

A, B, C OR X, Y, Z ????

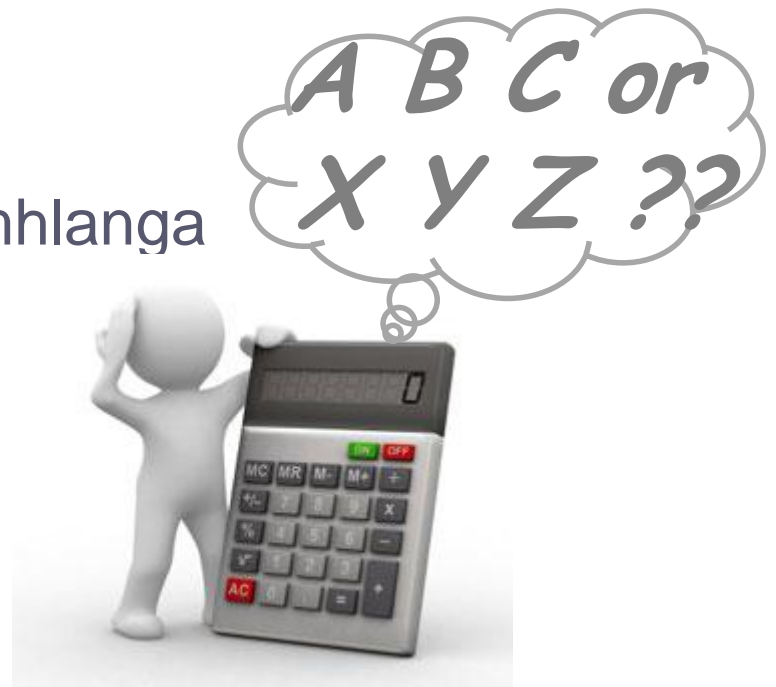
PTS FEEDBACK & PROGRESS REPORT

27th RPF

20th May 2014

Three Cities Gateway Hotel, Umhlanga

Barry Pearce



Discussion to include...

- Overview of PTS todate
- Methodology review
- Soils & Gravels feedback
 - CBR results
 - Comparison 1st Atterberg vs 2nd Atterberg results
- DSR PTS
- Asphalt PTS
- Concrete PTS
- Soils & Gravels PTS
- Acceptable range of HMA results
- A final word or 2 in conclusion



PTS already undertaken + *currently underway*

- This process of PT schemes is now in its 4rd year & 6th PTS
- 1st PTS – S&G
 - Grading analysis
 - Atterberg limits
- 2nd PTS - HMA
 - BRD, Rice, % Binder, Stability & Flow, ITS
- 3rd PTS – Binders
 - Pen, R&B, BV, RTFOT
- 4th PTS – S&G
 - CBR
 - Atterberg & grading - retest
- 5th DSR
 - *Initial trial run*
 - *More about this later*

Methodology – the AMRL z-score

- AASHTO Materials Reference Laboratory
 - Z-Score ≤ 1 Rating = 5
 - Z-Score > 1 & ≤ 1.5 Rating = 4
 - Z-Score > 1.5 & ≤ 2 Rating = 3
 - Z-Score > 2 & ≤ 2.5 Rating = 2
 - Z-Score > 2.5 & ≤ 3 Rating = 1
 - Z-Score > 3 Rating = 0
- ASTM z-score more stringent than conventional method
 - involves more labs
 - therefore better correlation

CBR & ATTERBERG PTS

2013/2014



CBR overview

- 32 participant
- Moisture & MDD provided for preparation & calcs
 - Done to reduce variability (OMC & MDD)
 - Not sure if this is best method due to large range of CBR results
- Some participants need to look quite closely at their results & do some investigation
- Currently looking too in detail at results
 - Should just take final reported result & analyse
 - Maybe this can occur once all are better acquainted with what is required.
 - Incorrect info provided, misunderstanding have an affect on results

CBR results

Comments on sieve analysis

- Majority of results acceptable
 - 76 % within range 1
 - 16 % within range 1 – 1.5
 - 7 % within range 1.5 – 3.
- Minor mathematical errors were also picked
- 2 results for 0.075 mm results are approx 15 standard deviations from norm.
 - Investigation needed by lab concerned
- Some serious concerns if one looks in more details than just final results.
 - Test method not followed
 - Sample preparation checks

