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Installation Instruction Manual

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A copy of this Manual must remain with the home
for reference by the homeowner



Revised: 19 March 2002

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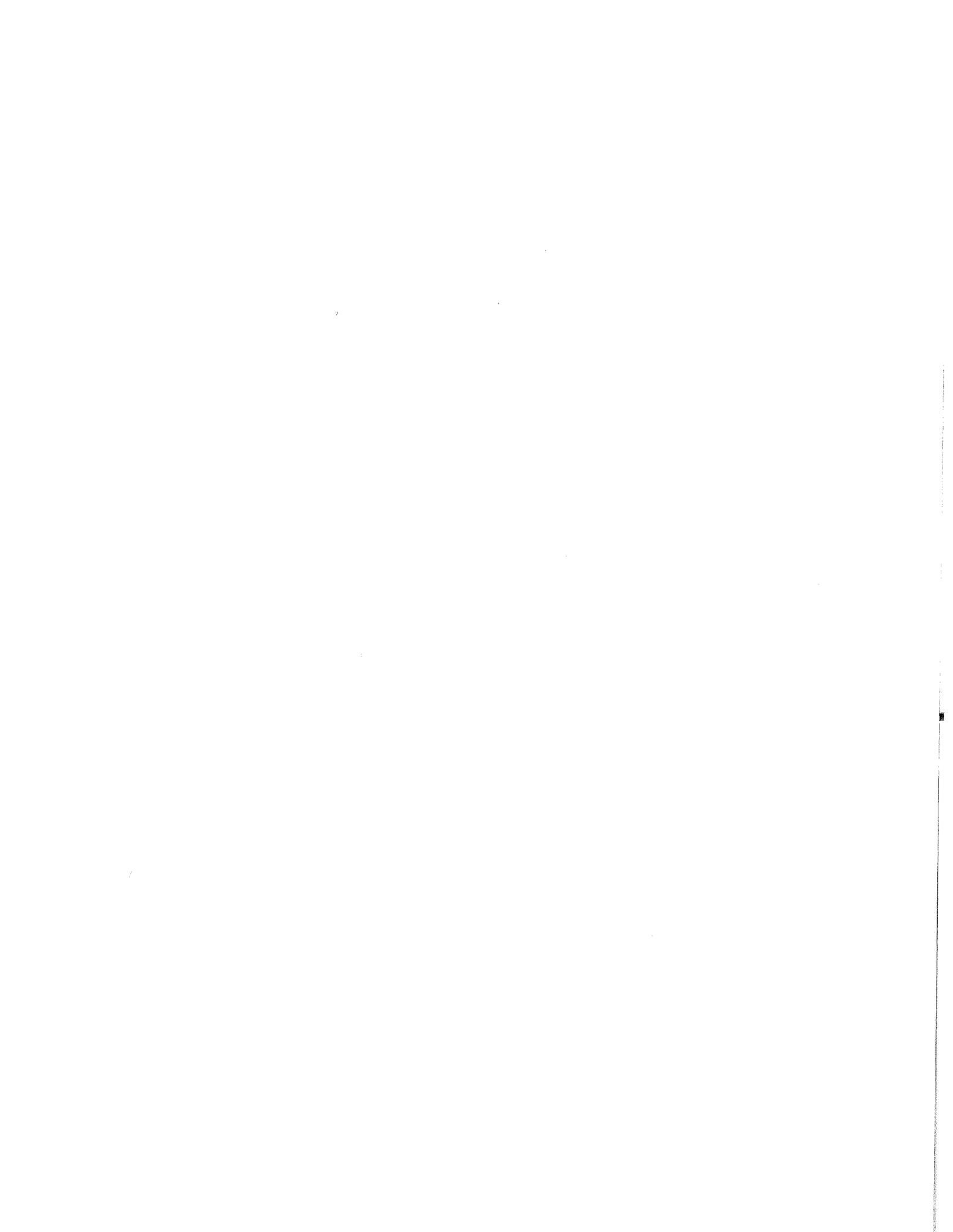


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APPROVED BY



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FEDERAL MANUFACTURED HOME
CONSTRUCTION AND SAFETY STANDARDS.

INTRODUCTION

Thank you for purchasing one of our manufactured homes. This Installation Manual contains instructions that must be followed for the proper installation of your home. **PLEASE READ ALL INSTRUCTIONS PRIOR TO SET-UP.**

1. Chapter One - Introduction

1.1. **How To Use This Manual.** This manual contains detailed installation instructions, including specifications and procedures for erection and hookup of your manufactured home. It has been written in an objective and easy-to-understand manner so it can be understood by people without extensive technical training. It discusses the set-up of the home from preparing the site through final inspection. It includes many tables and figures giving important data for proper set-up. Careful adherence to this manual by the homeowner and installation crew will assure you of a quality, safe and affordable home for many years to come.

1.2. **Pre-Installation Considerations.** Prior to locating or relocation of your home, contact the local authority having jurisdiction for installation to see if permits for such procedures as blocking, anchoring, or utility connections are required. Inspections may be required during installation. On private property, zoning or development covenants may apply and should be taken into consideration. [NOTE: Preparations of the site, when accomplished by someone other than the home installer, may not be in accordance with these instructions.]

1.3. **SAFETY. ONLY TRAINED CREWS SHOULD INSTALL THE HOME. INSTALLERS SHOULD FOLLOW THE SAFETY INSTRUCTIONS PROVIDED IN THIS MANUAL.**

1.4. **Consumer Information Card.** See your Homeowners Manual for information. If you bought your home from a retailer, please be sure that your retailer has completed and mailed the card for you. If you acquired your home from someone who is not a retailer, you should promptly fill out and send a card to us.

1.5. **Alterations.** Prior to altering this home after installation, (such as modifying the electrical, plumbing or heating systems, adding a room, carport, garage, or major repairs) be sure to contact the authority having jurisdiction as a permit or plan approval may be required. **ALSO, SUCH ALTERATIONS MAY VOID, IN WHOLE OR IN PART, THE LIMITED WARRANTY CONTAINED IN THE HOMEOWNER'S MANUAL.**

THIS HOME WEIGHS SEVERAL TONS.

USE ENOUGH TEMPORARY WOOD BLOCKING TO SUPPORT THE HOME DURING SET-UP OR WHEN LOCATED AT DEALER LOTS OR FACTORY FOR AN EXTENDED PERIOD OF TIME. NO ONE SHOULD BE ALLOWED UNDER THE HOME UNLESS THE BLOCKING IS SECURELY IN PLACE, EVEN IF THE HOME IS NOT MOVING.

2. Chapter 2 - Definitions

Anchoring Equipment: Straps, cables, turnbuckles and chains, including tensioning devices, that are used with ties to secure a manufactured home to ground anchors.

Anchoring System: A combination of ties, anchoring equipment, and ground anchors that will, when properly designed and installed, resist the wind which might overturn the home or move it sideways.

Footing: The part of the support system that sits directly on the ground at, below or partly below grade to support the piers or foundations.

Foundation: That part of a building that is an engineered structure designed to transfer the weight of the building or structure to the soil.

Pier: That portion of the support system between the footing and the manufactured home, exclusive of caps and shims. Types of piers include, but are not limited to, the following:

- 1.Manufactured steel stands
- 2.Manufactured concrete stands, and
- 3.Concrete blocks

Site, Manufactured Homes: A parcel of land designed and designated for the location of one manufactured home, its accessory buildings or structures, and accessory equipment for exclusive use of the home's occupants.

Stabilizing System: A combination of properly installed anchoring and support system.

Stand, Manufactured Home: That area of a manufactured home site which has been reserved for placement of a manufactured home.

Support System: A combination of footings, piers, caps and shims that will, when properly installed, support the manufactured home.

3. Chapter 3 - Site Preparation

3.1. **Location and Layout - Use Of Zone Maps.** Your home is designed for certain weather conditions and roof loads (see zone maps in a bedroom closet or near main electrical panel and Figure 3.1 of this manual). Do not site or relocate your home in a zone requiring greater wind, roof load, or heating/cooling capabilities than those for which it was designed. However, it is safe to locate your home in an area with lower load or weather requirements. For example, a home designed for a northern roof load or 40 psf may be sited in the southern roof load zones.

3.1.1. **Access For Transporter.** Before attempting to move your home to the installation site, be sure the transportation equipment can get through. Remove any overhanging branches and contact your local utility company to raise any overhead wires. Special transportation permits may be required from state, county or city officials.

3.1.2. **Encroachments And Setback Distances.** Obey local laws regarding encroachments in streets, yards and courts, and permissible setback distances from property lines and public roads. Consider future additions, such as awnings and screen rooms.

3.1.3. **Issuance Of Permits.** Be sure that all necessary local permits have been obtained and fees paid.

FIGURE 3.1

ZONE MAPS OF THE UNITED STATES

WIND ZONE 1 (15 PSF)

Includes areas of the United States and its territories that are not otherwise included as being in Wind Zone 2 or 3.

This home has not designed for the higher wind pressure and anchoring provisions required for ocean/coastal areas and should not be located with 1,500' of the coastline in Wind Zones 2 and 3, unless the home and its anchoring and foundation system have been designed for the increased requirements specified for Exposure D in ANSI/ASCE 7-88

WIND ZONE 2 (100 MPH)

Following are the local governments, listed by state (counties or parishes, unless specified otherwise) which are within Wind Zone 2:

- ALABAMA** - Baldwin, Mobile
- FLORIDA** - All counties except those identified as being within Wind Zone 3
- GEORGIA** - Bryan, Camden, Chatam, Glynn, Liberty, McIntosh
- LOUISIANA** - Acadia, Allen, Ascension, Assumption, Calcasieu, Cameron, East Baton Rouge, East Feliciana, Evangeline, Iberia, Iberville, Jefferson Davis, LaFayette, Livingston, Pointe Coupee, St. Helena, St. James, St. John the Baptist, St. Landry, St. Martin, St. Tammany, Tangipahoa, Vermillion, Washington, West Baton Rouge, West Feliciana
- MAINE** - Hancock, Washington
- MASSACHUSETTS** - Barnstable, Bristol, Dukes, Nantucket, Plymouth
- MISSISSIPPI** - George, Hancock, Harrison, Jackson, Pearl River, Stone
- NORTH CAROLINA** - Beaufort, Brunswick, Camden, Chowan, Columbus, Craven, Currituck, Jones, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, Washington
- SOUTH CAROLINA** - Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, Jasper, Williamsburg
- TEXAS** - Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, Willacy
- VIRGINIA** -(Cities)Chesapeake, Norfolk, Portsmouth, Princess Anne, Virginia Beach



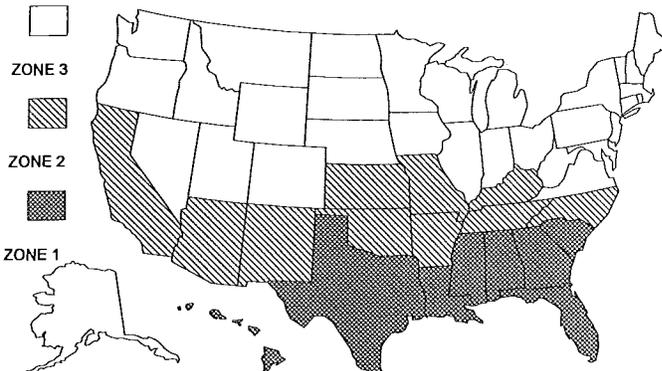
BASIC WIND ZONE MAP

WIND ZONE 3 (110 MPH)

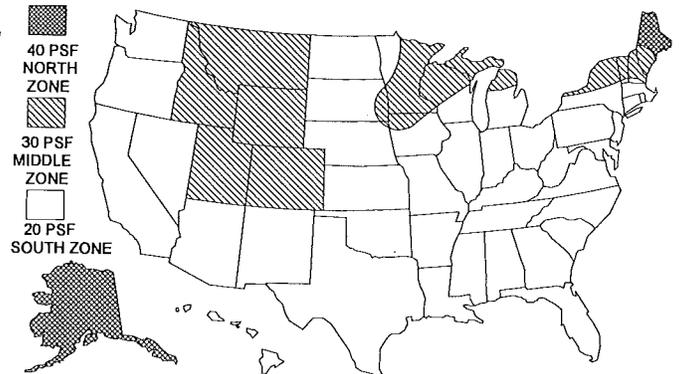
The following local governments listed by State, (Counties or parishes, unless specified otherwise) are within Wind Zone 3:

- FLORIDA** - Broward, Charlotte, Collier, Dade, Franklin, Gulf, Hendry, Lee, Martin, Manatee, Monroe, Palm Beach, Pinellas, Sarasota
- LOUISIANA** - Jefferson, LaFourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Mary, Terrebonne
- NORTH CAROLINA** - Carteret, Dare, Hyde

The following states and territories are within Wind Zone 3:
 State of **HAWAII**
 All **ALASKA** Coastal regions between the 90 mph isotach on ANSI/ASCE 7-88 wind map and the coast
US TERRITORIES: America Samoa, Guam, Northern Mariana Islands, Puerto Rico, Trust Territory of Pacific Islands, U.S. Virgin Islands



CLIMATIC ZONE MAP



ROOF LOAD MAP

3.2. Soil Conditions.

3.2.1. Requirements. To help prevent settling of your home, site it on firm, undisturbed soil or fill compacted at least 90% of its maximum relative density. Installation on loose, uncompacted fill may cause the home to shift and settle in such a way as to damage the home which may invalidate the home's limited warranty.

3.2.2. Bearing Capacity. Test the bearing capacity of the soil at the depth of the footings after completing any grading and filling (see 3.2.3). If you can't test the soil but can identify its type, use the foundation bearing pressure shown in Figure 3.2 as a guide. If you cannot identify the soil, use the lowest value (1,000 psf from Figure 3.2). Under unusual conditions, or if the soil appears to be peat or uncompacted fill, consult a local geologist or professional engineer.

3.2.3. Soil Bearing Testing Methods and Equipment. A pocket penetrometer (available from engineering supply houses) or other methods acceptable to local jurisdictions may be used.

3.3. Removal of Organic Material. Remove all decayable material such as grass, roots, and wood scraps from beneath the home, especially in areas where footings are to be placed, to minimize settling of footings and insect damage. Remove shrubs and overhanging branches from the immediate vicinity of the homesite to prevent windstorm damage.

3.4. Drainage.

3.4.1. Purpose. Drainage prevents water buildup under the home which may cause settling of the foundation, dampness in the home, damage to siding and bottom board, buckling of walls and floors, problems with the operation of doors and windows, AND COULD VOID YOUR WARRANTY.

3.4.2. Elimination of Depressions. Grade the homesite to permit water to drain from under the home and away from home for a minimum of 10 feet from the side of the home. See Figure 3.3.

3.4.3. Drainage Structures. Depending on the local landscape, ditches and culverts may be needed to drain surface runoff. If so, consult a registered professional engineer.

3.5. Ground Moisture Control.

3.5.1. Importance. If the crawlspace under the home is to be enclosed with skirting or other material, a vapor retarder ground cover shall be installed that keeps ground moisture out of the home. Where a concrete pad is installed (solid) under the entire home floor area, the vapor barrier is not required, if the concrete is a minimum of 4" thick.

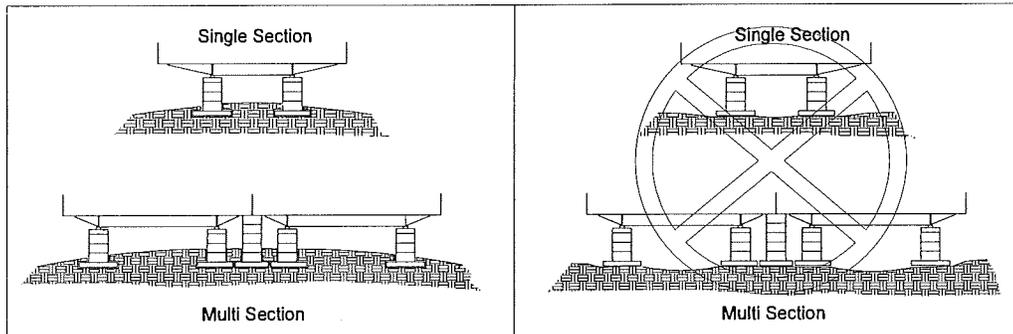
3.5.2. Acceptable Types of Ground Cover. Use polyethylene sheeting or its equivalent, at least six mils thick.

3.5.3. Proper Installation. Cover the entire area under the home with the sheeting and overlap it at least 6" at all joints. Where soil and frost condition permit placement of footings at grade level, place the sheeting directly beneath them.

SOIL TYPE BASED ON THE UNIFIED CLASSIFICATION SYSTEM	ALLOWABLE PRESSURE (POUNDS PER SQUARE FOOT) *
ROCK OR HARD PAN	4,000 AND UP
SANDY GRAVEL AND GRAVEL	2,000
SAND, SILTY SAND, CLAYEY SAND, SILTY GRAVEL, OR CLAYEY GRAVEL	1,500
CLAY, SANDY CLAY, SILTY CLAY, OR CLAYEY SILT	1,000
UNCOMMITTED FILL (TYPES OF SOIL NOT LISTED)	SPECIAL ANALYSIS IS REQUIRED
PEAT OR ORGANIC CLAYS	SPECIAL ANALYSIS IS REQUIRED

NOTE: THIS TABLE IS TO BE USED ONLY WHEN NONE OF THE FOLLOWING IS AVAILABLE:
 A. SOIL TESTING INVESTIGATION AND ANALYSIS OF THE SITE.
 B. COMPLIANCE WITH THE LOCAL BUILDING CODE.
 C. COMPETENT OPINION BY A LOCAL ENGINEER OR BUILDING OFFICIAL.
 * NO ALLOWANCES MADE FOR OVERBURDEN PRESSURE, EMBEDMENT DEPTH, WATER TABLE HEIGHT SETTLEMENT PROBLEMS

FIGURE 3.3 - ELIMINATION OF WATER BENEATH THE HOME



DO: Crown and grade site to slope away from home and cover with 6 mil thick polyethylene sheeting or equivalent.

DON'T: Grade site so that water collects beneath home or place footers above frost line.

4. Chapter 4- Foundations

NOTE: This chapter covers only foundations. Figure 4.1 and Table 4.1 summarizes the usual types. Set-up procedures and methods for securing the home to its foundation are discussed in Chapter 5.

4.1. Piers.

4.1.1. **Importance.** Incorrect size, location or spacing of piers may cause serious structural damage to your home. It is important to install piers around the perimeter, if required for your home. Failure to do so may lead to sagging floors, walls and roofs, and could void your limited warranty.

4.1.2. **Acceptable Types.** Piers are to be concrete blocks capped and shimmed with wedges, or adjustable manufactured metal or concrete stands (See Figure 4.1).

4.1.3. Design Requirements.

4.1.3.1. **Load-Bearing Capacity.** The load that each pier must carry depends on factors such as the dimensions of the home, the roof live load, the spacing of the piers, and the way they are used to support the home. Center beam/marriage wall blocking is required for multi-section homes.

See tables 4.2 and 4.3 for pier loads. Piers must be rated to resist the noted loads (see 4.1.3.2).

4.1.3.2. **Configuration.** Figure 4.1 shows the recommended arrangement of concrete block piers constructed on-site. Concrete blocks are to have nominal dimensions of at least 8" x 16". They must be stacked with their hollow cells aligned vertically. When piers are constructed of blocks stacked side-by-side, every layer must be at right angles to the previous one (see Figure 4.1).

Cap hollow block piers as shown in Figure 4.1 to distribute the structural load evenly across them. Caps shall be of solid masonry or hardwood, and of the same length and width as the piers they rest upon. Avoid plywood, as it may lead to unwanted settling or movement.

Use 4" x 6" hardwood shims to level the home and fill any gaps between the base of the I-beam and the top of the pier cap. Always use shims in pairs (see Figure 4.1). Drive them in tightly so they do not occupy more than 1" of vertical space. When the space to be shimmed is less than the minimum thickness of available caps or concrete blocks, pressure treated hardwood dimension lumber may be used under the caps.

Select manufactured pier heights so that their adjustable risers do not extend more than 3" when finally positioned.

All piers must be set on footings (see Paragraph 4.2) that are installed in such a manner so as to provide a stable environment for your home.

4.1.3.3. **Clearance Under The Home.** After the home is leveled, the resulting distance between the bottom of the chassis and the ground must be no less than 12" for 75% of the home. The remainder of the home may be less than 12" above the ground but may not touch the ground. The maximum clearance should be no more than the maximum described in Figure 4.1.

4.1.4. Design Procedures.

4.1.4.1. **Piers Up To 36" High.** You may construct piers less than 36" high out of single, open or closed-cell concrete blocks, 8" x 8" x 16". Install them so that the long side is at right angles to the supported I-beam (see Figure 4.1). Position open cells at right angles to the footers. Horizontal offsets should not exceed 1/2" top to bottom. Mortar is not normally required. Manufactured piers should be listed and labeled. Do not extend their adjusting studs beyond the limits specified by the manufacturer of the pier.

4.1.4.2. **Piers 36" To 80" High.** Construct all piers between 36" and 80" high, and all corner piers over three blocks high, out of double, interlocked concrete blocks (see Figure 4.1). Mortar will not normally be required.

4.1.4.3. **Piers Over 80" High.** Where permitted by local codes, lay them in concrete mortar with steel reinforcing bars inserted in the block cells and fill the cells with concrete. Where such construction is not permitted by local codes, have piers over 80" high designed by a registered professional or structural engineer.

4.1.5. **Location And Spacing.** The location and spacing of piers depends upon the dimensions and weight of the home, the roof load zone, the type of construction and other factors such as the locations of doors or other openings and heavy pieces of furniture. In general, locate piers no more than 2' from either end (unless specified). Place piers of your home as follows:

4.1.5.1. Single And Multi-Section Homes.

A) Homes not requiring perimeter support. Figure 4.2 shows the recommended location and spacing of piers for homes not requiring perimeter blocking generally located at south (20 PSF) and middle (30 PSF) roof zone areas.

B) Homes requiring perimeter support. See Figure 4.3 for homes requiring additional perimeter supports (generally at 40 PSF or higher roof load zones).

4.1.5.2. **Under Doors And Heavy Furniture.** Place piers on both sides of all exterior doors, sidewall openings wider than 4' (such as entry and sliding glass doors), under porch posts, fireplaces and wood stoves, and under the expected locations of heavy pieces of furniture such as pianos, waterbeds, etc. This additional blocking is required with all types of foundation.

4.2. **Footings.** Support every pier with a properly designed footing as follows:

4.2.1. **Acceptable Types Of Footings.**

4.2.5.1. **Concrete.** Footings may consist of precast or poured-in-place concrete, pads slabs, or ribbons with a 28-day compressive strength of at least 3,000 psi (see Figure 4.4 for minimum footer thickness).

4.2.5.2. **Other Materials.** You may also use other materials approved for this use by local authorities if they provide equal load-bearing capacity and resistance to decay.

4.2.2. **Footer Placement.** For homes which are to be set in areas susceptible to frost, in order to prevent the potentially harmful effects of frost heave, footings should be placed below the frost line or the home must be installed in such a manner as to provide a stable environment.

4.2.3. **Proper Sizing Of Footings.** Proper sizing of footings depends upon the load-carrying capacity of both the piers and the soil. See Table 4.4 for recommended footing sizes based on pier load (Table 4.2 and 4.3) and minimum soil bearing capacity.

4.2.4. **Other Footing Design Considerations.** You should check with applicable state or local building authorities concerning any other requirements they may have concerning design, construction or placement of acceptable footings.

4.3. **Permanent Foundations.** Check local building codes and regulations and consult a registered professional or structural engineer when you are setting your home on a permanent foundation (such as a full basement, crawl space or load-bearing perimeter foundation). You may get a

permanent foundation design that meets most local codes by writing to the address located on the back cover of manual, Attention Customer Service.

4.3.1. **Flood-Prone Areas.** We do not recommend setting your home in river or coastal flood-prone areas. Special local regulations or flood insurance provisions may apply. Special elevation and anchoring techniques are required when locating in a flood-prone area. Consult a registered professional or structural engineer to make sure that the home design and construction conform to applicable federal, state and local codes and regulations. The FEMA publication listed in Section 4.4.3 contains design and construction recommendations.

4.3.2. **Severe Wind Areas.** Special foundation and anchoring techniques are required when your home is located in a severe wind area. Consult a registered professional or structural engineer. HUD foundations design guide listed in Section 4.4.4 contains recommendations for designing foundations and anchoring systems. Do not place your home in a wind zone more severe than the one indicated on your home's Data Plate.

4.3.3. **Special Snow Load Conditions.** Homes designed for and located in heavy snowfall areas or subject to other extreme loading conditions will require special piers or footings. See Table 4.2 for pier loads up to 50 psf roof load. For higher roof load consult a registered professional engineer for your foundation design. Do not place your home in a roof zone more severe than the one indicated on your home data plate.

4.4. **Important Reference Documents.**

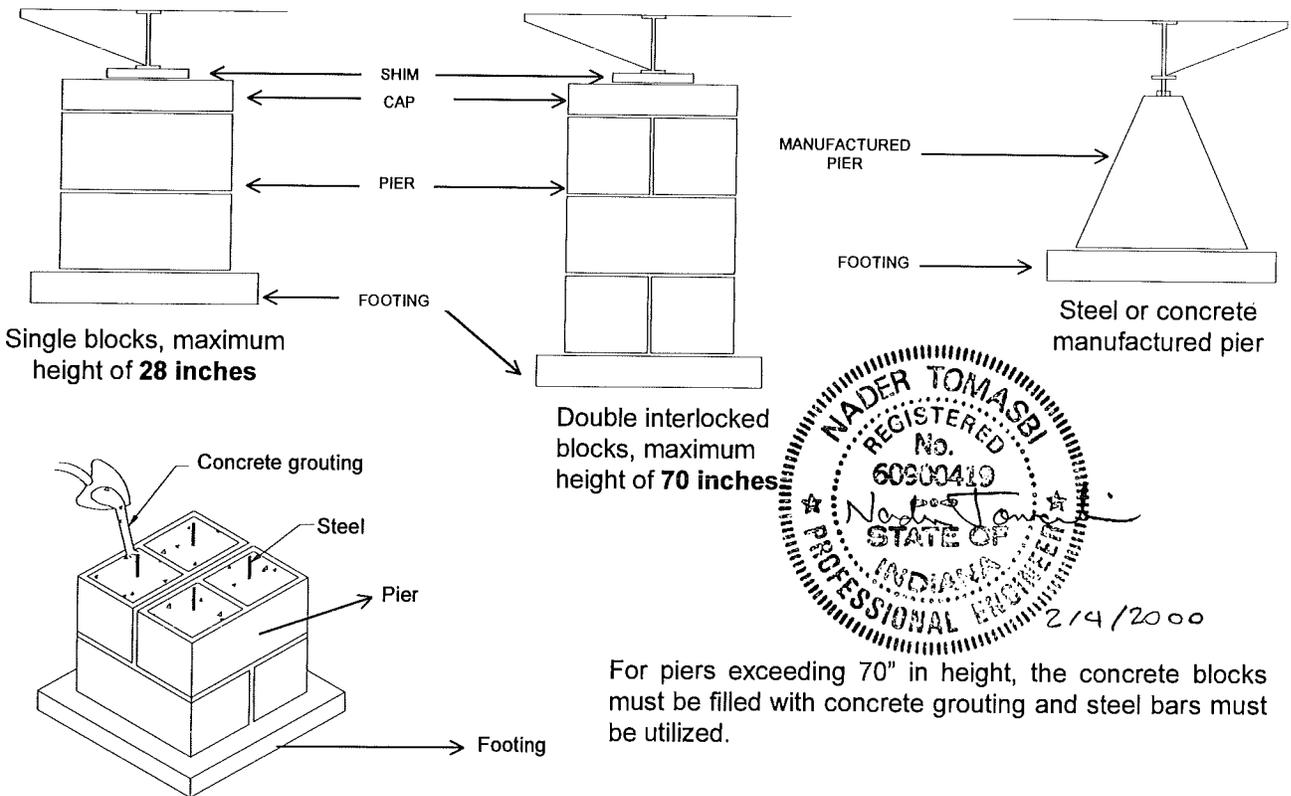
4.4.1. **ANSI/NCSBCS A225.1 - 1987,** "Manufactured Home Installations," NCSBCS, 505 Huntmar Park Drive, Herndon VA 22070 (703) 437-0100.

4.4.2. **ANSI A58.1 - 1982,** "Minimum Design Loads for Buildings and Other Structures," ANSI, 1430 Broadway, New York NY 10018.

4.4.3. **FEMA 85,** "Manufactured Home Installation in Flood Hazard Areas," FEMA, Washington DC 20472 (202) 646-2708, September, 1985.

4.4.4. **HUD Handbook 4930.3 (1989),** "Permanent Foundations Guide for Manufactured Housing," HUD, 415 7th Street, SW, Washington DC 20036, June, 1976.

FIGURE 4.1 - TYPICAL FOOTING & PIER INSTALLATION



For piers exceeding 70" in height, the concrete blocks must be filled with concrete grouting and steel bars must be utilized.

TABLE 4.1

TYPE OF CONCRETE BLOCK	MAXIMUM PIER HEIGHT
SINGLE STACK	28"
DOUBLE INTERLOCK	70"

NORMAL MANUFACTURED HOME INSTALLATION
Type of Foundation System

- Piers - Ground Anchors** - Home rests on piers of concrete block, formed-in-place concrete, permanent wood or steel pedestals on permanent wood, crushed stone or concrete footers. Ground anchors in soil angled to resist straps or embedded in concrete deadmen soil. Straps tied to the frame, with or without over-the-top straps.
- Concrete slab or continuous footing.** Home rests on a concrete slab or ribbons of concrete. Straps tied between frame and perimeter footers or concrete slab. Recommend installing earth anchors prior to pouring concrete slab. Concrete slab should be sloped to prevent water accumulation under home.
- Pile/post system.** Home rests on piles/posts. Place sufficiently deep in the ground to resist all wind, snow, frost heave and earthquake forces. Straps fasten home to piles/posts or caps placed thereon.
- Concrete or concrete block load-bearing perimeter walls (basement or crawl space).** Home rests on exterior load bearing walls which sit on concrete footings, sufficiently heavy to hold down home to resist all external forces.

REQUIRED FOOTINGS & PIER BLOCKING (For Homes NOT Requiring Perimeter Blocking)

In Table 4.2 below are the design loads used to determine the support structure for homes not requiring perimeter blocking. The minimum values to be used for pier and footing design based on the indicated roof live load and a floor live load of 40 pounds per square foot (PSF) are specified in Table 4.2. See Figure 4.2 for typical pier layout.

All load bearing pier supports and footings may be subject to approval by the local enforcement agency. As specified in Table 4.2, each pier shall have adequate capacity to support the design load shown. The required sizes of footings will depend on soil bearing capacity test results. In lieu of soil tests, confer with the local building authority for recommended soil bearing capacity in your area. The areas beneath the footing shall have all grass and organic materials removed before installation. All footers must be placed on either undisturbed soil or compacted fill.

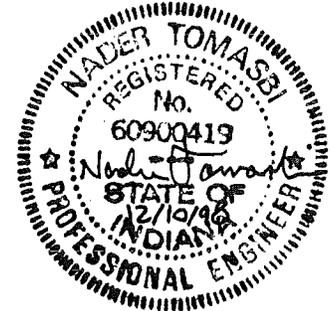


TABLE 4.2

PIER LOADING UNDER MAIN I-BEAMS (When only frame blocking is required.)

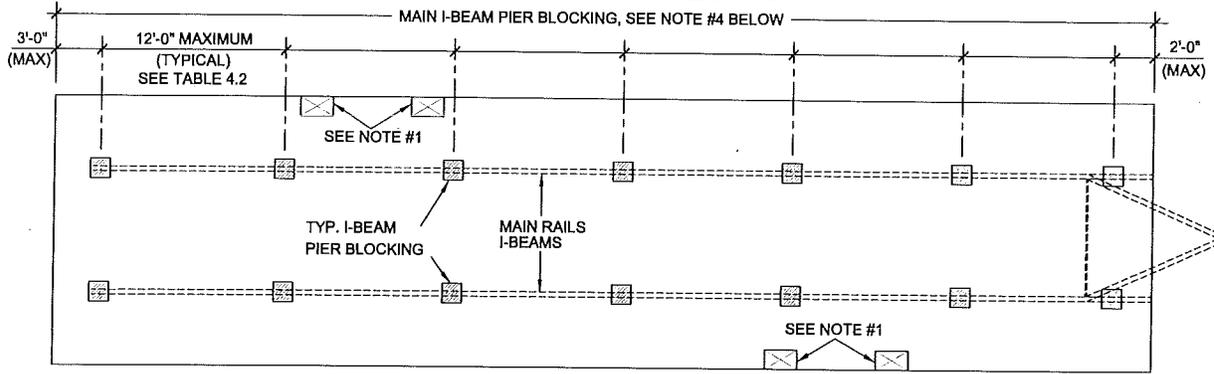
Pier Spacing Under Main I-Beams (Ft)	12' or 24' WIDE HOMES			14', 28', or 42' WIDE HOMES			16' or 32' WIDE HOMES		
	Pier Load (Lbs) 20 PSF Roof Load (South Zone)	Pier Load (Lbs) 30 PSF Roof Load (Middle Zone)	Pier Load (Lbs) 40 PSF Roof Load (North Zone)	Pier Load (Lbs) 20 PSF Roof Load (South Zone)	Pier Load (Lbs) 30 PSF Roof Load (Middle Zone)	Pier Load (Lbs) 40 PSF Roof Load (North Zone)	Pier Load (Lbs) 20 PSF Roof Load (South Zone)	Pier Load (Lbs) 30 PSF Roof Load (Middle Zone)	Pier Load (Lbs) 40 PSF Roof Load (North Zone)
4	2130	2420	2560	2410	2740	2940	2700	3060	3320
5	2660	3020	3190	3020	3420	3670	3370	3830	4150
6	3190	3620	3830	3620	4110	4410	4050	4590	4980
7	3720	4230	4470	4220	4790	5140	4720	5360	5810
8	4250	4830	5110	4820	5480	5880	5400	6120	6640
9	4780	5440	5750	5430	6160	6610	6070	6890	7470
10	5320	6040	6380	6030	6850	7340	6750	7650	8300
12	6390	7250	7660	7250	8250	8800	8100	9200	9950

NOTES:

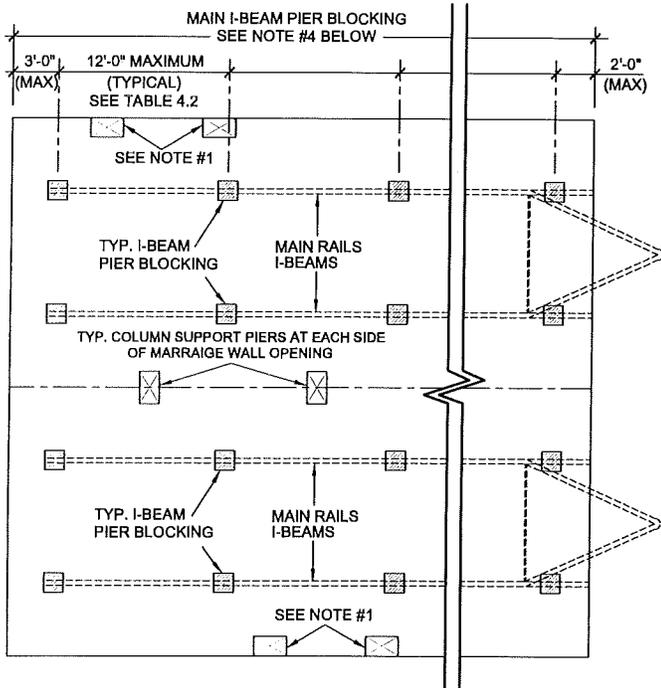
1. See Table 4.4 for minimum footing sizes based on pier loads and allowable soil bearing capacities. The footing sizes and pier loads are minimums required for the applicable conditions. The footing shall not be smaller than the pier it supports or 256 square inches.
2. The maximum spacing of supports is not to exceed 12 feet.
3. Where it is impractical to maintain spacing, such as in the axles area, the average of the distance to each adjacent support may be used to determine support requirements, for example: if the distances to the adjacent supports were 6'-0" and 8'-0", the average spacing would be 7'-0".
4. Homes located in the north (40 PSF) roof load zones MUST have perimeter blocking per Table 4.3 unless indicated otherwise by a letter from plant of manufacturing.

FIGURE 4.2 PIER LAYOUT FOR HOMES @ SOUTH AND MIDDLE ROOF LOAD ZONES

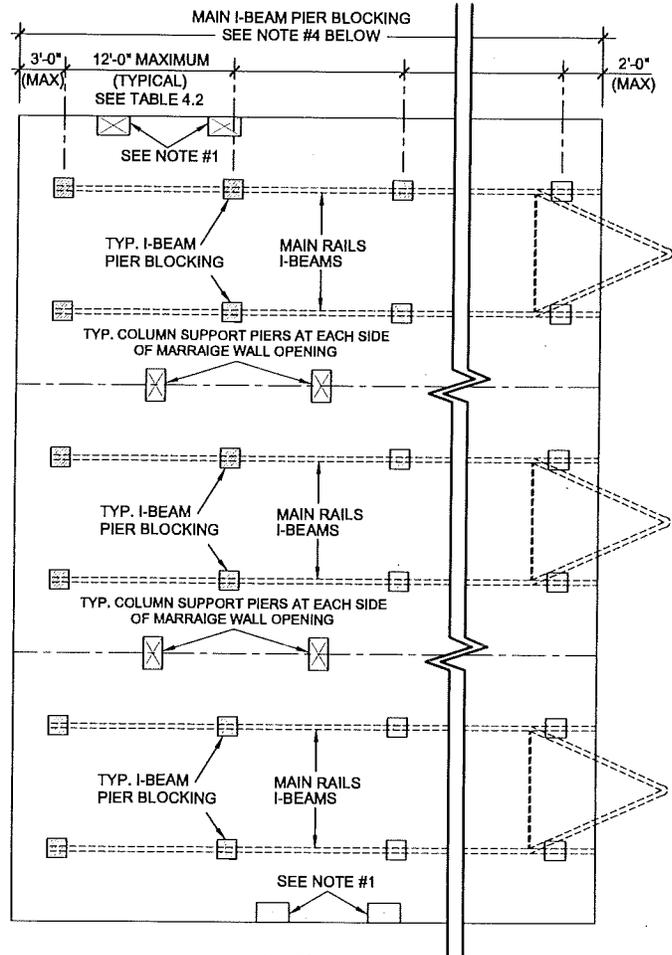
TOP VIEW - SINGLE SECTION



TOP VIEW - DOUBLE SECTION

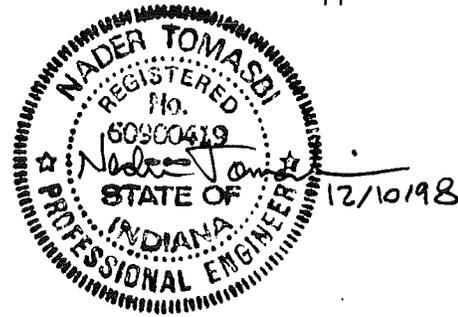


TOP VIEW - TRIPLE SECTION



GENERAL NOTES

1. PERIMETER PIER BLOCKING MUST BE PROVIDED AT BOTH SIDES OF ALL EXTERIOR DOORS (EXCEPT AT ENDS OF HOMES) AND ANY OPENING IN THE EXTERIOR SIDEWALL 4'-0" OR WIDER (INCLUDING PATION DOORS, RECESSED ENTRIES, BAY WINDOWS, AND PORCHES).
2. FOOTINGS AND PIER SUPPORTS MUST BE DESIGNED TO SUPPORT THE LOAD VALUES SHOWN.
3. COLUMN SUPPORT PIERS, LOCATE ONLY AT BOTH SIDES OF CENTER LINE WALL OPENING.
4. THE TABULATED PIER LOADS INCLUDE THE INDICATED LIVE LOADS PLUS HOME DEAD LOADS (INCLUDING CHASSIS AND WALLS).
5. RECOMMENDED MAXIMUM PIER SPACING FOR MAIN I-BEAM FOR THE FOLLOWING I-BEAM SIZES IS:
 - 8" I-BEAM.....8'-0" OC
 - 10" I-BEAM.....10'-0" OC
 - 12" I-BEAM.....12'-0" OC



REQUIRED FOOTINGS & PIER BLOCKING (For Homes Requiring Perimeter Blocking)

In Table 4.3 below are the design loads used to determine the support structure for homes requiring perimeter blocking. The minimum values to be used for pier and footing design based on the indicated roof live load and a floor live load of 40 pounds per square foot (PSF) are specified in Table 4.3. See Figure 4.3 for typical pier layout.

