

ASCE STANDARD

American Society of Civil Engineers

Minimum Design Loads for Buildings and Other Structures

Revision of ANSI/ASCE 7-95

This document uses both Système International (SI) units and customary units.

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ABSTRACT

ASCE standard, *Minimum Design Loads for Buildings and Other Structures* (ASCE 7-98 a revision of ANSI/ASCE 7-95), 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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STANDARDS

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 nonmembers, 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 5 years.

The following Standards have been issued.

- ANSI/ASCE 1-82 N-725 Guideline 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
- ANSE 4-86 Seismic Analysis of Safety-Related Nuclear Structures
- Building Code Requirements for Masonry Structures (ACI530-99/ASCE5-99/TMS402-99) and Specifications for Masonry Structures (ACI530.1-99/ASCE6-99/TMS602-99)
- ANSI/ASCE 7-98 Minimum Design Loads for Buildings 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 10-97 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
- ANSI/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
- ASCE 17-96 Air-Supported Structures
- ASCE 18-96 Standard Guidelines for In-Process Oxygen Transfer Testing
- ASCE 19-96 Structural Applications of Steel Cables for Buildings
- ASCE 20-96 Standard Guidelines for the Design and Installation of Pile Foundations
- ASCE 21-96 Automated People Mover Standards—Part 1
- ASCE 21-98 Automated People Mover Standards—Part 2
- ASCE 22-97 Independent Project Peer Review
- ASCE 23-97 Specification for Structural Steel Beams with Web Openings
- ASCE 24-98 Flood Resistant Design and Construction
- ASCE 25-97 Earthquake-Actuated Automatic Gas Shut-Off Devices

This document has been carefully reviewed, edited, and proofread. However, to notify readers of any errata in the text, ASCE has set up the following web site: www.seinstitute.org/pdf/errata.pdf

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FOREWORD

The material presented in this publication has been prepared in accordance with recognized engineering principles. This Standard and Commentary should not be used without first securing competent advice with respect to their suitability for any given application. The publication of the material contained herein is not intended as a representation or warranty

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This revision of the standard began in 1995 and incorporates information as described in the commentary.

This Standard was prepared through the consensus standards process by balloting in compliance with procedures of ASCE's Codes and Standards Activities Committee. Those individuals who serve on the Standards Committee are:

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Shirin D. Ader
Demirtas C. Bayar
John E. Breen
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CONTENTS

	Page
STANDARDS.....	iii
FOREWORD.....	v
ACKNOWLEDGMENTS.....	vii
Standard	
1.0 General.....	1
1.1 Scope.....	1
1.2 Definitions.....	1
1.3 Basic Requirements.....	1
1.3.1 Strength.....	1
1.3.2 Serviceability.....	2
1.3.3 Self-Straining Forces.....	2
1.3.4 Analysis.....	2
1.3.5 Counteracting Structural Actions.....	2
1.4 General Structural Integrity.....	2
1.5 Classification of Buildings and Other Structures.....	2
1.6 Additions and Alterations to Existing Structures.....	2
1.7 Load Tests.....	3
2.0 Combinations of Loads.....	5
2.1 General.....	5
2.2 Symbols and Notation.....	5
2.3 Combining Factored Loads Using Strength Design.....	5
2.3.1 Applicability.....	5
2.3.2 Basic Combinations.....	5
2.3.3 Load Combinations Including Flood Load.....	5
2.4 Combining Nominal Loads Using Allowable Stress Design.....	5
2.4.1 Basic Combinations.....	5
2.4.2 Load Combinations Including Flood Load.....	6
2.4.3 Load Reduction.....	6
2.5 Load Combinations for Extraordinary Events.....	6
3.0 Dead Loads.....	7
3.1 Definition.....	7
3.2 Weights of Materials and Constructions.....	7
3.3 Weight of Fixed Service Equipment.....	7
4.0 Live Loads.....	8
4.1 Definition.....	8
4.2 Uniformly Distributed Loads.....	8
4.2.1 Required Live Loads.....	8
4.2.2 Provision for Partitions.....	8
4.3 Concentrated Loads.....	8
4.4 Loads on Handrails, Guardrail Systems, Grab Bar Systems, Vehicle Barrier Systems, and Fixed Ladders.....	8
4.4.1 Definitions.....	8
4.4.2 Loads.....	8
4.5 Loads Not Specified.....	9
4.6 Partial Loading.....	9
4.7 Impact Loads.....	9

