

Book review

Historic Concrete : Background to Appraisal

Edited by James Sutherland, Dawn Hunn and Mike Chrimes. Thomas Telford Publishing, London, 2004. ISBN 0 727 72875 X, £95.00, 437 pp.

Every now and again a book is published that is visual and yet contains a great deal of quantitative and general information about concrete. This is such a book and it is about engineering with concrete. Do not expect to find it on the coffee tables of Starbucks but I hope it will be on the shelves of designers, consultants, contractors, researchers and students of concrete. It is a large book and sets a benchmark for historic concrete.

This edition has brought together 21 key individuals to write eruditely and passionately in some 19 chapters about what can be done with concrete. A material so often taken for granted, like the air we breathe, and yet civilized life depends upon it.

Consultants, practising engineers and partners, academics and information specialists have produced a magnificent statement about concrete and human endeavour from the eighteenth century to the 1980s.

The book contains 1184 references, 310 figures and 42 tables and as such represents a mass of data about concrete and its contribution to our lives.

The book begins with early precast (1905) in Liverpool with units being hauled by steam traction engines and men working on site in bowler hats and waistcoats. Proponents of modern methods of construction should take a look—it has all been done before.

Reinforced concrete is followed by prestressed and names such as Maillart, Torroja, Freyssenet, Nervi, Hennebique and Candela jump out of the pages. From the esoterically pleasing Travanasa Bridge (1905) to the Turin Exhibition Hall (1949). The Ganter Bridge (1980) to the Royal Liver Building (1909) to the functional Weavers' Mill, Swansea (1897) and Wembley Stadium (1921–1924).

Concrete and the cement on which it is based have changed since Aspdin took out his patent in 1824. There has been a steady increase in strength, particularly early-age strength, and cement will continue to evolve as energy and environmental considerations impact.

The book covers foundations and substructures. Did you know the Ritz Hotel (1904) sits on cast iron base plates, resting on a steel grillage above 18 inches (457 mm) of concrete footings that are some 3.96 m² sunk into clay? There is example upon example accompanied by detailed drawings and, in many cases, photographs.

Concrete can be formed into almost any shape and such a prospect excels when used for shell construction from 1945 into the 1960s. The barrel vault roofs at Kidderminster Cattle Market (1961) typified the freedom of the day.

The advent of prestressing pioneered by Eugene Freyssenet gave another dimension to reinforced concrete.

Surprisingly, reinforced concrete bridges were slow in making a mark in the UK, being some 20 years behind events on the Continent. Notable examples being Berw Bridge, Pontypridd (1907) and the Royal Tweed Bridge, Berwick (1928). The variety of forms is remarkable with function and grace combined, resulting in examples such as Mizen Head Bridge (1909).

In more recent times there are many examples of prestressed bridges; the first major one being Northam Bridge (Southampton 1954); although the visual appearance resembles bridges before the War. The variety of design and concepts is most impressive.

Reinforced and prestressed maritime structures are dealt with from 1896 up to the 1970s with the Condeep Platforms built more in the fashion of ships with certification and insurance requirements. One is left with the impression there is no limit to this type of engineering; a legacy of human endeavour that is repeated time and again in this book.

Strangely, at about two thirds of the way through the book, there is a chapter on the Concrete Institute (1908–23). Many younger readers will not have heard of this body that became the Institute of Structural Engineers and laid down terms of reference for build-

ing control officers, architects, engineers and others, based on understanding the subject matter. This was something of a turning point since much practice is driven by need and opportunity and often precedes detail and understanding.

The book moves on to tunnels showing wonderful photographs of concrete being placed by a gentleman in a top hat, Dickensian beard and leggings (1890). No hard hat, protective gloves and goggles or overalls!

Water-retaining structures (before 1940) and dams follow on. The latter can be massive, such as the Hoover Dam (1931–36); with concrete being provided by a fully automated batching plant producing 8000 m³ per day and a total of 2.5 Mm³. If that was not enough it was well beaten by the Grand Coulee Dam that used 7.5 Mm³ of concrete with placing rates of 16 000 m³ per day. These feats of construction are awe inspiring—
younger readers take note: there is no limit to what can

be done with concrete. We are limited only by our imaginations.

From dams to roads and military uses, in particular the Mulberry Harbour Breakwaters using the ‘Phoenix’ reinforced concrete caissons. If you visit Normandy, you can still see this living history.

The book ends with four Appendices giving further sources of information, nineteenth-century floor systems, proprietary reinforcing and flooring systems and assessing ancient mortars. There is also a subject/author index.

In all, this is a veritable feast about concrete, its capability and contribution to the environment in which we live. The authors are to be congratulated on a worthy publication that will become a standard reference work for students and enthusiasts of the subject.

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