

4781-6-03.4 Anchorage against wind.**(A) Anchoring instructions.**

- (1) After blocking and leveling, the manufactured home shall be secured against the wind by use of anchor assembly type installations or by connecting the home to the alternative foundation system. See rule 4781-6-02.3 of the Administrative Code.
- (2) For anchor assembly type installations, the installation shall ensure the manufactured home is secured against the wind as described in this section. Installations not completed in accordance with the manufactured installation instructions shall meet these standards or be designed by an Ohio registered professional engineer or registered architect in accordance with acceptable engineering practice, the design loads of the MHCSS and rule 4781-6-02.3 of the Administrative Code.
- (3) All anchoring and foundation systems shall be capable of meeting the loads that the manufactured home was designed to withstand required by MHCSS and rule 4781-6-02.3 of the Administrative Code and that the manufactured home was designed to withstand as shown on the home's data plate. However, if a home is placed in a zone which is less than the zone on the data plate then the anchoring and foundation requirements may be designed to the zone in which the home is placed; unless specifically excluded by the manufacturer of the home.
- (4) When an Ohio registered professional engineer or registered architect designs anchoring, the installation instructions are to include at least the following information and details for anchor assembly type instructions:
 - (a) The maximum spacing for installing diagonal ties and any required vertical ties or straps to ground anchors;
 - (b) The minimum and maximum angles or dimensions for installing diagonal ties or straps to ground anchors and the main chassis members of the manufactured home;
 - (c) Requirements for connecting the diagonal ties to the main chassis members of the manufactured home. If the diagonal ties are attached to the bottom flange of the main chassis beam, the frame shall be designed to prevent rotation of the beam;
 - (d) Requirements for longitudinal and mating wall tie downs and anchorage;
 - (e) The method of strap attachment to the main chassis member and ground anchor; including provisions for swivel-type connections;
 - (f) The method of strap attachment to the main chassis member and ground

anchor; including provisions for swivel-type connections;

(g) As applicable, the requirements for sizing and installation of stabilizer plates.

(B) Ground anchor installations.

(1) Specifications for tie-down straps and ground anchors.

(a) Ground anchors.

Ground anchors shall be listed, be provided with protection against weather deterioration and corrosion at least equivalent to that provided by a coating of zinc on steel of not less than 0.30 ounces per square foot of surface coated, and be capable of resisting a minimum ultimate load of four thousand seven hundred twenty five pounds and a working load of three thousand one hundred fifty pounds, unless reduced capacities are noted in accordance with note 11 of table 4.1 of this rule or note 12 of tables 4.2 and 4.3 of this rule. The ultimate load and working load of ground anchors and anchoring equipment shall be determined by a registered professional engineer, registered architect, or tested by a nationally recognized third party testing agency in accordance with a nationally recognized testing protocol.

(b) Tie-down straps.

A one and one-quarter inch by thirty five hundredths of an inch or larger steel strapping conforming to ASTM D 3953-97, "Standard Specification for Strapping, Flat Steel and Seals, Type 1 Grade 1, Finish B," with a minimum total capacity of four thousand seven hundred twenty-five pounds and a working capacity of three thousand one hundred fifty pounds shall be used. The tie-down straps shall be provided with protection against weather deterioration and corrosion at least equivalent to that provided by a coating of zinc on steel of not less than 0.30 ounces per square foot of surface coated. Slit or cut edges of coated strapping need not be zinc coated.

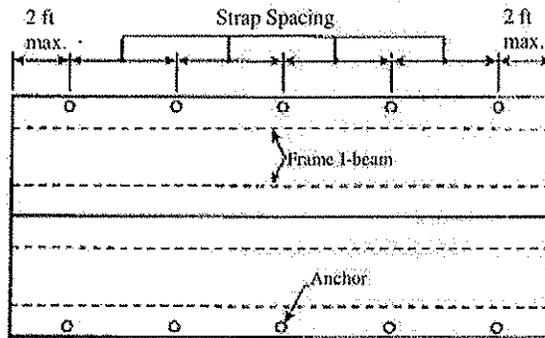
(2) Number and location of ground anchors.