All load bearing pier supports and footings may be subject to approval by the local enforcement agency. As specified in Table 4.3, each pier shall have adequate capacity to support the design load shown. The required sizes of footings will depend on soil bearing capacity test results. In lieu of soil tests, confer with the local building authority for recommended soil bearing capacity in your area. The areas beneath the footing shall have all grass and organic materials removed before installation. All footers should be placed on either undisturbed soil or compacted fill.

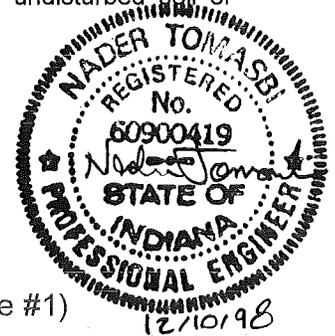


Table 4.3

**PIER LOAD
FRAME PLUS PERIMETER BLOCKING**
(When Both Frame And Perimeter Blocking Are Required. See Note #1)

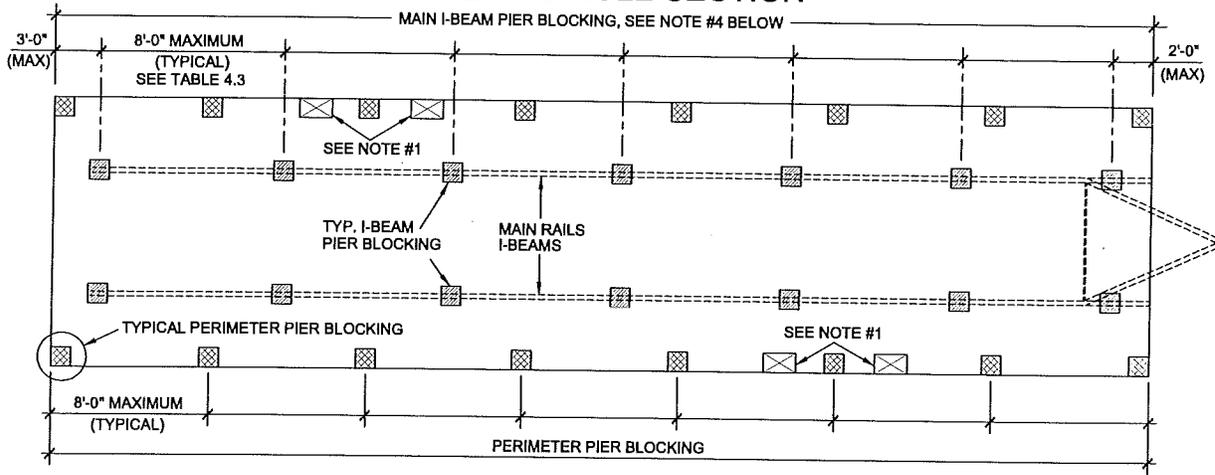
Section Width Ft.	Roof Live Load PSF	Pier Location	Maximum pier loads:		
			Maximum pier spacing		
			4'	6'	8'
12', 14', or 16' Single Section	20	Frame	1400#	2100#	2800#
		Perimeter	1470#	2206#	2941#
	30	Frame	1400#	2100#	2800#
		Perimeter	1800#	2701#	3601#
	40	Frame	1400#	2100#	2800#
		Perimeter	2130#	3196#	4261#
	60, 80, or 120	Frame	1100#	2100#	2800#
		Perimeter	See note 2	See note 2	See note 2
24', 28', 32' or 42' Multi-Section	20	Frame	1400#	2100#	2800#
		Perimeter	1470#	2206#	2941#
		Marriage Line	2941#	4411#	5882#
	30	Frame	1400#	2100#	2800#
		Perimeter	1800#	2701#	3601#
		Marriage Line	3601#	5401#	7202#
	40	Frame	1400#	2100#	2800#
		Perimeter	2130#	3196#	4261#
		Marriage Line	4261#	6391#	8522#
	60, 80, or 120	Frame	1400#	2100#	2800#
		Perimeter	See note 2	See note 2	See note 2
		Marriage Line	See note 2	See note 2	See note 2

NOTES:

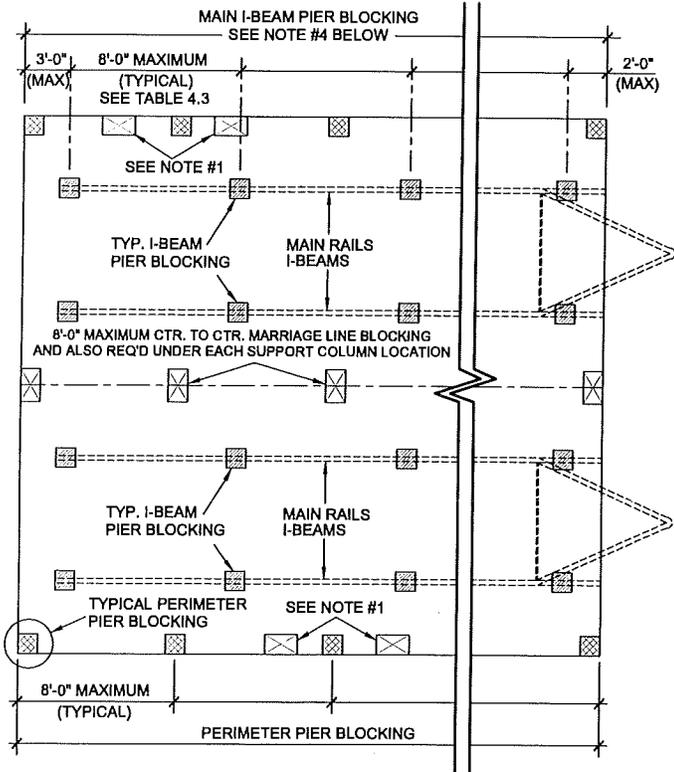
1. Perimeter blocking is required at North Zone (40 PSF) or higher roof load areas. Use above loads when optional perimeter blocking is provided at South (20 PSF) and Middle (30 PSF) roof load zones.
2. Homes at 60, 80 and 120 PSF roof load areas MUST have a continuous perimeter and marriage line foundation support.

FIGURE 4.3 PIER LAYOUT FOR HOMES @ NORTH ROOF LOAD ZONE

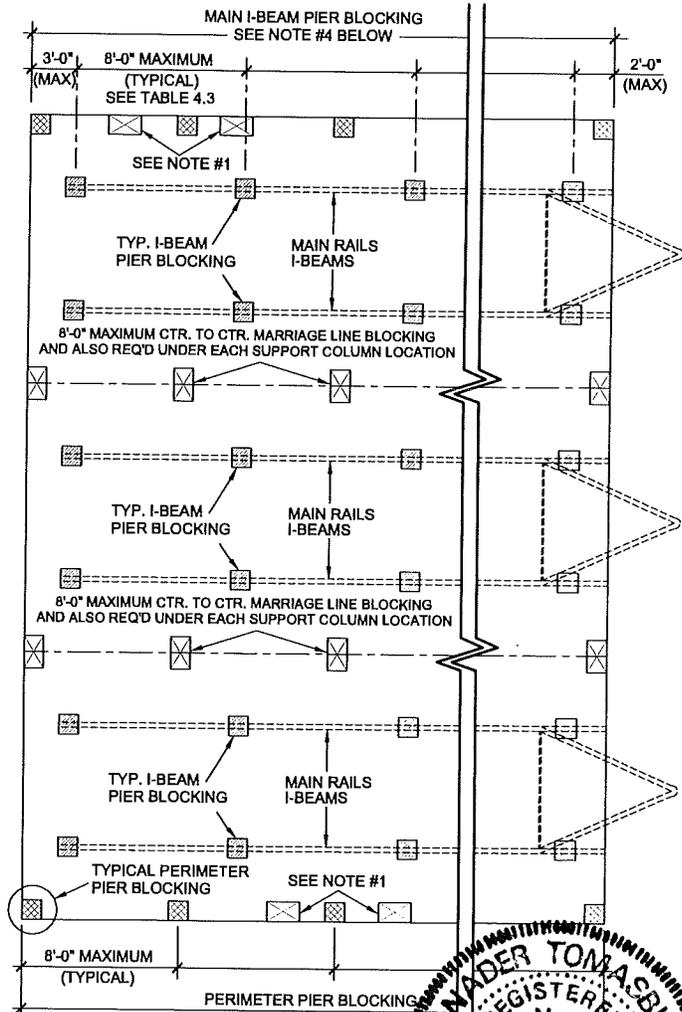
TOP VIEW - SINGLE SECTION



TOP VIEW - DOUBLE SECTION



TOP VIEW - TRIPLE SECTION



GENERAL NOTES

1. ADDITIONAL PERIMETER PIER BLOCKING MUST BE PROVIDED AT BOTH SIDES OF ALL EXTERIOR DOORS (EXCEPT AT ENDS OF HOMES) AND ANY OPENING IN THE EXTERIOR SIDEWALL 4'-0" OR WIDER (INCLUDING PATIO DOORS, RECESSED ENTRIES, BAY WINDOWS, AND PORCHES).
2. FOOTINGS AND PIER SUPPORTS MUST BE DESIGNED TO SUPPORT THE LOAD VALUES SHOWN.
3. COLUMN SUPPORT PIERS, LOCATE ONLY AT BOTH SIDES OF CENTER LINE WALL OPENING.
4. THE TABULATED PIER LOADS INCLUDE THE INDICATED LIVE LOADS PLUS HOME DEAD LOADS (INCLUDING CHASSIS AND WALLS).



TABLE 4.4

FOOTING SIZES

SOIL CAPACITY (PSF)	MINIMUM PAD SIZE (IN X IN)	FOOT CAPACITY	PAD THICKNESS	
			SINGLE STACK PIER	DOUBLE STACK PIER
1000	20 X 20	2778	4"	4"
	24 X 24	4000	4"	4"
	30 X 30	6250	4"	4"
1500	16 X 16	2667	4"	4"
	20 X 20	4167	4"	4"
	24 X 24	6000	4.5"	4"
	30 X 30	9375	6.5"	4"
2000	16 X 16	3556	4"	4"
	20 X 20	5556	4"	4"
	24 X 24	8000	5.5"	4"
2500	16 X 16	4444	4"	4"
	20 X 20	6944	5"	4"
	24 X 24	10000	6"	4"
3000	16 X 16	6222	4"	4"
	20 X 20	8333	5"	4"
3500	16 X 16	5333	4"	4"
	20 X 20	9722	5"	4"
4000	16 X 16	7111	4"	4"
	20 X 20	11111	6"	4"

Foundations in soil with a bearing capacity of less than 1,000 PSF or more than 4,000 PSF must have soil capacities verified by a local Registered Professional Engineer familiar with local site conditions.

TABLE 4.5

PIER LOADING UNDER MARRIAGE LINE OF MULTI SECTION HOMES

Span Between Columns (FT.) See Note 1	24' WIDE HOMES			26', 28', & 42' WIDE HOMES			32' WIDE HOMES		
	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)	Pier Load (Lbs)
	20 PSF Roof Zone	30 PSF Roof Zone	40 PSF Roof Zone	20 PSF Roof Zone	30 PSF Roof Zone	40 PSF Roof Zone	20 PSF Roof Zone	30 PSF Roof Zone	40 PSF Roof Zone
6	1080	1440	1800	1260	1680	2100	1440	1920	2400
10	1800	2400	3000	2100	2800	3500	2000	3200	4000
12	2160	2880	3600	2520	3360	4200	2880	3840	4800
14	2520	3360	4320	2940	3920	4900	3360	4480	5600
16	2880	3840	4800	3360	4480	5600	3840	5120	6400
18	3240	4320	5400	3780	5040	6300	4320	5760	7200
20	3600	4800	6000	4200	5600	7000	4800	6400	8000
24	4320	5660	7200	5040	6720	8400	5760	7680	9600

NOTES:

- Where a column is located between two openings or when two columns are too close for separate piers, sum the loads for each opening to obtain the required pier load.
- See Table 4.4 for minimum footing sizes based on pier loads and allowable soil bearing capacities.
- The concentrated loads consists of roof loads only.
- Pier locations at the marriage wall are marked with paint or metal indicator straps (or see specific foundation plans for pier locations.)
- Use the following procedure for pier loads at each sides of opening(s) in 60, 80, & 120 psf roof loads:
 Pier load @ 30 psf from above table x 2 = Pier load at 60 psf
 Pier load @ 40 psf from above table x 2 = Pier load at 80 psf
 Pier load @ 40 psf from above table x 3 = Pier load at 120 psf



5. Chapter 5 - Set-Up Procedures

5.1. **Moving Home To Location.** Make sure the following items are completed before placing the home:

1. The site is properly prepared. See Chapter 3.
2. All concrete work necessary to setting the home is finished.
3. Utilities are installed or available.
4. Any trenching, for crossover drain lines or for wheels that will be left in place, is complete.
5. Items that could be difficult to install after the home is sited (such as anchors and ground moisture retarders) are in their proper locations.

CAUTION: THE HOME WEIGHS SEVERAL TONS. USE ADEQUATE TEMPORARY SUPPORT BLOCKING TO SAFEGUARD WORKERS. WOOD BLOCKING FOR YOUR HOME IS RECOMMENDED.

5.1.1. **Positioning the home.** When not placing the home on a concrete slab or poured-in-place footings, mark the corners of the home and lay out footings, and support devices close to where they will be used.

5.1.2. Then move the home or first section into position.

5.2. **Singlewide Homes - Blocking and Leveling**

5.2.1. Before doing any jacking, place support piers for the home in the locations under the home as specified in the home installation instructions.

5.2.2. Use a minimum of two jacks, each with a rating of at least ten tons.

5.2.3. Jack only on the main chassis I-Beam. Locate the jack directly under the vertical web of the I-Beam. Do not jack on the seam (joint between flanges) of a twin I-Beam.

5.2.4. Use a large 3/8 inch thick steel plate, C-channel or other equivalent plate between the main chassis I-Beam and the jack head to distribute the load.

5.2.5. The jack base, and any blocking, must be located on firm ground.

5.2.6. Do not operate the jacks while you are under the main I-Beams of the home.

5.2.7. Use jacks only for raising the home. Do not rely on the jacks to support the home.

5.2.8. Place 4" x 6" x 48" minimum safety timbers between the I-Beams and ground in case of jack failure. Timber should be hardwood.

5.2.9. Raise the home in small increments and provide additional blocking between the home and the piers and safety piers as the home is raised.

5.2.10. Do not go under the home while it is supported on the jacks.

FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH.

Reminders before jacking...

1. Use only jacks in good condition with a minimum rating of 10 tons.

2. Use a Minute Man C-Channel jacking plate or equivalent between jack and steel I-Beam to distribute the concentrated loads from jack to I-Beam.

3. Use a firm support under the jack base to prevent tipping or settling of the jack. A 12" x 12" or larger pad is recommended.

4. Always follow the sequence of jacking outlined below to avoid overstressing structural members.

5.2.11. The jacking procedure is as follows:

5.2.11.1. After the home is located in its final position, you can preliminary level it by using the hitch jack but only after adequately wheel blocking the home so it does not roll.

5.2.11.2. Jack up one side of the home by placing one jack just forward of the front spring hanger and the other just behind the rear spring hanger of the same I-Beam. These two jacks must be operated simultaneously to raise the home. Jack low side of the home first. Install footings and piers; one just forward of the front jack and another just behind the rear jack (taking care not to exceed the correct spacing selected from Table 4.2.)

5.2.11.3. Next, jack the main I-beam at the front and position a pier within 2'-0" of the end of the I-Beam. At the completion of this step, this side of the home should be approximately level.

5.2.11.4. Repeat Steps 5.2.11.2 and 5.2.11.3 for the other side of the home. At the completion of this step, the home should be roughly level from front to rear and from side to side.

5.2.11.5. Place the remaining pier supports under the main I-Beam on each side taking care to maintain a maximum distance of no more than the spacing determined from Table 4.2 with piers located as specified at each end of each I-Beam (see Figure 4.2).

5.2.11.6. Level the home within reasonable tolerances, using a 6 foot carpenter's level, water level or similar equipment. The final height adjustment is obtained by jacking the I-Beam and placing hardwood shims between the piers and I-Beam or other approved methods such as adjustable piers. **THIS LEVELING PROCESS IS IMPORTANT FOR THE APPEARANCE**

AND IS ESSENTIAL FOR THE PROPER OPERATION OF DOORS, WINDOWS AND THE DRAINAGE SYSTEM.

5.2.11.7. Place additional supports at each side of sidewall openings over 4'-0" wide and each side of exterior doors.

5.2.11.8. Within 90 days after initial set-up, the home should be relevelled, if necessary, to compensate for any pier settlement. Following the procedure in Item 5.2.11.6. above.

5.2.11.9. **NOTE: DURING THE LEVELING OR RELEVELING PROCESS, LOOSEN FRAME TIES AND OVER-THE-ROOF TIES (IF PROVIDED) PRIOR TO JACKING THE HOME.**

5.3. Multi-Section Homes

Blocking and Leveling

With the exception of the requirement for support under the marriage walls of multisection units, leveling and blocking procedure are the same as for single section units. Prepare the site as previously described. It may be desirable to construct the footing and piers (to grade height) prior to moving the home to its final location. Figure 4.2 and 4.3 illustrate the typical pier layouts, making special note of additional piers required at center beam support locations. The following procedure describes the setting of a double-section home only. The procedure required for a triple-section home is similar, except for the blocking & leveling the "T-Section" first, prior to that of the "U" Section and "X" section.

5.3.1. **Leveling and blocking the U Half.** Figure 5.1 shows the way we recommend you level the home. To prevent tipping or settling, use a firm support under jacks. Use a steel channel or plate between jacks and steel beams to distribute the load. Use equipment in good working condition and strong enough to handle the loads. Work safely whenever you are under, in, or around a home that is being set. Use the following jacking sequence:

5.3.1.1. Using the water level described in Figure 5.1 or a 6' level, check the level of the floor crosswise in the axle area. If the floor is not level from side to side, place the 10 ton jack under the low side I-beam at the axle area and carefully raise the I-beam until the floor is level. Place blocks under the I-beam, on each side, at the pier points closest to the jack. Insert wedges, as shown on Figure 5.1, so that the blocks bear the weight.

5.3.1.2. Place the level lengthwise on the floor, and working towards each end of the home, place blocks and wedges under both I-beams, at selected pier spacings. Make continuous checks with the level, both lengthwise and crosswise. If you must jack the U-side to keep it level as you

work towards the ends, jack it only under the I-beams and only enough to make it level.

5.3.2. **Leveling and Blocking the X Half.**

CAUTION: Do not proceed with the X-half until the U-half is completely level and properly blocked. After it is, proceed as follows:

5.3.2.1. Remove the plastic used to close up the open side of each half during transportation, but DO NOT remove the wood supports holding up the ceiling at the open sides. Park the X-side as closely as possible to the U-side. At this point, insert a mating gasket between the two halves at the floor line, endwalls and roof. We suggest use of 6" fiberglass insulation or an equivalent sill sealer. Slide the X-half sideways to the U-half by using two come-alongs, placing one end on the U-half I-beam and the other end on the X-half I-beam. Use one come-a-long at the front and one at the rear, or more if necessary at interim locations.

5.3.2.2. Place a 10 ton jack under the X-half inside I-beam about 1/3 of the floor length from each end. Carefully jack the X-half inside I-beam until the X-half floor edge is about even with the U-half floor edge, as shown in Figure 5.3.

5.3.2.3. Loosely lag the X-half floor joists to the U-half floor per Figure 5.10 at Wind Zone 1 and per Figure 5.13 for Wind Zone 2 and 3. To prevent the splitting of rim joist pre-drilling of holes may be required. Do not tighten these lags at this time.

5.3.2.4. Temporarily block the X-half inside I-beam at selected pier spacings, removing the jacks and place them under the X-half outside I-beam about 1/3 of the floor length from each end.

5.3.2.5. Carefully jack the X-half outside I-beam until the X-half floor is approximately level crosswise. Temporarily block the X-half outside I-beam at pier points. The X-half should be very close to the U-half, and the small space (if any) between the floors and ceilings of the X and U halves should be the same. The two sides should now be loosely attached at the floor joists. The U-side is completely level and blocked. The X-side should be nearly level because the ceilings and floors were made to match up. You are now ready to level the X-half so that it is even with the U-half, and to permanently block it.

5.3.2.6. Place a 10 ton jack under each I-beam of the X-half at the axle area. Carefully adjust the floor to the X-half until it is level with the floor of the U-half. Go to the outside I-beam of the X-half and adjust it so that the X-half floor is level crosswise. The X-half floor should now be level crosswise and even with the U-half floor.

5.3.2.7. Place blocks under the I-beams, on each side of the X-half at the pier points closest to the jacks. Insert wedges, as shown on the drawing, so that the blocks bear the weight.

5.3.2.8. Work towards either end, placing blocks and wedges under the I-beams on both sides, at selected pier spacing. Make continuous checks with the level to be sure that the floor of the X-half is level and even with the U-half. CAUTION: Do not over-jack the X-half or you will strain the lags attaching the two halves together, make the floor unlevel or cause other problems.

5.3.2.9. Both halves should now be blocked and level. Before tightening the lags through the floor joists underneath the home, check all alignments. Are the front and rear end walls flush? Are the floors and ceilings flush? Space floor lags per Fig. 5.10 at Wind Zone 1 and Fig. 5.13 at Wind Zones 2 & 3.

NOTE: When the two sections are in place, aligned and leveled, gaps between floors or ridge beams, 1 1/2" wide maximum, which DO NOT extend the full length of the home may be closed up with plywood or lumber shims. The lag screws in the shimmed portion may need to be increased in length to ensure that they engage both the floor rim or roof ridge beam with the same penetration as area's without gap. Reduce the lag application angle to 30 degrees in gap area for proper penetration (see Detail "A" fig. 5.4).

5.3.2.10. Now that each half is properly leveled and blocked, and the floors are securely lagged together, you are ready to move to the ridge beam.

5.3.3. **Roof Ridge Fastening. See Figure 5.4.**

5.3.4. **End Wall Fastening.**

5.3.4.1. Secure the end wall studs, where the two halves come together, **by driving #8 x 4" wood screws every 8"** into both sides of the matching end wall studs at Wind Zone 1 (Ref. Figure 5.13 at Wind Zone 2 & 3.)

The home should now be level, properly blocked and properly and securely fastened together. CAUTION: Once again, use the level and be sure that the floor is properly level throughout the home. Many problems will result if the floors are not level or if the home is not properly fastened together. This is your final check for level. Adjust the wedges between the blocks and the I-beams so that the floor is level.

5.3.5. **Shingle Roof Close-Up.** (see Figure 5.5)

5.3.6. **Interior Closure.**

5.3.6.1. Carefully remove the ridge beam supports used to brace the ridge beam during shipment. Do not damage the ceiling.

5.3.6.2. Interior marriage column support studs at each end of open span area must be toe-nailed together with 16d nails 12" O.C. or #8 x 4" wood screws at 24" O.C. staggered. (see Figure 5.6).

5.3.6.3. Install the center beam furnished with the home.

5.3.6.4. Fit and secure carpet. Use your carpet stretcher. Bond carpet seams with your heat bond tape and seaming iron. Put the tape (glue side next to carpet) under the seam and apply heat to the top of the tape, pressing the carpet into the glue. (NOTE: You must stretch the carpet up to the seam and tack it down temporarily until you get the carpet seamed.)

5.3.6.5. Install interior trim moldings, as necessary.

5.3.6.6. Adjust for proper operation all cabinet doors, interior and exterior doors and sliding or folding doors, as necessary.

5.3.7. **Exterior Closure.**

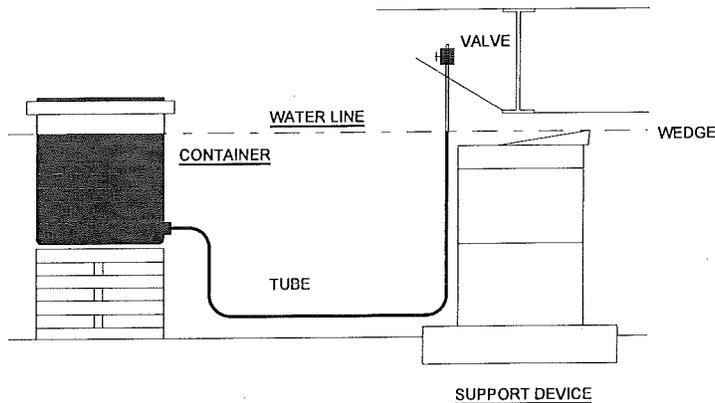
5.3.7.1. The house-type exterior lap siding (if applicable) needed to close-up the ends has been furnished with the home. Starting at the bottom, install each course of siding, cutting to fit as necessary (see Figure 5.7).

5.4. **Crossover Connections For Multi-Section Homes.**

5.4.1. **Utility Crossovers.** Connect water, drainage, gas, electricity, telephone and utility crossovers as outlined in Chapter 8.

5.4.2. **Ductwork Crossovers.** Clamp the flexible air conditioning and/or heating ducts to the sleeves projecting through the bottom covering, seal the ducts adjustable collars with several wraps of duct tape, and suspend them above the ground. If sleeves are not installed, cut opening for one sleeve and attach to main duct as close as possible directly under furnace (see Figure 5.8); opposite sleeve(s) should be attached to the main duct(s) at a point where there are approximately as many registers forward as there are to the rear. Inspect to insure that duct work is not crushed or touching the ground and is as level as possible.

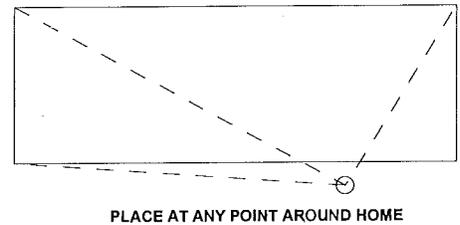
FIGURE 5.1 - USE OF WATER LEVEL



Material to Make Level

- Five gallon pail with lid
- Plastic tubing - 100 feet x 3/8" or 1/2"
- Cork - 1-1/2"
- Male barbed fitting - 3/8" x 3/4"
- Steel washer - 7/8"
- Nut - 3/4"
- Female barbed fitting - 3/8" x 1/2"
- Male valve - 1/2"
- Pipe sealant....
- Food coloring - 8 oz.
- Use RV solvent in cold weather....

FIGURE 5.2 - WATER LEVEL PLACEMENT



"How to Use a Water Level"

Unroll tubing: Position level where it is to be used. Take care not to have kink in it, step on it or lay anything on it...

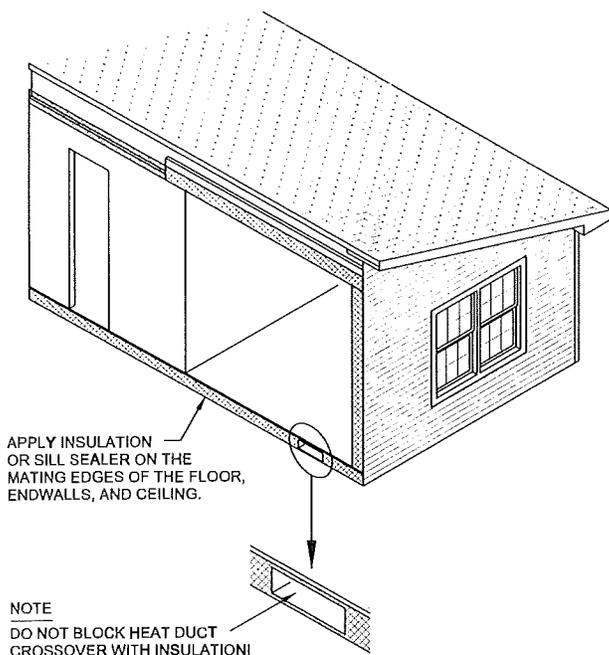
Check for air bubbles: To remove bubbles; lower valve below bottom of container and open. Close valve when bubbles are out...

Container location: Located so valve can reach all areas of home. Build up container so water line in valve end of tubing is at the predetermined height support devices will be set...

Leveling: Secure valve above determined height and open. Adjust device as needed. Close valve and move to next leveling location...

NOTE: Level all support devices before lowering home.

FIGURE 5.3 - JOINING OF MULTI-SECTION UNITS



CAREFULLY JACK THE X-HALF INSIDE I-BEAM UNTIL THE X-HALF FLOOR EDGE IS ABOUT EVEN WITH THE U-HALF FLOOR EDGE

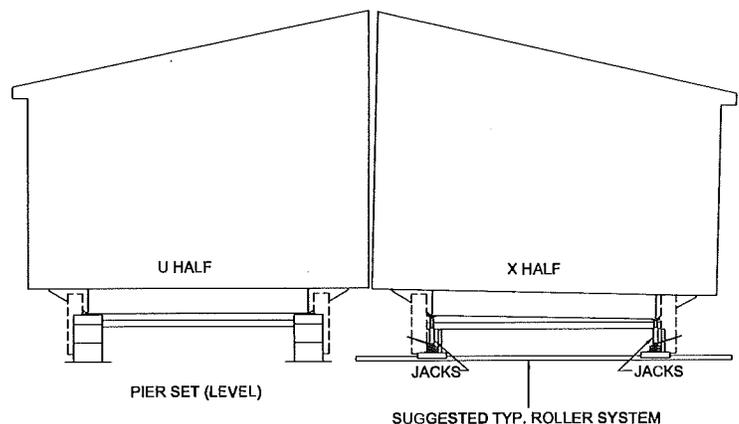


FIGURE 5.4 FASTENING AT ROOF MATING LINE

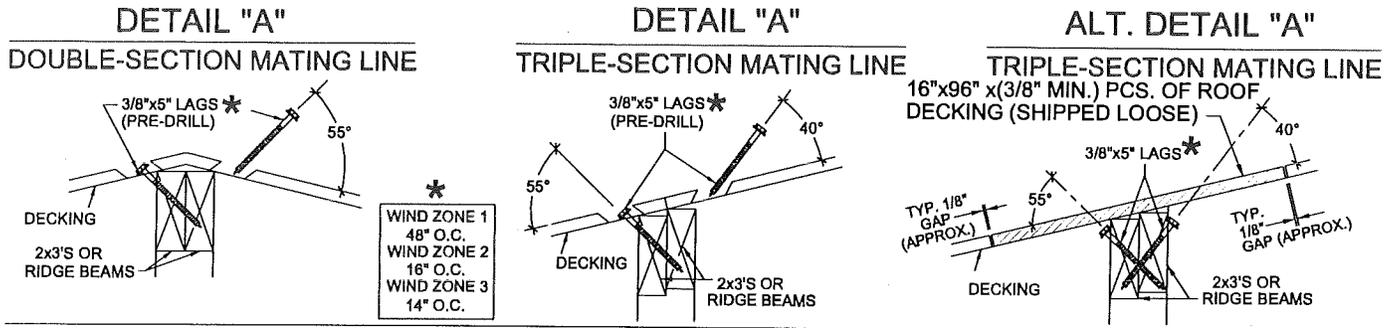
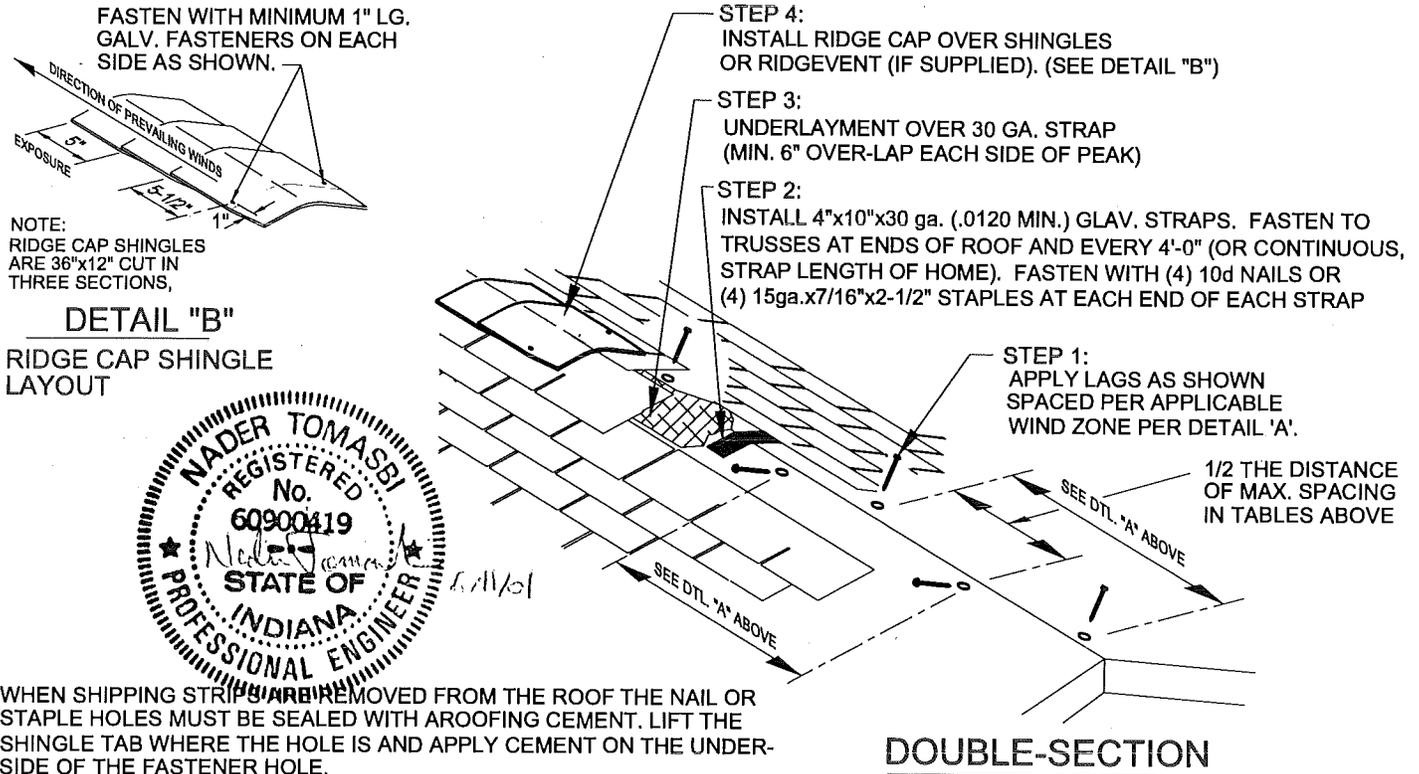
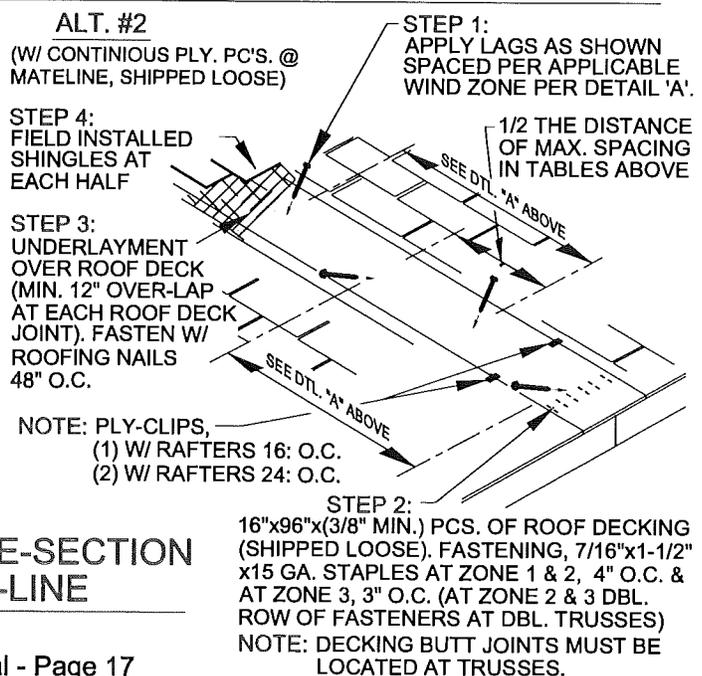
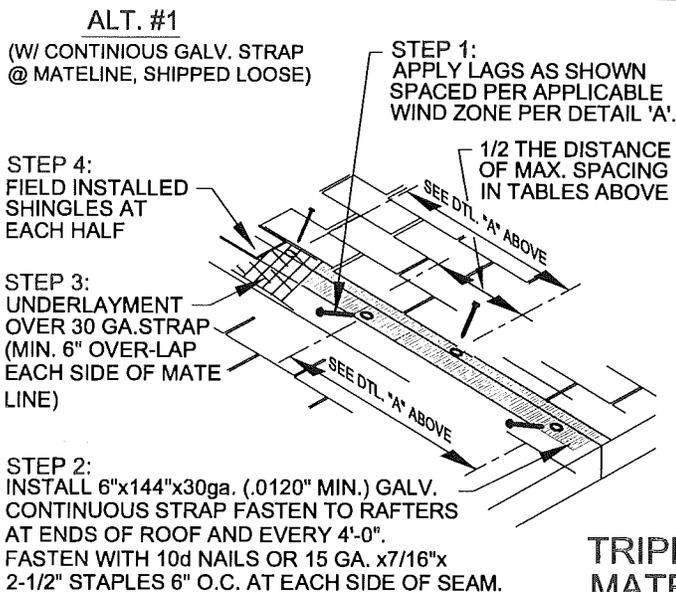


FIGURE 5.5 SHINGLE ROOF CLOSE-UP

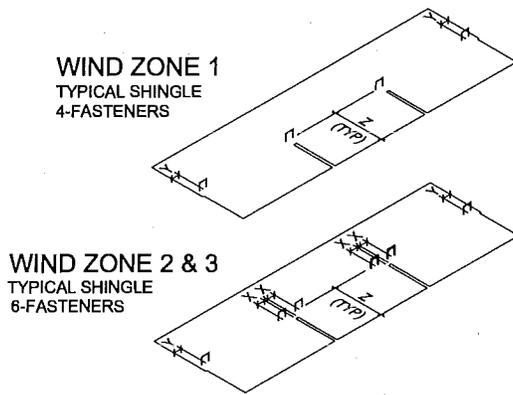


WHEN SHIPPING STRIPS ARE REMOVED FROM THE ROOF THE NAIL OR STAPLE HOLES MUST BE SEALED WITH A ROOFING CEMENT. LIFT THE SHINGLE TAB WHERE THE HOLE IS AND APPLY CEMENT ON THE UNDER-SIDE OF THE FASTENER HOLE.



TRIPLE-SECTION MATE-LINE

FIGURE 5.5 (continued) - SHINGLE ROOF CLOSE-UP



SHINGLE FASTENING DETAIL

1"x1"x16 GA. (MIN) GALV. STAPLES OR
0.407 x 1" x 12 GA. (MIN) ROOFING NAILS
(4 PER SHINGLE, MIN.) @ WIND ZONE 1
(6 PER SHINGLE) @ WIND ZONE 2 AND 3

X = 1" +/- 1"
Y = 1" FROM END OF SHINGLE
Z = 5-5/8" FROM EDGE OF SHINGLE

FASTENERS ARE NOT TO BE ABOVE
TAR STRIP OR BELOW RAIN SLOTS

1. INSTALL 15# FELT RIDGE CAP OVER PREVIOUSLY INSTALLED 4x10 METAL STRAPS AND LAGS.
2. ADD TWO ROWS OF SHINGLES AS SHOWN OVER 15# FELT RIDGE CAP.

