH-9b	Louvre	2	2850	6780	N/A	1.0	64.0	50.8	13.2	64.0	82
HUH-9c	Louvre	2	900	6780	N/A	1.0	66.7	53.7	13.0	66.7	77
HUH-10a	Louvre	2	2850	2000	N/A	1.0	62.4	52.8	9.6	61.9	78
HUH-10b	Louvre	2	2850	6780	N/A	1.0	63.9	51.2	11.7	62.9	81
HUH-10c	Louvre	2	900	6780	N/A	1.0	60.9	51.1	9.8	60.4	70
HUH-11a	Louvre	2	2850	2000	N/A	1.0	55.1	52.0	3.1	52.1	68
HUH-11b	Louvre	2	2850	6780	N/A	1.0	54.9	52.4	2.5	51.9	70
HUH-12a	Louvre	2	2850	2000	N/A	1.0	53.4	53.2	0.2	50.4	66
HUH-12b	Louvre	2	2850	6780	N/A	1.0	52.6	52.0	0.6	49.6	68
HUH-13a	Louvre	2	1500	3300	N/A	1.0	51.3	50.0	1.3	48.3	64
HUH-14-1-1	Louvre	2	2300	2100	N/A	1.0	62.4	56.1	6.3	61.2	75
HUH-14-1-2	Louvre	2	2300	1750	N/A	1.0	74.8	55.3	19.5	74.8	88
HUH-14-2	Louvre	2	3000	4500	N/A	1.0	75.6	57.2	18.4	75.6	91
HUH-14-3	Louvre	2	1300	2000	N/A	1.0	74.3	58.2	16.1	74.3	87
HUH-15	Louvre	2	7900	2800	N/A	1.0	66.4	60.4	6.0	65.1	84
HUH-16a	Louvre	2	3450	2250	N/A	1.0	64.6	56.2	8.4	63.9	80
HUH-16b	Louvre	2	3450	6500	N/A	1.0	67.2	57.7	9.5	66.6	85
HUH-20	Louvre	2	5939	2300	N/A	1.0	55.3	50.8	4.5	53.4	71
HUH-22a-1	Louvre	2	3400	4000	N/A	1.0	65.3	52.6	12.7	65.3	83
HUH-22a-2	Louvre	2	5150	2000	N/A	1.0	65.8	50.3	15.5	65.8	83
HUH-22b	Louvre	2	2000	2000	N/A	1.0	70.3	57.7	12.6	70.3	85
HUH-26H	Louvre	2	1000	1000	N/A	1.0	74.4	62.5	11.9	74.4	88
HUH-27H	Louvre	2	1200	1000	N/A	1.0	68.6	62.4	6.2	67.4	81
HUH-29	Louvre	2	200	200	N/A	0.5	66.3	61.7	4.6	64.5	70
HUH-30H	Louvre	2	1000	1000	N/A	1.0	71.2	62.7	8.5	70.5	84
HUH-32H	Louvre	2	1000	1000	N/A	1.0	70.5	61.7	8.8	69.9	83
HUH-33H	Louvre	2	1000	1200	N/A	1.0	74.3	62.3	12.1	74.3	88
HUH-37H	Louvre	2	1000	1000	N/A	1.0	71.8	60.8	11.0	71.8	85
HUH-80-1	Plant	3	3600	6000	3000	12.0	63.0	58.2	4.8	61.3	92
HUH-80-2	Plant	3	3600	6000	3000	12.0	62.8	57.9	4.9	61.1	92
HUH-80-3	Plant	3	3600	6000	3000	12.0	63.9	58.4	5.5	62.5	93
HUH-81	Plant	4	3000	5600	2200	1.0	78.2	52.9	25.3	78.2	99
HUH-82-1	Louvre	2	6100	6000	N/A	1.0	57.9	53.3	4.6	56.1	76
HUH-82-6	Louvre	2	1220	3000	N/A	0.5	76.2	64.4	11.8	76.2	88
HUH-85b	Louvre	2	4876	4235	N/A	1.0	69.6	58.7	10.9	69.6	87
HUH-86-4	Louvre	2	1220	3000	N/A	0.5	58.4	55.5	2.9	55.4	67
