

## DUBAI ACCREDITATION DEPARTMENT

### REPORT ON PTP 197<sup>TH</sup> INTER-LABORATORY PROFICIENCY TESTING PROGRAM DETERMINATION OF WET SIEVE ANALYSIS IN SOIL

Date: 20 October 2010

#### 1. INTRODUCTION

This document presents the results of the 197<sup>th</sup> inter-laboratory proficiency-testing program conducted during the month of September involving the determination of **Wet Sieve Analysis in Soil** with forty three 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 as accreditation requirement as per ISO/IEC 17011: 2004, other laboratories from gulf region also participating in the program.

#### 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:

Forty three laboratories were participated in this PTP including:

- Two governmental laboratories.
- Twenty six are private laboratories operating in Dubai including accredited and registered laboratories.
- Five private laboratories are from other Emirates.
- Seven laboratories are from Qatar.
- Two laboratories are from Oman
- One laboratory is from Bahrain.

##### 2.3 Samples Tested:

One Soil sample of approximately 2 kg consists of fine sand specimen was distributed to all participating laboratories. With each participant being given one sample with a unique identification number provided during the time of collection.

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### 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

- 4.1 Instructions were given to the participants to test the samples for Determination of wet sieve analysis as per (BS 1377 PART 2:1990 T 9.2 AMD9027:1996).
- 4.2 Test Sieves to be used: 5 mm, 3.35 mm, 2 mm, 1.18, 0.600 mm, 0.425 mm, 0.300 mm, 0.212 mm, 0.150 mm, 0.063 mm.

### 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 appendix A. 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*).

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### 6.3 Outlier Results

Test	Labs outside the z-scores $\pm 3$
Sieve Analysis (0.150 mm)	Lab IN01; Lab EX4; Lab EX17; Lab7; Lab64; Lab68; Lab72; Lab74

After evaluating the Z-Score the test results provided by the above mentioned laboratories are outside the Z - score limits of  $\pm 3$ , 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 other participating laboratories have showed Z-score values higher than **two** which is **not outlier** but a warning limit, these laboratories are 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 ---

## Determination of Wet Sieve Analysis in Soil

### Appendix A:

Table - 1	(0.300 mm)	(0.150 mm)	(0.063 mm)
Lab Code #	Results	Results	Results
Lab G01	9	6	5
Lab EX20	9.3	5.6	4.3
Lab3	10	6	5
Lab39	9	6	5
Lab4	11	6	4
Lab EX9	9	6	4
Lab56	10	6	5
Lab21	10	6	4
Lab7	9	5	4
Lab EX5	10	6	4
Lab9	10	6	5
Lab28	10	6	4
Lab23	10	6	4
Lab EX6	10	6	4
Lab EX16	9	6	4
Lab88	10.3	6.3	4.9
Lab57	10	6	5
Lab58	10	6	5
Lab EX14	10	6	5
Lab64	10	5	4
Lab68	8	5	4
Lab66	10	6	5
Lab72	9	5	4
Lab67	10	6	5
Lab71	10	6	4
Lab74	9	5	4
Lab76	9	6	4
Lab79	10	6	4
Lab82	10	6	4
Lab84	10	6	5
Lab EX10	9	6	4.3
Lab89	9	6	5
Lab EX1	10	6	5
Lab EX4	8	5	4
Lab35	10	6	4
Lab EX11	10	6	4
Lab EX17	9	5	4
Lab EX7	9	6	4
Lab EX12	9	6	4
Lab EX18	11	6	5
Lab EX19	11	6	4.9
Lab IN01	9	5	5
Lab EX21	10	6	4

