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Manufactured Home Set-Up Instructions
SINGLE WIDE & SECTIONALS
~ Typical Frame Set ~

INSTALLATION MANUAL



Wick[®]
Building Systems, Inc.

Marshfield Homes • Artcraft Homes • Rollhome

⚠ CAUTION ⚠

The instructions and details provided herein are intended to assist only qualified and trained personnel in the proper installation and set-up of Wick Manufactured Homes. These instructions and details are minimum requirements. Local or state law may have other requirements for installation or inspection before the home can be occupied. Be sure to consult with the proper authorities in the area to determine what other requirements must be followed. During the installation process, workers should not be permitted to work under the home unless adequate support blocking is used to safeguard workers from injury should the home accidentally slip. Additional instructions for installation and set-up may be provided in the form of supplements to these instructions. Be sure to follow the additional instructions provided in any such supplements.

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installing your home

This Wick manufactured home was designed and constructed in conformance with the National Manufactured Home Construction and Safety Standards (HUD Code) in effect at the time of its manufacture. The plumbing, heating/fuel supply and electrical systems of the home were carefully engineered and constructed to conform with these standards. The instructions and details that follow are provided to assist in the proper set-up and installation of this home. The proper set-up of this home is absolutely **essential**. If you are not certain of the proper procedures to follow or you encounter unusual circumstances, please let us know.

Before you start the set-up procedures, read all instructions carefully and check with your local building officials for any other requirements. After set-up is completed, the home should be inspected and tested to verify that it has been properly blocked, leveled and anchored, and that the plumbing, fuel supply and electrical systems have been properly connected.

NOTE: THE INSTRUCTIONS AND DETAILS THAT FOLLOW ARE INTENDED TO ASSIST QUALIFIED AND TRAINED PERSONNEL IN THE PROPER SET-UP AND INSTALLATION OF WICK MANUFACTURED (MOBILE) HOMES. THEY ARE NOT INTENDED TO ENABLE SOMEONE UNFAMILIAR WITH MANUFACTURED (MOBILE) HOME SET-UP AND INSTALLATION TO PERFORM THE SET-UP AND INSTALLATION OF THIS HOME. THESE SERVICES SHOULD ONLY BE PERFORMED BY TRAINED AND QUALIFIED PERSONNEL.

THESE INSTRUCTIONS ARE MINIMUM REQUIREMENTS. LOCAL OR STATE LAW MAY HAVE OTHER REQUIREMENTS FOR SET-UP AND INSTALLATION OR INSPECTION BEFORE THE HOME CAN BE OCCUPIED. BE SURE TO CONSULT WITH THE PROPER AUTHORITIES IN YOUR AREA TO DETERMINE WHAT OTHER REQUIREMENTS, IF ANY, ARE TO BE FOLLOWED.

PLEASE READ ALL INSTRUCTIONS CAREFULLY PRIOR TO STARTING THE SET-UP AND INSTALLATION OF THE HOME.



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SITE PREPARATION

Proper preparation of the site where the home is to be located is extremely important. The site must be properly sloped to provide for storm drainage run-off. The drainage grade slope is often specified by local building codes. In the absence of any local requirement, a slope of 1" in 12" is generally acceptable.

The site must be evenly graded so there are no depressions where surface water can accumulate, either underneath or alongside the perimeter of the home. The soil under the home must be stable enough to provide proper support for the home. The home should not be placed on a fill-in site or soils such as gumbo, mud, muck, peat or bentonite. Choose soils such as compact gravel or sand/gravel mixtures, loose gravel or compact course sand, or loose course to medium sand.

The ground surface under the home should be covered with a "continuous" vapor barrier to prevent ground moisture from entering the home. This ground cover should be 6 mil polyethylene or other acceptable vapor barrier material. If the ground cover material is not "seamless," it should be 6-inch lapped at all seams.

PIER SUPPORTS (FOOTINGS)

The requirements for load bearing pier supports may vary from state to state and depends on a number of factors, such as whether the home is a single-wide or sectional, the compactness of the soil at the site, and on weather conditions in your area such as the incidence of freezing.

The home may be placed on a solid concrete slab or parallel "ribbons" of poured concrete with the piers (blocks) placed directly on the slab or ribbons. (If the home is placed on parallel "ribbons" of poured concrete, the area between the ribbons must be graveled to a depth of 4 to 6 inches). The home may also be placed on cast-in-place or pre-cast concrete footings. Refer to the *Typical Pier and Footing Installation Chart* on Page 7 for the type and size of pier supports recommended. The installation of load bearing pier supports may vary from state to state. Be sure to check with the proper authorities for any local codes or regulations.

If the home is designed and constructed with a Lindsay Unified Floor System, the home must be installed on a basement foundation. Supplemental Set-Up and Installation Instructions for Lindsay Unified Floor Systems are provided with the home. Be sure to review and follow these supplemental instructions when installing the home.

CAUTION

All Wick Manufactured Homes Designed and Constructed with a Lindsay Unified Floor System must be installed on a Basement Foundation. Failure to do So Could Cause Damage to the Home Resulting in Liability to the Set-Up Contractor. Any Such Damage is Not Covered Under the Wick Limited Warranty.

PIER SPACING

The basic foundation for placement of the piers must be firm, such as cement or gravel and stone. The piers must be sturdy, such as poured concrete piers, hollow load bearing concrete blocks, steel horses, or adjustable steel level jacks.

The steps and diagrams on the following pages outline the general procedure for installing piers. Before you begin installing piers, you must first determine and lay out the required spacing of the piers. To determine the required spacing, first measure the "depth" of the main I-Beams, and then refer to the chart below which shows the "maximum" distance piers can be placed.

Pier Spacing Chart

I-Beam Size	Maximum Pier Spans
12"	12 Ft
10"	10 Ft
8"	8 Ft

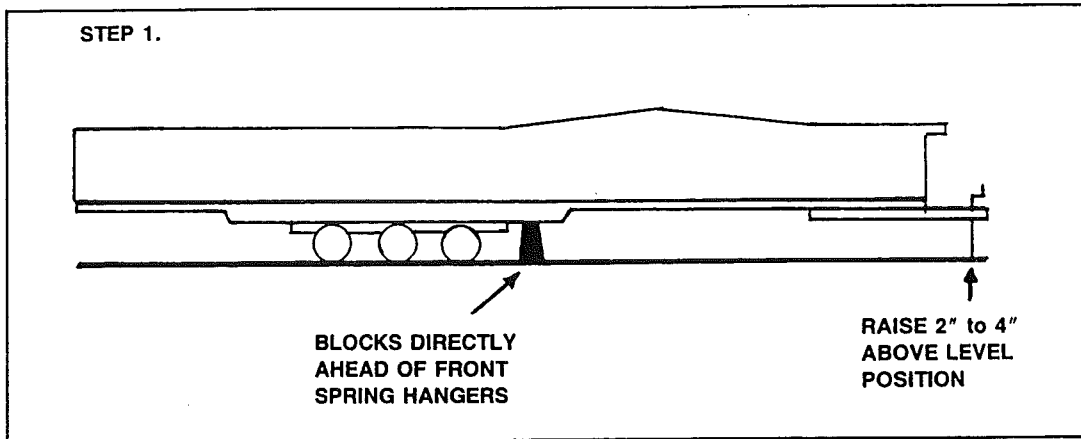
◀ NOTES ▶

1. Wherever there is a splice in the I-Beam, the distance between piers may not exceed 10'-0" regardless of the size of the I-Beam.
2. All piers (blocks) must be placed under the main frame members (I-Beams) on "both" sides of the home.
3. Piers should not be placed under an exterior door or closer than 18" from the hinge or door knob side of such door.

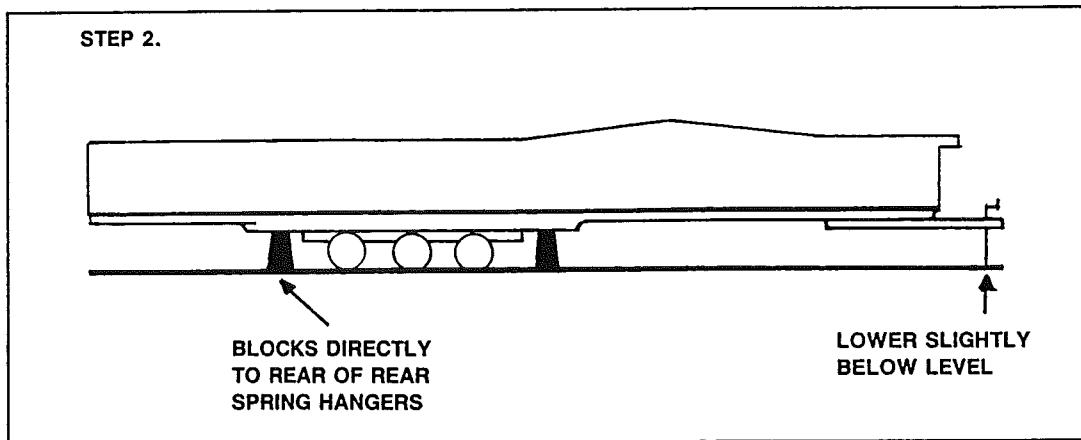
If the home is placed on cast-in-place or pre-cast concrete footings, you must determine the required footing size before proceeding further. Go to Page 5 to determine the required footing size for each pier. Otherwise, you can begin installing piers as outlined on the following pages.

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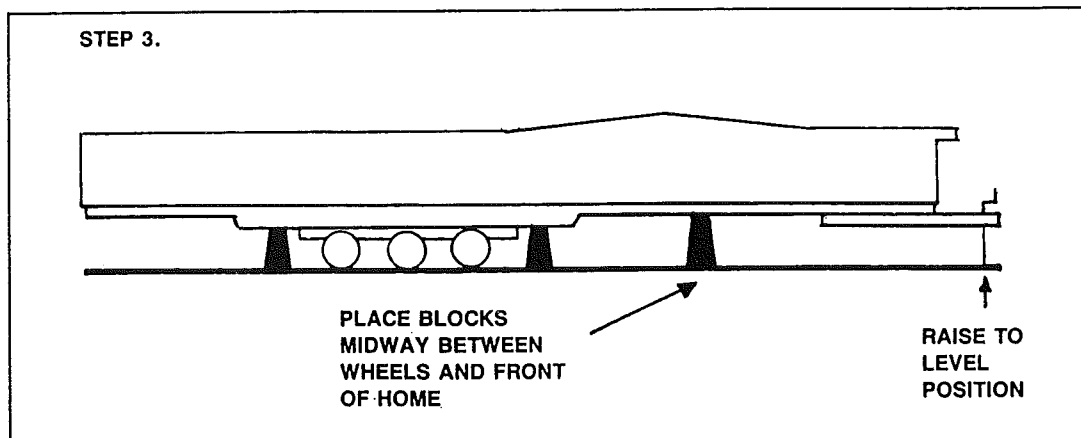
STEP 1: Using the Coupler Jack, raise the front end two to four inches above level position. Place Blocks directly ahead of the front Spring Hangers (on both sides).



