LESSONS LEARNED FROM BUILT ENVIRONMENT DAMAGE OF THE NOV 2018 M7.1 ANCHORAGE EARTHQUAKE

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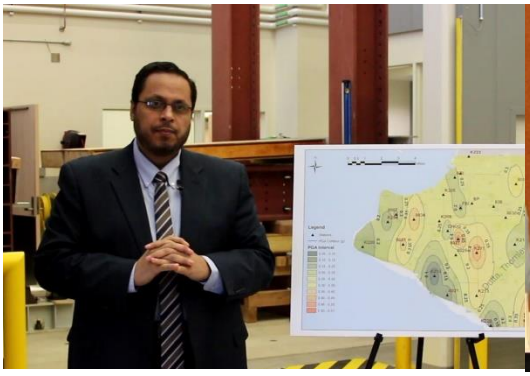

ABSTRACT

The Nov 30, 2018 M7.1 Anchorage Earthquake was the largest earthquake close to centers of large population in the U.S. in more than 50 years. However, the observed damage and absence of fatalities were less than anticipated from such a large event. Unlike general conception that this was a mere result of Alaska's stringent building codes, the depth of the event (29 miles) may have dissipated most of its energy along its long hypo-central path. In fact, most sites shook at less than 50% of the design earthquake, so most of the region's built environment was not truly tested for violent earthquake shaking. Nevertheless, widespread, operation-disruptive non-structural damage took place in different types of buildings ranging from cosmetic to heavy non-structural and equipment damage and water flooding. Major school, hospital and business disruption resulted from such damage. Structural damage to non-engineered residential buildings was substantial. Existing buildings lacking seismic details experienced minor to moderate structural damage, with a few partial collapses. Widespread geotechnical and foundation damage was observed due to uncompacted fills. Minor structural damage and moderate geotechnical related damage occurred in bridges. Major damage occurred in the Port of Alaska infrastructure. This lecture presents lessons learned from observing earthquake damage during the EERI Field Reconnaissance co-led by the author in Southcentral Alaska following the Earthquake.

BIOGRAPHY

Dr. Wael Hassan is an associate professor of structural & earthquake engineering at University of Alaska, Anchorage. He obtained his Master and PhD at University of California, Berkeley, where he also was a post-doctoral researcher. He is a licensed professional civil and structural engineer in the State of California where he developed and led the tall building performance-based seismic design practice at Skidmore, Owings and Merrill (SOM), San Francisco. Dr. Hassan was a seismic design consultant for several major projects in the U.S. and the Middle East. His research interests include numerical simulation and large-scale testing of structures under extreme hazards, seismic assessment of existing infrastructure and performance-based seismic design. He served on several U.S. national building code and standards committees including ACI 318: Structural Concrete U.S. Building Code, ACI 369: Seismic Evaluation of Existing Concrete Buildings, ASCE 41: Seismic Evaluation and Retrofit of Existing Buildings and ASCE 7: Loads on Building. Dr. Hassan has recently led the EERI Field Structural Reconnaissance in Alaska following the Nov 2018 Anchorage Earthquake.