



# Updated Open-air Lagoon Show with Pyrotechnic Effects

Noise Monitoring Report (July 2024)

PREPARED FOR



Ocean Park Corporation

DATE

8 August 2024

REFERENCE

0540005



## DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.

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SIGNATURE PAGE

# Updated Open-air Lagoon Show with Pyrotechnic Effects

Noise Monitoring Report (July 2024)

0540005



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**Environmental Permit No. EP-249/2006/D**  
**Ocean Park Master Redevelopment Project**  
**Environmental Team Leader Certification**

**Reference Document/Plan**

Document/ <del>Plan</del> to be Certified/ <del>Verified</del> :	Noise Monitoring Report (July 2024)
Date of Report:	8 August 2024

**Reference EP Condition**

Environmental Permit Condition:	3.4
Four hard copies and one electronic copy of the monthly EM&A Reports for the construction and operation stages shall be submitted to the Director within two weeks after the end of the reporting month. The monthly EM&A Reports shall include a summary of all non-compliance with the recommendations in the EIA Report or this Permit. The submissions shall be certified by the ET Leader and verified by the IEC as complied with the requirements as set out in the EM&A Manual before submission to the Director. Additional copies of the submission shall be provided upon request by the Director.	

**ETL Verification**

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-249/2006/D.

Ms Mandy To  
Environmental Team Leader

Date: 8 August 2024

Our ref: 0540005\_ETL Verification Cert\_20240808.docx

**Ocean Park Master Redevelopment Project**

**Environmental Permit No. EP-249/2006/D - Condition 3.4**

**Updated Open-air Lagoon Show with Pyrotechnic Effects  
Monthly Noise Monitoring Report  
(July 2024)**

**Submitted by ERM-Hong Kong, Limited dated 08 August 2024**

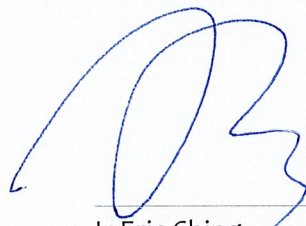
**This is to verify that**

**Updated Open-air Lagoon Show with Pyrotechnic Effects  
Monthly Noise Monitoring Report  
(July 2024)**

**Submitted by ERM-Hong Kong, Limited dated 08 August 2024**

**Has been verified by the undersigned.**

Signed



Ir Eric Ching  
Independent Environmental Checker (IEC)  
Retained by Ocean Park Corporation  
pursuant to Environmental Permit No. EP-249/2006/D

Date

08 August 2024

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## 1. BACKGROUND

ERM-Hong Kong, Limited (ERM) has been appointed by Ocean Park Corporation (OPC) to undertake noise monitoring of the Updated Open-air Lagoon Show with Pyrotechnic Effects under the "Repositioning and Long Term Operation Plan of Ocean Park" (the Project) with update of design in audio system and use of Pyrotechnic Special Effect Materials (PSEM), as presented in the *Noise Review Study Report 2024 (NRR 2024)* deposited to the Environmental Protection Department (EPD) on 6 June 2024.

### 1.1 PURPOSE OF THE REPORT

The Updated Open-air Lagoon Show with Pyrotechnic Effects, including *Soul of the Ocean (SOTO)* and *Vision of Hong Kong (VHK)*, commenced on 6 July 2024. As stated in *NRR 2024*, noise monitoring is proposed to be conducted on the first day of the updated lagoon night, as well as by the end of July, August and September 2024. The necessity and frequency of further noise monitoring should be further reviewed afterwards.

This is the noise monitoring report which summarises the impact monitoring results for the show held in **July 2024**.

### 1.2 STRUCTURE OF THE REPORT

After this introductory section, the remainder of this report is arranged as follows:

**Section 2:** describes the noise monitoring methodology, presents and discusses the monitoring results

**Section 3:** presents an overall conclusion of the noise monitoring

## 2. NOISE MONITORING

### 2.1 INTRODUCTION

Noise monitoring has been carried out following the requirements given in Condition 3.1 of the Environmental Permit (EP-249/2006/D) and the updated EM&A Manual. The requirements and results are detailed in the following sections.

### 2.2 NOISE MONITORING REQUIREMENTS

Operational phase noise monitoring during the first operational year of the lagoon night show was completed in accordance with the approved EIA report for “*Repositioning and Long Term Operation Plan of Ocean Park*” and EM&A Manual. Nevertheless, due to update in design of audio system and the use of PSEM, as stated in *NRR 2024*, it has been proposed that noise monitoring shall be carried out on the first day of the updated lagoon show (i.e. 6 July 2024), as well as by the end of July, August and September 2024. The necessity and frequency of further noise monitoring should be further reviewed afterwards.