CBR results

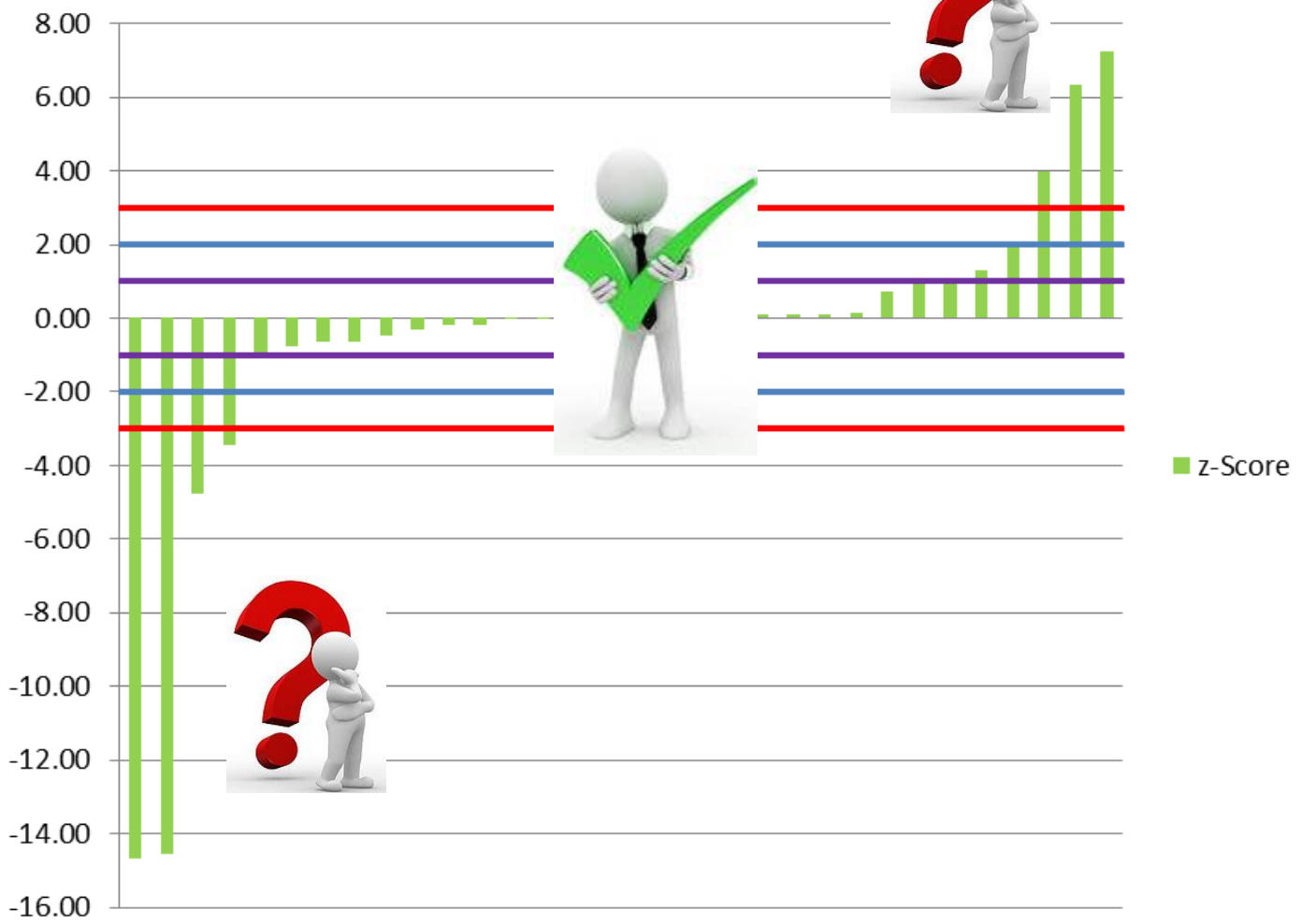
Comments on sieve analysis (2)

- Major concern 1
 - Sample size used - dry masses used varies from 500 g - 3.5 kg.
 - 3 paired results - exactly same dry mass for their 2 samples
 - 3 275.7 g, exactly 1 000 g and 977.3 g
- Major concern 2
 - 7 samples had < 300 g of fines.
 - An additional 4 samples just sufficient fines.
 - 33 % participants used samples smaller than required by test method.

