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For more than forty years the series of International Colloquia on Stability and Ductility of Steel Structures has been supported by the Structural Stability Research Council (SSRC). Its objective is to present the latest results in theoretical, numerical and experimental research in the area of stability and ductility of steel and steel-concrete composite structures. In Stability and Ductility of Steel Structures 2019, the focus is on new concepts and procedures concerning the analysis and design of steel structures and on the background, development and application of rules and recommendations either appearing in recently published Codes or

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Specifications and in emerging versions, all in anticipation of the new edition of Eurocodes. The series of International Colloquia on Stability and Ductility of Steel Structures started in Paris in 1972, the last five being held in: Timisoara, Romania (1999), Budapest, Hungary (2002), Lisbon, Portugal (2006), Rio de Janeiro, Brazil (2010) and Timisoara, Romania (2016). The 2019 edition of SDSS is organized by the Czech Technical University in Prague.

This book sets out the basic principles of composite construction with reference to beams, slabs, columns and frames, and their applications to building structures. It deals with the problems likely to arise in the design of composite members in buildings, and relates basic theory to the design approach of Eurocodes 2, 3 and 4. The new edition is based for the first time on the finalised Eurocode for steel/concrete composite structures.

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Analysis and Design of Steel and Composite Structures CRC Press
This is a collection of ten extensive review chapters by different authors.

FRP Composites for Reinforced and Prestressed Concrete Structures

Composite Structures of Steel and Concrete Designers' Guide to EN 1994-1-1

Proceedings of the International Colloquia on Stability and Ductility of Steel Structures (SDSS 2019), September 11-13, 2019, Prague, Czech Republic

Steel Plated Structures

Designers' Handbook to Eurocode 4: 1. Design of composite steel and concrete structures

The major expansion of transport networks

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in the twentieth century has been accompanied by extensive bridge construction. At the end of the century, the field of bridge engineering continues to grow and develop. Recent years have seen the construction of revolutionary new bridges, advances in materials and construction techniques and the development of international codes and standards aimed at producing more durable and reliable structures.

The fourth edition of this popular steel structures book contains references to

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both Eurocodes and British Standards. All the material has been updated where necessary, and new and revised worked examples are included. Sections on the meaning, the purpose and limits of structural design, sustainable steel building and energy saving have been updated. The initial chapters cover the essentials of structural engineering and structural steel design. The remainder of the book is dedicated to a detail examination of the analysis and design of selected types of structures, presenting

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complex designs in an understandable and user-friendly way. These structures include a range of single and multi-storey buildings, floor systems and wide-span buildings. Each design example is illustrated with applications based on current Eurocodes or British Standard design data, thus assisting the reader to share in the environment of the design process that normally takes place in practical offices and develop real design skills. Two new chapters on the design of cased steel columns and plate girders with

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and without rigid end posts to EC4 & EC3 are included too. References have been fully updated and include useful website addresses. Emphasis is placed on practical design with a view to helping undergraduate students and newly qualified engineers bridge the gap between academic study and work in the design office. Practising engineers who need a refresher course on up-to-dates methods of design and analysis to EC3 and EC4 will also find the book useful, and numerous worked examples are included.

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Steel-concrete composite structures are widely used throughout the world for buildings and bridges. A distinguishing feature of this form of construction is the combination of concrete and steel components to achieve enhanced structural performance. The time-dependent response of concrete and its influence on the service behaviour and design of composite structures are the main focus of this SED. For the first time, a publication combines a state-of-the-art review of the research with the available design specifications

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of Europe, Australia and New Zealand, and USA. This publication intends to enhance the awareness of the service response of composite structures and of the latest research and standards' developments. It is aimed at designers and researchers alike. The review of research available in open literature is provided and arranged according to structural typologies, i. e. slabs, beams, and columns. It serves as background information for current service design rules and provides insight into the most recent research advancements. The

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review of available design guidelines presents the similarities and differences of the recommended service design procedures influenced by concrete time effects. Selected case studies of building and bridge projects show possible design approaches and the rationale required when dealing with the time-dependent response and design of composite structures. The authors of this publication are design engineers and academics involved in the service design and research on the time-dependent response of composite

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structures.

Provides detailed information for civil and structural engineers who want to use Eurocode 4; Part 1-1: Design of Composite and Steel Structures. This handbook provides technical information on the background to the Eurocode and explains the relationships with other Eurocodes, particularly the close interactions with Eurocode 2 and Eurocode 3.