FIGURE 5.6 - TYPICAL FASTENING AT MARRIAGE WALL COLUMNS

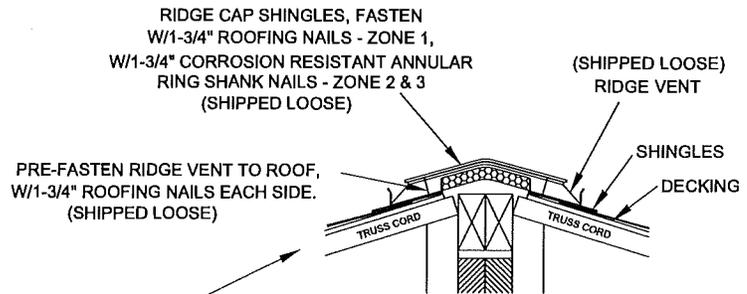
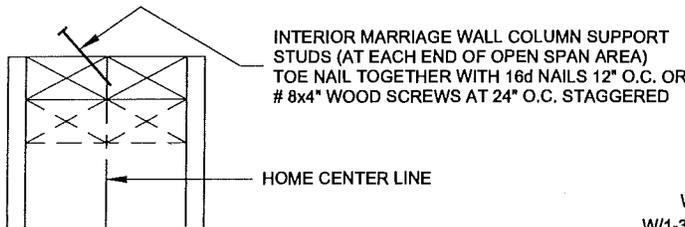
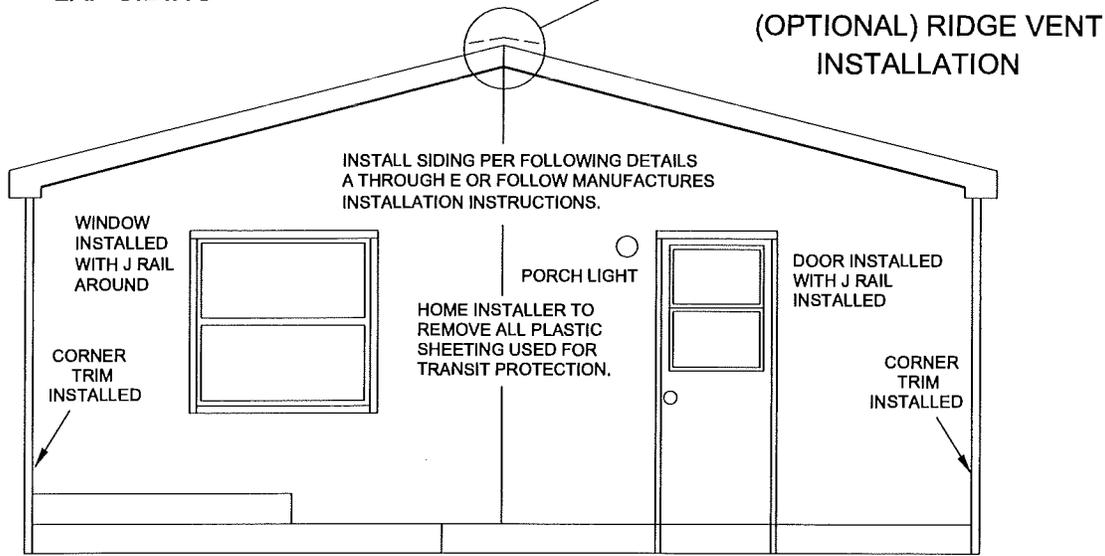


FIGURE 5.7 - FIELD APPLIED HORIZONTAL LAP SIDING

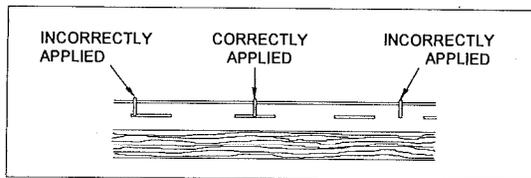


MULTI-SECTION HOMES WITH HORIZONTAL LAP SIDING MAY BE SHIPPED WITH NO SIDING ON THE FRONT AND REAR END WALLS. LIBERTY HOMES WILL INSTALL: DOORS/WINDOWS TRIMMED WITH J-RAIL, CORNER TRIM AND COVER WITH PLASTIC SHEETING FOR TRANSIT. ALL SIDING, STARTER TRIM, FASTENERS AND VENTS WILL BE SHIPPED LOOSE IN THE HOME FOR INSTALLATION ON SET UP.

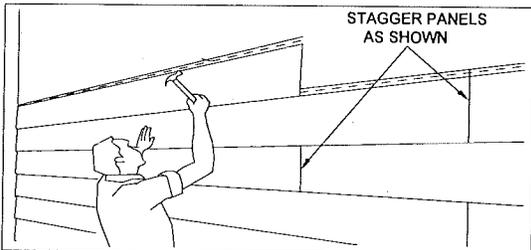
HOME INSTALLER TO COMPLETE INSTALLATION AFTER HOME IS SET UP. THIS WOULD INCLUDE THE INSTALLATION OF ROOF VENTS IF REQUIRED.

FIGURE 5.7 (CONTINUED) LAP SIDING INSTALLATION

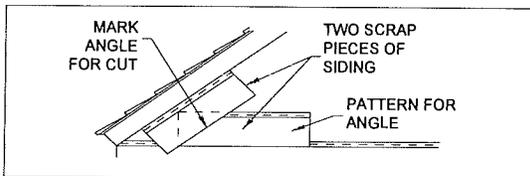
VINYL LAP SIDING



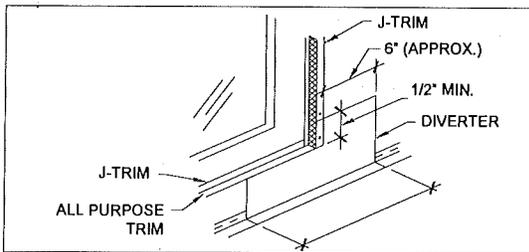
DETAIL A



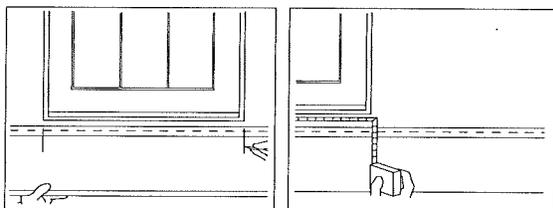
DETAIL B



DETAIL C



DETAIL D



DETAIL E

Apply a 2" wide strip of duct tape at the marriage joint of the endwalls for the entire height of the walls. Apply the duct tape directly over the sheathing.

The siding panels should be attached using 7/16 x 1 1/2" x 16 gauge galvanized steel or aluminum staples. (6d galvanized nails may also be used.) Staples should be driven so that there is a 1/32" clearance between the siding and staple crown to allow some lateral movement. Fasten every 16" to each stud. See Detail A for proper fastening.

Snap the bottom course of siding into the starter strip and fasten to the wall. Leave a 1/4" space at corner posts and 'J' channels around window and door openings to allow for expansion. Do not fasten within 4" of an accessory. Vertical butt joints in panels should overlap 1". Do not fasten the panel within 4" of the joint. Install vinyl, aluminum, felt or other suitable material for flashing at bottom corners of doors and windows per Detail E. Apply caulk around siding and light blocks, water faucets, or other small penetrations.

Install successive courses similarly to the first. Butt joints in adjacent courses should be offset by at least 24". Joints in alternate courses should be aligned vertically (see Detail B).

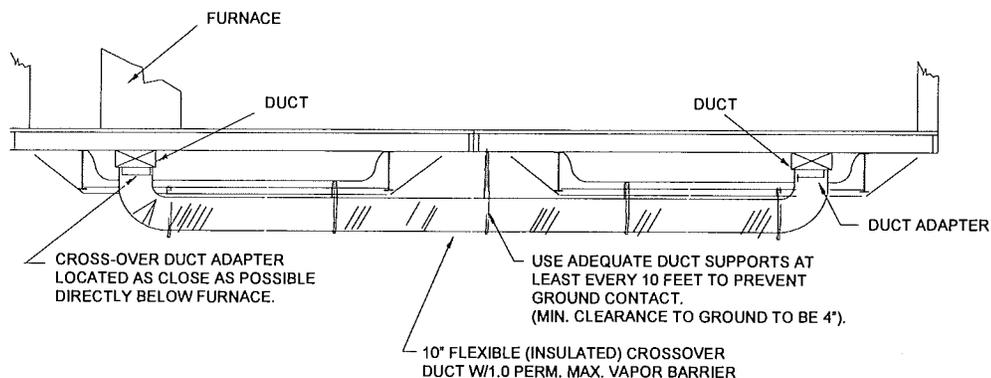
Panels will have to be cut at headers and sills. A single panel should extend without joints across the width of the opening. When cutting a panel at a sill, measure the distance between the bottom of the opening and the top lock of the lower course, then deduct 1/4" (see Detail C.)

Slide the cut panel into the under sill trim and install. Note that the undersill trim piece may have to be furred to maintain the proper pitch of the siding.

Measure and cut the header panel in the same manner as indicated above.

The top sections at the gable will need to be angle cut. Use two scrap pieces of siding to make a pattern (see Detail D). Interlock one piece with the siding panel below. Hold the other piece on top against the gable. Mark a line on the bottom piece and cut. Use this piece as a pattern for cutting gable pieces. Install the gable pieces by interlocking with the lower course, sliding into the gable 'J' rail and fastening.

FIGURE 5.8 CROSSOVER DUCT INSTALLATION



5.5. Tie Down Requirements For Single And Multi Section Homes.

5.5.1. **Anchoring Instructions.** After blocking and leveling, the installer should secure the home against the wind loads. The type of installation determines how this should be done, as follows:
CAUTION: In order to avoid electrocution and the possibility of damage to underground services, prior to digging for the purpose of securing anchors, make sure that the location of underground electrical cables, gas lines, sewer lines, and water lines are clearly marked above ground.

5.5.1.1. **Number And Location Of Anchors.** Select the number and location of straps and anchors from the charts and diagrams from Figures 5.9 thru 5.13. Only listed and approved ground anchors capable of resisting at least the minimum loads given in the chart must be used.

5.5.1.2. **Installation Of Anchors.** Tie down systems are designed using anchors with minimum working capacity of 3150 lbs. Installation of anchors (angle, stabilizer plates, type of soiling, ...) should be per anchor's installation instructions.

When connecting more than one strap to a single anchor, lining the shaft of each anchor between the two straps is recommended (refer to anchor's installation instruction.)

5.5.1.3. **Tie-Down Instructions.** Because high winds can occur anywhere, the home should be "tied down" to the ground in order to withstand sliding and/or overturning. See Figures 5.9 through 5.13 for anchor and tie down strap at applicable wind zones. Vertical ties or straps positioned at studs are available as an optional item for additional stability in Wind Zone 1 (standard at Wind Zone 2 and 3). When provided, attach to ground anchors with 3,150# minimum rating.

5.5.1.4. **Steps to Proper Tie Down.** To properly install ground anchors and tie-down straps for a home, certain criterias must be established. These criterias are as follows:

1. Wind Zone area where home is to be placed.
2. Main I-beam spacing of the home.
3. Width and length of the home.
4. Distance from top of I-beam to ground.
5. Torque reading of the soil.
6. Nominal roof pitch of unit (for doublesection.)

After determining the above criteria:

1. Make sure the distance from the bottom of the floor to ground level is within allowable range noted on the tables. Note: Allowable heights vary based on the wind zone, width of the home and frames main I-beam spacing. For example, the Table in the Figure 5.11 would allow 42" maximum height from ground for 28' double

section in Wind Zone 2 with 75.5" I-beam spacing.

2. Based on your wind zone, space the anchor and straps per Tables in Figure 5.9 through 5.13. Note: Homes with roof pitch higher than 4/12 (roof slope in excess of 20 degrees) may require additional tie downs. See addendum to installation instructions for this option.

3. Determine the correct soil anchors to be used. An anchor soil test probe is required to test the soil where the home is to be set. The soil test probe looks like a long drill bit with a fitting at the top which accepts a torque wrench. The torque required to turn the probe, when the probe reaches the desired anchor depth is measured. The anchor manufacturer provides a chart relating the measured torque value to the type of anchor required to provide the desired holding force. **AN INCORRECTLY SELECTED ANCHOR WILL NOT PROVIDE THE REQUIRED LOAD RESISTANCE.** For example, assume a torque of 300 inch-pounds was measured at a probe depth of 4 feet. A class 4 soil is indicated from the anchor manufacturer data. The correct anchor would be identified and rated for a class 4 soil.

Soil anchors must be installed as directed by the anchor manufacturer. The anchor manufacturer installation instructions should describe the correct anchor placement with regard to direction, water table level and frost line location.

5.5.2. Severe Climatic Conditions.

5.5.2.1. **Freezing Climates.** Be sure anchor augers are installed below the frost line. During period of frost heave, be prepared to adjust tension on the straps to take up slack.

5.5.2.2. **Severe Wind Zones.** Installing your home in any zone that requires greater wind-resisting capabilities than those for which it was designed is not recommended. (See data plate.)

5.5.2.3. **Flood-Prone Areas.** Installation of our manufactured homes in flood prone areas are not recommended. Foundation considerations are discussed in section 4.3.1 and the FEMA document referenced in Paragraph 4.4.3. Unconventional anchorage and tiedowns often are needed in designing and constructing the special elevated foundations that may be required in flood-prone areas. Consult a registered professional or structural engineer.

5.6. **Installation Of On-Site Attached Structures.** Design all attached buildings and structures to support all of their own live and dead loads, and to have fire separation as required by state or local ordinances.

5.6.1. **Attached Garages.** Attached garages must be installed according to the manufacturer's instructions and to all applicable local codes. They must be supported independently of the factory-built portion of the home. Electrical circuits in garages should be provided with ground fault interruption.

5.6.2. **Porches.** Site-constructed porches must be constructed and inspected according to applicable local building codes. They must be supported independently of the factory-built portion of the home.

5.6.3. **Steps, Stairways and Landings.** Steps, stairways and landings must be constructed and inspected according to applicable local building codes.

5.6.4. **Skirting.** Skirting installed around the home must have non-closing vents located at or near each corner and as high as possible to cross-ventilate the entire space under the home. Open vent area must be equal to at least one square foot for every 150 square feet of the home's floor area, and this area must be further increased when insect screens, slats, etc. are used over the open vent area. In freezing climates, install skirting so as to accommodate 1-2 inches of frost heave uplift to prevent buckling of floors. Take care to insure that rainwater cannot be channeled or trapped between the skirting and siding, and that normal movement of siding is not restricted.

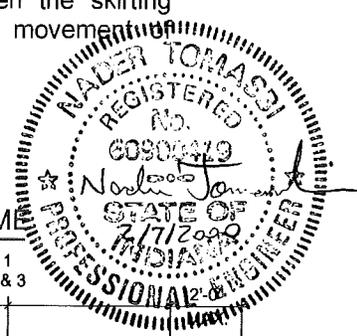
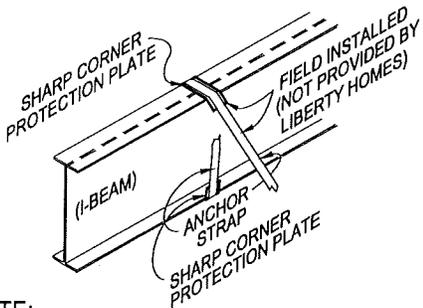


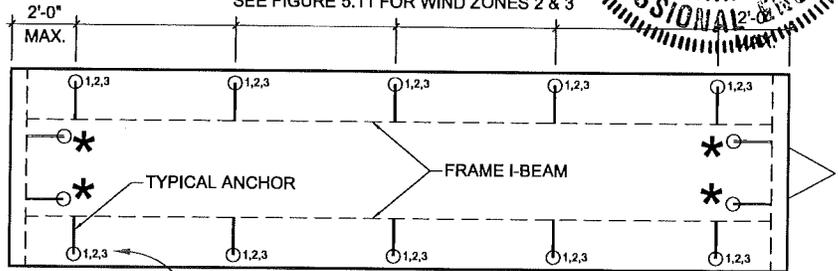
FIGURE 5.9 - TIE DOWN LOCATION REQUIREMENTS



NOTE:
SHARP CORNER PROTECTION PLATE - 2"x6" (MIN.) PLATE GAUGE SAME AS ANCHOR STRAP OR GREATER.

SINGLE SECTION HOME

SEE FIGURE 5.10 FOR WIND ZONE 1
SEE FIGURE 5.11 FOR WIND ZONES 2 & 3

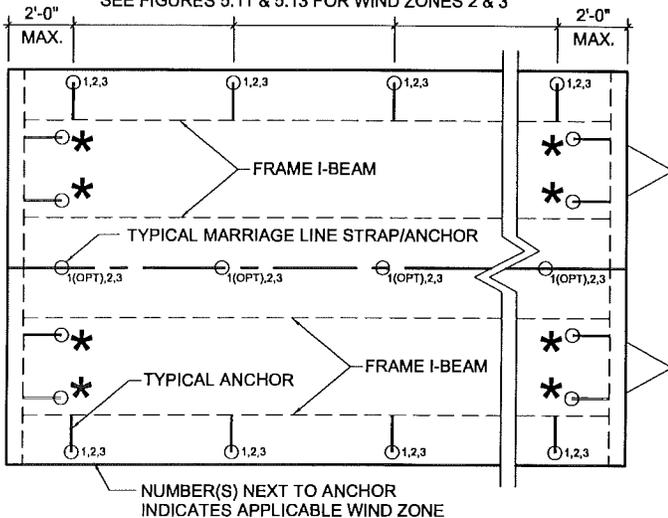


* SEE FIGURE 5.12 FOR TIEDOWN REQUIREMENT

NUMBERS NEXT TO ANCHORS INDICATE APPLICABLE WIND ZONE

DOUBLE SECTION HOME

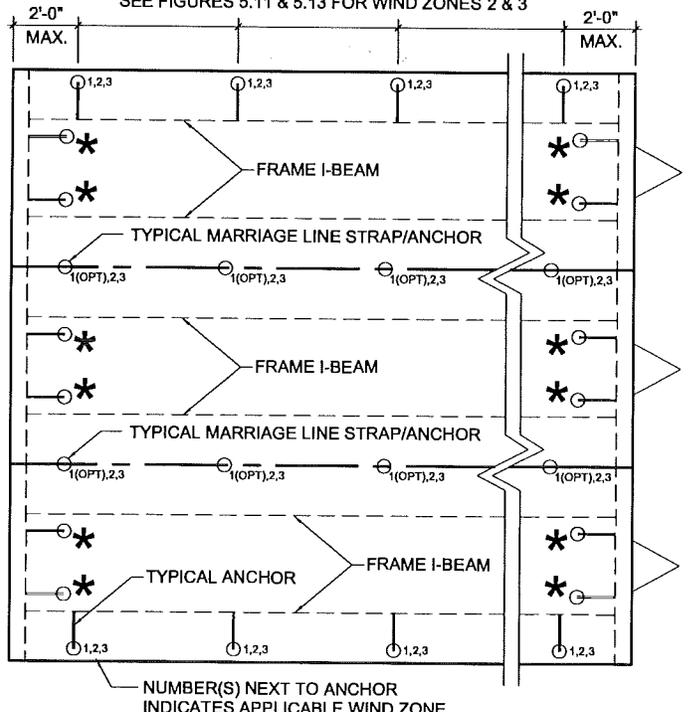
SEE FIGURE 5.10 FOR WIND ZONE 1
SEE FIGURES 5.11 & 5.13 FOR WIND ZONES 2 & 3



NUMBER(S) NEXT TO ANCHOR INDICATES APPLICABLE WIND ZONE

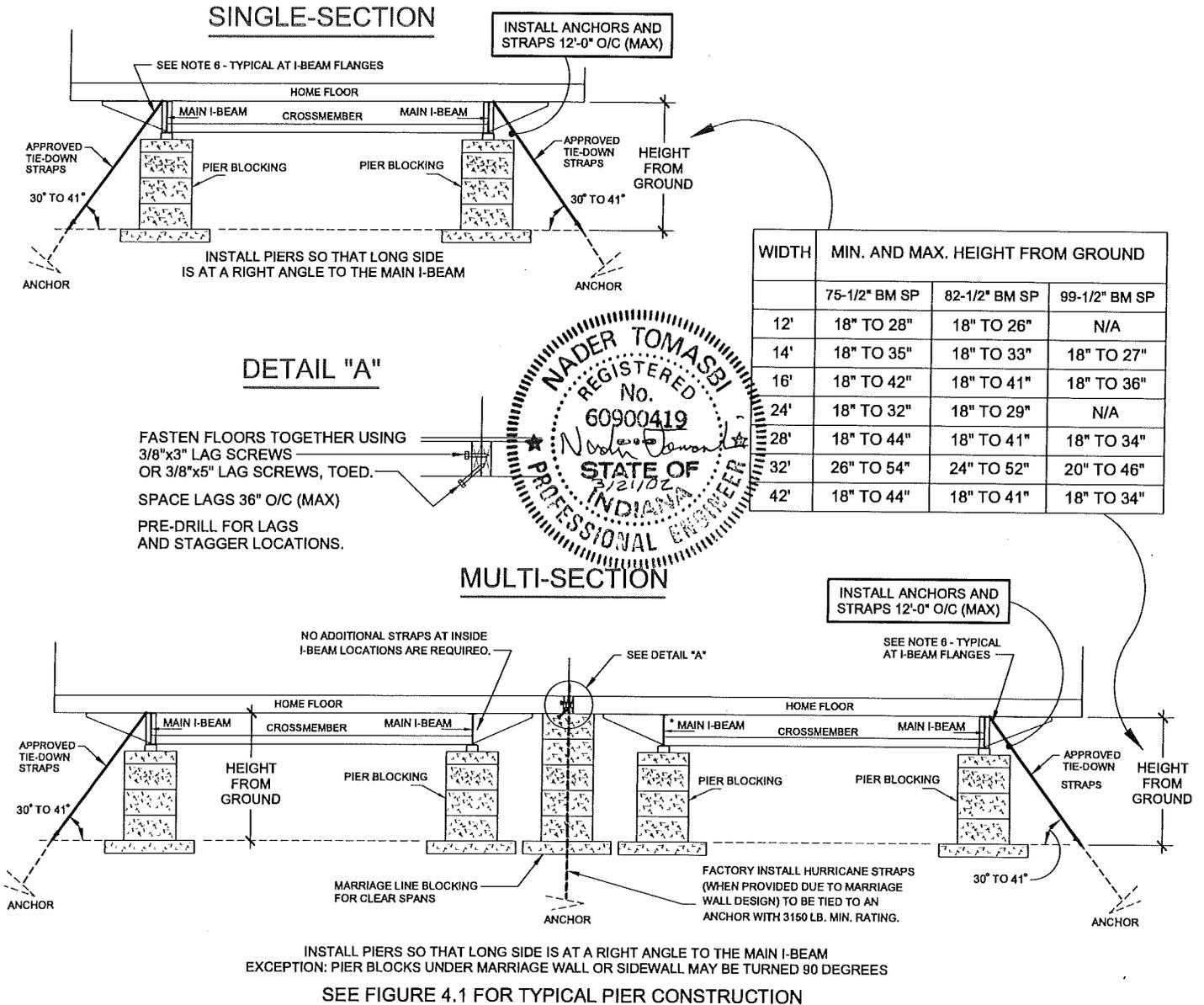
TRIPLE SECTION HOME

SEE FIGURE 5.10 FOR WIND ZONE 1
SEE FIGURES 5.11 & 5.13 FOR WIND ZONES 2 & 3



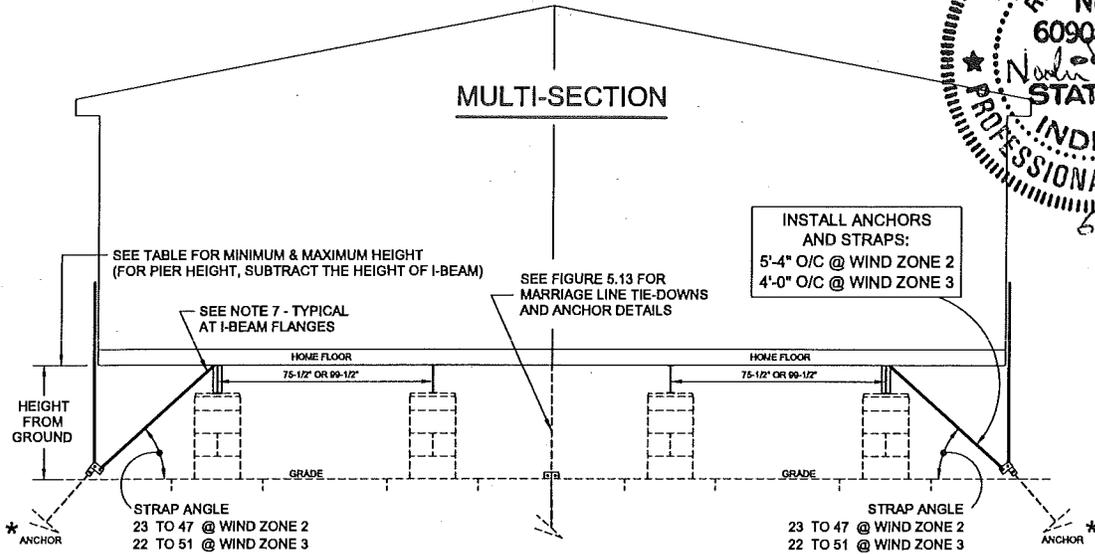
NUMBER(S) NEXT TO ANCHOR INDICATES APPLICABLE WIND ZONE

FIGURE 5.10 -FLOOR FASTENING AND TIE DOWN REQUIREMENTS FOR WIND ZONE 1

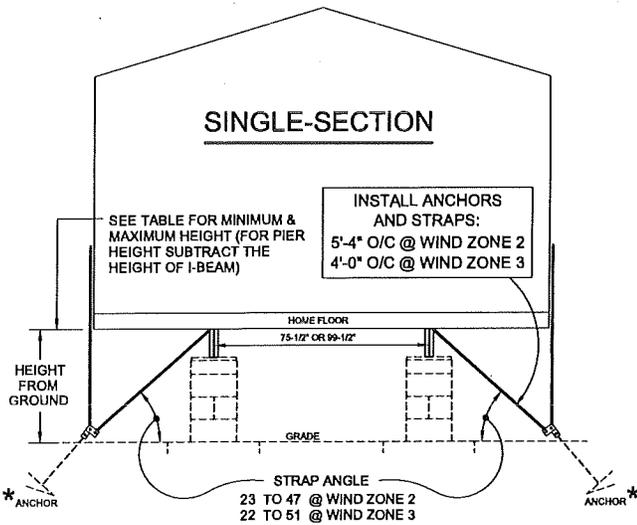


1. OTHER METHODS APPROVED BY LOCAL BUILDING AUTHORITIES MAY BE USED.
2. STEEL ANCHORING EQUIPMENT EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AT LEAST 0.30 OZ. OF ZINC PER SQUARE FOOT OF STEEL.
3. ANCHORING EQUIPMENT SHALL BE CAPABLE OF RESISTING AN ALLOWABLE LOAD OF 3150# AND SHOULD BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3593-91, STANDARD SPECIFICATION FOR STRAPPING FLAT STEEL AND SEALS.
4. ANCHORS SHOULD BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
5. GROUND ANCHORS SHOULD BE INSTALLED TO THEIR FULL DEPTH AND EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE.
6. TIEDOWNS MUST START NO MORE THAN 2'-0" FROM EACH END OF UNIT (I.E. OPEN END ANCHORAGE). PROTECTION SHALL BE PROVIDED AT SHARP CORNERS WHERE THE ANCHORING SYSTEM REQUIRES EXTERNAL STRAPS OR CABLES. IN ALL CASES, NO EXPOSED PART OF ANCHORING SYSTEM SHALL PROTRUDE PAST EDGE OF FLOOR.
7. DESIGN BASED ON 75-1/2", 82-1/2", AND 99-1/2" I-BEAM SPACING WITH A MAXIMUM SIDEWALL HEIGHT OF 8'-0"

FIGURE 5.11 -TIE DOWN REQUIREMENTS FOR WIND ZONE 2 & 3 AT EXTERIOR WALLS

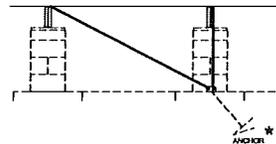


* ANCHOR TO BE RATED 3150# TOTAL FOR BOTH STRAPS (INSTALL PER MANUFACTURERS INSTALLATION INSTRUCTIONS)



INSTALL HURRICANE STRAPS (VERTICAL & DIAGONAL) PER DETAIL "A" ONLY AT AREA'S WHERE ANCHOR & STRAP INSTALLATION DIRECTLY UNDER SIDEWALL IS NOT POSSIBLE DUE TO CUT FLOOR AT ENDS (SKEWED CORNERS) OR RECESSED ENTRY AT SIDEWALL

DETAIL "A"



Notes

1. Vertical ties are required in addition to frame tiedowns. Frame tiedowns and anchors are not provided.
2. Steel anchoring equipment exposed to the weather shall be protected with at least 0.30 oz. of zinc per square foot of steel.
3. Anchoring equipment shall be capable of resisting an allowable load of 3150# and should be certified by a registered Professional Engineer or Architect to resist these specified forces in accordance with procedures in ASTM standard specification D3593-91, Standard Specification For Strapping Flat Steel And Seals.
4. Anchors should be certified for these conditions by a Professional Engineer, Architect, or a nationally recognized testing laboratory as to their resistance, based on the installed angle of the diagonal tie and/or vertical tie loading and angle of anchor installation, and type of soil in which the anchor is to be installed.
5. Ground anchors should be installed to their full depth, and embedded below the frost line, and be at least 12" above the water table.
6. Tiedowns must start no more than 2'-0" from each end of unit (i.e.: open end anchorage).
7. Protection shall be provided at sharp corners where the anchoring system requires external straps or cables.
8. In all cases, no exposed part of anchoring system shall protrude past edge of floor. Anchor may be located within 6" max. in from edge of floor.
9. Design based on 75-1/2" to 99-1/2" I-beam spacing and a maximum sidewall height of 8'-0".

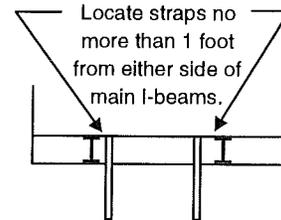
WIDTH	MIN. AND MAX. HEIGHT FROM GROUND (SEE ABOVE) @ WIND ZONE			
	ZONE 2		ZONE 3	
	75-1/2" BM SP	99-1/2" BM SP	75-1/2" BM SP	99-1/2" BM SP
12'	18" TO 35"	N/A	18" TO 41"	N/A
14'	21" TO 47"	18" TO 35"	19" TO 55"	18" TO 41"
16'	26" TO 58"	18" TO 41"	22" TO 64"	18" TO 49"
24'	18" TO 30"	N/A	18" TO 35"	N/A
28'	18" TO 42"	18" TO 30"	18" TO 50"	18" TO 35"
32'	18" TO 52"	18" TO 40"	18" TO 61"	18" TO 47"
42'	18" TO 42"	18" TO 30"	18" TO 50"	18" TO 35"

FIGURE 5.12 - LONGITUDINAL TIEDOWN STRAPS AT FRONT AND REAR OF THE HOME

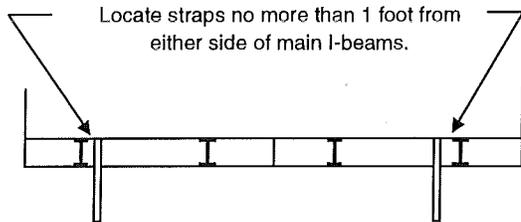
WIND ZONE 1:

Only homes at length noted below or less would require longitudinal straps:

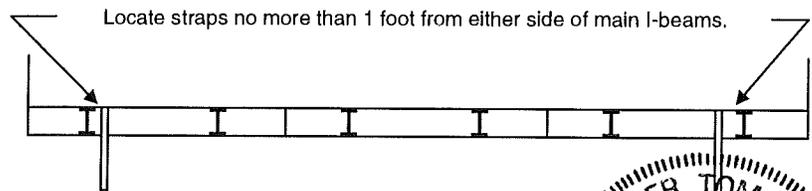
- Single section homes: 52' long or less would require longitudinal straps.
 - Double section homes: 55' long or less would require longitudinal straps.
 - Double section homes with hinged trusses: 63' long or less would require longitudinal straps.
 - Triple section homes: 58' or less would require longitudinal straps.
- (lengths noted above are actual size and do not reflect the length of the hitch)



Single section longitudinal strap req.

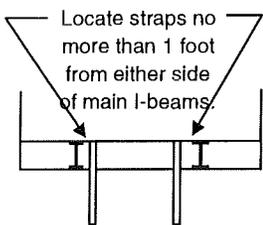


Double section longitudinal strap req.

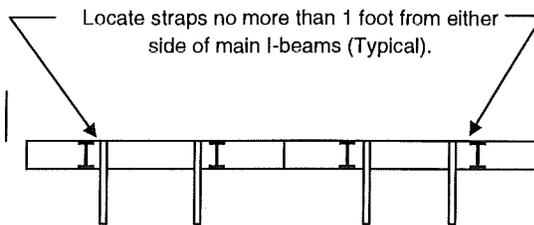


Triple section longitudinal strap req.

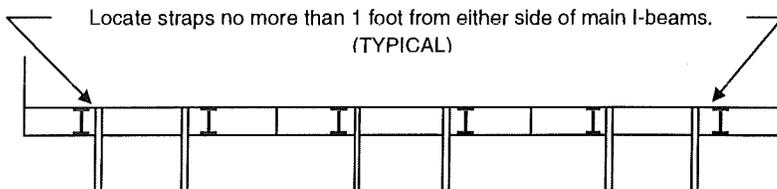
WIND ZONE 2 AND 3 : All homes in wind zones 2 & 3 would require longitudinal straps.



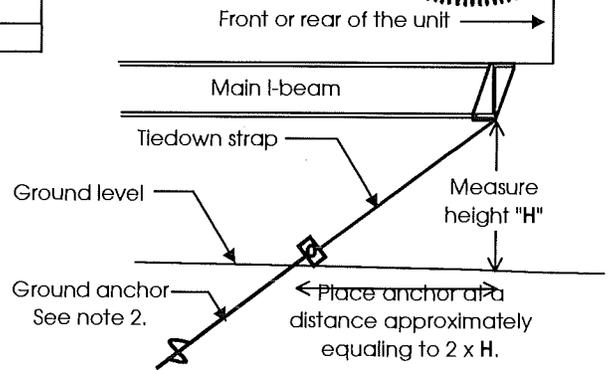
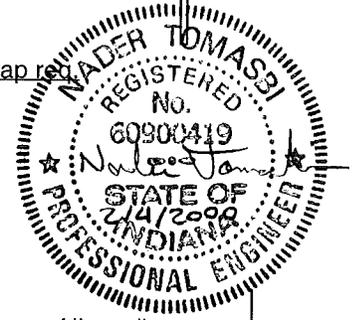
Single section longitudinal strap req.



Double section longitudinal strap req.



Triple section longitudinal strap req.



Longitudinal strap installation detail.

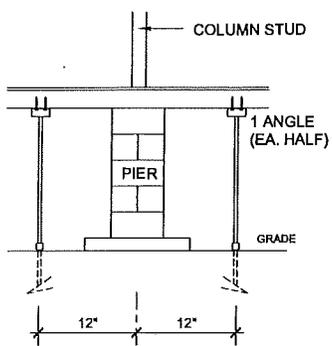
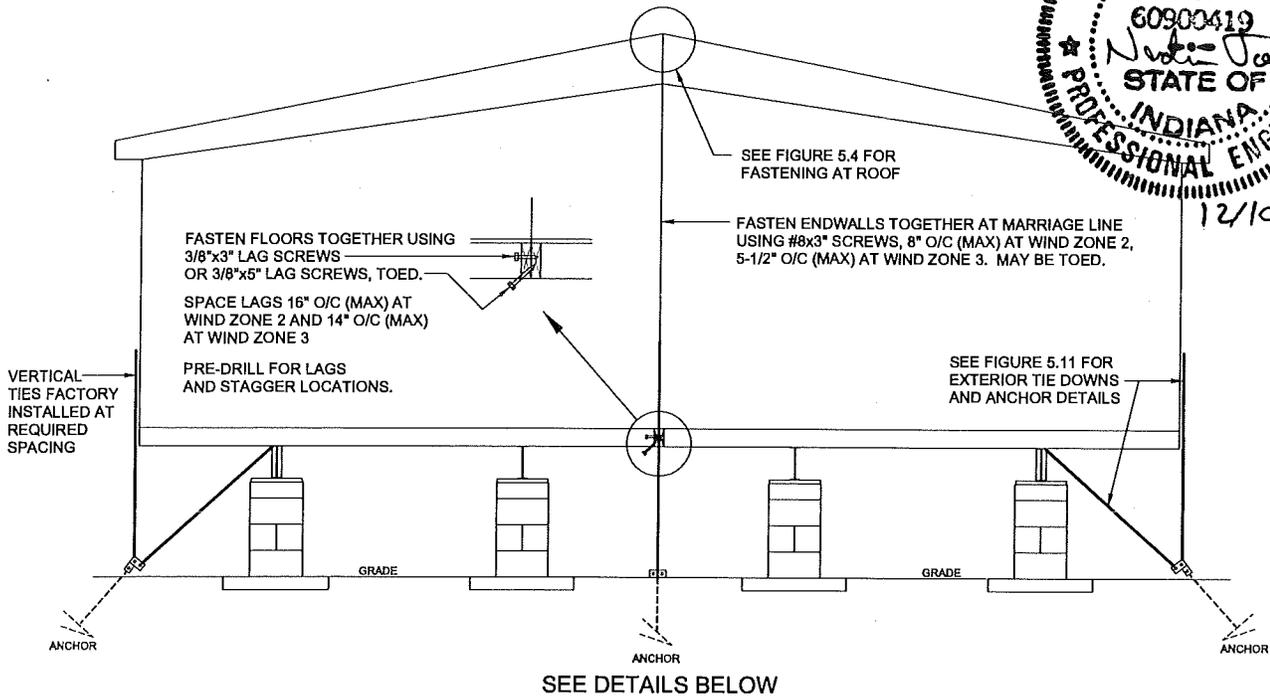
Notes:

- 1) Longitudinal tie-downs are in addition to diagonal tie downs at the sidewalls. Longitudinal straps should be installed at front and rear of all homes at each I-beam location per above details.
- 2) Longitudinal anchor must be rated for 3150# (design load) at wind zone 1 & 2 and 3700# (design load) at wind zone 3 (exception: 14' single section and 28' double section homes with 7' ceiling height may use 3150# anchor system at wind zone 3 areas). Anchor should be certified for these conditions by a professional engineer, architect or a nationally recognized testing laboratory as to their resistance, based on the installed angle and type of soil in which the anchor is installed. Steel anchoring equipment exposed to the weather shall be protected with at least 0.30 oz. of zinc per square of steel.
- 3) Ground anchors must be installed to their full depth and embedded below the frost line and to be at least 12" above the water table.
- 4) Care must be taken at sharp edges when tie down straps are connected to framing members. Sharp edges could cause premature failure of the straps. Installation of thick rubber or "U" shape steel between the tie down strap and the frame is one method to protect the sharp edges.

FIGURE 5.13 -FLOOR FASTENING AND TIE DOWN REQUIREMENTS FOR WIND ZONE 2 & 3 AT MARRIAGE WALLS



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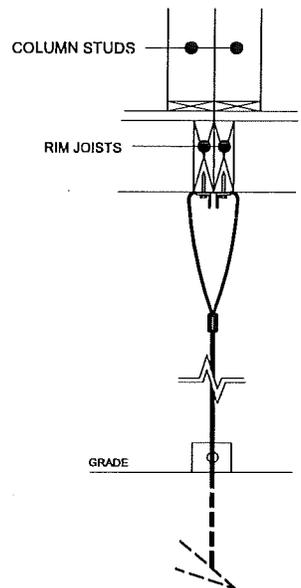
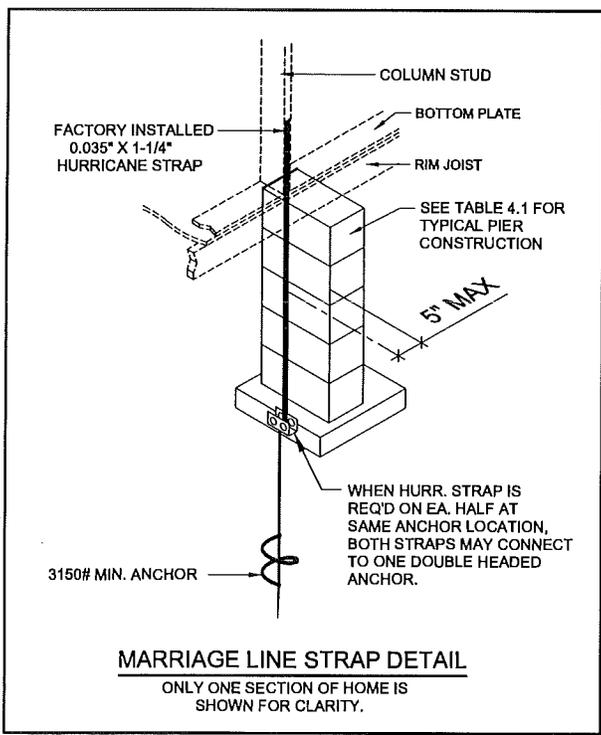


2" ANGLE (EACH SIDE) WHEN SPECIFIED IS ON OPPOSITE SIDE OF PIER AT COLUMN

NOTE: POSITIONING OF ANCHORS FROM EACH OTHER TO BE PER ANCHOR INSTRUCTIONS.