4.7.1	Elevators	9
4.7.2	Machinery	9
4.8	Reduction in Live Loads.....	9
4.8.1	General	9
4.8.2	Heavy Live Loads	10
4.8.3	Passenger Car Garages	10
4.8.4	Special Occupancies.....	10
4.8.5	Special Structural Elements.....	10
4.9	Minimum Roof Live Loads.....	10
4.9.1	Flat, Pitched, and Curved Roofs.....	10
4.9.2	Special-Purpose Roofs	10
4.10	Crane Loads	10
4.10.1	Maximum Wheel Load.....	11
4.10.2	Vertical Impact Force	11
4.10.3	Lateral Force.....	11
4.10.4	Longitudinal Force.....	11
4.11	References.....	11
5.0	Soil and Hydrostatic Pressure and Flood Loss.....	15
5.1	Pressure on Basement Walls	15
5.2	Uplift on Floors and Foundations	15
5.3	Flood Loads.....	15
5.3.1	Definitions.....	15
5.3.2	Design Requirements.....	16
5.3.2.1	Design Loads.....	16
5.3.2.2	Breakaway Walls	16
5.3.3	Loads during Flooding.....	16
5.3.3.1	Load Basis	16
5.3.3.2	Hydrostatic Loads.....	16
5.3.3.3	Hydrodynamic Loads	16
5.3.3.4	Wave Loads.....	16
5.3.3.4.1	Breaking Wave Loads on Vertical Pilings and Columns	17
5.3.3.4.2	Breaking Wave Loads on Vertical Walls	17
5.3.3.4.3	Breaking Wave Loads on Non-Vertical Walls	18
5.3.3.4.4	Breaking Wave Loads from Obliquely Incident Waves.....	18
5.3.3.5	Impact Loads	18
5.3.4	Special Flood Hazard Areas—A Zones	18
5.3.4.1	Elevation.....	18
5.3.4.2	Anchorage	18
5.3.4.3	Non-Residential Flood-Resistant Construction	19
5.3.4.4	Enclosures below Design Flood Elevation	19
5.3.4.5	Scour.....	19
5.3.5	Coastal High Hazard Areas—V Zones.....	19
5.3.5.1	Elevation.....	19
5.3.5.2	Space below Design Flood Elevation	19
5.3.5.3	Erosion and Scour	19
6.0	Wind Loads	23
6.1	General	23
6.1.1	Scope.....	23
6.1.2	Allowed Procedures	23
6.1.3	Wind Pressures Acting on Opposite Faces of Each Building Surface.....	23

6.1.4	Minimum Design Wind Loading	23
6.1.4.1	Main Wind Force Resisting System	23
6.1.4.2	Components and Cladding.....	23
6.2	Definitions	23
6.3	Symbols and Notations	25
6.4	Method 1—Simplified Procedure	26
6.4.1	Scope.....	26
6.4.2	Design Procedure.....	26
6.4.3	Air Permeable Cladding.....	26
6.5	Method 2—Analytical Procedure	27
6.5.1	Scope.....	27
6.5.2	Limitations	27
6.5.2.1	Shielding.....	27
6.5.2.2	Air Permeable Cladding.....	27
6.5.3	Design Procedure.....	27
6.5.4	Basic Wind Speed.....	27
6.5.4.1	Special Wind Regions.....	27
6.5.4.2	Estimation of Basic Wind Speeds from Regional Climatic Data	27
6.5.4.3	Limitation.....	28
6.5.4.4	Wind Directionality Factor	28
6.5.5	Importance Factor	28
6.5.6	Exposure Categories.....	28
6.5.6.1	General	28
6.5.6.2	Exposure Category for Main Wind-Force Resisting Systems.....	28
6.5.6.2.1	Buildings and Other Structures	28
6.5.6.2.2	Low-Rise Buildings.....	28
6.5.6.3	Exposure Category for Components and Cladding	28
6.5.6.3.1	Buildings with Mean Roof Height h Less Than or Equal to 60 ft (18 m).....	28
6.5.6.3.2	Buildings with Mean Roof Height h Greater Than 60 ft (18 m) and Other Structures	28
6.5.6.4	Velocity Pressure Exposure Coefficient.....	29
6.5.7	Topographic Effects	29
6.5.7.1	Wind Speed-Up over Hills, Ridges, and Escarpments	29
6.5.7.2	Topographic Factor	29
6.5.8	Gust Effect Factor.....	29
6.5.8.1	Rigid Structures.....	29
6.5.8.2	Flexible or Dynamically Sensitive Structures.....	29
6.5.8.3	Rational Analysis.....	30
6.5.8.4	Limitations	30
6.5.9	Enclosure Classifications.....	30
6.5.9.1	General	30
6.5.9.2	Openings.....	30
6.5.9.3	Wind Borne Debris	30
6.5.9.4	Multiple Classifications.....	30
6.5.10	Velocity Pressure	30
6.5.11	Pressure and Force Coefficients.....	30
6.5.11.1	Internal Pressure Coefficients.....	30
6.5.11.1.1	Reduction Factor for Large Volume Buildings, R_i	30
6.5.11.2	External Pressure Coefficients.....	31
6.5.11.2.1	Main Wind Force Resisting Systems.....	31
6.5.11.2.2	Components and Cladding.....	31

