Evaluating Fire Damaged Concrete

Bruce A. Suprenant

Concrete usually performs well in building fires. However, when it is subjected to prolonged fire exposure or unusually high temperatures, concrete can suffer significant distress. After a severe fire, the damaged to building elements must be assessed and repair plans must be formulated. To determine the extent of investigation and repair required, structural engineers must understand how fire affects concrete, steel reinforcement, and the bond between them.

Concrete Repair Digest, V. 8, No. 1, February 1997, pp. 20-23.

Semi-Rigid Connections in Precast Concrete Frames

K. S. Elliott, G. Davies, and H. Gorgun

Full-scale testing of precast concrete connections was carried out to generate practical semi-rigid moment-rotation data. The tests included 200-mm deep precast hollow-core floor slabs and stability tie reinforcements as used in practice. The results show that connections at internal columns may be considered as full strength and semi-rigid, whereas edge connections should be better classified as pin-jointed because of their limited strength. Designers may use these results as input data in a frame analysis by adopting the "beam line" approach to determine the stiffness and strength of the connections.

FIP Notes 97-3, Fédération Internationale de la Précontrainte, London, United Kingdom, 1997, pp. 6-12.

Composites for Infrastructure

This publication examines specific infrastructure applications integrating composite structural members into large construction projects, especially bridges. Organized by specific types of structural members (cables, beams, trusses, columns, piles, and other elements), seven chapters at the heart of the guide describe design issues central to using composites and successful projects involving these structural composites. Projects addressing both new construction and reinforcement of existing structures are included to illustrate the wide variety of structural problems that can be solved with composites.

A Ray Publishing Publication, 5891 Independence Street, Suite 270, Wheat Ridge, CO 80033, 1998, 100 pp., $60.00

Proceedings of Seminar on Seismic Design, Retrofit, and Performance of Nonstructural Components

This volume includes 38 technical papers covering the following topics: (1) Observed performance in recent earthquakes; (2) Seismic design codes, standards, and procedures for commercial and institutional buildings; (3) Seismic design issues relating to industrial and hazardous material facilities; (4) Design, analysis, and testing; and (5) Seismic evaluation and rehabilitation of conventional and essential facilities (including hospitals).

ATC 29-1, Applied Technology Council, 555 Twin Dolphin Drive, Suite 550, Redwood City, CA 94065, 1998, 520 pp.

The Vasco de Gama Bridge, Lisbon

The Vasco de Gama Bridge, under construction across the Tagus River at Lisbon, Portugal, is one of the major construction projects under way in the world at present. With a total length of 12 km (7 miles), it is divided into a number of different sections, each calling for different methods of construction. The main span, for instance, is a cable-stayed bridge 829 m (2720 ft) in length with a central span of 420 m (1378 ft). This article deals with the largest section of the bridge; crossing two navigation channels, 6531 m (21,430 ft) in length, it consists of 81 bays each approximately 80 m (262 ft) in length. The feature of the work lies in the fact that the prefabricated beams, 80 m (262 ft) in length, were cast some 25 km (15 miles) away from the construction site and lifted into place by a floating crane.

FIP Notes 97-4, Fédération Internationale de la Précontrainte, London, United Kingdom, 1997, pp. 11-13.

High Performance Concrete: Design and Materials and Recent Advances in Concrete Technology

V. Mohan Malhotra (Editor)

Presents the Proceedings of the Third CANMET/ACI International Conference held in Kuala Lumpur, Malaysia, December 2-5, 1997. Out of a total of 90 papers from 25 countries, 52 papers are published in this volume. Of interest in the Proceedings is Richard N. White's paper on "Precast Concrete Composite Deck Components for Rehabilitation of Bridges."

Special Publication SP-172, American Concrete Institute, Farmington Hills, MI, 1997, 1018 pp.

Recycling of Concrete at a Precast Concrete Plant: Parts 1 and 2

A. Van Acker

For nearly 8 years, all concrete from rejected components and waste concrete has been recycled in the daily production of structural precast, prestressed components at several plants of the Partek Concrete Group. An extensive study has been carried out on the properties of the fresh and hardened concrete: water-cement ratio, consistency, compressive, flexural and tensile strengths, modulus of elasticity, water absorption, and freeze-thaw resistance.

FIP Notes 97-3 and 97-4, Fédération Internationale de la Précontrainte, London, United Kingdom, 1997, pp. 3-6 and 4-6.