CBR – moisture content

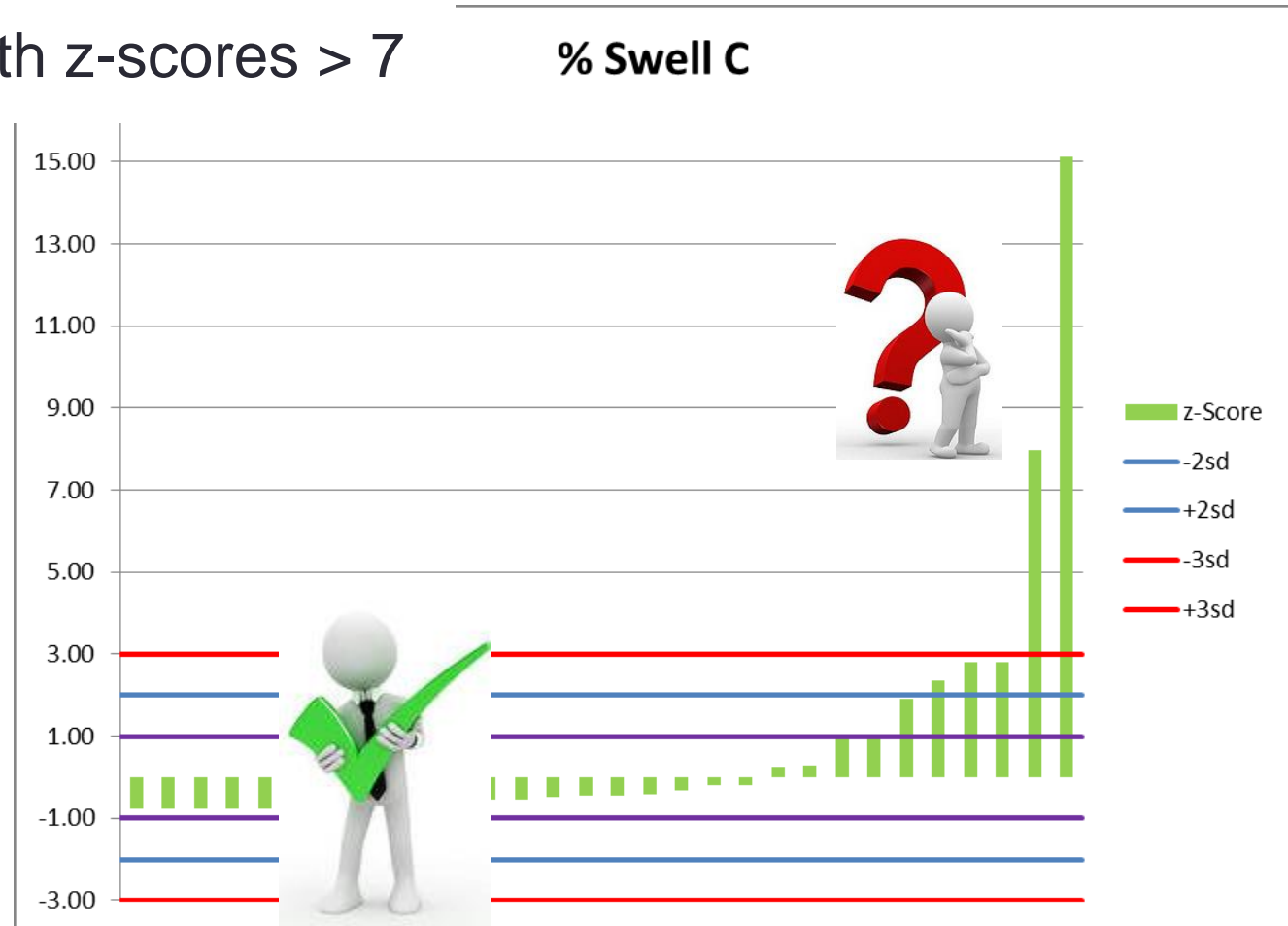
- Moisture content specified @ 7 %
- 73 % of results acceptable.
- 8 labs had exactly 7.00 % moisture
- 2 results look more like hygroscopic moisture content
 - More specific instructions could have prevented this misinterpretation.
- Remaining 8 samples (31 %) outside acceptable range
 - ± 0.3 % of OMC

