第一图书网, tushu007.com

<<钢结构稳定>>

图书基本信息

书名：<<钢结构稳定>>

13位ISBN编号：9787508389066

10位ISBN编号：7508389069

出版时间：2010-3

出版时间：中国电力

作者：陈骥//陈浩军

页数：875

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：http://www.tushu007.com

前言

The theory of structural stability is, strictly speaking, a branch of structural mechanics. But,from the process of the development, it can be observed that this learning is closely linked with theprogress of structural engineering. S. P. Timoshenko, in his classic monograph Theory of ElasticStability published in 1936, wrote: "The modern use of steel and high-strength alloys inengineering structures, especially in bridges, ships and aircraft, has made elastic instability aproblem of great importance". This statement made more than 60 years ago is still holding truenowadays, whereas buildings and offshore platforms are added to the rank of above structures andplasticity is more involved in stability issues. Constructional steel by itself is an elasto-plasticmaterial welding, the contemporary art of connection, gives rise to residual stresses whichaccentuate the inelastic behavior of steel members.

内容概要

本书为普通高等教育“十一五”规划教材，全书共八章，主要内容包括以下几个方面：　（1）失稳分类：分岔失稳的类型，极值点失稳和跃越失稳。
　（2）轴心受压柱，梁柱，刚接和半刚接刚架的平面弯曲屈曲性能和实用设计方法。
　（3）柱，梁和梁柱的平面外弯扭屈曲性能和实用设计方法。
　（4）薄板的凸曲和屈曲后性能，冷弯薄壁板件的局部屈曲，畸变屈曲，整体屈曲和它们之间的相关屈曲，有效宽度和直接强度两种设计方法。
　（5）弹性和弹塑性钢结构的能量法和数值法以及其试验验证。
　全书内容注重钢结构材料和构件几何非线性的特点，使之符合实际的结构设计。
同时，书中还附有依照国内外钢结构设计规范设计的许多钢结构构件和刚架有关理论研究和设计方法的实例。
　本书可作为普通高等院校工程结构、工程力学专业研究生的教材，也可作为结构工程师和研究人员的参考用书。

