
REFERENCE CARDS

KEYWORDS: construction; design (structural); fabrication; guideway; people-mover system; post-tensioning; precast concrete; prestressed concrete; production; seismic design; transportation structures.

ABSTRACT: To solve the problem of transporting visitors from an underground parking structure up a steep hillside to the new J. Paul Getty Museum (near Los Angeles, California), a people-mover system was devised. The design and construction of the guideway structure supporting this people-mover system posed several unique challenges to the designers and builders of the project. The answers to these challenges came in the innovative use of precast/prestressed concrete components combined with post-tensioning. This article presents the design considerations, precast concrete fabrication, and construction highlights of the project.

REFERENCE: Josten, Mark G., Painter, Wilfred L. Jr., and Guarre, James S., "Precast Prestressed Concrete Structure Provides Solution for Getty Center Tram Guideway," *PCI JOURNAL*, V. 40, No. 3, May-June 1995, pp. 24-39.

KEYWORDS: buildings; connections; construction; design (structural); ductility; floors; frames; joints; moment resisting frames; precast concrete; prestressed concrete; seismic design; walls.

ABSTRACT: The author describes trends and developments in the use of precast concrete in New Zealand for floors, moment resisting frames, and structural walls of buildings. Currently, almost all floors, most moment resisting frames, and many one- to three-story walls in buildings are constructed incorporating precast and prestressed concrete elements. Aspects of design and construction, particularly the means of forming connections between precast concrete elements, are discussed. The paper emphasizes seismic design; the aim of the design methods for frames is to emulate monolithic construction. Examples of recent precast concrete buildings using the above discussed methods are presented.

REFERENCE: Park, Robert, "A Perspective on the Seismic Design of Precast Concrete Structures in New Zealand," *PCI JOURNAL*, V. 40, No. 3, May-June 1995, pp. 40-60.

KEYWORDS: bridges; bridge decks; bridge deck panels; connections; construction; design (structural); durability; joints; performance; post-tensioning; precast concrete; prestressed concrete; survey.

ABSTRACT: There have been many applications of full depth precast and precast, prestressed concrete deck panels for bridge rehabilitation in North America. This paper presents the findings obtained through an investigation conducted in the United States to evaluate the field performance of bridge deck panels. The states included in the investigation were Illinois, Connecticut, Virginia, Maryland, Iowa, California, New York, Alaska, Ohio, Pennsylvania, and Washington, D.C. The investigation mainly consisted of a visual inspection of bridges selected through an earlier phase of the overall study. The inspection process entailed a general visual search for any problems associated with the joints between adjacent precast concrete panels as well as the connection between the deck and supporting system and the condition of the overlay system. The investigation also included discussions with state engineers regarding the design, construction, and performance of the precast concrete panels.

REFERENCE: Issa, Mohsen A., Yousif, Alfred A., Issa, Mahmoud A., Kaspar, Iraj I., and Khayyat, Salah Y., "Field Performance of Full Depth Precast Concrete Panels in Bridge Deck Reconstruction," *PCI JOURNAL*, V. 40, No. 3, May-June 1995, pp. 82-108.

KEYWORDS: architecture; architectural precast concrete; buildings; construction; design (structural); fabrication; precast concrete; production.

ABSTRACT: Completed in 1994, the John Pappajohn Business Administration Building at the University of Iowa was designed to build relationships — between students and faculty, between the classroom and the business world, and between the new building and the buildings around it. Rising four stories and occupying most of a city block, the new 187,000 sq ft (17372 m²) facility features tiered classrooms, computer laboratories, two auditoriums, a 50,000-volume business library with 300 work stations, a cafe, and departmental and faculty offices. A key ingredient in the success of this project was the extensive use of architectural precast concrete which provided beauty and classic elegance to the building and its surroundings.

REFERENCE: "Architectural Precast Concrete Plays Key Role in Construction of the University of Iowa John Pappajohn Building," *PCI JOURNAL*, V. 40, No. 3, May-June 1995, pp. 14-23.

KEYWORDS: bridges; cantilever construction; cast-in-place concrete; construction; durability; inspection; performance; post-tensioning; precast concrete; prestressed concrete; segmental construction; survey.

ABSTRACT: This report presents the results of a durability survey conducted by the American Segmental Bridge Institute of segmental concrete bridges in North America. The questionnaire identified 194 structures and evaluated the performance of 96 bridge inspection reports. The bridges had completion dates ranging from 1966 to 1993. The survey concludes that segmental construction performs well over time, with consistently high condition ratings for bridges that have been in use for up to 30 years.

REFERENCE: Miller, Maurice, "Durability Survey of Segmental Concrete Bridges," *PCI JOURNAL*, V. 40, No. 3, May-June 1995, pp. 110-123.

KEYWORDS: buildings; codes; ductility; earthquakes; frames; moment resisting frames; performance; reinforced concrete; seismic design; shear walls; survey.

ABSTRACT: The author describes observations of shear wall performance in severe earthquakes in which modern reinforced concrete buildings stood the test of violent shaking, starting with the Chilean earthquake of May 1960 through most of the subsequent strong earthquakes, up until the Armenian earthquake of December 1988. Despite the excellent behavior of shear wall-type concrete structures as compared to concrete frame-type structures, building codes continued, up until the last decade, to give preference to concrete ductile frame structures (which are subject to higher distortions) while placing a substantial penalty on the use of shear walls. This code approach was due to the lack of experimental and analytical background information on shear wall behavior. While a large body of information on shear walls accumulated during the 1980s, still more experimental and analytical studies are needed to create a solid basis for a rational seismic design approach. The availability of such information should encourage a wider use of shear walls for earthquake resistance.

REFERENCE: Fintel, Mark, "Performance of Buildings With Shear Walls in Earthquakes of the Last Thirty Years," *PCI JOURNAL*, V. 40, No. 3, May-June 1995, pp. 62-80.