Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 06680 Page 1 of 4 Pages

Customer : Lam Geotechnics Limited

Address : 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No. : Q02553 **Date of receipt :** 18-Nov-10

Item Tested

Description : Precision Integrating Sound Level Meter

Manufacturer : ACO

Model : Type 6224 **Serial No. :** 050112

Test Conditions

Date of Test : 19-Nov-10 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

Test Results

All results were within the IEC 651 Type 1 & 804 Type I Specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017A	Multi-Function Generator	00804	SCL-HKSAR
S024	Sound Level Calibrator	04062	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : _____
P. F. Wong

Approved by : _____
Dorothy Cheuk

Date: 23-Nov-10

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Wah Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

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Calibration Certificate

Results :

1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Time Const.		
20 – 100	L_A	Fast	94.0	94.3
		Slow		94.3
	L_C	Fast		94.3
30 – 120	L_A	Fast	94.0	94.4
		Slow		94.4
	L_C	Fast		94.4
30 – 120	L_A	Fast	114.0	94.3
		Slow		94.3
	L_C	Fast		94.3

IEC 651 Type 1 Spec. : ± 0.7 dB
Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Rdg (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
140	114.0	114.5	+0.1	± 0.7 dB
130	104.0	104.4	0.0	
120	94.0	94.4 (Ref.)	- -	
110	84.0	84.1	-0.3	
100	74.0	74.2	-0.2	
90	64.0	64.1	-0.3	
80	54.0	54.1	-0.3	

Uncertainty : ± 0.1 dB

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Calibration Certificate

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Rdg (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.1	-0.3	± 0.4
	94.0	94.4 (Ref.)	- -	
	95.0	95.4	0.0	± 0.2

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.3	- 39.4 dB, ± 1.5 dB
63 Hz	-26.2	- 26.2 dB, ± 1.5 dB
125 Hz	-16.1	- 16.1 dB, ± 1 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.3	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+1.3	+ 1.2 dB, ± 1 dB
4 kHz	+0.9	+ 1.0 dB, ± 1 dB
8 kHz	-1.2	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	-5.8	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

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Calibration Certificate

4. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	39.9	± 0.5 dB
$1/10^2$	40.0	39.9	
$1/10^3$	40.0	40.3	± 1.0 dB
$1/10^4$	40.0	40.3	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 009 hPa.

---------- END ----------

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Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 06681 Page 1 of 2 Pages

Customer : Lam Geotechnics Limited

Address : 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No. : Q02553 **Date of receipt :** 18-Nov-10

Item Tested

Description : Sound Level Calibrator (EL469)

Manufacturer : ACO

Model : -- **Serial No. :** 050213

Test Conditions

Date of Test : 19-Nov-10 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: F21, Z02.

Test Results

All results were within the IEC 942 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	03926	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	04062	NIM-PRC & SCL-HKSAR
S041	Universal Counter	04461	SCL-HKSAR
S206	Sound Level Meter	04462	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 23-Nov-10

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 6B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 6801 Fax: 2425 6646

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Calibration Certificate

Results :

1. Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.22	± 0.3 dB

The above measured values are the mean of 3 measurements.
Uncertainty : ± 0.1 dB

2. Frequency

UUT Nominal Value	Measured Value		IEC 942 Class 1 Spec.
1 kHz	0.9834	kHz	± 2 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

3. Level Stability : 0.0 dB
IEC 942 Class 1 Spec. : ± 0.1 dB
Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.2 %
IEC 942 Class 1 Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 009 hPa.

---------- END ----------

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Calibration Certificate

Certificate No. 03250A

Customer : Lam Geotechnics Limited

Address : 11/F., Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong

Order No. : Q01282 **Date of receipt :** 14-Jun-10

Item Tested

Description : Precision Integrating Sound Level Meter

Manufacturer : ONO SOKKI

Model : LA-5110 **Serial No. :** 72302293

Test Conditions

Date of Test : 21-Jun-10 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

Test Results

All results were within the IEC 651 Type 1 & IEC 804 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C101623	SCL-HKSAR
S024	Sound Level Calibrator	93758	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 8-Oct-10

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

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Calibration Certificate

Results :

1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Level Range	Filter	Frequency Weighting	Dynamic Characteristic		
40 - 100 dB	OFF	A	FAST	94.03	94.0
			SLOW		94.0
		C	FAST		94.0
60 - 120 dB	OFF	A	FAST	94.03	94.0
			SLOW		94.0
		C	FAST		94.0
60 - 120 dB	OFF	A	FAST	113.97	113.9
			SLOW		113.9
		C	FAST		113.9

