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Reinforced Concrete Design of Tall Buildings

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**Reinforced Concrete Design**

## **of Concrete Structures**

### **Reinforced Concrete**

*Reinforced Concrete Design A  
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and Reinforced Design of*

*Concrete Structures Reinforced  
Concrete Beams, Columns and  
Frames*

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**Design of Concrete**

**Structures Using High-  
strength Steel**

**Reinforcement Prestressed  
Concrete Design Reinforced  
Concrete Design PPI**

*Concrete Design for the PE*

*Civil and SE Exams, 3rd*

*Edition - A Comprehensive*

*Review Book for the NCEES PE*

## Civil and SE Exams

### **Reinforced Concrete Design: Principles And Practice**

Reinforced Concrete Design: A Practical Approach, 2E is the only Canadian textbook which covers the design of reinforced concrete structural members in accordance with the CSA Standard A23.3-04 Design of Concrete Structures, including its 2005, 2007, and 2009 amendments, and the National Building Code of Canada 2010. Reinforced Concrete Design: A Practical Approach covers key topics for curriculum of undergraduate reinforced concrete design courses, and it is a useful learning resource for the students and a practical

reference for design engineers. Since its original release in 2005 the book has been well received by readers from Canadian universities, colleges, and design offices. The authors have been commended for a simple and practical approach to the subject by students and course instructors. The book contains numerous design examples solved in a step-by-step format. The second edition is going to be available exclusively in hard cover version, and colours have been used to embellish the content and illustrations. This edition contains a new chapter on the design of two-way slabs and numerous revisions of the original manuscript. Design of

two-way slabs is a challenging topic for engineering students and young engineers. The authors have made an effort to give a practical design perspective to this topic, and have focused on analysis and design approaches that are widely used in structural engineering practice. The topics include design of two-way slabs for flexure, shear, and deflection control. Comprehensive revisions were made to Chapter 4 to reflect the changes contained in the 2009 amendment to CSA A23.3-04. Chapters 6 and 7 have been revised to correct an oversight related to the transverse reinforcement spacing requirements in the

previous edition of the book. Chapter 8 includes a new design example on slender columns and a few additional problems. Several errors and omissions (both text and illustrations) have also been corrected. More than 300 pages of the original book have been revised in this edition. Several supplements are included on the book web site. Readers will get time-limited access to the new column design software BPA COLUMN, which can generate column interaction diagrams for rectangular and circular columns of variable dimensions and reinforcement amount. Additional supplements include spreadsheets related to

foundation design and column load take down, and a few Power Point presentations showcasing reinforced concrete structures under construction and in completed form. Instructors will have an access to additional web site, which contains electronic version of the Instructor's Solution Manual with complete solutions to the end-of-chapter problems, and Power Point presentations containing all illustrations from the book. The book is a collaborative effort between an academic and a practising engineer and reflects their unique perspectives on the subject. Svetlana Brzev, Ph.D., P.Eng. is a faculty at the Civil Engineering Department of the

British Columbia Institute of Technology, Burnaby, BC. She has over 25 years of combined teaching, research, and consulting experience related to structural design and rehabilitation of concrete and masonry structures, including buildings, municipal, and industrial facilities. John Pao, MEng, PEng, Struct.Eng, is the President of Bogdonov Pao Associates Ltd. of Vancouver, BC, and BPA Group of Companies with offices in Seattle and Los Angeles. Mr. Pao has extensive consulting experience related to design of reinforced concrete buildings, including high-rise residential and office buildings, shopping centers, parking garages, and

institutional buildings. Prestressed concrete is widely used in the construction industry in buildings, bridges, and other structures. The new edition of this book provides up-to-date guidance on the detailed design of prestressed concrete structures according to the provisions of the latest preliminary version of Eurocode 2: Design of Concrete Structures, DD ENV 1992-1-1: 1992. The emphasis throughout is on design - the problem of providing a structure to fulfil a given purpose - but fundamental concepts are also described in detail. All major topics are dealt with, including prestressed flat slabs, an important and growing

application in the design of buildings. The text is illustrated throughout with worked examples and problems for further study. Examples are given of computer spreadsheets for typical design calculations. Prestressed Concrete Design will be a valuable guide to practising engineers, students and research workers. This book provides an extensive coverage of the design of reinforced concrete structures in accordance with the current Indian code of practice (IS 456: 2000). As some of the Indian code provisions are outdated, the American code provisions are provided, wherever necessary. In addition, an

