Total Suspended Particulates (TSP) Sampler Field Calibration Report

Station	Fanling Governm	nent Secondary	School (AM2)		Operator:	Shum Kar	n Yuen
Date:	11-Dec-13				Next Due Date:	11-Feb)-14
Model No:	TE-5170				Verified Against:	O.T.S	- 988
Equipment No.:	A-001-74T				Expiration Date:	20-May-	2014
200 - 10							
			Ambient C	ondition			
Tempera	ture, Ta	289.0	Kelvin	Pressi	ıre, Pa	756.9	mmHg
		Or	ifice Transfer Star	idard Informa	tion		
Equipme	ent No.:	988	Slope, mc	1.99	238	Intercept, bc	-0.00351
Last Calibra	ation Date:	20-May-13	***	o v Ostd + bo :	= [H x (Pa/760)	v (208/Ta)11/2	
Next Calibra	ation Date:	20-May-14		ic x Qstu + bc -	- [II x (I a/ 700)	X (296/14)j	
			page.				
			Calibration of				
Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)] ¹		Qstd (m ³ /min) X - axis	W in. of oil	[ΔW x (Pa/760) Y-a x	
1	6.2		2.52	1.27	5.1	2.29	9
2	5.0		2.27	1.14	4.1	2.05	
3	4.6		2.17	1.09	3.5	1.90	
4	3.8		1.98	0.99	3.1	1.78	
5	2.2		1.50	0.76	1.8	1.30	6
By Linear Regr	ession of Y on	X					
Slope, mw =	1.8045	_	1	intercept, bw =	€.	-0.01	88
Correlation C	oefficient* =	0	.9969				
			Set Point Ca	lculation			
From the TSP Fi	eld Calibration	Curve, take Qs	$td = 1.21 \text{ m}^3/\text{min } (4)$	3 CFM)			
From the Regres	sion Equation, t	he "Y" value a	ccording to				
		m v	Qstd + b = [W x (P	9/760) v (208/7	Γα)] ^{1/2}		
		шх	Qstu · b – [W X (I	a/ 100) x (200/)	/]		
Therefore, S	Set Point W = (m x Qstd + b)	² x (760 / Pa) x (T	a / 298) =	4	1.56	
*If Correlation C	Coefficient < 0.9	90, check and	recalibrate again.				
						. 1	
Remarks:							
							2
QC Reviewer:	T leing		Signature:		The state of the s	Date:	C-B

Total Suspended Particulates (TSP) Sampler Field Calibration Report

Station	Fanling Governr	ment Secondary	School (AM2)		Operator:	Shum Kam	Yuen
Date:	8-Feb-14	_			Next Due Date:	8-May-	14
Model No:	TE-5170				Verified Against:	O.T.S	988
Equipment No.:	A-001-74T	-			Expiration Date:	20-May-2	2014
			Ambient C	Condition		_	
Temperature, Ta 289.6 Kelvin Pressu					ıre, Pa	758.6	mmHg
					488		
		Oı	ifice Transfer Sta	ndard Informat	tion		
Equipme	ent No.:	988	Slope, mc	1.99	238	Intercept, bc	-0.00351
Last Calibra	ation Date:	20-May-13	r	nc x Qstd + bc =	= [H x (Pa/760)	v (298/Ta)l ^{1/2}	
Next Calibra	ation Date:	20-May-14		me a Qstu + be	[11 x (1 4/700)		
					- In three time.		
		1	Calibration of	TSP Sampler Qstd			
Calibration Point	H in. of water	[H x (Pa/70	[H x (Pa/760) x (298/Ta)] ^{1/2}		W in. of oil	[ΔW x (Pa/760) x Y-axi	3
1	6.3		2.54	1.28	5.2	2.31	
2	5.1		2.29	1.15	4.1	2.05	
3	4.6		2.17	1.09	3.4	1.87	
4	3.7		1.95	0.98	3.0	1.76	
5	2.3		1.54	0.77	1.6	1.28	
By Linear Regr	ession of Y on	X					
Slope, mw =	1.9796	_	ļ	Intercept, bw =	a	-0.232	5
Correlation C	oefficient* =	0.9948					
			Set Point Ca	alculation			
From the TSP Fig	eld Calibration	Curve, take Qs	$td = 1.21 \text{ m}^3/\text{min} (4)$	3 CFM)			
From the Regress	sion Equation, t	he "Y" value a	ecording to				
		m x	Qstd + b = [W x (P	Pa/760) x (298/T	(a)] ^{1/2}		1971
Therefore, S	Set Point W = (m x Qstd + b) ²	² x (760 / Pa) x (T	Ta / 298) =	4,	.55	
*If Correlation C	oefficient < 0.9	90, check and	recalibrate again.				
Remarks:							
QC Reviewer:	4 Shen		Signature:			Date: 12/2/1	t



