

**AECOM Asia Company Limited**  
**Tisch TSP Mass Flow Controlled High Volume Air Sampler**  
**Field Calibration Report**

|                |                                             |                |               |
|----------------|---------------------------------------------|----------------|---------------|
| Station        | Block B, Merit Industrial Centre ( E-A14a ) | Operator:      | Shum Kam Yuen |
| Cal. Date:     | 24/6/2025                                   | Next Due Date: | 24/8/2025     |
| Model No.:     | TE-5170                                     | Serial No.     | 10280         |
| Equipment No.: | A-001-15T                                   |                |               |

| Ambient Condition   |       |                     |       |
|---------------------|-------|---------------------|-------|
| Temperature, Ta (K) | 304.0 | Pressure, Pa (mmHg) | 766.8 |

| Orifice Transfer Standard Information |          |                                                                   |         |               |         |
|---------------------------------------|----------|-------------------------------------------------------------------|---------|---------------|---------|
| Serial No:                            | 843      | Slope, mc                                                         | 2.00986 | Intercept, bc | -0.0218 |
| Last Calibration Date:                | 7-Jan-25 | $mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$ |         |               |         |
| Next Calibration Date:                | 7-Jan-26 |                                                                   |         |               |         |

| Calibration of TSP Sampler |                            |                                              |                                     |                             |                                                  |
|----------------------------|----------------------------|----------------------------------------------|-------------------------------------|-----------------------------|--------------------------------------------------|
| Resistance Plate No.       | Orifice                    |                                              |                                     | HVS Flow Recorder           |                                                  |
|                            | DH (orifice), in. of water | $[DH \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (m <sup>3</sup> /min) X - axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 7.4                        | 2.71                                         | 1.36                                | 47.0                        | 46.74                                            |
| 13                         | 6.4                        | 2.52                                         | 1.26                                | 42.0                        | 41.77                                            |
| 10                         | 5.2                        | 2.27                                         | 1.14                                | 36.0                        | 35.80                                            |
| 7                          | 4.2                        | 2.04                                         | 1.02                                | 32.0                        | 31.82                                            |
| 5                          | 3.2                        | 1.78                                         | 0.90                                | 25.0                        | 24.86                                            |

By Linear Regression of Y on X

Slope, mw = 46.2951 Intercept, bw = -16.3876

Correlation Coefficient\* = 0.9981

\*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation                                                                            |              |
|--------------------------------------------------------------------------------------------------|--------------|
| From the TSP Field Calibration Curve, take Qstd = 1.30m <sup>3</sup> /min                        |              |
| From the Regression Equation, the "Y" value according to                                         |              |
| $mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$                               |              |
| Therefore, Set Point; IC = ( mw x Qstd + bw ) x [ ( 760 / Pa ) x ( Ta / 298 ) ] <sup>1/2</sup> = | <u>44.04</u> |

Remarks: \_\_\_\_\_

**AECOM Asia Company Limited**  
**Tisch TSP Mass Flow Controlled High Volume Air Sampler**  
**Field Calibration Report**

|                |                                             |                |               |
|----------------|---------------------------------------------|----------------|---------------|
| Station        | Block B, Merit Industrial Centre ( E-A14a ) | Operator:      | Shum Kam Yuen |
| Cal. Date:     | 22/8/2025                                   | Next Due Date: | 22/10/2025    |
| Model No.:     | TE-5170                                     | Serial No.     | 10280         |
| Equipment No.: | A-001-15T                                   |                |               |

| Ambient Condition   |       |                     |       |
|---------------------|-------|---------------------|-------|
| Temperature, Ta (K) | 303.0 | Pressure, Pa (mmHg) | 766.1 |

| Orifice Transfer Standard Information |          |                                                                   |         |               |         |
|---------------------------------------|----------|-------------------------------------------------------------------|---------|---------------|---------|
| Serial No:                            | 843      | Slope, mc                                                         | 2.00986 | Intercept, bc | -0.0218 |
| Last Calibration Date:                | 7-Jan-25 | $mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$ |         |               |         |
| Next Calibration Date:                | 7-Jan-26 |                                                                   |         |               |         |

