

The book cover features a photograph of a road roller paving a road. The roller is in the foreground, moving from left to right, with its large rear drum and smaller front drum visible. The road surface is being laid in a dark, granular material. In the background, there are several tall, cylindrical structures, possibly part of a construction site or a quarry, under a clear blue sky. The title 'Highway Materials, Soils, and Concretes' is printed in large, bold, blue letters across the middle of the cover, and 'Fourth Edition' is printed in smaller white letters to the right.

Highway Materials, Soils, and Concretes

Fourth Edition

WILEY
John Wiley & Sons, Inc.

Contents

CHAPTER 1 Engineering Properties of Soils, 1

- 1-1 Soil Types, 1
- 1-2 Mass-Volume Relations, 5
- 1-3 Classification Tests, 15
- 1-4 Soil Classification, 24
- 1-5 Soil Water, 31
- 1-6 Soil Strength and Settlement, 41
- 1-7 Test Procedures, 49
- 1-8 Problems, 63

CHAPTER 2 Soils Investigation, 76

- 2-1 Soil Deposits, 76
- 2-2 Field Investigation Techniques, 77
- 2-3 Laboratory Testing, 90
- 2-4 Soils Reports, 90
- 2-5 Problems, 94

CHAPTER 3 Compaction, 97

- 3-1 Maximum Dry Density, 97
- 3-2 Field Density, 103

- 3-3 Compaction Operations and Quality Control, 108
- 3-4 Test Procedures, 113
- 3-5 Problems, 116

CHAPTER 4 Aggregates, 121

- 4-1 Aggregate Sources, 121
- 4-2 Aggregate Terms and Types, 127
- 4-3 Aggregate Strength, 128
- 4-4 Properties, 130
- 4-5 Specifications, 139
- 4-6 Sampling and Testing, 143
- 4-7 Blending Aggregates, 147
- 4-8 Test Procedures, 148
- 4-9 Problems, 156

CHAPTER 5 Pavement Structure and Base, 162

- 5-1 Pavement Structure, 162
- 5-2 Thickness Design, 167
- 5-3 Subgrade Construction, 179
- 5-4 Granular Base and Subbase Courses, 184
- 5-5 Stabilized Base and Surface Courses, 188
- 5-6 Geosynthetics, 192
- 5-7 The Strategic Highway Research Program, 196
- 5-8 Inspection and Quality Control, 196
- 5-9 Test Procedures, 197
- 5-10 Problems, 200

CHAPTER 6 Asphalt Pavements and Materials, 204

- 6-1 Asphalt Paving Materials, 204
- 6-2 Superpave™ Asphalt Binders, 212

- 6-3 Asphalt Concrete—Properties, 216
- 6-4 Aggregates, 227
- 6-5 Asphalt Concrete Mix Design, 232
- 6-6 The Superpave™ Mix Design, 240
- 6-7 Stone Matrix Asphalt, 248
- 6-8 Production and Paving, 250
- 6-9 Inspection and Quality Control, 257
- 6-10 Asphalt Concrete Recycling, 262
- 6-11 Other Asphalt Surfaces, 265
- 6-12 Test Procedures, 265
- 6-13 Problems, 271

CHAPTER 7 Portland Cement Concrete, 277

- 7-1 Portland Cement, 277
- 7-2 Properties of Portland Cement Concrete, 284
- 7-3 Basic Tests, 294
- 7-4 Admixtures, 297
- 7-5 Supplementary Cementing Materials, 299
- 7-6 Materials, 301
- 7-7 Mix Design, 306
- 7-8 Trial Mixes, 314
- 7-9 High-Strength Concrete, 326
- 7-10 Mixing, Placing, and Curing, 333
- 7-11 Concrete Pavements, 337
- 7-12 Whitetopping, 339
- 7-13 Inspection and Quality Control, 342
- 7-14 Special Concretes, 347
- 7-15 Test Procedures, 349
- 7-16 Problems, 359

Units, Symbols, and Abbreviations, 365

Appendix, 369

Bibliography, 371

Index, 374