

precast concrete building construction

precast concrete building construction is a modern and efficient method widely used in the construction industry to fabricate structural components off-site, which are then transported and assembled on-site. This technique offers numerous advantages, including improved quality control, faster construction times, and enhanced durability. The use of precast concrete elements enables architects and engineers to design versatile and sustainable buildings with high precision. This article explores the fundamentals of precast concrete building construction, its benefits, the production process, common applications, and key considerations for successful implementation. Understanding these aspects provides valuable insights into why precast concrete remains a popular choice for commercial, residential, and industrial construction projects.

- Overview of Precast Concrete Building Construction
- Advantages of Using Precast Concrete
- Production and Manufacturing Process
- Common Applications in Building Construction
- Design Considerations and Structural Performance
- Installation and Assembly Techniques
- Challenges and Limitations

Overview of Precast Concrete Building Construction

Precast concrete building construction involves casting concrete components in a controlled factory environment before transporting them to the construction site. This method contrasts with traditional cast-in-place concrete, where concrete is poured and cured directly at the site. Precast components can include walls, floors, beams, columns, stairs, and facade elements, all manufactured according to precise specifications. The high level of control during production ensures consistent quality, dimensional accuracy, and enhanced structural integrity. Precast construction is integrated with modern construction workflows to optimize project schedules and reduce on-site labor requirements.

Types of Precast Concrete Elements

Various precast concrete elements serve different structural and architectural functions within a building. Common types include:

- **Precast Walls:** These can be load-bearing or non-load-bearing and often feature insulation or architectural finishes.
- **Precast Beams and Columns:** Structural members that support loads and frame the building.
- **Precast Floor and Roof Slabs:** Flat or hollow-core slabs used for creating floors and roofs.
- **Precast Stairs and Balconies:** Ready-made staircases and balcony units for rapid installation.
- **Facade Panels:** Decorative or protective outer surfaces with various textures and finishes.

Advantages of Using Precast Concrete

The adoption of precast concrete building construction offers multiple benefits that contribute to improved project efficiency and building performance. These advantages impact cost, time, quality, and sustainability factors.

Speed and Efficiency

Since precast elements are manufactured simultaneously with site preparation, overall construction timelines are significantly shortened. The rapid assembly of precast components reduces on-site labor and minimizes weather-related delays.

Quality Control and Durability

Factory-controlled environments allow for rigorous quality assurance and consistent curing conditions, resulting in durable, high-strength concrete components resistant to cracking, corrosion, and other common material failures.

Cost-Effectiveness

While initial manufacturing costs may be higher, the reduction in

construction time, labor savings, and minimized material waste often lead to lower overall project expenses.

Environmental Benefits

Precast concrete construction promotes sustainable building practices by reducing site disturbance, lowering material waste, and enabling the use of recycled materials in precast mixes.

Production and Manufacturing Process

The production of precast concrete components involves several carefully controlled steps to ensure the highest quality and performance standards are met.

Material Selection and Mix Design

The concrete mix is designed to meet specific strength, durability, and aesthetic requirements. Additives and admixtures may be included to enhance workability, set time, or resistance to environmental factors.

Molding and Casting

Steel or fiberglass molds are used to shape the concrete elements. Reinforcement, such as steel rebar or prestressing cables, is positioned within the molds before casting to provide structural support.

Curing and Finishing

Concrete elements are cured under controlled conditions to achieve optimal strength. Surface finishes, such as smooth, textured, or colored treatments, may be applied depending on design specifications.

Quality Inspection and Testing

Each precast component undergoes rigorous testing for dimensional accuracy, strength, and surface integrity before being approved for shipment to the construction site.

Common Applications in Building Construction

Precast concrete building construction is utilized across a wide range of building types and sectors, offering versatility and adaptability.

Residential Buildings

Precast panels and floor slabs are frequently used in multi-family housing projects, enabling rapid construction and uniform quality.

Commercial and Office Buildings

Structural frames, facade panels, and parking garages benefit from precast concrete's strength and design flexibility in commercial developments.

