

**§ 3280.304 Materials.**

(a) Dimension and board lumber shall not exceed 19 percent moisture content at time of installation.

(b)(1) Standards for some of the generally used materials and methods of construction are listed in the following table:

## Aluminum

Aluminum Design Manual, Specifications and Guidelines for Aluminum Structures, Part 1-A, Sixth Edition, October 1994, and Part 1-B, First Edition, October 1994.

## Steel

Specification for Structural Steel Buildings—Allowable Stress Design and Plastic Design—AISC—S335, 1989. The following parts of this reference standard are not applicable: 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.4.6, 1.5.1.5, 1.5.5, 1.6, 1.7, 1.8, 1.9, 1.10.4 through 1.10.7, 1.10.9, 1.11, 1.13, 1.14.5, 1.17.7 through 1.17.9, 1.19.1, 1.19.3, 1.20, 1.21, 1.23.7, 1.24, 1.25.1 through 1.25.5, 1.26.4, 2.3, 2.4, 2.8 through 2.10.

Specification for the Design of Cold-Formed Steel Structural Members—AISI—1996.

Specification for the Design of Cold-Formed Stainless Steel Structural Members—SEI/ASCE 8-02, 2002.

Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders, SJI, Fortieth Edition, 1994.

Structural Applications of Steel Cables for Buildings—ASCE19, 1996.

Standard Specification for Strapping, Flat Steel and Seals—ASTM D3953, 1991.

## Wood and Wood Products

Basic Hardboard—ANSI/AHA A135.4—1995.

Prefinished Hardboard Paneling—ANSI/AHA A135.5—1995.

Hardboard Siding—ANSI/AHA A135.6—1998.

American National Standard for Hardwood and Decorative Plywood—ANSI/HPVA HP-1-1994 (Approved 1995).

Structural Design Guide for Hardwood Plywood Wall Panels—HPVA Design Guide HP-SG-96, 1996.

For wood products—Structural Glued Laminated Timber—ANSI/AITC A190.1—1992.

Construction and Industrial Plywood (With Typical APA Trademarks)—PS 1-95.

APA Design/Construction Guide, Residential and Commercial—APA E30-P-1996.

Design Specifications for Metal Plate and Wood Connected Trusses—TPI-85.

Design and Fabrication of All-Plywood Beams—APA H-815E (PDS Supplement #5), 1995.

Panel Design Specification—APA D410A, 2004.

Design and Fabrication of Glued Plywood-Lumber Beams, Supplement# 2—APA S 812R, 1992 (incorporated by reference, see § 3280.4).

Design and Fabrication of Plywood Curved Panels—APA-S 811M, Suppl. 1, 1990.

Design and Fabrication of Plywood Sandwich Panels, Supplement #4—APA U 814H, 1990 (incorporated by reference, see § 3280.4).

Performance Standard for Wood-Based Structural Use Panels—NIST PS 2-04, 2004 (incorporated by reference, see § 3280.4).

Design and Fabrication of Plywood Stressed-Skin Panels, Supplement 3—APA-U 813L, 1992 (incorporated by reference, see § 3280.4).

National Design Specifications for Wood Construction, 2001 Edition, with Supplement, Design Values for Wood Construction, NDS-2001, ANSI/AFPA.

Wood Structural Design Data, 1986 Edition with 1992 Revisions, AFPA.

Span Tables for Joists and Rafters—PS-20-70, 1993, AFPA.

Design Values for Joists and Rafters 1992, AFPA.

Particleboard—ANSI A208.1-1999.

Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors—ANSI/AAMA/NWDA 101/I.S.2-97.

Standard Test Methods for Puncture and Stiffness of Paperboard, and Corrugated and Solid Fiberboard—ASTM D781, 1973.

Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials—ASTM D 4442-92 (Re-approved 1997), 1997.

Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters—ASTM D4444, 1992.

Engineered Wood Construction Guide—APA E30R 2001 (incorporated by reference, see § 3280.4).

Medium Density Fiberboard (MDF) For Interior Applications—ANSI A208.2-2002 (incorporated by reference, see § 3280.4).

## Other

Standard Specification for Gypsum Wallboard—ASTM C 36/C 36M-99, 1999.