ANGLES @ COLUMN

ALT#1 MARRIAGE LINE STRAP DETAIL (SEE NOTE #2)



ALT#2 MARRIAGE LINE STRAP DETAIL (SEE NOTE #2)

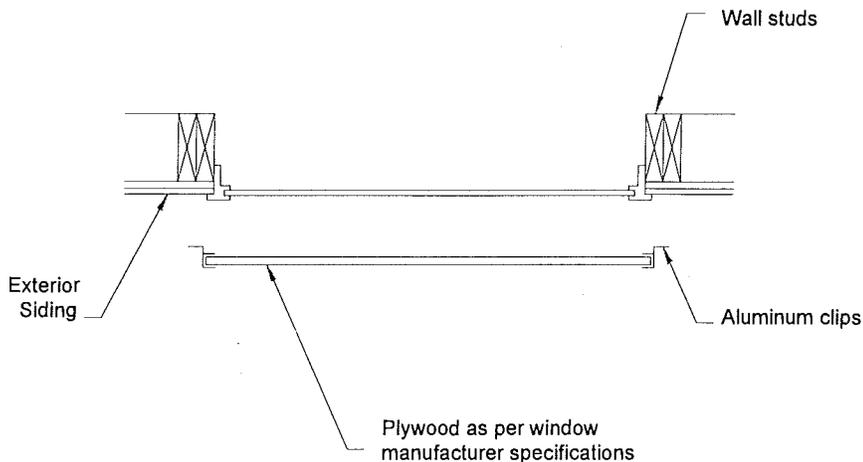
NOTES:

- MARRIAGE WALL ANCHORS TO BE RATED AT 3150# MINIMUM CAPACITY (4725# ULTIMATE).
- OPTIONAL ANGLES OR 1-1/2"x1-1/2"x11ga. (MIN) STEEL ANGLE WITH TWO (2) 7/16" DIA. HOLES 3/4" MINIMUM FROM EACH END AND 2" TO 3" BETWEEN HOLE CENTERS. ANGLE IS LAGGED TO CENTERLINE JOIST WITH (2) 3/8"x3-1/2" LAGS. MAXIMUM OPENING AT ZONE 2 FOR 1 SET OF ANGLES = 23'-11" MAXIMUM OPENING AT ZONE 3 FOR 1 SET OF ANGLES = 17'-8" IF OPTIONAL ANGLES ARE USED, ANGLES ARE REQUIRED AT ALL COLUMN LOCATIONS.

5.7 - PROTECTION OF WINDOWS & SLIDING GLASS DOORS BY HOME OWNER

For homes designed to be located in Wind Zones 2 & 3, the homeowner should install shutters or equivalent covering devices. It is strongly recommended that the home be made ready to be equipped with these devices with the following recommended methods:

a) Window clips - Optional aluminum clips may be provided with certain windows. The clips are designed to hold the protective plywood in place. If your home is equipped with this type of window, instructions for attaching the plywood and the clips will be shipped with your home. For plywood type and attachments, follow the instructions provided to you by the window manufacturer. If clip attachment and plywood specification are not provided, use **Table 5.1** below for plywood and the figure shown below for a typical application of this type of protective covering.

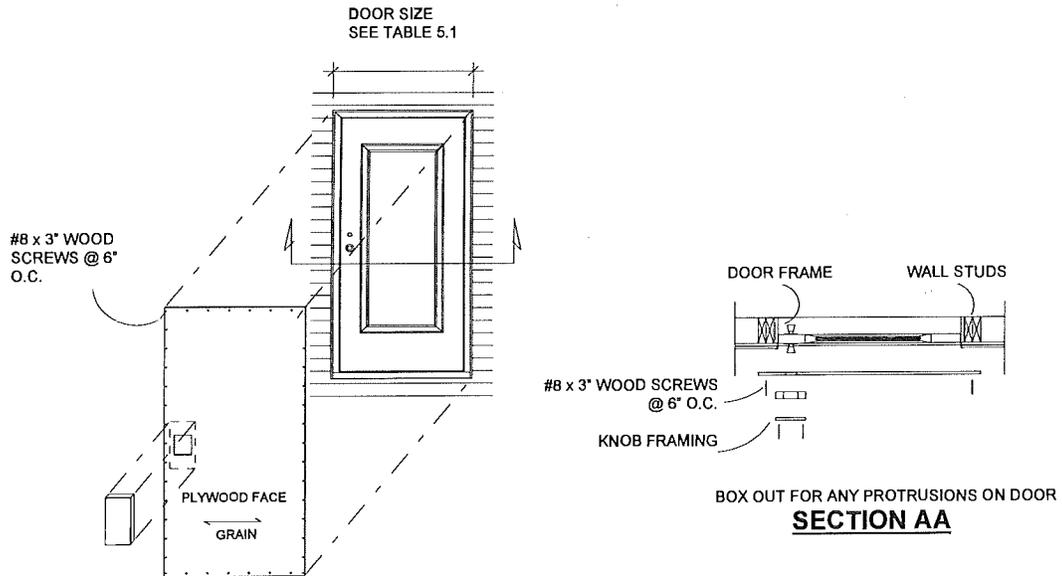
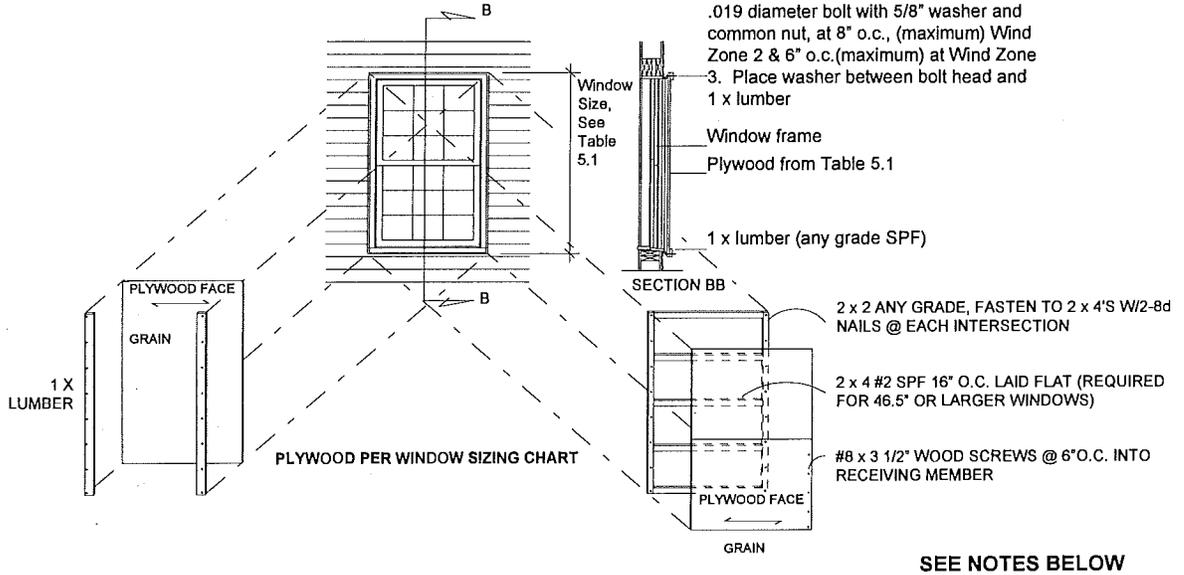


b) Direct plywood attachment - If your home is not equipped with any of the previous types of protective window covering provisions, then the following instructions apply to your home. This type of wind storm protective window and door covering is plywood installed over the window and doors. Plywood is to be bolted to the window frame with a 0.19" dia. bolt with 5/8" washer, and a common nut. The bolts are spaced 8" on center along the long sides of the window frame. Holes will have to be predrilled into the window frame. Use plywood listed in table below for the application of this type of window covering. For doors, sliding glass doors and windows without flange, remove mounting screws holding the door or window frame to exterior wall. Place the required plywood (from table below) over the door or window framing and fasten the plywood and framing back into the wall studs through the same holes in the door or window frame. Use #8x3" screws 8" o.c. for windows, and #8x4" screws 6" o.c. for sliding glass doors. See **Figure 5.14** for a typical application of this type of protective covering.

MAXIMUM WINDOW SIZE	TABLE 5.1	
	WIND ZONE 2	WIND ZONE 3
	PLYWOOD TYPE REQUIREMENTS	
14.5"	3/8" APA rated ply. 20/0 span rating	3/8" APA rated ply. 20/0 span rating
24.5"	3/8" APA rated ply. 24/0 span rating	1/2" APA rated ply. 32/16 span rating
30.5"	5/8" APA rated ply. 32/16 span rating	5/8" APA rated ply. 40/20 span rating
36.5"	5/8" APA rated ply. 40/20 span rating	7/8" APA rated ply. 48/24 span rating
40"	7/8" APA rated ply. 48/24 span rating	3/4" APA rated ply. 48/24 span rating
46.5"	3/8" APA rated ply. w/wood framing	3/8" APA rated ply. w/wood framing *
72"	3/8" APA rated ply. w/wood framing	3/8" APA rated ply. w/wood framing *

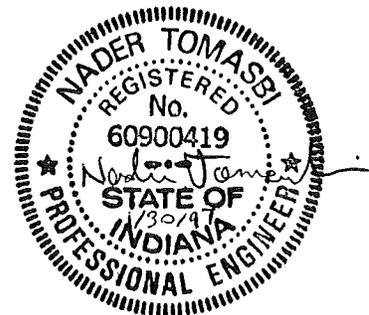
* See **Figure 5.14** for wood framing construction

FIGURE 5.14 - PROTECTION OF WINDOWS AND SLIDING DOORS BY HOME OWNER



Notes:

- 1) 3/8" plywood APA rated exterior sheathing with 20/0 span rating
- 2) Locate plywood seam over 2 x 4 member
- 3) Fasten plywood to 2 x framing members with full PVA white glue and 6d nails or #8 x 2" screws @ 6" o.c. all around



6. Chapter 6 - Installation of Optional Features

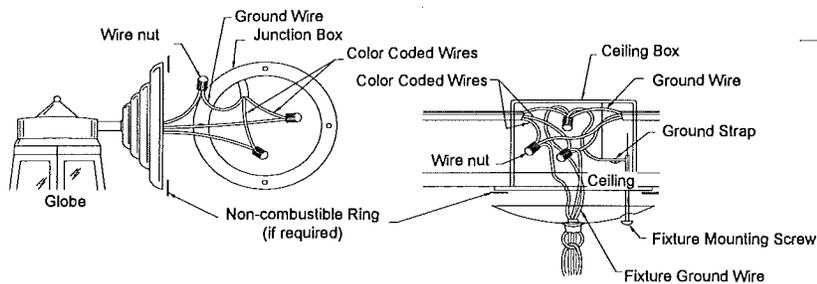
- 6.1. **Awnings And Carports.** Choose free-standing products with columns to support their weight.
- 6.2. **Accessory Windows.** Install accessory windows or components with the installation materials supplied, and follow the manufacturer's installation instructions.
- 6.3. **Miscellaneous Lights And Fixtures.**

NOTE: Circuits must be turned off to eliminate the risk of shock.

Some exterior lights, ceiling fans and chain-hung fixtures may not yet be installed when the home is delivered. All of these fixtures must be grounded by a fixture-grounding screw or wire. For chain-hung fixtures, use both methods. When fixtures are mounted on combustible surfaces such as hardboard, install a non-combustible ring to completely cover the combustible surface exposed between the fixture canopy and the wiring outlet box. If siding has not been installed at a fixture location, remove the outlet box and install the siding with a hole for the outlet box. Then reinstall the outlet box and proceed as for other fixtures.

- 6.3.1. **Exterior Lights.** Remove the junction box covers and make wire-to-wire connections using wire nuts. Connect wires black to black, white to white and ground to ground. Caulk around the base of the light fixture to ensure water tight seal to the sidewall. Push the wires into the box and secure the light fixture to the junction box. Install the light bulb and attach to the globe. Refer to Figure 6.1(a).
- 6.3.2. **Ceiling Fans.** Follow manufacturer's installation instructions. To reduce the risk of injury, install ceiling fans with the trailing edges of the blades at least 6'4" above the floor (see manufacturers instructions). If no instructions are available, connect the wiring as shown in Figure 6.1(b) (max. 35# ceiling fan).

FIGURE 6.1 - INSTALLATION OF EXTERIOR LIGHTS



a) Exterior Light Fixture

b) Chain hung fixture or ceiling fan (35# max.)

6.3.3. **Whole House Ventilation.** Your house is equipped with one of the following to introduce outdoor air to interior environment.

A) Fresh air through furnace. (Philips-Ventline)

How it works:

When the furnace air circulator is ON, a negative pressure (suction) is created in the furnace plenum. This suction draws in fresh air which is mixed with the return air from the room, and distributed through the home duct system. The fresh air supply to your home may be energized at any time by switching the furnace control (or thermostat control, if so equipped) to ventilation.

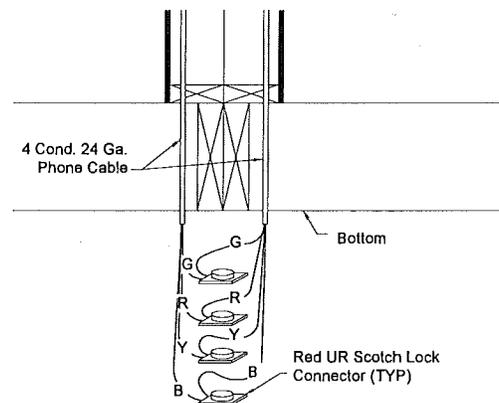
B) Fresh air by an exhaust fan.

How it works:

Inside air is exhausted outside by a mechanical fan allowing fresh air in through the louvered grill installed in exterior wall. Exhaust fan is operated by a manual switch.

6.4. **Telephone And Cable TV. CARELESS INSTALLATION OF THE TELEPHONE AND CABLE TELEVISION LINES MAY BE HAZARDOUS.** The walls and floors of your manufactured home contain electrical circuits, plumbing and duct work. Avoid contact with these home systems when drilling through and placing cables within these cavities. Only trained professionals should handle such work. **FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.** Figure 6.2 shows one procedure for telephone crossover connections in multi-section homes.

FIGURE 6.2 - TELEPHONE WIRING FOR MULTI-SECTION HOMES



Notes:

1. Connect blue to blue, red to red, yellow to yellow, and green to green.
2. Do not strip the individual wires.
3. Insert the same color wires into the connector, then using channel lock pliers, press the round portion to make the connection.

7. Chapter 7 - Preparation of Appliances

7.1. Clothes Dryer Vent. Your clothes dryer must exhaust to the exterior of the home, or of any perimeter skirting installed around it, through a moisture-lint exhaust system, as shown in Figure 7.1 **IMPORTANT: DO NOT LET THE EXHAUST SYSTEM END UNDER THE HOME WHERE EXCESS MOISTURE OR FLAMMABLE MATERIAL CAN ACCUMULATE.** Install a flex duct after the home is set up at the site. The access for the dryer vent is located under the home in the bottom board at the dryer location (bottom board is taped and marked with paint or colored tape for access). Hold the duct in place with metal straps spaced 2' on center secured to the bottom of the floor joists or frame. Vent openings are located in either the wall or the floor. After the duct is installed, seal the openings, both inside and outside. Follow the dryer manufacturer's instructions for installing the exhaust system.

If your home did NOT come equipped for a gas dryer, remember that installing one requires substantial alteration to the home. You must provide gas supply piping and adequate venting as specified by the gas dryer manufacturer. Only a trained and experienced person should install a gas dryer. Cutting major structural elements (such as rafters or floor joist) to allow for gas dryer installation is not permissible. Home manufacturer is not responsible for any weakening of the home's structural soundness resulting from dryer installation.

NOTE: Some dryer manufacturers require that metallic duct be connected to the dryer and vented through floor and or sidewall.

7.2. Comfort Cooling Systems. Only qualified personnel may install any comfort cooling system not provided with the home. Follow the manufacturer's installation instructions and conform to all local codes.

7.2.1. Air Conditioners. The air distribution system of this home has been designed for a central air conditioning system. Equipment you install must not exceed the rating shown on the home's compliance certificate.

The home's electrical distribution panel may contain optional factory installed circuits (Figure 7.2) for air conditioning. The maximum full load amperes draw for the desired air conditioning unit must not exceed the circuit rating shown.

On the other hand, electrical circuits within the home may NOT have been sized for additional load or non-factory-installed air conditioning, and a separate outside electrical supply may have to be provided.

Any field-installed wiring beyond the junction box must include a fused disconnect located within sight of the condensing unit. The maximum fuse size is marked on the condenser data plate. Local codes will determine the acceptability of the air conditioning equipment, rating, location of disconnect means, fuse type branch circuit protection, and connections to the equipment.

"A" coil air conditioning units must be compatible and listed for use with the furnaces in the home. Follow the air conditioner manufacturer's instructions.

If a remote (self-contained, packaged) air conditioner (cooling coil and blower located outside the home, Figure 7.3) is to be connected to the heating supply duct, install an automatic damper between the furnace and the home's air duct system, and another between the remote unit and the home's air duct system. Secure the duct system leading from the remote unit to the home and do not allow it to touch the ground. Insulate ducts with material of thermal resistance (R) no less than 4, and a perm rating of not more than 1 perm. Connect the duct carrying air to the home to the main duct at a point where there are approximately as many registers forward of the connection as there are to the rear. Locate the return air duct in the center of the home.

Do not cut or damage floor joists. Return air and supply ducts are sized to fit between floor joists. Replace insulation removed during the installation, and seal the bottom board around the duct connection.

Direct all condensation runoff away from the home by connecting a hose to the equipment runoff outlet or other means specified by the equipment manufacturer.

7.2.2. Heat Pumps. Install heat pumps according to the heat pump manufacturer's installation.

7.2.3. Evaporative Coolers. Install a roof-mounted cooler following the manufacturer's instructions.

7.3. Fireplace Chimneys And Air Inlets. Fireplaces require on-site installation of additional section(s) of approved, listed chimney pipe, a spark arrestor and a rain cap assembly. See Figure 7.4.

7.3.1. Minimum Extensions Above Roof. To assure sufficient draft for proper operation, extend the finished chimney at least 3' above the highest point where it penetrates the roof and at least 2' higher than any building or other obstruction located within a horizontal distance of 10'. If the site has obstructions extending higher than the home's peak within 10' of the chimney, the installer may have to provide an additional section of chimney pipe if required by local codes.

7.3.2. Required Components. The required components of a correctly-installed chimney are as shown in Figure 7.4.

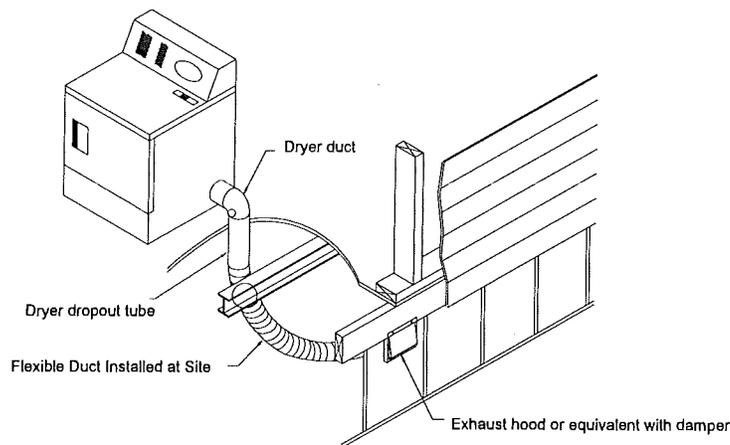
7.3.3. Assembly And Sealing Sequence.

Assemble and seal your fireplace chimney in accordance with the fireplace manufacturer's instructions supplied with the home. Avoid cutting any roof trusses or floor joists when installing chimney pipes or combustion air intakes. Carefully seal all roof penetrations to avoid leakage. Periodic inspections and resealing of all roof penetrations are required.

7.3.4. Combustion Air Duct Inlets. Combustion air intake ducts end just below the bottom covering of the floor. You must extend them to the outside when your home has a basement or crawlspace. These added ducts are not supplied, but may be purchased at your local hardware store. The fireplace manufacturer's instructions for installing combustion air ducts are in the fireplace or with the chimney parts. Do not allow the combustion air inlet to drop material from the hearth beneath the home. Locate its inlet damper above expected snow level, as shown in Figure 7.4.

7.4. Range, Cook Top And Oven Venting. If your home is equipped with a combination (cooktop) range/grill or oven that contains its own exhaust system, route the exhaust so that it does not exhaust under the home. Connect flexible metallic duct between the elbow protruding from the floor and the termination fitting, and support it according to the manufacturer's installation instructions.

FIGURE 7.1 - DRYER EXHAUST SYSTEM



CAUTION: INSTALLATION OF THE EXHAUST SYSTEM MUST BE IN ACCORDANCE WITH THE DRYER MANUFACTURER'S INSTRUCTIONS.

CAUTION: THIS EXHAUST SYSTEM MUST NOT TERMINATE UNDER THE HOME.

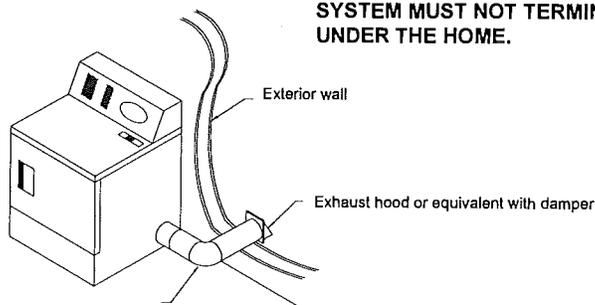
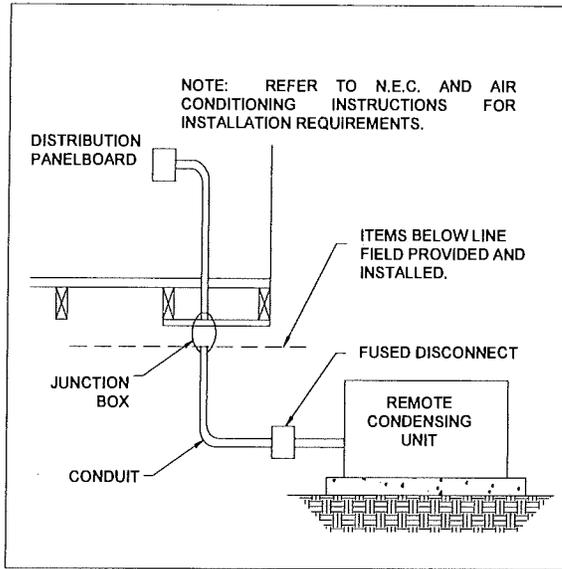


FIGURE 7.2 - OPTIONAL FACTORY-INSTALLED AIR CONDITIONING CIRCUITS



Note: Electrical connections made to energize air-conditioning equipment should be made only by qualified personnel. The completed installation must conform to Article 440 of the National Electric Code and applicable local codes. When the electrical connection is made at the junction box, the field installation wiring beyond the junction box must incorporate a disconnect (sized in accordance with NEC Article 440) located within sight of the condensing unit.

The acceptability of all air-conditioning equipment and its installation are to be determined by the local inspection authorities.

FIGURE 7.3 - TYPICAL INSTALLATION OF SELF-CONTAINED OR AIR CONDITIONING EQUIPMENT

REMOTE AIR CONDITIONING OR HEATING EQUIPMENT

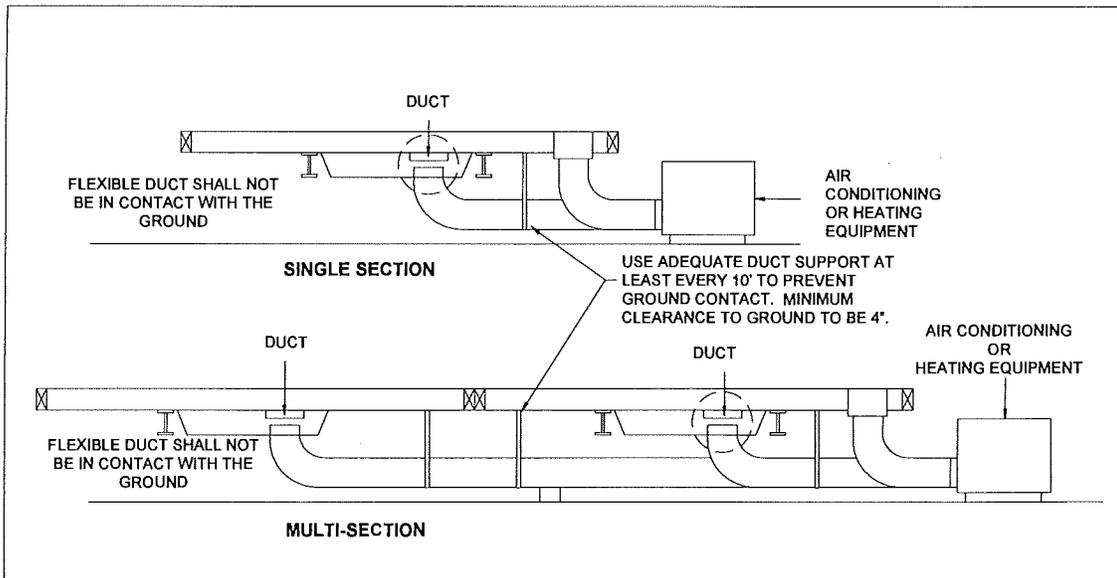
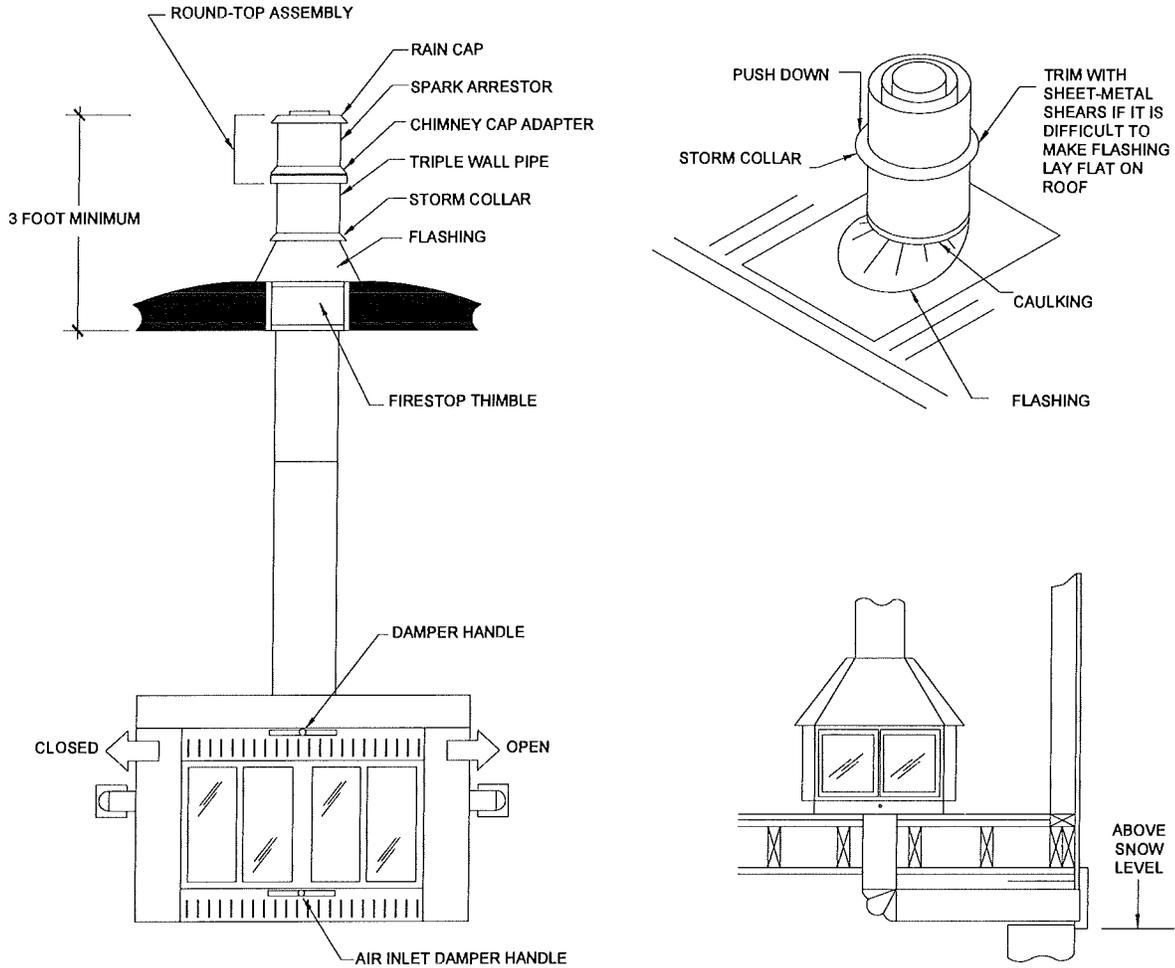


FIGURE 7.4 - FIREPLACE CHIMNEY AND AIR INTAKE INSTALLATION



OVER BASEMENT OR CRAWL SPACE INSTALLATION

8. Chapter 8 - Utility System Connection and Testing

8.1. **Proper Procedures.** Consult local, county or state authorities before connecting any utilities. Only qualified service personnel, familiar with local codes and licensed where required, should make utility connections and conduct tests.

8.2. Water Supply.

8.2.1. **Maximum Supply Pressure and Reduction.** The water systems of your home were designed for a maximum inlet pressure of 80 psi. If you are located in a water district where the local water supply pressure exceeds 80 psi, install a pressure-reducing valve.

8.2.2. Connection Procedures.

8.2.2.1. **To Supply Mains.** Connect the home's water system to the water source through the inlet located under the house, usually below the water heater compartment. A tag on the side of the home marks its location. The connection is via a single 3/4 inch inlet beneath the home. A master shut-off full flow valve must be installed in the water supply line adjacent to the home; this valve should be a full port gate or ball valve with threaded or solder joints. After removing the aerators from all the faucets, open all the faucet valves and allow the water to run for 15 minutes. This should remove any foreign particles left in the line that might cause an unpleasant taste or become lodged at faucet washers and cause dripping faucets.

8.2.2.2. Remove the shipping caps from the crossover water line connectors, provided with the home, and install as shown (see Figure 8.2).

8.2.3. Freezing Protection.

8.2.3.1. **Necessity.** In areas subject to subfreezing temperatures, protect exposed sections of water supply piping, shut-off valves and pressure reducers, and pipes in water heater compartments with uninsulated doors, from freezing. Otherwise, burst pipes and costly damage may result.

8.2.3.2. **Use Of Heat Tapes.** Heat tapes (either automatic or non-automatic) can protect exposed plumbing from freezing. USE ONLY HEAT TAPES LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY FOR USE WITH MANUFACTURED HOMES, AND INSTALL THEM ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTION. Plug the 3-wire, grounded cordset of the heat tape into the outlet under the home near the water supply (Figure 8.1).

FIGURE 8.1 TYPICAL WATER CONNECTION

WARNING! HEAT TAPE RECEPTACLE IS NOT GFCI PROTECTED. DO NOT USE THIS OUTLET FOR ANY CONNECTION EXCEPT THE HEAT TAPE.

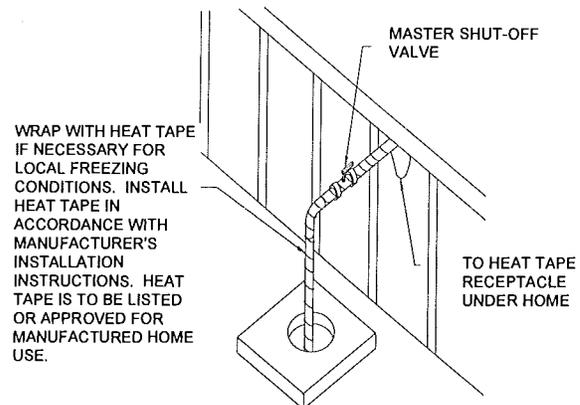
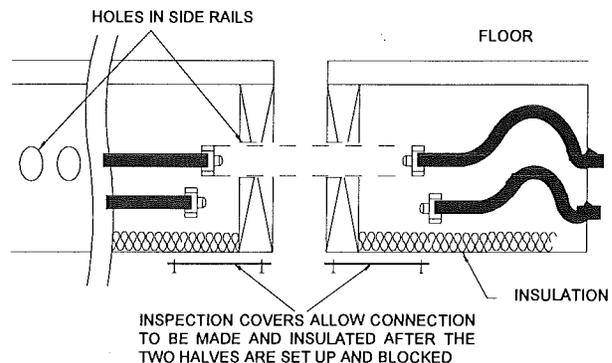


FIGURE 8.2 TYPICAL WATER LINE CROSSOVER



CAUTION: If freezing conditions exist, wrap water connector with insulation. Use water connectors supplied by manufacturer, where applicable.

8.2.3.3. Freezing Protection for Unoccupied Homes.

If the home is to be left unheated in cold weather, drain the water lines and blow them clear with compressed air to prevent damage from freezing.

8.2.4. **Testing Procedures.** Even though the water system was tested at the factory, it must be rechecked for leaks at the installation site. Close all water faucets, spigots and stool tank float valves, and use the following procedure:

8.2.4.1. **Hydrostatic.** Be sure the water heater tank is full of water. Pressurize the system with water at 100 psi, and then isolate it from the pressure source. The system must hold this pressure for at least 15 minutes without any loss. If the pressure falls off, re-pressurize the system and locate and correct leaks.

8.2.5. Anti-Siphon Frost-Proof Sill Cock (Faucet) - All Materials Provided

- 8.2.5.1. Locate area on home for installation of faucet.
- 8.2.5.2. Remove access panel, cover, etc. underside of home at this location.
- 8.2.5.3. Place putty tape material to back side of faucet (between mounting flange of faucet and home).
- 8.2.5.4. Position siding wedge between faucet and side of home.
- 8.2.5.5. Insert shaft of faucet through hole provided in side of home from outside.
- 8.2.5.6. Position faucet so the outside spout is pointing down and in a slightly downward angle to the outside (so it will drain properly).
- 8.2.5.7. Secure faucet to side of home with two (2) #8 or #10 wood screws (provided). Make sure that putty tape is between faucet mounting flange and side of home to provide weatherproof installation.
- 8.2.5.8. Remove plug from end of factory installed tubing.
- 8.2.5.9. Thread on end of factory installed tubing to end of faucet tightly.
- 8.2.5.10. Pressurize water tubing system with air to 100 PSI and hold for 15 minutes. Check field installed connection at exterior faucet.
- 8.2.5.11. Remove 100 PSI air from system and fill with on-site water and again check field installed connection for water leak.

Replace access panel, cover, etc. making sure the insulation is positioned between faucet/tubing and access panel cover.

8.3. Drainage System.

- 8.3.1. **Assembly And Support.** If portions of the drainage system were not installed at the factory, all materials and diagrams required to complete it have been shipped as loose items in the home. Assemble the drainage system following these specific instructions and diagrams. Start at the most remote end and work toward the outlet, supporting the piping with temporary blocking to achieve the proper slope (see Paragraph 8.3.2). When the entire system has been completed, install permanent drain line supports at 4' on center, as shown in Figure 8.3.

- 8.3.2. **Proper Slopes And Connector Sizes.** Drain lines must slope at least 1/4" fall per foot of run unless otherwise noted on the schematic diagram (see Figure 8.4).

Exception: 1/8" fall per foot is allowed when a cleanout is installed at the upper end of the run. Connect the main drain line to the site sewer hookup using an approved elastomer coupler (Figure 8.5).

- 8.3.3. **Crossovers.** Connect multi-section home drain line crossovers as shown in Figure 8.6.

- 8.3.4. **Solvent Welding Procedures.** The solvent cement used to connect drain lines must be compatible with the pipe installed in the home. Follow the manufacturer's instructions on the container.

- 8.3.5. **Protection From Freezing.** Fittings in the drainage system subject to freezing, such as P-traps in the floor have been insulated. Replace this insulation if removed during assembly or testing. Insulate drain lines installed below the bottom board in areas subject to freezing as shown in Figure 8.7. If the home is to be left unheated in cold weather, pour an approved antifreeze into P-traps at all fixtures and stools.

- 8.3.6. **Flood Level Test Procedure.** You must conduct a flood level test on the completed drainage system before connecting it to the site sewer. With the home in a level position, all fixtures connected, and all tub and shower drains plugged, connect the drainage piping system to the site water inlet and fill the system with water to the rim of the toilet bowl through a higher fixture. Release all trapped air. Allow the system to stand at least 15 minutes. Check for leaks. Drain the system. Plug all fixtures, sinks, showers and tubs and fill with water. Release the water in each fixture simultaneously to obtain the maximum possible flow in drain piping. Check all P-traps and the drain system for possible leaks. Repair any leaks and retest.

8.4. Gas Supply.

- 8.4.1. **Type Of Gas System Furnished With Home.**

All gas appliances in this home, including the heating system, are equipped for natural gas. If LP gas is to be used as the gas supply instead, a qualified service person must convert the appliances to LP gas following the instructions provided by each appliance manufacturer.

