綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong. Tel : (852) 2873 6860
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com

HOKLAS 028

CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0529 01-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2236	,	4188
Serial/Equipment No.:	2100736	,	2157055
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	29-May-2014

Date of test: 29-May-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	22-Jun-2014	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 10 %
Air pressure:	1000 ± 10 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 30-May-2014 **Company Chop:**

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0529 01-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 29-May-2014

Checked by: Lam Tze Wai **Date:** 30-May-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533
A CIGIS GROUP COMPANY

Sound level meter type: 2236 Serial No. 2100736 Date 29-May-2014
Microphone type: 4188 Serial No. 2157055
Report: 14CA0529 01-01

7943.0	94.0	91.0	90.9	1.5	3.0	-0.1
12590.0	94.0	87.8	87.7	3.0	6.0	-0.1

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	94.0	1.5	1.5	0.0
63.1	94.0	94.0	93.9	1.5	1.5	-0.1
125.9	94.0	94.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.1	1.5	3.0	0.1
12590.0	94.0	94.0	94.1	3.0	6.0	0.1

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
109.0	108.0	108.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
109.0	104.9	105.2	1.0	1.0	0.3

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

Positive polarities: (Weighting C, set the generator signal to single, Lcpmax)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
112.0	112.0	111.7	2.0	-0.3

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
112.0	112.0	111.7	2.0	-0.3

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533
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Test Data for Sound Level Meter

Sound level meter type: 2236 Serial No. 2100736 Date 29-May-2014
Microphone type: 4188 Serial No. 2157055
Report: 14CA0529 01-01

Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	111.0+6.6	111.0	110.8	0.5	-0.2

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
113.0	104.2	104.2	2.0	0.0

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
113.0	110.3	110.3	1.0	0.0

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	83.0	83.0	82.7	1.0	-0.3	60s integ.
10000	73.0	73.0	72.7	1.0	-0.3	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz
Integration time: 10 sec
The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	116.0	86.0	85.8	1.7	-0.2

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	116.0	96.0	95.9	1.7	-0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.
Test frequency: 2000 Hz

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G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533
A CIGIS GROUP COMPANY

Sound level meter type: 2236 Serial No. 2100736 Date 29-May-2014
Microphone type: 4188 Serial No. 2157055
Report: 14CA0529 01-01

Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
126.7	125.7	122.7	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.
For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as following:
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range
Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
130.6	129.6	89.6	89.4	2.2	-0.2

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.2	1.0	1.0	0.3
8000	92.9	92.8	1.5	3.0	-0.1

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

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G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong. Tel : (852) 2873 6860
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com

CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0529 01-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Rion Co., Ltd.
Type/Model No.:	NC-73
Serial/Equipment No.:	10465798
Adaptors used:	-

Item submitted by

Curstomer:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	29-May-2014

Date of test: 30-May-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	60 ± 10 %
Air pressure:	1000 ± 10 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 30-May-2014 **Company Chop:**

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0529 01-02 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.57	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.001 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 965.6 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.9 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 30-May-2014

Checked by: Lam Tze Wai **Date:** 30-May-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Information supplied by customer:

CONTACT: DEREK LO **WORK ORDER:** HK1410093

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: 23/05/2014

DATE OF ISSUE: 30/05/2014

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:	28 May, 2014

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: HK1410093
DATE OF ISSUE: 28th May, 2014
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203010
Equipment No.:	--
Date of Calibration:	28 May, 2014
Date of next Calibration:	28 August, 2014

Parameters:

Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.02	---
4	4.16	+4.0
10	9.80	-2.0
40	38.5	-3.75
100	104	+4.0
400	420	+5.0
1000	970	-3.0
	Tolerance Limit (±%)	10.0

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

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

Information supplied by customer:

CONTACT: DEREK LO **WORK ORDER:** HK1410074

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: 30/04/2014

DATE OF ISSUE: 04/05/2014

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:	04 May, 2014

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: HK1410074

DATE OF ISSUE: 04th May, 2014

CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203016
Equipment No.:	--
Date of Calibration:	04 May, 2014
Date of next Calibration:	04 August, 2014

Parameters:

Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.02	---
4	3.90	-2.5
10	10.1	+1.0
40	41.0	+2.5
100	96.0	-4.0
400	414	+3.5
1000	970	-3.0
	Tolerance Limit (±%)	10.0

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

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

Information supplied by customer:

CONTACT: DEREK LO **WORK ORDER:** HK1410073

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: 30/04/2014

DATE OF ISSUE: 04/05/2014

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.:	1203025
Equipment No.:	--
Date of Calibration:	04 May, 2014

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: HK1410073
DATE OF ISSUE: 04th May, 2014
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203025
Equipment No.:	--
Date of Calibration:	04 May, 2014
Date of next Calibration:	04 August, 2014

Parameters:

Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.02	---
4	3.86	-3.5
10	10.3	+3.0
40	42.0	+5.0
100	97.0	-3.0
400	406	+1.5
1000	975	-2.5
	Tolerance Limit (±%)	10.0

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

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
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS PAULINE WONG	**WORK ORDER:**	HK1412271
CLIENT:	LAM ENVIRONMENTAL SERVICES LTD	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	22/04/2014
		DATE OF ISSUE:	02/05/2014
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 acceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen, pH, Salinity and Temperature
Description:	Mulitmeter
Brand Name:	YSI
Model No.:	PROFESSIONAL PLUS
Serial No.:	11F100597
Equipment No.:	--
Date of Calibration:	29 April, 2014

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.

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}

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1412271
Date of Issue: 02/05/2014
Client: LAM ENVIRONMENTAL SERVICES LTD

Description: Mulitmeter
Brand Name: YSI
Model No.: PROFESSIONAL PLUS
Serial No.: 11F100597
Equipment No.: --
Date of Calibration: 29 April, 2014 Date of next Calibration: 29 July, 2014

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.94	3.88	-0.06
6.10	5.90	-0.20
7.98	7.89	-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	4.16	+0.16
7.0	7.13	+0.13
10.0	10.06	+0.06
	Tolerance Limit (pH Unit)	±0.20

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	9.12	-8.8
20	18.80	-6.0
30	27.70	-7.7
	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.**

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
10.5	10.2	-0.3
25.5	25.3	-0.2
37.5	37.5	0.0
	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
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS PAULINE WONG	**WORK ORDER:**	HK1411576
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	14/04/2014
		DATE OF ISSUE:	17/04/2014
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 acceptance criteria of ALS will be followed.

Scope of Test:	pH, Temperature, Salinity and Dissolved Oxygen
Description:	Multimeter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	11F100420
Equipment No.:	--
Date of Calibration:	17 April, 2014

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.

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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1411576
Date of Issue: 17/04/2014
Client: LAM GEOTECHNICS LIMITED

Description: Multimeter
Brand Name: YSI
Model No.: Professional Plus
Serial No.: 11F100420
Equipment No.: --
Date of Calibration: 17 April, 2014 Date of next Calibration: 17 July, 2014

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.86	3.79	-0.07
5.65	5.76	+0.11
8.02	8.12	+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	6.92	-0.08
10.0	9.97	-0.03
	Tolerance Limit (pH Unit)	±0.20

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	9.57	-4.3
20	18.85	-5.7
30	30.14	+0.5
	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.**

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
9.5	9.9	+0.4
22.0	22.1	+0.1
39.0	39.3	+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 -
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ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MS PAULINE WONG	**WORK ORDER:**	HK1418648
CLIENT:	LAM GEOTECHNICS LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG	**DATE RECEIVED:**	13/06/2014
		DATE OF ISSUE:	24/06/2014
PROJECT:	--		

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	pH, Temperature, Salinity and Dissolved Oxygen
Description:	Multimeter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	13A100242
Equipment No.:	--
Date of Calibration:	19 June, 2014

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.

