Aecom Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Access Road to Po Shan Mansions (CA1)	Operator:	Shum Kam Yuen
Cal. Date:	1-Sep-09	Next Due Date:	1-Nov-09
Equipment No.:	A.001.46T	Serial No.	10217

Ambient Condition			
Temperature, Ta (K)	306	Pressure, Pa (mmHg)	755.5

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	3.14	1.57	52.0	51.16
13	7.3	2.66	1.33	42.0	41.32
10	5.4	2.29	1.14	34.0	33.45
7	3.7	1.89	0.95	28.0	27.55
5	2.7	1.62	0.81	22.0	21.65

By Linear Regression of Y on X

Slope , mw = 38.6106 **Intercept, bw =** -9.7516

Correlation Coefficient* = 0.9971

*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; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **41.10**

Remarks:

QC Reviewer: Joe Fu Signature: Joe Date: 2 Sep 09

Aecom Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Podium oh Hamilton Court (CA2)	Operator:	Shum Kam Yuen
Cal. Date:	1-Sep-09	Next Due Date:	1-Nov-09
Equipment No.:	A.001.15T	Serial No.	10380

Ambient Condition			
Temperature, Ta (K)	306	Pressure, Pa (mmHg)	755.5

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.02158	Intercept, bc	-0.02524
Last Calibration Date:	4-Nov-08	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	4-Nov-09	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

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	10.0	3.11	1.55	48.0	47.23
13	7.6	2.71	1.35	40.0	39.36
10	5.5	2.31	1.15	34.0	33.45
7	4.0	1.97	0.99	28.0	27.55
5	2.5	1.56	0.78	20.0	19.68

By Linear Regression of Y on X

Slope , mw = 35.0842 **Intercept, bw =** -7.4387

Correlation Coefficient* = 0.9978

*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)]$^{1/2}$= **38.79**

Remarks: _____

QC Reviewer: Joe Fu Signature: Joe Date: 2 Sep 09

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*: *5 June 2009*

*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	*06-06-09*	*09:00 - 10:00*	*30.2*	*76*	*0.04175*	*1392*	*23.20*
2	*06-06-09*	*10:00 - 11:00*	*30.6*	*76*	*0.03983*	*1330*	*22.17*
3	*06-06-09*	*11:00 - 12:00*	*31.0*	*75*	*0.04025*	*1339*	*22.31*
4	*06-06-09*	*13:00 - 14:00*	*31.2*	*76*	*0.04271*	*1426*	*23.77*

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: *0.9965*

Validity of Calibration Record: *5 June 2010*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 8 June 2009

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: *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*: *5 June 2009*

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *799* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *799* 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	04-07-09	11:00 - 12:00	29.7	78	0.03713	1498	24.97
2	04-07-09	12:00 - 13:00	29.7	78	0.03520	1404	23.41
3	04-07-09	14:00 - 15:00	30.1	81	0.03891	1553	25.91
4	04-07-09	15:00 - 16:00	30.1	81	0.04025	1618	26.97

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): *0.0015*
Correlation coefficient: *0.9907*

Validity of Calibration Record: *3 July 2010*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 6 July 2009

綜合試驗有限公司
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Fax : (852) 2555 7533
HOKLAS 028

CERTIFICATE OF CALIBRATION

Certificate No.: 09CA0611 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:	ENSR ASIA (HK) LTD.
Address of Customer:	Room 1213-1219, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Rd,Sha Tin, New Territories,HK
Request No.:	-
Date of request:	10-Jun-2009

Date of test: 11-Jun-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	12-Jan-2010	CIGISMEC
Signal generator	DS 360	33873	12-Jun-2009	CEPREI
Signal generator	DS 360	61227	18-Jul-2009	CEPREI

Ambient conditions

Temperature:	23 ± 1 °C
Relative humidity:	55 ± 15 %
Air pressure:	995 ± 15 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:** 12-Jun-2009 **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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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Tel : (852) 2873 6860
Fax : (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 09CA0710 04-04 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Rion Co., Ltd.
Type/Model No.:	NC-73
Serial/Equipment No.:	10307223
Adaptors used:	-

Item submitted by

Curstomer:	ENSR ASIA (H.K.) LTD.
Address of Customer:	-
Request No.:	-
Date of request:	10-Jul-2009

Date of test: 14-Jul-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	23-Jun-2010	SCL
Preamplifier	B&K 2673	2239857	02-Dec-2009	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Dec-2009	CEPREI
Signal generator	DS 360	61227	22-Jun-2010	CEPREI
Digital multi-meter	34401A	US36087050	03-Dec-2009	CIGISMEC
Audio analyzer	8903B	GB41300350	27-Nov-2009	CEPREI
Universal counter	53132A	MY40003662	23-Jun-2010	CEPREI

Ambient conditions

Temperature:	23 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	995 ± 10 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-2009 **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.