TISCH ENVIROMENTAL, INC. 145 SOUTH MIAMI AVE. VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - M Operator		Rootsmeter Orifice I.I		438320 0988	Ta (K) - Pa (mm) -	297 751.84
PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1 2 3 4 5	NA NA NA NA	NA NA NA NA NA	1.00 1.00 1.00 1.00	1.3900 0.9720 0.8670 0.8270 0.6800	3.2 6.4 7.9 8.7 12.6	2.00 4.00 5.00 5.50 8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9884 0.9842 0.9821 0.9811 0.9759	0.7110 1.0125 1.1327 1.1863 1.4352	1.4090 1.9926 2.2278 2.3365 2.8179	0.9957 0.9915 0.9894 0.9884 0.9832	0.7163 1.0201 1.1412 1.1952 1.4459	0.8889 1.2570 1.4054 1.4740 1.7777
Qstd slo intercep coeffici	ot (b) = ent (r) =	1.94727 0.02332 0.99998 	Qa slop intercep coeffici v axis =	t (b) =	1.21935 0.01471 0.99998

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)

Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]

Qa = Va/Time

For subsequent flow rate calculations:

Qstd = $1/m\{[SQRT(H2O(Pa/760)(298/Ta))] - b\}$ $Qa = 1/m\{[SQRT H2O(Ta/Pa)] - b\}$

Type:	facturer/Brand:			Laser D	ust Mon	itor		
Mode	Transferred and the Street of the			LD-3				
Equipment No.: Sensitivity Adjustment Scale Setting: 5				A.005.07				
				557 CP				
				Mike She	ek (MSKI	M)		
Standa	rd Equipment							
Equip	ment [,]	Pun	precht & Pa	atachnick	TEOM®			
Venue			erport (Pui			chool)		
Mode			es 1400AB	ring occi	niual y 3	crioory		
Serial		Cont		OAB2198	99803			
200		Sens	And the second second	00C1436		K _o : 12500)	_
Last C	Calibration Date*:		1ay 2013		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	110		
*Remar	ks: Recommend	led interval	for hardwa	re calibra	tion is 1	year		
Calibra	tion Result			14,200				
0		0 1 0 11					60.4	
	tivity Adjustment tivity Adjustment					557 CF	PM PM	
Hour	Date (dd-mm-yy)	Ti	Time		oient dition	Concentration ¹ (mg/m ³)	Total Count ²	Count/ Minute ³
				Temp (°C)	R.H. (%)	Y-axis		X-axis
1	18-05-13	12:30	- 13:30	28.1	78	0.04714	1887	31.45
2	18-05-13		- 14:30	28.1	78	0.04932	1970	32.83
3	18-05-13	14:30	- 15:30	28.2	77	0.05156	2056	34.27
4	18-05-13	15:30	- 16:30	28.1	78	0.05083	2026	33.77
	2. Total Count 3. Count/minut ar Regression of	was logged e was calc	d by Laser I ulated by (1	Dust Moni	tor	shnick TEOM®		
	(K-factor):		0.0015					
Correla	ation coefficient:		0.9978					
Validity	y of Calibration R	Record:	17 May 2	014				
Remark	s:							
QC Re	viewer: _YWF	ung	Signat	ture:	4/	Date	e: _20 May	2013

Type: Manufacturer/Brand: Model No.: Equipment No.: Sensitivity Adjustment Sca Operator:	Laser Do SIBATA LD-3 A.005.09 797 CPI)a VI				
Standard Equipment						
Equipment: Venue: Model No.: Serial No: Last Calibration Date*: *Remarks: Recommended in	Cyberport (Series 1400 Control: Sensor: 18 May 201	140AB2198 1200C1436 3	99803 59803	K _o : <u>12500</u>)	
Calibration Result		32				
Sensitivity Adjustment Scal Sensitivity Adjustment Scal				797 CF		
Hour Date (dd-mm-yy)	Time		dition R.H. (%)	Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
1 18-05-13 12	2:30 - 13:		78	0.04714	1885	31.42
	3:30 - 14:		78	0.04932	1965	32.75
	1:30 - 15:		77	0.05156	2059	34.32
4 18-05-13 15	5:30 - 16:	30 28.1	78	0.05083	2024	33.73
Note: 1. Monitoring data of 2. Total Count was 3. Count/minute was 4. Suppose a suppose of Y or 5. Slope (K-factor): Correlation coefficient:	logged by La as calculated l	ser Dust Mon by (Total Cou	itor	shnick TEOM®		
Validity of Calibration Reco	ord: <u>17 Ma</u>	ay 2014				
Remarks:						

