Total Suspended Particulates (TSP) Sampler Field Calibration Report

Station	Fanling Governn	nent Secondary	School (AM2)		Operator:	Shum Kan	n Yuen
Date:	27-Jan-15				Next Due Date:	27-Mai	·-15
Model No:	TE-5170				Verified Against:	O.T.S	988
Equipment No.:	A-001-74T				Expiration Date:	28-May-	2015
			·····				
			Ambient C	Condition		,	
Tempera	ture, Ta	292.0	Kelvin	Pressu	ire, Pa	764.6	mmHg
		Or	rifice Transfer Sta	ndard Informat	tion		
Equipme	ent No :	988	Slope, mc	1.97		Intercept, bc	-0.01001
Last Calibra		28-May-14				379/3	-0.01001
Next Calibra		28-May-15	n	nc x Qstd + bc =	$= [H \times (Pa/760)]$	$(298/Ta)^{1/2}$	
Next Callon	ation Date.	20-Way-13					
			Calibration of	TSP Sampler			
Calibration Point	H in. of water	[H x (Pa/76	60) x (298/Ta)] ^{1/2}	Qstd (m³/min) X - axis	W in. of oil	[ΔW x (Pa/760) Y-ax	
1	6.5		2.58		4.6	2.13	7
2	5.3		2.33		3.6	1.92	
3	4.4		2.13	1.08	3.0	1.76	
4	3.5		1.90	0.96	2.5	1.60)
5	2.2		1.50	0.77	1.6	1.28	
By Linear Regr		X					
Slope, mw =		_		Intercept, bw =		0.044	12
Correlation C	coefficient* =	0.	.9975				
			Set Point C				
From the TSP Fi	ield Calibration	Curve, take Qs	$td = 1.21 \text{ m}^3/\text{min}$ (4)	43 CFM)			
From the Regres	sion Equation, t	he "Y" value a	ccording to				
		m x	Qstd + b = [W x (I	Pa/760) x (298/I	[a)] ^{1/2}		
Therefore,	Set Point W = (m x Qstd + b)	² x (760 / Pa) x (7	Γa / 298) =	3	3.83	r
*If Correlation (Coefficient < 0.9	90. check and	recalibrate again.				
		,					
Remarks:							
						-0	1 1
QC Reviewer:	WS CHA	N	Signature:	21		Date:	101/15



TISCH ENVIRONMENTAL, INC. 145 SOUTH MIAMI AVE VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - M Operator		Rootsmeter Orifice I.I		438320 0988	Ta (K) - Pa (mm) -	296 - 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	1.00 1.00 1.00 1.00 1.00	1.3790 0.9720 0.8690 0.8260 0.6830	3.2 6.4 7.9 8.8 12.8	2.00 4.00 5.00 5.50 8.00

DATA TABULATION

Vstd (x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9917 0.7191 0.9875 1.0159 0.9854 1.1339 0.9843 1.1916 0.9790 1.4333	1.4113 1.9959 2.2315 2.3405 2.8227	0.9957 0.9915 0.9894 0.9883 0.9829	0.7221 1.0201 1.1385 1.1965 1.4392	0.8874 1.2549 1.4030 1.4715 1.7747
Qstd slope (m) = intercept (b) = coefficient (r) =	1.97518 -0.01001 0.99998	Qa slope intercept coefficie	t (b) =	1.23683 -0.00630 0.99998
y axis = SQRT[H2O(H	Pa/760)(298/Ta)]	y axis =	SQRT[H20(Га/Ра)]

