Manufactured Housing Consensus Committee

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TO: **MHCC**

FROM: **Robert E. Solomon**

DATE: **December 13, 2012**

SUBJECT: **MHCC Letter Ballot – Part 3280, 3282, 3285**

Attached is a letter ballot for your completion and return. As discussed at the October 2012 meeting, finalizing the actions from the voice vote with a letter ballot offers a more complete record. The ballot consists of actions taken on proposed changes to:

24 CFR, Part 3280 – Construction and Safety Standards
24 CFR, Part 3282 – Enforcement Regulations
24 CFR, Part 3285 – Installation Standards

Your letter ballot on the proposed changes is being done in accordance with the MHCC by-laws. As such, per Section 8.b, you are being asked to vote:

- Affirmative
- *Affirmative with comment
- *Negative
- *Abstain

*A reason must accompany your vote.

Please complete and return your ballot as soon as possible but no later than **January 2, 2013.** As noted on the ballot form, please return the ballot to **Linda MacKay** either via e-mail to **lmackay@nfpa.org** or via fax to 617-984-7110. You may also mail your ballot to the attention of Linda MacKay at NFPA, 1 Batterymarch Park, Quincy, MA 02169.

PROPOSAL BALLOT DUE BY: January 2, 2013

HUD-MHCC

Manufactured Housing Consensus Committee - Staff Liaison: Robert E. Solomon

Return Completed Ballot To: Linda MacKay

E-Mail to: lmackay@nfpa.org

Fax to: 617-984-7110

Mail: One Batterymarch Park, Quincy, MA 02169

With respect to the Committee Actions on the Proposals which accompanied the ballot, please record me as voting: (check one):

☐ **Affirmative On All Items. I agree with all committee meeting actions without comment. Please return this Ballot Page only to NFPA.**

☐ **Affirmative With Exception(s): I agree with all committee meeting actions Except for the Affirmative with comment, Negative and /or Abstention checked below. *Reasons must accompany these votes.**

When possible, reasons are requested via e-mail in a Word Document.

Date:_____ Signed:_____

Name: _____ **(Type or Print black ink)**

Proposal No.	Log No.	Section	Committee Action	Affirm with Comment*	Negative*	Abstain*
3280HUD-	14	3280.403(b), 404 (b) and 405 (b)	Reject	☐	☐	☐
3280HUD-	20	3280.403, 3280.404 3280.405 and 3280.508(e)	Accept in Principle	☐	☐	☐
3280HUD-	25	3280.103	Accept in Principle	☐	☐	☐
3280HUD-	30	3280.103	Accept in Principle	☐	☐	☐
3280HUD-	33	3280.103	Accept in Principle	☐	☐	☐
3280HUD-	36	3280.305	Reject	☐	☐	☐
3280HUD-	37	3280.306	Reject	☐	☐	☐

3280HUD-	56	3280.304(b)(1))	Accept			
3280HUD-	59	3280.103	Accept in Principle			
3280HUD-	73	3280.304(b)(1))	Accept			
3280HUD-	77	3280.303(b))	Accept			
3280HUD-	79	3280.304	Accept			
3280HUD-	CP4	3280.304	Accept			
3280HUD-	CP5	3280.103(b)	Accept			
3282HUD-	1	(20)	Reject			
3285HUD-	3	3285.4 and 3285.603(f) (New)	Reject			
3285HUD-	4	3285.203(C) Site Drainage	Reject			

3280HUD- Log #14 Final Action: Reject
(3280.403(b), 404 (b) and 405 (b))

Submitter: Thomas Shuping, Fortifiber Building Systems Group
Recommendation: Change all references to AAMA Standard 1701.2-1985, to AAMA Standard 1701.2-2002.
Substantiation: This change will keep the HUD Code in line with AAMA's most current update as NFPA 501-2003, as already done.

I am forwarding to you copies of the ICC Public Hearing from September 2003, pages 90 and 91. They are the reasons why the IRC is changing the installation requirements for windows and doors. ASTM E 2112-01 mirrors AAMA-1701.1-02. The cost to flash windows and doors would range between $0.80 and $1.11 per window. Some mobile home manufacturers currently use some flashings.

Note: Supporting material is available for review at NFPA Headquarters.

Committee Meeting Action: Reject
Committee Statement: The MHCC notes that the AAMA standard does not contain additional requirements for weather resistant barriers. It is also noted that while the standard references window flashing, it is only provided as guidance linking to the manufacturer's installation instructions, and does not contain additional requirements for weather resistant barriers or flashing.

3280HUD- Log #20 Final Action: Accept in Principle
(3280.403, 3280.404, 3280.405, and 3280.508(e))

Submitter: Mark A. Nunn, Manufactured Housing Institute
Recommendation: Revise various subparagraphs of 3280.403, 3280.404, 3280.405, and 3280.508(e) to read as follows:

3280.403(b) Standard. All primary windows and sliding glass doors shall comply with AAMA Standard ~~1701.2 1985~~ 1701.2-2002, ~~Primary Window and Sliding Glass Door~~ Voluntary Standard for Utilization in Manufactured Housing for Primary Windows and Sliding Glass Doors, except that by January 17, 1995, the exterior and interior pressure tests shall be conducted at the design wind loads required for components and cladding specified in 3280.305(c)(1).

3280.403(e) Certification. All primary windows and sliding glass doors to be installed in manufactured housing shall be certified as complying with AAMA Standard ~~1701.2 1985~~ 1701.2-2002. As of January 17, 1995, this certification must be based on tests conducted at the design wind loads specified in 3280.305(c)(1).

3280.404(b) Performance. Egress windows including auxiliary frames and seals, if any, shall meet all requirements of AAMA Standard ~~1701.2 1985~~ 1701.2-2002, ~~Primary Window and Sliding Glass Door~~ Voluntary Standard for Utilization in Manufactured Housing for Primary Windows and Sliding Glass Doors and AAMA Standard ~~1704 1985~~ 1704-2001, Voluntary Standard Egress Window Systems for Utilization in Manufactured Hosing, except that by January 17, 1995, the exterior and interior pressure tests for components and cladding shall be conducted at the design wind loads required by 3280.305(c)(1).

3280.404(e) Certification of Egress Windows and Devices. Egress windows and devices shall be listed in accordance with the procedures and requirements of AAMA Standard ~~1704 1985~~ 1704-2001. As of January 17, 1995, this certification must be based on tests conducted at the design wind loads specified in 3280.305(c)(1).

3280.405(e)(2) In determining certifiability of the products, an independent quality assurance agency shall conduct preproduction specimen tests in accordance with AAMA ~~1701.2 1985~~ 1701.2-2002. Further, such agency shall inspect the product manufacturer's facility at least twice per year.

3280.508(e) U-values for any glazing (e.g., windows, skylights, and the glazed portions of any door) shall be based on tests using AAMA 1503.1-1988, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections or the National Fenestration Rating Council (NFRC) 100 (~~1997~~ 2002 edition), Procedures for Determining Fenestration Product Thermal Properties. In the absence of tests, manufacturers shall use the residential window U-values contained in Chapter 29, Table 5 of the 1997 ASHRAE Handbook of Fundamentals. In the event that the classification of the window type is indeterminate, the manufacturer shall use the classification that gives the higher U-value. Where a composite of materials from two different product types are used, the product shall be assigned the higher U-value. For the purposes of calculating U_o values, storm windows shall be treated as an additional pane.

Substantiation: The Manufactured Housing Consensus Committee (MHCC) has approved three segmental standards ballots for updating the federal HUD Code at 24 CFR 3280. Segmental ballots #2 and #3 included suggested updates of AAMA Standards 1701.2 and 1704 to more current year editions than that found in the HUD Code. The HUD Code currently references the 1985 edition of each standard.

Segmental ballot #2 updated AAMA 1701.2 to the 1995 edition. Segmental ballot #3 updated AAMA 1701.2 (again) to the 2000 edition, while AAMA 1704 was updated to the 2001 edition. Even though the MHCC segmental ballot #3 updated AAMA 1704 to the most current edition available, this suggested change repeats the MHCC approved change in two sections above.

