

Contents

Preface	vii
1 General Topics	1
1.1 How to Use This Book	2
1.2 You have to See It to <i>Solve</i> It	5
1.3 My Approach to Modern Geotechnical Engineering Practice – An Overview	12
1.4 Mistakes or Errors	26
2 Geotechnical Topics	35
2.1 Soil Classification – Why Do We Have It?	36
2.2 Soil Stresses and Strains	61
2.3 Soil Shear Strength	73
2.4 Shear Strength Testing – What is Wrong with the Direct Shear Test?	84
2.5 What is the Steady State Line?	94
2.6 Static Equilibrium and Limit States	105
2.7 Unsaturated Soils	110
3 Foundations	127
3.1 Settlements of Clays	128
3.2 Settlements of Sands	139
3.3 Self-Weight Settlement of Sandy Soils	161
3.4 Bearing Capacity of Shallow Foundations	169
3.5 Load Capacity of Deep Foundations	179
3.6 Laterally Loaded Piles and Shafts	205
4 Retaining Structures – Lateral Loads	221
4.1 Lateral Earth Pressure	222
4.2 Retaining Walls – Gravity, Cantilevered, MSE, Sheet Piles, and Soldier Piles	234
4.3 Tieback Walls	255

5 Geotechnical LRFD	267
5.1 Reliability, Uncertainty and Geo-Statistics	268
5.2 Geotechnical Load and Resistance Factor Design	278
5.3 LRFD Spread Footings	282
5.4 LRFD Pile Foundations	295
5.5 LRFD Drilled-Shaft Foundations	303
5.6 LRFD Slope Stability	312
6 Closing	321
6.1 The Big Picture	322
6.2 V and V and Balance	327
6.3 The Biggest Problem	330
6.4 Topics Left for Later	332
Index	335