- 8.4.2. **Proper Supply Pressure.** THE GAS PIPING SYSTEM IN YOUR HOME HAS BEEN DESIGNED FOR A PRESSURE NOT TO EXCEED 14" OF WATER COLUMN (8 OZ. OR 1/2 PSI). IF GAS FROM ANY SUPPLY SOURCE EXCEEDS, OR MAY EXCEED THIS PRESSURE, YOU MUST INSTALL A PRESSURE REDUCING VALVE. To operate gas appliances safely and efficiently, do not exceed the design pressure limitations. For natural gas systems, the incoming gas pressure should remain between 6" and 8" of

FIGURE 8.11 - MULTI-SECTION FRAME BONDING

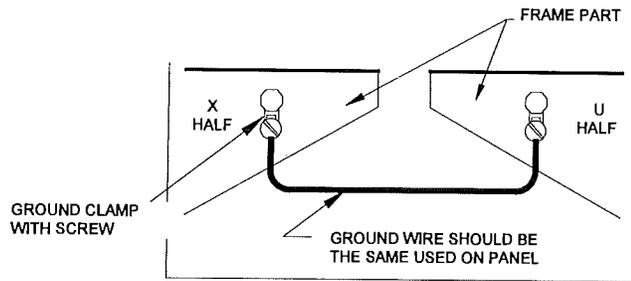


FIGURE 8.12 - TYPICAL UNDER CHASSIS FEED CONNECTIONS

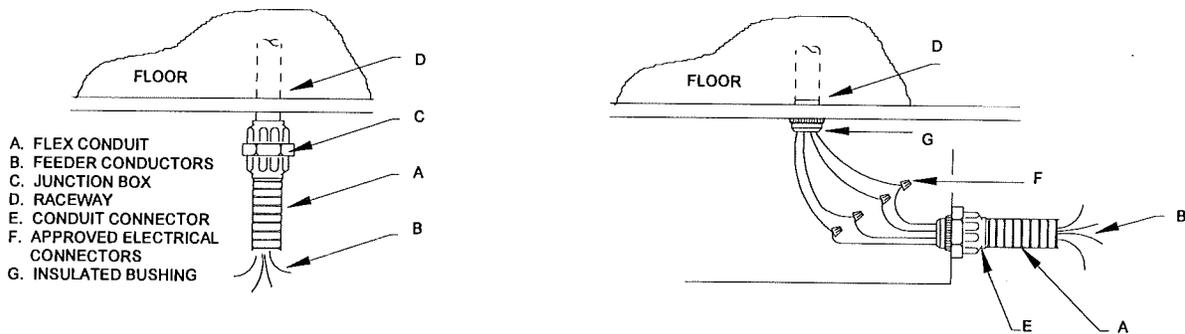


FIGURE 8.13 - TYPICAL METER BASE INSTALLATIONS AND GROUNDING

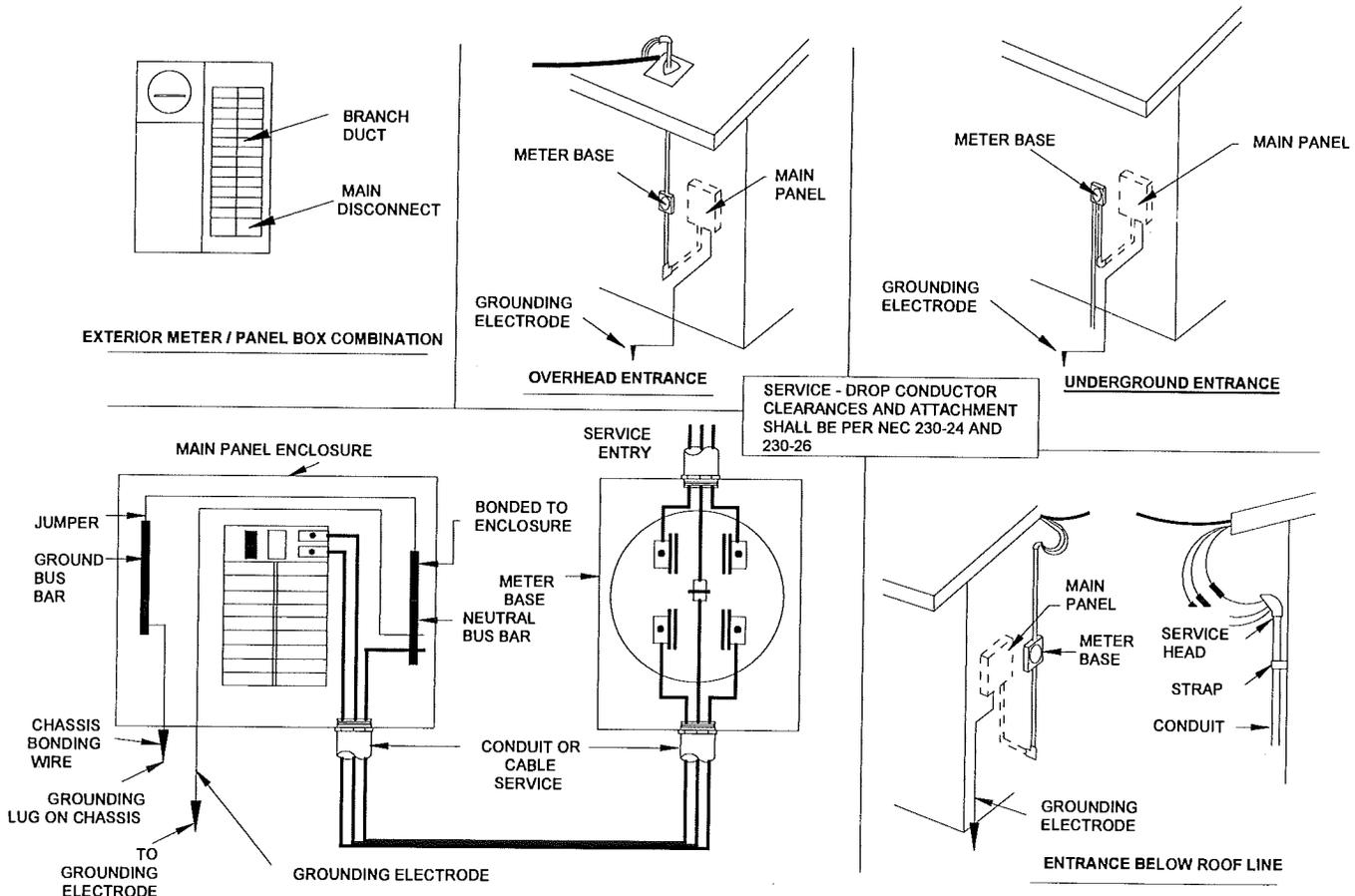
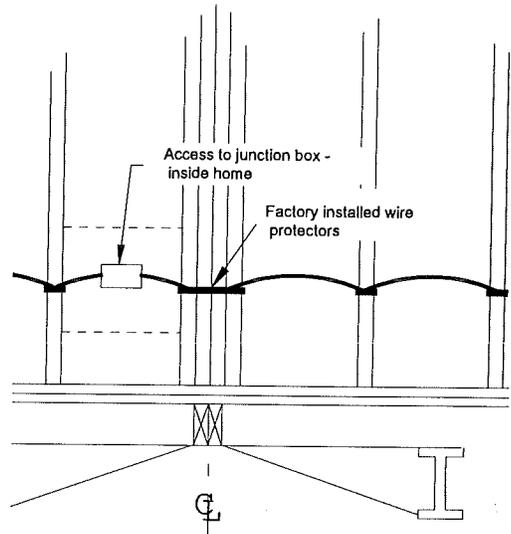
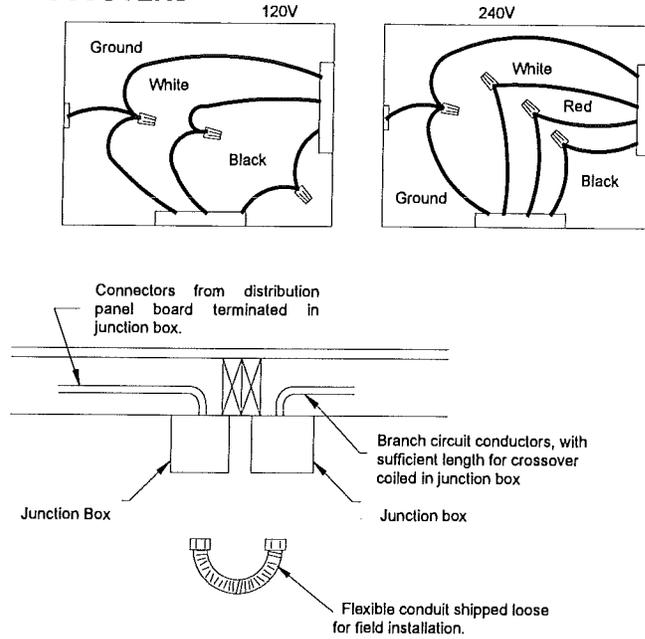
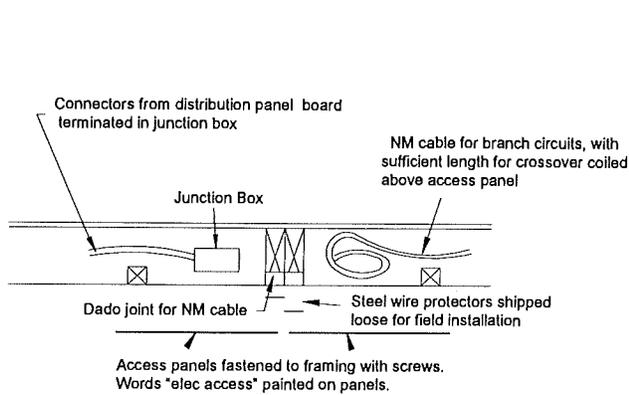


FIGURE 8.14 - ELECTRICAL CROSSOVERS

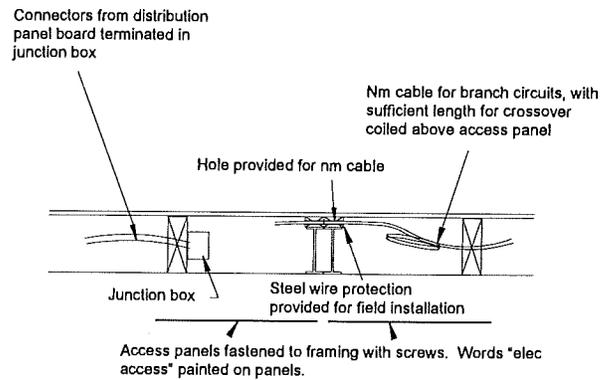
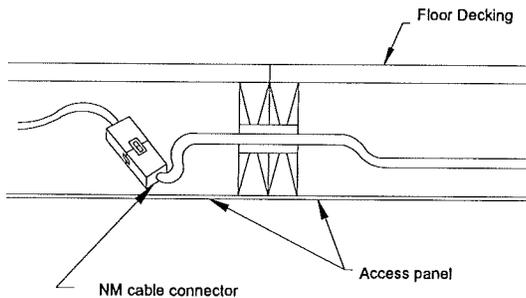


IN WALL - ALTERNATE



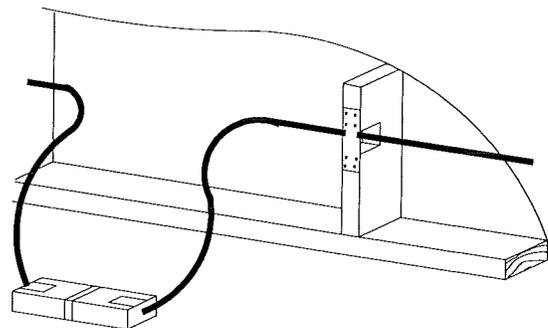
IN FLOOR - ALTERNATE A (SIDE VIEW)

THIS HOME MAY BE SHIPPED WITH ONE OR MORE PLUG-IN CONNECTORS. THESE CONNECTORS ARE TO BE SNAPPED TOGETHER ON SET-UP. CONNECTORS WILL BE COLOR-CODED AND/OR TAGGED TO PREVENT MIXING OF CIRCUITS



IN FLOOR - ALTERNATE B (SIDE VIEW)

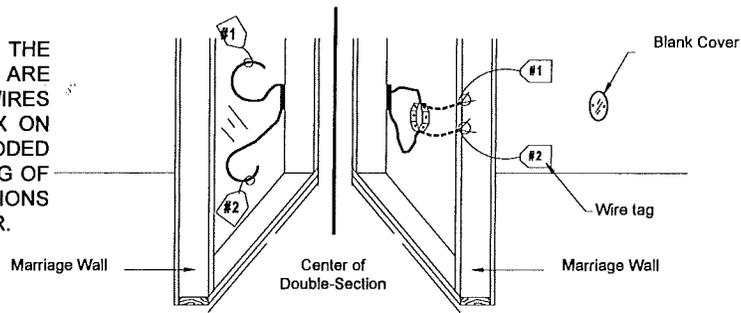
(PERIMETER TYPE FRAME)



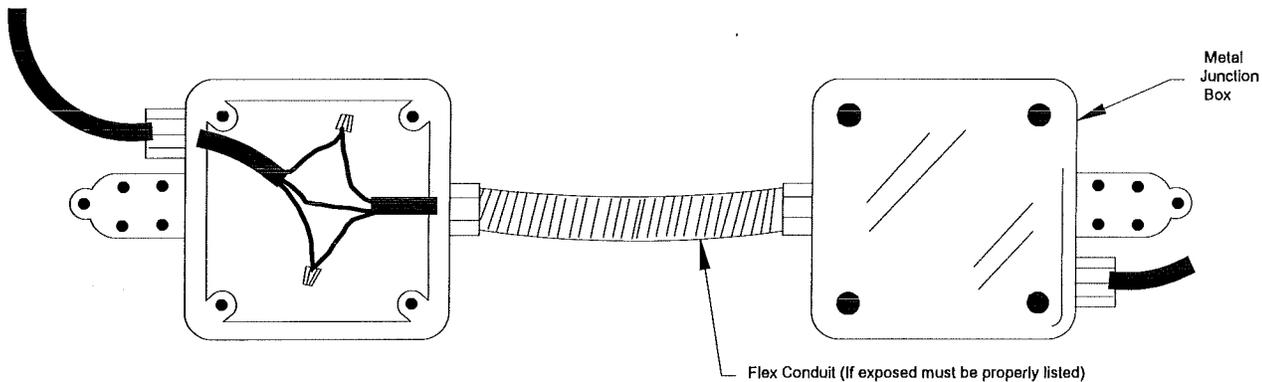
THE CONNECTORS ARE INTENDED FOR FACTORY OR ON-SITE INTERCONNECTION OF MODULES OR OTHER BUILDING COMPONENTS. THEY MAY BE CONCEALED OR SURFACE-MOUNTED AS DESCRIBED IN ARTICLES 545-13, 550-10(1) AND 551-16(A) OF THE NATIONAL ELECTRIC CODE.

FIGURE 8.14 - TYPICAL ELECTRIC CROSSOVERS

THE WIRES ARE COILED UP UNDER THE SHIPPING SEAL. BEFORE THE UNITS ARE PULLED TOGETHER PLACE THE WIRES FROM "U" HALF INTO JUNCTION BOX ON "X" HALF. WIRES WILL BE COLOR CODED AND/OR TAGGED TO PREVENT MIXING OF CIRCUITS. MAKE FINAL CONNECTIONS AFTER UNITS ARE PULLED TOGETHER.

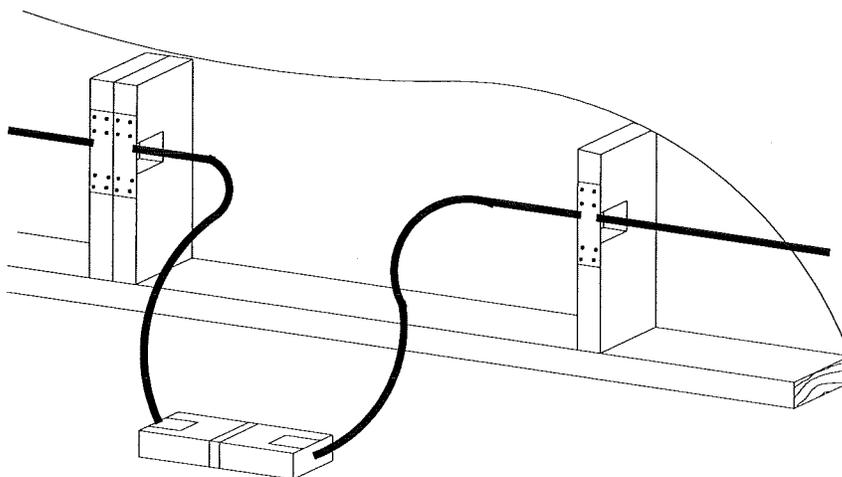


ALTERNATE ELECTRIC CROSSOVER



CONNECT THE FLEX CONDUIT TO THE JUNCTION BOX ON THE "X" HALF. THEN MAKE THE WIRE CONNECTIONS USING APPROVED WIRE CONNECTORS. WIRES WILL BE COLOR CODED AND/OR TAGGED TO PREVENT MIXING OF CIRCUITS.

THIS HOME MAY BE SHIPPED WITH ONE OR MORE PLUG-IN CONNECTORS. THESE CONNECTORS ARE TO BE SNAPPED TOGETHER ON SET-UP. CONNECTORS WILL BE COLOR-CODED AND/OR TAGGED TO PREVENT MIXING OF CIRCUITS.



THE CONNECTORS ARE INTENDED FOR FACTORY OR ON-SITE INTERCONNECTION OF MODULES OR OTHER BUILDING COMPONENTS. THEY MAY BE CONCEALED OR SURFACE-MOUNTED AS DESCRIBED IN ARTICLES 545-13, 550-10(I) AND 551-16(O) OF THE NATIONAL ELECTRIC CODE.

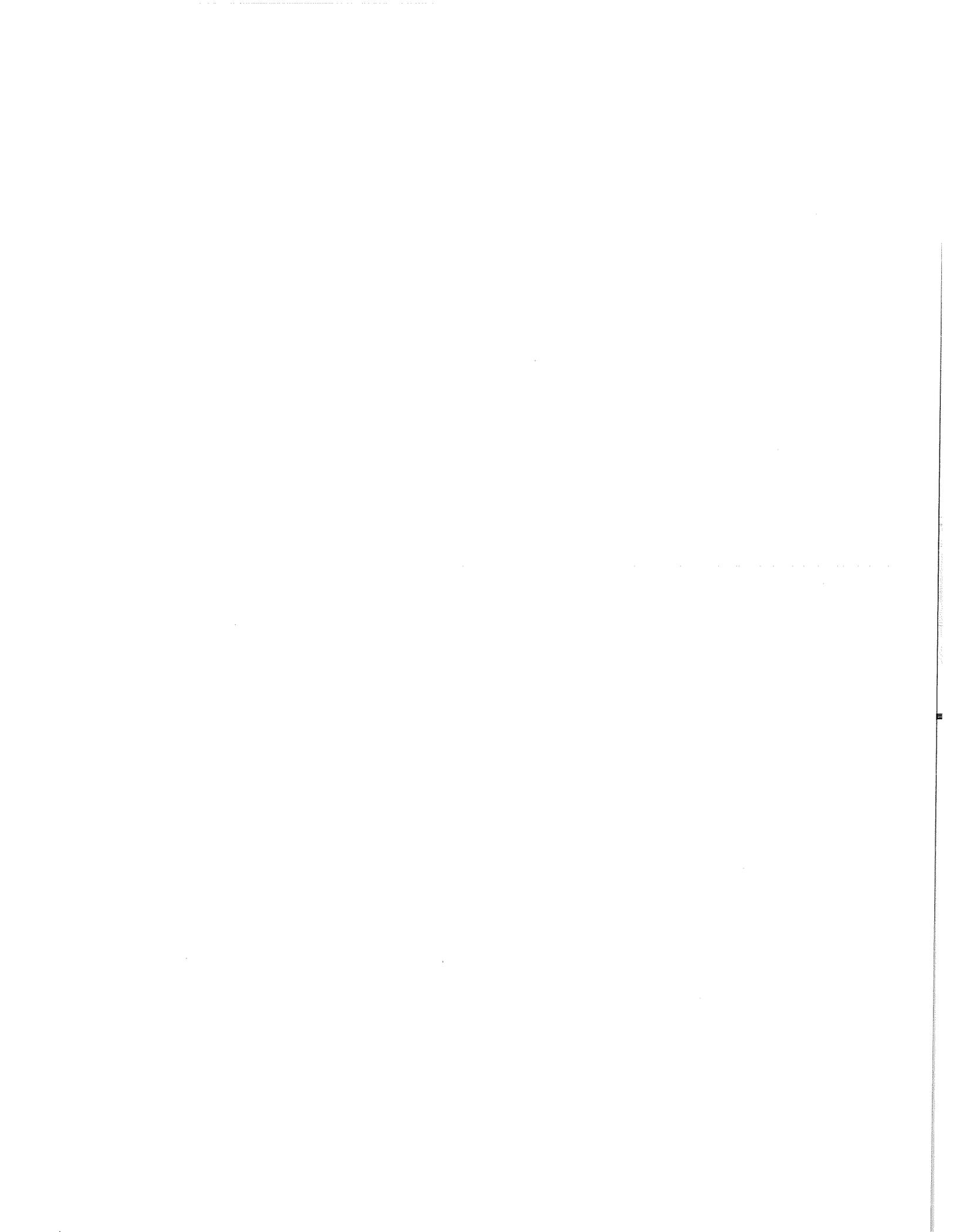
9. Chapter 9 - Final Inspection

Make a final inspection when home installation is complete to make sure that no items have been overlooked and that all work was done properly. Place special emphasis on the following "checklist" items.

- 9.1. **Water and Drain Systems.** All water and drain systems work properly and do not leak.
- 9.1.1. **Accesses Under Home.** Access for p-traps, etc. located under the home in the bottom board are taped and marked with paint or colored tape for access.
- 9.2. **Appliance Function and Operation.** Appliances have been tested and work properly.
- 9.3. **Windows, Doors and Drawers.** All windows, doors and drawers work properly.
- 9.4. **Exit Windows.** One window in each bedroom is designated as a secondary exit to be used in case of emergency. Each exit window is labeled as such with operating instructions. All shipping hardware should be removed, and the window should operate as explained in the window manufacturer's instructions.
- 9.5. **Exterior Siding and Trim.** No gaps, voids or missing fasteners and all seams are sealed.
- 9.6. **Stack Heads and Vent Pipe Flashings on Roof.** All stack head or vent pipe flashings are properly attached and sealed.
- 9.7. **Composition Roof.** Shingles are properly attached, none are loose or missing, and all holes are filled.
- 9.8. **Skirt Venting. (See Page 20, 5.6.4)**
- 9.9. **Low-Hanging Trees and Bushes.** If there are any low-hanging trees or bushes near your home, trim or cut them. Think about the plants' possible movement during windy conditions or under snow or ice loads in limiting their future growth.
- 9.10. **Exhaust Fan Operation and Air Flow.** Check all exhaust fans for proper operation and air flow.
- 9.11. **Bottom Board.** Carefully inspect the bottom covering of the home for loosening or tears from installation of pipes or wires. Seal openings around the floor perimeter, pipes or pipe hangers and splits or tears with weather-resistant tape.
- 9.12. **Ground Cover.** Repair any cuts or tears in the ground cover with tape.
- 9.13. **Anchors and Straps.** Be sure the correct number of anchors have been installed at the proper angle, and that all straps have been tightened.
- 9.1.4. **Interior Details.** Inspect for, and correct, all interior finishing details, such as loose molding, carpet seams, etc. The retailer's representative should inspect the home with the homeowner, give the homeowner a copy of the Homeowner's Manual, and brief the homeowner about maintaining the home.

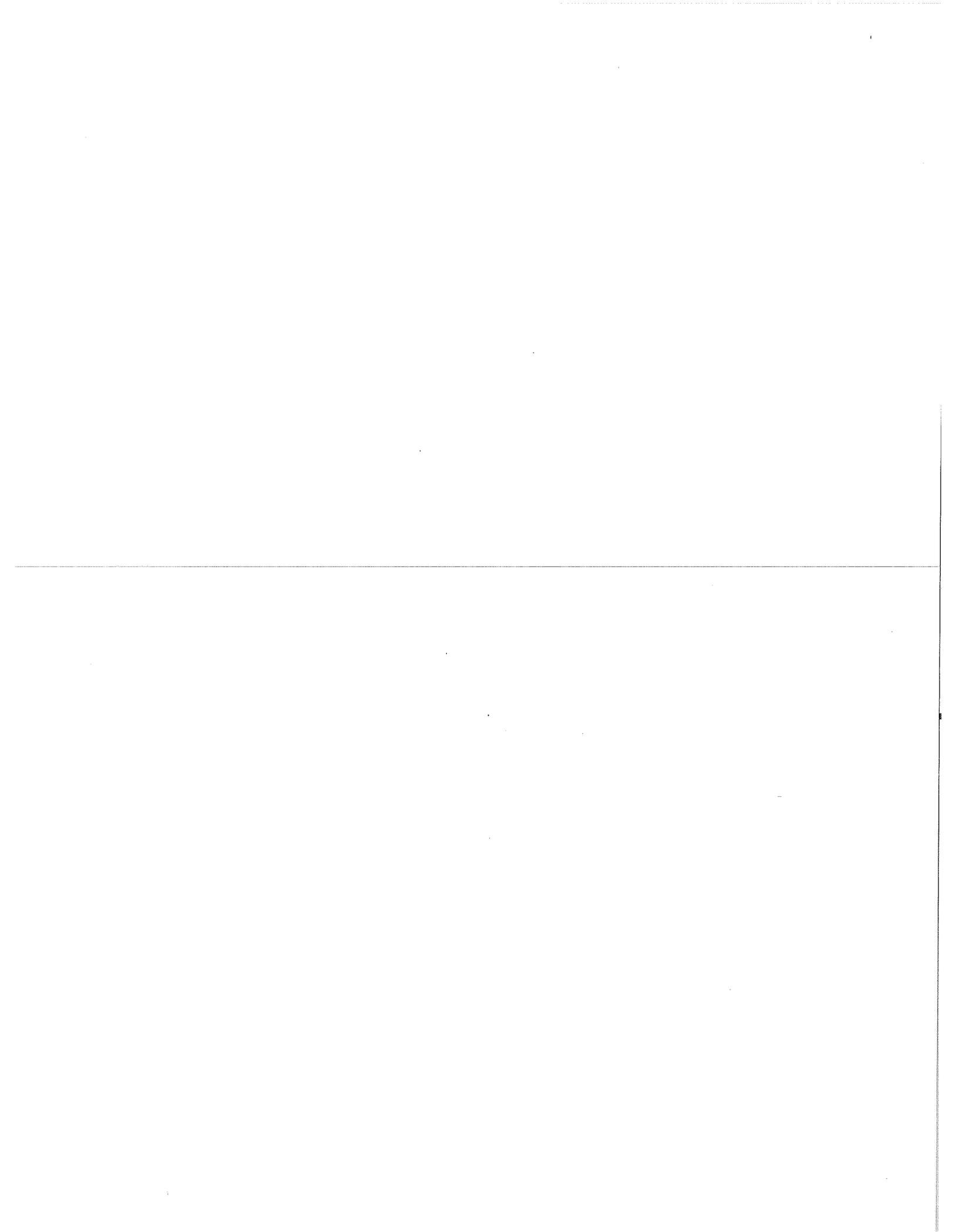
10. Chapter 10 – Relocating the Home

- 10.1. **Relocation of Home.** If it is necessary to move your home, have it moved by a professional manufactured home mover, making sure he uses enough temporary wood blocking, and check the following items:
 - 10.1.1. **New Zones.** Check the roof and wind load and the temperature requirements at the new location. If the new requirements are greater than those shown on your home's compliance certificate, check the cost of adapting the home before moving. Otherwise any resulting damages will not be covered under your warranty, and you may be held liable for any failures. Check with home's plant of manufacturing, your retailer, or a qualified manufactured home mover about making these home improvements.
 - 10.1.2. **Tires and Axles.** Replace any removed tires or axles as required by the manufacturer. Be sure that tires are inflated correctly, have at least 1/16" tread, and do not have any cracks or splits. Check and repair bearings and brakes as necessary.
 - 10.1.3. **Appliances.** Secure appliances to prevent movement during transportation.
 - 10.1.4. **Dust Caps.** Place dust caps on the ends of all pipe connections.
 - 10.1.5. **Blocking During Storage.** Any home placed in storage, including those on sales lots, must be immediately blocked under each I-beam, both at the rear of the home and midway between axles and hitch, to prevent excessive deflection and possible structural damage.
 - 10.1.6. **Transit of Furniture and Belongings.** Substantial damage may result if furniture, personal belongings, set-up materials or other items are stored in the home during transit. **TRANSIT DAMAGE IS NOT COVERED UNDER YOUR WARRANTY.**
 - 10.1.7. **Multi-Section Homes.** Re-install temporary structural supports and bracing materials before moving the home. Cover open sides of sections with weather-proof material such as 6 mil plastic sheeting. After the sections have been separated, secure 2" x 6" shipping braces at the front end and in the axle area. Place ridge beam supports in open areas or at a maximum of 4' on center.
 - 10.1.8. **Multi-section homes with stairwell must have the stairwell cutout reinforced for transportation.** Locate the factory installed framing plug and fasten to floor framing with #8 x 3" wood screws. If the factory installed stairwell plug cannot be located, construct a temporary stairwell plug with 2 x 6's #3 SPF at 24" o.c. with 5/8" APA rated decking. Fasten all framing members with (3) 16d nails and decking with 10d nails 6" o.c.





Corporate Office
Post Office Box 35
Goshen, Indiana 46527-0035



Superior Homes, LLC

P.O. BOX 1024
WATERTOWN, S. DAK. 57201
PHONE: (605)-886-3270

SINGLE WIDE

INSTALLATION
INSTRUCTIONS

RADCO FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS
AUG 04 2003
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WATERTOWN, SOUTH DAKOTA

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SITE PREPARATION

The site selected to place the home should be properly graded to prevent the accumulation of water under the home. Enclosed crawl spaces shall be cross ventilated with a free air space of at least 1/150 of the floor area. Internal moisture control is the responsibility of the home owner by controlling the humidity levels in the home. (See Condensation Control information provided in the warranty information).

WARRANTY INFORMATION

Refer to manufacturers warranty information included in the warranty package for periodic maintainance and general upkeep information on items such as exterior siding, shingles, appliances, windows, doors, floor coverings, etc...

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BLOCKING AND LEVELING INSTRUCTIONS

WARNING - LIMITED WARRANTY on your mobile home is partially NULL & VOID, of not properly blocked, steel frame is not to be removed.

The footing on which blocks are placed must be on firm ground to assure minimum settling - poured concrete, at least 4" thick, is recommended.

Concrete blocks, placed with walls vertical, must not be more than 8 feet apart, must not be more than two feet from both front and rear ends of the home. Each block support must be capable of holding at least 4,000 lbs. without failure.

Proper blocking and leveling on firm footing will prevent settling and much unnecessary trouble, such as: body sagging, doors dragging, windows binding, interior and/or exterior paneling buckling, floor seams, out of square conditions, etc.

The drawing below shows recommended blocking of a typical SINGLE WIDE mobile home. Wood shims are recommended to be used above blocks for precision leveling.

Make sure to place leveling jacks directly under center of I beams, floor joists and/or perimeter rails - do not place leveling jacks under axles, outriggers or other brake formed members.

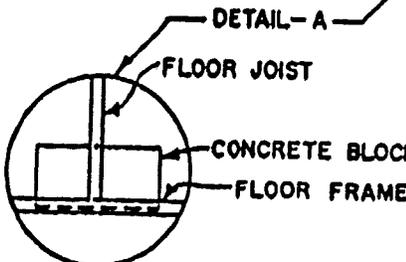
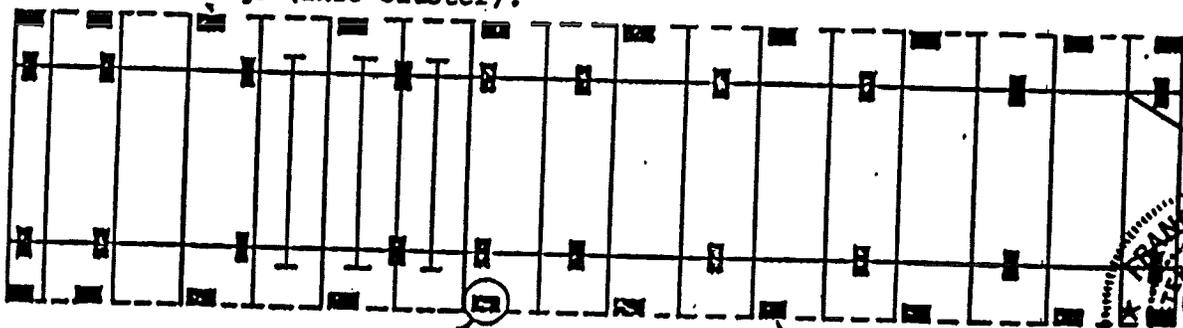
Always place a piece of 2" x 6" lumber or equivalent between leveling jack and frame member to avoid damage to frame.

Blocks must be placed under Rails of floor frame as shown, 1/2" from outer edge of exterior walls, under front and rear exit doors, sliding glass doors each side of sidewall openings 2' or larger, if any, at points indicated by white marks painted on surface of subfloor, along longitudinal perimeter floor rails, and 12' O.C. along remaining perimeter of home.
R1 : Detail A.

If HURRICANE TIE-DOWN STRAPS (over body type) are used, a set of blocks must be placed just inside each TIE-DOWN STRAP, directly under Rails of floor frame to prevent body sags at those points. Refer Detail A.

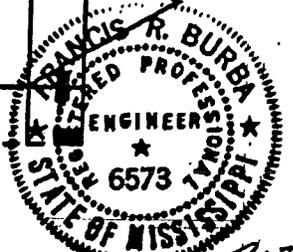
When Walk-A-Bay is located in sidewall, at least 2 piers must be located under edgerail-walk-a-bay joint.

NOTE: If 4 or 5 axles are used, add one (1) set of concrete blocks under longitudinal perimeter floor rails on each side of mobile home approximately centered with undercarriage (axle cluster).



Note:

For required footing size chart
Required Anchor Spacing chart, page 8-16.
FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS



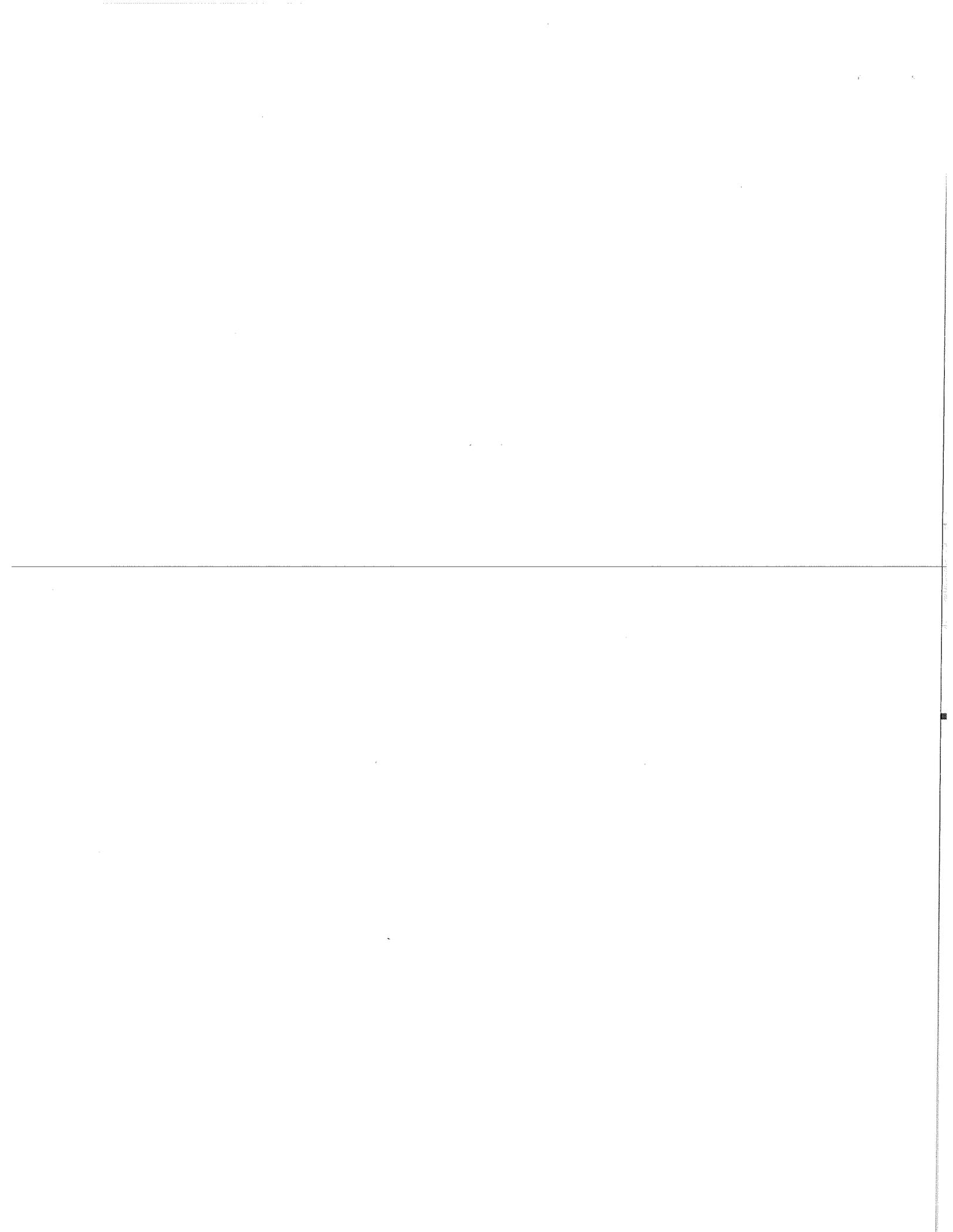
Francis R. Burba

RADCO

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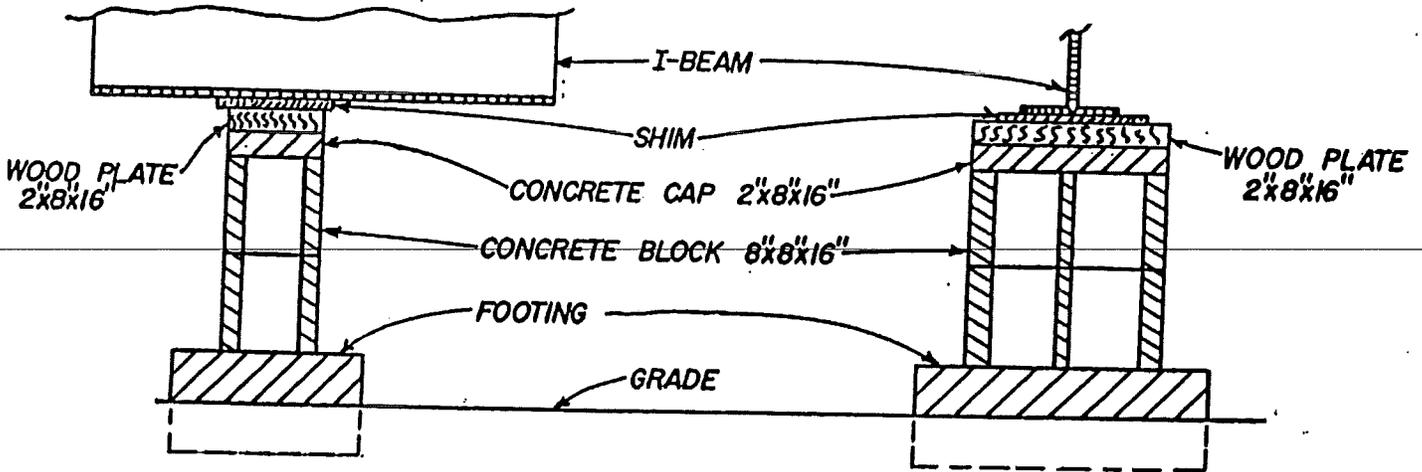
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TYPICAL BLOCKING SUPPORT

Illustrated below is a typical footing and concrete blocking arrangement. In areas where ground freezes as well as areas where ground support is soft, footings should be extended as necessary - in case of soft soil, to a depth of satisfactory bearing subsoil level. All organic material is to be removed from beneath footings.



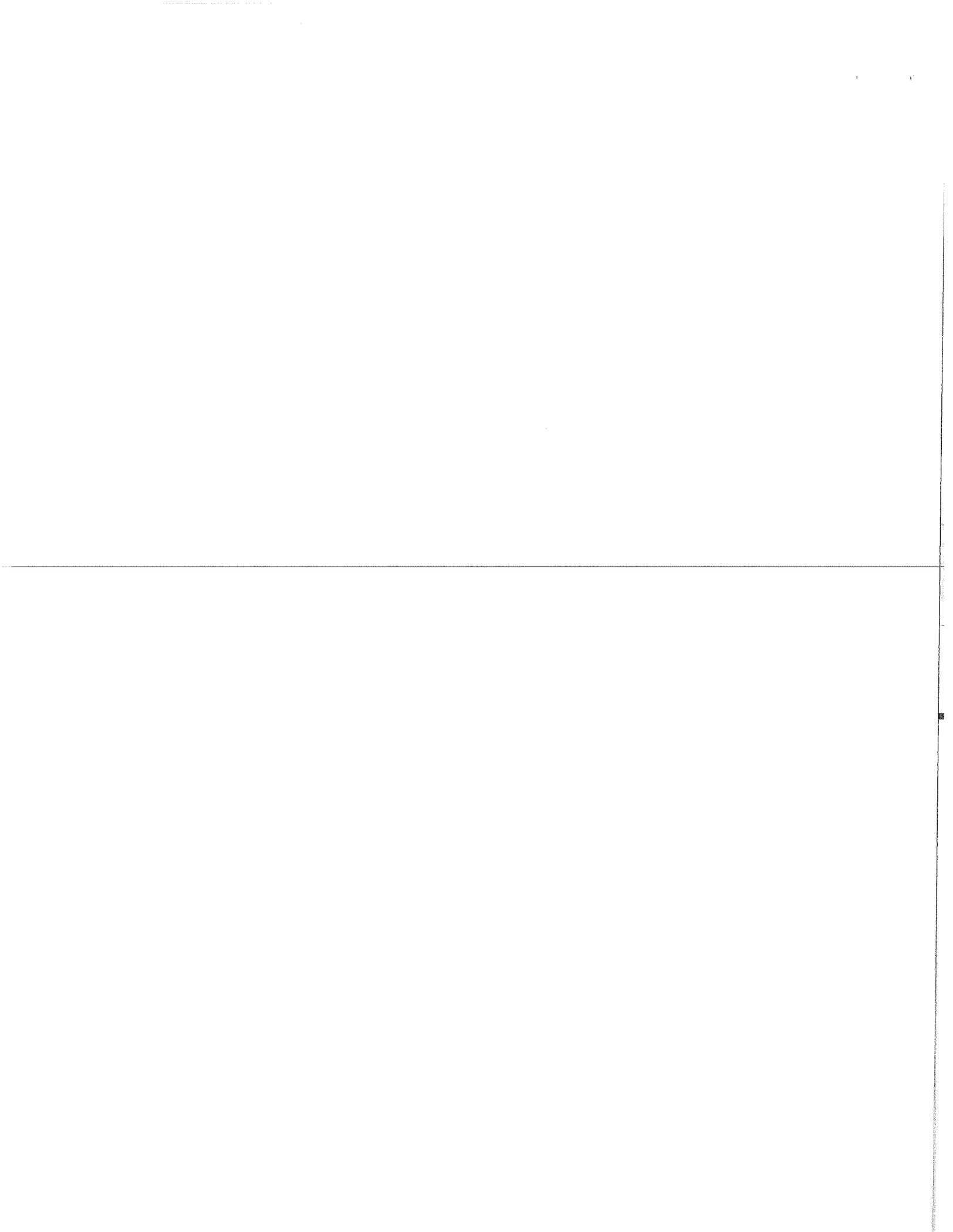
For soil bearing conditions and required footing size see page S-15.

