
Punching Shear Strength Of Interior Concrete Slab Column

Technical report

Further Tests of the Punching Shear Strength of Lightly Reinforced Isotropic Bridge Decks

DESIGN OF REINFORCED CONCRETE STRUCTURES

Design of Prestressed Concrete to Eurocode 2, Second Edition

Proceedings of the 2nd International Symposium. University of Stuttgart, September 4th - 7th, 2007

Connections between Steel and Concrete

Civil Engineering and Urban Planning IV

Punching shear of structural concrete slabs

Computational Plasticity

Proceedings of Tubular Structures XII, Shanghai, China, 8-10 October 2008

Final Report

Punching Shear in Reinforced Concrete Slabs

Fibre-Reinforced Polymer Reinforcement for Concrete Structures

Proceedings fib Symposium in Prague Czech Republic Vol2

Technical Report

Proceedings of the 2017 fib Symposium, held in Maastricht, The Netherlands, June 12-14, 2017

Full-scale Load Testing of Structures

Fibre-reinforced Polymer Reinforcement For Concrete Structures (In 2 Volumes) -

Proceedings Of The Sixth International Symposium On Frp Reinforcement For Concrete Structures (Frprcs-6)

Earthquake Engineer 10th World

Advances in Civil Engineering and Building Materials

Punching Shear Strength of Interior and Edge Column-slab Connections in CFRP

Reinforced Flat Plate Structures Transferring Shear and Moment

Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary

ACI Materials Journal

Full-Scale Load Testing of Structures

With Emphasis on the Application of the Unified Strength Theory

PPI PE Structural Reference Manual, 10th Edition - Complete Review for the NCEES

PE Structural Engineering (SE) Exam

Design and Construction ; Proceedings of the International Conference Held at the University of Dundee, Scotland, UK on 8-10 September 1999

Experimental Study of Punching Shear Resistance of Synthetic Fiber Reinforced
Concrete Interior Slabs
Punching Shear Capacity of Flat Slab-column Junctions
Hybrid Composite Precast Systems
Numerical Investigation to Construction
Influence of Size on Punching Shear Strength of Concrete Slabs
Design of Prestressed Concrete to AS3600-2009
Concrete Solutions 2011
Innovation in Concrete Structures
Tubular Structures XII
Proceedings of the International Conference on Concrete Slabs Held at Dundee
University, 3-6 April 1979
Finite Element Analysis of Prestressed Concrete Structures Using Post-Tensioning
Steel
Reinforced Polymer Composites

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Shear Strength
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Concrete Slab
Column* *Downloaded
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ATKINSON HULL

Technical report Thomas
Telford

"This study
experimentally explores
the suitability of Synthetic
Fiber-Reinforced Concrete

(SNFRC) as a feasible method for improving the punching shear strength of two-way slabs. The investigation involved interior flat slab panels made with two synthetic fiber volumetric percentages, as well as three spacing configurations for the flexural reinforcement. Nine full-scale, 2m*2m*0.15m slabs, are utilized to quantify the SNFRC impact on punching shear strength, toughness and deformation capacity. The nine slabs are divided into

three groups of fiber volumetric content: 1.25%, 0.75% and 0%. Each group consists of three flexural steel reinforcement spacing configurations: 16mm-diameter rebars at 60mm, 80mm and 110mm. For SNFRC material characterization, compressive strength and tensile rupture strength are captured via standard 150*150*150mm cubes and 150*150*500mm rectangular prisms, respectively. Material characterization revealed that the introduction of

synthetic fibers had a negligible impact on the compressive strength. A reduction of merely 3.4% and 2.3% is associated with adding 1.25% and 0.75% fiber content, respectively. Conversely, the three-point loading test results in 14% and 4% higher rupture tensile strengths associated with 1.25% and 0.75% fiber contents. Moreover, the introduction of synthetic fiber dosages of 1.25% and 0.75% resulted in considerable improvement to the punching shear strength,

36% and 15%, respectively. The greatest effect of the synthetic fiber is found to be on the slab deformation capacity and toughness (quantified as the area under the load-deflection curve). For the 0.75% fibers group, the improvement ranged from 67% to 274% associated with the 60mm the 110mm spacing, respectively. Similarly, for the 1.25% group, the corresponding counterparts have an improvement range of 82% to 324%. For comparison purposes,

several analytical predictions for the punching shear strength are made in accordance to the CEB-FIB 2010 Model Code, ACI-318, ACI-544 codes as well as models available in the literature. One particular model is found to best agree with SNFRC slabs when it is re-calibrated in this study. The re-calibration utilized the differences in the steel and synthetic fibers mechanical properties. Namely, Young's modulus, the tensile strength and fiber-concrete bond

strength."--Abstract.
Further Tests of the Punching Shear Strength of Lightly Reinforced Isotropic Bridge Decks
RILEM Publications
Designed primarily as a text for the undergraduate students of civil engineering, this compact and well-organized text presents all the basic topics of reinforced concrete design in a comprehensive manner. The text conforms to the limit states design method as given in the latest revision of Indian

