BOOK REVIEW

Demolition and Reuse of Concrete and Masonry

Reviewed by Bryant Mather, Director, Structures Laboratory, U.S. Army Engineer Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199.

REFERENCE: *Demolition and Reuse of Concrete and Masonry,* Erik K. Lauritzen, Ed., Proceedings of the Third RILEM Symposium, Odense, Denmark, 24–27 October 1993; E&FN Spon, Chapman & Hall, London, 1994, 534 pp.

Professor Torben C. Hansen of the Technical University of Denmark who is currently President of the Rèunion Internationale des Laboratories d'Essais et de recherches sur les Matèriaux et les Constructions (RILEM) has been the leader in developing information on the reuse of concrete and in the art of demolition since these fields were first recognized as areas of technology meriting attention. The proceedings of this third symposium reveal the progress that has been made and the degree to which the technology has matured while also indicating the areas where more knowledge is needed. Facing the title page are descriptions of the proceedings of the second symposium (1988, Tokyo) and a state-of-the-art report by RILEM TC 37. Not listed is the Proceedings of the NATO Conference on *Adhesion Problems in the Recycling of Concrete,* edited by Pieter C. Kreijger, published by Plenum, New York, 1980 (419 pp). I note that only one of the participants in the 1980 NATO Conference, C. De Pauw, is an author in the present proceedings.

The present work includes 49 papers, 2 keynote papers; 2 presentations of guidelines for reuse of concrete and masonry as aggregates in concrete in relation to existing specifications in the United Kingdom, Belgium, France, Spain, the United States, Japan, and Germany; 2 reports on the work of RILEM TC 121, 15 papers on recent developments in demolition techniques; 8 papers on properties of concrete with recycled aggregates; 7 on examples of reuse of concrete and masonry materials; 4 papers on management of building waste; and 3 papers in a closing session. The final paper (pp. 521–527), is entitled "The 'Recycled House' in Odense" and describes a 2-$^1/_2$-story, 2-wing building with 14 flats in the center of the city. Crushed concrete was used in the drainage layer; crushed concrete and bricks were used as concrete aggregate; steel reinforcement was rolled from melted scrap iron; structural steel, brick for walls, boards for floors, doors, window frames, roof timbers, and roof slates were all reused.

Of particular interest to subscribers and readers of *Cement, Concrete, and Aggregates* are the following:

1. Professor Hansen remarks in his preface that conclusions based on these proceedings will be given in a 1994 Committee report.

2. The American Concrete Institute was one of nine cosponsors of the symposium and Joseph F. Lamond, Chairman of ACI Committee 555 on Removal and Reuse of Concrete is a member of RILEM TC 121. Mr. C. J. Kibert of the Center for Construction and Environment, University of Florida, Gainesville, who reported on Concrete/Masonry Recycling Progress in the United States (pp. 83–91) is not listed as a member of ACI or ACI Committee 555. It is a pity that better interaction between ACI 555 and RILEM TC 121 does not seem to exist.

Mr. Kibbert's paper says there are no ASTM standards that deal "specifically with the subject of recycling concrete/masonry demolition debris." This is not quite true. ASTM C 33 on Concrete Aggregates states (Section 9.1).

> Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, air-cooled blast-furnace slag, or crushed hydraulic-cement concrete, or a combination thereof, conforming to the requirements of this specification.
>
> NOTE 6—Although crushed hydraulic-cement concrete has been used as an aggregate with reported satisfactory results, its use may require some additional precautions. Mixing water requirements may be increased because of the harshness of the aggregate. Partially deteriorated concrete, used as aggregate, may reduce freeze-thaw resistance, affect air void properties or degrade during handling, mixing, or placing. Crushed concrete may have constituents that would be susceptible to alkali-aggregate reactivity or sulfate attack in the new concrete or may bring sulfates, chlorides, or organic material to the new concrete in its pore structure.

3. Paper 13, "Experience Gained in Dismantling of the Japan Power Demonstration Reactor," will be of great interest to those concerned with dismantling nuclear reactors in the United States. The authors report "These . . . activities, especially dismantling of the biological shield concrete . . . (are) proceeding satisfactorily."

4. Paper 21 includes Sections 5.1 and 5.2 (p. 239) called "Demolding system for false teeth" and "Demolition of uretha calculus" which illustrate fascinating extensions of the technology.

5. Paper 38, "Special Techniques for the Recycling of Concrete Base Plates (Railway 'Sleepers')." The author notes that sometimes such plates are available for recycling when only one quarter of their intended service life has passed and comments that "The main reason for this (is) use of aggregates . . . not suited for this purpose."

The book is legibly printed, adequately bound, and includes a complete table of contents, an author index and subject index. Its scope is well defined, its audience is everybody concerned with demolition and reuse of concrete and masonry, and it is better organized than many proceedings of international meetings printed from camera-ready copy.