### 2.3 MONITORING LOCATIONS

Noise monitoring was conducted at five monitoring stations. These monitoring stations are identical to those adopted in the monthly noise monitoring report for the lagoon show (i.e. *SOTO* and *VHK*) of Ocean Park which launched on and off between 2020 and 2023. The locations of the five monitoring stations are indicated in **Figure 1** and presented in **Table 1** below.

**TABLE 1 NOISE MONITORING STATIONS**

Noise Monitoring Station	Description	Location	With or without Façade Correction
AON1	Open area adjacent to Police Training School	1.2m above street level	Without façade correction
AON2	Marriott Hotel. Ocean Park	1m from façade at roof level	With façade correction
AON3	Woodgreen Estate	1.5m above street level outside boundary wall	With façade correction
AON4	Manly Villa	1.2 above street level	With façade correction
AON5	Hau Yuen	3.0m above street level outside boundary wall	With façade correction

### 2.4 MONITORING PARAMETERS

#### NOISE LEVEL OF SHOW

Measurements of  $L_{Aeq(5min)}$  readings were carried out to monitoring the noise level during the show. The schedule of show is shown in **Table 2**.





**TABLE 2 SCHEDULE OF LAGOON NIGHT SHOW**

Description	Time
Vision of Hong Kong (VHK)	<ul style="list-style-type: none"> <li>Once between 1900 and 2200 hrs everyday since 6 July 2024</li> <li>Lasted for around 5 minutes</li> </ul>
Soul of the Ocean (SOTO)	<ul style="list-style-type: none"> <li>Once between 1900 and 2200 hrs everyday since 6 July 2024</li> <li>Lasted for around 12 minutes</li> </ul>

**BACKGROUND NOISE LEVEL**

Measurement of  $L_{Aeq(5min)}$  were carried out before and after the show when speakers were switched off to calculate the overall background noise level at each location.

Any significant influencing factors on the measured noise levels were noted in accordance with standard acoustical principles and practices. The background-corrected noise level due to the show was computed based on the background noise level and measured noise level during the shows.

**2.5 MONITORING FREQUENCY**

Noise monitoring for the show has been conducted twice in July 2024. The noise monitoring schedule is summarised in **Table 3**.

**TABLE 3 NOISE MONITORING SCHEDULE IN JULY 2024**

Monitoring Date	Monitoring Stations
6 July 2024 (Saturday) (Start of show)	AON1 to AON5
31 July 2024 (Wednesday)	AON1 to AON5

**2.6 MONITORING METHODOLOGY**

The sound level meters and calibrators used for the noise monitoring, as listed in **Table 4** below, complies with IEC 651: 1979 and 804:1985 (Type 1) or equivalent international standards.

**TABLE 4 NOISE MONITORING EQUIPMENT**

Noise Monitoring Station	Monitoring Equipment
AON1	Rion NL-52 Sound Level Meter CAL200 Calibrator
AON2	Rion NL-52 Sound Level Meter CAL200 Calibrator
AON3	Rion NL-52 Sound Level Meter CAL200 Calibrator
AON4	Rion NL-52 Sound Level Meter CAL200 Calibrator
AON5	Rion NL-52 Sound Level Meter CAL200 Calibrator

Noise monitoring was conducted with reference to the calibration and measurement procedures as stated in the *Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM)* issued under the *Noise Control Ordinance (NCO)*. Immediately prior to and following each noise measurement the accuracy of the monitoring equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements were accepted as the calibration levels from before and after the noise measurement agree to within 1.0 dB.

The sound level meters and acoustic calibrators have been calibrated by a HOKLAS accredited laboratory every two years. The relevant calibration certificates are presented in **Appendix A**.

Noise measurements were conducted without the presence of fog and rain, and with steady wind speed and gusts not exceeding  $5 \text{ ms}^{-1}$  and  $10 \text{ ms}^{-1}$ , respectively in accordance with international standards and practices (i.e. ISO 11819-1:1997 and ISO/FDIS 13472-1:2001). Measurement of  $L_{Aeq}$ ,  $L_{10}$ ,  $L_{90}$ ,  $L_{max}$  and  $L_{min}$  has been recorded for reference.

If measured noise level is affected by other noise sources at the monitoring station, e.g. traffic noise, such that the measured noise level is dominated by noise source other than the show, noise data will be discarded.

