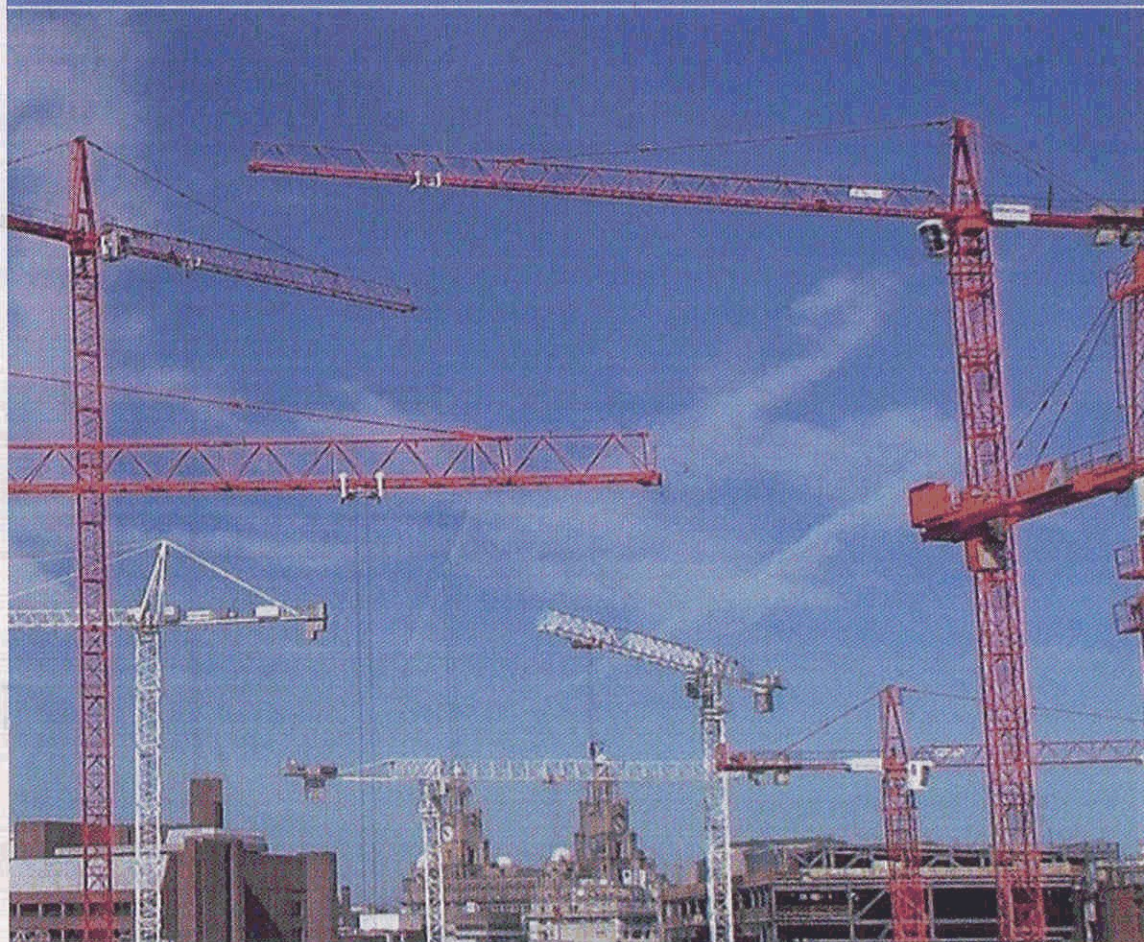


CONSTRUCTION COST MANAGEMENT

LEARNING FROM CASE STUDIES



KEITH POTTS

Contents

<i>Preface</i>	xiii
Part I Introduction	1
1 Introduction and overview	3
1.1 <i>Setting the scene</i>	3
1.2 <i>Construction overview</i>	3
1.3 <i>Influential reports</i>	5
1.4 <i>Recommendations from professional bodies</i>	6
1.5 <i>Learning from case studies</i>	7
1.6 <i>Learning from project failures</i>	10
1.7 <i>Relevant observation</i>	11
1.8 <i>Conclusion</i>	11
1.9 <i>Questions</i>	12
<i>Bibliography</i>	12
2 Reports and recommendations	14
2.1 <i>Introduction</i>	14
2.2 <i>The Latham report, Constructing the Team (1994)</i>	15
2.3 <i>Levene Efficiency Scrutiny (1995)</i>	17
2.4 <i>Construction Procurement Guidance, HM Treasury (1996)</i>	17
2.5 <i>Construction Industry Board (CIB) working groups (1996–1997)</i>	19
2.6 <i>The Egan report Rethinking Construction (1998)</i>	20
2.7 <i>Modernising Construction, National Audit Office (2001)</i>	22
2.8 <i>The second Egan report, Accelerating Change (2002)</i>	23
2.9 <i>Achieving Excellence in Construction Procurement Guides, Office of Government Commerce (2003)</i>	24
2.10 <i>Improving Public Services through Better Construction, National Audit Office (2005)</i>	24
2.11 <i>Conclusion</i>	25
2.12 <i>Questions</i>	25
<i>Bibliography</i>	26

