

AWC

American Wood Council
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Washington, DC 20036

ANSI/AF&PA NDS-2005 National Design Specification for Wood Construction

ASCE

American Society of Civil Engineers

SEI/ASCE Standard 8-02 (2008), Specification for the Design of Cold-Formed Stainless Steel Structural Members

TMS

The Masonry Society
3970 Broadway, Suite 201-D
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TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6: Building Code Requirements and Specification for Masonry Structures

ACI 530/530.1 Building Code Requirements and Specification for Masonry Structures to Building Code Requirements and Specification for Masonry Structures—MSJC (Masonry Standards Joint Committee) (TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6)

C1.3.1.3 Performance-Based Procedures

Section 1.3.1.3 introduces alternative performance-based procedures that may be used in lieu of the procedures of Section 1.3.1.1 and 1.3.1.2 to demonstrate that a building or other structure, or parts thereof, have sufficient strength. These procedures are intended to parallel the so-called “alternative means and methods” procedures that have been contained in building codes for many years. Such procedures permit the use of materials, design, and construction methods different than the prescriptive requirements of the building code, or in this case Standard, that can be demonstrated to provide equivalent performance. Such procedures are useful and necessary in that they permit innovation and the development of new approaches before the building codes and standards have an opportunity to provide for these new approaches. In addition, these procedures permit the use of alternative methods for those special structures, which by means of their occupancy, use, or other features, can provide acceptable performance without compliance with the prescriptive requirements.

Section 1.3.1.3 requires demonstration that a design has adequate strength to provide an equivalent or lower probability of failure under load than that adopted as the basis for the prescriptive requirements of this Standard for buildings and structures of comparable Risk Category. Tables C.1.3.1a and C.1.3.1b summarize performance goals associated with protection against structural failure that approximate those notionally intended to be accomplished using the Load and Resistance Factor Design procedures of Section 2.3.

It is important to recognize that the requirements of ASCE 7 and its companion referenced standards are intended to go beyond protection against structural failure and are also intended to provide property and economic protection for small events, to the extent practical, as well as to improve the probability that critical facilities will be functional after severe storms, earthquakes, and similar events. Although these goals are an important part of the requirements of this Standard, at the present time there is no documentation of the reliability intended with respect to these goals. Consequently, Tables C.1.3.1a and C.1.3.1b address safety considerations only. In part, the serviceability requirements of Section 1.3.2 address these other objectives. It is essential that these other performance criteria be considered when implementing the procedures of Section 1.3.1.3.

The alternative procedures of Section 1.3.1.3 are intended to be used in the design of individual projects, rather than as the basis for broad qualification of new structural systems, products, or components. Procedures for such qualification are beyond the scope of this Standard.

It is anticipated that compliance with Section 1.3.1.3 will be demonstrated by analysis, testing, or a combination of both of these. It is important to recognize that the performance objectives tabulated in Tables C.1.3.1a and C.1.3.1b are probabilistic in nature and that there is inherent uncertainty associated with prediction of the intensity of loading a structure will experience, the actual strength of materials incorporated in construction, the quality of construction, and the condition of the structure at the time of loading. Whether testing, or analysis, or a combination of these is used, provision must be made to account for these uncertainties and ensure that the probability of poor performance is acceptably low.

Rigorous methods of reliability analysis can be used to demonstrate that the reliability of a design meets or approximates those indicated in Tables C.1.3.1a and C.1.3.1b. While such analyses would certainly constitute an acceptable approach to satisfy