| Calibration of TSP Sampler |                            |                                              |                                   |                             |                                                  |
|----------------------------|----------------------------|----------------------------------------------|-----------------------------------|-----------------------------|--------------------------------------------------|
| Resistance Plate No.       | Orifice                    |                                              |                                   | HVS Flow Recorder           |                                                  |
|                            | DH (orifice), in. of water | $[DH \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (m <sup>3</sup> /min) X-axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 7.4                        | 2.71                                         | 1.36                              | 47.0                        | 46.80                                            |
| 13                         | 6.4                        | 2.52                                         | 1.26                              | 42.0                        | 41.82                                            |
| 10                         | 5.2                        | 2.27                                         | 1.14                              | 36.0                        | 35.84                                            |
| 7                          | 4.3                        | 2.06                                         | 1.04                              | 32.0                        | 31.86                                            |
| 5                          | 3.3                        | 1.81                                         | 0.91                              | 25.0                        | 24.89                                            |

By Linear Regression of Y on X

Slope, mw = 47.9722                      Intercept, bw = -18.5610

Correlation Coefficient\* = 0.9989

\*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation                                                                            |              |
|--------------------------------------------------------------------------------------------------|--------------|
| From the TSP Field Calibration Curve, take Qstd = 1.30m <sup>3</sup> /min                        |              |
| From the Regression Equation, the "Y" value according to                                         |              |
| $mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$                               |              |
| Therefore, Set Point; IC = ( mw x Qstd + bw ) x [ ( 760 / Pa ) x ( Ta / 298 ) ] <sup>1/2</sup> = | <u>43.99</u> |

Remarks: \_\_\_\_\_

QC Reviewer: WS CHAN

Signature: 

Date: 22/8/2025

## Certificate of Calibration

### Calibration Certification Information

Cal. Date: January 7, 2025      Rootsmer S/N: 438320      Ta: 293 °K  
 Operator: Jim Tisch      Pa: 759.0 mm Hg  
 Calibration Model #: TE-5025A      Calibrator S/N: **0843**

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|-----|----------------|-----------------|------------|-------------|------------|-------------|
| 1   | 1              | 2               | 1          | 1.4050      | 3.2        | 2.00        |
| 2   | 3              | 4               | 1          | 0.9940      | 6.4        | 4.00        |
| 3   | 5              | 6               | 1          | 0.8870      | 7.9        | 5.00        |
| 4   | 7              | 8               | 1          | 0.8460      | 8.7        | 5.50        |
| 5   | 9              | 10              | 1          | 0.6990      | 12.7       | 8.00        |

### Data Tabulation

| Vstd (m3)   | Qstd (x-axis) | $\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis) | Va        | Qa (x-axis) | $\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis) |
|-------------|---------------|------------------------------------------------------------------------------------------|-----------|-------------|---------------------------------------------------------|
| 1.0114      | 0.7198        | 1.4252                                                                                   | 0.9958    | 0.7087      | 0.8787                                                  |
| 1.0071      | 1.0132        | 2.0156                                                                                   | 0.9916    | 0.9976      | 1.2427                                                  |
| 1.0051      | 1.1331        | 2.2535                                                                                   | 0.9896    | 1.1157      | 1.3893                                                  |
| 1.0040      | 1.1868        | 2.3635                                                                                   | 0.9885    | 1.1685      | 1.4572                                                  |
| 0.9987      | 1.4287        | 2.8505                                                                                   | 0.9833    | 1.4067      | 1.7574                                                  |
| <b>QSTD</b> | m=            | <b>2.00986</b>                                                                           | <b>QA</b> | m=          | <b>1.25854</b>                                          |
|             | b=            | <b>-0.02180</b>                                                                          |           | b=          | <b>-0.01344</b>                                         |
|             | r=            | <b>1.00000</b>                                                                           |           | r=          | <b>1.00000</b>                                          |

### Calculations

|                                                                                                                             |                                                                                       |                                                                                          |                                                      |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------|
| Vstd=                                                                                                                       | $\Delta Vol \left( \frac{Pa - \Delta P}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)$ | Va=                                                                                      | $\Delta Vol \left( \frac{Pa - \Delta P}{Pa} \right)$ |
| Qstd=                                                                                                                       | Vstd/ΔTime                                                                            | Qa=                                                                                      | Va/ΔTime                                             |
| For subsequent flow rate calculations:                                                                                      |                                                                                       |                                                                                          |                                                      |
| Qstd= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$ |                                                                                       | Qa= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right) - b \right)$ |                                                      |