	6.5.11.3	Force Coefficients	31
	6.5.11.4	Roof Overhangs	31
		6.5.11.4.1 Main Wind-Force Resisting System	31
		6.5.11.4.2 Components and Cladding.....	31
	6.5.12	Design Wind Loads on Enclosed and Partially Enclosed Buildings	31
	6.5.12.1	General	31
		6.5.12.1.1 Sign Convention.....	31
		6.5.12.1.2 Critical Load Condition	31
		6.5.12.1.3 Tributary Areas Greater Than 700 ft ² (65 m ²)	31
	6.5.12.2	Main Wind Force Resisting Systems.....	31
		6.5.12.2.1 Rigid Buildings of All Heights.....	31
		6.5.12.2.2 Low-Rise Buildings.....	32
		6.5.12.2.3 Flexible Buildings.....	32
	6.5.12.3	Full and Partial Loading	32
	6.5.12.4	Components and Cladding.....	32
		6.5.12.4.1 Low-Rise Buildings and Buildings with $h \leq 60$ ft (18.3 m).....	32
		6.5.12.4.2 Buildings with $h > 60$ ft (18.3 m).....	32
		6.5.12.4.3 Alternative Design Wind Pressures for Components and Cladding in Buildings with 60 ft (18.3 m) < h < 90 ft (27.4 m).....	32
	6.5.13	Design Wind Loads on Open Buildings and Other Structures	33
6.6		Method 3—Wind Tunnel Procedure	33
	6.6.1	Scope.....	33
	6.6.2	Test Conditions	33
	6.6.3	Dynamic Response.....	33
	6.6.4	Limitations	33
		6.6.4.1 Limitations on Wind Speeds.....	33
7.0		Snow Loads.....	69
	7.1	Symbols and Notation	69
	7.2	Ground Snow Loads, p_g	69
	7.3	Flat-Roof Snow Loads, p_f	69
		7.3.1 Exposure Factor, C_e	69
		7.3.2 Thermal Factor, C_t	69
		7.3.3 Importance Factor, I	69
		7.3.4 Minimum Values of p_f for Low-Slope Roofs	69
	7.4	Sloped-Roof Snow Loads, p_s	69
		7.4.1 Warm-Roof Slope Factor, C_s	70
		7.4.2 Cold Roof Slope Factor, C_s	70
		7.4.3 Roof Slope Factor for Curved Roofs.....	70
		7.4.4 Roof Slope Factor for Multiple Folded Plate, Sawtooth, and Barrel Vault Roofs....	70
		7.4.5 Ice Dams and Icicles along Eaves	70
	7.5	Partial Loading.....	70
		7.5.1 Continuous Beam Systems	70
		7.5.2 Other Structural Systems.....	71
	7.6	Unbalanced Roof Snow Loads.....	71
		7.6.1 Unbalanced Snow Loads for Hip and Gable Roofs	71
		7.6.2 Unbalanced Snow Loads for Curved Roofs.....	71
		7.6.3 Unbalanced Snow Loads for Multiple Folded Plate, Sawtooth, and Barrel Vault Roofs.....	71
		7.6.4 Unbalanced Snow Loads for Dome Roofs	71

