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~ TYPICAL FRAME SET ~
Set-Up Instructions for Manufactured Homes

INSTALLATION MANUAL

Wick®
Building Systems, Inc.

Marshfield Homes • Artcraft Homes • Rollohome

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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.

INSTALLING YOUR HOME

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 along the outside 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 coarse sand, or loose coarse 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.

SUPPORT REQUIREMENTS

The requirements for load bearing supports (blocks or piers) 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 load bearing supports (blocks or piers) 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 concrete blocks or piers of poured concrete with cast-in-place or pre-cast concrete "footings." Footings other than concrete, such as treated wood, may also be acceptacle, provided that all applicable codes and load bearing capabilities are met. The type and size of footings required and method of installation may vary from state to state. Be sure to check with the proper authorities for any local codes or regulations for footing installation.

NOTE: IF THE HOME IS DESIGNED TO BE PLACED ON A PERMANENT FOUNDATION OR BASEMENT, INSTALLATION IS SUBJECT TO LOCAL BUILDING CODES.

BLOCKING AND LEVELING A MANUFACTURED HOME

The basic foundation for placement of blocking (piers) must be firm, such as cement or gravel and stone. The blocking supports should be sturdy, such as poured concrete piers, hollow load bearing concrete blocks (placed with open cells running vertically), steel horses or adjustable steel leveling jacks.

NOTE: YOU SHOULD DRAW A SKETCH OR PLAN OF WHAT YOU ARE GOING TO DO BEFORE STARTING THE BLOCKING PROCEDURE.

Procedure for Blocking a Manufactured Home

The following steps and diagrams outline the general procedure for blocking a single-wide home. All blocks (piers) should be placed under the main frame members (I-Beams) on "both" sides of the home.

First, determine and lay out the required spacing of the blocking (piers). To determine the required spacing, measure the "depth" of the Main I-Beams. Then, refer to the chart below which shows the "maximum" distance blocking (piers) can be placed.

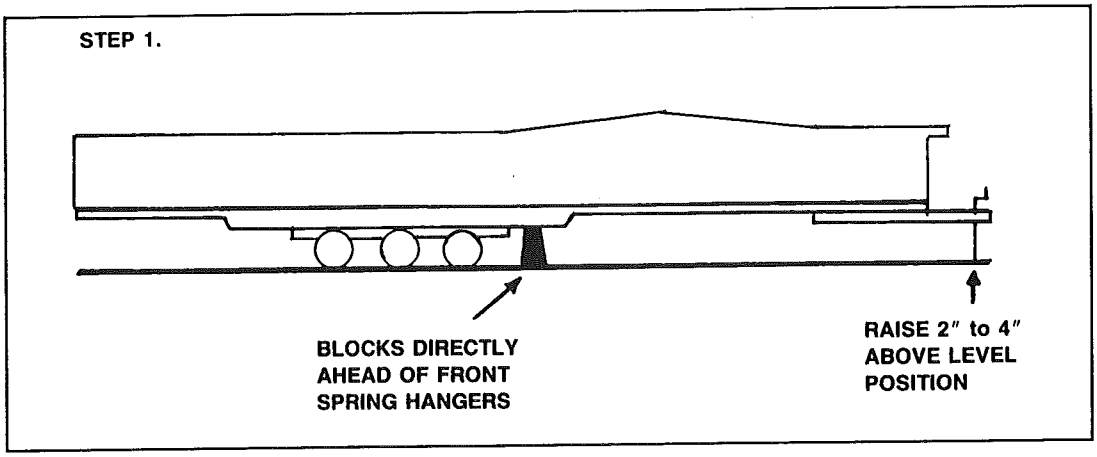
I-Beam Size	Maximum Blocking Spans
12" I-Beam	14' - 0"
10" I-Beam	12' - 0"
8" I-Beam	11' - 0"

NOTE: WHEREVER THERE IS A SPLICE IN THE I-BEAM, THE DISTANCE BETWEEN BLOCKING (PIERS) MAY NOT EXCEED 10' - 0" REGARDLESS OF THE SIZE OF THE I-BEAM.

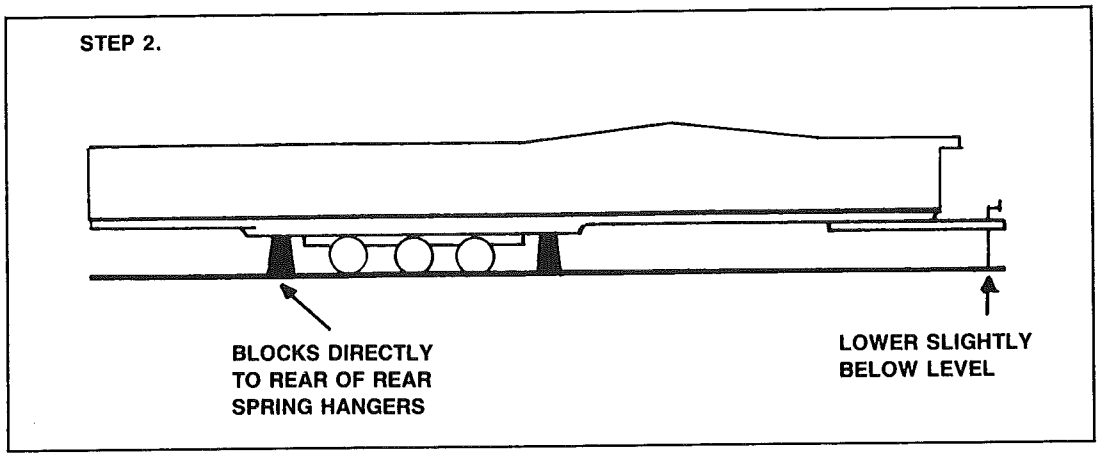
NOTE: BLOCKS OR PIERS SHOULD NOT BE PLACED UNDER AN EXTERIOR DOOR OR CLOSER THAN 18" FROM THE HINGE OR DOOR KNOB SIDE OF SUCH DOOR. IF IT IS NECESSARY TO PLACE BLOCKS IN THIS MANNER, CAUTION MUST BE USED SO THAT THE DOORS SWING PROPERLY.

NOTE: IF THE HOME IS BEING SUPPORTED BY BLOCKS (PIERS) WITH CONCRETE "FOOTINGS," YOU MUST DETERMINE THE REQUIRED FOOTING SIZE BEFORE PROCEEDING FURTHER. SEE PAGE 39.

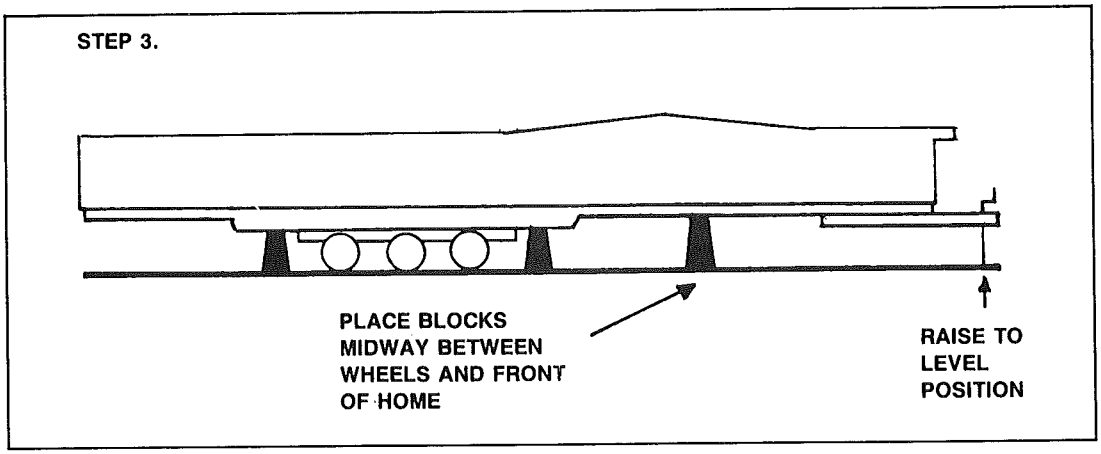
STEP 1: Using the Coupler Jack, raise the front end two to four inches above level position. Place Blocks directly ahead of the front Spring Hangers (on both sides).



