Hong Kong Calibration Ltd.
香 港 校 正 有限公司

Calibration Certificate

Certificate No. 33624 Page 1 of 4 Pages

Customer : Lam Geotechnics Limited

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

Order No. : Q31494 **Date of receipt :** 30-May-13

Item Tested

Description : Digital Sound Level Meter

Manufacturer : B&K

Model : Type 2236 **Serial No. :** 2100736

Test Conditions

Date of Test : 3-Jun-13 **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 Type 1 & IEC 1260 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	C127181	SCL-HKSAR
S024	Sound Level Calibrator	30620	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 : Liam Wong

Approved by : Dorothy Cheuk

Date: 3-Jun-13

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

E

Calibration Certificate

Results :

1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range	Parameter	Frequency Wt.	Freq. Response		
20 - 100	SPL	dBA	F	94.0	93.8
			S		93.8
		dBC	F		93.8
		dBL	F		93.9
		1 kHz	F		93.8
40 - 120	SPL	dBA	F	94.0	93.9
		1 kHz	F		93.9
	SPL	dBA	F	114.0	113.8
			S		113.8
		dBC	F		113.9
		dBL	F		113.9
		1 kHz	F		113.8

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 : ± 0.1 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)
140	114.0	113.9	0.0	± 0.7 dB
130	104.0	103.9	0.0	
120	94.0	93.9 (Ref.)	--	
110	84.0	83.9	0.0	
100	74.0	73.9	0.0	
100	64.0	63.9	0.0	
100	54.0	53.9	0.0	

Uncertainty : ± 0.1 dB

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	83.9	0.0	± 0.4 dB
	94.0	93.9 (Ref.)	- -	
	95.0	94.9	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, ± 1.5 dB
63 Hz	-26.4	- 26.2 dB, ± 1.5 dB
125 Hz	-16.3	- 16.1 dB, ± 1 dB
250 Hz	-8.8	- 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	+1.2	+ 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	-6.8	- 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	39.9	± 0.5 dB
$1/10^2$	40.0	39.8	
$1/10^3$	40.0	39.7	± 1.0 dB
$1/10^4$	40.0	39.5	

Uncertainty : ± 0.1 dB

Calibration Certificate

6. Filter Response

Filter Setting	Attenuation (dB)	IEC 1260 Class 1 Spec.
125 Hz	-63.6	< - 61
250 Hz	-44.8	< - 42
500 Hz	-21.0	< - 17.5
707 Hz	-3.7	- 2 ~ - 5
1 kHz (Ref.)	0.0 (Ref.)	--
1.414 kHz	-4.1	- 2 ~ - 5
2 kHz	-21.4	< - 17.5
4 kHz	-45.0	< - 42
8 kHz	-63.9	< - 61

Uncertainty : ± 0.2 dB

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 996 hPa
4. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

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

Hong Kong Calibration Ltd.
香 港 校 正 有限公司

Calibration Certificate

Certificate No. 34228 Page 1 of 2 Pages

Customer : Lam Geotechnics Limited

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

Order No. : Q31610 **Date of receipt :** 21-Jun-13

Item Tested

Description : Sound Level Calibrator

Manufacturer : Rion

Model : NC-73 **Serial No. :** 10707358

Test Conditions

Date of Test : 25-Jun-13 **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 manufacturer's specification.

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

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	30259	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	30620	NIM-PRC & SCL-HKSAR
S041	Universal Counter	28347	SCL-HKSAR
S206	Sound Level Meter	30655	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 : Liam Wong

Approved by : Dorothy Cheuk

Date: 25-Jun-13

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

Calibration Certificate

Results :

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

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	93.88 dB	± 1 dB

Uncertainty : ± 0.2 dB

2. **Frequency Accuracy**

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.995 kHz	± 2 %

Uncertainty : ± 0.1 %

3. **Level Stability** : 0.0 dB
   Uncertainty : ± 0.01 dB

4. **Total Harmonic Distortion** : < 0.2 %
   Mfr's 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. The above measured values were the mean of 3 measurements.
4. Atmospheric Pressure : 999 hPa

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

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS EMILY KONG	**WORK ORDER:**	HK1316903
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	25/06/2013
		DATE OF ISSUE:	03/07/2013
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	XIN RUI
Model No.:	WGZ-3B
Serial No.:	1203008
Equipment No.:	--
Date of Calibration:	03 July, 2013

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@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1316903
Date of Issue: 03/07/2013
Client: LAM GEOTECHNICS LIMITED

Equipment Type: Turbidimeter
Brand Name: XIN RUI
Model No.: WGZ-3B
Serial No.: 1203008
Equipment No.: --
Date of Calibration: 03 July, 2013 Date of next Calibration: 03 October, 2013

