



Vancouver Geotechnical Society

A Local Section of the
Canadian Geotechnical
Society

www.v-g-s.ca

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NOTICE OF UPCOMING TECHNICAL PRESENTATION Wednesday, 17 April 2019

TOPIC: A New and Unified Approach to improved Scalability and Volumetric Intensity Quantification for GSI and Rockmass Strength and Deformability Estimation

SPEAKER: Dr. Paul Schlotfeldt – *Rock Mechanics Engineer, Golder Associates Ltd.*

Paul Schlotfeldt is a Principal in Golder Associates Vancouver office. Paul has over 36 years of civil rock engineering experience and has consulted on projects in southern Africa, United Kingdom, Canada, Australia, USA, and South America. Dr. Schlotfeldt's specialist niche includes the assessment and characterization of rockmasses mainly for civil rock mechanics projects. He also provides specialist rock mechanics consulting services on dams, tunnels, rock slopes, and foundations of rock. Typical projects that he leads include the conceptualization, feasibility assessments, and detailed design for highway rock cut slopes and bridges founded on rock, for hydroelectric and transportation tunnels and underground infrastructure, and for hydroelectric and water supply dams founded on rock. He also regularly undertakes terrain and natural hazard assessments with a primary focus on rockfall mitigation for highways and other infrastructure at risk.

CONTENT: Several investigators have attempted to quantify the Geological Strength Index (GSI) chart, with the latest modification of the chart (2013) utilizing RQD as a measure of blockiness. This approach has limitation in where discontinuity spacing is wide (typically greater than 0.3 m) and RQD alone cannot adequately characterize the degree of blockiness, since it remains static at 100%. This talk introduces a new approach to quantifying widely spaced jointed rockmasses that is not dependent on RQD alone. At the core of the approach is a bias free volumetric fracture count (VFC) parameter (fractures/m³), that is integrated into the newly defined GSI chart as an aid to alleviate scalability and bias concerns related to the use of RQD in the quantification process. While the new GSI chart builds on the work of many, it is unique in the sense that not only is it fully quantifiable for a full range of block sizes including block sizes much larger than possible with RQD alone, but it provides a unique approach linking the VFC parameter with P₃₂, a parameter frequently used in DFN modelling. The correlation of VFC with P₃₂ in particular, is possible because the VFC parameter has no constraints of a limited number and/or assumed orthogonality of discontinuity sets or rectilinear block shapes or the need for block shape correction factors. The new chart also includes correlated scales on both the vertical and horizontal axis using both the RMR and the Q-systems, providing a unified approach that is both scalable and easily quantifiable and allows for the use of all three major rock mass classification systems along with P₃₂ within one chart, something not attempted before. Data from a dam foundation rockmass in the Lesotho Highlands are introduced and are used to validate the quantification process for the overall GSI ratings for the foundation rock mass. These ratings have been used to estimate strength and deformability parameters for the foundation rock mass using the Hoek-Brown empirical failure criteria equations and then they were compared to the large-scale in-situ test results to validate the use of the V-GSI chart and system as a new tool for use in rock engineering.

DETAILS: **Location:** Centennial Room, Executive Inn, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6
Social Hour: 5:30 to 6:30 pm (drinks available at the hotel bar)
Technical Presentation: 6:30 to 7:30 pm (No need to RSVP)
Dinner: 8:00 pm (\$20 will be charged for dinner). If you would like to stay for dinner, please RSVP to Ali Ghandeharion via email (aghandeharion@klohn.com) or at the door.