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Interpretative Bulletin for Manufactured Home Construction

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Office of the Assistant Secretary for Housing
-Federal Housing Commissioner

24 CFR Part 3280

Docket No. R-94-1632; FR-3380-N-06

Interpretative Bulletin for Manufactured Home Construction and Safety Standards and Notice of Waiver of Certain Requirements

AGENCY: Office of the Assistant Secretary for Housing-Federal Housing Commissioner, HUD.

ACTION: Notice of interpretative bulletin and waiver.

SUMMARY: HUD published a final rule amending the Federal Manufactured Home Construction and Safety Standards (FMHCSS) on January 14, 1994 (59 FR 2456) to improve the resistance of manufactured homes to wind forces in areas prone to hurricanes. An Interpretative Bulletin was issued on April 15, 1994 and published in the Federal Register on April 21, 1994 to clarify some aspects of the new standards that have been the subject of questions from the industry and the public. This Interpretative Bulletin addresses certain additional questions and announces the issuance of a waiver, pursuant to 24 CFR 3280.1(b), relating to certain exterior wall cladding.

DATES: Issued June 24, 1994.

FOR FURTHER INFORMATION CONTACT: David C. Nimmer, Director, Office of Manufactured Housing and Regulatory Functions, Department of Housing and Urban Development, 451 Seventh Street SW., Attn: Mailroom B-133, Washington, DC 20410-8000. Telephones: (voice) (202) 755-7410; (TDD) (202) 708-4594. (These are not toll-free numbers.)

SUPPLEMENTARY INFORMATION: Accordingly, the following Interpretative Bulletin, which includes the Secretary's determination that it should not be subject to notice-and-comment, has been issued by the Department.

Interpretative Bulletin to the Standards

Manufactured Home Construction and Safety Standards
24 CFR Part 3280

Under Section 604 of the National Manufactured Housing Construction and Safety Standards Act of 1974, 42 U.S.C. 5403, the Secretary of the U.S. Department of Housing and Urban Development ("HUD") is authorized to issue, amend and revoke by order appropriate Federal manufactured home construction and safety standards. On January 14, 1994 (59 FR 2456), HUD published certain changes to the Federal Manufactured Home Construction and Safety Standards for high wind areas. The effective date of the wind standards is July 13, 1994.

Since the publication of this rule, the Department received a number of questions asking for clarification of certain provisions. Those who requested the clarifications urged the Department to provide a timely response so that industry designers can move forward to revise plans and specifications well ahead of the effective date.

HUD recognized that it was imperative to respond to these requests for clarification as soon as possible to assist Primary Inspection Agencies ("PIAs"), manufacturers and State Administrative Agencies in understanding the changes to the manufactured housing standards in advance of the effective date. Therefore, on April 21, 1994, the Department published a series of technical interpretations of the rule in the Federal Register 59 FR 19072.

In that Interpretative Bulletin, the Department indicated that it may issue further Interpretative Bulletins to provide further assistance in the implementation of these new standards. Since the publication of those interpretations, additional requests for clarification of both rules have been received.

In addition, certain questions were raised about 24 CFR 3280.305(c)(1)(ii)(B) and Footnote 8 to the "Table of Design Wind Pressures." The questions related to the requirement that exterior wall cladding materials be fastened at 6" on center ("o.c.") as provided in Footnote 8. The Department has been advised that the impracticability of such a fastening requirement may have a significant negative effect on the manufacturers of certain siding traditionally used in manufactured housing. The use of these specific requirements was not intended to prohibit the utilization of any material, piece of equipment, or system which cannot meet the precise specifications.

24 CFR 3280.1(b) of the Manufactured Home Construction and Safety Standards provides that where any material, piece of equipment, or system which does not meet precise specifications set out in the standard is shown, to the satisfaction of the Secretary, to meet the level of performance of a material, piece of equipment or system which meets the precise specifications, the Secretary may waive the specifications set out in the standard for that material, piece of equipment, or system. The Secretary, in granting such a waiver, may set out any limitations or other requirements with respect to how the material, piece of equipment, or system must be used, including any tests of the material, piece of equipment, or system which the Secretary determines must be carried out before it can be used.

