



REF: 812/02/02/1/797

DATE: 26 February 2007

ATTENTION: LAB MANAGER

SUBJECT: 151ST INTER-LABORATORY PROFICIENCY TESTING PROGRAM

We are pleased to present the results of the 151st Inter-laboratory Proficiency Testing Program involving the determination of chloride and sulphate content of hardened concrete. As in previous programs, we have assigned code numbers to participating laboratories in order to protect their identities. For this particular program please contact Dr. Yaser (Tel. No. 3027074) or Eng. Raniah (Tel. No. 3027069) to inform you which code number has been assigned to you.

You are also requested to pay to Dubai Accreditation Center (DAC), an amount of (Dhs 418) in return for your participation in the Inter-laboratory Proficiency Testing Program (please note that the governmental laboratories are exempted from participation fees). We would like to draw your attention that payment can be made through DCLD counter- ground floor by credit card. Should you intend to pay by cheque please address the cheque to Dubai Municipality. After payment, please submit a copy of the invoice to Dubai Accreditation Center (Eng. Raniah Ed Dili in the administration building on the second floor office no. 310).

You are kindly requested to pay the amount within one month from the date in which the result is posted on our website.

We thank you for your participation and we would welcome any comments or suggestions on this and on future programs. Please do not hesitate to contact us if you need any clarification on the report.

Kind Regards

A handwritten signature in black ink, appearing to be 'Lina Qudah', written over a horizontal line.

Eng. Lina Qudah

for/ Head of Accreditation Decisions Section

رؤيتنا: بناء مدينة متميزة تتوفر فيها رفاهية العيش ومقومات النجاح

Our Vision : To create an excellent city that provides the essence of success and comfort of living



DUBAI ACCREDITATION CENTER

Report on 151st Inter-Laboratory Proficiency Testing Chloride and Sulphate Content of Hardened Concrete

7 March 2007

1. INTRODUCTION

This document presents the results of the 151st inter-laboratory proficiency-testing program conducted during the month of January 2007 and the results received during February 2007, involving determination of chloride and sulphate of hardened concrete according to BS 1881: Part 124:1988.

This program is part of the Interlaboratory Comparison Programs organized by Dubai Accreditation Center of DM for monitoring the validity of tests 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 Participants:

A total of fifteen laboratories participated in this program.

2.2 Samples tested:

The samples consisted of Four (4) Masonry Hollow Normal Weight Block 400*100*200mm sizes were distributed to all participating laboratories.

From one source, 30 samples were randomly collected using standard sampling procedure. Similarly from the other source, another 30 samples were also collected. The samples were randomly distributed to the fifteen participating laboratories with each participant receiving four samples (two from each source). The samples were designated as Samples 1, 2, 3 and 4 with a unique identification number marked on each sample.

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 for:
Determination of Chloride and Sulphate content of Hardened Concrete as per BS: 1881: Part 124:1988



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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

Please refer to document **DAC-G3-03** Robust Z-Score Analyses for the methodologies of analysis that can be downloaded from our website www.dac.gov.ae

6.2 CALCULATIONS OF Z- SCORES

Appendix B gives the details of the calculation of the Z-Scores from the raw data. The Z-Score analysis is based on an internationally accepted procedure being used by accreditation bodies implementing Interlaboratory comparison programs.

6.3 OUTLIER RESULTS

After evaluating the Z-Score, the following results were considered outliers:

Test Parameter	Labs with outlier results	Type of Outlier
Chloride Content %	Lab 3-2	Between Labs
	Lab 1-1	Within Labs
	Lab 1-2	
	Lab 3-2	
	Lab 4-1	
	Lab 4-2	
	Lab 6-1	
	Lab 6-2	
	Lab 8-1	
	Lab 8-2	
Lab 9-1		
Sulphate Content %	Lab 6-1	Between Labs
	Lab 1-1	Within Labs
	Lab 1-2	
	Lab 5-1	
	Lab 5-2	
	Lab 6-2	



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7. CONCLUSIONS AND RECOMMENDATION

The test results provided by the above mentioned laboratories are outside the Z-score limits of ± 3 and identified as outliers. The above-mentioned laboratories are requested to investigate the root cause of the outlier results, implement corrective action and email a report within 2 weeks to the head of the Accreditation Decisions Section of Dubai Accreditation Center to the following email address lmqudah@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

