

File No. MA20003/18/0009 Project No. CKL 1 - Flat 121 Cha Kwo Ling Village Date: 6-Jul-21 Next Due Date: 6-Sep-21 Operator: SK Model No.: _____ TE 5170 ____ Serial No. ____ 0723 Equipment No.: A-01-18 **Ambient Condition** 302.4 Pressure, Pa (mmHg) 754.7 Temperature, Ta (K) **Orifice Transfer Standard Information** 0.05846 Intercept, bc Serial No. 3864 Slope, mc -0.00313 mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 11-Jan-21 Last Calibration Date: Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 11-Jan-22 **Calibration of TSP Sampler** Orfice HVS Calibration ΔW (HVS), in. $\left[\Delta W \times (Pa/760) \times (298/Ta) \right]^{1/2} Y$ - ΔH (orifice), Ostd (CFM) Point $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ in. of water X - axis of water axis 13.2 3.59 61.53 10.6 3.22 11.2 3.31 56.68 8.0 2.80 8.3 2.85 48.80 6.1 2.44 3 4 6.2 2.46 42.19 3.9 1.95 1.9 5 3.4 1.82 31.26 1.36 By Linear Regression of Y on X Slope, mw = 0.0603Intercept, bw = -0.5439 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 x Qstd + bw = $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ Remarks: Signature: Date: 6-Jul-21

Signature: Date: 6-Jul-21 Conducted by: Wong Shing Kwai Checked by: Henry Leung



File No. MA20003/55/0009

Project No.	CKL 2 - Flat 10	3 Cha Kwo Ling	Village				
Date:	6-Jı	ıl-21	Next Due Date:	6-5	Sep-21	Operator:	SK
Equipment No.:	A-0	1-55	Model No.:	TE	E 5170	Serial No	1956
Tommorotu		202.4	Ambient C			754.7	
Temperatu	re, 1a (K)	302.4	Pressure, Pa	(mmHg)		/34./	
		Ori	ifice Transfer Star	ndard Informa	ation		
Seria	l No.	3864	Slope, mc	0.05846	Intercept	, bc	-0.00313
Last Calibra	ation Date:	11-Jan-21			$c = [\Delta H \times (Pa/760)]$		
Next Calibr	ration Date:	11-Jan-22		$Qstd = \{ [\Delta H x] $	(Pa/760) x (298/7	$[\Gamma a]^{1/2}$ -bc} / mc	:
			Calibration of	TSP Sampler	l		
Calibration	177 (:0)	Or	fice			HVS	-> -1/2
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	$(0) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water		0) x (298/Ta)] ^{1/2} •axis
1	13.5		3.63	62.23	9.6		.07
2	11.3	1	3.33	56.94	7.5	2	.71
3	8.3		2.85	48.80	5.9	2	.40
4	5.2	,	2.26	38.64	3.5	1	.85
5	3.0		1.71	29.36	1.9	1	.36
-	ression of Y on 2	X					
Slope, mw =		_		Intercept, bw =	-0.112	0	
	coefficient* =		.9982				
*If Correlation (Coefficient < 0.9	90, check and rec	alibrate.				
			Set Point Ca	alculation			
From the TSP Fi	ield Calibration (Curve, take Qstd		aculation			
		ne "Y" value acco					
C	1 ,				1/2		
		mw x Q	$\mathbf{pstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore, Se	et Point: W = (m	nw x Ostd + bw)	² x (760 / Pa) x (7	Γa / 298) =	4.36		
,	, (()	(, , , , , , , , , , , , , , , , , ,				
D1							
Remarks:							
				S	λ		
Conducted by:	Wong Sl	ning Kwai	Signature:		/\	Date:	6-Jul-21
ci : ::	Henry	-	Signature:	\ 0	0/	-	6-Jul-21