IEC 651 Type 1 Spec. : ± 0.7 dB
Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	114.1	+0.1	± 0.7 dB
130	104.0	104.1	+0.1	
120	94.0	94.0 (Ref.)	- -	
110	84.0	84.0	0.0	
100	74.0	74.1	+0.1	
90	64.0	64.1	+0.1	
80	54.0	54.0	0.0	

Uncertainty : ± 0.1 dB

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Calibration Certificate

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.0	0.0	± 0.4
	94.0	94.0 (Ref.)	- -	
	95.0	95.0	0.0	± 0.2

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-40.5	- 39.4 dB, ± 1.5 dB
63 Hz	-26.9	- 26.2 dB, ± 1.5 dB
125 Hz	-16.9	- 16.1 dB, ± 1 dB
250 Hz	-9.1	- 8.6 dB, ± 1 dB
500 Hz	-3.5	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+1.5	+ 1.2 dB, ± 1 dB
5 kHz	+1.2	+ 1.0 dB ,± 1 dB
8 kHz	-1.0	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	-7.0	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	---
1/10	40.0	40.0	± 0.5 dB
$1/10^2$	40.0	40.0	
$1/10^3$	40.0	40.1	± 1.0 dB
$1/10^4$	40.0	39.9	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 000 hPa.
4. This certificate is supersede our former certificate no. 03250.

---------- END ----------

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Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 03445

Customer : Lam Geotechnics Limited

Address : 11/F., Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong

Order No. : Q01282 **Date of receipt :** 14-Jun-10

Item Tested

Description : Sound Level Calibrator (EL078)

Manufacturer : ONO SOKKI

Model : SC-2110 **Serial No. :** 00393

Test Conditions

Date of Test : 21-Jun-10 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z02.

Test Results

All results were within the IEC 942 Class 2 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Due Date	Traceable to
S024	Sound Level Calibrator	93758	16-Jul-10	NIM-PRC & SCL-HKSAR
S041	Universal Counter	94005	6-Aug-10	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 25-Jun-10

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

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Calibration Certificate

Results :

1. **Level Accuracy (at 1 kHz)**

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 2 Spec.
94	94.05	± 0.5 dB

Uncertainty : ± 0.2 dB

2. **Frequency Accuracy**

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 942 Class 2 Spec.
1	0.998	± 4 %

Uncertainty : ± 0.1 %

3. **Level Stability** : 0.0 dB
IEC 942 Class 2 Spec. : ± 1.2 dB
Uncertainty : ± 0.01 dB

4. **Total Harmonic Distortion** : < 1.2 %
IEC 942 Class 1 Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The above measured values are the mean of 3 measurements.
3. The uncertainty claimed is for a confidence probability of not less than 95%.
4. Atmospheric Pressure : 1 000 hPa.

---------- END ----------

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Brüel & Kjær

SPECTRIS CHINA LIMITED
思百吉中國有限公司

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS100612-7 **Page** 1 **of** 2

Calibration of :

Description	:	Sound Level Meter	,	Microphone
Manufacture	:	Brüel & Kjær		
Type No.	:	2250	,	4950
Serial No.	:	2722310		2698702

Client :

Lam Geotechnics Limited
11/F, Centre Point
181-185 Gloucester Road
Wanchai
Hong Kong

Calibration Conditions :

Air Temperature	:	23	**°C**
Air Pressure	:	101.9	**kPa**
Relative Humidity	:	62	**%**

Test Specifications :

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC 60651 and IEC 60804 type 1, and vendor specific procedures.

The measurements has been performed with the assistance of :
Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 CAL2238A, Ver.25.10.1999
The standard(s) and instrument(s) used in the calibration are traceable to international standard and are calibrated on a schedule which is adjusted to maintain the required accuracy level.

Test Result :

A list of the performed (sub) tests is stated on page 2 of this certificate. Actual Measurement are documented on worksheet.

Date of Calibration : 22 July, 2010
Calibrated By :

Dai Bin

Certificate issued : 22 July, 2010
Approved signatory :

Jacky Leung

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Unit 706 7/F., Miramar Tower, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong
香港九龍尖沙咀彌敦道132號美麗華大廈7樓706室

Tel : (852) 2548 7486
Fax : (852) 2858 1168

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CERTIFICATE OF CALIBRATION

Certificate No. : 2KS100612-7 **Page 2 of 2**

Results :

List of performed (sub) test with test status:

"OK" Means the result of the (sub)test is Inside the tolerances stated in the test specifications.