Accordingly, this Interpretative Bulletin, in accordance with 24 CFR 3280.1(b), also announces the waiver of certain requirements of 24 CFR 3280.305(c)(1)(ii)(B) and Footnote 8 to the "Table of Design Wind Pressures" applicable to permeable exterior wall cladding materials which cannot be secured at the 6" o.c. fastening pattern. This Interpretative Bulletin, however, sets out limitations and other requirements with respect to how the waiver applies. Due to the need for expeditious resolution of the issue relating to air permeable exterior wall cladding materials and the need for expeditious resolution and clarification of other issues related to the wind rule, and since these clarifications do not establish a change in the position or policy of the Department but merely involved technical matters, the Secretary deems it not to be in the public interest to issue the announcement of the waiver or the clarifications for public comment in the Federal Register or to otherwise treat this Interpretative Bulletin as rulemaking. The Department is providing this guidance to manufacturers and PIAs so that they can proceed immediately with the redesign of their homes.

I. Waiver of Certain Requirements of 24 CFR 3280.305(c)(1)(ii)(B) and Footnote 8 to the "Table of Design Wind Pressures" Relating to Permeable Exterior Wall Cladding Materials Which Cannot Be Secured at the 6" o.c. Fastening Pattern

The Secretary, through his duly authorized designee, finds that it may be impracticable for certain exterior cladding materials to be fastened at 6" o.c. as provided in Footnote 8 of 24 CFR 3280.305(c)(1)(ii)(B). Accordingly, the Secretary hereby grants waiver of certain requirements of 24 CFR 3280.305(c)(1)(ii)(B) and Footnote 8 to the "Table of Design Wind Pressures" applicable to permeable exterior wall cladding materials which cannot be secured at the required fastening pattern. Because this waiver has been issued, the requirements of 24 CFR 3280.305(c)(1)(ii)(B) and Footnote 8 to the "Table of Design Wind Pressures," to which the waiver relates, may be met either by meeting the specifications set out in the standard or by meeting the following requirements:

Air permeable exterior wall cladding materials which cannot be secured at the 6" o.c. fastening pattern due to the materials' configuration, such as vinyl lap siding, may be alternatively evaluated by testing for the design pressures specified in the "Table of Design Wind Pressures," provided that the following requirements are met:

1. The air permeable siding is intermittently secured through structural rated wall sheathing at least 3/8" thick at a maximum spacing of 16" o.c. to the wall framing;
2. The 3/8" structural rated wall sheathing is secured to wall framing members (plates, studs, jamb studs, headers) at 6" o.c. except that for vertical wall and jamb studs, the 6" o.c. orientation is in the vertical direction;
3. The wall framing members are installed at a maximum spacing no greater than 16" o.c.;
4. The exterior cladding materials are fastened in accordance with the manufacturer's installation

instructions; and

5. For vinyl siding, the siding and fastening strip (nailing hem) is at least .035" in thickness.

Such tests must be conducted in accordance with 24 CFR 3280.401(b) and demonstrate the adequacy of the design to resist the negative design pressures in the "Table of Design Wind Pressures" for wall corners and other areas. The entire exterior wall construction and fastenings including the exterior wall cladding (siding), 3/8" minimum structural rated sheathing, and wall framing members must be tested for the full negative design pressures specified by the "Table of Design Wind Pressures."

While the above requirement does not meet precise specifications set out in 24 CFR 3280.305(c)(1)(ii)(b) and Footnote 8 to the "Table of Design Wind Pressures," the Secretary, through his duly authorized designee, is satisfied that compliance with this requirement will meet the level of performance sought in 24 CFR 3280.305(c)(1)(ii)(b) and Footnote 8 to the "Table of Design Wind Pressures."

II. Additional Clarifications of the Wind Standards

The requested clarifications of the Manufactured Home Construction and Safety Standards have been organized into questions and answers.

Questions: 1. 24 CFR 3280.304-Will the Department accept the application of a 1.6 load duration factor as permitted in the 91 NDS for wind loads in designing connections which use staples?

Answer: No. However, as indicated in our response to Question 6 in the previous Interpretative Bulletin published in the Federal Register on April 21, 1994 [59 FR 19075], a 1.33 factor may be used in accordance with UM-25d. No additional test data or adequate technical substantiation has been provided which changes our prior clarification on this subject.

2. 24 CFR 3280.304 and 3280.306(f)(2)-Does the 1.6 load duration factor permitted by the NDS also apply to the design of interior partitions?