The NFRC 100 Standard is for determination of window and door U-values. This NFRC Standard is a new reference standard that has been proposed for inclusion in the HUD Code by proposed rule making issued on December 1, 2004 at 69 CFR 70015. At the time of this MHI proposal, the final rule on the HUD Code revisions noticed at 69 CFR 70015 had not been published.

The NFRC 100 Standard has not been proposed to be updated to the latest year edition (2002) by the subsequent MHCC segmental ballots. This 2002 edition is also not included in the NFPA 501-2005 standard. The NFRC 100-2002 version was finalized midway through the NFPA 2005 revision process and could not be submitted for consideration.

It is imperative that window and sliding glass door test/certification standards be updated to the current year editions. Suppliers of these products are testing to the new standards even though the HUD Code has lagged behind in keeping reference standards up-to-date. Many suppliers of manufactured housing products may not even be relying on outdated versions of these AAMA or NFRC standards. Manufacturers have been using these updated AAMA and NFRC standards in their selection of window products for DAPIA design packages (DAPIA have been providing approvals).

While some may suggest that the MHCC first review these three standards changes noted above through the usual

channel (by relying on revisions to the HUD Code based on editions of NFPA 501), the problem lies in the department has not published a proposed rule for MHCC Segmental Ballot #2. Segmental Ballot #3 still waits development in draft form. To get these updates to HUD in the quickest manner possible, MHI has taken an initiative to submit these standard updates as a separate change for MHCC consideration. It is not known at this time when the MHCC may consider revisions to the HUD Code based on the NFPA 501-2005 edition, which has the same AAMA standards referenced for window and sliding glass doors as this change suggests.

Note: Supporting material is available for review at NFPA Headquarters.

This is not original material; its reference/source is as follows:

AAMA 1701.2-2002, AAMA 1704-2001 and NFRC 100-2002

Committee Meeting Action: Accept in Principle

Revise only the one section to update the NFRC standard from 1997 to 2002 but not the AAMA Standards as follows.

3280.508(e) U-values for any glazing (e.g., windows, skylights, and the glazed portions of any door) shall be based on tests using AAMA 1503.1-1988, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections or the National Fenestration Rating Council (NFRC) 100 (~~1997~~ 2002 edition), Procedures for Determining Fenestration Product Thermal Properties. In the absence of tests, manufacturers shall use the residential window U-values contained in Chapter 29, Table 5 of the 1997 ASHRAE Handbook of Fundamentals. In the event that the classification of the window type is indeterminate, the manufacturer shall use the classification that gives the higher U-value. Where a composite of materials from two different product types are used, the product shall be assigned the higher U-value. For the purposes of calculating Uo values, storm windows shall be treated as an additional pane.

Committee Statement: The MHCC notes that the newer editions of the AAMA Standards would basically require a recertification of the existing stock of acceptable windows but with no recognized benefit. In addition, there are other factors (flashing, sealing, insulation, taping) that the AAMA standard does not govern. See the committee statement on 3280 Log #14.

3280HUD- Log #25 **Final Action: Accept in Principle**
(3280.103)

Submitter: Tom Neltner, National Center for Healthy Housing
Recommendation: Add new paragraph (d) as follows:
(d) The manufactured housing must comply with ANSI/ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings
Substantiation: According to ASHRAE the most effective strategy for minimizing indoor air exposure to pollutants is to prevent them from being released into the air in the first place. The ANSI/ASHRAE standard requires source-control measures that exhaust pollutants from specific rooms before the pollutants enter the rest of the household. In addition, whole-house ventilation brings fresh air into the house, diluting pollutants that are difficult to control at the source. This change will increase the cost of construction. It will result in significantly healthier air for residents of manufactured housing.
Committee Meeting Action: Accept in Principle
Add new Section to 3280.103 as follows:
3280.103 (d) As an option to 3280.103 (b) and 3280.103 (c), manufactured homes shall be permitted to comply with ANSI/ASHRAE Standard 62.2, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, 2010.

Committee Statement: In lieu of mandating compliance with ASHRAE Standard 62.2 across the board, the MHCC instead wishes to offer this as a design option for the home. Manufacturers should be given, when possible, various compliance options if they all can meet the performance criteria of the standard.

3280HUD- Log #30 **Final Action: Accept in Principle**
(3280.103)

Submitter: Tom Neltner, National Center for Healthy Housing
Recommendation: Add new paragraph (d) as follows:
(d) The manufactured housing must comply with ANSI/ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.
Substantiation: Poor indoor air quality is associated with adverse health effects. A consensus industry standard that provides adequate indoor air quality has been established by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). The most effective method of controlling indoor air exposure to pollutants is to prevent them from being released into the air in the first place and by providing sufficient fresh air. The ASHRAE standard requires source-control measures that exhaust pollutants from specific rooms, such as bathrooms, before the pollutants enter the rest of the house. This change will increase the cost of construction slightly. It will result in significantly healthier air for residents of manufactured housing.
Committee Meeting Action: Accept in Principle
Committee Statement: See the MHCC Action on 3280 Log #25.

3280HUD- Log #33 Final Action: Accept in Principle
(3280.103)

Submitter: Mike Moore, Newport Ventures
Recommendation: Revise entire section as follows:

Sec. 3280.103 Light and ventilation.

(a) Lighting. Each habitable room shall be provided with exterior windows and/or doors having a total glazed area of not less than 8 percent of the gross floor area.

(1) Kitchens, bathrooms, toilets compartments, laundry areas, and utility rooms may be provided with artificial light in place of windows.

(2) Rooms and areas may be combined for the purpose of providing the required natural lighting provided that at least one half of the common wall area is open and unobstructed, and the open area is at least equal to 10 percent of the combined floor area or 25 square feet whichever is greater.

(b) Whole-house ventilation. Each manufactured home must be provided with whole-house ventilation in accordance with ASHRAE Standard 62.2 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.

~~(1) The ventilation capacity must be provided by a mechanical system or a combination passive and mechanical system. The ventilation system or provisions for ventilation must not create a positive pressure in Uo Valve Zone 2 and Zone 3 or a negative pressure condition in Uo Value Zone 1. Mechanical systems must be balanced. Combination passive and mechanical systems must have adequately sized inlets or exhaust to release any unbalanced pressure. Temporary pressure imbalances due to gusting or igh winds are permitted.~~

(2) ~~The ventilation system or provision for ventilation must exchange air directly with the exterior of the home, except the ventilation system, or provisions for ventilation must not draw or expel air with the space underneath the home.~~ The ventilation system or provisions for ventilation must not draw air from or expel air into the space underneath the home, the floor, wall, or ceiling/roof systems through the use of ducts or passive inlets~~, even if those systems are vented.~~ The ventilation system must be designed to ensure that outside air is distributed to all bedrooms and main living areas. The combined use of undercut doors or transom grills connecting those areas to the room where the mechanical system is located is deemed to meet this requirement.

~~(3) The ventilation system or a portion of the system is permitted to be integral with the home's heating or cooling system. The system must be capable of operating independently of the heating or cooling modes. A ventilation system that is integral with the heating or cooling system is to be listed as part of the heating and cooling system or listed as suitable for use with that system.~~

~~(4) A mechanical ventilation system, or mechanical portion thereof, must be provided with a manual control, and must be permitted to be provided with automatic timers or humidistats.~~

(5) A whole-house ventilation label must be attached to the whole-house ventilation control, must be permanent, and must state: "WHOLE-HOUSE VENTILATION".

(6) Instructions for correctly operating and maintaining whole-house ventilation systems must be included with the homeowner's manual. The instructions must encourage occupants to operate these systems whenever the home is occupied, and must refer to the labeled whole-house ventilation control.

