



## Editorial

Since its inception in 1995, the Indian Society for Rock Mechanics & Tunnelling Technology (ISRMTT) has been promoting Research & Development (R&D) activities in the field of Underground Space Technology, Geotechnical Engineering, Mining Sciences, Tunnel Engineering, Rock Mechanics and allied subjects. Also, the society has been regularly publishing a bi-annual Journal of Rock Mechanics and Tunnelling Technology (JRMTT) since 1995 as one of its principal activities with a view to enabling dissemination and exchange of information of new technologies for sustainable development of Water Resources, Infrastructure and Mining related projects. The main objective of this Journal has been to attract research work and typical case studies on underground structures, tunnelling through weak rocks, mining sector, landslides and dynamic rock mechanics with a particular emphasis of its application in complex geological conditions as in Himalayas. Besides, the works related to the latest development in mathematical modelling for its effective application in Rock Mechanics and Tunnelling Technology to predict realistic behaviour of rock mass for design have also been given importance in our Journal.

During the last twenty-one years 164 research/ technical papers including technical notes from researchers, academicians and practicing engineers from India and foreign countries were selected for the publications in JRMTT. Eminent experts from India and abroad have also been invited to share their views in the 'Guest Editorial' column of JRMTT. A complete list of Papers, Guest Editorial and Editorial published till date is given here for reference. For further details, ISRMTT website [www.isrmtt.com](http://www.isrmtt.com) may be visited.

### Vol.21, No.2, July 2015

- Guest Editorial – *Rajbal Singh*
- A New Approach to Estimate Joint Roughness Coefficient and its Influence on Bond Strength of Steel Fibre Reinforced Shotcrete - *D. Kumar, P. K. Behera, U. K. Singh*
- Use of Appropriate Geophysical Technique for Subsurface Assessment - *Birendra Pratap, Hari Dev, Rajbal Singh*
- Risk Analysis of High Hill Slopes – A Case History *P.K. Singh, Ashutosh Kainthola, T.N. Singh*
- Extraction of Locked-Up Coal in Standing Pillars in Indian Underground Coal Mines - *A. Kushwaha, R. Bhattacharjee, S. Tewari, A. Sinha*

### Vol.21, No.1, Jan. 2015

- Editorial: Twenty Years of JRMTT - *Subhash Mitra*
- Influence of Support Pressure on Stress Variation in Cracked Concrete Lined Pressure Tunnels - *I. S. Parvathi, T. V. Praveen*
- Shear Strength Evaluation for Dam Foundations on Rock - *K. R. Dhawan*
- An Analysis of In Situ Test Data for Deformation Modulus of Weak Pyroclastic Rock Mass - *Hari Dev, Rajbal Singh*
- An Investigation on Stability of Mine Slopes Using Two Dimensional Numerical Modelling - *V. Vishal, S. P. Pradhan, T. N. Singh*

### Vol.20, No.2, July 2014

- Guest Editorial - *Chairman and Editors*
- Behaviour of Limestone Rock with Opening under Confining Pressures- *Moataz A. Al-Obaydi, Yussra H. Al-Jobory*

- Steel Liners for Pressure Shafts – Hydrostatic Pressure Testing and Other Quality Control Aspects - *Hari Dev, R.K. Jagota, Rajbal Singh*
- Stress Orientation in the Godavari Gondwana Graben, India - *A. Manohar Rao, D.N.Sharma*
- Geological Overbreak: A Viewpoint of Storage Cavern Excavation - *Saikat Pal, Vijay Shahri*
- Parametric Analysis of An Empirical Correlation Predicting Support Pressure in Squeezing Ground - *R. D. Dwivedi, M. Singh, M. N. Viladkar, R. K. Goel*

Vol.20, No.1, Jan. 2014

- Guest Editorial - *Manoj Verman*
- The Behaviour of Rock Support in Tunnels in Seismic Regions with a Case Study of a Large Underground Cavern in the Himalayas - *Rajinder Bhasin, Thomas Pabst*
- Stress Measurements by Hydraulic Fracturing for Design of Steel Liner for Head Race Tunnel – A Case Study - *Rajbal Singh, A.K. Dhawan, Ranjodh Singh*
- 3D Tunnel Seismic Prediction: A Next Generation Tool to Characterize Rock Mass Conditions Ahead of the Tunnel Face - *T. Dickmann*
- Effect of Shape of Twin Tunnels during Seismic Loading - *S.D.Anitha Kumari, K.S. Vipin, T.G. Sitharam*