attempt is made to integrate the provisions of IS 456 with earthquake code (IS 13920), as more than 60% of India falls under moderate or severe earthquake zones. The text is based on the limit state approach to design and covers areas such as the properties of concrete, design of various structural elements such as compression and tension members, beams & slabs, and design for flexure, shear torsion, uni-axial and biaxial bending and interaction of these forces. Each chapter features solved examples, review questions, and practice problems as well as ample illustrations that supplement the text. An exhaustive list of

references as well as appendices on strut-and-tie-method, properties of soils, and practical tips add value to the rich contents of book. An exploration of the world of concrete as it applies to the construction of buildings, Reinforced Concrete Design of Tall Buildings provides a practical perspective on all aspects of reinforced concrete used in the design of structures, with particular focus on tall and ultra-tall buildings. Written by Dr. Bungale S. Taranath, this work explains the fundamental principles and state-of-the-art technologies required to build vertical structures as sound as they are eloquent. Dozens of

cases studies of tall buildings throughout the world, many designed by Dr. Taranath, provide in-depth insight on why and how specific structural system choices are made. The book bridges the gap between two approaches: one based on intuitive skills and experience and the other based on computer skills and analytical techniques. Examining the results when experiential intuition marries unfathomable precision, this book discusses: The latest building codes, including ASCE/SEI 7-05, IBC-06/09, ACI 318-05/08, and ASCE/SEI 41-06 Recent developments in studies of seismic vulnerability and retrofit design Earthquake

hazard mitigation technology, including seismic base isolation, passive energy dissipation, and damping systems Lateral bracing concepts and gravity-resisting systems Performance based design trends Dynamic response spectrum and equivalent lateral load procedures Using realistic examples throughout, Dr. Taranath shows how to create sound, cost-efficient high rise structures. His lucid and thorough explanations provide the tools required to derive systems that gracefully resist the battering forces of nature while addressing the specific needs of building owners, developers, and architects. The

book is packed with broad-ranging material from fundamental principles to the state-of-the-art technologies and includes techniques thoroughly developed to be highly adaptable. Offering complete guidance, instructive examples, and color illustrations, the author develops several approaches for designing tall buildings. He demonstrates the benefits of blending imaginative problem solving and rational analysis for creating better structural systems. In *Finite Element Design of Concrete Structures: practical problems and their solutions* the author addresses this blind belief in computer results by offering a useful

critique that important details are overlooked due to the flood of information from the output of computer calculations. Indeed, errors in the numerical model may lead in extreme cases to structural failures as the collapse of the so-called Sleipner platform has demonstrated. Designed primarily as a text for undergraduate students of Civil Engineering for their first course on Limit State Design of Reinforced Concrete, this compact and well-organized text covers all the fundamental concepts in a highly readable style. The text conforms to the provision of the latest revision of Indian Code of Practice for Plain and Reinforced Concrete,

IS : 456 (2000). First six chapters deal with fundamentals of limit states design of reinforced concrete. The objective of last two chapters (including design aids in appendix) is to initiate the readers in practical design of concrete structures. The text gives detailed discussion of basic concepts, behaviour of the various structural components under loads, and development of fundamental expressions for analysis and design. It also presents efficient and systematic procedures for solving design problems. In addition to the discussion of basis for design calculations, a large number of worked-out practical design

examples based on the current design practices have been included to illustrate the basic principles of reinforced concrete design. Besides students, practising engineers would find this text extremely useful. While most people think of concrete as a material for sidewalks, roads, and industrial uses, it can work wonderfully in the home, too—adding strength, texture, and utility. Take an unprecedented look at the myriad design possibilities of concrete in the domestic space, and see how beautiful it can be. Featuring magnificent examples of work by such star designers as Santiago Calatrava, Herzog & de Meuron, Maya Lin, Rem

