Innovative Steel Braced Frame Structures for Resistance to Earthquakes

Over the last two decades, significant changes to seismic design provisions for buildings have been implemented to ensure minimum life safety performance in the event of a large earthquake. These new provisions have posed major challenges to structural design engineers, including more stringent system limitations and greater complexity in analysis, design and construction, which typically have led to cost increases. No consideration has been given in these new code provisions to the reduction of structural damage or downtime periods in case of a strong earthquake event. The presentation will illustrate the impact of new code requirements for steel braced frames, one of the most common lateral load resisting systems for building structures. New braced frame systems that have been specifically developed to improve cost-efficiency while achieving minimum seismic safety objectives will be presented, together with supporting numerical and experimental validation studies. Innovative braced frame solutions that exhibit superior seismic performance to reduce the impact of future strong ground shaking will also be introduced.