Report No. 544

SOILS PROFICIENCY TESTING

ROUND 5 (NSW & ACT)

Liquid Limit, Plastic Limit, Plasticity Index & Linear Shrinkage

June 2007

ACKNOWLEDGMENTS

PTA wishes to gratefully acknowledge the technical assistance provided for this program by Mr Peter Sheen of Testrite Laboratories Pty Ltd. This assistance included providing input into the design of the program, technical advice, sample supply, homogeneity testing and technical commentary of the final report.

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CONTENTS

1. Foreword

This report summarises the results of a proficiency testing program on selected tests of a soil.

The exercise was conducted in April 2007 by the Proficiency Testing Australia (PTA). The main aim of the program was to assess the competency of participating laboratories in performing the prescribed analyses.

2. Program Features and Design

2.1 Each laboratory was randomly allocated a unique code number for the program to ensure confidentiality of results. Reference to each laboratory in this report is by code number only.

2.2 Laboratories were provided with the "Instructions to Participants" and "Results Sheet" (see Appendix C). NATA accredited laboratories were requested to perform the tests according to their accredited methods.

2.3 Participants were provided with one 1000g soil sample for testing.

Laboratories were asked to perform the following analyses (see Appendix C):

+425µm Sieve
Liquid Limit
Plastic Limit
Plasticity Index
Linear Shrinkage

2.4 A total of 98 laboratories throughout NSW, ACT and Papua New Guinea received samples. 16 laboratories did not return results by the due date.

2.5 Results (as reported by participants) with corresponding summary statistics (i.e. number of results, median, normalised interquartile range, minimum, maximum and range) are presented in Appendix A (for each of the analyses performed by each method).

2.6 A robust statistical approach, using z-scores, was utilised to assess laboratories' testing performance. Robust z-scores, z-score charts relevant to each test and method are presented in Appendix A.

The document entitled *Guide to PTA Proficiency Testing*, Jan 2006 (reference [1]) defines the statistical terms and details the statistical procedures referred to in this report.

2.7 A tabulated listing of laboratories (by code number) identified as having outlier results can be found on page 4.

2.8 Prior to sample distribution, a number of randomly selected samples were analysed for homogeneity. Based on the results of this testing (see Appendix B) it was

considered that the samples utilised for this program were homogenous. As such, any results later identified as extreme could not be attributed to any significant sample variability.

3. Statistical Format

For each test, where appropriate, the following information is given:

- a table of results and calculated z-scores;
- a list of summary statistics;
- ordered z-score charts;

3.1 Outlier Results and Z-scores

In order to assess laboratories' testing performance, a robust statistical approach, using z-scores, was utilised. Z-scores give a measure of how far a result is from the consensus value (i.e. the median), and gives a "score" to each result relative to the other results in the group.

A z-score close to zero indicates that the result agrees well with those from other laboratories. Whereas, a z-score with an absolute value greater than three is considered to be an outlier and is marked by the symbol "**§**".

Each determination was examined for outliers with all methods pooled. Please see reference [1] for details on how these z-scores are calculated.

3.2 Results Tables and Summary Statistics

Each of these tables contains the results returned by each laboratory, including the code number for the method used, and the robust z-score calculated for each result.

Results have been entered exactly as reported by participants. That is, laboratories which did not report results to the precision (i.e. number of significant figures) requested on the Results Sheet have not been rounded to the requested precision before being included in the statistical analysis.

A list of summary statistics appears at the bottom of each of the tables of results and consists of:

- the number of results for that test/sample (*No. of Results*);
- the median of these results, i.e. the middle value (*Median*);
- the normalised interquartile range of the results (*Normalised IQR*);
- the robust coefficient of variation, expressed as a percentage (*Robust CV*) - i.e. 100 x *Normalised IQR* / *Median*;
- the minimum and maximum laboratory results; and
- the range (*Maximum* - *Minimum*).

The median is a measure of the centre of the data.

The normalised IQR is a measure of the spread of the results. It is calculated by multiplying the interquartile range (IQR) by 0.7413, a factor which converts the IQR to an estimate of the standard deviation. The IQR is the difference between the upper and lower quartiles (i.e. the values above and below which a quarter of the results lie, respectively).

Please see reference [1] for further details on these robust summary statistics.

The following summary statistics were sent to participants shortly after the return of results to provide them with “early information” about the results for the program.

TABLE A – SUMMARY STATISTICS

Analysis	Median	Normalised IQR	Robust CV	Number of Results
+425µm Sieve	1	0.74	74.1%	80
Liquid Limit	46	1.48	3.2%	82
Plastic Limit	19	1.48	7.8%	82
Plasticity Index	27	2.13	7.9%	82
Linear Shrinkage	12	1.11	9.3%	79

3.3 Ordered Z-Score Charts

On these charts each laboratory's robust z-score is shown, in order of magnitude, and is marked with its code number. From these charts, each laboratory can readily compare its performance relative to the other laboratories.

These charts contain solid lines at +3 and -3, so that outliers are clearly identifiable as those laboratories whose "bar" extends beyond these "cut-off" lines. The y-axis of these charts has been limited, so very large z-scores appear to extend beyond the chart boundary.

For the test +425µm sieve the results reported were only tabulated.

4. Outlier Results

Laboratories reporting outlier results are listed in the following table:

Lab Code	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage
28,44,123		§		
123			§	
47,80,114,148				§

*A "**§**" indicates the occurrence of a z-score outlier result (i.e. those results for which |z-score|>3).*

5. PTA and Technical Advisers' Comments

+425µm Sieve

Lab Codes 24, 27 & 144 have most likely reported percentage passing the 425µm sieve. If this is a misinterpretation of the request then the actual testing is in line with the norm. Taking into account the results reported for Lab Codes 24, 27 & 144 the percentage of significant error for this test is <1%.

Lab Code 35 result is significantly different from the norm. The laboratory concerned should review the testing procedures.

Liquid Limit

No outliers recorded.

Lab Code 35 although providing a 425µm result that could be expected to provide a significant different liquid limit result, has recorded a results that is the median of all the results.

Plastic Limit

Three outliers were recorded for Lab Codes 28, 44 & 123.

Plasticity Index

One outlier was recorded for Lab Code 123. 1.2% of returned results reported statistical outliers for this test.