Industrial Facilities

Heavy-duty precast components are ideal for warehouses, factories, and distribution centers requiring robust and durable construction.

Infrastructure Projects

Bridges, tunnels, and transportation hubs often employ precast concrete elements to expedite construction and improve longevity.

Design Considerations and Structural Performance

Effective precast concrete building construction requires careful design and engineering to address load-bearing requirements, connections, and integration with other building systems.

Structural Analysis and Load Distribution

Engineers analyze the load paths and structural behavior of precast components to ensure stability and safety under various loading conditions.

Connection Systems

Precast elements are joined using mechanical fasteners, grouted joints, or welded connections designed for strength and ease of assembly. Proper

detailing is critical to accommodate movement and maintain integrity.

Thermal and Acoustic Performance

Insulated precast panels can enhance energy efficiency, while sound-absorbing finishes improve occupant comfort within the building.

Installation and Assembly Techniques

On-site handling and assembly of precast concrete components require specialized equipment and skilled labor to ensure accurate placement and secure connections.

Transportation and Handling

Precast elements are transported from the manufacturing facility to the site using flatbed trucks or specialized trailers, with precautions taken to avoid damage during transit.

Cranes and Lifting Equipment

Cranes equipped with appropriate lifting gear are used to position large precast components safely and efficiently.

Joint Sealing and Finishing

Once installed, joints between precast units are sealed with grout or sealants to prevent water infiltration and improve structural continuity.

Challenges and Limitations

Despite its numerous benefits, precast concrete building construction presents certain challenges that must be addressed during planning and execution.

Transportation Constraints

Large or heavy precast components may face logistical challenges related to transport regulations, route restrictions, and site accessibility.

Design Flexibility

Although precast concrete allows for diverse designs, modifications after casting are difficult, requiring thorough planning and coordination.

Initial Investment

Setting up precast manufacturing facilities and molds involves significant upfront costs, which may not be justified for small-scale projects.

Site Coordination

Efficient scheduling and communication are essential to ensure the timely delivery and installation of precast elements, avoiding delays and disruptions.

Frequently Asked Questions

What is precast concrete in building construction?

Precast concrete refers to concrete elements that are cast and cured in a controlled factory environment before being transported to the construction site for assembly. This method enhances quality control and speeds up construction.

What are the main advantages of using precast concrete in building construction?

The main advantages include faster construction times, improved quality control, reduced site labor, enhanced durability, better resistance to weather conditions, and less material waste.

How does precast concrete contribute to sustainability in construction?

Precast concrete contributes to sustainability by minimizing waste through precise manufacturing, allowing for reuse of molds, reducing site disturbance, and often incorporating recycled materials. Additionally, its durability reduces the need for frequent repairs or replacements.

What types of building components can be made using precast concrete?

Common precast concrete components include walls, floors, beams, columns,

stairs, façade panels, and parking structures. These elements can be customized to meet specific architectural and structural requirements.

How is quality controlled in precast concrete manufacturing?

Quality control in precast concrete involves strict monitoring of raw materials, controlled mixing and curing processes, dimensional accuracy checks, strength testing, and adherence to industry standards in a factory setting.

What are the typical challenges faced during precast concrete building construction?

Challenges include transportation logistics of large precast elements, the need for precise on-site assembly, coordination between design and manufacturing teams, and ensuring proper connections between precast units for structural integrity.

How does precast concrete compare to cast-in-place concrete?

Precast concrete offers faster construction and better quality control since elements are produced in a factory, whereas cast-in-place concrete is poured and cured on-site, allowing for more flexibility but often requiring longer construction times and more site labor.

Additional Resources

1. Precast Concrete Structures: Principles and Practice

This book offers a comprehensive overview of the design and construction of precast concrete structures. It covers fundamental principles, materials, manufacturing processes, and structural behavior. The text is ideal for engineers and architects seeking to deepen their understanding of precast concrete applications in building construction.

2. Design and Construction of Prestressed Concrete Structures

Focusing on prestressed concrete, this book provides detailed guidance on design methods, construction techniques, and quality control. It includes case studies and examples relevant to precast concrete elements, helping professionals optimize structural performance and durability.