Annex A: Raw results

Table 1: Chloride content, %

Lab#	1	2	3	4
Lab1	0.10	0.10	0.01	0.01
Lab2	0.09	0.09	0.02	0.02
Lab3	0.10	0.11	0.03	0.03
Lab4	0.08	0.08	0.02	0.02
Lab5	0.09	0.09	0.02	0.02
Lab6	0.08	0.08	0.02	0.02
Lab7	0.09	0.09	0.02	0.02
Lab8	0.10	0.09	0.01	0.01
Lab9	0.09	0.10	0.03	0.03
Lab10	0.09	0.09	0.02	0.02
Lab11	0.09	0.09	0.02	0.02
Lab12	0.09	0.09	0.02	0.02
Lab13	0.1	0.1	0.03	0.03
Lab14	0.08	0.08	0.02	0.02
Lab15	0.08	0.08	0.01	0.01

Table 2 : Sulphate content, %

Lab#	1	2	3	4
Lab1	0.60	0.60	0.5	0.5
Lab2	0.49	0.49	0.53	0.54
Lab3	0.54	0.55	0.61	0.62
Lab4	0.52	0.50	0.55	0.56
Lab5	0.57	0.57	0.52	0.52
Lab6	0.40	0.50	0.4	0.4
Lab7	0.49	0.49	0.54	0.53
Lab8	0.56	0.56	0.63	0.63
Lab9	0.52	0.50	0.57	0.55
Lab10	0.49	0.5	0.53	0.54
Lab11	0.49	0.49	0.54	0.53
Lab12	0.48	0.47	0.5	0.54
Lab13	0.56	0.55	0.63	0.64
Lab14	0.53	0.54	0.58	0.57
Lab15	0.48	0.48	0.5	0.52

Appendix B: Calculation of z-scores and other statistics

Acid Soluble Chloride Content %

Result#	S1 S2	S3 S4	S1+S3 S2+S4	S1-S3 S2-S4	Between Labs z- score	Within Labs z- score
Lab1-1	0.10	0.01	0.11	0.09	0.00	20.00
Lab1-2	0.10	0.01	0.11	0.09	0.00	20.00
Lab2-1	0.09	0.02	0.11	0.07	0.00	0.00
Lab2-2	0.09	0.02	0.11	0.07	0.00	0.00
Lab3-1	0.10	0.03	0.13	0.07	2.86	0.00
Lab3-2	0.11	0.03	0.14	0.08	4.29	10.00
Lab4-1	0.08	0.02	0.10	0.06	-1.43	-10.00
Lab4-2	0.08	0.02	0.10	0.06	-1.43	-10.00
Lab5-1	0.09	0.02	0.11	0.07	0.00	0.00
Lab5-2	0.09	0.02	0.11	0.07	0.00	0.00
Lab6-1	0.08	0.02	0.10	0.06	-1.43	-10.00
Lab6-2	0.08	0.02	0.10	0.06	-1.43	-10.00
Lab7-1	0.09	0.02	0.11	0.07	0.00	0.00
Lab7-2	0.09	0.02	0.11	0.07	0.00	0.00
Lab8-1	0.10	0.01	0.11	0.09	0.00	20.00
Lab8-2	0.09	0.01	0.10	0.08	-1.43	10.00
Lab9-1	0.09	0.03	0.12	0.06	-1.43	-10.00
Lab9-2	0.10	0.03	0.13	0.07	2.86	0.00
Lab10-1	0.09	0.02	0.11	0.07	0.00	0.00
Lab10-2	0.09	0.02	0.11	0.07	0.00	0.00
Lab11-1	0.09	0.02	0.11	0.07	0.00	0.00
Lab11-2	0.09	0.02	0.11	0.07	0.00	0.00
Lab12-1	0.09	0.02	0.11	0.07	0.00	0.00
Lab12-2	0.09	0.02	0.11	0.07	0.00	0.00
lab13-1	0.1	0.03	0.13	0.07	2.86	0.00
lab13-2	0.1	0.03	0.13	0.07	2.86	0.00
lab14-1	0.08	0.02	0.10	0.06	-1.43	-10.00
lab14-2	0.08	0.02	0.10	0.06	-1.43	-10.00
Lab15-1	0.08	0.01	0.09	0.07	-2.86	0.00
Lab15-2	0.08	0.01	0.09	0.07	-2.86	0.00

No. of Results	30	30	30	30
Median	0.09	0.02	0.11	0.070
Q 1	0.08	0.02	0.10	0.069
Q 3	0.10	0.02	0.11	0.070
Inter Q Range	0.02	0.00	0.01	0.001
Normalzd IQR	0.011	0.000	0.007	0.001
Robust CV,%	12.56	0.00	6.74	0.794
Minimum	0.08	0.01	0.09	0.060
Maximum	0.11	0.03	0.14	0.090
Range	0.03	0.02	0.05	0.030