### Standard Conditions

Tstd: 298.15 °K

Pstd: 760 mm Hg

### Key

ΔH: calibrator manometer reading (in H2O)

ΔP: rootsmer manometer reading (mm Hg)

Ta: actual absolute temperature (°K)

Pa: actual barometric pressure (mm Hg)

b: intercept

m: slope

### RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
Manufacturer/Brand: SIBATA  
Model No.: LD-3  
Equipment No.: A.005.11a  
Sensitivity Adjustment Scale Setting: 799 CPM

Operator: WS CHAN

### Standard Equipment

Equipment: High Volume Sampler  
Venue: Ma Wan Chung Village  
Model No.: TE-5170  
Serial No.: 5008  
Last Calibration Date: 27-Jun-24

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 799 CPM  
Sensitivity Adjustment Scale Setting (After Calibration): 799 CPM

| Hour | Date<br>(dd/mm/yy) | Time        | Ambient Condition |         | Concentration <sup>①</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>②</sup> | Count/<br>Minute <sup>③</sup><br>X-axis |
|------|--------------------|-------------|-------------------|---------|--------------------------------------------------------------|--------------------------|-----------------------------------------|
|      |                    |             | Temp (°C)         | R.H.(%) |                                                              |                          |                                         |
| 1    | 09/08/24           | 9:00-10:00  | 33.0              | 76      | 0.1280                                                       | 5150                     | 85.83                                   |
| 2    | 09/08/24           | 10:20-11:20 | 33.0              | 76      | 0.0615                                                       | 2645                     | 44.08                                   |
| 3    | 09/08/24           | 13:00-14:00 | 33.0              | 76      | 0.1590                                                       | 5945                     | 99.08                                   |

Note: ① Monitoring data was measured by High Volume Sampler  
② Total Count was logged by Laser Dust Monitor  
③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X

Slope (K-factor): 0.0015  
Correlation coefficient: 0.9978

Validity of Calibration Record: 9-Aug-25

Remarks:

QC Reviewer: Y.W. Fung

Signature: 

Date: 9-Aug-24

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
Manufacturer/Brand: SIBATA  
Model No.: LD-3  
Equipment No.: A.005.11a  
Sensitivity Adjustment Scale Setting: 799 CPM

Operator: WS CHAN

### Standard Equipment

Equipment: High Volume Sampler  
Venue: Ma Wan Chung Village  
Model No.: TE-5170  
Serial No.: 5008  
Last Calibration Date: 24-Feb-25

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 799 CPM  
Sensitivity Adjustment Scale Setting (After Calibration): 799 CPM

| Hour | Date<br>(dd/mm/yy) | Time        | Ambient Condition |         | Concentration <sup>①</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>②</sup> | Count/<br>Minute <sup>③</sup><br>X-axis |
|------|--------------------|-------------|-------------------|---------|--------------------------------------------------------------|--------------------------|-----------------------------------------|
|      |                    |             | Temp (°C)         | R.H.(%) |                                                              |                          |                                         |
| 1    | 07/08/25           | 9:00-10:00  | 31.0              | 57      | 0.0687                                                       | 2610                     | 43.50                                   |
| 2    | 07/08/25           | 10:21-11:21 | 31.0              | 57      | 0.0441                                                       | 1761                     | 29.35                                   |
| 3    | 07/08/25           | 13:00-14:00 | 31.0              | 57      | 0.0415                                                       | 1732                     | 28.87                                   |

Note: ① Monitoring data was measured by High Volume Sampler  
② Total Count was logged by Laser Dust Monitor  
③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X

Slope (K-factor): 0.0015  
Correlation coefficient: 0.9985

Validity of Calibration Record: 7-Aug-26

Remarks:

QC Reviewer: Y.W. Fung

Signature: 

Date: 7-Aug-25

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
Manufacturer/Brand: SIBATA  
Model No.: LD-3B  
Equipment No.: A.005.13a  
Sensitivity Adjustment Scale Setting: 643 CPM  
  
Operator: WS CHAN

### Standard Equipment

Equipment: High Volume Sampler  
Venue: Ma Wan Chung Village  
Model No.: TE-5170  
Serial No.: 5008  
Last Calibration Date: 27-Jun-24

