

# COMPOSITE STEEL STRUCTURES

Advances, Design and Construction

*Edited by*

**R. NARAYANAN**

M.Sc. (Eng.), Ph.D., D.I.C., C.Eng., F.I.C.E., F.I.Struct.E., F.I.E.  
*Reader in Civil and Structural Engineering,  
University College, Cardiff, UK*



**ELSEVIER APPLIED SCIENCE**  
LONDON and NEW YORK

## CONTENTS

<i>Preface</i> . . . . .	v
Shear Lag in Steel and Composite Structures . . . . . <i>P. J. Dowling and B. A. Burgan</i>	1
Recent Studies in Composite Bridges . . . . . <i>J. B. Kennedy and N. F. Grace</i>	24
Lateral Distribution of Load in Composite Multi-Girder Bridges <i>M. Elgaaly</i>	35
Choices Facing the Designer of Continuous Composite Plate Girder Bridges to BS 5400 . . . . . <i>A. Low</i>	48
Ultimate Shear Strength of Thin Webbed Steel and Concrete Composite Girders . . . . . <i>D. M. Porter and Z. E. A. Cherif</i>	55
Unwelded Shear Connectors for Composite Beams . . . . . <i>S. Moy, C. Jolly and A. El-Shihy</i>	65
Design Tools for Steel Beams with Web Openings . . . . . <i>R. G. Redwood and S. H. Cho</i>	75
The Use of Tapered Welded Composite Beams in Buildings . . . . . <i>G. K. Raven and M. J. Glover</i>	84
Composite Floor Design-Practices in Canada . . . . . <i>E. Y. L. Chien</i>	96
Flexural Strength of Composite Slabs . . . . . <i>L. D. Luttrell</i>	106

Composite Reinforced End-Anchored Concrete Floors . . . . .	117
<i>D. O'Leary, A. El-Dharat and C. Duffy</i>	
The Efficiency of Shear-Bond Interlock Between Profiled Steel Sheeting and Concrete . . . . .	127
<i>C. K. Jolly and A. K. M. Zubair</i>	
A Comparison of Smeared and Discrete Connection in Composite Construction . . . . .	137
<i>H. D. Wright, V. Kristek and J. Vitek</i>	
Behaviour of Semi-rigid Composite Frames . . . . .	145
<i>R. T. Leon</i>	
Cyclic Tests of Composite Steel Frames with Energy Absorbing Elements . . . . .	154
<i>D. Jurukovski, B. Simeonov, V. Trajkovski and B. Andonovic</i>	
Thermal Stresses in Structural Sandwich Panels . . . . .	162
<i>J. M. Davies and F. Texier</i>	
Structural Behaviour of Composite Panels . . . . .	172
<i>R. F. Pedreschi</i>	