7.7	Drifts on Lower Roofs (Aerodynamic Shade).....	71
7.7.1	Lower Roof of a Structure	71
7.7.2	Adjacent Structures and Terrain Features	72
7.8	Roof Projections.....	72
7.9	Sliding Snow	72
7.10	Rain-on-Snow Surcharge Load.....	72
7.11	Ponding Instability.....	72
7.12	Existing Roofs	72
8.0	Rain Loads	84
8.1	Symbols and Notation	84
8.2	Roof Drainage.....	84
8.3	Design Rain Loads.....	84
8.4	Ponding Instability	84
8.5	Controlled Drainage	84
9.0	Earthquake Loads	85
9.1	General Provisions	85
9.1.1	Purpose.....	85
9.1.2	Scope and Application	85
9.1.2.1	Scope.....	85
9.1.2.2	Additions to Existing Structures	85
9.1.2.2.1	(no heading)	85
9.1.2.2.2	(no heading)	85
9.1.2.3	Change of Use	85
9.1.2.4	Application of Provisions.....	86
9.1.2.4.1	New Buildings	86
9.1.2.5	Alternate Materials and Methods of Construction.....	86
9.1.3	Seismic Use Groups.....	86
9.1.3.1	(no heading)	86
9.1.3.1.1	(no heading)	86
9.1.3.1.2	(no heading)	86
9.1.3.2	(no heading)	86
9.1.3.3	(no heading)	86
9.1.3.4	Multiple Use.....	86
9.1.4	Occupancy Importance Factor.....	86
9.2.1	Definitions.....	86
9.2.2	Symbols.....	92
9.3	This Section Left Intentionally Blank.....	98
9.4.1	Procedures for Determining Maximum Considered Earthquake and Design Earthquake Ground Motion Accelerations and Response Spectra.....	98
9.4.1.1	Maximum Considered Earthquake Ground Motions.....	98
9.4.1.2	General Procedure for Determining Maximum Considered Earthquake and Design Spectral Response Accelerations	98
9.4.1.2.1	Site Class Definitions	99
9.4.1.2.2	Steps for Classifying a Site	99
9.4.1.2.3	Definitions of Site Class Parameters	118
9.4.1.2.4	Site Coefficients and Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameters.....	119
9.4.1.2.5	Design Spectral Response Acceleration Parameters.....	119
9.4.1.2.6	General Procedure Response Spectrum.....	120
9.4.1.3	Site-Specific Procedure for Determining Ground Motion Accelerations...	121

	9.4.1.3.1	Probabilistic Maximum Considered Earthquake	121
	9.4.1.3.2	Deterministic Limit on Maximum Considered Earthquake Ground Motion.....	121
	9.4.1.3.3	Deterministic Maximum Considered Earthquake Ground Motion.....	121
	9.4.1.3.4	Site-Specific Design Ground Motion	121
9.4.2		Seismic Design Category	121
	9.4.2.1	Determination of Seismic Design Category	121
	9.4.2.2	Site Limitation for Seismic Design Categories E and F.....	122
9.4.3		Quality Assurance	122
9.5		Structural Design Criteria, Analysis & Procedures.....	122
	9.5.1	This Section Has Been Intentionally Left Blank	122
	9.5.2	Structural Design Requirements	122
	9.5.2.1	Design Basis	122
	9.5.2.2	Basic Seismic-Force-Resisting Systems	123
	9.5.2.2.1	Dual System	123
	9.5.2.2.2	Combinations of Framing Systems	123
	9.5.2.2.2.1	R and Ω_0 Factors	123
	9.5.2.2.2.2	Combination Framing Detailing Requirements.....	123
	9.5.2.2.3	Seismic Design Categories A, B and C	123
	9.5.2.2.4	Seismic Design Categories D and E.....	123
	9.5.2.2.4.1	Increased Building Height Limit.....	123
	9.5.2.2.4.2	Interaction Effects	123
	9.5.2.2.4.3	Deformational Compatibility	127
	9.5.2.2.4.4	Special Moment Frames	128
	9.5.2.2.5	Seismic Design Category F	128
	9.5.2.3	Structure Configuration	128
	9.5.2.3.1	Diaphragm Flexibility.....	128
	9.5.2.3.2	Plan Irregularity.....	128
	9.5.2.3.3	Vertical Irregularity	128
	9.5.2.4	Redundancy	128
	9.5.2.4.1	Seismic Design Categories A, B, and C	128
	9.5.2.4.2	Seismic Design Category D.....	128
	9.5.2.4.3	Seismic Design Categories E and F.....	129
	9.5.2.5	Analysis Procedures	130
	9.5.2.5.1	Seismic Design Category A.....	130
	9.5.2.5.2	Seismic Design Categories B and C.....	130
	9.5.2.5.3	Seismic Design Categories D, E, and F.....	131
	9.5.2.5.4	Diaphragms	131
	9.5.2.6	Design, Detailing Requirements, and Structural Component Load Effects	131
	9.5.2.6.1	Seismic Design Category A.....	132
	9.5.2.6.1.1	Component Load Effects	132
	9.5.2.6.1.2	Load Path Connections	132
	9.5.2.6.1.3	Anchorage of Concrete or Masonry Walls	132
	9.5.2.6.2	Seismic Design Category B.....	132
	9.5.2.6.2.1	Component Load Effects	132
	9.5.2.6.2.2	Openings	132
	9.5.2.6.2.3	Direction of Seismic Load	132
	9.5.2.6.2.4	Discontinuities in Vertical System.....	132
	9.5.2.6.2.5	Nonredundant Systems.....	132

