Structural Engineering Seminar Series

CEE 595 S

Why do Concrete Buildings Collapse during Extreme Events?

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Abstract:

Major factors contributing to collapse of reinforced concrete buildings under lateral and gravity loads will be presented. Contribution of slabs, beams, beam-column joints, columns and foundations to the performance of building frame system will be briefly discussed. Insufficient steel reinforcement details commonly observed in structural components will be reviewed. While the ductility, interconnectivity and redundancy are critical for the transfer and redistribution of loads after the failure of a member, one of the main reasons for the collapse of buildings is insufficient design and detailing of columns. Shear failure and gravity load collapse of columns will be discussed. Building failure examples from recent earthquakes and other extreme events will be presented. Experimental evidence from laboratory tests of columns and examples from the field will be shown to demonstrate the importance of steel reinforcement detailing in structural design. Actual buildings on the Ohio State University campus were tested by physically removing first story columns. Results from these field experiments will be presented.

Bio:

Halil Sezen is a professor of structural engineering in the Department of Civil, Environmental and Geodetic Engineering at The Ohio State University. He received his PhD from University of California at Berkeley in 2002. He was the president of Structural Engineers Association of Ohio (SEAoO) in 2023. He is a fellow of American Concrete Institute (ACI), Structural Engineering Institute (SEI), and American Society of Civil Engineers (ASCE). He has been a member of several technical committees of ACI, ASCE, Earthquake Engineering Research Institute (EERI), and Precast/Prestressed Concrete Institute (PCI).

Monday, April 13, 2026 4:00 – 5:00 p.m.

1310 Yeh Student Center