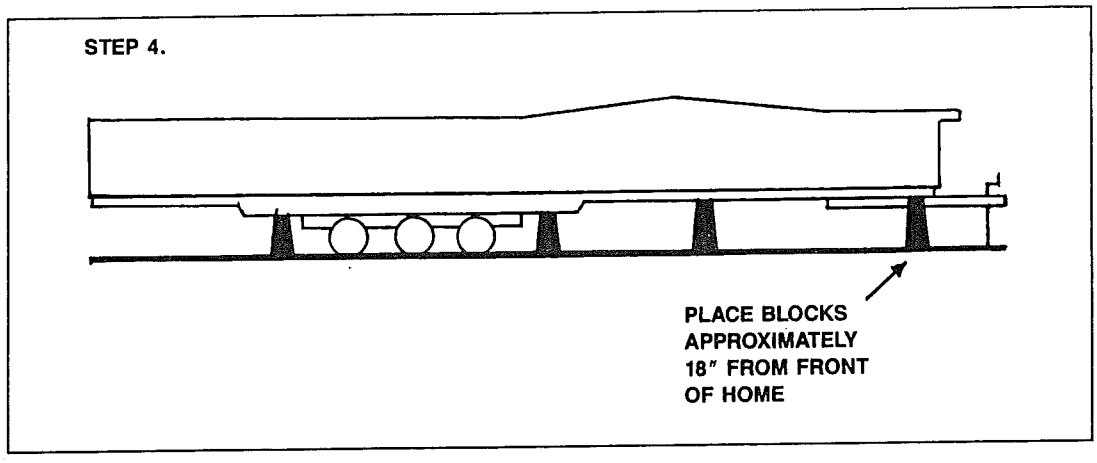
STEP 2: Using the Coupler Jack, lower the front end slightly below level position. Place Blocks directly to the rear of the Spring Hangers (on both sides).



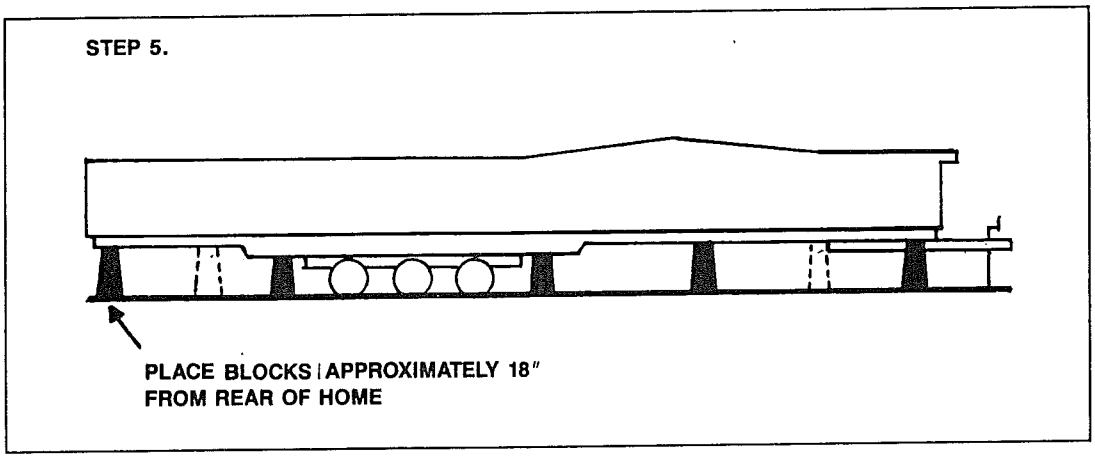
STEP 3: Using the Coupler Jack, raise the front end again to level position. Place Blocks midway between wheels and front of home, as required.



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.

BLOCKING (PIER) FOOTING SIZE

If the home is placed on concrete blocks or piers with "footings," the required footing size must be determined. As previously discussed, footing size will vary depending on the soil bearing capacity in the area, the structural design of the home and the distance between blocking (piers). The following steps and diagrams outline the procedure for determining the required footing size.

NOTE: USE EITHER SQUARE OR RECTANGULAR SHAPED CONCRETE PRE-CAST OR CAST-IN-PLACE FOOTINGS. PRE-CAST FOOTINGS SHOULD BE A MINIMUM OF 4" IN DEPTH. CAST-IN-PLACE FOOTINGS SHOULD BE A MINIMUM OF 6" IN DEPTH. OTHER SHAPES RESULTING IN EQUAL SQUARE FOOTAGES MAY ALSO BE ACCEPTABLE.

NOTE: WHEN PLANNING FOOTING SIZES, PLAN YOUR TIE DOWN LOCATIONS ALSO. YOU CAN INCREASE THE SIZE OF AN EXISTING FOOTING AT THE TIE DOWN OR ADD A SEPARATE FOOTING. (SEE TIE-DOWN PROCEDURE, PAGE 48).

Procedure For Determining 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 49. Then refer to the table below to determine the "total" design load of the home.

Table 1	South	Middle	North
Roof Load Live & Dead	28 PSF	38 PSF	48 PSF
Floor Load Live & Dead	45 PSF	45 PSF	45 PSF
Misc. Dead Load	12 PSF	12 PSF	12 PSF
Total	85 PSF	95 PSF	105 PSF

NOTE: LIVE LOAD IS SNOW, FURNITURE, OR OTHER ITEMS NOT PART OF THE STRUCTURE. DEAD LOAD IS THE STRUCTURE ALONE. PSF MEANS POUNDS PER SQUARE FOOT.

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

Table 2	Typical Soil Bearing Capacities
Compact Gravel or Sand-Gravel Mixtures	12000 PSF
Loose Gravel; Compact Coarse Sand	8000 PSF
Loose Coarse Sand or Sand-Gravel Mixtures	6000 PSF
Loose Fine Sand or Wet Confined Fine Sand	4000 PSF
Medium Stiff Clay	3000 PSF
Soft Clay	1500 PSF

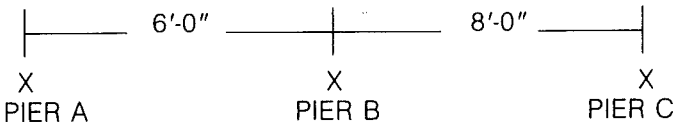
CAUTION: DO NOT MAKE YOUR OWN SOIL BEARING JUDGEMENT, UNLESS YOU ARE A KNOWLEDGEABLE EXPERT. AN INCORRECT ESTIMATION MAY RESULT IN IMPROPER SET-UP AND CAUSE DAMAGE TO THE HOME.

Step 3: Determine and lay out the required spacing of the blocking (piers). Keep in mind that you must position blocking directly to the front and rear of the Axle Assembly and 18" from the front and rear of the home. (See Procedure for Blocking a Manufactured Home on Page 36).

Step 4: Go to the Footing Load Charts on Page 41 and locate the Chart 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 blocking (piers). This will determine the blocking pier "load." Divide this "load" by the soil bearing capacity of the site where the home is located. This will determine the "minimum" footing size required. Examples of calculating the required footing sizes for both a single-wide and sectional home are provided below.

NOTE: LARGER FOOTING SIZES MAY BE USED. HOWEVER, THE SIZE OF THE FOOTINGS MUST BE AT LEAST THE "MINIMUM" AS CALCULATED BY THE ABOVE METHOD.

NOTE: WHERE THE DISTANCE BETWEEN BLOCKING (PIERS) IS UNEQUAL, THE AVERAGE OF THE DISTANCE TO EACH ADJACENT 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) ÷ 2 = 7.0

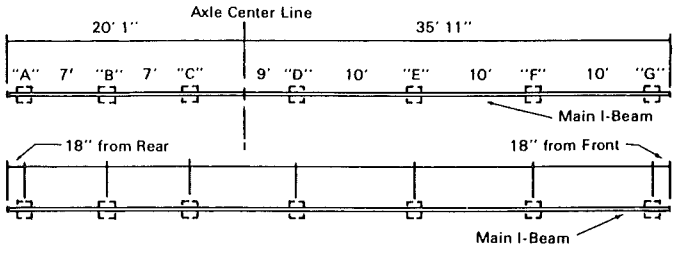
FOOTING SIZE CALCULATION EXAMPLES

Singlewide Home

14 x 60 home located in Rhinelander, Wisconsin. Local building inspector says soil bearing capacity is 3000 PSF.