	9.5.2.6.2.6	Collector Elements	133
	9.5.2.6.2.7	Diaphragms	133
	9.5.2.6.2.8	Bearing Walls	133
	9.5.2.6.2.9	Inverted Pendulum-Type Structures	133
	9.5.2.6.2.10	Anchorage of Nonstructural Systems	133
	9.5.2.6.2.11	Columns Supporting Discontinuous Walls or Frames	133
	9.5.2.6.3	Seismic Design Category C	133
	9.5.2.6.3.1	Direction of Seismic Load	133
	9.5.2.6.3.2	Collector Elements	133
	9.5.2.6.3.3	Anchorage of Concrete or Masonry Walls	133
	9.5.2.6.4	Seismic Design Category D	134
	9.5.2.6.4.1	Direction of Seismic Load	134
	9.5.2.6.4.2	Collector Elements	134
	9.5.2.6.4.3	Plan or Vertical Irregularities	134
	9.5.2.6.4.4	Vertical Seismic Forces	134
	9.5.2.6.5	Seismic Design Categories E and F	134
	9.5.2.6.5.1	Plan or Vertical Irregularities	134
	9.5.2.7	Combination of Load Effects	134
	9.5.2.8	Deflection and Drift Limits	135
9.5.3		Equivalent Lateral Force Procedure	135
	9.5.3.1	General	135
	9.5.3.2	Seismic Base Shear	136
	9.5.3.2.1	Calculation of Seismic Response Coefficient	136
	9.5.3.3	Period Determination	136
	9.5.3.4	Vertical Distribution of Seismic Forces	137
	9.5.3.5	Horizontal Shear Distribution and Torsion	137
	9.5.3.5.1	Direct Shear	137
	9.5.3.5.2	Torsion	138
	9.5.3.6	Overturning	138
	9.5.3.7	Drift Determination and <i>P</i> -Delta Effects	138
	9.5.3.7.1	Story Drift Determination	138
	9.5.3.7.2	<i>P</i> -Delta Effects	139
	9.5.3.8	Simplified Analysis Procedure for Seismic Design of Buildings	139
	9.5.3.8.1	Seismic Base Shear	139
	9.5.3.8.2	Vertical Distribution	140
9.5.4		Modal Analysis Procedure	140
	9.5.4.1	General	140
	9.5.4.2	Modeling	140
	9.5.4.3	Modes	140
	9.5.4.4	Periods	140
	9.5.4.5	Modal Base Shear	140
	9.5.4.6	Modal Forces, Deflections, and Drifts	141
	9.5.4.7	Modal Story Shears and Moments	141
	9.5.4.8	Design Values	141
	9.5.4.9	Horizontal Shear Distribution	142
	9.5.4.10	Foundation Overturning	142
	9.5.4.11	<i>P</i> -Delta Effects	142
9.5.5		Soil Structure Interaction	142
	9.5.5.1	General	142
	9.5.5.2	Equivalent Lateral Force Procedure	142
	9.5.5.2.1	Base Shear	142

		9.5.5.2.1.1	Effective Building Period	142
		9.5.5.2.1.2	Effective Damping.....	143
		9.5.5.2.2	Vertical Distribution of Seismic Forces.....	145
		9.5.5.2.3	Other Effects.....	145
	9.5.5.3		Modal Analysis Procedure.....	145
		9.5.5.3.1	Modal Base Shears	145
		9.5.5.3.2	Other Modal Effects.....	145
		9.5.5.3.3	Design Values	146
9.6			Architectural, Mechanical, and Electrical Components and Systems.....	146
	9.6.1		General	146
		9.6.1.1	Reference Standards.....	147
			9.6.1.1.1 Consensus Standards	147
			9.6.1.1.2 Accepted Standards.....	147
		9.6.1.2	Component Force Transfer	148
		9.6.1.3	Seismic Forces	148
		9.6.1.4	Seismic Relative Displacements	148
		9.6.1.5	Component Importance Factor	149
		9.6.1.6	Component Anchorage.....	149
			9.6.1.6.1 (no heading)	149
			9.6.1.6.2 (no heading)	149
			9.6.1.6.3 (no heading)	149
			9.6.1.6.4 (no heading)	149
			9.6.1.6.5 (no heading)	149
			9.6.1.6.6 (no heading)	149
		9.6.1.7	Construction Documents	149
	9.6.2		Architectural Component Design.....	149
		9.6.2.1	General	149
		9.6.2.2	Architectural Component Forces and Displacements.....	149
		9.6.2.3	Architectural Component Deformation	150
		9.6.2.4	Exterior Nonstructural Wall Elements and Connections.....	150
		9.6.2.5	Out-of-Plane Bending.....	152
		9.6.2.6	Suspended Ceilings.....	152
			9.6.2.6.1 Seismic Forces	152
			9.6.2.6.2 Industry Standard Construction	152
			9.6.2.6.2.1 Seismic Design Category C	152
			9.6.2.6.2.2 Seismic Design Categories, D, E, and F.....	152
			9.6.2.6.3 Integral Ceiling/Sprinkler Construction.....	153
		9.6.2.7	Access Floors.....	153
			9.6.2.7.1 General	153
			9.6.2.7.2 Special Access Floors.....	153
		9.6.2.8	Partitions.....	153
		9.6.2.9	Steel Storage Racks	153
	9.6.3		Mechanical and Electrical Component Design.....	153
		9.6.3.1	General	153
		9.6.3.2	Mechanical and Electrical Component Forces and Displacements	153
		9.6.3.3	Mechanical and Electrical Component Period.....	154
		9.6.3.4	Mechanical and Electrical Component Attachments	155
		9.6.3.5	Component Supports	155
		9.6.3.6	Component Certification	155
		9.6.3.7	Utility and Service Lines at Structure Interfaces	155
		9.6.3.8	Site-Specific Considerations.....	155
		9.6.3.9	Storage Tanks Mounted in Structures.....	155