~~(c) Additional ventilation.~~

~~(1) At least half of the minimum required glazed in paragraph (a) of this section shall be openable directly to the outside of the manufactured home for unobstructed ventilation. These same ventilation requirements apply to rooms combined in accordance with 3280.103(a)(2).~~

~~(2) Kitchens shall be provided with a mechanical ventilation system that is capable of exhausting 100 cfm to the outside of the home. The exhaust fan shall be located as close as possible to the range or cook top, but in no case farther than 10 feet horizontally from the range or cook top.~~

~~(3) Each bathroom and separate toilet compartment shall be provided with a mechanical ventilation system capable of exhausting 50 cfm to the outside of the home. A separate toilet compartment may be provided with 1.5 square feet of openable glazed area in place of mechanical ventilation, except in Uo value Zone 3.~~

Substantiation: Newport Ventures is a building consulting firm that works with manufacturers, associations, and agencies and programs such as U.S. DOE Building America, U.S. HUD's Partnership for Advancing Technology in Housing, and NYSERDA to advance the performance and affordability of homes. As the energy performance of homes continues to improve, the need for mechanical ventilation in site built and manufactured homes has increased. The MHSCC has done well to respond by requiring whole house ventilation systems and also establishing guidelines for the implementation of these systems. To ensure that the MHSCC keeps pace with current consensus-based industry standards, the MHSCC should reference ASHRAE 62.2 for the design and specification of ventilation systems.

Referencing ASHRAE 62.2 for whole house mechanical ventilation would remove confusion caused by some of the current ventilation language and result in the adoption of the most widely recognized single source residential ventilation standards. Within this code change proposal, we have retained those components of the MHSCC that are meritorious but are not addressed within the main body of ASHRAE 62.2. These include air distribution, labeling ventilation controls, and including operational instructions in the user's manual. All other original text o f section 3280.103 that we have recommended be stricken pertains to issues that are already addressed within ASHRAE 62.2. The revisions and insertions made within (b)(2) were done to clarify the intention of this section code as written.

Cost/Benefits: Because whole house ventilation is already requried by MHSCC, no additional costs are expected by requiring that these systems comply with ASHRAE 62.2.

Committee Meeting Action: Accept in Principle

Committee Statement: See the MHCC Action on 3280 Log #25.

3280HUD- Log #36 Final Action: Reject
(3280.305)

Submitter: David K. Low, D. K. Low & Associates
Recommendation:

Include 3280HUD_L36_R.doc here
(contains 3 tables & Insert lines for 3 pieces of art)

Substantiation: The wind provisions of the MHCSS contained in 24CFR3280 are based on a modified version of ASCE 7-88 Minimum Design Loads for Buildings and Other Structures, a wind standard that is now 20 years old. The contemporary wind standard ASCE/SEI 7-05 Minimum Design Loads for Buildings and Other Structures indicates that high winds extend much further inland than what was considered in 1988. The extension of the high wind regions places HUD homes in areas where design level winds are greater than what homes were designed to resist. Wind analyses completed by Keshor Mehta, PhD, PE determined that during a design event, homes placed near the edge of the existing HUD Zone I will be exposed to wind pressures nearly twice (186%) those for which the homes were designed. This exposes occupants of those homes to greater risk than occupants of homes designed and constructed to contemporary wind codes and standards like the International residential Code IRC-2006 and the International Building Code IBC-2006. The analyses completed for this proposal indicate that even greater increases exist for Components and Cladding.

This proposal will correct the wind design deficiencies that exist in 24 CFR3280 Sections 305 by requiring HUD homes to be constructed to resist wind loads determined by a contemporary wind standard and will update the wind zone county lists to reflect the higher wind speeds that exist inland.

The proposal establishes four winds zones with design 3 second gust wind speeds of 90 mph, 110 mph, 130 mph and 150 mph respectively. The wind zones are identical to those adopted in the 2005 version of NFPA 501, a consensus standard that based on ASCE/SEI 7-02.

Note: Supporting material is available for review at NFPA Headquarters.

Cost/Benefit: A cost benefit analysis has been completed. The cost benefit analysis determined that revisions to the wind speed map are needed and are cost beneficial.

This is not original material; its reference/source is as follows:
NFPA 501 2005 Edition
Committee Meeting Action: Reject
Committee Statement: The committee is not convinced that the benefit derived from adopting these changes is worth the additional costs that would be imposed. In addition, the committee does not believe that the case has been made showing where the design values being recommended are addressing any known problems with the wind design criteria.

Code of Federal Regulations
Title 24, Volume 5
Revised as of April 1, 2006

From the U.S. Government Printing Office via GPO Access
[CITE: 24CFR3280.305]

Proposed Revisions to Subpart D Body and Frame Construction Requirements
Sec. 3280.305 Structural design requirements.

* * * * *

(4) Whenever the roof slope does not exceed 20 degrees, the design horizontal wind loads required by Sec. 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, Zone III or Zone ~~III~~IV) specified in paragraph (c)(1)(ii) of this section, the manufactured home and each of its wind resisting parts and portions shall be designed to resist design wind loads for Exposure C specified in ACSE/SEI 7-05, "Minimum Design Loads for Buildings and Other Structures", for a design wind speed of 90 mph. ~~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 and Zone IV). When designed for high wind areas (Zone II, ~~and~~ Zone III and Zone IV), 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~~ACSE/SEI 7-~~88~~05, "Minimum Design Loads for Buildings and Other Structures", ~~for a fifty-year recurrence interval, and~~ a design wind speed of ~~100~~ 110 mph, as specified for Wind Zone II, ~~or 110~~ 130 mph for Wind Zone III and 150 mph for Wind Zone IV as specified for ~~Wind Zone III~~ (Basic Wind Zone Map); or

(B) The wind pressures specified in the following tables for Main Wind Force Resisting Systems (MWFRS) and for Components and Cladding (C&C):

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 Sec. 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 Systems:		
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 roof sections)	-30 PSF	-36 PSF
Components and Cladding:		
Roof trusses4 in all areas; trusses shall be doubled within 3foot-0 inch 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: Within 3 foot 0 inch from each gable end (overhang at end wall) of the roof or endwall if no overhang is povided [4,6,7] Within 3 foot 0 inch from the ridge and eave (overhang at sidewall) or sidewall if no overhang is provided [4,6,7]	[5] -39 PSF	[5]+/- 47 PSF
Within 3 foot 0 inch from each gable end (overhang at end all) of the roof or endwall if no overhang is provided[4,6,7]	[5] -73 PSF	[5] -89 PSF
Within 3 foot 0 inch from the ridge and eave (overhang at idewall) or sidewall if no overhang 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 raming), exterior coverings, sheathing and fastenings[8]:~~		
~~Within 3 foot-0 inch from each corner of the sidewall and endwall~~	~~+/- 48 PSF~~	~~+/- 58 PSF~~
~~All other areas~~	~~+/- 38 PSF~~	~~+/- 46 PSF~~

Table of Design Wind Pressures					
Design Pressures for Main Wind Force Resisting Systems					
		Wall Pressures		**Roof Uplift Pressures**	
V	**roof**	**(psf)**		**(psf)**	
(mph)	**pitch**	All Units		Single Unit	Double Unit
90 (Zone I)	3:12	12.9	-9.1	-14.7	-12.1
	5:12	12.9	-9.1	-12.1	-13.9
	7:12	12.0	-9.1	-11.7	-13.5
110 (Zone II)	3:12	19.2	-13.5	-21.9	-18.1
	5:12	19.9	-13.5	-18.1	-20.8
	7:12	19.2	-13.5	-17.5	-20.1
130 (Zone III)	3:12	26.9	-18.9	-30.6	-25.3
	5:12	26.9	-18.9	-25.3	-29.0
	7:12	26.9	-18.9	-24.4	-28.1
150 (Zone IV)	3:12	35.8	-25.2	-40.7	-33.7
	5:12	35.8	-25.2	-33.7	-38.6
	7:12	35.8	-25.2	-32.5	-37.4