#1 Determine Roof Load Zone from Data Plate (Middle Zone)
#2 Determine Soil Bearing Capacity (3000 PSF)
#3 Lay Out Pier (Blocking) Spacing (See Figure A)

FIGURE A (14 x 60 Singlewide)



#4 Size of Footing "A"

Remember: Size the footing for the average of the space to the right and left of the pier, i.e.
(1.5′ + 7′) ÷ 2 = 4.25′ always round up, i.e., 5′

Go to Footing Load Chart, Middle Zone
See 14 Wide Column, Pier Row for 5′
Pier (Blocking) Load = 3285 pounds

Divide Pier (Blocking) Load by Soil Bearing Capacity, i.e.,
3285 pounds ÷ 3000 PSF = 1.10 SF

A footing area of 1.10 SF will be approximately equal to a 12″ x 14″ rectangular footing, i.e.

1.10 SF x 144 sq. in. = 158 sq. in.
Pick a dimension for the length or width, i.e., 12″
158 sq. in ÷ 12″ = 13.2 in. (Always round up)

Size of Footing "C"

(7′ + 9′) ÷ 2 = 8′

Go to Footing Load Chart, Middle Zone
See 14 Wide Column, Pier Row for 8′
Pier (Blocking) Load = 5257 pounds

Divide Pier (Blocking) Load by Soil Bearing Capacity, i.e.,
5257 pounds ÷ 3000 PSF = 1.75 SF

A footing area of 1.75 SF will be approximately equal to a 16″ x 16″ square or 12″ x 21″ rectangular footing, i.e.,

1.75 SF x 144 sq. in. = 252 sq. in.
Pick a dimension for the length or width, i.e., 12″
252 sq. in. ÷ 12″ = 21 in.

Size of Remaining Footings:

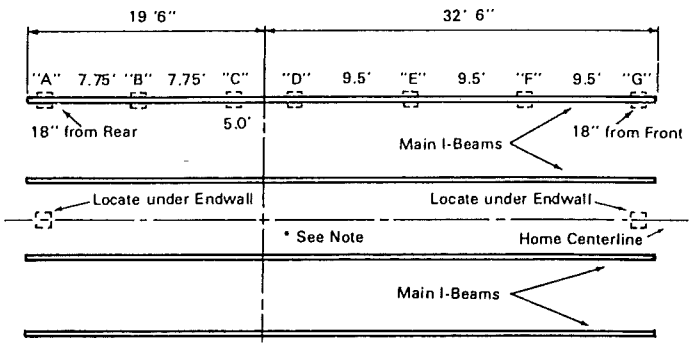
"B" - 14″ x 16″
"D" - 16″ x 20″
"E" - same as D
"F" - same as D
"G" - 12″ x 16″

Sectional Home

24 x 52 home located in Winder, Georgia. Local city engineer says soil bearing capacity is 2000 PSF.

#1 Determine Roof Load Zone from Data Plate (Southern Zone)
#2 Determine Soil Bearing Capacity (2000 PSF)
#3 Lay Out Pier (Blocking) Spacing (See Figure B)

FIGURE B (24 x 52 Sectional)



*NOTE: Mating wall blocking is required at: 1. Mating endwalls 2. Beam column supports 3. End of hall walls 4. Each side of large opening (over 4′)

#4 Size of Footing "A"

Remember: Size the footing for the average of the space to the right and left of the pier, i.e.
(1.5′ + 7.75′) ÷ 2 = 4.63′ always round up, i.e., 5′

Go to Footing Load Chart, Southern Zone
See 24 Wide Column, Pier Row for 5′
Pier (Blocking) Load = 2479 pounds

Divide Pier (Blocking) Load by Soil Bearing Capacity, i.e.,
2479 pounds ÷ 2000 PSF = 1.24 SF

A footing area of 1.24 SF will be approximately equal to a 12″ x 15″ rectangular footing, i.e.,

1.24 SF x 144 sq. in. = 178.56 sq. in.
Pick a dimension for the length or width, i.e., 12″
178.56 sq. in. ÷ 12″ = 14.88 in. (Always round up)

Size of Footing "D"

(5′ + 9.5′) ÷ 2 = 7.25′ always round up, i.e., 8′

Go to Footing Load Chart, Southern Zone
See 24 Wide Column, Pier Row for 8′
Pier (Blocking) Load = 3967 pounds

Divide Pier (Blocking) Load by Soil Bearing Capacity, i.e.,
3967 pounds ÷ 2000 PSF = 1.98 SF

A footing area of 1.98 SF will be approximately equal to a 12″ x 24″ or 16″ x 18″ rectangular footing, i.e.,

1.98 SF x 144 sq. in. = 285.12 sq. in.
Pick a dimension for the length or width, i.e., 12″
285.12 sq. in. ÷ 12″ = 23.76 in. (Always round up)

Size of Remaining Footings:

"B" - 16″ x 18″
"C" - 16″ x 16″
"E" - 16″ x 23″
"F" - same as E
"G" - 12″ x 18″

FOOTING LOAD CHARTS

NOTE: The Loads In These Charts Are In Pounds.

Footing Load Chart					
Nothern Zone-105 PSF					
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
13' OC	9441	10693	7963	8816	9441
14' OC	10168	11515	8575	9494	10168

Footing Load Chart					
Middle Zone-95 PSF					
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
13' OC	8542	9674	7204	7976	8542
14' OC	9199	10418	7758	8590	9199

Footing Load Chart					
Southern Zone-85 PSF					
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
13' OC	7643	8656	6446	7136	7643
14' OC	8231	9322	6942	7685	8231

Footing Load Chart				
Mating Wall For Sectional Homes				
Roof Load Zone	Pier Spacing	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

NOTE: Blocking (Pier) spacing for Mating Wall must not exceed 24'0".

INSTALLING YOUR HOME

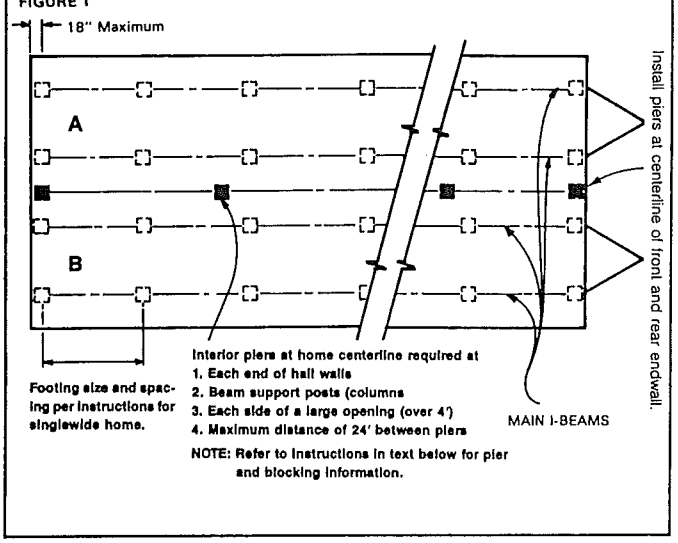
SECTIONAL HOME SET-UP

NOTE: BE SURE YOU HAVE A SKETCH OR PLAN OF WHAT YOU ARE GOING TO DO BEFORE YOU START THE SET-UP PROCEDURE.

Step 1. Prepare the site as described on page 36.

Step 2. Position Section "A" of the home. (See Figure 1.) Block and level as indicated on Page 36.

FIGURE 1



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

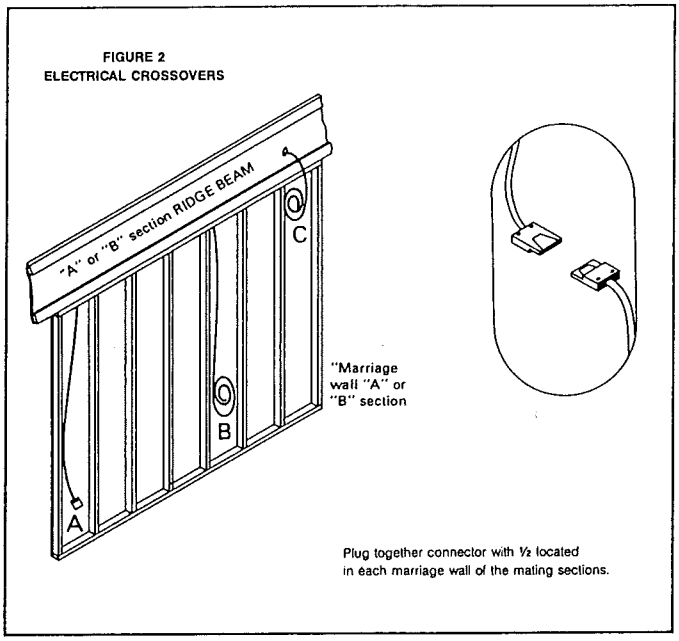
Step 4. Position Section "B" of the home as close to Section "A" as practicable (usually about 6 inches), taking care to allow enough room to complete the electrical connections between both sections of the home as described in Step 5, below.