Creative Systems in Structural and Construction Engineering

Eurocode 3: Design of Steel Structures,

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Part 1-9 Fatigue; Eurocode 4: Design of Composite Steel and Concrete Structures
Modeling Steel and Composite Structures
Analysis and Design of Steel and Composite Structures

Design of Composite Steel-concrete Structures

Behaviour and Design of Composite Steel and Concrete Building Structures

This volume elucidates the design criteria and principles for steel structures under seismic loads according to Eurocode 8-1. Worked Examples illustrate the application of the design rules. Two case

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studies serve as best-practice samples.

Modeling Steel and Composite Structures explains the computational tools, methods and procedures used to design steel and composite structures. The reference begins with the main models used to determine structural behavior. This is followed by a detailed description of experimental models and their main requirements and care. Numerous simulations presenting non-linear response are illustrated as are their restrictions in terms of boundary conditions, main difficulties, solution strategies and methods adopted to surpass convergence difficulties. In addition, examples of the use of computational intelligence methods to simulate steel and composite

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structures response are presented. Includes numerical models based in the finite element method Provides numerous simulations, presenting a non-linear response Contains examples of the use of computational intelligence methods to simulate steel and composite structures

An examination of creative systems in structural and construction engineering taken from conference proceedings. Topics covered range from construction methods, safety and quality to seismic response of structural elements and soils and pavement analysis. This book deals with the analysis and behaviour of composite structural members that are made by joining a steel component to a concrete component.

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The emphasis of the book is to impart a fundamental understanding of how composite structures work, so engineers develop a feel for the behaviour of the structure, often missing when design is based solely by using codes of practice or by the direct application of prescribed equations. It is not the object to provide quick design procedures for composite members, as these are more than adequately covered by recourse to such aids as safe load tables. The subject should therefore be of interest to practising engineers, particularly if they are involved in the design of non-standard or unusual composite structures for buildings and bridges, or are involved in assessing, upgrading, strengthening or repairing existing

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composite structures. The fundamentals in composite construction are covered first, followed by more advanced topics that include: behaviour of mechanical and rib shear connectors; local buckling; beams with few shear connectors; moment redistribution and lateral-distortional buckling in continuous beams; longitudinal splitting; composite beams with service ducts; composite profiled beams and profiled slabs; composite columns; and the fatigue design and assessment of composite bridge beams.

Design of Steel Structures for Buildings in Seismic Areas

Practical Design Studies, Fourth Edition

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Proceedings of the 4th International Specialty Conference, Naples, Italy, 9-12 June 2003
Advanced Polymer Composites and Polymers in the Civil Infrastructure

Perspectives on European Earthquake Engineering and Seismology

Composite Steel and Concrete Structures: Fundamental Behaviour (Second Edition)

This book publishes the proceedings from the Third International Workshop on Connections in Steel Structures: Behaviour, Strength and Design held in Trento, Italy, 29-31 May 1995. The workshop brought together the world's foremost experts in steel connections research, development, fabrication and

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design. The scope of the papers reflects state-of-the-art issues in all areas of endeavour, and manages to bring together the needs of researchers as well as designers and fabricators. Topics of particular importance include connections for composite (steel-concrete) structures, evaluation methods and reliability issues for semi-rigid connections and frames, and the impact of extreme loading events such as those imposed by major earthquakes. The book highlights novel methods and applications in the field and ensures that designers and other members of the construction industry gain access to the new results and procedures.

In recent years, the fabrication technologies for the

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production of advanced polymer composites have been revolutionised by sophisticated manufacturing techniques. These methods have enabled polymer composite materials to produce good quality laminates with minimal voids and accurate fibre alignment. This book familiarises and provides a background to the understanding and use of advanced polymer composites in the civil infrastructure; numerous examples have been provided to illustrate the use and versatility of the material. Furthermore, the book discusses the current fabrication techniques, design methods and formulae for the design of structural composite systems. In addition it discusses the fundamentals of

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geosynthetics used in geotechnical engineering. The book introduces the fibres and matrices that are used to manufacture composites, their mechanical and in-service properties and their long term loading characteristics; all these properties are specifically associated with the construction industry. The chapters then discuss the design aspects for 'all composite' units, as well as systems used for the renewal of civil infrastructure. Finally, the book demonstrated the unique possibilities of combining composites with conventional materials to form units in which the various materials making up the unit are loaded in the mode that specifically suits their mechanical characteristics.

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This Designer's Guide provides the user with guidance on the Interpretation and use of Part:1:f: General rules and rules for buildings of EN 1994, with flow charts and worked examples. It explains their relationship with the other Eurocode parts to which it refers and to the relevant British codes. The provision of background information and references also enables file users of Eurocode 4 to understand the origin and objectives of its provision.