Design Pressures for Components and Cladding (psf)								
				Roof Pressures				
V	**roof**	**Wall Pressures**		**Roof**			**Roof Overhang**	
(mph)	**pitch**	**Zone 4**	**Zone 5**	**Zone 1**	**Zone 2**	**Zone 3**	**Edge (Zone 2)**	**Corner (Zone 3)**
90 (Zone I)	3:12	17.7	17.7	10.2	10.2	10.2	-33.0	-55.4
		-19.2	-23.7	-16.2	-28.2	-41.6		
	5:12	17.7	17.7	10.2	10.2	10.2	-33.0	-55.4
		-19.2	-23.7	-16.2	-27.2	-41.6		
	7.12	17.7	17.7	16.2	16.2	16.2	-30.0	-30.0
		-19.2	-23.7	-17.7	-20.7	-20.7		
110 (Zone II)	3:12	26.4	26.4	15.2	15.2	15.2	-49.2	-82.8
		-28.6	-35.4	-24.2	-42.1	-2.2		
	5:12	26.4	26.4	24.2	24.2	24.2	-49.2	-82.8
		-28.6	-35.4	-26.4	-30.9	-30.9		
	7:12	26.4	26.4	24.2	24.2	24.2	-44.8	-44.8
		-28.6	-35.4	-26.4	-30.9	-30.9		
130 (Zone III)	3:12	36.9	36.9	21.3	21.3	21.3	-68.8	-115.7
		-40.0	-49.4	-33.8	-58.8	-86.9		
	5:12	36.9	36.9	33.8	33.8	33.8	-68.8	-115.7
		-40.0	-49.4	-33.8	-58.8	-86.9		
	7:12	36.9	36.9	33.8	33.8	33.8	-62.5	-62.5
		-40.0	-49.4	-36.9	-43.1	-43.1		
150 (Zone IV)	3:12	49.1	49.1	28.3	28.3	28.3	-91.6	-154.0
		-53.3	-65.8	-44.9	-78.2	-115.7		

	5:12	49.1	49.1	28.3	28..3	28.3	-91.6	-154.0
		-53.3	-65.8	-44.9	-78.2	-115.7		
	7:12	49.1	49.1	44.9	44.9	44.9	-83.2	-83.2
		-53.3	-65.8	-49.1	-57.4	-57.4		

NOTES:

1 The wall pressures ~~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 exterior pressure coefficients (Cp) of +0.8 for windward walls and -0.5 for leeward walls from ASCE/SEI 7-05 *Minimum Design Loads for Buildings and Other Structures* Figure 6-6 with internal pressure coefficients (GCpi) of +/- 0.18 and with a velocity pressure coefficient Kh of 0.85 from Table 6-3 of ASCE/SEI 7-05. ~~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 150 degrees (nominal 3~~2~~/12 slope) and 30 degrees (nominal 7/12 slope) for mean roof heights up to 20 feet.

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 inch in thickness, installed with the long dimension perpendicular to roof framing supports, and secured with fasteners at 4" on center within 3 foot 0inch of each gable end or endwall if no overhang is provided and 6 inches 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.

9 Uplift pressures on single-unit Main Wind Force Resisting Systems within one half of the mean roof height (h) from the end walls shall be increased by 18 percent for roofs with a 3:12 slope, 50 percent for roofs with a 5:12 slope and 62 percent for roofs with a 7:12 roof slope to account for uplift pressures for winds parallel to the roof ridge. Uplift pressures on multi-unit Main Wind Force Resisting Systems within one half of the mean roof height (h) from the end walls shall be increased by 17 percent for roofs with a 3:12 slope, 6 percent for roofs with a 5:12 slope and 15 percent for roofs with a 7:12 slope.

10 See Figure XX for wind pressure zone designations for Components and Cladding.

Insert Figure here*

Figure XX – Components & Cladding Wall and Roof Zones and Roof Diagram (From ASCE 7-05 Figures 6-11A and 6- 11D) (New Figure)

(2) Wind loads--zone designations. The Wind Zone and specific wind design load requirements are determined by the ~~fastest~~ 3-second gust 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~~ Wind Zone III, or Wind Zone IV respectively.
(ii) Wind Zone II.....110~~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: Autauga, Barbour, Bibb, Bullock, Butler, Chambers, Chilton, Choctaw, Coffee, Conecuh, Coosa, Covington, Crenshaw, Dave, Dallas, Elmore, Escambia, Macon, Montgomery, Perry, Pike, Russell, Sumter, Tallapoosa, Washington, Wilcox

Connecticut: Fairfield, Hartford, Litchfield, New haven, Tolland, Windham

Delaware: Kent, Sussex

Florida: Alachua, Baker, Bradford, Clay, Columbia, De Soto, Gadsden, Gilchrist, Glades, Hamilton, Hardee, Highlands, Jefferson, Lafayette, Lake, Leon, Madison, Marion, Orange, Osceola, Putnam, Polk, Seminole, Sumter, Suwannee, Union

Georgia: Appling, Atkinson, Bacon, Baker, Baldwin, Ben Hill, Berrien, Bibb, Bleckley, Brantley, Brooks, Bulloch, Burke, Calhoun, Charlton, Chattahoochee, Clay, Clinch, Coffee, Colquitt, Columbia, Cook, Crawford, Crisp, Decatur, Dodge, Dooly, Dougherty, Early, Echols, Effingham, Emanuel, Evans, Glascock, Grady, Hancock, Harris, Houston, Irwin, Jeff Davis, Jefferson, Jenkins, Johnson, Jones, Lamar, Lanier, Laurens, Lee, Long, Lowndes, Macon, Marion, McDuffie, Meriwether, Miller, Mitchell, Monroe, Montgomery, Muscogee, Peach, Pierce, Pike, Pulaski, Quitman, Randolph, Richmond, Schley, Screven, Seminole, Stewart, Sumter, Talbot, Tattnall, Taylor, Telfair, Terrell, Thomas, Tift, Toombs, Treutlen, Troup, Turner, Twiggs, Upson, Ware, Warren, Washington, Wayne, Webster, Wheeler, Wilcox, Wilkinson, Worth

Hawaii: the entire state

Louisiana: Parishes of Acadia, Allen, Ascension, Avoyelles, Beauregard, Calcasieu, Catahoula, Concordia, East Baton Rouge, East Feliciana, Evangeline, Iberville, Jefferson Davis, Livingston, Pointe Coupee, Rapides, St. Helena, St. Landry, St. Martin, Tangipahoa, Vermilion, Vernon, Washington, West Baton Rouge, West Feliciana

Maine: Androscoggin, Cumberland, Hancock, Kennebec, Knox, Lincoln, Sagadahoc, Waldo, York

Maryland: Caroline, Dorchester, Queen Annes, Talbot, Wicomico

Massachusetts: Bristol, Essex, Franklin, Hampden, Hampshire, Middlesex, Norfolk, Suffolk, Worcester

Mississippi: Adams, Amite, Claiborne, Clarke, Copiah, Covington, Forrest, Franklin, Hinds, Jasper, Jefferson, Jefferson Davis, Jones, Kemper, Lamar, Lauderdale, Lawrence, Leake, Lincoln, Marion, Neshoba, Newton, Noxubee, Pike, Rankin, Scott, Simpson, Smith, Walthall, Wayne, Wilkinson, Winston

New Hampshire: Cheshire, Hillsborough, Merrimack, Rockingham, Strafford

New Jersey: Bergen, Burlington, Camden, Cumberland, Essex, Gloucester, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, Salem, Somerset, Union

New York: Bronx, Kings, New York, Putnam, Queens, Richmond, Rockland, Westchester

North Carolina: Bertie, Bladen, Cumberland, Duplin, Edgecombe, Gates, Greene, Halifax, Harnett, Hertford, Hoke, Johnston, Lenior, Martin, Nash, Northampton, Pitt, Robeson, Sampson, Scotland, Wayne, Wilson

Pennsylvania: none

Rhode Island: Providence

South Carolina: Aiken, Allendale, Bamberg, Barnwell, Berkeley, Calhoun, Chesterfield, Clarendon, Colleton, Darlington, Dillon, Dorchester, Fairfield, Florence, Hampton, Jasper, Kershaw, Lancaster, Lee, Lexington, Marion, Marlboro, Orangeburg, Richland, Sumter, Williamsburg

Texas: Angelina, Atascosa, Austin, Bastrop, Bee, Brooks, Burleson, Caldwell, Colorado, De Witt, Duval, Fayette, Fort Bend, Goliad, Gonzales, Grimes, Guadalupe, Hardin, Harris, Hidalgo, Jackson, Jasper, Jim Hogg, Jim Wells, Karnes, Lavaca, Lee, Liberty, Live Oak, McMullen, Montgomery, Newton, Orange, Polk, San Jacinto, Starr, Trinity, Tyler, Victoria, Walker, Waller, Washington, Webb, Wharton, Wilson, Zapata