Linear Shrinkage

Four outliers were recorded for Lab Codes 47, 80, 114 and 148.

These outliers are not indicated by the Liquid Limit results (close to the Liquid Limit consistency is nominated for the Linear Shrinkage Test).

It is noted that all of the outliers are less than that of the median which may suggest that the test specimens were not dried out until the shrinkage ceased or the mould was not oiled.

5.1% of returned results reported statistical outliers for this test.

6. Reference

[1] Guide to Proficiency Testing Australia (Jan 2006).

APPENDIX A

Results & Data Analysis

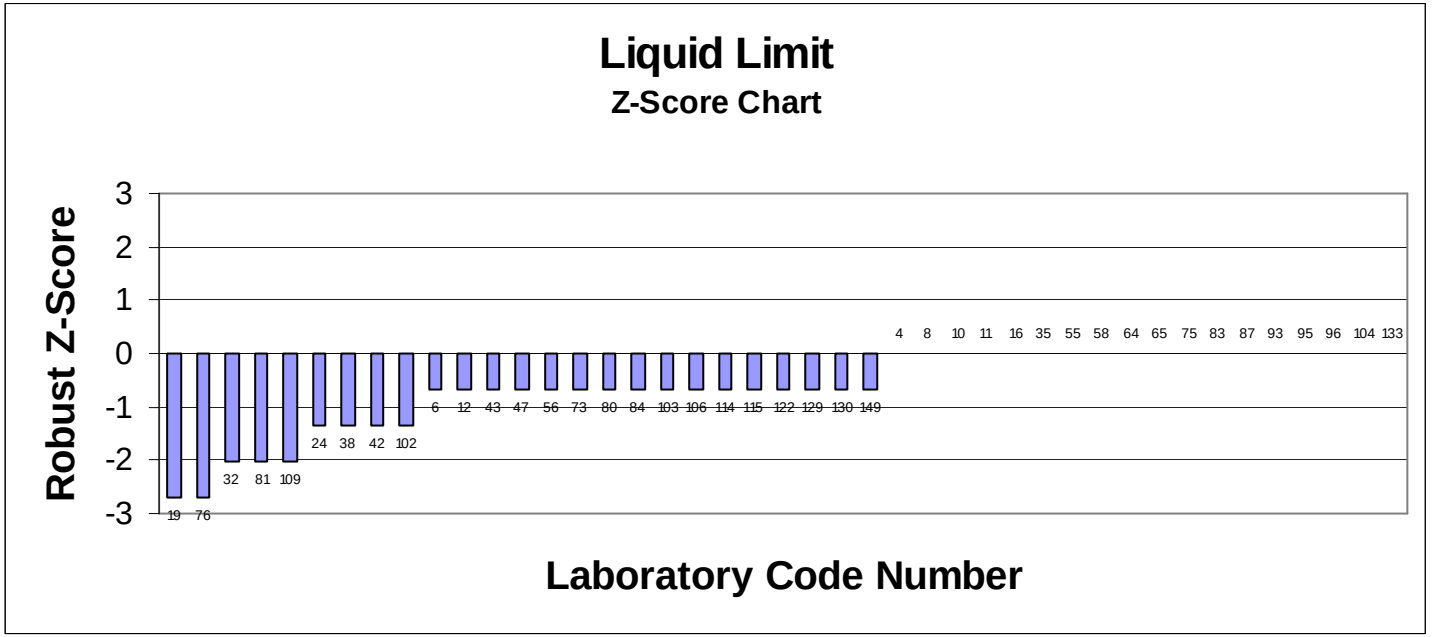
+425µm Sieve

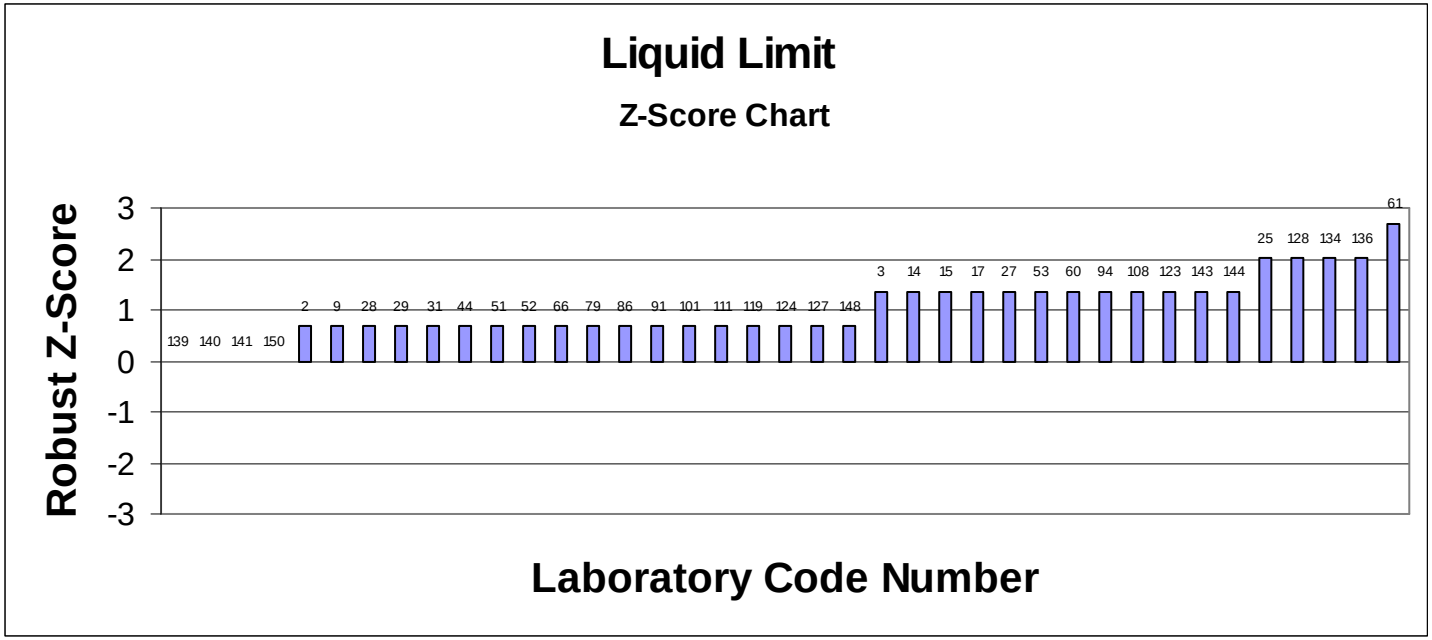
Lab Code	Results	Lab Code	Results
2	1	79	1.0
3	1	80	1
4	nil	81	5.8
6	0	83	1.0
8	0.8	84	0.1
9	0	86	0
10	0	87	1
11	1	91	0
12	1	93	0
14	1	94	1
15	0.7	95	1
16	0	96	1
17	1	101	1
19	0	102	0.7
24	99.2	103	1
25	0	104	1
27	99	106	1
28	1.0	108	0
29	0	109	1
31	0	111	0
32	1.0	114	5
35	58.0	115	1
38	1	119	1
42	1	122	0
43	1	123	1.0
44	1	124	1
47	0.0	127	nil
51	0	128	1
52	0	129	1
53	0	130	0
55	0	133	5.0
56	1.0	134	0
58	1	136	0
60	1	139	1.0
61	1	140	1
64	0	141	1
65	1.0	143	0.0
66	2	144	100
73	1	148	0.8
75	1	149	1.0
76	1	150	1.0