Answer: Yes. 24 CFR 3280.305(f)(2) as amended in the Federal Register on October 25, 1993 [59 FR 54975] indicates that a 1.33 factor may be used to increase the allowable design stress. The 1.6 factor which is permitted under the 1991 National Design Specification for Wood Products would also be acceptable for interior partition members.

3. 24 CFR 3280.305(c)(1)(I)-(a) Can the dead load of the whole roof/ceiling assembly including the trusses be subtracted from the design roof uplift loads to obtain a net uplift for test/design purposes?

(b) If so, can all of the actual dead loads be used including eave portions?

Answer: (a) Yes, the dead load may be deducted for homes designed to be located in high wind areas (Wind Zones II and III). However, the roof/ceiling dead load (including trusses) cannot be deducted from the "net" uplift load for homes designed for Wind Zone I.

(b) Yes, except for Wind Zone I as indicated in the response to 3. (a) above.

4. 24 CFR 3280.305(c)(1)(ii)-(a) Do the design prints, calculations and test reports, etc., relating to shear walls, diaphragms, ridge beams, fastenings and its components and cladding material (roof trusses, wall studs, exterior sheathing, roofing siding material exterior glazing, etc.) need to be sealed (stamped) and/or signed by a registered Professional Engineer or Architect?

(b) Can a Professional Engineer on the staff of a DAPIA, witness component tests in the capacity of a listing agency [24 CFR 3280.2(a)(14), and 24 CFR 3282.360], provide the professional certification required, and accept the certified design for clients it serves as a DAPIA without violating the conflict of interest provisions of 24 CFR 3282.359 of the Manufactured Housing Procedural and Enforcement Regulations?

Answer: (a) All of the cited documents are required to be certified by a Professional Engineer or Architect. If a Professional Engineer or Architect elects not to seal and/or sign each document, there must be an up-to-date record in the package (e.g. an index or list of all documents) which the Professional Engineer or Architect has prepared and sealed.

(b) Yes, provided a different Professional Engineer on the staff of the DAPIA who did not witness the tests and certify the design accepts the listing for any manufacturer clients it serves as a DAPIA.

5. 24 CFR 3280.305(c)(1)(ii)-(a) Do skylights need to be designed for the same wind design pressure as the roof system? What pressures would apply?

(b) Do the skylights need to be protected similar to exterior windows and sliding glass doors of homes designed to be in Wind Zones II and III?

Answer: (a) Skylights need to be designed to resist the same design pressures as "Exterior roof coverings, sheathing, and fastenings" indicated in the "Table of Design Wind Pressures". The location of the skylight in the roof would determine the specific design pressure requirements. However, it is not necessary to complete certification of skylights to the higher wind pressures until January 17, 1995.

(b) The Department believes that the subject needs further examination before a final judgment is made. The Department will issue further guidance on this question in the future.

6. 24 CFR 3280.305(c)(1)(ii)(a)-Can the wind design pressures for Wind Zones II and III be based in

part on ASCE 7-88 and in part on the "Table of Design Wind Pressures"?

Answer: No. The two alternatives cannot be mixed. One of the two methods must be used to completely design the manufactured home structure and each of its wind resisting parts for the design wind pressures designated by ASCE 7-88 or the "Table".

7. 24 CFR 3280.305(c)(1)(ii)(a)-What specific design wind pressures are required to be used for homes designed for high wind areas with roof slopes less than 10 degrees or greater than 30 degrees?

Answer: The design criteria are those for Overturning, Sliding and Anchoring, Main Wind Force Resisting Systems, and Components and Cladding identified in Chapter 6., "Wind Loads" of ASCE 7-88.

8. 24 CFR 3280.305(c)(1)(ii)(b)-Additional questions regarding Footnote 8 in the "Table of Design Wind Pressures":

(a) Can air permeable exterior wall cladding materials which cannot be secured at the 6" o.c. fastening pattern due to their configuration be alternatively evaluated by testing for the design pressures specified in the "Table"?

(b) If the answer to (a) is yes, can a pressure reduction factor be applied in testing certain air permeable exterior cladding materials, such as vinyl lap siding, for the design pressures specified by the "Table"?

(c) Do the fastening requirements for structural rated sheathing to wall framing members in Footnote 8 of the Table of Design Pressures indicated in our response to Question 17, in the previous Interpretative Bulletin 59 FR 19076], also apply when the material is both a structural sheathing and an exterior covering material?

