Retrofitting Of Concrete Columns By Conventional Steel Method Structural Rehabilitation Using Retrof

Pushover Analysis of Retrofitted Reinforced Concrete Buildings
Experimental Characterization of Steel Jacket Retrofitted Reinforced Concrete Bridge Column Behavior in Cascadia Subduction Zone Earthquakes
Decision Based Design
Seismic Retrofitting of Reinforced Concrete Columns Using SIMCON Jackets
Statistics of Retrofitting Rcc Columns with Frp Overlays
Seismic Retrofitting of Rectangular Reinforced Concrete Columns with Partial Interaction Plating
Techniques of Seismic Retrofitting for Concrete Structures

Failure, Distress and Repair of Concrete Structures
Retrofitting of Concrete Columns by Conventional Steel Method
Seismic Retrofitting of Concrete Bridge Columns by External Prestressing
Advances in Geotechnics and Structural Engineering
Construction of SIMCON Retrofitted Reinforced Concrete Columns
FRP Composites for Reinforced and Prestressed Concrete Structures
Behavior of Non-Ductile Slender Reinforced Concrete Columns Retrofit by CFRP Under Cyclic Loading
Seismic Design, Assessment and Retrofitting of Concrete Buildings
Seismic Retrofit of Reinforced Concrete Beams, Columns, and Joints with Thin Steel Sheets and Steel Plates
Seismic Evaluation and Retrofit of Concrete Bridge Columns and Joints
Effect of Column Retrofitting on the Seismic Response of Concrete Frames
Strengthening and Retrofitting of Existing Structures
Design of Retrofitting FRP for Concrete Columns [microform]
Seismic Retrofitting of Rectangular Reinforced Concrete Bridge Columns for Shear
Experimental Research of Reinforced Concrete Column Retrofit Methods

Retrofitting of Reinforced Concrete Bridge Columns
New Technique for Repairing and Retrofitting Rectangular Reinforced Concrete Columns Using Anisotropic Sandwich Structural Element
Performance of Confined Concrete Columns Under Simulated Life Cycles
Advanced fibre-reinforced polymer (FRP) composites for structural applications
Concrete Repair, Rehabilitation and Retrofitting III
Comparison and Retrofitting of Rcc Columns with Frp Overlays
Retrofitting of Concrete Structures by Externally Bonded FRPs, With Emphasis on Seismic Applications
Facing the Challenges in Structural Engineering
Seismic Assessment and Retrofit of Reinforced Concrete Columns
Retrofitting of Split Reinforced Concrete Bridge Columns Using High Strength Composites
Advances in Earthquake Engineering for Urban Risk Reduction
Effects of Retrofitting Applications on Reinforced Concrete Bridges
Seismic Retrofitting Techniques for Bridges - a State-of-the-art Report
Seismic Design and Retrofit of Bridges
Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures
Analytical Models for Reinforced Concrete Columns Retrofitted with Fiber-reinforced

Polymer Composites
Seismic Assessment and Retrofit of Reinforced Concrete Buildings

BRAYLON JOVANI

Pushover Analysis of Retrofitted Reinforced Concrete Buildings
Springer
The book describes a detailed comparision of the various engineering properties of an FRP column and a reinforced concrete column. Also, a detailed understanding of the various processes involved in the manufacturing and testing of a FRP composite for retrofitting has been presented. There is a considerable number of existing reinforced concrete structures that do not meet current design standards because of inadequate design and/or construction or need structural upgrading to meet new seismic design requirements. Inadequate performance of this type of structures is a major concern from public safety standpoint. This paper presents an experimental research program aimed at developing a retrofitting technique that utilizes locally available high strength, lightweight, corrosion resistance advanced composites for retrofitting

existing reinforced concrete columns. The proposed technique consists of applying Glass Fiber Reinforced Plastic (GFRP) to all surfaces of the concrete column to increase its stiffness and flexural strength. Experimental Characterization of Steel Jacket Retrofitted Reinforced Concrete Bridge Column Behavior in Cascadia Subduction Zone Earthquakes fib Fédération internationale du béton This book comprises select proceedings of the International Conference on Trends and Recent Advances in Civil Engineering (TRACE 2020). The book focuses on the latest research developments in structural engineering, structural health monitoring, rehabilitation and retrofitting of structures, geotechnical engineering, and earthquake-resistant structures. The contents also cover the latest innovations in building repair and maintenance, and sustainable materials for rehabilitation and retrofitting. The contents of this book are useful for students, researchers, and professionals working in structural engineering and allied areas. Decision Based Design CRC Press

