

1. Record Nr.	UNINA9910820234603321
Autore	Singh Bhawani
Titolo	Engineering rock mass classification : tunnelling, foundations, and landslides // Bhawani Singh, R.K. Goel
Pubbl/distr/stampa	Burlington, Mass., : Butterworth-Heinemann, 2011
ISBN	1-283-15265-7 9786613152657 0-12-385879-8
Edizione	[1st ed.]
Descrizione fisica	1 online resource (382 p.)
Altri autori (Persone)	GoelR. K. <1960->
Disciplina	625.1/22 625.122
Soggetti	Engineering geology Tunneling Foundations Landslides - Prevention Rocks Rock mechanics
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 and index.
Nota di contenuto	Front Cover -- Engineering Rock Mass Classification: Tunneling, Foundations, and Landslides -- Copyright -- Dedication -- Contents -- Preface -- Acknowledgments -- Chapter 1: Philosophy of Engineering Classifications -- The classification -- Philosophy of classification system -- Need for engineering geological map -- Management of uncertainties -- Present-day practice -- Scope of the book -- References -- Chapter 2: Shear Zone Treatment in Tunnels and Foundations -- Shear zone -- Treatment for tunnels -- Treatment for dam foundations -- References -- Chapter 3: Rock Material -- Rock material -- Homogeneity and inhomogeneity -- Classification of rock material -- Class I and II brittle rocks -- Uniaxial compression -- Stability in water -- Classification on the basis of slake durability index -- References -- Chapter 4: Rock Quality Designation -- Rock quality designation -- Direct method -- Indirect methods -- Weighted joint density -- Red-flag effect of low RQD -- Application of RQD --

References -- Chapter 5: Terzaghi's Rock Load Theory -- Introduction -- Rock classes -- Rock load factor -- Modified Terzaghi's theory for tunnels and caverns -- References -- Chapter 6: Rock Mass Rating -- Introduction -- Collection of field data -- Estimation of RMR -- Applications of RMR -- Precautions -- Rock mass excavability index for TBM -- Tunnel alignment -- References -- Chapter 7: Tunneling Hazards -- Introduction -- Tunneling Conditions -- Empirical approach for predicting ground conditions -- Theoretical/analytical approach -- Effect of thickness of weak band on squeezing ground condition -- Sudden flooding of tunnels -- Chimney formation -- Environmental hazards due to toxic or explosive gases and geothermal gradient -- Concluding remarks -- References -- Chapter 8: Rock Mass Quality Q-System -- The Q-system -- Joint orientation and the Q-system.

Updating the Q-system -- Collection of field data -- Classification of the rock mass -- Estimation of support pressure -- Estimation of deformation or closure -- Unsupported span -- Design of supports -- New austrian tunneling method -- Norwegian method of tunneling -- Rock mass characterization -- Drainage measures -- Experiences in poor rock conditions -- Concluding remarks -- References -- Chapter 9: Rock Mass Number -- Introduction -- Interrelation between Q and RMR -- Prediction of ground conditions -- Prediction of support pressure -- Effect of tunnel size on support pressure -- Correlations for estimating tunnel closure -- Effect of tunnel depth on support pressure and closure in tunnels -- Approach for obtaining ground reaction curve -- Coefficient of volumetric expansion of failed rock mass -- References -- Chapter 10: Rock Mass Index -- Introduction -- Selection of parameters used in R_{Mi} -- Calibration of R_{Mi} from known rock mass strength data -- Scale effect -- Examples (palmstrom, 1995) -- Applications of R_{Mi} -- Benefits of using R_{Mi} -- Limitations of R_{Mi} -- References -- Chapter 11: Rate of Tunneling -- Introduction -- Classification of ground/job conditions for rate of tunneling -- Classification of management conditions for rate of tunneling -- Combined effect of ground and management conditions on rate of tunneling -- Tunnel management (Singh, 1993) -- Poor tender specifications -- Contracting practice -- Quality management by international tunneling association -- References -- Chapter 12: Support System in Caverns -- Support pressure -- Wall support in caverns -- Roof support in caverns -- Stress distribution in caverns -- Opening of discontinuities in roof due to tensile stress -- Rock reinforcement near intersections -- Radial displacements -- Precautions -- References -- Chapter 13: Strength Enhancement of Rock Mass in Tunnels.

