



FEMA

SEP 11 2007

**NOTICE OF AVAILABILITY OF HUD COMPLIANT MANUFACTURED HOUSING
(MOBILE HOMES) OFFERED BY FEMA TO TRIBAL GOVERNMENTS with
ATTACHED OFFICIAL REQUEST FORM**

DEADLINE TO SUBMIT REQUEST FORM: OCTOBER 15, 2007

Dear Tribal Leader:

This letter is to request that you submit your Tribe's official request for surplus unused manufactured housing units to the Federal Emergency Management Agency (FEMA) not later than October 15, 2007. One thousand (1000) units are being made available in accordance with the Post Katrina Emergency Management Reform Act of 2006, and in cooperation with the U.S. Department of Housing and Urban Development (HUD), the General Services Administration (GSA), and the Department of the Interior's Bureau of Indian Affairs (BIA).

This letter includes an attachment which gives specific information on the program.

We understand that you may have submitted an earlier request in response to a letter from BIA asking for comments on the allocation method for the units. If so, such a request does not satisfy this requirement. We respectfully ask that you sign and submit the attached Request Form, which is the official procedure to request the mobile homes.

The Request Form should be faxed to:

FEMA Emergency Housing Unit
(202) 646-3669
Attn: Elizabeth Kelley

In addition to faxing the form, please mail it to:

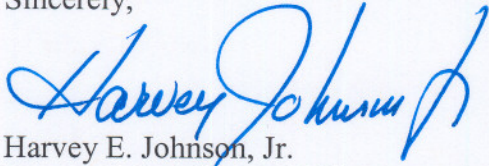
FEMA
Emergency Housing Unit
Logistics Management Directorate
500 C St. S.W.
Washington, D.C. 20472

Two forms are provided in this letter; please sign both forms and keep one for your records.

If you have any questions about this program, or wish to verify your fax was received, please contact Elizabeth Kelley, a member of my staff, at (202) 646-3752.

FEMA is proud to participate in this program, and we thank you for your interest.

Sincerely,

A handwritten signature in blue ink that reads "Harvey Johnson Jr." with a stylized flourish at the end.

Harvey E. Johnson, Jr.
Deputy Administrator/Chief Operating Officer

ATTACHMENT

AVAILABILITY OF HUD COMPLIANT MANUFACTURED HOUSING OFFERED BY FEMA TO TRIBAL GOVERNMENTS

INFORMATION AND REQUEST FORM

COST

The approximately 1000 available units are free of charge; however there are costs associated with transportation, unit set up, and if necessary, retrofitting. Tribes must pay for transportation and in some instances the cost to make the unit road worthy. Tribes must also pay for set up costs, and any retrofitting costs incurred. However, transportation and set up costs, and if necessary, retrofitting costs, are eligible under the Indian Housing Block Grant program (see section titled "Transportation and Set Up" for additional details).

CONDITION

(See also the section titled "Transfer of Title/Pick Up")

The manufactured housing units are single wide units, range in size from 14X64 to 16x84, and were manufactured in 2004 and 2005. The manufacturing companies include, but aren't limited to: Cavalier, Fleetwood, Giles, Clayton, Southern Energy, Skyline, and Palm Harbor.

These homes were manufactured in accordance with the Manufactured Home Construction and Safety Standards set forth in 24 Code of Federal Regulations (CFR) 3280, commonly called the HUD code. The HUD code requires formaldehyde emission levels in manufactured housing not to exceed .2 parts per million (ppm) for plywood and .3 ppm for particleboard materials. The HUD standards also require that a Health Notice on formaldehyde emissions be posted in each manufactured home as required by 24 CFR 3280.309 of the Standards. (See attached Important Health Notice).

FLOOD INSURANCE and CLIMATE ZONES

FEMA encourages participation in the National Flood Insurance Program and the purchase of flood insurance by unit recipients.

Described in the aforementioned HUD code there are three thermal zones, three wind speed zones, and three roof load zones. Please see the attached maps for more details.

The standards for these zones are shown on the next page.

THERMAL ZONES

	Thermal Zone Uo value (transmission of heat in BTUs per hour per square foot related to indoor design temperature of 70 degrees F (oF))	States in Each Zone (also see attached map)
Zone 1	.116 BTU/(hour)(square foot)(oF)	Alabama, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, and Texas
Zone 2	.096 BTU/(hour)(square foot)(oF)	Arizona, Arkansas, California, Kansas, Kentucky, Missouri, New Mexico, North Carolina, Oklahoma, Tennessee
Zone 3	.079 BTU/(hour)(square foot)(oF)	All other states

WIND SPEED ZONES

	Wind Speed Miles Per Hour (mph)	States
Zone I	70 mph	See attached map
Zone II	100 mph	See attached map
Zone III	110 mph	See attached map

ROOF LOAD ZONES

	Roof Load Pounds Per Square Foot (PSF)	States
South Zone	20 PSF	See Attached Map
Middle Zone	30 PSF	See Attached Map
North Zone	40 PSF	See Attached Map

Most of the mobile homes currently available are rated only for the southern climate roof load zone. There are not many mobile homes available that meet the roof load zones for the northern states or Alaska. We have 5 units that meet the criteria for the northern roof load zone, and approximately 69 units that meet the criteria for the middle roof load zone (the roof load zone for the states in the northern continental U.S.) However, there are approximately 250 southern *roof load zone* units that fall into the *thermal zone 3* category, the thermal zone for the northern states in the continental United States.

Units will be matched to the corresponding wind zone (Wind Zone I, II, or III).

Mobile homes that are rated for a lower (warmer) zone will be allocated to Tribes located in a higher (colder) zone, if the Tribe signs a waiver of liability (included in the Request Form), holding the federal government harmless from any liability arising from any harm that may occur to anyone using a mobile home in the wrong zone.

We encourage Tribes to retrofit the units to the appropriate climate zone, if necessary. We understand that tribal governments and tribal housing authorities will comply with tribal and/or local building codes and that these code regulations will ultimately define the use of the units.

TRANSPORTATION AND SET UP

Tribes considering applying for transfer of these mobile homes should obtain their own bid estimates for these costs. The following costs are estimates only:

Transportation:	Fixed cost per mile, may average \$5.50 - \$7.50 per mile (including permits)
Dead Head:	Cost per mile for hauling empty trailer on return trip: \$1.90 per mile. May be negotiable depending on number of units.
Fuel Surcharge:	Charge per mile based on the price of fuel: \$.45 (45 cents) per mile.
Hook-Up:	Hitch, lights, etc. \$197.00 per unit. May be negotiable based on the number of units.
Escort Car:	\$1.40 per mile, depending on route, state regulations, etc.
Permits:	Average per state: \$25.00
Tires:	\$40.00 per tire. Necessary in the event of blow outs or flats.
Setting and Leveling:	\$500.00 per unit.
Blocks:	\$150.00
Anchors:	\$140.00 (4 anchors)
Water and Sewer:	\$180.00 plus materials for water, \$200.00 plus materials for sewer.
Skirting:	\$1,500.00 - \$1,800.00 for hardi-board
Steps:	\$150.00
Electrical:	Pole installation, meter. \$200.00 – \$250.00 depending on distance.

Tribes may use funds provided by HUD through the Indian Housing Block Grant (IHBG) program to pay for the cost of transporting and setting up the mobile homes, and if necessary, for retrofitting the mobile homes. If a Tribe uses the IHBG funds for this purpose, all current program rules and regulations will apply. The Tribe may need to amend its Indian Housing Plan, and the Tribe must obtain environmental clearances relative to the relocation site of the mobile

homes'. For more information related to the use of these funds, please contact your regional HUD Area Office of Native American Programs.