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

EQUIPMENT CALIBRATION RECORD

Model Equipr	acturer/Brand: No.: nent No.: ivity Adjustment	Scale Setti	- - -	Laser Du SIBATA LD-3 A.005.07 557 CPI	а	tor		
Opera	Operator:			Mike She	k (MSKN	0		
Standai	rd Equipment	w ·						
Equipr Venue Model Serial Last C	: No.:	Cybe Serie Conti Sens			ndary So 99803	:hool) K _o : <u>12500</u>		
Calibra Sensit	ks: Recommend tion Result ivity Adjustment ivity Adjustment	Scale Setti	ng (Before	Calibratic	on):	/ear CF CF CF		
Hour	Date (dd-mm-yy)		me	Amt	oient dition R.H.	Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ⁵ X-axis
1 2	11-05-14 11-05-14	10:30	- 10:30 - 11:30	26.7 26.7	(%) 75 75	0.04434 0.04716	1775 1880	29.58 31.33
3	11-05-14 11-05-14	11:30 12:30	- 12:30 - 13:30	26.8 26.8	76 75	0.04927 0.05035	1964 2015	32.73 33.58
Slope	Monitoring of 2. Total Count 3. Count/minuter Regression of (K-factor): ation coefficient:	was logged te was calc	d by Laser I	Dust Mon	itor	shnick TEOM [®]		
Validit Remark	y of Calibration F	Record:	11 May 2	015				
	eviewer: YW I	-ung	Signa		4/	Dat	40 Ma	y 2014

EQUIPMENT CALIBRATION RECORD

		а И			
_	Mike She	k (MSKN	1)		
1000					
Cyberport (Pui Y Series 1400AB Control: 140 Sensor: 120 10 May 2014	/ing Seco 0AB21989 00C14365	99803 99803	K _o : <u>12500</u>		
				200	
Setting (After Ca	alibration)): [*]			
Time	Cond Temp	lition R.H.	Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
45 - 13:45	28.4	77	0.05027	2158	35.97
	28.5	76	0.05161	2211	36.85
	28.5	76	0.05235	2247	37.45
45 - 16:45	28.4	77	0.05203	2233	37.22
ogged by Laser Es calculated by (TX) 0.0014 0.9969	Oust Moni otal Cour	tor	shnick TEOM [®]		
	Rupprecht & Pail Cyberport (Pui Y Series 1400AB Control: 140 Sensor: 120 10 May 2014 terval for hardwar e Setting (Before 0 e Setting (After Ca Time 45 - 13:45 45 - 14:45 45 - 15:45 45 - 16:45 Vas measured by logged by Laser Description of the control of the	Rupprecht & Patashnick Cyberport (Pui Ying Second Series 1400AB	Rupprecht & Patashnick TEOM® Cyberport (Pui Ying Secondary Scotes 1400AB	Cyberport (Pui Ying Secondary School) Series 1400AB Control: 140AB219899803 Sensor: 1200C143659803 K _o : 12500 10 May 2014 terval for hardware calibration is 1 year	Rupprecht & Patashnick TEOM® Cyberport (Pui Ying Secondary School) Series 1400AB

EQUIPMENT CALIBRATION RECORD

	acturer/Brand:			Laser Du SIBATA	ıst Monit	tor		
Model	ment No.:		_	LD-3B A.005.16	9			
	Sensitivity Adjustment Scale Setting:			521 CPI				
Operator:			_	Mike She		1)		
Standa	rd Equipment	* 2						
5.00			39					
Equipr			echt & Pa					
Venue			port (Pui \	ing Seco	ondary Sc	chool)		
Model			1400AB				200	
Serial	No:	Contro		DAB2198		14 40,000		
		Senso		00C1436	59803	K _o : <u>12500</u>		
Last C	Calibration Date*:	_10 Ma	y 2014					
*Remar	ks: Recommend	ed interval fo	or hardwar	re calibra	tion is 1 y	/ear		
Calibra	tion Result			7				
	ivity Adjustment ivity Adjustment					521 CF 521 CF		
Hour	Date	Tim	ie	20 Dec 2011	pient	Concentration	Total	Count/
	(dd-mm-yy)			Cond	dition	(mg/m ³)	Count ²	Minute ³
				Temp	R.H.	Y-axis		X-axis
				(°C)	(%)			
1	26-07-14	10:30 -	11:30	28.6	77	0.04931	1971	32.85
2	26-07-14	11:45 -	12:45	28.6	77	0.05142	2052	34.20
3	26-07-14	13:15 -	14:15	28.7	77	0.05589	2243	37.38
4	26-07-14	14:40 -	15:40	28.8	78	0.05293	2116	35.27
Note:	Total Count Count/minut	was logged te was calcu	by Laser I	Dust Mon	itor	shnick TEOM®		
By Linea	ar Regression of	Y or X						
SOUR SANCTON BUSINESS.	(K-factor):	-	0.0015					
	ation coefficient: y of Calibration F	-	0.9934 26 July 20	015				
validit	y of Calibration i	vecora.	20 July 20	313				
Remark	s:							
			8 <u></u>					
QC Re	eviewer: _ <i>YW F</i>	-ung	Signa	ture:		Date	e: _28 July	y 2014



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 Website: www.cigismec.com E-mail: smec@cigismec.com

Tel: (852) 2873 6860 Fax: (852) 2555 7533



CERTIFICATE OF CALIBRATION

Certificate No.:

14CA1106 04-01

Page

of

2

Item tested

Description: Manufacturer: Sound Level Meter (Type 1)

Rion Co., Ltd.