File No. MA20003/41/0007

Project No.	KTD 2D - Next	to the SOR Offi	ce of Trunk Road	Γ2 in Kai Tak A	Area		
Date:	26-J	ul-21	Next Due Date:	26-	26-Sep-21		SK
Equipment No.:	A-0	1-41			5170	· · · · · · · · · · · · · · · · · · ·	5280
			Ambient C	Condition			
Temperatur	re, Ta (K)	302	Pressure, Pa			751	
G : 1	N		ifice Transfer Sta			1	0.00212
Serial	1	3864	Slope, mc	0.05846	Intercept $c = [\Delta H \times (Pa/760)]$		-0.00313
Last Calibra Next Calibra	1	11-Jan-21 11-Jan-22			$(Pa/760) \times (298/7)$		
Next Callora	tion Date.			Qstu ([MITA	(1 at 700) A (200)	rajj bej inc	<u>'</u>
		•	Calibration of	TSP Sampler			
Calibration		Or	fice			HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		0) x (298/Ta)] ^{1/2} axis
1	13.7		3.65	62.57	8.8	2	.93
2	11.5		3.35	57.33	7.0	2	.61
3	8.2		2.83	48.42	5.5	2	.32
4	5.8		2.38	40.73	4.1	2	.00
5	2.9		1.68	28.82	2.3	1	.50
Slope, mw = Correlation C	coefficient* =		.9978 calibrate.	Intercept, bw =	0.313	1	
			Set Point Ca	alculation			
		Curve, take Qstd ne "Y" value acc mw x Q		x (Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore, Se	t Point; W = (m	nw x Qstd + bw)	² x (760 / Pa) x (Ta / 298) =	4.45		
Remarks:							
Conducted by:	Wong Sh	ning Kwai	Signature:		<u></u>	Date:	26-Jul-21
Checked by:	Henry	Leung	Signature:	- lem	Jan-	Date:	26-Jul-21

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/04/0007

Project No.	KER 1 - Future	Residential Dev	elopment at Kerry	Godown		_	
Date:	2-Aı	ıg-21	Next Due Date:	2-Oct-21		Operator:	SK
Equipment No.:	A-0	1-04	<u>-</u>		E 5170	Serial No.	10595
			Ambient C	ondition			
Temperatu	re, Ta (K)	302.7	Pressure, Pa			750	
•	, , , , ,		,	· · · · · · · · · · · · · · · · · · ·			
		Or	ifice Transfer Sta	ndard Informa	ation		
Serial	l No.	3864	Slope, mc	0.05846	Intercept		-0.00313
Last Calibra	ation Date:	11-Jan-21	1	nc x Qstd + bo	$c = [\Delta H \times (Pa/760]]$	$(298/Ta)]^{1}$	/2
Next Calibr	ation Date:	11-Jan-22	($Qstd = \{ [\Delta H \ x] $	(Pa/760) x (298/7	Γa)] -bc} / n	ıc
	1		Calibration of	TSP Sampler			
Calibration		Or	fice	1		HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		60) x (298/Ta)] ^{1/2} Y-axis
1	13.7		3.65		9.0		2.96
2	11.4		3.33	56.98	7.0		2.61
3	8.6		2.89	49.50	5.4		2.29
4	5.2		2.25	38.50	3.2		1.76
5	3.0		1.71	29.26	2.1		1.43
_	coefficient* =	_	. 9970	Intercept, bw	0.048	3	
*If Correlation (Coefficient < 0.99	90, check and red	calibrate.				
			Set Point Ca	alculation			
From the TSP Fi	ield Calibration (Curve, take Qstd	= 43 CFM				
From the Regres	ssion Equation, th	ne "Y" value acc	ording to				
		_					
		mw x Q	$\mathbf{pstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)]"²		
Therefore, Se	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (′	Ta / 298) =	4.16	!	
Remarks:							
Conducted by:	Wong Sh	ing Kwai	Signature:		<u> </u>	Date:	2-Aug-21
Checked by:	Henry	Leung	Signature:	\-Pa	, Xon	Date:	2-Aug-21

