Total Suspended Particulates (TSP) Sampler Field Calibration Report

Station Fanling Government Secondary School (AM2) Operator: Shum Kam Yuen										
Date:	6-Jun-14					6-Aug				
Model No:	TE-5170					O.T.S				
Equipment No.:	A-001-74T					28-May-				
			Ambient C	Condition						
Tempera	ture, Ta	301.0	Kelvin	Pressu	ıre, Pa	753.8	mmHg			
Orifice Transfer Standard Information										
Equipme		988	Slope, mc	1.97	518	Intercept, bc	-0.01001			
Last Calibra	ation Date:	28-May-14	r	nc x Qstd + bc =	= [H x (Pa/760)	v (208/Ta)l ^{1/2}				
Next Calibra	ation Date:	28-May-15		ne a Quiu - Be	[11 A (1 a/ /00)	A (290/14)]				
			-			. N. 11 300 N N N N N N N N N N N N N N N N N N				
		T 0- 00-	Calibration of							
Calibration	Н	[H v (Do/74	50) x (298/Ta)] ^{1/2}	Qstd	W	[ΔW x (Pa/760) z	k (298/Ta)] ^{1/2}			
Point	in. of water	[n x (ra//	50) x (298/1a)]	(m³/min) X - axis	in. of oil	Y-axis				
1	6.1		2.45	1.24	4.6	2.13				
2	5.0		2.22	1.13	4.0	1.98				
3	4.5		2.10	1.07	3.3	1.80				
4	3.7		1.91	0.97	2.7	1.63				
5	2.3		1.50	0.77	1.5	1.21				
By Linear Regr	ession of Y on X	X								
Slope, mw =	1.9918	_	;	Intercept, bw =		-0.313	35			
Correlation C	oefficient* =	0.	9970							
			Set Point Ca	alculation						
From the TSP Fi	eld Calibration (Curve, take Qs	$td = 1.21 \text{ m}^3/\text{min} (4)$	3 CFM)						
From the Regress	sion Equation, th	ne "Y" value a	ecording to							
$m \times Qstd + b = [W \times (Pa/760) \times (298/Ta)]^{1/2}$										
m a gotta · 0 [[17 a (1 a/ /00) a (270/1 a)]										
Therefore, Set Point W = $(m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.48										
*If Correlation C	oefficient < 0.99	90, check and i	ecalibrate again.							
Remarks:										
				> 1						
QCReviewer: 🔼	15 CHAN		Signature:			Date: <u>6/6</u>	114			



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

Type:					Laser Du	ıst Moni	tor		
	acturer/Brand:			-	SIBATA				
Model				_	LD-3				
	ment No.:	01-0-4	u*	_	A.005.07				
Sensit	ivity Adjustment	Scale Set	tting:	_	557 CPI	Л			
Opera	tor:				Mike She	k (MSKN	1)		
Standa	rd Equipment								
Equip	ment:	Rui	pprecht	& Pai	tashnick	TEOM®			
Venue					ing Seco		chool)		
Model	No.:	Ser	ries 140	0AB	•				
Serial	No:	Cor	ntrol:		AB21989				
			nsor:		00C14368	59803	K₀: <u>12500</u>		
Last C	Calibration Date*:	_10	May 201	14					
*Remar	ks: Recommend	ed interva	al for hai	rdwar	e calibra	tion is 1 y	/ear		
Calibra	tion Result								
Sensit	ivity Adjustment	Scale Set	ttina (Re	fore	Calibratio	m).	<i>557</i> CF	PΜ	
	ivity Adjustment		- 1			•	557 CP		
00,101	irriy / tajaotirro		9 (*			,.			
Hour	Date	7	Time		Aml	pient	Concentration ¹	Total	Count
	(dd-mm-yy)					dition	(mg/m ³)	Count ²	Minute
	,				Temp	R.H.	Y-axis		X-axis
					(°C)	(%)			
1	11-05-14	09:30):30	26.7	75	0.04434	1775	29.58
2	11-05-14	10:30		:30	26.7	75	0.04716	1880	31.33
3	11-05-14	11:30 12:30		2:30 3:30	26.8 26.8	76 75	0.04927 0.05035	1964 2015	32.73 33.58
4	11-05-14							2015	33.30
Note:							ishnick TEOM®		
	2. Total Count 3. Count/minu								
Bylino	ar Regression of	Y or Y		•					
	(K-factor):	1017	0.00	15					
	ation coefficient:	ı	0.99						
Validit	y of Calibration I	Record:	11 N	lay 20	015				
	,								
Remark	ks:								
						. ,			
						1./			
QC R	eviewer: YW I	-ung	§	Signat	ture:	4/	Date	e: <u>12 Ma</u>	y 2014