" - " Means the result of the (sub)test is Outside these tolerances.

Test :	Subtest :	Status :
Noise	A	OK
Noise	C	OK
Noise	Lin	OK
Frequency Weighting	A	OK
Frequency Weighting	C	OK
Frequency Weighting	Lin	OK
Level Range Control	1000 Hz	OK
Linearity Range	SPL 10dB 4000 Hz	OK
Linearity Range	SPL 1dB 1000 Hz	OK
Linearity Range	Leq	OK
Linearity Range	SEL	OK
RMS Detector	CF 3	OK
RMS Detector	CF 5	OK
RMS Detector	CF 10	OK
RMS Detector	Symmetry	OK
Time Weighting	Difference Indication	OK
Time Weighting	Single Burst FAST	OK
Time Weighting	Single Burst SLOW	OK
Time Weighting	Single Burst IMPULSE	OK
Time Weighting	Repetitive Burst	OK
Time Weighting	Peak	OK
Time Averaging		OK
Pulse Range		OK
Overload	SPL	OK
Overload	SEL	OK
Acoustic Response	A	OK
Acoustic Response	Lin	OK

Calibration Equipment :

Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 CAL2238A, Ver.25.10.1999

Description :	Make & Model :	Serial No. :	Last Cal. Date :	Traceable to:
Digital Multi-meter	Datron 1281	27361	30 Sept, 2009	HKSCL (HOKLAS)
Sine/Noise Generator	B&K 1049	1314978	Test	B&K Conformance
Test Waveform Generator	B&K 5918	1482949	Test	B&K Conformance
Acoustical Calibrator	B&K 4226	1843103	11 Aug 2009	NPL via B&K (DANAK)

Calibrated By : Date : 22 July 2010

Checked By : Date : 22 July, 2010

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS100705-2 **Page** 1 **of** 2

Calibration of :

Description	:	Sound Level Meter	,	Microphone
Manufacture	:	Brüel & Kjær		
Type No.	:	2250	,	4950
Serial No.	:	2722311		2698703

Client :

Lam Geotechnics Limited
11/F, Centre Point
181-185 Gloucester Road
Wanchai
Hong Kong

Calibration Conditions :

Air Temperature	:	23	**°C**
Air Pressure	:	101.9	**kPa**
Relative Humidity	:	62	**%**

Test Specifications :

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC 60651 and IEC 60804 type 1, and vendor specific procedures.

The measurements has been performed with the assistance of :
Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 CAL2238A, Ver.25.10.1999
The standard(s) and instrument(s) used in the calibration are traceable to international standard and are calibrated on a schedule which is adjusted to maintain the required accuracy level.

Test Result :

A list of the performed (sub) tests is stated on page 2 of this certificate. Actual Measurement are documented on worksheet.

Date of Calibration : 03 Aug, 2010
Calibrated By :

Dai Bin

Certificate issued : 03 Aug, 2010
Approved signatory :

Jacky Leung

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CERTIFICATE OF CALIBRATION

Certificate No. : 2KS100705-2

Results :

List of performed (sub) test with test status:
"OK" Means the result of the (sub)test is Inside the tolerances stated in the test specifications.
" - " Means the result of the (sub)test is Outside these tolerances.

Test :	Subtest :	Status :
Noise	A	OK
Noise	C	OK
Noise	Lin	OK
Frequency Weighting	A	OK
Frequency Weighting	C	OK
Frequency Weighting	Lin	OK
Level Range Control	1000 Hz	OK
Linearity Range	SPL 10dB 4000 Hz	OK
Linearity Range	SPL 1dB 1000 Hz	OK
Linearity Range	Leq	OK
Linearity Range	SEL	OK
RMS Detector	CF 3	OK
RMS Detector	CF 5	OK
RMS Detector	CF 10	OK
RMS Detector	Symmetry	OK
Time Weighting	Difference Indication	OK
Time Weighting	Single Burst FAST	OK
Time Weighting	Single Burst SLOW	OK
Time Weighting	Single Burst IMPULSE	OK
Time Weighting	Repetitive Burst	OK
Time Weighting	Peak	OK
Time Averaging		OK
Pulse Range		OK
Overload	SPL	OK
Overload	SEL	OK
Acoustic Response	A	OK
Acoustic Response	Lin	OK

