

**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION****Information supplied by customer:**

**CONTACT:** DEREK LO **WORK ORDER:** HK1410350  
**CLIENT:** LAM GEOTECHNICS LIMITED  
**DATE RECEIVED:** 2014-11-25  
**DATE OF ISSUE:** 2014-12-02  
**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.

<b>Scope of Test:</b>	Turbidity
<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203010
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	25-Nov-14

**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

This report may not be reproduced except with prior written approval from Pilot Testing Limited.

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:** HK1410350  
**DATE OF ISSUE:** 2014-12-02  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203010
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	25-Nov-14
<b>Date of next Calibration:</b>	25-Feb-15

**Parameters:****Turbidity**Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	3.86	-3.5
10	10.2	2.0
40	39.1	-2.3
100	104	4.0
400	412	3.0
1000	994	-0.6
	<b>Tolerance Limit (±%)</b>	<b>10.0</b>

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

**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION****Information supplied by customer:**

**CONTACT:** DEREK LO **WORK ORDER:** HK1410310  
**CLIENT:** LAM GEOTECHNICS LIMITED  
**DATE RECEIVED:** 9/10/2014  
**DATE OF ISSUE:** 16/10/2014  
**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.

<b>Scope of Test:</b>	Turbidity
<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203008
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	09-Oct-14

**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

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**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**WORK ORDER:** HK1410310  
**DATE OF ISSUE:** 16/10/2014  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203008
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	09-Oct-14
<b>Date of next Calibration:</b>	09-Jan-15

**Parameters:****Turbidity**Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	4.13	3.3
10	10.3	3.0
40	39.8	-0.5
100	101	1.0
400	380	-5.0
1000	980	-2.0
	Tolerance Limit ( $\pm\%$ )	10.0

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

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**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**Information supplied by customer:**

**CONTACT:** SAM LAM **WORK ORDER:** HK1510001  
**CLIENT:** LAM GEOTECHNICS LIMITED  
**DATE RECEIVED:** 06/01/2015  
**DATE OF ISSUE:** 13/01/2015  
**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.

<b>Scope of Test:</b>	Turbidity
<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203008
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	08/01/2015

**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

This report may not be reproduced except with prior written approval from Pilot Testing Limited.

**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**WORK ORDER:** HK1510001  
**DATE OF ISSUE:** 13/01/2015  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203008
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	08/01/2015
<b>Date of next Calibration:</b>	08/04/2015

**Parameters:****Turbidity**Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.01	---
4	3.97	-0.7
10	10.2	2.0
40	38.5	-3.8
100	101	1.0
400	380	-5.0
1000	982	-1.8
	<b>Tolerance Limit (<math>\pm</math>%)</b>	<b>10.0</b>

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

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**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**Information supplied by customer:**

**CONTACT:** DEREK LO **WORK ORDER:** HK1410311  
**CLIENT:** LAM GEOTECHNICS LIMITED  
**DATE RECEIVED:** 9/10/2014  
**DATE OF ISSUE:** 16/10/2014  
**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.

<b>Scope of Test:</b>	Turbidity
<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203015
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	09-Oct-14

**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

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**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**WORK ORDER:** HK1410311  
**DATE OF ISSUE:** 16/10/2014  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203015
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	09-Oct-14
<b>Date of next Calibration:</b>	09-Jan-15

**Parameters:**  
**Turbidity**

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	3.90	-2.5
10	10.2	2.0
40	39.3	-1.8
100	103	3.0
400	388	-3.0
1000	986	-1.4
	<b>Tolerance Limit (<math>\pm\%</math>)</b>	<b>10.0</b>

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

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**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**Information supplied by customer:**

**CONTACT:** SAM LAM **WORK ORDER:** HK1510002  
**CLIENT:** LAM GEOTECHNICS LIMITED  
**DATE RECEIVED:** 06/01/2015  
**DATE OF ISSUE:** 13/01/2015  
**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.