**Table - 1 ( 0.300 mm )**

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	1.04	(xi-x*) <sup>2</sup>	1.03	(xi-x*) <sup>2</sup>	0.96	(xi-x*) <sup>2</sup>	0.95	(xi-x*) <sup>2</sup>	0.94	(xi-x*) <sup>2</sup>	0.94	(xi-x*) <sup>2</sup>	
$x^* - \delta$	---		8.97		8.65		8.70		8.72		8.72				
$x^* + \delta$	---		11.04		10.72		10.63		10.61		10.60				
Lab EX4	8	2.00	8.97	0.52	8.97	0.49	8.97	0.48	8.97	0.48	8.97	0.48	8.97	0.48	-2.65
Lab68	8	2.00	8.97	0.52	8.97	0.49	8.97	0.48	8.97	0.48	8.97	0.48	8.97	0.48	-2.65
Lab IN01	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX10	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX12	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX16	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX17	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX7	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX9	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab G01	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab39	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab7	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab72	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab74	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab76	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab89	9	1.00	9.00	0.47	9.00	0.45	9.00	0.44	9.00	0.43	9.00	0.43	9.00	0.43	-1.05
Lab EX20	9.3	0.70	9.30	0.15	9.30	0.13	9.30	0.13	9.30	0.13	9.30	0.13	9.30	0.13	-0.57
Lab EX1	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab EX11	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab EX14	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab EX21	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab EX5	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab EX6	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab21	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab23	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab28	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab3	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab35	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab56	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab57	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab58	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab64	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab66	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab67	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab71	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab79	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab82	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab84	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab9	10	0.00	10.00	0.10	10.00	0.11	10.00	0.11	10.00	0.12	10.00	0.12	10.00	0.12	0.55
Lab88	10.3	0.30	10.30	0.38	10.30	0.40	10.30	0.41	10.30	0.41	10.30	0.41	10.30	0.41	1.03
Lab EX18	11	1.00	11.00	1.72	10.72	1.11	10.63	0.94	10.61	0.90	10.60	0.89	10.60	0.88	2.14
Lab EX19	11	1.00	11.00	1.72	10.72	1.11	10.63	0.94	10.61	0.90	10.60	0.89	10.60	0.88	2.14
Lab4	11	1.00	11.00	1.72	10.72	1.11	10.63	0.94	10.61	0.90	10.60	0.89	10.60	0.88	2.14
<b>Average</b>	<b>9.64</b>		<b>9.69</b>	<b>15.50</b>	<b>9.67</b>	<b>13.52</b>	<b>9.66</b>	<b>12.98</b>	<b>9.66</b>	<b>12.84</b>	<b>9.66</b>	<b>12.80</b>	<b>9.66</b>	<b>12.78</b>	
<b>SD</b>	<b>0.69</b>		<b>0.61</b>	<b>0.37</b>	<b>0.57</b>	<b>0.32</b>	<b>0.56</b>	<b>0.31</b>	<b>0.55</b>	<b>0.31</b>	<b>0.55</b>	<b>0.30</b>	<b>0.55</b>	<b>0.30</b>	
<b>New x*</b>	<b>10</b>	<b>0.00</b>	<b>9.69</b>	<b>0.61</b>	<b>9.67</b>	<b>0.57</b>	<b>9.66</b>	<b>0.56</b>	<b>9.66</b>	<b>0.55</b>	<b>9.66</b>	<b>0.55</b>	<b>9.66</b>	<b>0.55</b>	
<b>New s*</b>	<b>0.69</b>		<b>0.69</b>		<b>0.64</b>		<b>0.63</b>		<b>0.63</b>		<b>0.63</b>		<b>0.63</b>	<b>0.74</b>	

N 43

Target value	9.66
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Low Acceptable	7.78
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High Acceptable	11.54
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Acceptable Range	7.78 - 11.54
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Table - 2 ( 0.150 mm )