STEP 2: Using the Coupler Jack, lower the front end slightly below level position. Place Blocks directly to the rear of the Spring Hangers (on both sides).

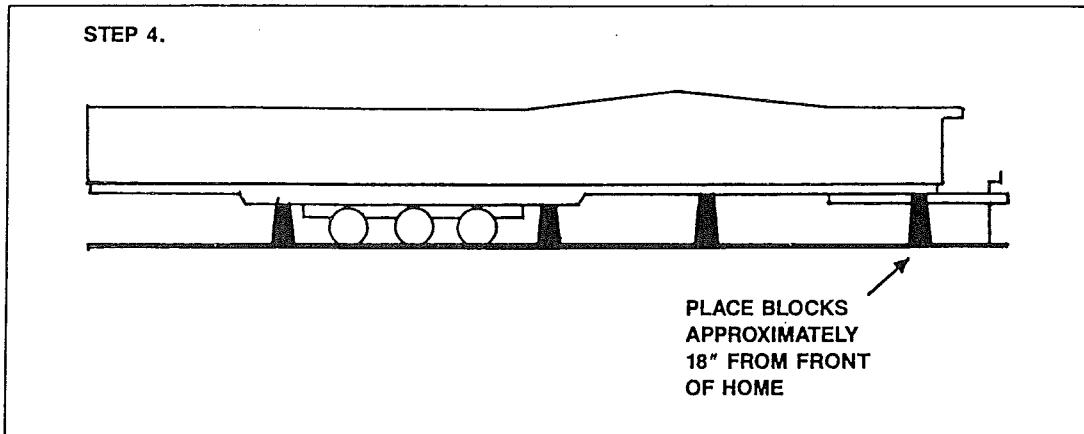


STEP 3: Using the Coupler Jack, raise the front end again to level position. Place Blocks mid-way between wheels and front of home, as required.

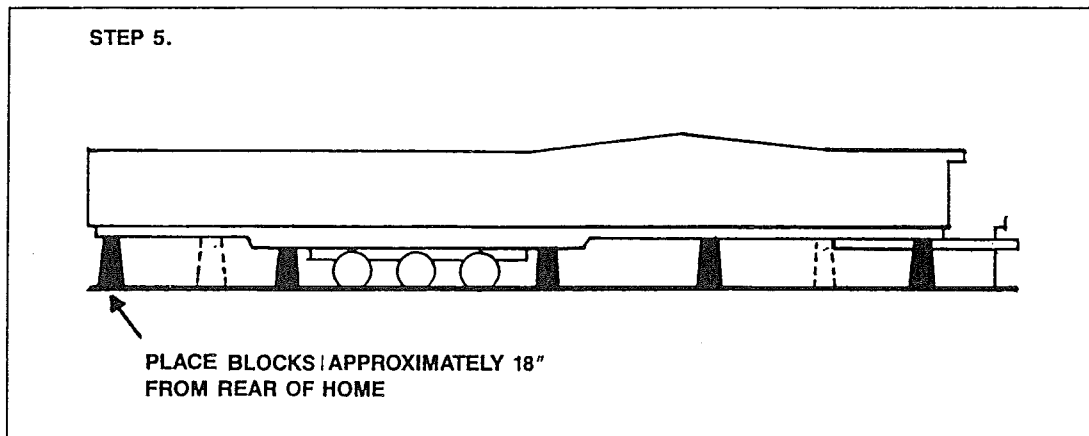


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STEP 4: Place Blocks approximately 18" from front of the home.



STEP 5: Place Blocks approximately 18" from rear of the home.



NOTE: DEPENDING ON GEOGRAPHICAL LOCATION, VARIANCES IN STATE CODES AND MANUFACTURED HOME DESIGNS, SPECIAL INSTRUCTIONS OR ADDITIONAL BLOCKING INFORMATION MAY BE PROVIDED WITH THIS HOME. BE SURE TO FOLLOW ANY SPECIAL INSTRUCTIONS OR ADDITIONAL BLOCKING INFORMATION PROVIDED.

Procedure for Leveling a Manufactured Home

Proper leveling of the home is **essential**. To determine if the home is properly leveled, place a carpenter's level (a 5-foot level is recommended) on the floor at various lengthwise and crosswise areas in each room. All readings should indicate a level condition. "Minor" variances can occur with no significant consequences.

Level the home within reasonable tolerances. The final adjustment is obtained by placing either metal or solid hardwood shims between the blocks (piers) and I-Beam or by other approved methods, such as adjustment to steel leveling jacks, if used. Within 90 days after the initial set-up, the home should be checked for any settlement, and re-leveled if necessary, using the following procedure:

Step 1: Place the carpenter's level on the floor of the home, while using the Coupler Jack at the front of the home, level the home lengthwise.

Step 2: Check to see if the home is level crosswise. If not, raise the side that is low by using a hydraulic jack under the main frame in the axle location.

Step 3: Place additional blocks or shims immediately ahead of and behind the spring hangers under the main frame, as required.

Step 4: Place additional blocks or shims under the main frame of the home near the front and rear ends, as required.

Step 5: Place additional blocks or shims under the main frame members beneath the door areas or other locations, as required.

NOTE: PRIOR TO JACKING UP THE HOME DURING THE LEVELING OR RELEVELING PROCEDURE, FRAME TIES OR OVER-THE-ROOF TIES (IF PROVIDED) SHOULD BE LOOSENED.

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HOW TO DETERMINE FOOTING SIZE

Footing size for cast-in-place or pre-cast concrete footings will vary depending on the soil bearing capacity in the area, the structural design of the home, and the distance between piers. The following steps and diagrams outline the procedure for determining the required footing size.

Step 1: Determine the Roof Load Design for the area where the home will be placed from the Data Plate or the Map on Page 16. Then refer to the *Design Load Table* below to determine the total design load of the home.

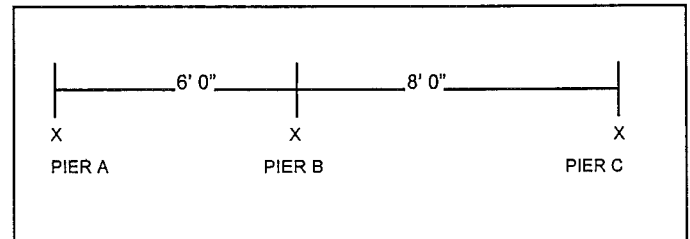
Step 2: Determine the soil bearing capacity of the site. This may be obtained from either local building officials, city or county engineering departments, or local architectural or engineering firms. (The *Soil Load Bearing Table* below shows typical soil types and load bearing capacities.)

Step 3: Determine and lay out the required spacing of the piers. Keep in mind that you must position piers directly to the front and rear of the Axle Assembly and 18" from the front and rear of the home. (See Pier Spacing on Page 2.)

Step 4: Go to the *Footing Load Tables* on Page 8 and locate the table for the zone where the home is located, i.e., North, Middle or Southern Zone. Locate the column for the width of the home and the row for the spacing between the piers. (Maximum spacing between piers is 8 ft. O.C. for 8" I-Beam, 10 ft. O.C. for 10" I-Beam, and 12 ft. O.C. for 12" I-Beam). This will determine the pier load. Divide this load by the soil bearing capacity of the site where the home is located. This will determine the footing size required. Minimum footer size is 144 sq. in. Examples of calculating the required footing sizes for both a single-wide and sectional home are provided on Page 6.

Notes:

1. Larger footing sizes may be used. However, the size of the footings must be at least the "minimum" as calculated by the above method.
2. Where the distance between piers is unequal, the average of the distance to each adjacent pier support should be used to determine footing size requirements. See example below:



The average for Pier "B" would be 7 Feet
i.e., $(6.0 + 8.0) \div 2 = 7.0$

3. Footings should be approximately square. Use only pre-cast or cast-in-place concrete footings.
4. When planning footing sizes, plan the tie-down locations also. You can increase the size of an existing footing at the tie-down or add a separate footing. (See *Anchoring* on page 13).

▶ DESIGN LOAD TABLE ◀			
	South	Middle	North
Roof Load (Live+Dead)	28 PSF	38 PSF	48 PSF
Floor Load (Life+Dead)	45 PSF	45 PSF	45 PSF
Misc. Dead Load	12 PSF	12 PSF	12 PSF
TOTAL DESIGN LOAD	85 PSF	95 PSF	105PSF

Dead load is the structure only. Live load means snow, furniture, or other items not part of the structure. PSF means pounds per square foot.

▶ SOIL LOAD BEARING TABLE ◀	
SOIL TYPE	ALLOWABLE PRESSURE (Pounds Per Sq. Foot)
Crushed Rock or Hard Pan	4,000
Sandy Gravel	2,000
Sand or Silty Sand	1,500
Soft or Silty Clay	1,000
Peat or Organic Clays	Not Recommended
Uncommitted Fill	Not Recommended

Use this Table only when a soils investigation of the site is not available; in the absence of local building code requirements; or when the opinion of a local engineer or building official is not available.

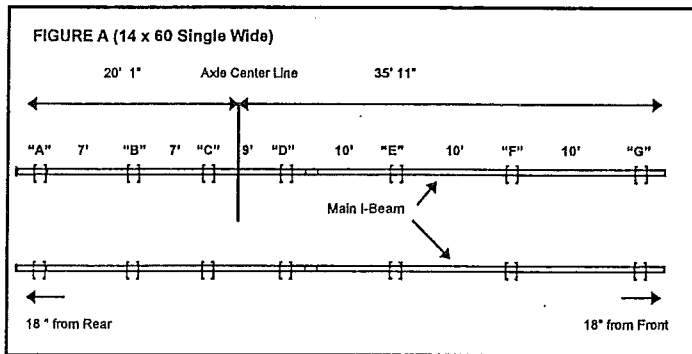
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FOOTING SIZE CALCULATION EXAMPLES

Single Wide Home

14 x 60 home located in Rhinelander, Wisconsin. Local building inspector says soil bearing capacity is 2000 PSF.

- Step1 Roof Load Zone: Middle Zone
- Step2 Soil Bearing Capacity: 2000 PSF
- Step3 Pier Spacing Layout: See Figure A



•Step4

Size of Footing "A"

Size the footing for the average of the space to the right and left of the pier, i.e., $(1.5' + 7') \div 2 = 4.25'$ always round up, i.e., 5'

Go to *Footing Load Table, Middle Zone*

See 14 Wide Column, Pier Row for 5'

Pier Load = 3,285 pounds

A 20 x 20 Type I Footer (single stack blocks) is good for 5,560 pounds; A 16 x 16 Type I Footer is good for 3,560 pounds. (From *Typical Pier and Footing Installation Chart*).

Footing "A" may be 16 x 16 x 4" thick.

