

Appendix 4.1A Prevailing Background Noise Measurement

1 INTRODUCTION

1.1 In accordance with Table 1A of the EIAO-TM, noise criteria for planned fixed plant sources should be determined as follows:

- 5 dB(A) below the appropriate ANL set out in the IND-TM; or
- prevailing background noise level where the prevailing background noise level is 5 dB(A) below the appropriate ANL (i.e. ANL – 5 dB(A)).

1.2 Prevailing background noise measurements were conducted to determine the noise criteria for fixed plant noise assessment. This appendix presents the details of the prevailing background noise measurement, and the results of the measurement were summarized in Section 4.3.9 of the EIA Report.

2 DETAILS OF NOISE MEASUREMENT

Measurement Location and Date

2.1 The prevailing background noise measurement were conducted at three locations in Tuen Mun South Area for a continuous period of 48 hours, including weekday and weekend. The measurement locations are shown in **Figure No. C1502/C/TME/ACM/M52/101**. The details of noise measurement are presented in **Table 2.1** below. Photographs taken during the measurement are presented in **Appendix A**.

Table 2.1 Measurement Locations and Dates

| Measurement Point ID | Location | Measurement Condition | Measurement Date |
|----------------------|---|-------------------------|--|
| M01 | Block 14, Lung Mun Oasis (Roof Level) | 1m from building facade | 16 th & 17 th May 2021 |
| M02 | Tower 1, Oceania Heights (Podium Level) | 1m from building facade | 2 nd & 3 rd May 2021 |
| M03 | Roof Level of Yan Chai Hospital Law Chan Chor Si Primary School | 1m from building facade | 16 th & 17 th May 2021 |

Measurement Equipment

2.2 In accordance with the *Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites* (IND-TM), sound level meter in compliance with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications was used for carrying out the noise measurement. Immediately prior to and following each noise measurement, the accuracy of sound level meter was checked using an acoustic calibrator generating 94dB at 1000 Hz. Measurement was considered to be valid with the calibration level from before and after the noise measurement within 1.0 dB. **Table 2.2** summarizes the equipment used in the noise measurement.

Table 2.2 Noise Measurement Equipment

| Equipment | Model ⁽¹⁾ |
|-------------------------------|---|
| Integrating Sound Level Meter | <ul style="list-style-type: none">• B&K 2250 (Serial No. 3001291)• NTi XL2 (Serial No. A2A-17440-E0) |
| Calibrator | <ul style="list-style-type: none">• B&K 4231 (Serial No. 3006428) |

Note:

(1) Calibration certificates are provided in **Appendix B**.

Measurement Procedures

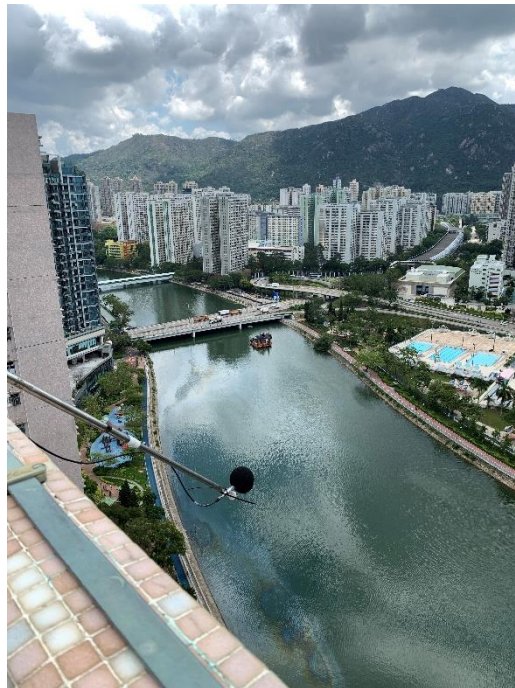
2.3 During the noise measurement, the following procedures were followed:

- Parameters such as frequency weighting, the time weighting and the duration of measurement were set as follows:
 - Frequency weighting : A
 - Time weighting : Fast
 - Duration of measurement : 48 hours (with data being logged at every one second)
- Prior to and after each noise measurement, the sound level meter was calibrated using the Calibrator for 94 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB (A), the measurement is considered invalid and repeat of noise measurement should be required after repair or re-calibration of the equipment.
- All the measurement data within the sound level meter system were downloaded through the computer software. All these data were then checked and reviewed properly.
- Noise measurement was conducted in the absence of fog, rain, and wind with a steady speed lower than 5 m/s, or wind with gusts lower than 10 m/s.