Liquid Limit			
Lab Code	**Results**	**Robust Z-Score**	**Method**
2	47	0.67	AS1289
3	48	1.35	AS1289
4	46	0.00	
6	45	-0.67	AS1289
8	46	0.00	AS1289
9	47	0.67	AS1289
10	46	0.00	AS1289
11	46	0.00	AS1289
12	45	-0.67	AS1289
14	48	1.35	
15	48	1.35	AS1289
16	46	0.00	AS1289
17	48	1.35	AS1289
19	42	-2.70	AS1289
24	44	-1.35	AS1289
25	49	2.02	AS1289
27	48	1.35	AS1289
28	47	0.67	AS1289
29	47	0.67	
31	47	0.67	
32	43	-2.02	AS1289
35	46.0	0.00	
38	44	-1.35	AS1289
42	44	-1.35	AS1289
43	45	-0.67	AS1289
44	47	0.67	AS1289
47	45	-0.67	AS1289
51	47	0.67	AS1289
52	47	0.67	AS1289
53	48	1.35	AS1289
55	46	0.00	AS1289
56	45	-0.67	AS1289
58	46	0.00	AS1289
60	48	1.35	AS1289
61	50	2.70	AS1289
64	46	0.00	AS1289
65	46	0.00	AS1289
66	47	0.67	AS1289
73	45	-0.67	AS1289
75	46	0.00	AS1289
76	42	-2.70	
79	47.0	0.67	AS1289
80	45	-0.67	AS1289
81	43	-2.02	AS1289
83	46	0.00	AS1289
84	45	-0.67	AS1289

Liquid Limit			
Lab Code	**Results**	**Robust Z-Score**	**Method**
86	47	0.67	
87	46	0.00	AS1289
91	47	0.67	AS1289
93	46	0.00	AS1289
94	48	1.35	AS1289
95	46	0.00	AS1289
96	46	0.00	AS1289
101	47	0.67	AS1289
102	44	-1.35	AS1289
103	45	-0.67	AS1289
104	46	0.00	AS1289
106	45	-0.67	AS1289
108	48	1.35	AS1289
109	43	-2.02	
111	47	0.67	AS1289
114	45	-0.67	
115	45	-0.67	AS1289
119	47	0.67	AS1289
122	45	-0.67	AS1289
123	48	1.35	AS1289
124	47	0.67	AS1289
127	47	0.67	AS1289
128	49	2.02	AS1289
129	45	-0.67	AS1289
130	45	-0.67	AS1289
133	46	0.00	AS1289
134	49	2.02	AS1289
136	49	2.02	AS1289
139	46	0.00	AS1289
140	46	0.00	P2B/2
141	46	0.00	AS1289
143	48	1.35	AS1289
144	48	1.35	AS1289
148	47	0.67	AS1289
149	45	-0.67	
150	46	0.00	AS1289