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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1418648
Date of Issue: 24/06/2014
Client: LAM GEOTECHNICS LIMITED

Description: Multimeter
Brand Name: YSI
Model No.: Professional Plus
Serial No.: 13A100242
Equipment No.: --
Date of Calibration: 19 June, 2014 Date of next Calibration: 19 September, 2014

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
4.38	4.52	+0.14
6.42	6.46	+0.04
7.95	7.87	-0.08
	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	4.07	+0.07
7.0	7.02	+0.02
10.0	10.13	+0.13
	Tolerance Limit (pH Unit)	±0.20

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

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)
0	0.00	--
10	9.40	-6.0
20	18.81	-6.0
30	28.28	-5.7
	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.**

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
12.2	12.1	-0.1
24.4	24.2	-0.2
33.7	33.6	-0.1
	Tolerance Limit (°C)	±2.0

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

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VILLAGE OF CLEVES, OH 45002
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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	:	CMA1b	**Calbration Date**	:	13-May-14
Equipment no.	:	EL452	**Calbration Due Dat**	:	13-Jul-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition			
Temperature, T_a	300 Kelvin	**Pressure, P_a**	1007 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 TSP

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	6.2	6.2	12.4	1.7459	61	60.6070
2	5.1	5.1	10.2	1.5847	51	50.6715
3	4.1	4.1	8.2	1.4223	43	42.7230
4	2.5	2.5	5.0	1.1136	27	26.8261
5	1.4	1.4	2.8	0.8368	14	13.9098

By Linear Regression of Y on X

Slope, m = 50.9704 Intercept, b = -29.3862

Correlation Coefficient* = 0.9991

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Derek Lo
Date	:	13-May-14	**Date**	:	13-May-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA1b	**Calbration Date**	:	2-Jul-14
Equipment no.	:	EL452	**Calbration Due Dat**	:	2-Sep-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	302	Kelvin	**Pressure, P_a**	1009	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 TSP

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	1.7557	60	59.4747
2	5.0	5.0	10.0	1.5656	49	48.5710
3	4.0	4.0	8.0	1.4018	40	39.6498
4	2.7	2.7	5.4	1.1541	26	25.7724
5	1.2	1.2	2.4	0.7739	12	11.8949

By Linear Regression of Y on X

Slope, m = 48.8251 Intercept, b = -27.8761

Correlation Coefficient* = 0.9947

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Henry Lau	**Checked by**	:	Pauline Wong
Date	:	2-Jul-14	**Date**	:	2-Jul-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA2a	**Calbration Date**	:	13-May-14
Equipment no.	:	EL449	**Calbration Due Dat**	:	13-Jul-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition			
Temperature, T_a	300 Kelvin	**Pressure, P_a**	1007 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 TSP

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	6.1	6.1	12.2	1.7319	61	60.6070
2	5.2	5.2	10.4	1.6000	53	52.6586
3	4.0	4.0	8.0	1.4050	43	42.7230
4	2.4	2.4	4.8	1.0914	26	25.8325
5	1.4	1.4	2.8	0.8368	14	13.9098

By Linear Regression of Y on X

Slope, m	=	52.1379	Intercept, b	=	-30.3543
Correlation Coefficient*	=	0.9995			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Derek Lo
Date	:	13-May-14	**Date**	:	13-May-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA2a	**Calbration Date**	:	2-Jul-14
Equipment no.	:	EL449	**Calbration Due Dat**	:	2-Sep-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	302	Kelvin	**Pressure, P_a**	1009	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 TSP						
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	6.1	6.1	12.2	1.7279	60	59.4747
2	4.7	4.7	9.4	1.5183	54	53.5273
3	3.7	3.7	7.4	1.3487	48	47.5798
4	2.3	2.3	4.6	1.0662	40	39.6498
5	1.4	1.4	2.8	0.8349	30	29.7374

By Linear Regression of Y on X

Slope, m	=	32.7993	Intercept, b	=	3.3810
Correlation Coefficient*	=	0.9971			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Henry Lau	**Checked by**	:	Pauline Wong
Date	:	2-Jul-14	**Date**	:	2-Jul-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA3a	**Calbration Date**	:	21-Jun-14
Equipment no.	:	EL333	**Calbration Due Dat**	:	21-Aug-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	301	Kelvin	**Pressure, P_a**	1003	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 TSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** $(W(P_a/1013.3x298/T_a)^{1/2}/35.31)$ **Y-axis**
	(up)	(down)	(difference)			
1	5.5	5.5	11.0	1.6392	61	60.3860
2	4.4	4.4	8.8	1.4676	52	51.4766
3	3.7	3.7	7.4	1.3469	43	42.5672
4	2.4	2.4	4.8	1.0874	26	25.7383
5	1.5	1.5	3.0	0.8626	14	13.8591

