A new book on the finite strip method

THE FINITE STRIP METHOD IN COMPUTATIONAL MECHANICS

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I should like to present to you a new book on the Finite Strip Method. This work is the result of continuing cooperation between the Faculty of Civil Engineering, Subotica, University of Novi Sad, Faculty of Civil Engineering Budapest, Technical University of Budapest and Faculty of Civil Engineering, Belgrade, University of Belgrade. The specific cooperation program is established on regular joint meeting of the representatives of the Parties to the Agreement and Mr. Branislav Ivković Ph.D. (Minister of Civil Engineering of Serbian Republic). It is surely worth mentioning as a very important fact that the new book in English language is published in the cooperation between the three Faculties and two countries (Yugoslavia and Hungary).

This book contains the theory and computation methods for the application of the finite strip method in analysis of structural stability of engineering structures and structural components. The contents of the book include: Introduction; The Finite Strip Variational Formulation; The Finite Strip Displacement Function; Linear Elastic Problems; Linear Viscoelastic Problems; Free Vibration and Bifurcation Problem; Geometrically Nonlinear Elastic Problems; Geometrically Nonlinear Viscoelastic Problems; **Rheological-Dynamical Analogy and Inelastic Response** & Bibliography. To obtain a sophisticated tool for analytical investigation of prismatic folded plate structures, the present book includes development of the corresponding computer software, employing the previously developed analytical models and analytical procedures.

This book describes in detail the main procedures for the application of the Finite Strip Method in Static and Dynamic analysis of engineering structures and structural components by using geometrically nonlinear elastic models of structures. It also includes geometrically nonlinear viscoelastic problems and rheological-dynamical analogy with an emphasis on the important nonlinear features of behaviour. The fundamental theoretical investigation, the computer implementations by developed computer programs and modeling strategies are treated. Advantages of alternative methods and the practical implications of recent research developments are stressed. Mathematical and algorithmic developments are explained in terms comprehensible to engineers.

The motivation for the application of the Finite Strip Method is that this method is ideally suited for the prismatic folded plate structures and box girder bridges. In comparison with the standard Finite Element Method the main advantage is that the effort and expense for data preparation and input are minimized because the Finite Strip

Method reduces the three-dimensional spatial structure to a one-dimensional structure.

In chapters 7 and 8 especially, attention is focussed on the continuinual development of nonlinear elastic and nonlinear viscoelastic models in computer software, with the application to the problem of lateral buckling of thin-walled girders. Also, the bifurcation problem is analyzed in the Chapter 6 of this book with the explanation of the computer program for the computation of layered plates.

The book is intended for undergraduate and postgraduate courses in civil and mechanical engineering. A background in engineering or applied sciences and two previous books to Finite Strip Method (The Finite Strip Method in Structural Analysis, by Y. K. Cheung, published by Pergamon Press in 1976, and The Finite Strip Method in Bridge Engineering, by W. C. Loo and A. R. Cusens, published by Wexham Springs in 1978) are necessary for understanding the material covered in this book.

I am expecting great interest in this book, the purpose of which is to provide engineers, sciences and researchers with a critical survey of the state-of-the-art of the Finite Strip Method in static and dynamic analysis of engineering structures, with an emphasis on methodologies and applications for nonlinear problems.

K. H.