HUH-86-13	Louvre	2	1220	3000	N/A	0.5	62.5	58.5	4.0	60.3	72
HUH-95b	Louvre	2	1400	3500	N/A	0.5	81.0	55.6	25.4	81	92
HUH-103-1	Plant	4	1330	940	340	1.0	58.2	55.8	2.4	55.2	70
HUH-103-2	Plant	4	1330	940	340	1.0	56.2	52.4	3.8	53.9	69
HUH-103-3	Plant	4	1758	770	930	1.0	61.6	57.0	4.6	59.8	76
HUH-103-4	Plant	4	1758	770	930	1.0	60.8	55.6	5.2	59.2	75
HUH-103-5	Plant	4	1758	770	930	1.0	61.3	58.8	2.5	58.3	74
HUH-103-6	Plant	4	1330	940	340	1.0	58.6	54.7	3.9	56.3	71
HUH-103-7	Plant	4	1330	940	340	1.0	61.7	58.7	3.0	58.7	74
HUH-103-8	Plant	4	1330	940	340	1.0	59.2	55.9	3.3	56.5	72
HUH-103-9	Plant	4	1330	940	340	1.0	61.0	58.0	3.0	58	73
HUH-103-10	Plant	4	1330	940	340	1.0	58.7	54.5	4.2	56.6	72
HUH-103-11	Plant	4	1330	940	340	1.0	59.6	55.0	4.6	57.8	73
HUH-103-12	Plant	4	1330	940	340	1.0	59.5	55.1	4.4	57.5	72
HUH-103-13	Plant	4	1330	940	340	1.0	57.4	53.5	3.9	55.1	70
HUH-103-14	Plant	4	1330	940	340	1.0	58.9	53.8	5.1	57.3	72
HUH-104-1	Plant	4	1330	940	340	1.0	53.3	51.4	1.9	50.3	65
HUH-104-2	Plant	4	1330	940	340	1.0	56.8	52.1	4.7	55	70
HUH-104-3	Plant	4	1758	770	930	1.0	61.0	53.4	7.6	60.2	76
HUH-104-4	Plant	4	1758	770	930	1.0	61.9	53.4	8.5	61.2	77
HUH-104-5	Plant	4	1758	770	930	1.0	55.8	52.4	3.4	53.1	69
HUH-104-6	Plant	4	1330	940	340	1.0	57.1	53.9	3.2	54.3	69
HUH-104-7	Plant	4	1330	940	340	1.0	58.1	51.7	6.4	57	72
HUH-107b	Louvre	2	1500	2000	N/A	0.5	82.5	56.9	25.6	82.5	94
HUH-108	Louvre	2	1000	1500	N/A	0.5	51.2	50.3	0.9	48.2	58
HUH-109	Plant	4	1330	940	340	1.0	62.7	58.8	3.9	60.4	75
HUH-110	Plant	4	1330	940	340	1.0	63.4	60.2	3.2	60.6	76
HUH-111	Plant	4	1330	940	340	1.0	63.2	59.7	3.5	60.6	76
HUH-112	Plant	4	1330	940	340	1.0	63.8	60.5	3.3	61.1	76
HUH-113	Plant	4	1330	940	340	1.0	62.4	58.5	3.9	60.1	75
HUH-115	Louvre	2	1020	1020	N/A	0.5	65.4	61.0	4.4	63.4	73
HUH-116	Louvre	2	1020	1020	N/A	0.5	62.6	58.5	4.1	60.5	70
HUH-117	Louvre	2	1020	1020	N/A	0.5	63.3	59.8	3.5	60.7	70
HUH-118	Louvre	2	1100	1200	N/A	0.5	60.9	56.6	4.3	58.9	68
HUH-119	Plant	4	918	320	320	0.5	56.3	48.4	7.9	55.5	65
HUH-120	Plant	4	918	320	320	0.5	61.7	48.5	13.2	61.7	71