Recent Progress in Steel and Composite Structures includes papers presented at the XIIIth International Conference on Metal Structures (ICMS 2016, Zielona Gra, Poland, 15-17 June 2016). The contributions focus on the progress made in theoretical, numerical

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and experimental research, with special attention given to new concepts and algorithmic proc
Recent Progress in Steel and Composite Structures
A Guide to Fundamentals and Design for Repair and Retrofit

Stability and Ductility of Steel Structures 2019
Design of Steel-Concrete Composite Bridges to Eurocodes

Polymers and Polymer Composites in Construction Behaviour, Strength and Design

This book collects 4 keynote and 15 theme lectures presented at the 2nd European Conference on Earthquake Engineering and Seismology (2ECEES), held in Istanbul, Turkey, from

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August 24 to 29, 2014. The conference was organized by the Turkish Earthquake Foundation - Earthquake Engineering Committee and Prime Ministry, Disaster and Emergency Management Presidency under the auspices of the European Association for Earthquake Engineering (EAEE) and European Seismological Commission (ESC). The book's nineteen state-of-the-art chapters were written by the most prominent researchers in Europe and address a comprehensive collection of topics on earthquake engineering, as well as interdisciplinary subjects such as engineering seismology and seismic risk assessment and management. Further topics include engineering seismology, geotechnical earthquake engineering, seismic performance of buildings, earthquake-

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resistant engineering structures, new techniques and technologies, and managing risk in seismic regions. The book also presents the First Professor Inge Lehmann Distinguished Award Lecture given by Prof. Shamita Das in honor of Prof. Dr. Inge Lehmann. The aim of this work is to present the state-of-the-art and latest practices in the fields of earthquake engineering and seismology, with Europe's most respected researchers addressing recent and ongoing developments while also proposing innovative avenues for future research and development. Given its cutting-edge content and broad spectrum of topics, the book offers a unique reference guide for researchers in these fields. Audience: This book is of interest to civil engineers in the fields of geotechnical and

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structural earthquake engineering; scientists and researchers in the fields of seismology, geology and geophysics. Not only scientists, engineers and students, but also those interested in earthquake hazard assessment and mitigation will find in this book the most recent advances.

EN 1994, or Eurocode 4, specifies the principles and rules for safety, serviceability and durability of composite steel and concrete structures.

Presenting a comprehensive overview of recent developments in the field of seismic resistant steel structures, this volume reports upon the latest progress in theoretical and experimental research into the area, and groups findings in the following key sections: · performance-based design of structures ·

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structural integrity under exceptional loading · material and member behaviour · connections · global behaviour · moment resisting frames · passive and active control · strengthening and repairing · codification · design and application

High strength fibre composites (FRPs) have been used with civil structures since the 1980s, mostly in the repair, strengthening and retrofitting of concrete structures. This has attracted considerable research, and the industry has expanded exponentially in the last decade. Design guidelines have been developed by professional organizations in a number of countries including USA, Japan, Europe and China, but until now designers have had no publication which provides practical guidance or accessible coverage of the fundamentals.

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This book fills this void. It deals with the fundamentals of composites, and basic design principles, and provides step-by-step guidelines for design. Its main theme is the repair and retrofit of un-reinforced, reinforced and prestressed concrete structures using carbon, glass and other high strength fibre composites. In the case of beams, the focus is on their strengthening for flexure and shear or their stiffening. The main interest with columns is the improvement of their ductility; and both strengthening and ductility improvement of un-reinforced structures are covered. Methods for evaluating the strengthened structures are presented. Step by step procedures are set out, including flow charts, for the various structural components, and design examples and practice

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problems are used to illustrate. As infrastructure ages worldwide, and its demolition and replacement becomes less of an option, the need for repair and retrofit of existing facilities will increase. Besides its audience of design professionals, this book suits graduate and advanced undergraduate students.

Eurocode 8: Design of Structures for Earthquake Resistance.
Part 1: General Rules, Seismic Action and Rules for Buildings
Beams, Slabs, Columns and Frames for Buildings
Advances in Steel Concrete Composite Structures
STESSA 2003 - Behaviour of Steel Structures in Seismic
Areas
Steel-concrete Composite Beams for Buildings

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Connections in Steel Structures III

Composite steel-concrete structures are the dominant structural form in the construction of steel framed buildings. Steel framed buildings represent over half of the world market for multi-storey buildings. They are also one of the most attractive building forms for meeting the new sustainability agendas of governments worldwide. Steel framed structures provide building owners with greater flexibility and there are future moves to enable them to be made demountable. Demountability provides a

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particular advantage over traditional reinforced and prestressed concrete structures which can prove highly problematic and hazardous when decommissioned. This book highlights the rapid developments in the understanding of the behaviour and design of composite-steel concrete structures, and links them to a range of international standards. It offers an in-depth treatment of the fundamental behaviour and design of composite steel-concrete building structures incorporating beams, columns, joints, slabs and systems. It also addresses the needs

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created by the increasing internationalisation of consulting engineering practices, as structural engineers have to be adept in design provisions from more than their home nation, by tying the practical applications of the basic methods to Australian, Chinese, European and United States standards.