If measured noise level for the show is below or equal to the measured background noise level, the noise from the show is considered as insignificant and hence negligible at the monitoring location.

## 2.7 COMPLIANCE ASSESSMENT

### FIXED PLANT NOISE CRITERIA

As recommended in the approved EIA Report and stated in the EM&A Manual, OPC will follow the Action and Limit (A/L) Levels as recommended in the approved EIA Report and EM&A Manual which are summarised in **Table 5**. In case exceedances are resulted from cumulative impacts, all step stipulated in the Event/Action Plan shall be followed.

**TABLE 5 ACTION AND LIMIT LEVELS FOR ENTERTAINMENT NOISE**

Noise Monitoring Station	Action Level	Limit Level
AON1	When documented complaint is received from any of the sensitive receivers	L <sub>eq</sub> (5min) 60 dB(A)
AON2		L <sub>eq</sub> (5min) 60 dB(A)
AON3		L <sub>eq</sub> (5min) 55 dB(A)
AON4		L <sub>eq</sub> (5min) 55 dB(A)
AON5		L <sub>eq</sub> (5min) 55 dB(A)

**NOISE CRITERIA FOR OUTDOOR ACTIVITIES**

The same set of noise criteria for outdoor activities as per the monthly noise monitoring reports prepared in 2020 to 2023 was adopted. The noise levels from the outdoor activities should not be more than 5dB(A) above the prevailing background noise level during the daytime and evening periods (0700-2300 hrs), as measured at 1m from the exterior building façade of the most affected NSRs for regular outdoor activities. For the night-time period (2300-0700 hrs of the next day), the noise from outdoor events should not be audible at the nearby NSRs.

**2.8 RESULTS OF NOISE MONITORING**

The results of noise monitoring conducted on 6 July 2024 are given in **Appendix B**, with summary of compliance shown in **Table 6**. Photographs taken at the monitoring stations are shown in **Appendix C**.

**TABLE 6 COMPLIANCE OF NOISE MONITORING**

Date and Show	Noise Monitoring Station	Compliance		
		<BGL+5	Limit Level	Not Applicable
6 July 2024 (VHK)	AON1	Yes	Yes	-
	AON2	Yes	Yes	-
	AON3	-	-	N/A <sup>a</sup>
	AON4	Yes	Yes	-
	AON5	Yes	Yes	-
6 July 2024 (SOTO)	AON1	Yes	Yes	-
	AON2	Yes	Yes	-
	AON3	Yes	Yes	-
	AON4	Yes	Yes	-

Date and Show	Noise Monitoring Station	Compliance		
		<BGL+5	Limit Level	Not Applicable
	AON5	Yes	Yes	-
31 July 2024 (SOTO)	AON1	Yes	Yes	-
	AON2	Yes	Yes	-
	AON3	Yes	Yes	-
	AON4	Yes	Yes	-
	AON5	Yes	Yes	-
		AON1	Yes	Yes
31 July 2024 (VHK)	AON2	Yes	Yes	-
	AON3	Yes	Yes	-
	AON4	Yes	Yes	-
	AON5	Yes	Yes	-
		AON1	Yes	Yes

**Note:**

<sup>a</sup> Measured noise data was considered being affected by other significant noise sources, i.e., traffic and idling heavy vehicle.

## 2.9 SUMMARY OF NOISE EXCEEDANCES

No record of noise exceedances during the show in July 2024.

### 3. CONCLUSION

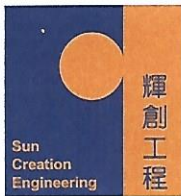
This is the noise monitoring report which summarises the noise monitoring results during the lagoon night show in **July 2024**.

The noise monitoring was carried out at five designated monitoring stations.

No noise exceedance has been recorded.



APPENDIX A      CALIBRATION CERTIFICATES OF THE  
NOISE MEASUREMENT EQUIPMENT



# Certificate of Calibration 校正證書

Certificate No. : C243578  
證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC24-0986 )

Date of Receipt / 收件日期 : 4 June 2024

Description / 儀器名稱 : Sound Level Meter  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NL-52  
Serial No. / 編號 : 00643049  
Supplied By / 委託者 : Envirotech Services Co.  
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

## TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$  Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$   
Line Voltage / 電壓 : ---

## TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 30 June 2024

## TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results do not exceed specified limits. (after adjustment)  
These limits refer to manufacturer's published tolerances as requested by the customer.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :  
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory  
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark  
- Agilent Technologies / Keysight Technologies  
- Fluke Everett Service Center, USA

Tested By :   
測試 : H T Wong  
Assistant Engineer

Certified By :   
核證 : K C Lee  
Engineer

Date of Issue : 3 July 2024  
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



# Certificate of Calibration

## 校正證書

Certificate No. : C243578  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration using the internal standard (After Adjustment) was performed before the test from 6.1.1.2 to 6.3.2.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C240212
CL281	Multifunction Acoustic Calibrator	CDK2302738

- Test procedure : MA101N.