In a presentation that formalizes what makes up decision based design, Decision Based Design defines the major concepts that go into product realization. It presents all major concepts in design decision making in an integrated way and covers the fundamentals of decision analysis in engineering design. It also trains engineers to understand the impacts of design decision. The author teaches concepts in demand modeling and customer preference modeling and provides examples. This book teaches most fundamental concepts encountered in engineering design like: concept generation, multiattribute decision analysis, reliability engineering, design optimization, simulation, and demand modeling. The book provides the tools engineering practitioners and researchers need to first understand that engineering design is best viewed as a sequence of decisions made by the stakeholders involved and then apply the decision based design concepts in practice. It teaches fundamental concepts encountered in engineering design, such as concept generation, multiattribute decision

analysis, reliability engineering, design optimization, simulation, and demand modeling. This book helps students and practitioners understand that there is a rigorous way to analyze engineering decisions taking into consideration all the potential technical and business impacts of their decisions. It can be used in its entirety to teach a course in decision based design, while selected chapters can also be used to cover courses in subdisciplines that make up decision based design. *Seismic Retrofitting of Reinforced Concrete Columns Using SIMCON Jackets* Springer Reflecting the historic first European seismic code, this professional book focuses on seismic design, assessment and retrofitting of concrete buildings, with thorough reference to, and application of, EN-Eurocode 8. Following the publication of EN-Eurocode 8 in 2004-05, 30 countries are now introducing this European standard for seismic design, for application in parallel with existing national standards (till March 2010) and exclusively after that. Eurocode 8 is also expected to influence standards in countries outside Europe, or at the least, to

be applied there for important facilities. Owing to the increasing awareness of the threat posed by existing buildings substandard and deficient buildings and the lack of national or international standards for assessment and retrofitting, its impact in that field is expected to be major. Written by the lead person in the development of the EN-Eurocode 8, the present handbook explains the principles and rationale of seismic design according to modern codes and provides thorough guidance for the conceptual seismic design of concrete buildings and their foundations. It examines the experimental behaviour of concrete members under cyclic loading and modelling for design and analysis purposes; it develops the essentials of linear or nonlinear seismic analysis for the purposes of design, assessment and retrofitting (especially using Eurocode 8); and gives detailed guidance for modelling concrete buildings at the member and at the system level. Moreover, readers gain access to overviews of provisions of Eurocode 8, plus an understanding for them on the basis of the simple models of the element

behaviour presented in the book. Also examined are the modern trends in performance- and displacement-based seismic assessment of existing buildings, comparing the relevant provisions of Eurocode 8 with those of new US prestandards, and details of the most common and popular seismic retrofitting techniques for concrete buildings and guidance for retrofitting strategies at the system level. Comprehensive walk-through examples of detailed design elucidate the application of Eurocode 8 to common situations in practical design. Examples and case studies of seismic assessment and retrofitting of a few real buildings are also presented. From the reviews: "This is a massive book that has no equal in the published literature, as far as the reviewer knows. It is dense and comprehensive and leaves nothing to chance. It is certainly taxing on the reader and the potential user, but without it, use of Eurocode 8 will be that much more difficult. In short, this is a must-read book for researchers and practitioners in Europe, and of use to readers outside of Europe too. This book will remain an indispensable

backup to Eurocode 8 and its existing Designers' Guide to EN 1998-1 and EN 1998-5 (published in 2005), for many years to come. Congratulations to the author for a very well planned scope and contents, and for a flawless execution of the plan". AMR S. ELNASHAI "The book is an impressive source of information to understand the response of reinforced concrete buildings under seismic loads with the ultimate goal of presenting and explaining the state of the art of seismic design. Underlying the contents of the book is the in-depth knowledge of the author in this field and in particular his extremely important contribution to the development of the European Design Standard EN 1998 - Eurocode 8: Design of structures for earthquake resistance. However, although Eurocode 8 is at the core of the book, many comparisons are made to other design practices, namely from the US and from Japan, thus enriching the contents and interest of the book". EDUARDO C. CARVALHO