By Linear Regression of Y on X

Slope, m = 61.3367 Intercept, b = -39.7515

Correlation Coefficient* = 0.9987

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Pauline Wong
Date	:	21-Jun-14	**Date**	:	21-Jun-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA4a	**Calbration Date**	:	13-May-14
Equipment no.	:	EL390	**Calbration Due Dat**	:	13-Jul-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	300	Kelvin	**Pressure, P_a**	1007	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 TSP						
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	1.7177	62	61.6006
2	5.1	5.1	10.2	1.5847	53	52.6586
3	4.0	4.0	8.0	1.4050	43	42.7230
4	2.6	2.6	5.2	1.1354	27	26.8261
5	1.5	1.5	3.0	0.8657	13	12.9163

By Linear Regression of Y on X

Slope, m	=	56.9672	Intercept, b	=	-37.0880
Correlation Coefficient*	=	0.9993			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Derek Lo
Date	:	13-May-14	**Date**	:	13-May-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location : CMA4a

Calbration Date : 2-Jul-14

Equipment no. : EL390

Calbration Due Dat : 2-Sep-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	302	Kelvin	**Pressure, P_a**	1009	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 TSP

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	6.2	6.2	12.4	1.7419	60	59.4747
2	5.3	5.3	10.6	1.6115	52	51.5448
3	4.1	4.1	8.2	1.4190	43	42.6236
4	2.7	2.7	5.4	1.1541	24	23.7899
5	1.4	1.4	2.8	0.8349	12	11.8949

By Linear Regression of Y on X

Slope, m = 53.7477 Intercept, b = -34.8156

Correlation Coefficient* = 0.9945

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

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

** Delete as appropriate.

Remarks :

Calibrated by : Felix Li

Checked by : Pauline Wong

Date : 2-Jul-14

Date : 2-Jul-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA5a	**Calbration Date**	:	21-Jun-14
Equipment no.	:	EL380	**Calbration Due Dat**	:	21-Aug-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	301	Kelvin	**Pressure, P_a**	1003	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 TSP						
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	5.6	5.6	11.2	1.6539	61	60.3860
2	4.8	4.8	9.6	1.5323	52	51.4766
3	3.5	3.5	7.0	1.3104	42	41.5772
4	2.3	2.3	4.6	1.0648	26	25.7383
5	1.2	1.2	2.4	0.7729	13	12.8691

By Linear Regression of Y on X

Slope, m	=	53.8279	Intercept, b	=	-29.7835
Correlation Coefficient*	=	0.9974			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Pauline Wong
Date	:	21-Jun-14	**Date**	:	21-Jun-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA6a	**Calbration Date**	:	13-May-14
Equipment no.	:	EL448	**Calbration Due Dat**	:	13-Jul-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	300	Kelvin	**Pressure, P_a**	1007	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 TSP

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	6.1	6.1	12.2	1.7319	62	61.6006
2	5.0	5.0	10.0	1.5692	52	51.6650
3	4.0	4.0	8.0	1.4050	42	41.7294
4	2.4	2.4	4.8	1.0914	25	24.8389
5	1.5	1.5	3.0	0.8657	13	12.9163

By Linear Regression of Y on X

Slope, m = 55.9776 Intercept, b = -36.0474

Correlation Coefficient* = 0.9995

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

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

** Delete as appropriate.

Remarks :

Calibrated by	:	Felix Li	**Checked by**	:	Derek Lo
Date	:	13-May-14	**Date**	:	13-May-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA6a	**Calbration Date**	:	2-Jul-14
Equipment no.	:	EL448	**Calbration Due Dat**	:	2-Sep-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	302	Kelvin	**Pressure, P_a**	1009	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 TSP						
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	6.2	6.2	12.4	1.7419	60	59.4747
2	5.1	5.1	10.2	1.5811	52	51.5448
3	4.3	4.3	8.6	1.4529	42	41.6323
4	2.3	2.3	4.6	1.0662	23	22.7986
5	1.6	1.6	3.2	0.8916	12	11.8949