Koolhaas, Ron Arad, Tadao Ando, and Luis Barragán, this stunning guide covers staircases, floors, walls, kitchens, bathrooms, fireplaces, and furniture. Highlights include a grotto-like bedroom in the Segal House, created by architect John Lautner; the Möbius House in the Netherlands, based on a Möbius strip; a sculptural loft apartment in the UK; and colored concrete towers that make a powerful visual statement in Mexico. Encouraging creative uses of reinforced concrete, Principles of Reinforced Concrete Design draws a clear distinction between fundamentals and professional consensus. This

text presents a mixture of fundamentals along with practical methods. It provides the fundamental concepts required for designing reinforced concrete (RC) structures, emphasizing principles based on mechanics, experience, and experimentation, while encouraging practitioners to consult their local building codes. The book presents design choices that fall in line with the boundaries defined by professional consensus (building codes), and provides reference material outlining the design criteria contained in building codes. It includes applications for both building and bridge structural design,

and it is applicable worldwide, as it is not dependent upon any particular codes. Contains concise coverage that can be taught in one semester  
Underscores the fundamental principles of behavior Provides students with an understanding of the principles upon which codes are based Assists in navigating the labyrinth of ever-changing codes Fosters an inherent understanding of design The text also provides a brief history of reinforced concrete. While the initial attraction for using reinforced concrete in building construction has been attributed to its fire resistance, its increase in popularity was also due to the creativity of

engineers who kept extending its limits of application. Along with height achievement, reinforced concrete gained momentum by providing convenience, plasticity, and low-cost economic appeal. Principles of Reinforced Concrete Design provides undergraduate students with the fundamentals of mechanics and direct observation, as well as the concepts required to design reinforced concrete (RC) structures, and applies to both building and bridge structural design. Emphasizing a conceptual understanding of concrete design and analysis, this revised and updated edition builds the student's understanding by presenting



design methods in an easy to understand manner supported with the use of numerous examples and problems. Written in intuitive, easy-to-understand language, it includes SI unit examples in all chapters, equivalent conversion factors from US customary to SI throughout the book, and SI unit design tables. In addition, the coverage has been completely updated to reflect the latest ACI 318-11 code. Based on the 1995 edition of the American Concrete Institute Building Code, this text explains the theory and practice of reinforced concrete design in a systematic and clear fashion, with an abundance of step-by-step

worked examples, illustrations, and photographs. The focus is on preparing students to make the many judgment decisions required in reinforced concrete design, and reflects the author's experience as both a teacher of reinforced concrete design and as a member of various code committees. This edition provides new, revised and expanded coverage of the following topics: core testing and durability; shrinkage and creep; bases the maximum steel ratio and the value of the factor on Appendix B of ACI318-95; composite concrete beams; strut-and-tie models; dapped ends and T-beam flanges. It also expands the discussion of STMs and adds

new examples in SI units. Concrete is one of the most used materials in the construction industry. In structural systems, the combination of concrete and steel reinforcement bars gives rise to reinforced concrete (RC), which is widely applied in the civil engineering field due to its adequate mechanical strength, durability, and fire resistance. Steel-rebar reinforced structures are subjected to structural deterioration when subjected to extreme loadings such as earthquake, fire, impact loadings and cyclic loading, consequently reducing the expected life and performance of structures. To enhance the

structural performance, the RC structures are usually retrofitted or strengthened. This book reviews design, performance and applications of reinforced concrete.

□ Contents Introduction to Limit State Design \* Materials \* Limit Analysis of R.C. Structures \* Limit State of Collapse- Flexure (PART-A : sSingly Reinforced Rectangular Beams. PART- B : Doubly Reomfrnced Beams, PART - C : Flanged Beams) \* Limit State of Collapse- Shear \* Limit State of Collapse- Bond \* Limit State of Collapse- Torsion \* Limit State of Serviceability and Detailing of Reinforcement (PART- A : Limit State of Deflection, PART - B : Limit

State of Cracking, PART - C : Detailing of R.C Structures) \* Slab \* Design of Beams \* Column \* Miscellaneous Problems \* Apendiices \* Index.

□ Book Details: Author : S.R. Karve & V.L. Shah Edition: 8th: Reprint: 2018 ISBN: 9788190371711 Page No.: 829 Binding: Paperback This Book Systematically Explains The Basic Principles And Techniques Involved In The Design Of Reinforced Concrete Structures. It Exhaustively Covers The First Course On The Subject At B.E./ B.Tech Level. Important Features: \* Exposition Is Based On The Latest Indian Standard Code Is: 456-2000. \* Limit State Method Emphasized Throughout The