(a) Ground anchor and anchor strap spacing shall be:

(i) No greater than the spacing shown in tables 4.1 to 4.3 of this rule and figures 4A and 4B of this rule; or

(ii) Designed by an Ohio registered engineer or architect in accordance with acceptable engineering practice, Chapter 4781-6 of the Administrative Code, and the requirements of the MHCSS.

Figure 4A- Ground Anchor Spacing Plan View



Notes:

1. In Ohio refer to Table 4.1 of this section for maximum ground anchor spacing. Tables 4.2 and 4.3 are included for reference.
2. Longitudinal anchors are not shown for clarity. Refer to 4781-6-02.4 B (2)(b) for longitudinal anchoring requirements.

(b) Longitudinal anchoring. Manufactured homes in Ohio are not required to be stabilized against the wind in the longitudinal direction unless specified in the manufacturer's installation manual or by an Ohio registered professional engineer or registered architect. An Ohio registered professional engineer or registered architect shall design alternative longitudinal anchoring methods in accordance with acceptable engineering practice.

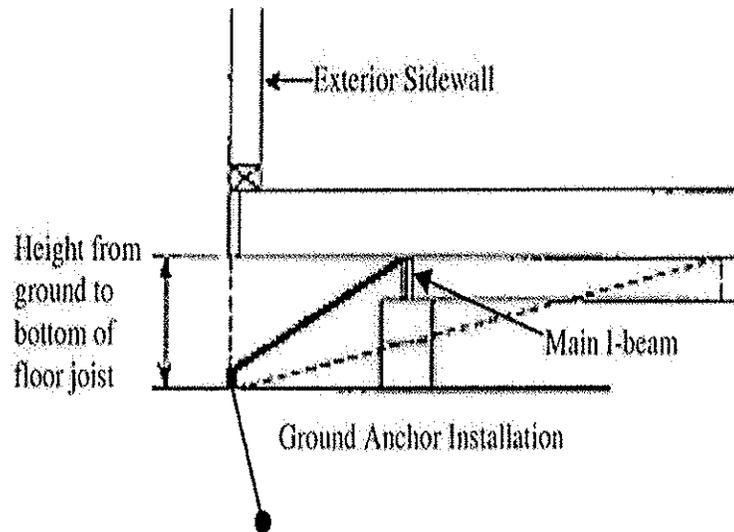
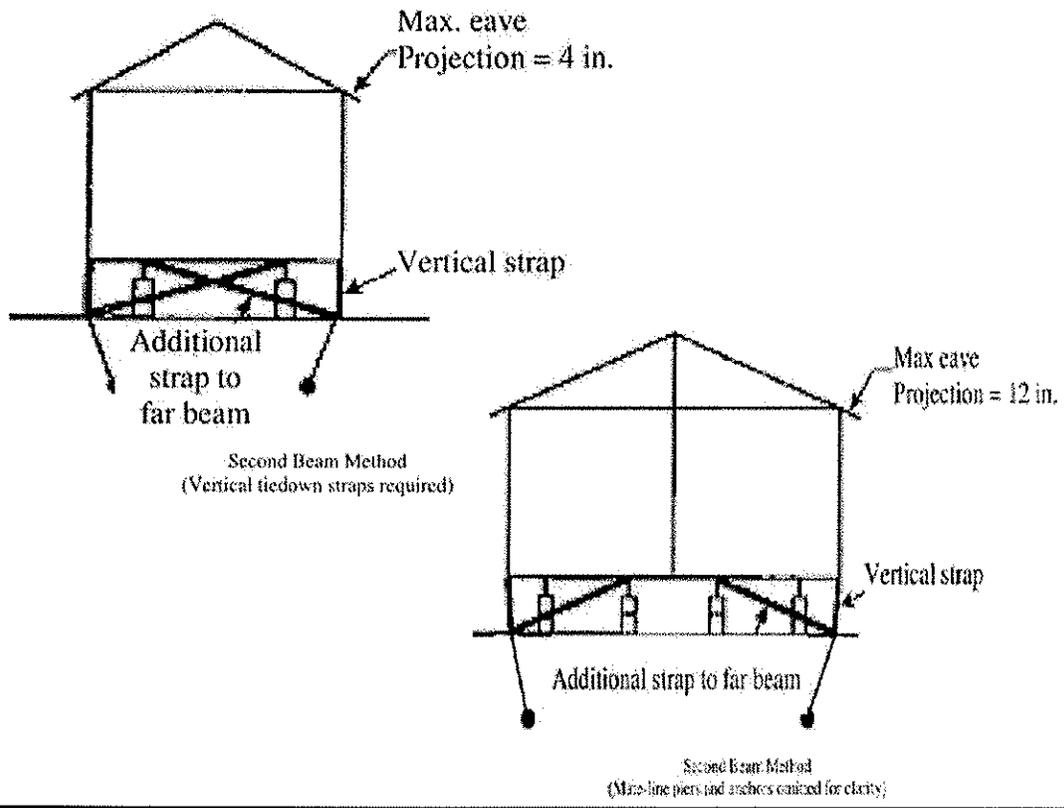
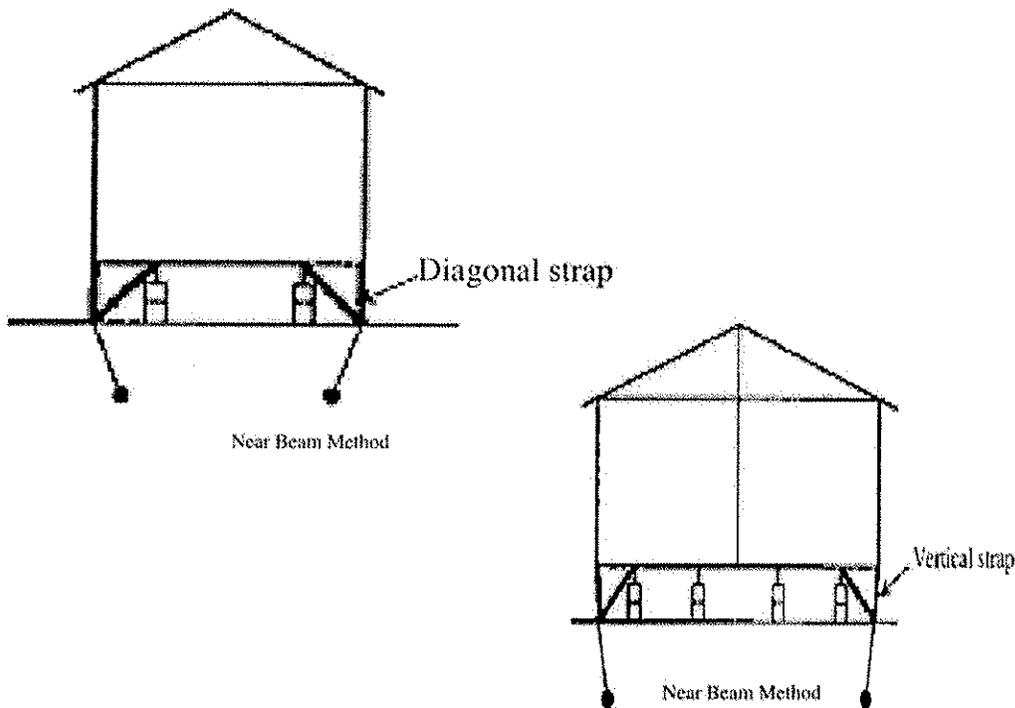


