

JOE B. RAMEY, PROFESSIONAL ENGINEER

8833 EAST 11TH STREET
TULSA, OKLAHOMA 74112
(918) 838-0021

Ms. Deanna Fields, Executive Director
Manufactured Housing Association of Oklahoma
6400 Shields
Oklahoma city, OK 73149

February 28, 2001

Re: Oklahoma Generic Installation Code

Dear Ms. Fields:

Upon your request and the authorization of the Manufactured Housing Authority of Oklahoma, This engineer has reviewed the final revised version (2001) for the Oklahoma Generic Installation Code for Manufactured Homes.

After a substantial amount of time in review and discussion with board members, It is the opinion of this Engineer (Registered as a Professional Engineer in the State of Oklahoma) that the installation code is very well written and should be implemented for standardization of the manufactured home industry for installation and support of manufactured homes.

There are no exceptions and a copy of the final approved version is attached with engineer's seal and signature.

This opinion is based on the qualified knowledge and experience of this office. Except as expressly noted, compliance with any specifications, legal or code requirements have been considered but are specifically excluded from this opinion report. This opinion is for the sole use of the Manufactured Housing Authority of Oklahoma and I assume no liability to third parties in connection with this report.

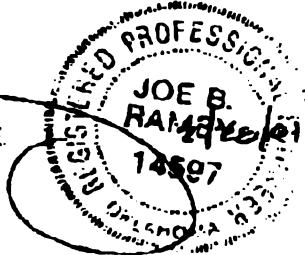
If any questions should arise concerning this report or if I can be of assistance in the future, please contact this office.

Sincerely,


Joe B. Ramey, P.E.

JBR/jh

Enclosures



OKLAHOMA GENERIC INSTALLATION CODE FOR MANUFACTURED HOMES

This code incorporates, in as simple a language as possible, the four key elements to installation: *Site Preparation, Support, Anchoring and Perimeter Skirting.* Mechanical, Electrical and Plumbing codes of the State of Oklahoma govern installation and connection of utilities. Manufacturer's manuals direct matters related to their product design, such as roof and floor connections, siding installation, etc.

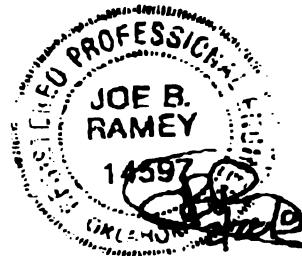
I. SITE PREPARATION: The responsibility for adequate site preparation, including grading and drainage requirements, and for providing proper facilities for the connection of utilities shall be that of the purchaser or homeowner, except when located within a manufactured home rental community.

II. SUPPORT SYSTEMS: This section includes Footers, Pier Construction and Pier Spacing.

FOOTERS: These will consist of 3 - 4"x8"x16" solid concrete blocks, positioned with the joints parallel to the I-beam if, single blocks are used. When double-blocking, the footer joint may be either parallel to or perpendicular to the frame. Alternatively, a pad constructed of ABS, steel, or treated lumber or plywood meeting the AWWPA requirements for ground contact, a minimum of 384 square inches in size and tested to a load-bearing capacity of not less than 6,000# may be used. Note: Other material providing equivalent load-bearing capacity and resistance to decay, and which is approved by either the manufacturer or ANSI 225.1 -1994, may be used. All organic material, sod, grassroots and topsoil shall be removed from under the footer to a depth of 3", whereupon an assumption of 2,000 P. S. F. soil may be made.

PIERS UP TO 36" IN HEIGHT: (Measured from top of footer to bottom of the frame) These will be constructed of single 8"x8"x16" two-celled concrete blocks with cells aligned vertically and 16" dimension perpendicular to the I-beam + 2"x8"x16" or 4"x8"x16" solid concrete blocks. Such piers may be capped, between the blocks and the I-beam, with 1"x8"x16" or 2"x8"x16" (nominal) wood plates, not to exceed 3-1/4", and wedges driven from both sides of the I-beam, not to exceed 1" in thickness. Alternatively, piers up to 36" in height may be manufactured steel piers, provided they are rated, listed and labeled for the required load capacity. Adjustable risers may not extend more than 2" when finally positioned. Other engineering-approved, rated and listed systems may be used. Minimum height of any pier, as measured from the top of the footing to the bottom of the I-beam shall be 12".

PIERS FROM 36" TO 80" IN HEIGHT: (Measured from top of footer to bottom of frame) These will be constructed of doubled, interlocked 8"x8"x16" two-celled concrete blocks with cells aligned vertically, topped with 2 - 4"x8"x16" solid concrete blocks. Such piers may be capped, between the blocks and the I-beam, with 2 - 1"x8"x16" or 2"x8"x16" (nominal) wood plates, not to exceed 3-1/4", and wedges driven from both sides of the I-beam, not to exceed 1" in thickness.