Part II Management of the pre-contract stage	27
3 Selecting the consultants and contractors	29
3.1 Introduction	29
3.2 Selecting consultants	30
3.3 Selecting contractors by value	34
3.4 Construction Industry Research and Information Association (CIRIA) Guide – Selecting Contractors by Value	39
3.5 Two-stage tendering	41
3.6 FIDIC tendering procedures	41
3.7 Conclusion	44
3.8 Questions	44
Bibliography	45
4 Pre-contract cost management	46
4.1 Introduction	46
4.2 Cost estimating on engineering, manufacturing and process industries	47
4.3 Cost estimating on civil engineering projects	49
4.4 Cost estimating on building projects	52
4.5 General comments	57
4.6 Action after receipt of tenders	57
4.7 Conclusion	57
4.8 Questions	58
Bibliography	58
5 Cost management on PFI projects	59
5.1 Introduction	59
5.2 Structure of BOT projects	60
5.3 Case study: Nottingham Express Transit (NET) Light Rail	60
5.4 Factors leading to success on BOT projects	62
5.5 Risks and securities	62
5.6 Case study: Sydney SuperDome, Australia	63
5.7 The Private Finance Initiative (PFI)	64
5.8 The role of the cost consultant in PFI/PPP projects	69
5.9 Case study: Stoke-on-Trent Schools, UK	70
5.10 Conclusion	72
5.11 Questions	72
Bibliography	73
6 Contractor's estimating and tendering	75
6.1 Introduction	75
6.2 Stage 1 – decision to tender	77
6.3 Stage 2 – determining the basis of the tender	77
6.4 Stage 3 – preparation of cost estimate	79
6.5 Stage 4 – commercial appreciation	84
6.6 Stage 5 – conversion of estimate to tender	85
6.7 Stage 6 – submission of tender	86

- 6.8 *Conclusion* 86
- 6.9 *Questions* 86
- Bibliography* 87

Part III Key tools and techniques 89

7 Value management 91

- 7.1 *Introduction* 91
- 7.2 *What is value management?* 91
- 7.3 *Value planning (VP)* 93
- 7.4 *Metropolis United's new football stadium* 94
- 7.5 *Value engineering (VE)* 97
- 7.6 *Value reviewing (VR)* 98
- 7.7 *Case studies* 99
- 7.8 *Conclusion* 103
- 7.9 *Questions* 103
- Bibliography* 103

8 Risk management (RM) 105

- 8.1 *Introduction* 105
- 8.2 *Risk identification* 106
- 8.3 *Risk analysis techniques* 108
- 8.4 *Risk register* 114
- 8.5 *Risk response* 114
- 8.6 *Strategic risk management* 116
- 8.7 *Case studies* 118
- 8.8 *Conclusion* 119
- 8.9 *Questions* 120
- Bibliography* 120

9 Whole-life costing 122

- 9.1 *Introduction* 122
- 9.2 *Understanding the relevance of whole-life costing (WLC)* 123
- 9.3 *The basic steps in whole-life costing (WLC)* 123
- 9.4 *Money, time and investment* 125
- 9.5 *Calculations* 127
- 9.6 *Problems with assessing whole-life costs* 129
- 9.7 *Whole-life value (WLV)* 129
- 9.8 *Conclusion* 130
- 9.9 *Questions* 130
- Bibliography* 131

Part IV Procurement strategies 133

10 Organizational methods (part A) 135

- 10.1 *Introduction* 135
- 10.2 *Traditional method* 137

- 10.3 *Design and build* 140
- 10.4 *Turnkey* 146
- 10.5 *Joint ventures* 147
- 10.6 *Consortium* 149
- 10.7 *Partnering* 149
- 10.8 *Conclusion* 155
- 10.9 *Questions* 155
- Bibliography* 155

