C-49: Relationships between Los Angeles Abrasion Value and Aggregate Impact Value for aggregate in road construction

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In road construction, it is required to test the strength characteristics of crushed rock aggregate used for construction of bases and surfacings, in order to determine the durability of such aggregate with regard to impact and abrasion when roads are subjected to traffic. Such tests are carried out in the laboratory by using the Aggregate Impact Value (AIV) and the Los Angeles Abrasion Value (LAAV) apparatus.

The provincial and major project site laboratories of the Road Development Authority (RDA) have been provided with AIV apparatus for such work. LAAV too is important with respect to surfacings. As it was not possible, to provide the above laboratories with LAAV apparatus due to high costs, a study was undertaken from 1987 to 1991 to determine whether there is any correlation between AIV and LAAV and if so these correlations.

475 samples of rocks were obtained from all over the country and analysed in this project. The AIV was determined by carrying out the tests in accordance with BS 812: Part 8:1975, Clause 6, while LAAV was tested in conformity with ASTM C 535-89 & C 131-87.

The correlation determined, coefficient of determination and the number of samples used in each regression analysis are given in the paper. The relationships appear to indicate that LAAV is size dependent and the explanation for this is given in the paper.

If facilities for testing LAAV are not available, these correlations can be used to find LAAV when AIV is available, so that the field staff can have an idea of the LAAV of the aggregate.

Table: Relationships between AIV and LAAV

Grading Number in LAAV test	Relationships of AIV with LAAV	Ranges of AIV
1 (G-1)	LAAV = 0.93 AIV + 0.43	15 to 55
2 (G-2)	LAAV =1.61 AIV - 12.7	13 to 56
A (G-A)	LAAV = 1.92 AIV – 11.2	18 to 43
B (G-B)	LAAV = 2.19 AIV – 13.5	15 to 42
C (G-C)	LAAV = 2.27 AIV - 12.45	17 to 32