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November Seminar

ROCKING, FUSING, SELF-CENTERING, AND MULTI-HAZARD: SOME RESEARCH AND SOME QUESTIONS

Date:	November 29, 2010
Venue:	UBC Robson Square Theatre
	800 Robson Street, Vancouver
Time:	Refreshments 6:00 p.m. Presentation 6:30 p.m.
Presenter:	Dr. Michel Bruneau, Ph.D., P.Eng.,Professor, Department of Civil, Structural and Environ mental Engineering, University at Buffalo
Cost:	Free for SEABC Members. $75+HST for non-members
	Pre-registration is required: www.seabc.ca/multi-hazard-strategies

Strategies to achieve more resilient structural systems have included frame rocking, the use of structural fuses, and self-centering post-tensioned frames. An increased interest in multi-hazard strategies has also emerged in recent years. This presentation will review selected recent research conducted at the University at Buffalo on those topics. This includes: (1) a general formulation for structural fuse systems, validate by shake-table testing of a 3-story steel frame having replaceable fuses; (2) A fuse concept for tall dual columns, verified experimentally using cyclic inelastic testing of a 30' tall specimen; (3) A structural braced-frame rocking strategy, verified using shake table testing of a 30' tall 4-legged braced tower; (4) A self-centering steel plate shear wall concept under development, and; (5) A composite concrete-filled steel tube concept for multi-hazard performance. For each of these systems, potential advantages are highlighted, along with some general challenges for that will be faced for their codification.

Dr. Bruneau has conducted extensive research on the evaluation and retrofit of existing bridges and buildings subjected to large destructive forces up to collapse. This research has encompassed the development and large-scale experimental validation of various metallic energy-dissipating design concepts to enhance the resilience of structures against extreme events. This work has contributed to the adoption of special design requirements for ductile steel walls, ductile bridge diaphragms, and tubular eccentrically braced frames. Recent focus has been on the development of multi-hazard resistant design concepts capable of simultaneously providing an adequate level of protection against collapse under both seismic and blast loading. Dr. Bruneau has conducted numerous reconnaissance visits to disaster stricken areas, and is a member of many professional and technical code-writing committees.