1. Record Nr. UNINA9910492149403321 Advanced tunneling techniques and information modeling of **Titolo** underground infrastructure: proceedings of the 6th GeoChina International Conference on Civil & Transportation Infrastructures: From Engineering to Smart & Green Life Cycle Solutions -- Nanchang, China, 2021 / / J. James Yang, Wen-Chieh Cheng, Shuying Wang, editors Pubbl/distr/stampa Cham, Switzerland:,: Springer,, [2021] ©2021 **ISBN** 3-030-79672-8 Descrizione fisica 1 online resource (129 pages) Sustainable civil infrastructures Collana Disciplina 624.151 Soggetti Geotechnical engineering

Lingua di pubblicazione Inglese **Formato** Materiale a stampa

Nota di contenuto

Monografia

Livello bibliografico

Intro -- Introduction -- Contents -- About the Editors -- Inception of Debris Avalanches: A Material Point Method Modelling -- 1 Introduction -- 2 Materials and Methods -- 2.1 The Material Point Method (MPM) -- 2.2 Scheme and Input Data -- 3 Modelling the Impact-Induced Debris Avalanche -- 4 Remarks on the Inception Mechanisms -- 5 Concluding Remarks -- References -- Research on the Calculation of Segment Floating Considering the Action Degree of Soil Arching Effect -- 1 Introduction -- 2 Analysis of Segment Floating -- 2.1 The Effect of Groundwater -- 2.2 The Impact of the Tunnel Wall Grouting and Grouting Slurry -- 2.3 The Impact of Back Channeling of Mud Slurry -- 2.4 The Impact of Rebound Action of Foundation -- 3 Stress Analysis of Segment -- 3.1 Establishment of Calculation Model -- 3.2 Calculation of Buoyancy -- 3.3 Calculation of Anti-buoyancy -- 3.4 Integral Calculation of Segment Buoyancy -- 4 Application in Practical Project -- 5 Effective Anti-floating Measures for Segments on Site -- 5.1 Controlling the Shield Attitude -- 5.2 Stacking Heavy Objects in the Tunnel -- 5.3 Adjusting the Value of Tunneling Parameters -- 5.4 Adjusting the Mixture Ratio of Grouting Slurry -- 6 Conclusions -- References -- Invert Heave Disease and Treatment Measures of Operating Railway Tunnel in Horizontal

Layered Rock Mass -- 1 Introduction -- 2 Project Overview -- 3 Field Investigation of Geological Conditions and Tunnel Support -- 3.1 Survey of Lithology and Rock Mass Structure -- 3.2 In-Situ Stress Test -- 3.3 Inspection of Tunnel Support -- 4 Three-Dimensional Numerical Analysis -- 4.1 Numerical Modeling with Layered Rock Mass -- 4.2 Comparison for Cases with and Without Layered Rock Mass -- 4.3 Influence of Horizontal In-Situ Stress -- 5 Numerical Analysis of Two Treatment Schemes -- 5.1 Options for Treatment Scheme. 5.2 Displacement of Tunnel Structure -- 5.3 Structural Stress of Tunnel Support Structure -- 6 Conclusions -- References -- A Semi-analytical Model for a Compaction-Grouted Soil Nail with Grout Bulb -- 1 Introduction -- 2 Energy Equilibrium Equation of the Soil Nail with Grout Bulb Considering the Compaction Effect -- 2.1 Establish of Relationship Considering Compaction Effect -- 2.2 Analysis of Soil Nail with a Grout Bulb -- 3 Laboratory Test Verification -- 3.1 Test System -- 3.2 Test Procedure -- 3.3 Verification of the Presented Method -- 3.4 Parameter Analysis -- 4 Conclusions -- References --Prediction on the Penetration Resistance of Mono-Bucket Foundations in Silty Soil -- 1 Introduction -- 2 Prototype Field Test -- 3 Penetration Resistance Prediction -- 4 Calculation Method Based on Soil Parameters -- 5 Calculation Method Based on In-Situ CPT Test -- 6 Back-Analysis -- 7 Discussion -- 8 Conclusion -- References -- CPT and SPT as Complementary Tests for the Formulation of Geotechnical Design Profiles -- 1 Introduction -- 2 Sites and Investigation Description --2.1 Subsurface Strata Conditions -- 3 SPT and CPT Data Analysis -- 4 Results and Discussions -- 5 Conclusions -- 6 Recommendations -- 7 Limitation -- References -- Research on Rapid Detection Technology Based on Infrared Image and Calibration Method of Tunnel Cracks -- 1 Introduction -- 2 Tunnel Image Acquisition Mode Based on Infrared Supplement Light -- 3 Tunnel Lining Crack Measurement Technology Based on Digital Images -- 3.1 Crack Area Extraction -- 3.2 Crack Edge Extraction Based on Zernike Orthogonal Moments -- 3.3 Calculation of Crack Width -- 4 Conventional Calibration Method -- 5 New Methods -- 5.1 Implementation Steps -- 5.2 Field Test -- 5.3 Calibration Index -- 5.4 Qualification Standard -- 6 Case Studies --6.1 Implementation Plan -- 6.2 Test Results -- 7 Conclusions. References -- Research on the Construction of 3D Laser Scanning Tunnel Point Cloud Based on B-spline Interpolation -- 1 Point Cloud Data Processing -- 2 Tunnel Surface Construction -- 2.1 Construction of All Area Polynomial Surface -- 2.2 Construction of Subdivision Surface -- 3 Tunnel Surface Analysis -- 3.1 Regional Accuracy Evaluation of Vault -- 3.2 Accuracy Evaluation of the Region of the Arch Waist -- 4 Conclusion and Prospect -- References -- Author Index.