AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Sheung Wun Yiu (AM1A)	Operator:	Shum Kam Yuen
Cal. Date:	19-Apr-11	Next Due Date:	19-Jun-11
Equipment No.:	A-001-53T	Serial No.	10216

Ambient Condition			
Temperature, Ta (K)	292	Pressure, Pa (mmHg)	765.1

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01259	Intercept, bc	-0.01532
Last Calibration Date:	7-May-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-May-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) X axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.4	3.27	1.63	54.0	54.73
13	6.3	2.54	1.27	41.0	41.56
10	4.7	2.20	1.10	33.0	33.45
7	3.6	1.92	0.96	30.0	30.41
5	2.3	1.54	0.77	21.0	21.29

By Linear Regression of Y on X

Slope , mw = 38.4641 **Intercept, bw =** -7.8509

Correlation Coefficient* = 0.9953

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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 = $(mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$ = **41.59**

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 20 Apr 11

Station	Sheung Wun Yiu (AM1A)
Cal. Date:	19-Apr-11
Next Due Date:	19-Jun-11
Set Point (IC)	41.59

IC (CFM)	Qstd (m^3/min)
24	0.828
25	0.854
26	0.880
27	0.906
28	0.932
29	0.958
30	0.984
31	1.010
32	1.036
33	1.062
34	1.088
35	1.114
36	1.140
37	1.166
38	1.192
39	1.218
40	1.244
41	1.270
42	1.296
43	1.322
44	1.348
45	1.374
46	1.400
47	1.426
48	1.452
49	1.478
50	1.504
51	1.530
52	1.556
53	1.582
54	1.608
55	1.634
56	1.660
57	1.686
58	1.712
59	1.738
60	1.764
61	1.790
62	1.816
63	1.842
64	1.868
65	1.894

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Shan Tong New Village (AM2)	Operator:	Shum Kam Yuen
Cal. Date:	24-Mar-11	Next Due Date:	24-May-11
Equipment No.:	A-001-29T	Serial No.	10202

Ambient Condition			
Temperature, Ta (K)	294	Pressure, Pa (mmHg)	765.4

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01259	Intercept, bc	-0.01532
Last Calibration Date:	7-May-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-May-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	10.2	3.23	1.61	48.0	48.50
13	7.7	2.80	1.40	42.0	42.43
10	5.3	2.33	1.16	34.0	34.35
7	4.0	2.02	1.01	28.0	28.29
5	2.3	1.53	0.77	22.0	22.23

By Linear Regression of Y on X

Slope , mw = 32.0816 **Intercept, bw =** -3.0522

Correlation Coefficient* = 0.9956

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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; $IC = \{ mw \times Qstd + bw \} \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **38.26**

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 25 Mar 11

Station	Shan Tong New Village (AM2)
Cal. Date:	24-Mar-11
Next Due Date:	24-May-11
Set Point (IC)	38.26

IC (CFM)	Qstd (m^3/min)
24	0.843
25	0.874
26	0.906
27	0.937
28	0.968
29	0.999
30	1.030
31	1.061
32	1.093
33	1.124
34	1.155
35	1.186
36	1.217
37	1.248
38	1.280
39	1.311
40	1.342
41	1.373
42	1.404
43	1.435
44	1.467
45	1.498
46	1.529
47	1.560
48	1.591
49	1.622
50	1.654
51	1.685
52	1.716
53	1.747
54	1.778
55	1.810
56	1.841
57	1.872
58	1.903
59	1.934
60	1.965
61	1.997
62	2.028
63	2.059
64	2.090
65	2.121

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Shan Tong New Village (AM2)	Operator:	Choi wing ho
Cal. Date:	24-May-11	Next Due Date:	24-Jul-11
Equipment No.:	A-001-29T	Serial No.	10202

Ambient Condition			
Temperature, Ta (K)	297	Pressure, Pa (mmHg)	755.5

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00691	Intercept, bc	-0.0214
Last Calibration Date:	8-Nov-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	8-Nov-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) X - axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.8	3.28	1.65	48.0	47.94
13	8.0	2.82	1.42	42.0	41.95
10	5.4	2.32	1.17	34.0	33.96
7	4.2	2.05	1.03	28.0	27.96
5	2.5	1.58	0.80	22.0	21.97

By Linear Regression of Y on X

Slope , mw = 31.4651 Intercept, bw = -3.3763

Correlation Coefficient* = 0.9946

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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)]$^{1/2}$= 37.58

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 30 May 11

Station	Shan Tong New Village (AM2)
Cal. Date:	24-May-11
Next Due Date:	24-Jul-11
Set Point (IC)	37.58