Remarks:

a) Measurement Distance between louvre and microphone.

b) For Method 2 & 4, results are averaged from number of points in accordance with ISO3746.

c) 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.

d) Measurement distance of 1 m was generally adopted. However, the impact noise at 1m from some louvers was not noticeably higher than the background noise. In accordance with Section 7.2.1 of ISO3746-2010, for a noise source located in a space having unfavourable acoustical conditions (e.g. being subject to high levels of background noise), the selection of a small measurement distance is appropriate. Therefore shorter measurement distance of at least 0.15m was adopted in accordance with Section 7.2.4 of ISO3746-2010 to determine the parallelepiped measurement surface to increase the measurement accuracy.

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## **Appendix C**

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

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**Appendix C1**  
**Calibration Certificates –**  
**Noise Measurement at Representative NSRs**

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## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA1019 02-01

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250	4950	ZC0032
Serial/Equipment No.:	3001291	3005374	23853
Adaptors used:	-	-	-

### Item submitted by

Customer Name:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	19-Oct-2020

Date of test: 22-Oct-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021	CIGISMEC
Signal generator	DS 360	61227	24-Dec-2020	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.
- 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 responses of the Sound Level Meter.

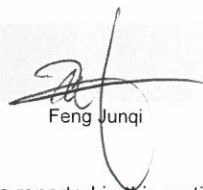
### Test results

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: 23-Oct-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA1019 02-01

Page 2 of 2

### 1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage 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 Frequency weightings	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	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	
	Single 100µs rectangular pulse	Pass	0.3	
Peak response	Crest factor of 3	Pass	0.3	
R.M.S. accuracy	Single burst 5 ms at 2000 Hz	Pass	0.3	
Time weighting I	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	SPL	Pass	0.3	
Overload indication	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 Uncertainty (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.

- End -

Calibrated by:

Date:

Fung Chi Yip  
22-Oct-2020

Checked by:

Date:

Feng Junqi  
23-Oct-2020

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0318 01

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamplifier
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: 18-Mar-2020

Date of test: 19-Mar-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2020	CIGISMEC
Signal generator	DS 360	33873	10-May-2020	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1005 \pm 5$  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  $\pm 20\%$ .
- 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 response 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: 19-Mar-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

20CA0318 01

Page 2 of 2

### 1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage 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 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> 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 Uncertainty (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.

Calibrated by:

Date:

Fung Chi Yip  
19-Mar-2020

Checked by:

Date:

Shek Kwong Tat  
19-Mar-2020

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0302 01

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Pream
Manufacturer:	B & K	B & K	B & 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: 02-Mar-2020

Date of test: 03-Mar-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2020	CIGISMEC
Signal generator	DS 360	33873	10-May-2020	CEPREI

### Ambient conditions

Temperature:  $21 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1005 \pm 5$  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  $\pm 20\%$ .
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: 03-Mar-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA0302 01

Page 2 of 2

## 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:	Uncertainty (dB) / Coverage Factor	
Self-generated noise	A	Pass	0.3	
	C	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	
	A	Pass	0.3	
	C	Pass	0.3	
Frequency weightings	Lin	Pass	0.3	
	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Time weightings	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
R.M.S. accuracy	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 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> 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	Uncertainty (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 uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95 %. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date:

Fung Chi Yip  
03-Mar-2020

Checked by:

Date:

Shek Kwong Tat  
03-Mar-2020

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0520 02-01

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	Nti	Nti Andio	Nti Andio
Type/Model No.:	XL2	MC230A	MA220
Serial/Equipment No.:	A2A-17440-EO	A18423	9087
Adaptors used:	-		

### Item submitted by

Customer Name: AECOM  
Address of Customer: -  
Request No.: -  
Date of receipt: 20-May-2020

Date of test: 23-May-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2020	CIGISMEC
Signal generator	DS 360	61227	24-Dec-2020	CEPREI

### Ambient conditions

Temperature:  $21 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1000 \pm 5$  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  $\pm 20\%$ .
- 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 responsiveness 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: 25-May-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA0520 02-01

Page 2 of 2

### 1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	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	
	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Linearity range for SPL	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	
	Single 100µs rectangular pulse	Pass	0.3	
Peak response	Crest factor of 3	Pass	0.3	
	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 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	SPL	Pass	0.3	
Overload indication	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 Uncertainty (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.

Calibrated by:

Fung Chi Yip

Date: 23-May-2020

Checked by:

Shek Kwong Tat

Date: 25-May-2020

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.



## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0520 02-02

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	Nti	Nti Andio	Nti Andio
Type/Model No.:	XL2	MC230A	MA220
Serial/Equipment No.:	A2A-17788-EO	A18398	9065
Adaptors used:	-		

### Item submitted by

Customer Name: AECOM  
Address of Customer: -  
Request No.: -  
Date of receipt: 20-May-2020

Date of test: 23-May-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2020	CIGISMEC
Signal generator	DS 360	61227	24-Dec-2020	CEPREI

### Ambient conditions

Temperature:  $21 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1000 \pm 5$  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  $\pm 20\%$ .
- 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 responsiveness 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: 25-May-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA0520 02-02

Page 2 of 2

### 1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	2.2
	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	
	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 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> 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 Uncertainty (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.