Moisture Content



Swell

- In general acceptable
- Some results with z-scores > 7

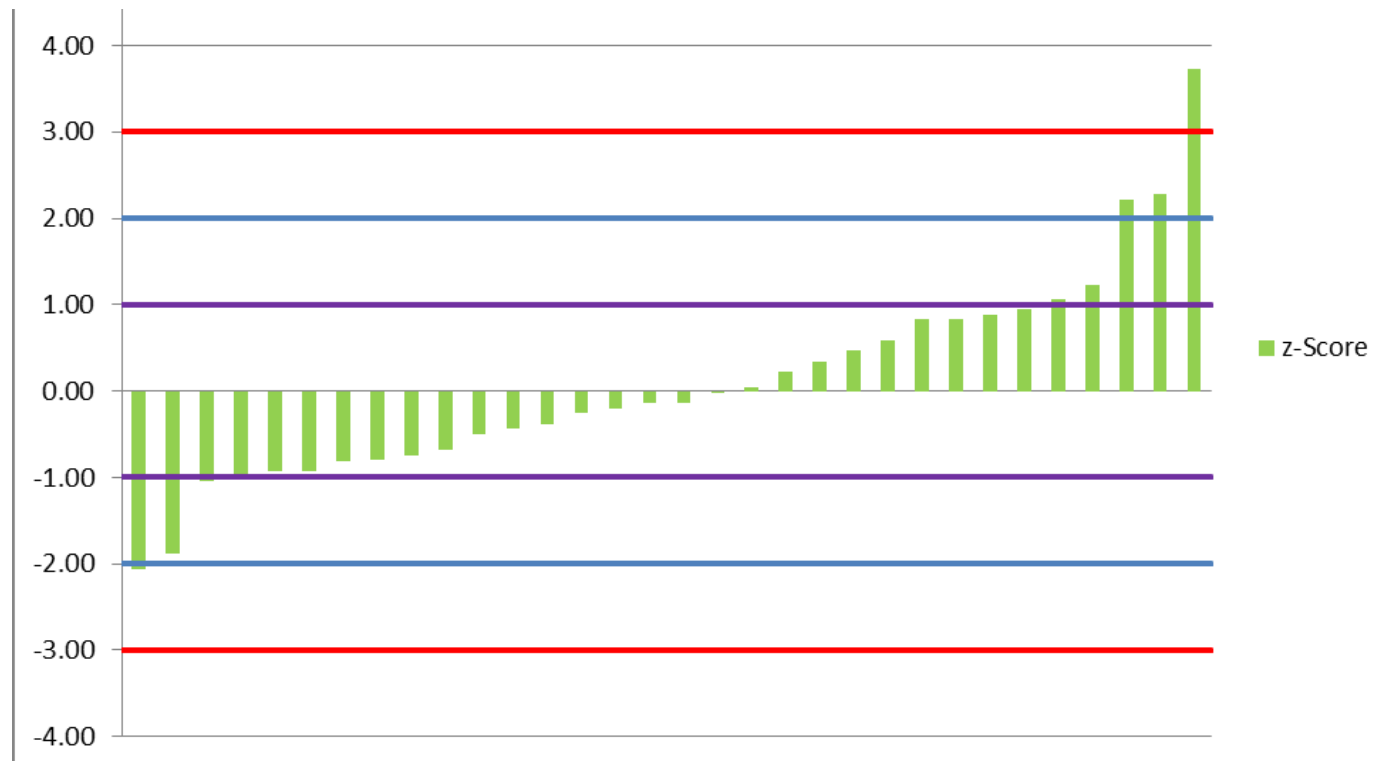


CBR results

- 23 results obtained.
- CBR range 25 – 191
 - 166 % @ 100 % CBR
- Need a different approach