Code of Practice for Plain and Reinforced Concrete, IS: 456 (2000). This book covers the applications of design concepts and provides a wealth of state-of-the-art information on design aspects of wide variety of reinforced concrete structures. However, the emphasis is on modern design approach. The text attempts to:

- Present simple, efficient and systematic procedures for evolving design of concrete structures.
- Make available a large amount of field tested

practical data in the appendices.

- Provide time saving analysis and design aids in the form of tables and charts.
- Cover a large number of worked-out practical design examples and problems in each chapter.
- Emphasize on development of structural sense needed for proper detailing of steel for integrated action in various parts of the structure. Besides students, practicing engineers and architects would find this text extremely useful.

DESIGN OF REINFORCED CONCRETE STRUCTURES
CRC Press

“Computational Plasticity with Emphasis on the Application of the Unified Strength Theory” explores a new and important branch of computational mechanics and is the third book in a plasticity series published by Springer. The other two are: Generalized Plasticity, Springer: Berlin, 2006; and Structural Plasticity, Springer and Zhejiang University Press: Hangzhou, 2009. This monograph describes the

unified strength theory and associated flow rule, the implementation of these basic theories in computational programs, and shows how a series of results can be obtained by using them. The unified strength theory has been implemented in several special nonlinear finite-element programs and commercial Finite Element Codes by individual users and corporations. Many new and interesting findings for beams, plates, underground caves, excavations, strip

foundations, circular foundations, slop, underground structures of hydraulic power stations, pumped-storage power stations, underground mining, high-velocity penetration of concrete structures, ancient structures, and rocket components, along with relevant computational results, are presented. This book is intended for graduate students, researchers and engineers working in solid mechanics, engineering and materials science. The theories and methods

provided in this book can also be used for other computer codes and different structures. More results can be obtained, which put the potential strength of the material to better use, thus offering material-saving and energy-saving solutions. Mao-Hong Yu is a professor at the Department of Civil Engineering at Xi'an Jiaotong University, Xi'an, China. *Design of Prestressed Concrete to Eurocode 2, Second Edition* CRC Press Advances in Civil

Engineering and Building Materials presents the state-of-the-art development in: - Structural Engineering - Road & Bridge Engineering - Geotechnical Engineering - Architecture & Urban Planning - Transportation Engineering - Hydraulic Engineering - Engineering Management - Computational Mechanics - Construction Technology - Building Materials - Environmental Engineering - Computer Simulation - CAD/CAE Emphasis was given to

basic methodologies, scientific development and engineering applications. Advances in Civil Engineering and Building Materials will be useful to professionals, academics, and Ph.D. students interested in the above mentioned areas. **Proceedings of the 2nd International Symposium. University of Stuttgart, September 4th - 7th, 2007** Springer This book details the theory and applications of finite element (FE) modeling of post-

tensioned (PT) concrete structures, and provides the updated MATLAB code (as of 2019). The challenge of modeling PT prestressed concrete structures lies in the treatment of the interface between the concrete and prestressing tendons. Using MATLAB, this study develops an innovative nonlinear FE formulation which incorporates contact techniques and engineering elements to considerably reduce the need of computational power. This FE formulation has the ability

to simulate different PT frame systems with fully bonded, fully unbonded or partially bonded tendons, as well as actual sliding behavior and frictional effects in the tendons. It also allows for the accurate simulation of anchor seating loss.

Connections between Steel and Concrete fib Fédération internationale du béton

This book contains the proceedings of the fib Symposium “High Tech Concrete: Where Technology and Engineering Meet”, that

was held in Maastricht, The Netherlands, in June 2017. This annual symposium was organised by the Dutch Concrete Association and the Belgian Concrete Association. Topics addressed include: materials technology, modelling, testing and design, special loadings, safety, reliability and codes, existing concrete structures, durability and life time, sustainability, innovative building concepts, challenging projects and historic concrete, amongst others.