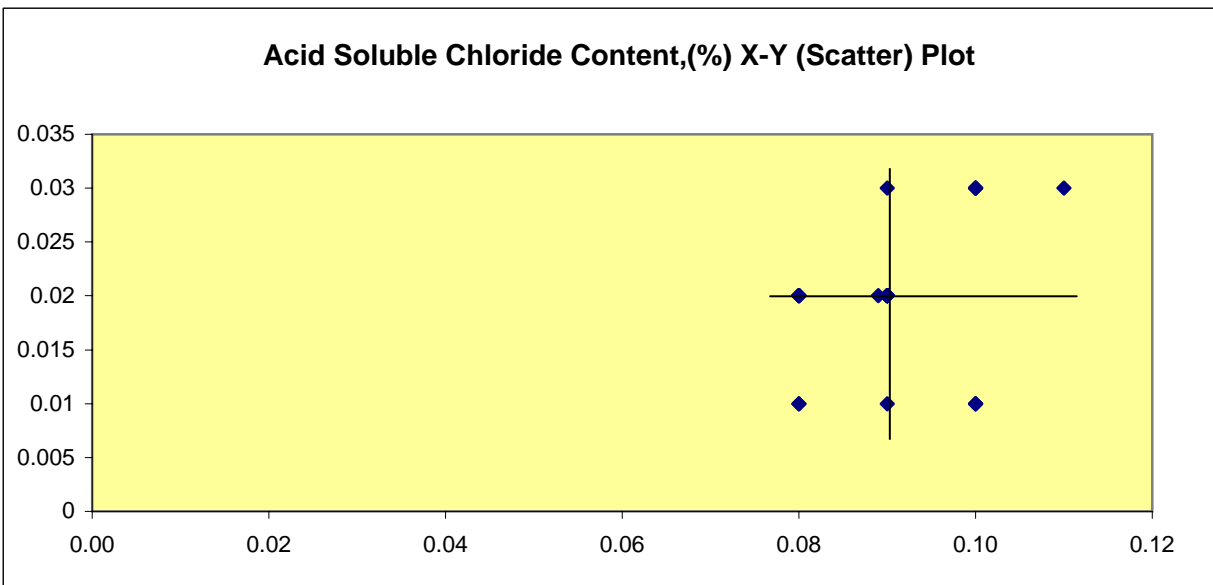
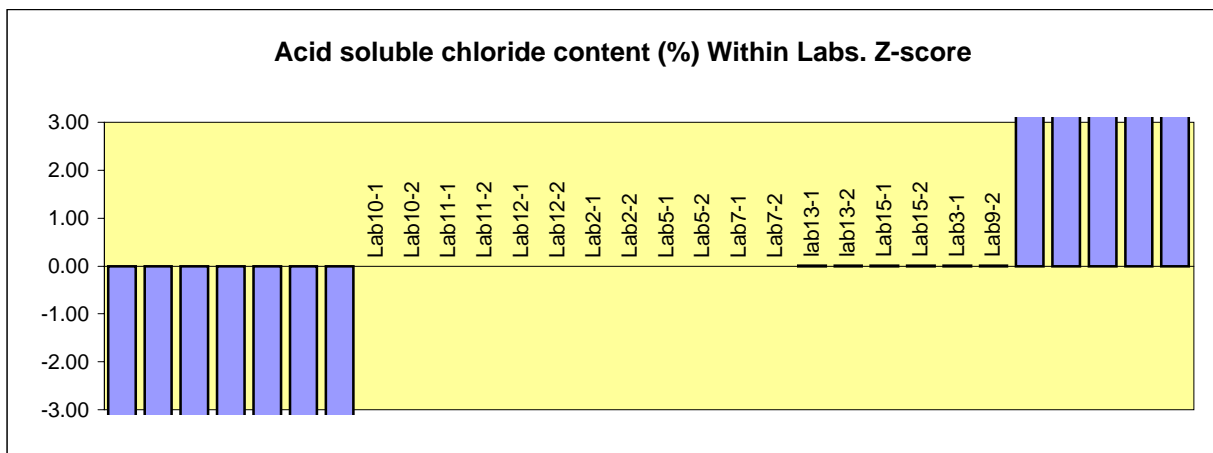
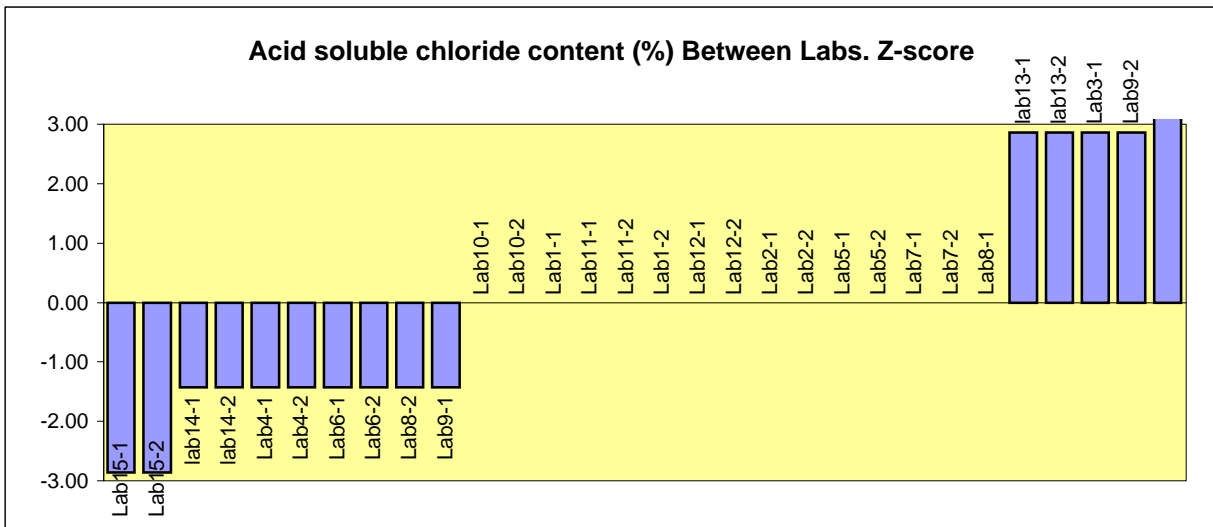
Appendix B: Calculation of z-scores and other statistics