	facturer/Brand:		_	Laser Du SIBATA	ust Moni	tor		
Mode			_	LD-3 A.005.11	3			
Equipment No.: Sensitivity Adjustment Scale Setting:				799 CPI				
Opera			_	Mike She		Л)		
Standa	rd Equipment							
Equip	ment:	Rupi	orecht & Pa	tashnick	TEOM®			
Venue			erport (Pui \			chool)		
Mode	l No.:	Serie	es 1400AB					
Serial	No:	Cont		DAB21989		200,000,000		
		Sens		00C1436	59803	K _o : _12500		
Last C	Calibration Date*:	_18 M	lay 2013					
*Remar	ks: Recommend	ed interval	for hardwar	re calibra	tion is 1 y	year		
Calibra	tion Result							
	tivity Adjustment tivity Adjustment					799 CP		
Hour	Date	Ti	me	Amb	pient	Concentration ¹	Total	Count/
	(dd-mm-yy)			Cond		(mg/m³)	Count ²	Minute ³
				Temp	R.H.	Y-axis		X-axis
	10.05.10	40.45	10.15	(°C)	(%)	0.04005	1071	04.40
1	18-05-13	,	- 13:15	28.1	78	0.04685	1871	31.18
3	18-05-13 18-05-13	13:15 14:15	- 14:15 - 15:15	28.1 28.2	78 77	0.04941 0.05127	1979 2055	32.98
4	18-05-13	15:15	- 15.15 - 16:15	28.1	78	0.05727	2033	34.25 33.68
Note:						shnick TEOM®	2021	
	 Total Count Count/minut 	was logged e was calc	d by Laser [Dust Mon	itor	STITION TEOM		
	ar Regression of	Y or X						
	(K-factor):		0.0015					
	ation coefficient:		0.9976	2 8 3	=======================================			
Validit	y of Calibration F	Record:	_17 May 20	014				
Remark	s:	× 11 11 11 11 11 11 11 11 11 11 11 11 11						
					1./			
QC Re	eviewer: YW F	ung	_ Signat	ure:	7/	Date	e: _20 May	y 2013

Model Equip Sensit Opera	ment No.: tivity Adjustment ator:	Scale Se	tting:	=	Laser Du SIBATA LD-3B A.005.13 643 CPI Mike She	a M			
Standa	rd Equipment								
Equipo Venue Model Serial	e: No.:	Cyk Ser Cor Ser		t (Pui \ 00AB 140 120	tashnick /ing Seco DAB21989 DOC14365	ndary So 9803	chool) K _o : <u>12</u> 5	00	
	ks: Recommend		20 20 20		e calibrat	ion is 1 y	/ear		
Calibra	tion Result								
	ivity Adjustment ivity Adjustment		٠,			,		CPM CPM	
Hour	Date (dd-mm-yy)	,	ime		Amb Cond Temp (°C)		Concentration (mg/m³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
1	18-05-13	12:15	- 1	13:15	28.1	78	0.04685	1867	31.12
2	18-05-13	13:15		14:15	28.1	78	0.04941	1975	32.92
3	18-05-13	14:15	- 1	15:15	28.2	77	0.05127	2048	34.13
4	18-05-13	15:15		16:15	28.1	78	0.05060	2017	33.62
Slope Correla	1. Monitoring d 2. Total Count 3. Count/minut ar Regression of (K-factor): ation coefficient:	was logge e was cal Y or X	ed by I culate 	Laser [d by (T 015 986	Oust Moni otal Cour	tor	shnick IEOM®		
Validity	y of Calibration F	(ecord:	_1/	May 20)14				
Remark	S:								
QC Re	eviewer: YW F	ung		Signat	ure:	4/	D	ate: _20 Ma	y 2013



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.:

13CA1107 01-01

Page

Item tested

Description:

Sound Level Meter (Type 1)

Rion Co., Ltd.

Microphone Rion Co., Ltd.

Manufacturer: Type/Model No.:

NL-31

UC-53A

Serial/Equipment No .: Adaptors used:

90565 00320528 / N.007.03A

Item submitted by

Customer Name: Address of Customer: AECOM ASIA CO., LTD.

Request No.:

Date of receipt:

07-Nov-2013

Date of test:

08-Nov-2013

Reference equipment used in the calibration

Description:

Multi function sound calibrator

Signal generator Signal generator

Model:

DS 360

B&K 4226 DS 360

Serial No. 2288444

33873 61227 **Expiry Date:**

22-Jun-2014 15-Apr-2014 15-Apr-2014

Traceable to:

CIGISMEC CEPREI **CEPREI**

Ambient conditions

Temperature: Relative humidity: 22 ± 1 °C 60 ± 10 %

Air pressure:

1000 ± 10 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 2, 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.

