

Distinguished Guest Presentation:
**A METHOD TO ESTIMATE EFFECTIVE MODULUS OF ELASTICITY
AND SHEAR MODULUS FOR BRICK MASONRY WALLS**

Presented by Dr. Aftab Mufti

Friday, July 22, 2011
Room 1047 ERF, 11am

ABSTRACT

Many historic and old masonry buildings are constructed of load bearing unreinforced brick wall units. The tensile strength of masonry walls is lower than its compressive strength. As a result, masonry structures are more vulnerable to failure under lateral load than vertical load. Heritage and old masonry buildings have not been designed to resist lateral earthquake forces but mainly to resist vertical loads. Hence, upgrading of masonry structures in seismic areas is critical to achieve continuous satisfactory performance. For any rehabilitation techniques it is essential to accurately establish masonry materials properties; modulus of elasticity (E) and share modulus (G).

Three unreinforced brick masonry walls were constructed and tested by applying in plane horizontal load to study un-cracked and cracked flexural behavior. This presentation describes the experimental results and finite element analysis that are used to establish E and G using system identification technique of the structural health monitoring methodology. The proposed method of research will be significant since it gives new approach for determining E and G values which are related to the performance of masonry under in plane lateral load.



Aftab A. Mufti, C.M. Ph.D., FCAE, P.Eng.

Dr. Aftab A. Mufti is a Professor of Civil Engineering at the University of Manitoba, Winnipeg, Manitoba, Canada. He is also the President of the ISIS Canada Research Network, a Network of Centres of Excellence. His research interests include FRPs, FOSs, FEM, bridge engineering, structural health monitoring and civionics. He has authored or co-authored 5 books, plus provided chapters for 2 others, edited 9 books, and written more than 350 technical publications. Dr. Mufti is the recipient of 24 awards. He is the holder of several patents on the steel-free bridge deck concept, of which he is the principal developer. On July 1, 2010 he was appointed as a Member of the Order of Canada for his contribution to and leadership in the field of civil engineering, notably for researching the use of advanced composite materials and fibre optic sensors in the construction and monitoring of bridges and other infrastructures.