

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Record Nr.           | UNINA9910254199203321                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Autore                  | Ameratunga Jay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Titolo                  | Correlations of Soil and Rock Properties in Geotechnical Engineering<br>[[electronic resource] /] / by Jay Ameratunga, Nagaratnam Sivakugan,<br>Braja M. Das                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Pubbl/distr/stampa      | New Delhi : , : Springer India : , : Imprint : Springer, , 2016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ISBN                    | 81-322-2629-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Edizione                | [1st ed. 2016.]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Descrizione fisica      | 1 online resource (236 p.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Collana                 | Developments in Geotechnical Engineering, , 2364-5156                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Disciplina              | 624.151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Soggetti                | Engineering geology<br>Engineering—Geology<br>Foundations<br>Hydraulics<br>Geotechnical engineering<br>Building—Superintendence<br>Construction industry—Management<br>Construction superintendence<br>Geoengineering, Foundations, Hydraulics<br>Geotechnical Engineering & Applied Earth Sciences<br>Construction Management                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Lingua di pubblicazione | Inglese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Formato                 | Materiale a stampa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Livello bibliografico   | Monografia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Note generali           | Description based upon print version of record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Nota di bibliografia    | Includes bibliographical references at the end of each chapters and<br>index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Nota di contenuto       | Preface; Acknowledgements; Contents; About the Authors; Chapter 1:<br>Introduction; 1.1 Laboratory Testing; 1.2 In Situ Testing; 1.3 Empirical<br>Correlations; 1.4 Contents of the Book; References; Chapter 2:<br>Geotechnical Properties of Soils - Fundamentals; 2.1 Laboratory Tests<br>for Soils; 2.2 Phase Relations; 2.2.1 Terminology and Definitions; 2.2.2<br>Relationships Between the Variables; 2.3 Granular Soils; 2.3.1 Grain<br>Size Distribution; 2.3.2 Relative Density; 2.4 Plasticity; 2.4.1 Atterberg<br>Limits; 2.4.2 Classification of Fine Grained Soils Based on Plasticity; 2.5<br>Compaction; 2.6 Permeability<br>2.6.1 Darcy's Law and Permeability Measurements2.6.2 Intrinsic<br>Permeability; 2.6.3 Reynolds Number and Laminar Flow; 2.6.4 |

Anisotropy; 2.6.5 One-Dimensional Flow in Layered Soils; 2.6.6 Effect of Applied Pressure on Permeability; 2.6.7 Critical Hydraulic Gradient; 2.7 Effective Stresses and Total Stresses; 2.8 Consolidation; 2.8.1 Computation of Final Consolidation Settlement; 2.8.2 Time Rate of Consolidation; 2.8.3 Coefficient of Volume Compressibility  $m_v$ ; 2.8.4 Secondary Compression; 2.9 Shear Strength; 2.9.1 Shear Strength, Friction Angle and Cohesion  
2.9.2 Undrained and Drained Loadings in Clays  
2.9.3 Undrained Shear Strength of Clays; 2.9.4 Peak, Residual and Critical States; 2.9.5 Dilatancy Angle; 2.9.6 Coefficient of Earth Pressure at Rest; 2.10 Soil Variability; References; Chapter 3: Correlations for Laboratory Test Parameters; 3.1 Permeability; 3.1.1 Granular Soils; 3.1.2 Cohesive Soils; 3.2 Consolidation; 3.2.1 Compression Index; 3.2.2 Recompression Index or Swelling Index; 3.2.3 Compression Ratio and Recompression Ratio; 3.2.4 Constrained Modulus; 3.2.5 Coefficient of Consolidation  $c_v$ ; 3.2.6 Secondary Compression  
3.3 Shear Strength Parameters  $c$  and  $\phi$   
3.3.1 Cohesion in Terms of Effective Stress  $c$ ; 3.3.2 Effects of Dilatancy in Granular Soils; 3.3.3  $\phi_{peak}$ ,  $\phi_{icv}$ ,  $\phi_{ires}$  Relationships with Plasticity Index for Clays; 3.3.4 Other Friction Angle Correlations; 3.3.5 Stress Path Dependence of Friction Angles; 3.3.6 Skempton's Pore Pressure Parameters; 3.3.7 Sensitivity of Clays; 3.4 Undrained Shear Strength of a Clay  $c_u$ ; 3.5 Soil Stiffness and Young's Modulus; 3.6 Coefficient of Earth Pressure at Rest  $K_0$ ; 3.7 Using Laboratory Test Data in Pile Designs; References; Chapter 4: Standard Penetration Test  
4.1 Standard Penetration Test Procedure  
4.2 Correction of N Value for Effective Overburden Pressure (For Granular Soils); 4.3 Correction for SPT Hammer Energy Efficiency; 4.4 Correlation of Standard Penetration Number with Relative Density ( $D_r$ ) of Sand; 4.5 Correlation of N with Peak Drained Friction Angle ( $\phi$ ) for Sand; 4.6 Correlation of N with Modulus of Elasticity ( $E$ ) for Sandy Soils; 4.7 Correlation of Undrained Cohesion ( $c_u$ ) with N for Clay Soil; 4.8 Correlation of Preconsolidation Pressure ( $\sigma_{mac}$ ) with N for Clay Soil  
4.9 Correlation of Overconsolidation Ratio ( $O_{cr}$ ) with N for Clay Soil

## Sommario/riassunto

This book presents a one-stop reference to the empirical correlations used extensively in geotechnical engineering. Empirical correlations play a key role in geotechnical engineering designs and analysis. Laboratory and in situ testing of soils can add significant cost to a civil engineering project. By using appropriate empirical correlations, it is possible to derive many design parameters, thus limiting our reliance on these soil tests. The authors have decades of experience in geotechnical engineering, as professional engineers or researchers. The objective of this book is to present a critical evaluation of a wide range of empirical correlations reported in the literature, along with typical values of soil parameters, in the light of their experience and knowledge. This book will be a one-stop-shop for the practising professionals, geotechnical researchers and academics looking for specific correlations for estimating certain geotechnical parameters. The empirical correlations in the forms of equations and charts and typical values are collated from extensive literature review, and from the authors' database.