BUILDING MATERIALS: TESTING AND SUSTAINABILITY

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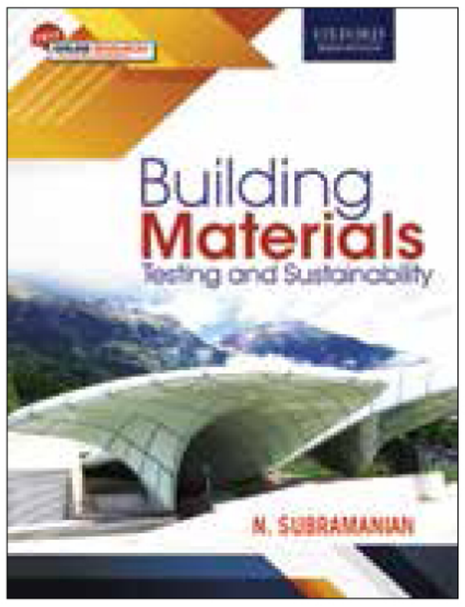
It is nominally priced and an exhaustive book running to 788 pages covering every possible material encountered in construction. The author has given the roadmap to navigate such a vast content by providing a summary of the contents, detailed contents in 11 pages and chapter wise coverage enabling even a busy practising engineer to locate the relevant sought-after information quite easily.



The one highlight of this book is the supplementary free online resources which is now limited to faculty and students, and as knowledge is ever expanding, it is important for the content to be continually updated. I strongly feel that this online resource should be relevant for industry personnel as well and if it gets updated along with the changes happening in the various Indian Standards it would be a real treasure trove – many would cherish. The exhaustive list of names in the acknowledgements is a testimony to the tremendous efforts of the author in reaching out to many subject experts, as it is difficult to gain expertise in every area of civil engineering. In this respect the earlier experience of the author in running a consultancy firm at Chennai has become useful and relevant in understanding the requirements of the industry. Further, he has tapped a huge network of contacts both in the academia and the industry. Hence, extensive coverage of topics was possible, and their meticulous treatment is to be appreciated.

As ICJ is a journal primarily concerned with the concrete ecosystem, I would like to review the Chapters 5,6,7,8,9 dealing with cementitious materials and Chapter 25 on the testing of building materials. The author has provided a separate list of brief and detailed contents, making it easier for the reader to locate and read the topic of interest. For example, in Chapter 5, self-healing cement not known to many readers is listed in 5.11.2. Typical physical and chemical properties of cement, fly ash, ggbs and silica fume are given in a tabular form. In the Chapter 6 on aggregates, the basic properties required to qualify are presented in a crisp format. One important point to note is the inclusion of recycled aggregates, which many text books do not have, and it is well connected to the title of the book which has the word "Sustainability". It is also a strange coincidence that this review is appearing in the special edition of ICJ dealing with recycled C&D waste materials in construction. In the section 6.13.1 the term “manufactured sand” is used to refer "crushed stone sand" which is rather well-defined in IS383:2016.

Chapter 8 traces the brief history of concrete, the advantages in using it and covers the entire range of construction chemicals used to obtain the desired fresh properties of concrete. Some aspects of batching plant, transportation and placing of concrete including different compacting methods have been adequately described. Most importantly, the need for proper curing and the importance of compaction methods is covered with proper illustrations. Whilst detailing the steps for concrete mix design, the author has rightly advised on conducting trial mixes at site before finalising the concrete mix proportions. This is often a bone of contention at project sites and unfortunately there is a prevailing view among many structural engineers that the mix proportions can be calculated, which is not the case. The importance of providing the required cover for durability and fire resistance of concrete has also been emphasised. In the future revisions of the book, the author may well expand the scope of concrete to higher grades such as M100 and exposure classes as in the BS8500 may also be included, since it is followed in India to design for a service life of 100 years for many infrastructure projects. The defects in concrete has been covered and a brief note on the formwork requirements to get the right shape of concrete, and enhancement of its durability by adopting controlled permeability formwork is enough for the reader to gain some basic understanding. Chapter 9 on special concretes is a container of summary information on different concrete types in one place. An exclusive Chapter 25 on testing of building materials is quite an exhaustive coverage of stones, cement, fresh and hardened properties of concrete, serving as a ready reckoner for field engineers and consultants alike. This chapter takes up more than a tenth of the space in the book.

True to the words "Testing and Sustainability" in the title, the author has introduced “Embodied Energy and Energy Efficiency” in Section 1.10. The multiple-choice questions at the end of each chapter really helps the reader to test their understanding of the content, as the answer keys have also been provided. The reference to Standards from India and elsewhere makes the reader comfortable and saves time searching for such resources. It is a useful reference and guidance to engineers not conversant with site practices, who often lack knowledge of the wide variance in the material properties and their consequent influence, for example, on the quality of the fresh concrete produced. Overall, this book is an important addition to civil engineering portfolio, a laudable effort, and budding engineers should necessarily equip themselves with cutting edge knowledge that is relevant to current practice.