REFERENCE CARDS

KEYWORDS: design (structural); floors; precast concrete; prestressed concrete; vibration.

ABSTRACT: This paper is a summary of new information that has become available relating to the design of floor systems for vibration. Particular attention is given to the application of this information to precast, prestressed concrete floors. Design recommendations for three different sources of vibration are given, with the reasoning behind the recommendations. The paper will serve as a basis for revising the appropriate section of the Sixth Edition of the PCI Design Handbook and will provide useful information to structural engineers who might be designing structures with potential vibration problems.


KEYWORDS: bridges; construction; design (structural); high performance concrete; high strength concrete; PCI committee report; performance; precast concrete; prestressed concrete.

ABSTRACT: This report describes twelve bridges that were built as part of the Federal Highway Administration's national program to implement and showcase the use of high performance concrete in bridges. High strength concrete was used in the precast, prestressed concrete girders to permit longer span lengths, wider girder spacings, or shallower sections. High performance concrete was used in the bridge decks to provide more durable concrete and to extend the service life of bridges. For each bridge, information on the structural characteristics, concrete mix proportions, concrete properties, and planned instrumentation is reported. Preliminary results indicate that increased structural efficiency, durability, and economy can be achieved in precast, prestressed concrete bridges by using high performance concrete.


KEYWORDS: errata; Design Handbook; design (structural); precast concrete; prestressed concrete.

ABSTRACT: In 1999, the Precast/Prestressed Concrete Institute published the Fifth Edition of the PCI Design Handbook: Precast and Prestressed Concrete. Although careful efforts were made to provide an accurate document, some errors have been discovered. As this edition of the Handbook is used, additional errata may be found. You are urged to notify PCI of these items, and to send any questions or comments you may have regarding the presentation of the material in the Handbook.


KEYWORDS: construction; design (structural); double tees; justice facilities; precast concrete; prestressed concrete; wall panels.

ABSTRACT: Precast, prestressed concrete was used successfully to provide the new Greene County Justice Center with a detention center that doubled the capacity of the existing facility. The new building is sandwiched by a historical limestone courthouse on one side and a modern precast concrete courthouse on the other, so the new addition had to blend architecturally with the contrasting construction forms. Precast concrete provided both the architectural skin and the structural system to handle all design loads. This article presents the design considerations and construction highlights of the project.


KEYWORDS: codes; compressive strength; design (structural) normal weight concrete; seismic design.

ABSTRACT: This article points out and emphasizes the fact that no United States code or national standard imposes an upper limit on the strength of normal weight concrete that can be used in construction, including structures built in regions of high seismicity. The 2002 Edition of the ACI Building Code Requirements for Structural Concrete (ACI 318-02) has chosen to explicitly state this fact.


KEYWORDS: aesthetics; bridges; construction; cost; design (structural); integral abutments; NEBT girders; precast concrete; prestressed concrete.

ABSTRACT: The New England Bulb Tee (NEBT) girder played a prominent role in constructing the Jetport Interchange Bridge on the Maine Turnpike near Portland, Maine. The bridge has two 125 ft (38.1 m) end spans and an interior span of 106 ft (32.3 m), giving it a total length of 356 ft (108.5 m). An added feature of the design is the use of integral abutments, which reduce substructure costs by eliminating bearing devices and roadway joints. The NEBT girder provided structural efficiency, strength, aesthetics, lower construction cost and uninterrupted turnpike traffic during construction. This article presents the design features of the bridge and gives highlights of its construction.


KEYWORDS: bridges; design (structural); earthquake; India; prestressed concrete; reinforced concrete.

ABSTRACT: On January 26, 2001, an extremely severe earthquake (magnitude 7.7) struck western India (just south of Pakistan) centered around Gujarat. The epicenter of the earthquake was only 14.1 miles (22.7 km) below the surface. Many buildings, bridges, and other structures either collapsed or were severely damaged. Based on an inspection visit to the earthquake site, the authors provide an assessment of the damage to existing bridge structures and bridges under construction. This damage is attributed mainly to the lack of adequate seismic design and detailing.


KEYWORDS: anchorages; CFRP tendons; pre-stressed concrete; prestressing tendons; research; swaged sleeves.

ABSTRACT: This paper presents the test results of an anchorage system for carbon fiber reinforced polymer (CFRP) prestressing tendons. The system consisted of a metal sleeve attached to a CFRP rod that can be gripped with a matching wedge and barrel assembly. Three different procedures for attaching the sleeves to the rods were studied. Specimens with resin-filled, epoxy-bonded, or swaged sleeves were prepared and tested in tension failure. It was observed that the strength and failure mode of the resin-filled and epoxy-bonded sleeves varied widely and were sensitive to the preparation of the specimens. In contrast, the specimens provided with swaged sleeves showed dependable strengths and consistent failure modes. In addition, this technique was found to be more practical and better suited for the anchorage of CFRP tendons in the field.