High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/03/0027

Project No.	AM3 - Yau Lai Estate, Bik Lai House			
Date:	10-Dec-20	Next Due Date:	10-Feb-21	Operator: SK
Equipment No.:	A-01-03	Model No.: GS2310	Serial No.	10379

Ambient Condition			
Temperature, Ta (K)	293.9	Pressure, Pa (mmHg)	762.5

Orifice Transfer Standard Information				
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$
Next Calibration Date:	17-Jan-21	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$

$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$

$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$

Calibration of TSP Sampler					
Calibration Point	**Orifice**			**HVS**	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	13.0	3.64	61.89	8.6	2.96
2	9.6	3.13	53.25	6.5	2.57
3	7.7	2.80	47.74	5.3	2.32
4	5.1	2.28	38.94	3.3	1.83
5	2.6	1.63	27.93	2.0	1.42

By Linear Regression of Y on X

Slope , mw = __0.0463__   Intercept, bw = __0.0950__

Correlation coefficient* = __0.9981__

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = __4.27__

Remarks: _____

_____

Conducted by:	SK Wong	Signature:	Date:	10 December 2020
Checked by:	Henry Leung	Signature:	Date:	10 December 2020

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No.　MA16034/54/0027

Project No.	AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

Date:	10-Dec-20	Next Due Date:	10-Feb-21	Operator:	SK
Equipment No.:	A-01-54	Model No.:	TE-5170	Serial No.	1536

Ambient Condition

Temperature, Ta (K)	293.9	Pressure, Pa (mmHg)	762.5

Orifice Transfer Standard Information

Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20				
Next Calibration Date:	17-Jan-21				

$$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$$

$$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$$

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	13.0	3.64	61.89	8.8	2.99
2	9.9	3.17	54.07	6.4	2.55
3	7.5	2.76	47.12	5.0	2.26
4	5.3	2.32	39.69	3.3	1.83
5	3.0	1.75	29.97	1.9	1.39

By Linear Regression of Y on X

Slope , mw = 0.0501   Intercept, bw = -0.1281

Correlation coefficient* = 0.9991

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

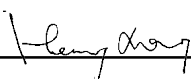From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) =   4.04

Remarks:

Conducted by:	SK Wong	Signature:	Date:	10 December 2020
Checked by:	Henry Leung	Signature:	Date:	10 December 2020

Calibration Certificate

0023157

Customer :		Object 1 :	SVAN959 SLM
Cinotech Consultants Limited		Serial No. /Ref. No. :	11275 / N-08-01
RM 1710, Technology Park,		Object 2 :	Microphone
18 On Lai Street, Shatin, N.T.		Serial No. /Ref. No. :	22452
Hong Kong			
Customer Code : SVEC09005		Manufacturer :	BSWAtech
Date of calibration:	08/01/2020	Certificate No.:	0023157
Date of the recommended re-calibration:	08/01/2021	Handle by:	E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.2dB	+0.2dB	+/- 1.5dB	1
114.0dB	113.9dB	-0.1dB	+/- 1.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature   (20...26)°C   Humidity   (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) | within | the allowable deviation.

Performed by

Calibration Technician

Approved by

Quality Manager

Equipment no.: N-12-01

Calibration Certificate

0024993

Customer :		Object 1 :	BSWA 308 SLM
Cinotech Consultants Limited		Serial No. /Ref. No. :	570183 / 550233
RM 1710, Technology Park,		Object 2 :	
18 On Lai Street, Shatin, N.T.		Serial No. /Ref. No. :	
Hong Kong			
Customer Code : SVEC09005		Manufacturer : BSWAtech	
Date of calibration:	07/10/2020	Certificate No.:	0024993
Date of the recommended re-calibration:	07/10/2021	Handle by:	E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.4dB	-0.6dB	+/- 1.5dB	1
114.0dB	113.2dB	-0.8dB	+/- 1.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature   (20...26)°C   Humidity (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains
the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) | within | the allowable deviation.