3. Precast Concrete Building Systems: Design and Construction

This book examines various precast concrete building systems and their applications in modern construction. Topics include modular construction, panelized systems, and connections, highlighting the advantages of speed, quality, and sustainability in precast building projects.

4. *Advances in Precast Concrete Technology*

Exploring the latest innovations in precast concrete, this book discusses novel materials, manufacturing technologies, and design approaches. It is an essential resource for researchers and practitioners aiming to incorporate cutting-edge solutions in precast construction.

5. *Construction of Precast Concrete Structures*

A practical guide to the step-by-step process of constructing precast concrete buildings, this book covers site preparation, transportation, lifting, and installation of precast components. It emphasizes safety, quality assurance, and project management aspects specific to precast construction.

6. *Structural Design of Precast Concrete Elements*

This book delves into the structural analysis and design of various precast concrete elements, including beams, slabs, walls, and columns. It presents design codes, load considerations, and detailing requirements, providing engineers with the tools needed for safe and efficient designs.

7. *Sustainability in Precast Concrete Construction*

Addressing environmental concerns, this book discusses sustainable practices in the precast concrete industry. Topics include material reuse, energy-efficient manufacturing, and lifecycle assessment, guiding professionals to reduce the environmental impact of precast building projects.

8. *Precast Concrete Connections: Design and Detailing*

This specialized book focuses on the design and detailing of connections in precast concrete structures. It covers mechanical, welded, and grouted connections, emphasizing structural integrity, ease of assembly, and durability to ensure robust building performance.

9. *Quality Control and Testing of Precast Concrete*

Dedicated to quality assurance, this book outlines testing methods and quality control procedures for precast concrete elements. It includes material testing, production monitoring, and site inspection techniques, helping manufacturers and contractors maintain high standards throughout the construction process.

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precast concrete building construction: *Planning and design handbook on precast building structures* FIB - Féd. Int. du Béton, 2014 In 1994 fib Commission 6: Prefabrication edited a

successful Planning and Design Handbook that ran to approximately 45,000 copies and was published in Spanish and German. Nearly 20 years later Bulletin 74 brings that first publication up to date. It offers a synthesis of the latest structural design knowledge about precast building structures against the background of 21st century technological innovations in materials, production and construction. With it, we hope to help architects and engineers achieve a full understanding of precast concrete building structures, the possibilities they offer and their specific design philosophy. It was principally written for non-seismic structures. The handbook contains eleven chapters, each dealing with a specific aspect of precast building structures. The first chapter of the handbook highlights best practice opportunities that will enable architects, design engineers and contractors to work together towards finding efficient solutions, which is something unique to precast concrete buildings. The second chapter offers basic design recommendations that take into account the possibilities, restrictions and advantages of precast concrete, along with its detailing, manufacture, transport, erection and serviceability stages. Chapter three describes the precast solutions for the most common types of buildings such as offices, sports stadiums, residential buildings, hotels, industrial warehouses and car parks. Different application possibilities are explored to teach us which types of precast units are commonly used in all those situations. Chapter four covers the basic design principles and systems related to stability. Precast concrete structures should be designed according to a specific stability concept, unlike cast in-situ structures. Chapter five discusses structural connections. Chapters six to nine address the four most commonly used systems or subsystems of precast concrete in buildings, namely, portal and skeletal structures, wall-frame structures, floor and roof structures and architectural concrete facades. In chapter ten the design and detailing of a number of specific construction details in precast elements are discussed, for example, supports, corbels, openings and cutouts in the units, special features related to the detailing of the reinforcement, and so forth. Chapter eleven gives guidelines for the fire design of precast concrete structures. The handbook concludes with a list of references to good literature on precast concrete construction.