CHECK WITH LOCAL AUTHORITIES FOR SPECIFIC FOOTING, FROST LINE, SOIL CAPACITY AND OTHER LOCAL REQUIREMENTS

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OPTIONAL BLOCKING INSTRUCTIONS FOR 2" X 10" FLOORS ONLY

WARNING! - LIMITED WARRANTY on your manufactured home is partially NULL & VOID if not properly blocked. Steel frame is not to be removed.

The footing on which blocks are placed must be on firm ground to assure minimum settling, poured concrete at least 4" thick is recommended.

Concrete blocks, placed with walls vertical, must not be more than 8 feet apart, center to center, and must be within 4 feet of both front and rear ends of the home.

Proper blocking and leveling of firm footings will prevent settling and much unnecessary trouble, such as: body sagging, doors dragging, windows binding, interior and/or exterior paneling buckling, and other out of square conditions.

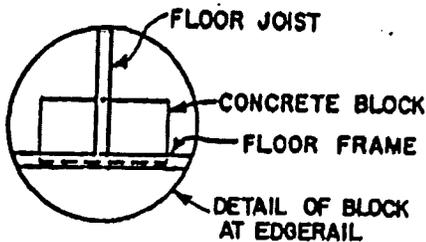
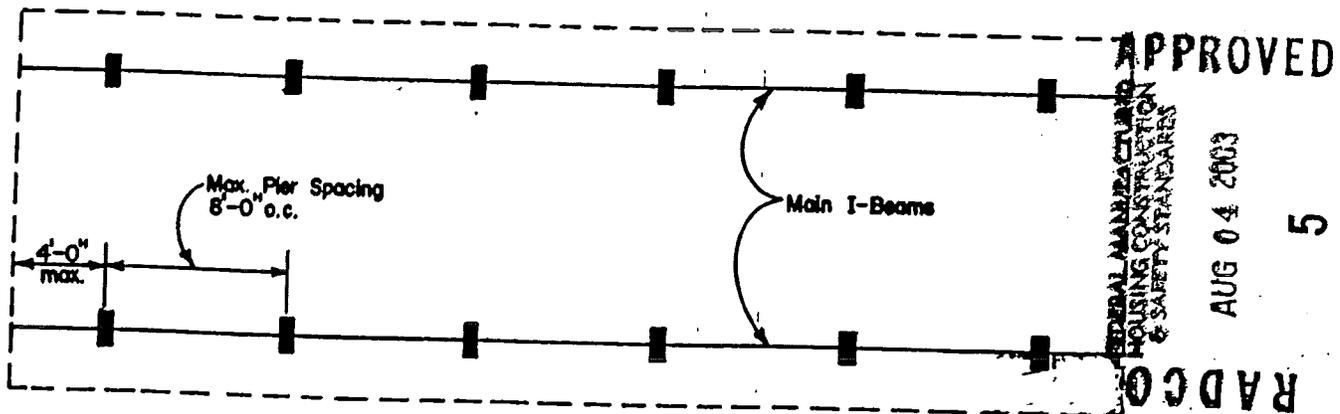
The drawing shows the required blocking for a typical SINGLE WIDE home. Wood shims are recommended to be used above blocks for precision leveling.

Make sure to place leveling jacks directly under center of I beams, floor joists and/or perimeter rails - DO NOT place leveling jacks under axles or other brake formed members. Always place a piece of 2" x 6" lumber or equivalent between leveling jack and frame member to avoid damage to frame.

Blocks must be placed under perimeter rails of the floor framing, 1/2" from outer edge of exterior walls, at the front and rear exit doors, sliding glass or French doors, and at points indicated by white marks painted on the surface of the subfloor covering material.

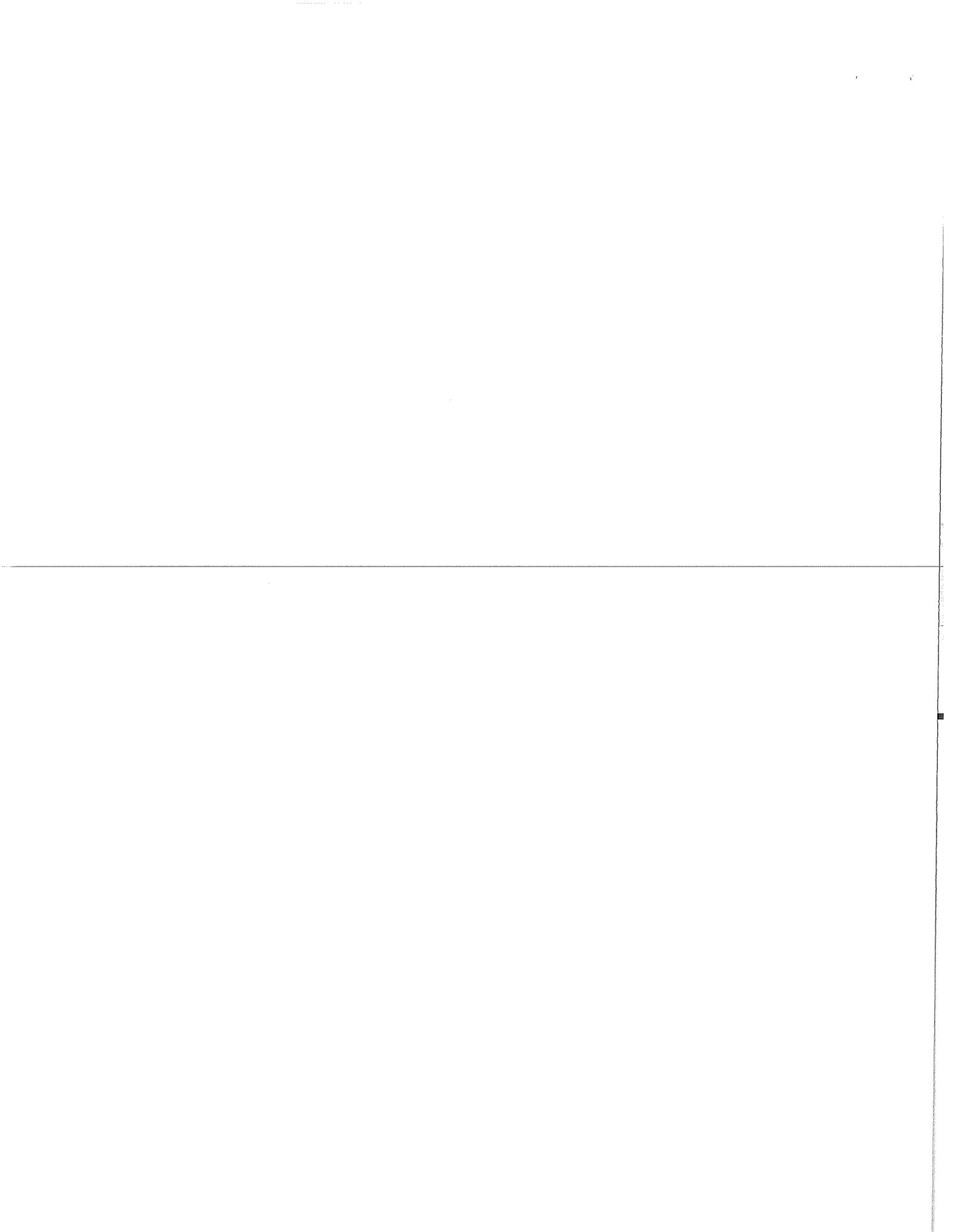
When a WALK-IN-BAY is located in the sidewall, piers must be located under the edgerail and walk-in-bay joints.

If HURRICANE TIE-DOWN STRAPS (over body type) are used, a set of piers must be placed just inside of each TIE DOWN STRAP, directly under perimeter rail of floor to prevent body sags at those points.



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PIER & PAD SCHEDULE FOR 2" X 10" FLOORS ONLY

14' WIDE
Pier & Pad Schedule:

Soil Cap. psf	8 ft. o.c.	
	Pier Cap. lbs.	Ftg. Size sq. ft.
1000	5868	10.67
2000	5868	3.79
3000	5868	2.30
4000	5868	1.65

16' WIDE
Pier & Pad Schedule:

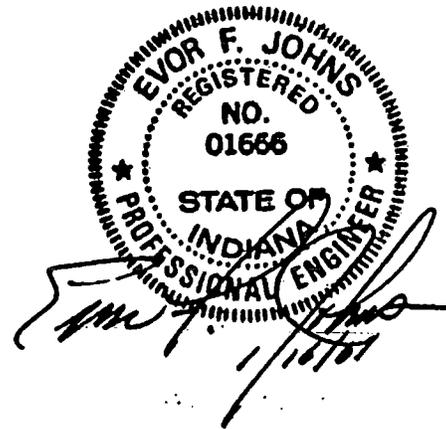
Soil Cap. psf	8 ft. o.c.	
	Pier Cap. lbs.	Ftg. Size sq. ft.
1000	6383	11.60
2000	6383	4.12
3000	6383	2.50
4000	6383	1.80

18' WIDE
Pier & Pad Schedule:

Soil Cap. psf	8 ft. o.c.	
	Pier Cap. lbs.	Ftg. Size sq. ft.
1000	6989	12.71
2000	6989	4.51
3000	6989	2.74
4000	6989	1.97

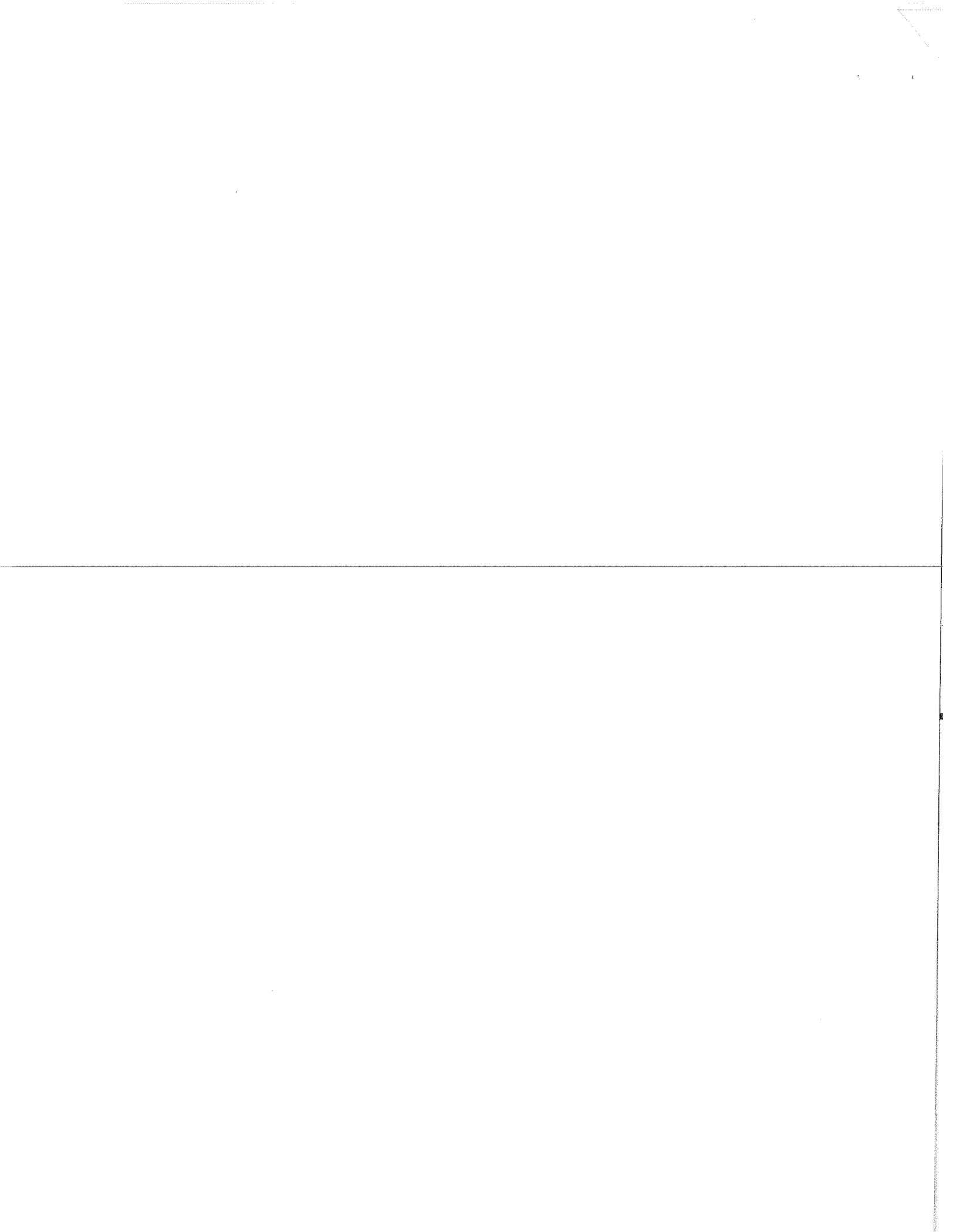
Refer to page S-16 for anchor requirements.

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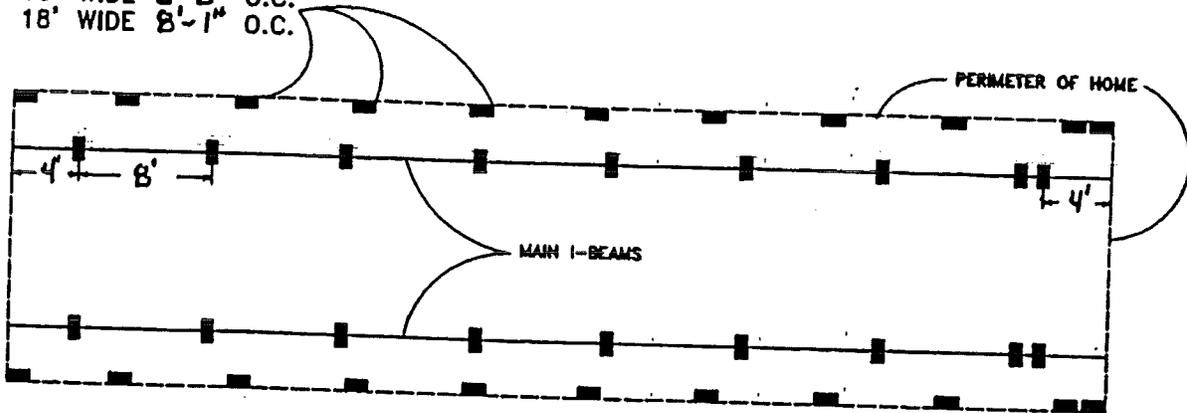
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BLOCKING FOR SINGLE WIDES W/45 PSF ROOF LOAD

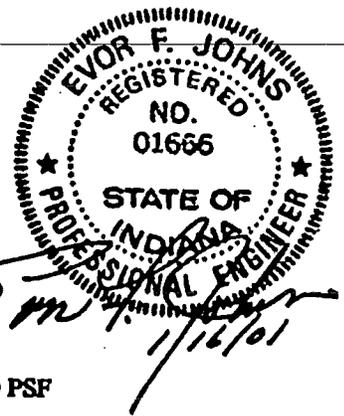
PERIMETER BLOCK SPACING
 16' WIDE 3'-8" O.C.
 18' WIDE 8'-1" O.C.



PIER & PAD LOADS FOR 45 PSF ROOF LOADS
 SPACED 8'-0" O.C.
 16' WIDE = 6770 LBS
 18' WIDE = 7502 LBS

FOOTING SIZES BASED ON SOIL CAPACITIES (3000 PSI Concrete)

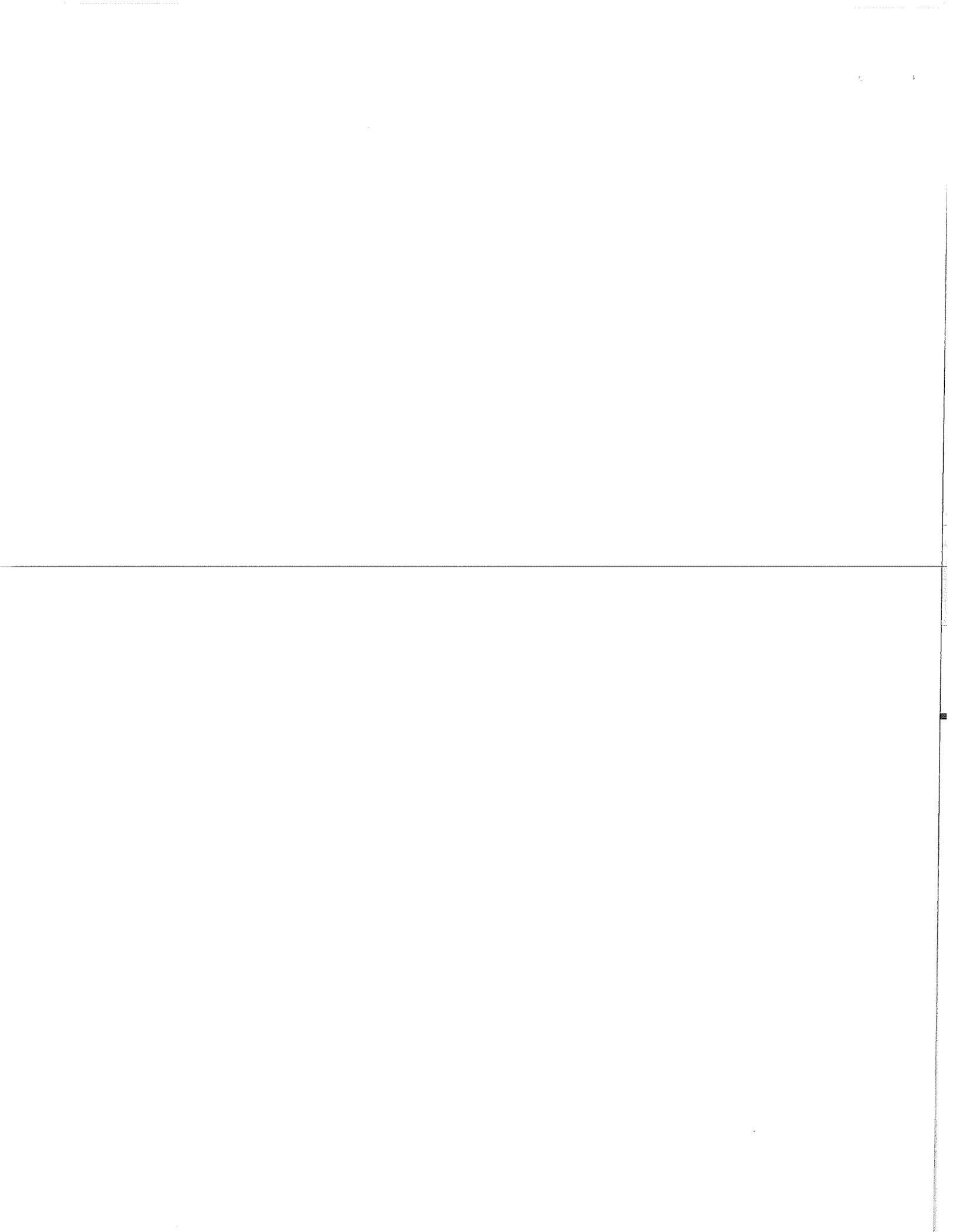
PIER CAP. (LBS)	THICKNESS	SOILS			
		2000 PSF	2500 PSF	3000 PSF	3500 PSF
3500	4"	16" x 16"			
4000	4"	18" x 18"	16" x 16"		
5000	4"	20" x 20"	18" x 18"		
6000	4"	32" x 32"	19" x 19"	16" x 16"	
7000	6"	23" x 23"	21" x 21"	18" x 18"	16" x 16"
8000	6"	25" x 25"	22" x 22"	19" x 19"	18" x 18"
9000	6"	26" x 26"	24" x 24"	20" x 20"	19" x 19"
10,000	6"	28" x 28"	25" x 25"	21" x 21"	20" x 20"
15,000	6"	34" x 34"	30" x 30"	23" x 23"	21" x 21"
20,000	8"	39" x 39"	35" x 35"	28" x 28"	26" x 26"
25,000	8"	44" x 44"	39" x 39"	32" x 32"	30" x 30"
30,000	10"	48" x 48"	43" x 43"	36" x 36"	33" x 33"
31,000	10"	49" x 49"	44" x 44"	39" x 39"	36" x 36"
				40" x 40"	37" x 37"



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EXTERIOR HEAT TAPE RECEPTACLE OUTLET

A 15 AMP receptacle outlet is provided on the exterior of the home, under the water heater compartment, which may be used for heat tape to protect plumbing to avoid freezing.

If heat tape is used, it shall be listed for mobile homes, and must be used in accordance with the heat tape manufacturer's instructions.

INLET WATER PRESSURE

This Mobile Home is designed for a water inlet pressure of 80 PSI maximum.

When the water pressure exceeds 80 PSI, a pressure reducing valve shall be installed at the water inlet.

MASTER COLD WATER SHUTOFF

A Master Cold Water Shutoff Full Flow Valve is to be installed in the water supply line adjacent to the home.

The Valve is to provide through flow capability equal to or greater than the minimum required water distribution piping size supplied by the valve.

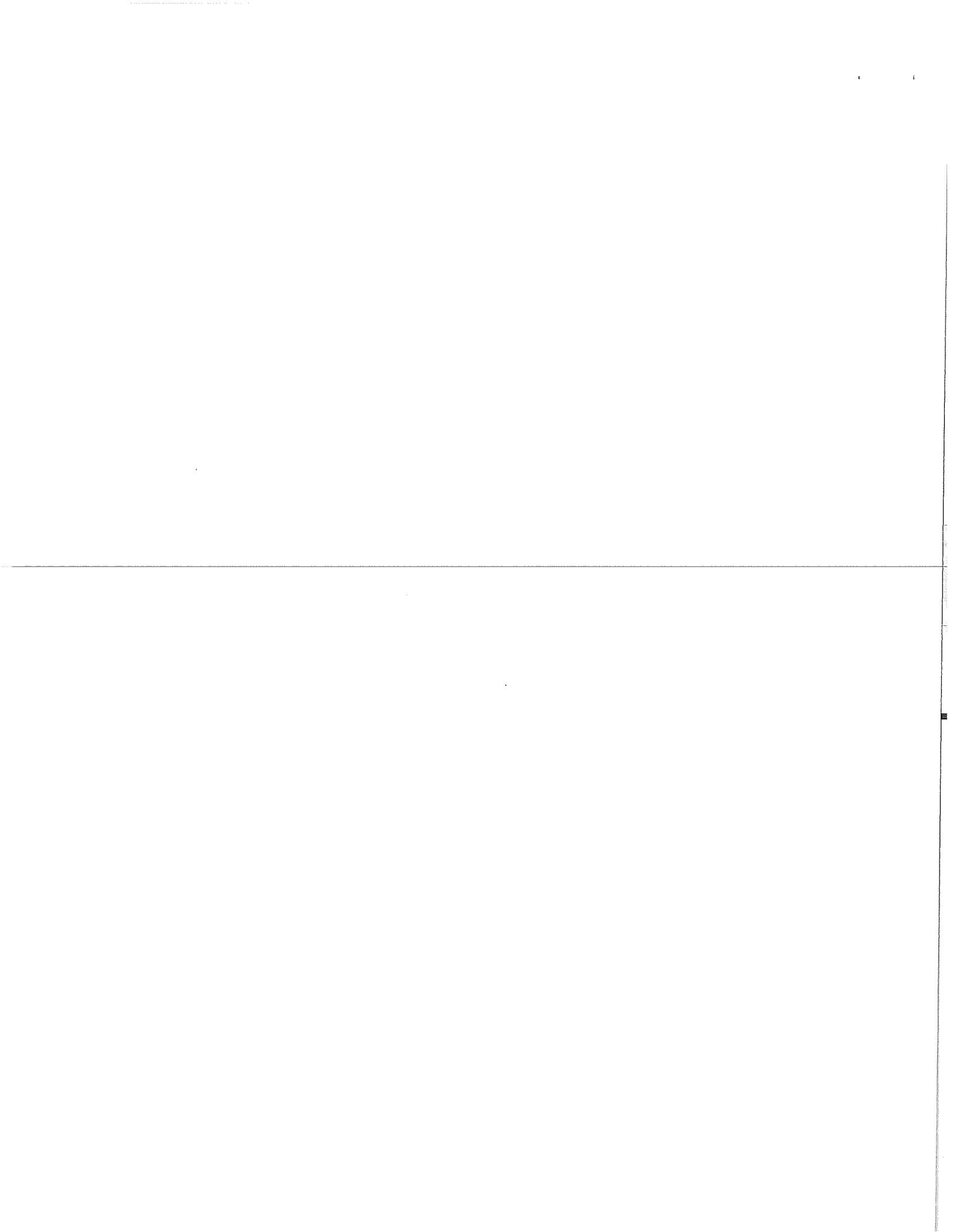
GAS SUPPLY SYSTEM DESIGN PRESSURE

The design pressure limitation for safe and effective operation of the gas piping system in this mobile home is designed for a pressure not exceeding 14 inch water column and not less than 11 inch water column for L.P. gas and not exceeding 10.5 inch water column and not less than 7 inch water column for natural gas.

DRAINING MAIN WATER LINES

To drain water lines, remove cap from drain location or open faucets and apply air pressure until all water is removed from system.

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JUNCTION BOX SIZE

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For straight pulls the length of the box shall not be less than eight times the trade diameter of the largest raceway.

For angle pulls the distance between each raceway entry inside the box and the opposite wall of the box shall not be less than six times the trade diameter of the largest raceway.

Note - For angle pulls if one of the raceway entries is opposite a cover the distance between the entry and the cover may be less than indicated above, but shall not be less than given in the following table:

Size of Feeder Conductors To Be Installed, Awg Or MCM	Distance, Raceway Entry To Cover, In.
4-3	2
2	2-1/2
1	3
1/0-2/0	3-1/2
3/0-4/0	4
250	4-1/2
300-350	5

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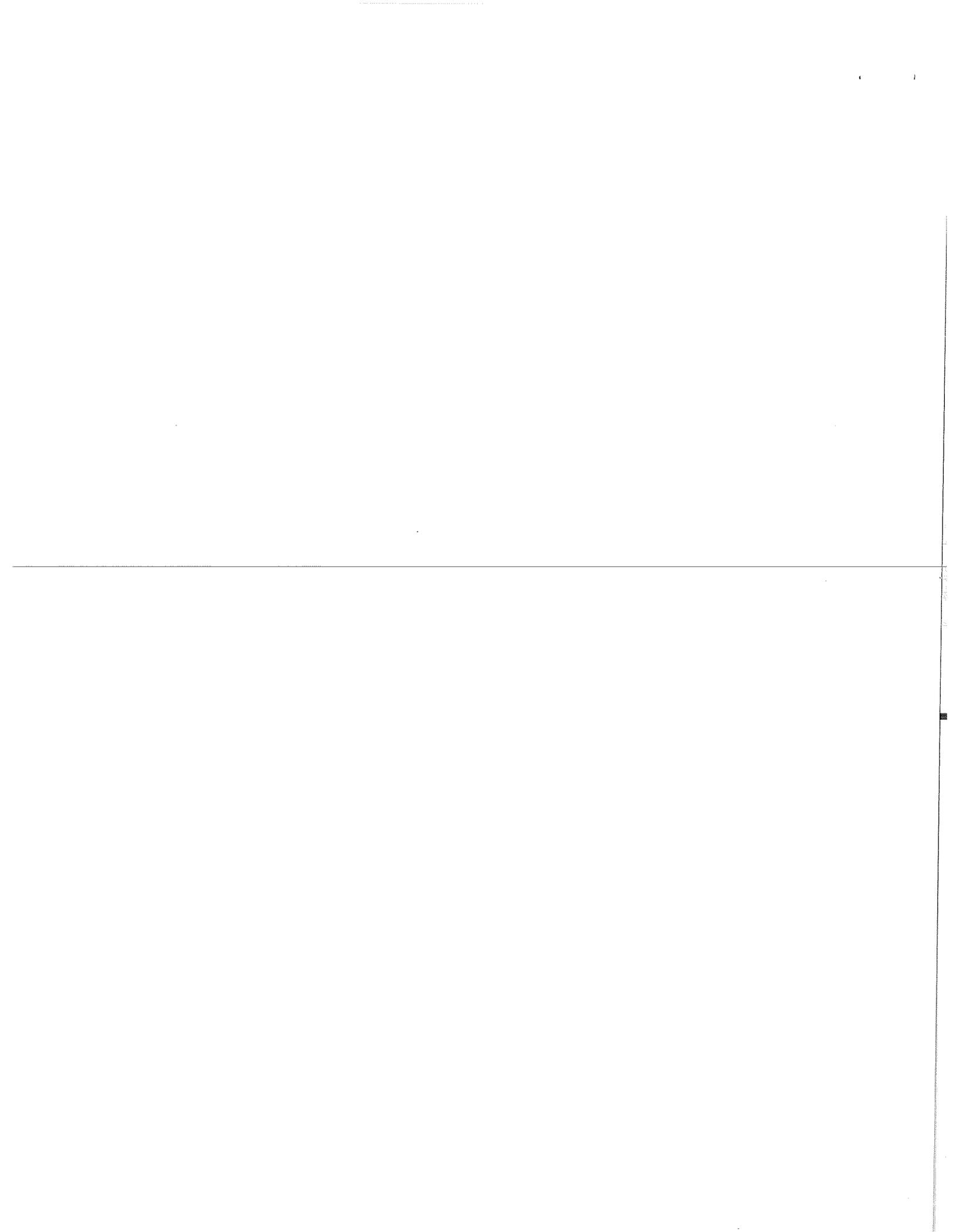
RESIDENTIAL MOBILE HOME FIXED FEEDER SUPPLY
(BASED ON 1993 NEC)
REQUIRED FEEDER RACEWAY SIZE AND MARKING
FOR CONDUCTOR SIZE

When this Mobile Home is equipped with 100 Amp Maximum Load and Main Breaker or Fuse, the Feeder Raceway is sized for Copper, 75C rated conductors, Types RH, RHH, RHW without outer covering, THW or XHHW, size No. 4 Awg circuit conductors and size No. 8 Awg grounding conductor.

When this Mobile Home is equipped with 200 Amp Maximum Load and Main Breaker or Fuse, the Feeder Raceway is sized for Copper, 75C rated conductors; Types RH, RHH, RHW without outer covering, THW or XHHW, size No. 2/0 Awg circuit conductors and size No. 6 Awg grounding conductor.

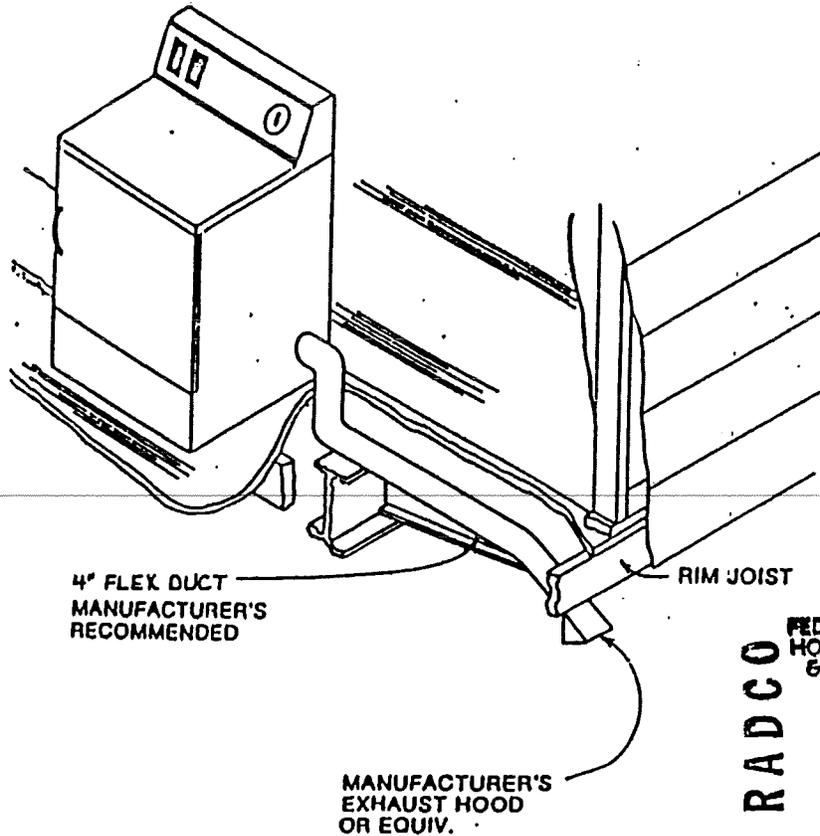
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TYPICAL DRYER VENTILATION

*If dryer vent cap is installed through the exterior siding of home it shall be caulked to prevent moisture and air infiltration.



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DRYER INSTALLATION:

If your home is equipped with a clothes dryer, it must be exhausted to the outside by a moisture-lint exhaust system.

CAUTION: THIS EXHAUST SYSTEM MUST NOT TERMINATE IN THE FLOOR CAVITY OR UNDER THE HOME.

All required components and fittings are provided in the home. An opening in the floor is provided. Typical dryer exhaust connections are shown in illustration.

If your home is not equipped with a dryer, but an electrical or gas outlet is provided for one, then the opening in the floor or wall is provided. Installation of the exhaust system must be in accordance with the dryer manufacturer's installation instructions.



FINAL (DEALER) ON SITE INSTALLATION INSTRUCTIONS
EXTERIOR DRYER VENT

M

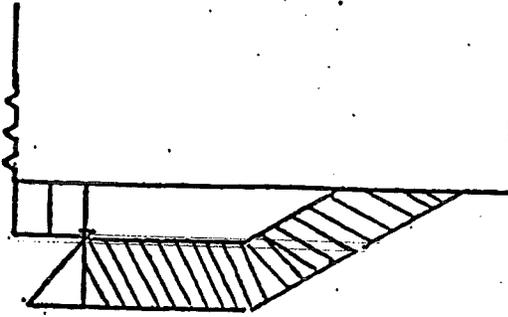


Fig. 1. Remove 2 screws on back side of 2 x 3 x 6 Doublor Vent Block.

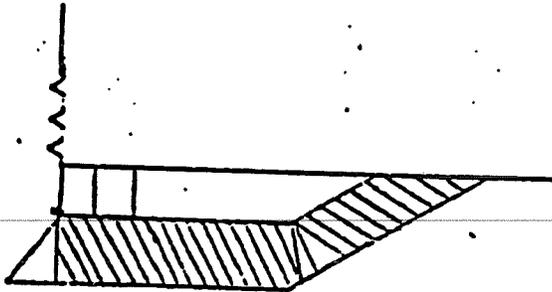


Fig. 2. Extend Dryer Vent beyond 2 x 3 x 6 Doublor Vent Block and resecure to exterior side of mobile home.

STEEL FRAME TOUCH-UP PAINT

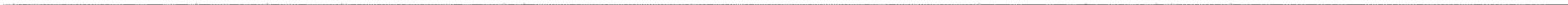
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The steel frame on this mobile home is painted with an asphaltic base type material in compliance with Federal Mobile Home Construction and Safety standards, Paragraph 280.305.

It is recommended that Mortell #615 Asphalt Frame Paint be used for touch-up purposes.

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BOTTOM BOARD MATERIAL PATCHING INSTRUCTIONS

M

Small cuts or tears may be repaired by using CP-1 pressure sensitive tape or equivalent. For larger holes use additional pieces of Mobile Flex which extend at least 2" beyond the damaged area. Secure the large patch with either a mechanical fastener, CP-1 pressure sensitive tape, High Tack Adhesive 76 manufactured by 3M contact cement or equivalent. When mechanical fasteners are used the entire perimeter of the patch is to be secured/sealed with either the CP-1 pressure sensitive tape or High Tack Adhesive 76 contact cement, or equivalent.

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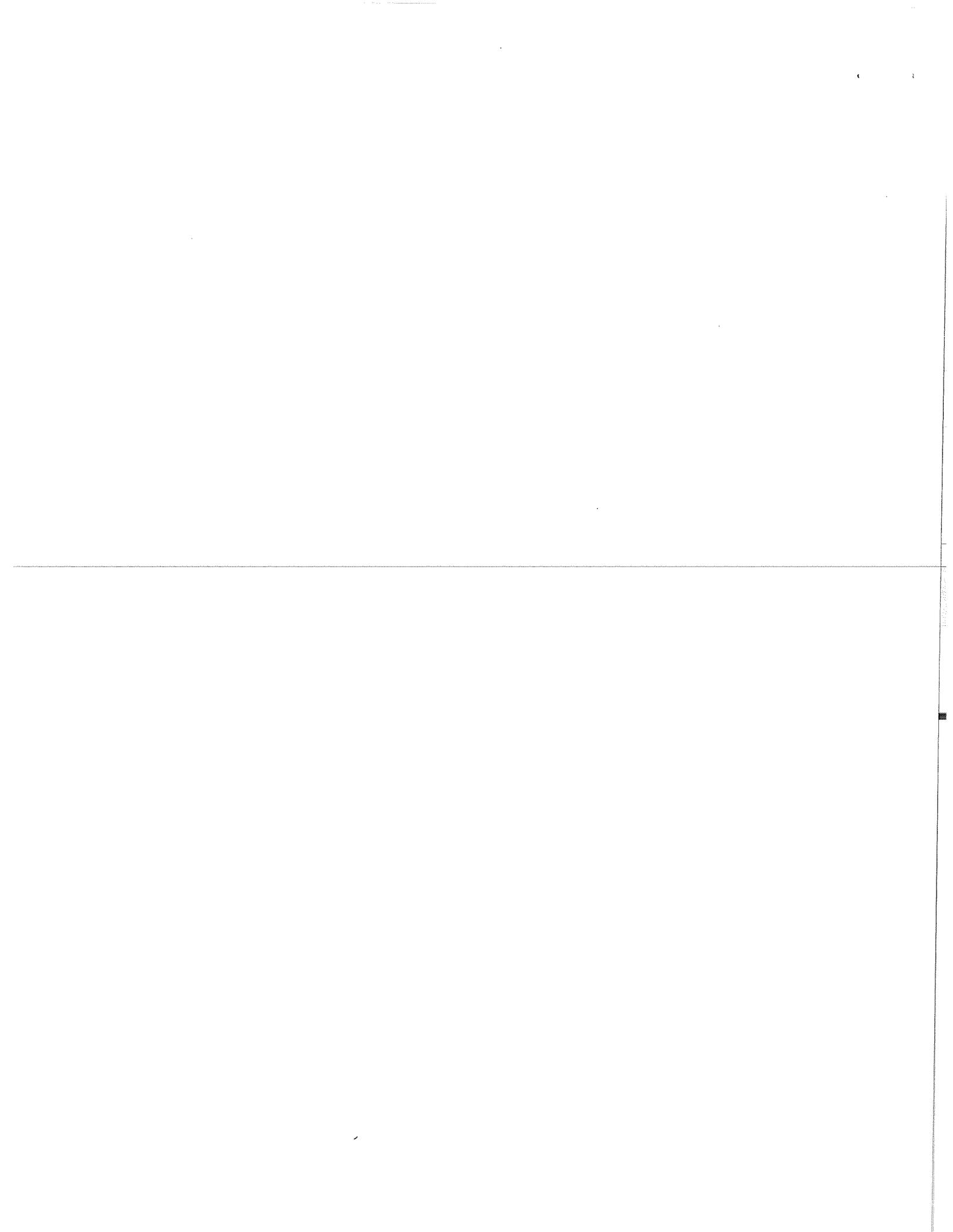
REQUIRED TIE DOWN SYSTEM FOR
FRAME TIES ONLY

Required diagonal frame tie is to be spaced per page S-16 for units located in wind zone 1.

See attached "Minute Man Anchors" brochure for suggested tie down system.