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 643 CPM  
Sensitivity Adjustment Scale Setting (After Calibration): 643 CPM

| Hour | Date<br>(dd/mm/yy) | Time        | Ambient Condition |         | Concentration <sup>①</sup><br>(mg/m3)<br>Y-axis | Total Count <sup>②</sup> | Count/<br>Minute <sup>③</sup><br>X-axis |
|------|--------------------|-------------|-------------------|---------|-------------------------------------------------|--------------------------|-----------------------------------------|
|      |                    |             | Temp (°C)         | R.H.(%) |                                                 |                          |                                         |
| 1    | 09/08/24           | 9:00-10:00  | 33.0              | 76      | 0.128                                           | 5325                     | 88.75                                   |
| 2    | 09/08/24           | 10:20-11:20 | 33.0              | 76      | 0.062                                           | 2650                     | 44.17                                   |
| 3    | 09/08/24           | 13:00-14:00 | 33.0              | 76      | 0.159                                           | 6120                     | 102.00                                  |

Note: ① Monitoring data was measured by High Volume Sampler  
② Total Count was logged by Laser Dust Monitor  
③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X

Slope (K-factor): 0.0015  
Correlation coefficient: 0.9981

Validity of Calibration Record: 9-Aug-25

Remarks:

QC Reviewer: Y.W. Fung

Signature: 

Date: 9-Aug-24

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
Manufacturer/Brand: SIBATA  
Model No.: LD-3B  
Equipment No.: A.005.13a  
Sensitivity Adjustment Scale Setting: 643 CPM

Operator: WS CHAN

### Standard Equipment

Equipment: High Volume Sampler  
Venue: Ma Wan Chung Village  
Model No.: TE-5170  
Serial No.: 5008  
Last Calibration Date: 24-Feb-25

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 643 CPM  
Sensitivity Adjustment Scale Setting (After Calibration): 643 CPM

| Hour | Date<br>(dd/mm/yy) | Time        | Ambient Condition |         | Concentration①<br>(mg/m3)<br>Y-axis | Total Count② | Count/<br>Minute③<br>X-axis |
|------|--------------------|-------------|-------------------|---------|-------------------------------------|--------------|-----------------------------|
|      |                    |             | Temp (°C)         | R.H.(%) |                                     |              |                             |
| 1    | 07/08/25           | 9:00-10:00  | 31.0              | 57      | 0.0687                              | 2640         | 44.00                       |
| 2    | 07/08/25           | 10:21-11:21 | 31.0              | 57      | 0.0441                              | 1785         | 29.75                       |
| 3    | 07/08/25           | 13:00-14:00 | 31.0              | 57      | 0.0415                              | 1744         | 29.07                       |

Note: ① Monitoring data was measured by High Volume Sampler  
② Total Count was logged by Laser Dust Monitor  
③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X

Slope (K-factor): 0.0015  
Correlation coefficient: 0.9986

Validity of Calibration Record: 7-Aug-26

Remarks:

QC Reviewer: Y.W. Fung

Signature: 

Date: 7-Aug-25

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3B  
 Equipment No.: A.005.16a  
 Sensitivity Adjustment Scale Setting: 521 CPM

Operator: WS CHAN

### Standard Equipment

Equipment: High Volume Sampler  
 Venue: Ma Wan Chung Village  
 Model No.: TE-5170  
 Serial No.: 5008  
 Last Calibration Date: 27-Jun-24

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 521 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 521 CPM

| Hour | Date<br>(dd/mm/yy) | Time        | Ambient Condition |         | Concentration <sup>①</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>②</sup> | Count/<br>Minute <sup>③</sup><br>X-axis |
|------|--------------------|-------------|-------------------|---------|--------------------------------------------------------------|--------------------------|-----------------------------------------|
|      |                    |             | Temp (°C)         | R.H.(%) |                                                              |                          |                                         |
| 1    | 09/08/24           | 9:00-10:00  | 33.0              | 76      | 0.128                                                        | 5110                     | 85.17                                   |
| 2    | 09/08/24           | 10:20-11:20 | 33.0              | 76      | 0.062                                                        | 2645                     | 44.08                                   |
| 3    | 09/08/24           | 13:00-14:00 | 33.0              | 76      | 0.159                                                        | 5942                     | 99.03                                   |

Note: ① Monitoring data was measured by High Volume Sampler  
 ② Total Count was logged by Laser Dust Monitor  
 ③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X  
 Slope (K-factor): 0.0015  
 Correlation coefficient: 0.998

