REFERENCE CARDS

KEYWORDS: bridges; bulb-tee girders; construction; design (structural); fabrication; New England; precast concrete; prestressed concrete; production.

ABSTRACT: The authors discuss the benefits of a partnership approach to problem solving through a case study examination of the development of the New England bulb-tee precast concrete bridge girder. A committee, named the Precast/Prestressed Concrete Institute (PCI) New England Technical Committee for Bridges was formed and consists of a unique public/private partnership of all six New England state highway departments, area precasters and private consultants. The members of this committee have joined together to develop regional solutions to precast concrete bridge problems shared by the New England states. This paper discusses the development of the committee, the partnering approach to problem solving used by the committee, and the application of this approach in the development of a new precast, prestressed concrete bridge girder. The new bulb-tee girder is already being used in several bridge projects in New England.

REFERENCE: Bardow, Alexander K., Seraderian, Rita L., and Culmo, Michael P., "Design, Fabrication and Construction of the New England Bulb-Tee Girder," PCI JOURNAL, V. 42, No. 6, November-December 1997, pp. 29-40.

KEYWORDS: aesthetics; bridges; cable-stayed bridges; construction; design (structural); erection; pedestrian bridges; precast concrete; production; tower.

ABSTRACT: The basic structure of this $920,000 pedestrian crossing in Calgary, Alberta, Canada, is a two-span symmetrical cable-stayed bridge supported by a single A-frame tower. The bridge deck and tower use precast concrete components. The resulting bridge is an elegant design solution to the functional, aesthetic, structural and budgetary requirements set by the City of Calgary. In addition, the project was completed on schedule and with reduced traffic disruption. This article presents the design challenge, conceptual design and design considerations, as well as the production and erection highlights of the project.

REFERENCE: Tromposch, Eric, and Armitage, J. Herb, "Design-Construction of Fox Hollow Pedestrian Bridge," PCI JOURNAL, V. 42, No. 6, November-December 1997, pp. 50-59.

KEYWORDS: aesthetics; bridges; design (construction); erection; pedestrian bridges; precast concrete; prestressed concrete; production; U-shaped girder.

ABSTRACT: Precast/prestressed concrete became the solution of choice in replacing an old non-functional footbridge at Washington State University in Pullman, Washington. The new $280,000 pedestrian bridge has spans of 24, 64, 24 ft (7.32, 19.52, 7.32 m), in which the two end spans are straight and the middle span is parabolic. Only seven precast components — three U-shaped girders and four piers — were needed to build the structure. The end result is a magnificent bridge that is very functional, was erected on schedule with minimal disruption of traffic and was within budget. This article presents the owner's requirements and design considerations, as well as the production, hauling, and erection highlights of the project.

REFERENCE: Ames, Richard L., and Prussack, Chuck, "Design-Construction of Gannon/Goldsworthy Pedestrian Bridge," PCI JOURNAL, V. 42, No. 6, November-December 1997, pp. 42-48.

KEYWORDS: aesthetics; bridges; cable-stayed bridges; construction; design (structural); dynamic analysis; erection; pedestrian bridges; post-tensioned construction; precast concrete; prestressed concrete; stability; suspension bridges.

ABSTRACT: Both structure and architecture were integrated imaginatively into the design of the Vranov Lake Pedestrian Bridge by combining the inherent advantages of precast concrete with both cable-stay and external cable technology. The design demonstrates how the strength and durability of concrete can result in a structure of exceptional lightness and beauty that is also safe and comfortable for pedestrians and bicyclists. With a ratio of $d/l = 1/630$, the deck is one of the most slender structures ever built. The aerodynamic stability of the bridge is provided by the whole structural system, using the geometric stiffness of the deck and external cables. An innovative application of post-tensioning technology in the erection of the pylons and deck facilitated a rapid and economical construction schedule with minimal impact on the environment.

REFERENCE: Strasky, Jiri, "Design-Construction of Vranov Lake Pedestrian Bridge, Czech Republic," PCI JOURNAL, V. 42, No. 6, November-December 1997, pp. 60-75.

KEYWORDS: beams; buildings; codes; columns; connections; design (structural); frames; multistory buildings; precast concrete; prestressed concrete; seismic design; splices; Uniform Building Code.

ABSTRACT: The 1997 edition of the Uniform Building Code, for the first time, contains design provisions for precast concrete structures located in regions of high seismicity (Seismic Zones 3 and 4). This paper provides background and discussion of the new code provisions, along with a design example illustrating the provisions.

REFERENCE: Ghosh, S. K., Nakaki, Suzanne Dow, and Krishnan, Kosal, "Precast Structures in Regions of High Seismicity: 1997 UBC Design Provisions," PCI JOURNAL, V. 42, No. 6, November-December 1997, pp. 76-93.

KEYWORDS: cantilevered structures; connections; deflections; design (structural); erection; foundations; framed structures; guyed structures; installations; loadings; manufacture; materials; precast concrete; prestressed concrete; PCI Committee report; quality control; shear strength; specifications; splicing; spun-cast poles; statically cast poles; testing; torsion.

ABSTRACT: This document provides guidelines for the design, manufacture, testing, installation and erection of prestressed concrete poles. Both spun-cast and statically cast poles are considered, including cantilevered, guyed, framed and combined structures. The report was developed jointly by the ASCE Task Force on Concrete Poles and the PCI Committee on Prestressed Concrete Poles. There are nine chapters in the document: (1) Structural configurations and pole applications; (2) Initial considerations; (3) Materials; (4) Design loads; (5) Design; (6) Manufacturing and quality assurance; (7) Structure testing; (8) Assembly and erection; and (9) Foundations. In addition, a seven-part Appendix section includes design examples and other useful information.

REFERENCE: Joint ASCE Task Force – PCI Committee on Prestressed Concrete Poles, "Guide for the Design of Prestressed Concrete Poles," PCI JOURNAL, V. 42, No. 6, November-December 1997, pp. 94-134.