Book. \* Working Stress Method Also Explained. \* Detailing Aspects Of Reinforcement Highlighted. \* Incorporates Earthquake Resistant Design. \* Includes A Large Number Of Solved Examples, Practice Problems And Illustrations. The Book Would Serve As A Comprehensive Text For Undergraduate Civil Engineering Students. Practising Engineers Would Also Find It A Valuable Reference Source. This book provides an up-to-date survey of durability issues, with a particular focus on specification and design, and how to achieve durability in actual concrete construction. It is aimed at the practising

engineer, but is also a valuable resource for graduate-level programs in universities. Along with background to current philosophies it gathers together in one useful reference a summary of current knowledge on concrete durability, includes information on modern concrete materials, and shows how these materials can be combined to produce durable concrete. The approach is consistent with the increasing focus on sustainability that is being addressed by the concrete industry, with the current emphasis on 'design for durability'. 17 2 STRESS FIELDS FOR SIMPLE STRUCTURES 2. 1

INTRODUCTION In this chapter the behavior and strength of simple structures made of reinforced or prestressed concrete is investigated with the aid of stress fields. In particular, the webs and flanges of beams, simple walls, brackets, bracing beams and joints of frames are investigated. By this means, the majority of design cases are already covered. In reality, all structural components are three-dimensional. Here, however, components are considered either directly as two-dimensional plate elements (i. e. the plane stress condition with no variation of stress over the thickness of the element) or they are subdivided into

several plates. Since two-dimensional structural elements are statically redundant, it is possible for a particular loading to be in equilibrium with many (theoretically an infinite number of) stress states. If the lower bound method of the theory of plasticity is employed, then an admissible stress field or any combination of such stress fields may be selected. In chapter 4 it is shown that this method is suitable for the design of reinforced concrete structures, and the consequence of the choice of the final structural system on the structural behavior is dealt with in detail. The first cases of the use of this method date

back to Ritter [6] and Morsch [4], who already at the beginning of the century investigated the resultants of the internal stresses by means of truss models. Through four editions, Phil M. Ferguson's Reinforced Concrete Fundamentals has become a recognized classic, known for its clarity and thoroughness. There is, in fact, no other reinforced concrete text available as useful for both beginners and experienced designers. Now a fifth edition, reflecting the 1983 and 1986 ACI Code revisions, brings Reinforced Concrete Fundamentals completely up to date while retaining Ferguson's popular approach. Changes

include a return, for most examples, to the use of English units to reflect current practice, reorganization of material for greater clarity, revision and expansion of seismic design-related topics, and an emphasis on conceptual models for design. There are entirely new chapters on design and detailing in the central joint regions, and on shear wall design. In addition, substantial revisions have been made in the basic approach to the design of slender columns in order to emphasize the secondary deflection patterns, and in the treatment of splices, reinforcement development and hooks in order to reflect the basic behavior and failure

patterns rather than just arbitrary code rules. The coverage of seismic design, interaction curves for eccentrically loaded columns, and direct design procedures for two-way slabs has been revised as well. As in previous editions, Reinforced Concrete Fundamentals imparts a clear understanding of the behavior of reinforced concrete members and assemblages with an emphasis on the "flow" of the design process. Throughout, behavior at all load stages is illustrated by figures and photos. A set of working appendices delivers a summary treatment of service load analysis for flexure, and design tables and curves.

Maintaining the high standards of its popular predecessors, Reinforced Concrete Fundamentals, Fifth Edition makes up an ideal reference, refresher, and desktop resource for civil engineers needing a clear, modern approach to concrete design. This practical, problem-solving work explores the design and analysis of reinforced concrete structural members. Coverage includes the materials and mechanics of bending, reinforced concrete beams, continuous construction design considerations, walls, columns, footings and concrete frameworks. Ordinary concrete is strong in compression but weak in tension. Even

reinforced concrete, where steel bars are used to take up the tension that the concrete cannot resist, is prone to cracking and corrosion under low loads. Prestressed concrete is highly resistant to stress, and is used as a building material for bridges, tanks, shell roofs, floors. This new edition of a highly practical text gives a detailed presentation of the design of common reinforced concrete structures to limit state theory in accordance with BS 8110. Publisher Description Complete coverage of earthquake-resistant concrete building design. Written by a renowned seismic engineering expert, this authoritative resource discusses the theory

and practice for the design and evaluation of earthquake-resisting reinforced concrete buildings. The book addresses the behavior of reinforced concrete materials, components, and systems subjected to routine and extreme loads, with an emphasis on response to earthquake loading. Design methods, both at a basic level as required by current building codes and at an advanced level needed for special problems such as seismic performance assessment, are described. Data and models useful for analyzing reinforced concrete structures as well as numerous illustrations, tables, and equations are included in this