Tribes not using the IHBG funds to transport the mobile homes must use their own funds or funds from other sources to cover the costs. GSA solicited special transportation rates for transporting FEMA surplus mobile homes. Tribes can use GSA approved transportation service providers and rates for transporting the mobile homes only if IHBG funds are *not* involved. The bids submitted by the transportation service providers apply only for the transportation of the mobile homes and do not include other services such as set-up, skirting, and hook-ups. Tribes may contact GSA representatives listed below for a listing of the qualified carriers and rates:

Ray Price	(703) 605-2890
Yolanda Miller	(703) 605-5618
Maria Gutierrez	(415) 522-2846
Mary Keenan	(404) 331-0532
John Wheeler	(202) 619-8958

ALLOCATION

BIA received numerous replies for its request for comments on the allocation method outlined in its June 20, 2007, letter to Tribes. Based on these comments, the participating agencies have determined that the method outlined below would be the fairest and simplest method, and would allow the Tribes to receive units in the shortest amount of time:

FEMA, in consultation with the other Agencies, will randomly allocate one mobile home to each requesting Tribe until all Tribes that have requested a mobile home have been allocated one. Tribes, if any, which have requested only one mobile home, would have received their entire request and would be removed from the allocation process. FEMA and the aforementioned collaborating agencies will then randomly allocate a second mobile home to each Tribe that has requested at least two mobile homes until all Tribes that have requested two mobile homes have been allocated a second unit. Any Tribes that have requested only two units will then be removed from the allocation process. The allocation process will continue in this manner until all the available mobile homes have been allocated.

Units will be matched as much as possible to the corresponding roof load zone and thermal zone for each Tribe. Due to the very limited number of northern and middle roof load zone units, the northern and middle roof load zone units will be allocated to appropriate climate areas separately, until these units are depleted. If the number of requested northern and middle roof load zone units exceeds our supply, units will be allocated according to the highest poverty level and lack of complete plumbing and kitchen facilities data from the U.S. Census of the year 2000. Units will match corresponding wind zones.

All units allocated to northern Tribes may not match the northern roof load and thermal climate zones. Tribes will have the opportunity to turn down units they have been allocated that do not match their climate zones after receiving their award letter.

RETROFITTING

We do not have estimates on the cost for retrofitting units, but we do recommend Tribes prepare a cost benefit analysis to compare the transportation, hook up, and retrofitting costs on units versus purchasing a new unit locally with the correct climate zone. Manufacturers should have information on retrofitting.

TRANSFER OF TITLE/PICK UP

The mobile homes are located in Hope, Arkansas and Texarkana, Texas.

After the units are allocated to Tribes, HUD will notify Tribes by letter of how many units they are to receive, with the corresponding Vehicle Identification Numbers (VINs), a Standard Form 122 (transfer order), and a Release Authorization Form. Once Tribes receive this award letter, they should contact the appropriate storage facility (either Texarkana, Texas or Hope, Arkansas) to schedule pick up of the unit(s). We expect units to be ready for pick up at the end of October, 2007.

If a Tribe hires a transportation contractor to pick up the units, the contractor must present the previously signed (by an authorized tribal representative) Standard Form 122 listing the VINs that the Tribe has accepted, and a Release Authorization Form signed by the Tribal representative which allows the contractor(s) to pick up the unit(s). If a Tribe is picking up the units using internal transportation, the drivers' must present valid Tribal Identification to pick up the units along with the Standard Form 122.

Tribes will have the opportunity to reject any or all units allocated to them at the time of pick up, but cannot select other units as replacement for any not accepted. Tribes will have a minimum of 30 days and maximum of 60 days from the date of the award letter's certified mail receipt to pick up the units from the FEMA facilities unless otherwise coordinated with the FEMA storage facility contact listed below. Manufactured homes (mobile homes) not picked up within the pickup period may be allocated to another tribe if arrangements are not made.

The contacts for the FEMA storage facilities are:

Texarkana, Texas

Highway 82 West
Texarkana, TX 75505
Contact: Carrie Black or Brian Hall
903-334-4659 or 903-334-4468
Cell 703-399-0494

Hope, Arkansas

3910 Hwy 278 W
Hope, AR 71801
Contact: Ruth Pierce or Jenifer Williamson
870-777-3343
Cell 832-851-4125

APPLICATION

To apply, Tribes should fax a copy of the attached form, signed by the tribal chairperson or the tribal leader authorized to sign on behalf of the Tribe, to:

FAX: 202-646-3669

ATTN: Elizabeth Kelley, Emergency Housing Unit

The Tribe should also mail in the form (and keep a copy for its records), with the original signature, to:

Federal Emergency Management Agency
Emergency Housing Unit, Logistics Management Directorate
500 C Street, S.W.
Washington, D.C. 20472
Attn: Elizabeth Kelley

Thank you.

**REQUEST FOR HUD COMPLIANT MANUFACTURED HOUSING (MOBILE HOMES)
OFFERED BY FEMA**

REQUEST FORM

RETURN BY FAX TO FEMA AT 202-646-3669

DUE DATE: OCTOBER 15, 2007

We would like to request the following number of unused mobile homes from the Federal Emergency Management Agency (FEMA) under the authority of the Post Katrina Emergency Management Reform Act:

_____ Number of Unused Housing Units

_____ 1 Bedroom

_____ 2 Bedroom

_____ 3 Bedroom

_____ 4 Bedroom

(Number of bedrooms will be matched as much as possible; Tribes may not receive the exact number of bedrooms that they request).

Upon review of the mobile home zone maps, we determined that the Tribe is located (and the unused mobile home units will be located) within the following geographic thermal, roof load, and wind zone areas:

_____ Thermal Zone (1, 2, or 3)

_____ Roof Load Zone (South, Middle, North)

_____ Wind Zone (1, 2, or 3)

AGREEMENT

Please check:

_____ We agree to hold the Federal Government and its entities harmless from any liability for any damage to persons or property that may occur from using a mobile home built for a lower thermal, roof load, and/or wind speed zone in a higher zone(s).

_____ We certify that we have enough money for the transportation and set up of the units that we have requested.

REQUEST FORM

Page Two

_____ We agree to accept the units allocated to us in an “as is” condition.

Please check if applicable:

_____ We cannot accept housing units that do not correspond to our area’s climate zone. Please amend our request by only selecting units that match our (check all that apply): _____ Roof Load Zone ___ Thermal Zone _____ Wind Zone and re-allocate incompatible units to another Tribe. We understand this will most likely decrease the number of housing units we will receive through this program.

FOR: _____
NAME OF TRIBE

Name

Title

Signature

Date

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FOR: _____
NAME OF TRIBE

Name

Title

Signature

Date

TRIBE COPY

Important Health Notice

Extracted from the Code of Federal Regulations 24, Section 3280

Some of the building materials used in this home emits formaldehyde. Eye, nose, and throat irritation, headache, nausea, and variety of asthma-like symptoms, including shortness of breath, have been reported as a result of formaldehyde exposure. Elderly persons and young children, as well as anyone with a history of asthma, allergies, or lung problems may be at greater risk. Research is continuing on the possible long-term effects of exposure to formaldehyde.

Reduced ventilation resulting from energy efficiency standards may allow formaldehyde and other contaminants to accumulate in the indoor air. Additional ventilation to dilute the indoor air may be obtained from a passive or mechanical ventilation system offered by the manufacturer. Consult your dealer for information about the ventilation options offered with this home.

High indoor temperatures and humidity raise formaldehyde levels. When a home is to be located in areas subject to extreme summer temperatures, an air conditioning system can be used to control indoor temperature levels. Check the comfort-cooling certificate to determine if this home has been equipped or designed for the installation of an air conditioning system.

If you have any questions regarding the health effects of formaldehyde, consult your doctor or local health department.

ATTACHMENT

HUD CLIMATE ZONE MAPS AND INFORMATION
(REFERENCE: 24 CODE OF FEDERAL REGULATIONS (3280))

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.

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.