No. of Results	82
Median	46
Norm IQR	1.48
CV	3.2%
Min	42
Max	50
Range	8

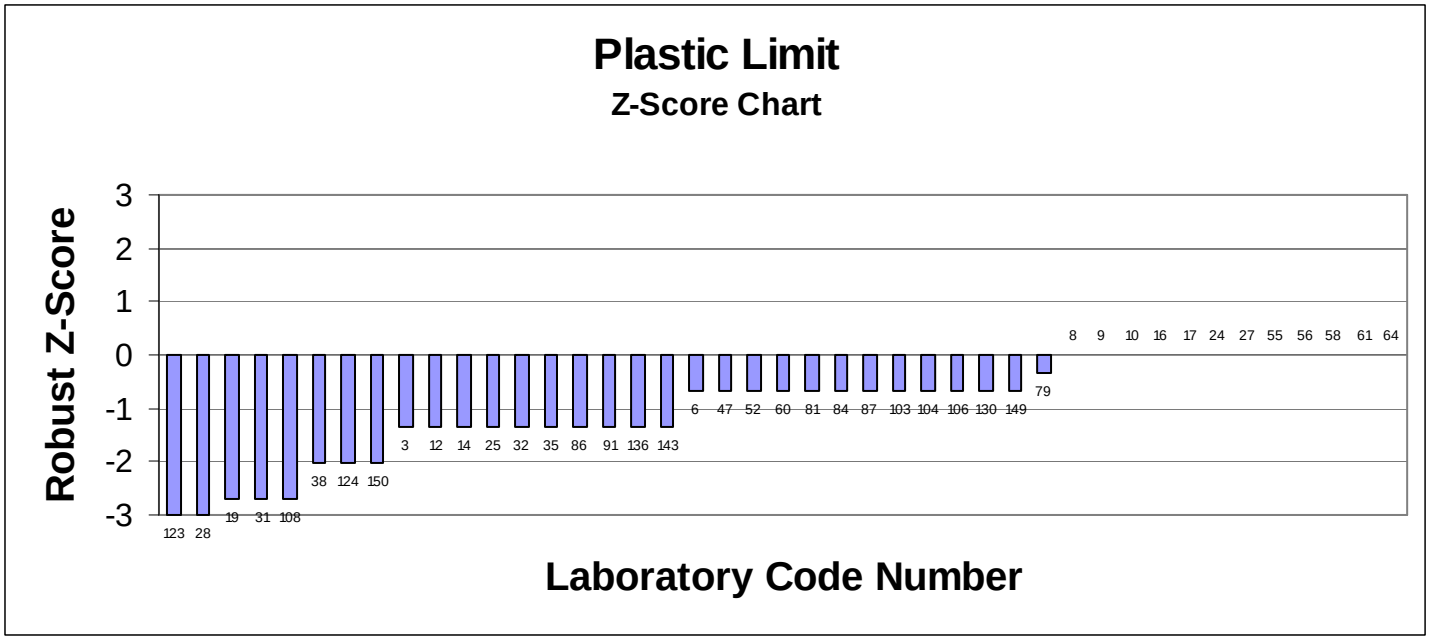

Liquid Limit
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
19 76 32 81 109 24 38 42 102 6 12 43 47 56 73 80 84 103 106 114 115 122 129 130 149 4 8 10 11 16 35 55 58 64 65 75 83 87 93 95 96 104 133
Laboratory Code Number

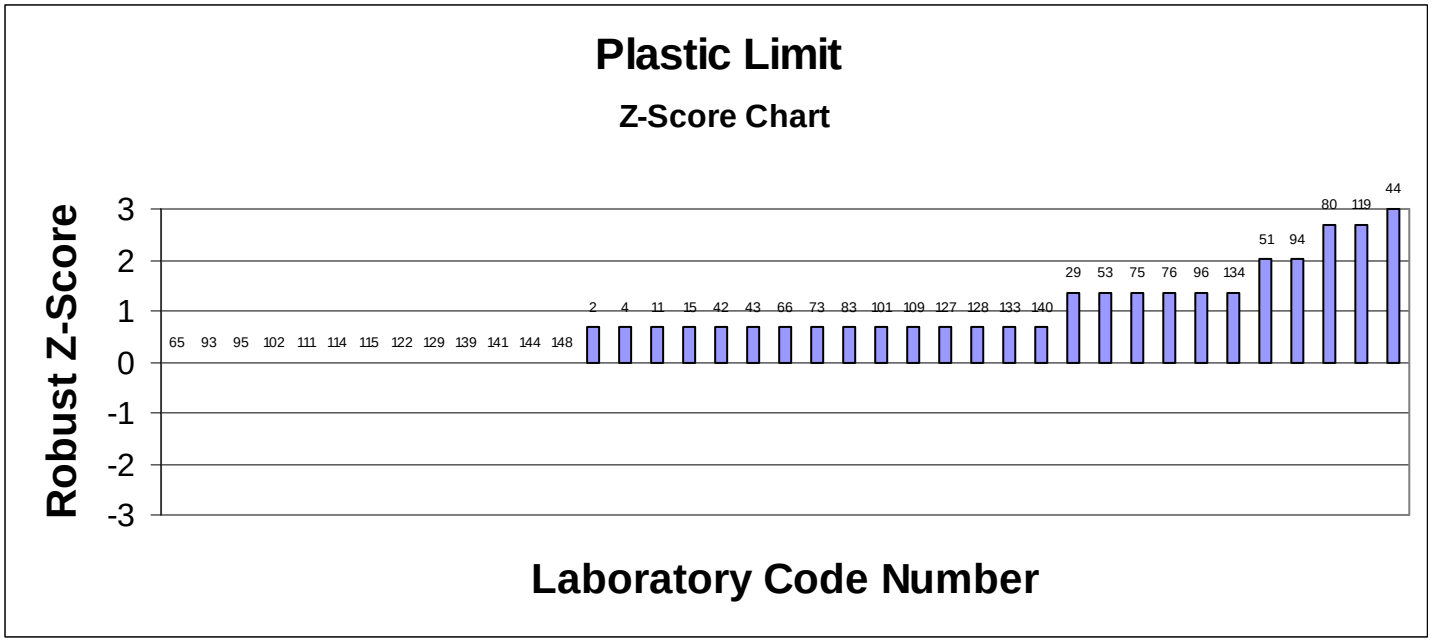

Liquid Limit
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
139 140 141 150 2 9 28 29 31 44 51 52 66 79 86 91 101 111 119 124 127 148 3 14 15 17 27 53 60 94 108 123 143 144 25 128 134 136 61
Laboratory Code Number

Plastic Limit			
Lab Code	**Results**	**Robust Z-Score**	**Method**
2	20	0.67	AS1289
3	17	-1.35	AS1289
4	20	0.67	
6	18	-0.67	AS1289
8	19	0.00	AS1289
9	19	0.00	AS1289
10	19	0.00	AS1289
11	20	0.67	AS1289
12	17	-1.35	AS1289
14	17	-1.35	
15	20	0.67	AS1289
16	19	0.00	AS1289
17	19	0.00	AS1289
19	15	-2.70	AS1289
24	19	0.00	AS1289
25	17	-1.35	AS1289
27	19	0.00	AS1289
28	14	-3.37 **§**	AS1289
29	21	1.35	
31	15	-2.70	
32	17	-1.35	AS1289
35	17.0	-1.35	
38	16	-2.02	AS1289
42	20	0.67	AS1289
43	20	0.67	AS1289
44	24	3.37 **§**	AS1289
47	18	-0.67	AS1289
51	22	2.02	AS1289
52	18	-0.67	AS1289
53	21	1.35	AS1289
55	19	0.00	AS1289
56	19	0.00	AS1289
58	19	0.00	AS1289
60	18	-0.67	AS1289
61	19	0.00	AS1289
64	19	0.00	AS1289
65	19	0.00	AS1289
66	20	0.67	AS1289
73	20	0.67	AS1289
75	21	1.35	AS1289
76	21	1.35	
79	18.5	-0.34	AS1289
80	23	2.70	AS1289
81	18	-0.67	AS1289
83	20	0.67	AS1289
84	18	-0.67	AS1289