Size of Footing "C"

$(7 + 9) \div 2 = 8'$

Go to *Footing Load Table, Middle Zone*

See 14 Wide Column, Pier Row for 8'

Pier Load = 5,257 pounds

Footing "C" Type I Footer is 20 x 20 x 4"

Size of Remaining Footings:

B - 5,804 pounds — 20 x 20 x 4 Type I Footer

D - 7,263 pounds — 24 x 24 x 4 Type 2 Footer

E - 7,263 pounds — 24 x 24 x 4 Type 2 Footer

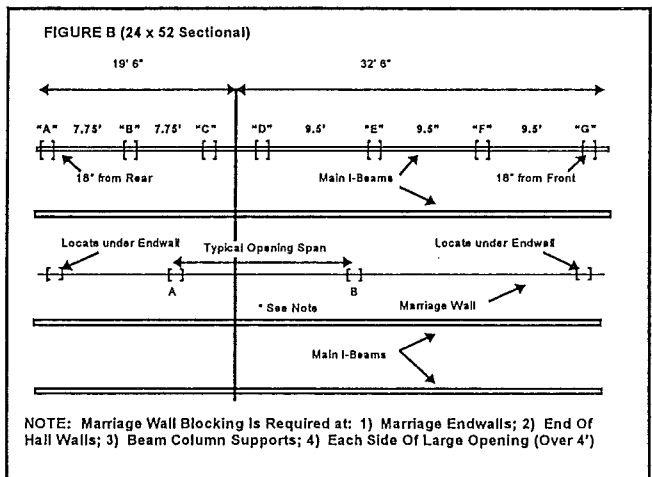
F - 7,263 pounds — 24 x 24 x 4 Type 2 Footer

Sectional Home

24 x 52 sectional home located in Winder, Georgia. Local city engineer says soil bearing capacity is 2000 PSF. Determine I-Beam pier spacing and footing size same as for single-wide.

Marriage Wall footing requirements are determined as follows:

- Step1 Roof Load Zone: Southern Zone
- Step2 Soil Bearing Capacity: 2000 PSF
- Step3 Pier Spacing Layout: See Figure B



•Step4

Find load at column supports from *Footing Load Table* entitled *Marriage Wall for Sectional Homes*. Two conditions are typical for column supports:

- 1) End column condition for which the openingspan is the distance to the column at the other end of the span; and
- 2) Post condition between two spans for which the opening span is the sum of the spans of both openings. For load determined from span find the footing size in the *Typical Pier and Footing Installation Chart*

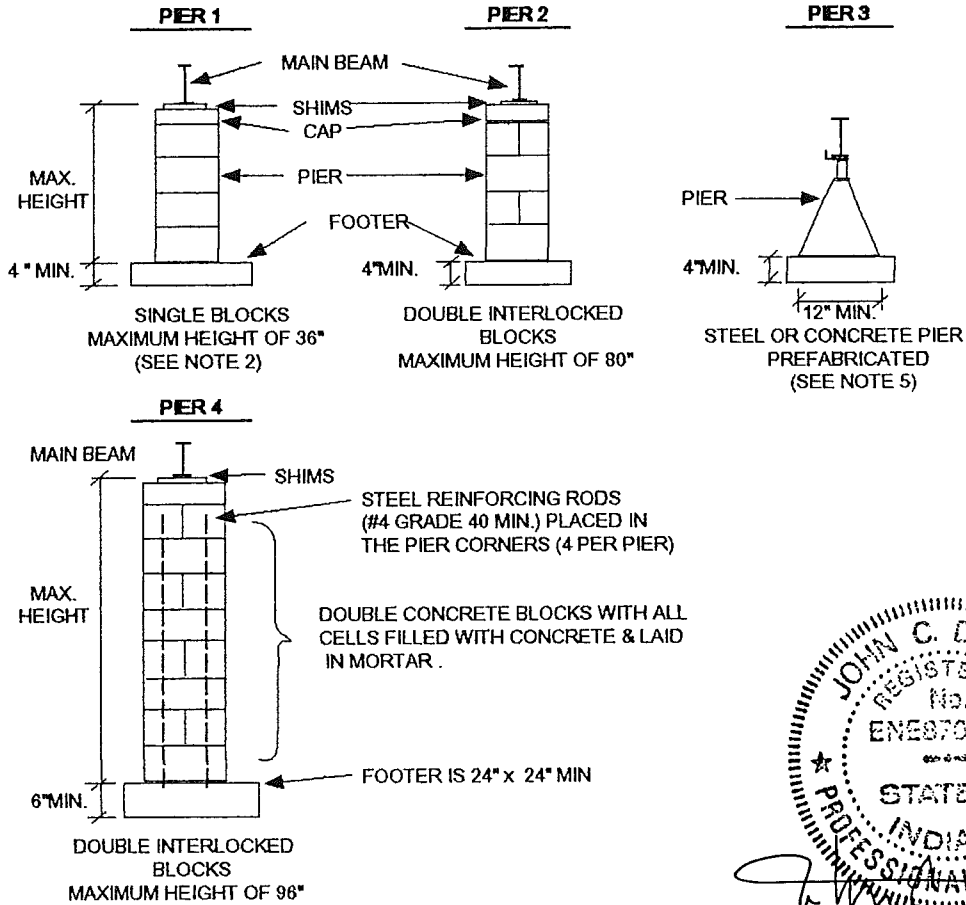
Size of Footing "A" and "B"

Go to the *Footing Load Table* entitled *Marriage Wall for Sectional Homes, South Roof Zone, 24W Column*. The load at 20 span is 3,267 pounds. A Type I pier on a 16 x 16 x 4" footer is good for 3,560 pounds. (From *Footing Size Table* in the *Typical Pier and Footing Installation Chart*).

INSTALLING YOUR HOME

WICK BUILDING SYSTEMS

TYPICAL PIER AND FOOTING INSTALLATION



NOTES:

- 1) CONCRETE BLOCKS FOR PIERS ARE 8 x 16 x 8 NOMINAL SIZE HOLLOW CELL LOAD BEARING CMUs MANUFACTURED IN CONFORMANCE WITH ASTM C90-70, GRADE 'N'. OPEN CELLS ARE VERTICAL.
- 2) SINGLE STACKED CONCRETE BLOCKS ARE ORIENTED SO THAT LONG DIRECTION IS PERPENDICULAR TO THE LONG DIRECTION OF THE MAIN BEAM.
- 3) FOOTERS MAY BE PRECAST OR POURED, BUT, IN EITHER CASE, MUST BE LEVEL IN ALL DIRECTIONS.
- 4) PIERS ARE TO BE PLACED ON THE FOOTER APPROXIMATELY CENTERED SO THAT THE FOOTER PROJECTION FROM THE PIER IS EQUAL FROM SIDE-TO-SIDE AND FRONT-TO-BACK. PIERS MUST BE LEVEL VERTICALLY ON ALL SIDES AND SQUARE WITH THE FOOTER.
- 5) PREFABRICATED PIERS (TYPE #3) MUST BE CERTIFIED FOR A RATED CAPACITY AT LEAST EQUAL TO THE LOAD DETERMINED FROM TABLES
- 6) CONCRETE MINIMUM COMPRESSIVE STRENGTH (F_c) IS 3000 PSI AFTER 28 DAYS.

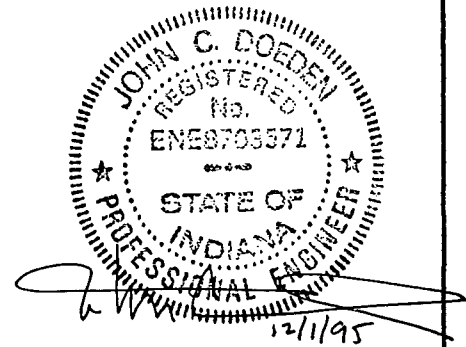


TABLE : FOOTER SIZE (INCHES x INCHES) AND CAPACITY FOR VARIOUS SOIL BEARING PRESSURES

PIER No.	MINIMUM THICKNESS OF FOOTER	1000 PSF		1500 PSF		2000 PSF		4000 PSF	
		SIZE	LOAD	SIZE	LOAD	SIZE	LOAD	SIZE	LOAD
1	4"	25 x 25	4350 #	22 x 22	4950 #	20 x 20	5560 #	16 x 16	7100 #
2	4"	32 x 32	7110 #	29 x 29	8760 #	27 x 27	10,100 #	24 x 24	16,000 #
2 OR 3	4"	29 x 29	5840 #	26 x 26	7040 #	24 x 24	8000 #	20 x 20	11,110 #
4	6"	41 x 41	11,875 #	36 x 36	13,500 #	33 x 33	15,125 #	28 x 28	21,780 #
	6"	24 x 24	4000 #	24 x 24	6000 #	24 x 24	8000 #	24 x 24	16,000 #
1, 2, OR 3	4"	16 x 16	1780 #	16 x 16	2670 #	16 x 16	3560 #	16 x 16	7110 #
	4"	20 x 20	2780 #	20 x 20	4170 #	20 x 20	5560 #		

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FOOTING LOAD TABLES

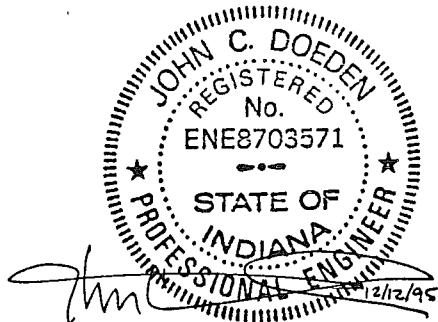
FOOTING LOAD TABLE Northern Zone — 105 PSF Single-Wide					
Pier Spacing	14W	16W	24W	26W	28W
4' OC	2905	3290	2450	2713	2905
5' OC	3631	4113	3063	3391	3631
6' OC	4358	4935	3675	4069	4358
7' OC	5084	5758	4288	4747	5084
8' OC	5810	6580	4900	5425	5810
9' OC	6536	7403	5513	6103	6536
10' OC	7263	8225	6125	6781	7263
11' OC	7989	9048	6738	7459	7989
12' OC	8715	9870	7350	8138	8715

FOOTING LOAD TABLE Southern Zone — 85 PSF Single-Wide					
Pier Spacing	14W	16W	24W	26W	28W
4' OC	2352	2663	1983	2196	2352
5' OC	2940	3329	2479	2745	2940
6' OC	3528	3995	2975	3294	3528
7' OC	4115	4661	3471	3843	4115
8' OC	4703	5327	3967	4392	4703
9' OC	5291	5993	4463	4941	5291
10' OC	5879	6658	4958	5490	5879
11' OC	6467	7324	5454	6039	6467
12' OC	7055	7990	5950	6587	7055

FOOTING LOAD TABLE Middle Zone — 95 PSF Single-Wide					
Pier Spacing	14W	16W	24W	26W	28W
4' OC	2628	2977	2217	2454	2628
5' OC	3285	3721	2771	3068	3285
6' OC	3943	4465	3325	3681	3943
7' OC	4600	5209	3879	4295	4600
8' OC	5257	5953	4433	4908	5257
9' OC	5914	6697	4987	5522	5914
10' OC	6571	7442	5542	6135	6571
11' OC	7228	8186	6096	6749	7228
12' OC	7885	8930	6650	7362	7885

FOOTING LOAD TABLE Marriage Wall For Sectional Homes				
Roof Load Zone	Open Span	24W	26W	28W
North 40 PSF	5' 0"	1400	1520	1640
	10' 0"	2800	3040	3280
	15' 0"	4200	4560	4920
	20' 0"	5600	6080	6560
	24' 0"	6720	7296	7872
Middle 30 PSF	5' 0"	1108	1203	1298
	10' 0"	2217	2407	2597
	15' 0"	3325	3610	3895
	20' 0"	4433	4813	5193
	24' 0"	5320	5776	6232
South 20 PSF	5' 0"	817	887	957
	10' 0"	1633	1773	1913
	15' 0"	2450	2660	2870
	20' 0"	3267	3547	3827
	24' 0"	3920	4256	4592

Loads in these Tables are in pounds.