This volume addresses the specific subject of fatigue, a subject not familiar to many engineers, but still relevant for proper and good design of numerous steel structures. It explains all issues related to the subject: Basis of fatigue design,

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reliability and various verification formats, determination of stresses and stress ranges, fatigue strength, application range and limitations. It contains detailed examples of applications of the concepts, computation methods and verifications.

This book provides an introduction to the theory and design of composite structures of steel and concrete. Material applicable to both buildings and bridges is included, with more detailed information relating to structures for buildings. Throughout, the design methods are illustrated

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by calculations in accordance with the Eurocode for composite structures, EN 1994, Part 1-1, 'General rules and rules for buildings' and Part 1-2, 'Structural fire design', and their cross-references to ENs 1990 to 1993. The methods are stated and explained, so that no reference to Eurocodes is needed. The use of Eurocodes has been required in the UK since 2010 for building and bridge structures that are publicly funded. Their first major revision began in 2015, with the new versions due in the early 2020s. Both authors are involved in the work on Eurocode 4.

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They explain the expected additions and changes, and their effect in the worked examples for a multi-storey framed structure for a building, including resistance to fire. The book will be of interest to undergraduate and postgraduate students, their lecturers and supervisors, and to practising engineers seeking familiarity with composite structures, the Eurocodes, and their ongoing revision.

This book is aimed at developing the elementary analysis skills, familiarity and intuitive feel for composite construction that is required by

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undergraduate and graduate students, and by structural engineers. It does not require a prior knowledge of advanced analysis and design techniques, but builds on simple concepts such as statics and the mechanics of materials. A topic is first introduced by a brief description, with numerous carefully-chosen examples forming an integral part of the main text. Working through the examples allows the reader to gain a full understanding of the subject, as a technique is illustrated by its application to the design of new structures, or the important area of

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assessing and upgrading existing structures. The techniques described for the analysis of standard structures form a basis for understanding the way composite structures work, and these techniques are applied to many non-standard forms of composite construction that are rarely covered in national standards, if at all. The book is an essential purchase for all undergraduate and postgraduate students of structural and civil engineering, as well as all practitioners.

Beams, Slabs, Columns, and Frames for

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Buildings

Fatigue Design of Steel and Composite Structures

Eurocode 3: Design of Steel Structures, Part 1 - 9 Fatigue; Eurocode 4: Design of Composite Steel and Concrete Structures

Design of Steel Structures to Eurocodes

Composite Structures Of Steel And Concrete

Steel and composite steel–concrete structures are widely used in modern bridges, buildings, sport stadia, towers, and offshore structures. Analysis and Design of Steel and Composite Structures offers a

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comprehensive introduction to the analysis and design of both steel and composite structures. It describes the fundamental behavior of steel and composite members and structures, as well as the current design criteria and procedures given in Australian standards AS/NZS 1170, AS 4100, AS 2327.1, Eurocode 4, and AISC-LRFD specifications. Featuring numerous step-by-step examples that clearly illustrate the detailed analysis and design of steel and composite members and connections, this practical and easy-to-understand text: Covers plates, members, connections, beams, frames, slabs,

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columns, and beam-columns Considers bending, axial load, compression, tension, and design for strength and serviceability Incorporates the author ' s latest research on composite members Analysis and Design of Steel and Composite Structures is an essential course textbook on steel and composite structures for undergraduate and graduate students of structural and civil engineering, and an indispensable resource for practising structural and civil engineers and academic researchers. It provides a sound understanding of the behavior of structural

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members and systems.