Vol.19, No.2, July 2013

- Guest Editorial- *A.B. Pandya*
- A Study of Numerical Modelling of a Rock Slope Based on Modified Mohr-Coulomb Criterion - *S. Rukhaiyar, M. Singh & A. Pain*
- Dynamic Rock Testing and Performance Study of Underground Structures Subjected to Blasting and Seismicity - *R. K. Goel, Bhawani Singh & Subhash Mitra*
- *A Technical Note* on Effect of Saturation and Deformation Rate on Split Tensile Strength for Various Sedimentary Rocks - *K. S. Pathania*
- *A Technical Note* on Monitoring of Jhakri Landslide in Bari Village Area of Himachal Pradesh - *S. K. Mittal, Manjeet Singh & Bhoop Singh*

Vol.19, No.1, Jan. 2013

- Guest Editorial - *Rajbal Singh*
- Effect of Spacing and Orientation of Joints in the Rock on Stress Variation in Lined Pressure Tunnels using Finite Element Method - *I. Siva Parvathi, T. V. Praveen & K. Suresh Kumar*
- Investigation of Delay Time Precision in Pyrotechnic Detonators - *Harsh K. Verma & N. R.Thote*
- Rock Supports and Geological Appraisal for Head Race Tunnel of Tala Hydroelectric Project, Bhutan - *Hari Dev, Rajbal Singh & C.K. Sengupta*
- Assessment and Mitigation of Blast Induced Vibration and Overbreak in Kol Dam Hydroelectric Power Project, India – A Case Study - *Harsh K. Verma, R. K. Goel & V. V. R. Prasad*

Vol.18, No.2, July 2012

- An Experimental Study on Ultimate Bearing Capacity of a Foundation in Anisotropic Rock Masses - *Ajay Bindlish, Mahendra Singh & N. K. Samadhiya*
- Meso-Scale Landslide Hazard Zonation (LHZ) Mapping Technique - A Case Study of Nainital Area, Uttarakhand - *D. Chakraborty & R. Anbalagan*
- State-of-the-Art of Tunnelling Through Squeezing Ground Conditions - *R.D. Dwivedi, R.K. Goel, M. Singh & M.N. Viladkar*

Vol.18, No.1, Jan. 2012

- Editorial – *Subhash Mitra*
- Seismic Microzonation for Kochi City, India in GIS Environment - *A. Kumar, H. N. Singh & D. Shanker*
- Analysis of Excavation Shapes on Fully Grouted Rock Bolt using EFEM - *Debasis Deb, Kamal C. Das & Sandeep Kavala*
- Selection of Suitable Location for Large Underground Openings in Complex Geology - *Amit Gupta & Aditya K. Bhat*
- Polyaxial Stress Analysis of Underground Openings using FLAC® - *D. Scussel & S. Chandra*
- Simple Approach to Non-Linear Analysis of Jointed Rocks - *V. B. Maji*

Vol.17, No.2, July 2011

- Editorial – *Rajbal Singh*
- An Engineering Assessment of Pre-Injection in Tunnelling - *N.R.Barton*
- Analysis of Crack Coalescence in Rock Bridges Using Neural Networks - *A. Ghazvinian, V. Sarfarazi, S.A. Moosavi*
- Effect of Rock Mass Discontinuities on Shock Wave Attenuation Produced by Ground Surface Explosion - *Abdolhadi Ghazvinian, Shahima Rahmatipour*
- Use of Polypropylene Fibre Reinforced Shotcrete (PFRS) for Rock Slope Protection at Tala Hydroelectric Project in Bhutan – *A Case Study - Rajbal Singh, A.K. Sthapak*

Vol.17, No.1, Jan. 2011

- Editorial – *Chairman and Editors*
- Least Square Vector Machine Applied to Elastic Modulus of Jointed Rock Mass - *Pijush Samui*
- Earthquake Mechanism and Active Tectonics of Eastern Nepal Himalayas and Vicinity - *Harihar Paudyal*
- Stress Dependency of Rock Mass Modulus in Predicting Closure of Underground Openings - *Mahendra Singh, M.N. Viladkar, Jaysing Choudhari, R. Rajaraman*
- Efficacy of Grouting in Head Race Tunnel of Tala Hydroelectric Project - *Rajbal Singh, U.S. Vidyarthi*