precast concrete building construction: Precast Concrete Structures Kim S. Elliott, 2019-08-08 This second edition of Precast Concrete Structures introduces the conceptual design ideas for the prefabrication of concrete structures and presents a number of worked examples that translate designs from BS 8110 to Eurocode EC2, before going into the detail of the design, manufacture, and construction of precast concrete multi-storey buildings. Detailed structural analysis of precast concrete and its use is provided and some details are presented of recent precast skeletal frames of up to forty storeys. The theory is supported by numerous worked examples to Eurocodes and European Product Standards for precast reinforced and prestressed concrete elements, composite construction, joints and connections and frame stability, together with extensive specifications for precast concrete structures. The book is extensively illustrated with over 500 photographs and line drawings.

precast concrete building construction: Investigation Into Fully Precast Concrete Building Construction Bernadette Righetti, 1993 Precast concrete building construction is becoming more popular in recent times because of the economic advantages it offers to those involved in development, design and construction. This project presented a comparison between traditional insitu concrete building construction and precast concrete building construction. The Ballarat University College Library extension building which was constructed in 1991 became the basis for the comparison of the design process. After an investigation of the building requirements and loads acting, the precast concrete structure was designed to have beams and columns in the interior with load bearing walls at the exterior. The floor system was hollow core floor panels with a concrete topping. The external facade was designed as having a brick look exterior combined with water washed exposed aggregate finish. The brick look finish is important to ensure a blend with the surrounding environment. A cost comparison between the two methods was made difficult by the lack of available information on the cost of the insitu concrete design. However based on rough estimates, it appears that precast concrete buildings are more economical to build than insitu

concrete structures. If precast concrete buildings are correctly designed, then a precast construction in Ballarat is an economical option to be considered. -- Abstract/Synopsis.

precast concrete building construction: Precast-concrete buildings in seismic areas FIB - Féd. Int. du Béton, 2016 This document has a broad scope and is not focussed on design issues. Precast construction under seismic conditions is treated as a whole. The main principles of seismic design of different structural systems, their behavior and their construction techniques are presented through rules, construction steps and sequences, procedures, and details that should lead to precast structures built in seismic areas complying with the fundamental performance requirements of collapse prevention and life safety in major earthquakes and limited damage in more frequent earthquakes. The content of this document is largely limited to conventional precast construction and, although some information is provided on the well-known "PRESSS technology" (jointed ductile dry connections), this latter solution is not treated in detail in this document. The general overview, contained in this document, of alternative structural systems and connection solutions available to achieve desired performance levels, intends to provide engineers, architects, clients, and end-users (in general) with a better appreciation of the wide range of applications that modern precast concrete technology can have in various types of construction from industrial to commercial as well as residential. Lastly, the emphasis on practical aspects, from conceptual design to connection detailing, aims to help engineers to move away from the habit of blindly following prescriptive codes in their design, but instead go back to basic principles, in order to achieve a more robust understanding, and thus control, of the seismic behaviour of the structural system as a whole, as well as of its components and individual connections.

precast concrete building construction: Precast Concrete Structures Alfred Steinle, Hubert Bachmann, Mathias Tillmann, 2019-01-28 Der Betonfertigteilbau ist eine der innovativsten Bauweisen - hier werden neue Betone, Bewehrungen und Herstellverfahren erstmals angewendet, denn das Fertigteilwerk bietet hervorragende Voraussetzungen für die industrielle Herstellung. Dieses Buch führt in die Bauweise ein und vermittelt alles notwendige Wissen für die Konstruktion, Berechnung und Bemessung. Auch die geschichtliche Entwicklung und der Stand der europäischen Normung werden aufgezeigt. Der Dreh- und Angelpunkt für den wirtschaftlichen und fehlerfreien Einsatz von Betonfertigteilen ist der fertigungs- und montagegerechte Entwurf. Neben den zu beachtenden Randbedingungen werden typische Fertigteilkonstruktionen zur Diskussion gestellt. Die Verbindungen der Betonfertigteile sind gerade bei Horizontallasten besonders zu beachten, daher wird die Aussteifung von Fertigteilgebäuden ausführlich behandelt. Besonderheiten der Bemessung, z. B. Lager, Konsolen und Stützenstöße, werden detailliert dargestellt. Ein zunehmend wichtiger Anwendungsbereich für Betonfertigteile ist der Fassadenbau, welchem ein eigenes Kapitel gewidmet ist. Abschließend wird auf die Fertigung eingegangen, um beim Leser das Verständnis für die Bauweise zu vertiefen. Für die vorliegende 2. Auflage wurde das Werk vom erweiterten Autorenteam komplett überarbeitet. Das Buch ist eine Einführung und ein praktisches Arbeitsmittel mit Beispielen für Bauingenieure und Architekten gleichermaßen.