Plastic Limit			
Lab Code	**Results**	**Robust Z-Score**	**Method**
86	17	-1.35	
87	18	-0.67	AS1289
91	17	-1.35	AS1289
93	19	0.00	AS1289
94	22	2.02	AS1289
95	19	0.00	AS1289
96	21	1.35	AS1289
101	20	0.67	AS1289
102	19	0.00	AS1289
103	18	-0.67	AS1289
104	18	-0.67	AS1289
106	18	-0.67	AS1289
108	15	-2.70	AS1289
109	20	0.67	
111	19	0.00	AS1289
114	19	0.00	
115	19	0.00	AS1289
119	23	2.70	AS1289
122	19	0.00	AS1289
123	13	-4.05 **§**	AS1289
124	16	-2.02	AS1289
127	20	0.67	AS1289
128	20	0.67	AS1289
129	19	0.00	AS1289
130	18	-0.67	AS1289
133	20	0.67	AS1289
134	21	1.35	AS1289
136	17	-1.35	AS1289
139	19	0.00	AS1289
140	20	0.67	P3A/1
141	19	0.00	AS1289
143	17	-1.35	AS1289
144	19	0.00	AS1289
148	19	0.00	AS1289
149	18	-0.67	
150	16	-2.02	AS1289

No. of Results	82
Median	19
Norm IQR	1.48
CV	7.8%
Min	13
Max	24
Range	11

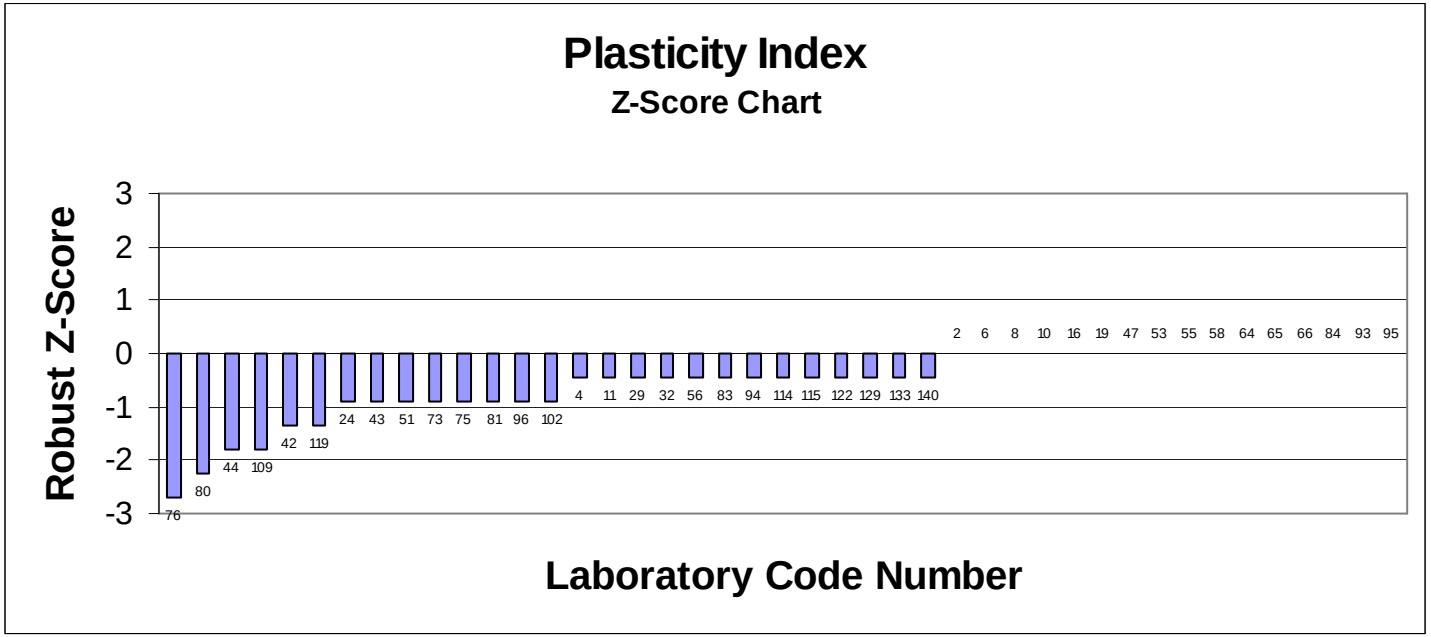

Plastic Limit
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
123 28 19 31 108 38 124 150 3 12 14 25 32 35 86 91 136 143 6 47 52 60 81 84 87 103 104 106 130 149 79 8 9 10 16 17 24 27 55 56 58 61 64
Laboratory Code Number