Vol.16, No.2, July 2010

- Editorial – *S.Mitra & R.K. Goel*
- New Model for Predicting Blast-Induced Overbreak in Development Drivage of Metal Mines - *Kaushik Dey & V.M.S.R. Murthy*
- Rock Joint and Rock Mass Characterization for Nuclear Waste Repositories - *Rajinder Bhasin & Roger Olsson*
- Application of Support Vector Machine for Rock Slope Stability Analysis - *Pijush Samui*
- Time and Cost Aspects of Tunnel Construction if Different Rock Mass - *Rajbal Singh & R.N. Khazanchi*
- Use of Crushed Rock in Developing Abrasion Resistant Concrete for Vishnu Prayag Hydro-Electric Project - *Suresh Chandra Sharma, Subhash Mitra & Pramod Kumar Gupta*

Vol.16, No.1, Jan. 2010

- Guest Editorial – *Shunsuke Sakurai*
- Design of Drilling and Blasting Pattern for Excavation of HRT in High Temperature Zone (Adit 4 Upstream) at Karcham-Wnagtoo Hydroelectric Project - *D.G.Kadkade*
- Study of the Effect of Ratio of Hole Diameter to Rock Bolt Diameter on Pullout Capacity of Fully Grouted Rock Bolts - *A.H. Ghazvinian & M. Rashidi*
- Response and Earthquake Induced Damage of Underground Structures in Rock Mass - *Omer Aydan, Yoshimi Ohta, Melih Geni. Naohiko Tokashiki & K. Ohkubo*
- Instrumentation for Underground Powerhouse of Sardar Sarovar Project, Gujrat - *Rajbal Singh, R.K. Mathur & S.L. Gupta*

Vol.15, No.2, July 2009

- Guest Editorial - *V.M. Sharma*
- Investigation of Dynamic Response for Blast Hole Wall in Rock Excavations - *K. Goshtasbi & M. Eslami*
- Strength Characteristics of Hollow Specimens from Sedimentary Rocks - *Moataz A. Al-Obaydi, Thamer M. Nuri & Abdul Nasser Y. Ali*
- Predictions of Shear Displacement in Fully Grouted Rock Bolt - *T. N. Singh, M. K. Verma, A. K. Verma & K. Sarkar*
- Measurement of In Situ Shear Strength of Rock Mass - *Rajbal Singh*

Vol.15, No.1, Jan. 2009

- Guest Editorial - Extending the Boundaries in the Himalayas - *N. R. Barton*
- Designing and Optimizing Support System - Case Study of Tabriz Metro Single Tunnel - *A.H. Ghazvinian, K. Goshtasbi & N. Ghasempour*
- Effect of Repeated Blast Vibrations on Rock Mass Damage at a Penstock Tunnel of a Hydroelectric Power Project – A Case Study - *M. Ramulu, T.G. Sitharam, P.B. Choudhury, A. K. Raina & A. K. Chakraborty*

- Comparison of Modulus of Deformation of Rock Mass by Different Methods - *Rajbal Singh*
- Control of Earthquakes by Lakes in Himalayas and Vicinity - *Bhawani Singh, D. Shanker & Mahendra Singh*

Vol.14, No.2, July 2008

- Editorial – *Prof. A.K. Ghose*
- Stress Measurement by Hydraulic Fracturing - *Rajbal Singh*
- An Investigation into the Mechanism of Dust Generation in a Tumbling Mill - *Sam W. Kingman, Ian S. Lowndes, Evagellia Petavratzi & David N. Whittles*
- Rock Mass – Tunnel Support Interaction Analysis: Part I – Ground Response Curves - *M. N. Viladkar, M. Verman, Bhawani Singh & J. L. Jethwa*
- Rock Mass – Tunnel Support Interaction Analysis: Part II – Support Reaction Curves - *M. N. Viladkar, M. Verman, Bhawani Singh & J. L. Jethwa*

Vol.14, No.1, Jan. 2008

- Editorial – *D.G.Kadkade*
- Simulation and Numerical Modelling of Ground Water Rebound after Opencast Mine Closure and its Relationship with Backfill Settlement in a Shallow Aquifer - *F. Doulati Ardejani & R.N. Singh*
- Excavation and Support System for Powerhouse Cavern at Tala Hydroelectric Project in Bhutan - *Rajbal Singh*
- Nonlinear Analysis of Nathpa Jhakri Powerhouse Cavern - A Case Study - *Moataz A. Al-Obaydi, N. K. Samadhiya & M. N. Viladkar*