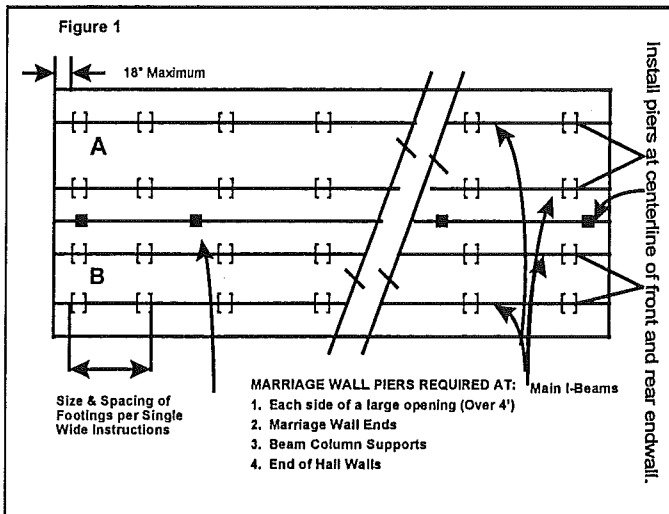
CAUTION: Pier Spacing For Marriage Wall Must Not Exceed 24' - 0".

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SECTIONAL HOME SET-UP

Step 1. Be sure the site is properly prepared as described on Page 2. Plan the pier spacing layout and calculate the required footing sizes as described on Pages 2 and 5.

Step 2. Position Section "A" of the home, and block and level in the manner described for a Single Wide home. (See Figure 1 and Pages 3 and 4).



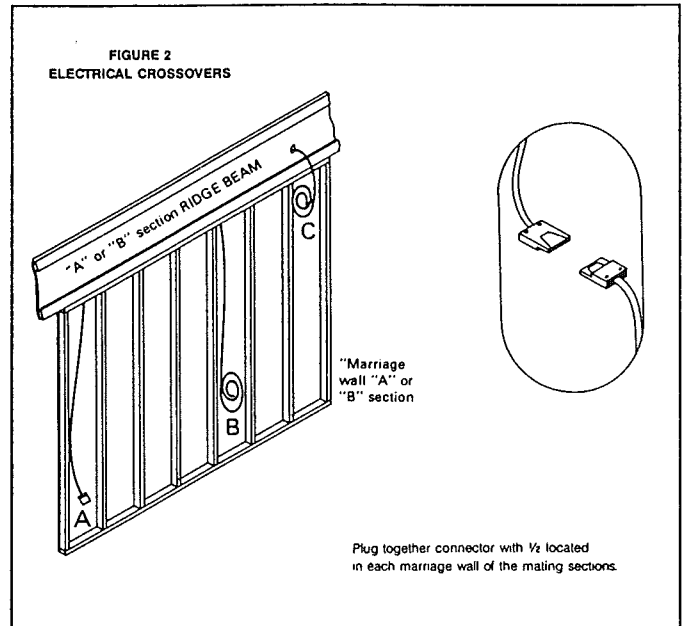
Step 3. Remove close-up material from both sections of the home.

Step 4. Position Section "B" of the home as close to Section "A" as practicable (usually about 6 inches), taking care to allow enough room to complete the electrical connections between each section as described in Step 5, below.

Step 5. Make the electrical connections between each section as shown in Figure 2.

›CAUTION‹

All Electrical Work Must be Performed by Experienced Technicians or Qualified Set-Up Personnel. Be Sure There is no Electrical Power to Either Section of the Home Until all Electrical Connections Have Been Made. Failure to Take This Precaution Could Cause Damage to the Home or Result in Serious Injury.



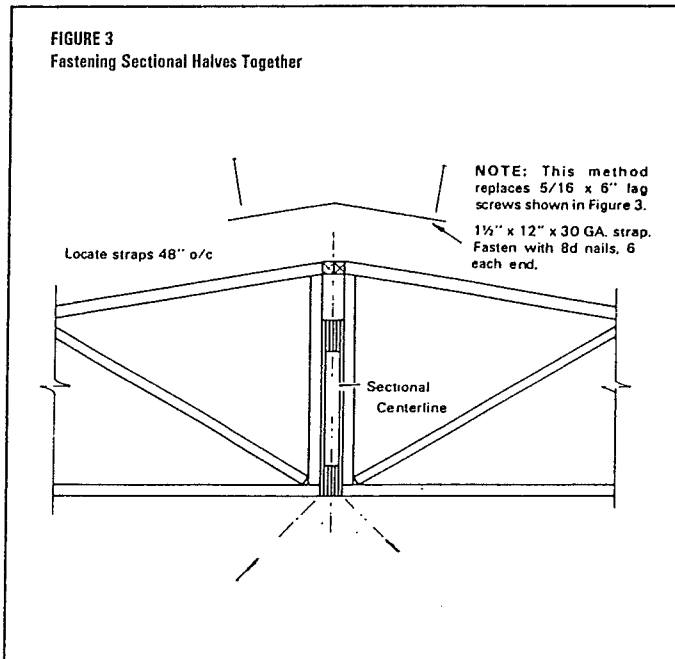
Step 6. Install a 3" x 1" strip of fiberglass insulation or equivalent weather stripping material between the marriage rim joist, end wall studs, and ridge beams.

Step 7. Snug roof ridge of Section "B" to already set, blocked and leveled Section "A". You will need to use a come-along attached to the frame, or a system using a set of jacks and rollers. When using a come-long, greased boards or paneling below the ties will aid in moving the sections together. You may also need to deflate the tires near the marriage wall of both sections when bringing the roof ridge together.

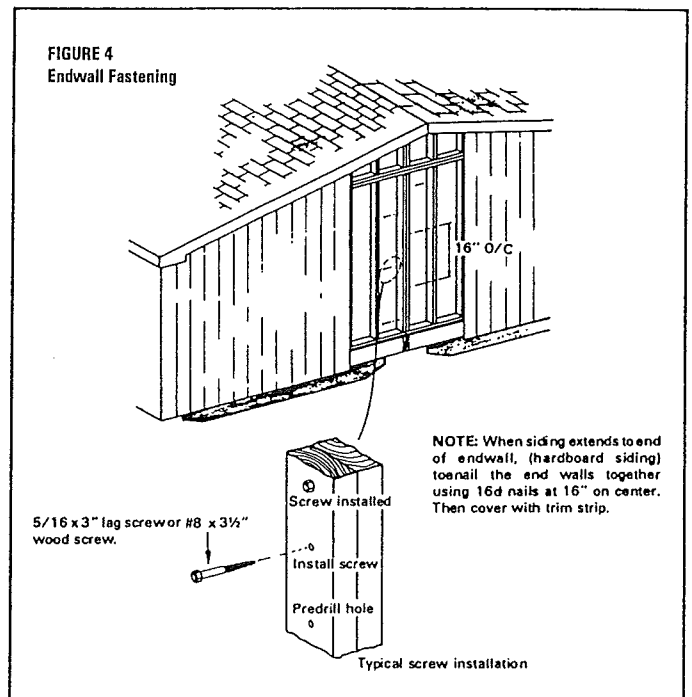
›CAUTION‹

When Using a Come-Along or Jacks and Rollers, Care Must Be Taken to Prevent Stress on Structural Members of the Home. Failure to do so Could Cause Damage to the Home.

INSTALLING YOUR HOME



Step 8. Secure exterior roof and ceiling together. Align interior ceiling panels at the end wall and level ceiling of both sections. Jack at the center most I-Beam as required to level the roof. Jack posts may be needed to level long interior spans. When the ceiling and roof are aligned, fasten using the method shown in Figure 3. When installing the fasteners, it may be necessary to pre-drill pilot holes to assure a strong connection.



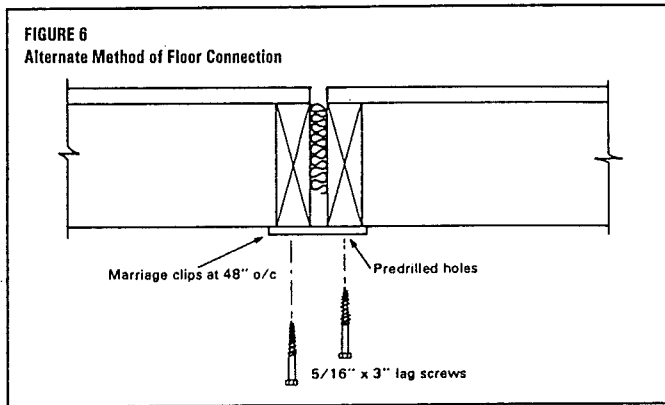
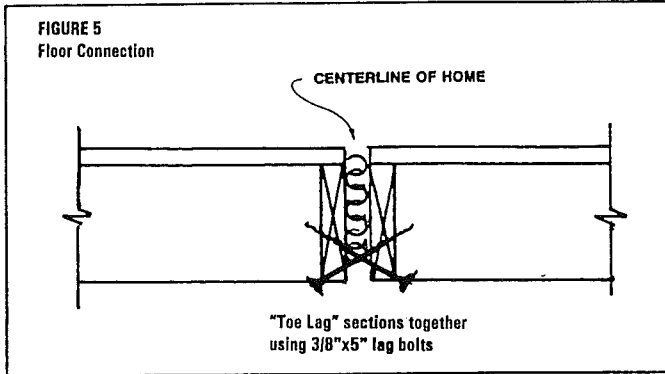
Step 9. Align and fasten the exterior marriage end wall studs by using one of the methods shown in Figure 4.

NOTE: It may be necessary to shift Section "B" lengthwise to align end walls or floor system to Section "A". This can be done by attaching a come-along to opposite corners of the marriage floor or at diagonal points on the frame.