	9.6.3.10	HVAC Ductwork	155
	9.6.3.11	Piping Systems.....	156
		9.6.3.11.1 Pressure Piping Systems	156
		9.6.3.11.2 Fire Protection Sprinkler Systems.....	156
		9.6.3.11.3 Other Piping Systems	156
		9.6.3.11.4 Supports and Attachments for Other Piping.....	156
	9.6.3.12	Boilers and Pressure Vessels.....	157
		9.6.3.12.1 ASME Boilers and Pressure Vessels.....	157
		9.6.3.12.2 Other Boilers and Pressure Vessels	157
		9.6.3.12.3 Supports and Attachments for Other Boilers and Pressure Vessels.....	157
	9.6.3.13	Mechanical Equipment, Attachments and Supports.....	157
		9.6.3.13.1 Mechanical Equipment	158
		9.6.3.13.2 Attachments and Supports for Mechanical Equipment.....	158
	9.6.3.14	Electrical Equipment, Attachments and Supports.....	158
		9.6.3.14.1 Electrical Equipment	158
		9.6.3.14.2 Attachments and Supports for Electrical Equipment	159
	9.6.3.15	Alternate Seismic Qualification Methods	159
	9.6.3.16	Elevator Design Requirements	159
		9.6.3.16.1 Reference Document	159
		9.6.3.16.2 Elevators and Hoistway Structural System	159
		9.6.3.16.3 Elevator Machinery and Controller Supports and Attachments	160
		9.6.3.16.4 Seismic Controls.....	160
		9.6.3.16.5 Retainer Plates	160
9.7		Foundation Design Requirements	160
	9.7.1	General	160
	9.7.2	Seismic Design Category A.....	160
	9.7.3	Seismic Design Category B.....	160
		9.7.3.1 Structural Components.....	160
		9.7.3.2 Soil Capacities	160
	9.7.4	Seismic Design Category C.....	160
		9.7.4.1 Investigation	160
		9.7.4.2 Pole-Type Structures	161
		9.7.4.3 Foundation Ties.....	161
		9.7.4.4 Special Pile Requirements	161
	9.7.5	Foundation Requirements for Seismic Design Categories D, E, and F.....	161
		9.7.5.1 Investigation	161
		9.7.5.2 Foundation Ties.....	161
		9.7.5.3 Liquefaction Potential and Soil Strength Loss	161
		9.7.5.4 Special Pile Requirements	161
9.8		Steel	161
	9.8.1	Reference Documents	161
9.9		Structural Concrete	162
	9.9.1	Reference Documents	162
9.10		Reserved for Composite Structures	162
9.11		Masonry.....	162
	9.11.1	Reference Documents	162
9.12		Wood.....	162
	9.12.1	Reference Documents	162
9.13		Provisions for Seismically Isolated Structures.....	163
	9.13.1	General	163

