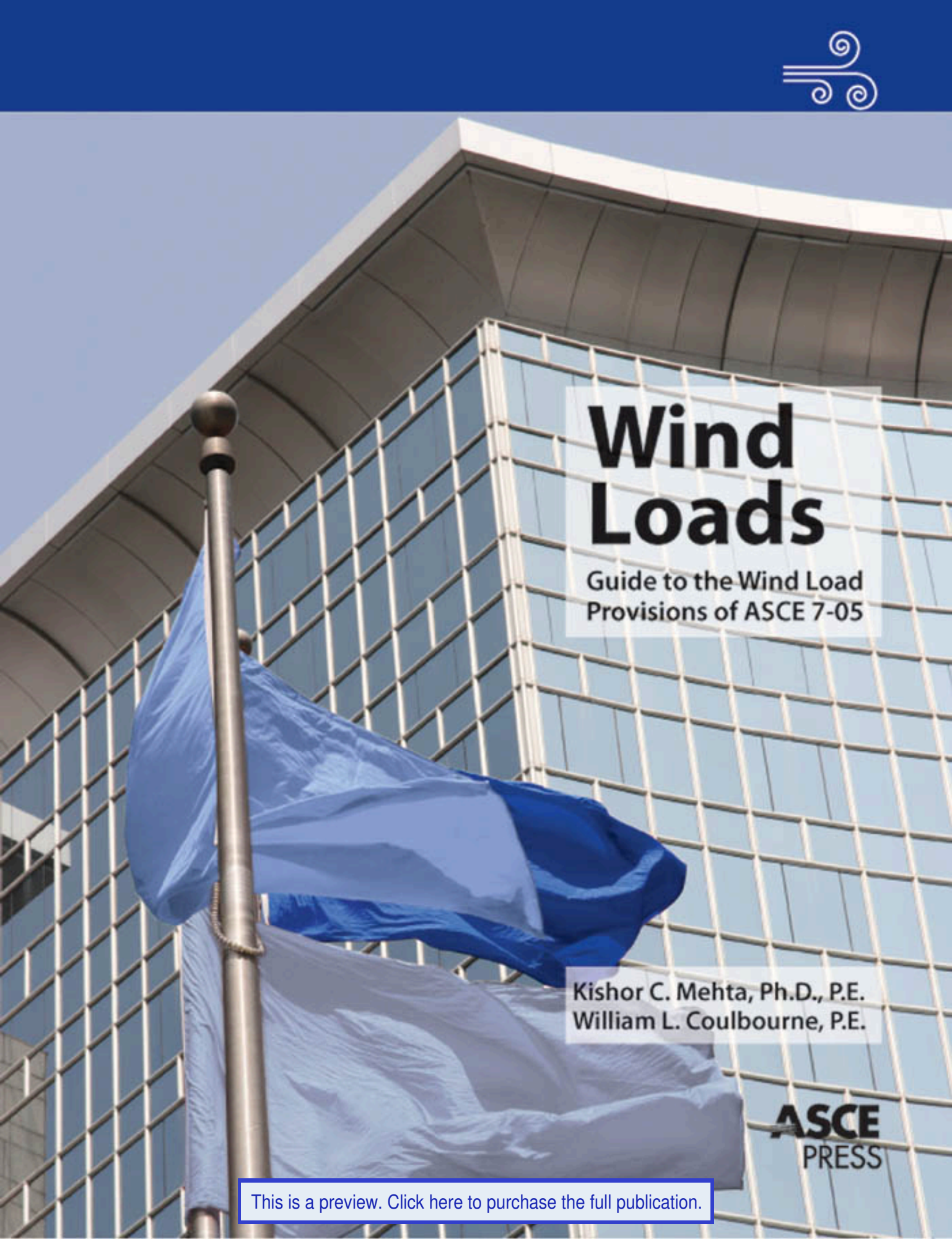

Wind Loads

Guide to the Wind Load Provisions of ASCE 7-05

Kishor C. Mehta, Ph.D., P.E.
William L. Coulbourne, P.E.

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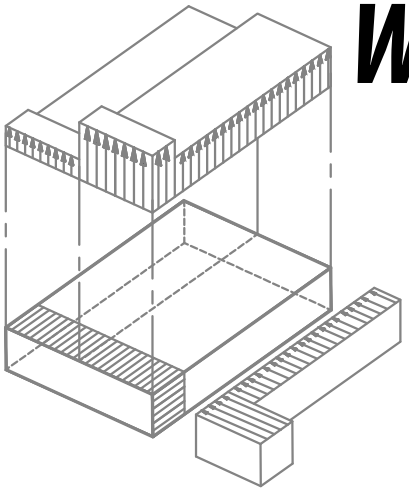


Wind Loads

Other Titles of Interest

Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-05. (ASCE Standard, 2006). Provides requirements for general structural design and includes means for determining various loads and their combinations. Includes commentary. (ISBN 978-0-7844-0831-5)