The fib (International Federation for Structural Concrete) is a not-for-profit association committed to advancing the technical, economic, aesthetic and environmental performance of concrete structures worldwide. *Civil Engineering and Urban Planning IV* FIB - Féd. Int. du Béton Punching Shear Strength of Interior and Edge Column-slab Connections in CFRP Reinforced Flat Plate Structures Transferring Shear and Moment A New Punching

Shear Strengthening
Technique for Reinforced
Concrete Slabs at Interior
Slab-column
Connections
Experimental
Study of Punching Shear
Resistance of Synthetic
Fiber Reinforced Concrete
Interior Slabs
*Punching shear of
structural concrete slabs*
Woodhead Publishing
Hybrid Composite Precast
Systems: Numerical
Investigation to
Construction focuses on
the design and
construction of novel
composite precast frame
systems that permit

almost effortless erection
and structural efficiency.
The precast frame
systems discussed in the
book are similar to that of
steel frames, but offer
similar savings to
concrete frames. The
design of connections and
detailed analysis of their
structural behavior is
discussed in detail.
Fundamentals with
regards to the post yield
behavior of concrete and
metal are also presented
to illustrate how these two
different materials are
integrated together to
remove individual

material drawbacks.
Readers are given a broad
introduction to existing
technologies that are then
combined with a
description of the
construction methods the
author proposes. This
book will help the end
users become familiar
with the existing types of
structural forms, not just
the "Lego" type frame
system that the author
proposes. Discusses how
traditional construction
methods can be replaced
by innovative hybrid
composite precast frame
systems that provide

rapid and effortless erection capabilities and structural efficiency
 Contains several design examples using non-linear finite element analysis completed with Abaqus based-software
 Contains new milestone inventions in construction that offer structural engineering solutions using a novel, modularized hybrid frame system
 Provides information on structural testing that verifies the accuracy of the structural design
Computational Plasticity
 CRC Press

Topics covered within this set of conference proceedings include:
 structural analysis - theory and methods;
 structural design - concept, technique and codes of practice;
 structural forms - concept and application; and
 construction of structures.
Proceedings of Tubular Structures XII, Shanghai, China, 8-10 October 2008
 Taylor & Francis US
 The Concrete Solutions series of International Conferences on Concrete Repair began in 2003, with a conference held in

St. Malo, France in association with INSA Rennes, followed by the second conference in 2006 (with INSA again, at St. Malo, France), and the third conference in 2009 (in Padova and Venice, in association with the University of Padova).
 Now in 2011, the event is being held in Dresden in Germany and has brought together some 112 papers from 33 countries.
 Whereas electrochemical repair tended to dominate the papers in earlier years, new developments in structural

strengthening with composites have been an increasingly important topic, with a quarter of the papers now focusing on this area. New techniques involving Near Surface Mounted (NSM) carbon fibre rods, strain hardening composites, and new techniques involving the well established carbon fibre and polyimide wrapping and strengthening systems are presented. Seventeen papers concentrate on case studies which are all-important in such

conferences, to learn about what works (and what doesn't work) on real structures. Thirteen papers are devoted to new developments in Non-Destructive Testing (NDT). Other topics include service life modelling, fire damage, surface protection methods and coatings, patch repair, general repair techniques and whole life costing. This book is essential reading for anyone engaged in the concrete repair field, from engineers, to academics and students and also to

clients, who, as the end user, are ultimately responsible for funding these projects and making those difficult decisions about which system or method to use. Final Report CRC Press *Advances in Concrete Slab Technology* documents the proceedings of the International Conference on Concrete Slabs held at Dundee University on April 3-6, 1979. This book discusses the influence of steel fiber-reinforcement on the shear strength of slab-column connections;

sulfur-treated concrete slabs; yield line analysis of orthotropically reinforced exterior panels of flat slab floors; and behavior of flat slab/edge column joints. The design of multiple panel flat slab structures; structural behavior of floor slabs in shear wall buildings; shrinkage and cracking of concrete at early ages; and slab construction for HAB system modules are also elaborated. This text likewise covers the direct finishing of concrete slabs using the early age power grinding technique;

application of vacuum dewatering to in-situ slab production; retexturing of concrete slabs; and fatigue resistance of composite precast and in situ concrete floors. This publication is a good reference for students and individuals concerned with the practices and research relating to slab technology.

Punching Shear in Reinforced Concrete Slabs MDPI

Anchorage by fasteners and composite structures of steel and concrete have seen dramatic

progress in research, technology and application over the past decades. The understanding of the fundamental principles underlying both disciplines has significantly improved. Concurrently, there has been rapid growth in the development of sophisticated new products and the establishment of international directives and codes to ensure their safe and economical use in a wide range of engineered structures.