IC (CFM)	Qstd (m^3/min)
24	0.870
25	0.902
26	0.934
27	0.965
28	0.997
29	1.029
30	1.061
31	1.093
32	1.124
33	1.156
34	1.188
35	1.220
36	1.251
37	1.283
38	1.315
39	1.347
40	1.379
41	1.410
42	1.442
43	1.474
44	1.506
45	1.537
46	1.569
47	1.601
48	1.633
49	1.665
50	1.696
51	1.728
52	1.760
53	1.792
54	1.823
55	1.855
56	1.887
57	1.919
58	1.951
59	1.982
60	2.014
61	2.046
62	2.078
63	2.110
64	2.141
65	2.173

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Riverain Bayside (AM3)	Operator:	Shum Kam Yuen
Cal. Date:	24-Mar-11	Next Due Date:	24-May-11
Equipment No.:	A-001-69T	Serial No.	716

Ambient Condition			
Temperature, Ta (K)	294	Pressure, Pa (mmHg)	765.4

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01259	Intercept, bc	-0.01532
Last Calibration Date:	7-May-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-May-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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^3/min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.2	3.23	1.61	50.0	50.52
13	8.2	2.89	1.45	46.0	46.48
10	6.0	2.47	1.24	40.0	40.41
7	4.3	2.10	1.05	34.0	34.35
5	2.4	1.57	0.79	24.0	24.25

By Linear Regression of Y on X

Slope , mw = 31.7870 Intercept, bw = 0.2478

Correlation Coefficient* = 0.9926

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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)]$^{1/2}$= 41.15

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 25 Mar 11

Station	Riverain Bayside (AM3)
Cal. Date:	24-Mar-11
Next Due Date:	24-May-11
Set Point (IC)	41.15

IC (CFM)	Qstd (m^3/min)
24	0.747
25	0.779
26	0.810
27	0.842
28	0.873
29	0.905
30	0.936
31	0.967
32	0.999
33	1.030
34	1.062
35	1.093
36	1.125
37	1.156
38	1.188
39	1.219
40	1.251
41	1.282
42	1.314
43	1.345
44	1.376
45	1.408
46	1.439
47	1.471
48	1.502
49	1.534
50	1.565
51	1.597
52	1.628
53	1.660
54	1.691
55	1.722
56	1.754
57	1.785
58	1.817
59	1.848
60	1.880
61	1.911
62	1.943
63	1.974
64	2.006
65	2.037

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station: Riverain Bayside (AM3)
Cal. Date: 24-May-11
Next Due Date: 24-Jul-11
Set Point (IC): 40.43

Station: Riverain Bayside (AM3) | Operator: Choi wing ho
Cal. Date: 24-May-11 | Next Due Date: 24-Jul-11
Equipment No.: A-001-69T | Serial No. 716

Ambient Condition			
Temperature, Ta (K)	297	Pressure, Pa (mmHg)	755.5

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00691	Intercept, bc	-0.0214
Last Calibration Date:	8-Nov-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	8-Nov-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) X axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.5	3.24	1.62	50.0	49.94
13	8.5	2.91	1.46	46.0	45.94
10	6.4	2.53	1.27	40.0	39.95
7	4.5	2.12	1.07	34.0	33.96
5	2.7	1.64	0.83	24.0	23.97

By Linear Regression of Y on X

Slope , mw = 32.4101 | Intercept, bw = -1.7559

Correlation Coefficient* = 0.9908

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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)]$^{1/2}$= 40.43

Remarks:

QC Reviewer: [signature] Signature: [signature] Date: 30 May 11

IC (CFM)	Qstd (m^3/min)
24	0.795
25	0.826
26	0.856
27	0.887
28	0.918
29	0.949
30	0.980
31	1.011
32	1.042
33	1.072
34	1.103
35	1.134
36	1.165
37	1.196
38	1.227
39	1.258
40	1.288
41	1.319
42	1.350
43	1.381
44	1.412
45	1.443
46	1.473
47	1.504
48	1.535
49	1.566
50	1.597
51	1.628
52	1.659
53	1.689
54	1.720
55	1.751
56	1.782
57	1.813
58	1.844
59	1.875
60	1.905
61	1.936
62	1.967
63	1.998
64	2.029
65	2.060

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Tai Kwong Secondary School (AM4)	Operator:	Shum Kam Yuen
Cal. Date:	24-Mar-11	Next Due Date:	24-May-11
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	290	Pressure, Pa (mmHg)	766.7

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	2.01259	Intercept, bc	-0.01532
Last Calibration Date:	7-May-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-May-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X-axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	10.1	3.24	1.62	52.0	52.94
13	8.4	2.95	1.47	46.0	46.84
10	5.8	2.45	1.23	38.0	38.69
7	4.0	2.04	1.02	32.0	32.58
5	2.4	1.58	0.79	22.0	22.40