Step 5. Make the electrical connections between both sections of the home as shown in Figure 2.

NOTE: All electrical work must be performed by experienced technicians or qualified set-up personnel.

CAUTION: 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 serious injury or fatal accidents.

FIGURE 2
ELECTRICAL CROSSOVERS



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

Step 7. Snug roof ridge of Section "B" to already set, blocked and leveled Section "A". It will be necessary to use a come-along attached to the frame or a system using a set of jacks and rollers. When using a come-along, greased boards or paneling below the tires will aid in moving the sections together. While bringing the roof ridge together it may be necessary to deflate the tires near the mating wall of the sections.

CAUTION: WHEN USING EQUIPMENT DESCRIBED IN STEP 7 ABOVE, CARE MUST BE TAKEN TO PREVENT STRESS ON STRUCTURAL MEMBERS OF THE HOME. FAILURE TO DO SO COULD RESULT IN DAMAGE TO THE HOME.

FIGURE 3
ROOF CONNECTION AND CLOSE-UP

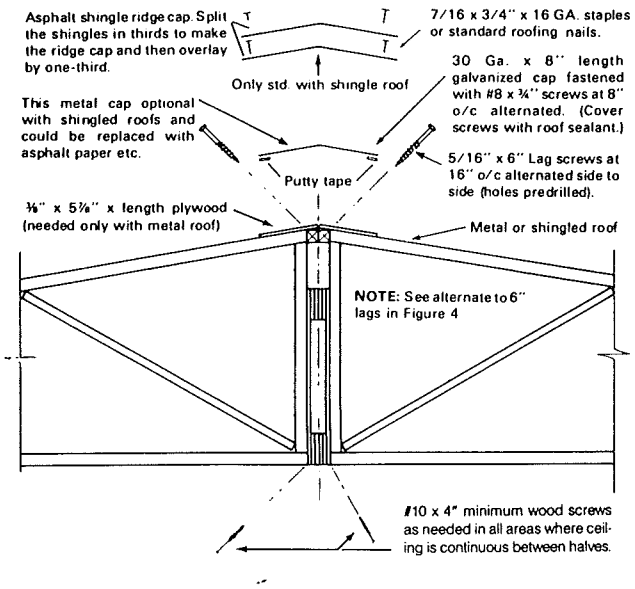
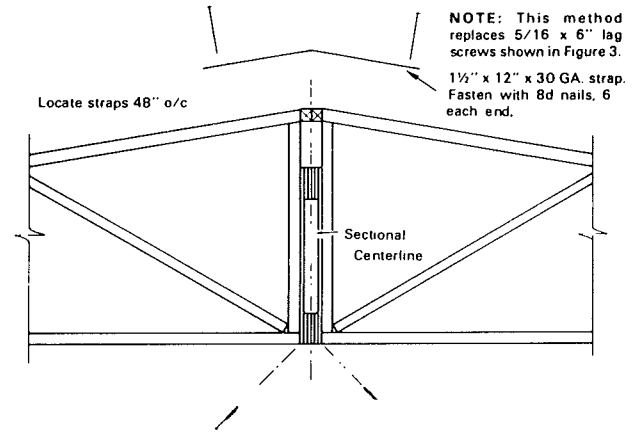
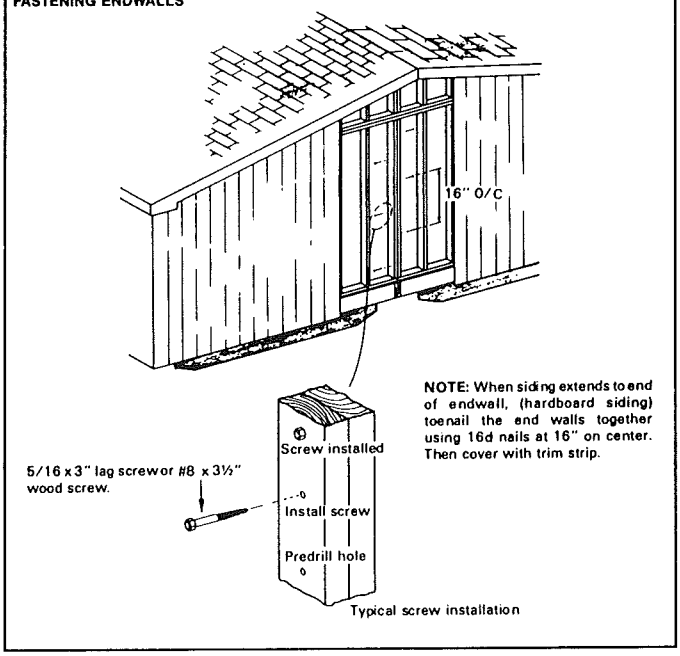


FIGURE 4
ALTERNATE METHOD
FASTENING SECTIONAL HALVES TOGETHER



Step 8. Secure mating roof and ceiling together. Align interior ceiling panels at the end wall and level ceiling of mating 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 one of the methods shown in Figures 3 & 4. When installing the fasteners it may be necessary to pre-drill pilot holes to assure a strong connection.

FIGURE 5
FASTENING ENDWALLS



Step 9. Align and fasten the exterior end wall mating studs by using one of the methods shown in Figure 5.

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 mating floor or at diagonal points on the frame.

Step 10. Block and level Section "B" of the home as indicated on Page 36.

Step 11. Place additional blocking at the marriage wall location as needed. (See Figure 1 and Footing Load Chart for Mating Wall for Sectional Homes on page 41). Size footings, if applicable, as described on page 39.

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FIGURE 6
FLOOR CONNECTION

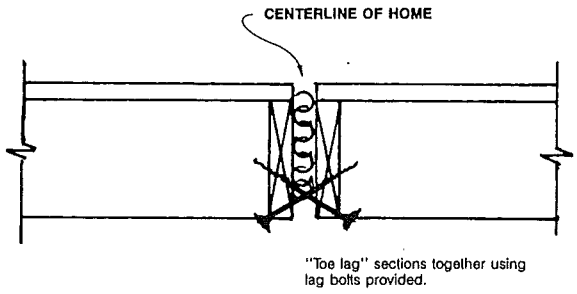
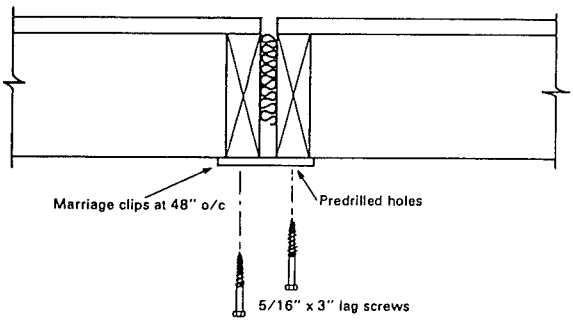


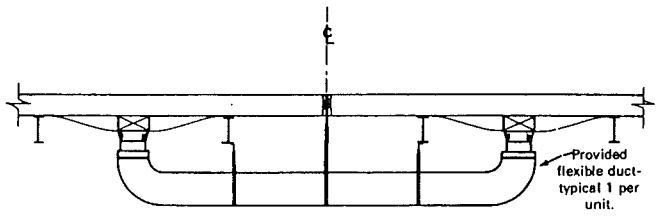
FIGURE 7
ALTERNATE METHOD OF FLOOR CONNECTION



Step 12. Secure the floor mating rails together by using one of the methods as shown in Figures 6 and 7.