Causes of strength enhancement -- Effect of intermediate principal stress on tangential stress at failure in tunnels -- Uniaxial compressive strength of rock mass -- Reason for strength enhancement in tunnels and a new failure theory -- Critical strain of rock mass -- Criterion for squeezing ground condition -- Rock burst in brittle rocks -- Tensile strength across discontinuous joints -- Dynamic strength of rock mass -- Residual strength parameters -- References -- Chapter 14: Rock Mass Quality for Open Tunnel Boring Machines -- Introduction -- Q and QTBM -- Penetration and advance rates -- Cutter wear -- Penetration and advance rates versus QTBM -- Estimating time for completion -- Risk management -- References -- Chapter 15: Strength of Discontinuities -- Introduction -- Joint wall roughness coefficient -- Joint wall compressive strength -- Joint matching coefficient -- Residual angle of friction -- Shear strength of joints -- Dynamic shear strength of rough rock joints -- Theory of shear strength at very high

confining stress -- Normal and shear stiffnesses of rock joints --
 References -- Chapter 16: Shear Strength of Rock Masses in Slopes --
 Mohr-coulomb strength parameters -- Non-linear failure envelopes for
 rock masses -- Strength of rock masses in slopes -- Back analysis of
 distressed slopes -- References -- Chapter 17: Types of Failures of
 Rock and Soil Slopes -- Introduction -- Planar (translational) failure --
 3D Wedge failure -- Circular (rotational) failure -- Toppling failure
 (topples) -- Raveling slopes (falls) -- Effect of slope height and
 groundwater conditions on safe slope angle -- A basic landslide
 classification system -- Causative classification -- Comprehensive
 classification system of landslides -- Landslide in over-consolidated
 clays -- Rock slope failures -- Landslide dams -- References --
 Chapter 18: Slope Mass Rating.
 The slope mass rating -- Slope stability classes -- Support measures
 -- Modified SMR approach -- Case study of stability analysis using
 modified SMR approach -- Portal and cut slopes -- References --
 Chapter 19: Landslide Hazard Zonation -- Introduction -- Landslide
 hazard zonation maps-the methodology -- A case history (gupta and
 anbalagan, 1995) -- Proposition for tea gardens -- Geographic
 information system -- Mega-regional landslide zonation -- References
 -- Chapter 20: Allowable Bearing Pressure for Shallow Foundations --
 Introduction -- A classification for net safe bearing pressure --
 Allowable bearing pressure -- Coefficient of elastic uniform
 compression for machine foundations -- Scour depth around bridge
 piers -- Rock parameters to select type of dam -- References --
 Chapter 21: Method of Excavation -- Excavation techniques --
 Assessing the rippability -- Rock mass classification according to ease
 of ripping -- Empirical methods in blasting -- References -- Chapter
 22: Rock Drillability -- Drillability and affecting parameters --
 Classification for drilling condition -- Other approaches -- References
 -- Chapter 23: Permeability and Groutability -- Permeability --
 Permeability of various rock types -- Permeability for classifying rock
 masses -- Permeability versus grouting -- Determination of
 permeability -- Grouting -- References -- Chapter 24: Gouge Material
 -- Gouge -- Shear strength of filled discontinuities (silty to clayey
 gouge) -- Dynamic strength -- References -- Chapter 25: Engineering
 Properties of Hard Rock Masses -- Hard rock masses -- Modulus of
 deformation -- UCS -- Uniaxial tensile strength -- Strength criterion
 -- Support pressure in non-squeezing/non-rock burst conditions (H
 < -- 350 Q1/3) -- Half-tunnels -- References -- Chapter 26:
 Geological Strength Index -- Geological strength index -- Generalized
 strength criterion.
 Mohr-coulomb strength parameters -- Modulus of deformation --
 Rock parameters for intact schistose -- Estimation of residual strength
 of rock masses -- Classification of squeezing ground condition --
 References -- Chapter 27: Evaluation of Critical Rock Parameters --
 Introduction -- Critical parameters -- Parameter intensity and
 dominance -- Classification of rock mass -- Example for studying
 parameter dominance in underground excavation for a coal mine with a
 flat roof -- Relative importance of rock parameters in major projects --
 Interaction between rock parameters -- Application in entropy
 management -- References -- Chapter 28: In Situ Stresses -- The need
 for in situ stress measurement -- Classification of geological
 conditions and stress regimes -- Variation of in situ stresses with
 depth -- Effects of in situ stress on rock mass properties -- Core
 Discing -- References -- Appendix I -- Appendix II -- Index.

little information. It forms the bases for design and estimation of the required amount and type of rock support and groundwater control measures. Encompassing nearly all aspects of rock mass classifications in detail, Civil Engineering Rock Mass Classification: Tunnelling, Foundations and Landsides provides construction engineers and managers with extensive practical knowledge which is time-tested in the projects in Himalaya and other parts of the world in comple