Type:	:				I aser D	ust Mon	itor		
	facturer/Brand:			-	SIBATA				
Mode	el No.:			_	LD-3				
	ment No.:			_	A.005.0	9a	·		
Sensi	itivity Adjustment	Scale S	Settin	g: _	797 CP	M			
Opera	ator:			_	Mike Sh	ek (MSKI	M)		
Standa	ard Equipment								
Equip									
Venue	ement:			echt & Pa					
Mode			yper	port (Pui	Ying Sec	ondary S	chool)		
Serial				1400AB	0400400	00000			
Ochai	110.		ontro		0AB2198				
Last C	Calibration Date*:		enso O Ma	r: <u>12</u> 0 y 2014	00C1436	59803	K _o : <u>12500</u>)	
									
*Remar	ks: Recommend	led inter	val fo	r hardwa	re calibra	tion is 1	year		
Calibra	tion Result					<u>-</u>			
Sensit	livity Adjustment	Scale S	etting	(Before	Calibration	on):		PM	
Sensi	livity Adjustment	Scale S	etting	(After C	alibration):	_797 CF	PM	
Hour	Date		Time		Ami	oient	Camanata dia 1	T =	T =
, roui	(dd-mm-yy)		1 1111	5	1	dition	Concentration ¹	Total	Count/
İ	(dd iiiii yy)				Temp	R.H.	(mg/m³) Y-axis	Count ²	Minute ³
					(°C)	(%)	r-axis		X-axis
1	11-05-14	13:30	_	14:30	26.8	75	0.05034	2017	33.62
2	11-05-14	14:30		15:30	26.9	76	0.05211	2084	34.73
3	11-05-14	15:30		16:30	26.9	76	0.05163	2066	34.43
4	11-05-14	16:30		17:30	26.9	76	0.05272	2113	35.22
Note:	1. Monitoring d	ata was	mea	sured by			shnick TEOM®	2110	00.22
	2. Total Count	was log	ged b	y Laser [Dust Mon	itor			
	3. Count/minut	e was c	alcula	ated by (T	otal Cou	nt/60)			
Duline	Danis	V V							
	ar Regression of	Y or X		0045					
	(K-factor): ation coefficient:		_	0.0015					
Cone	ation coemcient:			0.9965					
Validity	y of Calibration R	ecord:	1	1 May 20	015				
					"				
Remark	s:								
									
						_/			
QC Re	viewer: YW F	ung		Signat	ure:	_9/	Date	e: 12 May	2014

Type: Manufacturer/Brand: Model No.: Equipment No.: Sensitivity Adjustment So	_	Laser Do SIBATA LD-3B A.005.14 786 CPI	a	tor			
Operator:	_	Mike She	k (MSKN	1)			
Standard Equipment	4555 451 11148						
Equipment: Venue: Model No.: Serial No: Last Calibration Date*: *Remarks: Recommended	Sensor: 120 10 May 2014	7ing Seco 0AB21989 00C14369	99803 99803	K _o : <u>12500</u>)		
	Gen.			·			
Calibration Result Sensitivity Adjustment Scale Setting (Before Calibration): 786 CPM Sensitivity Adjustment Scale Setting (After Calibration): 786 CPM							
Hour Date (dd-mm-yy)	Time	Amb Cond Temp (°C)	dition R.H. (%)	Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis	
1 18-05-14	12:45 - 13:45	28.4	77	0.05027	2158	35.97	
2 18-05-14	13:45 - 14:45	28.5	76	0.05161	2211	36.85	
3 18-05-14	14:45 - 15:45	28.5	76	0.05235	2247	37.45	
4 18-05-14	15:45 - 16:45	28.4	77	0.05203	2233	37.22	
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): 0.0014 Correlation coefficient: 0.9969 Validity of Calibration Record: 18 May 2015							
Remarks:							