Parameters:

Turbidity **Method Ref: APHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.13	--
4	3.82	-4.5
40	38.37	-4.1
80	80.45	0.6
400	383.8	-4.1
800	840.4	5.1
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

領導檢測有限公司

PILOT TESTING LIMTIED

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Information supplied by customer:

CONTACT: DEREK LO **WORK ORDER:** HK1310006

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: 13/07/2013

DATE OF ISSUE: 15/07/2013

ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD, WANCHAI, HONG KONG

PROJECT: ---

METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

COMMENTS

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory. Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203010
Equipment No.:	--
Date of Calibration:	15 July, 2013

Remarks:

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

Mr. Peter Lee

Director

Address: Room 1503, 15/F, Wayson Commercial House, 68-70 Lockhart Road, Wanchai, Hong Kong
Phone +852 2527 6691 | Email info@pilot-testing.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

WORK ORDER: HK1310006
DATE OF ISSUE: 15th July, 2013
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203010
Equipment No.:	--
Date of Calibration:	15 July, 2013
Date of next Calibration:	15 October, 2013

Parameters:

Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	0
4	3.76	-6.0
10	10.3	+3.0
40	38.6	-3.5
100	104	+4.0
400	386	-3.5
1000	989	-1.1
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

Mr. Peter Lee
Director

Address: Room 1503, 15/F, Wayson Commercial House, 68-70 Lockhart Road, Wanchai, Hong Kong
Phone +852 2527 6691 | Email info@pilot-testing.com

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS EMILY KONG	**WORK ORDER:**	HK1310783
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	22/04/2013
		DATE OF ISSUE:	02/05/2013
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	XIN RUI
Model No.:	WGZ-3B
Serial No.:	1203016
Equipment No.:	--
Date of Calibration:	29 April, 2013

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@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1310783
Date of Issue: 02/05/2013
Client: LAM GEOTECHNICS LIMITED

Equipment Type: Turbidimeter
Brand Name: XIN RUI
Model No.: WGZ-3B
Serial No.: 1203016
Equipment No.: --
Date of Calibration: 29 April, 2013 Date of next Calibration: 29 July, 2013

Parameters:

Turbidity **Method Ref: APHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	-0.43	--
4	3.99	-0.2
40	40.63	1.6
80	78.50	-1.9
400	401.9	0.5
800	836.9	4.6
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

領導檢測有限公司

PILOT TESTING LIMTIED

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Information supplied by customer:

CONTACT: DEREK LO **WORK ORDER:** HK1310007

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: 30/07/2013

DATE OF ISSUE: 31/07/2013

ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD, WANCHAI, HONG KONG

PROJECT: ---

METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

COMMENTS

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory. Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203016
Equipment No.:	--
Date of Calibration:	31 July, 2013

Remarks:

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

Mr. Peter Lee

Director

Address: Room 1503, 15/F, Wayson Commercial House, 68-70 Lockhart Road, Wanchai, Hong Kong
Phone +852 2527 6691 | Email info@pilot-testing.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

WORK ORDER: HK1310007
DATE OF ISSUE: 31st July, 2013
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203016
Equipment No.:	--
Date of Calibration:	31 July, 2013
Date of next Calibration:	30 October, 2013

Parameters:

Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.02	+0.2
4	3.85	-3.8
10	9.68	-3.2
40	42.1	+5.2
100	96.0	-4.0
400	387	-3.2
1000	985	-1.5
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

Mr. Peter Lee
Director

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS EMILY KONG	**WORK ORDER:**	HK1316245
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	18/06/2013
		DATE OF ISSUE:	26/06/2013
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity and Temperature
Equipment Type:	Multimeter
Brand Name:	YSI
Model No.:	Professional plus
Serial No.:	11F100420
Equipment No.:	--
Date of Calibration:	25 June, 2013

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@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1316245
Date of Issue: 26/06/2013
Client: LAM GEOTECHNICS LIMITED

Equipment Type: Multimeter
Brand Name: YSI
Model No.: Professional plus
Serial No.: 11F100420
Equipment No.: --
Date of Calibration: 25 June, 2013 Date of next Calibration: 25 September, 2013

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.85	2.99	0.14
6.09	5.94	-0.15
7.37	7.47	0.10
	Tolerance Limit (±mg/L)	0.20

pH Value **Method Ref: APHA (21st edition), 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.89	-0.11
7.0	6.99	-0.01
10.0	9.97	-0.03
	Tolerance Limit (±pH unit)	0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.01	--
10	10.33	3.3
20	20.96	4.8
30	32.22	7.4
	Tolerance Limit (±%)	10.0