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/44/0008

Project No.	KTD1 - Centre	of Excellence in	Paediatrics (Childs	ren's Hospital)			
Date:	2-Aı	ıg-21	Next Due Date:	2-0	Oct-21	Operator: SK	SK
Equipment No.:	A-0	1-44			2-5170	Serial No.	1316
			Ambient C	ondition			
Temperatu	re, Ta (K)	302.7	Pressure, Pa			750	
•			,	· · · · · · · · · · · · · · · · · · ·			
		Ori	ifice Transfer Sta	ndard Informa	ation		
Serial	l No.	3864	Slope, mc	0.05846	Intercept		-0.00313
Last Calibra	ation Date:	11-Jan-21	1	mc x Qstd + bo	$c = [\Delta H \times (Pa/760)]$) x (298/Ta)] ¹	/2
Next Calibr	ration Date:	11-Jan-22	($Qstd = \{ [\Delta H x] \}$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} / n	ac
			Calibration of	TSP Sampler			
Calibration		Or	fice	T		HVS	1.0
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	0) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		760) x (298/Ta)] ^{1/2} Y-axis
1	13.8		3.66	62.69	9.2		2.99
2	11.2		3.30	56.48	7.0		2.61
3	8.3		2.84		5.4		2.29
4	6.2		2.45	42.04	3.4		1.82
5	3.2		1.76	30.21	1.8		1.32
	ression of Y on Y 0.0516	_	. 9964	Intercept, bw =	-0.270	4	
	Coefficient < 0.99			•			
			Set Point Ca	alculation			
From the TSP Fi	ield Calibration (Curve, take Qstd					
	ssion Equation, th						
C	•		C		1/0		
		mw x Q	$\mathbf{pstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore, Se	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (⁷	Ta / 298) =	3.90		
_							
Remarks:							
Conducted by:	Wong Sh	ing Kwai	Signature:	\\	X	Date:	2-Aug-21
				١ -		_	
Checked by:	Henry	Leung	Signature:	1-Pa	men ,	Date:	2-Aug-21



						File No.	MA20003/18/0010
Project No.	CKL 1 - Flat 12	l Cha Kwo Ling	Village			-	
Date:	6-Se	p-21	Next Due Date:	6-N	Jov-21	Operator:	SK
Equipment No.:	A-01	1-18	Model No.:	TE	E 5170	Serial No.	0723
Tomas anatus	ma Ta (V)	302.7		Condition		757.8	
Temperatu	re, ra (K)	302.7	Pressure, Pa	(шшпд)		131.8	
		Oı	rifice Transfer St	andard Inform	nation		
Serial	l No.	3864	Slope, mc	0.05846	Intercep		-0.00313
Last Calibra	ation Date:	11-Jan-21			$c = [\Delta H \times (Pa/76)]$		
Next Calibra	ation Date:	11-Jan-22		$\mathbf{Qstd} = \{ [\Delta \mathbf{H} \ \mathbf{y}] \}$	x (Pa/760) x (298	/Ta)] ^{1/2} -bc}	/ mc
			G 19 41 4	TOD C I			
		Or	Calibration of	18P Sampler		HVS	
Calibration Point	ΔH (orifice),			Qstd (CFM)	ΔW (HVS), in.		60) x (298/Ta)] ^{1/2} Y -
1 OIIIt	in. of water	[ΔH x (Pa//6	(0) x (298/Ta)] ^{1/2}	X - axis	of water	`	axis
1	12.8	,	3.54	60.69	9.8		3.10
2	10.2		3.16	54.18	8.0		2.80
3	8.4	1	2.87	49.17	5.9		2.41
4	6.2		2.47	42.25	4.0		1.98
5	3.4		1.83	31.30	1.9		1.37
Ry Linear Regr	ession of Y on X	(
Slope, mw =		-		Intercept, bw =	-0.541	4	
Correlation		0.	.9981	• ′			
*If Correlation C	Coefficient < 0.99	0, check and rec	calibrate.	-			
- 4 FGD E		1 0 1	Set Point (Calculation			
	ield Calibration C						
from the Regres	sion Equation, th	ie "Y" value acco	ording to				
		mw x ($Qstd + bw = [\Delta W]$	x (Pa/760) x (2	$[298/Ta)]^{1/2}$		
T1 6 C	AD THE WAY	O-+1 + 1)	² x (760 / Pa) x (T. (200.)	4.22		
Therefore, Se	et Point; w = (m	w x Qsia + bw)	x (/60 / Pa) x (1a / 298) =	4.32		
Remarks:							
					200		
a 1			~.	X	λ c	_	
Conducted by:	Wong Sh	ıng Kwai	Signature			Date:	6-Sep-21
Checked by:	Henry	Leung	Signature	1-0-	- Mar	Date:	6-Sep-21
checked by.			. Signature.	- lem	7	. Duic.	0 5 c p 21