Calibrated by:

Date:

Fung Chi Yip

23-May-2020

- End -

Checked by:

Date:

Shek Kwong Tat

25-May-2020

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0330 01

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: B & K  
Type/Model No.: 4231  
Serial/Equipment No.: 3006428  
Adaptors used: -

### Item submitted by

Customer: AECOM  
Address of Customer: -  
Request No.: -  
Date of receipt: 30-Mar-2020

LN.004.037

Date of test: 31-Mar-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	03-May-2020	SCL
Preamplifier	B&K 2673	2239857	17-May-2020	CEPREI
Measuring amplifier	B&K 2610	2346941	05-Jun-2020	CEPREI
Signal generator	DS 360	33873	10-May-2020	CEPREI
Digital multi-meter	34401A	US36087050	08-May-2020	CEPREI
Audio analyzer	8903B	GB41300350	13-May-2020	CEPREI
Universal counter	53132A	MY40003662	10-May-2020	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1005 \pm 5$  hPa

### Test specifications

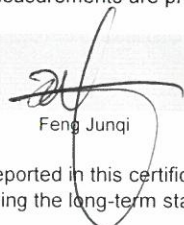
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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:

  
Feng Junqi

Date: 31-Mar-2020 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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA0330 01

Page: 2 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.

(Output level in dB re 20  $\mu$ Pa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.21	0.10

### 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 = 0.011 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 = 1000.0 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.

- End -

Calibrated by:

Date:

Fung Chi Yip  
31-Mar-2020

Checked by:

Date:

Shek Kwong Tat  
31-Mar-2020

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0324 01

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: MVI  
Type/Model No.: CAL21  
Serial/Equipment No.: 34113610(2011) / N.004.11  
Adaptors used: Yes (BAC21)

### Item submitted by

Customer: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 24-Mar-2020

Date of test: 25-Mar-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	03-May-2020	SCL
Preamplifier	B&K 2673	2239857	17-May-2020	CEPREI
Measuring amplifier	B&K 2610	2346941	05-Jun-2020	CEPREI
Signal generator	DS 360	33873	10-May-2020	CEPREI
Digital multi-meter	34401A	US36087050	08-May-2020	CEPREI
Audio analyzer	8903B	GB41300350	13-May-2020	CEPREI
Universal counter	53132A	MY40003662	10-May-2020	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1^\circ\text{C}$   
Relative humidity:  $55 \pm 10\%$   
Air pressure:  $1005 \pm 5\text{ hPa}$

### Test specifications

- 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.
- 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:

  
Feng Junqi

Date: 26-Mar-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA0324 01

Page: 2 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 Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 $\mu$ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	94.14	0.10

### 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 = 0.014 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 = 1002.6 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 = 1.5 %

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.

- End -

Calibrated by:

Date:

Fung Chi Yip  
25-Mar-2020

Checked by:

Date:

Shek Kwong Tat  
26-Mar-2020

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA1006 03

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Rion Co., Ltd.  
Type/Model No.: NC-74  
Serial/Equipment No.: 34246490 / N.004.10  
Adaptors used: -

### Item submitted by

Customer: AECOM ASIA CO LIMITED  
Address of Customer: -  
Request No.: -  
Date of receipt: 06-Oct-2020

Date of test: 12-Oct-2020

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	SCL
Preamplifier	B&K 2673	2743150	03-Jun-2021	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	CEPREI
Signal generator	DS 360	33873	19-May-2021	CEPREI
Digital multi-meter	34401A	US36087050	19-May-2021	CEPREI
Audio analyzer	8903B	GB41300350	18-May-2021	CEPREI
Universal counter	53132A	MY40003662	18-May-2021	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1005 \pm 5$  hPa

### Test specifications

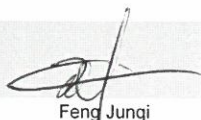
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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:

  
Feng Junqi

Date: 12-Oct-2020

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.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA1006 03

Page: 2 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.

(Output level in dB re 20 $\mu$ Pa)			
Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.10	0.10

### 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 = 0.017 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 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 = 1.6%

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.