Vol.13, No.2, July, 2007

- Editorial – *Editors, JRMTT*
- Constitutive Laws for Jointed Rock Mass - *N.K. Samadhiya*
- Support Requirement for Underground Excavation Using Numerical Technique - *A.K. Ghosh, B. K. Saha & J. M. Shirke*
- Landslide Hazard Zonation Mapping and Digital Elevation Model (DEM) Development of a Part of Tehri Dam Reservoir Area Pertaining to Bhilangna Valley - *N. N. Srivastava & R. Anbalagan*
- Study of Rockfall at Amritanjan Bridge Site on Mumbai – Pune Expressway – A Case Study - *Kishor Kumar, P. S. Prasad, Nitesh K. Goyal & Sudhir Mathur*
- Economical Grout for Tunnelling through Highly Jointed and Sheared Water-Charged Strata in Himalayan Region - *Naveesh Sharma & A. A. Masoodi*

Vol.13, No.1, Jan. 2007

- Editorial – *Chairman & Editors, JRMTT*
- Critical State Mechanics of Polyaxial Strength of Intact Rocks – *Mahendra Singh & Bhawani Singh*
- Modelling of Jointed Rock Mass Using Practical Equivalent Continuum Concept – *V.B. Maji & T.G. Sitharam*
- Performance of New Innovative Cutting Machines in Dolomitic Marble Mining – *S.C. Jain, S.S. Rathore & S.N. Wahy*
- Case History of Head Race Tunnel of Dulhasti Hydroelectric Project – *D.G.Kadkade*
- Technical Note – Would it Have been Possible to Predict October 08, 2005 Kashmir Earthquake? Possibility of Another Earthquake in Himalayas – *D. Shanker, Papadimitriou E. Eleftheria, M. Banerjee, Harihar Paudyal, H.N. Singh & V.P. Singh*

Vol.12, No.2, July, 2006

- Editorial – *V.M. Sharma*
- Stability Assessment of Underground Openings in British Rocks using Fracture Toughness as Failure Criterion - *A. G. Pathan & R. N. Singh*
- New SRF Values for Moderately Jointed Rocks - *Naresh Kumar, N.K. Samadhiya & R. Anbalagan*
- Case Study of Failure of Slopes at Morni Hills - *A. Mittal, P. Aggarwal & M. P. Gupta*
- ‘Dishansh 2005’ - A Java Based Software Application to Plot and Analyze Structural Data for Seismological and Geotechnical Interpretation - *N. N. Srivastava, R. U. Thakor, S. V. Patel, S. G. Viroja, U. S. Chetta, H. B. Naik & S. A. Sharma*
- Stress Mapping for Preferred Orientation of Galleries in Underground Coal Mines - *D. N. Sharma, U. Shivnarayana & P. Kulshrestha*

- Shear strength of Some Rock Forming Powdered Minerals Under High Confining Pressure - *I. J. S. Lamba, D. K. Soni & Ashwani Jain*

Vol.12, No.1, January, 2006

- Editorial – *Board of Editors*
- Control Measures for Ground Vibration Induced by Blasting at Coal Mines and Assessment of Damage to Surface Structures - *G. R. Adhikari, N. K. Jain, S. Roy, A. I. Theresraj, R. Balachander, H. S. Venkatesh & R. N. Gupta*
- Slope Stability Using Non-Linear Failure Strength Criterion - *N. K. Samadhiya & P. N. V. Mahesh Babu*
- A Geotechnical Approach to Assess Roof Rock Instability in Underground Coal Mine - *D. N. Sharma*
- Strength Characteristics of Limestone Under High Pressure - *D. K. Soni & Ashwani Jain*
- Tensile strength of Sandstone Under Unconfined and Confined Conditions - *R. K. Bansal, D. K. Soni & Ashwani Jain*