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Minimum Requirement for Ground Anchors

1. Anchors shall have an ultimate strenght of 4725#.
2. Anchors should be certified by a professional engineer, architect, or nationally recognized testing laboratory as to their resistance, based on the maximum angle of diagonal tie and/or verticle tie loading.
3. Angle of anchor installation as recommended by anchor manufacturer.
4. Instructions shall specify types of soil in which anchors are to be installed.
5. Ground anchor should be embedded below the frost line and at least 12" above the water table.
6. Ground anchors should be installed to their full depth.
7. Stabilizer plates should be installed to provide added resistance to overturning or sliding forces.
8. Anchoring equipment should be certified by a registered professional engineer or architect to resist these specified forces in accordance with testing procedures in ASTM Standard Specifications D3953-91, Standard Specification for Strapping, Flat Steel and Seals.

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Minute Man **anchors**,[®] Inc.



**Installation
Instructions
For
Anchors,
Frame Ties,
& Steel Piers**

305 West King St.
East Flat Rock, North Carolina 28726

**Revised
June 2003**
MMA-A001 R3

Minute Man **anchors**,[®] Inc.

LIMITED WARRANTY

Minute Man Anchors, Inc. warrants its product is free from defects in materials and workmanship at the time of installation when properly installed in accordance with the installation instructions. THE FOREGOING WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY LIABILITY IS EXPRESSLY LIMITED TO AN AMOUNT EQUAL TO THE PURCHASE PRICE PAID, AND ALL CLAIMS FOR SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE HEREBY EXCLUDED. Minute Man does not assume any other liability or obligation in connection with the sale or use of this product.

If the product is defective at the time of delivery or installation and you give prompt notice to Minute Man no later than thirty (30) days of attempted installation of the defect, Minute Man, at its option, will replace the product at no cost or refund the full amount of the purchase price, provided the defective product is returned to Minute Man with proof of purchase at the address set forth below. PRODUCT REPLACEMENT OR REFUND IS YOUR SOLE AND EXCLUSIVE REMEDY.

This warranty extends only to the distributor and original installer of the product and does not cover a defect resulting from abuse, misuse, neglect, repairs, any use not in conformity with the printed instructions or installation by unauthorized personnel.

This warranty gives you specific legal rights, and you may also have other legal rights which vary from state to state. Some states do not allow limitations on implied warranties or special, incidental or consequential damages, so the foregoing limitations may not apply to you.

If you have a claim under this warranty, please contact our CUSTOMER SERVICE department (have model and type numbers available):

CUSTOMER SERVICE

Toll Free In the U.S. 1-800-438-7277

1-828-692-0256

OR WRITE TO:

Minute Man- Customer Service

305 West King Street

East Flat Rock, NC 28726

To our knowledge, the information provided in and by the independent, professional engineers' reports and certifications and obtained from other independent sources contained in the installation instructions and product manuals is accurate. However, Minute Man Anchors, Inc. cannot assume any liability whatsoever for the accuracy or completeness thereof. Final determination of the suitability of any information or material for the use contemplated is the sole responsibility of the user. Specifications are subject to change without notice. The load ratings established in the report are not valid in any application where the use of the product would overload any structural member of the home or foundation,

To Our Customers:

These Installation Instructions are provided as a source of reference and installation information.

Minute-Man Anchors, Inc., Having pioneered anchoring for the manufactured home industry, continues in our efforts to provide new and innovative products. In so doing, we are committed to the highest quality materials, workmanship and total customer satisfaction.

If you are a longtime Minute-Man customer, "thank you" for your continued trust and patronage. If you are a new customer, "welcome!" We look forward to serving you in this ever growing industry.

Questions?

Regardless of your level of association with the Manufactured Housing market, if you have questions or we may be of service, please contact our office.

1-800-438-7277

FAX: (828) 692-0258

You can also find further information at our website:

www.minutemanproducts.com

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Note: Prior to installation, refer to any local, state and federal regulations, to assure proper compliance.

Soil test probe the anchor location in order to match the soil classification with the proper anchor.

Note: Prior to installation, refer to any local, state and federal regulations, to assure proper compliance. Soil test probe the anchor location in order to match the soil classification with the proper anchor.



Minute Man anchors, Inc.

ANCHOR INSTALLATION

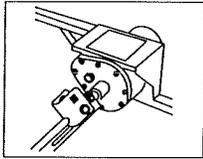
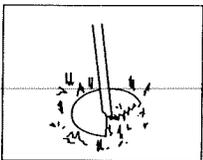
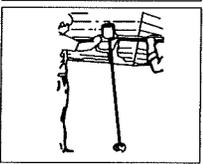
There are two basic methods of installing anchors, each equally effective in properly securing manufactured homes to the ground.

CAUTION: The installation of anchors with a drive machine is a two person operation.

Warning: Before ground anchor installation, determine that the anchor locations around home will not be close to any underground electrical cables, water lines or sewer piping. Failure to determine the location of electrical cables may result in serious personal injury.

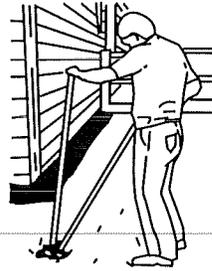
MACHINE INSTALLATION

In this method, the anchor is turned to full depth into the ground by an anchor drive machine.

1.  Attach anchor to machine.
2.  Placed anchor in proper position in line with strap and machine.
3.  Anchor should be installed at a slight angle as shown to assure head being positioned behind future skirting.

MANUAL INSTALLATION

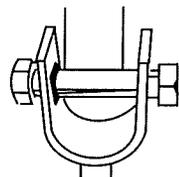
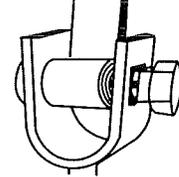
A hole is dug to a depth of approximately 1/2 the length of the anchor, in the proper position as explained under machine installation.



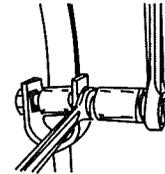
After the hole is dug to 1/2 the length of the anchor, then the anchor is turned into the ground by hand, using a rod or length of pipe for leverage or by machine.

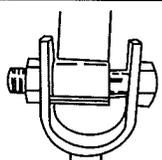
After anchor is installed full depth, earth is repacked, six inches at a time.

PROPER TENSIONING OF STRAP TO ANCHOR HEAD

1.  Insert bolt into head; attach nut loosely. Insert strap in slot of 5/8" bolt until strap is flush with far side of bolt.
2.  Bend strap 90° and take at least three complete turns on bolt until strap is taut.

3. Bolt is turned with 15/16" socket wrench, or adjustable wrench, on hex head. With square hole in anchor head, hold bolt under tension while repositioning wrench: Place open-end wrench on 5/8" square shoulders of bolt. Align square shoulders of bolt with square hole in anchor head.



4.  Holding hex head of bolt in position, tighten nut to draw square shoulders into square hole. Shoulders are now in locking position; continue to tighten nut. Tensioning device is now in locked, secure position.

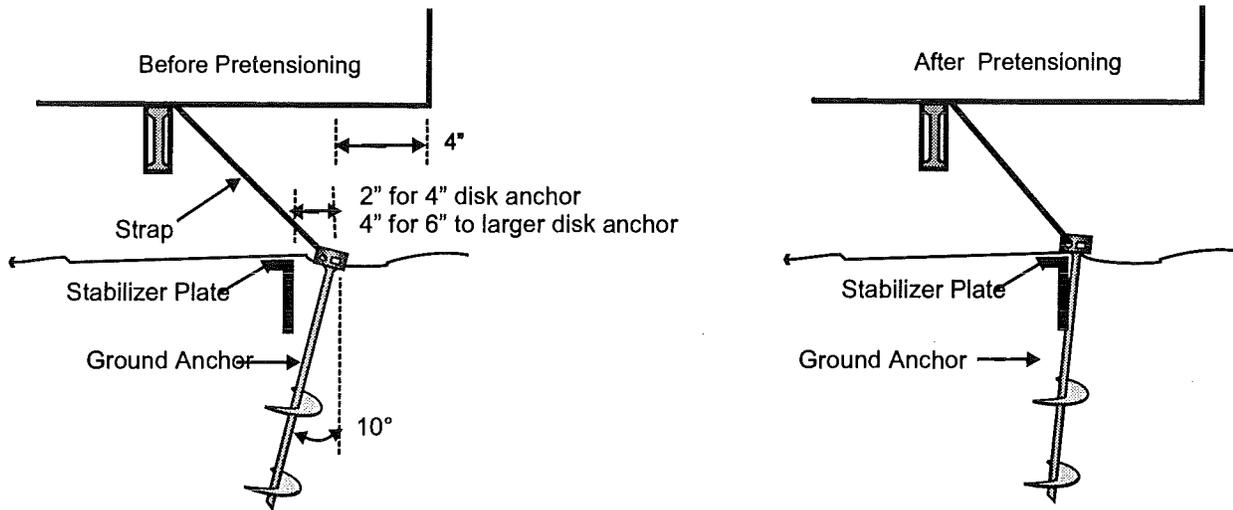
Note: The tensioning bolt can be inserted in the head from either side.

Notice: In areas of severe cold weather, where possible damage could occur from frost heave, the homeowner should be prepared to adjust tension on the straps to take up slack.

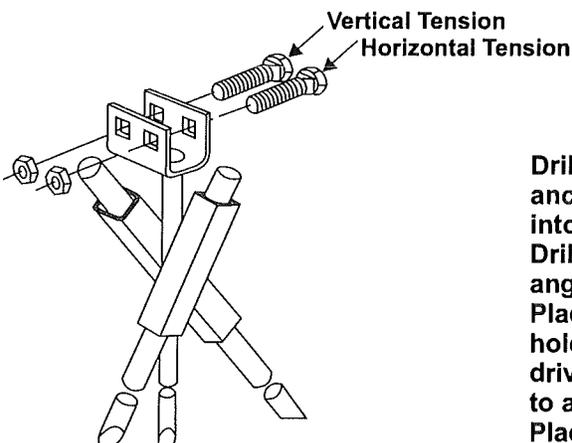
MINUTE MAN ANCHORS, INC.

INSTRUCTION FOR USING MINUTE MAN STABILIZING DEVICE

Minute Man stabilizing devices are designed for use with Minute Man anchors and intended to laterally restrict movement of the anchor through the soil.



1. Place the anchors approximately four inches to the inside of the exterior wall line of the home or a sufficient distance to avoid interference with the skirting (see above)
2. Hold the anchor at an angle of approximately 10 degrees off of vertical so that the head of the anchor is just outside the sidewall (see above)
3. Install the anchor to a depth of approximately one-third (1/3) the anchor length.
4. Place a stabilizer plate to the inside of the anchor shaft (side of shaft toward center of house) and the distance indicated from the shaft.
5. Drive the stabilizer plate into the ground until the top of the plate is 1" below the surface of the ground.
6. Install the anchor to its full depth.
7. Pretension the anchor by pulling it up to the stabilizer plate. Pull the anchor approximately 1/2 inch more while it is in contact with the plate using the strap and take-up bolt to move the anchor head.



Installation Instructions for Cross Drive Rock Anchor

INSTALLATION INSTRUCTIONS

Drill 5/8" diameter hole 5 1/2" deep, in center of anchor location, for pilot stud. Insert pilot stud into hole.
 Drill two - 3/4" diameter holes in rock at 45 degree angles, using anchor head as a locating guide.
 Place rod through top of (1) square tube and into hole. Drive rod to desired depth. (Rod must be driven into rock at least 80% of its length in order to achieve minimum allowable pullout resistance.)
 Place second rod through top of remaining tube. Drive rod to desired depth to lock.
 Maximum pullout resistance is developed when anchor head is low as possible and ground surface is solid rock. Distance from square tubing to rock surface should not exceed 1".

IN LINE INSTALLED AND CONNECTED GROUND ANCHOR AND FRAME CONNECTION

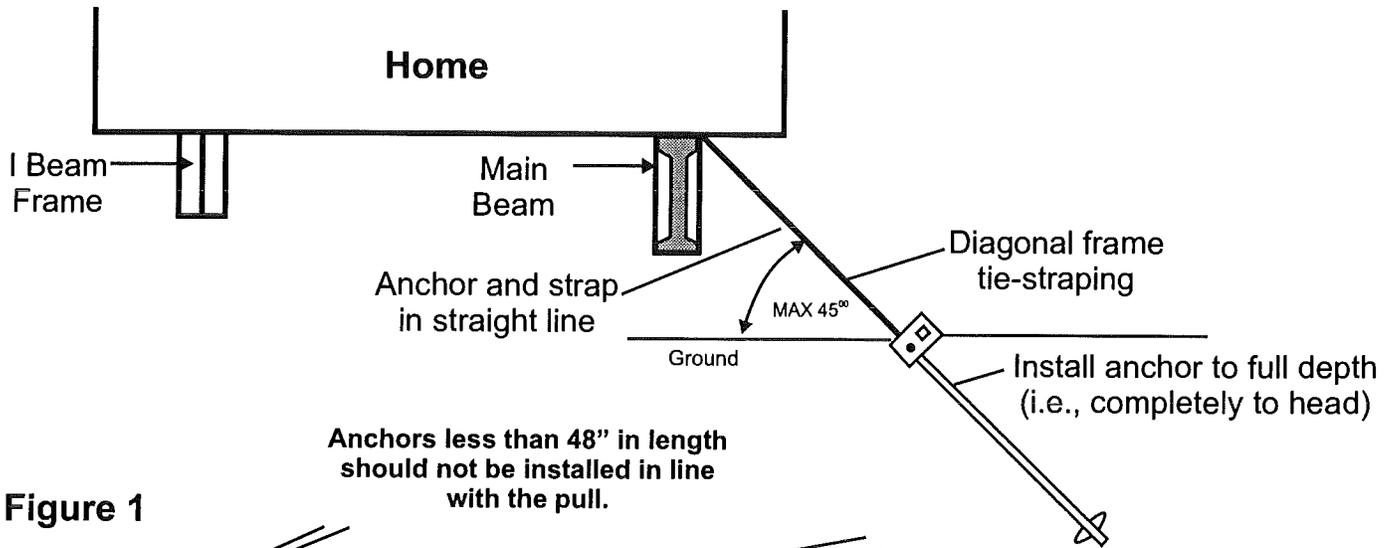


Figure 1

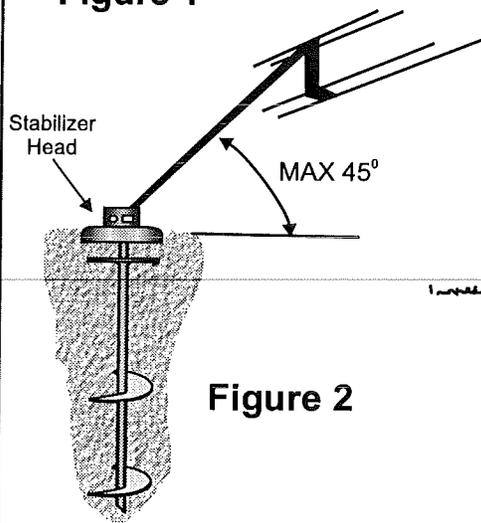


Figure 2

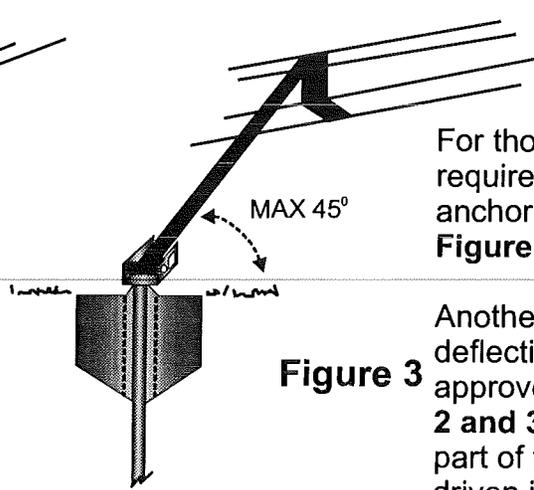
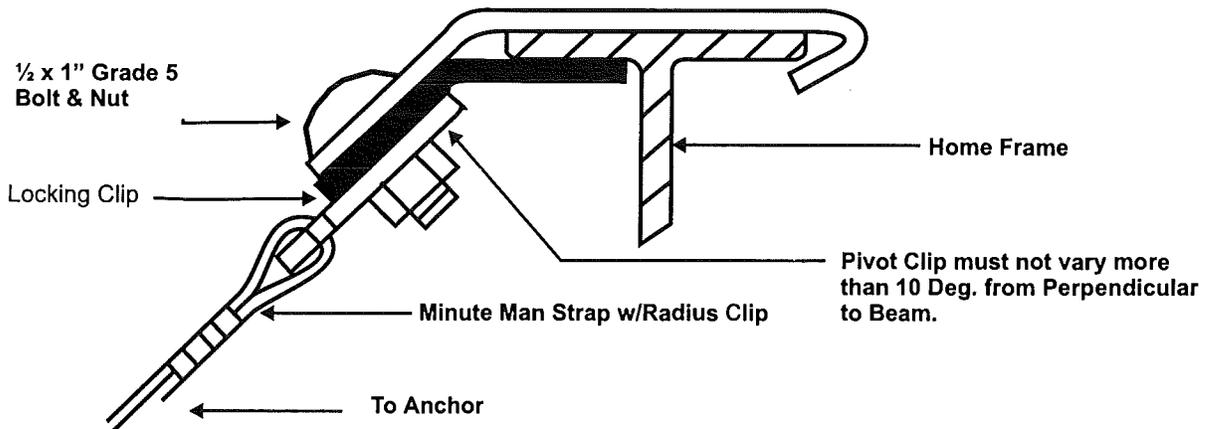


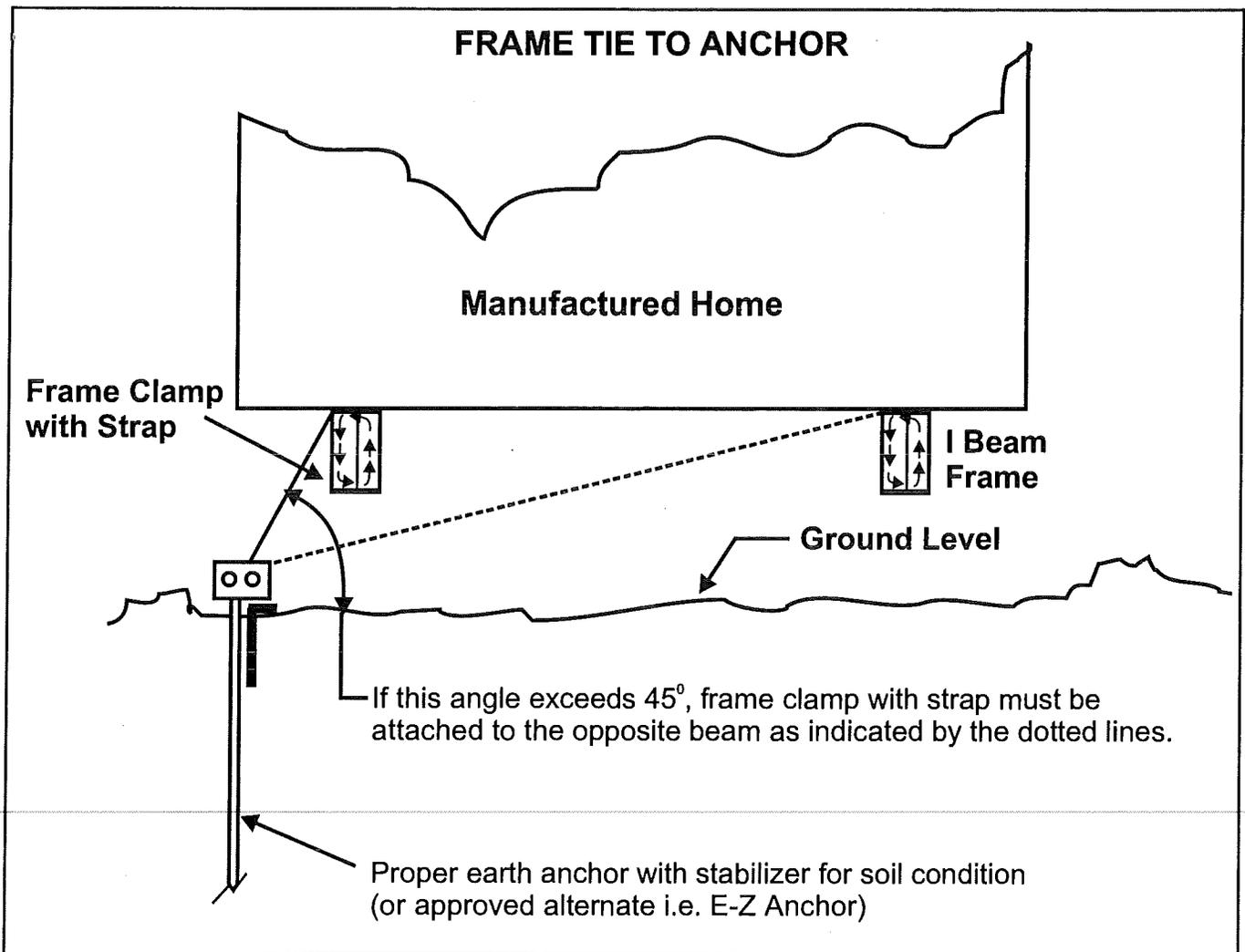
Figure 3

For those homes which are designed to require only diagonal frame ties, the anchor can be installed in line with the ties. **Figure 1.**

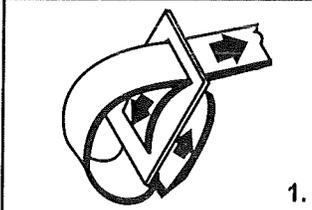
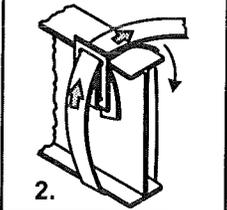
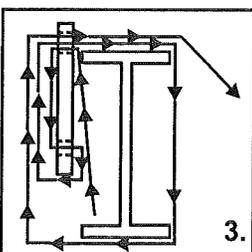
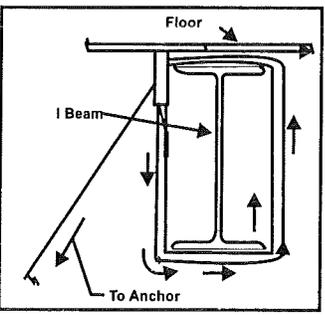
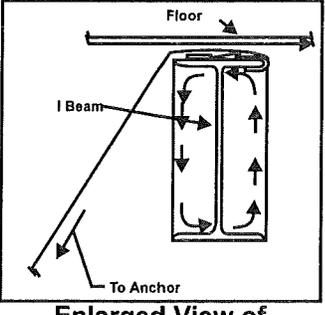
Another accepted way to limit lateral deflection is by use of a tested and approved Metal Stabilizing Device. **Figure 2 and 3.** In **Figure 2**, the Stabilizer is a part of the anchor. In **Figure 3**, the plate is driven in front of the anchor's direction of pull and will act to minimize the anchor rod deflection. See Top of Page 2.

LOCKING FRAME CLAMP II MMA-33 ASSEMBLED UNIT





FRAME TIE INSTALLATION INSTRUCTIONS

Frame Tie With Buckle	Single Slot Buckle With Strap	Frame Tie With Hook
 <p style="text-align: right;">1.</p>  <p style="text-align: right;">2.</p>  <p style="text-align: right;">3.</p>	 <p style="text-align: center;">Enlarged View of Frame Beam</p>	 <p style="text-align: center;">Enlarged View of Frame Beam</p>
<p>Thread sufficient length of frame tie strap through buckle as shown.</p> <p>Next, thread long end of strap between frame and floor of home. Bring strap around frame and back through buckle as shown in diagram and fasten to anchor head.</p> <p>Diagram showing strap in position around frame and through buckle. It is important to remove all slack from system.</p> <p>Note: Use of a single buckle is an appropriate alternate.</p>	<p>Place buckle at top of anchor side of beam, pass strap around beam and through buckle. Pass strap back around beam and through buckle to anchor. Strap will wrap beam twice. Remove all slack from system.</p>	<p>Attach Frame Clamp (Hook) inside top flange of home frame. Bring strap around frame. Place strap between frame and home as shown in sketch. Pull strap tight and attach to anchor tension head.</p>

E-Z ANCHOR INSTALLATION METHOD

Note: With machine installation, a Minute-Man adapter designed to fit both the anchor head and drive machine shaft is available. Installers do not need additional or special equipment for E-Z Anchor Installation.

E-Z Anchors are a patented item.

1. MACHINE INSTALLATION

The drive machine is started and the anchor is turned into the ground to a point where the top (stabilizer head plate) is flush with or slightly below ground level. This assures that the E-Z Anchor Stabilizer will be at its required installation position. **See Figure A.**

To achieve full potential, install the E-Z Anchor vertically. A 10° deviation from vertical is acceptable. **See Figure A.**

Note: A slightly greater angle may be used to start anchor to avoid contact with the home and straightened as anchor is ground set. The splitbolt is inserted, strap is fastened, and tightening adjustment made.

E-Z Anchor carries U.S. Patents and manufacture is exclusive to Minute-Man Anchors, Inc.

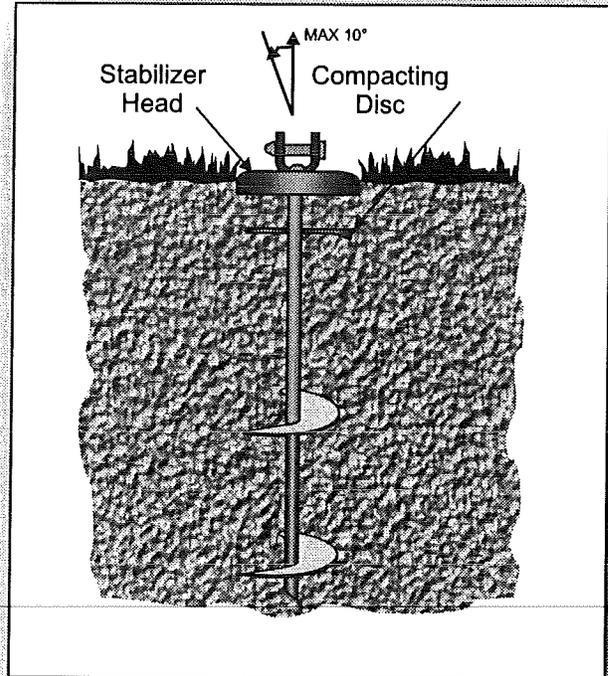


Figure A

2. STANDARDS FOR INSTALLATION

- E-Z Anchors and all components are to be installed per manufacturer's instructions.
- E-Z Anchors are approved for designated Soil Class III.
- E-Z Anchor working load capacity is 3,150 pounds for a single tie or the load of (2) ties combined.. **See Figure B.**
- Consult manufactured home set up instructions for number of frame tie downs, over the roof tie downs and tie down spacing.
- Proper site preparation requires removal of grass and sod prior to installation.

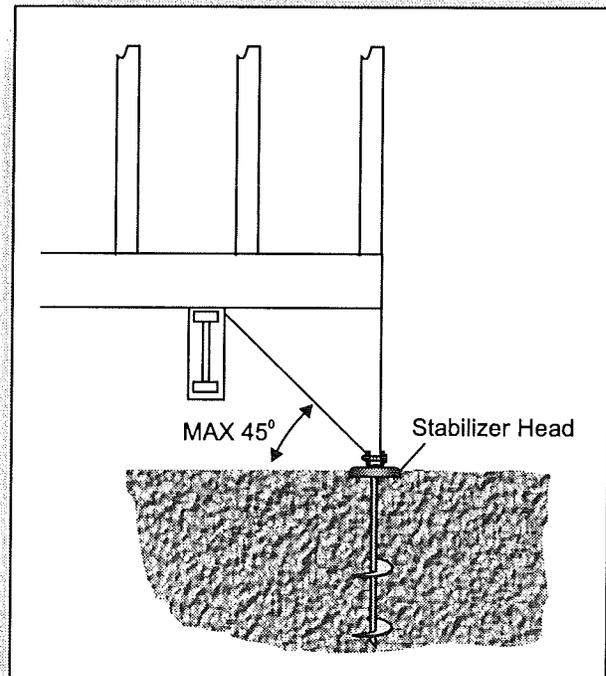


Figure B

For additional information, copies of engineering test(s) and report, Contact Minute-Man Anchors, Inc. (Revised: November 1998)

Minute Man Anchors, inc.®

INSTALLATION

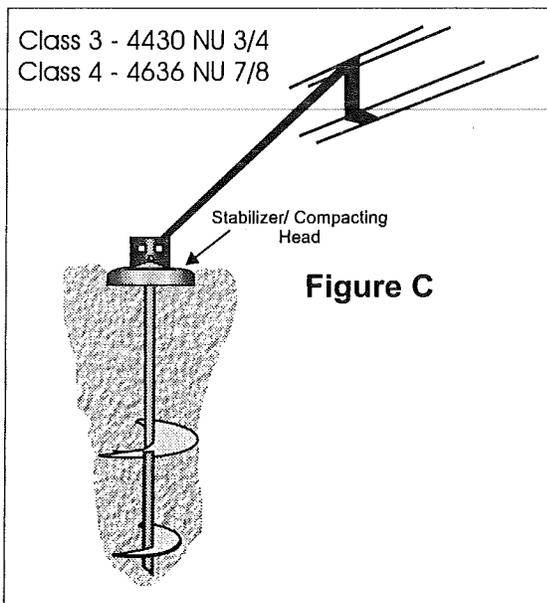
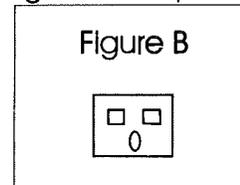
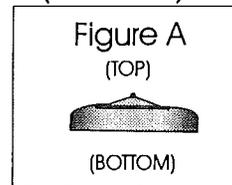
NU-CONCEPT ANCHOR

CLASS 3&4

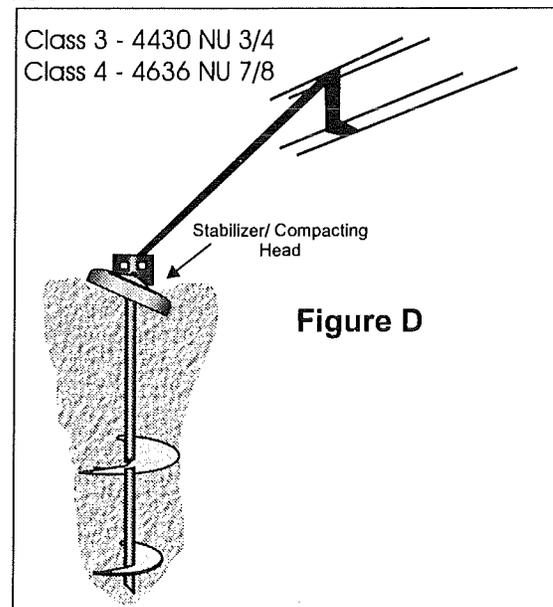
Patent Pending

The Nu-Concept Anchor combines a patented elongated hole in the tension head with a stabilizing and compaction cap. When combined with a grade 5 bolt, the anchor will rotate in all directions allowing adjustment to uneven terrain. Under load conditions the cap, rotates down ward in the direction of the pull, causing a double compaction of the soil and laterally restricts movement of anchor through the soil.

- I. Attach stabilizer/ compaction cap to the tension head of the anchor. This is done by sliding the cap over the top of the tension head, aligning 9/32" holes in cap with 1/4" elongated hole in tension head. Insert 1/4" x 2-1/4", grade 5 bolt (included). Hand tighten. Cap must be installed at any time prior to ground contact. See Cap *Figure A* and Tension Head *Figure B*.

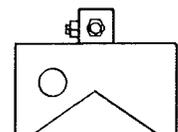


- II. The Drive Machine is started and the anchor is turned into the ground to a point where the bottom of the tension head is at or slightly below ground level. This insures maximum soil compression by the cap. See *Figure C*. Engineered to allow ground anchor to be installed at a slight back angle of 15°

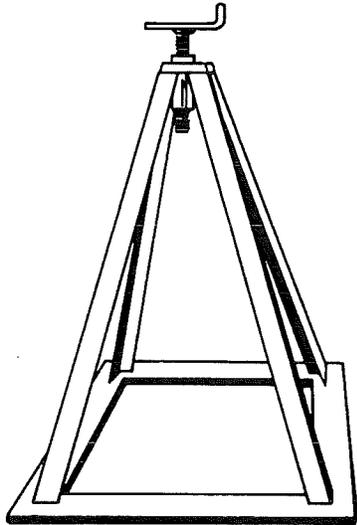


- III. Anchor is pre-loaded. Pre-load causes the cap to rotate downward in the direction of pull, further compacting the soil and presenting a larger surface area, resisting both horizontal and vertical movement. See *Figure D*. When used with rigid support tubes, rather than strap systems, pre-loading is not required.

Note: A special adapter is available to insure against tension head and bolt damage.



INSTRUCTIONS FOR USING *Minute Man* anchors, Inc. MOBILE HOME PIERS



The manufactured home shall be installed and leveled by qualified contracting personnel who are acceptable and licensed by the governing authority. Minute Man piers are designed to SUPPORT mobile homes and are not to be used for raising or lowering the home.

Minute Man piers should be placed directly under the main support frames on both sides of the home spaced in accordance with the home manufacturer's instructions. Minute Man piers are rated at 6,000 lbs. vertical maximum load capacity.

MINUTE MAN PIER SET-UP PROCEDURES

- K Designed and manufactured for use under mobile and manufactured homes and commercial structures, the support pier is best suited to a dry environment. Minute Man piers are not recommended for use within 1500 foot of a coastline or in an application where the base of the pier would be immersed in water. All support piers must be attached to the I-beams with an appropriate pier head, to prevent horizontal movement.
- L Use hydraulic jacks or other suitable devices to level the chassis beam of the home. Be sure to use sufficient jacks and safety blocking to safely support the home before installing support piers. Level the chassis using a water level or other leveling device for accuracy. After the chassis is leveled using hydraulic jacks and levels, you may begin to install the support piers.
- M Using the appropriate pier for the installation, determine the pier height that will be best for each individual pier location and insure that the height to the bottom of the chassis beam is no greater than 36 inches. Insure that the pier caps are appropriate for the type of chassis beam or for the marriage line.
- N Prepare a level surface at the location of each pier. Use coarse sand or gravel, if necessary to prepare the surface so as to have full contact for the footing pad. The surface of the footing pad needs to be high enough to insure that the base of the support pier does not come into contact with any drainage water that may be present under the home. Do not set a footing pad on organic material. Use the appropriate type and size of footing pad for the load required. Refer to the home manufacturer's installation manual for specific loads and footing sizes; and to the governing authority in the locale in which you are installing.
- O Locate the support pier on the footing pad, making certain to center the support pier on the pier pad. Where required by local code, secure the support pier to the footing pad with appropriate fasteners. In no case are you to extend the threaded rod adjuster more than 2 inches. When more height is needed, use the next taller size support pier. Carefully align the support pier under the chassis beam or marriage line and install the pier head. Tighten and snug plus one-half turn.
- P Repeat this installation process with each pier. After all support piers are installed, you may then remove the safety blocking and hydraulic jacks used to initially level the chassis.

CONCRETE ANCHOR INSTALLATION INSTRUCTIONS

NOTE:

Your set must be designed by a Registered Professional Engineer if the location is within 1500 feet of the coastline.

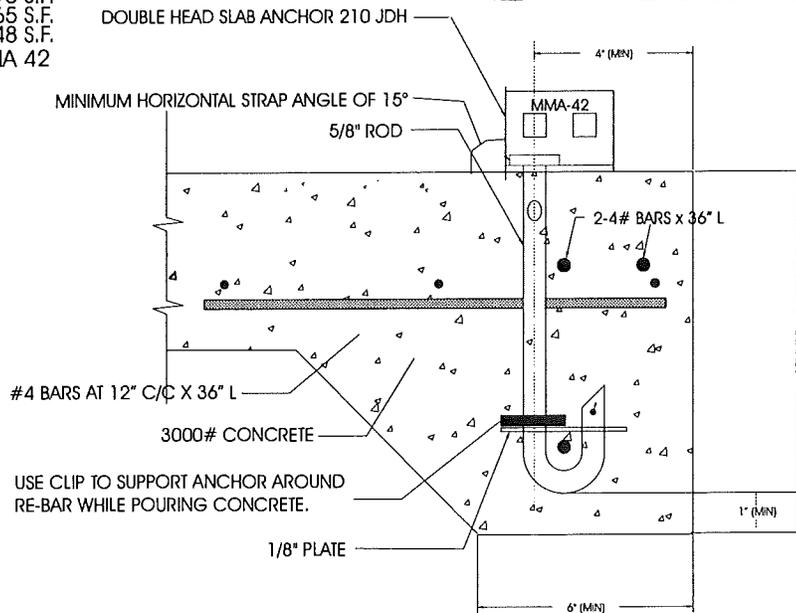
The maximum allowable working load on concrete anchor models 210 PDH, THDHLS, and 210 JDH is 3,150 pounds vertical for single or double ties in 3,000 PSI concrete. There must be a minimum 4" of distance from the edge of the concrete to the center of the anchor shaft.



