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Nota di contenuto	Title Page; Table of Content; 1 Introduction; 1.1 Verification Methods; 1.2 Methods to Determine the Internal Forces and Moments; 1.3 Element Types and Fields of Application; 1.4 Linear and Nonlinear Calculations; 1.5 Designations and Assumptions; 1.6 Fundamental Relationships; 1.7 Limit States and Load Combinations; 1.8 Introductory Example; 1.9 Content and Outline; 1.10 Computer Programs; 2 Cross Section Properties; 2.1 Overview; 2.2 Utilisation of Symmetry Properties; 2.3 Standardisation Part I: Centre of Gravity, Principal Axes and Moments of Inertia 2.4 Calculation of Standardised Cross Section Properties Part I 2.4.1 Separation of the Cross Section into Partial Areas; 2.4.2 Partial Areas of Thin-Walled Rectangles; 2.4.3 Basic Cross Sections and Elementary Compound Cross Section Shapes; 2.4.4 Tabular Calculation of Cross

Section Properties; 2.4.5 Numeric Integration / Fibre and Stripe Model; 2.5 Standardisation Part II: Shear Centre, Warping Ordinate and Warping Constant; 2.6 Warping Ordinate; 2.7 Shear Centre M; 3 Principles of FEM; 3.1 General Information; 3.2 Basic Concepts and Methodology; 3.3 Progress of the Calculations  
3.4 Equilibrium3.4.1 Preliminary Remarks; 3.4.2 Virtual Work Principle; 3.4.3 Principle of Minimum of Potential Energy; 3.4.4 Differential Equations; 3.5 Basis Functions for the Deformations; 3.5.1 General; 3.5.2 Polynomial Functions for Beam Elements; 3.5.3 Trigonometric and Hyperbolic Functions for Beam Elements; 3.5.4 Basis Functions for Plate Buckling; 3.5.5 One-Dimensional Functions for Cross Sections; 3.5.6 Two-Dimensional Functions for Cross Sections; 4 FEM for Linear Calculations of Beam Structures; 4.1 Introduction; 4.2 Beam Elements for Linear Calculations  
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5.7 Initial Deformations and Equivalent Geometric Imperfections

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#### Sommario/riassunto

This book presents the design of steel structures using finite element methods (FEM) according to the current state of the art in Germany and the rest of Europe. After a short introduction on the basics of the design, this book illustrates the FEM with a focus on internal forces, displacements, critical loads and modal shapes. Next to finite element procedures for linear calculations considering the stress states of normal force, biaxial bending and warping torsion, non-linear calculations and the stability cases of flexural buckling, lateral torsional buckling and plate buckling are concentrat

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