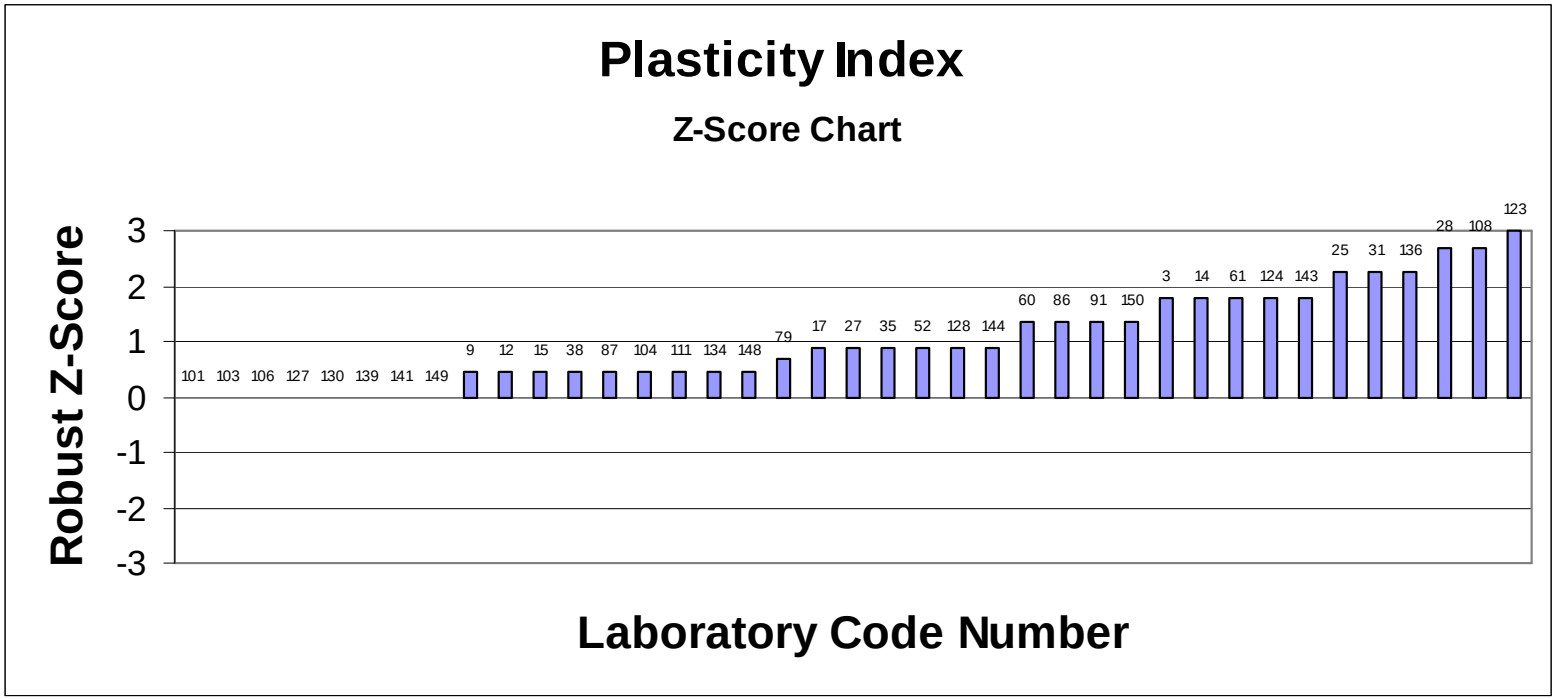

Plastic Limit
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
65 93 95 102 111 114 115 122 129 139 141 144 148
2 4 11 15 42 43 66 73 83 101 109 127 128 133 140
29 53 75 76 96 134
51 94
80 119
44
Laboratory Code Number

Plasticity Index			
Lab Code	**Results**	**Robust Z-Score**	**Method**
2	27	0.00	AS1289
3	31	1.88	AS1289
4	26	-0.47	
6	27	0.00	AS1289
8	27	0.00	AS1289
9	28	0.47	AS1289
10	27	0.00	AS1289
11	26	-0.47	AS1289
12	28	0.47	AS1289
14	31	1.88	
15	28	0.47	AS1289
16	27	0.00	AS1289
17	29	0.94	AS1289
19	27	0.00	AS1289
24	25	-0.94	AS1289
25	32	2.35	AS1289
27	29	0.94	AS1289
28	33	2.82	AS1289
29	26	-0.47	
31	32	2.35	
32	26	-0.47	AS1289
35	29.0	0.94	
38	28	0.47	AS1289
42	24	-1.41	AS1289
43	25	-0.94	AS1289
44	23	-1.88	AS1289
47	27	0.00	AS1289
51	25	-0.94	AS1289
52	29	0.94	AS1289
53	27	0.00	AS1289
55	27	0.00	AS1289
56	26	-0.47	AS1289
58	27	0.00	AS1289
60	30	1.41	AS1289
61	31	1.88	AS1289
64	27	0.00	AS1289
65	27	0.00	AS1289
66	27	0.00	AS1289
73	25	-0.94	AS1289
75	25	-0.94	AS1289
76	21	-2.82	
79	28.5	0.70	AS1289
80	22	-2.35	AS1289
81	25	-0.94	AS1289
83	26	-0.47	AS1289
84	27	0.00	AS1289

Plasticity Index			
Lab Code	**Results**	**Robust Z-Score**	**Method**
86	30	1.35	
87	28	0.45	AS1289
91	30	1.35	AS1289
93	27	0.00	AS1289
94	26	-0.45	AS1289
95	27	0.00	AS1289
96	25	-0.90	AS1289
101	27	0.00	AS1289
102	25	-0.90	AS1289
103	27	0.00	AS1289
104	28	0.45	AS1289
106	27	0.00	AS1289
108	33	2.70	AS1289
109	23	-1.80	
111	28	0.45	AS1289
114	26	-0.45	
115	26	-0.45	AS1289
119	24	-1.35	AS1289
122	26	-0.45	AS1289
123	35	3.60 **§**	AS1289
124	31	1.80	AS1289
127	27	0.00	AS1289
128	29	0.90	AS1289
129	26	-0.45	AS1289
130	27	0.00	AS1289
133	26	-0.45	AS1289
134	28	0.45	AS1289
136	32	2.25	AS1289
139	27	0.00	AS1289
140	26	-0.45	P3A/1
141	27	0.00	AS1289
143	31	1.80	AS1289
144	29	0.90	AS1289
148	28	0.45	AS1289
149	27	0.00	
150	30	1.35	AS1289