Step 10. Block and level Section "B" of the home as indicated on Pages 3 and 4. Be sure to size footings as instructed on Page 5.

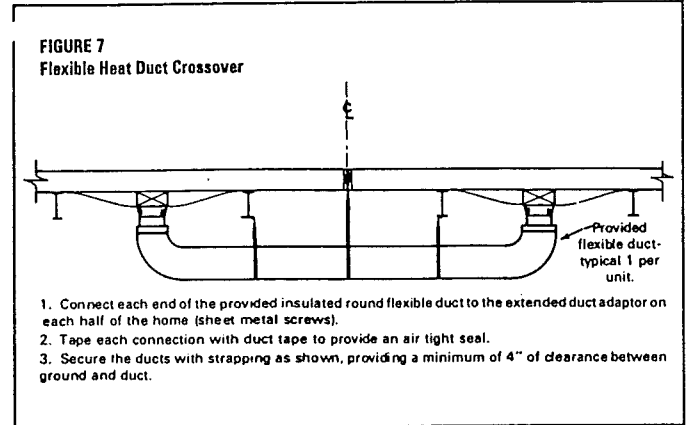
Step 11. Place additional blocking at the marriage wall as required. Marriage wall blocking is required at (1) the Marriage End Walls; (2) the End of Hall Walls; (3) Beam Column Supports; and (4) Each Side of Large Openings (Over 4 Feet). See Figure 2 on Page 6 and Footing Load Table for Marriage Wall for Sectional Homes on Page 8.

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Step 12. Secure the floor marriage rails together by using one of the methods shown in Figures 5 and 6.

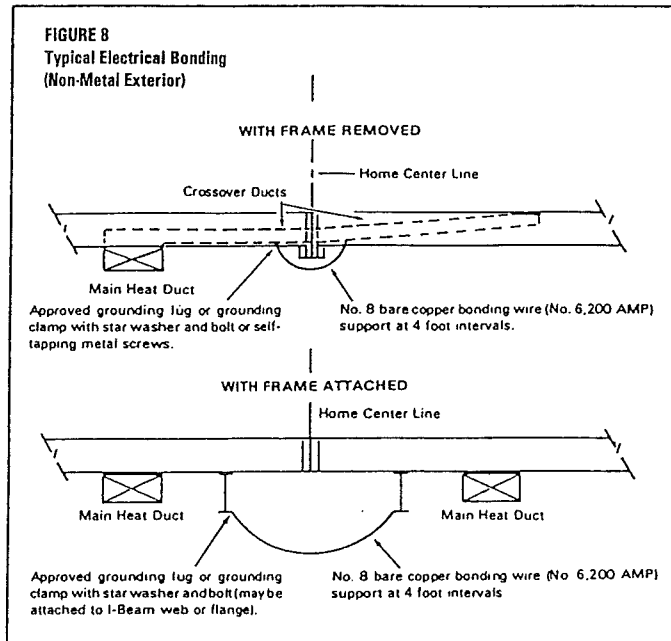
Step 13. Most plumbing systems are contained in one section of the home. If you need to connect water distribution and/or drainage systems between the two sections of the home, follow the supplemental instructions provided.



Step 14. Complete the heat duct crossover as shown in Figure 7.

NOTE: Be sure crossover duct is supported as shown in Figure 7. A minimum 4" clearance between the ground and duct must be provided.

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Step 15. Electrical bonding (grounding) is important in maintaining continuity through each section of the home. See Figure 8 for typical bonding connections in homes with non-metal exterior siding.

Step 16. Complete exterior siding close-up at end wall marriage location. End walls may be lap sided or spliced in per manufacturer's instructions. Fasten with siding nails .0915 x 2 1/4" minimum, 16" or 24" on center, depending on siding manufacturer's instructions and stud spacing. Siding strips may be shipped loose for end wall close-up. Fasten with siding nails .0915 x 2 1/4" minimum, 8 inches on center, single row each section.

Step 17. Install interior trim, decorative marriage beam, and adjust exit doors for proper operation and fit. Adjust interior cabinet doors and drawers for proper operation and fit.

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ANCHORING

The home should be secured against high winds after blocking and leveling has been completed. All anchoring equipment used to secure the home must be certified by a professional engineer, architect or nationally recognized testing lab as to their resistance based on the maximum angle of diagonal tie and/or vertical tie loading and the angle of anchor installation and type of soil in which the anchor is to be installed.

The requirements for securing the home against damage from high winds are provided in the instructions, drawings, and specifications that follow. However, please be sure to consult with the proper local authorities to determine if there are additional requirements for anchoring in your area.

General Requirements for Anchoring Systems

- ▶ Ground anchors must be embedded below the frost line and be at least 12 inches above the water table. Ground anchors should be installed to their full depth, and stabilizer plates should be installed to provide added resistance to overturning or sliding forces.
- ▶ Manufactured homes in Wind Zone I require only diagonal frame ties placed along the main frame and below the outer side walls. All manufactured homes designed to be located in Wind Zones II and III shall have a vertical tie installed at each diagonal tie location.
- ▶ Diagonal frame ties should be as evenly spaced as practicable along the length of the manufactured home, with not more than two (2) feet open-end spacing on each end.
- ▶ Where a vertical (over-the-roof) tie and a diagonal frame 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, simultaneously.
- ▶ Protection shall be provided at sharp corners where the anchoring system requires the use of external straps or cables and to minimize damage to siding by the cable or strap.
- ▶ Anchoring equipment must be capable of resisting an allowable working load equal to or exceeding 3,150 pounds and shall be capable of withstanding a 50% overload (4,725 pounds total) without failure of either the anchoring equipment or the attachment point on the manufactured home.
- ▶ Anchoring equipment exposed to weathering shall have a resistance to weather deterioration 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 in accordance with the following: (1) Slit or cut edges of zinc-coated steel strapping do not need to be zinc coated; and (2) Frame tie strapping material must be Type 1, Finish B, Grade 1 steel strapping, 1-1/4 inches wide and 0.035

inches in thickness and certified by a registered professional engineer or architect as conforming with ASTM Standard Specification D3953-91, Standard Specification for Strapping, Flat Steel, and Seals. The number of frame ties required varies with the size (length) of the home, the frame configuration, and the wind zone where the home is installed.

Determining the Number of Ties Required:

- **Step 1.** Locate the Table corresponding to the width of the home. (See Page 15).
- **Step 2.** Locate in that Table the Wind Zone where the home is located. (See Data Plate or Design Maps on Page 16).
- **Step 3.** Locate in that Table the Length of Home and Frame Configuration (C.L.) For the home.
- **Step 4.** Read across to determine the number of frame ties required.

Installing the Ties:

Note: If the home has optional over-the-roof ties, begin with Step 1. If not, proceed directly to Step 2.

Step 1. Locate the optional over-the-roof ties. Install a double-headed ground anchor under the rim of the home on each side of the home. Anchors may be inset from the exterior line of the home to accommodate skirting installation. Connect the frame ties and over-the-roof ties loosely to the double-headed anchors. (See Figure 2, Page 14). **Do not tighten!**

Step 2. Determine the number and location of frame ties required from the Tie-Down Tables. Install single-headed ground anchors and frame ties at the tie-down locations required with the anchor under the perimeter of the home. **Do not tighten!**

Step 3. With one man on each side of the home, start at the front of the home and simultaneously tighten straps on both sides.

⚠ CAUTION ⚠

Do not tighten straps on one side at a time. Straps must be tightened simultaneously on both sides to prevent the home from pulling off its piers.

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Step 4. In frost-prone areas, a pier should be placed under the perimeter of the home at each tie-down location. This will prevent the exterior walls from being pulled downward should the main beam piers move upward due to frost conditions.

Step 5. Complete the placement of tie-downs from each end. Maximum allowable is 2'-0" to first tie location from each end of the home. If the home requires 9 tie-downs, there will be 8 spaces. Find the spacing between tie-downs by subtracting 4 from the box length and dividing by the number of spaces (8 in this case).

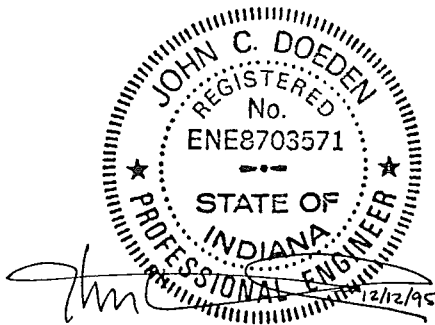
Example: $\frac{66'-0'' \text{ actual length} - 2 \text{ ends} \times 2'}{8 \text{ spaces}} = 7'-9''$

Use 2'-0" (maximum) to first tie from each end and space the remaining tie-downs as equally as practicable.

If the same home requires 5 tie-downs, there will be 4 spaces.

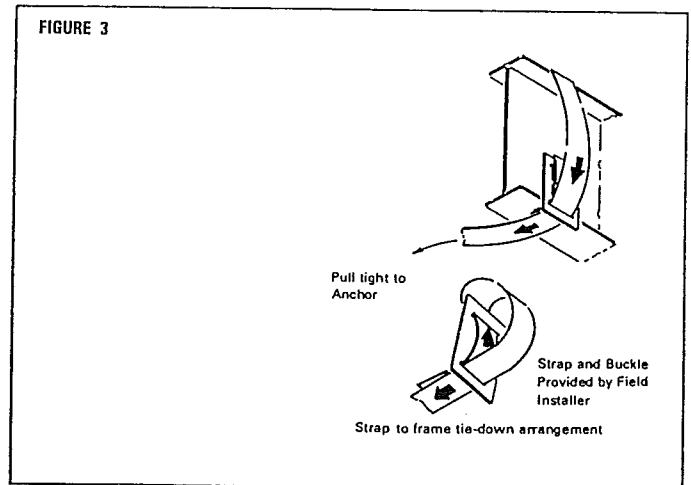
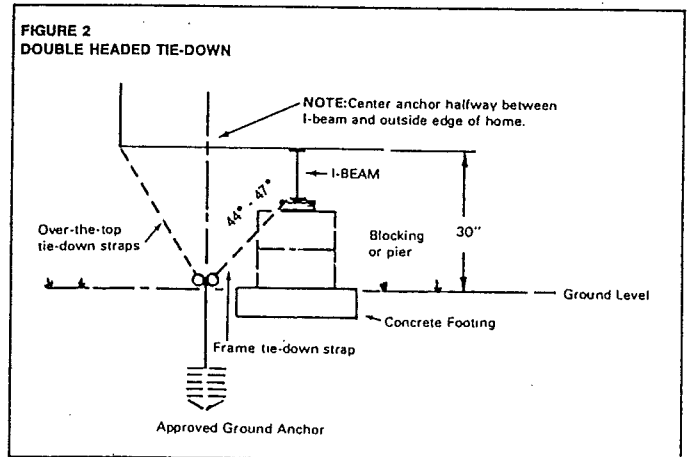
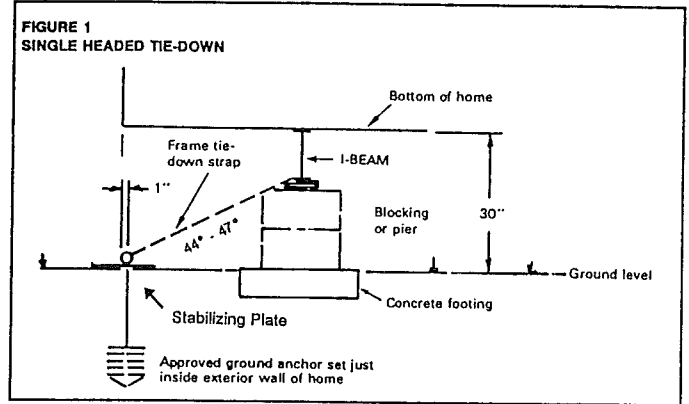
Example: $\frac{66'-0'' \text{ actual length} - 4}{4 \text{ spaces}} = 15'-6''$

Use 2'-0" (maximum) to first tie from each end and space the remaining tie-downs as equally as practicable.