Vol.11, No.2, July 2005

- Guest Editorial - *M. N. Viladkar*
- Numerical Modelling of Tri-axial Testing of Jointed Rocks using FLAC3D - *T. G. Sitharam, Ravindra Dwivedi & Vidya Bhushan Maji*
- Elasto-Plastic Analyses of Circular Tunnels at Different Insitu Stress Conditions using Finite Element Method - *S. Jakki & K. G. Sharma*
- EMM – An Approach for Prediction of Stability of Rectangular Underground Openings - *Anupam Mital & V. K. Arora*
- Physical and Constitutive Modelling to Simulate Jointed Rock Mass under Uniaxial Stress State - *Mahendra Singh & K. Seshagiri Rao*
- Slope Failure and Remediation in Hill Stations of Himalayan Region - A Case Study - *D. K. Soni & Ashwani Jain*

Vol.11, No.1, January 2005

- Guest Editorial: Rock Mechanics – An Ongoing Challenge - *Hani Mitri*
- Prediction of Ground Vibration from Construction Blasts - *G.R. Adhikari, R. Balachander, A.I. Theresraj, H.S. Venkatesh & R.N. Gupta*
- Critical State Mechanics in Non-Linear Failure Criterion for Rocks - *Mahendra Singh, Bhawani Singh & Daya Shankar*
- Wireless Data Acquisition System for Chock Shields in Underground Mines - Performance Monitoring and Analysis - *Srinivasulu Tadisetty, Kikuo Matsui, Hideki Shimada & R.N. Gupta*
- Effect of Rock Mass Quality and Tunnel Size on Lined Pressure Tunnels using FEM - *I. Siva Parvathi, S. Surya Rao & T. V. Praveen*

Vol. 10 No. 2, July 2004

- Editorial – Minimization of Entropy - *Chairman & Editors, JRMTT*
- Strength Criteria of Infilled Rock Joints Tested in Ko Condition Using Triaxial Apparatus - *U.N. Sinha & Bhawani Singh*
- Shock Tube Initiation System for Improving Pull in Tunnels - *A. K. Mishra, P. Balamadeswaran, V. Bhusan & R. N. Gupta*
- Prediction of Stability of Underground Openings Using EMM - *Anupam Mital & VK Arora*
- Technical Note on The Prediction and Control of Flyrock During Rock Blasting - *G.R.Tripathy & I.D.Gupta*

Vol. 10 No. 1, January 2004

- Editorial - *Subhash Mitra*
- Assessment of Ground Water Rebound in Backfilled Open Cut Mines using the Finite Element Method - *F. Doulati Ardejani & R.N. Singh*
- Monitoring the Stability of Two Parallel Caverns for Hydroelectric Project– A Case Study - *P. Kumar, J.C. Jhanwar, S. Kiran, B. K. Jha & C. Bandopadhyay*
- Development of Predictive Model for Controlling Blast-Induced Overbreak in Tunnels - *V.M.S.R. Murthy & Kaushik Dey*
- Software Package for 3-Dimensional Non-Linear Elastic Analysis of Caverns - *N.K. Samadhiya, M.N. Viladkar & Pradeep Bhargava*



Vol. 9 No. 2, July 2003

- Guest Editorial - *A.K. Dhawan*
- Damage Control Blast Design for Excavation of Desilting Chambers at Nathpa Jhakri Hydroelectric Project - *G.R. Adhikari, R. Balachander, A.I. Theresraj & R.N. Gupta*
- Instability Assessment of Jointed Rock Slopes – A Case Study - *R.N. Chowdhury, R.N. Singh & G.R. Khanlari*
- Application of Rmi System for the Design of Tunnel Supports - *Naresh Kumar & N.K. Samadhiya*
- Design of Tunnel Support and Blasting for Railway Tunnels in Basaltic Rocks – A Case Study - *J.C.Jhanwar, R.K.Goel, A.K.Chakraborty, P.Kumar & C. Bandopadhyay*
- The Role of Interface Material at the Base of Internal Dumps and Effectiveness of Coal Rib in the Safe Working of Opencast Coal Mines - *Indrajit Roy*

Vol. 9 No. 1, January 2003

- Guest Editorial – Rock Mechanics Frontiers & Tunnelling Technology for Infrastructure Development - *R. Jeyaseelan*
- Mine Water Inrush Prediction Using the Probability Index Method - *Longqing Shi & R. N. Singh*
- Intelligent Prediction of Elastic Properties of Jointed Rocks - *T. G. Sitharam, K. Shailendra, G. Madhavi Latha & N. Madhusudhan*
- Application of Acoustic Emission Technique for Indirect Measurement of Vertical Insitu Stress in Rock Mass – A Lab-Scale Study - *P. B. Choudhury, A. K. Chakraborty, S. K. Singh, A. K. Raina, M. Ramulu, A. Sinha, A. Halder & J. L. Jethwa*
- Instrumentation for Study of Distress in Powerhouse and Concrete Dam – A Case Study - *Rajbal Singh, S.K. Verma & A. K. Dhawan*
- Strength Behaviour of Phyllites Under Triaxial Stress Condition - *N. K. Samadhiya & P. K. Jain*

