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American Society of Civil Engineers

Minimum Design Loads for Buildings and Other Structures

Revision of ANSI/ASCE 7-93

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ABSTRACT

ASCE standard, *Minimum Design Loads for Buildings and Other Structures* (ASCE 7-95 a revision of ANSI/ASCE 7-93), gives requirements for dead, live, soil, flood, wind, snow, rain, ice, and earthquake loads, and their combinations, that are suitable for inclusion in building codes and other documents. The major revision of this standard involves the section on wind loads. This section has been greatly expanded to include the latest information in the field of wind load engineering. Requirements have been added for flood loads and ice loads. An appendix on serviceability requirements has also been added. The structural load requirements provided by this standard are intended for use by architects, structural engineers, and those engaged in preparing and administering local building codes.

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In April 1980, the Board of Direction approved ASCE Rules for Standards Committees to govern the writing and maintenance of standards developed by the Society. All such standards are developed by a consensus standards process managed by the Management Group F (MGF), Codes and Standards. The consensus process includes balloting by the balanced standards committee made up of Society members and non-members, balloting by the membership of ASCE as a whole and balloting by the public. All standards are updated or reaffirmed by the same process at intervals not exceeding five years.

The following standards have been issued:

ANSI/ASCE 1-82 N-725 Guidelines for Design and Analysis of Nuclear Safety Related Earth Structures

ANSI/ASCE 2-91 Measurement of Oxygen Transfer in Clean Water

ANSI/ASCE 3-91 Standard for the Structural Design of Composite Slabs and ANSI/ASCE 9-91 Standard Practice for the Construction and Inspection of Composite Slabs

ASCE 4-86 Seismic Analysis of Safety-Related Nuclear Structures

Building Code Requirements for Masonry Structures (ACI530-95/ASCE5-95/TMS402-95) and Specifications for Masonry Structures (ACI530.1-95/ASCE6-95/TMS602-95)

Specifications for Masonry Structures (ACI530-95/ASCE6-95/TMS602-95)

ANSI/ASCE 7-93 Minimum Design Loads for Building and Other Structures

ANSI/ASCE 8-90 Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members

ANSI/ASCE 9-91 listed with ASCE 3-91

ANSI/ASCE 10-90 Design of Latticed Steel Transmission Structures

ANSI/ASCE 11-90 Guideline for Structural Condition Assessment of Existing Buildings

ANSI/ASCE 12-91 Guideline for the Design of Urban Subsurface Drainage

ASCE 13-93 Standard Guidelines for Installation of Urban Subsurface Drainage

ASCE 14-93 Standard Guidelines for Operation and Maintenance of Urban Subsurface Drainage

ASCE 15-93 Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)

ASCE 16-95 Standard for Load and Resistance Factor Design (LRFD) of Engineered Wood Construction

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FOREWORD

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Conversion Factors—Inch-Pound Units to SI (Metric) Units

To convert from	to	Multiply by
pounds-force	kilonewtons (kN)	4.448 222 E−03
pounds-force per linear foot	kilonewtons per meter (kN/m)	1.459 390 E−02
pounds-force per square foot	kilonewtons per square meter (kN/m^2)	4.788 026 E−02
pounds per cubic foot	kilonewtons per cubic meter (kN/m^3)	1.570 875 E−01
slug	kilogram (kg)	1.459 390 E+01
pounds per cubic foot	kilograms per cubic meter (kN/m^3)	1.601 846 E+01
feet	meters (m)	3.048 000 E−01
inches	millimeters (mm)	2.540 000 E+01
miles	kilometers (km)	1.609 344 E+00
square feet	square meters (m^2)	9.290 304 E−02
square inches	square millimeters (mm^2)	6.451 600 E+02
miles per hour	kilometers per hour (km/h)	1.609 344 E+00
feet per second	meters per second (m/s)	3.048 000 E−01
feet per second per second	meters per second squared (m/s^2)	3.048 000 E−01
inches per hour	millimeters per hour (mm/h)	2.540 020 E+01
gallons per minute	cubic meters per second (m^3/s)	6.309 020 E−05
°F · h · sq ft/Btu	kelvin square meter per watt ($K \cdot m^2/W$)	1.762 280 E−01
degree Fahrenheit	degree Celsius (°C)	$t_c = (t_f - 32)/1.8$

Note: This table includes most units used throughout this Standard. For additional conversion factors see ASTM E380-93 "Standard Practice for Use of the International System of Units (The Modernized Metric System)."

American Society of Civil Engineers Standard
Minimum Design Loads for Buildings and Other Structures

1. General

*1.1 Scope

This standard provides minimum load requirements for the design of buildings and other structures that are subject to building code requirements. Loads and appropriate load combinations, which have been developed to be used together, are set forth for strength design and allowable stress design. For design strengths and allowable stress limits, design specifications for conventional structural materials used in buildings and modifications contained in this standard shall be followed.

1.2 Definitions

The following definitions apply to the provisions of the entire standard.

Allowable stress design: a method of proportioning structural members, such that elastically computed stresses produced in the members by nominal loads do not exceed specified allowable stresses (also called working stress design).

Authority having jurisdiction: the organization, political subdivision, office or individual charged with the responsibility of administering and enforcing the provisions of this standard.

Buildings: structures, usually enclosed by walls and a roof, constructed to provide support or shelter for an intended occupancy.

Design strength: the product of the nominal strength and a resistance factor.

Essential facilities: buildings and other structures that are intended to remain operational in the event of extreme environmental loading from wind, snow, or earthquakes.

Factored load: the product of the nominal load and a load factor.

Limit state: a condition beyond which a structure or member becomes unfit for service and is judged either to be no longer useful for its intended function (serviceability limit state) or to be unsafe (strength limit state).

Load effects: forces and deformations produced in structural members by the applied loads.

Load factor: a factor that accounts for deviations of the actual load from the nominal load, for uncertainties in the analysis that transforms the load into a load effect, and for the probability that more than one extreme load will occur simultaneously.

Loads: forces or other actions that result from the weight of all building materials, occupants and their possessions, environmental effects, differential movement, and restrained dimensional changes. Permanent loads are those loads in which variations over time are rare or of small magnitude. All other loads are variable loads (see also nominal loads).

Nominal loads: the magnitudes of the loads specified in Sections 3–9 (dead, live, soil, wind, snow, rain, flood, and earthquake) of this standard.

Nominal strength: the capacity of a structure or member to resist the effects of loads, as determined by computations using specified material strengths and dimensions and formulas derived from accepted principles of structural mechanics or by field tests or laboratory tests of scaled models, allowing for modeling effects and differences between laboratory and field conditions.

Occupancy: the purpose for which a building or other structure, or part thereof, is used or intended to be used.

Other structures: structures, other than buildings, for which loads are specified in this standard.

P-delta effect: the second order effect on shears and moments of frame members induced by axial loads on a laterally displaced building frame.

Resistance factor: a factor that accounts for deviations of the actual strength from the nominal