Statistics of Retrofitting Rcc Columns with Frp Overlays LAP Lambert Academic Publishing Accompanying CD-ROM contains an electronic version of the

text in the form of one PDF document. Seismic Retrofitting of Rectangular Reinforced Concrete Columns with Partial Interaction Plating National Library of Canada = Bibliothèque nationale du Canada There is a growing interest on infrastructure retrofitting due to updated seismic codes and increased service loads. There may be some economical reasons or preservation needs to strengthen a structure instead of demolishing it. For strengthening purposes alternatives include steel jacketing and Fiber Reinforced Plastic (FRP) wrapping. This study focuses on Slurry Infiltrated Mat Concrete (SIMCON) as an option for strengthening of reinforced concrete columns. Before SIMCON is applied routinely for strengthening of a column, however, certain critical construction and constructibility factors affecting the jacketed column behavior must be resolved. In this study, the frost durability of SIMCON was examined, factors associated with the construction of a SIMCON jacket were identified, the influence of these factors on service load and ultimate state behavior were evaluated, the criticality of

these factors was determined, and general guidelines for the construction or design of SIMCON jackets on existing columns were developed. In addition, an approximate cost of SIMCON jackets for existing reinforced concrete columns was developed in order to evaluate the economic viability of the SIMCON jacket. SIMCON exhibited satisfactory deicer salt scaling resistance, even without the presence of entrained air. No significant effect of cracking on scaling was observed. Several construction aspects of jacketing were studied analytically. Bonding was not found to be necessary for SIMCON jacketing of a column. The most important factor is the end connections of a SIMCON jacket for load and moment transfer. Other critical factors were thickness and strength tolerances of SIMCON jacket. The construction costs of SIMCON jacket were estimated based on available data. This and some other strengthening technique cost data showed that SIMCON jacketing is an economically viable technique.

Techniques of Seismic Retrofitting for Concrete Structures

John Wiley & Sons

The book is an effort to bring forth the process involved in retrofitting deformed or cracked concrete columns with Fiber Reinforced Plastic overlays and to analyse the properties of the columns before and after retrofitting. It details the various process available for retrofitting and details the calculations and analysis of a typical process using multiple samples of the columns. It is statistical in nature outlining the observation from the experimental results and their interpretation.

CRC Press

This edited volume brings together findings and case studies on fundamental and applied aspects of structural engineering, applied to buildings, bridges and infrastructures in general. It focuses on the application of advanced experimental and numerical techniques and new technologies to the built environment. This volume is part of the proceedings of the 1st GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures , Egypt 2017.

Failure, Distress and Repair of Concrete Structures

CRC Press

This book presents the fundamentals of strengthening and retrofitting approaches,

solutions and technologies for existing structures. It addresses in detail specific techniques for the strengthening of traditional constructions, reinforced concrete buildings, bridges and their foundations. Finally, it discusses issues related to standards and economic decision support tools for retrofitting.

Retrofitting of Concrete Columns by Conventional Steel Method

Retrofitting of Concrete Columns by Conventional Steel Method "This study is aimed to develop a new seismic retrofit technique of reinforced concrete (RC) beams, columns, and their joints with lightweight steel sheets and steel plates, to validate the retrofit technique with testing of two 4/5-scaled beam-column assemblage specimens, and to develop a strut-and-tie model to ascertain the force transfer mechanism of beam-column joints under seismic loads. Because of the introduction of thin steel sheets, weld joints that were used in the conventional steel jacket of RC columns could be costly in field applications. Nailed joints of two types, interlocked and lap-spliced, were therefore proposed in this study"--Abstract, leaf iii.

Seismic Retrofitting of Concrete

Bridge Columns by External Prestressing Elsevier Inc. Chapters fib Bulletin 35 is the first bulletin to publish documentation from an fib short course. These courses are held worldwide and cover advanced knowledge of structural concrete in general, or specific topics. They are organized by fib and given by internationally recognized experts in fib, often supplemented with local experts active in fib. They are based on the knowledge and expertise from fib's ten Commissions and nearly fifty Task Groups. fib Bulletin 35 presents the course materials developed for the short course "Retrofitting of Concrete Structures through Externally Bonded FRP, with emphasis on Seismic Applications", given in Ankara and Istanbul in June 2005. The course drew on expertise both from outside Turkey and from the large pool of local experts on this subject. In most countries of the world, the building stock is ageing and needs continuous maintenance or repair. Moreover, the majority of existing constructions are deficient in the light of current knowledge and design codes. The problem of structural deficiency of existing constructions