1/3

PIERS OVER 30" IN HEIGHT: (Measured from top of footer to bottom of frame) The footer for such piers shall consist of a 24"x24"x6" concrete pad (poured in place) into which have been embedded 4 - 3/8" re-bars, bent at a 90-degree angle so that at least 12" of each bar is so embedded, with the vertical portion reaching to the height of the topmost hollow-celled concrete block to be used in the pier. Doubled, interlocked 8"x8"x16" concrete blocks will then be used to construct the pier. The vertical rebars shall be centered in the open cells of the blocks and the cells filled with concrete. The blocks will be topped with 2 solid 4"x8"x16" concrete blocks. Such piers may be capped with 2 - 1"x8"x16" or 2"x8"x16" (nominal) wood plates, not to exceed 3-1/4", and wedges driven from both sides of the I-beam, not to exceed 1" in thickness.

NOTES: (1) Mating-line or perimeter piers shall be measured from the footer to the bottom of the floor.

PIER SPACING: (Measured from center-to-center of piers)

Single Section Homes: The center of end piers should not exceed 2' from the frame-ends. Piers are to be placed under each longitudinal mainframe member, not to exceed 6' on-center. Exterior doors must have perimeter piers, or approved adjustable outriggers, under both sides of the opening, except when located over a steel cross member or when such piers are accepted by factory design.

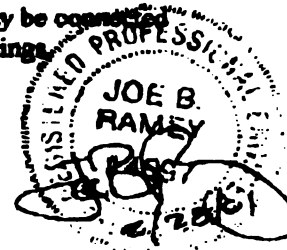
Multi-Section Homes: The center of end piers should not exceed 2' from the frame-ends. Piers are to be placed under each longitudinal mainframe member, not to exceed 6' on-center. Exterior doors must have perimeter piers, or approved adjustable outriggers, under both sides of the opening, except when located over a steel cross member or when such piers are accepted by factory design. Marriage-line piers shall be located at each position marked on the underside of the home by the manufacturer and in accord with printed instructions shipped with each home by the manufacturer, specifying location and required load capacity of each such pier.

III ANCHORING: (Zone I)

Ties shall be as evenly spaced as practicable along the length of the home, and the distance from each end of the home and the diagonal tie nearest that end shall not exceed 2'. Ties will be spaced no more than 11' apart on a side, allowing adjustment for obstructions (any strap spacing may be exceeded by 10%, so long as the average strap spacing does not exceed 11'). The number of ties per side will be calculated by the formula: section-length minus 4', divided by the spacing of 11' (rounded to next whole number), plus 1 tie. [The result for a 16x80 (overall length) would be 8 diagonal ties per side.] (This method is based on ANSI 225.1 - 1994)

Over-the-top vertical ties will not be necessary for homes 13.50' or wider, with 10' or less wall height, with I-beams that are 96" or more apart, with no evidence that vertical ties have been cut or removed and with diagonal ties installed extending to the nearest I-beam.

Where a vertical tie and a diagonal tie are located at the same place, both ties may be connected to a single anchor, provided that the anchor used is capable of carrying both loadings.



2/3

Anchor shall be capable of resisting a load of 4,725#.

All anchoring devices shall be installed in accordance with the anchor manufacturer's instructions, including, but not limited to, the use of approved stabilizer plates or 10" diameter x 18" deep poured concrete cylinders to prevent lateral movement of the anchor through the soil.

Tie down anchors are not required when the home is installed on a FOUNDATION SYSTEM designed by an architect or registered engineer, which is designed to resist all tributary vertical live and dead loads, as well as lateral loads (wind or seismic), for the local conditions.

IV. PERIMETER SKIRTING: (This section also deals with ventilation and moisture control)

Skirting, if used, shall be of durable materials suitable for exterior exposures. Any lumber used in connection with skirting within 6" of the ground shall be pressure-treated to prevent decay and termite infestations.

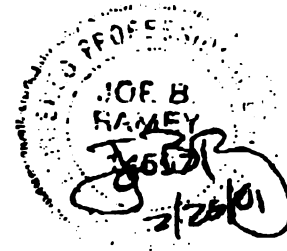
Ventilation shall be provided for the crawlspace at a minimum of one square foot of free area for every 150 square feet of the home's floor area.

Ventilation may be obtained by:

1. Ventilation openings shall be placed at or near each corner of the home and shall be located so as to provide cross-ventilation on at least two opposite sides of solid foundations.
2. Self-ventilating skirting may be used to satisfy cross ventilation in all other cases

Some manufacturers and ANSI 225.1 require that a polyethylene moisture-retarder sheet be placed on the ground underneath the home. When such instructions call for such a vapor-retarder, it is the responsibility of the purchaser or homeowner to see that it is installed.

Dryer vents and air conditioning condensation drains must pass through the skirting to the outside, rather than terminating underneath the home.



3/3