Abstract: The Millennium Footbridge was officially opened on June 10, 2000 – the first new bridge spanning the Thames River in historic London in more than a century. The bridge features a “Blade of Light” design theme, conceived by Sir Norman Foster and Partners, Architects, and sculptor Sir Anthony Caro. The design was executed by Ove Arup and Associates, Engineers. A major tourist attraction, nearly 100,000 people used the bridge during its first day of operation. Yet, on June 12, 2000, the Millennium Bridge was ordered closed – due to hazardous structural motions of the bridge deck under pedestrian loadings.

The adverse dynamic motions were not continuous, but rather showed a periodic building-up of amplitude, indicative of structural feedback caused by seemingly random pedestrian footfalls. Up to five distinct structural modes exhibited the feedback response. Peak lateral deck accelerations were in the range of 0.25 g, at frequencies of 0.5 to 1.1 Hz. At these levels, people on the bridge found walking to be extremely difficult, if not impossible.

A retrofit method was conceived and implemented in 2001, using an array of 37 Fluid Viscous Dampers providing 20% critical damping to control gross lateral motions of the bridge. This report discusses the retrofit program requirements and the dedicated damper design. Final test results are provided from controlled testing using directed groups of 700 to 2,000 pedestrians on the modified bridge during January, 2002.

The bridge was successfully reopened in February 2002, and has now been used by millions of people.

Short Biography: Mr. Taylor holds a B.S. degree in Mechanical Engineering from SUNY at Buffalo, awarded 1971. He has been employed by Taylor Devices, Inc. of North Tonawanda, NY since 1971, and was appointed President in 1991. He is inventor or co-inventor of 28 U.S. patents in the fields of energy management, hydraulics, and shock isolation and is widely published within the international shock and vibration community. Mr. Taylor’s lectures on shock and vibration have been presented at numerous universities including M.I.T., and SUNY in the United States, the Tokyo Institute of Technology, the National Taiwan University, the Chung-Cheng Institute of Technology in Taiwan, the University of Mexico at Mexico City, and the Technion in Israel. In 1998, Mr. Taylor was awarded the Franklin and Jefferson Medal for his commercialization of defense technology developed under the U.S. Government’s Small Business Innovation Research program. In 1999, Mr. Taylor was awarded the Clifford C. Furnas Memorial Award by the Alumni Association of the University at Buffalo for his accomplishments in the field of engineering. Mr. Taylor is also a founding member of the International Association on Structural Control.

DATE: FRIDAY, APRIL 4th 2003
TIME: 3:30 – 4:30 PM (EST)
LOCATION: 120 CLEMENS HALL, NORTH CAMPUS, UB

FACULTY, GRADUATE STUDENTS & ALL OTHERS ARE INVITED TO ATTEND. For further information please contact Gordon Warn of the UB-EERI at (716) 645-2114 (ext.2437). This seminar will be webcast. Please visit this website: http://civil.eng.buffalo.edu/webcast/ for details. Information may also be found at the MCEER website: http://mceer.buffalo.edu.

Refreshments will be served