This textbook describes the rules for the design of steel and composite building structures according to Eurocodes, covering the structure as a whole, as well as the design of individual structural components and connections. It addresses the following topics: the basis of design in the Eurocodes framework; the loads applied to building structures; the load combinations for the various limit states of design and the main steel properties and steel fabrication methods; the models and methods of structural analysis in combination with

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the structural imperfections and the cross-section classification according to compactness; the cross-section resistances when subjected to axial and shear forces, bending or torsional moments and to combinations of the above; component design and more specifically the design of components sensitive to instability phenomena, such as flexural, torsional and lateral-torsional buckling (a section is devoted to composite beams); the design of connections and joints executed by bolting or welding, including beam to column connections in frame structures; and alternative configurations to

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be considered during the conceptual design phase for various types of single or multi-storey buildings, and the design of crane supporting beams. In addition, the fabrication and erection procedures, as well as the related quality requirements and the quality control methods are extensively discussed (including the procedures for bolting, welding and surface protection). The book is supplemented by more than fifty numerical examples that explain in detail the appropriate procedures to deal with each particular problem in the design of steel structures in accordance with Eurocodes. The book is an ideal

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learning resource for students of structural engineering, as well as a valuable reference for practicing engineers who perform designs on basis of Eurocodes.

Very Good, No Highlights or Markup, all pages are intact.

This book details the basic concepts and the design rules included in Eurocode 3 Design of steel structures: Part 1-8 Design of joints. Joints in composite construction are also addressed through references to Eurocode 4 Design of composite steel and concrete structures Part 1-1: General rules and

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rules for buildings. Attention has to be duly paid to the joints when designing a steel or composite structure, in terms of the global safety of the construction, and also in terms of the overall cost, including fabrication, transportation and erection. Therefore, in this book, the design of the joints themselves is widely detailed, and aspects of selection of joint configuration and integration of the joints into the analysis and the design process of the whole construction are also fully covered. Connections using mechanical fasteners, welded connections, simple joints, moment-resisting joints

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and lattice girder joints are considered. Various joint configurations are treated, including beam-to-column, beam-to-beam, column bases, and beam and column splice configurations, under different loading situations (axial forces, shear forces, bending moments and their combinations). The book also briefly summarises the available knowledge relating to the application of the Eurocode rules to joints under fire, fatigue, earthquake, etc., and also to joints in a structure subjected to exceptional loadings, where the risk of progressive collapse has to be mitigated. Finally,

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there are some worked examples, plus references to already published examples and to design tools, which will provide practical help to practitioners.

Eurocode 4: Design of Composite Steel and Concrete Structures. General rules and rules for buildings

Elementary Behaviour of Composite Steel and Concrete Structural Members

Time-dependent Behaviour and Design of Composite Steel-concrete Structures

Final Report

Steel Structures

Modelling and Pre-design of Steel and Composite

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Structures

Nowadays in engineering offices usual pre-design is still often based on the allowable stress method instead of the more efficient limit states method prescribed by Eurocodes 3 and 4. In order to satisfy the needs of engineering offices, the intention of this research project was : - to develop guidance on the basis of Eurocodes for structural modelling, for global analysis, for checks of members, etc.; - to prepare practical tools (software in particular) for pre-design of steel structures and composite steel-concrete structures according to Eurocodes 1, 3 and 4 respectively, in function of different decisive parameters: the type of rigidity allocated to the structure (i.e. rigid or sway buildings), the type of joints, etc. Engineering offices from the European Community have participated in the project in order

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to study different methods of modelling and pre-designing structures. The practical examples of usual structures concern different types of buildings (offices, industrial buildings, public areas, from low-rise buildings, etc.) and different structural properties. All guidelines and practical tools, i.e. design aids and pre-design soft library (PSL), are in conformity with Eurocodes 1, 3 and 4.

This volume strives to give comprehensive information about the main aspects of the behaviour and limit states of steel plated structures. In following this objective, the volume presents a complete scientific background (profiting from the fact that the authors of the individual parts of the publication have personally been very active in the corresponding fields of research for an extended period of time), but also establishes

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design recommendations, procedures and formulae. The significance of the volume may be seen in its challenging current concepts of the analysis of steel plated structures, encouraging progress in the field, and thereby establishing an advanced basis for a more reliable and economical design.

Combining a theoretical background with engineering practice, Design of Steel-Concrete Composite Bridges to Eurocodes covers the conceptual and detailed design of composite bridges in accordance with the Eurocodes. Bridge design is strongly based on prescriptive normative rules regarding loads and their combinations, safety factors, material proper

Fundamental Behaviour

Steel-Concrete Composite Structures

Current and Future Trends in Bridge Design, Construction and

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Maintenance

Design of Composite Steel and Concrete Structures: EN 1994-1-1

Designers' Guide to Eurocode 4

Safety, Economy, Sustainability and Aesthetics : Proceedings of the International Conference Organized by the Institution of Civil Engineers and Held in Singapore on 4-5 October 1999