Virginia: Gloucester, Isle of Wight, James City, Lancaster, Mathews, Middlesex, Northumberland, Southampton, Surry, York. Cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk, Virginia Beach

~~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, Kennedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, and Willacy.~~

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

(iii) Wind Zone III.....130 ~~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 110 ~~90~~ mph isotach on the ~~ANSI/ASCE~~ASCE/SEI 7-05 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):

Alabama: Baldwin, Mobile

Connecticut: Middlesex, New London

Florida: Bay, Brevard, Calhoun, Charlotte, Citrus, Collier, DeSoto, Dixie, Duval, Escambia, Flagler, Gulf, Hendry, Hernando, Hillsborough, Holmes, Indian River, Jackson, Lee, Levy, Liberty, Manatee, Nassau, Okaloosa, Okeechobee, Pasco, Pinellas,

Santa Rosa, Sarasota, St. Johns, St. Lucie, Taylor, Volusia, Wakulla, Walton, Washington

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

Louisiana: Parishes of Assumption, Iberia, Lafayette, Orleans, St. Charles, St. James, St. John the Baptist, St. Martin, St. Tammany

Maryland: Somerset, Worchester

Massachusetts: Barnstable, Bristol, Dukes, Nantucket, Plymouth

Mississippi: George, Greene, Hancock, Harrison, Pearl River, Perry, Stone

New Jersey: Atlantic, Cape May, Ocean

New York: Nassau, Suffolk

North Carolina: Beaufort, Camden, Chowan, Columbus, Craven, Currituck, Dare, Hyde, Jones,

New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, Washington

Rhode Island: Bristol, Kent, Newport, Washington

South Carolina: Beaufort, Charleston, Georgetown, Horry

Texas: Brazoria, Calhoun, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio, Willacy

Virginia: Accomack, Northampton

~~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) Wind Zone IV.....150 mph. The following areas are considered to be within Wind Zone IV of the Basic Wind Zone Map:

The following territories of all of the U.S. Territories of Guam, Northern Mariana Islands, Puerto Rico, Trust Territory of the Pacific Islands, and the United States Virgin

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

Florida: Broward, Martin, Miami-Dade, Monroe, Palm Beach

Louisiana: Parishes of Cameron, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermillion

Mississippi: Jackson

North Carolina: Brunswick, Carteret

Texas: Cameron

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

* * * * *

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

* * * * *

Insert figure here (NEW)*
Figure to be deleted and replaced

Insert figure here (not sure if this is the new figure they are referring to above or something else)
Figure to be added
Basis Wind Zone Map (Figure 6.5.3.1(a) of NFPA 501-2005)

(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):
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 for components and cladding for roof overhangs cited ~~in paragraph (c)(1)(ii) of~~ this section for all Wind Zones ~~II and III~~. The allowable deflection shall be (2xLc)/180, where Lc is the measured horizontal eave projection from the wall.

(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.

(2) For Wind Zone II, III and Wind Zone III IV, 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 and Wind Zone IV. *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.

(f) Walls. The walls shall be of sufficient strength to withstand the load requirements for components and cladding as defined in Sec. 3280.305(c) of this part, without exceeding the deflections as specified in Sec. 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.

* * * * *

3280HUD- Log #37 **Final Action: Reject**
(3280.306)

Submitter: David K. Low, D. K. Low & Associates
Recommendation:
****Include 3280_L37_R.doc here****

Substantiation: The wind provisions of the MHCSS contained in 24CFR3280 are based on a modified version of ASCE 7-88 Minimum Design Loads for Buildings and Other Structures, a wind standard that is now 20 years old. The contemporary wind ASCE/SEI 7-05 Minimum Design Loads for Buildings and Other Structures indicates that high winds extend much further inland than what was considered in 1988. The extension of the high wind regions places HUD homes in areas where design level winds are greater than what the homes were designed to resist. Wind analyses completed by Keshor Mehta, PhD, PE determined that during a design event, homes placed near the edge of the existing HUD Zone I will be exposed to wind pressures nearly twice (186%) those for which the homes where designed. This exposes occupants of those homes to greater risk than occupants of homes designed and constructed to contemporary wind codes and standards like the International Residential Code IRC-2006 and the International Building Code IBC-2006.

This proposal will correct the wind design deficiencies that exist in 24CFR3280 Sections 306 by requiring HUD homes to be secured and anchored to resist wind loads determined by a contemporary wind standard.

Note: Supporting material is available for review at NFPA Headquarters.

Cost/Benefits: A cost benefit analysis has been completed for FEMA Proposal #1. The cost benefit analysis determined that revisions to the wind speed map are needed and are cost beneficial. An electronic copy of the cost benefit analysis completed by Peter Vickery, PhD of Applied Research Associates (titled *MH Final Report 2005*) is available for review at NFPA headquarters.

Committee Meeting Action: Reject

Committee Statement: This is a companion and related change to Log # 36. In addition to the reason given for rejecting Log # 36, the MHCC has made and passed an MHCC recommendation that will reference the 2005 edition of ASCE 7 with limitations. See action on MHCC Proposal Log #3280-CP4.

Code of Federal Regulations
Title 24, Volume 5
Revised as of April 1, 2006
From the U.S. Government Printing Office via GPO Access
[CITE: 24CFR3280.305]

Proposed Revisions to Sec. 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 respective 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 Sec. 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 Sec. 3280.305(c)(1)(ii).~~

(i) The design wind loads for Exposure C specified in ACSE/SEI 7-05, "Minimum Design Loads for Buildings and Other Structures", for a design wind speed of 90 mph, as specified for Wind Zone I, 110 mph, as specified for Wind Zone II, 130 mph for Wind Zone III and 150 mph for Wind Zone IVas specified Basic Wind Zone Map); or

(ii) The wind pressures specified in the following tables for Support and Anchorage Systems:

Support and Anchorage Pressures

		Wall Pressures		Roof Pressures			
		All Units		Single Unit		Double Unit	
V	roof	(psf)	(psf)	(psf)		(psf)	
(mph)	pitch	Windward	Leeward	Windward	Leeward	Windward	Leeward
90 (Zone I)	3:12	10.2	-6.4	-12.0	-7.3	-9.4	-6.4
	5:12	10.2	-6.4	-9.4	-9.4	-11.2	-11.2
	7:12	10.2	-6.4	-9.0	-9.0	-10.8	-10.8
110 (Zone II)	3:12	15.2	-9.5	17.9	-10.9	-14.1	-9..5
	5:12	15.2	-9.5	-14.1	-14.1	-16.7	-16.7
	7:12	15.2	-9.5	-13.5	-13.5	-16.1	-16.1
130 (Zone III)	3:12	21.3	-13.3	-25.0	-15.3	-19.7	-13.3
	5:12	21.3	-13.3	-19.7	-19.7	-23.4	-23.4
	7:12	21.3	-13.3	-18.8	-18.2	-22.5	-22.5
150 (Zone IV)	3:12	28.3	-17.7	-33.3	-20.3	-26.2	-17.7
	5:12	28.3	-17.7	-26.2	-26.2	-31.1	-31.1
	7:12	28.3	-17.7	-25.1	-25.1	-29.9	-29.9

1 The pressures used in calculating the design of Support and Anchorage Pressures are based on exterior pressure coefficients of Method 2 from ASCE/SEI 7-05 *Minimum Design Loads for Buildings and Other Structures* (Figure 6-6). Internal pressure which do not affect support and anchorage loads were not considered.

2 + sign would mean pressures are acting towards or on the structure; - sign meanspressures are acting away from the structure.

3 Design values in this ``Table'' are only applicable to roof slopes between 15 degrees (nominal 3/12 slope) and 30 degrees (nominal 7/12 slope) for mean roof heights up to 20 feet.

4 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.