Vol. 8 No. 2, July 2002

- Guest Editorial - *Shunsuke Sakurai*
- Current and Future Prospects for Microtunnelling - *R. L. Sterling*
- Prediction of Stress-Strain Behaviour of Intact and Jointed Rocks in Triaxial Compression - *T. G. Sitharam and G. Madhavi Latha*
- Excavation of Turbine Pits for a Hydroelectric Project - A Case Study - *G. R. Adhikari, R. Balachander, H. K. Verma and R. N. Gupta*
- A Technical Note on Effect of Temperature on Quality of Fibre Reinforced Concrete - *U. K. Singh, B. K. Kumar and B. Munshi*

Vol. 8 No. 1, January 2002

- Guest Editorial - *Nick Barton*
- Application of the Conventional and a New Failure Criteria in the Stability Analysis of Underground Structures - *J. Hematian, I. Porter and R. N. Singh*
- Steel Fibre Characterisation for Reinforcement of Shotcrete - *U. K. Singh and R. C. Mishra*
- Geotechnical Investigations and Stability Analysis of Slopes at Matli Site in Garhwal Himalaya - *S. Parkash and A. K. Awasthi*
- A Technical Note on Non-Linear Finite Element Study of Lined Circular Tunnel - *Prabhat Kumar*

Vol. 7 No. 2, September 2001

- Guest Editorial – *J. L. Jethwa*
- Effects of a Non-Uniform radial Load Distribution on Stress Field in Brazilian Tests - *A.Lavrov & A.Vervoort*
- Finite Element Study of the Subsidence in Longwall Coal Mines - *K. Rajagopal & P.L.S. Ramakanth*
- Stability Analysis of Some Hill Slopes Pertaining to Tehri Dam Reservoir - *N.C.N. Srivastava*
- A Technical Note on - Landslide Protection in Sinking Zone of Darjeeling Himalaya Using Reinforced Soil Technique - *Somnath Biswas*

Vol. 7 No. 1, April 2001

- Editorial: Himalayan Vision 2030 – *Board of Editors*
- Simulation of Bedding Planes in Finite Element Analysis of Underground Structures - *I. Porter, J. Hematian & R. N. Singh*

- Improved Finite Element Simulation of Excavation in Elastic and Elasto-Plastic Geologic Media - *K.G. Sharma, A. Varadarajan & C.S. Desai*
- Environmental Dimensions of Underground Space Use - *A. K. Soni*
- A Technical Note on - Variability Analysis of Physico-Mechanical Properties of Some Indian Rocks - *T.N. Singh & A. Suresh*

Vol. 6 No. 2, October 2000

- Guest Editorial – *John A. Hudson*
- Analysis of Mining Structures - *J. Hematian, I. Porter & R. N. Singh*
- Simulation of Jointed Rock Mass Behaviour Using Finite Element Method - *Sridevi Jade, Thallak. G. Sitharam & H. M. Chandrashekar*
- No Tension Zones around Underground Openings - *Prabhat Kumar*

Vol. 6 No. 1, May 2000

- Guest Editorial – *B.B. Dhar*
- Recent developments in rock support estimates by the RMI - *Arild Palmstrom*
- Dynamic load assessment in small scale blasting and design of a muffling system - *V M S R Murthy*
- Landslide hazard evaluation and geostatistical studies in Garhwal Himalaya, India - *Pankaj Gupta, Neelam Jain, R. Anbalagan & P. K. Sikdar*
- A note on internet for rock engineers - *Anil Swarup & V V R Prasad*

Vol. 5 No. 2, December 1999

- Guest Editorial – *A. K. Dube*
- Underground excavation in jointed medium - *Prabhat Kumar*
- On the importance of seismic wave velocity in rock blasting - *G R Tripathy, R R Shirke, I D Gupta*
- Strength criteria for rock masses with gouge filled discontinuities - *U N Sinha, Bhawani Singh*