Appendix A
Measurement Photos



Photograph 1 Measurement set up at Oceania Heights



Photograph 2 Measurement set up at Lung Mung Oasis



Photograph 3 Measurement set up at Yan Chai Hospital Law Chan Chor Si Primary School

Appendix B
Calibration Certificates

Cert 1: Calibration Certificate of Integrated Sound Level Meter B&K 2250 (SN: 3001291)



綜合試驗有限公司

SOILS & MATERIALS ENGINEERING CO., LTD.

香港新界葵涌永基路22-24號好爸爸創科大廈

Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong

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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.



綜合試驗有限公司

SOILS & MATERIALS ENGINEERING CO., LTD.

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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 | 0.6 | |
| | 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 | |
| | A | Pass | 0.3 | |
| Frequency weightings | C | Pass | 0.3 | |
| | Lin | Pass | 0.3 | |
| | Single Burst Fast | Pass | 0.3 | |
| Peak response | Single Burst Slow | Pass | 0.3 | |
| | Single 100µs rectangular pulse | Pass | 0.3 | |
| R.M.S. accuracy | Crest factor of 3 | Pass | 0.3 | |
| Time weighting I | Single burst 5 ms at 2000 Hz | Pass | 0.3 | |
| | Repeated at frequency of 100 Hz | Pass | 0.3 | |
| Time averaging | 1 ms burst duty factor 1/10 ³ at 4kHz | Pass | 0.3 | |
| | 1 ms burst duty factor 1/10 ⁴ at 4kHz | Pass | 0.3 | |
| Pulse range | Single burst 10 ms at 4 kHz | Pass | 0.4 | |
| Sound exposure level | Single burst 10 ms at 4 kHz | Pass | 0.4 | |
| Overload indication | SPL | Pass | 0.3 | |
| | Leq | Pass | 0.4 | |

2, Acoustic tests

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

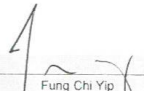
| Test: | Subtest | Status | Expanded Uncertainty (dB) | Coverage Factor |
|-------------------|------------------------|--------|---------------------------|-----------------|
| Acoustic response | Weighting A at 125 Hz | Pass | 0.3 | |
| | Weighting A at 8000 Hz | Pass | 0.5 | |

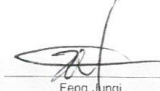
3, Response to associated sound calibrator

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: 22-Oct-2020

Checked by: 
Date: 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.

Cert 2: Calibration Certificate of Integrated Sound Level Meter NTi XL2 (SN: A2A-17440-E0)



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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
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Tel: (852) 2873 6860
Fax: (852) 2555 7533



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-E0 | 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 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure 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 | |
| Linearity range for SPL | At reference range, Step 5 dB at 4 kHz | Pass | 0.3 | |
| | Frequency weightings | | | |
| Time weightings | A | Pass | 0.3 | |
| | C | Pass | 0.3 | |
| | Lin | Pass | 0.3 | |
| Peak response | Single Burst Fast | Pass | 0.3 | |
| | Single Burst Slow | Pass | 0.3 | |
| R.M.S. accuracy | Single 100µs rectangular pulse | Pass | 0.3 | |
| Time weighting I | Crest factor of 3 | Pass | 0.3 | |
| | Single burst 5 ms at 2000 Hz | Pass | 0.3 | |
| Time averaging | Repeated at frequency of 100 Hz | Pass | 0.3 | |
| | 1 ms burst duty factor 1/10 ³ at 4kHz | Pass | 0.3 | |
| Pulse range | 1 ms burst duty factor 1/10 ⁴ at 4kHz | Pass | 0.3 | |
| | Single burst 10 ms at 4 kHz | Pass | 0.4 | |
| Sound exposure level | Single burst 10 ms at 4 kHz | Pass | 0.4 | |
| | 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:

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.



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CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0401 02

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: 01-Apr-2021

Date of test: 05-Apr-2021

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

Test specifications

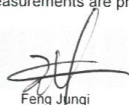
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results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

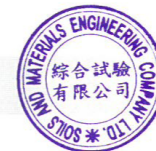
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Feng Junqi

Date: 07-Apr-2021

Company Chop:



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