detailed reference. Seismic Design of Reinforced Concrete Buildings covers: Seismic design and performance verification Steel reinforcement Concrete Confined concrete Axially loaded members Moment and axial force Shear in beams, columns, and walls Development and anchorage Beam-column connections Slab-column and slab-wall connections Seismic design overview Special moment frames Special structural walls Gravity framing Diaphragms and collectors Foundations This established and popular textbook has now been extensively rewritten and expanded in line with the current Eurocodes. It presents

the principles of the design of concrete elements and also the design of complete structures, and provides practical illustrations of the theory. It explains the background to the Eurocode rules and goes beyond the c This introduction to the principles of concrete mechanics and design focuses on the fundamentals - from very basic, elementary to the very complicated concepts and features an easy-to-follow yet thorough step-by-step design methodology. \*emphasizes basic principles of the mechanics aspects of concrete design and avoids explanations of the detail requirements which can be found in the ACI Code and Commentary.

\*surveys modern design philosophies and features an amply illustrated tour of the world of concrete. \*carefully lays out the various design procedures step-by-step - for flexural design, shear design, column design, etc, prepares and encourages students to program procedures for computer solution. Instructors, at their own discretion, can suggest follow-up coding assignment. \*goes beyond the traditional description of materials to provide substantive coverage of concrete, current concrete technology, and the durability of materials - especially since many engineers will find themselves repairing,

rehabilitating, and strengthening existing structures, rather than designing new ones. \*explores the interrelationship between design and analysis - a typical problem area for students, especially in relation to statically indeterminate structures, reviews some structural analysis methods for continuous beams and frames, especially those methods that designers will find useful for checking purposes - e.g., moment distribution, explains how the behavior of structures can be controlled through design decisions. \*includes sections on basic plate theory and yield line theory as supplements to the common

design procedures of the ACI Code. \*contains important optional topics that students can master through self-study after understanding the basics such as torsion, slab design, footings, and retaining walls. \*includes many easy-to-follow examples worked out in great detail. \*contains a large number of illustrations. \*features very carefully designed problem sets that require students to think and appreciate various physical aspects of what they are doing. \*contains a comprehensive glossary of terms common in concrete engineering and the construction industry. Definitions are based largely on The Cement and Concrete

Terminology Report of ACI Committee 116. A text/reference book describing the design of many types of concrete highway bridges. Using examples, the text examines the development of all required loads and the associated bridge design specifications. Details working stress and load factor methods. Includes design charts. Illustrates the design of box beam, segmental, T-Beams, prestressed, posttensioned, and pier beams. Explanations can be applied directly to design problems. Using the 2002 ACI Code, this text covers the behavior and design aspects of concrete and provides examples and homework

problems. It covers strut-and-tie models, and presents the basic mechanics of structural concrete and methods for the design of individual members for bending, shear, torsion, and axial force. Through my book with the Title: Civil Engineering In Reinforced Concrete Design Making It Easy For You Without Acquiring Bachelor's Degree You will learn the following series of designs: 1.) To determine the thickness of the Concrete Slab and the Diameter (size) of the Reinforcement Bars for any building according to the specified load that the slab will be carrying. 2.) The dimension of the beam and the Diameter

(size) of Reinforcement Bars where the slab transfers its load. 3.) The dimension of the Column and the Diameter (size) of the Reinforcement Bars that carries the Beam and last but not least, 4.) The dimension of the Foundation and the Diameter (size) of the Reinforcement Bars. The foregoing series of Designs are all in the category of the Preliminary Design using Working Stress Design Method prior to the execution of the final Design where the Ultimate Strength Design Method will be used. The book combines history with academic notes for use at the university level, presenting design examples from actual

jobs with applications and detailing for the practicing engineer. Chapter 1 tells the history of post-tensioned concrete as only Ken Bondy can tell it. Chapters 2-8 are the notes Dirk Bondy uses to teach Design of Prestressed Concrete Structures at UCLA and Cal Poly-San Luis Obispo. Chapters 9-13 are design examples that address many of the decisions faced by practicing engineers on typical projects. Chapters 13-14 cover the art of detailing and observing the construction of post-tensioned concrete. This knowledge was obtained over many years of working on our own projects and listening and learning from the the pioneers of post-tensioned



