



CCC-06072008-0240
Invoice No.: INV/PT-LB/21

Date: 30 June 2008

Participant Name:

Fax No. :

Attention: Laboratory Manager

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

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

PTP No.	163
Details	Determination of Compressive Strength of Paving Blocks
Amount	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:

- You are kindly requested to pay the amount within one month from the date in which the result is posted on our website.
- 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.
- After payment please submit a copy of the receipt to Dubai Accreditation Department (Aisha Al Ali in DCLD administration building- 2nd floor- DAC Director Secretary and Technical Support Office.

Best Regard.


AMINA A. MOHAMMED
DIRECTOR OF DUBAI ACCREDITATION DEPARTMENT

Cc:

- Planning and Development Office- DAC

DUBAI ACCREDITATION DEPARTMENT

REPORT ON 163rd LABORATORY PROFICIENCY TESTING DETERMINATION OF COMPRESSIVE STRENGTH OF PAVING BLOCKS

30 June 2008

1. INTRODUCTION

This document presents the results of the 163rd inter-laboratory proficiency-testing program conducted during the month of June involving the determination **Compressive Strength of Paving Blocks** with twenty five 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 taking the paving blocks from the same patch to ensure that all samples are from the same source and having similar conditions, this patch is tested and certified by Dubai Municipality, therefore, DAC did not conduct homogeneity test for this program only.

2.2 Participants:

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

2.3 Samples Tested:

One (1) sample of Rectangular Shape Paving Block red color 200*100*60 mm size consists of 10 specimens were 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 this particular program participating Laboratories are requested to contact Dr. Yaser Saleh Rahag (Tel No.: 302 7074) to know their code number.

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4. TEST METHOD

Instructions were given to the participants to test the samples as per: BS 6717:1993 Part 1 Annex A&B).

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

6.3 Outlier Results

Test	Labs outside the z-scores ± 3
Compressive Strength of Paving Blocks	Lab No. 12 ; 18 & 22

7. CONCLUSION AND RECOMMENDATIONS

The test results provided by the above mentioned laboratories are outside the Z - score limits of ± 3 .

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

Compressive Strength of Paving Blocks

Lab #	1	2	3	4	5	6	7	8	9	10	Ave
Lab1	65.60	67.70	60.60	66.00	74.30	68.20	71.30	64.70	68.30	74.70	68
Lab2	67.40	63.20	69.00	68.90	67.30	68.50	63.60	66.90	68.50	65.40	67
Lab3	69.40	73.60	66.10	71.00	67.60	61.90	65.90	61.70	66.40	69.50	67
Lab4	67.90	70.40	65.90	71.00	61.60	61.00	57.00	70.40	63.40	71.40	66
Lab5	67.80	61.20	68.00	67.80	64.50	62.80	63.90	69.50	68.70	65.00	66
Lab6	67.10	66.60	66.80	67.10	66.90	66.30	67.20	67.00	67.30	67.30	67
Lab7	67.10	65.50	64.40	69.00	66.50	66.00	67.10	68.90	68.20	67.70	67
Lab8	73.30	69.70	67.40	63.40	71.20	72.80	55.50	61.00	73.10	74.70	68
Lab9	69.50	62.80	60.40	63.70	65.10	67.90	67.10	70.40	71.00	68.10	67
Lab10	66.80	65.60	66.40	64.30	67.50	68.40	64.40	64.00	68.10	64.50	66
Lab11	69.00	66.50	66.10	65.10	65.60	64.00	67.60	67.20	69.60	66.40	67
Lab12	50.65	56.01	69.76	49.78	60.02	72.61	67.12	62.43	58.05	54.92	60
Lab13	61.00	63.00	65.00	61.00	63.00	65.00	64.00	64.00	63.00	65.00	63
Lab14	61.80	61.20	65.30	64.30	68.20	71.20	60.60	70.40	64.30	73.00	66
Lab15	66.00	66.00	65.00	66.00	65.00	67.00	66.00	65.00	66.00	66.00	66
Lab16	78.00	65.00	66.00	66.00	61.00	59.00	69.00	60.00	64.00	65.00	65
Lab17	68.40	61.30	70.30	70.60	64.10	66.60	59.70	66.70	67.30	69.90	66
Lab18	71.38	77.66	71.28	77.61	71.64	79.31	73.86	73.44	79.62	76.07	75
Lab19	69.20	64.80	63.70	65.80	65.40	64.30	63.10	68.60	63.50	65.50	65
Lab20	63.00	59.00	66.00	64.00	58.00	69.00	68.00	69.00	64.00	61.00	64
Lab21	66.50	68.70	61.90	63.20	69.90	69.70	69.60	69.70	64.50	67.40	67
Lab22	62.00	62.80	69.80	58.80	66.00	67.90	66.6	44.90	56.40	46.20	59
Lab23	59.00	66.00	69.00	65.00	65.00	60.00	68.00	62.00	66.00	67.00	65
Lab24	68.40	64.70	64.50	69.20	64.60	70.80	67.80	68.20	70.50	66.10	67
Lab25	67.10	65.70	64.00	67.30	67.30	65.10	64.40	66.00	66.80	65.00	66