is especially acute in seismic regions, as, even there, seismic design of structures is relatively recent. The direct and indirect costs of demolition and reconstruction of structurally deficient constructions are often prohibitive; furthermore they entail a substantial waste of natural resources and energy. Therefore, structural retrofitting is becoming increasingly widespread throughout the world. Externally bonded Fibre Reinforced Polymers (FRPs) are rapidly becoming the technique of choice for structural retrofitting. They are cleaner and easier to apply than conventional retrofitting techniques, reduce disruption to the occupancy and operation of the facility, do not generate debris or waste, and reduce health and accident hazards at the construction site as well as noise and air pollution in the surroundings. fib Bulletin 35 gives state-of-the-art coverage of retrofitting through FRPs and presents relevant provisions from three recent standardisation milestones: EN 1998-3:2005 "Eurocode 8: Design of structures for earthquake resistance - Part 3: Assessment and retrofitting of buildings", the 2005 Draft of

the Turkish seismic design code, and the Italian regulatory document CNR-DT 200/04, "Instructions for Design, Execution and Control of Strengthening Interventions by Means of Fibre-Reinforced Composites" (2004).

Advances in Geotechnics and Structural Engineering

LAP Lambert Academic Publishing

This proceedings volume consists of papers focusing on repairing, maintaining, rehabilitating, and retrofitting of existing infrastructures to extend their life and maximize economic return. Moreover, structural performance and material durability are discussed. Contributions fall under the following headings: (i) Concrete durability aspects, (ii) Construction of SIMCON Retrofitted Reinforced Concrete Columns

Springer

To ensure better performance for a range of existing reinforced concrete structures in seismic regions with substandard structural details, seismic retrofit is an economical solution. Hence, this chapter presents some of the available results in which fiber-reinforced polymer (FRP) composites can be used for damage-controllable structures. For

example, the performance of existing reinforced concrete structures whose components are vulnerable to shear failure, flexural-compression failure, joint reinforcement bond failure, or longitudinal reinforcement lap splice failure and retrofitted with FRPs is described. Novel concepts of modern constructions with controllability and recoverability using FRP composites are addressed.

FRP Composites for Reinforced and Prestressed Concrete Structures

Cambridge Scholars Publishing

Because of their structural simplicity, bridges tend to beparticularly vulnerable to damage and even collapse when subjectedto earthquakes or other forms of seismic activity. Recentearthquakes, such as the ones in Kobe, Japan, and Oakland,California, have led to a heightened awareness of seismic risk andhave revolutionized bridge design and retrofit philosophies. In Seismic Design and Retrofit of Bridges, three of the world's topauthorities on the subject have collaborated to produce the mostexhaustive reference on seismic bridge design currently available.Following a detailed examination

of the seismic effects of actualearthquakes on local area bridges, the authors demonstrate designstrategies that will make these and similar structures optimallyresistant to the damaging effects of future seismicdisturbances. Relying heavily on worldwide research associated with recentquakes, Seismic Design and Retrofit of Bridges begins with anin-depth treatment of seismic design philosophy as it applies tobridges. The authors then describe the various geotechnicalconsiderations specific to bridge design, such as soil-structureinteraction and traveling wave effects. Subsequent chapters coverconceptual and actual design of various bridge superstructures, andmodeling and analysis of these structures. As the basis for their design strategies, the authors' focus is onthe widely accepted capacity design approach, in which particularlyvulnerable locations of potentially inelastic flexural deformationare identified and strengthened to accommodate a greater degree ofstress. The text illustrates how accurate application of thecapacity design philosophy to the design of new bridges results instructures

that can be expected to survive most earthquakes withonly minor, repairable damage. Because the majority of today's bridges were built before thecapacity design approach was understood, the authors also devoteseveral chapters to the seismic assessment of existing bridges,with the aim of designing and implementing retrofit measures toprotect them against the damaging effects of future earthquakes.These retrofitting techniques, though not considered appropriate inthe design of new bridges, are given considerable emphasis, sincethey currently offer the best solution for the preservation ofthese vital and often historically valued thoroughfares. Practical and applications-oriented, Seismic Design and Retrofit ofBridges is enhanced with over 300 photos and line drawings toillustrate key concepts and detailed design procedures. As the onlytext currently available on the vital topic of seismic bridgedesign, it provides an indispensable reference for civil,structural, and geotechnical engineers, as well as students inrelated engineering courses. A state-of-the-art text on