Acid Soluble Sulphate Content %

Result#	S1 S2	S3 S4	S1+S3 S2+S4	S1-S3 S2-S4	Between Labs z- score	Within Labs z- score
Lab1-1	0.60	0.5	1.10	0.10	0.60	5.38
Lab1-2	0.60	0.5	1.10	0.10	0.6	5.38
Lab2-1	0.49	0.53	1.02	-0.04	-0.6	0.00
Lab2-2	0.49	0.54	1.03	-0.05	-0.45	-0.38
Lab3-1	0.54	0.61	1.15	-0.07	1.34	-1.15
Lab3-2	0.55	0.62	1.17	-0.07	1.64	-1.15
Lab4-1	0.52	0.55	1.07	-0.03	0.15	0.38
Lab4-2	0.50	0.56	1.06	-0.06	0	-0.77
Lab5-1	0.57	0.52	1.09	0.05	0.45	3.46
Lab5-2	0.57	0.52	1.09	0.05	0.45	3.46
Lab6-1	0.40	0.4	0.80	0.00	-3.88	1.54
Lab6-2	0.50	0.4	0.90	0.10	-2.39	5.38
Lab7-1	0.49	0.54	1.03	-0.05	-0.45	-0.38
Lab7-2	0.49	0.53	1.02	-0.04	0.6	0.00
Lab8-1	0.56	0.63	1.19	-0.07	1.94	-1.15
Lab8-2	0.56	0.63	1.19	-0.07	1.94	-1.15
Lab9-1	0.52	0.57	1.09	-0.05	1.94	-0.38
Lab9-2	0.50	0.55	1.05	-0.05	-0.15	-0.38
Lab10-1	0.49	0.53	1.02	-0.04	-0.6	0.00
Lab10-2	0.5	0.54	1.04	-0.04	-0.3	0.00
Lab11-1	0.49	0.54	1.03	-0.05	-0.45	-0.38
Lab11-2	0.49	0.53	1.02	-0.04	-0.6	0.00
Lab12-1	0.48	0.5	0.98	-0.02	-1.19	0.77
Lab12-2	0.47	0.54	1.01	-0.07	-0.75	-1.15
Lab13-1	0.56	0.63	1.19	-0.07	1.94	-1.15
Lab13-2	0.55	0.64	1.19	-0.09	1.94	-1.92
Lab14-1	0.53	0.58	1.11	-0.05	0.75	-0.38
Lab14-2	0.54	0.57	1.11	-0.03	0.75	0.38
Lab15-1	0.48	0.5	0.98	-0.02	-1.19	0.77
Lab15-2	0.48	0.52	1.00	-0.04	-0.9	0.00

No. of Results	30	30	30	30
Median	0.50	0.54	1.06	-0.040
Q 1	0.49	0.52	1.02	-0.058
Q 3	0.55	0.57	1.11	-0.023
Inter Q Range	0.06	0.05	0.09	0.035
Normalzd IQR	0.044	0.037	0.067	0.026
Robust CV,%	8.90	6.86	6.35	-65.000
Minimum	0.40	0.40	0.80	-0.090
Maximum	0.60	0.64	1.19	0.100
Range	0.20	0.24	0.39	0.190

Appendix C: Charts



Appendix C: Charts