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.0	9.8	0.8
25.0	25.2	0.2
41.0	41.4	0.4
	Tolerance Limit (±°C)	2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS EMILY KONG	**WORK ORDER:**	HK1314154
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	27/05/2013
		DATE OF ISSUE:	04/06/2013
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity and Temperature
Equipment Type:	Multimeter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	13A100242
Equipment No.:	--
Date of Calibration:	31 May, 2013

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@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1314154
Date of Issue: 04/06/2013
Client: LAM GEOTECHNICS LIMITED

Equipment Type: Multimeter
Brand Name: YSI
Model No.: Professional Plus
Serial No.: 13A100242
Equipment No.: --
Date of Calibration: 31 May, 2013 Date of next Calibration: 31 August, 2013

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.22	2.24	0.02
5.76	5.65	-0.11
7.90	8.00	0.10
	Tolerance Limit (±mg/L)	0.20

pH Value **Method Ref: APHA (21st edition), 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.97	-0.03
7.0	7.05	0.05
10.0	9.95	-0.05
	Tolerance Limit (±pH unit)	0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.60	-4.0
20	19.49	-2.6
30	30.05	0.2
	Tolerance Limit (±%)	10.0

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.5	9.7	-0.8
20.0	19.4	-0.6
38.0	38.3	0.3
	Tolerance Limit (±°C)	2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS EMILY KONG	**WORK ORDER:**	HK1317591
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	03/07/2013
		DATE OF ISSUE:	12/07/2013
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity and Temperature
Equipment Type:	Sonde Environmental Monitoring System
Brand Name:	YSI
Model No.:	Professional plus
Serial No.:	11F100597
Equipment No.:	--
Date of Calibration:	10 July, 2013

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@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1317591
Date of Issue: 12/07/2013
Client: LAM GEOTECHNICS LIMITED

Equipment Type: Sonde Environmental Monitoring System
Brand Name: YSI
Model No.: Professional plus
Serial No.: 11F100597
Equipment No.: --
Date of Calibration: 10 July, 2013 Date of next Calibration: 10 October, 2013

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
4.52	4.63	0.11
6.72	6.53	-0.19
7.80	7.71	-0.09
	Tolerance Limit (±mg/L)	0.20

pH Value **Method Ref: APHA (21st edition), 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.92	-0.08
7.0	7.08	0.08
10.0	10.07	0.07
	Tolerance Limit (±pH unit)	0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.49	-5.1
20	19.02	-4.9
30	29.29	-2.4
	Tolerance Limit (±%)	10.0

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.0	11.2	1.2
22.5	23.6	1.1
39.0	38.8	-0.2
	Tolerance Limit (±°C)	2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jul 15, 2013 Rootsmeter S/N 0438320 Ta (K) - 300
Operator Tisch Orifice I.D. - 0005 Pa (mm) - 759.46

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	1.3910	3.2	2.00
2	NA	NA	1.00	0.9830	6.4	4.00
3	NA	NA	1.00	0.8800	7.9	5.00
4	NA	NA	1.00	0.8380	8.8	5.50
5	NA	NA	1.00	0.6930	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9884	0.7106	1.4090		0.9958	0.7159	0.8888
0.9843	1.0013	1.9926		0.9916	1.0087	1.2570
0.9822	1.1161	2.2278		0.9895	1.1244	1.4054
0.9811	1.1708	2.3365		0.9884	1.1795	1.4740
0.9760	1.4084	2.8180		0.9832	1.4188	1.7777
Qstd slope (m) =		2.01968		Qa slope (m) =		1.26469
intercept (b) =		-0.02746		intercept (b) =		-0.01732
coefficient (r) =		0.99999		coefficient (r) =		0.99999
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}

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA3a	**Calbration Date**	:	25-Jun-13
Equipment no.	:	EL333	**Calbration Due Dat**	:	25-Aug-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	304	Kelvin	**Pressure, P_a**	1012	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

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	5.8	5.8	11.6	1.6893	58	57.3879
2	4.8	4.8	9.6	1.5381	49	48.4829
3	4.0	4.0	8.0	1.4053	41	40.5673
4	2.4	2.4	4.8	1.0917	25	24.7362
5	1.5	1.5	3.0	0.8659	14	13.8523

By Linear Regression of Y on X

Slope, m	=	52.6106	Intercept, b	=	-32.3377
Correlation Coefficient*	=	0.9991			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Henry	**Checked by**	:	Derek Lo
Date	:	25-Jun-13	**Date**	:	25-Jun-13

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA1b	**Calbration Date**	:	17-Jul-13
Equipment no.	:	EL452	**Calbration Due Dat**	:	17-Sep-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