Step 13. Most plumbing systems are contained in one section of the home. **If it is necessary to connect water distribution and/or drainage systems between the two sections of the home, follow the special instructions provided with this home.**

FIGURE 8
FLEXIBLE HEAT DUCT CROSS OVER

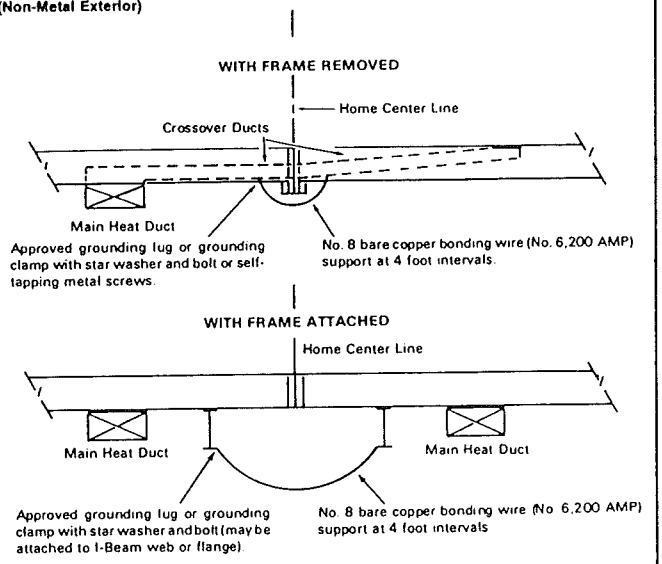


1. Connect each end of the provided insulated round flexible duct to the extended duct adaptor on each half of the home (sheet metal screws).
2. Tape each connection with duct tape to provide an air tight seal.
3. Secure the ducts with strapping as shown, providing a minimum of 4" of clearance between ground and duct.

Step 14. Complete the heat duct crossover system as shown in Figure 8.

NOTE: Be sure duct is supported, and not in contact with the ground.

FIGURE 9
TYPICAL ELECTRICAL BONDING
(Non-Metal Exterior)



Step 15. Electrical bonding (grounding) is important in maintaining continuity through each section of the home. See Figure 9 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 2¼" minimum, 16" or 24" on center, depending on siding manufacturer and stud spacing. 4 to 6 inch siding strips may be shipped loose for end wall close-up. Fasten with siding nails .0915 x 2¼" 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 cabinet doors and drawers for proper operation and fit.

INSTALLING YOUR HOME

ANCHORING

In some geographical locations (especially in high-wind or hurricane-prone areas), the installation of approved "tie-down" apparatus is required for safety reasons. The illustrations and recommendations that follow indicate general anchoring requirements. Be sure to consult the proper authorities for the specific procedure that is required in your area.

Over-The-Roof Ties.

These straps are not required. If installed at the factory as an option, they must be anchored to the ground on site at a corresponding frame tie location.

Frame Ties.

Frame-Tie strapping material must meet or exceed the following specifications: 0.035" x 1.250" Federal Specification QQ-S-781H Type 1, Class B. The number of frame ties required varies with the following:

1. Wind Zone.
2. Size of the Home.
3. Frame Configuration.

Steps for Determining Tie Downs Required:

1. Locate the Table for the width of the home.
2. Locate in that Table the Wind Zone where the home is located. (See Data Plate or maps on page 49).
3. Locate the size and frame configuration for the home.
4. Read number of frame ties required.

TIE-DOWN TABLE 1
14 Wide Home

		Wind Zone 1	
Length of Home	Frame C.L.	Single Anchor	Double Anchor
44.00	118	5	4
48.00	118	5	4
52.00	118	5	4
56.00	118	5	4
60.00	118	6	4
61.33	118	6	4
64.00	118	6	4
66.00	118	6	5
66.67	118	6	5
68.00	118	6	5
70.00	118	6	5
72.00	118	6	5
74.00	118	7	5
76.00	118	7	5

TIE-DOWN TABLE 2
16 Wide Home

		Wind Zone 1	
Length of Home	Frame C.L.	Single Anchor	Double Anchor
48.00	118	5	4
52.00	118	5	4
56.00	118	5	4
60.00	118	6	4
61.33	118	6	4
64.00	118	6	4
66.00	118	6	4
66.67	118	6	4
68.00	118	6	5
70.00	118	6	5
72.00	118	6	5
74.00	118	7	5
76.00	118	7	5

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

INSTALLING YOUR HOME

Notes To Tie-Down Tables

1. Spacing of Tie Downs is based on angle of frame tie strap (See Figure 1 or 2).
2. A significant change in the angle of the tie-down strap will alter spacing of the tie-downs.
3. Angle of frame tie-down strap should not be less than 44 degrees, or more than 47 degrees.

Tie-Down Details

Following are several illustrations showing methods in common use and effective for securing the home against high winds. These illustrations indicate general anchoring methods. Be sure to consult your local building inspector for specific recommendations. (See pages IM-35 and IM-38.)

FIGURE 1
SINGLE HEADED TIE-DOWN

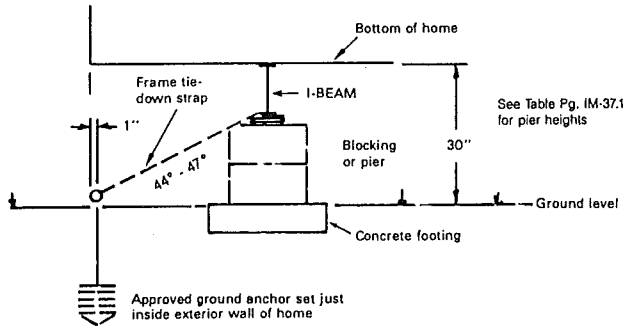
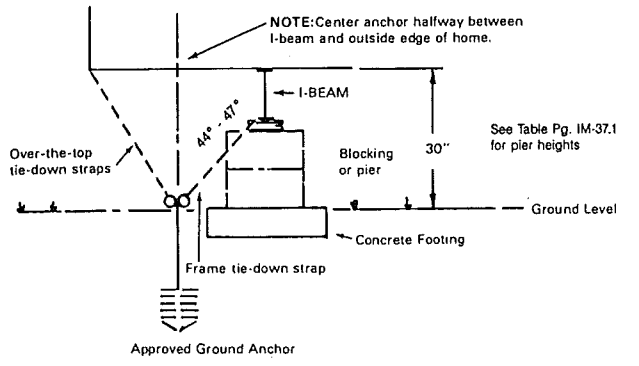
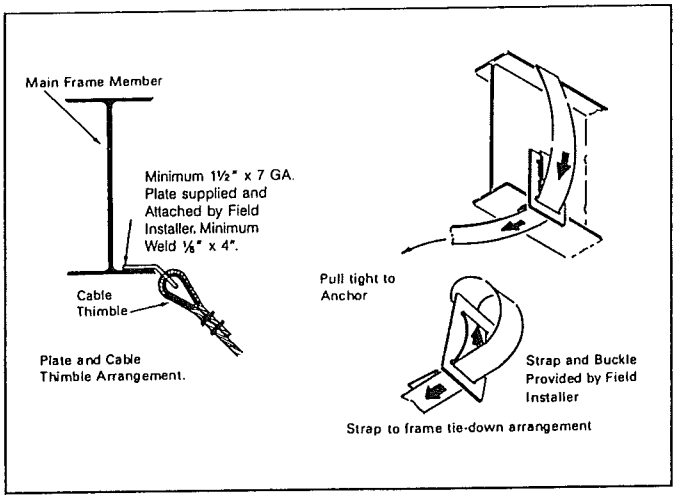


FIGURE 2
DOUBLE HEADED TIE-DOWN



NOTE: A local professional engineer should be consulted if tie-downs are not installed as shown.



Tie-Down Procedure

NOTE: IF YOUR HOME HAS OPTIONAL OVER-THE-ROOF TIES, BEGIN WITH STEP 1; IF NOT, PROCEED DIRECTLY TO STEP 2.

Step 1. Locate optional Over-The-Roof Ties. Install a ground anchor with double head on each side of the home under the rim of the home. For convenience of installing skirting, anchors may be inset (see Figure 2) from the exterior line of the home. Connect the Frame Ties and Over-The-Roof ties loosely to the double-headed anchors. **Do not tighten.**

Step 2. Refer to Tie-Down Tables to determine the number of frame ties required and their location. Install single-headed Ground Anchors and Frame Ties at these locations, 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 and tighten straps on both sides simultaneously.