Figure 4-B Anchor Strap and Pier Relationship

Notes:

1. Vertical Straps are not required in Ohio or in Wind Zone 1 unless specified by the manufacturer or a design professional.
 2. The frame must be designed to prevent rotation of the main chassis beam, when the diagonal ties are not attached to the top flange of the beam. In general, diagonal ties shall be attached to the top flange of the beam.
-





(Metallic piers and anchors omitted for clarity)

- (c) The requirements in this rule shall be used to determine the maximum spacing of ground anchors and their accompanying anchor straps based on the soil classification determined in accordance with rule 4781-6-02.2 of the Administrative Code.
- (i) The installed ground anchor size (length) shall be for the listed soil class.
- (ii) All ground anchors shall be installed in accordance with their listing or certification and the ground anchor manufacturer installation instructions.
- (iii) Plate size and type. The size and type of stabilizer plate to be provided shall be determined by the manufacturer of the anchor in accordance with the ground anchor listing or certification. Metal stabilizer plates shall be provided with protection against weather deterioration and corrosion at least equivalent to that provided by a coating of zinc on steel of not less than 0.30 ounces per square foot of surface coated. Alternatively, ABS stabilizer plates may be used when listed and certified for such use.

- (3) Each ground anchor shall be manufactured and provided with installation instructions in accordance with its listing or certification. A nationally recognized testing agency shall list, or a registered professional engineer or registered architect shall certify the ground anchor for use in a classified soil (see rule 4781-6-02.2 of the Administrative Code) based on a nationally recognized testing protocol.

Table 4.1 – Maximum Diagonal Tiedown Strap Spacing, Wind Zone I.

Nominal Floor Width, Single Section/Multi-section	Max. Height from Ground to Diagonal Strap Attachment	I-Beam Spacing (82.5 in. max.)	I-Beam Spacing (99.5 in. max.)
12/24 ft, 132 in to 155 in. section(s)	25 in.	14 ft 2 in.	9 ft 9 in.
	33 in.	11 ft 9 in.	7 ft 8 in.
	46 in.	9 ft 1 in.	5 ft 8 in.
	67 in.	6 ft 6 in.	4 ft 0 in.
	25 in.	18 ft 2 in.	15 ft 11 in.
14/28 ft, 156 in to 179 in. section(s)	33 in.	16 ft 1 in.	13 ft 6 in.
	46 in.	13 ft 3 in.	10 ft 8 in.
	67 in.	10 ft 0 in.	7 ft 9 in.
	25 in.	20 ft 7 in.	19 ft 5 in.
	33 in.	19 ft 0 in.	17 ft 5 in.
16/32 ft, 180 in. to 204 section(s)	46 in.	16 ft 5 in.	14 ft 7 in.
	67 in.	13 ft 1 in.	11 ft 3 in.

Notes:

1. Table is based on maximum 90 in. sidewall height.
2. Table is based on maximum 4 in. inset for ground anchor head from edge of floor or wall.
3. Table is based on main rail (I-beam) spacing per given column.
4. Table is based on maximum 4 in. eave width for single-section homes and maximum 12 in. for multi-section homes.
5. Table is based on maximum 20-degree roof pitch (4.3/12).
6. Interpolation may be required for other heights from ground to strap attachment. The minimum height from the ground to the bottom of the floor joist must be 18 in.
7. Additional tiedowns may be required per the home manufacturer instructions.
8. Ground anchors must be certified for these conditions by a professional engineer, architect, or listed by a nationally recognized testing laboratory.
9. Ground anchors must be installed to their full depth, and stabilizer plates, if required by the ground anchor listing or certification, must be installed per the ground anchor and home manufacturer instructions.
10. Strapping and anchoring equipment must be certified by a registered professional engineer or registered architect, or listed by a nationally recognized testing agency to resist these specified forces in accordance with testing procedures in ASTM D 3953-97, *Standard Specification for Strapping, Flat Steel and Seals*.
11. A reduced ground anchor or strap working load capacity will require reduced tiedown strap and anchor spacing. Ground anchors must not be spaced closer than the minimum spacing permitted by the listing or certification.
12. Table is based on 3150 lb working load capacity, and straps must be placed within 2 ft of the ends of the home.
13. Table is based on minimum angle of 30 degrees between the diagonal strap and the ground.

(C) Sidewall, over-the-roof, mate-line, and shear wall straps.

If sidewall, over-the roof, mate-line, or shear wall straps are installed on the home, they shall be connected to an anchoring assembly.

(D) Sever climatic conditions.

In frost-susceptible soil locations, ground anchor augers shall be installed below the frost line unless the foundation system is frost protected to prevent the effects of frost heave in accordance with acceptable engineering practice and rule 4781-6-02.3 of the Administrative Code.

(E) Flood hazard areas.

In flood hazard areas, the piers, anchoring, and support systems shall comply with FEMA 85 requirements and shall be capable of resisting all loads associated with design flood and wind events or combined flood and wind events. See rule 4781-6-02.1 of the Administrative Code. In manufactured home parks, manufactured homes shall be installed in accordance with Chapter 4781 of the Administrative Code.

Replaces: 4781-6-02.4
Effective: 12/01/2012
R.C. 119.032 review dates: 12/01/2017

CERTIFIED ELECTRONICALLY

Certification

11/20/2012

Date

Promulgated Under: 119.03
Statutory Authority: 4781.04
Rule Amplifies: 4781.04
Prior Effective Dates: 1/1/2010