9.13.2	Criteria Selection	163
9.13.2.1	Basis for Design	163
9.13.2.2	Stability of the Isolation System	163
9.13.2.3	Seismic Use Group	163
9.13.2.4	Configuration Requirements	163
9.13.2.5	Selection of Lateral Response Procedure	163
9.13.2.5.1	General	163
9.13.2.5.2	Equivalent-Lateral-Force Procedure	163
9.13.2.5.3	Dynamic Analysis	163
9.13.2.5.3.1	Response-Spectrum Analysis	163
9.13.2.5.3.2	Time-History Analysis	163
9.13.2.5.3.3	Site-Specific Design Spectra	164
9.13.3	Equivalent-Lateral Force Procedure	164
9.13.3.1	General	164
9.13.3.2	Deformation Characteristics of the Isolation System	164
9.13.3.3	Minimum Lateral Displacements	164
9.13.3.3.1	Design Displacement	164
9.13.3.3.2	Effective Period at Design Displacement	164
9.13.3.3.3	Maximum Lateral Displacement	165
9.13.3.3.4	Effective Period at Maximum Displacement	165
9.13.3.3.5	Total Lateral Displacement	165
9.13.3.4	Minimum Lateral Forces	166
9.13.3.4.1	Isolation System and Structural Elements at or below the Isolation System	166
9.13.3.4.2	Structural Elements above the Isolation System	166
9.13.3.4.3	Limits on V_s	166
9.13.3.5	Vertical Distribution of Force	166
9.13.3.6	Drift Limits	167
9.13.4	Dynamic Lateral Response Procedure	167
9.13.4.1	General	167
9.13.4.2	Isolation System and Structural Elements below the Isolation System	167
9.13.4.3	Structural Elements above the Isolation System	167
9.13.4.4	Ground Motion	167
9.13.4.4.1	Design Spectra	167
9.13.4.4.2	Time Histories	168
9.13.4.5	Mathematical Model	168
9.13.4.5.1	General	168
9.13.4.5.2	Isolation System	168
9.13.4.5.3	Isolated Building	168
9.13.4.5.3.1	Displacement	168
9.13.4.5.3.2	Forces and Displacements in Key Elements	168
9.13.4.6	Description of Analysis Procedures	168
9.13.4.6.1	General	168
9.13.4.6.2	Input Earthquake	168
9.13.4.6.3	Response-Spectrum Analysis	169
9.13.4.6.4	Time-History Analysis	169
9.13.4.7	Design Lateral Force	169
9.13.4.7.1	Isolation System and Structural Elements at or below the Isolation System	169
9.13.4.7.2	Structural Elements above the Isolation System	169
9.13.4.7.3	Scaling of Results	169

	9.13.4.7.4	Drift Limits	169
9.13.5		Lateral Load on Elements of Structures and Nonstructural Components Supported by Buildings	169
	9.13.5.1	General	169
	9.13.5.2	Forces and Displacements	170
		9.13.5.2.1 Components at or above the Isolation Interface	170
		9.13.5.2.2 Components Crossing the Isolation Interface	170
		9.13.5.2.3 Components below the Isolation Interface.....	170
9.13.6		Detailed System Requirements	170
	9.13.6.1	General	170
	9.13.6.2	Isolation System	170
		9.13.6.2.1 Environmental Conditions	170
		9.13.6.2.2 Wind Forces	170
		9.13.6.2.3 Fire Resistance	170
		9.13.6.2.4 Lateral-Restoring Force.....	170
		9.13.6.2.5 Displacement Restraint	170
		9.13.6.2.6 Vertical-Load Stability	171
		9.13.6.2.7 Overturning	171
		9.13.6.2.8 Inspection and Replacement	171
		9.13.6.2.9 Quality Control	171
	9.13.6.3	Structural System.....	171
		9.13.6.3.1 Horizontal Distribution of Force.....	171
		9.13.6.3.2 Building Separations	171
		9.13.6.3.3 Nonbuilding Structures	171
9.13.7		Foundations	171
9.13.8		Design and Construction Review.....	171
	9.13.8.1	General	171
	9.13.8.2	Isolation System	171
9.13.9		Required Tests of the Isolation System.....	172
	9.13.9.1	General	172
	9.13.9.2	Prototype Tests.....	172
		9.13.9.2.1 General	172
		9.13.9.2.2 Record	172
		9.13.9.2.3 Sequence and Cycles.....	172
		9.13.9.2.4 Units Dependent on Loading Rates.....	172
		9.13.9.2.5 Units Dependent on Bilateral Load.....	172
		9.13.9.2.6 Maximum and Minimum Vertical Load.....	173
		9.13.9.2.7 Sacrificial-Wind-Restraint Systems.....	173
		9.13.9.2.8 Testing Similar Units.....	173
	9.13.9.3	Determination of Force-Deflection Characteristics	173
	9.13.9.4	System Adequacy	173
	9.13.9.5	Design Properties of the Isolation System.....	173
		9.13.9.5.1 Maximum and Minimum Effective Stiffness	173
		9.13.9.5.2 Effective Damping.....	174
9.14		Nonbuilding Structures	174
	9.14.1	General	174
		9.14.1.1 (no heading)	174
		9.14.1.2 (no heading)	174
		9.14.1.3 (no heading)	175
		9.14.1.4 (no heading)	175
		9.14.1.5 (no heading)	175
		9.14.1.6 (no heading)	175

