

# Design Fundamentals Of Post Tensioned Concrete Slabs

Post-Tensioned Concrete Reinforced Concrete Slabs Recommendations for the design of flat slabs in post tension concrete using unbonded and bonded tendons Architectural Graphic Standards Unbonded Tendons in Post-tensioned Construction Concrete Slabs Guide for Concrete Floor and Slab Construction The Design of Post-tensioned Concrete Flat Slabs in Buildings Design of Post-tensioned Slabs Modern Prestressed Concrete The Design of Post-tensioned Concrete Flat Slabs in Buildings The design of post-tensioned concrete flat slabs in buildings Post-tensioned Prestressed Concrete Structural Fire Performance of Contemporary Post-tensioned Concrete Construction Characteristics of Reinforced and Post-tensioned Concrete Slabs During Construction Design of a Post-tensioned Prestressed Concrete Pavement, Construction Guidelines, and Monitoring Plan Tentative Standards for Prestressed Concrete Piles, Slabs, I-beams and Box Beams for Bridges and an Interim Manual for Inspection of Such Construction Design and Construction of Concrete Slabs on Grade Load Tests on Post-tensioned Pavement Slabs Advances in Concrete Slab Technology K. Dirk Bondy Robert Park FIB – International Federation for Structural Concrete The American Institute of Architects Arthur E. Andrew L.A. Clarke American Concrete Institute. Committee 302 Concrete Society. Working Party on Post-Tensioned Flat Slab Construction Post-Tensioning Institute James R. Libby Concrete Society. Working Party on Post-tensioned Flat Slab Construction Concrete Society. Post-Tensioned Flat Slab Construction Working Party Joseph J. Shideler John Gales Khin Thandar Soe César Iván Medina Chávez American Association of State Highway Officials. Committee on Bridges and Structures A. P. Christensen R. K. Dhir

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textbook and design guide for the structural design of post tensioned concrete

comprehensive up to date coverage of reinforced concrete slabs from leading authorities in the field offering an essential background for a thorough understanding of building code requirements and design procedures for slabs reinforced concrete slabs second edition provides a full treatment of today s approaches to reinforced concrete slab analysis and design now brought up to date with a wealth of new material on computer optimization the equivalent frame method lateral load analysis and other current topics the new edition of this classic text begins with a general discussion of slab analysis and design followed by an exploration of key methods equivalent frame direct design and strip methods and theories elastic lower bound and yield line theories later chapters discuss other important issues including shear strength serviceability membrane action and fire resistance comprehensive and accessible reinforced concrete slabs second edition appeals to a broad range of readers from senior and graduate students in civil and architectural engineering to practicing structural engineers architects contractors construction engineers and consultants

these recommendations present a guide to the design of two way spanning post tensioned concrete flat slabs using unbonded or bonded tendons recommendations purely related to the use of unbonded tendons are clearly marked these recommendations are intended only for the design of post tensioned flat slabs in buildings and do not include the use in bridges post tensioned concrete construction can be defined as unbonded or bonded depending on whether the tendon ducts are filled with a cement grout in order to provide a bonded structure or whether the tendons are suitably coated and wrapped or greased and plastic covered unbonded while in a number of countries e g united states and canada economic and construction considerations have resulted in the selection of unbonded tendons in other countries the use of the traditional bonded tendons is favoured e g australia some of the advantages claimed for the use of unbonded tendons can be summarized as follows extremely low friction values tendons are fully protected against corrosion during construction maximum possible tendon drape due to the small diameter of the tendon this is of major importance in slender structures such as flat plates simple and fast placement of the tendons avoidance of grouting operations when tendons are grouted after stressing the claimed advantages are particularly that the bond between the concrete structure and the tendons increases the ultimate strength and less reliance is placed on the long term adequacy of the anchorage

since 1932 the ten editions of architectural graphic standards have been referred to as the architect s bible from site excavation to structures to roofs this book is the first place to look when an architect is confronted with a question about building design with more than 8 000 architectural illustrations including both reference drawings and constructible architectural details this book provides an easily accessible graphic reference for highly visual professionals to celebrate seventy five years as the cornerstone of an industry this commemorative eleventh edition is the most thorough and significant revision of architectural graphic standards in a generation substantially revised to be even more relevant to today s design professionals it features an entirely new innovative look and design created by bruce mau design that includes a modern page layout bold second color and new typeface better organized a completely new organization structure applies the uniformat r classification system which organizes content by function rather than product or material expanded and updated coverage of inclusive universal and accessible design strategies environmentally sensitive and sustainable design is presented and woven throughout including green materials leads standards and recyclability a bold