5 Uplift pressures for single-unit Support and Anchorage systems within one half of the mean roof height (h) from the end walls shall be increased by 22 percent for roofs with a 3:12 slope, 64 percent for roofs with a 5:12 slope and 81 percent for roofs with a 7:12 roof slope to account for uplift pressures for winds parallel to the roof ridge. Uplift pressures on multi-unit Support and Anchorage Systems within one half of the mean roof height (h) of the end walls shall be increased by 55 percent for roofs with a 3:12 slope, 35 percent for roofs with a 5:12 slope and 46 percent for roofs with a 7:12 slope.

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. Sixty percent of the ~~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.

3280HUD-17 Log #56 **Final Action: Accept**
(3280.304(b)(1))

Submitter: John G. Bradfield, Composite Panel Assn.
Recommendation: Add text as follows:
Medium Density Fiberboard (MDF) For Interior Applications ANSI A208.2-2002.
Substantiation: This is the standard for a product commonly used in Manufactured Housing that does not have a standard referenced in the current materials section.
Note: Supporting material is available for review at NFPA Headquarters.
This is not original material; its reference/source is as follows:
ANSI A 208.2-2002
Committee Meeting Action: Accept

3280HUD- Log #59 Final Action: Accept in Principle
(3280.103)

Submitter: Michael Lubliner, Washington State University
Recommendation: Revise text as follows:
This proposal replaces current whole house mechanical ventilation system requirements with ASHRAE Standard 62.2.
Sec. 3280.103 Light and ventilation.
(a) Lighting. Each habitable room shall be provided with exterior windows and/or doors having a total glazed area of not less than 8 percent of the gross floor area.
(1) Kitchens, bathrooms, toilet compartments, laundry areas, and utility rooms may be provided with artificial light in place of windows.
(2) Rooms and areas may be combined for the purpose of providing the required natural lighting provided that at least one half of the common wall area is open and unobstructed, and the open area is at least equal to 10 percent of the combined floor area or 25 square feet whichever is greater.
(b) Whole-house ventilation. Each manufactured home must be provided with whole-house ventilation in accordance with ASHRAE Standard 62.2 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.
DELETE REST OF SECTION
Substantiation: Unlike the current MHCSS language, the ASHRAE standard 62.2 has been developed by recognized international experts and represents the most current residential ventilation standard. Adoption of 62.2 will help to improve the indoor environment for new HUD code homebuyers. Adoption of ASHRAE 62.2 will address problems associated with HUD's lack of definition of "balanced" ventilation and better address spatial and temporal ventilation effectiveness issues. Adoption of 62.2 will not increase the first cost of the home, since HUD MHSCC already requires mechanical whole house and spot ventilation systems.
Note: If ASHRAE 62.2 is adopted, whole house ventilation systems should be commissioned; homeowners should also be provided with system operating instructions. HUD should also then consider eliminating the need to the Consumer Formaldehyde Notice.
Note: Supporting material is available for review at NFPA Headquarters.
Committee Meeting Action: Accept in Principle
Committee Statement: See the MHCC Action on 3280 Log #25.

3280HUD-18 Log #73 Final Action: Accept
(3280.304(b)(1))

Submitter: Gary L. Heroux, Composite Panel Association (CPA)
Recommendation: Update product standard for particle board:
Old standard - ANSI A208.1-1999
Replace with new - ANSI A208.1-2009
Substantiation: No Substantiation given.
Committee Meeting Action: Accept

3280HUD-20 Log #77 Final Action: Accept
(3280.303(b))

Submitter: Michael Wade, Cavalier Home Builders, Inc.
Recommendation: Revise text to read as follows:
3280.303 General requirements.
(b) Construction. All construction methods shall be in conformance with an approved quality assurance manual and accepted engineering practices to insure durable, livable, and safe housing. ~~and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.~~
Substantiation: Journeyman is an antiquated term. This word/term does not appear in any other location within 3280, nor is it used in 3282. The term is not defined and is potentially confusing and misleading.
To be considered/qualified as a Journeyman, typically a journeyman's license is required by many localities and states. Such requirements do not apply to the typical employee working in the manufactured housing industry.
The new QC program which HUD is requiring the industry to implement places tremendous emphasis on training of employees, especially employees that are responsible for verifying that specific job functions or work processes have been performed properly. This fact in conjunction with each manufacturer's commitment to quality and the ever increasing expectations of our consumers, will result in a quality standard that continues to increase.

Cost Benefit: The proposal must include a statement as to whether the proposed change would result in an increased cost, and if so, how much of an increase. The benefit to be gained if the proposed change is implemented in the manufactured housing program document must also be described.
The proposed change to this section will not have an effect on the cost of homes produced in our industry.
Committee Meeting Action: Accept

3280HUD- Log #79 **Final Action: Accept**
(3280.304)

Submitter: Matthew Dobson, Vinyl Siding Institute, Inc.
Recommendation: *Add to section 304 Materials*
Plastic
Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding - ASTM D3679-09a
Standard Specification for Polypropylene (PP) Siding ASTM D7254 - 07

Add to Subpart E - Testing
3280.407 Standard for vinyl siding and polypropylene siding used in manufactured homes.
(a) Scope. This section sets the requirements for the manufacturing and installation of vinyl siding and polypropylene siding.
(b) Standard
(1) Vinyl siding. All vinyl siding shall comply with the requirements of ASTM D3679-97a and shall be certified and labeled as conforming to those requirements by an independent quality assurance agency.
(2) Polypropylene siding. All polypropylene siding shall comply with the requirements of ASTM D7254-07 and shall be certified and labeled as conforming to those requirements by an independent quality assurance agency.
(c) Installation.
(1) Vinyl siding and polypropylene siding shall be installed in accordance with the manufactures installation instructions. Vinyl siding and soffit installation shall be based on ASTM D4756 Standard Practice for Installation of Rigid Poly (Vinyl Chloride) (PVC) Siding and Soffit, 2006.

Substantiation: Minimum standards for the manufacturing of vinyl siding have been in place for well over a decade. Additionally, manufacturing standards or polypropylene siding have been in place for several years.

Both the International Residential Code and the International Building Code have required third party product certification for vinyl siding since 2006. Without these requirements, substandard materials can be used in manufactured housing.

For example, recently noncertified vinyl siding was found being used in the Carolinas that did not meet the requirements of ASTM D3679. It was disintegrating on the wall and after further tests it was noted that Lead was being used as a stabilizer in the product. Certified products are not allowed to use Lead as a stabilizer.

In 1998, the Vinyl Siding Institute, Inc. launched the VSI Product Certification Program as a means for manufacturers to independently verify the quality of the vinyl siding they produce. Based on the success of the VSI Product Certification Program for vinyl siding, VSI added polypropylene siding certification in the program in 2010.

Vinyl siding certified through a third party certification program:

- Meets or exceeds the industry standard for quality and performance (ASTM D3679), as verified by an independent, accredited quality control agency through twice yearly, unannounced plant inspections, product testing and quality review.
- Meets the requirements of the International Residential Code and International Building Code, which requires that vinyl siding be certified to meet ASTM D3679 by an accredited quality control agency.
- Withstands the impacts of recommended installation procedures.
- Lies straight on a flat wall and does not buckle under normal conditions.
- Weathers the effects of sunshine, rain, and heavy winds of at least 110 mph.
- Meets manufacturers' advertised specifications for length, width, thickness, and gloss.
- Can be identified by a variety of program logos and/or labels.

Vinyl siding must be installed correctly in order to perform correctly. The base point for proper vinyl siding installation is ASTM D4756, Standard Practice for Installation of Rigid Poly Vinyl Chloride (PVC) Siding and Soffit. This is the standard method for installation of vinyl siding and soffit. Manufactures may have small variations from this standard so it is necessary to reference the manufacture's installation instructions first and the standard second. This standard is indirectly referenced in both the International Building Code and International Residential Code.

More information on product certification is available at www.vinylsiding.org and www polypropylenesiding.org.

Cost/Benefit Information. The Proposal must include a statement as to whether the proposed change would result in an increased cost, and if so, how much of an increase. The benefit to be gained if the proposed change is implemented in the manufactured housing program document must also be described.

This change will not impact the cost of construction as most vinyl siding and polypropylene siding is currently certified.

