

FORMATTING CONSTRAINTS

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It may be argued that this thesis is the most extensive study ever undertaken in the field of abrasion resistance and abrasion wear in concrete. It has been written with the specific intent of advancing knowledge and understanding in a defined area of engineering, rather than merely satisfying the minimum requirements for a higher degree at a university. However, the comprehensive nature of this investigation has resulted in a document that far exceeds the 200 pages recommended in the guide.

In order to restrict the bulkiness of the final product, the document uses a space efficient 'Arial' size 10 font throughout together with single line spacing, while printing is done on both leaves of the page. These measures are in keeping with 21st century thinking on minimising waste and preserving the forests, and the greatly reduced the bulkiness of the document makes it much easier to carry in a briefcase, and *much* cheaper to airfreight to a colleague. It also more than halves the cost of the printing, as today's modern photo-copying machines can print double sided at virtually the same price as single sided copying.

However, the main advantage of the 'double page / single spacing' format is that a much larger window of information is open at any give place. Often this allows a sub-section to be completely contained on the two pages that are visible to the reader. This makes referring backwards and forwards when considering a particular topic much simpler. Generally it means that discussions relating to graphs and tables can be contained on the 'double page' in view.

For example, in appendix U, where 66 abrasion tests are described, each fully contained on a 'double page', it means that all the illustrations and photographs (e.g. of abrasion equipment, wear patterns etc.) are 'open' when studying a particular test.

NOTE TO THE EXAMINER

In going through this thesis it is possible for an examiner who does not have a special interest in abrasion resistance to significantly reduce the amount of reading and still retain a grasp of the main arguments. The table below may be considered a useful guide in this regard.

Table Showing Essential Reading	
Volume 1	
Chapter 1	Introduction/Background - Read all
Chapter 2	This places abrasion resistance in its proper context from a historical and technological point of view, but is not essential reading.
Chapter 3	Read all
Chapter 4	Read all
Chapter 5	Read all
Chapter 6	Read most. Sections 6.3.2, 6.4.2 and 6.5.2 are repetitive and can be ignored.
Chapter 7	Read introduction and conclusion.
Chapter 8	Read all.
Chapter 9	Read all.
Chapter 10	Although this chapter deals with the wirebrush test, and the subject material is therefore different to that of chapter 9, the arguments none the less follow a similar line of reasoning. The chapter may therefore be passed over, unless the reader has a particular interest in the specifics of this test. In either event it will be useful to read the conclusion.
Chapter 11	This chapter discusses the sandblast test. As for the wirebrush test, it may also be passed over by the reader who does not have a special interest in its various merits and mechanisms. Again, it will be useful to absorb the conclusion.
Chapter 12	This chapter compares the three abrasion tests. It should suffice to read the introduction and conclusion, and consider table 12.1.
Chapter 13	This chapter may be passed over – read introduction and conclusion.
Chapter 14	Read all.
Chapter 15	Read all.
Chapter 16	Conclusion to volume 1 - Read all.
Volume 2	
Chapter 1	Short Introduction/Background - Read all.
Chapter 2	This is by far the longest chapter in the thesis and includes a review of the literature review. It discusses the many factors that affect abrasion resistance, in a very comprehensive/exhaustive way. It demonstrates how conflicting points of view can often be explained by considering the different mechanisms of wear of different abrasion tests. However, it departs from the normal style of writing in that it amasses as much evidence from as many investigators as possible (often with apparently contradictory viewpoints) under various topical headings. This kind of presentation is very good for dipping into, for a better understanding on a specific subject. However, when reading through at one sitting, the reader is advised to focus mainly on the many 'sectional conclusions' corresponding to the various headings. On the other hand references, accompanied by lengthy discussions are generally interesting. These attempt to explain a certain principle, or the reason for an unexpected or contradictory finding. Otherwise, most of the references may be skimmed, as they (1) merely reinforce the principle stated in the opening paragraph/s under a particular heading and (2) the same reference may appear under a number of headings if it has relevance to more than one topic. Finally, it is suggested that the first 31 pages (i.e. up to the end of section 2.1) should be read rather than skimmed, as they describe foundational concepts and the later pages serve as a sample of what follows in the rest of the chapter.
Chapter 3	Read all.
Chapter 4	Read all.
Chapter 5	Conclusion to volume 2 - Read all.

NOMENCLATURE

cbp	concrete block paving
C&CI	Cement and Concrete Institute
CMA	Concrete Masonry Association
cpb	concrete paving blocks
CSIR	Council for Scientific and Industrial Research
c/w	cement / water ratio
FA	Fly ash
FRD	Foundation for Research and Development
GGBS	Ground granulated blastfurnace slag
ISAT	Initial surface absorption test
lme	local manufacturing environment
mc	moisture content
mcd	mean crater depth
MGBS	Milled granulated blastfurnace slag
mvd	mean visible depth
OPC	Ordinary Portland cement
PCI	Portland Cement Institute
RHC	Rapid hardening Portland cement
SABS	South African Bureau of Standards
SF	Silica fume
tss	tensile splitting strength