Portland Cement Paste and Concrete

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Portland Cement Paste and Concrete

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Preface

This book describes and explains the properties and behaviour of Portland cement paste and concrete with respect to their composition and physical structure. The intention is to provide civil and structural engineers, architects and other users of concrete with a better insight into these aspects, and consequently to help them to understand and cope with practical problems which may arise in the daily use of concrete. In addition, the book is intended for use as an advanced textbook on cement and concrete for students of civil engineering or architecture.

First, Portland cement is discussed with particular reference to the effect of its composition and some manufacturing factors on its properties, and the resultant properties of the paste and concrete. Then the hydration process and structure formation of the hardened paste are described, and the factors affecting these processes are explained. The physical structure of the hardened paste is presented in some detail together with the suggested models. The properties of the hardened paste and its behaviour are explained with respect to these models. Finally, concrete properties and behaviour are dealt with at some length. Essentially this is done by considering the effect of the aggregate on the properties of the paste. The effect of some technical factors on the properties of concrete are briefly considered with some emphasis on the effect of steam curing and autoclave treatment.

A number of topics included in this book are usually dealt with in some detail in publications addressed to non-engineers, such as chemists, physicists, etc., and have hitherto only been partially discussed in the available books on concrete. The book, although not claiming to be comprehensive, tries to provide a systematic and comprehensive treatment of these topics in terms which are familiar to its potential readers, namely, civil and structural engineers, architects, etc. It is believed that, in this respect, and in its more basic treatment of the subject, the book differs from apparently similar books.

Haifa, July, 1978

I.S.

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