

Composite Megacolumns Research Meeting Held in Beijing

December 15, 2014

BEIJING -- CTBUH representatives traveled to Beijing with colleagues from ArcelorMittal to inspect the scaled-down specimens for "[A study on the constructability and the engineering properties of Composite Megacolumns](#)," a project funded by a \$150,000 grant from ArcelorMittal in April 2014.

The research explores the actual behavior (N-M curve) of large composite concrete/steel megacolumns with encased steel profiles. The columns to be studied are directly derived from a project currently being developed by Chinese developer Suning, but are scaled to 1:4 and 1:6 scale in order to meet the testing equipment limitations.

Magnusson Klemencic Associates provided the design properties of the megacolumn, and a testing methodology was established by the research team (LINK TO PREVIOUS ANNOUNCEMENT). The steel profiles were fabricated in Luxembourg and shipped to Beijing, where colleagues at the China Academy for Building Research and CABR Technologies Ltd. assembled them by adding rebar and stirrups.

The columns will now be concreted, and failure tests with eccentricities of 0%, 10% and 15% will begin in January 2015, after concrete has reached its design strength. The testing methodology has been decided on the basis of a 30-page long peer-reviewed first interim report, issued in September 2014.

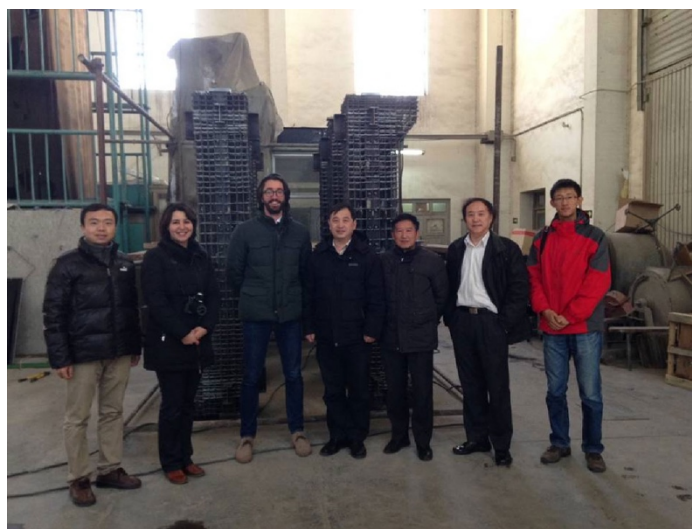
As part of this 40-hour-long visit to Beijing to inspect the 1:4 scale specimens for the megacolumn research, CTBUH managers had the opportunity to have another "Lilliputian" tall-building experience at CABR's laboratory, not far from Beijing's capital International Airport.

The vast majority of recent and future Chinese supertall buildings are in fact tested at CABR at a 1:30 to 1:40 scale. Incredibly detailed, realistic models are superbly created by skilled craftsman using real concrete and steel, so as to simulate the real building behavior when subject to earthquakes.

Smaller samples are deployed in CABR's wind tunnel, where high-rise and long-span buildings are tested against the extreme gusts that occur in some Chinese regions.



Detail of the test column being assembled by CBR



Research Team in front of the 1:4 megacolumn specimens (left to right): Chen Tao, CBR; Nicoleta Popa, ArcelorMittal; Dario Trabucco, CTBUH-Iuav; Congzhen Xiao, CBR; Jingye Wang, MKA; Johnny Sun, ArcelorMittal; Fei Deng, CBR.



1:30 and 1:40 models of famous tall buildings tested on CBR's shake-test platform. The models are incredibly detailed and, despite the scaling factor, are some 40 ft (12 meters) in height.



Detail of 1:30 model built for the seismic testing