NORTHEASTERN UNIVERSITY
College of Engineering
Distinguished Seminar Series
Civil & Environmental Engineering

THE PHILOSOPHY OF ENGINEERING FOR THE BURJ KHALIFA, THE WORLD'S TALLEST BUILDING

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ABSTRACT

The **Burj Khalifa Tower**, formally known as the Burj Dubai, is the world's tallest manmade structure. The multi-use skyscraper soars to over a half mile high (828 meters, 2717 feet). The 280,000 m^2 (3 million square feet) reinforced concrete multi-use Tower is utilized for Retail, a Giorgio Armani Hotel, Residential and Office. The goal of the Burj Khalifa Tower is not simply to be the world's highest building; it's to embody the world's highest aspirations. Designers purposely shaped the structural concrete Burj Dubai – "Y" shape in plan – to reduce the wind forces on the tower, as well as to keep the structure simple and foster constructability. The structural system can be described a "buttressed" core; each wing, with its own high performance concrete core and perimeter columns, buttresses the others via a six-sided central core, or hexagonal hub. The result is a tower that is extremely stiff. Skidmore, Owings & Merrill (SOM), the architects and engineers for the project, applied a rigorous geometry to the tower to align all the common central core and column elements.

Lawrence Novak is the Director of Engineered Buildings for the Portland Cement Association. Prior to joining PCA, he was an Associate Partner with Skidmore, Owings & Merrill where he served as the lead structural engineer for the Burj Khalifa, the world's tallest building. Novak serves on several technical committees, including the ACI 318 Code committee and the ACI 130 committee on Sustainability of Concrete. He has served as Director on the governing board for organizations including SEAOI, TCA and the Illinois Engineering Hall of Fame. He has co-authored numerous papers on engineering and is a recipient of SEAOI's "*Meritorious Publication Award*", the NCSEA's "*Outstanding Structural Engineering Publication Award*" and the United Kingdom's "*Oscar Faber Award*". Novak is the recipient of the SEAOI "*Most Innovative Structure Award*" for the Burj Khalifa project. In 2010, he was selected as the "*Centennial Lecturer*" in engineering and he was named the "*Citizen Engineer of the Year*" by the Illinois Chapter of ASCE. In 2010, he was selected as the ACI "*Speaker of the Year*". Novak utilizes exciting interactive demonstrations to bring structural concepts to life with the goal to inspire the next generation of young minds to study math, science, engineering and sustainability.

Thursday, September 20, 2012
12:00 p.m. – 1:00 p.m.
444 Curry Student Center