Safety Performance Specifications and Methods of Test for Safety Glazing Materials Used in Building—ANSI Z97.1-1984.

* * * * *

§ 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 shall be designed for horizontal wind loads of not less than 15 psf and net uplift load of not less than 9 psf.

(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 recurrence interval, and a design wind speed of 100 mph, as specified for Wind

Zone II, or 110 mph, as specified for (B) The wind pressures specified in Wind Zone III (Basic Wind Zone Map); the following table:
or

TABLE OF DESIGN WIND PRESSURES

Element	Wind zone II design wind speed 100 MPH	Wind zone III design wind speed 110 MPH
Anchorage for lateral and vertical stability (See § 3280.306(a)):		
Net Horizontal Drag ^{1,2} :	³ ±39 PSF	³ ±47 PSF
Uplift ⁴ :	⁵ -27 PSF	-32 PSF
Main wind force resisting system:		
Shearwalls, Diaphragms and their Fastening and Anchorage Systems ^{1,2}	±39 PSF	±47 PSF
Ridge beams and other Main Roof Support Beams (Beams supporting expanding room sections, etc.)	-30 PSF	-36 PSF
Components and cladding:		
Roof trusses ⁴ in all areas; trusses shall be doubled within 3'-0" from each end of the roof	⁵ -39 PSF	⁵ -47 PSF
Exterior roof coverings, sheathing and fastenings ^{4,6,7} in all areas except the following	⁵ -39 PSF	⁵ -47 PSF
Within 3'-0" from each gable end (overhang at end wall) of the roof or endwall if no overhang is provided ^{4,6,7}	⁵ -73 PSF	⁵ -89 PSF
Within 3'-0" from the ridge and eave (overhang at sidewall) or sidewall if no eave is provided ^{4,6,7}	⁵ -51 PSF	⁵ -62 PSF
Eaves (Overhangs at Sidewalls) ^{4,6,7}	⁵ -51 PSF	⁵ -62 PSF
Gables (Overhangs at Endwalls) ^{4,6,7}	⁵ -73 PSF	⁵ -89 PSF
Wall studs in sidewalls and endwalls, exterior windows and sliding glass doors (glazing and framing), exterior coverings, sheathing and fastenings ⁸ :		
Within 3'-0" from each corner of the sidewall and endwall	±48 PSF	±58 PSF
All other areas	±38 PSF	±46 PSF

NOTES:

¹ The net horizontal drag of ±39 PSF to be used in calculating Anchorage for Lateral and Vertical Stability and for the design of Main Wind Force Resisting Systems is based on a distribution of wind pressures of +0.8 or +24 PSF to the windward wall and -0.5 or -15 PSF to the leeward wall.

² Horizontal drag pressures need not be applied to roof projections when the roof slope does not exceed 20 degrees.

³ + sign would mean pressures are acting towards or on the structure; - sign means pressures are acting away from the structure; ± sign means forces can act in either direction, towards or away from the structure.

⁴ Design values in this "Table" are only applicable to roof slopes between 10 degrees (nominal 2/12 slope) and 30 degrees.

⁵ The design uplift pressures are the same whether they are applied normal to the surface of the roof or to the horizontal projection of the roof.

⁶ Shingle roof coverings that are secured with 6 fasteners per shingle through an underlayment which is cemented to a 3/8" structural rated roof sheathing need not be evaluated for these design wind pressures.

⁷ Structural rated roof sheathing that is at least 3/8" in thickness, installed with the long dimension perpendicular to roof framing supports, and secured with fasteners at 4" on center within 3'-0" of each gable end or endwall if no overhang is provided and 6" on center in all other areas, need not be evaluated for these design wind pressures.

⁸ Exterior coverings that are secured at 6" o.c. to a 3/8" structural rated sheathing that is fastened to wall framing members at 6" on center need not be evaluated for these design wind pressures.

(2) *Wind loads—zone designations.* The Wind Zone and specific wind design load requirements are determined by the fastest basic wind speed (mph) within each Zone and the intended location, based on the Basic Wind Zone Map, as follows:

(i) *Wind Zone I.* Wind Zone I consists of those areas on the Basic Wind Zone Map that are not identified in paragraphs (c)(2)(ii) or (iii) of this section as being within Wind Zone II or III, respectively.

(ii) *Wind Zone II.*.....100 mph. The following areas are deemed to be within Wind Zone II of the Basic Wind Zone Map:

Local governments: The following local governments listed by State (counties, unless specified otherwise):

Alabama: Baldwin and Mobile.

Florida: All counties except those identified in paragraph (c)(1)(i)(C) of this section as within Wind Zone III.

Georgia: Bryan, Camden, Chatham, Glynn, Liberty, McIntosh.

Louisiana: Parishes of Acadia, Allen, Ascension, Assumption, Calcasieu, Cameron, East Baton Rouge, East Feliciana, Evangeline, Iberia, Iberville, Jefferson Davis, LaFayette, Livingston, Pointe Coupee, St. Helena, St. James, St. John the Baptist, St. Landry, St. Martin, St. Tammany, Tangipahoa, Vermillion, Washington, West Baton Rouge, and West Feliciana.

Maine: Hancock and Washington.
Massachusetts: Barnstable, Bristol, Dukes, Nantucket, and Plymouth.

Mississippi: George, Hancock, Harrison, Jackson, Pearl River, and Stone.

North Carolina: Beaufort, Brunswick, Camden, Chowan, Columbus, Craven, Currituck, Jones, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, and Washington.

South Carolina: Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, Jasper, and Williamsburg.

Texas: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, and Willacy.

Virginia: Cities of Chesapeake, Norfolk, Portsmouth, Princess Anne, and Virginia Beach.

(iii) *Wind Zone III*.....110 mph. The following areas are considered to be within Wind Zone III of the Basic Wind Zone Map:

(A) *States and Territories:* The entire State of Hawaii, the coastal regions of Alaska (as determined by the 90 mph isotach on the ANSI/ASCE 7-88 map), and all of the U.S. Territories of American Samoa, Guam, Northern Mariana Islands, Puerto Rico, Trust Territory of the Pacific Islands, and the United States Virgin Islands.

(B) *Local governments:* The following local governments listed by State (counties, unless specified otherwise):

Florida: Broward, Charlotte, Collier, Dade, Franklin, Gulf, Hendry, Lee, Martin, Manatee, Monroe, Palm Beach, Pinellas, and Sarasota.

Louisiana: Parishes of Jefferson, La Fourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Mary, and Terrabonne.

North Carolina: Carteret, Dare, and Hyde.

(iv) *Consideration of local requirements.* For areas where local building code requirements exceed the design wind speed requirements of these standards, the Department will consider the adop-

tion through rulemaking of the more stringent requirements of the State or local building authority.