NOTE: The home could be pulled off its piers if all straps on one side are tightened at once.

Step 4. As an added precaution, especially in areas subject to "frost heave," we recommend placing a pier under the perimeter of the home at each tie-down location. This will prevent the exterior walls from being pulled downward if the main beam piers heave upward due to climatic conditions.

Step 5. Increase footing size or add an additional footing to support tie down load of 350# per foot. Compute the load by first computing the average distance covered by each tie down. (See also page 39 Procedure for Determining Footing Size).

SAMPLE CALCULATION:

Assume your first tie down takes in 15′ of the home and the soil bearing capacity is 3000 PSF.

Multiply 350# per lineal foot times 15 feet i.e.,
350# x 15′ = 5250 pounds.
Divide 5250 pounds by Soil Bearing Capacity, i.e.,
5250 lbs. ÷ 3000 = 1.75 SF

Add 1.75 SF to a footing adjacent to the Tie Down, or add a separate footing equaling 1.75 SF

Step 6. Complete placement of Tie-Downs from each end. Maximum allowable is 8′-0″ to first tie location from each end of the home. If the home requires 9 tie-downs, there will be 10 spaces. Check to see if the maximum of 8′-0″ can be used by dividing 10 spaces into the length of the home.

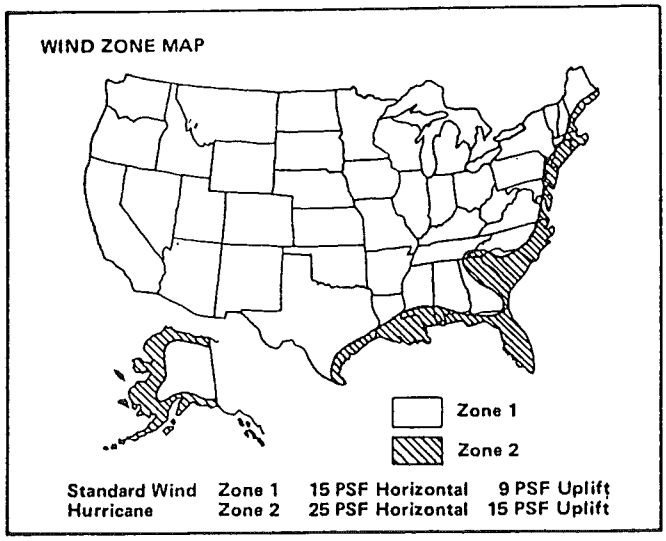
$$\text{Example: } \frac{66'\text{-}0'' \text{ actual length}}{10 \text{ spaces}} = 6'\text{-}7''$$

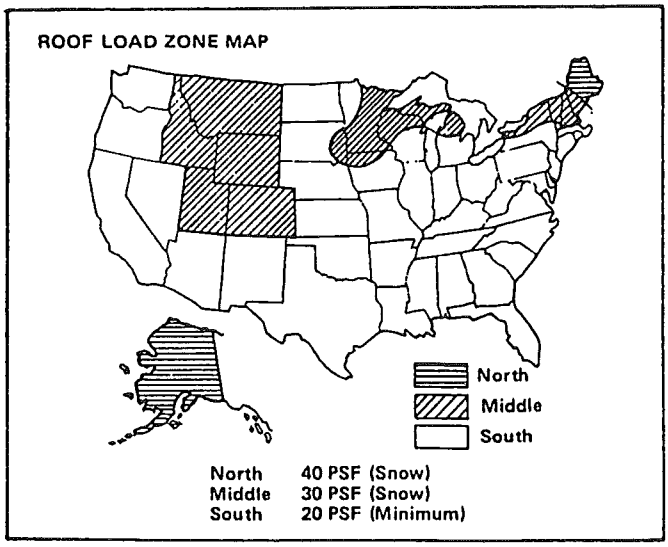
Use 6′-7″ to first tie from each end and space the remaining tie-downs as equally as practicable.

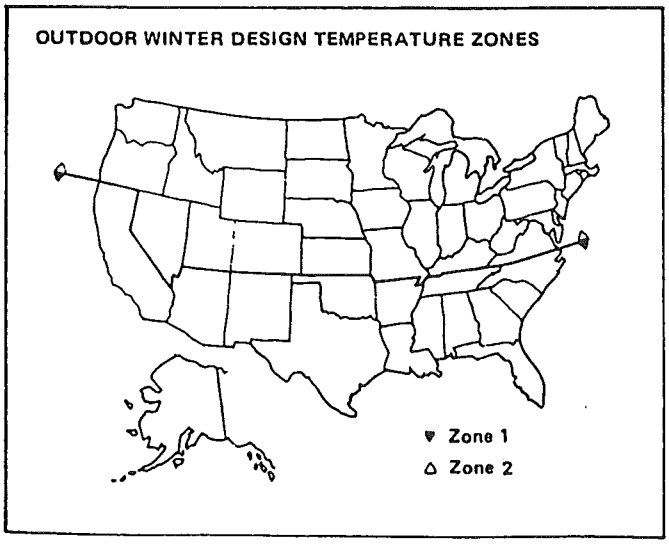
If the same home required 5 tie-downs, there would be 6 spaces.

$$\text{Example: } \frac{66'\text{-}0'' \text{ actual length}}{6 \text{ spaces}} = 11'\text{-}0''$$

Use 8′-0″ (maximum) to first tie from each end and space the remaining tie-downs as equally as practicable.







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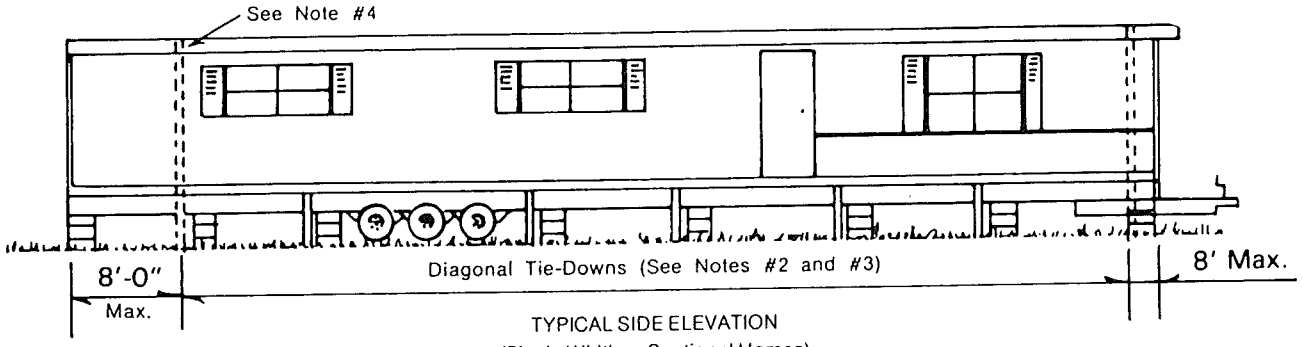
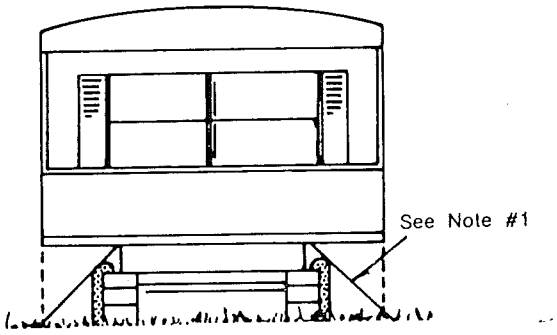


TYPICAL SIDE ELEVATION
(Single Width or Sectional Homes)



TYPICAL FRONT ELEVATION
(SINGLE WIDTH HOME)

NOTES: 1. ANGLE OF TIE DOWN STRAPS PER NOTE 1 TO TIE DOWN TABLES. (SEE PAGE IM-37.1)

2. (A) *ZONE I*-DIAGONAL STRAPS FROM FRAME TO APPROVED GROUND ANCHOR ARE TO BE SPACED PER TIE DOWN TABLE. THIS WILL RESULT IN MAXIMUM SPACING DEPENDING ON SIZE OF HOME AND FRAME CONFIGURATION.