earthquake-proof design and retrofit ofbridges Seismic Design and Retrofit of Bridges fills the urgent need for acomprehensive and up-to-date text on seismic-ally resistant bridgedesign. The authors, all recognized leaders in the field,systematically cover all aspects of bridge design related toseismic resistance for both new and existing bridges. * A complete overview of current design philosophy for bridges,with related seismic and geotechnical considerations * Coverage of conceptual design constraints and their relationshipto current design alternatives * Modeling and analysis of bridge structures * An exhaustive look at common building materials and theirresponse to seismic activity * A hands-on approach to the capacity design process * Use of isolation and dissipation devices in bridge design * Important coverage of seismic assessment and retrofit design ofexisting bridges

Behavior of Non-Ductile Slender Reinforced Concrete Columns Retrofit by CFRP Under Cyclic Loading

fib Fédération internationale du béton

For the past decade or more, the structural engineering profession has been using the nonlinear

static procedure (NSP) or pushover analysis. Modeling for such analysis requires the determination of nonlinear properties of each component in the structure, quantified by strength and deformation capacities, which depend on the modeling assumptions. Pushover analysis is carried out for either user-defined nonlinear hinge properties or default-hinge properties, available in some programs based on the FEMA-356 such as SAP2000. While such documents provide the hinge properties for several ranges of detailing, programs may implement averaged values. In the realm of retrofitting of existing structures, few tested procedures have been identified such as steel jacketing and carbon fiber reinforced polymer (CFRP) composite jacketing system techniques in order to increase lateral stiffness of existing structures. Several methodologies have been developed using these processes in recent years. In some cases, the codes require non-linear analysis for the verification of design proposed for a retrofitting a structure. In this study, the seismic behavior of a typical residential

building in South of Tehran, Iran, was investigated by performing static pushover analysis before and after retrofitting the columns. In the selected reinforced concrete (RC) structure, seismic analysis was performed for the structure retrofitted by two methods: 1) Steel jacketing and 2) CFRP jacketing technique assuming full composite action between jacketing and the existing concrete columns. By using nonlinear static (pushover) analysis, the performance level of structural members were evaluated for all structures, before and after retrofitting. The selected model building is a good representation of all typical residential buildings constructed in 1970's in Iran. These structures are almost always without proper seismic detailing. In this study, to investigate the effectiveness of the retrofitting systems, a comparative study was performed. *Seismic Design, Assessment and Retrofitting of Concrete Buildings* CRC PressI Llc Reinforced concrete columns play a very important role in structural performance. As such, it is essential to apply a suitable analytical tool

to estimate their structural behaviour considering all failure mechanisms such as axial, shear, and flexural failures. This book highlights the development of a fiber beam-column element accounting for shear effects and the effect of tension stiffening through reinforcement -to-concrete bond, along with the employment of suitable constitutive material laws. *Seismic Retrofit of Reinforced Concrete Beams, Columns, and Joints with Thin Steel Sheets and Steel Plates* Springer Abstract: As our infrastructure continues to age, retrofitting of existing structural members is becoming a very common practice. Several methods have been researched and proven effective in increasing the axial load capacity of reinforced concrete columns. These methods include concrete, steel, and fiber reinforced polymer (FRP) jackets. Reinforcement for concrete jacketed specimens has traditionally been provided by rebar reinforcement as well as welded wire fabric (WWF). FRP has been applied as a wrap and in composite plate form. A new reinforcement product, Prefabricated Cage System

(PCS), is suggested as a possible alternative retrofit reinforcement for concrete jackets. A thorough literature review of concrete retrofit and confinement research was conducted. The aforementioned retrofits are experimentally tested and compared with the new PCS reinforcement product as part of this research. Seventeen circular columns were constructed, retrofitted, and tested under axial compression until failure. Axial load-displacement responses of the specimens were recorded and the critical behaviors of the specimens were documented during testing. Data from the testing is analyzed and compared. Additionally, innovative concepts to accurately determine the behavior of concrete jacket retrofitted columns are presented, which may assist in future concrete jacket retrofit modeling.