No. of Results	82
Median	27
Norm IQR	2.13
CV	7.9%
Min	21
Max	35
Range	14

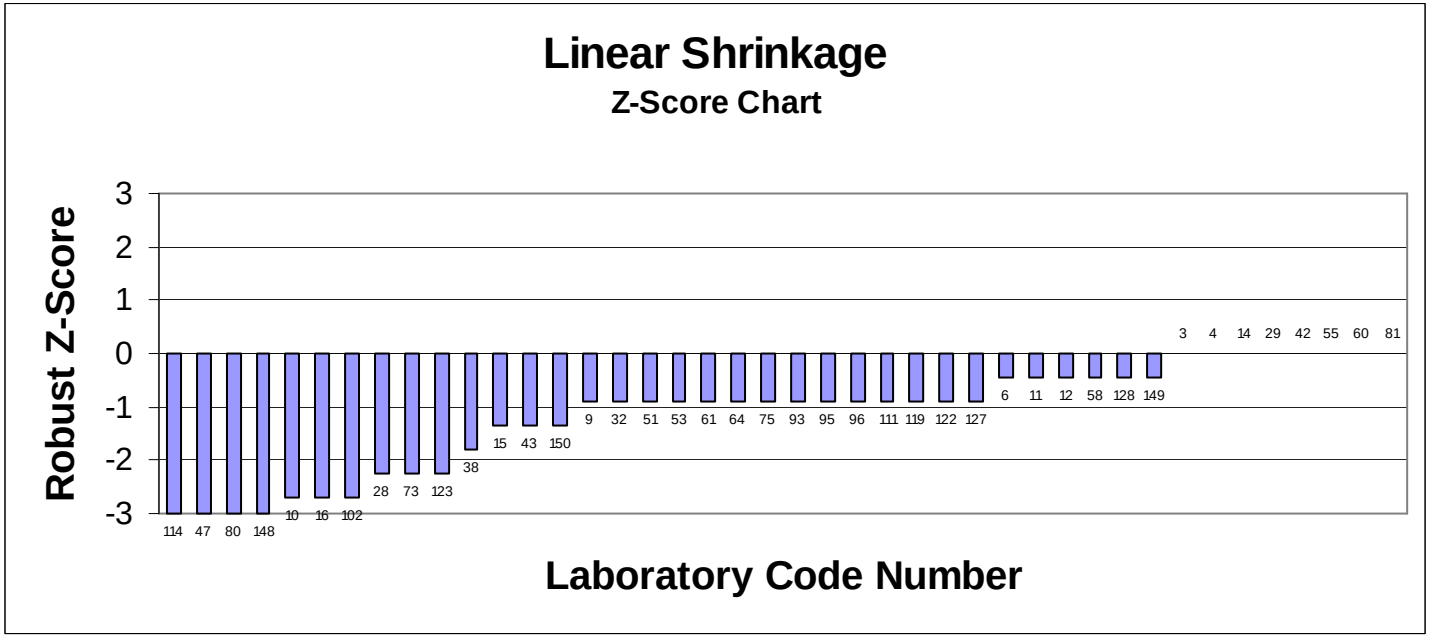

Plasticity Index
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
76 80 44 109 42 119 24 43 51 73 75 81 96 102 4 11 29 32 56 83 94 114 115 122 129 133 140 2 6 8 10 16 19 47 53 55 58 64 65 66 84 93 95
Laboratory Code Number

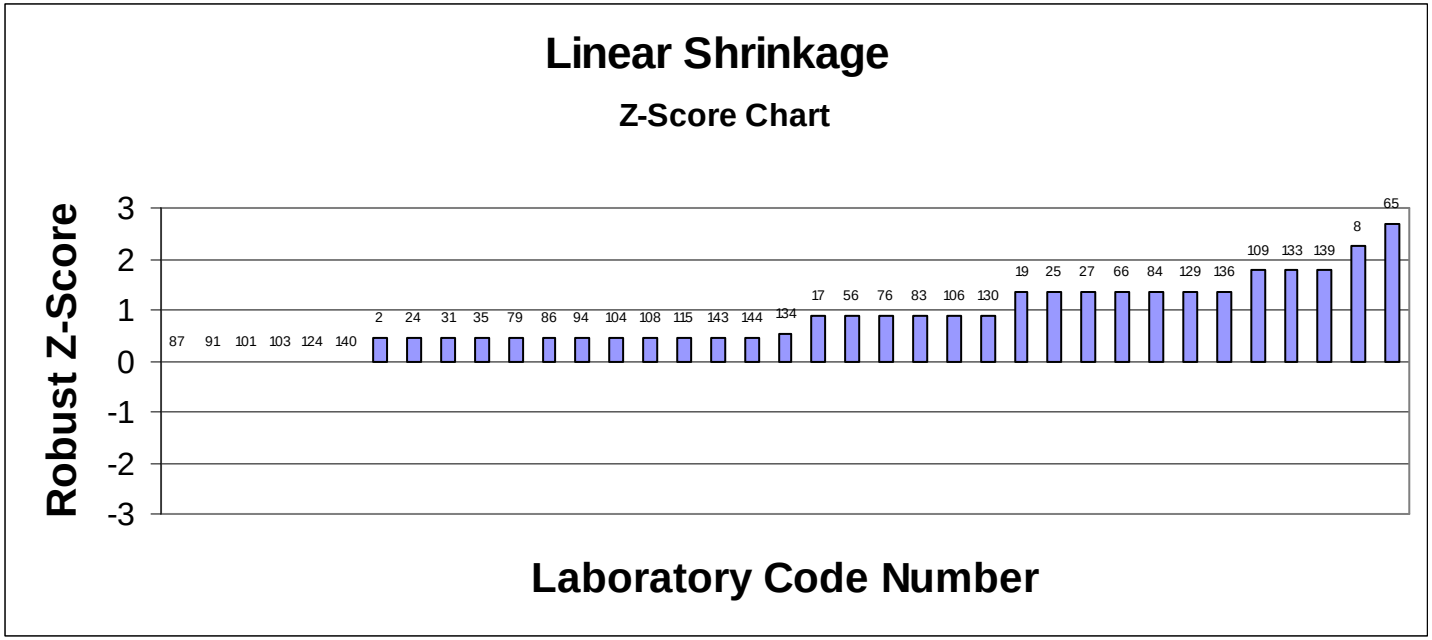

Plasticity Index
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
101 103 106 127 130 139 141 149 9 12 15 38 87 104 111 134 148 79 17 27 35 52 128 144 60 86 91 150 3 14 61 124 143 25 31 136 28 108 123
Laboratory Code Number

Linear Shrinkage			
Lab Code	**Results**	**Robust Z-Score**	**Method**
2	12.5	0.45	AS1289
3	12.0	0.00	AS1289
4	12.0	0.00	
6	11.5	-0.45	AS1289
8	14.5	2.25	AS1289
9	11	-0.90	AS1289
10	9.0	-2.70	AS1289
11	11.5	-0.45	AS1289
12	11.5	-0.45	AS1289
14	12	0.00	
15	10.5	-1.35	AS1289
16	9.0	-2.70	AS1289
17	13.0	0.90	AS1289
19	13.5	1.35	AS1289
24	12.5	0.45	AS1289
25	13.5	1.35	AS1289
27	13.5	1.35	AS1289
28	9.5	-2.25	AS1289
29	12.0	0.00	
31	12.5	0.45	
32	11	-0.90	AS1289
35	12.5	0.45	
38	10.0	-1.80	AS1289
42	12	0.00	AS1289
43	10.5	-1.35	AS1289
47	8.5	-3.15 **§**	AS1289
51	11.0	-0.90	AS1289
53	11	-0.90	AS1289
55	12.0	0.00	AS1289
56	13.0	0.90	AS1289
58	11.5	-0.45	AS1289
60	12.0	0.00	AS1289
61	11.0	-0.90	AS1289
64	11.0	-0.90	AS1289
65	15.0	2.70	AS1289
66	13.5	1.35	AS1289
73	9.5	-2.25	AS1289
75	11.0	-0.90	AS1289
76	13	0.90	
79	12.5	0.45	AS1289
80	8.5	-3.15 **§**	AS1289
81	12.0	0.00	AS1289
83	13.0	0.90	AS1289
84	13.5	1.35	AS1289
86	12.5	0.45	
87	12	0.00	AS1289