3280HUD- Log #CP4 **Final Action: Accept**
(3280.304)

Submitter: HUD Manufactured Housing Consensus Committee,

Recommendation: Update the appropriate sections of Part 3280 to recognize ASCE 7-2005, but don't make any changes to the wind pressure tables or wind zone maps in Section 3280.305. Further, the MHCC recommends that the HUD staff work to update the wind speed references in Part 3280.305 as appropriate.

3280.304 Materials.

Unclassified

Minimum Design Loads for Buildings and Other Structures—ASCE 7-~~1988~~ 2005.

Substantiation: The MHCC wishes to offer a compliance option that includes a more recent edition of ASCE 7 (the 2005 edition). While the MHCC believes that the current wind pressure tables in Part 3280 are adequate, offering use of a more recent edition of ASCE 7 is seen as a step forward in recognizing more current design approaches.

Committee Meeting Action: Accept

3280HUD- Log #CP5 Final Action: Accept
(3280.103(b))

Submitter: HUD Manufactured Housing Consensus Committee,
Recommendation: Revise the section as follows:
(b) Whole-house ventilation. Each manufactured home must be provided with whole-house ventilation having a minimum capacity of 0.035 ft3 /min/ft2 of interior floor space or its hourly average equivalent. This ventilation capacity must be in addition to any openable window area. In no case shall the installed ventilation capacity of the system be less than 50 cfm ~~nor more than 90 cfm~~. The following criteria must be adhered to: (No further changes to remainder of the section).

Substantiation: Deletion of the 90 cfm criteria will dispense the need for a manufacturer to apply for and request an AC letter for home designs larger than 2,571 square feet.
Committee Meeting Action: Accept

3282HUD- (20) Log #1 Final Action: Reject

Submitter: Steven T. Anderson, Murray, UT

Recommendation: Add text to read as follows:

The infrastructure supporting a manufactured home, including but not limited to — streets and roads, water, sewer and drainage, electricity, and natural gas, and all other utility services, shall be constructed and maintained in accordance with the public works standard design specifications and maintenance standards that are appropriate for the home and the immediate area as determined by the local public works authority. Inspection and enforcement of this provision is left at the local level.

Substantiation: Several manufactured home communities are constructed at where the infrastructure — particularly the electrical — will not support the newer energy star homes. Most public works standards already support upgraded conditions. The cost would be borne by the park owner as a capital improvement in order to upgrade their community and get newer homes in their parks.

Committee Meeting Action: Reject

Committee Statement: While the MHCC understands the problem that is trying to be addressed, neither the 1974 Act nor even the provisions of MHIA 2000 give the Secretary the ability to regulate infrastructure. This is a local issue that needs to be worked out with local developers and planners.

3285HUD- Log #3 Final Action: Reject
(3285.4 and 3285.603(f) (New))

Submitter: Lois Starkey, Manufactured Housing Institute
Recommendation: 24 CFR Part 3285
Model Manufactured Home Installation Standards.

Add to 3285.4 the following reference.

(h)(4) NFPA 13D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes, 2010 edition.

Add to 3285.603 a new subsection (f).

3285.603(f) Fire sprinkler system water supply and testing verification by home installer. The adequacy of the water supply to the fire sprinkler system inlet is to be verified by the installer as meeting the minimum requirements identified of the Fire Sprinkler Certificate (located in the home next to the data plate). (See ξ3280.210(q) of the Manufactured Home Construction and Safety Standards.) The fire sprinkler system piping is to be tested in accordance with the home manufacturer's installation instructions. The home installer must provide its company (or individual if no company) name and address along with the date on the Fire Sprinkler System Certificate.

INSERT 2 FIGURES #1 & #2 for 3285HUD_L3_R.HERE

Substantiation: The Manufactured Home Construction and Safety Standards (MHCSS) do not address fire safety and prevention through the use of fire sprinklers. HUD has taken the position that it cannot preempt state and local jurisdictions from requiring the installation of fire sprinkler systems in new manufactured homes. An increasing number of state and local jurisdictions have established ordinances requiring fire sprinklers in new single family dwellings including manufactured homes, and/or are adopting the 2009 International residential Code which includes fire sprinkler system requirements.

This proposal, therefore, adds a new subpart to Section 3280 providing for a preemptive fire sprinkler system when a manufacturer elects to install a fire sprinkler system or a state or local authority having jurisdiction require that a fire sprinkler system be installed for new manufactured homes.

The standard gives manufacturers the option of utilizing fire sprinkler systems designed in accordance with NFPA 13D or in accordance with a prescriptive method outlined in the new section 3280.210. This prescriptive method is based on the 2009 IRC code and specifically references the tables used in the IRC 2009 edition to determine pipe sizing and water pressure. One advantage of this method, as opposed to the NFPA 13D method, is that the actual design process is much simpler and can easily be done without the use of a complicated computer program. The proposal is also modeled closely from elements of the fire sprinkler standards for manufactured homes in the California code, Title 25, article 2.5, sections 4300-4318.

The proposed standard utilizes a design process that considers the production and distribution methods of factory built housing where the ultimate site location of the home is unknown. The proposal provides for the calculation of the minimum required water pressure and flow rate at the inlet to the home needed for the fire sprinkler system to operate properly, and then requires the information to be included on a certificate placed in the home. The NFPA 13D method uses a design approach whereby the water pressure in the street, pressure losses in the water mete, and the piping between the street and the home inlet must be known. This approach does not work for our industry. As noted, the proposal requires that the manufacturer permanently affix a Fire System Certificate adjacent to the data plate specifying the minimum required pressure in pounds per square inch (psi) and flow rate in gallons per minute (gpm) for the water supply system (Section 3280.210(q)).

The proposed standard also requires a valve tag to be placed on the inlet of the fire sprinkler system [210(r)]; a short statement to be added to the manufacturer's installation instruction [210(t)] and a copy of any fire system component

written instructions to be shipped with the home [210(s)].

Under a new section 3285.603(g) the proposal would make the home installer responsible to do the following as part of the installation process:

1. Pressure test the fire sprinkler system piping system following instructions provided by the manufacturer,
2. Verify that the adequacy of the supply to the system against the minimum requirements call out on the Certificate provided by the manufacturer, and
3. Provide his company name, address and date of home installation on the Certificate.

Cost Impact:

The estimated cost impact for installing a sprinkler system in a new manufactured home on a "where required" basis should be minimal. In fact this proposal should reduce costs from current requirements to meet state and local fire sprinkler standards because the MHI proposal calls for design approval and installation in-house, using the procedures outlined in the Manufactured Home Procedural and Enforcement Regulations, (24 CFR Part 3282).

This proposal will minimize cost variances caused by local ordinances that go beyond the NFPA 13D minimum requirements for fire sprinkler systems.

According to a 2008 study prepared by the Fire Protection Research Foundation, *Home Fire Sprinkler Cost Assessment,* the cost of installing sprinkler systems to the site builder averaged $1.61/per sprinklered square foot. Sprinklered square feet is the total area of spaces with sprinklers. This cost includes design, installation, and other costs such as permits, and water meter fees, to the extent they apply.

Since manufactured homebuilders will be able to utilize in-plant design and inspection procedures, it is estimated that the cost for this proposal would be between $.50 and $.75 per square sprinklered foot.

This is not original material; its reference/source is as follows:

IRC 2009

Committee Meeting Action: Reject

Committee Statement: This item was related to the MHCC action taken on Log #76 (3280) dealing with the residential sprinkler allowance in October of 2011. The water supply verification provisions addressed in 3285 Log #3 were handled by MHCC action on 3280 thus this change has already been dealt with.

