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Course Inclinations; 1.11 Masonry Deformations; 1.11.1 Masonry Elastic Modulus; 1.11.2 Masonry Deformation at the Onset of Blocks Failure; 1.11.3 Stress--Strain Diagram of the Compressed Masonry; 1.11.4 Creep Deformation of Mortar; 1.11.5 The Concept of Memory in Constitutive Creep Models; 1.11.6 Mortar Shrinkage; References; 2 Fundamentals of Statics of Masonry Solids and Structures; Abstract; 2.1 Introduction; 2.2 No-Tension Masonry Models; 2.2.1 No-Tension Assumption; 2.2.2 The Problem of Elastic Compressive Strains 2.3 The Rigid No-Tension Model 2.3.1 The Heyman's Assumptions; 2.3.2 The Unit Resistant Masonry Cell; 2.3.3 Properties of the Rigid No Tension Material; 2.3.3.1 Stability; 2.3.3.2 Elasticity; 2.3.3.3 The Coulomb Definition of the Masonry Material; 2.4 The Masonry Continuum; 2.4.1 Compatibility Conditions on Loads; 2.4.2 Compatibility Conditions on Stresses; 2.4.3 First Consequence of the No-Tension Assumption; 2.4.4 Impenetrability Condition on the Displacement Fields; 2.4.5 Compatibility Conditions on Strains and Detachments; 2.4.6 The Boundary of the Cracked Body 2.4.7 Coupled Conditions on Stresses and Strains and on Stress Vectors and Detachments 2.4.8 Specifications for One-Dimensional Masonry Systems; 2.4.9 Indeformable Masonry Structures; 2.5 Equilibrium and Compatibility; 2.5.1 Principle of Virtual Work; 2.5.2 Variational Inequality for the Existence of the Admissible Equilibrium State; 2.5.3 No-Existence of Self-Equilibrating Stress Fields in Deformable Structures; 2.5.4 Indeformable Structures: Statically Indeterminate Behaviour; 2.5.5 Admissible Equilibrium in One-Dimensional Systems 2.5.6 Admissible Equilibrium of Elastic No Tension One-Dimensional Systems

Sommario/riassunto

This successful book, which is now appearing in its second edition, presents a comprehensive new Statics of Masonry Constructions. Masonry constructions are the great majority of the buildings in Europe's historic centres and the most important monuments in its architectural heritage. Given the age of these constructions, the demand for safety assessments and restoration projects is pressing and constant. The book you hold in hands contributes to fill this demand. The second edition integrates the original text of the first edition with new developments, widening and revisions, due to recent research studies achievements. The result is a book that gives a complete picture of the behaviour of the Masonry Constructions. First of all, it gives the fundamentals of its Statics, based on the no-tension assumption, and then it develops the Limit Analysis for the Masonry Constructions. In this framework, through an interdisciplinary approach combining Engineering and Architecture, the book also investigates the static behaviour of many historic monuments, such as the Pantheon, the Colosseum, the domes of Santa Maria del Fiore in Florence and St Peter's in Rome, as well as the Leaning Tower of Pisa, the Gothic Cathedrals. Finally, the book gives an in-depth study of masonry buildings under seismic actions.