precast concrete building construction: *Building Construction Handbook* R. Chudley, Roger Greeno, 2013 This handbook provides extensive coverage of building construction practice, processes and techniques, representing both traditional procedures and modern developments. It has been revised and updated to take into account changes in standards and regulations, and developments in industry practice.

precast concrete building construction: *Design of precast concrete structures against accidental actions* fib Fédération internationale du béton, 2012-01-01 Since the 1980's, several buildings throughout the world have been subject to gas explosions, impact by cars or airplanes, or car bomb attacks. In many cases the effect of the impact or explosion has been the failure of a critical structural member at the perimeter of the building. After the failure, the load supported by that member could not be redistributed and part or all of the structure has collapsed in a progressive manner. The phenomenon that occurs when local failure is not confined to the area of initial distress, and spreads horizontally and/or vertically through the structure, is termed

progressive collapse. Progressive collapse is a relatively rare event, as it requires both an accidental action to cause local damage and a structure that lacks adequate continuity, ductility, and redundancy to prevent the spread of damage. It is technically very difficult and economically prohibitive to design buildings for absolute safety. However it is possible to construct precast concrete buildings that afford an acceptable degree of safety with regard to accidental actions. A structure is normally designed to respond properly, without damage, under normal load conditions, but local and/or global damages cannot be avoided under the effect of an unexpected, but moderate degree of accidental overload. Properly designed and constructed structures usually possess reasonable probability not to collapse catastrophically under such loads, depending on different factors, for example: the type of loading; the degree and the location of accidental loading in regard to the structure and its structural members; the type of structural system, the construction technology, and the spans between structural vertical members, etc. No structure can be expected to be totally resistant to actions arising from an unexpected and extreme cause, but it should not be damaged to an extent that is disproportionate to the original cause. The aim of fib Bulletin 63 is to summarize the present knowledge on the subject and to provide guidance for the design of precast structures against progressive collapse. This is addressed in terms of (a) the classification of the actions, (b) their effect on the structural types, (c) the strategies to cope with such actions, (d) the design methods and (e) some typical detailing, all supplemented with illustrations from around the world, and some model calculations.

precast concrete building construction: Precast Concrete Buildings S. Jonsson, 1975

precast concrete building construction: The Art of Precast Concrete David Bennett, 2005-08-26 As a building material, precast concrete allows a wide range of sculptural forms and design options. By treating the surface in various ways, fascinating textures and fine finishes can be produced. This book provides a systematic overview of the variety of applications for such concrete elements throughout Europe. Author David Bennett provides in-depth information on newly developed, especially lightweight forms of concrete such as GRC (Glass-Fibre Reinforced Concrete), Ductal and CRC (Compact Reinforced Composite). A selection of some 24 projects which are of particular significance, are documented in detail and provide a wealth of inspiring design ideas. The appendix comprises an overview of the building practices in the individual European countries and the availability of concrete elements. Amongst the buildings documented are the Scottish Parliament Building in Edinburgh by Enric Miralles Benedetta Tagliabue, the Synagogue in Dresden by Wandel, Hoefer, Lorch + Hirsch, and the Mexican Embassy in Berlin by González de León.