Calibration Equipment :

Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 CAL2238A, Ver.25.10.1999

Description :	Make & Model :	Serial No. :	Last Cal. Date :	Traceable to:
Digital Multi-meter	Datron 1281	27361	30 Sept, 2009	HKSCL (HOKLAS)
Sine/Noise Generator	B&K 1049	1314978	Test	B&K Conformance
Test Waveform Generator	B&K 5918	1482949	Test	B&K Conformance
Acoustical Calibrator	B&K 4226	1843103	11 Aug 2009	NPL via B&K (DANAK)

Calibrated By : Dai Kim
Date : 03 Aug 2010

Checked By : Jenny
Date : 03 Aug, 2010

ALS Technichem (HK) Pty Ltd

CERTIFICATE OF ANALYSIS

CONTACT:	MS CHERRY MAK	**WORK ORDER:**	HK1031088
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	30/12/2010
		DATE OF ISSUE:	04/01/2011
		SAMPLE TYPE:	EQUIPMENT
PROJECT:	--	**No. of SAMPLES:**	1

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd
11/F
Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsenviro.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

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Abbreviations: *% SPK REC denotes percentage spike recovery*
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

ADDRESS 11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong PHONE +852 2610 1044 FAX +852 2610 2021
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CERTIFICATE OF ANALYSIS

Work Order: HK1031088
Date of Issue: 04/01/2011
Client: LAM GEOTECHNICS LIMITED
Client Reference:

Calibration of Multimeter

Item : Sonde
ALS Lab ID: HK1031088 -001
Date of Calibration: 31 December, 2010

Model No.: YSI Sonde 600XL
Equipment No.: EL424
Serial No.: 05C1607

Testing Results :

pH

Expected Reading	Recording Reading
4.00	3.88
7.00	7.07
10.0	9.90
Allowing Deviation	± 0.2 unit

Testing Method:
APHA (20th edition), 4500-H^+B

Conductivity

Expected Reading	Recording Reading
146.9 uS/cm	146.0 uS/cm
6667 uS/cm	6230 uS/cm
12890 uS/cm	12473 uS/cm
58670 uS/cm	54244 uS/cm
Allowing Deviation	± 10%

Testing Method:
APHA (20th edition), 2510B

Temperature

Expected Reading	Recording Reading
14.5 °C	14.9 °C
22.5 °C	22.3 °C
34.0 °C	34.3 °C
Allowing Deviation	±2.0°C

Testing Method:
In-House Method

Salinity

Expected Reading	Recording Reading
0 g/L	0 g/L
10.0 g/L	9.61 g/L
20.0 g/L	19.8 g/L
30.0 g/L	29.9 g/L
Allowing Deviation	± 10%

Testing Method:
APHA (20th edition), 2520 A and B

Dissolved Oxygen

Expected Reading	Recording Reading
6.61 mg/L	6.65 mg/L
7.94 mg/L	8.03 mg/L
8.69 mg/L	8.61 mg/L
Allowing Deviation	± 0.2 mg/L

Testing Method:
APHA (20th edition), 4500-OC & G

Mr Chan Kwok Fai, Godfrey
Laboratory Manager – Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

ALS Technichem (HK) Pty Ltd

CERTIFICATE OF ANALYSIS

CONTACT:	MS CHERRY MAK	**WORK ORDER:**	HK1100487
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	06/01/2011
		DATE OF ISSUE:	11/01/2011
		SAMPLE TYPE:	EQUIPMENT
PROJECT:	--	**No. of SAMPLES:**	1

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

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Laboratory Manager - Hong Kong

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Abbreviations: *% SPK REC denotes percentage spike recovery*
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

CERTIFICATE OF ANALYSIS

Work Order: HK1100487
Date of Issue: 11/01/2011
Client: LAM GEOTECHNICS LIMITED
Client Reference:

Calibration of Multimeter

Item : Sonde
ALS Lab ID: HK1100487-001
Date of Calibration: 07 January, 2011

Model No.: YSI Professional Plus
Equipment No.: --
Serial No.: 10E100385

Testing Results :

pH

Expected Reading	Recording Reading
4.00	3.99
7.00	7.04
10.0	9.97
Allowing Deviation	± 0.2 unit