Validity of Calibration Record: 9-Aug-25

Remarks:

QC Reviewer: Y.W. Fung

Signature: 

Date: 9-Aug-24

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
Manufacturer/Brand: SIBATA  
Model No.: LD-3B  
Equipment No.: A.005.16a  
Sensitivity Adjustment Scale Setting: 521 CPM

Operator: WS CHAN

### Standard Equipment

Equipment: High Volume Sampler  
Venue: Ma Wan Chung Village  
Model No.: TE-5170  
Serial No.: 5008  
Last Calibration Date: 24-Feb-25

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 521 CPM  
Sensitivity Adjustment Scale Setting (After Calibration): 521 CPM

| Hour | Date<br>(dd/mm/yy) | Time        | Ambient Condition |         | Concentration <sup>①</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>②</sup> | Count/<br>Minute <sup>③</sup><br>X-axis |
|------|--------------------|-------------|-------------------|---------|--------------------------------------------------------------|--------------------------|-----------------------------------------|
|      |                    |             | Temp (°C)         | R.H.(%) |                                                              |                          |                                         |
| 1    | 07/08/25           | 9:00-10:00  | 31.0              | 57      | 0.0687                                                       | 2574                     | 42.90                                   |
| 2    | 07/08/25           | 10:21-11:21 | 31.0              | 57      | 0.0441                                                       | 1740                     | 29.00                                   |
| 3    | 07/08/25           | 13:00-14:00 | 31.0              | 57      | 0.0415                                                       | 1708                     | 28.47                                   |

Note: ① Monitoring data was measured by High Volume Sampler  
② Total Count was logged by Laser Dust Monitor  
③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X

Slope (K-factor): 0.0015  
Correlation coefficient: 0.9985

Validity of Calibration Record: 7-Aug-26

Remarks:

QC Reviewer: Y.W. Fung

Signature: 

Date: 7-Aug-25



## CERTIFICATE OF CALIBRATION

Certificate No.: 24CA1031 03-04

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: 31-Oct-2024

Date of test: 06-Nov-2024

### Reference equipment used in the calibration

| Description:            | Model:   | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 3257888    | 30-Jul-2025  | SCL           |
| Preamplifier            | B&K 2673 | 3353200    | 29-Jun-2025  | CEPREI        |
| Measuring amplifier     | B&K 2610 | 2346941    | 27-Jun-2025  | CEPREI        |
| Signal generator        | DS 360   | 33873      | 06-Mar-2025  | CEPREI        |
| Digital multi-meter     | 34401A   | US36087050 | 20-Jun-2025  | CEPREI        |
| Audio analyzer          | 8903B    | GB41300350 | 19-Jun-2025  | CEPREI        |
| Universal counter       | 53132A   | MY40003662 | 26-Jun-2025  | CEPREI        |

### Ambient conditions

Temperature:  $21 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1005 \pm 5$  hPa

### Test specifications

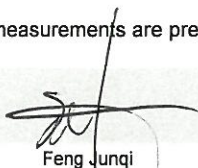
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results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

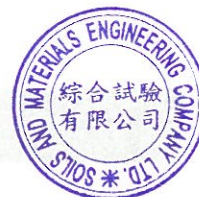
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

  
Feng Junqi

Date: 07-Nov-2024

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

Certificate No.: 25CA0408 03-03

Page: 1 of 2

### Item tested

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

### Item submitted by

Customer: AECOM  
Address of Customer: -  
Request No.: -  
Date of receipt: 08-Apr-2025

Date of test: 10-Apr-2025

### Reference equipment used in the calibration

| Description:            | Model:   | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 3257888    | 30-Jul-2025  | SCL           |
| Preamplifier            | B&K 2673 | 3353200    | 29-Jun-2025  | CEPREI        |
| Measuring amplifier     | B&K 2610 | 2346941    | 27-Jun-2025  | CEPREI        |
| Signal generator        | DS 360   | 61227      | 24-Feb-2026  | CEPREI        |
| Digital multi-meter     | 34401A   | US36087050 | 20-Jun-2025  | CEPREI        |
| Audio analyzer          | 8903B    | GB41300350 | 19-Jun-2025  | CEPREI        |
| Universal counter       | 53132A   | MY40003662 | 26-Jun-2025  | CEPREI        |