(d) Can exterior cladding materials, such as vertical steel siding, which are directly secured to wall framing members without a 3/8" rated structural sheathing be evaluated by testing for the design pressures specified in the Table?

Answer: (a) Yes, provided that there is compliance with the requirements of the waiver announced above.

(b) No.

(c) Yes, provided fasteners for any combined 3/8" minimum structural rated sheathing and exterior covering material are installed at 6" o.c. from the sheathing to wall framing members (plates, studs, jamb studs, headers). For vertical wall and jamb studs the orientation of 6" o.c. is in the vertical direction.

(d) Yes, provided the exterior covering and its fastenings are capable of resisting the full positive and

negative design pressures specified in the "Table" for wall corners and other areas when tested in accordance with 24 CFR 3280.401(b) of the Standards.

9. 24 CFR 3280.305(c)(1)(ii)(b)-What uplift loads are required to be used when evaluating the field connection of ridge beams of multi-module homes?

Answer: For designs which are prepared in accordance with the "Table of Design Wind Pressures", the pressures indicated for the entry "Ridge Beams and Other Main Roof Support Beams" are to be used to design the connections (30 PSF Wind Zone II, 36 PSF Wind Zone III).

10. 24 CFR 3280.305(c)(1)(ii)(b)-Do the higher uplift loads indicated in the Table within 3'-0" from the ridge and sidewall need to be applied to roof trusses in conjunction with the normal uplift loads when uplift tested/evaluated?

Answer: No. However, trusses are required to be doubled within 3'-0" from each end of the roof and all roof trusses are to be capable of resisting the design pressures indicated in the Table (39 PSF for Wind Zone II; 47 PSF for Wind Zone III).

11. 24 CFR 3280.305(c)(1)(ii)(b)-(a) Do manufactured home sidewalls including header assemblies in high wind areas need to be calculated/tested for combined horizontal and uplift wind forces?

(b) If yes, what uplift pressures should be applied?

(c) If testing is used to substantiate a manufacturer's design, do the wall assemblies need to be tested under the combined loading conditions?

(d) Can the sidewalls be tested for the horizontal wind load only and calculated for the tensile load independently using accepted engineering design practices?

(e) If sidewalls are tested, can wall stud requirements for openings be evaluated separately by calculations using accepted engineering practices?

(f) Is there a minimum number of wall studs which are required to be utilized in tested assemblies?

(g) Would any testing procedure employed that applies combined loading to a sidewall test assembly require HUD approval in accordance with 24 CFR 3280.303(g)?

Answer: (a) Yes

(b) For sidewall studs not located at openings, the design uplift pressure is 39 PSF for Wind Zone II and 47 PSF for Wind Zone III. For headers and studs at openings, the uplift design pressure is 30 PSF for Wind Zone II and 36 PSF for Wind Zone III.

(c) Yes. (d) No. (e) Yes.

(f) There is no minimum quantity of wall studs which must be utilized in a test assembly for a sidewall. However, there needs to be an adequate number of wall studs in the assembly to measure all wind load effects and the influence of repetitive framing members in resisting the combined lateral and uplift design wind pressures. (g) No. The requirement for obtaining HUD approval of testing procedures pursuant to 24 CFR 3280.303(g) is not effective until October 25, 1994. However, manufacturers and DAPIAs are encouraged to submit proposed testing protocols to the Department for review and evaluation prior to the effective date.

12. For homes with end gables, does the 3'-0" measurement for doubling of roof trusses start at the extreme end of the gable or at the end wall?

Answer: All trusses within 3'-0" of the extreme end of the gable are to be doubled.

13. 24 CFR 3280.306(a)-In designing anchoring or foundation systems, can the dead load of the complete home be deducted to determine the net overturning wind design forces?

Answer: Yes, the dead load of the entire structure may be used to resist wind loading effects in all Wind Zones.

14. 24 CFR 3280.305(c)(1)(ii)(b)-If a roof truss forms or contains an eave at the sidewall, does the overhang or projection have to meet the higher eave load requirements in the "Table of Design Pressures" for Wind Zones II (-51 PSF) and III (-62 PSF)?

Answer: Yes.