Testing Method:
APHA (20th edition), 4500-H^+B

Temperature

Expected Reading	Recording Reading
12.5 °C	12.4 °C
20.5 °C	20.3 °C
37.0 °C	36.9 °C
Allowing Deviation	±2.0°C

Testing Method:
In-House Method

Salinity

Expected Reading	Recording Reading
0 g/L	0 g/L
10.0 g/L	10.3 g/L
20.0 g/L	20.5 g/L
30.0 g/L	30.7 g/L
Allowing Deviation	± 10%

Testing Method:
APHA (20th edition), 2520 A and B

Dissolved Oxygen

Expected Reading	Recording Reading
6.35 mg/L	6.41 mg/L
7.29 mg/L	7.32 mg/L
9.44 mg/L	9.35 mg/L
Allowing Deviation	± 0.2 mg/L

Testing Method:
APHA (20th edition), 4500-OC & G

Mr. Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

CERTIFICATE OF ANALYSIS

CONTACT:	MS CHERRY MAK	**WORK ORDER:**	HK1027605
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT,	**DATE RECEIVED:**	20/11/2010
	181-185 GLOUCESTER ROAD,	**DATE OF ISSUE:**	24/11/2010
	WAN CHAI, HONG KONG.	**SAMPLE TYPE:**	EQUIPMENT
		No. of SAMPLES:	1

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

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ISSUING LABORATORY: HONG KONG

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Abbreviations: *% SPK REC denotes percentage spike recovery*
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LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

CERTIFICATE OF ANALYSIS

Work Order: HK1027605
Date of Issue: 24/11/2010
Client: LAM GEOTECHNICS LIMITED
Client Reference:

Calibration of Turbidimeter

Item : TURBIDIMETER
ALS Lab ID: HK1027605-001
Date of Calibration: 22 November, 2010

Model No.: HACH 2100P
Equipment No.: EL148
Serial No.: 931000003861

Testing Results :

Turbidity

Expected Reading	Recording Reading
0.00 NTU	0.27 NTU
4.00 NTU	4.24 NTU
40.0 NTU	38.7 NTU
80.0 NTU	76.1 NTU
400 NTU	392 NTU
Allowing Deviation	± 10%

Testing Method:

APHA (19th edition), 2130B

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

CERTIFICATE OF ANALYSIS

CONTACT:	MS CHERRY MAK	**WORK ORDER:**	HK1103015
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	09/02/2011
		DATE OF ISSUE:	14/02/2011
		SAMPLE TYPE:	EQUIPMENT
PROJECT:	--	**No. of SAMPLES:**	1

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

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Abbreviations: *% SPK REC denotes percentage spike recovery*
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

CERTIFICATE OF ANALYSIS

Work Order: HK1103015
Date of Issue: 14/02/2011
Client: LAM GEOTECHNICS LIMITED
Client Reference:

Calibration of Multimeter

Item : Turbidimeter
ALS Lab ID: HK1103015 -001
Date of Calibration: 09 February, 2011

Model No.: 2100P
Equipment No.: EN06
Serial No.: 1000032935

Testing Results :

Turbidity

Expected Reading	Recording Reading
0.00 NTU	0.25 NTU
4.00 NTU	4.17 NTU
40.0 NTU	40.7 NTU
80.0 NTU	78.3 NTU
400 NTU	396 NTU
800 NTU	828 NTU
Allowing Deviation	± 10%

Testing Method:

APHA (19th edition), 2130B

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TISCH ENVIROMENTAL, INC.
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WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jun 28, 2010 Rootsmeter S/N 9833620 Ta (K) - 298
Operator Tisch Orifice I.D. - 0005 Pa (mm) - 745.49

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3860	3.2	2.00
2	NA	NA	1.00	0.9740	6.4	4.00
3	NA	NA	1.00	0.8730	7.9	5.00
4	NA	NA	1.00	0.8320	8.8	5.50
5	NA	NA	1.00	0.6850	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9767	0.7047	1.4006		0.9957	0.7184	0.8941
0.9725	0.9985	1.9808		0.9914	1.0179	1.2645
0.9704	1.1116	2.2146		0.9893	1.1332	1.4137
0.9693	1.1650	2.3227		0.9882	1.1877	1.4828
0.9641	1.4075	2.8013		0.9829	1.4349	1.7883
Qstd slope (m) =		1.99628		Qa slope (m) =		1.25003
intercept (b) =		-0.00699		intercept (b) =		-0.00446
coefficient (r) =		0.99995		coefficient (r) =		0.99995
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

