



## DUBAI ACCREDITATION CENTER

### REPORT ON 156<sup>TH</sup> LABORATORY PROFICIENCY TESTING DETERMINATION OF ACID SOLUBLE SULPHATE CONTENT OF SOIL

6 MARCH 2008

#### 1. INTRODUCTION

This document presents the results of the 156<sup>th</sup> inter-laboratory proficiency-testing program conducted during the month of November involving the **Determination of Acid Soluble Sulphate Content of Soil** with twenty two laboratories participating.

This program is part of the Inter-laboratory Comparison Programs organized by the Dubai Accreditation Center (DAC) of Dubai Municipality (DM) for monitoring the validity of test results of laboratories operating in Dubai as a requirement of the Local Order 52/1990 and ISO/IEC 17011: 2004.

#### 2. EXPERIMENTAL DESIGN

##### 2.1 Homogeneity:

DAC ensure the homogeneity of the samples prior to their distribution to the participating laboratories by conducting homogeneity test on six samples (randomly selected). Based on the test results the homogeneity is statistically evaluated as per *ISO 13528:2005 as explained in DAC-G3-03*.

##### 2.2 Participants:

Nineteen private laboratories and three governmental laboratories (eleven of them are accredited by DAC for construction materials testing) participated in this program.

##### 2.3 Samples Tested:

One sample of Soil approximately 1KG was distributed to all participating laboratories.

#### 3. CONFIDENTIALITY

Each laboratory is given a code number to maintain confidentiality of results and to protect their identities. Only the concerned laboratory knows its code number.

#### 4. TEST METHOD

Instructions were given to the participants to test the samples as per BS 1377: 1990 Part 3, Cl.5

#### 5. TEST RESULTS

The test results submitted by the participating laboratories are presented in Appendix A. In order to protect the identity of the participating laboratories, each one was assigned a code number. The numbers in the column headings, Lab #, of the tables represents the code numbers for the participating laboratories.



## DUBAI ACCREDITATION CENTER

### 6. EVALUATION OF RESULTS

#### 6.1 Method of Analysis

The analysis of the participant's results is based on *ISO 13528:2005 (Statistical Methods for the Use in Proficiency Testing by Inter-laboratory Comparisons)*

#### 6.2 Calculations of Z- scores

Appendix B gives the details of the calculation of the laboratories results and their Z- Scores from the raw data which are obtained from the raw data. Also Z- Score and participant's results are represented in a bar chart and X-Y scattered plots C. The Z-Score analysis is based on an international Standard (*ISO 13528:2005*).

#### 6.3 Outlier Results

Test	Labs outside the z-scores $\pm 3$
Acid Soluble Sulphate Content of Soil	Lab 5 Lab 21

### 7. CONCLUSION AND RECOMMENDATIONS

The test results provided by the abovementioned laboratories are outside the Z score limits of  $\pm 3$ , the abovementioned laboratories are requested to investigate the root cause of the outlier results, implement corrective action and email a report within 2 weeks to Accreditation Decisions Section of the Dubai Accreditation Center to the following address [msrassol@dm.gov.ae](mailto:msrassol@dm.gov.ae).

### 8. APPENDICES

8.1 Appendix A: Raw Data

8.2 Appendix B: Calculation of z-scores and other statistics

8.3 Appendix C: Charts

## Appendix A: Raw Data

### Acid Soluble Sulphate Content of Soil

Lab #	Sample No	Results
Lab 2	15602	0.17
Lab 3	15604	0.16
Lab 4	15605	0.17
Lab 5	15606	0.32
Lab 6	15607	0.16
Lab 7	15608	0.15
Lab 8	15609	0.15
Lab 9	15610	0.15
Lab 10	15612	0.16
Lab 11	15613	0.16
Lab 12	15614	0.16
Lab 13	15615	0.15
Lab 14	15616	0.16
Lab 15	15618	0.16
Lab 16	15619	0.17
Lab 17	15620	0.16
Lab 18	15621	0.17
Lab 19	15623	0.14
Lab 20	15624	0.15
Lab 21	15625	0.02
Lab 22	15626	0.17
Lab 23	15627	0.19