11 Organizational methods (part B) 157

- 11.1 *Introduction: management methods* 157
- 11.2 *Management contracting* 158
- 11.3 *Construction management* 161
- 11.4 *Management contracting or construction management?* 165
- 11.5 *Reflections on the Scottish Parliament building* 165
- 11.6 *Design and manage* 167
- 11.7 *EC procurement rules* 168
- 11.8 *Achieving Excellence in Construction* 168
- 11.9 *The NHS Procure 21 guidelines* 170
- 11.10 *Highways Agency – overlying principles for future procurement* 171
- 11.11 *The 2012 London Olympics* 172
- 11.12 *Selecting the procurement route* 173
- 11.13 *Achieving Excellence in Construction methodology* 174
- 11.14 *Conclusion* 174
- 11.15 *Questions* 176
- Bibliography* 176

12 Payment systems and contract administration 178

- 12.1 *Introduction* 178
- 12.2 *Price-based, lump-sum plan and specification* 179
- 12.3 *Price-based, bills of quantities (BofQ)* 180
- 12.4 *Operational bills* 183
- 12.5 *Price-based, method-related bills* 184
- 12.6 *Price-based bills of quantities (BofQ) with milestone payments* 184
- 12.7 *Price-based activity schedules* 186
- 12.8 *Cost-based, cost-reimbursement contracts* 188
- 12.9 *Cost-based, target-cost contracts* 189
- 12.10 *Conclusion* 192
- 12.11 *Questions* 193
- Bibliography* 193

Part V Management of the post-contract stage 195

13 Contractors' cost-control and monitoring procedures 197

- 13.1 *Introduction* 197
- 13.2 *Developing a cost-control system* 198
- 13.3 *Method 1: cost-value reconciliation (CVR)* 199
- 13.4 *Method 2: contract variance – unit costing* 203

- 13.5 *Method 3: earned value analysis* 206
- 13.6 *Conclusion* 207
- 13.7 *Question* 209
- Bibliography* 209

14 Change management – valuing variations 211

- 14.1 *Introduction* 211
- 14.2 *Contractual requirements – ICE Conditions of Contract, 7th edition, January 2003* 212
- 14.3 *Contractual requirements – JCT Standard Building Contract with Quantities (SBC/Q 2005 edition)* 213
- 14.4 *Contractual requirements – The NEC Engineering and Construction Contract, 3rd edition* 214
- 14.5 *Fixing the rate* 215
- 14.6 *Quantum meruit claims* 219
- 14.7 *Some other relevant legal cases (reported in date order)* 221
- 14.8 *Conclusion* 225
- 14.9 *Questions* 225
- Bibliography* 226

15 Claims management 227

- 15.1 *Introduction* 227
- 15.2 *Terms in contract conditions* 228
- 15.3 *Legal requirements of claims submission* 229
- 15.4 *Contractor's programme* 231
- 15.5 *Concurrent delays* 231
- 15.6 *Proving the delay* 233
- 15.7 *Disruption* 234
- 15.8 *Progress records* 234
- 15.9 *Claims presentation* 235
- 15.10 *Quantifying the claim* 236
- 15.11 *Conclusion* 240
- 15.12 *Some legal cases* 240
- 15.13 *Questions* 242
- Bibliography* 243

Part VI Contracts and case study 245

16 The NEC *Engineering and Construction Contract* 247

- 16.1 *Introduction* 247
- 16.2 *The NEC family of contracts* 247
- 16.3 *Objectives of the NEC* 248
- 16.4 *Design principles* 250
- 16.5 *Core clauses* 252
- 16.6 *Secondary options* 254
- 16.7 *ECC tender documents* 255
- 16.8 *Conclusion* 256

16.9 Question 257
Bibliography 257

17 FIDIC standard forms of international construction contract 258

17.1 Introduction 258
17.2 The new forms 258
17.3 Balance of risk 260
17.4 Structure of the new Red Book 260
17.5 The employer (clause 2) 261
17.6 The engineer (clause 3) 262
17.7 The contractor (clause 4) 263
17.8 Commencement, delays and suspension (clause 8) 265
17.9 Measurement and evaluation (clause 12) 269
17.10 Variations and adjustments (clause 13) 271
17.11 Contract price and payments (clause 14) 275
17.12 Claims, dispute and arbitration (clause 20) 278
17.13 Conclusion 278
17.14 Questions 279
Acknowledgements 279
Bibliography 279

18 Case study: Heathrow Terminal 5 281

18.1 Introduction 281
18.2 Project management philosophy 282
18.3 T5 Agreement 283
18.4 The approval process 285
18.5 Controlling the time, cost and quality 286
18.6 Logistics 287
18.7 The 3D project model 288
18.8 The use of the NEC 288
18.9 Role of the cost consultants 289
18.10 Lessons learned 290
18.11 Conclusion 291
Bibliography 292

Table of cases 293
Index 295