### Ambient conditions

Temperature: (20.8~21.3) °C  
Relative humidity: (55 ± 10) %  
Air pressure: (1010 ± 5) hPa

### Test specifications

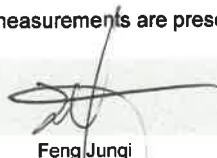
- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
-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

### Test results

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

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

Approved Signatory:

  
Feng Junqi

Date: 11-Apr-2025

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

**Certificate No.:** 25CA0416 02-02**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:** 16-Apr-2025

**Date of test:** 30-Apr-2025**Reference equipment used in the calibration**

| Description:            | Model:   | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 3257888    | 30-Jul-2025  | SCL           |
| Preamplifier            | B&K 2673 | 3353200    | 29-Jun-2025  | CEPREI        |
| Measuring amplifier     | B&K 2610 | 2346941    | 27-Jun-2025  | CEPREI        |
| Signal generator        | DS 360   | 61227      | 24-Feb-2026  | CEPREI        |
| Digital multi-meter     | 34401A   | US36087050 | 22-Apr-2026  | CEPREI        |
| Audio analyzer          | 8903B    | GB41300350 | 19-Jun-2025  | CEPREI        |
| Universal counter       | 53132A   | MY40003662 | 26-Jun-2025  | CEPREI        |

**Ambient conditions**

**Temperature:** (20.7~20.9)°C  
**Relative humidity:** (56.6~57.2)%RH  
**Air pressure:** (1010 ± 5) hPa

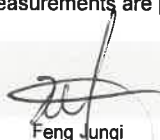
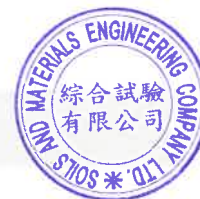
**Test specifications**

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

**Test results**

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

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

**Approved Signatory:**  
Feng Junqi**Date:** 02-May-2025**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

Certificate No.: 24CA1031 03-01

Page 1 of 2

### Item tested

|                       |                             |            |        |
|-----------------------|-----------------------------|------------|--------|
| Description:          | Sound Level Meter (Class 1) | Microphone | Preamp |
| Manufacturer:         | B & K                       | B & K      | B & K  |
| Type/Model No.:       | 2250                        | 4189       | ZC0032 |
| Serial/Equipment No.: | 3001291 / N011.05           | 3005374    | 31351  |
| Adaptors used:        | -                           | -          | -      |

### Item submitted by

|                      |                       |
|----------------------|-----------------------|
| Customer Name:       | AECOM ASIA CO LIMITED |
| Address of Customer: | -                     |
| Request No.:         | -                     |
| Date of receipt:     | 31-Oct-2024           |

Date of test: 06-Nov-2024

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 28-Aug-2025  | CIGISMEC      |
| Signal generator                | DS 360   | 33873      | 06-Mar-2025  | CEPREI        |

### Ambient conditions

|                    |              |
|--------------------|--------------|
| Temperature:       | 21 ± 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 responsiveness of the Sound Level Meter.

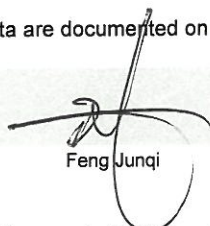
### Test results

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: 07-Nov-2024

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

Certificate No.: 24CA1031 03-02

Page 1 of 2

### Item tested

|                       |                             |            |        |
|-----------------------|-----------------------------|------------|--------|
| Description:          | Sound Level Meter (Class 1) | Microphone | Preamp |
| Manufacturer:         | B & K                       | B & K      | B & K  |
| Type/Model No.:       | 2270                        | 4189       | ZC0032 |
| Serial/Equipment No.: | 3007965                     | 2846461    | 17965  |
| Adaptors used:        | -                           | -          | -      |

### Item submitted by

|                      |                       |
|----------------------|-----------------------|
| Customer Name:       | AECOM ASIA CO LIMITED |
| Address of Customer: | -                     |
| Request No.:         | -                     |
| Date of receipt:     | 31-Oct-2024           |

Date of test: 06-Nov-2024

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 28-Aug-2025  | CIGISMEC      |
| Signal generator                | DS 360   | 33873      | 06-Mar-2025  | CEPREI        |

### Ambient conditions

|                    |              |
|--------------------|--------------|
| Temperature:       | 21 ± 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 responsiveness of the Sound Level Meter.