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}

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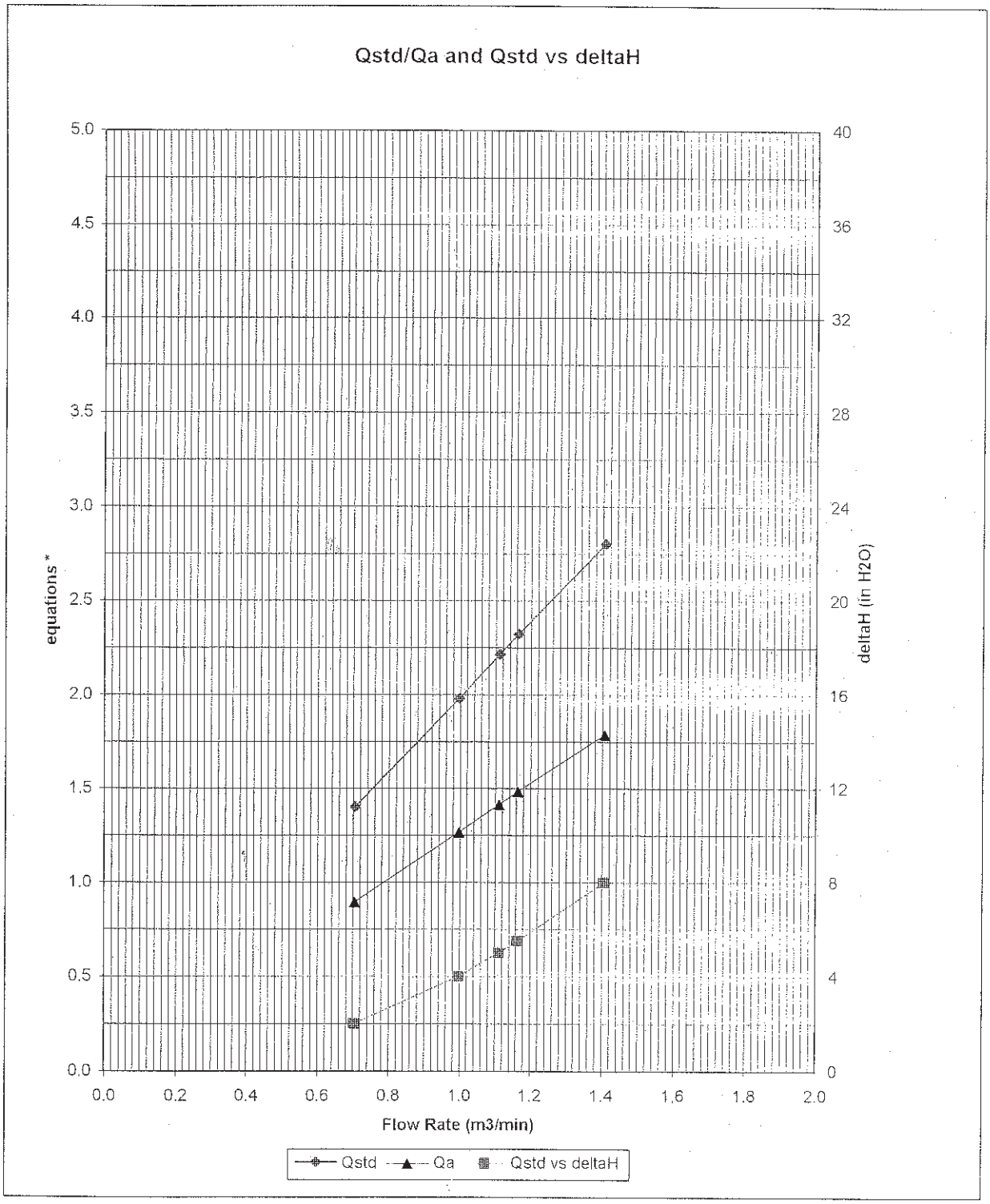
AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#0005

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA1b	Calbration Date	:	28-Dec-10
Equipment no.	:	EL452	Calbration Due Date	:	28-Feb-11

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	293	Kelvin	Pressure, P_a	1020	mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m_c	1.99628	Intercept, bc	-0.06990
Last Calibration Date	28-Jun-10	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	28-Jun-11	$= m_c \times Q_{std} + b_c$			