- Results :

### 6.1 Sound Pressure Level

#### 6.1.1 Reference Sound Pressure Level

##### 6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	* 91.3	± 1.1

\* Out of IEC 61672 Class 1 Limit

##### 6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	± 1.1

##### 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.1
				114.00		114.2

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C243578

證書編號

### 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

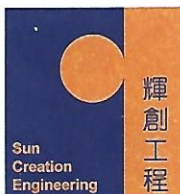
UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.8	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C243578  
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 10446

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

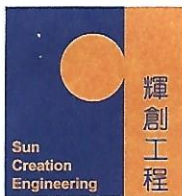
Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C240423

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0020)

Date of Receipt / 收件日期 : 5 January 2024

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 16172

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,

New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 24 January 2024

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

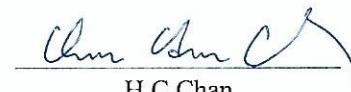
Tested By

測試

  
K C Lee  
Engineer

Certified By

核證

  
H C Chan  
Engineer

Date of Issue

簽發日期

24 January 2024

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c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

# Certificate of Calibration

## 校正證書

Certificate No. : C240423  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.90	± 0.2	± 0.20
114 dB, 1 kHz	113.90		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

#### Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

# Certificate of Calibration

## 校正證書

Certificate No. : C237486

證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC23-2475 )      Date of Receipt / 收件日期 : 8 December 2023

Description / 儀器名稱 : Sound Level Meter

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 01010406

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (50 ± 25)%

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 31 December 2023

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

: 

H T Wong

Assistant Engineer

Certified By

核證

: 

K C Lee

Engineer

Date of Issue

簽發日期

: 3 January 2024

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C237486

證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	CDK2302738

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.1
				114.00		114.0

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C237486

證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。





# Certificate of Calibration

## 校正證書

Certificate No. : C237486  
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 13748

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C235237

證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC23-1753 )

Date of Receipt / 收件日期 : 22 August 2023

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 16878

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 September 2023

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA


Tested By

測試

  
K C Lee  
Engineer

Certified By

核證

  
H C Chan  
Engineer

Date of Issue

簽發日期

12 September 2023

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C235237  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.95	± 0.2	± 0.20
114 dB, 1 kHz	113.95		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

#### Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

# Certificate of Calibration

## 校正證書

Certificate No. : C240424  
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0020)

Date of Receipt / 收件日期 : 5 January 2024

Description / 儀器名稱 : Sound Level Meter

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 00710259

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 24 January 2024

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

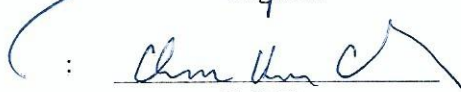
:

  
K C Lee  
Engineer

Certified By

核證

:

  
H C Chan  
Engineer

Date of Issue

簽發日期

:

24 January 2024

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C240424  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C240212
CL281	Multifunction Acoustic Calibrator	CDK2302738

- Test procedure : MA101N.

- Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C240424

證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C240424  
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12128

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C237485

證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC23-2475 )      Date of Receipt / 收件日期 : 8 December 2023

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 15678

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (50 ± 25)%

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 31 December 2023

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

:

  
H T Wong  
Assistant Engineer

Certified By

核證

:

  
K C Lee  
Engineer

Date of Issue

簽發日期

:

3 January 2024

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



# Certificate of Calibration

## 校正證書

Certificate No. : C237485

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.90	± 0.2	± 0.20
114 dB, 1 kHz	113.90		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

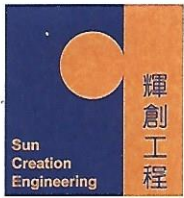
#### Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。



# Certificate of Calibration

## 校正證書

Certificate No. : C237046  
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-2316) Date of Receipt / 收件日期 : 15 November 2023

Description / 儀器名稱 : Sound Level Meter  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NL-52  
Serial No. / 編號 : 00175561  
Supplied By / 委託者 : Envirotech Services Co.  
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$  Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$   
Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範