precast concrete building construction: Seismic Design of Precast Concrete Building Structures fib Fédération internationale du béton, 2003-01-01 The aim of this state-of-art report is to present current practices for use of precast and prestressed concrete in countries in seismic regions, to recommend good practice, and to discuss current developments. The report has been drafted by 30 contributors from nine different countries. This state-of-art report covers: state of the practice in various countries; advantages and disadvantages of incorporating precast reinforced and prestressed concrete in construction; lessons learned from previous earthquakes; construction concepts; design approaches; primary lateral load resisting systems (precast and prestressed concrete frame systems and structural walls including dual systems) diaphragms of precast and prestressed concrete floor units; modelling and analytical methods; gravity load resisting systems; foundations; and miscellaneous elements (shells, folded plates, stairs and architectural cladding panels). Design equations are reported where necessary, but the emphasis is on principles. Ordinary cast-in-place reinforced concrete is not considered in this report. This fib state-of-the-art report is intended to assist designers and constructors to provide safe and economical applications of structural precast concrete and at the same time to allow innovation in design and construction to continue. This Bulletin N° 27 was approved as an fib state-of-art report in autumn 2002 by fib Commission 7, Seismic design.

precast concrete building construction: Fundamentals of Building Construction Edward Allen, Joseph Iano, 2019-08-28 THE #1 REFERENCE ON BUILDING CONSTRUCTION—UPDATED

FROM THE GROUND UP Edward Allen and Joseph Iano's *Fundamentals of Building Construction* has been the go-to reference for thousands of professionals and students of architecture, engineering, and construction technology for over thirty years. The materials and methods described in this new Seventh Edition have been thoroughly updated to reflect the latest advancements in the industry. Carefully selected and logically arranged topics—ranging from basic building methods to the principles of structure and enclosure—help readers gain a working knowledge of the field in an enjoyable, easy-to-understand manner. All major construction systems, including light wood frame, mass timber, masonry, steel frame, light gauge steel, and reinforced concrete construction, are addressed. Now in its Seventh Edition, *Fundamentals of Building Construction* contains substantial revisions and updates. New illustrations and photographs reflect the latest practices and developments in the industry. Revised chapters address exterior wall systems and high-performance buildings, an updated and comprehensive discussion of building enclosure science, evolving tools for assessing environmental and health impacts of building materials, and more. New and exciting developments in mass timber construction are also included. This Seventh Edition includes: 125 new or updated illustrations and photographs, as well as 40 new photorealistic renderings The latest in construction project delivery methods, construction scheduling, and trends in information technology affecting building design and construction Updated discussion of the latest LEED and Living Building Challenge sustainability standards along with expanded coverage of new methods for assessing the environmental impacts of materials and buildings Expanded coverage of mass timber materials, fire resistance of mass timber, and the design and construction of tall wood buildings Revised end-of-chapter sections, including references, websites, key terminology, review questions, and exercises Fully-updated collection of best-in-class ancillary materials: PowerPoint lecture slides, Instructor's Manual, Test Bank, Interactive Exercises, and more Companion book, *Exercises in Building Construction*, available in print and eBook format For the nuts and bolts on building construction practices and materials, *Fundamentals of Building Construction: Materials and Methods*, 7th Edition lays the foundation that every architect and construction professional needs to build a successful career.

precast concrete building construction: *Building Construction with Precast Concrete Structural Elements* Wai Kwong Lau, 2010-09 Over the past few decades, construction practitioners have been facing the challenges of high quality demand and high labour cost. Building construction with precast concrete structural elements (PCSEs) is one of the initiatives used to overcome these challenges. In 1990, PCSEs were introduced in the construction industry of Hong Kong. As from 1997, it became mandatory to use PCSEs in the construction of Hong Kong Public Housing. So, it was worth to investigate the effectiveness of PCSEs in the building construction of Hong Kong. For this reason, this study was focused on why PCSEs are widely used and how to manage their use so as to achieve the benefits. The book is basically aimed at construction practitioners especially for those who are responsible for site management. It will be of value to the researchers in conducting studies in the construction industry. The book will also be of value to academics, undergraduate and postgraduate students on building, construction, surveying and management courses.