(3) *Snow and roof loads.* (i) Flat, curved and pitched roofs shall be designed to resist the following live loads, applied downward on the horizontal projection as appropriate for the design zone marked on the manufactured home:

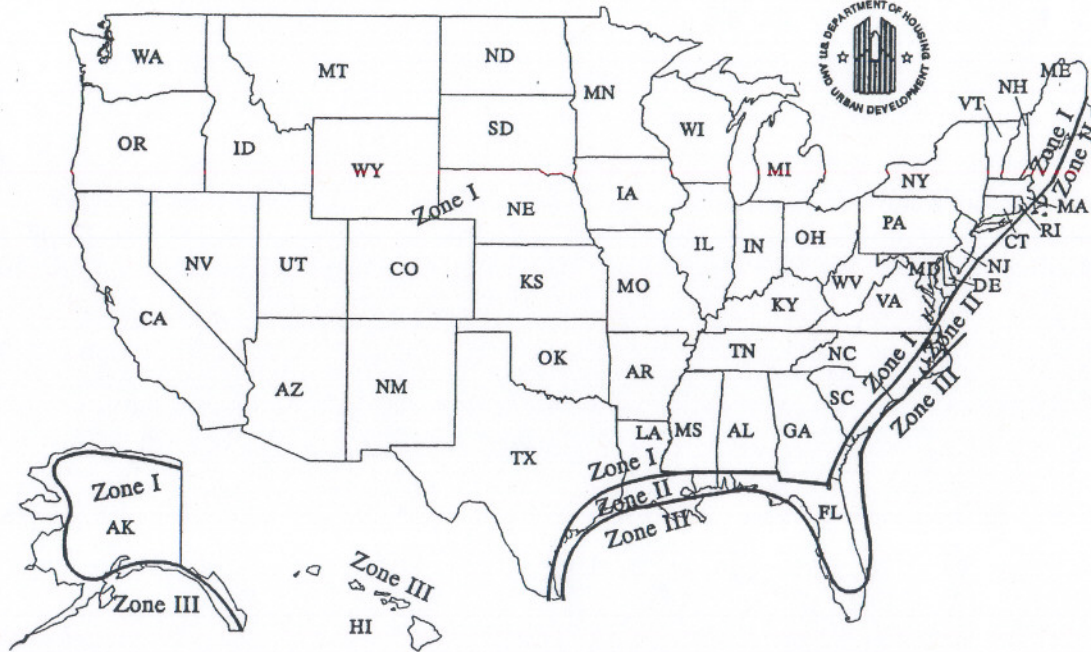
Zone (see Map in § 3280.305(c)(4))	Pounds per square foot
North Zone	40
Middle Zone	30
South Zone	20

(ii) For exposures in areas (mountainous or other) where snow or wind records or experience indicate significant differences from the loads stated above, the Department may establish more stringent requirements for homes known to be destined for such areas. For snow loads, such requirements are to be based on a roof snow load of 0.6 of the ground snow load for areas exposed to wind and a roof snow load of 0.8 of the ground snow load for sheltered areas.

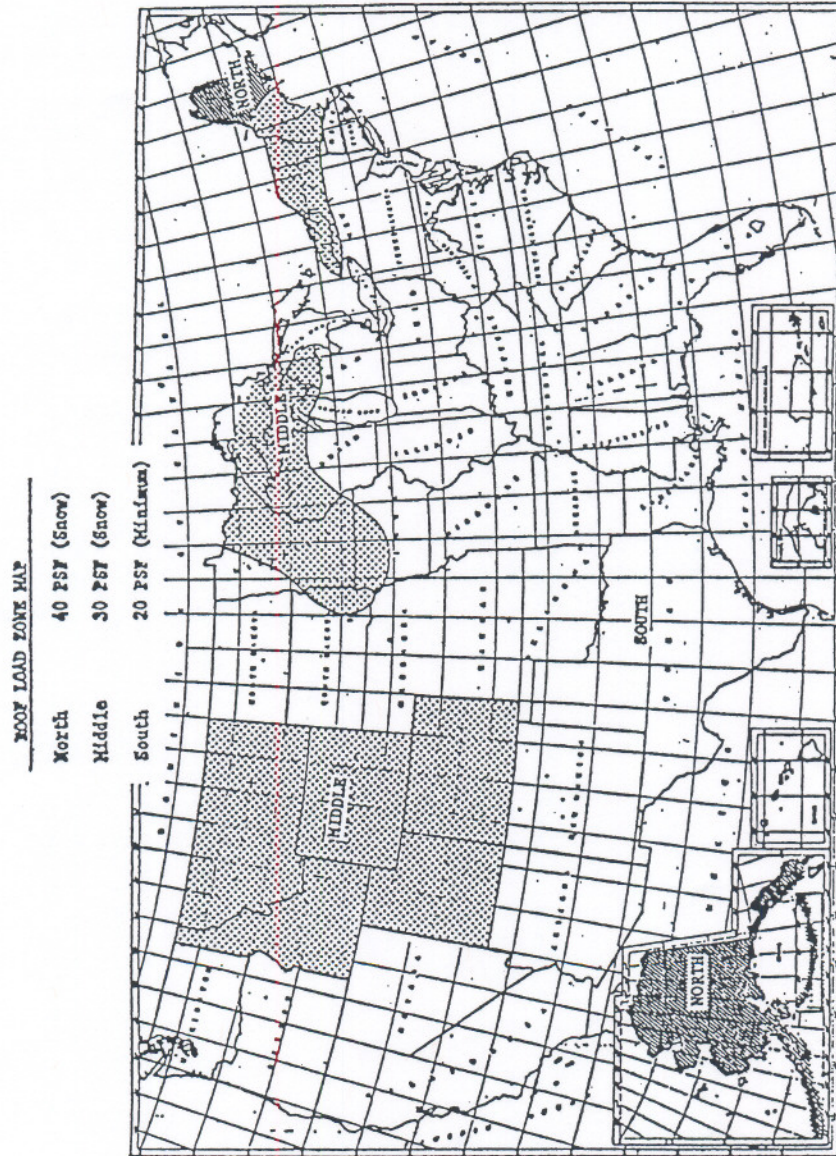
(iii) Eaves and cornices shall be designed for a net uplift pressure of 2.5 times the design uplift wind pressure cited in § 3280.305(c)(1)(i) for Wind Zone I, and for the design pressures cited in § 3280.305(c)(1)(ii) for Wind Zones II and III.

(4) *Data plate requirements.* The Data Plate posted in the manufactured home (see § 3280.5) shall designate the wind and roof load zones or, if designed for higher loads, the actual design external snow and wind loads for which the home has been designed. The Data Plate shall include reproductions of the Load Zone Maps shown in this paragraph (c)(4), with any related information. The Load Zone Maps shall be not less than either 3½ in. by 2¼ in., or one-half the size illustrated in the Code of Federal Regulations.

Basic Wind Zone Map for Manufactured Housing



NOTE: See Section 3280.305(c)(2) for areas included in each Wind Zone.



(d) *Design load deflection.* (1) When a structural assembly is subjected to total design live loads, the deflection for structural framing members shall not exceed the following (where L equals the clear span between supports or two times the length of a cantilever):

§ 3280.305

Floor—L/240
Roof and ceiling—L/180
Headers, beams, and girders (vertical load)—
L/180
Walls and partitions—L/180

(2) The allowable eave or cornice deflection for uplift is to be measured at the design uplift load of 9 psf for Wind Zone I, and at the design uplift pressure cited in paragraph (c)(1)(ii) of this section for Wind Zones II and III. The allowable deflection shall be $(2 \times L_c)/180$, where L_c is the measured horizontal eave projection from the wall.

(e) *Fastening of structural systems.* (1) 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 specified in this part.

(2) For Wind Zones II and III, roof trusses shall be secured to exterior wall framing members (studs), and exterior wall framing members (studs) shall be secured to floor framing members, with 26 gage minimum steel strapping or brackets or by a combination of 26 gage minimum steel strapping or brackets and structural rated wall sheathing that overlaps the roof and floor. Steel strapping or brackets shall be installed at a maximum spacing of 24" on center in Wind Zone II and at a maximum of 16" on center in Wind Zone III. The number and type of fasteners used to secure the steel straps or brackets or structural sheathing shall be capable of transferring all uplift forces between elements being joined.

(f) *Walls.* The walls shall be of sufficient strength to withstand the load requirements as defined in § 3280.305(c) of this part, without exceeding the deflections as specified in § 3280.305(d). The connections between the bearing walls, floor, and roof framework members shall be fabricated in such a manner as to provide support for the material used to enclose the manufactured home and to provide for transfer of all lateral and vertical loads to the floor and chassis.

(1) Except where substantiated by engineering analysis or tests, studs shall not be notched or drilled in the middle one-third of their length.