<b>Scope of Test:</b>	Turbidity
<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203015
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	08/01/2015

**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

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**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

**WORK ORDER:** HK1510002  
**DATE OF ISSUE:** 13/01/2015  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type:</b>	Turbidimeter
<b>Brand Name:</b>	Xin Rui
<b>Model No.:</b>	WGZ-3B
<b>Serial No.:</b>	1203015
<b>Equipment No.:</b>	---
<b>Date of Calibration:</b>	08/01/2015
<b>Date of next Calibration:</b>	08/04/2015

**Parameters:****Turbidity**Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)
0	0.00	---
4	4.20	5.0
10	9.80	-2.0
40	41.0	2.5
100	100	0.0
400	420	5.0
1000	990	-1.0
	<b>Tolerance Limit (±%)</b>	<b>10.0</b>

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

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www.alsglobal.com

## REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

**CONTACT:** MR ALAN LI  
**CLIENT:** LAM GEOTECHNICS LIMITED  
**ADDRESS:** 11/F., CENTRE POINT,  
181-185 GLOUCESTER ROAD,  
WAN CHAI, HONG KONG

**WORK ORDER:** HK1436509  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 10/11/2014  
**DATE OF ISSUE:** 17/11/2014


### 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: Dissolved Oxygen, pH, Salinity and Temperature  
Equipment Type: Multifunctional Meter  
Brand Name: YSI  
Model No.: Professional Plus  
Serial No.: 11F100597  
Equipment No.: --  
Date of Calibration: 17 November, 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:** HK1436509  
**Date of Issue:** 17/11/2014  
**Client:** LAM GEOTECHNICS LIMITED



**Equipment Type:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** Professional Plus  
**Serial No.:** 11F100597  
**Equipment No.:** --  
**Date of Calibration:** 17 November, 2014

**Date of next Calibration:** 17 February, 2015

**Parameters:**

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.60	3.57	-0.03
6.24	6.20	-0.04
8.06	8.03	-0.03
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	4.09	+0.09
7.0	7.19	+0.19
10.0	10.02	+0.02
Tolerance Limit (pH unit)		±0.20

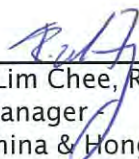
**Salinity**      **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.57	-4.3
20	19.70	-1.5
30	29.86	-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.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
11.0	11.4	+0.4
21.5	21.9	+0.4
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  
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## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**CONTACT:** MR ALAN LI  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD  
**ADDRESS:** 11/F., CENTRE POINT,  
181-185 GLOUCESTER ROAD,  
WAN CHAI, HONG KONG

**WORK ORDER:** HK1435131  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 29/10/2014  
**DATE OF ISSUE:** 05/11/2014

### 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: Dissolved Oxygen, pH, Salinity and Temperature  
Equipment Type: Multifunctional Meter  
Brand Name: YSI  
Model No.: Professional Plus  
Serial No.: 14E100105  
Equipment No.: --  
Date of Calibration: 31 October, 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:** HK1435131  
**Date of Issue:** 05/11/2014  
**Client:** LAM ENVIRONMENTAL SERVICES LTD



**Equipment Type:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** Professional Plus  
**Serial No.:** 14E100105  
**Equipment No.:** --

**Date of Calibration:** 31 October, 2014      **Date of next Calibration:** 31 January, 2015

**Parameters:**

**Dissolved Oxygen**

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.46	2.58	+0.12
5.04	4.91	-0.13
8.02	7.92	-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	3.98	-0.02
7.0	6.98	-0.02
10.0	10.05	+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	9.58	-4.2
20	19.48	-2.6
30	30.32	+1.1
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)
13.4	13.7	+0.3
23.8	24.0	+0.2
33.8	33.6	-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



## EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

**Report No.** : HK1410306  
**Project Name** : EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT  
**Date of Issue** : 16/10/2014  
  
**Customer** : LAM GEOTECHNICS LIMITED  
**Address** : 11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

---

**Calibration Job No.** : HK1410306  
**Test Item No.** : HK1410306-01  
**Test Item Details**  
**Test Item Description** : Multifunctional Meter  
**Manufacturer** : YSI  
**Model No.** : YSI 600XL  
**Serial No.** : 05C1607  
**Test Item Receipt Date** : 13-Oct-14  
**Test Period** : 14/10/2014 - 15/10/2014

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- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
  2. Results relate to item(s) as received.
  3.  $\pm$  indicates the tolerance limit
  4. N/A = Not applicable
  5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
  6. DO, salinity, pH and temperature performance check was subcontracted to FT Laboratories Ltd.