concrete. Chapter 15 covers the slab on grade industry, which represents more sales of post-tensioning tendons than all other post-tensioning applications combined. Chapter 16 discusses the challenging application of post-tensioning-external post-tensioning. Concrete Design covers concrete design fundamentals for architects and engineers, such as tension, flexural, shear, and compression elements, anchorage, lateral design, and footings. As part of the Architect's Guidebooks to Structures Series it provides a comprehensive overview using both imperial and metric units of measurement. Written by

experienced professional structural engineers Concrete Design is beautifully illustrated, with more than 170 black and white images, contains clear examples that show all design steps, and provides rules of thumb and simple tables for initial sizing. A refreshing change in textbooks for architectural materials courses, it is an indispensable reference for practicing architects and students alike. As a compact summary of key ideas it is ideal for anyone needing a quick guide to concrete design. This substantially revised second edition takes into account the provisions of the revised Indian Code of practice for Plain and

Reinforced Concrete IS 456 : 2000. It also provides additional data on detailing of steel to make the book more useful to practicing engineers. The chapter on Limit State of Durability for Environment has been completely revised and the new provisions of the code such as those for design for shear in reinforced concrete, rules for shearing main steel in slabs, lateral steel in columns, and stirrups in beams have been explained in detail in the new edition. This comprehensive and systematically organized book is intended for undergraduate students of Civil Engineering, covering the first course on Reinforced Concrete Design

and as a reference for the practicing engineers. Besides covering IS 456 : 2000, the book also deals with the British and US Codes. Advanced topics of IS 456 : 2000 have been discussed in the companion volume Advanced Reinforced Concrete Design (also published by Prentice-Hall of India). The two books together cover all the topics in IS 456 : 2000 and many other topics which are so important in modern methods of design of reinforced concrete. This book is focused on the theoretical and practical design of reinforced concrete beams, columns and frame structures. It is based on an analytical approach of designing normal

reinforced concrete structural elements that are compatible with most international design rules, including for instance the European design rules - Eurocode 2 - for reinforced concrete structures. The book tries to distinguish between what belongs to the structural design philosophy of such structural elements (related to strength of materials arguments) and what belongs to the design rule aspects associated with specific characteristic data (for the material or loading parameters). Reinforced Concrete Beams, Columns and Frames - Mechanics and Design deals with the fundamental aspects of the

mechanics and design of reinforced concrete in general, both related to the Serviceability Limit State (SLS) and the Ultimate Limit State (ULS). A second book, entitled Reinforced Concrete Beams, Columns and Frames - Section and Slender Member Analysis, deals with more advanced ULS aspects, along with instability and second-order analysis aspects. Some recent research results including the use of non-local mechanics are also presented. This book is aimed at Masters-level students, engineers, researchers and teachers in the field of reinforced concrete design. Most of the books in this area are very practical or

code-oriented, whereas this book is more theoretically based, using rigorous mathematics and mechanics tools. Contents 1. Design at Serviceability Limit State (SLS). 2. Verification at Serviceability Limit State (SLS). 3. Concepts for the Design at Ultimate Limit State (ULS). 4. Bending-Curvature at Ultimate Limit State (ULS). Appendix 1. Cardano's Method. Appendix 2. Steel Reinforcement Table. About the Authors Charles Casandjian was formerly Associate Professor at INSA (French National Institute of Applied Sciences), Rennes, France and the chairman of the course on reinforced concrete design.

He has published work on the mechanics of concrete and is also involved in creating a web experience for teaching reinforced concrete design - BA-CORTEX. Noël Challamel is Professor in Civil Engineering at UBS, University of South Brittany in France and chairman of the EMI-ASCE Stability committee. His contributions mainly concern the dynamics, stability and inelastic behavior of structural components, with special emphasis on Continuum Damage Mechanics (more than 70 publications in International peer-reviewed journals). Christophe Lanos is Professor in Civil Engineering at the University of Rennes 1 in

France. He has mainly published work on the mechanics of concrete, as well as other related subjects. He is also involved in creating a web experience for teaching reinforced concrete design - BA-CORTEX. Jostein Helleland has been Professor of Structural Mechanics at the University of Oslo, Norway since January 1988. His contribution to the field of stability has been recognized and magnified by many high-quality papers in famous international journals such as Engineering Structures, Thin-Walled Structures, Journal of Constructional Steel Research and Journal of Structural Engineering. A