By Linear Regression of Y on X

Slope , mw = 35.7858 **Intercept, bw =** -5.1541

Correlation Coefficient* = 0.9951

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **40.63**

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 25 Mar 11

Station	Tai Kwong Secondary School (AM4)
Cal. Date:	24-Mar-11
Next Due Date:	24-May-11
Set Point (IC)	40.63

IC (CFM)	Qstd (m^3/min)
24	0.815
25	0.843
26	0.871
27	0.899
28	0.926
29	0.954
30	0.982
31	1.010
32	1.038
33	1.066
34	1.094
35	1.122
36	1.150
37	1.178
38	1.206
39	1.234
40	1.262
41	1.290
42	1.318
43	1.346
44	1.374
45	1.402
46	1.429
47	1.457
48	1.485
49	1.513
50	1.541
51	1.569
52	1.597
53	1.625
54	1.653
55	1.681
56	1.709
57	1.737
58	1.765
59	1.793
60	1.821
61	1.849
62	1.877
63	1.905
64	1.932
65	1.960

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Tai Kwong Secondary School (AM4)	Operator:	Choi wing ho
Cal. Date:	24-May-11	Next Due Date:	24-Jul-11
Equipment No.:	A-001-70T	Serial No.	10273

Ambient Condition			
Temperature, Ta (K)	297	Pressure, Pa (mmHg)	755.3

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00691	Intercept, bc	-0.0214
Last Calibration Date:	8-Nov-10	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	8-Nov-11	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) X axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	11.0	3.31	1.66	55.0	54.92
13	9.0	3.00	1.50	50.0	49.93
10	6.2	2.49	1.25	41.0	40.94
7	4.4	2.09	1.05	35.0	34.95
5	2.8	1.67	0.84	27.0	26.96

By Linear Regression of Y on X

Slope , mw = 34.0441 Intercept, bw = -1.4331

Correlation Coefficient* = 0.9991

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/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)]$^{1/2}$= 42.89

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 30 May 11

Station	Tai Kwong Secondary School (AM4)
Cal. Date:	24-May-11
Next Due Date:	24-Jul-11
Set Point (IC)	42.89

IC (CFM)	Qstd (m^3/min)
24	0.747
25	0.776
26	0.806
27	0.835
28	0.865
29	0.894
30	0.923
31	0.953
32	0.982
33	1.011
34	1.041
35	1.070
36	1.100
37	1.129
38	1.158
39	1.188
40	1.217
41	1.246
42	1.276
43	1.305
44	1.335
45	1.364
46	1.393
47	1.423
48	1.452
49	1.481
50	1.511
51	1.540
52	1.570
53	1.599
54	1.628
55	1.658
56	1.687
57	1.716
58	1.746
59	1.775
60	1.805
61	1.834
62	1.863
63	1.893
64	1.922
65	1.951

EQUIPMENT CALIBRATION RECORD

Type:	***Laser Dust Monitor***
Manufacturer/Brand:	***SIBATA***
Model No.:	***LD-3***
Equipment No.:	***A.005.07a***
Sensitivity Adjustment Scale Setting:	***557 CPM***
Operator:	*Mike Shek (MSKM)*

Standard Equipment

Equipment:	*Rupprecht & Patashnick TEOM®*		
Venue:	*Cyberport (Pui Ying Secondary School)*		
Model No.:	*Series 1400AB*		
Serial No:	Control: *140AB219899803*		
	Sensor: *1200C143659803*	K_o: *12500*	
Last Calibration Date*:	*30 May 2010*		

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *557* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *557* CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration[1] (mg/m^3) **Y-axis**	Total Count[2]	Count/ Minute[3] **X-axis**
			Temp (°C)	R.H. (%)			
1	*05-06-10*	*10:00 - 11:00*	*27.3*	*78*	*0.05537*	*1850*	*30.83*
2	*05-06-10*	*11:00 - 12:00*	*27.4*	*77*	*0.05441*	*1812*	*30.20*
3	*05-06-10*	*12:00 - 13:00*	*27.4*	*78*	*0.05245*	*1753*	*29.22*
4	*05-06-10*	*13:00 - 14:00*	*27.5*	*78*	*0.05355*	*1787*	*29.78*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0018*
Correlation coefficient: *0.9949*

Validity of Calibration Record: *4 June 2011*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 7 June 2010

EQUIPMENT CALIBRATION RECORD

Type: ***Laser Dust Monitor***
Manufacturer/Brand: ***SIBATA***
Model No.: ***LD-3***
Equipment No.: ***A.005.09a***
Sensitivity Adjustment Scale Setting: ***797 CPM***

Operator: *Mike Shek (MSKM)*

Standard Equipment

Equipment: *Rupprecht & Patashnick TEOM®*
Venue: *Cyberport (Pui Ying Secondary School)*
Model No.: *Series 1400AB*
Serial No: Control: *140AB219899803*
Sensor: *1200C143659803* K_o: *12500*
Last Calibration Date*: *30 May 2010*