Calibration check

DATE OF TEST / 測試日期 : 6 December 2023

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results do not exceed specified limits.  
These limits refer to manufacturer's published tolerances as requested by the customer.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :  
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory  
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark  
- Agilent Technologies / Keysight Technologies  
- Fluke Everett Service Center, USA

Tested By :   
測試 : C K Lo  
Project Engineer

Certified By :   
核證 : K Q Lee  
Engineer

Date of Issue : 6 December 2023  
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C237046  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	CDK2302738

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	93.2	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	93.2 (Ref.)
				104.00		103.3
				114.00		113.4

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	93.2	Ref.
			Slow			93.2	± 0.3

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C237046  
證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	66.9	-26.2 ± 1.5
					125 Hz	77.0	-16.1 ± 1.5
					250 Hz	84.5	-8.6 ± 1.4
					500 Hz	89.9	-3.2 ± 1.4
					1 kHz	93.2	Ref.
					2 kHz	94.4	+1.2 ± 1.6
					4 kHz	94.2	+1.0 ± 1.6
					8 kHz	92.1	-1.1 (+2.1 ; -3.1)
					16 kHz	85.2	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	92.3	-0.8 ± 1.5
					125 Hz	93.0	-0.2 ± 1.5
					250 Hz	93.2	0.0 ± 1.4
					500 Hz	93.2	0.0 ± 1.4
					1 kHz	93.2	Ref.
					2 kHz	93.0	-0.2 ± 1.6
					4 kHz	92.4	-0.8 ± 1.6
					8 kHz	90.2	-3.0 (+2.1 ; -3.1)
					16 kHz	83.3	-8.5 (+3.5 ; -17.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。



# Certificate of Calibration

## 校正證書

Certificate No. : C237046  
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 16651

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C242738  
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0781)

Date of Receipt / 收件日期 : 3 May 2024

Description / 儀器名稱 : Precision Acoustic Calibrator  
Manufacturer / 製造商 : LARSON DAVIS  
Model No. / 型號 : CAL200  
Serial No. / 編號 : 11334  
Supplied By / 委託者 : Envirotech Services Co.  
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$   
Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

### TEST SPECIFICATIONS / 測試規範

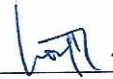
Calibration check

DATE OF TEST / 測試日期 : 19 May 2024

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results do not exceed specified limits.  
These limits refer to manufacturer's published or user's specified tolerances as requested by the customer.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :  
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory  
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark  
- Agilent Technologies / Keysight Technologies  
- Fluke Everett Service Center, USA

Tested By :   
測試 : H T Wong  
Assistant Engineer

Certified By :   
核證 : K C Lee  
Engineer

Date of Issue : 20 May 2024  
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.  
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C242738  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C241879

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	User's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.60	± 0.5	± 0.20
114 dB, 1 kHz	113.60		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remarks : - The user's limit is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C235238  
證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC23-1753 )      Date of Receipt / 收件日期 : 22 August 2023

Description / 儀器名稱 : Sound Level Meter  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NL-52  
Serial No. / 編號 : 00643040  
Supplied By / 委託者 : Envirotech Services Co.  
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C      Relative Humidity / 相對濕度 : (50 ± 25)%  
Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 9 September 2023

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results do not exceed specified limits. (after adjustment)  
These limits refer to manufacturer's published tolerances as requested by the customer.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By :   
測試 : K C Lee  
Engineer

Certified By :   
核證 : H C Chan  
Engineer

Date of Issue : 12 September 2023  
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



# Certificate of Calibration

## 校正證書

Certificate No. : C235238  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration using the internal standard (After Adjustment) was performed before the test from 6.1.1.2 to 6.3.2.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	CDK2302738

- Test procedure : MA101N.

- Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

- 6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	* 95.6	± 1.1

\* Out of IEC 61672 Class 1 Limit

- 6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C235238

證書編號

### 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.0	Ref.
			Slow				

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

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# Certificate of Calibration

## 校正證書

Certificate No. : C235238  
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12128

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

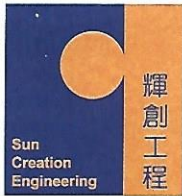
Note :

Only the original copy or the laboratory's certified true copy is valid.

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本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C240965

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號: IC24-0190)

Date of Receipt / 收件日期: 1 February 2024

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 10227

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 22 February 2024

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.