Approved Signatory

\_\_\_\_\_  
 Peter Lee  
 (Director)

Issue Date:

16/10/2014


**REPORT OF EQUIPMENT PERFORMANCE CHECK**

**WORK ORDER:** HK1410306  
**DATE OF ISSUE:** 16/10/2014  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type</b>	Multifunctional Meter
<b>Manufacturer</b>	YSI
<b>Model No.</b>	YSI 600XL
<b>Serial No.</b>	05C1607
<b>Date of Calibration</b>	14-Oct-14
<b>Date of next Calibration</b>	14-Jan-15

**Parameters:**
**Temperature (Method Ref: APHA 19e 2550B)**

Reference Reading (°C)	Temperature corrected of Thermometer (°C)	Display Reading (°C)	Deviation (°C)
10.21	10.37	10.33	-0.04
19.97	20.13	20.12	-0.01
30.02	30.18	30.16	-0.02
Tolerance Limit			±0.50

**pH Value (Method Ref: APHA 19e 4500-H, B)**

Expected Reading (pH unit)	pH unit of buffer at 20 °C (pH unit)	Display Reading at 20 °C (pH unit)	Deviation (pH unit)
6.0	6.01	5.89	-0.12
9.0	9.02	8.85	-0.17
Tolerance Limit			±0.20

**Conductivity (Method Ref: APHA 19e 2520B)**

KCl concentration (mol/L)	Standard conductivity (ms/cm) at 25°C	Reading of SpCond (ms/cm)	Deviation (%)
0.0000	0.00	0.00	-
0.1000	12.89	12.82	-0.54
0.2000	24.8	24.78	-0.08
0.5000	58.67	58.43	-0.41
Tolerance Limit			±2.0

**Dissolved Oxygen (DO) (Method Ref: (APHA 19e 4500-O, C)**

DO of water sample (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
4.15	3.98	-0.17
6.24	6.14	-0.10
8.16	8.15	-0.01
Tolerance Limit		±0.20

- Remarks:
- (1) Maxium tolerance ans calibration frequency stated in the reprot, unless otherwisestated, the internal acceptance criteria of Pilot Testing Limited will be followed.
  - (2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
  - (3) Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

- End of Report -





## EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

**Report No.** : HK1510022  
**Project Name** : EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT  
**Date of Issue** : 26/01/2015  
  
**Customer** : LAM GEOTECHNICS LIMITED  
**Address** : 11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

---

**Calibration Job No.** : HK1510022  
**Test Item No.** : HK1510022-01  
**Test Item Details**  
**Test Item Description** : Multifunctional Meter  
**Manufacturer** : YSI  
**Model No.** : Professional Plus  
**Serial No.** : 14M100277  
**Performance Method** : Checked according to in-house method CAL005  
 (References: Temperature (Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure), pH value (APHA 21e 4500H:B), Salinity (Refer to Conductivity APHA 19e 2510B ) , Dissolved oxygen (APHA 19e 4500-O,C))

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**Test Item Receipt Date** : 19-Jan-15  
**Test Item Calibration Date** : 19-Jan-15  
**Test Period** : 19/01/2015 - 26/01/2015

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- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
  2. Results relate to item(s) as received.
  3.  $\pm$  indicates the tolerance limit
  4. N/A = Not applicable
  5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
  6. DO, pH, salinity and temperature performance check was conducted by Pilot Testing Limited.
  7. Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

Approved Signatory

Mr. Peter Lee  
(Director)

Issue Date:

26/01/2015


**REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION**

**WORK ORDER:** HK1510022  
**DATE OF ISSUE:** 26/01/2015  
**CLIENT:** LAM GEOTECHNICS LIMITED

<b>Equipment Type</b>	Multifunctional Meter
<b>Manufacturer</b>	YSI
<b>Model No.</b>	Professional Plus
<b>Serial No.</b>	14M100277
<b>Date of Calibration</b>	19-Jan-15
<b>Date of next Calibration</b>	19-Apr-15

**Parameters:**

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

Reference Reading (°C)	Display Reading (°C)	Deviation (°C)
10.4	10.8	+0.4
19.9	20.1	+0.2
30.2	30.0	-0.2
	<b>Tolerance Limit</b>	<b>±2.0</b>