Tie-Down Details:

Following are several illustrations showing methods in common use and effective for securing the home against high winds. These illustrations are general anchoring methods. Be sure to consult with your local building authority for other appropriate or recommended methods.

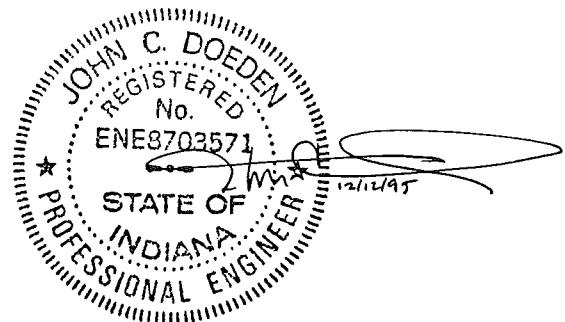


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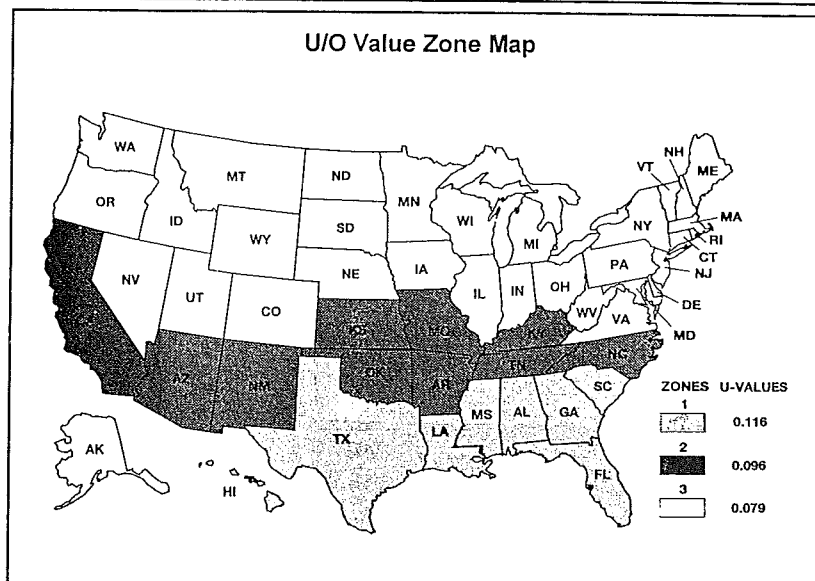
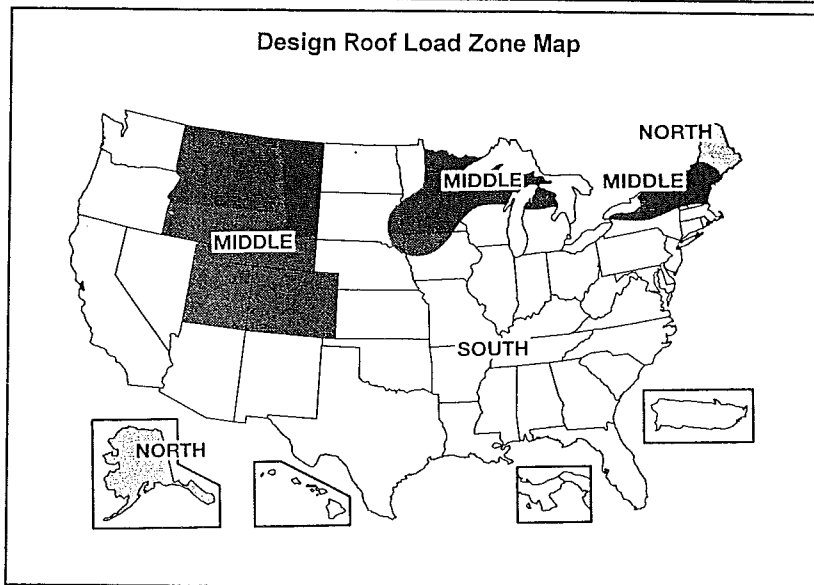
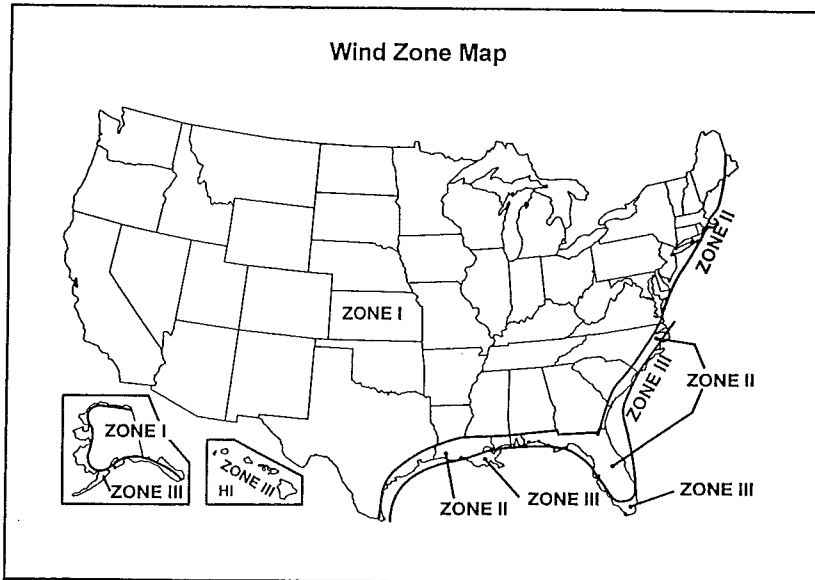
► TIE-DOWN TABLE 1 ◀ (14-Wide Single Section Home)			
		Wind Zone I	
Length of Home	Frame C.L.	Single Anchor	Double Anchor
44.00	118	5	4
48.00	118	5	4
52.00	118	6	4
56.00	118	6	4
60.00	118	7	4
61.33	118	7	4
64.00	118	7	4
66.00	118	7	5
66.67	118	7	5
68.00	118	7	5
70.00	118	7	5
72.00	118	8	5
74.00	118	8	5
76.00	118	8	5

► TIE-DOWN TABLE 2 ◀ (16-Wide Single Section Home)			
		Wind Zone I	
Length of Home	Frame C.L.	Single Anchor	Double Anchor
48.00	130	5	4
52.00	130	6	4
56.00	130	6	4
60.00	130	7	4
61.33	130	7	4
64.00	130	7	4
66.00	130	7	4
66.67	130	7	4
68.00	130	7	5
70.00	130	7	5
72.00	130	8	5
74.00	130	8	5
76.00	130	8	5

► TIE-DOWN TABLE 3 ◀ (Sectional Homes-Wind Zone 1)				
		24 Wide	26 Wide	28 Wide
Length of Home	Frame C.L.	Single Anchor	Single Anchor	Double Anchor
36.00	118		4	4
	75.5	4	4	4
40.00	118		5	5
	75.5	5	5	5
44.00	118		5	5
	75.5	5	5	5
48.00	118		5	5
	75.5	5	5	5
52.00	118		6	6
	75.5	6	6	6
56.00	118		6	6
	75.5	6	6	6
60.00	118		7	7
	75.5	7	7	7
61.33	118		7	7
	75.5	7	7	7
64.00	118		7	7
	75.5	7	7	7
66.00	118		7	7
	75.5	7	7	7
66.67	118		7	7
	75.5	7	7	7
68.00	118		7	7
	75.5	7	7	7
70.00	118		7	7
	75.5	7	7	7
72.00	118		8	8
	75.5	8	8	8
74.00	118		8	8
	75.5	8	8	8
76.00	118		8	8
	75.5	8	8	8

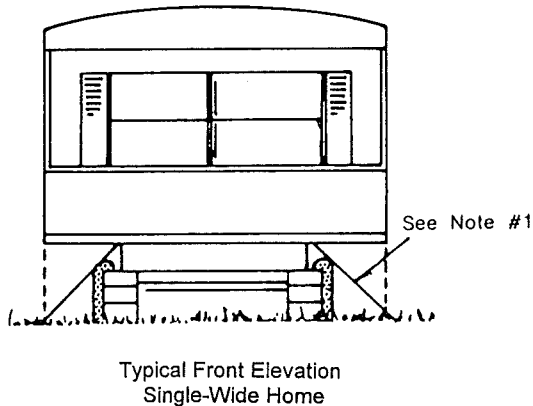
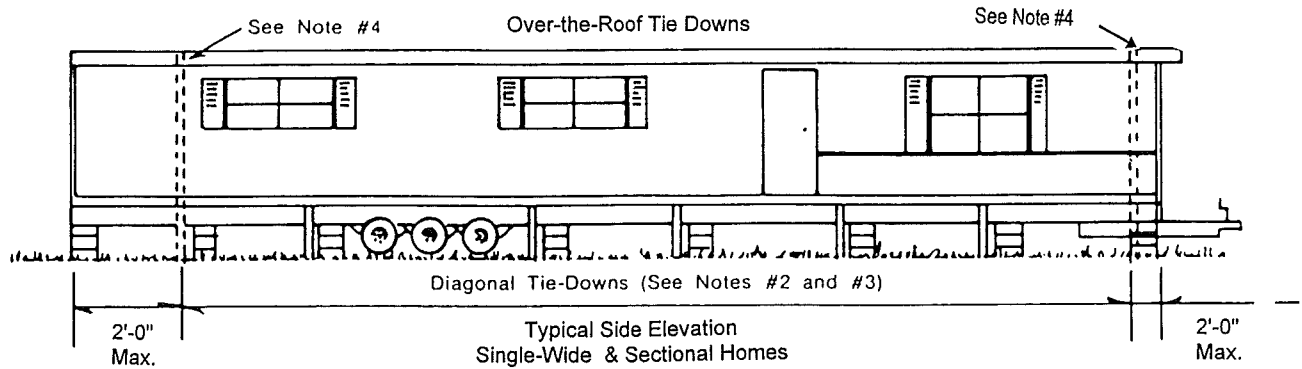