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(2) Interior walls and partitions shall be constructed with structural capacity adequate for the intended purpose and shall be capable of resisting a horizontal load of not less than five pounds per square foot. An allowable stress increase of 1.33 times the permitted published design values may be used in the design of wood framed interior partitions. Finish of walls and partitions shall be securely fastened to wall framing.

(g) *Floors.* (1) Floor assemblies shall be designed in accordance with accepted engineering practice standards to support a minimum uniform live load of 40 lb/ft² plus the dead load of the materials. In addition (but not simultaneously), floors shall be able to support a 200-pound concentrated load on a one-inch diameter disc at the most critical location with a maximum deflection not to exceed one-eighth inch relative to floor framing. Perimeter wood joists of more than six inches depth shall be stabilized against overturning from superimposed loads as follows: at ends by solid blocking not less than two-inch thickness by full depth of joist, or by connecting to a continuous header not less than two-inch thickness and not less than the depth of the joist with connecting devices; at eight-foot maximum intermediate spacing by solid blocking or by wood cross-bridging of not less than one inch by three inches, metal cross-bridging of equal strength, or by other approved methods.

(2) Wood, wood fiber or plywood floors or subfloors in kitchens, bathrooms (including toilet compartments), laundry areas, water heater compartments, and any other areas subject to excessive moisture shall be moisture resistant or shall be made moisture resistant by sealing or by an overlay of nonabsorbent material applied with water-resistant adhesive. Use of one of the following methods would meet this requirement:

(i) Sealing the floor with a water-resistant sealer; or

(ii) Installing an overlay of a non-absorbent floor covering material applied with water-resistant adhesive; or

(iii) Direct application of a water-resistant sealer to the exposed wood floor

area when covered with a non-absorbent overlay; or

(iv) The use of a non-absorbent floor covering which may be installed without a continuous application of a water-resistant adhesive or sealant when the floor covering meets the following criteria:

(A) The covering is a continuous membrane with any seams or patches seam bonded or welded to preserve the continuity of the floor covering; and

(B) The floor is protected at all penetrations in these areas by sealing with a compatible water-resistant adhesive or sealant to prevent moisture from migrating under the nonabsorbent floor covering; and

(C) The covering is fastened around the perimeter of the subfloor in accordance with the floor covering manufacturer's instructions; and,

(D) The covering is designed to be installed to prevent moisture penetration without the use of a water-resistant adhesive or sealer except as required in this paragraph (g). The vertical edges of penetrations for plumbing shall be covered with a moisture-resistant adhesive or sealant. The vertical penetrations located under the bottom plates of perimeter walls of rooms, areas, or compartments are not required to be sealed; this does not include walls or partitions within the rooms or areas.

(3) Carpet or carpet pads shall not be installed under concealed spaces subject to excessive moisture, such as plumbing fixture spaces, floor areas under installed laundry equipment. Carpet may be installed in laundry space provided:

- (i) The appliances are not provided;
- (ii) The conditions of paragraph (g)(2) of this section are followed; and
- (iii) Instructions are provided to remove carpet when appliances are installed.

(4) Except where substantiated by engineering analysis or tests:

- (i) Notches on the ends of joists shall not exceed one-fourth the joist depth.
- (ii) Holes bored in joists shall not be within 2 inches of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third the depth of the joist.
- (iii) Notches in the top or bottom of the joists shall not exceed one-sixth

the depth and shall not be located in the middle third of the span.

(5) Bottom board material (with or without patches) shall meet or exceed the level of 48 inch-pounds of puncture resistance as tested by the Beach Puncture Test in accordance with Standard Test Methods for Puncture and Stiffness of Paperboard, and Corrugated and Solid Fiberboard, ASTM D-781-1968 (73). The material shall be suitable for patches and the patch life shall be equivalent to the material life. Patch installation instruction shall be included in the manufactured home manufacturer's instructions.

(h) *Roofs.* (1) Roofs shall be of sufficient strength to withstand the load requirements as defined in § 3280.305 (b) and (c) without exceeding the deflections specified in § 3280.305(d). The connections between roof framework members and bearing walls shall be fabricated in such a manner to provide for the transfer of design vertical and horizontal loads to the bearing walls and to resist uplift forces.

(2) Roofing membranes shall be of sufficient rigidity to prevent deflection which would permit ponding of water or separation of seams due to wind, snow, ice, erection or transportation forces.

(3) Cutting of roof framework members for passage of electrical, plumbing or mechanical systems shall not be allowed except where substantiated by engineering analysis.

(4) All roof penetrations for electrical, plumbing or mechanical systems shall be properly flashed and sealed. In addition, where a metal roof membrane is penetrated, a wood backer shall be installed. The backer plate shall be not less than 5/16 inch plywood, with exterior glues, secured to the roof framing system beneath the metal roof, and shall be of a size to assure that all screws securing the flashing are held by the backer plate.

(i) *Frame construction.* The frame shall be capable of transmitting all design loads to stabilizing devices without exceeding the allowable load and deflections of this section. The frame shall also be capable of withstanding the effects of transportation shock and vibration without degradation as required by subpart J.

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(1) *Welded connections.* (i) All welds shall be made in accordance with the applicable provisions of the Specification for Structural Steel Buildings, Allowable Stress Design and Plastic Design, AISC, June 1, 1989. The Specification for the Design of Cold-Formed Steel Structural Members, AISI-1986 with 1989 addendum, and the Stainless Steel Cold-Formed Structural Design Manual, AISI-1974.

(ii) Regardless of the provisions of any reference standard contained in this subpart, deposits of weld slag or flux shall be required to be removed only from welded joints at the following locations:

- (A) Drawbar and coupling mechanisms;
- (B) Main member splices, and
- (C) Spring hanger to main member connections.

(2) *Protection of metal frames against corrosion.* Metal frames shall be made corrosion resistant or protected against corrosion. Metal frames may be protected against corrosion by painting.

[40 FR 58752, Dec. 18, 1975. Redesignated at 44 FR 20679, Apr. 6, 1979, as amended at 44 FR 66195, Nov. 19, 1979; 52 FR 4582, Feb. 12, 1987; 58 FR 55006, Oct. 25, 1993; 59 FR 2469, Jan. 14, 1994; 59 FR 15113, 15114, Mar. 31, 1994; 62 FR 54547, Oct. 20, 1997]

EFFECTIVE DATE NOTE: At 70 FR 72043, Nov. 30, 2005, § 3280.305 was amended by adding paragraphs (c)(1)(iii), (c)(3)(i)(A) through (C) following the table in paragraph (c)(3)(i), and (c)(3)(iv); revising paragraph (e), redesignating paragraphs (g)(3) through (g)(5) as paragraphs (g)(4) through (g)(6), and adding

new paragraph (g)(3); redesignating paragraphs (i)(1)(i), (i)(1)(ii), (i)(1)(ii)(A), (i)(1)(ii)(B) and (i)(1)(ii)(C) as paragraphs (j)(1), (j)(2), (j)(2)(i), (j)(2)(ii), and (j)(2)(iii), respectively; reserving vacated paragraph (i), and revising newly redesignated paragraph (j)(1), effective May 30, 2006. For the convenience of the user the revised and added text follows:

§ 3280.305 Structural design requirements.

- * * * * *
- (c) * * *
- (1) * * *

(iii) One-piece metal roofing capable of resisting the design wind pressures for "Components and Cladding: (Exterior roof coverings)" in the Table for Design Wind Pressures in this section is allowed to be used without structural sheathing, provided the metal roofing is tested using procedures that have been approved by HUD and that meet all requirements of §§ 3280.303(c) and (g) and 3280.401.

- * * * * *
- (3) * * *
- (i) * * *

(A) *North Roof Load Zone.* The following counties in each of the following states are deemed to be within the North Roof Load Zone:

Maine—Aroostook, Piscataquis, Somerset, Penobscot, Waldo, Knox, Hancock, and Washington.