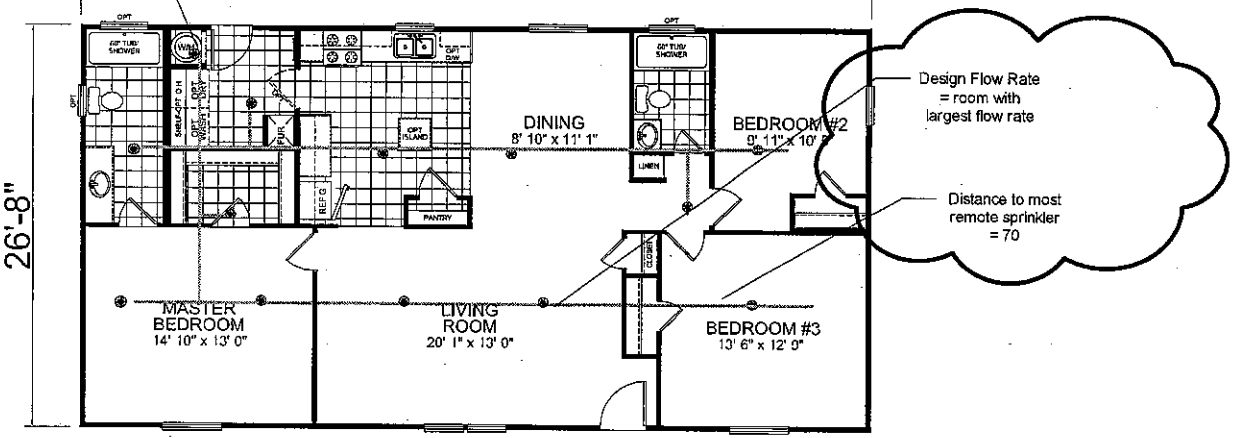
	26 gpm	/	70' to most remote sprinkler		
		70'	10'		
Psup	=	Pt +	Ple +	Psp	PIPING MATERIAL
56.4	=	45	4.4	7	3/4 copper
26.4	=	15	4.4	7	1 copper
41.4	=	30	4.4	7	3/4 CPVC
26.4	=	15	4.4	7	1 CPVC
#VALUE!	=	NP	4.4	7	3/4 PEX
41.4	=	30	4.4	7	1 PEX

	26 gpm	/	75' to most remote sprinkler		
			(added 5' to pipe to refect additional vertical rise)		
		75'	15'		
Psup	=	Pt +	Ple +	Psp	PIPING MATERIAL
63.5	=	50	6.5	7	3/4 copper
26.5	=	15	6.5	7	1 copper
43.5	=	30	6.5	7	3/4 CPVC
26.5	=	15	6.5	7	1 CPVC
#VALUE!	=	NP	6.5	7	3/4 PEX
48.5	=	35	6.5	7	1 PEX

Water Supply provided by others

52'

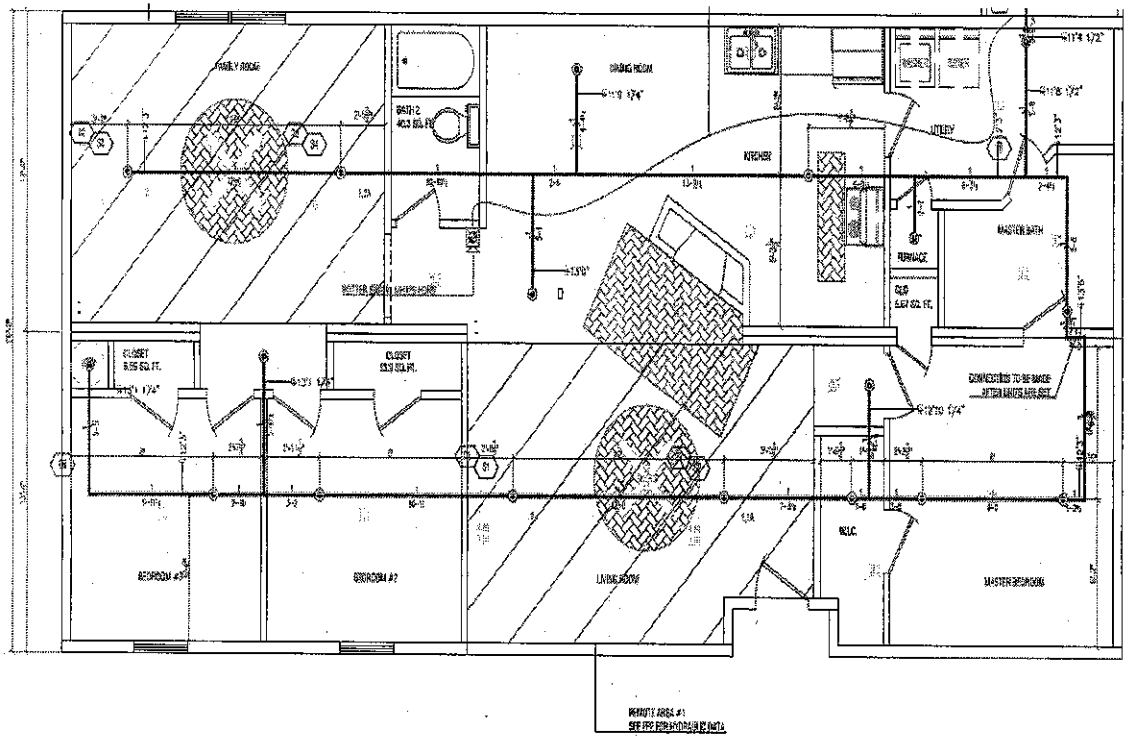
26'-8"



rapidresponse DESIGN SERVICES

Sample Project

		TWO SPRINKLER ROOM at 26 gpm			
		81'	11.5'		
Psup	=	Pt +	Ple +	Psp	PIPING MATERIAL
63.5	=	30	6.5	7	3/4 copper
63.5	=	15	6.5	7	1 copper
48.5	=	35	6.5	7	3/4 CPVC
48.5	=	15	6.5	7	1 CPVC
#VALUE!	=	NR	6.5	7	3/4 PEX
48.5	=	35	6.5	7	1 PEX



rapidresponse DESIGN SERVICES
by Tyco Fire Suppression & Building Products

Sample Project

3285HUD- Log #4 Final Action: Reject
(3285.203(C) Site Drainage)

Submitter: Gregory L. Johnloz, Follett Investment Properties, Inc. / Rep. Manufactured Housing Communities of Arizona
Recommendation: (c) All drainage must be diverted away from the home. Drainage shall be done in accordance with regulations set forth by the Local Authority Having Jurisdiction (LAHJ). If the LAHJ has not adopted regulations regarding drainage, drainage ~~and~~ must slope a minimum of one-half in. per ft away from the foundation for the first ten feet and, where ~~Where~~ property lines, walls, slopes, or other physical conditions prohibit this slope, the site must be provided with drains or swales or otherwise graded to drain water away from the structure, as shown in Figure to 3285.203.

Substantiation: In many manufactured housing rental communities, particularly in areas with low annual rainfalls and older communities, there is not 10 ft between homes. This is because many of the early zoning ordinances only required 6 ft between homes. Under the current rule, community owners are discouraged from replacing older homes with new homes due to the fact that installation of a new home will require drains, swales, etc. This may also prevent homeowners from moving their homes into communities that have less than 10 ft between homes because of the additional expense to install drains or swales and the aesthetics of having a home which sets on a dramatically sloped lot.

Swales and drains are difficult to install in many rental communities due to the fact that typically water is diverted from the home to the street by the grade of the land (in fact, there have been several cases before the Arizona Mobile Home Parks Hearing Officer where it was ruled that proper grading in rental communities was a responsibility of the community owner as the owner must provide safe, habitable premises). In many communities the land is graded down to street level, and water runs down the street or gutter. If an installer then has to add a drain or swale because there is less than 10 ft between homes, the drain or swale could end up running lower than street level and some other accommodation will have to be made for drainage (i.e., installing larger swales throughout the community, drains under road, etc.) unless more dirt is added to the lot.

Cost/Benefit Information: In speaking with installers and community owners in the Phoenix and Tucson, Arizona areas, I have learned that installation of drains or swales can add $1,000 to $3,000 to the cost of installing a manufactured home.

The issue of drainage should be left up to the local authority having jurisdiction since annual rainfall and soil types differ throughout the United States.

This is not original material; its reference/source is as follows:
Generally from Proposal generated by Susan Brenton - MHCA Executive Director.
Committee Meeting Action: Reject
Committee Statement: This proposal is basically a duplication of Log #2 for 3285 concerning grading and drainage at the site. The site drainage provisions addressed in 3285 Log #2 were handled by MHCC action on 3285 Log #2 at the October 2011 meeting thus this change has already been dealt with.