

Publishing particulars of the paper under discussion

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The identification and treatment of poor durability Karoo dolerite base course aggregate – evidence from case studies

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COMMENT

Table 1 (referencing COLTO 1998) of the above-mentioned technical paper incorrectly states that the PI shall be < 12 when the PI is determined on the –0.075 mm fraction because –0.425 mm fraction is non-plastic. COLTO requires that the PI of

the –0.075 mm fraction shall not exceed 12 without any qualification. If the PI exceeds 12, the material shall be chemically modified. After chemical modification the PI of the –0.075 mm fraction shall not exceed 8. The Technical Committee involved in the COLTO 1998 edition based these criteria

Table 1 Discussion Pre-1994 results pertaining to base course sources

Type of stone	Area	Sample number	PI –0.425 mm	PI –0.075 mm
Dolerite	SE Transvaal	1	1.7	7.9
	SE Transvaal	2	0.6	3.9
	OFS	3	3.1	9.1
Andesite	S Transvaal	4	5.7	9.2
	PWV	5	SP	6.0
Norite	N Transvaal	6	1.9	15.4
	N Transvaal	7	1.0	4.8
Granite	PWV	8	1.3	6.6
	E Transvaal	9	NP	2.9
	NE Transvaal	10	1.4	5.5
Quartzite	E Transvaal	11	2.5	7.7
	OFS – 11 tests	12	0–4	7–13
	PWV	13	4.0	6.0
	PWV	14	SP	4.0
	N Transvaal	15	NP	12.0
	W Transvaal	16	SP	5.0
	Natal	17	SP	7.0
Natal	18	SP	6.0	
Dwyka tillite	S Natal	19	5.0	10.0
Malmesbury hornfels	W Cape	20	2.1	13.7
	W Cape	21	SP	10.4
	W Cape	22	3.1	11.0
	W Cape	23	SP	12.5
	W Cape	24	NP	3.0
	W Cape (G2)	25	3.0	8.0
	W Cape (on R.O.C.)	26	4.0	6.0
Felsite	E Transvaal	27	SP	7.0



Figure 1 Discussion Plotted data from dolerite samples in Table 1 above, suggesting that an NP (“0”) result for PI on –0.425 mm fractions would equate to a PI of 3.3 on the –0.075 mm fractions, which is above the value observed by us (the authors) in our original paper; the limited data supplied does, however, not make the trend very reliable

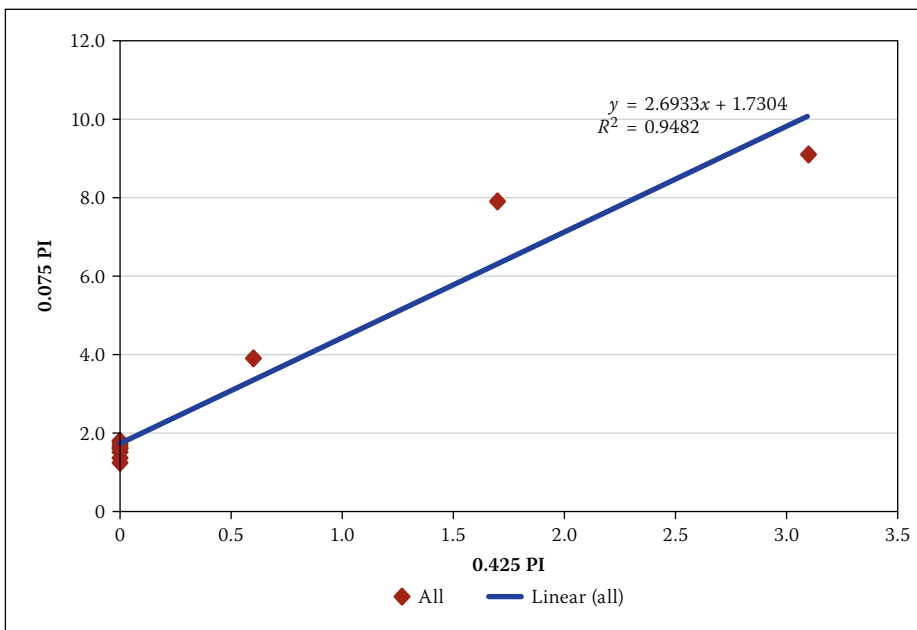


Figure 2 Discussion Following on Figure 1, if we (the authors) include our original data in the trend analysis, then an even better linear correlation is obtained

on experience, as well as the results in Table 1 (above) pertaining to base course sources at the time (pre-1994), made available by the Aggregate and Sand Producers’ Association of South Africa who were kept in the picture regarding various changes to especially base-course specifications to accommodate increasing pavement structural demands, which were not adequately

covered by TRH 14:1985 Guidelines for Road Construction Materials.

It is clear that the cementing matrix of the same rock type can produce widely varying plasticity index results for the –0.075 mm fraction, as obtained for different sources of the same rock type, the outcome definitely not being directly related to the plasticity index of the –0.425 mm fraction.

It would be most interesting to hear from the authors whether these tests were carried out for the projects in question, and for them to provide such details.

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RESPONSE FROM AUTHORS

Thank you for pointing out the error in Table 1 of our paper. The intention was not to provide an incorrect specification, but rather to illustrate that if the –0.425 mm fraction was non-plastic, the –0.075 mm material was also tested to ensure that that material PI was not above the specified value of 12. We agree that it would have been beneficial to test the –0.075 mm fraction of each sample, but unfortunately this was not possible for reasons including budgets and sample volumes.

In all the cases where we obtained NP results for –0.425 mm fractions (seven results in total) the PI of the –0.075 mm fraction ranged from 1.2–1.8. Similarly we did testing of PI on glycol-treated DMI samples, and obtained a PI (–0.075 mm) range of 1.6–1.8 (four results) when the PI of the –0.425 mm fraction was NP. Our dolerite results therefore show a strong correlation between PI of –0.425 mm and –0.075 mm fractions when the PI of the former is NP.

Plotting the data you provided for the dolerite samples only (Table 1 Discussion), a trend can be seen which suggests that an NP (“0”) result for PI on –0.425 mm fractions would equate to a PI of 3.3 on the –0.075 mm fractions. This value is above that observed by us. The limited data supplied does, however, not make this trend very reliable.

Additionally, if we include our data in the trend analysis, an even better linear correlation is obtained (see Figures 1 and 2 alongside).

In conclusion, it would have been ideal if we could have added to the data, thereby better defining the trend, but unfortunately that is not the case. This provides a useful consideration for future testing and research projects.

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