书籍目录

PrefaceForewordNotationGlossaryCHAPTER 1 INTRODUCTION 1.1 TYPES OF INSTABILITY 1.2 METHODS OF STABILITY ANALYSIS 1.3 STABILITY OF PERFECT MECHANICAL MODELS 1.4 STABILITY OF IMPERFECT MECHANICAL MODELS 1.5 STABILITY OF SNAP-THROUGH MECHANICAL MODEL 1.6 MECHANICAL PROPERTIES OF STRUCTURAL STEEL 1.7 RESIDUAL STRESS DISTRIBUTIONS IN STEEL MEMBERS 1.8 BEHAVIOR AND DESIGN OF STEEL STRUCTURES Problems ReferencesCHAPTER 2 FLEXURAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 2.1 INTRODUCTION 2.2 ELASTIC FLEXURAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 2.3 CENTRALLY COMPRESSED MEMBERS WITH END RESTRAINT 2.4 EFECTIVE LENGTH FACTORS OF CENTRALLY COMPRESSED MEMBERS 2.5 ELASTrC LARGE DEFLECTION ANALYSIS OF CENTRALLY COMPRESSED MEMBERS 2.6 EFFECT OF INITIAL GEOMETRICAL IMPERFECTIONS ON CENTRALLY COMPRESSED MEMBERS 2.7 INELASTIC FLEXURAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 2.8 EFFECT OF RESIDUAL STRESSES ON CENTRALLY COMPRESSED MEMBERS 2.9 APPLICATION OF STABILITY THEORY OF CENTRALLY COMPRESSED MEMBERS ON STEEL STRUCTURE DESIGN Problems ReferencesCHAPTER 3 IN-PLANE STABILITY OF BEAM-COLUMNS 3.1 INTRODUCTION 3.2 DEFORMATIONS AND INTERNAL FORCES OF SIMPLY SUPPORTED ELASTIC BEAM-COLUMNS UNDER TRANSVERSE LOADS 3.3 DEFORMATIONS AND INTERNAL FORCES OF FIXED ENDED ELASTIC BEAMCOLUMNS UNDER TRANSVERSE LOADS 3.4 DEFORMATIONS AND INTERNAL FORCES OF ELASTIC BEAM-COLUMN UNDER END MOMENTS 3.5 IN-PLANE EQUIVALENT MOMENT AND IN-PLANE EQUIVALENT MOMENT FACTOR OF BEAM-COLUMN 3.6 SLOPE-DEFLECTION EQUATIONS OF ELASTIC BEAM-COLUMN WITHOUT SWAY 3.7 SLOPE-DEFLECTION EQUATIONS OF ELASTIC BEAM-COLUMN WITH SWAY 3.8 SLOPE-DEFLECTION EQUATIONS OF ELASTIC BEAM-COLUMN UNDER TRANSVERSE LOADS 3.9 IN-PLANE ULTIMATE LOAD OF BEAM-COLUMN 3.10 APPLICATION OF IN-PLANE STABILITY THEORY OF BEAM-COLUMNS ON STEEL STRUCTURE DESIGN 3.11 FURTHER INVESTIGATIONS OF IN-PLANE STRENGTH OF NON-SWAY BEAM-COLUMNS Problems ReferencesCHAPTER 4 IN-PLANE STABILITY OF FRAMES 4.1 TYPES OF INSTABILITY OF FRAMES 4.2 ELASTIC BUCKLING LOADS OF FRAMES BY EQUILIBRIUM METHOD 4.3 ELASTIC BUCKLING LOADS OF FRAMES BY SLOPE-DEFLECTION METHOD 4.4 ELASTIC BUCKLING OF MULTI-STORY FRAMES 4.5 ELASTIC BUCKLING LOADS OF MULTISTORY FRAMES BY APPROXIMATE METHOD 4.6 STABILITY OF FRAMES UNDER PRIMARY BENDING MOMENT 4.7 ELASTICopLASTIC STABILITY OF FRAMES 4.8 ULTIMATE LOADS OF SWAY FRAMES 4.9 APPLICATION OF STABILITY THEORY OF FRAMES ON STEEL STRUCTURE DESIGN 4.10 OVERALL DESIGN METHOD OF IN-PLANE STABILITY OF FRAME-DIRECT ANALYSIS（ADVANCED ANALYSIS） METHOD 4.11 MOMENT ROTATION CURVES OF BEAM-TO-COLUMN CONNECTIONS AND DESIGN OF SEMI-RIGID FRAMES 4.12 OVERALL IN-PLANE BUCKLING OF SINGLE-STORY MULTI-BAY PITCHED-ROOF FRAMES Problems ReferencesCHAPTER 5 APPROXIMATE METHODS OF STABILITY ANALYSIS 5.1 INTRODUCTION 5.2 PRINCIPLE OF ENERGY CONSERVATION 5.3 PRINCIPLE OF STATIONARY VALUE OF POTENTIAL ENERGY AND PRINCIPLE OF MINIMUM POTENTIAL ENERGY 5.4 RAYLEIGH - RITZ METHOD 5.5 GALERKIN METHOD 5.6 FINITE DIFFERENCE METHOD 5.7 FINITE INTEGRAL METHOD 5.8 FINITE ELEMENT METHOD 5.9 USING FINITE ELEMENT METHOD TO DETERMINE EFFECTIVE LENGTH FACTORS OF THE UNBRACED TAPERED PORTAL FRAMED COLUMN Problems ReferencesCHAPTER 6 TORSIONAL BUCKLING AND FLEXURAL-TORSIONAL BUCKLING OF COMPRESSION MEMBERS 6.1 INTRODUCTION 6.2 SHEAR CENTER OF THIN-WALLED OPEN SECTION MEMBERS 6.3 TORSION OF THIN-WALLED OPEN SECTION MEMBERS 6.4 ELASTIC TORSIONAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 6.5 ELASTIC-PLASTIC

TORSIONAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 6.6 ELASTIC FLEXURAL-TORSIONAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 6.7 ELASTIC-PLASTIC FLEXURAL-TORSIONAL BUCKLING OF CENTRALLY COMPRESSED MEMBERS 6.8 ELASTIC FLEXURAL-TORSIONAL BUCKLING OF BEAM-COLUMN 6.9 ELASTIC-PLASTIC FLEXURAL-TORSIONAL BUCKLING OF BEAM-COLUMN 6.10 APPLICATION OF TORSIONAL AND FLEXURAL- TORSIONAL BUCKLING THEORIES OF COMPRESSION MEMBERS ON STEEL STRUCTURE DESIGN Problems References Appendix A-Derivations of Ixf, lyf, Ixyf, Ix, ly and I, ofor Sloping Lipped ChannelCHAPTER 7 FLEXURAL-TORSIONAL BUCKLING OF BEAMS 7.1 INTRODUCTION 7.2 ELASTIC FLEXURAL-TORSIONAL BUCKLING OF BEAMS UNDER UNIFORM BENDING 7.3 BEAMS UNDER UNEQUAL END MOMENTS 7.4 BEAMS UNDER TRANSVERSE LOADS 7.5 ELASTIC FLEXURAL-TORSIONAL BUCKLING OF BEAMS WITH VARYING CROSS-SECTION 7.6 ELASTIC-PLASTIC FLEXURAL-TORSIONAL BUCKLING OF BEAMS 7.7 APPLICATION OF FLEXURAL-TORSIONAL BUCKLING THEORY OF BEAMS FOR DESIGN OF STEEL STRUCTURES 7.8 ULTIMATE CAPACITIES AND DESIGN FORMULAS OF BIAXIAL BENDING BEAM-COLUMNS AND BEAMS 7.9 SINGLE ANGLE FLEXURAL MEMBERS Problems ReferencesCHAPTER 8 BUCKLING OF THIN PLATES 8.1 INTRODUCTION 8.2 EQUILIBRIUM EQUATIONS OF A PLATE BY SMALL DEFECTION THEORY 8.3 ELASTIC BUCKLING LOADS OF SIMPLY SUPPORTED PLATES UNDER UNIFORM COMPRESSION IN ONE DIRECTION 8.4 ELASTIC BUCKLING LOADS OF PLATES BY ENERGY METHOD 8.5 ELASTIC BUCKLING OF SIMPLY SUPPORTED PLATES UNDER NON-UNIFORM BENDING 8.6 ELASTIC BUCKLING OF SIMPLY SUPPORTED PLATES UNDER UNIFORM SHEAR 8.7 DIFFERENTIAL EQUATIONS OF PLATES BY LARGE DEFLECTION THEORY 8.8 POST-BUCKLING STRENGTH OF SIMPLY SUPPORTED PLATES UNDER UNIFORM COMPRESSION 8.9 ELASTIC-PLASTIC BUCKLING ANALYSIS OF PLATES 8.10 APPLICATION OF BUCKLING THEORY OF PLATES ON STEEL STRUCTURE DESIGN 8.11 PLATE ELEMENTS IN A CENTRALLY COMPRESSED MEMBER 8.12 WEB IN BEAM AND STABILITY DESIGN OF PLATE GIRDER 8.13 PLATE ELEMENTS IN BEAM-COLUMNS 8.14 PROVISIONS OF CLASSIFICATION AND RECOMMENDATION FOR LIMIT STATE DESIGN OF STEEL STRUCTURES IN ARCHITECTURAL INSTITUTE OF JAPAN 8.15 EFFECTIVE WIDTH OF PLATE ELEMENTS IN COLD-FORMED STEEL SECTIONS 8.16 DESIGN OF AXIALLY LOADED SLENDER COMPRESSION MEMBERS 8.17 UTILIZATION OF WEB POST-BUCKLING STRENGTH IN SLENDER I-SECTION BEAM-COLUMNS Problems ReferencesAPPENDIX 1.BUCKLING LOAD OF AXIALLY LOADED MEMBER ON ELASTIC SUPPORT 2.TOTAL POTENTIAL ENERGY OF FLEXURAL-TORSIONAL BUCKLING OF BEAMS AND BEAM-COLUMNS 3.FLEXURAL-TORSIONAL BUCKLING LOADS OF COMPRESSION MEMBERS AND BEAMS BY FINITE ELEMENT METHOD 4.FLEXURAL-TORSIONAL BUCKLING LOADS OF COMPRESSION MEMBERS AND BEAMS BY FINITE INTEGRAL METHOD 5.FLEXURAL-TORSIONAL BUCKLING LOADS OF COMPRESSION MEMBERS AND BEAMS BY FINITE DIFFERCE METHOD 6.DIRECT STRENGTH METHOD FOR DESIGN OF COLD-FORMED LIPPED CHANNEL MEMBERSReferencesAnswers to Some Selected ProblemsAUTHOR INDEXSUBJECT INDEXPOSTSCRIPT

章节摘录

edge-stiffened plate, as shown in Fig. A6. 8, into mang longitudinal strips. Each strip is assumedto be free to deform both in its plane to produce membrane displacements and out of its plane toproduce flexural displacements in a single half-sine wave over the length of the section beinganalyzed. The ends of the section are free to deform longitudinally but are prevented from deformingin a cross-sectional plane. This allows the section to be subjected to a range of longitudinal stressdistributions varying from uniform compression to pure bending. References [28], [29], [30]and [31] present the stability analysis of cold-formed members by finite strip method. A computerprogram THIN-WALL has been developed at University of Sydney to perform a finite strip analysisof thin-walled sections under compression and bending. These strips buckle cubic polynomialtransversely. The bending modes computed are for a single buckle half-wavelength. Each strip in the cross-section is assumed to be subjected to a longitudinal compressive stress o~ which isuniform along the length of the strip but varies linearly from one nodal line to the other line, asshown in Fig. A6. 8. A computer CUFSM has been developed at Cornell University for finite stripbuckling analysis. The above Figs. A6. 2 and A6. 3 show the relationships of plate element elastic local buckling,section distortional buckling and overall member flexural or flexural-torsional buckling undercompression and bending by using finite strip method respectively. For the short or medium lengthmember, if its length is shorter than the buckling half-wave length, as shown in Fig. A6. 2 or A6. 3,the flexural or flexural-distortional buckling stress will be higher than local or distortional bucklingstress. If the local buckling or distortional buckling occurs before, the member buckling load will bereduced. The influence of the distortiona

buckling on member buckling is much evident.

<<钢结构稳定>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:http://www.tushu007.com