	9.14.1.7	(no heading)	175
	9.14.1.8	Reference Standard	175
9.14.2		Nonbuilding Structures Similar to Buildings	175
	9.14.2.1.2	(no heading)	175
	9.14.2.2	Rigid Nonbuilding Structures	175
	9.14.2.3	Deflection Limits and Structure Separation	176
	9.14.2.1	Design Basis	176
9.14.3		Nonbuilding Structures Similar to Buildings	176
	9.14.3.1	(no heading)	176
	9.14.3.2	Pipe Racks	178
	9.14.3.2.1	Design Basis	178
	9.14.3.3	Steel Storage Racks	178
	9.14.3.3.1	General Requirements	178
	9.14.3.3.2	Operating Weight	179
	9.14.3.3.3	Vertical Distribution of Seismic Forces	179
	9.14.3.3.4	Seismic Displacements	179
	9.14.3.4	Electrical Power Generating Facilities	179
	9.14.3.4.1	General	179
	9.14.3.4.2	Design Basis	179
	9.14.3.5	Structural Towers for Tanks and Vessels	179
	9.14.3.5.1	General	179
	9.14.3.6	Piers and Wharves	179
	9.14.3.6.1	General	179
	9.14.3.6.2	Design Basis	179
9.14.4		Nonbuilding Structures Not Similar to Buildings	180
	9.14.4.1	General	180
	9.14.4.2	Earth Retaining Structures	180
	9.14.4.2.1	General	180
	9.14.4.3	Tanks and Vessels	180
	9.14.4.3.1	General	180
	9.14.4.3.2	Design Basis	180
	9.14.4.3.3	Additional Requirements	180
	9.14.4.4	Electrical Transmission, Substation, and Distribution Structures	180
	9.14.4.4.1	General	180
	9.14.4.4.2	Design Basis	180
	9.14.4.5	Telecommunication Towers	180
	9.14.4.5.1	General	180
	9.14.4.5.2	Design Basis	180
	9.14.4.6	Stacks and Chimneys	180
	9.14.4.6.1	General	180
	9.14.4.6.2	Design Basis	180
	9.14.4.7	Amusement Structures	181
	9.14.4.7.1	General	181
	9.14.4.7.2	Design Basis	181
	9.14.4.8	Special Hydraulic Structures	181
	9.14.4.8.1	General	181
	9.14.4.8.2	Design Basis	181
	9.14.4.9	Buried Structures	181
	9.14.4.9.1	General	181
	9.14.4.9.2	Design Basis	181
	9.14.4.10	Inverted Pendulums	181

10.0	Ice Loads—Atmospheric Icing	182
10.1	Definitions	182
10.2	General	182
10.3	Design for Ice Loads	182
10.3.1	Weight of Ice	182
10.3.2	Wind on Ice Covered Structures	182
10.3.3	Partial Loading	182

Appendix A

A.9.0	Supplemental Provisions	184
A.9.1	Purpose	184
A.9.3	Quality Assurance	184
A.9.7	Supplementary Foundation Requirements	188
A.9.8	Supplementary Provisions for Steel	190
A.9.9	Supplementary Provisions for Concrete	192
A.9.11	Supplementary Provisions for Masonry	205
A.9.12	Supplementary Provisions for Wood	206

Appendix B

B.0	Serviceability Considerations	208
B.1	Deflection, Vibration and Drift	208
B.2	Design for Long-Term Deflections	208
B.3	Camber	208
B.4	Expansion and Contraction	208
B.5	Durability	208

Commentary	209
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Minimum Design Loads for Buildings and Other Structures

1.0 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 through 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 strength and the manner and consequences of failure (also called strength reduction factor).

Strength design: A method of proportioning structural members such that the computed forces produced in the members by the factored loads do not exceed the member design strength (also called load and resistance factor design).

Temporary facilities: Buildings or other structures that are to be in service for a limited time and have a *limited exposure period for environmental loadings*.

1.3 BASIC REQUIREMENTS

1.3.1 Strength

Buildings and other structures, and all parts thereof, shall be designed and constructed to support