Vol. 5 No. 1, June 1999

- Guest Editorial – *P.L. Diwan*
- Time-dependent modulus of deformation in tunnels - *R K Goel, Bhawani Singh, Suneel Singh*
- Analysis of rock bolts in bedded strata - *N Kumar Pitchumani*
- Technical note on ambient stress at the Malanjkhand copper mine project, Madhya Pradesh, India - *S V Srirama Rao, K B Chary, T N Gowd*

Vol. 4 No. 2, August 1998

- Editorial: Mega Earthquake to Rock Himalaya within a Decade – *V.K. Mehrotra*
- On a rational method of analysis and design of tunnel supports based on the finite element technique - *W G Louhenapessy, G N Pande*
- Influence of saturation on modulus of deformation of Himalayan rock masses - *V K Mehrotra, Bhawani Singh, Subhash Mitra*
- Technical note on rock cutting and tunnels on Khandala - Karjat railway line - *R S Dubey*

Vol. 4 No. 1, March 1998

- Editorial – *V.K. Mehrotra*
- Steel fibre reinforced shotcrete for underground support - *D R Morgan, A Fekete*
- A semi-empirical method for the prediction of mine subsidence and associated parameters in Indian coal mines - *P P Bahuguna*

Vol. 3 No. 2, July 1997

- Editorial: On 50 Years of India's Self Reliance – *Chairman & Editors*
- Laboratory investigations on grouting of polyurethane resins - *Richard Snuparek, Petr Martinec*
- Non-linear analysis of jointed rock using equivalent continuum approach - *Sridevi Jade, T G Sitharam*

Vol. 3 No. 1, January 1997

- Editorial: On 150 Years of Technical Education at Roorkee University – *Bhawani Singh*
- Sequential excavation of a rectangular underground opening - *Prabhat Kumar*
- Influence of geological features on long-term behaviour of underground powerhouse cavities in lower Himalayan region - a case study - *Subhash Mitra, Bhawani Singh*

Vol. 2 No. 2, July 1996

- Guest Editorial – *D. G. Kadkade*
- A method of recording and presenting rock mechanical data - *Rajbal Singh, Rajinder Bhasin, Fredrik Loset*
- A statistical approach to landslide analysis - *Sanjeev Sharma, R Anbalagan, Tarun Raghuvanshi*
- Numerical modelling of underground power houses in India - *B Dasgupta, L J Lorig*

Vol. 2 No. 1, January 1996

- Editorial– *Chairman & Editors*
- The rock mass index (R<sub>Mi</sub>) applied in rock mechanics and rock engineering - *Arild Palmström*
- Topography induced high in-situ stress under a river valley in Himalayas - a case - *S Sengupta, D Joseph, N M Raju*
- Failure envelopes for jointed rocks in lesser Himalayas - *V K Mehrotra*

Vol. 1 No. 2, July 1995

- Guest Editorial: Hydropower Development in Himalayas – *Vishnu Choubey*
- R<sub>Mi</sub> - A system for characterising rock mass strength for use in rock engineering - *Arild Palmström*
- Finite element analyses of circular, horse-shoe and interacting circular tunnels - *R K Shrivastava, K G Sharma, A Varadarajan*
- Landslide blockade on the river Satluj and its removal by underwater - *Rajiv Badal, V M Sharma, K Venkatachalam, A K Dhawan, R B Singh*

Vol. 1 No. 1, January 1995

- Editorial – *V.M.Sharma*
- Hydraulic fracturing stress measurements - theory and practice - *F. Rummel*
- A classification system for support pressure in tunnels and caverns - *Bhawani Singh, J. L. Jethwa, A. K. Dube*
- The effect of rock properties on the design and results of tunnel blasts - *T. N. Hagan*
- Landslide hazard zonation mapping of Tehri-Pratapnagar area of Garhwal Himalaya - *Pankaj Gupta, R.Anbalagan*

The editorial board owes its deep gratitude to all the authors for their strong supports and contributions without which it would not have been possible to bring out JRMTT issues on regular basis since 1995. Grateful thanks are equally due to the present and past Presidents/ Honorary Secretaries, ISRMTT and all members of Editorial Board, JRMTT for their constant help and support for review of papers from time to time. It is hoped that the contents of the papers published in JRMTT have proved to be fruitful and purposeful and will help in identifying the research and development needs of the years to come.

**- Subhash Mitra & R. K. Goel, JRMTT**