# REFERENCE CARDS

**KEYWORDS:** architecture; PCI Awards Program; bridges; buildings; design (structural); precast concrete; prestressed concrete; structures.

**ABSTRACT:** From a record number of entries, nine buildings/structures and three bridges were chosen for awards in the 1981 PCI Awards Program. They include: three bridges, two office buildings, a police station, a shopping mall, a multi-event student athletic center, a hospital, a bank, a mass transit center, and a warehouse showroom. Brief descriptions (together with jury comments) are given for each project.

**REFERENCE:** "Nineteenth Annual PCI Awards Program," PCI JOURNAL V. 26, No. 5, September-October 1981, pp. 14-27.

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**KEYWORDS:** admixtures; cement content; cement properties; compressive strength; curing; high-range water-reducing admixtures; high early strength concrete; high strength concrete; performance; precast concrete; prestressed concrete; production; proportioning; recommended practice; slump; superplasticizers; workability.

**ABSTRACT:** This PCI Committee report presents a state-of-the-art on the use of high-range water-reducing admixtures (HRWR's) in precast prestressed operations. Covered are advantages and limitations of this new material, characteristics of HRWR's, considerations and objectives for use and special considerations. Two appendices include information on the significance of cement types and the effect of air entrainment on the performance of the resulting HRWR concrete.

**REFERENCE:** PCI Committee on High-Range Water-Reducing Admixtures, "Recommended Practice for Use of High-Range Water-Reducing Admixtures in Precast Prestressed Concrete Operations," PCI JOURNAL, V. 26, No. 5, September-October 1981, pp. 28-48.

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**KEYWORDS:** analysis; buildings; design (structural); energy requirements; heating loads; cooling loads; insulation; low-rise buildings; mass; performance; precast concrete; prestressed concrete; roof thermal mass; roof systems; thermal capacity.

**ABSTRACT:** Based on performance criteria, the report analyzes the energy requirements of a concrete roof system for a typical low-rise commercial building situated in nine different locations. A design aid (explained with a practical example) is furnished for determining the required insulation in a precast concrete roof.

**REFERENCE:** Balik, Joseph S., and Barney, George B., "Performance Approach in Determining Required Levels of Insulation in Concrete Roof Systems," PCI JOURNAL, V. 26, No. 5, September-October 1981, pp. 50-64.

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**KEYWORDS:** beams; construction; cost; design (structural); double-tees; erection; hollow-core slabs; precast concrete; prestressed concrete; underground structures; wall panels.

**ABSTRACT:** Precast and prestressed concrete provided a simple and economical solution for a complex, energy efficient underground facility near Portland, Oregon. Over 600 precast components (comprising columns, floor and roof beams, conventional and giant sized double-tees, hollow-core slabs and wall panels) were used to build this $12½ million, 185,500 sq ft (17,233 $m^2$) two-story building. This article gives the design-erection highlights of the project.

**REFERENCE:** Laszlo, George, and Romish, John H., "Multnomah County (Oregon) Maintenance and Operations Facility," PCI JOURNAL, V. 26, No. 5, September-October 1981, pp. 66-81.

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**KEYWORDS:** amplitude; analysis; bond; cracking; creep; cyclic loads; design (structural); fatigue; precast concrete; performance; prestressed concrete; prestress loss; reinforcement; sea structures; serviceability; strength; stress ranges; waves; wave amplitude; wave cycles.

**ABSTRACT:** During the past decade concrete structures, both conventionally reinforced and prestressed, have been used (and will continue to be utilized) for fixed and floating platforms in the world's oceans. As such, these structures are subjected during a normal service lifetime to fully-reversing loads from the waves, ranging from $2 \times 10^8$ cycles of relatively low waves to a few hundred very large waves.

More recently, prestressed concrete structures are being used in Arctic environments, where their peripheral walls are being subjected to large numbers of flexural cycles under continuous crushing of the ice, punctuated by a few extreme cases of very high local loads.

This paper addresses the special considerations for high-amplitude low-cycle fatigue which may occur in concrete structures due to repeated opening and closing of cracks in the sea environment.

**REFERENCE:** Gerwick, Jr., Ben C., "High-Amplitude Low-Cycle Fatigue in Concrete Sea Structures," PCI JOURNAL, V. 26, No. 5, September-October 1981, pp. 82-96.

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**KEYWORDS:** architectural precast concrete; design (structural); hospital; production; precast concrete; prestressed concrete; sculptured panels; wall panels.

**ABSTRACT:** Nearly 500 architectural precast concrete panels were used imaginatively and economically for the building, exterior stairway, and pedestrian bridge of this medical center in Bremerton, Washington. A special design feature of the facility is the use of sculptured precast concrete panels, reflecting native Indian artforms of the Pacific Northwest.

**REFERENCE:** "Naval Regional Medical Center," PCI JOURNAL, V. 26, No. 5, September-October 1981, pp. 98-104.

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