Model	acturer/Brand: No.: ment No.:			Laser Du SIBATA LD-3B A.005.16		tor		
	ivity Adjustment	Scale Setting	-	521 CPN				
Opera	tor:		_	Mike She	k (MSKN	<i>Л</i>)		
Standa	rd Equipment			416				
Equipr	ment:	Ruppre	echt & Pa	tashnick '	TEOM®			
Venue				Ying Seco	ndary So	chool)		
Model			1400AB					
Serial	No:	Contro		DAB21989		17 1050		
Last C	alibration Date*:	Sensor 18 May	-	00C14365	9803	K _o : _12500)	
Lasi C	alibration Date .	_ TO IVIA	7 2013					<u></u>
*Remar	ks: Recommend	ed interval fo	r hardwai	re calibrat	ion is 1	year		
Calibra	tion Result							
-		(3)						
	ivity Adjustment						PM	
Sensit	ivity Adjustment	Scale Setting	(After Ca	alibration)):	_521C	PM	
Hour	Date	Time	2	Amb	pient	Concentration ¹	Total	Count/
11001	(dd-mm-yy)	, , , , , ,	5	Cond		(mg/m ³)	Count ²	Minute ³
	(00),)			Temp	R.H.	Y-axis		X-axis
				(°C)	(%)		907-27-2	
1	27-07-13	11:00 -	12:00	27.3	75	0.04734	1893	31.55
2	27-07-13	12:00 -	13:00	27.3	75	0.04789	1915	31.92
3	27-07-13	13:00 -	14:00	27.4	74	0.04953	1976	32.93
4	27-07-13	14:00 -	15:00	27.4	75	0.04867	1949	32.48
Note:	Monitoring of 2. Total Count 3. Count/minus ar Regression of 2.	was logged t te was calcula	by Laser I	Dust Mon	itor	ashnick TEOM [®]		
	(K-factor):		0.0015					
	ation coefficient:		0.9934					
Validit	y of Calibration F	be-	26 July 20	014				
Remark	s:							
				- <u> </u>				
							7	
QC Re	eviewer: YW I	-ung	Signa	ture:	4	Da	te: _29 Jul	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.:

14CA0305 06-01

Page

of

Item tested

Sound Level Meter (Type 1)

Microphone

2

Description:

Manufacturer:

B&K

B&K

2238

4188

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

2285692

Adaptors used:

2250420

Item submitted by

Customer Name:

AECOM ASIA CO. LTD.

Address of Customer:

Request No .:

Date of receipt:

05-Mar-2014

Date of test:

07-Mar-2014

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

22-Jun-2014

CIGISMEC

Signal generator

DS 360

33873 61227

15-Apr-2014 15-Apr-2014

CEPREI **CEPREI**

Ambient conditions

Temperature:

22 ± 1 °C

Relative humidity: Air pressure:

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.

Huang Jian Min/Feng Jun Qi

Actual Measurement data are documented on worksheets.

Approved Signatory:

Date:

12-Mar-2014

Company Chop:

ENGIN

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.CARP152-1/Issue 1/Rev.C/01/02/2007



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CERTIFICATE OF CALIBRATION

Certificate No.:

14CA0305 06-02

Page

of

2

Item tested

Description:

Sound Level Meter (Type 1)

Microphone

Manufacturer:

B & K

B & K

Type/Model No.: Serial/Equipment No.: 2250 2681366 //. 0//. o/ 4950 2665582

Adaptors used:

-

-

Item submitted by

Customer Name:

AECOM ASIA CO. LTD.

Address of Customer:

-

Request No.: Date of receipt:

05-Mar-2014

Date of test:

07-Mar-2014

Reference equipment used in the calibration

Description:

-116 -- 1 --

Model: B&K 4226 Serial No.

Expiry Date: 22-Jun-2014

Traceable to: CIGISMEC

Multi function sound calibrator Signal generator Signal generator

DS 360 DS 360 2288444 33873 61227

15-Apr-2014 15-Apr-2014 CEPREI CEPREI

Ambient conditions

Temperature:

22 ± 1 °C 60 ± 10 %

Relative humidity: 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 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.

Huang Jian Min/Feng Jun Qi

Actual Measurement data are documented on worksheets.

Approved Signatory:

Date:

12-Mar-2014

Company Chop:

SENGINEEA 線合試驗 SOMP 有限公司 和 有限公司 和

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.CARP152-1/Issue 1/Rev.C/01/02/2007



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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