CBR Value @ 95%

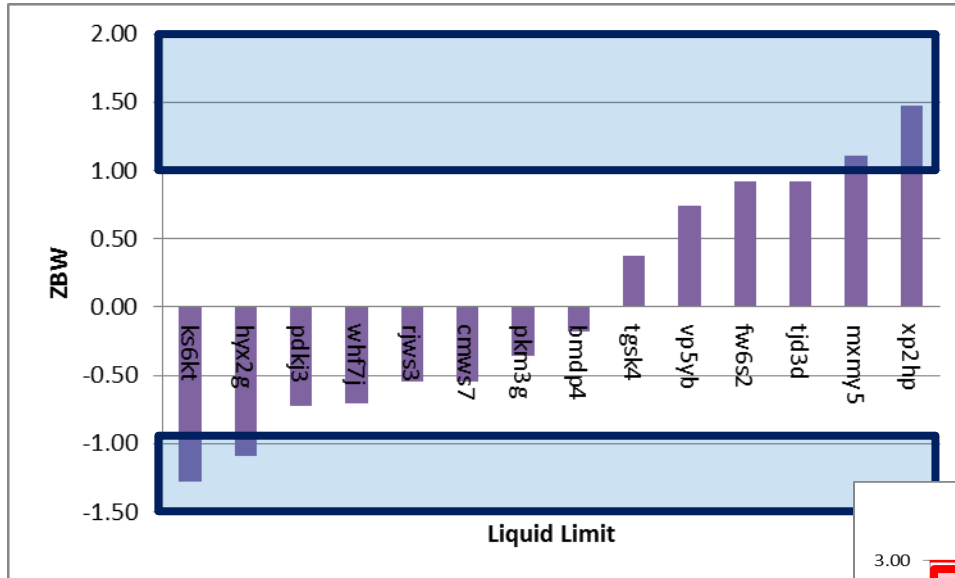


ATTERBERG RESULTS

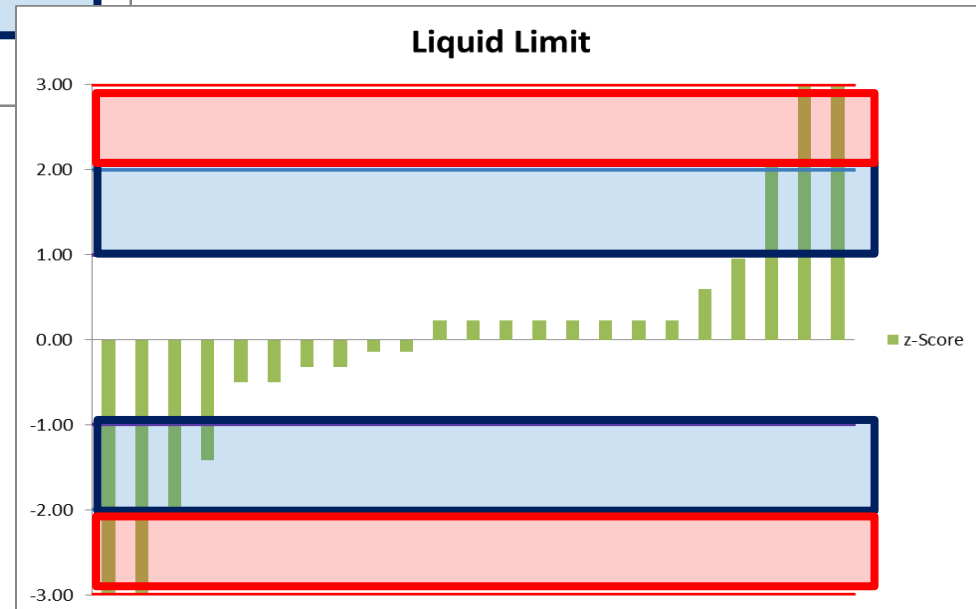
2011 VS 2014



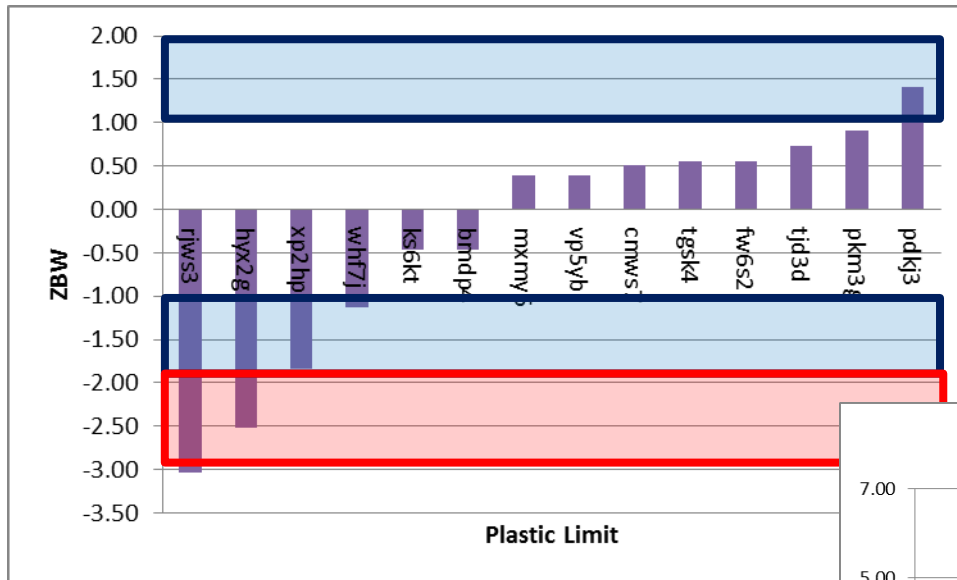