The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

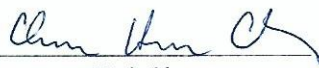
Tested By

測試

  
K C Lee  
Engineer

Certified By

核證

  
H C Chan  
Engineer

Date of Issue

簽發日期

22 February 2024

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C240965

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.90	± 0.20
114 dB, 1 kHz	113.90	

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Uncertainty of Measured Value (Hz)
1	1.000	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.



## APPENDIX B      RESULTS OF NOISE MONITORING

**Noise Measurement Field Record Sheet**

**Project Name / GMS No.:** 0540005 OPC Noise Monitoring for Updated Lagoon Show

**Noise Monitoring Station:** AON1

**Noise Monitoring Staff:** K. C. Ho

**Noise Meter Model / Identification:** Rion NL-52 / 00643049

**Calibrator Model / Identification:** CAL200 / 16172

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
6-Jul-24	19:30	19:35	Background	67.5	-	66.7	-	-	71.7	60	-	-	-
	19:35	19:40	Background	67.3							-	-	-
	19:40	19:45	Background	67.8							-	-	-
	19:45	19:50	VHK	66.1	65.1		-1.6	Negligible			Yes	Yes	-
	19:50	19:55	VHK / SOTO	63.7			-	-			-	-	
	19:55	20:00	SOTO	63.4	62.4		-4.2	Negligible			Yes	Yes	-
	20:00	20:05	SOTO	61.7			-	-			-	-	
	20:05	20:10	SOTO	62.0			-	-			-	-	
	20:10	20:15	Background	63.1	-		-	-			-	-	-
20:15	20:20	Background	61.8	-		-	-	-					
20:20	20:25	Background	68.6	-		-	-	-					

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
31-Jul-24	19:00	19:05	Background	62.8	-	65.6	-	-	70.6	60	-	-	-
	19:05	19:10	Background	64.8							-	-	-
	19:10	19:15	Background	62.5							-	-	-
	19:15	19:20	SOTO	63.4	62.5		-3.1	Negligible			Yes	Yes	-
	19:20	19:25	SOTO	62.4			-	-			-	-	
	19:25	19:30	SOTO	61.4	64.0		-1.6	Negligible			Yes	Yes	-
	19:30	19:35	SOTO / VHK	63.8			-	-			-	-	
	19:35	19:40	VHK	64.2			-	-			-	-	
	19:40	19:45	Background	65.5	-		-	-			-	-	-
19:45	19:50	Background	68.1	-		-	-	-					
19:50	19:55	Background	67.1	-		-	-	-					

**Schedule of Event:**

6-7-2024: VHK (19:46 - 19:52), SOTO (19:53 - 20:06)

31-7-2024: SOTO (19:17 - 19:30), VHK (19:31 - 19:37)

**Note:**

(a) Average BGL was calculated using  $L_{eq(5min)}$  15 minutes before and after the show.

(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.

(c) The Schedule of Event was confirmed with OPC's staff on-site.

(d) +3 dB(A) free-field correction has been applied to monitoring results at AON1.

**Noise Measurement Field Record Sheet**

**Project Name / GMS No.:** 0540005 OPC Noise Monitoring for Updated Lagoon Show

**Noise Monitoring Station:** AON2

**Noise Monitoring Staff:** Y. P. Fai / H. K. Fat

**Noise Meter Model / Identification:** Rion NL-52 / 01010406

**Calibrator Model / Identification:** CAL200 / 16878

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
6-Jul-24	19:30	19:35	Background	64.1	-	62.8	-	-	67.8	60	-	-	-
	19:35	19:40	Background	61.0							-	-	-
	19:40	19:45	Background	62.3							-	-	-
	19:45	19:50	VHK	62.2	63.5		0.7	55.5			Yes	Yes	-
	19:50	19:55	VHK / SOTO	64.5			-	-			-	-	
	19:55	20:00	SOTO	63.1	63.6		0.9	56.2			Yes	Yes	-
	20:00	20:05	SOTO	65.0			-	-			-	-	
	20:05	20:10	SOTO	62.3			-	-			-	-	
	20:10	20:15	Background	63.6	-		-	-			-	-	-
20:15	20:20	Background	61.9	-		-	-	-					
20:20	20:25	Background	62.9	-		-	-	-					