- End -

Calibrated by:

Date:

Fung Chi Yip  
12-Oct-2020

Checked by:

Date:

Feng Junqi  
12-Oct-2020

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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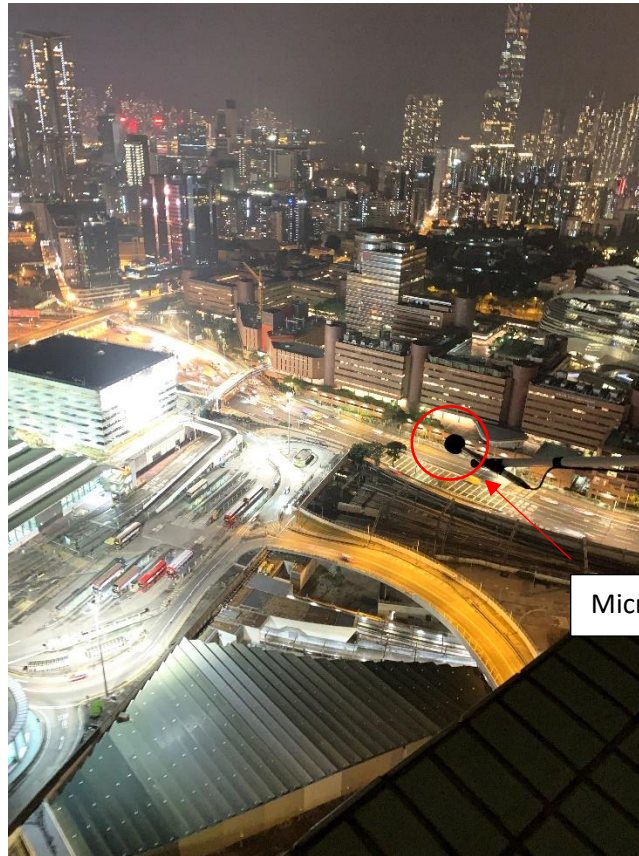
## **Appendix C2**

### **Photographs – Noise Measurement at Representative NSRs**

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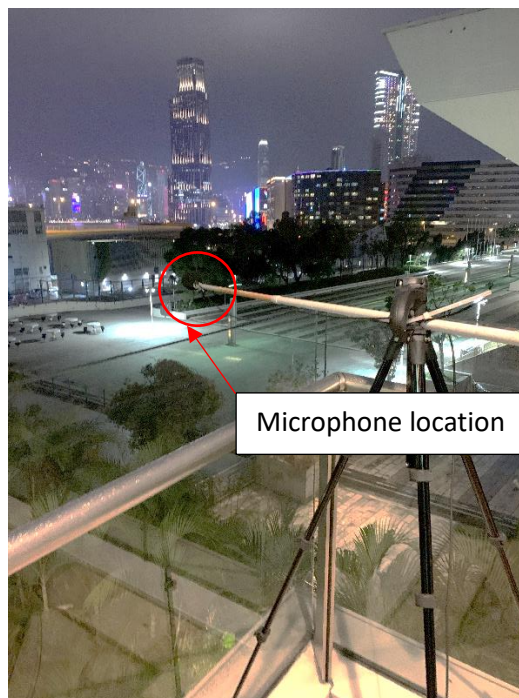