Seismic Evaluation and Retrofit of Concrete Bridge Columns and Joints CRC Press

The First International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICCRRR 2005) was held in Cape Town, South Africa, from 21-23 November 2005. The conference was a collaborative venture by

researchers from the South African Research Programme in Concrete Materials (based at the Universities of Cape Town and The Witwatersrand) and The Construction Materials Section at Leipzig University in Germany. The conference has come at an opportune moment for concrete construction worldwide and sought to focus on an increasingly important aspect in modern infrastructure provision and retention: that of appropriately repairing, maintaining, rehabilitating, and if necessary retrofitting existing infrastructure with a view to extending its life and maximising its economic return. The conference Proceedings contain papers, presented at the conference, and classified into a total of 15 sub themes which can be grouped under the four main themes of (i) Concrete durability aspects, (ii) Condition assessment of concrete structures, (iii) Concrete repair, rehabilitation and retrofitting, and (iv) Performance monitoring and health assessment. The major interest in terms of submissions exists in the fields of concrete durability aspects in connection with material compositions, NDE/NDT and

measurement techniques, repair methods and materials, and structural strengthening and retrofitting techniques. The large number of high-quality papers presented and the wide range of relevant topics covered confirm that these Proceedings will be a valued reference for many working in the important fields of concrete durability and repair and that they form a suitable base for discussion and provide suggestions for future development and research.

Effect of Column Retrofitting on the Seismic Response of Concrete Frames LAP Lambert Academic Publishing

In most parts of the developed world, the building stock and the civil infrastructure are ageing and in constant need of maintenance, repair and upgrading. Moreover, in the light of our current knowledge and of modern codes, the majority of buildings stock and other types of structures in many parts of the world are substandard and deficient. This is especially so in earthquake-prone regions, as, even there, seismic design of structures is relatively recent. In those regions the major part of the seismic threat to human life and property

comes from old buildings. Due to the infrastructure's increasing decay, frequently combined with the need for structural upgrading to meet more stringent design requirements (especially against seismic loads), structural retrofitting is becoming more and more important and receives today considerable emphasis throughout the world. In response to this need, a major part of the fib Model Code 2005, currently under development, is being devoted to structural conservation and maintenance. More importantly, in recognition of the importance of the seismic threat arising from existing substandard buildings, the first standards for structural upgrading to be promoted by the international engineering community and by regulatory authorities alike are for seismic rehabilitation of buildings. This is the case, for example, of Part 3: Strengthening and Repair of Buildings of Eurocode 8 (i. e. of the draft European Standard for earthquake-resistant design), and which is the only one among the current (2003) set of 58 Eurocodes attempting to address the problem of structural upgrading. It is also the case of the recent (2001)

ASCE draft standard on Seismic evaluation of existing buildings and of the 1996 Law for promotion of seismic strengthening of existing reinforced concrete structures in Japan. As noted in Chapter 1 of this Bulletin, fib - as CEB and FIP did before - has placed considerable emphasis on assessment and rehabilitation of existing structures. The present Bulletin is a culmination of this effort in the special but very important field of seismic assessment and rehabilitation. It has been elaborated over a period of 4 years by Task Group 7.1 Assessment and retrofit of existing structures of fib Commission 7 Seismic design, a truly international team of experts, representing the expertise and experience of all the important seismic regions of the world. In the course of its work the team had six plenary two-day meetings: in January 1999 in Pavia, Italy; in August 1999 in Raleigh, North Carolina; in February 2000 in Queenstown, New Zealand; in July 2000 in Patras, Greece; in March 2001 in Lausanne, Switzerland; and in August 2001 in Seattle, Washington. In October 2002 the final draft of the

Bulletin was presented to public during the 1st fib Congress in Osaka. It was also there that it was approved by fib Commission 7 Seismic Design. The contents is structured into main chapters as follows: 1 Introduction - 2 Performance objectives and system considerations - 3 Review of seismic assessment procedures - 4 Strength and deformation capacity of non-seismically detailed components - 5 Seismic retrofitting techniques - 6 Probabilistic concepts and methods - 7 Case studies

Strengthening and Retrofitting of Existing Structures

Springer Science & Business Media

Evaluates the effects of different retrofit applications on the global response of short-spanned reinforced concrete bridges. Retrofitting methods addressed include steel jacketing of columns, foundation, and abutment retrofit.