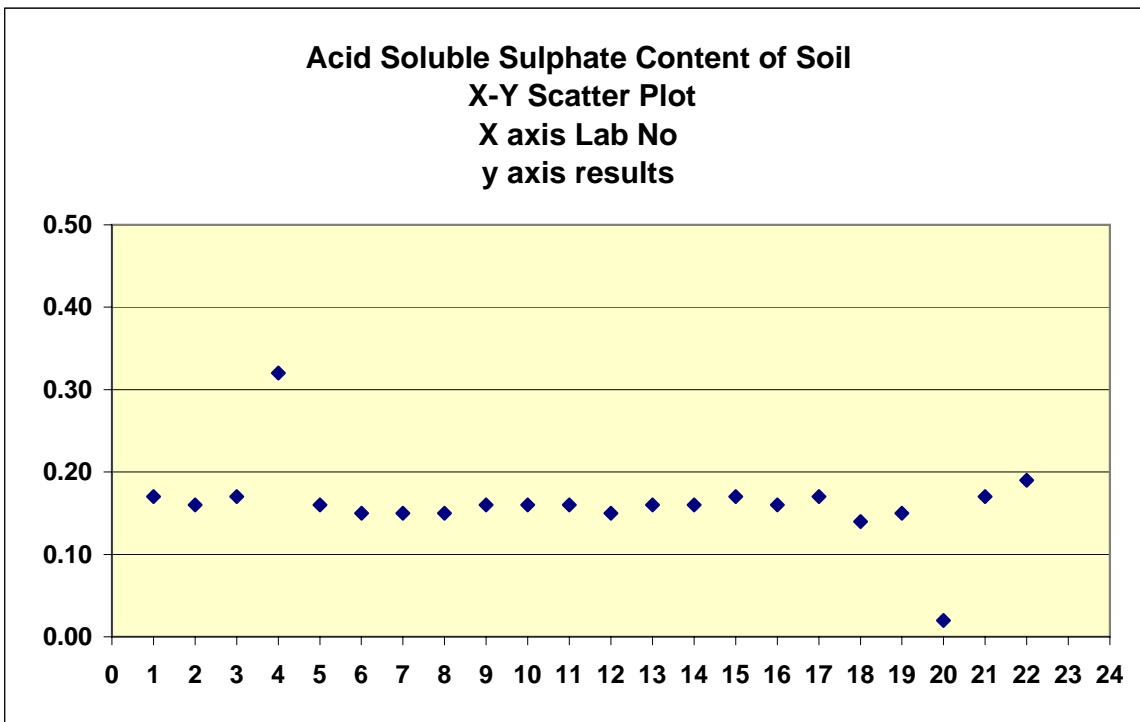
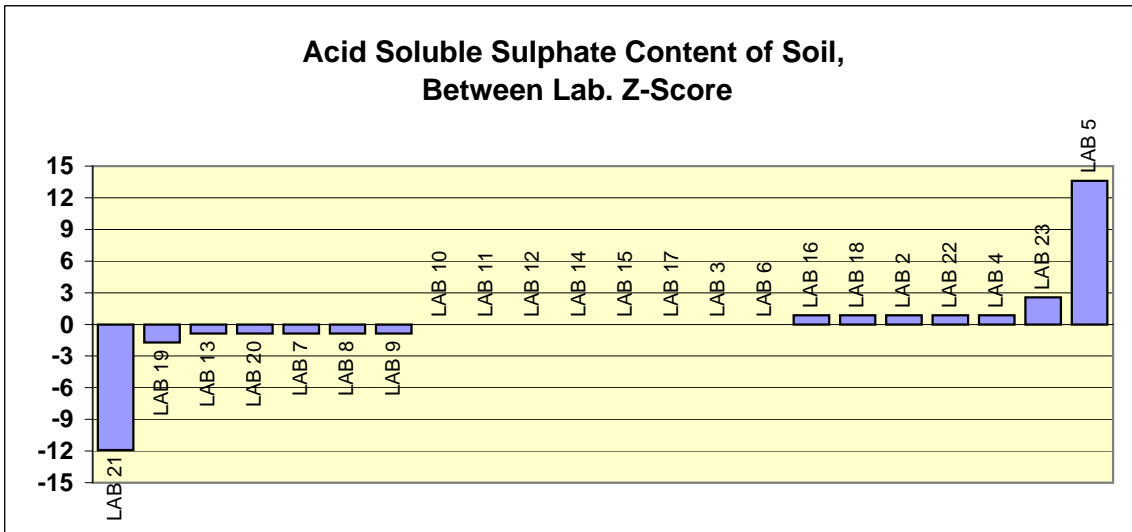
## Appendix B: Calculation of z-scores and other statistics