## Appendix C2 Photographs – Noise Measurement at Representative NSRs



Microphone location

**NSR Measurement Location at FN-1**



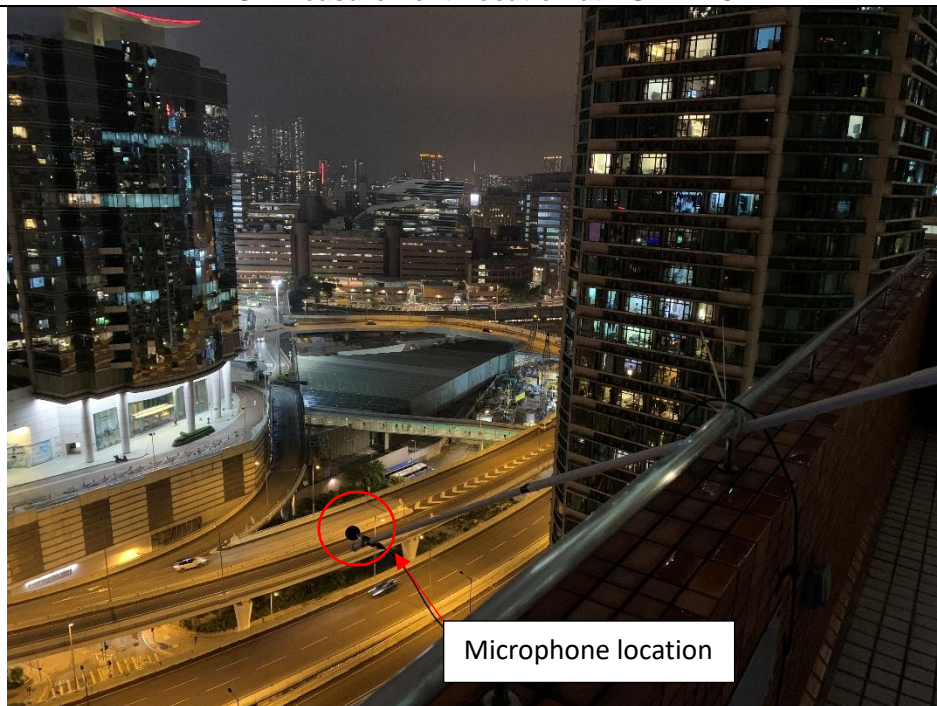
Microphone location

**NSR Measurement Location at HUH-FN-2**

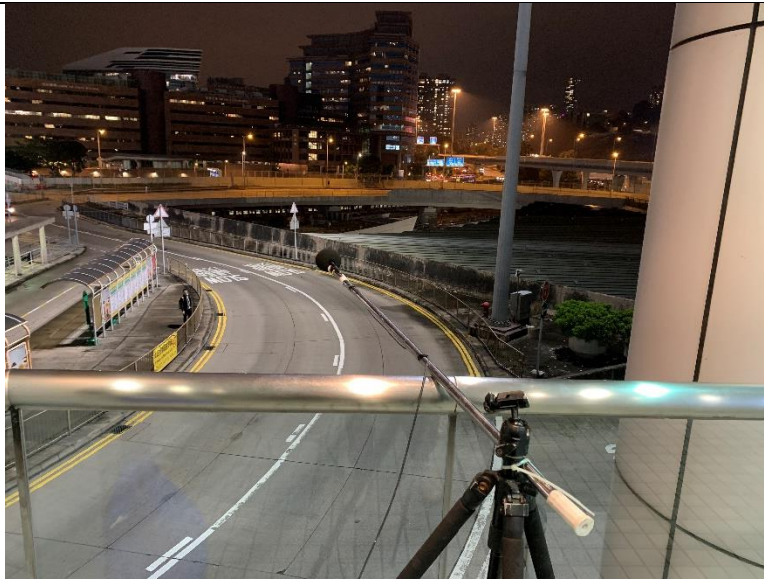




**NSR Measurement Location at HUH-FN-3**



**NSR Measurement Location at HUH-FN-4**



**NSR Measurement Location at HUH-FN-5**

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## **Appendix C3**

### **Measurement Results at Representative NSRs**

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### Appendix C3 Noise Measurement Results at Measurement Locations

Measurement Location ID	Measurement Date	Operation Scenario <sup>(1)(2)</sup>	Fixed Plant Noise		Background Noise		Difference between Measured Noise Level and Background Level, dB(A) <sup>(3)</sup>
			Measurement Time	Measured Noise Level, $L_{Aeq\ 30mins}$ , dB(A)	Measurement Time	Background Noise Level, $L_{Aeq\ 5mins}$ , dB(A)	
HUH-FN1	23/12/2020 - 24/12/2020	Daytime and Evening	2215-2245 hours	65.9	2155-2200 hours	65.8	0.1
		Night-time	2303-2333 hours	65.5	2354-2359 hours	64.7	0.8
HUH-FN2	23/12/2020 - 24/12/2020	Daytime and Evening	2215-2245 hours	58.0	2155-2200 hours	57.7	0.3
		Night-time	2303-2333 hours	57.6	2349-2354 hours	55.8	1.8
HUH-FN3	23/12/2020 - 24/12/2020	Daytime and Evening	2215-2245 hours	61.7	2155-2200 hours	62.5	-0.8
		Night-time	2303-2333 hours	60.4	2349-2354 hours	59.8	0.6
HUH-FN4	23/12/2020 - 24/12/2020	Daytime and Evening	2215-2245 hours	64.0	2154-2359 hours	64.6	-0.6
		Night-time	2303-2333 hours	63.4	2352-2357 hours	61.8	1.6
HUH-FN5	23/12/2020 - 24/12/2020	Daytime and Evening	2215-2245 hours	66.8	2155-2200 hours	66.9	-0.1
		Night-time	2303-2333 hours	67.0	2349-2354 hours	67.4	-0.4

Notes:

(1) Daytime and evening period (i.e 0700 to 2300 hours) and night-time period (i.e. 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.

(3) The measured noise levels were dominated by background noise (i.e. road traffic noise from major roads nearby). Since traffic noise fluctuated during the measurement periods, leading to higher background noise levels than the measured noise levels at few measurement locations.