## Fasteners

National Evaluation Report, Power Driven Staples, Nails, and Allied Fasteners for Use in All Types of Building Construction—NER-272, 1997.

## Unclassified

Minimum Design Loads for Buildings and Other Structures—ASCE 7-1988.

Standard for Safety Glazing Materials used in Buildings—Safety Performance Specifications and Methods of Test, ANSI Z97.1-2004 (incorporated by reference, see § 3280.4).

(2) Materials and methods of construction utilized in the design and

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construction of manufactured homes which are covered by the standards in the following table, or any applicable portion thereof shall comply with these requirements.

(3) Engineering analysis and testing methods contained in these references shall be utilized to judge conformance with accepted engineering practices required in § 3280.303(c).

(4) Materials and methods of installation conforming to these standards shall be considered acceptable when installed in conformance with the requirements of this part.

(5) Materials meeting the standards (or the applicable portion thereof) are considered acceptable unless otherwise specified herein or unless substantial doubt exists as to conformance.

(c) Wood products shall be identified as complying with the appropriate standards.

[40 FR 58752, Dec. 18, 1975, as amended at 42 FR 961, Jan. 4, 1977. Redesignated at 44 FR 20679, Apr. 6, 1979, as amended at 58 FR 55006, Oct. 25, 1993; 59 FR 15113, Mar. 31, 1994; 70 FR 72043, Nov. 30, 2005; 78 FR 73982, Dec. 9, 2013]

### § 3280.305 Structural design requirements.

(a) *General.* Each manufactured home shall be designed and constructed as a completely integrated structure capable of sustaining the design load requirements of this standard, and shall be capable of transmitting these loads to stabilizing devices without exceeding the allowable stresses or deflections. Roof framing shall be securely fastened to wall framing, walls to floor structure, and floor structure to chassis to secure and maintain continuity between the floor and chassis, so as to resist wind overturning, uplift, and sliding as imposed by design loads in this part. Uncompressed finished flooring greater than 1/8 inch in thickness shall not extend beneath load-bearing walls that are fastened to the floor structure.

(b) *Design loads—(1) Design dead loads.* Design dead loads shall be the actual dead load supported by the structural assembly under consideration.

(2) *Design live loads.* The design live loads and wind and snow loads shall be as specified in this section and shall be considered to be uniformly distributed.

The roof live load or snow load shall not be considered as acting simultaneously with the wind load and the roof live or snow load and floor live loads shall not be considered as resisting the overturning moment due to wind.

(3) When engineering calculations are performed, allowable unit stresses may be increased as provided in the documents referenced in § 3280.304 except as otherwise indicated in §§ 3280.304(b)(1) and 3280.306(a).

(4) Whenever the roof slope does not exceed 20 degrees, the design horizontal wind loads required by § 3280.305(c)(1) may be determined without including the vertical roof projection of the manufactured home. However, regardless of the roof slope of the manufactured home, the vertical roof projection shall be included when determining the wind loading for split level or clerestory-type roof systems.

(c) *Wind, snow, and roof loads—(1) Wind loads—design requirements.* (i) *Standard wind loads (Zone I).* When a manufactured home is not designed to resist the wind loads for high-wind areas (Zone II or Zone III) specified in paragraph (c)(1)(ii) of this section, the manufactured home and each of its wind-resisting parts and portions must be designed for horizontal wind loads of not less than 15 psf and a net uplift roof load of not less than 9 psf. The net uplift roof load must not be reduced by the dead loading of the roof structure for the purposes of engineering design or structural load testing.

(ii) *Wind loads for high wind areas (Zone II and Zone III).* When designed for high wind areas (Zone II and Zone III), the manufactured home, each of its wind resisting parts (including, but not limited to, shear walls, diaphragms, ridge beams, and their fastening and anchoring systems), and its components and cladding materials (including, but not limited to, roof trusses, wall studs, exterior sheathing, roofing and siding materials, exterior glazing, and their connections and fasteners) shall be designed by a Professional Engineer or Architect to resist:

(A) The design wind loads for Exposure C specified in ANSI/ASCE 7-88, “Minimum Design Loads for Buildings and Other Structures,” for a fifty-year