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this title provides an assessment of pre stressed concrete unbonded tendons properties of materials losses in pre stress suitable types of structures design of floor and roof slabs of buildings using unbonded tendons design of other structures using unbonded tendons work on site and post tensioning systems

this book provides an up to date description of the latest procedures for analysis and design of reinforced concrete slabs it explains the yield line method of analysis and hillerborg s strip method of design and discusses the basic north american and british practices

this book was written with a dual purpose as a reference book for practicing engineers and as a textbook for students of prestressed concrete it represents the fifth generation of books on this subject written by its author significant additions and revisions have been made in this edition chapters 2 and 3 contain new material intended to assist the engineer in understanding factors affecting the time dependent properties of the reinforcement and concrete used in prestressing concrete as well as to facilitate the evaluation of their effects on prestress loss and deflection flexural strength shear strength and bond of prestressed concrete members were treated in a single chapter in the of flexural strength has third edition now in the fourth edition the treatment been expanded with more emphasis on strain compatibility and placed in chapter 5 which is devoted to this subject alone chapter 6 of this edition on flexural shear strength torsional strength and bond of prestressed reinforcement was expanded to include discussions of compression field theory and torsion that were not treated in the earlier editions in similar fashion expanded discussions of loss of prestress deflection and partial prestressing now are presented separately in chapter 7 minor additions and revisions have been made to the material contained in the remaining chapters with the exception of xv xvi i preface chapter 17 this chapter which is devoted to construction considerations has important new material on constructibility and tolerances as related to prestressed concrete

this springerbrief equips readers to develop defensible fire safety designs for a range of concrete structures it identifies current gaps in the research and provides a more complete understanding of the structural and thermal response of contemporary post tensioned pt concrete structures to fire the brief includes chapters on contemporary construction using pt concrete previous structural fire test research programs recent research programs real fire case studies and current research needs it explores the progression of pt concrete structures looking at the sustainability

and aesthetic benefits the ongoing development of stronger concretes and best practice guidance for improving safety in the event of fire designed for practitioners and researchers in fire engineering this brief is a valuable tool for those studying the impact of fire on concrete fire safety designs and building safety optimization advanced level students in civil engineering will also find the content useful

the temporary formwork system is one of the most important features of construction in terms of safety and economy especially in multi storey buildings for which post tensioned slab structures are very common however general practices for formwork systems including removal times in both post tensioned and reinforced concrete buildings have to comply with the standards established for reinforced concrete structures although a recommended formwork removal times for reinforced concrete structures is specified in these standards such as in table 5.4.2 as 3610 there is no such table which can be easily put into practice by the industry in post tensioned structures nevertheless some standards such as as 3600 and aci 347r specify certain requirements for removal of the formwork system from under a post tensioned slab post tensioning causes the negative curvature of a slab segment to increase which increases its cracking moment capacity in the service load range this may allow formwork supports to be removed earlier from post tensioned than from reinforced concrete structures in order to improve current formwork operating practices in post tensioned building construction this study has examined the characteristics of reinforced and post tensioned slabs during construction by taking extensive on site measurements data was collected from two post tensioned building constructions in canberra australia a residential 20 storey building and a commercial low rise building the average slab load distribution on a typical suspended post tensioned slab was determined by monitoring the prop forces strains in the slab sections deflections and ambient and concrete slab temperatures over the construction period of four suspended floor levels the slab load distribution is generally represented by the ratio of the applied load to the self weight of the slab and is referred to as the slab load ratio slr there are several methods for estimating the slr for the reinforced concrete multi storey building construction however very little work has been conducted in the area of slr estimation for post tensioned building construction these slr estimation methods are usually applied to all formwork systems adopted by the industry in building construction in order to validate decisions regarding the removal of formwork supports during construction slr estimation methods originally proposed for reinforced concrete structures are not necessarily appropriate to post tensioned structures as they behave differently at the early age this work proposes a new slr estimation method designed specifically for post tensioned structures it is based on two methods the simplified method used for reinforced concrete structures and kajewski's modified method which has been proposed for post tensioning structures kajewski 1998 an analysis of the collected data is reported and is used in proposing a new slr estimation method which is more suitable for post tensioned structures it is then applied to determine the load distributions of the post tensioned slabs in the five most prominent types of formwork support systems the fundamental concept of this new method is that if the maximum applied load obtained from the calculated slr does not exceed the cracking slab load capacity at the desired removal time the temporary formwork supports may be removed however if it does the slab needs to be supported longer to achieve sufficient strength applying the proposed slr method in the five most commonly employed formwork systems has enabled suitable formwork removal times for post tensioned multi storey construction to be proposed under this proposal the props or backprops at the lowest level of support for a suspended post tensioned slab may be removed one to three days

earlier than they are currently depending on the type of formwork system used these proposed removal times are validated by investigating the serviceable limits of the slabs allowable deflection and cracking moment the particular significance of this work for the construction industry is its potential for improving the economy and speed of construction it also encourages the practice of applying more suitable shoring and reshoring removal time to post tensioned construction a table of prop removal time is provided for the use of post tensioned structures to go along with as 3610 table 5 4 2 which is more suitable for traditional reinforced concrete construction the proposed new slr method offers a greater accuracy in determining the slab load distributions of post tensioned structures in multi storey building construction

advances in concrete slab technology documents the proceedings of the international conference on concrete slabs held at dundee university on april 3 6 1979

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