

Contents

**Part I Ground Motion, Rotations and Wave
 Propagation Effects**

1 A General Procedure for Selecting and Scaling Ground Motion Records for Nonlinear Analysis of Asymmetric-Plan Buildings	3
Juan C. Reyes, Erol Kalkan, and Andrea C. Riaño	
2 Prediction of the “Average” Peak Nonlinear Seismic Response of Asymmetric Buildings Under Bi-directional Ground Motion Acting at an Arbitrary Angle of Incidence	13
Kenji Fujii	
3 Evaluation of Torsional Component of Ground Motion by Different Methods Using Dense Array Data	25
G.R. Nouri, M.R. Ghayamghamian, and M. Hashemifard	
4 Estimation of Rotational Ground Motion Effects on the Bell Tower of Parma Cathedral	35
Zbigniew Zembaty, Andrea Rossi, and Andrea Spagnoli	
5 FOSREM: Fibre-Optic System for Rotational Events and Phenomena Monitoring: Construction, Investigation and Area of Application	49
Leszek R. Jaroszewicz, Anna Kurzych, Zbigniew Krajewski, Jerzy K. Kowalski, and Krzysztof P. Teisseyre	

6	Application of Rotation Rate Sensors in Measuring Beam Flexure and Structural Health Monitoring	65
	Zbigniew Zembaty, Seweryn Kokot, and Piotr Bobra	
7	Asymmetric Continuum with Shear and Rotation Strains Including Quantum Synchronous Processes	77
	Roman Teisseyre	
 Part II Seismic Analysis and Design of Irregular Structures		
8	Seismic Assessment of RC Frame Buildings	89
	Klemen Sinkovič, Iztok Peruš, and Peter Fajfar	
9	Torsional Index of an Asymmetric Building Based on Mode Shape	99
	Kenji Fujii	
10	An Approximate Method for Assessing the Seismic Response of Irregular in Elevation Asymmetric Buildings	111
	George K. Georgoussis	
11	Application of Nonlinear Static Procedures for the Seismic Assessment of a 9-Storey Asymmetric Plan Building	123
	André Belejo and Rita Bento	
12	Seismic Assessment of an Existing Irregular RC Building According to Eurocode 8 Methods	135
	Alessandra La Brusco, Valentine Mariani, Marco Tanganelli, Stefania Viti, and Mario De Stefano	
13	The Concrete Strength Variability as Source of Irregularity for RC Existing Buildings	149
	Stefania Viti, Marco Tanganelli, and Marco De Stefano	
14	The Influence of Axial Load Variation on the Seismic Performance of RC Buildings	159
	Valentine Mariani, Marco Tanganelli, Stefania Viti, and Mario De Stefano	
15	Parametric Study of Inelastic Seismic Response of Reinforced Concrete Frame Buildings	171
	Asimina M. Athanatopoulou, Grigorios E. Manoukas, and Amfilohios Throumoulopoulos	
16	Seismic Upgrading of Vertically Irregular Existing r.c. Frames by BRBs	181
	Francesca Barbagallo, Melina Bosco, Edoardo M. Marino, Pier Paolo Rossi, and Paola R. Stramondo	

17	Application of Nonlinear Static Method with Corrective Eccentricities to Steel Multi-storey Braced Buildings	193
	Melina Bosco, Giovanna A.F. Ferrara, Aurelio Ghersi, Edoardo M. Marino, and Pier Paolo Rossi	
18	Influence of the Interaction Yield Domain on Lateral-Torsional Coupling of Asymmetric Single-Storey Systems	205
	Melina Bosco, Aurelio Ghersi, Edoardo M. Marino, and Pier Paolo Rossi	
19	Improved Nonlinear Static Methods for Prediction of the Seismic Response of Asymmetric Single-Storey Systems	215
	Melina Bosco, Aurelio Ghersi, Edoardo M. Marino, and Pier Paolo Rossi	
20	Influence of the Rotational Mass Inertia on the Torsional Seismic Response	225
	Dietlinde Köber and Dan Zamfirescu	
21	Seismic Response Trends of SDOF Plan Irregular Structures. Simplified Approach	233
	Dietlinde Köber and Dan Zamfirescu	
22	Maximum Corner Displacement Amplifications for Inelastic One-Storey In-Plan Asymmetric Systems Under Seismic Excitation	243
	Michele Palermo, Stefano Silvestri, Giada Gasparini, and Tomaso Trombetti	
23	Earthquake-Induced Pounding Between Asymmetric Steel Buildings	255
	Barbara Soltysik and Robert Jankowski	
24	Dynamic Analysis of Irregular Multistorey Shear Wall Buildings Using Continuous-Discrete Approach	263
	Jacek Wdowicki, Elżbieta Wdowicka, and Zdzisław Pawlak	
25	Analysis of the Dynamic Response of Masonry Buildings with Irregularities of Localization of Bearing Elements Due to Mining Shocks	275
	Tadeusz Tatara and Filip Pachla	
26	Numerical and Experimental Prediction Methods for Assessment of Induced Vibrations in Irregular Buildings	289
	Jan Benčat	
27	Stability Analysis of Żelazny Most Tailings Dam Loaded by Mining-Induced Earthquakes	303
	Waldemar Świdziński, Aleksandra Korzec, and Kinga Woźniczko	

Part III Seismic Control and Monitoring of Irregular Structures

28 Optimal Drift and Acceleration Control of 3D Irregular Buildings by Means of Multiple Tuned Mass Dampers 315
Yael Daniel and Oren Lavan

29 Improved Seismic Performance of RCC Building Irregular in Plan with Water Tank as Passive TMD 323
Suraj N. Khante and Rutuja S. Meshram

30 Behaviour of Asymmetric Structure with Base Isolation Made of Polymeric Bearings 333
Tomasz Falborski and Robert Jankowski

Index 343