By Linear Regression of Y on X

Slope, m = 55.4756 Intercept, b = -37.2410

Correlation Coefficient* = 0.9984

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Henry Lau	**Checked by**	:	Pauline Wong
Date	:	2-Jul-14	**Date**	:	2-Jul-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	MA1e	**Calbration Date**	:	13-May-14
Equipment no.	:	EL455	**Calbration Due Dat**	:	13-Jul-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	300	Kelvin	**Pressure, P_a**	1007	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 TSP						
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	6.2	6.2	12.4	1.7459	62	61.6006
2	5.1	5.1	10.2	1.5847	52	51.6650
3	4.1	4.1	8.2	1.4223	43	42.7230
4	2.5	2.5	5.0	1.1136	26	25.8325
5	1.6	1.6	3.2	0.8936	15	14.9034

By Linear Regression of Y on X

Slope, m	=	54.6458	Intercept, b	=	-34.5374
Correlation Coefficient*	=	0.9995			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Derek Lo
Date	:	13-May-14	**Date**	:	13-May-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	MA1e	**Calbration Date**	:	21-Jun-14
Equipment no.	:	EL455	**Calbration Due Dat**	:	21-Aug-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	301	Kelvin	**Pressure, P_a**	1003	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 TSP						
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	6.5	6.5	13.0	1.7808	57	56.4262
2	4.2	4.2	8.4	1.4342	48	47.5168
3	3.3	3.3	6.6	1.2728	42	41.5772
4	2.1	2.1	4.2	1.0181	32	31.6779
5	1.4	1.4	2.8	0.8338	28	27.7182

By Linear Regression of Y on X

Slope, m = 31.5589 Intercept, b = 0.9687

Correlation Coefficient* = 0.9958

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Pauline Wong
Date	:	21-Jun-14	**Date**	:	21-Jun-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	MA1w	**Calbration Date**	:	21-Jun-14
Equipment no.	:	EL080	**Calbration Due Dat**	:	21-Aug-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	301	Kelvin	**Pressure, P_a**	1003	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 TSP						
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	6.3	6.3	12.6	1.7534	53	52.4665
2	5.1	5.1	10.2	1.5790	48	47.5168
3	4.2	4.2	8.4	1.4342	40	39.5974
4	2.6	2.6	5.2	1.1313	30	29.6980
5	1.8	1.8	3.6	0.9436	24	23.7584

By Linear Regression of Y on X

Slope, m = 36.2029 Intercept, b = -10.9288

Correlation Coefficient* = 0.9965

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

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

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Felix Li	**Checked by**	:	Pauline Wong
Date	:	21-Jun-14	**Date**	:	21-Jun-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	ACL1	**Calbration Date**	:	21-Jun-14
Equipment no.	:	EL222	**Calbration Due Dat**	:	21-Aug-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	301	Kelvin	**Pressure, P_a**	1003	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 TSP						
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	5.8	5.8	11.6	1.6830	56	55.4363
2	4.4	4.4	8.8	1.4676	48	47.5168
3	3.7	3.7	7.4	1.3469	43	42.5672
4	2.2	2.2	4.4	1.0417	34	33.6578
5	1.5	1.5	3.0	0.8626	26	25.7383

By Linear Regression of Y on X

Slope, m = 35.2472 Intercept, b = -4.1457

Correlation Coefficient* = 0.9981

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

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

** Delete as appropriate.

Remarks :

Calibrated by	:	Felix Li	**Checked by**	:	Pauline Wong
Date	:	21-Jun-14	**Date**	:	21-Jun-14

Lam Geotechincs Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	ACL2a	**Calbration Date**	:	3-Jun-14
Equipment no.	:	EL111	**Calbration Due Dat**	:	3-Aug-14

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	303	Kelvin	**Pressure, P_a**	1004	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 TSP						
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	6.2	6.2	12.4	1.7347	61	60.2164
2	5.1	5.1	10.2	1.5746	53	52.3191
3	4.2	4.2	8.4	1.4302	46	45.4091
4	2.6	2.6	5.2	1.1282	33	32.5761
5	1.6	1.6	3.2	0.8879	23	22.7045

By Linear Regression of Y on X

Slope, m	=	44.0592	Intercept, b	=	-16.8841
Correlation Coefficient*	=	0.9993			
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	:	3-Jun-14	**Date**	:	3-Jun-14