Determination of Compressive Strength of Paving Blocks

Appendix B: Calculation of z-scores and other statistics

Compressive Strength of Paving Blocks

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s$	---	xi-x*	2.22	(xi-x*) ²	2.26	(xi-x*) ²	2.24	(xi-x*) ²	2.23	(xi-x*) ²	2.23	(xi-x*) ²	2.22	(xi-x*) ²	
$x^* - \delta$	---		63.78		63.84		63.87		63.88		63.89		63.89		
$x^* + \delta$	---		68.22		68.37		68.35		68.34		68.34		68.34		
LAB 1	68	2.00	68.00	3.60	68.00	3.57	68.00	3.56	68.00	3.55	68.00	3.55	68.00	3.55	1.27
LAB 2	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 3	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 4	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
LAB 5	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
LAB 6	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 7	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 8	68	2.00	68.00	3.60	68.00	3.57	68.00	3.56	68.00	3.55	68.00	3.55	68.00	3.55	1.27
LAB 9	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 10	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
LAB 11	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 12	60	6.00	63.78	5.41	63.84	5.16	63.87	5.04	63.88	4.98	63.89	4.95	63.89	4.94	-4.13
LAB 13	63	3.00	63.78	5.41	63.84	5.16	63.87	5.04	63.88	4.98	63.89	4.95	63.89	4.94	-2.10
LAB 14	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
LAB 15	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
LAB 16	65	1.00	65.00	1.21	65.00	1.23	65.00	1.24	65.00	1.24	65.00	1.24	65.00	1.25	-0.75
LAB 17	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
LAB 18	75	9.00	68.22	4.50	68.22	4.47	68.22	4.46	68.22	4.45	68.22	4.45	68.22	4.45	6.00
LAB 19	65	1.00	65.00	1.21	65.00	1.23	65.00	1.24	65.00	1.24	65.00	1.24	65.00	1.25	-0.75
LAB 20	64	2.00	64.00	4.42	64.00	4.45	64.00	4.47	64.00	4.47	64.00	4.48	64.00	4.48	-1.43
LAB 21	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 22	59	7.00	63.78	5.41	63.84	5.16	63.87	5.04	63.88	4.98	63.89	4.95	63.89	4.94	-4.81
LAB 23	65	1.00	65.00	1.21	65.00	1.23	65.00	1.24	65.00	1.24	65.00	1.24	65.00	1.25	-0.75
LAB 24	67	1.00	67.00	0.81	67.00	0.79	67.00	0.79	67.00	0.78	67.00	0.78	67.00	0.78	0.60
LAB 25	66	0.00	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	66.00	0.01	-0.08
Average	66.00		66.10	42.53	66.11	41.68	66.11	41.27	66.11	41.07	66.12	40.97	66.12	40.93	
SD	2.87		1.33	1.77	1.32	1.74	1.31	1.72	1.31	1.71	1.31	1.71	1.31	1.71	
New x*	66	1.00	66.102	1.33	66.109	1.32	66.113	1.31	66.115	1.31	66.12	1.31	66.12	1.31	
New s*	1.48		1.510		1.494		1.487		1.483		1.48		1.48		

N 25

Target value	66.12
Low Acceptable	62
High Acceptable	71
Acceptable Range	62 - 71

Appendix C:Charts