### Acid Soluble Sulphate Content of Soil

Iteration	0	xi-x*	1	(xi-x*) <sup>2</sup>	2	(xi-x*) <sup>2</sup>	3	(xi-x*) <sup>2</sup>	4	(xi-x*) <sup>2</sup>	5	(xi-x*) <sup>2</sup>	6	(xi-x*) <sup>2</sup>	Z Score	
$\delta = 1.5 s^*$	---		0.02		0.02		0.02		0.02		0.02		0.02			
$x^* - \delta$	---		0.14		0.14		0.14		0.14		0.14		0.14			
$x^* + \delta$	---		0.18		0.18		0.18		0.18		0.18		0.18			
LAB 2	0.17	0.01	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.85	LAB 21 <b>-11.90</b>
LAB 3	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 19 <b>-1.70</b>
LAB 4	0.17	0.01	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.85	LAB 13 <b>-0.85</b>
LAB 5	0.32	0.16	0.18	0.00	0.18	0.00	0.18	0.00	0.18	0.00	0.18	0.00	0.18	0.00	13.60	LAB 20 <b>-0.85</b>
LAB 6	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 7 <b>-0.85</b>
LAB 7	0.15	0.01	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	-0.85	LAB 8 <b>-0.85</b>
LAB 8	0.15	0.01	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	-0.85	LAB 9 <b>-0.85</b>
LAB 9	0.15	0.01	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	-0.85	LAB 10 <b>0.00</b>
LAB 10	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 11 <b>0.00</b>
LAB 11	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 12 <b>0.00</b>
LAB 12	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 14 <b>0.00</b>
LAB 13	0.15	0.01	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	-0.85	LAB 15 <b>0.00</b>
LAB 14	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 17 <b>0.00</b>
LAB 15	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 3 <b>0.00</b>
LAB 16	0.17	0.01	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.85	LAB 6 <b>0.00</b>
LAB 17	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.00	LAB 16 <b>0.85</b>
LAB 18	0.17	0.01	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.85	LAB 18 <b>0.85</b>
LAB 19	0.14	0.02	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	-1.70	LAB 2 <b>0.85</b>
LAB 20	0.15	0.01	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	0.15	0.00	-0.85	LAB 22 <b>0.85</b>
LAB 21	0.02	0.14	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	-11.90	LAB 4 <b>0.85</b>
LAB 22	0.17	0.01	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.17	0.00	0.85	LAB 23 <b>2.55</b>
LAB 23	0.19	0.03	0.18	0.00	0.18	0.00	0.18	0.00	0.18	0.00	0.18	0.00	0.18	0.00	2.55	LAB 5 <b>13.60</b>
Average	0.16		0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00		
SD	0.05		0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00		
New x*	0.16	0.01	0.160	0.01	0.160	0.01	0.160	0.01	0.160	0.01	0.16	0.01	0.16	0.01		
New s*	0.01		0.013		0.013		0.012		0.012		0.01		0.01			
N	22															

Target value	0.16
Low Acceptable	0.12
High Acceptable	0.20
Acceptable Range	0.16 - 0.20

**Appendix C: Charts**





Invoice No.: INV/PT-LB/14

Participant Name: .....

Fax No. : .....

Attention: .....

**Subject: Invoice for Participation in Inter-Laboratory Proficiency Testing Program (PTP)**

You are hereby requested to pay to Dubai Accreditation Center, Dubai Municipality the participation fee for the Inter-laboratory Proficiency Testing Program having the following details:

PTP No.	156
Details	Determination of Acid Soluble Sulphate Content of Soil
Amount	Dhs 850

**How to Pay:**

**EFT**

**Electronic Funds Transfer**

Bank Name: Emirates Bank International PJSC  
Branch: Dubai Main Branch, P.O. Box 2923 UAE  
Account Name: Dubai Municipality – Revenue A/C  
Account Number: 0022 – 107445 – 001  
SWIFT Code: EBILAEAD

**Credit Card**

By visiting Dubai Central Laboratory  
Department  
Administration Building- DCLD counter –  
ground floor

**Cheque**

Please address the cheque to Dubai Municipality  
and submit it by hand to DCLD counter.

**Note:**

- All sending and receiving bank charges must be included in the payment to ensure the full invoice amount is received.
- Please make sure that the payment is referring to DAC Accreditation Fees Alies No. 631 regardless of the payment method used.

Best Regard.

**ENG. LINA QUDAH  
DIRECTOR OF DUBAI ACCREDITATION CENTER**

Cc:

- Quality and Support Unit- DAC