File No. MA20003/55/0010

Project No.	CKL 2 - Flat 103	3 Cha Kwo Ling	Village				
Date:	6-Sep-21		Next Due Date:	6-N	6-Nov-21		SK
Equipment No.:	A-0	A-01-55 Model No.		TE	E 5170	Serial No.	1956
			Ambient C	ondition			
Temperatur	re. Ta (K)	302.7	Pressure, Pa			757.8	
T T T T T T T T T T T T T T T T T T T	10, 10 (11)	20217	11000010,10	(mm1g)		70,10	
Orifice Transfer Standard Information							
Serial	No.	3864	Slope, mc	0.05846	Intercept	, bc	-0.00313
Last Calibra	ation Date:	11-Jan-21	1	mc x Qstd + bo	$c = [\Delta H \times (Pa/760)]$	$(298/Ta)^{1/2}$	
Next Calibra	ation Date:	11-Jan-22		$Qstd = \{ [\Delta H \ x]$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} / mc	
		•					
			Calibration of	TSP Sampler			
Calibration		Or	fice	T		HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	60) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		0) x (298/Ta)] ^{1/2} axis
1	12.8		3.54	60.69	9.8	3	.10
2	10.8		3.26		7.6	2	.73
3	8.4		2.87	49.17	6.0	2	.43
4	5.6		2.34	40.16	3.6	1	.88
5	3.0		1.72	29.41	1.9	1	.37
Bv Linear Regr	ession of Y on X						
Slope, mw =]	Intercept, bw :	-0.283	1	
- '	coefficient* =	- 0	.9979	•			
*If Correlation C	Coefficient < 0.99	0, check and red	calibrate.	•			
			Set Point Ca	alculation			
From the TSP Fi	eld Calibration C	Curve, take Qstd	= 43 CFM				
From the Regres	sion Equation, th	e "Y" value acco	ording to				
		mw v C	$\mathbf{0std} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Do/760) v (20	19/Ta)1 ^{1/2}		
		IIIW X (zstu + υw – _[Δw x	(76/1a)j		
Therefore, Se	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (7	Γa / 298) =	4.40		
Remarks:							
Kelliai Kõ.							
Conducted by:	Wong Sh	ing Kwai	Signature:	X	<u></u>	Date:	6-Sep-21
				<u> </u>			
Checked by:	Henry	Leung	Signature:	- Plan	y Dong	Date:	6-Sep-21
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File No. MA20003/41/0008