Although they deal with very similar problems, the two disciplines have developed independently from each other. To optimize the use of composite structures and fastenings to concrete, however, it is necessary to have knowledge of both: the local behavior of the fastening system and the global behavior of the structure. It became apparent that a forum offering the opportunity to expand and to exchange experience in the field of connecting steel and concrete would benefit all

involved. Furthermore this forum would aid in the rapid dissemination of new ideas, technologies and solutions as well as explore new areas of research. This book forms the Proceedings of the 2 Symposium on "Connections between Steel and Concrete". As the 1 Symposium in 2001 it brought together leading experts from all facets of the research, design, construction and anchor manufacturing community from around the world. Their lectures covered the topics:- test

methods- behavior and design- dynamic loading: shock, earthquake, fatigue- durability- exceptional applications, strengthening and structures- related topics. In total 129 papers are gathered in these 2 volumes.

Fibre-Reinforced Polymer Reinforcement for Concrete Structures FIB - International Federation for Structural Concrete
Fibre-reinforced polymer (FRP) reinforcement has been used in construction as either internal or external reinforcement for

concrete structures in the past decade. This book provides the latest research findings related to the development, design and application of FRP reinforcement in new construction and rehabilitation works. The topics include FRP properties and bond behaviour, externally bonded reinforcement for flexure, shear and confinement, FRP structural shapes, durability, member behaviour under sustained loads, fatigue loads and blast loads,

prestressed FRP tendons, structural strengthening applications, case studies, and codes and standards. Proceedings fib Symposium in Prague Czech Republic Vol2 World Scientific
The quality and testing of materials used in construction are covered by reference to the appropriate ASTM standard specifications. Welding of reinforcement is covered by reference to the appropriate AWS standard. Uses of the Code include adoption by reference in general

building codes, and earlier editions have been widely used in this manner. The Code is written in a format that allows such reference without change to its language. Therefore, background details or suggestions for carrying out the requirements or intent of the Code portion cannot be included. The Commentary is provided for this purpose. Some of the considerations of the committee in developing the Code portion are discussed within the Commentary, with emphasis given to the

explanation of new or revised provisions. Much of the research data referenced in preparing the Code is cited for the user desiring to study individual questions in greater detail. Other documents that provide suggestions for carrying out the requirements of the Code are also cited. *Technical Report Elsevier* "The NCEES SE Exam is Open Book - You Will Want to Bring This Book Into the Exam. Alan Williams' PE Structural Reference Manual Tenth Edition (STRM10) offers a

complete review for the NCEES 16-hour Structural Engineering (SE) exam. This book is part of a comprehensive learning management system designed to help you pass the PE Structural exam the first time. PE Structural Reference Manual Tenth Edition (STRM10) features include: Covers all exam topics and provides a comprehensive review of structural analysis and design methods New content covering design of slender and shear walls Covers all up-to-date

codes for the October 2021 Exams Exam-adopted codes and standards are frequently referenced, and solving methods—including strength design for timber and masonry—are thoroughly explained 270 example problems Strengthen your problem-solving skills by working the 52 end-of-book practice problems Each problem's complete solution lets you check your own solving approach Both ASD and LRFD/SD solutions and explanations are provided

for masonry problems, allowing you to familiarize yourself with different problem solving methods. Topics Covered: Bridges Foundations and Retaining Structures Lateral Forces (Wind and Seismic) Prestressed Concrete Reinforced Concrete Reinforced Masonry Structural Steel Timber Referenced Codes and Standards - Updated to October 2021 Exam Specifications: AASHTO LRFD Bridge Design Specifications (AASHTO) Building Code Requirements and

Specification for Masonry Structures (TMS 402/602) Building Code Requirements for Structural Concrete (ACI 318) International Building Code (IBC) Minimum Design Loads for Buildings and Other Structures (ASCE 7) National Design Specification for Wood Construction ASD/LRFD and National Design Specification Supplement, Design Values for Wood Construction (NDS) North American Specification for the Design of Cold-Formed Steel Structural

Members (AISI) PCI Design Handbook: Precast and Prestressed Concrete (PCI) Seismic Design Manual (AISC 327) Special Design Provisions for Wind and Seismic with Commentary (SDPWS) Steel Construction Manual (AISC 325) *Proceedings of the 2017 fib Symposium, held in Maastricht, The Netherlands, June 12-14, 2017* CRC Press Concrete will be the key material for Mankind to create the built environment of the next millenium. The

requirements of this infrastructure will be both demanding, in terms of technical performance and economy, and yet be greatly varied, from architectural masterpieces to the simplest of utilities. Innovation in Concrete Structures: Design and Construction forms the proceeding of the three day International Conference held during the Congress, Creating with Concrete, 6-10 September 1999, organised by the Concrete Technology University.