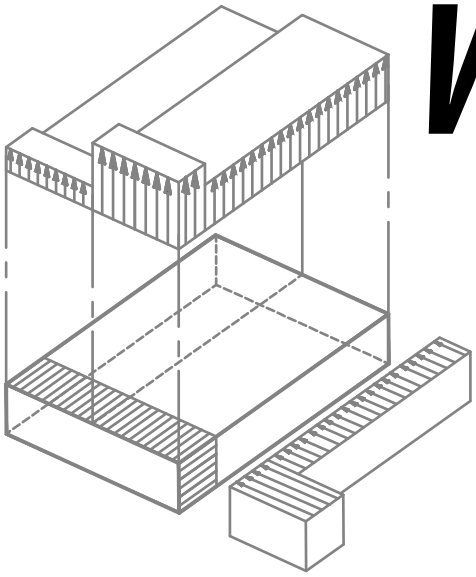
***Snow Loads: Guide to the Snow Load Provisions of ASCE 7-05*, by Michael O'Rourke.** (ASCE Press, 2007). Presents a detailed, authoritative interpretation of the snow load provisions of ASCE/SEI 7-05, including worked examples and FAQs. (ISBN 978-0-7844-0857-5)

***Seismic Loads: Guide to the Seismic Load Provisions of ASCE 7-05*, by Finley A. Charney.** (ASCE Press, 2010). Offers an authoritative interpretation of the seismic load provisions of ASCE/SEI 7-05, including worked examples and FAQs. (ISBN 978-0-7844-1076-9)

Also:

***Wind Tunnel Studies of Buildings and Structures*, edited by Nicholas Isyumov.** (ASCE Manual No. 67, 1999). Assists architects and engineers to improve the reliability of structural performance and to achieve cost effectiveness. (ISBN 978-0-7844-0319-8)

***In the Wake of Tacoma: Suspension Bridges and the Quest for Aerodynamic Stability*, by Richard Scott** (ASCE Press, 2001). Surveys changes in the design of suspension bridges evolving from the 1940 collapse of the first Tacoma Narrows Bridge. (ISBN 978-0-7844-0542-0)



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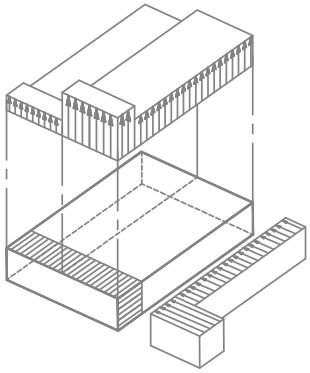
Preface

This guide is designed to assist professionals in the use of the wind load provisions of ASCE/SEI Standard 7-05, *Minimum Design Loads for Buildings and Other Structures*, published by the American Society of Civil Engineers (ASCE). The guide is a revision of the *Guide to the Use of Wind Load Provisions of ASCE 7-02*, reflecting the significant changes made to wind load provisions when the previous version of the Standard, SEI/ASCE 7-02, was updated. The guide contains 13 example problems worked out in detail, which can provide direction to practicing professionals in assessing wind loads on a variety of buildings and other structures. Every effort has been made to make these illustrative example problems correct and accurate. The authors would welcome comments regarding inaccuracies, errors, or different interpretations. The views expressed and interpretation of the wind load provisions made in the guide are those of the authors and not of the ASCE 7 Standards Committee or of the American Society of Civil Engineers.

Table of Conversion Factors

U.S. customary units	*International System of Units (SI)*
1 inch (in.)	25.4 millimeters (mm)
1 foot (ft)	0.3048 meter (m)
1 statute mile	1.6093 kilometers (km)
1 square foot (ft^2)	0.0929 square meter (m^2)
1 cubic foot (ft^3)	0.0283 cubic meter (m^3)
1 pound (lb)	0.4536 kilogram (kg)
1 pound (force)	4.4482 newtons (N)
1 pound per square foot (lb/ft^2)	0.0479 kilonewton per square meter (kN/m^2)
1 pound per cubic foot (lb/ft^3)	16.0185 kilograms per cubic meter (kg/m^3)
1 degree Fahrenheit (°F)	1.8 degrees Celsius (°C)
1 British thermal unit (Btu)	1.0551 kilojoules (kJ)
1 degree Fahrenheit per British thermal unit (°F/Btu)	1.7061 degrees Celsius per kilojoule (°C/kJ)



Chapter 1

Introduction

The American Society of Civil Engineers (ASCE) publication, *Minimum Design Loads for Buildings and Other Structures*, ASCE/SEI Standard 7-05, is a consensus standard. It originated in 1972 when the American National Standards Institute (ANSI) published a standard with the same title (ANSI A58.1-1972). That 1972 standard was revised ten years later, containing an innovative approach to wind loads for components and cladding (C&C) of buildings (ANSI A58.1-1982). Wind load criteria were based on the understanding of aerodynamics of wind pressures in building corners, eaves, and ridge areas, as well as the effects on pressures of area averaging.

In the mid-1980s, the ASCE assumed responsibility for the Minimum Design Loads for Buildings and Other Structures Standards Committee, which establishes design loads. The document published by ASCE (ASCE 7-88) contained design load criteria for live loads, snow loads, wind loads, earthquake loads, and other environmental loads, as well as load combinations. The ASCE 7 Standards Committee has voting membership of close to 100 individuals representing all aspects of the building construction industry. The criteria for each of the environmental loads are developed by respective task committees.

The wind load criteria of ASCE 7-88 (ASCE, 1990) were essentially the same as ANSI A58.1-1982. In 1995, ASCE published ASCE 7-95. This version contained major changes in wind load criteria: the basic wind speed averaging time was changed from fastest-mile to 3-second gust. This in turn necessitated significant changes in boundary-layer profile parameters, gust effect