Project No.	KTD 2D - Next	to the SOR Offic	ce of Trunk Road T	2 in Kai Tak A	rea		
Date:	25-S	ep-21	Next Due Date:	25-]	Nov-21	Operator:	SK
Equipment No.:	A-0	01-41	Model No.:	TE	5170	Serial No	5280
			Ambient C	ondition			
Temperatur	re, Ta (K)	302.6	Pressure, Pa	(mmHg)		759.5	
		Or	ifice Transfer Star	ndard Informa	tion		
Serial	No.	3864	Slope, mc	0.05846	Intercept		-0.00313
Last Calibra	ntion Date:	11-Jan-21	1		$c = [\Delta H \times (Pa/760)]$		
Next Calibra	ation Date:	11-Jan-22		$Qstd = \{ [\Delta H \ x]$	(Pa/760) x (298/7	[a)] ^{1/2} -bc} / n	ıc
			Calibration of	ΓSP Sampler			
Calibration		Or	fice	.		HVS	1/2
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		60) x (298/Ta)] ^{1/2} Y-axis
1	13.4		3.63	62.17	8.9		2.96
2	11.6		3.38	57.85	7.1		2.64
3	8.3		2.86	48.94	5.6		2.35
4	6.0		2.43	41.62	4.0		1.98
5	3.0		1.72	29.45	2.4		1.54
By Linear Regr Slope , mw =		x	1	Intercept, bw =	0.261	7	
_	coefficient* =	_ 0	.9954	1 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,			
		90, check and red		•			
		,					
			Set Point Ca	alculation			
From the TSP Fi	eld Calibration (Curve, take Qstd	= 43 CFM				
From the Regres	sion Equation, tl	ne "Y" value acco	ording to				
					1/2		
		mw x Q	$Qstd + bw = [\Delta W x]$	(Pa/760) x (29	08/Ta)] ^{1/2}		
Therefore Se	et Point: W = (m	nw v Oetd + hw)	² x (760 / Pa) x (7	Γα / 208) =	4.41		
Therefore, Se	tromi, w	iw x Qsia + ow)	X (700714)X (147 270)	4,41		
Remarks:							
Conducted by:	Wong Sł	ning Kwai	Signature:	K	<u></u>	Date:	25-Sep-21
				1			
Checked by:	Henry	Leung	Signature:	\-lan	men	Date:	25-Sep-21
				1			



RECALIBRATION
DUE DATE:

January 11, 2022

Certificate of Calibration

Calibration Certification Information

Cal. Date: January 11, 2021

Rootsmeter S/N: 438320

°K

Operator: Jim Tisch

Ta: 297
Pa: 750.1

mm Hg

Calibration Model #: TE-5025A

Calibrator S/N: 3864

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4470	3.2	2.00
2	3	4	1	1.0210	6.4	4.00
3	5	6	1	0.9140	8.0	5.00
4	, 7	8	1	0.8670	8.8	5.50
5	9	10	1	0.7140	12.9	8.00

	Data Tabulation					
Vstd	Qstd	$\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right) \left(\frac{Tstd}{Ta}\right)}$		Qa	$\sqrt{\Delta H (Ta/Pa)}$	
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(y-axis)	
0.9860	0.6814	1.4073	0.9957	0.6881	0.8899	
0.9818	0.9616	1.9902	0.9915	0.9711	1.2585	
0.9797	1.0719	2.2251	0.9893	1.0824	1.4071	
0.9786	1.1288	2.3337	0.9883	1.1399	1.4757	
0.9732	1.3630	2.8146	0.9828	1.3765	1.7798	
	m=	2.06566		m=	1.29348	
QSTD	b=	0.00315	QA	b=	0.00199	
	r=	0.99996		r=	0.99996	

Calculations					
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)		
Qstd= Vstd/ΔTime Qa= Va/ΔTime			Va/∆Time		
	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:	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

FAX: (513)467-9009

www.tisch-env.com



Certificate of Calibration - Wind Monitoring Station

Description: Yau Lai Estate, Bik Lai House

Manufacturer: <u>Davis Instruments</u>

Model No.: <u>Davis7440</u>

Serial No.: <u>MC01010A44</u>

Equipment No.: SA-03-04

Date of Calibration <u>20-Aug-2021</u>

Next Due Date <u>20-Feb-2022</u>

1. Performance check of Wind Speed

Wind Sp	peed, 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
2.8	2.7	0.1
4.0	4.1	-0.1

2. Performance check of Wind Direction

Wind Direction (°)		Difference D (°)
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:

Wong Shing Kwai

Approved by:

Henry Leung