

Contents

Preface	iii
Stephen Foster, Fausto Minelli, Giovanni Plizzari and Viktor Sigrist	
1 A historical review of shear	1
György L. Balázs	
PART I: Background to draft Model Code 2010	
2 MC2010: Shear strength of beams and implications of the new approaches	15
Evan C. Bentz	
3 MC2010: The Critical Shear Crack Theory as a mechanical model for punching shear design and its application to code provisions	31
Aurelio Muttoni and Miguel Fernández Ruiz	
4 MC2010: overview on the shear provisions for FRC	61
Marco di Prisco, Giovanni Plizzari and Lucie Vandewalle	
PART II: Recent advancements in shear and punching shear of R/C structures	
5 Improving analytical models for shear design and evaluation of reinforced concrete structures	77
Michael P. Collins	
6 A structured approach to the design and analysis of beams in shear	93
Viktor Sigrist and Britta Hackbarth	
7 Shear in slabs and beams: should they be treated in the same way?	105
Aurelio Muttoni and Miguel Fernández Ruiz	
8 Residual shear bearing capacity of existing bridges	129
Joost Walraven	
9 Development of Dutch guidelines for nonlinear finite element analyses of shear critical bridge and viaduct beams	139
Jan Rots, Beatrice Belletti, Cecilia Damoni and Max Hendriks	
10 Components of shear resistance in prestressed bulb-tee girders	155
Daniel Kuchma, Shaoyun Sun, Tom Nagle and Kang Su Kim	
11 Thin-walled open-section P/C beams in fire: a case study	173
Patrick Bamonte, Roberto Felicetti, Pietro G. Gambarova and Ezio Giuriani	

PART III: Recent advancements in shear and punching shear of FRC structures

- 12 Design of FRC beams for shear using the VEM and the draft Model Code approach** **195**
Stephen Foster
- 13 Shear strength of FRC members with little or no shear reinforcement: a new analytical model** **211**
Fausto Minelli and Giovanni A. Plizzari
- 14 Effectiveness of steel fiber as minimum shear reinforcement: panel tests** **227**
Jimmy Susetyo and Frank J. Vecchio
- 15 Use of steel fibre reinforcement for shear resistance in beams and slab-column connections** **243**
Gustavo J. Parra-Montesinos, James K. Wight, Hai H. Dinh and Min-Yuan Cheng