Alaska—All Counties

(B) *Middle Roof Load Zone.* The following counties in each of the following states are deemed to be within the Middle Roof Load Zone:

States	Counties			
South Dakota	Grant Codington Deuel Hamlin Kingsbury	Brookings Miner Lake Moody McCook	Hanson Minnehaha Hutchinson Turner	Lincoln Yankton Union Clay
Minnesota	Koochiching Itasca Hubbard Cass Crow Wing Aitkin St. Louis Lake Cook Carlton Pine Wadena Todd Morrison Douglas	Stearns Swift Kandiyohi Meeker Wright Lac qui Parle Chippewa Yellow Medicine Mille Lacs Kanabec Benton Isanti Sherburne Anoka Chisago	Renville McLeod Carver Dakota Goodhue Wabasha Winona Fillmore Mower Olmsted Dodge Rice Steele Freeborn Faribault	Sibley Nicollet Blue Earth Martin Watonwan Brown Redwood Lyon Lincoln Pipestone Murray Cottonwood Jackson Nobles Rock

	Grant	Washington	Waseca	St. Croix
	Stevens	Hennepin	Le Sueur	
	Pope	Ramsey	Scott	
Iowa	Hanock	Mitchell	Hamilton	Buena Vista
	Lyon	Howard	Webster	Cherokee
	Osceola	Chickasaw	Calhoun	Plymouth
	Dickinson	Butler	Sac	Sioux
	Emmet	Floyd	Ida	O'Brien
	Kossuth	Cerro Gordo	Humboldt	Clay
	Winnebago	Franklin	Pocahontas	Wright
	Worth	Hardin	Palo Alto	Crawford
Wisconsin	Douglas	Oconto	Pepin	Lincoln
	Bayfield	Menominee	Pierce	Oneida
	Ashland	Langlade	Dunn	Polk
	Iron	Marathon	Eau Claire	Burnett
	Vilas	Clark	Chippewa	Washburn
	Forest	Jackson	Rusk	Sawyer
	Florence	Trempealeau	Barron	Price
	Marquette	Buffalo	Taylor	Doon
Michigan	Houghton	Iron	Presque Isle	Wexford
	Baraga	Dickinson	Charlevoix	Benzie
	Marquette	Menominee	Montmorency	Grand Traverse
	Alger	Delta	Alpena	Kalkaska
	Luce	Schoolcraft	Alcona	Oscoda
	Chippewa	Mackinaw	Ogemaw	Otsego
	Keweenaw	Cheyboygan	Roscommon	Leelanau
	Ontonagon	Emmet	Missaukee	Antrim
	Gogebic			
New York	St. Lawrence	Herkimer	Onondage	Genesee
	Franklin	Lewis	Madison	Orleans
	Clinton	Oswego	Cayuga	Niagara
	Essex	Jefferson	Seneca	Erie
	Hamilton	Oneida	Wayne	Wyoming
	Warren	Fulton	Ontario	Monroe
	Saratoga	Montgomery	Yates	
	Washington	Schenectady	Livingston	
Massachusetts	Essex			
Maine	Franklin	Kennebec	Lincoln	Cumberland
	Oxford	Androscoggin	Sagadahoc	York
Montana	All Counties			
Idaho	All Counties			
Colorado	All Counties			
Wyoming	All Counties			
Utah	All Counties			
Vermont	Franklin	Orleans	Caledonia	Addison
	Grand Isle	Essex	Washington	Rutland
	Lamoille	Chittendon	Orange	Windsor
New Hampshire	Cocis	Belknap	Sullivan	Hillsborough
	Grafton	Strafford	Rockingham	Cheshire
	Carroll	Merrimack		

(C) *South Roof Load Zone.* The states and counties that are not listed for the North Roof Load Zone in paragraph (c)(3)(i)(A) of this section, or the Middle Roof Load Zone in paragraph (c)(3)(i)(B) of this section, are deemed to be within the South Roof Load Zone.

* * * * *

(iv) Skylights must be capable of withstanding roof loads as specified in paragraphs (c)(3)(i) or (c)(3)(ii) of this section. Skylights must be listed and tested in ac-

cordance with AAMA 1600/I.S.7-00, 2003, Voluntary Specification for Skylights.

* * * * *

(e) *Fastening of structural systems.* (1) Roof framing must 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 in order to resist wind overturning, uplift, and sliding, and to provide continuous load paths for these forces to the foundation or anchorage system. The number and type of fasteners used must be capable of transferring all forces between elements being joined.

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(2) For Wind Zone II and Wind Zone III, roof framing members must be securely fastened at the vertical bearing points to resist design overturning, uplift, and sliding forces. When engineered connectors are not installed, roof framing members must be secured at the vertical bearing points to wall framing members (studs), and wall framing members (studs) must be secured to floor framing members, with 0.016 inch base metal, minimum steel strapping or engineered connectors, or by a combination of 0.016 inch base metal, minimum steel strapping or engineered connectors, and structural-rated wall sheathing that overlaps the roof and floor system if substantiated by structural analysis or by suitable load tests. Steel strapping or engineered connectors are to be installed at a maximum spacing of 24 inches on center in Wind Zone II, and 16 inches on center in Wind Zone III. Exception: Where substantiated by structural analysis or suitable load tests, the 0.016 inch base metal minimum steel strapping or engineered connectors may be omitted at the roof to wall and/or wall to floor connections, when structural rated sheathing that overlaps the roof and wall and/or wall and floor is capable of resisting the applicable design wind loads.

* * * * *

(g) ***
(3) Wood panel products used as floor or subfloor materials on the exterior of the home, such as in recessed entryways, must be rated for exterior exposure and protected from moisture by sealing or applying non-absorbent overlay with water resistant adhesive.

* * * * *

(j) *Welded connections.* (1) All welds must be made in accordance with the applicable provisions of the Specification for Structural Steel Buildings, Allowable Stress Design and Plastic Design, AISC-S335, 1989; the Specification for the Design of Cold-Formed Steel Structural Members, AISI, 1996; and the Specification for the Design of Cold-Formed Stainless Steel Structural Members, SEI/ASCE 8-02, 2002.

* * * * *

§ 3280.306 Windstorm protection.

(a) *Provisions for support and anchoring systems.* Each manufactured home shall have provisions for support/anchoring or foundation systems that, when properly designed and installed, will resist overturning and lateral movement (sliding) of the manufactured home as imposed by the respec-

tive design loads. For Wind Zone I, the design wind loads to be used for calculating resistance to overturning and lateral movement shall be the simultaneous application of the wind loads indicated in § 3280.305(c)(1)(i), increased by a factor of 1.5. The 1.5 factor of safety for Wind Zone I is also to be applied simultaneously to both the vertical building projection, as horizontal wind load, and across the surface of the full roof structure, as uplift loading. For Wind Zones II and III, the resistance shall be determined by the simultaneous application of the horizontal drag and uplift wind loads, in accordance with § 3280.305(c)(1)(ii). The basic allowable stresses of materials required to resist overturning and lateral movement shall not be increased in the design and proportioning of these members. No additional shape or location factors need to be applied in the design of the tiedown system. The dead load of the structure may be used to resist these wind loading effects in all Wind Zones.

(1) The provisions of this section shall be followed and the support and anchoring systems shall be designed by a Registered Professional Engineer or Architect.

(2) The manufacturer of each manufactured home is required to make provision for the support and anchoring systems but is not required to provide the anchoring equipment or stabilizing devices. When the manufacturer's installation instructions provide for the main frame structure to be used as the points for connection of diagonal ties, no specific connecting devices need be provided on the main frame structure.

(b) *Contents of instructions.* (1) The manufacturer shall provide printed instructions with each manufactured home specifying the location and required capacity of stabilizing devices on which the design is based. The manufacturer shall provide drawings and specifications certified by a registered professional engineer or architect indicating at least one acceptable system of anchoring, including the details of required straps or cables, their end connections, and all other devices needed to transfer the wind loads from the manufactured home to an anchoring or foundation system.

