



## Vancouver Geotechnical Society

A Local Section of the Canadian Geotechnical Society

Visit : [www.v-g-s.ca](http://www.v-g-s.ca)

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## NOTICE OF UPCOMING AGM & DINNER PRESENTATION

WEDNESDAY, SEPTEMBER 25, 2013

### SUBJECT:

(1) Annual General Meeting & Election of Executive Members for 2013/2014

(2) Technical Presentation: ROCK FALLS – Developments in modelling and design of protection structures

### SPEAKER:

Mr. Duncan Wyllie, P.Eng.

Wyllie & Norrish Rock Engineers

Duncan Wyllie is a Principal in the company Wyllie & Norrish Rock Engineers based in Vancouver, Canada. Mr. Wyllie is a graduate of the University of California at Berkeley and has a total of 46 years of experience in the field of rock engineering. He has worked on slope, landslide, tunnel, blasting and foundation projects throughout North America, as well as overseas. The major portion of this work is for highways, railways and power projects, and involves both new construction and the evaluation and remediation of existing slopes and tunnels. Many of these projects have involved rock fall hazards and the design of protection structures.

Mr. Wyllie is also the author/co-author of the books Rock Slope Engineering, 4th Ed. (2004); Foundations on Rock (1992, 1999 editions), and Landslides, Investigation and Mitigation (1996). He has prepared manuals on rock slope engineering for the Federal Highway Administration, and taught over 80 courses for the National Highway Institute in Washington D.C. He is currently a Ph. D. candidate at the University of British Columbia doing research in the field of rock fall mechanics.

### CONTENT:

The talk will address two recent developments related to the design of rock fall protection structures.

First, it will be shown that values of the **normal coefficient of restitution**  $e_N$ , used in modelling of rock falls are more dependent on impact conditions than on the properties of the slope materials. That is, for steep angle ( $\theta_i > 40$  degrees) impacts, the values of  $e_N$  are low ( $e_N < 0.3$ ), while for shallow angle ( $\theta_i < 15$  degrees) impacts,  $e_N$  can be greater than 1. This relationship between  $e_N$  and  $\theta_i$  is based on both documentation of actual rock fall events, and the application of impact mechanics theory to rock fall behavior. The [ $e_N - \theta_i$ ] relationship also shows that actual trajectories are generally lower than those calculated by most modelling programs.

Second, attenuator-type rock fall fences will be discussed. Attenuators are fences that deflect and redirect rock falls rather than stop falls. Observations of the behaviour of actual rock falls, and the results of model testing, show that attenuators reduce impact velocities such that only a portion of the impact energy is absorbed by the fence, with the remaining energy being retained in the moving rock. This behaviour means that attenuators can be designed for higher impact energies compared to conventional fences that stop falls.

**DETAILS**

**Executive Inn**, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6 (Phone: 604-298-2010)

**Social Hour:** 5:30 to 6:30 pm (drinks available at the hotel bar)

**Annual General Meeting:** 6:30 to 7:00 pm (Last year report + 2013/2014 Elections)

**Technical Presentation:** 7:00 to 8:00 pm

**Dinner:** 8:15 pm (\$30 will be charged for dinner)

**RSVP:** Dinner reservation to [ali.amini@shaw.ca](mailto:ali.amini@shaw.ca) by Tuesday, September 24<sup>th</sup>, 2013 or at the door.