Linear Shrinkage			
Lab Code	**Results**	**Robust Z-Score**	**Method**
91	12.0	0.00	AS1289
93	11.0	-0.90	AS1289
94	12.5	0.45	AS1289
95	11	-0.90	AS1289
96	11.0	-0.90	AS1289
101	12.0	0.00	AS1289
102	9.0	-2.70	AS1289
103	12.0	0.00	AS1289
104	12.5	0.45	AS1289
106	13	0.90	AS1289
108	12.5	0.45	AS1289
109	14	1.80	
111	11.0	-0.90	AS1289
114	7.5	-4.05 **§**	
115	12.5	0.45	AS1289
119	11.0	-0.90	AS1289
122	11.0	-0.90	AS1289
123	9.5	-2.25	AS1289
124	12	0.00	AS1289
127	11.0	-0.90	AS1289
128	11.5	-0.45	AS1289
129	13.5	1.35	AS1289
130	13.0	0.90	AS1289
133	14	1.80	AS1289
134	12.6	0.54	AS1289
136	13.5	1.35	AS1289
139	14.0	1.80	AS1289
140	12.0	0.00	P3A/1
143	12.5	0.45	AS1289
144	12.5	0.45	AS1289
148	8.5	-3.15 **§**	AS1289
149	11.5	-0.45	
150	10.5	-1.35	AS1289

No. of Results	79
Median	12
Norm IQR	1.11
CV	9.3%
Min	8
Max	15
Range	8


Linear Shrinkage
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
114 47 80 148 10 16 102 28 73 123 38 15 43 150 9 32 51 53 61 64 75 93 95 96 111 119 122 127 6 11 12 58 128 149 3 4 14 29 42 55 60 81
Laboratory Code Number


Linear Shrinkage
Z-Score Chart
Robust Z-Score
3
2
1
0
-1
-2
-3
87 91 101 103 124 140 2 24 31 35 79 86 94 104 108 115 143 144 134 17 56 76 83 106 130 19 25 27 66 84 129 136 109 133 139 8 65
Laboratory Code Number

APPENDIX B

Sample Homogeneity

Homogeneity Testing

The following results were obtained for the purpose of homogeneity testing.

Statistical analysis has shown that all samples are sufficiently homogenous such that any results later identified as outliers should not be attributed to any significant sample variability.

Test	1	2	3	4	5	6	CV
Liquid Limit (%)	49	49	49	49	49	48	**0.84%**
Plastic Limit (%)	17	16	16	16	18	17	**4.90%**
Plasticity Index (%)	32	33	33	33	31	31	**3.06%**
Linear Shrinkage (%)	13.0	13.0	14.0	13.5	13.5	13.5	**2.81%**

APPENDIX C

Documentation

PROFICIENCY TESTING AUSTRALIA
Proficiency Testing Program

Soils Round 5

INSTRUCTIONS TO PARTICIPANTS

Please read instructions carefully **BEFORE** commencing testing.

To ensure that the results of this program can be analysed properly, participants are asked to carefully note the following:

1. One 1000 gram soil sample is supplied to each laboratory.

2. To obtain information in regards to the preparation stages of the tests the following exercise is requested. It does not form part of the proficiency exercise, however, it may help laboratories assess their performance.

   a) At the time that the "test sample" (i.e. for liquid limit, plastic limit, plasticity index and linear shrinkage) is taken from the supplied sample determine the moisture content (w) as per AS1289 2.1.1 Ensure that the moisture content test sample weight between 150 and 200g.

   b) Determine the wet mass (M_w) to the nearest 0.1g of the "test sample".

   c) At the completion of the preparation stage determine the dry mass (M_d) of the +425µm material sieved out of the "test sample" to the nearest 0.1g.

   d) Calculate and report on the results sheet the percentage of +425µm material of the "test sample" on a dry basis to the nearest 1%:

   $$\text{PTS\% + 425µm (dry)} = \frac{M_d}{\frac{M_w}{1+\frac{w}{100}}} \times 100$$

3. The following tests are to be conducted:

   Liquid Limit Plastic Limit Plasticity Index Linear Shrinkage

4. Laboratories are required to perform all tests for which NATA accreditation is held and are welcome to report results for any remaining tests.

5. These tests are to be conducted in accordance to AS1289-1995, 3.1.1, 3.2.1, 3.3.1, 3.4.1.

6. For each test on the sample the result is to be reported on the results sheet to the accuracy and reporting basis indicated.

7. Testing may commence as soon as the sample is received. All laboratories must return the result sheet no later than **4 May 2007** to:

Dr Michael Li, Proficiency Testing Australia.
PO Box 7507, Silverwater NSW 2128. Australia.
phone: +61 2 9736 8397 or 1300 782 867
fax: +61 2 9743 6664
email: michael.li@pta.asn.au

PROFICIENCY TESTING AUSTRALIA
Soils - Proficiency Testing Program

Results Sheet

Lab Code:

Test (report to)	Result	Method
+425µm sieve(dry mass -%)		PTA Instructions No.2
Liquid Limit (%)		
Plastic Limit (%)		
Plasticity Index (%)		
Linear Shrinkage (0.5%)		

Signed: _____ **Date:** _____

Name of Signatory:

Return no later than **Friday 4 May 2007**, to:

Dr Michael Li, Proficiency Testing Australia.
PO Box 7507, Silverwater NSW 2128. Australia.
phone: +61 2 9736 8397 or 1300 782 867, fax: +61 2 9743 6664, email: michael.li@pta.asn.au