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.60	(xi-x*) <sup>2</sup>	0.42	(xi-x*) <sup>2</sup>	0.38	(xi-x*) <sup>2</sup>	0.35	(xi-x*) <sup>2</sup>	0.38	(xi-x*) <sup>2</sup>	0.38	(xi-x*) <sup>2</sup>	
$x^* - \delta$	---		5.40		5.47		5.51		5.56		5.53		5.53		
$x^* + \delta$	---		6.60		6.31		6.27		6.26		6.30		6.30		
Lab IN01	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab EX17	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab EX4	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab64	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab68	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab7	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab72	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab74	5	1.00	5.40	0.24	5.47	0.18	5.51	0.16	5.56	0.13	5.56	0.13	5.56	0.13	-3.60
Lab EX20	5.6	0.40	5.60	0.08	5.60	0.08	5.60	0.09	5.60	0.10	5.60	0.10	5.60	0.10	-1.24
Lab EX1	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX10	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX11	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX12	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX14	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX16	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX18	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX19	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX21	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX5	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX6	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX7	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab EX9	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab G01	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab21	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab23	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab28	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab3	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab35	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab39	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab4	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab56	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab57	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab58	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab66	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab67	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab71	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab76	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab79	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab82	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab84	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab89	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab9	6	0.00	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	6.00	0.01	0.34
Lab88	6.3	0.30	6.30	0.17	6.30	0.17	6.27	0.13	6.26	0.12	6.26	0.12	6.26	0.12	1.52
Average	5.81		5.89	2.57	5.89	2.10	5.91	1.78	5.91	1.49	5.91	1.49	5.91	1.49	
SD	0.40		0.25	0.06	0.22	0.05	0.21	0.04	0.19	0.05	0.19	0.05	0.19	0.05	
New x*	6	0.00	5.886	0.25	5.889	0.22	5.906	0.21	5.914	0.22	5.91	0.22	5.91	0.22	
New s*	0.40		0.281		0.253		0.233		0.254		0.254		0.25		

N 43

Target value	5.91
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Low Acceptable	5.15
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High Acceptable	6.68
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Acceptable Range	5.15 - 6.68
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Table - 3 ( 0.063 mm )

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.72	(xi-x*) <sup>2</sup>	0.60	(xi-x*) <sup>2</sup>	0.60	(xi-x*) <sup>2</sup>	0.60	(xi-x*) <sup>2</sup>	0.60	(xi-x*) <sup>2</sup>	0.60	(xi-x*) <sup>2</sup>	
$x^* - \delta$	---		3.28		3.70		3.70		3.70		3.70		3.70		
$x^* + \delta$	---		4.72		4.89		4.89		4.89		4.89		4.89		
Lab EX11	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX12	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX16	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX17	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX21	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX4	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX5	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX6	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX7	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX9	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab21	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab23	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab28	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab35	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab4	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab64	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab68	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab7	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab71	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab72	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab74	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab76	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab79	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab82	4	0.00	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	4.00	0.09	-0.75
Lab EX10	4.3	0.30	4.30	0.00	4.30	0.00	4.30	0.00	4.30	0.00	4.30	0.00	4.30	0.00	0.00
Lab EX20	4.3	0.30	4.30	0.00	4.30	0.00	4.30	0.00	4.30	0.00	4.30	0.00	4.30	0.00	0.00
Lab EX19	4.9	0.90	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.51
Lab88	4.9	0.90	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.51
Lab IN01	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab EX1	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab EX14	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab EX18	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab G01	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab3	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab39	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab56	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab57	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab58	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab66	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab67	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab84	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab89	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Lab9	5	1.00	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	4.72	0.18	1.76
Average	4.40		4.30	5.16	4.30	5.16	4.30	5.16	4.30	5.16	4.30	5.16	4.30	5.16	
SD	0.48		0.35	0.12	0.35	0.12	0.35	0.12	0.35	0.12	0.35	0.12	0.35	0.12	
New x*	4	0.00	4.30	0.35	4.30	0.35	4.30	0.35	4.30	0.35	4.30	0.35	4.30	0.35	
New s*	0.48		0.40		0.40		0.40		0.40		0.40		0.40		

N 43

Target value	4.30
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Low Acceptable	3.11
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High Acceptable	5.49
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Acceptable Range	3.11 - 5.49
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