precast concrete building construction: *Precast Concrete in Tall Buildings* FIB – International Federation for Structural Concrete, 2021-12-01 There has been continued global growth in tall building construction over recent years. The variation in the use of such buildings is remarkable, from lavish hotels and apartments to socially affordable units. As the world struggles to cope with growing numbers of people, dwindling resources and movements from rural to urban habitats it is unavoidable that population densities will increase, and more efficient use of scarce land will be needed. Taller buildings are the inevitable consequence. Tall buildings can use several different types of material to form their framework and envelope. Those materials are mixed to provide an optimum building solution to suit client requirements such as structure, occupancy, vision, affordability, timing, sustainability and quality. Precast concrete is one of those materials, and has been used from whole frameworks to facades, and elements mixed with structural steelwork and cast in place concrete. This state of the art report shows how precast concrete can be effectively

integrated into tall buildings using modern materials and techniques, drawing on the experience and expertise that is currently available in the global precast concrete industry. The report is aimed at not only building professionals and students, but also at contractors, investors, owners, public bodies and any other parties interested in the possibilities for use of precast concrete in tall building construction. Extensive case studies at the end of the Bulletin illustrate the benefits and applications discussed in the earlier chapters.

precast concrete building construction: Architecture in Precast Concrete, 1999

precast concrete building construction: Precast Wall Panels, Their Fabrication and Use in Modern Building Construction Jack Edward Binning, 1955

precast concrete building construction: Multi-Storey Precast Concrete Framed Structures

Kim S. Elliott, Colin Jolly, 2013-10-07 Precast reinforced and prestressed concrete frames provide a high strength, stable, durable and robust solution for any multi-storey structure, and are widely regarded as a high quality, economic and architecturally versatile technology for the construction of multi-storey buildings. The resulting buildings satisfy a wide range of commercial and industrial needs. Precast concrete buildings behave in a different way to those where the concrete is cast in-situ, with the components subject to different forces and movements. These factors are explored in detail in the second edition of Multi-Storey Precast Concrete Framed Structures, providing a detailed understanding of the procedures involved in precast structural design. This new edition has been fully updated to reflect recent developments, and includes many structural calculations based on EUROCODE standards. These are shown in parallel with similar calculations based on British Standards to ensure the designer is fully aware of the differences required in designing to EUROCODE standards. Civil and structural engineers as well as final year undergraduate and postgraduate students of civil and structural engineering will all find this book to be thorough overview of this important construction technology.

precast concrete building construction: Manual of Precast Concrete Construction with Large Reinforced Concrete and Prestressed Concrete Components Tihamér Koncz, 1967

precast concrete building construction: Manual of precast concrete construction, 1970

precast concrete building construction: Precast Concrete in Mixed Construction fib

Fédération internationale du béton, 2002-01-01 The purpose of this publication is to show how precast concrete may be mixed in combination with other structural materials to maximise overall building performance. The other materials are: cast insitu concrete, reinforced and post-tensioned, structural steelwork, timber and glue-laminated timber, masonry in brickwork and blockwork, glass and glazing. The aim is to provide a companion volume to composite Floor Structures [FIP, 1998] and to show some of the many other ways that precast concrete can be used to advantage with other materials. The term mixed precast construction is used to describe these other combinations. The intention is not to discuss design calculations - that is for a future 'fib Guide to good practice'. Instead, the bulletin is meant as a 'State-of-art' publication showing photographs, sketches and details of precast concrete with other materials. There are no design equations, although some technical information on how to combine the materials, e.g. bearings, connections, tolerances, thermal and shrinkage effects, etc., is included if appropriate. Thus, the document focuses on the use of mixed construction in multistorey buildings, offices, housing, grandstands, parking garages, and industrial warehouses, etc. i. e. on precast concrete as the main construction material and looks at the manner in which other materials can be integrated. Chapter by chapter the strengths and weakness of each material studied are assessed as part of the total building design. In some cases it is obvious that the load carrying performance of one material outweighs another. In other cases aspects such as thermal, fire, vibration, fatigue, creep, acoustic, seismic and visual characteristics, and the geographical local availability of that material, may be critical. A world-wide survey, presented in Table 1.1, found that precast concrete is a universal building material, but mixed construction is limited mostly to developed countries where structural steelwork and types of timber, such as glue-laminated timber, is readily available. In addition there may be design, detailing, production, transportation, erection and maintenance limitations, which do or do not

favour mixed construction.

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