Performed by

Calibration Technician   Mr. K.L. Ng

Approved by

Mr. K.S. Ng

Quality Manager

Appleone Calibration Laboratory Ltd.   Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR   Tel: +852 2370 4437 Fax: +852 2114 0393

Calibration Certificate

0024995

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong	**Object 1** : BSWA 308 SLM **Serial No. /Ref. No.** : 570187 / 550841 **Object 2** : **Serial No. /Ref. No.** :
Customer Code : SVEC09005	**Manufacturer** : BSWAtech
Date of calibration: 07/10/2020 **Date of the recommended re-calibration:** 07/10/2021	**Certificate No.:** 0024995 **Handle by:** E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.1dB	-0.9dB	+/- 1.5dB	1
114.0dB	113.1dB	-0.9dB	+/- 1.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature   (20...26)°C   Humidity   (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains
the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5.The calibrations certificate may not be reproduced.

Measured value(s) within   **the allowable deviation.**

Performed by

Calibration Technician   Mr. K.L. Ng

Approved by

Mr. K.S. Ng

Quality Manager

Appleone Calibration Laboratory Ltd.   Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR   Tel: +852 2370 4437 Fax: +852 2114 0393

Calibration Certificate

0024996

Customer :	Object 1 : BSWA 308 SLM
Cinotech Consultants Limited	Serial No. /Ref. No. : 570188 / 550850
RM 1710, Technology Park,	Object 2 :
18 On Lai Street, Shatin, N.T.	Serial No. /Ref. No. :
Hong Kong	
Customer Code : SVEC09005	Manufacturer : BSWAtech
Date of calibration: 07/10/2020	Certificate No.: 0024996
Date of the recommended re-calibration: 07/10/2021	Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	92.9dB	-1.1dB	+/- 1.5dB	1
114.0dB	112.8dB	-1.2dB	+/- 1.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature   (20...26)°C   Humidity   (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) **within** the allowable deviation.

Performed by

Calibration Technician   Mr. K.L. Ng

Approved by

Mr. K.S. Ng

Quality Manager

Calibration Certificate   0025247

Customer :		Object 1 :	ST-120 sound calibrator
Cinotech Consultants Limited		Serial No. /Ref. No. :	181001608
RM 1710, Technology Park,		Object 2 :	
18 On Lai Street, Shatin, N.T.		Serial No. /Ref. No. :	
Hong Kong			
Customer Code : SVEC09005		Manufacturer : Soundtek	
Date of calibration:	05/11/2020	Certificate No.:	0025247
Date of the recommended re-calibration:	05/11/2021	Handle by:	E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.7dB	-0.3dB	+/- 0.3dB	1
114.0dB	113.6dB	-0.4dB	+/- 0.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature   (20...26)°C   Humidity   (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) within the allowable deviation.

Performed by		Approved by
Calibration Technician	Mr. K.L. Ng	Quality Manager

Appleone Calibration Laboratory Ltd.   Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR   Tel: +852 2370 4437 Fax: +852 2114 0393

Equipment no.: N-13-02

Calibration Certificate

0025249

Customer :	
Cinotech Consultants Limited	
RM 1710, Technology Park,	
18 On Lai Street, Shatin, N.T.	
Hong Kong	

Object 1 :	ST-120 sound calibrator
Serial No. /Ref. No. :	181001636
Object 2 :	
Serial No. /Ref. No. :	

Customer Code :	SVEC09005

Manufacturer :	Soundtek

Date of calibration:	05/11/2020
Date of the recommended re-calibration:	05/11/2021

Certificate No.:	0025249
Handle by:	E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.7dB	-0.3dB	+/- 0.3dB	1
114.0dB	113.6dB	-0.4dB	+/- 0.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature   (20...26)°C   Humidity   (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains
the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) within the allowable deviation.

Performed by

Calibration Technician   Mr. K.L. Ng

Approved by

Quality Manager

Equipment no.: N-13-03

Calibration Certificate 0025248

Customer :		Object 1 :	ST-120 sound calibrator
Cinotech Consultants Limited		Serial No. /Ref. No. :	181001637
RM 1710, Technology Park,		Object 2 :	
18 On Lai Street, Shatin, N.T.		Serial No. /Ref. No. :	
Hong Kong			
Customer Code : SVEC09005		Manufacturer : Soundtek	
Date of calibration: 05/11/2020		Certificate No.: 0025248	
Date of the recommended re-calibration: 05/11/2021		Handle by: E0002	

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.8dB	-0.2dB	+/- 0.3dB	1
114.0dB	113.6dB	-0.4dB	+/- 0.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature (20...26)°C   Humidity (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

Uncertainty

+/- 0.2 dB   for probability not less than 95%.

Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) within the allowable deviation.

Performed by   Approved by

Calibration Technician   Mr. K.L. Ng   Quality Manager

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description:	Digital Dust Indicator	Date of Calibration	5-Oct-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Dec-20
Model No.:	LD-5R		
Serial No.:	8Y2374		
Equipment No.:	SA-01-04	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-03	Before Sensitivity Adjustment	652
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	652

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (μg/m3) X-axis	Mass concentration (μg/m³) Y-axis
1	48.0	78.9
2	44.0	75.2
3	40.0	70.8
Average	44.0	75.0

By Linear Regression of Y on X

Slope , mw = 1.0125   **Intercept, bw =** 30.4167

Correlation coefficient* = 0.9988

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (μg/m³)	75.0
Particaulate Concentration by Dust Meter (μg/m³)	44.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (μg/m3)]	1.7

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler
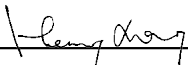
Description: Digital Dust Indicator   Date of Calibration   5-Dec-20

Manufacturer: Sibata Scientific Technology LTD.   Validity of Calibration Record   5-Feb-21

Model No.:   LD-5R

Serial No.:   8Y2374

Equipment No.: SA-01-04   Sensitivity   0.001 mg/m3

High Volume Sampler No.:   A-01-03   Before Sensitivity Adjustment   652

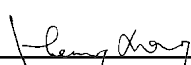Tisch Calibration Orifice No.:   3607   After Sensitivity Adjustment   652

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	50.0	88.4
2	46.0	84.2
3	42.0	79.3
Average	**46.0**	**84.0**

By Linear Regression of Y on X

  Slope , mw =   **1.1375**   Intercept, bw =   **31.6417**

  Correlation coefficient* =   **0.9990**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	84.0
Particaulate Concentration by Dust Meter (µg/m^3)	46.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**1.8**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: _____   Approved by: _____

. Wong Shing Kwai   Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator   Date of Calibration   5-Oct-20

Manufacturer: Sibata Scientific Technology LTD.   Validity of Calibration Record   5-Dec-20

Model No.:   LD-5R

Serial No.:   8Y2373

Equipment No.:   SA-01-05   Sensitivity   0.001 mg/m3

High Volume Sampler No.:   A-01-03   Before Sensitivity Adjustment   657

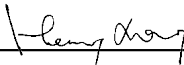Tisch Calibration Orifice No.:   3607   After Sensitivity Adjustment   657

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu g/m3$) X-axis	Mass concentration ($\mu g/m^3$) Y-axis
1	35.0	78.9
2	32.0	75.2
3	29.0	70.8
Average	32.0	75.0

By Linear Regression of Y on X

Slope , mw =   1.3500   Intercept, bw =   31.7667

Correlation coefficient* =   0.9988

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler ($\mu g/m^3$)	75.0
Particaulate Concentration by Dust Meter ($\mu g/m^3$)	32.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, ($\mu g/m3$)]	**2.3**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: _____   Approved by: _____

Wong Shing Kwai   Henry Leung

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description:	Digital Dust Indicator	Date of Calibration	5-Dec-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Feb-21
Model No.:	LD-5R		
Serial No.:	8Y2373		
Equipment No.:	SA-01-05	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-03	Before Sensitivity Adjustment	657
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	657

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor** Mass Concentration (µg/m3) **X-axis**	**HVS** Mass concentration (µg/m^3) **Y-axis**
1	38.0	88.4
2	33.0	84.2
3	29.0	79.3
Average	**33.3**	**84.0**

By Linear Regression of Y on X

Slope , mw = 1.0041   Intercept, bw = 50.4967

Correlation coefficient* = 0.9941

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	84.0
Particaulate Concentration by Dust Meter (µg/m^3)	33.3
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**2.5**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: _____ Approved by: _____

Wong Shing Kwai   Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler
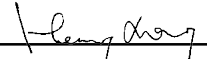
Description:	Digital Dust Indicator	Date of Calibration	5-Oct-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Dec-20
Model No.:	LD-5R		
Serial No.:	972778		
Equipment No.:	SA-01-07	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	735 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	735 CPM

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (μg/m3) **X-axis**	Mass concentration (μg/m^3) **Y-axis**
1	45.0	78.9
2	34.0	75.2
3	23.0	70.8
Average	**34.0**	**75.0**