Atterberg comparison 1st vs 2nd PTS



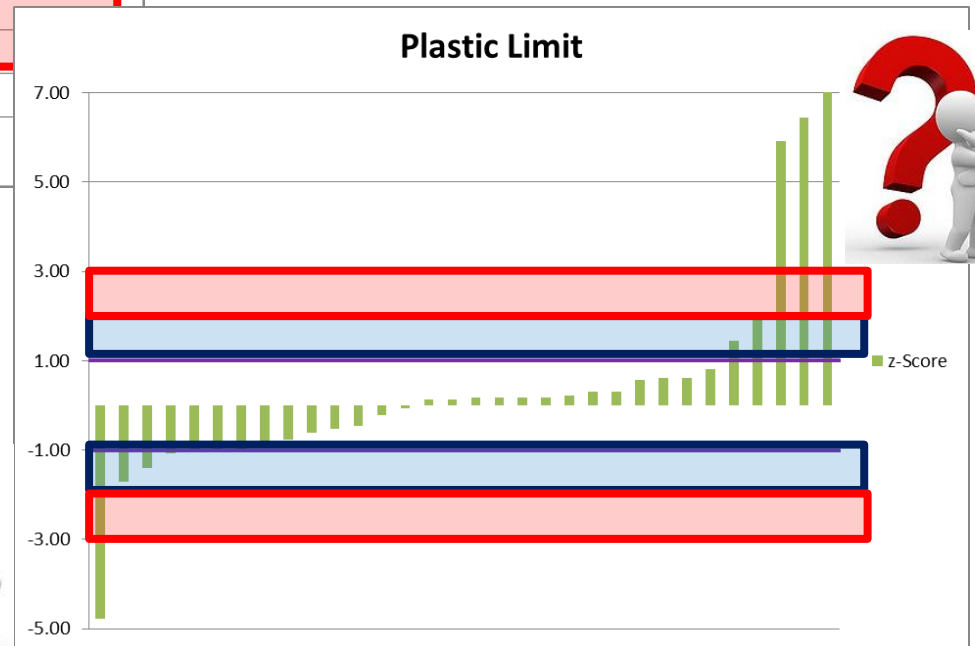
LL	2011	2014
stdev	2.439	1.455
max	26.5	28.0
min	19.0	22.0
range	7.5	6.0



