Bridge Construction Equipment

Marco Rosignoli
Contents
Foreword ix
Preface xi
Acknowledgements xvii
Notation xix

01 Introduction 1
  1.1. Construction cost of a bridge deck 1
  1.2. Introduction to bridge construction equipment 2
  1.3. Typical configurations of bridge construction equipment 5
        References 7

02 Beam launchers 9
  2.1. Technology of beam precasting 9
  2.2. Straddle carriers and heavy lifters 10
  2.3. Beam launchers 13
        References 21

03 Self-launching gantries for span-by-span erection of precast segments 23
  3.1. Technology of precast segmental construction 23
  3.2. Technology of span-by-span erection of precast segments 41
  3.3. Twin-girder overhead gantries 44
  3.4. Single-girder overhead gantries 58
  3.5. Underslung gantries 67
        References 77

04 Launching gantries for macro-segmental construction 79
  4.1. Technology of macro-segmental construction 79
  4.2. Twin-girder overhead gantries for span-by-span erection of adjacent macro-segmental decks 83
  4.3. Twin-girder overhead gantries for balanced cantilever macro-segmental construction 93
        References 98

05 Movable scaffolding systems (MSSs) for in-place span-by-span casting 99
  5.1. Technology of span-by-span casting 99
  5.2. Advancing shoring based on ground falsework 109
  5.3. Twin-girder overhead MSSs 110
  5.4. Single-girder overhead MSSs 120
  5.5. Modular single-truss overhead MSSs for long spans 136
  5.6. Underslung MSSs 149
        References 164

06 Forming carriages for the deck slab of composite bridges 167
  6.1. Technology of composite bridges 167
  6.2. Forming carriages 174
        References 184
From procurement to safe operations

11.1. Contractual environment 377
11.2. Request for Proposal 379
11.3. Design documents 387
11.4. Risk management 408
11.5. Safety 410

References 412

Forensics

12.1. Introduction 415
12.2. Emergency response to failure 417
12.3. Forensic investigation 424
12.4. Case studies 432

References 441

Glossary 443

Further reading 453

Index 455