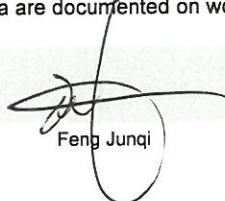
### Test results

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: 07-Nov-2024

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

Certificate No.: 24CA1031 03-03

Page 1 of 2

### Item tested

|                       |                             |            |        |
|-----------------------|-----------------------------|------------|--------|
| Description:          | Sound Level Meter (Class 1) | Microphone | Preamp |
| Manufacturer:         | B & K                       | B & K      | B & K  |
| Type/Model No.:       | 2270                        | 4189       | ZC0032 |
| Serial/Equipment No.: | 2644597                     | 2879980    | 29398  |
| Adaptors used:        | -                           | -          | -      |

### Item submitted by

|                      |                       |
|----------------------|-----------------------|
| Customer Name:       | AECOM ASIA CO LIMITED |
| Address of Customer: | -                     |
| Request No.:         | -                     |
| Date of receipt:     | 31-Oct-2024           |

Date of test: 06-Nov-2024

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 28-Aug-2025  | CIGISMEC      |
| Signal generator                | DS 360   | 33873      | 06-Mar-2025  | CEPREI        |

### Ambient conditions

|                    |              |
|--------------------|--------------|
| Temperature:       | 21 ± 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 responsiveness of the Sound Level Meter.

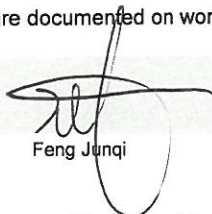
### Test results

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: 07-Nov-2024

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

**Certificate No.:** 25CA0408 03-01**Page** 1 **of** 2**Item tested**

|                              |                            |   |            |           |
|------------------------------|----------------------------|---|------------|-----------|
| <b>Description:</b>          | Sound Level Meter (Type 1) | , | Microphone | Preamp    |
| <b>Manufacturer:</b>         | Nti                        | , | Nti Andio  | Nti Andio |
| <b>Type/Model No.:</b>       | XL2                        | , | MC230A     | MA220     |
| <b>Serial/Equipment No.:</b> | A2A-17788-EO               | , | A24645     | 9087      |
| <b>Adaptors used:</b>        | -                          | , |            |           |

**Item submitted by**

|                             |             |
|-----------------------------|-------------|
| <b>Customer Name:</b>       | AECOM       |
| <b>Address of Customer:</b> | -           |
| <b>Request No.:</b>         | -           |
| <b>Date of receipt:</b>     | 08-Apr-2025 |

**Date of test:** 09-Apr-2025**Reference equipment used in the calibration**

|                                 |               |                   |                     |                      |
|---------------------------------|---------------|-------------------|---------------------|----------------------|
| <b>Description:</b>             | <b>Model:</b> | <b>Serial No.</b> | <b>Expiry Date:</b> | <b>Traceable to:</b> |
| Multi function sound calibrator | B&K 4226      | 2288444           | 28-Aug-2025         | CIGISMEC             |
| Signal generator                | DS 360        | 61227             | 24-Feb-2026         | CEPREI               |

**Ambient conditions**

|                           |                |
|---------------------------|----------------|
| <b>Temperature:</b>       | (21.3~21.8) °C |
| <b>Relative humidity:</b> | (55 ± 10) %    |
| <b>Air pressure:</b>      | (1005 ± 5) hPa |

**Test specifications**

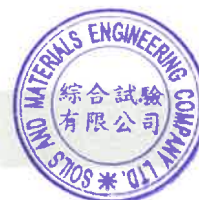
- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced 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 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:** 10-Apr-2025**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

Certificate No.: 25CA0408 03-02

Page 1 of 2

**Item tested**

|                       |                             |            |        |
|-----------------------|-----------------------------|------------|--------|
| Description:          | Sound Level Meter (Class 1) | Microphone | Preamp |
| 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  
Address of Customer: -  
Request No.: -  
Date of receipt: 08-Apr-2025

Date of test: 10-Apr-2025

**Reference equipment used in the calibration**

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 28-Aug-2025  | CIGISMEC      |
| Signal generator                | DS 360   | 61227      | 24-Feb-2026  | CEPREI        |

**Ambient conditions**

Temperature: (20.8~21.3) °C  
Relative humidity: (55 ± 10) %  
Air pressure: (1010 ± 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 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: 11-Apr-2025

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.