Dr. Fahim H. Sadek

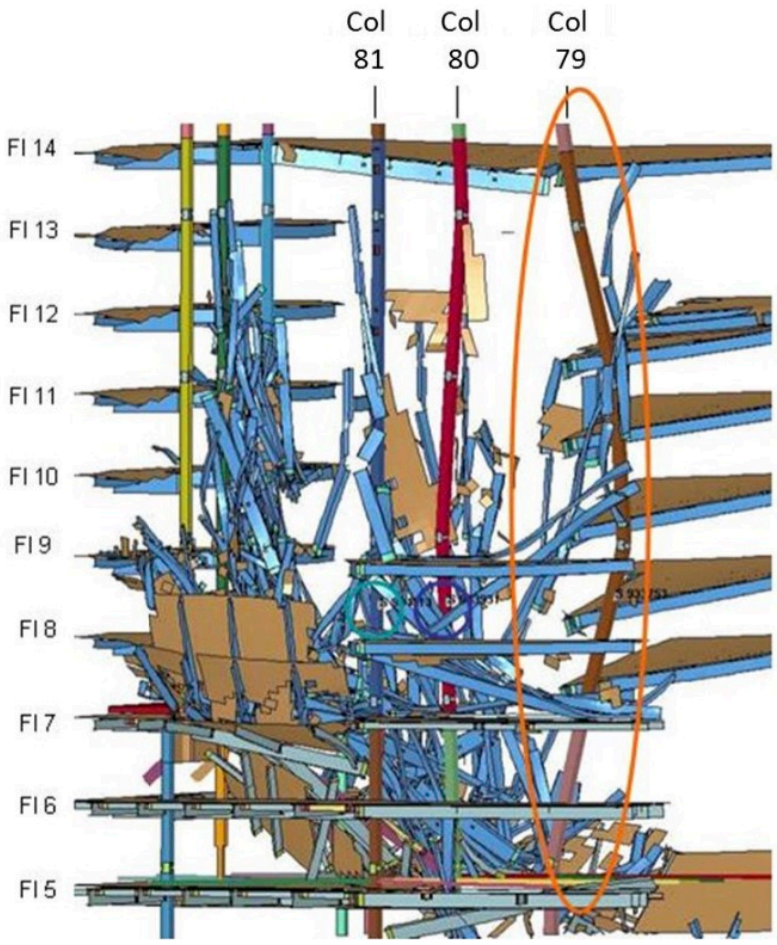

Figure 17. Close-up view of Column 79 buckling from Figure 16(c)

From: Therese P. McAllister, John L. Gross, Fahim Sadek, Steven W. Kirkpatrick, Robert S. MacNeill, Mehdi S. Zarghamee, Omer O. Erbay, Andrew T. Sarawit, "Structural response of the world trade center buildings 1, 2 and 7 to impact and fire damage", NIST publication, 18 October, 2012, DOI: 10.1007/s10694-012-0289-2

See:
https://www.nist.gov/people/sadek-fahim-h
https://www.researchgate.net/profile/Fahim_Sadek
https://www3.nd.edu/~coast/jjwteach/www/www/2014_Spring/Flyers/Sadek.html

Head, Structures Group, Materials and Structural Systems Division (MSSD), Engineering Laboratory (EL)
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Education:
1987 B.S. Civil Engineering, Cairo University, Egypt
1991 M.S. Structural Engineering, Cairo University, Egypt
1996 Ph.D. Structural Engineering, Southern Methodist University, Dallas Texas

Biography:
Dr. Fahim H. Sadek is the leader of and a supervisory research structural engineer in the Structures Group of the Materials and Structural Systems Division (MSSD) of the Engineering Laboratory (EL) at the National Institute of Standards and Technology (NIST). He received his Ph.D. in structural engineering from Southern Methodist University in 1996 and has worked at NIST since then. Dr. Sadek has extensive experience in finite element modeling and computer simulation of linear and nonlinear, static and dynamic structural response, particularly for structures subjected to seismic, wind, impact, and other extreme loads. He also has experience in experimental work, having performed structural testing on seismic isolation units and wood-frame housing. His research specialties include mitigation of progressive structural collapse, structural dynamics and earthquake engineering, active and passive structural control, and wind engineering and structural reliability. Dr. Sadek has worked extensively in the field of structural control, and has developed control algorithms for active and hybrid control of structures, as well as methods for the analysis and design of structures with damping devices. His contributions to wind engineering research include: database-assisted reliability-based design procedures and standardization, an innovative approach for the design of wind-sensitive structures utilizing: information technology techniques applied to large aerodynamic data sets generated in the wind tunnel, reliability analyses of low and high-rise structures, and finite elements ultimate capacity estimates of structural systems and components. Dr. Sadek is the co-author of "Ground Motion and Response Spectra" in the Seismic Design Handbook (F. Naeim, ed., Kluwer Academic Publishers, 2001, pp. 47-124). He is also the author and co-author of more than seventy technical publications. Dr. Sadek led the project "Baseline Structural Performance and Aircraft Impact Damage Analysis" as part of the NIST investigation into the collapse of the World Trade Center buildings. The project involved development and analysis of sophisticated finite element models of the towers to establish their baseline performance under design loading conditions and to estimate probable damage to the towers due to aircraft impact. Currently, Dr. Sadek co-leads a project on mitigation of progressive collapse of structural systems. The project's focus is on the development of experimentally-validated analytical tools for assessment of structural robustness and potential for progressive collapse. Dr. Sadek is a member of the ASCE/SEI Technical Committee on Progressive Collapse, the CTBUH Working Group on progressive collapse, and the Joint Committee on Structural Safety (JCSS)'s Task Group on Robustness. He is the recipient of the Department of Commerce's Gold Medal Award in 2005 for his role in conducting the NIST federal building and fire safety investigation of the World Trade Center disaster and the Department of Commerce's Silver Medal Award in 2007 for his role in conducting the NIST reconnaissance following Hurricanes Katrina and Rita. Dr. Sadek also received the Department of Commerce's Special Act Award for his contributions to the investigation of the World Trade Center Building 7 collapse in 2008 and the Building and Fire Research Laboratory Communication Award in 2002.

Selected Publication:
Therese P. McAllister, John L. Gross, Fahim Sadek, Steven W. Kirkpatrick, Robert S. MacNeill, Mehdi S. Zarghamee, Omer O. Erbay, Andrew T. Sarawit, “Structural response of the world trade center buildings 1, 2 and 7 to impact and fire damage”, NIST publication, 18 October, 2012, DOI: 10.1007/s10694-012-0289-2
ABSTRACT: The National Institute of Standards and Technology (NIST) conducted an extensive investigation of the collapse of World Trade Center towers (WTC 1 and WTC 2) and the WTC 7 building. This paper describes the component, subsystem, and global analyses performed for the reconstruction of the structural response of WTC buildings 1, 2, and 7 to impact and fire damage. To illustrate the component and subsystem analyses, the approach taken for simulating the performance of concrete slabs and shear stud connectors in composite floors subject to fire conditions are presented, as well as steel floor framing connections for beams and girders. The development of the global models from the component and subsystem analyses is briefly

described, including the sets of input data used to bound the probable conditions of impact and fire damage. The final analysis results that were used to develop the probable collapse hypotheses, and a comparison of the results against observed events, are presented for each building. A review of research activities focused on improving understanding of structural system response to multi-floor fires following the WTC disaster is also provided.