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
31-Jul-24	19:00	19:05	Background	65.5	-	63.6	-	-	68.6	60	-	-	-
	19:05	19:10	Background	64.7							-	-	-
	19:10	19:15	Background	64.2							-	-	-
	19:15	19:20	SOTO	63.8	64.2		0.7	55.7			Yes	Yes	-
	19:20	19:25	SOTO	64.5			-	-			-	-	
	19:25	19:30	SOTO	64.4	64.7		1.1	58.2			Yes	Yes	-
	19:30	19:35	SOTO / VHK	65.2			-	-			-	-	
	19:35	19:40	VHK	64.1			-	-			-	-	
	19:40	19:45	Background	61.3	-		-	-			-	-	-
	19:45	19:50	Background	62.0			-	-			-	-	
19:50	19:55	Background	62.2	-		-	-	-					

**Schedule of Event:**

6-7-2024: VHK (19:46 - 19:52), SOTO (19:53 - 20:06)

31-7-2024: SOTO (19:17 - 19:30), VHK (19:31 - 19:37)

**Note:**

(a) Average BGL was calculated using  $L_{eq(5min)}$  15 minutes before and after the show.

(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.

(c) The Schedule of Event was confirmed with OPC's staff on-site.



**Noise Measurement Field Record Sheet**

**Project Name / GMS No.:** 0540005 OPC Noise Monitoring for Updated Lagoon Show

**Noise Monitoring Station:** AON3

**Noise Monitoring Staff:** Lap Kwok

**Noise Meter Model / Identification:** Rion NL-52 / 00710259

**Calibrator Model / Identification:** CAL200 / 15678

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
6-Jul-24	19:30	19:35	Background	61.6	-	62.3	-	-	67.3	60	-	-	-
	19:35	19:40	Background	63.5							-	-	-
	19:40	19:45	Background	62.9							-	-	-
	19:45	19:50	VHK	63.8	65.1		2.8	61.8			N/A	N/A	Dominated by traffic noise
	19:50	19:55	VHK / SOTO	66.1			-	-			-	-	
	19:55	20:00	SOTO	62.1	63.0		0.6	54.4			Yes	Yes	-
	20:00	20:05	SOTO	64.1			-	-			-	-	
	20:05	20:10	SOTO	62.5			-	-			-	-	
	20:10	20:15	Background	60.9	-		-	-			-	-	-
20:15	20:20	Background	63.4	-		-	-	-					
20:20	20:25	Background	60.9	-		-	-	-					

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
31-Jul-24	19:00	19:05	Background	64.6	-	64.3	-	-	69.3	60	-	-	-
	19:05	19:10	Background	65.0							-	-	-
	19:10	19:15	Background	64.2							-	-	-
	19:15	19:20	SOTO	66.1	64.6		0.3	52.5			Yes	Yes	-
	19:20	19:25	SOTO	65.0			-	-			-	-	
	19:25	19:30	SOTO	61.5	63.8		-0.5	Negligible			Yes	Yes	-
	19:30	19:35	SOTO / VHK	63.3			-	-			-	-	
	19:35	19:40	VHK	64.2			-	-			-	-	
	19:40	19:45	Background	63.8	-		-	-			-	-	-
	19:45	19:50	Background	64.3			-	-			-	-	
19:50	19:55	Background	63.9	-		-	-	-					

**Schedule of Event:**

6-7-2024: VHK (19:46 - 19:52), SOTO (19:53 - 20:06)

31-7-2024: SOTO (19:17 - 19:30), VHK (19:31 - 19:37)

**Note:**

(a) Average BGL was calculated using  $L_{eq(5min)}$  15 minutes before and after the show.

(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.

(c) The Schedule of Event was confirmed with OPC's staff on-site.

**Noise Measurement Field Record Sheet**

**Project Name / GMS No.:** 0540005 OPC Noise Monitoring for Updated Lagoon Show

**Noise Monitoring Station:** AON4

**Noise Monitoring Staff:** K. T. Ho

**Noise Meter Model / Identification:** Rion NL-52 / 00175561

**Calibrator Model / Identification:** CAL200 / 11334

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
6-Jul-24	19:30	19:35	Background	49.7	-	53.6	-	-	58.6	60	-	-	-
	19:35	19:40	Background	53.2							-	-	-
	19:40	19:45	Background	50.3							-	-	-
	19:45	19:50	VHK	55.4	54.9		1.4	49.2			Yes	Yes	-
	19:50	19:55	VHK / SOTO	54.4	55.2		1.6	50.1			Yes	Yes	-
	19:55	20:00	SOTO	55.2									
	20:00	20:05	SOTO	55.6									
	20:05	20:10	SOTO	54.7	-		-	-			-	-	-
	20:10	20:15	Background	55.3									
20:15	20:20	Background	54.7										
20:20	20:25	Background	55.1	-	-	-	-	-	-				