By Linear Regression of Y on X

Slope , mw = 0.3682   **Intercept, bw =** 62.4485

Correlation coefficient* = 0.9988

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (μg/m^3)	75.0
Particaulate Concentration by Dust Meter (μg/m^3)	34.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (μg/m3)]	**2.2**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: _____   Approved by: _____

Wong Shing Kwai   Henry Leung

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

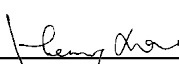|			
Description:	Digital Dust Indicator	Date of Calibration	5-Dec-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Feb-21
Model No.:	LD-5R		
Serial No.:	972778		
Equipment No.: SA-01-07		Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	735 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	735 CPM

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (μg/m3) **X-axis**	Mass concentration ($\mu g/m^3$) **Y-axis**
1	48.0	88.4
2	43.0	84.2
3	38.0	79.3
Average	**43.0**	**84.0**

By Linear Regression of Y on X

Slope , mw =   0.9100   Intercept, bw =   44.8367

Correlation coefficient* =   0.9990

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler ($\mu g/m^3$)	84.0
Particaulate Concentration by Dust Meter ($\mu g/m^3$)	43.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (μg/m3)]	**2.0**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: _____   Approved by: _____

          Wong Shing Kwai   Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

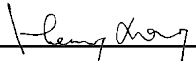|			
Description:	Digital Dust Indicator	Date of Calibration	5-Oct-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Dec-20
Model No.:	LD-5R		
Serial No.:	972779		
Equipment No.:	SA-01-08	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	744 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	744 CPM

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (μg/m3) X-axis	Mass concentration (μg/m^3) Y-axis
1	49.0	78.9
2	38.0	75.2
3	28.0	70.8
Average	38.3	75.0

By Linear Regression of Y on X

Slope , mw = 0.3849   **Intercept, bw =** 60.2124

Correlation coefficient* = 0.9970

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (μg/m^3)	75.0
Particaulate Concentration by Dust Meter (μg/m^3)	38.3
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (μg/m3)]	**2.0**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: _____   Approved by: _____

Wong Shing Kwai   Henry Leung

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

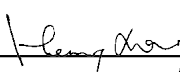|			
Description:	Digital Dust Indicator	Date of Calibration	5-Dec-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Feb-21
Model No.:	LD-5R		
Serial No.:	972779		
Equipment No.: SA-01-08		Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	744 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	744 CPM

Calibration of 1 hr TSP		
	Laser Dust Monitor	**HVS**
Calibration Point	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	51.0	88.4
2	47.0	84.2
3	41.0	79.3
Average	**46.3**	**84.0**

By Linear Regression of Y on X

Slope , mw = 0.9026   Intercept, bw = 42.1447

Correlation coefficient* = 0.9975

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	84.0
Particaulate Concentration by Dust Meter (µg/m^3)	46.3
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	1.8

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: _____   Approved by: _____

Wong Shing Kwai   Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

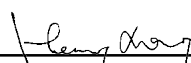|			
Description:	Digital Dust Indicator	Date of Calibration	5-Oct-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Dec-20
Model No.:	LD-5R		
Serial No.:	972780		
Equipment No.:	SA-01-09	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	739 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	739 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor** Mass Concentration (µg/m3) **X-axis**	**HVS** Mass concentration ($\mu g/m^3$) **Y-axis**
1	48.0	78.9
2	41.0	75.2
3	30.0	70.8
Average	**39.7**	**75.0**

By Linear Regression of Y on X

Slope , mw = 0.4455   **Intercept, bw =** 57.2933

Correlation coefficient* = 0.9970

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler ($\mu g/m^3$)	75.0
Particaulate Concentration by Dust Meter ($\mu g/m^3$)	39.7
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**1.9**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: _____   Approved by: _____

Wong Shing Kwai   Henry Leung

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

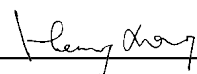|			
Description:	Digital Dust Indicator	Date of Calibration	5-Dec-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Feb-21
Model No.:	LD-5R		
Serial No.:	972780		
Equipment No.: SA-01-09		Sensitivity	0.001 mg/m3
High Volume Sampler No.: A-01-01A		Before Sensitivity Adjustment	739 CPM
Tisch Calibration Orifice No.: 3607		After Sensitivity Adjustment	739 CPM

Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor Mass Concentration (µg/m3) **X-axis**	HVS Mass concentration (µg/m^3) **Y-axis**
1	50.0	88.4
2	45.0	84.2
3	40.0	79.3
Average	**45.0**	**84.0**

By Linear Regression of Y on X

Slope , mw = 0.9100   Intercept, bw = 43.0167

Correlation coefficient* = 0.9990

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	84.0
Particaulate Concentration by Dust Meter (µg/m^3)	45.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**1.9**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: _____   Approved by: _____

Wong Shing Kwai   Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

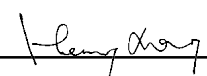|			
Description:	Digital Dust Indicator	Date of Calibration	5-Oct-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Dec-20
Model No.:	LD-5R		
Serial No.:	972781		
Equipment No.:	SA-01-10	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	734 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	734 CPM

Calibration of 1 hr TSP		
	Laser Dust Monitor	**HVS**
Calibration Point	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	48.0	78.9
2	39.0	75.2
3	30.0	70.8
Average	**39.0**	**75.0**

By Linear Regression of Y on X

Slope , mw =	0.4500	**Intercept, bw =**	57.4167
Correlation coefficient* =	0.9988		

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	75.0
Particaulate Concentration by Dust Meter (µg/m^3)	39.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**1.9**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

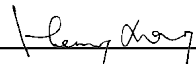|			
Description:	Digital Dust Indicator	Date of Calibration	5-Dec-20
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibration Record	5-Feb-21
Model No.:	LD-5R		
Serial No.:	972781		
Equipment No.:	SA-01-10	Sensitivity	0.001 mg/m3
High Volume Sampler No.:	A-01-01A	Before Sensitivity Adjustment	734 CPM
Tisch Calibration Orifice No.:	3607	After Sensitivity Adjustment	734 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor** Mass Concentration (μg/m3) **X-axis**	**HVS** Mass concentration (μg/m^3) **Y-axis**
1	53.0	88.4
2	46.0	84.2
3	36.0	79.3
Average	**45.0**	**84.0**

By Linear Regression of Y on X

Slope , mw = 0.5322   Intercept, bw = 60.0180

Correlation coefficient* = 0.9984

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (μg/m^3)	84.0
Particaulate Concentration by Dust Meter (μg/m^3)	45.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (μg/m3)]	1.9

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung

TISCH Environmental

Certificate of Calibration

Calibration Certification Information

Cal. Date: January 17, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295 °K
Operator: Jim Tisch		**Pa:** 744.2 mm Hg
Calibration Model #: TE-5025A	**Calibrator S/N: 3746**	

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4340	3.2	2.00
2	3	4	1	1.0180	6.4	4.00
3	5	6	1	0.9080	7.9	5.00
4	7	8	1	0.8700	8.7	5.50
5	9	10	1	0.7150	12.6	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9849	0.6868	1.4066	0.9957	0.6944	0.8904
0.9807	0.9633	1.9892	0.9914	0.9739	1.2592
0.9787	1.0779	2.2240	0.9894	1.0896	1.4078
0.9776	1.1237	2.3325	0.9883	1.1360	1.4765
0.9724	1.3601	2.8131	0.9831	1.3749	1.7808
QSTD	m=	2.09221	**QA**	m=	1.31010
	b=	-0.02779		b=	-0.01759
	r=	0.99994		r=	0.99994

Calculations

Vstd= ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=** ΔVol((Pa-ΔP)/Pa)
Qstd= Vstd/ΔTime	**Qa=** Va/ΔTime

For subsequent flow rate calculations:

$$Qstd = 1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right) - b\right)$$

$$Qa = 1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right) - b\right)$$

Standard Conditions

Tstd:	298.15 °K
Pstd:	760 mm Hg

Key

ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Cerificate of Calibration - Wind Monitoring Station

Description:	Yau Lai Estate, Bik Lai House
Manufacturer:	Davis Instruments
Model No.:	Davis7440
Serial No.:	MC01010A44
Equipment No.:	SA-03-04
Date of Calibration	21-Aug-2020
Next Due Date	21-Feb-2021

1. Performance check of Wind Speed

Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V2)	D = V1 – V2
0.0	0.0	0.0
1.5	1.5	0.0
2.2	2.3	-0.1
3.5	3.4	0.1
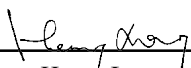
2. Performance check of Wind Direction

Wind Direction (^{o})		Difference D (^{o})
Wind Direction Reading (W1)	Marine Compass Value (W2)	D = W1 - W2
0	0	0.0
90	90	0.0
180	180	0.0
270	270	0.0

Test Specification:
1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer
2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction

Calibrated by: _____   Approved by: _____
           Wong Shing Kwai   Henry Leung

MSA Hong Kong Ltd.