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SINGLE-WIDE HOME

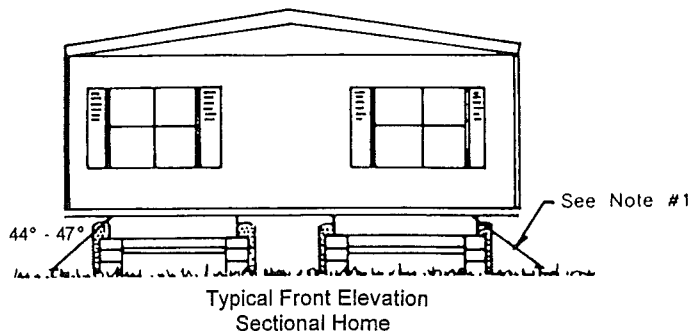


NOTES:

1. Angle of frame ties per Figure 1 (Page 14).
2. Diagonal straps from frame to approved ground anchor are to be spaced per Tie-Down Tables (Page 15). This will result in maximum spacing depending on size of home and frame configuration.
3. Straps and anchoring equipment must be capable of resisting an allowable working load of not less than 3,150 lbs and capable of withstanding a 50% overload (4,750 lbs) without failure. Use Type I, Finish B, Grade 1 Steel Strapping 1-1/4" wide and 0.035" thick conforming with ASTM Standard D3953-91 to meet these load requirements.
4. If "over-the-roof" ties coincide with the location of a frame tie, they must be capable of carrying both loadings simultaneously. Over-the-roof ties can be located up to 14 feet from each end of the home and can be 28 feet maximum between.

SECTIONAL HOME

Frame ties are to be used only on the outermost main beams. The number of ties needed can be found in the Sectional Home Tie-Down Table on Page 15.



NOTES:

1. Angle of frame ties per Figure 1 (Page 14).
2. Diagonal straps from frame to approved ground anchor are to be spaced per Tie-Down Tables (Page 15). This will result in maximum spacing depending on size of home and frame configuration.
3. Straps and anchoring equipment must be capable of resisting an allowable working load of not less than 3,150 lbs and capable of withstanding a 50% overload (4,750 lbs) without failure. Use Type I, Finish B, Grade 1 Steel Strapping 1-1/4" wide and 0.035" thick conforming with ASTM Standard D3953-91 to meet these load requirements.
4. Sectional Home models will not have over-the-roof straps.

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WATER & DRAINAGE SYSTEM CONNECTION

The water and drainage system has been tested for leaks prior to shipment from the factory. When these systems are connected, or following any move, they **must** be retested for leaks that can result from vibration and road shock experienced during transit. All visible water lines, drain lines, and P-traps should be checked to ensure that they are free from leaks, and all sinks, basins, tubs and toilets must be checked for proper operation. The Hot and Cold water lines must be checked to verify that they are properly connected to fixtures. Some local jurisdictions may have other requirements for connection of the water and drainage systems or on-site inspections of these systems when connection is completed. Be sure to consult with the proper authorities for any other requirements in your area.

CAUTION

Failure to Properly Connect and Test the Water and Drainage System Could Cause Damage to the Home.

Water System

The water system is designed and intended to operate at pressures not exceeding 80 p.s.i. If the waterline pressure at the site exceeds 80 p.s.i., a pressure regulating valve **must** be installed at the water inlet. The water system can be connected to any safe, reliable source through the 3/4" inlet pipe under the home which is identified by a tag.

In areas where temperatures drop to freezing and below, the water supply should be installed below the frost line and all exposed piping and connections should be protected from freezing by either insulation or the use of heat tape. If a heat tape is used, it must be "listed" and approved for use in manufactured homes.

CAUTION

Failure to Install Heat Tape Approved for Use in Manufactured Homes Could Create a Fire Hazard and Cause Damage to the Home or Serious Injury.

Drainage System

Piping from the outlet to the site connection of the drainage system must be installed with sufficient slope (1/4" per foot), and it must be suitably supported to prevent the possibility of water standing in the pipe.

FUEL SUPPLY CONNECTION

Gas Systems

The piping system for the gas supply is designed for a gas supply pressure range of not less than 10% and not greater than 14" of water column. The gas supply pressure must be within this range for safe and efficient operation.

The gas system was tested for leaks prior to shipment from the factory. When the gas is connected, or following any move, the gas system and all incoming fuel lines, connections, and appliance valves and controls must be retested for leaks or loose connections that can result from vibration and road shock experienced during transit. The instructions for testing the gas system are printed on a tag near the gas supply line. Many local jurisdictions or utility companies may have additional requirements for connecting and testing this gas system. Be sure to consult with the proper authorities for any other requirements in your area.

CAUTION

Failure to Properly Connect and Test the Gas System Could Cause Damage to the Home or Result in Serious Injury.

Natural Gas

Unless otherwise specified, Wick manufactured homes are shipped natural gas ready. Therefore, all gas fueled appliances must be carefully adjusted to accommodate the type of fuel being used, and the proper orifice must be installed to accommodate the type of fuel being used.

CAUTION

Failure to Properly Adjust a Gas Appliance to Accommodate the Type of Fuel Being Used Could Cause Damage to the Home or Result in Serious Injury.

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LP GAS

Because all Wick manufactured homes are shipped natural gas ready unless otherwise specified, the proper conversion **must** be made if LP Gas will be utilized. We suggested that conversion to an LP System be a vapor withdrawal type, incorporating the use of a vapor drip leg cap. Use only LP Gas or Butane Cylinders (or "bottles") bearing the approval marking of the U.S. Department of Transportation (DOT) or the American Society of Engineers (ASME).

All gas fueled appliances **must** be carefully adjusted to accommodate the type of fuel being used, and the proper orifice(s) attached to the appliance(s) **must** be installed in accordance with the instructions provided by the appliance manufacturer.

⚠ CAUTION ⚠

Failure to Properly Adjust or Convert a Gas Appliance to Accommodate the Type of Fuel Being Used Could Cause Damage to this Home or Result in Serious Injury or Fatal Accidents.

OIL SYSTEMS

Oil may be used as a fuel supply for heating. If oil is used, an adequate supply must be readily available, either through an individual oil storage tank located adjacent to the home, or through a centralized oil distribution system which is now found in many manufactured home parks.

If an oil storage tank is utilized, it must be installed so that the oil flows by "gravity". The top of the tank can be no higher than 8 feet above the appliance (furnace) control valve, and the bottom of the tank can be no lower than 18 inches above the control valve. A readily accessible and approved manual shut-off valve must be installed at the outlet of the oil supply tank, and an approved oil filter or strainer must be installed in the oil line downstream from the shut-off valve. The oil filter must contain a drain for the entrapment and disposal of any water in the oil supply.

When a centralized oil system exists, it may only be necessary to hook up to the oil connection provided. The oil in the system should be under pressure and supplied through a suitable metering device.

Where oil is used as a fuel, all connections, testing and adjustment of oil tanks, lines and controls **must** be performed in accordance with the instructions provided by the manufacturer of the appliance (furnace).

⚠ CAUTION ⚠

Failure to Properly Connect, Test and Adjust Oil Tanks, Lines, Connections and Controls Could Cause Damage to this Home or Result in Serious Injury or Fatal Accidents.

ELECTRICAL POWER SUPPLY

The electrical system in all Wick manufactured homes is designed and installed to comply with the requirements of the National Manufactured Home Construction and Safety Standards (HUD Code). A large enough electrical power supply must be available at the site. Inadequately sized wire can result in low voltage, causing a drop in light and appliance efficiency, and possible damage to motors and appliances. It may also increase your electricity costs. The current rating of the home, in amperes, can be found on the tag located outside next to the feeder or service entrance and also on the electrical distribution panel.

Proper and safe connection depends on the type of supply system the home is equipped with. The home is designed for connection to an electrical wiring system rated at 120/240 Volt AC. The connection to the home is a "feeder" requiring wiring at the site. All wiring must be U.L. listed. Conductors and raceways are sized for copper four-wire service. Consult the current National Electrical Code, Section on Manufactured Homes, for further information.

◆ Feeder Wire & Junction Box Materials

The main breaker and the label on the electrical distribution panel give the feeder current capacity in amperes. Using this information, determine the required feeder size from the following table. The ampere rating of the service panel must not exceed the power supply assembly rating.

Electrical Wire Feeder Size Copper Conductor Size 75°				
Service Amps	Wire Size			Conduit Size
	Feeders	Ground	Neutral	
40	#8	#8	#8	¾"
50	#6	#8	#6	¾"
60	#6	#8	#6	¾"
80	#4	#8	#4	1"
100	#3	#8	#3	1 ¼"
125	#1	#6	#3	1 ½"
150	#0	#6	#3	1 ½"
200	#000	#6	#3	2"

Overhead Feeders. Homes equipped with overhead (mast weather head) feeder entrances contain all the necessary conduit to the electrical distribution panel. However, you must install feeder conductors (not provided) on site.

Underside Feeders. Homes with an under-the-floor entrance come with a permanently-attached conduit

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raceway that runs from the electrical distribution panel to a point under the floor. Install an approved conduit fitting or junction box at the termination point. For service sizes up to 60 Amps, use a 4"x4"x2" junction box. For 80 or 100 Amp service, use a 10"x10"x4" box. For 125 or 150 Amp service use a 12"x12"x4" box. For 200 Amp service, use a 16"x16"x4" junction box.

◆ Grounding

The home must be properly grounded. The only safe and approved method for grounding a feeder-connected manufactured home is through an electrically isolated ground bar in the electrical distribution panel. This bar grounds all noncurrent-carrying metal parts of the electrical system at a single point.

⚠ CAUTION ⚠

Grounding Is Not Required on the Metal Inlet of a Plastic Water System or on Plumbing Fixtures Such as Tubs, Faucets, Shower Risers, and Metal Sinks When They Are Connected Only to Plastic Water and Drain Piping.

The ground conductor of the power supply feeder cable connects the grounding bar to a good electrical ground. The neutral (white) conductor must not be connected to the equipment ground in the power supply panel. Insulate the ground circuit conductor (neutral or white wire) from the grounding conductors (green wires) and from equipment enclosures and other grounded parts. Insulate neutral circuit terminals in the distribution panel board — and in ranges, clothes dryers, and counter-mounted cooking units — from the equipment enclosure. Bonding screws, straps, or buses in the distribution panel board or in appliances should have been removed and discarded at the manufacturing facility.

⚠ CAUTION ⚠

Never Use the Neutral Conductor of the Feeder Cable as a Ground Wire. Do Not Ground the Neutral Bar in the Electrical Distribution Panel. Failure to Properly Connect and Ground the Electrical System Could Cause Damage to the Home or Result in Serious Injuries or Fatal Accidents.