Calibration Point	Manometer Reading H (inches of water) (up)	(down)	(difference)	Q_{std} (m^3 / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$ Y-axis
1	6.5	6.5	13.0	1.8625	59	59.6977
2	5.3	5.3	10.6	1.6852	54	54.6385
3	3.9	3.9	7.8	1.4506	48	48.5676
4	2.5	2.5	5.0	1.1684	37	37.4375
5	1.5	1.5	3.0	0.9129	29	29.3429

By Linear Regression of Y on X

Slope, m	=	32.3952	Intercept, b	=	0.0678
Correlation Coefficient*	=	0.9975			
Calibration Accepted	=	Yes/~~No~~**			

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Derek Lo	Checked by	:	Cherry Mak
Date	:	28-Dec-10	Date	:	28-Dec-10

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	Oil Street	**Calbration Date**	:	10-Feb-11
Equipment no.	:	EL452	**Calbration Due Date**	:	10-Apr-11

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	290	Kelvin	**Pressure, P_a**	1019	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.00300	**Intercept, bc**	-0.00500
Last Calibration Date	28-Jun-10	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	28-Jun-11	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.)	**Continuous Flow Recorder, W**	**IC** $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$
	(up)	(down)	(difference)	**X-axis**	(CFM)	**Y-axis**
1	6.3	6.3	12.6	1.8040	64	65.0590
2	5.0	5	10.0	1.6074	55	55.9101
3	3.9	3.9	7.8	1.4199	48	48.7942
4	2.5	2.5	5	1.1373	36	36.5957
5	1.5	1.5	3.0	0.8815	27	27.4468

By Linear Regression of Y on X

Slope, m	=	40.7724	Intercept, b	=	-9.0981
Correlation Coefficient*	=	0.9992			
Calibration Accepted	=	Yes/~~No~~**			

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Derek Lo	**Checked by**	:	Cherry Mak
Date	:	10-Feb-11	**Date**	:	10-Apr-11

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA2a	Calbration Date	:	28-Dec-10
Equipment no.	:	EL449	Calbration Due Date	:	28-Feb-11

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	293	Kelvin	Pressure, P_a	1020	mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m_c	1.99628	Intercept, bc	-0.06990
Last Calibration Date	28-Jun-10	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	28-Jun-11	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	Manometer Reading H (inches of water)			Q_{std} (m^3 / min.)	Continuous Flow Recorder, W	IC $(W(P_a/1013.3x298/T_a)^{1/2}/35.31)$
	(up)	(down)	(difference)	X-axis	(CFM)	Y-axis
1	6.5	6.5	13.0	1.8625	52	52.6149
2	5.2	5.2	10.4	1.6696	47	47.5558
3	4.0	4.0	8.0	1.4686	40	40.4730
4	2.6	2.6	5.2	1.1908	30	30.3547
5	1.5	1.5	3.0	0.9129	18	18.2128

By Linear Regression of Y on X

Slope, m	=	36.4116	Intercept, b	=	-13.8945
Correlation Coefficient*	=	0.9967			
Calibration Accepted	=	Yes/~~No~~**			

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Derek Lo	Checked by	:	Cherry Mak
Date	:	28-Dec-10	Date	:	28-Dec-10

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA4a	Calbration Date	:	11-Jan-11
Equipment no.	:	EL390	Calbration Due Date	:	11-Mar-11

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	297	Kelvin	Pressure, P_a	1008	mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m_c	1.99628	Intercept, bc	-0.06990
Last Calibration Date	28-Jun-10	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	28-Jun-11	$= m_c \times Q_{std} + b_c$			

Calibration of RSP

Calibration Point	Manometer Reading H (inches of water) (up)	(down)	(difference)	Q_{std} (m^3 / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$ Y-axis
1	6.3	6.3	12.6	1.8115	60	59.9435
2	5.0	5	10.0	1.6176	52	51.9511
3	3.9	3.9	7.8	1.4327	44	43.9586
4	2.5	2.5	5	1.1541	32	31.9699
5	1.5	1.5	3.0	0.9018	22	21.9793

By Linear Regression of Y on X

Slope, m = 41.9976 Intercept, b = -16.1451

Correlation Coefficient* = 0.9999

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Derek Lo	Checked by	:	Cherry Mak
Date	:	11-Jan-11	Date	:	14-Jan-11