
REFERENCE CARDS

KEYWORDS: construction; design (structural); erection; high-rise buildings; justice facilities; modular cells; precast concrete; prestressed concrete; production.

ABSTRACT: Precast concrete is used as the primary structural system for a seven-story justice facility for the City of Jacksonville, Florida. A variety of precast concrete components, including modular cells and modular rooms combined with standard beam, column, double tee, slab and panel units, were employed. The design, manufacture and erection of the precast concrete elements are described.

REFERENCE: Kraemer, Paul E., "Precast Concrete Justice Facilities Go High-Rise," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 40-47.

KEYWORDS: aesthetics; architectural precast concrete; construction; cost; design (structural); highway noise; history; murals; noise barrier walls; precast concrete; production; wall panels.

ABSTRACT: Presents the design, production and erection highlights of a historic precast concrete noise attenuation barrier wall built for the City of Winnipeg.

REFERENCE: Ulyatt, Norman B., and Winch, Garry W., "Precast Concrete Noise Barrier Commemorates Historic Selkirk Settlement," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 48-55.

KEYWORDS: analysis; design (structural); distribution width; flexural strength; floors; hollow-core slabs; precast concrete; prestressed concrete; shear strength; torsion.

ABSTRACT: A comprehensive analytical program, supported by test results, was conducted to determine the distribution of response in hollow-core slab floors subjected to concentrated point and line loads. An extensive computer generated parametric study was used to accurately analyze the responses. The results were then condensed to produce simple rules which design engineers can use for the analysis of hollow-core slab systems. Fully worked numerical examples demonstrate the use of the proposed analysis rules and compare them with the rules contained in the *PCI Manual for the Design of Hollow-Core Slabs*.

REFERENCE: Stanton, John F., "Response of Hollow-Core Slab Floors to Concentrated Loads," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 98-113.

KEYWORDS: bridges; construction; design (structural); precast concrete; prestressed concrete; production; spliced girder bridges.

ABSTRACT: This summary paper is a condensation of a full report which contains information on over 40 bridge projects in North America. The paper gives design, production and erection considerations, and other details for many of these bridges. It also includes a fully worked example of preliminary design of a 350 ft (106 m) long overpass, made of two equal spans. The example calculations are done by a handheld calculator without need for any specialized computer facility. Also included is reference to a PC-based computer software for detailed time-dependent analysis of this bridge type.

REFERENCE: Abdel-Karim, Ahmad M., and Tadros, Maher K., "Design and Construction of Spliced I-Girder Bridges," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 114-122.

KEYWORDS: beams; bridges; fiber reinforced plastic; glass fiber tendons; loading tests; non-destructive testing; non-metallic tendons; prestressed concrete; prestressing tendons; reinforcement; research; ultimate strength.

ABSTRACT: First, a brief survey of the development and characteristics of glass fiber prestressing bars is given. The system was developed in Germany and has been applied in three highway bridges and one pedestrian bridge. The main part of the paper deals with loading tests on beams prestressed with glass fiber tendons. The tests were performed in the Magnel Laboratory of the University of Ghent. Three short beams, each with a span of 6 ft 7 in. (2 m), and a long beam, with a span of 65 ft 7 in. (20 m), were loaded to failure. In the glass fiber bars, optical sensors and copper wire sensors were integrated, thus allowing long-term monitoring of the tendons. Although the paper deals mainly with the structural behavior of the beams, the test program was also used to evaluate these non-destructive techniques by comparing the results with conventional deformation measurements.

REFERENCE: Taerwe, Luc R., Lambotte, H., and Miesslerer, Hans-Joachim, "Loading Tests on Concrete Beams Prestressed with Glass Fiber Tendons," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 84-97.

KEYWORDS: bridges; construction; cracking; demolition; design (structural); erection; girders; history; I-girders; performance; post-tensioned girders; precast concrete; prestressed concrete; pretensioned girders; production; prestressing steel; reinforcement; replacement.

ABSTRACT: This Part 2 paper describes the fabrication and installation of the hybrid AASHTO I-girders, showing how the owner's requirement of using the existing substructure and maintaining traffic for at least 19 hours per day on two roadway levels was met. Proceeding on the south half of the bridge, the contractor cut apart and removed the old structure, and installed new fully pretensioned plant fabricated 160 ft (49 m) girders while maintaining traffic on the north half. As soon as traffic could be routed to the new south half, the process was repeated on the north side. Detailed descriptions document the contractor's procedure for cutting the bridge into segments, removing them, and safely releasing girder prestressing forces. Part 1, "A History of Design, Construction, and Service Life," appeared in the May-June 1992 issue of the *PCI JOURNAL*.

REFERENCE: Zollman, Charles C., Depman, Frank, Nagle, Joseph, and Hollander, Edward F., "Building and Rebuilding of Philadelphia's Walnut Lane Memorial Bridge — Part 2: Demolition and Rebuilding of the Superstructure," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 64-82.

KEYWORDS: aesthetics; construction; cost; design (structural); durability; footings; foundations; highway noise; noise barrier walls; posts; precast concrete; wall panels.

ABSTRACT: An improved design of a precast concrete noise barrier wall, comprised of posts spaced at 15 ft (4.57 m) on centers and drop-in panels, represents a cost-effective, long lasting and aesthetically pleasing solution to mitigating the effects of highway noise on adjacent residential communities.

REFERENCE: Guzaltan, Fuat, "Precast Concrete Noise Barrier Walls for New Jersey Interstate Route 80," *PCI JOURNAL*, V. 37, No. 4, July-August 1992, pp. 56-63.