MSA The Safety Company

25/F Jupiter Tower, 9 Jupiter Street, Hong Kong
Tel 852-22587588 Fax 25478780 Email info.hk@msasafety.com Website www.msasafety.com

Ref.   2020/05/008   Date: 22-May-20
Customer   Leighton China State Joint Venture

CERTIFICATE FOR CALIBRATION CHECK TEST

Model	Serial No.	Calibration Check Gas	Regulator	Full Scale	Response
Altair 5X	152097	1.45% Methane,	.25litre/min	100% LEL	29%LEL
		15% Oxygen		30% Vol	15% O2
		60ppm Carbon Monoxide		1999 ppm	60ppm CO
		20ppm Hydrogen Sulfide		200 ppm	20ppm H2S
		2.5% Carbon Dioxide		10% Vol	2.5% CO2
		25ppm Ammonia	Demand	100 ppm	25ppm NH3

Remarks: Regular inspection completed. Calibration passed

MSA Hong Kong Ltd. certify that instrument/s listed above has/have been calibrated check tested on:
 22-May-20

This instrument was calibrated in accordance with all requirements of the specifications of MSA.

This instrument must be calibration checked prior to use in accordance with the instruction manual.

This instrument was calibrated using NIST traceable equipment and was in accordance with all requirements of the drawings and specifications of MSA.

For and on behalf of
MSA Hong Kong Ltd.

Authorised Signature

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No.   MA16034/05/0026

Project No.   AM1 - Tin Hau Temple

Date:	10-Oct-20	Next Due Date:	10-Dec-20	Operator:	SK
Equipment No.:	A-01-05	Model No.:	GS2310	Serial No.	10599

Ambient Condition			
Temperature, Ta (K)	299.5	Pressure, Pa (mmHg)	759.5

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	17-Jan-21	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	13.0	3.60	61.19	8.6	2.92
2	9.5	3.07	52.38	6.4	2.52
3	7.6	2.75	46.90	4.8	2.18
4	4.8	2.18	37.37	3.2	1.78
5	2.6	1.61	27.62	1.8	1.34

By Linear Regression of Y on X

Slope , mw =   0.0474   Intercept, bw =   0.0129

Correlation coefficient* =   0.9988

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) =   4.23

Remarks:

Conducted by:	SK Wong	Signature:		Date:	10 October 2020
Checked by:	Henry Leung	Signature:		Date:	10 October 2020

F:\Cinotech Solutions\Equipment\Calibration Cert\HVS\new\MA16034_20201010_AM1_(A-01-05).xls

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No.   MA16034/08/0026

Project No.   AM2 - Sai Tso Wan Recreation Ground

Date:	10-Oct-20	Next Due Date:	10-Dec-20	Operator:	SK
Equipment No.:	A-01-08	Model No.:	GS2310	Serial No.	1287

Ambient Condition			
Temperature, Ta (K)	299.5	Pressure, Pa (mmHg)	759.5

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$			
Next Calibration Date:	17-Jan-21	Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ Y-axis
1	13.0	3.60	61.19	8.6	2.92
2	9.9	3.14	53.46	6.2	2.48
3	7.9	2.80	47.81	4.8	2.18
4	4.8	2.18	37.37	3.0	1.73
5	2.8	1.67	28.65	1.9	1.37

By Linear Regression of Y on X

Slope , mw =   0.0472   Intercept, bw =   -0.0191

Correlation coefficient* =   0.9972

*If Correlation Coefficient < 0.990, check and recalibrate.