(B) *ZONE II*-DIAGONAL STRAPS FROM FRAME TO APPROVED GROUND ANCHOR ARE TO BE SPACED PER TIE DOWN TABLE. THIS WILL RESULT IN MAXIMUM SPACING DEPENDING ON SIZE OF HOME AND FRAME CONFIGURATION.

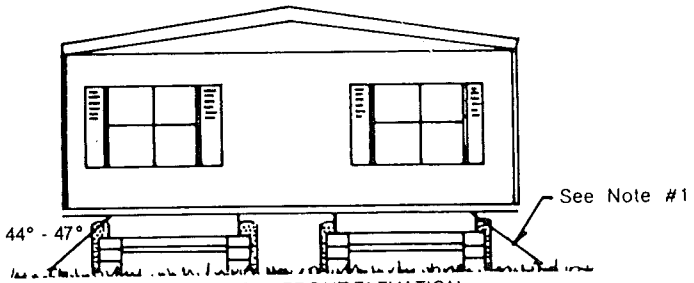
3. STRAPS AND ANCHORING EQUIPMENT MUST BE CAPABLE OF RESISTING AN ALLOWABLE WORKING LOAD OF NOT LESS THAN 3,150 LBS. AND CAPABLE OF WITHSTANDING A 50% OVERLOAD (4,750 LBS.) WITHOUT FAILURE.

TYPE I, FINISH B, GRADE 1 STEEL STRAPPING 1¼" WIDE AND 0.035" THICK CONFORMING WITH FEDERAL SPEC. QQ-781-H IS RECOMMENDED TO MEET ABOVE LOAD REQUIREMENTS.

4. "OVER-THE-TOP" STRAPS (IF PROVIDED) SHOULD COINCIDE WITH THE LOCATION OF A FRAME STRAP AND MUST COINCIDE WITH STRUCTURAL FRAMING MEMBERS OF THE HOME.

Sectional Home

Sectional Home models will not have over-the-roof ties. Frame ties are to be used only on the outermost main beams. Their quantity and location is listed in the Sectional Home Tie-Down Table.



TYPICAL FRONT ELEVATION
(SECTIONAL HOME)

(SEE TABLE PAGE IM-37.1 FOR PIER HEIGHTS)

NOTES: 1. ANGLE OF TIE DOWN STRAPS PER NOTE 1 TO TIE DOWN TABLES. (SEE PAGE IM-37.1)

2. (A) *ZONE I*-DIAGONAL STRAPS FROM FRAME TO APPROVED GROUND ANCHOR ARE TO BE SPACED PER TIE DOWN TABLE. THIS WILL RESULT IN MAXIMUM SPACING DEPENDING ON SIZE OF HOME AND FRAME CONFIGURATION.

(B) *ZONE II*-DIAGONAL STRAPS FROM FRAME TO APPROVED GROUND ANCHOR ARE TO BE SPACED PER TIE DOWN TABLE. 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 BE CAPABLE OF WITHSTANDING A 50% OVERLOAD (4,750 LBS.) WITHOUT FAILURE.

TYPE I, FINISH B, GRADE 1 STEEL STRAPPING 1¼" WIDE AND 0.035" THICK CONFORMING WITH FEDERAL SPEC. QQ-781-H IS RECOMMENDED TO MEET ABOVE LOAD REQUIREMENTS.

WATER AND DRAINAGE SYSTEM CONNECTION

The water and drainage systems in all Wick manufactured homes are tested for leaks prior to shipment from the factory. At the time these systems are connected, or following any move, they **must** be re-tested 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 should be checked to verify that they operate properly. The Hot and Cold water lines should also be checked to verify that they are properly connected to fixtures

NOTE: MANY 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 RESULT IN 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 water line 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 ¾" inlet pipe fitting 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 application of heat tape. If heat tape is used, it **must** be "listed" and approved for use in manufactured (mobile) homes.

CAUTION: FAILURE TO INSTALL HEAT TAPE WHICH IS APPROVED FOR USE IN MANUFACTURED (MOBILE) HOMES COULD CREATE A FIRE HAZARD AND CAUSE SERIOUS INJURY OR FATAL ACCIDENTS.

Drainage System

Piping from the outlet to the site connection of the drainage system must be installed with sufficient slope (¼" per foot), and it must be suitably supported to prevent the possibility of water standing in the pipe.

FUEL SUPPLY CONNECTION

Gas Systems

The gas piping system in all Wick manufactured homes 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 of the gas system.

The gas system was tested for leaks prior to shipment from the factory. At the time the gas is connected, or following any move, the gas system and all incoming fuel lines, connections and appliance valves and controls **must** be re-tested 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 (see Figure 1).

NOTE: MANY LOCAL JURISDICTIONS OR UTILITY COMPANIES MAY HAVE ADDITIONAL REQUIREMENTS FOR CONNECTING AND TESTING GAS SYSTEMS. 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 RESULT IN SERIOUS INJURY OR FATAL ACCIDENTS.

FIGURE 1

Combination LP-Gas and Natural Gas System

This gas piping system is designed for use of either liquefied petroleum gas or natural gas.

NOTICE: BEFORE TURNING ON GAS BE CERTAIN APPLIANCES ARE DESIGNED FOR THE GAS CONNECTED AND ARE EQUIPPED WITH CORRECT ORIFICES. SECURELY CAP THIS INLET WHEN NOT CONNECTED FOR USE.

When connecting to lot outlet, use a listed gas supply connector for manufactured homes rated at:

☐ 100,000 Btuh or more
☐ 250,000 Btuh or more

Before turning on gas, make certain all connections have been made tight, all appliance valves are turned off, and any unconnected outlets are capped.

After turning on gas, test gas piping and connections to appliances for leakage with soapy water or bubble solution, and light all pilots.

Natural Gas

Unless otherwise specified, all 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(s) attached to the appliance(s) **must** be installed in accordance with the instructions provided by the appliance manufacturer.

CAUTION: FAILURE TO PROPERLY ADJUST A GAS APPLIANCE TO ACCOMMODATE THE TYPE OF FUEL BEING USED COULD RESULT IN SERIOUS INJURY OR FATAL ACCIDENTS.

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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 suggest that conversion to an LP System be a vapor withdrawal type, incorporating the use of a vapor drip leg cap.

CAUTION: WHEN LP GAS IS UTILIZED, USE ONLY LP GAS OR BUTANE CYLINDERS (OR "BOTTLES") BEARING THE APPROVAL MARKING OF EITHER THE U.S. DEPARTMENT OF TRANSPORTATION (DOT) OR THE AMERICAN SOCIETY OF ENGINEERS (ASME). DOT CYLINDERS ARE ACCEPTABLE IN ALL STATES. CONSULT WITH YOUR LOCAL LP GAS SUPPLIER FOR REQUIREMENTS IN YOUR STATE FOR THE PROPER CYLINDER TO USE.

All gas fueled appliances **must** be carefully adjusted to accommodate the type of fuel being used, i.e., LP Gas, 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 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 RESULT IN SERIOUS INJURY OR FATAL ACCIDENTS.

ELECTRICAL POWER SUPPLY CONNECTION

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), and with applicable sections of the National Electric Code. All electrical connections **must** be performed by a qualified electrician who is familiar with these codes and/or other local electrical codes.

CAUTION: FAILURE TO PROPERLY CONNECT THE ELECTRICAL SYSTEM COULD RESULT IN SERIOUS INJURY OR FATAL ACCIDENTS.

The electrical supply to the home requires 120/240 volt, 1 phase, 3 wire with ground. Inadequately sized wire can result in low voltage, causing a drop in light and appliance efficiency. All wiring **must** be U.L. listed. Conductors and raceways are sized for copper four wire service. Aluminum feeder service will require larger wire and raceways. Consult the current national and local electrical codes.

The proper feeder conductor size for a 100 ampere service panel will require a minimum of #4 AWG, 75°C copper with #8 ground; 200 ampere service panel will require a minimum of #2/0 AWG, 75°C copper with #6 ground. The ampere rating of the service panel **must not** exceed the power supply assembly rating.

The home **must** be properly grounded. The only safe and approved method for grounding is through an electrically isolated grounding bar (equipment ground) installed on the power supply panel. The neutral (white) conductor **must not** be connected to the equipment ground in the power supply panel.

CAUTION: IMPROPER GROUNDING AND CONNECTIONS COULD RESULT IN SERIOUS INJURY 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 power supply source, the following additional tests **must** be conducted using approved testing equipment: (1) A continuity test of circuit conductors; (2) a polarity test; and (3) a continuity test of electrical grounding system.