NL-31

Rion Co., Ltd. UC-53A 90565

Microphone

Type/Model No.: Serial/Equipment No.: Adaptors used:

Item submitted by

AECOM ASIA CO., LTD.

00320528 / N.007.03A

Customer Name: Address of Customer:

Request No.

Date of receipt:

06-Nov-2014

Date of test:

07-Nov-2014

Reference equipment used in the calibration

Description:

Multi function sound calibrator

Signal generator

Signal generator

DS 360 DS 360

Model: Serial No. B&K 4226 2288444

33873

61227

Expiry Date:

15-Jun-2015 09-Apr-2015

09-Apr-2015

Traceable to:

CIGISMEC CEPREI CEPREI

Ambient conditions

Temperature:

Relative humidity:

22 ± 1 °C

65 ± 10 %

Air pressure:

1010 ± 10 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:

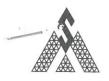
08-Nov-2014

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.:

14CA0702 01-01

Page

2

Item tested

Description: Manufacturer: Type/Model No.:

Sound Level Meter (Type 1)

B&K 2238

Microphone

B&K 4188 2791211

Serial/Equipment No.: Adaptors used:

2800927 / N.009.06

Item submitted by

Customer Name: Address of Customer:

AECOM ASIA CO., LTD.

Request No:

02-Jul-2014

Date of receipt:

Date of test:

03-Jul-2014

Reference equipment used in the calibration

Description:

Multi function sound calibrator

Signal generator Signal generator

Model: B&K 4226

DS 360 DS 360

Serial No. 2288444

33873 61227

Expiry Date:

20-Jun-2015 09-Apr-2015 09-Apr-2015 Traceable to:

CIGISMEC CEPREI CEPREI

Ambient conditions

Temperature:

Relative humidity: Air pressure:

21 ± 1 °C 60 ± 10 %

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 1, 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 3, 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:

Huana Jiann/Fena Jun Qi Date:

04-Jul-2014

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.:

14CA1106 04-02

Page:

of

2

Item tested

Description:

Acoustical Calibrator (Class 1)

Manufacturer: Type/Model No.: Rion Co., Ltd. NC-73

Serial/Equipment No.:

NC-73 10307223 / N.004.08

Serial/Equipment No Adaptors used:

.

Item submitted by

Curstomer:

AECOM ASIA CO., LTD.

Address of Customer:

555

Request No.: Date of receipt:

06-Nov-2014

Date of test:

07-Nov-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

Ambient conditions

Temperature:

22 ± 1 °C

Relative humidity:

65 ± 10 %

Air pressure:

1010 ± 10 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.
- 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:

08-Nov-2014

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.

© Soils & Materials Engineering Co., Ltd.

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.:

14CA0408 01-02

Page:

of

2

Item tested

Description:

Acoustical Calibrator (Class 1)

Manufacturer:

Rion Co., Ltd.

Type/Model No.: Serial/Equipment No .: NC-74

Adaptors used:

34246490 004 10 Yes

Item submitted by

Curstomer:

AECOM ASIA CO., LTD.

Address of Customer:

Request No.: Date of receipt:

08-Apr-2014

Date of test:

15-Apr-2014

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. 2341427 2239857 2346941 61227 US36087050 GB41300350	Expiry Date: 17-Apr-2014 10-Apr-2015 08-Apr-2015 09-Apr-2015 17-Dec-2014 07-Apr-2015	Traceable to: SCL CEPREI CEPREI CEPREI CEPREI CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

Ambient conditions

Temperature:

22 ± 1 °C 60 ± 10 %

Relative humidity: Air pressure:

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.

Huang Jian Min/Feng Jun Qi

Approved Signatory:

Date:

23-Apr-2014

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.

© Soils & Materials Engineering Co., Ltd

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