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3.5 Stability Analysis; 3.6 Analyses Using Exact Stiffness Matrices; References; 4 FINITE ELEMENTS FOR CROSS-SECTIONAL ANALYSIS; 4.1 Shape Functions; 4.2 Transformation of Derivatives and Integrals; 4.3 Integrals; 4.4 Cross-Sectional Properties; 4.5 Modulus-Weighted Properties; References; 5 SAINT-VENANT TORSION; 5.1 Fundamentals of Saint-Venant Torsion; 5.1.1 Force Formulation; 5.1.2 Membrane Analogy; 5.2 Classical Formulas for Thin-Walled Cross Sections; 5.2.1 Open Sections; 5.2.2 Closed Sections, Hollow Shafts; 5.3 Composite Cross Sections; 5.4 Stiffness Matrices
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6.1.4 Finite Element Solution Formulation

Sommario/riassunto

State-of-the-art coverage of modern computational methods for the analysis and design of beams. Analysis and Design of Elastic Beams presents computer models and applications related to thin-walled beams such as those used in mechanical and aerospace designs, where thin, lightweight structures with high strength are needed. This book will enable readers to compute the cross-sectional properties of individual beams with arbitrary cross-sectional shapes, to apply a general-purpose computer analysis of a complete structure to determine the forces and moments in the individual members, and to us