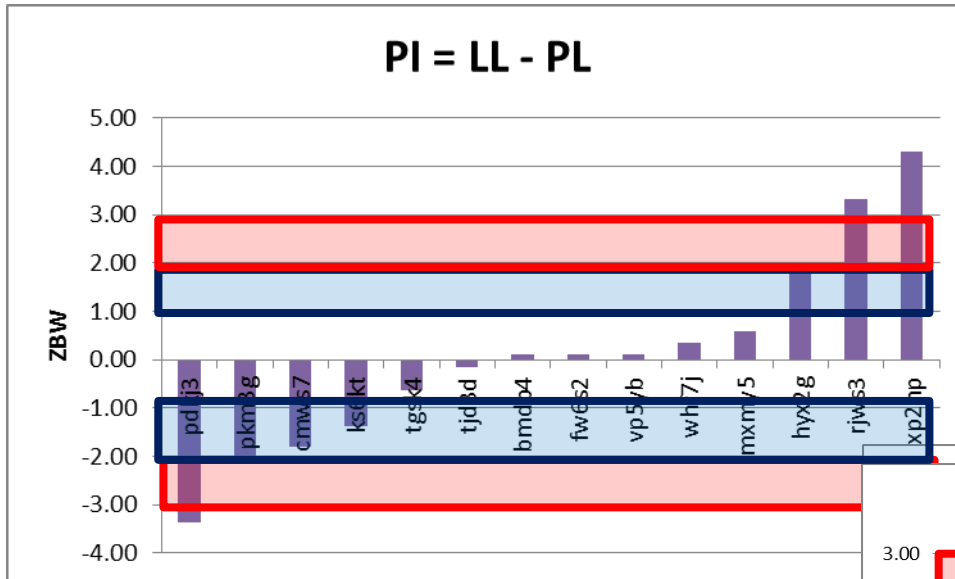
Atterberg comparison 1st vs 2nd PTS



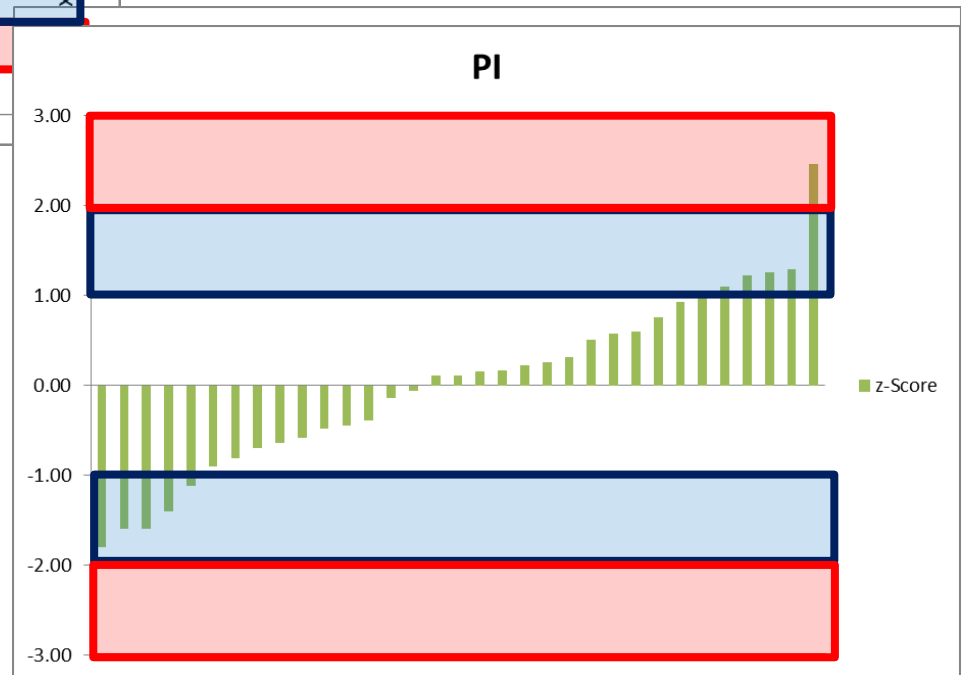
PL	2011	2014
stdev	3.293	2.872
max	18.0	25.1
min	6.5	9.7
range	11.5	15.4