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Falls, Fayette, Fort Bend, Franklin, Free-
stone, Frio, Galveston, Goliad, Gonzales,
Gregg, Grimes, Guadalupe, Hardin, Harris,
Harrison, Hays, Henderson, Hidalgo, Hop-
kins, Houston, Jackson, Jasper, Jefferson,
Jim Hogg, Jim Wells, Karnes, Kaufman, Ken-
nedey, Kinney, Kleberg, La Salle, Lavaca,
Lee, Leon, Liberty, Limestone, Live Oak,
Madison, Marion, Matagorda, Maverick,
McMullen, Medina, Milam, Montgomery,
Morris, Nacogdoches, Navarro, Newton,
Nueces, Orange, Panola, Polk, Rains,
Refugio, Robertson, Rusk, Sabine, San Au-
gustine, San Jacinto, San Patricio, Shelby,
Smith, Starr, Titus, Travis, Trinity, Tyler,
Upshur, Uvalde, Val Verde, Van Zandt, Vic-
toria, Walker, Waller, Washington, Webb,
Wharton, Willacy, Williamson, Wilson,
Wood, Zapata, Zavala.

* * * * *

§ 3280.505 Air infiltration.

(a) *Envelope air infiltration.* The opaque envelope shall be designed and constructed to limit air infiltration to the living area of the home. Any design, material, method or combination thereof which accomplishes this goal may be used. The goal of the infiltration control criteria is to reduce heat loss/heat gain due to infiltration as much as possible without impinging on health and comfort and within the limits of reasonable economics.

(1) *Envelope penetrations.* Plumbing, mechanical and electrical penetrations

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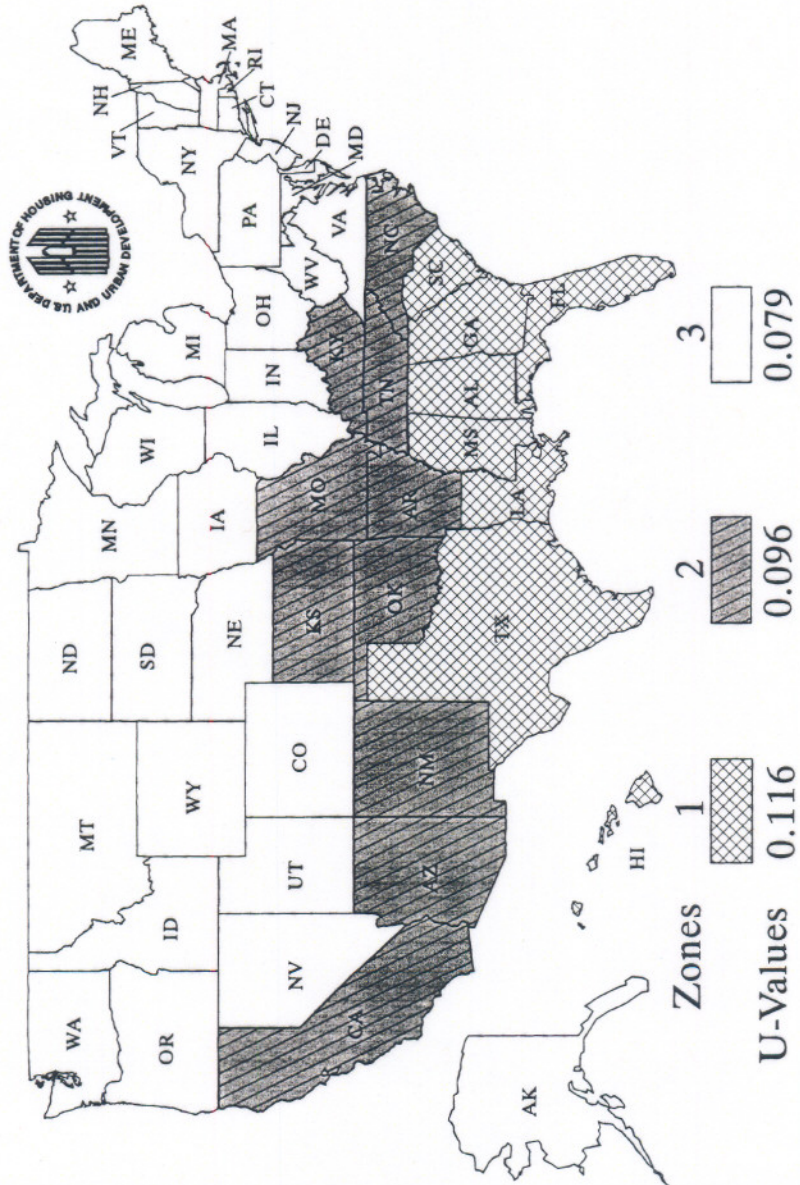
of the pressure envelope not exempted by this part, and installations of window and door frames shall be constructed or treated to limit air infiltration. Penetrations of the pressure envelope made by electrical equipment, other than distribution panel boards and cable and conduit penetrations, are exempt from this requirement. Cable penetrations through outlet boxes are considered exempt.

(2) *Joints between major envelope elements.* Joints not designed to limit air infiltration between wall-to-wall, wall-to-ceiling and wall-to-floor connections shall be caulked or otherwise sealed. When walls are constructed to form a pressure envelope on the outside of the wall cavity, they are deemed to meet this requirement.

§ 3280.506 Heat loss/heat gain.

The manufactured home heat loss/heat gain shall be determined by methods outlined in §§ 3280.508 and 3280.509. The Uo (Coefficient of heat transmission) value zone for which the manufactured home is acceptable and the lowest outdoor temperature to which the installed heating equipment will maintain a temperature of 70 F shall be certified as specified in § 3280.510 of this subpart. The Uo value zone shall be determined from the map in figure 506.

U/O Value Zone Map for Manufactured Housing



(a) *Coefficient of heat transmission.* The overall coefficient of heat transmission (U_o) of the manufactured home for the respective zones and an indoor

design temperature of 70 F, including internal and external ducts, and excluding infiltration, ventilation and condensation control, shall not exceed

§ 3280.507

the Btu/(hr.) (sq. ft.) (F) of the manufactured home envelope are as tabulated below:

Uo value zone	Maximum coefficient of heat transmission
1	0.116 Btu/(hr.) (sq. ft.) (F).
2	0.096 Btu/(hr.) (sq. ft.) (F).
3	0.079 Btu/(hr.) (sq. ft.) (F).

(b) To assure uniform heat transmission in manufactured homes, cavities in exterior walls, floors, and ceilings shall be provided with thermal insulation.

(c) Manufactured homes designed for Uo Value Zone 3 shall be factory equipped with storm windows or insulating glass.

[58 FR 55009, Oct. 25, 1993; 59 FR 15113, Mar. 31, 1994]

§ 3280.507 Comfort heat gain.

Information necessary to calculate the home cooling load shall be provided as specified in this part.

(a) *Transmission heat gains.* Homes complying with this section shall meet the minimum heat loss transmission coefficients specified in § 3280.506(a).

§ 3280.508 Heat loss, heat gain and cooling load calculations.

(a) Information, values and data necessary for heat loss and heat gain determinations shall be taken from the 1989 ASHRAE Handbook of Fundamentals, chapters 20 through 27. The following portions of those chapters are not applicable:

- 21.1 Steel Frame Construction
- 21.2 Masonry Construction
- 21.3 Floor Systems
- 21.14 Pipes
- 21.16 Tanks, Vessels and Equipment
- 21.17 Refrigerated Rooms and Buildings
- 22.15 Mechanical and Industrial Systems
- 23.13 Commercial Building Envelope Leakage
- 25.4 Calculation of Heat Loss from Crawl Spaces

(b) The calculation of the manufactured home's transmission heat loss coefficient (Uo) shall be in accordance with the fundamental principals of the 1989 ASHRAE Handbook of Fundamentals and, at a minimum, shall address all the heat loss or heat gain considerations in a manner consistent with the

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calculation procedures provided in the document Overall U-values and Heating/Cooling Loads-Manufactured Homes—February 1992-PNL 8006, HUD User No. 0005945.