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	6.2	6.2	12.4	1.7416	61	60.1977
2	5.1	5.1	10.2	1.5808	53	52.3029
3	4.1	4.1	8.2	1.4188	46	45.3950
4	2.5	2.5	5.0	1.1110	32	31.5791
5	1.4	1.4	2.8	0.8349	21	20.7238

By Linear Regression of Y on X

Slope, m = 43.5073 Intercept, b = -16.1479

Correlation Coefficient* = 0.9994

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam	**Checked by**	:	Derek Lo
Date	:	17-Jul-13	**Date**	:	17-Jul-13

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA2a	**Calbration Date**	:	17-Jul-13
Equipment no.	:	EL449	**Calbration Due Dat**	:	17-Sep-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

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	6.1	6.1	12.2	1.7276	59	58.2240
2	5.0	5.0	10.0	1.5654	51	50.3292
3	4.2	4.2	8.4	1.4359	43	42.4344
4	2.5	2.5	5.0	1.1110	26	25.6580
5	1.5	1.5	3.0	0.8637	14	13.8159

By Linear Regression of Y on X

Slope, m = 51.8624 Intercept, b = -31.4400

Correlation Coefficient* = 0.9996

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam	**Checked by**	:	Derek Lo
Date	:	17-Jul-13	**Date**	:	17-Jul-13

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA3a	**Calbration Date**	:	22-Aug-13
Equipment no.	:	EL333	**Calbration Due Dat**	:	22-Oct-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01968	**Intercept, bc**	-0.02746
Last Calibration Date	15-Jul-13	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	15-Jul-14	$= m_c \times Q_{std} + b_c$			

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	5.8	5.8	11.6	1.6778	58	57.2371
2	4.8	4.8	9.6	1.5275	49	48.3555
3	4.0	4.0	8.0	1.3956	42	41.4476
4	2.4	2.4	4.8	1.0841	25	24.6712
5	1.6	1.6	3.2	0.8877	14	13.8159

By Linear Regression of Y on X

Slope, m	=	54.5515	Intercept, b	=	-34.6041
Correlation Coefficient*	=	0.9999			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Henry	**Checked by**	:	Derek Lo
Date	:	22-Aug-13	**Date**	:	22-Aug-13

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA4a	**Calbration Date**	:	17-Jul-13
Equipment no.	:	EL390	**Calbration Due Dat**	:	17-Sep-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

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	6.0	6.0	12.0	1.7135	61	60.1977
2	5.0	5.0	10.0	1.5654	54	53.2897
3	4.1	4.1	8.2	1.4188	46	45.3950
4	2.5	2.5	5.0	1.1110	31	30.5923
5	1.5	1.5	3.0	0.8637	19	18.7501

By Linear Regression of Y on X

Slope, m	=	48.9540	Intercept, b	=	-23.6832
Correlation Coefficient*	=	0.9999			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam	**Checked by**	:	Derek Lo
Date	:	17-Jul-13	**Date**	:	17-Jul-13

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA5a	**Calbration Date**	:	17-Jul-13
Equipment no.	:	EL380	**Calbration Due Dat**	:	17-Sep-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**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**
	(up)	(down)	(difference)			
1	6.1	6.1	12.2	1.7276	61	60.1977
2	4.9	4.9	9.8	1.5498	53	52.3029
3	4.0	4.0	8.0	1.4016	46	45.3950
4	2.4	2.4	4.8	1.0888	31	30.5923
5	1.5	1.5	3.0	0.8637	20	19.7369

By Linear Regression of Y on X

Slope, m	=	46.9543	Intercept, b	=	-20.6306
Correlation Coefficient*	=	0.9999			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam	**Checked by**	:	Derek Lo
Date	:	17-Jul-13	**Date**	:	17-Jul-13

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA6a	**Calbration Date**	:	17-Jul-13
Equipment no.	:	EL448	**Calbration Due Dat**	:	17-Sep-13

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**EL086**	**Slope, m_c**	2.01145	**Intercept, bc**	-0.02803
Last Calibration Date	19-Jul-12	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	19-Jul-13	$= m_c \times Q_{std} + b_c$			

Calibration of RSP						
Calibration Point	**Manometer Reading H (inches of water)**			**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**
	(up)	(down)	(difference)			
1	6.1	6.1	12.2	1.7276	60	59.2108
2	5.0	5.0	10.0	1.5654	52	51.3161
3	4.1	4.1	8.2	1.4188	44	43.4213
4	2.5	2.5	5.0	1.1110	30	29.6054
5	1.5	1.5	3.0	0.8637	19	18.7501

By Linear Regression of Y on X

Slope, m	=	46.8114	Intercept, b	=	-22.1402
Correlation Coefficient*	=	0.9994			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam	**Checked by**	:	Derek Lo
Date	:	17-Jul-13	**Date**	:	17-Jul-13