Reference Cards

KEYWORDS: admixtures; aggregates; alignment; allowable stresses; anchorages; bearing capacity; bridges; building codes; buildings; cements; circular piles; concrete stresses; connections; cover; cracking; cylinder piles; damages; design considerations; design (structural); driving heads; driving practices; driving stresses; dynamic stresses; foundations; grout; handling; hollow piles; installation; interaction diagrams; lateral loads; load testing; manufacture; materials; octagonal piles; PCI Committee report; piles; precast concrete; prestressed concrete; prestressing steel; reinforcement; seismic loads; service load stresses; slenderness; spiral reinforcement; square piles; steel stresses; storage; stresses; tolerances; torsion; transportation; ultimate strength.
ABSTRACT: Covers the design of prestressed concrete piling, materials and manufacture, handling and transportation, and an extensive discussion of installation including best driving practices. Under design, allowable stresses are given, typical interaction charts show their application to piles subject to bending, and sample design problems suggest design approaches. Load testing is also covered. Selected references and reference standards are included.
REFERENCE: PCI Committee on Prestressed Concrete Piling, "Recommended Practice for Design, Manufacture and Installation of Prestressed Concrete Piling," PCI JOURNAL, V. 22, No. 2, March-April 1977, pp. 20-49.

KEYWORDS: building codes; damage; earthquake; multistory buildings; performance; precast concrete; Rumanian earthquake; seismic behavior.
ABSTRACT: This report is based on observations the author made when he visited Bucharest between March 19-22, 1977. The high rise precast concrete buildings performed excellently during the earthquake.
REFERENCE: Fintel, Mark, "Performance of Precast Concrete Structures During Rumanian Earthquake of March 4, 1977," PCI JOURNAL, V. 22, No. 2, March-April 1977, pp. 10-15.

KEYWORDS: handling; precast concrete; prestressed concrete; prestressing operation; safety; strand; stress-relieved strand; tensioning.
ABSTRACT: Presents some helpful suggestions on proper handling and tensioning of stress-relieved strand for precast prestressed concrete production.
REFERENCE: Anon., "Tips on Handling and Tensioning Strand," PCI JOURNAL, V. 22, No. 2, March-April 1977, pp. 16-19.

KEYWORDS: axial strain; camber; creep; curvature; deflection; design (structural); non-prestressed steel; post-tensioned members; prestress force; prestress loss; prestressed concrete; pretensioned members; shrinkage; steel relaxation.
ABSTRACT: A simple accurate method is presented for calculating prestress loss, axial strain, and curvature at a cross section of a member containing prestressed as well as non-prestressed steel. Two sets of graphs are given as design aids, and their use is demonstrated by numerical examples.
The method indicates that the presence of non-prestressed steel slightly reduces the loss in tension in the prestressed steel, but can significantly reduce the prestressing force in the concrete. It has a small effect on the axial shortening but can have a much more pronounced effect on the camber or the deflection.
REFERENCE: Tadros, Maher E., Ghali, Amin, and Dilger, Walter H., "Effect of Non-Prestressed Steel on Prestress Loss and Deflection," PCI JOURNAL, V. 22, No. 2, March-April, 1977, pp. 50-63.

KEYWORDS: beams, building codes; continuous beams; design (structural); equivalent loads; load balancing method; moment-distribution; post-tensioning; prestressed concrete; reversed curvature; shear strength.
ABSTRACT: A design procedure is presented that uses the concept of equivalent loading to obtain the shear component of prestress. The prestressing tendons are replaced by a set of equivalent loads. The resulting shear diagram includes the effects of both the vertical component of the prestress and the induced reactions (if any).
Several examples are presented to illustrate the method. The proposed procedure allows the designer to use familiar analysis techniques, reduce the tedium involved in shear design, and obtain a clear picture of the forces in the concrete.
REFERENCE: Darwin, David, "Shear Component of Prestress by Equivalent Loads," PCI JOURNAL, V. 22, No. 2, March-April 1977, pp. 64-77.

KEYWORDS: beams; design (structural); fatigue strength; Goodman diagrams; non-prestressed reinforcement; partially prestressed beams; prestressed concrete; reinforcement; stresses.
ABSTRACT: The ranges of stress in the prestressed and non-prestressed reinforcement of a variety of partially prestressed concrete beams are analyzed using a computer program based on the conventional elastic theory of reinforced concrete.
The results are compared with typical modified Goodman diagrams and lead to some general conclusions on the design of partially prestressed beams for resistance to fatigue.
REFERENCE: Bennett, E. W., and Joynes, H. W., "Fatigue Resistance of Reinforcement in Partially Prestressed Beams," PCI JOURNAL, V. 22, No. 2, March-April 1977, pp. 78-88.