(c) Areas where the insulation does not fully cover a surface or is compressed shall be accounted for in the U-calculation (see § 3280.506). The effect of framing on the U-value must be included in the Uo calculation. Other low-R-value heat-flow paths ("thermal shorts") shall be explicitly accounted for in the calculation of the transmission heat loss coefficient if in the aggregate all types of low-R-value paths amount to more than 1% of the total exterior surface area. Areas are considered low-R-value heat-flow paths if:

- (1) They separate conditioned and unconditioned space; and
- (2) They are not insulated to a level that is at least one-half the nominal insulation level of the surrounding building component.

(d) *High efficiency heating and cooling equipment credit.* The calculated transmission heat loss coefficient (Uo) used for meeting the requirement in § 3280.506(a) may be adjusted for heating and cooling equipment above that required by the National Appliance Energy Conservation Act of 1987 (NAECA) by applying the following formula:

$$U_o \text{ adjusted} = U_o \text{ standard} \times [1 + (0.6) (\text{heating efficiency increase factor}) + (\text{cooling multiplier}) (\text{cooling efficiency increase factor})]$$

where:

Uo standard = Maximum Uo for Uo Zone required by § 3280.506(a)

Uo adjusted = Maximum Uo standard adjusted for high efficiency HVAC equipment

Heating efficiency increase factor = The increase factor in heating equipment efficiency measured by the Annual Fuel Utilization Efficiency (AFUE), or the Heating Seasonal Performance Factor (HSPF) for heat pumps, above that required by NAECA (indicated as "NAECA" in formula). The formula is heating efficiency increase factor = AFUE (HSPF) home - AFUE (or HSPF) NAECA divided by AFUE (HSPF) NAECA.

Cooling efficiency increase factor = the increase factor in the cooling equipment efficiency measured by the Seasonal Energy Efficiency Ratio (SEER) above that required by NAECA.

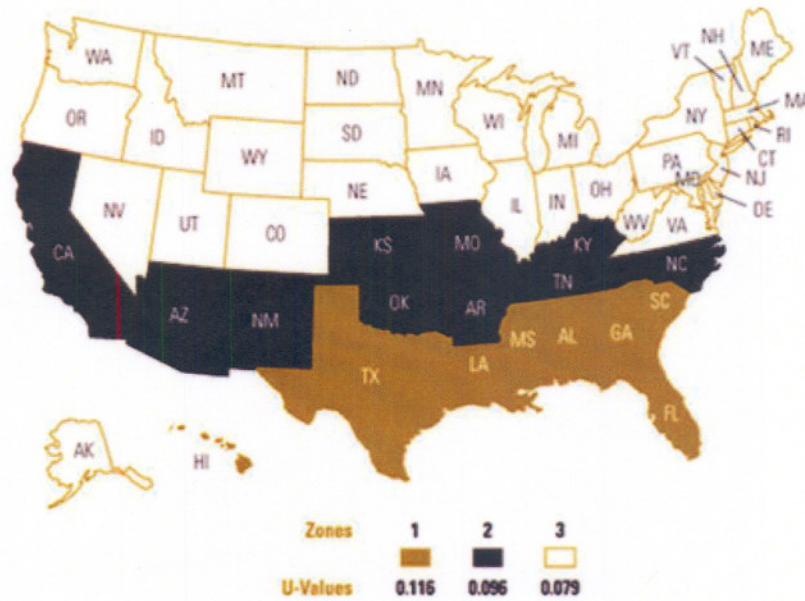
ATTACHMENT

CLIMATE ZONE MAPS PUBLISHED BY THE
MANUFACTURED HOUSING INSTITUTE

www.manufacturedhousing.org

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Thermal Zone Map

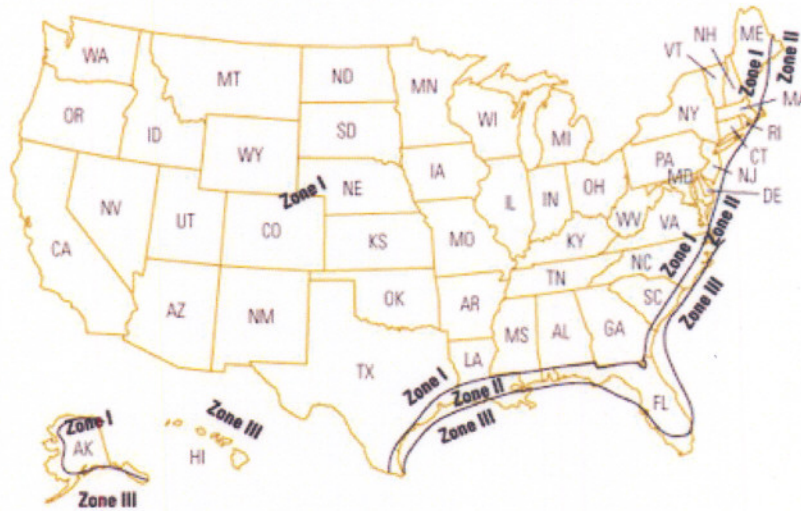


Each manufactured home must be designed according to the federal Manufactured Home Construction and Safety Standards at 24 CFR 3280, commonly called the HUD Code. The HUD Code stipulates, at §3280.506, that the home shall be designed and constructed to conform to one of three thermal load zones. The appropriate thermal zone value used in design is dependent on where the home will be initially installed. Homes designed and constructed to a higher Thermal Zone can be installed in a lower Thermal Zone (a home designed to a Thermal Zone 3 can be installed in a Thermal Zone 1 or 2). However, a Thermal Zone 1 home cannot be installed in either a Thermal Zone 2 or 3 area.

The Uo value zone is determined from thermal zone map above. The Uo value is the overall coefficient of heat transmission of the manufactured home based on the respective thermal zone location and an indoor design temperature of 70 oF, and is defined in units of BTU/(hour)(square foot)(oF). The overall Uo value for the home thermal envelope design must not exceed the values as shown on the above map. The design Uo value for Thermal Zone 1 is 0.116 BTU/hr·ft²·oF, for Thermal Zone 2 is 0.096 BTU/hr·ft²·oF, and for Thermal Zone 3 is 0.079 BTU/hr·ft²·oF.

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Basic Wind Zone Map



Each manufactured home must be designed according to the federal Manufactured Home Construction and Safety Standards at 24 CFR 3280, commonly called the HUD Code. The HUD Code stipulates, at §3280.305(c)(1) and §3280.305(c)(2), that the home shall be designed and constructed to conform to one of three wind load zones. The appropriate wind zone used in design is dependent on where the home will be initially installed. Homes designed and constructed to a higher Wind Zone can be installed in a lower Wind Zone (a Wind Zone III home can be installed in a Wind Zone I or II location). However, a Wind Zone I home cannot be installed in either a Wind Zone II or III area.

Wind loads (a lateral load) must be resisted by the home. The home must be capable of transferring these imposed lateral loads to the home's stabilizing devices without exceeding the allowable stresses and other deflection requirements. Wind Zone I, Wind Zone II and Wind Zone III are identified on the basic wind zone map above. The manufactured home producer designs the home to resist the wind load, which is measured in pounds per square foot. Wind Zone I equates to a 70-mph fastest-mile wind speed. Wind Zone II equates to a 100-mph fastest-mile wind speed. Wind Zone III equates to a 110-mph fastest-mile wind speed.

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