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
31-Jul-24	19:00	19:05	Background	56.7	-	52.5	-	-	57.5	60	-	-	-
	19:05	19:10	Background	53.8							-	-	-
	19:10	19:15	Background	49.7							-	-	-
	19:15	19:20	SOTO	55.3	53.0		0.5	43.6			Yes	Yes	-
	19:20	19:25	SOTO	51.6									
	19:25	19:30	SOTO	50.8	50.7		-1.9	Negligible			Yes	Yes	-
	19:30	19:35	SOTO / VHK	50.8									
	19:35	19:40	VHK	50.5									
	19:40	19:45	Background	49.2	-		-	-			-	-	-
	19:45	19:50	Background	49.7									
19:50	19:55	Background	49.7										

**Schedule of Event:**

6-7-2024: VHK (19:46 - 19:52), SOTO (19:53 - 20:06)

31-7-2024: SOTO (19:17 - 19:30), VHK (19:31 - 19:37)

**Note:**

(a) Average BGL was calculated using  $L_{eq(5min)}$  15 minutes before and after the show.

(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.

(c) The Schedule of Event was confirmed with OPC's staff on-site.

**Noise Measurement Field Record Sheet**

**Project Name / GMS No.:** 0540005 OPC Noise Monitoring for Updated Lagoon Show

**Noise Monitoring Station:** AON5

**Noise Monitoring Staff:** Magnum Fan

**Noise Meter Model / Identification:** Rion NL-52 / 00643040

**Calibrator Model / Identification:** CAL200 / 10227

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
6-Jul-24	19:30	19:35	Background	61.8	-	59.1	-	-	64.1	60	-	-	-
	19:35	19:40	Background	54.4							-	-	-
	19:40	19:45	Background	55.8							-	-	-
	19:45	19:50	VHK	57.5	58.6		-0.5	Negligible			Yes	Yes	-
	19:50	19:55	VHK / SOTO	59.4			-0.8	Negligible			Yes	Yes	-
	19:55	20:00	SOTO	58.9	58.3		-	-			-	-	-
	20:00	20:05	SOTO	57.3			-	-			-	-	-
	20:05	20:10	SOTO	58.4			-	-			-	-	-
	20:10	20:15	Background	53.2	-		-	-			-	-	-
20:15	20:20	Background	63.0	-		-	-	-	-				
20:20	20:25	Background	56.8	-		-	-	-	-				

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
31-Jul-24	19:00	19:05	Background	57.0	-	59.3	-	-	64.3	60	-	-	-
	19:05	19:10	Background	58.2							-	-	-
	19:10	19:15	Background	58.0							-	-	-
	19:15	19:20	SOTO	57.4	57.4		-2.0	Negligible			Yes	Yes	-
	19:20	19:25	SOTO	58.2			-1.2	Negligible			Yes	Yes	-
	19:25	19:30	SOTO	56.3	58.2		-	-			-	-	-
	19:30	19:35	SOTO / VHK	56.6			-	-			-	-	-
	19:35	19:40	VHK	59.3			-	-			-	-	-
	19:40	19:45	Background	57.4	-		-	-			-	-	-
19:45	19:50	Background	63.4	-		-	-	-	-				
19:50	19:55	Background	57.8	-		-	-	-	-				

**Schedule of Event:**

6-7-2024: VHK (19:46 - 19:52), SOTO (19:53 - 20:06)

31-7-2024: SOTO (19:17 - 19:30), VHK (19:31 - 19:37)

**Note:**

(a) Average BGL was calculated using  $L_{eq(5min)}$  15 minutes before and after the show.

(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.

(c) The Schedule of Event was confirmed with OPC's staff on-site.



## APPENDIX C      PHOTOGRAPHS OF THE MONITORING STATIONS



Appendix C

Open Area adjacent to Police Training School (AON1)















ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina	The Netherlands
Australia	New Zealand
Belgium	Peru
Brazil	Poland
Canada	Portugal
China	Puerto Rico
Colombia	Romania
France	Senegal
Germany	Singapore
Ghana	South Africa
Guyana	South Korea
Hong Kong	Spain
India	Switzerland
Indonesia	Taiwan
Ireland	Tanzania
Italy	Thailand
Japan	UAE
Kazakhstan	UK
Kenya	US
Malaysia	Vietnam
Mexico	
Mozambique	

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