15. 24 CFR 3280.305(c)(1)(ii)(b)-(a) Does Footnote 6 of the "Table of Design Pressures" require complete cementing of the underlayment of asphalt roofing shingles to a 3/8" structural rated roof sheathing or is the cement to be applied to all edges, ends, and end laps of the underlayment and other areas indicated in the Asphalt Roofing Manufacturers Association (ARMA) Residential Roofing Manual, Chapter 7, for low slope applications?

(b) If the cement application is limited to edges, ends and end laps of the underlayment, is a 6" minimum wide strip of asphalt cement acceptable for those areas and a 3" minimum wide strip of asphalt cement acceptable for top laps?

Answer: (a) The application of cement for the underlayment need only be applied to edges, ends and end laps of the underlayment. This is in addition to cementing required for the starter strip, eave flashing, and locations 24" from the inside of the exterior wall as indicated in the ARMA Residential Roofing Manual, Chapter 7, for low slope applications.

(b) Yes.

16. 24 CFR 3280.402(c)(2)-Please confirm if the roof trusses required to be uplift tested for high wind areas shall be tested in the inverted position and loads applied to the bottom chords of the roof trusses?

Answer: Roof trusses may be tested for uplift loads either in an inverted or upright position. The Department is in the process of examining research and engineering analysis to determine the proper protocol for testing trusses. Further guidance will be issued on this subject in the future.

17. Questions regarding the effective date of the new wind safety standards as related to the Department's statement in the Interpretative Bulletin published in the Federal Register on April 21, 1994: "Every home entering the first stage of production as of July 13, 1994 must comply with the new wind safety provisions." (59 FR 19075).

(a) Does this mean that every home entering the first stage of production before July 13, 1994 may still comply with the current wind standards?

(b) Please clarify that the first stage of production for an individual manufacturing plant is identified in the approved quality control manual for that facility?

(c) Can manufacturers produce homes to the new wind standards earlier than the effective date of July 13, 1994?

Answer: (a) Homes that enter the first stage before July 13, 1994 may not necessarily be built to the current standards. Based on our review of the National Manufactured Housing Construction and Safety Standards Act of 1974 ("Act") and the Manufactured Home Procedural and Enforcement Regulations ("Regulations"), all homes that are labeled on or after the effective date of the new standards would be required to comply with those standards. Pursuant to 24 CFR 3280.8(c), and 24 CFR 3282.362(c)(2)(I)(c), the label is the certification by the manufacturer that the home "is constructed in conformance with the Federal manufactured home construction and safety standards in effect on the date of manufacture."

The "Date of Manufacture" is the date on which the label is affixed to the manufactured home. The label is to be affixed only at the end of the last stage of production of the manufactured home. Consequently, a manufacturer labeling a home on or after the effective date of the new standards must comply with those standards or be in violation of Section 610(a)(4) of the Act, 42 U.S.C. 5409(a)(4), even if the home entered the first stage of production before the effective date. The Department recognizes that, in one respect, the Regulations are not clear. Because of this lack of clarity, the Department, in this instance only, will take no action to enforce this requirement if it can be shown that homes entered the normal first stage of production before July 13, 1994. In the future, however, the Department will expect compliance with the standards that are in effect on the date the home is labeled.

(b) The Regulations, under 24 CFR 3282.203(c), require the DAPIA to approve the quality assurance manual which includes, among other information, "a station-by-station description of the manufacturing process." Therefore, the normal first station in the production process as identified in the quality control manual would be "the first stage of production."

(c) Yes, provided the manufacturer is completely capable of meeting all requirements of the new standards, uses the new data plate and includes a copy of the new wind zone map with each home so produced. In addition, the Department urges manufacturers to use the time before the effective date of the standards to prepare for producing homes to the new standards so that production will continue without interruption. This includes preparing designs, seeking approval for the designs ordering any necessary materials, testing, etc. For homes that are built to the current standards but sold after July 13, 1994 to be sited in an area designated as Zone II or Zone III in the new rule, the Department recommends that the consumer be informed: (1) That the home has been built to previous standards which have since been amended; and (2) that these new wind standards have been enacted to increase the safety of manufactured homes in high-wind areas.

Authority: 42 U.S.C. 5403 and 42 U.S.C. 3535(d).

Dated: June 24, 1994.

James E. Schoenberger, Associate General Deputy Assistant Secretary for Housing-Federal Housing Commissioner.

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