

ATC Design Guide 2

Basic Wind Engineering for Low-Rise Buildings



ATC Applied Technology Council



Applied Technology Council

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Basic Wind Engineering for

Low-Rise Buildings

1st Edition
Based on ASCE 7-2005
And IBC-2009

Funded by
The Applied Technology Council
and the Henry J. Degenkolb Memorial Endowment Fund
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Preface

This document is the second in a series of Design Guides developed by the Applied Technology Council, with funding in part from the ATC Endowment Fund. The series is intended to provide succinct, state-of-the-art information on important design issues for practicing structural engineers. The first such document, *ATC Design Guide 1, Minimizing Floor Vibration*, was published in 1999.

This second ATC Design Guide provides background information and guidance on wind engineering provisions for low-rise buildings contained in *ASCE 7-05, Minimum Design Loads for Buildings and Other Structures* and the *2009 International Building Code*. Treatment is limited to common building types and buildings under 60 feet in height. Tall buildings, dynamic effects, non-building structures, and wind tunnel applications are beyond the scope of this guide.

The project to develop this guide was initiated by James M. Delahay (now deceased), an inspirational engineer who contributed many years of dedicated service to the Applied Technology Council. A portion of the proceeds from the publication and sale of this

document will be contributed to the James M. Delahay Memorial Fund at the University of Alabama.

ATC gratefully acknowledges the contributions of co-authors William Coulbourne and Ed Huston, who contributed significantly to the work that James Delahay started; the assistance of John Henry in the preparation of Chapter 6, the technical oversight and guidance provided by the members of the Project Engineering Panel, which consisted of Arthur Chiu (deceased), Ronald Cook, Lawrence Griffis, Marc Levitan, James Robinson, Joseph Shepard, and Thomas Smith; and the cooperation of the American Society of Civil Engineers, the International Code Council, and the Structural Engineers of Washington (SEAW) for permission to reproduce portions of *ASCE 7-05*, the *International Building Code*, and the *SEAW 2009 Commentary on Wind Code Provisions*.

Christopher Rojahn
ATC Executive Director

Dedication



James M. Delahay

**Wind design expert,
structural engineer,
and leader of the
engineering profession**

This Design Guide is dedicated to co-author James M. Delahay, former President of the Applied Technology Council Board of Directors. Jim was an outstanding engineer, a dedicated professional, an exceptional father (of two young boys) and a true friend to the many individuals with whom he worked. He was a nationally recognized expert in wind-resistant design and a strong advocate for teaching wind engineering fundamentals to engineering practitioners nationwide, particularly those entering the profession. Jim was also widely recognized for his leadership skills and his deft handling of complicated problems and issues, often under difficult circumstances. Those capabilities, and his perpetual good will, led him to leadership

positions within many professional organizations, including the Applied Technology Council; the National Council of Structural Engineers Associations, where he served as Chair of the Code Advisory Committee; the ASCE 7 Wind Load Task Committee, where he served as Chair; and the International Code Council, where he was the first engineer elected as Chair of the Structural Committee. At the time of his death, he was president and CEO of Lane Bishop York Delahay (LBYD Inc.) of Birmingham, Alabama. In 2003, he was named a Distinguished Engineering Fellow by the University of Alabama College of Engineering, from which he earned both his BS and MS degrees in Civil Engineering.

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