

DUBAI ACCREDITATION DEPARTMENT

REPORT ON 177th LABORATORY PROFICIENCY TESTING DETERMINATION OF ACID SOLUBLE SULPHATE IN SOIL

25 June 2009

1. INTRODUCTION

This document presents the results of the 177th inter-laboratory proficiency-testing program conducted during the month of June involving the determination **Acid soluble Sulphate in Soil** with twenty six laboratories participating.

This program is part of the Inter-laboratory Comparison Programs organized by Dubai Accreditation Department (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 had ensured 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:

Twenty six private laboratories and one governmental laboratory (eighteen of them are accredited by DAC for construction materials testing) participated in this program.

2.3 Samples Tested:

One soil sample of approximately 1 Kg 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. For PT programs participating Laboratories are requested to contact Dr. Yaser Saleh Rahag (Tel No.: 302 7074) to know their code number.

4. TEST METHOD

Instructions were given to the participants to test the samples as per: **(BS 1377:1990 Part 3 Amd 9028.1996 Clause 5)**.

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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.

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 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 calculation is based on an international Standard (*ISO 13528:2005*).

6.3 Outlier Results

Test	Labs outside the z-scores ± 3
Acid soluble Sulphate in Soil	Lab No. 1; 66; 68; 76; 88; FQ; QIL & TQ

After evaluating the Z-Score the test results provided by the above mentioned laboratories are outside the Z - score limits of ± 3 , the above mentioned laboratories are requested to investigate the root cause of the outlier results, implement corrective action and a report shall be available for checking by assessment team during the nearest assessment visit.

Also one participating laboratory has showed Z-score values higher than **two** which representing **not outlier** but a warning limit, this laboratory is advised to investigate the potential root cause of such results.

7. APPENDICES

7.1 Appendix A: Raw Data

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

7.3 Appendix C: Charts

---- End of Report ----

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Acid Soluble Sulphate Content in Soil

Appendix A: Raw Data

Lab #	Results
Lab 1	1.44
Lab 3	1.34
Lab 39	1.34
Lab 4	1.36
Lab 56	1.31
Lab 21	1.28
Lab 7	1.33
Lab 9	1.34
Lab 28	1.32
Lab 23	1.34
Lab 88	1.22
Lab 57	1.33
Lab 58	1.34
Lab 64	1.32
Lab 66	1.48
Lab 72	1.32
Lab 74	1.34
Lab 76	1.45
Lab 79	1.32
Lab 78	1.30
Lab 82	1.32
Lab 89	1.33
Lab FQ	1.45
Lab TQ	1.22
Lab QIL	1.27
Lab 68	1.02

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Appendix B: Calculation of z-scores and other statistics

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.02	$(xi-x^*)^2$	0.02	$(xi-x^*)^2$	0.02	$(xi-x^*)^2$	0.02	$(xi-x^*)^2$	0.02	$(xi-x^*)^2$	0.02	$(xi-x^*)^2$	
$x^* - \delta$	---		1.31		1.30		1.30		1.30		1.30		1.30		
$x^* + \delta$	---		1.35		1.35		1.35		1.35		1.35		1.35		
Lab 68	1.02	0.31	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-18.79
Lab 88	1.22	0.11	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-6.58
Lab TQ	1.22	0.11	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-6.58
Lab QIL	1.27	0.06	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-3.53
Lab 21	1.28	0.05	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-2.92
Lab 78	1.30	0.03	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-1.70
Lab 56	1.31	0.02	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	1.31	0.00	-1.09
Lab 28	1.32	0.01	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	-0.48
Lab 64	1.32	0.01	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	-0.48
Lab 72	1.32	0.01	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	-0.48
Lab 79	1.32	0.01	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	-0.48
Lab 82	1.32	0.01	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	1.32	0.00	-0.48
Lab 57	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	0.13
Lab 7	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	0.13
Lab 89	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	1.33	0.00	0.13
Lab 23	1.34	0.01	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	0.74
Lab 3	1.34	0.01	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	0.74
Lab 39	1.34	0.01	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	0.74
Lab 58	1.34	0.01	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	0.74
Lab 74	1.34	0.01	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	0.74
Lab 9	1.34	0.01	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	1.34	0.00	0.74
Lab 4	1.36	0.03	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.96
Lab 1	1.44	0.11	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	6.85
Lab 76	1.45	0.12	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	7.46
Lab FQ	1.45	0.12	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	7.46
Lab 66	1.48	0.15	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	1.35	0.00	9.29
Average	1.32		1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	
SD	0.09		0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	
New x*	1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	1.33	0.01	
New s*	0.01		0.02		0.02		0.02		0.02		0.02		0.02		

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Target value	1.33
Low Acceptable	1.28
High Acceptable	1.38
Acceptable Range	1.28 -1.38

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Appendix C:Charts