CAUTION: FAILURE TO PROPERLY TEST THE ELECTRICAL SYSTEM COULD RESULT IN SERIOUS INJURY OR FATAL ACCIDENTS.

COMMUNICATION CABLE INSTALLATION

The walls and floors of all Wick manufactured homes contain electrical wiring and plumbing lines. When installing communication cables, such as telephone wires and cable television lines, extreme caution **must** be taken to prevent contact with or drilling through these systems. This type of work should only be performed by qualified personnel.

MISCELLANEOUS EXTERIOR

Skirting or Crawl Space Foundation

The area between the bottom of the floor and the ground under the home (crawl space) may be skirted or enclosed. Lattice Skirting is recommended because it allows for maximum ventilation. Aluminum, Fiberglass, or Vinyl Skirting with a Receiver Strip is also available.

When skirting or enclosing the crawl space, access areas should be provided and located so that water supply and sewer drain connections can be inspected or repaired. Before you skirt or enclose the crawl space, remember to install a vapor barrier on the ground under the home (see Site Preparation on Page 36).

NOTE: IF A CLOTHES DRYER IS INSTALLED, ITS EXHAUSTED AIR MUST BE VENTED "OUTSIDE" THE SKIRTING OR CRAWL SPACE FOUNDATION, BEYOND THE PERIMETER OF THE HOME. CLOTHES DRYER VENTS MUST NOT BE ALLOWED TO TERMINATE UNDER THE HOME

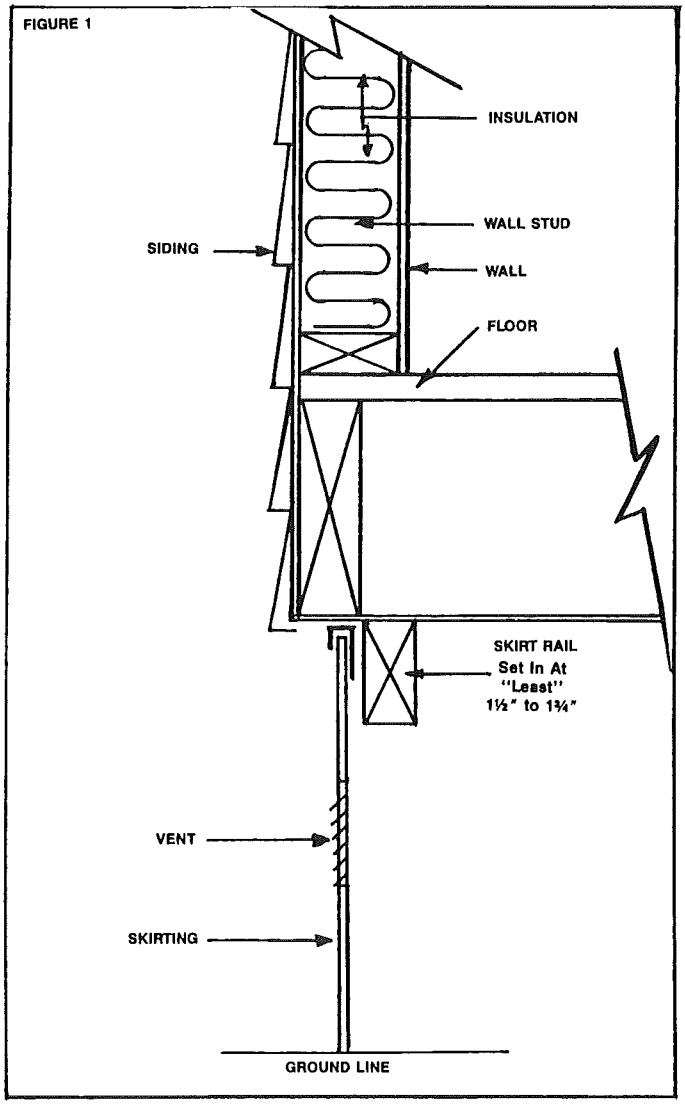
If skirting is used to enclose the crawl space, it should be secured as necessary to assure stability and compensate for possible frost heave. In frost-susceptible areas, the installation should allow for frost heave ground movement. The J-Rail or other receiver strip for skirting should be attached to a "skirt rail" installed at the bottom of the floor. The "skirt rail" should be set in at least 1½" to 1¾" from the edge of the siding (which extends below floor level). If alternative methods of attachment are used, the skirting must be attached in a manner that does not allow water to become trapped along the bottom of the siding. (See Fig. 1).

NOTE: WHEN ATTACHING SKIRTING TO VINYL-SIDED HOMES, TO ALLOW FOR NORMAL EXPANSION OF THE SIDING, A ½" to ⅝" OPENING SHOULD BE PROVIDED IN THE SIDING WHERE FASTENERS PASS THROUGH.

The skirting or crawl space foundation must provide adequate ventilation to prevent moisture accumulation under the home and to provide combustion air for any heat producing appliances. Ventilation can be provided through openings (vents) or other suitable means. Vents should be covered with a corrosion-resistant wire mesh not less than ¼" and not more than ½" in any dimension, or with screened or louvered openings to prevent entry of dry vegetation, waste materials or rodents.

The amount of ventilation in skirting or crawl space foundations must be 1 square foot of "free area" for every 150 square feet of crawl space area. If combustion air for heat producing appliances is taken from under the home, the amount of free area should be increased by at least 37.0 square inches per appliance to assure proper operation of the appliance(s).

FIGURE 1



To compute the total amount of "free area" ventilation required, divide the square footage of the floor area of the home by 150. For example: if the home is a 14 x 70, there is 924 square feet of floor area, i.e., 14 x 66 = 924 (excludes 4 feet for the hitch). 924 ÷ 150 = 6.16 square feet, or 887 square inches, total "free area" ventilation required. If one heat producing appliance drawing its combustion air from under the home is installed, increase the total "free area" ventilation to 6.42 square feet, i.e., 37.0 square inches + 887 square inches = 924 square inches, or 6.42 square feet.

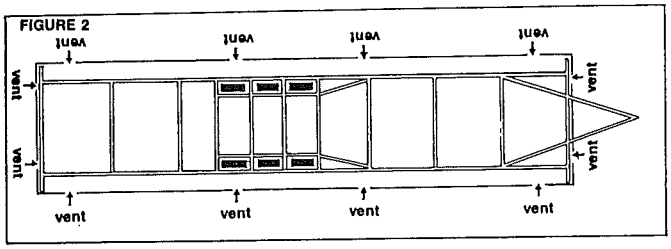
The amount of free area ventilation obtained will depend on the type and size of the vent installed, and the type of obstruction (covering) over the vent opening, i.e., wire mesh, screen or louvers, etc. Some skirting products are "continuous venting" or have pre-vented skirting panels that can be installed. You should refer to the skirting or vent manufac-

turer's specifications to determine the amount of free area your ventilation system will provide.

NOTE: THESE ARE "MINIMUM" FREE AREA VENTILATION REQUIREMENTS. ADDITIONAL VENTILATION CAN BE PROVIDED. HOWEVER, THE TOTAL FREE AREA VENTILATION MUST BE "AT LEAST" THE MINIMUM AS CALCULATED BY THE ABOVE METHOD.

Ventilation openings should be installed as "high" as reasonably practicable, but not higher than the bottom of the floor of the home. To assure "cross-ventilation," the openings or pre-vented skirting panels should be installed within three (3) feet of each corner of the home. Depending on the size of the home and the number of vents installed to obtain the total "free area" ventilation required, additional vents or pre-vented panels should be installed along the sidewalls toward the center of the home. (See Fig. 2).

FIGURE 2



NOTE: VARIOUS LOCAL, CITY OR STATE CODES MAY AFFECT THE APPLICABILITY OF THESE GUIDELINES. BE SURE TO CONSULT WITH YOUR LOCAL AUTHORITIES TO ENSURE THAT YOUR SKIRTING OR CRAWL SPACE FOUNDATION COMPLIES WITH ANY OTHER REQUIREMENTS.

Exterior Light Fixtures

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

Roof

All Wick manufactured home roofs are sealed around vents, stacks and other flashings 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 on shingled roofs should be removed, and all penetrations from staples or other fasteners should be sealed.

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