Comprehensive Review Book for the NCEES PE Civil and SE Exams An in-depth review of concrete design methods and standards, Concrete Design for the PE Civil and SE Exams presents the concrete design and analysis methods most needed by civil and structural engineers. The book's 12 chapters provide a concise but thorough review of concrete theory, code application, design principles, and structural analysis. It's multiple-choice problems and scenario-based design problems will enhance your problem-solving skills, and each problem's complete solution lets you check your solving approach. On exam

day, you can use this book's thorough index to quickly locate important codes and concepts. Topics Covered Columns and Compression Members Continuous One-Way Systems Design Specifications Development of Reinforcement Flexural Design of Reinforced Concrete Beams Materials Prestressed Concrete Seismic Design of Reinforced Concrete Members Serviceability of Reinforced Concrete Beams Shear Design of Reinforced Concrete Two-Way Slab Systems Key Features 51 example problems demonstrate how to apply concepts, codes, and equations Over 40 figures and tables provide essential support material A complete

nomenclature list defines the industry-standard variables and symbols used in each chapter Includes code references to familiarize you with the exam-adopted codes, such as ASCE 7 and ACI 318 Binding: Paperback Publisher: PPI, A Kaplan Company TRB's National Cooperative Highway Research Program (NCHRP) Report 679: Design of Concrete Structures Using High-Strength Steel Reinforcement evaluates the existing American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications relevant to the use of high-strength reinforcing

steel and other grades of reinforcing steel having no discernible yield plateau. The report also includes recommended language to the AASHTO LRFD Bridge Design Specifications that will permit the use of high-strength reinforcing steel with specified yield strengths not greater than 100 ksi. The Appendixes to NCHRP Report 679 were published online. The leading structural concrete design reference for over two decades—updated to reflect the latest ACI 318-19 code A go-to resource for structural engineering students and professionals for over twenty years, this newly updated text on concrete structural design

and analysis reflects the most recent ACI 318-19 code. It emphasizes student comprehension by presenting design methods alongside relevant codes and standards. It also offers numerous examples (presented using SI units and US-SI conversion factors) and practice problems to guide students through the analysis and design of each type of structural member. New to Structural Concrete: Theory and Design, Seventh Edition are code provisions for transverse reinforcement and shear in wide beams, hanger reinforcement, and bi-directional interaction of one-way shear. This edition also includes the latest information

on two-way shear strength, ordinary walls, seismic loads, reinforcement detailing and analysis, and materials requirements. This book covers the historical background of structural concrete; advantages and disadvantages; codes and practice; and design philosophy and concepts. It then launches into a discussion of the properties of reinforced concrete, and continues with chapters on flexural analysis and design; deflection and control of cracking; development length of reinforcing bars; designing with the strut-and-tie method; one-way slabs; axially loaded columns; and more. Updated to align with the new ACI 318-19

code with new code provisions to include: transverse reinforcement and shear in wide beams, hanger reinforcement, bi-directional interaction of one-way shear, and reference to ACI certifications Includes dozens of worked examples that explain the analysis and design of structural members Offers updated information on two-way shear strength, seismic loads, materials requirements, and more Improves the design ability of students by explaining code requirements and restrictions Provides examples in SI units in every chapter as well as conversion factors from customary units to SI Offers instructors access to

a solutions manual via the book's companion website Structural Concrete: Theory and Design, Seventh Edition is an excellent text for undergraduate and graduate students in civil and structural engineering programs. It will also benefit concrete designers, structural engineers, and civil engineers focused on structures. CONTENT: Materials - Design of Beams for Flexure - Shear and Diagonal Tension - Torsion - Bond, Anchorage, and Reinforcing Details - Design of Columns - Footing Design - Retaining Walls - The Design and Analysis of Multistory Building Frames - Design of Two-Way Slabs -

Prestressed Concrete. The recent worldwide boom in industrial construction and the corresponding billions of dollars spent every year in industrial, oil, gas, and petrochemical and power generation project, has created fierce competition for these projects. Strong management and technical competence will bring your projects in on time and on budget. An in-depth explorat This detailed guide is designed to enable the reader to understand the relative importance of the numerous parameters involved in seismic design and the relationships between them, as well as the motivations behind the choices adopted by the codes.