Topics discussed include civil engineering structures, sub-structures, high-rise structures, deep basements, precast concrete construction and housing.

Full-scale Load Testing of Structures ibidem-Verlag / ibidem Press

The design of structures in general, and prestressed concrete structures in particular, requires considerably more information than is contained in building codes. A sound understanding of structural behaviour at all

stages of loading is essential. This textbook presents a detailed description and explanation of the behaviour of prestressed concrete

Fibre-reinforced Polymer Reinforcement For Concrete Structures (In 2 Volumes) - Proceedings Of The Sixth International Symposium On Frp Reinforcement For Concrete Structures (Frprcs-6) Springer Science & Business Media
fib Bulletin 81 reports the latest information available to researchers

and practitioners on the analysis, design and experimental evidence of punching shear of structural concrete slabs. It follows previous efforts by the International Federation for Structural Concrete (fib) and its predecessor the Euro-International Committee for Concrete (CEB), through CEB Bulletin 168, Punching Shear in Reinforced Concrete (1985) and fib Bulletin 12, Punching of structural concrete slabs (2001), and an international symposium sponsored by

the punching shear subcommittee of ACI Committee 445 (Shear and Torsion) and held in Kansas City, Mo., USA, in 2005. This bulletin contains 18 papers that were presented in three sessions as part of an international symposium held in Philadelphia, Pa., USA, on October 25, 2016. The symposium was co-organized by the punching shear subcommittee of ACI 445 and by fib Working Party 2.2.3 (Punching and Shear in Slabs) with the objectives of not only disseminating

information on this important design subject but also promoting harmonization among the various design theories and treatment of key aspects of punching shear design. The papers are organized in the same order they were presented in the symposium. The symposium honored Professor Emeritus Neil M. Hawkins (University of Illinois at Urbana-Champaign, USA), whose contributions through the years in the field of punching shear of

structural concrete slabs have been paramount. The papers cover key aspects related to punching shear of structural concrete slabs under different loading conditions, the study of size effect on punching capacity of slabs, the effect of slab reinforcement ratio on the response and failure mode of slabs, without and with shear reinforcement, and its implications for the design and formulation in codes of practice, an examination of different

analytical tools to predict the punching shear response of slabs, the study of the post-punching response of concrete slabs, the evaluation of design provisions in modern codes based on recent experimental evidence and new punching shear theories, and an overview of the combined efforts undertaken jointly by ACI 445 and fib WP 2.2.3 to generate test result databanks for the evaluation and calibration of punching shear design recommendations in

North American and international codes of practice.

Earthquake Engineer

10th World CRC Press
Fibre-reinforced polymer (FRP) reinforcement has been used in construction as either internal or external reinforcement for concrete structures in the past decade. This book provides the latest research findings related to the development, design and application of FRP reinforcement in new construction and rehabilitation works. The topics include FRP

properties and bond behaviour, externally bonded reinforcement for flexure, shear and confinement, FRP structural shapes, durability, member behaviour under sustained loads, fatigue loads and blast loads, prestressed FRP tendons, structural strengthening applications, case studies, and codes and standards.

Advances in Civil Engineering and Building Materials

ASTM International
The design of structures in general, and

prestressed concrete structures in particular, requires considerably more information than is contained in building codes. A sound understanding of structural behaviour at all stages of loading is essential. This textbook presents a detailed description and explanation of the behaviour of prestressed concrete members and structures both at service loads and at ultimate loads and, in doing so, provide a comprehensive and up-to-date guide to

structural design. Much of the text is based on first principles and relies only on the principles of mechanics and the properties of concrete and steel, with numerous worked examples. However, where the design requirements are code specific, this book refers to the provisions of Eurocode 2: Design of Concrete Structures and, where possible, the notation is the same as in Eurocode 2. A parallel volume is written to the Australian Standard for Concrete Structures

AS3600-2009. The text runs from an introduction to the fundamentals to in-depth treatments of more advanced topics in modern prestressed concrete structures. It suits senior undergraduate and graduate students and also practising engineers who want comprehensive introduction to the design of prestressed concrete structures. It retains the clear and concise explanations and the

easy-to-read style of the first edition, but the content has been extensively re-organised and considerably expanded and updated. New chapters cover design procedures, actions and loads; prestressing systems and construction requirements; connections and detailing; and design concepts for prestressed concrete bridges. The topic of serviceability is developed

extensively throughout. All the authors have been researching and teaching the behaviour and design of prestressed concrete structures for over thirty-five years and the proposed new edition of the book reflects this wealth of experience. The work has also gained much from Professor Gilbert active and long-time involvement in the development of standards for concrete buildings and concrete bridges.

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