**pH Value (Method Ref: APHA21e, 4500H:B)**

Expected Reading (pH unit)	Reference Reading (pH unit)	Display Reading (pH unit)	Deviation (pH unit)
4.0	4.05	4.07	+0.02
7.0	7.02	7.04	+0.02
10.0	9.99	10.18	+0.19
	<b>Tolerance Limit</b>		<b>±0.20</b>

**Conductivity (Method Ref: APHA 19e, 2510)**

KCl concentration (mol/L)	Reference Reading (ms/cm)	Display Reading (ms/cm)	Deviation (%)
0.0000	0.00	0.00	--
0.1000	12.89	12.99	+0.74
0.2000	24.80	24.91	+0.43
0.5000	58.67	59.21	+0.93
	<b>Tolerance Limit</b>		<b>±2.0</b>

**Dissolved Oxygen (DO) (Method Ref: APHA 19e, 4500-O, C)**

Reference DO reading (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
8.28	8.22	-0.06
4.67	4.59	-0.08
1.42	1.48	+0.06
	<b>Tolerance Limit</b>	<b>±0.20</b>

- Remarks:
- (1) Maxium tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.
  - (2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
  - (3) Because of high sensitivity and ease of measurement, the conductivity method (accoriding to APHA 19e 2510) is used to determine salinity.

- End of Report -



TISCH ENVIRONMENTAL, INC.  
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ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jul 14, 2014 Rootsmeter S/N 0438320 Ta (K) - 298  
 Operator Tisch Orifice I.D. - 0005 Pa (mm) - 749.3

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	1.3870	3.2	2.00
2	NA	NA	1.00	0.9830	6.4	4.00
3	NA	NA	1.00	0.8760	7.9	5.00
4	NA	NA	1.00	0.8340	8.8	5.50
5	NA	NA	1.00	0.6860	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9817	0.7078	1.4042	0.9957	0.7179	0.8919
0.9775	0.9944	1.9859	0.9915	1.0086	1.2613
0.9754	1.1135	2.2203	0.9894	1.1294	1.4101
0.9743	1.1683	2.3286	0.9882	1.1849	1.4790
0.9692	1.4128	2.8084	0.9830	1.4330	1.7837
Qstd slope (m) = 1.99175			Qa slope (m) = 1.24720		
intercept (b) = -0.00041			intercept (b) = -0.00026		
coefficient (r) = 0.99991			coefficient (r) = 0.99991		
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 Geotechnics Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : CMA1b Calibration Date : 18-Dec-14  
 Equipment no. : EL452 Calibration Due Date : 18-Feb-15

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	287	Kelvin	Pressure, P <sub>a</sub>
			1026 mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m <sub>c</sub>	1.99175	Intercept, b <sub>c</sub>	-0.00041
Last Calibration Date	14-Jul-14	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	14-Jul-15				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	6.2	6.2	12.4	1.8130	65	66.6477
2	4.5	4.5	9.0	1.5446	55	56.3942
3	3.9	3.9	7.8	1.4380	50	51.2675
4	2.5	2.5	5.0	1.1513	42	43.0647
5	1.4	1.4	2.8	0.8616	31	31.7858

By Linear Regression of Y on X

Slope, m = 36.0094 Intercept, b = 0.7978  
 Correlation Coefficient\* = 0.9981  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_

Calibrated by : Henry Lau Checked by : Derek Lo  
 Date : 18-Dec-14 Date : 18-Dec-14



Lam Geotechnics Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : CMA2a  
 Equipment no. : EL449

Calibration Date : 18-Dec-14  
 Calibration Due Date : 18-Feb-15

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	287	Kelvin	Pressure, P <sub>a</sub>
			1026 mmHg

Orifice Transfer Standard Information				
Equipment No.	EL086	Slope, m <sub>c</sub>	1.99175	Intercept, b <sub>c</sub>
				-0.00041
Last Calibration Date	14-Jul-14	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$		
Next Calibration Date	14-Jul-15			

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	6.1	6.1	12.2	1.7983	62	63.5717
2	4.9	4.9	9.8	1.6118	55	56.3942
3	3.7	3.7	7.4	1.4006	49	50.2421
4	2.3	2.3	4.6	1.1043	40	41.0140
5	1.2	1.2	2.4	0.7977	32	32.8112

By Linear Regression of Y on X

Slope, m = 30.4893      Intercept, b = 7.8731  
 Correlation Coefficient\* = 0.9984  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_  
 \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 18-Dec-14