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *797* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *797* CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration[1] (mg/m^3) **Y-axis**	Total Count[2]	Count/ Minute[3] **X-axis**
			Temp (°C)	R.H. (%)			
1	*06-06-10*	*13:30 - 14:30*	*27.8*	*77*	*0.06421*	*2408*	*40.13*
2	*06-06-10*	*14:30 - 15:30*	*27.8*	*78*	*0.06643*	*2491*	*41.52*
3	*06-06-10*	*15:30 - 16:30*	*27.9*	*78*	*0.06375*	*2379*	*39.65*
4	*06-06-10*	*16:30 - 17:30*	*27.7*	*78*	*0.06159*	*2305*	*38.42*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0016*
Correlation coefficient: *0.9944*

Validity of Calibration Record: *5 June 2011*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 7 June 2010

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533
HKLAS 028

CERTIFICATE OF CALIBRATION

Certificate No.: 10CA0728 02-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2255680	,	2250447
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of request:	28-Jul-2010

Date of test: 29-Jul-2010

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	12-Jan-2011	CIGISMEC
Signal generator	DS 360	33873	28-Jun-2011	CEPREI
Signal generator	DS 360	61227	24-Jun-2011	CEPREI

Ambient conditions

Temperature:	(21 ± 1) °C
Relative humidity:	(60 ± 5) %
Air pressure:	(1000 ± 5) hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 29-Jul-2010 **Company Chop:** 綜合試驗有限公司 SOILS AND MATERIALS ENGINEERING COMPANY LTD.

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., B/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 10CA0724 01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2255677	,	2250455
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of request:	24-Jul-2010

Date of test: 26-Jul-2010

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	12-Jan-2011	CIGISMEC
Signal generator	DS 360	33873	28-Jun-2011	CEPREI
Signal generator	DS 360	61227	24-Jun-2011	CEPREI

Ambient conditions

Temperature:	(21 ± 1) °C
Relative humidity:	(60 ± 5) %
Air pressure:	(1000 ± 5) hPa

Test specifications

1. The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 26-Jul-2010 **Company Chop:**

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

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533
HOKLAS 028

CERTIFICATE OF CALIBRATION

Certificate No.: 10CA0803 01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	RION CO., LTD.	,	RION CO., LTD.
Type/Model No.:	NL-31	,	UC-53A
Serial/Equipment No.:	00320528 / N.007.03A	,	88783
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of request:	03-Aug-2010

Date of test: 05-Aug-2010

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	12-Jan-2011	CIGISMEC
Signal generator	DS 360	33873	28-Jun-2011	CEPREI
Signal generator	DS 360	61227	24-Jun-2011	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 5 %
Air pressure:	1000 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 06-Aug-2010 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 10CA0708 04-01 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B&K
Type/Model No.:	4231
Serial/Equipment No.:	1790985 / N004.01
Adaptors used:	-

Item submitted by

Customer:	AECOM ASIA CO. LTD
Address of Customer:	-
Request No.:	-
Date of request:	08-Jul-2010

Date of test: 14-Jul-2010

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	02-Jul-2011	SCL
Preamplifier	B&K 2673	2239857	15-Dec-2010	CEPREI
Measuring amplifier	B&K 2610	2346941	11-Dec-2010	CEPREI
Signal generator	DS 360	61227	24-Jun-2011	CEPREI
Digital multi-meter	34401A	US36067050	03-Dec-2010	CIGISMEC
Audio analyzer	8903B	GB41300350	07-Dec-2010	CEPREI
Universal counter	53132A	MY40003662	05-Jul-2011	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 5 %
Air pressure:	1000 ± 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: Huang Jian Min/Feng Jun Qi **Date:** 14-Jul-2010 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong. Tel : (852) 2873 6860
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com

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CERTIFICATE OF CALIBRATION

Certificate No.: 11CA0317 06-02 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Rion Co., Ltd.
Type/Model No.:	NC-73
Serial/Equipment No.:	10186482/N.004.09
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of request:	17-Mar-2011

Date of test: 26-Mar-2011

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	02-Jul-2011	SCL
Preamplifier	B&K 2673	2239857	14-Dec-2011	CEPREI
Measuring amplifier	B&K 2610	2346941	15-Dec-2011	CEPREI
Signal generator	DS 360	61227	24-Jun-2011	CEPREI
Digital multi-meter	34401A	US36087050	09-Dec-2011	CEPREI
Audio analyzer	8903B	GB41300350	28-Jun-2011	CEPREI
Universal counter	53132A	MY40003662	05-Jul-2011	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 5 %
Air pressure:	1005 ± 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

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

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

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 29-Mar-2011 **Company Chop:**

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