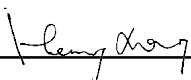| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \text{ x } Qstd + bw = [\Delta W \text{ x } (Pa/760) \text{ x } (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) =   4.07

Remarks:

Conducted by:	SK Wong	Signature:		Date:	10 October 2020
Checked by:	Henry Leung	Signature:		Date:	10 October 2020

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/03/0026

Project No.	AM3 - Yau Lai Estate, Bik Lai House			
Date:	10-Oct-20	Next Due Date: 10-Dec-20	Operator:	SK
Equipment No.:	A-01-03	Model No.: GS2310	Serial No.	10379

Ambient Condition			
Temperature, Ta (K)	299.5	Pressure, Pa (mmHg)	759.5

Orifice Transfer Standard Information				
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$		
Next Calibration Date:	17-Jan-21	Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc		

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ Y-axis
1	13.1	3.61	61.43	8.7	2.94
2	9.5	3.07	52.38	6.5	2.54
3	7.7	2.77	47.20	5.2	2.27
4	5.2	2.27	38.87	3.4	1.84
5	2.6	1.61	27.62	2.0	1.40

By Linear Regression of Y on X

Slope , mw = 0.0463   Intercept, bw = 0.0915

Correlation coefficient* = 0.9984

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) =   4.37

Remarks:

Conducted by:	SK Wong	Signature:	Date: 10 October 2020
Checked by:	Henry Leung	Signature:	Date: 10 October 2020

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CiNOTECH

File No.   MA16034/54/0026

Project No.   AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

Date: 10-Oct-20   Next Due Date: 10-Dec-20   Operator: SK

Equipment No.:   A-01-54   Model No.:   TE-5170   Serial No.   1536

Ambient Condition			
Temperature, Ta (K)	299.5	Pressure, Pa (mmHg)	759.5

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$			
Next Calibration Date:	17-Jan-21	Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc			

.

Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ Y-axis
1	12.9	3.58	60.96	8.7	2.94
2	9.9	3.14	53.46	6.4	2.52
3	7.5	2.73	46.59	5.1	2.25
4	5.4	2.32	39.60	3.3	1.81
5	3.0	1.73	29.64	1.9	1.37

By Linear Regression of Y on X

Slope , mw =   0.0502   Intercept, bw =   -0.1302

Correlation coefficient* =   0.9982

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) =   4.13

Remarks:

Conducted by: SK Wong   Signature: Date: 10 October 2020

Checked by: Henry Leung   Signature: Date: 10 October 2020

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No.   MA16034/05/0027

Project No.   AM1 - Tin Hau Temple

Date:	10-Dec-20	Next Due Date:	10-Feb-21	Operator:	SK
Equipment No.:	A-01-05	Model No.:	GS2310	Serial No.	10599

Ambient Condition			
Temperature, Ta (K)	293.9	Pressure, Pa (mmHg)	762.5

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	17-Jan-21	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	13.1	3.65	62.13	8.7	2.97
2	9.5	3.11	52.98	6.4	2.55
3	7.6	2.78	47.43	4.8	2.21
4	4.9	2.23	38.18	3.1	1.78
5	2.6	1.63	27.93	1.9	1.39

By Linear Regression of Y on X

Slope , mw =   0.0471   Intercept, bw =   0.0260

Correlation coefficient* =   0.9972

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.14

Remarks:

Conducted by:	SK Wong	Signature:		Date:	10 December 2020
Checked by:	Henry Leung	Signature:		Date:	10 December 2020

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No. MA16034/08/0027

Project No. AM2 - Sai Tso Wan Recreation Ground

Date:	10-Dec-20	Next Due Date:	10-Feb-21	Operator:	SK
Equipment No.:	A-01-08	Model No.:	GS2310	Serial No.	1287

Ambient Condition			
Temperature, Ta (K)	293.9	Pressure, Pa (mmHg)	762.5

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$			
Next Calibration Date:	17-Jan-21	Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc			

$$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$$

$$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$$

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	13.1	3.65	62.13	8.7	2.97
2	9.9	3.17	54.07	6.2	2.51
3	7.8	2.82	48.05	4.7	2.19
4	4.9	2.23	38.18	3.1	1.78
5	2.8	1.69	28.97	1.9	1.39

By Linear Regression of Y on X

Slope , mw =   0.0472   Intercept, bw =   -0.0186

Correlation coefficient* =   0.9968

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) =   3.98

Remarks:

Conducted by:	SK Wong	Signature:	Date: 10 December 2020
Checked by:	Henry Leung	Signature:	Date: 10 December 2020