The electrical system in all Wick manufactured homes is tested and inspected prior to shipment from the factory. After the electrical system has been connected to the electrical power supply source, the following additional tests must be conducted using approved testing equipment: A continuity test of circuit conductors; a polarity test; and a continuity test of the electrical grounding system.

◆ System Test Procedures & Equipment

The following tests must be conducted before any electrical power is supplied to the home:

Circuit Conductor Continuity Test. Conduct a continuity test by placing all branch circuit breakers and switches controlling individual outlets in the "on" position. The test should give no evidence of a connection between any of the supply conductors (including the neutral) and the grounding circuit. You may use a flashlight continuity tester.

Grounding Continuity Test. Using a continuity tester, test all noncurrent-carrying metal parts to assure continuity to ground. The parts to be checked include the following:

- Appliance enclosures, including fans
- Fixture enclosures and canopies
- Metal water supply and gas lines
- Metal ducts (except foil-covered insulated ducts)
- The frame of the home

After turning on the main circuit breaker and each individual circuit breaker, conduct the following three additional electrical system tests:

Polarity and Grounding of Receptacles. With receptacle and lighting circuits energized, check the polarity and grounding of each 102-Volt receptacle and light socket using a polarity tester capable of determining an incorrect wiring configuration. A conversion device may be required to test various fixture bulb sizes and outlet configurations. Investigate and correct any indication of reversed polarity, open grounds or shorts.

Ground Fault Circuit Interruption Tests. Make certain that all receptacles requiring GFCI protection are in fact on the correct circuits. Check each ground fault circuit interrupter device by pushing the test button to determine if the power route to the receptacle has been interrupted. Replace any GFCI that does not operate properly.

Operational Tests. Check all light fixtures by placing a bulb in the socket and turning the switch on and off. Using a pigtail light, check all 240 volt receptacles to determine if both legs of the circuit are powered. Check all 120 volt receptacles to be sure that each is operational. Switched receptacles require the switch to be turned on and off. It is not necessary to check appliances, but their power sources must be assured. Failure of electrical wiring or fixtures requires repair and retesting.

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MISCELLANEOUS EXTERIOR WORK

Roof

All Wick manufactured homes are sealed around vents, stacks and other flashing prior to shipment from the factory. These areas must be examined and resealed, if necessary, to prevent leaks that can result from vibration and road shock experienced during transit. The hold-down straps should be removed, and all penetrations from staples or other fasteners should be sealed.

Exterior Light Fixtures

To install exterior light fixtures, connect wires, black to black, white to white, and ground to ground. Push wires in to box and secure fixture in position. Caulking must be applied around the base of the light fixture to prevent water leaks to the sidewall.

SKIRTING INSTALLATION & VENTILATION

The crawl space area under the home may be skirted or enclosed. There are a number of skirting products available such as wood lattice, aluminum, fiberglass or vinyl skirting. Before installing the skirting, be sure that the ground is evenly graded so there are no depressions where water can accumulate and install a vapor barrier on the ground to prevent moisture from migrating to the structure of the home.

When installing the skirting, be sure to provide an access panel so that water supply and sewer drain connections can be inspected or repaired when necessary. Be sure the skirting is secured as necessary to provide stability and compensate for possible frost heave. In frost susceptible areas, the skirting should be installed to allow room at the ground for frost heave. Finally, the exhausted air from clothes dryer vents must not be allowed to terminate under the home. Clothes dryer vents must be vented outside the exterior perimeter of the home.

CAUTION

Clothes Dryer Vents must Not Be Allowed to Terminate under the Home. Clothes Dryer Vents must Terminate Outside the Perimeter of the Skirting or Other Crawl Space Enclosure. Failure to Do So Could Cause Damage to the Home.

Installing Wood, Aluminum or Other Skirting Types

If you install wood, aluminum, fiberglass, or vinyl type skirting requiring a j-channel or other receiver strip, a skirt rail should be installed at the bottom of the floor for attachment of the skirting. This "skirt rail" should be set in a least 1½" to 1¾" from the edge of the siding. (Generally, the siding will extend below floor level). When the home is sided with wood type siding products, the skirting must be attached in a manner that does not allow water to become trapped between the siding and receiver strip. (See Figure 1).

Installing Vinyl Skirting with Top Trim Mounting Piece

If you install vinyl skirting such as the T-Lok® brand skirting on vinyl-sided homes, fasteners must be installed to allow room for expansion and contraction of the siding.

If the bottom row of siding is cut to accommodate installation of the Top Trim Mounting Piece: The Mounting Piece must be installed so that the nail slots are located "below" the cut edge of the bottom of the siding. Do not nail the lower 1" flange of the vinyl to the sheathing, and do not drive nails directly into the siding.

If the bottom row of siding is not cut to accommodate installation of the Top Trim Mounting Piece: Pre-drill ½" to ¾" slots or holes in the siding where nails will pass through the Mounting Piece and the siding. Do not install the fasteners directly into the siding and Top Trim Piece. Nails must be installed through the slots provided in the Top Trim Mounting Piece and the pre-drilled holes made in the siding, and they must be driven loosely.

CAUTION

When Attaching Skirting to Vinyl-Sided Homes, Do Not Install Fasteners Directly Into the Siding and Top Trim Mounting Piece. Slots for Fasteners Must be Pre-Drilled in the Siding to Allow for Normal Expansion and Contraction of the Siding. Fasteners Must be Installed Through the Slots Provided in the Top Trim Mounting Piece and the Pre-Drilled Holes Made in the Siding. Failure to do so Could Cause Damage to the Siding.

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Skirting Ventilation

All skirting must be ventilated to prevent moisture accumulation under the home and to provide combustion air for heat producing appliances such as the water heater or furnace. Ventilation can be provided by a number of ways. Standard vents must be covered with a corrosion-resistant wire mesh not less than 1/4" and not more than 1/2" in any dimension or with screened or louvered openings that prevent entry of dry vegetation, water materials, or rodents. These types of vents should be installed in the skirting as high as possible but not higher than the bottom of the floor of the home. To assure cross-ventilation, the vents or prevented skirting panels should be placed evenly around the perimeter of the home. We recommend that vents or vented panels be installed within 3 feet of each corner of the home and evenly spaced along sidewalls toward the center of the home. (See Figure 2).

CAUTION

If the Home is Placed on a Crawl Space, the Required Amount of "Free Area" Ventilation Must be Provided in the Skirting or Other Crawl Space Foundation. Failure to do so Could Create Moisture-Related Problems and cause Damage to the Home.

Formula to Calculate Crawl Space Ventilation

One Square Foot of Free Area Ventilation for every 150 Feet of Crawl Space Area Must be Provided! If combustion air for heat producing appliances is taken from under the home, the amount of free area ventilation must be increased by at least 37.0 square inches per appliance.

To determine the total amount of free area ventilation required for the home, divide the total square footage of the crawl space area by 150. (Always round up!) Multiply the result by 144 to obtain the ventilation in square inches. Add an additional 37.0 square inches if a gas water heater is installed obtaining its combustion air from the crawl space area.

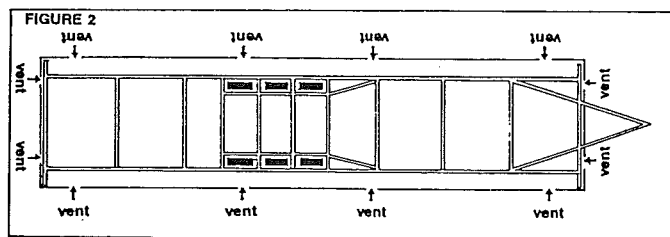
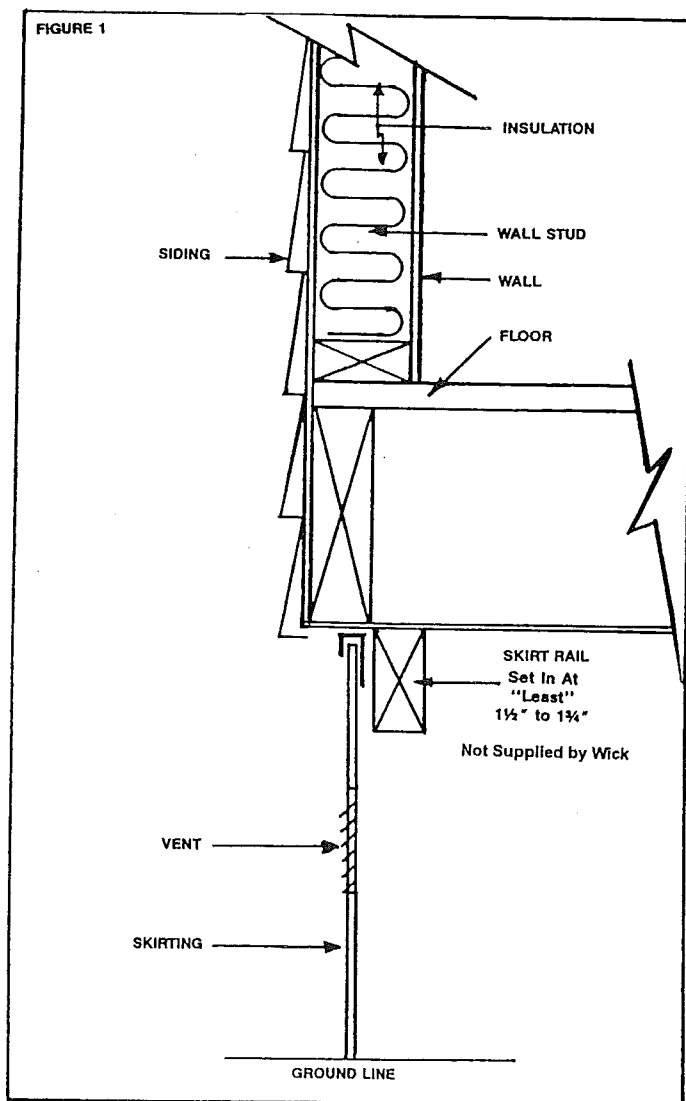
Additional ventilation can be provided. However, the total free area ventilation must be at least the minimum as calculated by this method.

Example Calculation for Skirting Ventilation:

Assuming the home is a 16' x 80':
16'x80' = 1280 Sq. Ft. of Crawl Space Area.
 $1280 \div 150 = 9.0$ Sq. Ft. ($9.0 \times 144 = 1,296$ Sq. In.)

Assuming the home is a 28' x 56':
28'x56' = 1,568 Sq. Ft. of Crawl Space Area.
 $1568 \div 150 = 11$ Sq.Ft. ($11 \times 144 = 1,584$ Sq. In.)

The amount of ventilation provided by each vent or pre-vented panel will depend on the type and size of the vent and the type of obstruction over the vent opening. Some skirting products have pre-vented panels that can be installed. Refer to the vent or skirting manufacturer's specifications to determine the amount of ventilation provided by each vent or pre-vented vinyl panel.



NOTES

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