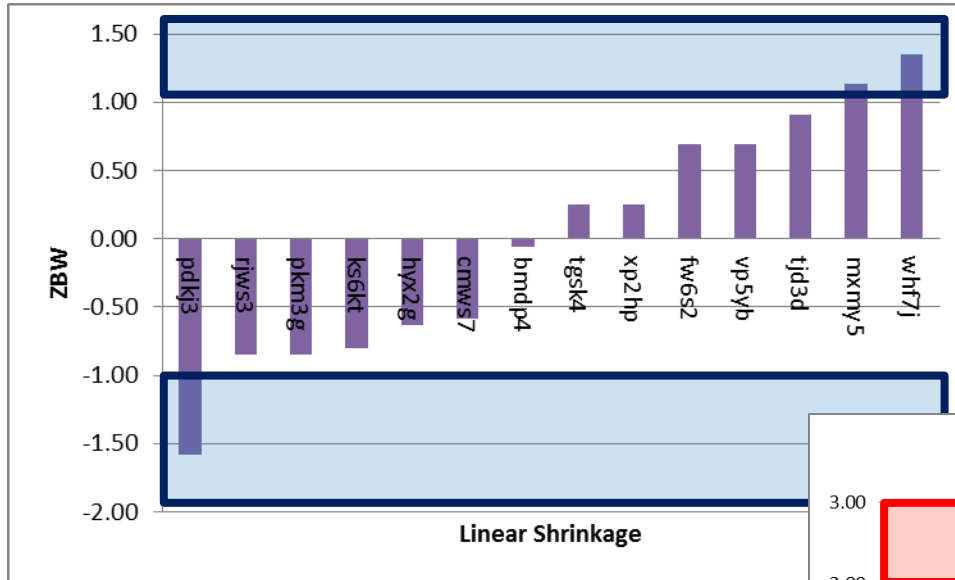
Atterberg comparison 1st vs 2nd PTS



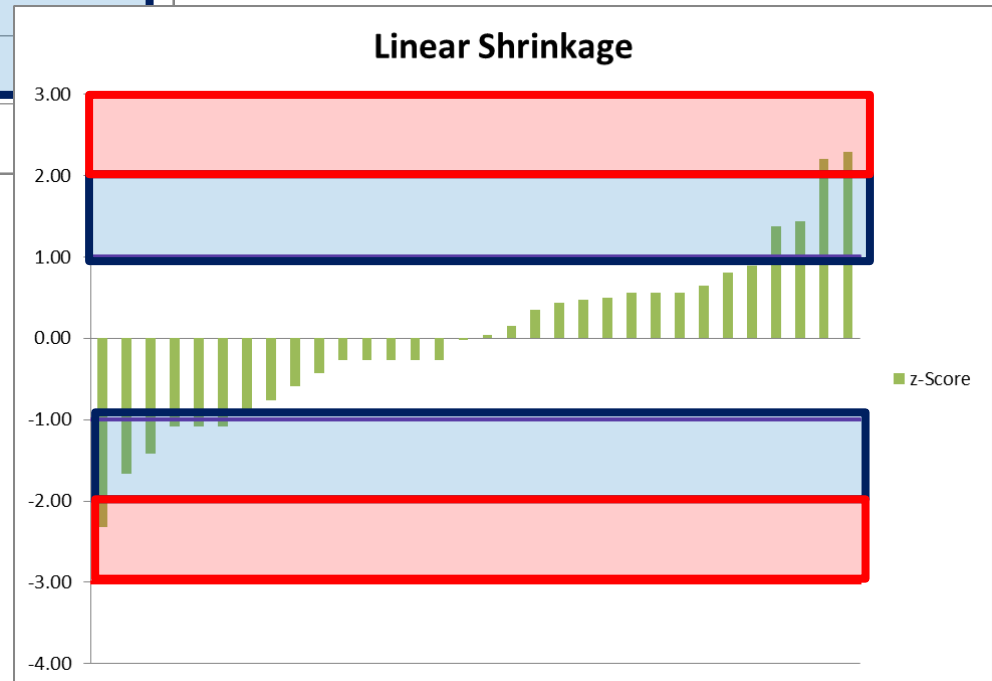
PI	2011	2014
stdev	3.847	1.744
max	18.0	14.0
min	2.5	6.4
range	15.5	7.6



Atterberg comparison 1st vs 2nd PTS



LS	2011	2014
stdev	1.014	1.266
max	5.0	10.1
min	1.7	4.5
range	3.3	5.6



HMA RANGE OF RESULTS



Comparative unedited results study

- HMA results over period of 15 months
- Same material, same source
- BRD 140 kg/m³
- Rice 80 kg/m³
- VIM 5.2 %
- Stability 8.7 kN
- Flow 4.6 mm
- Binder 1.3 %
- ITS 1 800 kPa

Comparative results study - edited results

Individual ranges

Average

·BRD	76	58	96	67	kg/m ³	74
·Rice	18	20	23	20	kg/m ³	20
·VIM	3.3	2.6	4.2	1.8	%	3.0
·Stability	5.5	6.2	6.0	7.7	kN	6.4
·Flow	2.0	2.1	1.1	3.2	mm	2.1
·Binder	0.3	0.3	0.4	0.4	%	0.4
·ITS	369	570	568	685	kPa	548

Comparison range unedited vs edited results (z-score <2)

• BRD	140	kg/m ³	•	112	•	74
• Rice	80	kg/m ³	•	32	•	20
• VIM	5.2	%	•	4.8	•	3.0
• Stability	8.7	kN	•	8.7	•	6.4
• Flow	4.6	mm	•	3.2	•	2.1
• Binder	1.3	%	•	1.0	•	0.4
• ITS	1 800	kPa	•	694	•	548

- **Are we willing to accept these ranges?**
- **With more effort can these be further reduced?**
- **Will SANS 3001 assist in reducing these values?**

A FINAL WORD ... OR 2



09/04/2014 15:37

PTS plans for 2014 & early 2015

- DSR currently underway
 - Very small sample
 - Initially running a trial to ensure testing methods correct
 - Actual PT to be run once initial trial/training completed
- 2nd HMA - May/June & last quarter 2014
 - Considering having briquettes compacted by a single lab to reduce variability in compaction hammer
- Concrete - August 2014
 - Protocols still to be developed
- S&G - early 2015

So are we making progress ... ???

- Looks like we are heading in right direction
- Everyone is **still** learning their way around system
- For NLA in evaluating results
 - **Still** battling to get reports out timeously
 - Mainly due to too much forensics
- For Labs in providing information
 - Particularly in requested format & manner.
- Currently PTs are funded to a degree
 - Will need to look at a costing proposal to fund them into future



In closing...

- **Purpose**
- to improve consistency of results between labs
- Assist in identifying your own internal areas that require attention
- addressing these issues
- Also a requirement for SANAS accreditation
- Still building towards a more professional laboratory environment that will be seen as being
 - Trustworthy
 - Honest
 - Quality driven
- Keep at it – we'll get there!!

Thank folks...