Huang Jian Min/Feng Jun Qi

Actual Measurement data are documented on worksheets.

Approved Signatory:

Date:

11-Nov-2013

Company Chop:

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.

Soils & Materials Engineering Co., Ltd.

Form No.CARP152-1/Issue 1/Rev.C/01/02/2007



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.:

13CA0305 01-01

Page

of

2

Item tested

Description: Manufacturer: Sound Level Meter (Type 1)

B & K

Type/Model No.:

B & K 2250-L

4950

Serial/Equipment No.:

2681366 (N. OII.01)

2665582

Microphone

Adaptors used:

-

-

Item submitted by

Customer Name: Address of Customer: AECOM ASIA CO LIMITED

Request No.:

-

Date of receipt:

05-Mar-2013

Date of test:

05-Mar-2013

Reference equipment used in the calibration

Description:

Model:

Serial No.

Expiry Date:

Traceable to:

Multi function sound calibrator Signal generator B&K 4226 DS 360 2288444 33873

23-May-2013 29-May-2013 CIGISMEC

Signal generator

DS 360

61227

29-May-2013

CEPREI CEPREI

Ambient conditions

Temperature:

21 ± 1 °C

Relative humidity:

60 ± 10 % 1000 ± 10 hPa

Air pressure:

1000 ± 10

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.
- 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%.
- 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.

n/F

eng Jun Qi

Actual Measurement data are documented on worksheets.

Huang Jian M

carry no implication regarding the long-term stability of the instrument.

Approved Signatory:

Date:

05-Mar-2013

Company Chop:

The results reported in this certificate refer to the condition of the instrument on the date of calibration and

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Form No.CARP152-1/Issue 1/Rev.C/01/02/2007



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.:

13CA1107 01-02

Page:

of

2

Item tested

Description:

Acoustical Calibrator (Class 1)

Manufacturer:

Rion Co., Ltd.

Type/Model No .: Serial/Equipment No.: NC-73

10307223 / N.004.08

Adaptors used:

Item submitted by

Curstomer:

AECOM ASIA CO., LTD.

Address of Customer:

Request No .: Date of receipt:

07-Nov-2013

Date of test:

08-Nov-2013

Reference equipment used in the calibration

Description: Lab standard microphone Preamplifier	Model: B&K 4180 B&K 2673	Serial No. 2341427 2239857	Expiry Date: 17-Apr-2014 16-Apr-2014	Traceable to: SCL CEPREI
Measuring amplifier	B&K 2610	2346941	24-Apr-2014	CEPREI
Signal generator	DS 360	61227	15-Apr-2014	CEPREI
Digital multi-meter	34401A	US36087050	10-Dec-2013	CEPREI
Audio analyzer	8903B	GB41300350	15-Apr-2014	CEPREI
Universal counter	53132A	MY40003662	15-Apr-2014	CEPREI

Ambient conditions

Temperature: Relative humidity:

Air pressure:

22 ± 1 °C 60 ± 10 % 1000 ± 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.

Huang Jian Min/Feng Jun Qi

Approved Signatory:

Date:

11-Nov-2013

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.

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Form No.CARP156-1/Issue 1/Rev.D/01/03/2007



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.:

13CA0325 01-03

Page:

Item tested

Description:

Acoustical Calibrator (Class 1)

Manufacturer:

Type/Model No.:

Rion Co., Ltd. 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 receipt:

25-Mar-2013

Date of test:

26-Mar-2013

Reference equipment used in the calibration

Description: Lab standard microphone Preamplifier Measuring amplifier Signal generator Digital multi-meter Audio analyzer	Model: B&K 4180 B&K 2673 B&K 2610 DS 360 34401A 8903B	Serial No. 2412857 2239857 2346941 61227 US36087050 GB41300350	Expiry Date: 29-May-2013 17-Dec-2013 17-Dec-2013 29-May-2013 10-Dec-2013 29-May-2013	Traceable to: SCL CEPREI CEPREI CEPREI CEPREI CEPREI CEPREI
Audio analyzer Universal counter				CEPREI CEPREI

Ambient conditions

Temperature:

22 ± 1 °C

Relative humidity: Air pressure:

60 ± 10 % 1000 ± 10 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B 1, 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. 2,
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference 3, 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:

Date:

26-Mar-2013

Company Chop:

Huang Jian Min/Feng Jun Qi

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.

Soils & Materials Engineering Co., Ltd

Form No.CARP156-1/Issue 1/Rev.D/01/03/2007