Checked by : Derek Lo  
 Date : 18-Dec-14



Lam Geotechnics Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : CMA3a  
 Equipment no. : EL333

Calibration Date : 18-Dec-14  
 Calibration Due Date : 18-Feb-15

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	287	Kelvin	Pressure, P <sub>a</sub>
			1026 mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m <sub>c</sub>	1.99175	Intercept, b <sub>c</sub>	-0.00041
Last Calibration Date	14-Jul-14	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	14-Jul-15				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	5.5	5.5	11.0	1.7076	56	57.4196
2	4.3	4.3	8.6	1.5099	47	48.1914
3	3.2	3.2	6.4	1.3026	44	45.1154
4	2.5	2.5	5.0	1.1513	38	38.9633
5	1.2	1.2	2.4	0.7977	25	25.6337

By Linear Regression of Y on X

Slope, m = 33.6450      Intercept, b = -0.4658  
 Correlation Coefficient\* = 0.9920  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 18-Dec-14

Checked by : Derek Lo  
 Date : 18-Dec-14



Lam Geotechnics Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : CMA4a Calibration Date : 18-Dec-14  
 Equipment no. : EL390 Calibration Due Date : 18-Feb-15

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	287	Kelvin	Pressure, P <sub>a</sub>
			1026 mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m <sub>c</sub>	1.99175	Intercept, b <sub>c</sub>	-0.00041
Last Calibration Date	14-Jul-14	$\left( \frac{H \times P_a}{1013.3 \times 298 / T_a} \right)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	14-Jul-15				

Calibration of TSP						
Calibration Point	Manometer Reading H (inches of water)			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	6.0	6.0	12.0	1.7835	65	66.6477
2	4.7	4.7	9.4	1.5785	52	53.3182
3	3.5	3.5	7.0	1.3622	45	46.1407
4	2.2	2.2	4.4	1.0801	32	32.8112
5	1.4	1.4	2.8	0.8616	27	27.6844

By Linear Regression of Y on X

Slope, m = 41.9297 Intercept, b = -10.5801  
 Correlation Coefficient\* = 0.9901  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_

Calibrated by : Henry Lau Checked by : Derek Lo  
 Date : 18-Dec-14 Date : 18-Dec-14



Lam Geotechnics Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : CMA5b  
 Equipment no. : EL222

Calibration Date : 4-Dec-14  
 Calibration Due Date : 4-Mar-15

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	288	Kelvin	Pressure, P <sub>a</sub>
			1021 mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m <sub>c</sub>	1.99175	Intercept, b <sub>c</sub>	-0.00041
Last Calibration Date	14-Jul-14	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	14-Jul-15				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	5.8	5.8	11.6	1.7462	60	61.2642
2	4.6	4.6	9.2	1.5552	54	55.1378
3	3.5	3.5	7.0	1.3566	48	49.0114
4	2.3	2.3	4.6	1.0997	41	41.8639
5	1.4	1.4	2.8	0.8580	34	34.7164

By Linear Regression of Y on X

Slope, m = 29.6907      Intercept, b = 9.1139  
 Correlation Coefficient\* = 0.9997  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 4-Dec-14

Checked by : Derek Lo  
 Date : 4-Dec-14





Lam Geotechnics Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : CMA6a Calibration Date : 18-Dec-14  
 Equipment no. : EL448 Calibration Due Date : 18-Feb-15

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	287	Kelvin	Pressure, P <sub>a</sub>
			1026 mmHg

Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, m <sub>c</sub>	1.99175	Intercept, b <sub>c</sub>	-0.00041
Last Calibration Date	14-Jul-14	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	14-Jul-15				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	6.1	6.1	12.2	1.7983	55	56.3942
2	5.3	5.3	10.6	1.6763	49	50.2421
3	3.5	3.5	7.0	1.3622	41	42.0393
4	2.2	2.2	4.4	1.0801	36	36.9126
5	1.2	1.2	2.4	0.7977	25	25.6337

By Linear Regression of Y on X

Slope, m = 28.5508 Intercept, b = 3.9029  
 Correlation Coefficient\* = 0.9912  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_

Calibrated by : Henry Lau Checked by : Derek Lo  
 Date : 18-Dec-14 Date : 18-Dec-14