NOTE:

1. MINIMUM ANCHOR EMBEDMENT = 6"
2. MAXIMUM LOAD PER ANCHOR = 4750 lb.
3. MINIMUM SLAB PER ANCHOR:
 - 4" SLAB = 95 S.F.
 - 6" SLAB = 65 S.F.
 - 8" SLAB = 48 S.F.
4. MARK: MMA 42

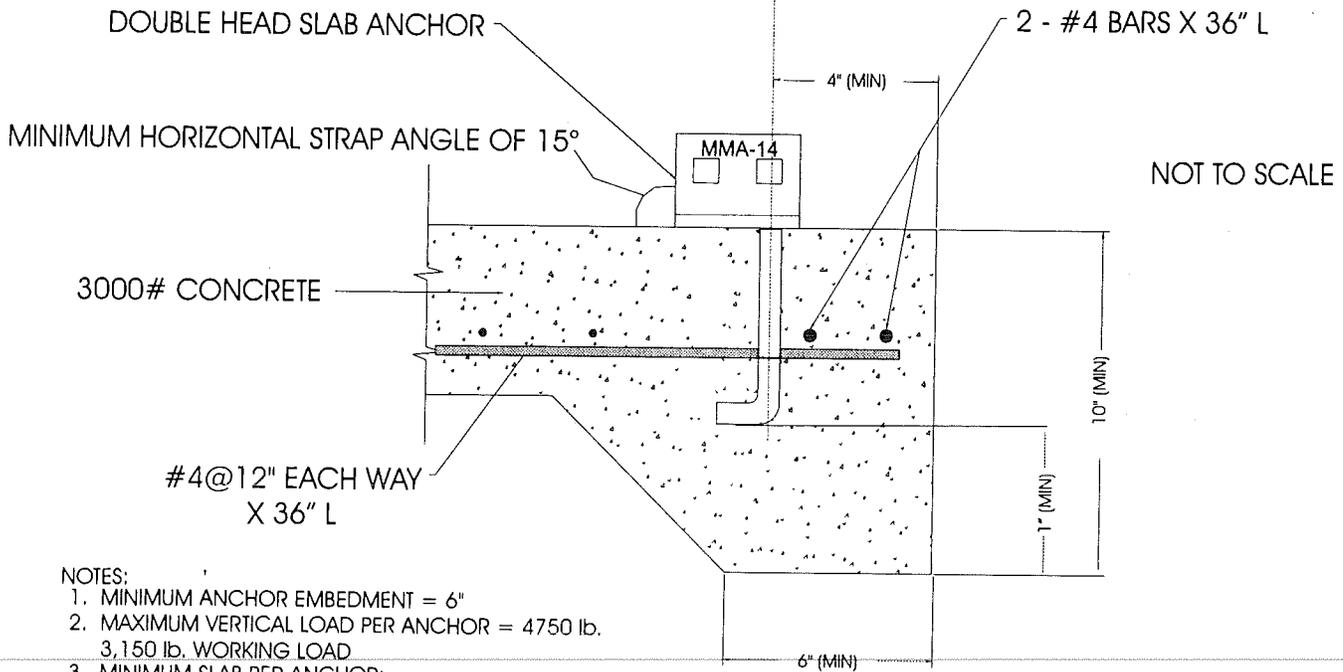
210 JDH CONCRETE ANCHOR



CONCRETE ANCHOR INSTALLATION INSTRUCTIONS

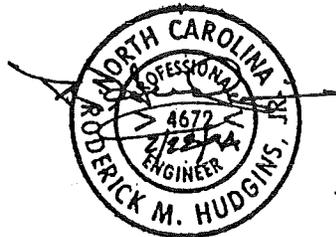
210 PDH CONCRETE ANCHOR

⊕ ANCHOR

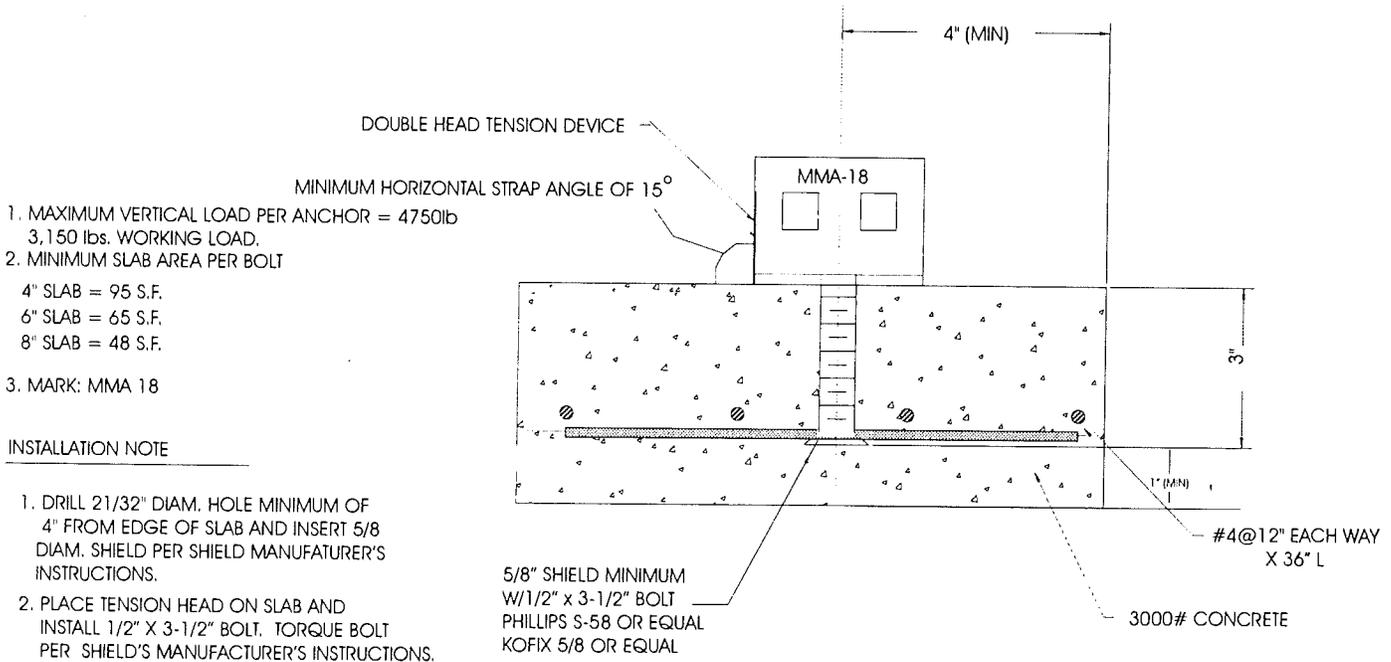


NOTES:

1. MINIMUM ANCHOR EMBEDMENT = 6"
2. MAXIMUM VERTICAL LOAD PER ANCHOR = 4750 lb.
3,150 lb. WORKING LOAD
3. MINIMUM SLAB PER ANCHOR:
4" SLAB = 95 S.F.
6" SLAB = 65 S.F.
8" SLAB = 48 S.F.
4. MARK: MMA-14



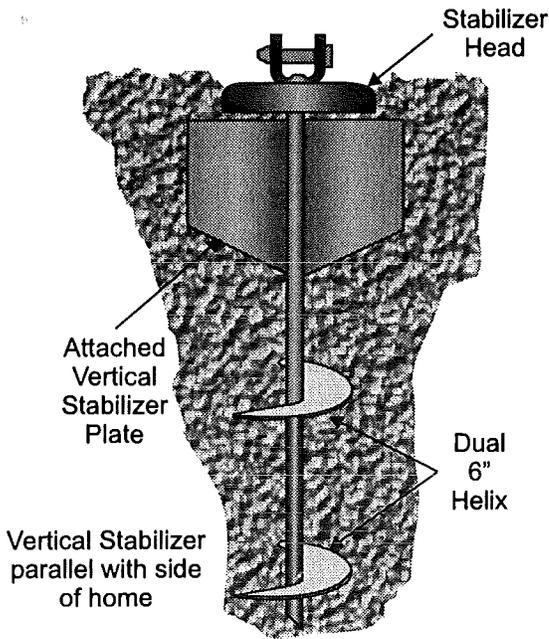
THDHLS CONCRETE ANCHOR



1. MAXIMUM VERTICAL LOAD PER ANCHOR = 4750lb
3,150 lbs. WORKING LOAD.
2. MINIMUM SLAB AREA PER BOLT
4" SLAB = 95 S.F.
6" SLAB = 65 S.F.
8" SLAB = 48 S.F.
3. MARK: MMA 18

INSTALLATION NOTE

1. DRILL 21/32" DIAM. HOLE MINIMUM OF 4" FROM EDGE OF SLAB AND INSERT 5/8 DIAM. SHIELD PER SHIELD MANUFACTURER'S INSTRUCTIONS.
2. PLACE TENSION HEAD ON SLAB AND INSTALL 1/2" X 3-1/2" BOLT. TORQUE BOLT PER SHIELD'S MANUFACTURER'S INSTRUCTIONS.



Vertical Stabilizer parallel with side of home

EZVDH 6650

Note: Before insertion, make sure vertical stabilizer is parallel with direction of pull.

FOR INDIVIDUAL TEST REPORTS ON PRODUCTS, PLEASE CONTACT:

MINUTE MAN PRODUCTS
305 WEST KING STREET
EAST FLAT ROCK, NC 28726

(800)438-7277

DESIGN WIND-LOAD ZONES:



Design Wind-Load Zones:			
Standard Wind	Zone I	15 psf Horizontal	9 psf uplift*
Hurricane	Zone II	±39 psf Horizontal	27 psf uplift
Hurricane	Zone III	±47 psf Horizontal	32 psf uplift
			*net uplift
Note: psf: pounds per square foot			

Source: Manufactured Home Construction and Safety Standards- Part 3280.305

Note: Prior to installation, refer to any local, state and federal regulations, to assure proper compliance. Soil test probe the anchor location in order to match the soil classification with the proper anchor.

For tie down strap and anchor spacing. See the Mobile Home Manufacturers Installation Manual. Each state, county or municipality may require a specific anchor from the groups shown for each soil classification. Check local regulations before installation.

Note:

The distance from the end of the home to the first anchor must not exceed 2'- 0".
All homes located in Wind Zones II and III must have a vertical tie installed at each diagonal tie location.

SOIL CLASSIFICATION CHART

Soil Class	Soil Description	Blow Count (ASTM D1586)	Test Probe Value	Recommended Minute Man Anchor
1	Sound hard rock	NA	NA	Cross Drive or Rock Anchor
2(a)	Very dense &/or cemented sands, coarse gravel and cobbles, caliche, preloaded silts, and clays.	40-up	551 lb. in. Up	4430DH 650DH 4430 EZDH 636 EZDH GW 2
2(b)	Coral	40-up	551 lb. In. up	4430 DH 650DH
3	Medium dense coarse sands, sandy gravels, very stiff silts, and clays.	24-39	351 to 550 lb in.	4430 DH 4430 EZDH 650DH 636 EZDH GW 2 4636 EZDH
4(a)	Loose to medium dense sands, firm to stiff clays and silts alluvial fill.	18-23,3	276 to 350 lb. in.	650DH 6650 EZVDH(FL).
4(b)	VERY loose to medium dense sands, firm to stiff clays and silts, alluvial fill.	12-17	175 to 275 lbs. in	760DH 860DH 8860 EZVDH (FL) 1060DH 4636 NU Concept

Remember: Each state, county or municipality may require a specific anchor from the groups shown for each soil classification. Check local regulations first.

Note: Many anchors are designed for particular soil condition(s) and are unacceptable for use in other type soils. We have listed the soils for which each anchor is designed and approved. Soil classifications are taken from the "standard for the installation on mobile homes". Each anchor model listed has been tested by an independent professional engineer to meet ANSI A225.1 and ASTM D3953.91 codes.

Following is a list of Minute-Man Anchors with a minimum holding power of 4,725 pounds (2143 kg.).

MARK	MODEL	DESCRIPTION	USE IN SOIL TYPE
MMA-2 MMA-4 MMA-38	650-DH 5/8" 650-DH 3/4 650-DH 11/16	6" DISC, 50" ANCHOR 6" DISC, 50" ANCHOR 6" DISC, 50" ANCHOR	2,3,4 2,3,4 2,3,4
MMA-28	636-DH 3/4	6" DISC, 36" ANCHOR	2,3,4
MMA-30 MMA-36 MMA-6	4430-DH 5/8 4430-DH 11/16 4430-DH 3/4	DOUBLE 4" DISC, 30" ANCHOR DOUBLE 4" DISC, 30" ANCHOR DOUBLE 4" DISC, 30" ANCHOR	2,3 2,3 2,3
MMA-35 MMA-8	36-XDH 48-XDH	36" CROSS DRIVE ANCHOR 48" CROSS DRIVE ANCHOR	1 1
MMA-86 MMA-71 MMA-75	860-DH 3/4 1060-DH 3/4 760-DH 3/4	8" DISC, 60" ANCHOR 10" DISC, 60" ANCHOR 7" DISC, 60" ANCHOR	4B (Fla.) 4B 2,3,4A,4B
MMA-52	4636-DH 3/4	4" & 6" DISC, 36" ANCHOR	2,3,4
MMA-55	4450-DH 3/4	DOUBLE 4" DISC, 50" ANCHOR	2,3,4
MMA-57	4636 NU 7/8	4" & 6" DISC, NU CONCEPT CAP	2,3,4
MMA-92 MMA-93 MMA-94 MMA-96 MMA-98 MMA-99	4430-EZDH 3/4 4636-EZDH 3/4 636-EZDH 3/4 650-EZDH 3/4 6650 EZVDH 3/4 8860 EZVDH 3/4	DOUBLE 4" DISC, 30" EZ ANCHOR 4" DISC, 6" DISC, 36" EZ ANCHOR 6" DISC, 36" EZ ANCHOR 6" DISC, 50" EZ ANCHOR DOUBLE 6" DISC, VERT. STABILIZER DOUBLE 8" DISC, VERT. STABILIZER	2,3 2,3 2,3 2,3,4 2,3,4A (Fla.) 4B(Fla.)
MMA-18 MMA-18 MMA-10	THDH THDHLS 36-DH	DOUBLE HEAD TENSION DEVICE DH TENSION DEVICE W/LAG CORAL ANCHOR	SLAB SLAB CORAL
MMA-12 MMA-14 MMA-42	210-DH 210-PDH 210-JDH	CONCRETE ANCHOR WET CONCRETE ANCHOR SWIVEL HEAD WET CONCRETE ANCHOR	SLAB SLAB SLAB
MMA-BR	24 BA	BARB ROCK ANCHOR	1
MMA-22 MMA-SDA2 MMA-SD2 N C1	100-DH	DOUBLE HEAD TENSION ADAPTER STABILIZER STABILIZER NU CONCEPT STABILIZER CAP	FLA.
MMA-29 MMA-31 MMA-31	FCIIW/S FRAME TIE FRAME TIE	FRAME CLAMP II W/STRAP LONGITUDINAL FRAME TIE-8 BOLT LONGITUDINAL FRAME TIE-4 BOLT	FLA.

MARK	MODEL	DESCRIPTION	USE IN SOIL TYPE
MMA-32 MMA-33 MMA-71 MMA-71-C MMA	BUC/WS FCII (LOCKING) CT/WS CT/WS SBN	BUCKLE W/STRAP LOCKING FRAME CLAMP II CORNER TIE W/STRAP CORNER TIE II W/STRAP STRAP BOLT & NUT	FLA. FLA.
MMA-25 MMA-32	22 BUCKLE SS BUCKLE	DOUBLE SLOT BUCKLE SINGLE SLOT BUCKLE	
	44RB 66 RB	4X4" ROOF BRACKET 6X6" ROOF BRACKET	
	POCKET PENETROMETER	POCKET PENETROMETER	
	SOIL TEST PROBE	SOIL TEST PROBE	
	PERIMETER JACK JACKING PLATE	PERIMETER JACK I BEAM JACKING PLATE	
MMP-6 MMP-8 MMP-10 MMP-12 MMP-14 MMP-16 MMP-18 MMP-20 MMP-22 MMP-24 MMP-26 MMP-28 MMP-30	6" PIER 8" PIER 10" PIER 12" PIER 14" PIER 16" PIER 18" PIER 20" PIER 22" PIER 24" PIER 26" PIER 28" PIER 30" PIER	STANDARD MOBILE HOME PIER STANDARD MOBILE HOME PIER	
MDP-16 MDP-20 MDP-24 MDP-28 MDP-32	16" DELUXE PIER 20" DELUXE PIER 24" DELUXE PIER 28" DELUXE PIER 32" DELUXE PIER	LOCKING HEAD HEAVY DUTY PIER LOCKING HEAD HEAVY DUTY PIER LOCKING HEAD HEAVY DUTY PIER LOCKING HEAD HEAVY DUTY PIER LOCKING HEAD HEAVY DUTY PIER	
MMSPP MMLBT MMLBT MMLBT MMLBC	20" STEEL PIER PAD 39" BRACE TUBE 44" BRACE TUBE 53" BRACE TUBE BEAM CLIP W/B&N	LONGITUDINAL STABILIZING SYSTEM LONGITUDINAL STABILIZING SYSTEM LONGITUDINAL STABILIZING SYSTEM LONGITUDINAL STABILIZING SYSTEM LONGITUDINAL STABILIZING SYSTEM	
MMSBC MMAST	E-Z ASTS AST BEAM CLIP AST TUBES	E-Z ADJUSTABLE SUPPORT TUBE SYS AST TUBE SYSTEM BEAM CLIP ADJUSTABLE SUPPORT TUBE(S)	



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ASHEVILLE, N.C.28813-5070
 Phone (828) 274-9244 Fax (828) 274-9525

FEBRUARY 14, 2001

MINUTE MAN ANCHORS, INC.
 305 WEST KING STREET
 EAST FLAT ROCK, N.C. 28726

DEAR SIR:

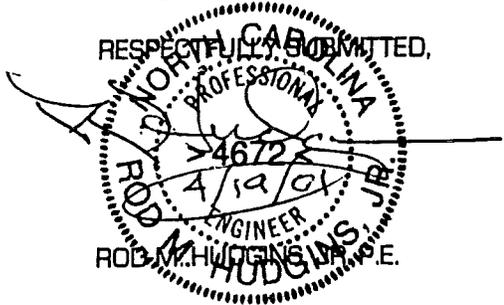
I HAVE ANALYZED DESIGN DRAWING, PHYSICAL TESTING REPORTS AND INSTALLATION INSTRUCTIONS FOR THE MINUTE MAN PRODUCTS LISTED AS FOLLOWS:

650 DH 5/8	4430 DH 5/8	36 XDH	THDH
650 DH 11/16	4430 DH 11/16	48 XDH	THDHLS
650 DH 3/4	4430 DH 3/4	36 DH	
760 DH3/4		24 BA	FCI W/S
636 DH 5/8	4442 DH 5/8	210 DH	FCII W/S
636 DH 3/4		210 PDH	BUC W/S
	4450 DH 11/16	210 JDH	SBN
4636 DH 3/4	4450 DH 3/4	100 DH	MMA2SD2
4636 NCI 7/8			MMA2SDA2
4430 EZDH		CT/WS CORNER TIE	
636 EZDH 3/4			
650 EZDH 3/4		MMA 31 LONGITUDINAL FRAME TIE	
660 EZDH 3/4		MMA 33 LOCKING FRAME CLAMP 11	
6650 EZVDH 3/4 W/ VERT. STABILIZER		MMSP LONG STAB SYSTEM	
8860 EZVDH 3/4 W/VERT. STABILIZER		E-Z ASTS SUPPORT TUBS SYSTEM	

MY ANALYSIS OF THE PHYSICAL TEST REPORTS DEFINE THE BREAKING STRENGTH OF EACH OF THESE ANCHORS AND THEIR COMPONENTS TO BE IN EXCESS OF 5,000 POUNDS. THE STRAPPING MEETS FEDERAL SPECIFICATION QQ-S-781H FOR TYPE I, CLASS B, GRADE I STRAPPING. THE STRAPPING ALSO MEETS WITH ANSI 225.1 STANDARDS AND ASTM D3953-91 STANDARDS. THE STRAPPING IS 1 1/4 X .035 MINIMUM, HOT DIP GALVANIZED STEEL.

ON FILE ARE TESTING REPORTS OF THE DIRECT WITHDRAWAL STRENGTH OF THESE ANCHORS. THESE TEST EVALUATE THE ANCHORAGE STRENGTH OF MINUTE MAN ANCHORS INSTALLED RESISTING AN AXIAL AND 45 DEGREE ANGLE APPLIED WITHDRAWAL LOAD. FOR THE ANCHORS LISTED ON PAGES 10 AND 11, THE AVERAGE HOLDING POWER MEETS AND/ OR EXCEEDS THE REQUIRED MINIMUM OF 4,725 POUNDS, WHEN INSTALLED IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS IN THE SOIL TYPES AND CLASS SHOWN.

RESPECTFULLY SUBMITTED,



INSTALLATION NOTES

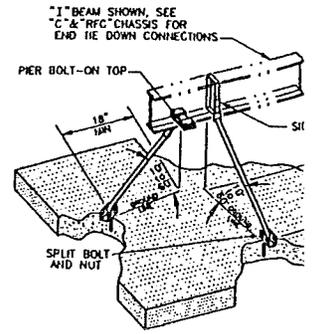
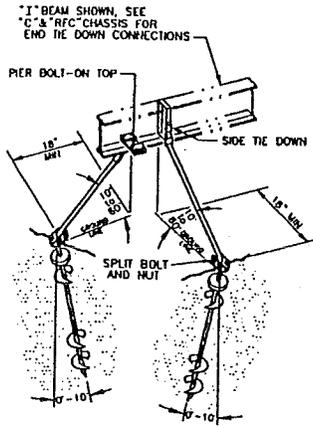
MACHINE INSTALLATION

THE DRIVE MACHINE IS STARTED AND THE ANCHOR IS TURNED INTO THE GROUND TO A POINT WHERE THE TOP (STABILIZER HEAD PLATE) IS FLUSH OR SLIGHTLY BELOW GROUND LEVEL. THIS INSURES THAT THE E-Z ANCHOR STABILIZER WILL BE AT ITS REQUIRED INSTALLATION POSITION.

FOR THE E-Z ANCHOR/STABILIZER TO ACHIEVE FULL POTENTIAL, INSTALL THE ANCHOR VERTICALLY WITH NO DEVIATION GREATER THAN 10 DEGREES. NOTE: A SLIGHTLY GREATER ANGLE MAY BE USED TO START THE ANCHOR TO AVOID CONTACT WITH THE HOME & STRAIGHTENED AS THE ANCHOR IS GROUND SET. THE SPLIT BOLT IS INSERTED, STRAP FASTENED, AND TIGHTENING ADJUSTMENT MADE.

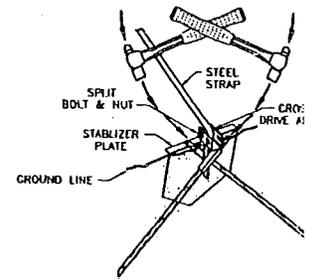
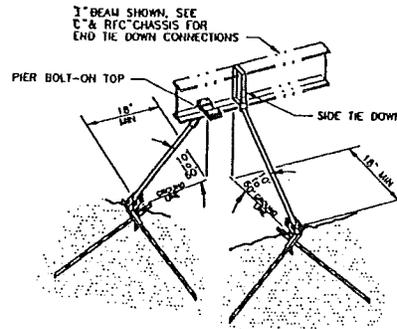
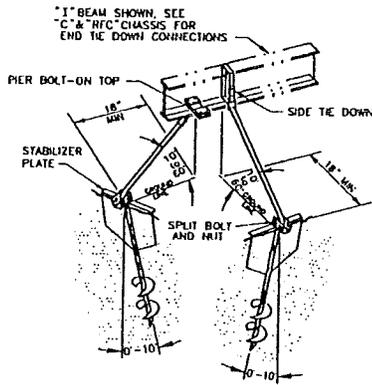
NOTE: WITH MACHINE INSTALLATION, A MINUTE-MAN ADAPTER DESIGNED TO FIT BOTH THE ANCHOR HEAD AND DRIVE MACHINE SHAFT IS AVAILABLE. INSTALLERS DO NOT NEED ADDITIONAL OR SPECIAL EQUIPMENT FOR E-Z ANCHOR INSTALLATION.

NOTE: AN ADDITIONAL STABILIZER PLATE IS NOT REQUIRED WITH THE EZDH EARTH AUGER TIE DOWN.



NC4636, EZDH & MMA 6 Earth Auger Tie Down

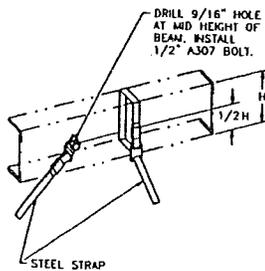
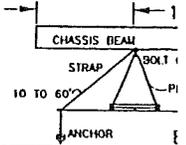
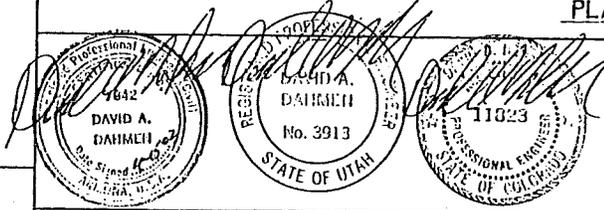
Concrete Tie D



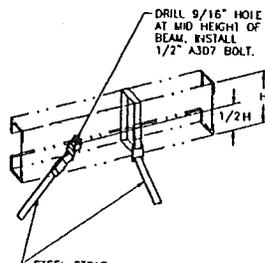
CROSS DRIVE W/ STABILIZER PLATE DETAIL

Earth Auger Tie Down

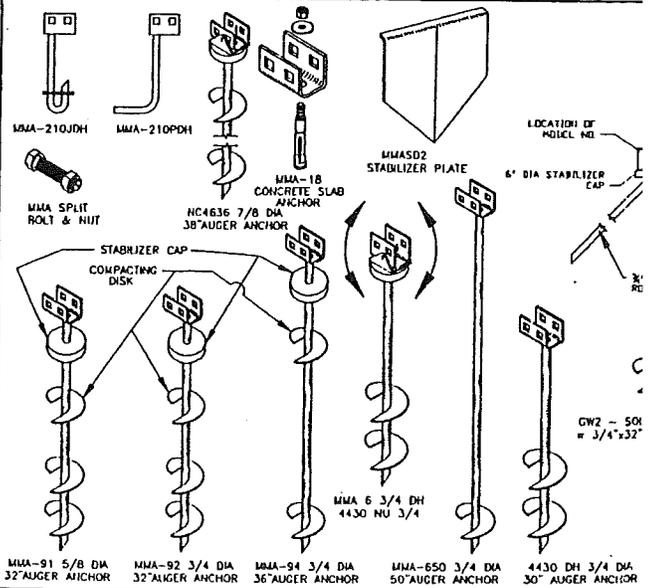
Cross Drive Tie Down



"C" BEAM CHASSIS



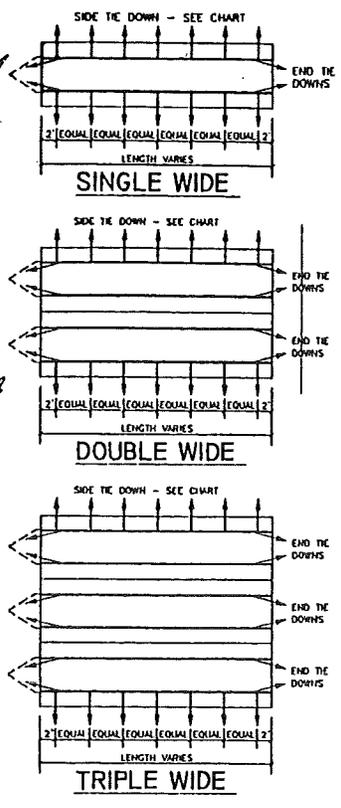
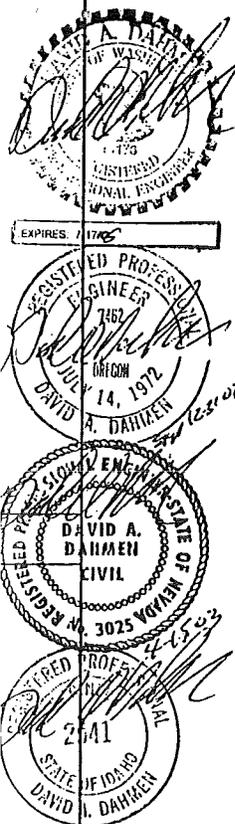
"RFC" BEAM CHASSIS



"C" Beam Chassis

"RFC" Beam Chassis

Minute Man



Design & General Notes

DESIGN LOADS:
 WIND ----- 80 MPH, EXP."C" 22.6 PSF
 85 MPH, EXP."C" 25.6 PSF
 SOIL BEARING ----- 1000 PSF
 TIE DOWN STRAPS ----- 3150# WORKING LOAD
 SENSARC ZONE ----- 4
 TIE DOWN STRAPS TO BE MIN. 1 1/4" WIDE x 0.035 THICKNESS ZINC PLATED & MEET FEDERAL SPEC QQ-5-781H FOR TYPE 1, CLASS B, GRADE 1, STRAPPING.
 EARTH AUGERS ----- 2962# (TESTED TO 4750# MIN.)
 CROSS DRIVES ----- 1727# (CALCULATED)
 CONCRETE SLAB ANCHORS - 1390# (CALCULATED)

- GENERAL NOTES:**
- THE CHARTS SHOWN HEREIN ARE FOR THE REQUIRED NUMBER OF THE DOWNS ON THE SIDES OF THE MANUFACTURED HOME W/ 16' WIDE MODELS AND 4:12 PITCHED ROOFS.
 - THE DOWNS ARE REQUIRED AT EACH CHASSIS BEAM, EACH END OF EACH TRANSPORTABLE SECTION OF THE MANUFACTURED HOME AND CAN BE ANY OF THE TYPES SHOWN HEREIN.
 - COMBINATIONS OF THE DIFFERENT TYPES OF THE DOWNS CAN BE USED.
 - IN THE EVENT AN EARTH AUGER CANNOT BE INSTALLED DUE TO AN OBSTRUCTION, USE OF CROSS DRIVE ANCHORS IS PERMITTED, PROVIDED (2) CROSS DRIVES ARE INSTALLED FOR EACH EARTH AUGER THAT CANNOT BE INSTALLED.
 - FOR ALL THE DOWN INSTALLATIONS, THE MFG'D HOME CHASSIS MEMBERS ARE SHOWN AS "T" BEAMS. FOR ILLUSTRATION PURPOSES ONLY, CHASSIS BEAMS CAN ALSO BE "C" SHAPED OR "RF" SHAPED.
 - END TIE DOWNS CAN BE LOCATED WITHIN 24" OF EITHER SIDE OF CHASSIS BEAM AXIS AS SHOWN.
-
- THE SIZES, TYPES, LENGTHS, ETC. OF MATERIAL SHOWN HEREIN ARE MINIMUM. LARGER, LONGER, HEAVIER MATERIALS SUPPLIED BY MINUTE-MAN PRODUCTS MAY BE USED AT THE SAME SPACING & LOCATION SHOWN.
 - ALL PARTS ARE STAMPED MMA- WITH THE APPROPRIATE PART NUMBER.
 - THIS TIE DOWN SYSTEM CAN BE USED WITH 10' WIDE MANUFACTURED HOME SECTIONS WITH 100' CHASSIS CENTERS PROVIDED THE HEIGHT FROM GRADE TO THE BOTTOM OF THE CHASSIS BEAM DOES NOT EXCEED 19".
 - THE DOWN STRAPS IN THE LONGITUDINAL OR TRANSVERSE DIRECTION CAN BE BOLTED TO THE HITCH ATTACHMENT PLATE THAT IS WELDED TO THE CHASSIS BEAM.
 - THE DOWN STRAPS AT THE CHASSIS BEAM ENDS (END TIE DOWNS) CAN BE ATTACHED TO A CHASSIS SUPPORT PIER WITH A PIER BOLT ON TOP. SEE THE SKETCH TO THE RIGHT.

NOTES
 IF OBSTRUCTIONS PRECLUDE THE PLACEMENT OF THE SIDE TIEDOWNS AT THE 2'-0" LOCATION SHOWN, SIDE TIEDOWNS AT 2' FROM EACH END HAVE A TOLERANCE OF 1'-0" ±

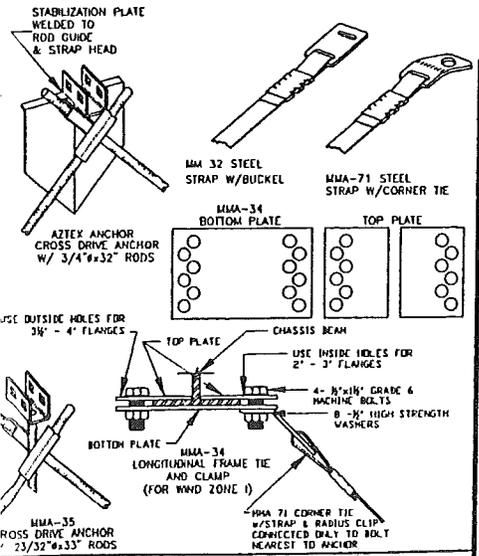
80 MPH, EXP."C" WIND (22.6 PSF)					85 MPH, EXP."C" WIND (25.6 PSF)							
EARTH AUGERS					EARTH AUGERS							
MAX. LENGTH OF MFG'D. HOME	36'	45'	54'	63'	72'	MAX. LENGTH OF MFG'D. HOME	32'	40'	48'	56'	64'	72'
MIN. NO. OF SIDE TIE DOWNS	4	5	6	7	8	MIN. NO. OF SIDE TIE DOWNS	4	5	6	7	8	9
CROSS DRIVE ANCHORS					CROSS DRIVE ANCHORS							
MAX. LENGTH OF MFG'D. HOME	36'	45'	54'	63'	72'	MAX. LENGTH OF MFG'D. HOME	32'	40'	48'	56'	64'	72'
MIN. NO. OF SIDE TIE DOWNS	7	9	11	13	15	MIN. NO. OF SIDE TIE DOWNS	7	9	11	13	15	17
CONCRETE SLAB ANCHORS					CONCRETE SLAB ANCHORS							
MAX. LENGTH OF MFG'D. HOME	36'	45'	54'	63'	72'	MAX. LENGTH OF MFG'D. HOME	32'	40'	48'	56'	64'	72'
MIN. NO. OF SIDE TIE DOWNS	8	10	13	15	17	MIN. NO. OF SIDE TIE DOWNS	9	11	13	15	17	19

Installation Instructions

- FIRST CHECK FOR UNDERGROUND UTILITY LOCATIONS:**
- EZDH EARTH AUGERS**
- SEE DETAIL THIS SHEET FOR INSTALLATION INSTRUCTIONS
- EARTH AUGERS**
- INSTALL AUGERS INTO SOIL WITH CONSTANT DOWNWARD PRESSURE TO MINIMIZE SOIL DISTURBANCE, LEAVING APPROX. 12" OF SHAFT EXPOSED.
 - INSTALL STABILIZER PLATE - DRIVE FLUSH WITH GROUND SURFACE.
 - COMPLETE TURNING AUGER INTO GROUND UNTIL AUGER HEAD IS FLUSH WITH GROUND SURFACE AND TOP OF STABILIZER PLATE.
- CROSS DRIVE ANCHORS**
- CROSS DRIVES ARE USED WHERE HARD OR ROCKY SOIL OCCURS. IF THE GROUND SURFACE IS OTHER THAN ROCK OR MINIMUM 2" ASPHALT, INSTALL MMA-S02 STABILIZER PLATE, OR PLACE 12"x12"x12" DEEP CONCRETE.
- CONCRETE SLAB ANCHORS**
- CONCRETE SLAB TO BE MINIMUM 3 1/2" THICK AND IN GOOD CONDITION.
 - MINIMUM SLAB AREA REQUIRED FOR EACH ANCHOR IS 28 SQ. FEET.
 - DRILL PROPER SIZE HOLE IN SLAB MINIMUM 12" FROM ANY EDGE.

- ALL APPLICATIONS**
- ATTACH STRAPS TO CHASSIS BEAM IN MANNER SHOWN.
 - INSERT STRAP THROUGH SPLIT ANUT, CUT OFF EXCESS STRAP AND TIGHTEN UNTIL SHUG.

Tie Down Location



MINUTE MAN ANCHORS, INC. ENGINEERED TIE DOWNS

ENGINEER APPROVAL

THIS TIE DOWN SYSTEM MEETS THE REQUIREMENTS OF SECTION 1336.3, SUBSECTION (a)

STATE APPROVAL

ENGINEERED TIEDOWN SYSTEM APPROVED
 SUBJECT TO CORRECTIONS NOTED

Approval does not authorize or approve any omission or deviation from requirements of applicable State laws and regulations.

State of California
 Department of Housing and Community Development
 DIVISION OF CODES AND STANDARDS

By: Date: 02/24/05
 SPA NO: ETS 119
 This Plan Approval Expires: 02/23/05

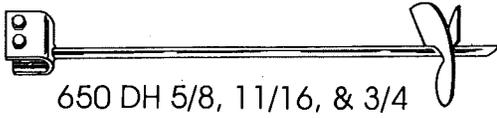
PACIFIC CONSULTING ENGINEERS
 2150 4th Ave., Suite 145
 Sacramento, Calif. 95830 Ph: (916) 566-6026

MINUTE MAN ANCHORS, INC.
 305 West King St. East Flat Rock, NC 28726 Ph: (828) 692-0254

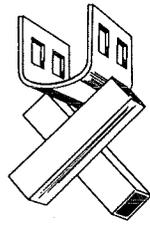
Anchor Drive Anchors Anchor Kits Anchor Drive Machines Strapping Mobile Home Piers



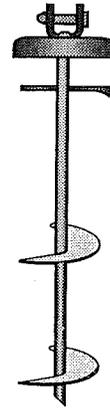
Eye Anchor



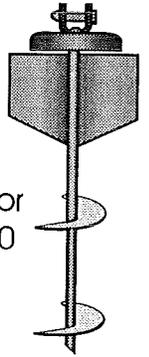
650 DH 5/8, 11/16, & 3/4



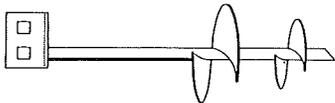
36" & 48" Cross Drive



EZDH Anchor
4430, 4636,
636, & 650
Available



EZVDH Anchor
6650 & 8860
Available



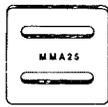
4636 DH 3/4



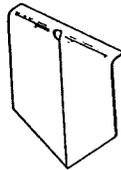
4430 DH 5/8, 11/16, & 3/4



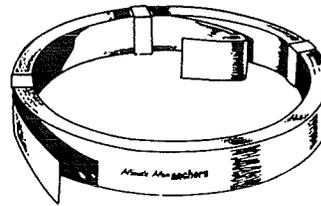
Strap Bolt and Nut



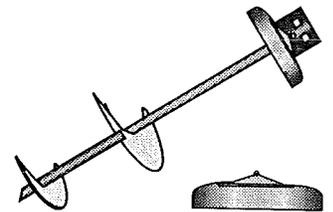
Strap Buckle



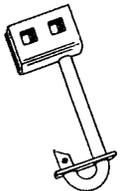
Stabilizer Plate



Galvanized Strapping



NU Concept Anchor
and Cap



210JDH



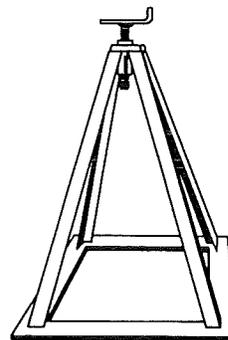
210PDH



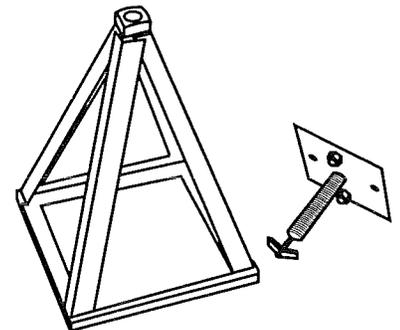
210DH



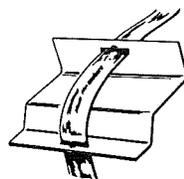
THDHLs



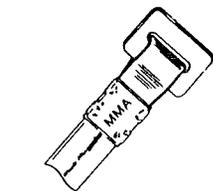
Standard Pier



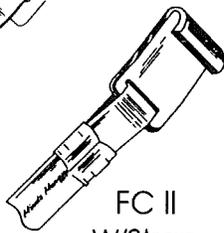
Deluxe Pier w/Locking Head



Roof Bracket



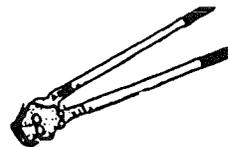
Buckle
W/Strap



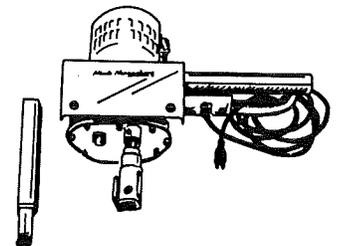
FC II
W/Strap



LFCII
W/Strap



Crimping Tool



Minute Man Anchors
Drive Machine

PIER AND PAD SCHEDULE SINGLE WIDE AND DOUBLE WIDE 30. Psf

Soil Cap.	Pier Location	18 Feet Wide						Soil Cap.	Pier Location	16 Feet Wide					
		8 Foot O.C.			12 Foot O.C.					8 Foot O.C.			12 Foot O.C.		
		Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.	Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.			Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.	Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.
1000	Chassis Perimeter	2779	3.2	460	5181	6.6	858	1000	Chassis Perimeter	2629	3.0	425	4596	5.3	761
1500	Chassis Perimeter	2779	2.8	293	5181	3.8	547	1500	Chassis Perimeter	2529	1.9	278	4596	3.4	485
2000	Chassis Perimeter	2779	1.5	215	5181	2.8	461	2000	Chassis Perimeter	2629	1.4	203	4596	2.5	356
2500	Chassis Perimeter	2779	1.2	170	5181	2.2	316	2500	Chassis Perimeter	2629	1.1	161	4596	1.9	281
3000	Chassis Perimeter	2779	1.0	140	5181	1.8	251	3000	Chassis Perimeter	2629	.9	133	4596	1.6	232

Soil Cap.	Pier Location	20 Feet Wide (14' single wide)						Soil Cap.	Pier Location	24 Feet Wide					
		8 Foot O.C.			12 Foot O.C.					8 Foot O.C.			12 Foot O.C.		
		Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.	Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.			Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.	Req'd Pier Cap. (lbs)	Req'd Footing sq.ft.	Req'd sq.in.
1000	Chassis Perimeter	2029	2.3	336	4856	5.6	804	1000	Chassis Perimeter	1829	2.1	303	4076	4.7	675
1500	Chassis Perimeter	2029	1.5	214	4856	3.6	513	1500	Chassis Perimeter	1829	1.3	193	4076	3.0	430
2000	Chassis Perimeter	2029	1.1	157	4856	2.6	376	2000	Chassis Perimeter	1829	1.0	142	4076	2.2	316
2500	Chassis Perimeter	2029	.9	124	4856	2.1	297	2500	Chassis Perimeter	1829	.8	113	4076	1.7	249
3000	Chassis Perimeter	2029	.7	102	4856	1.7	245	3000	Chassis Perimeter	1829	.6	92	4076	1.4	205

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REQUIRED ANCHOR SPACING PER PIER HEIGHT

18' WIDE	Pier Hght	Zone I
	16 in	15 ft
	24 in	13 ft
	32 in	12 ft
	40 in	11 ft
	48 in	10 ft

16' WIDE	Pier Hght	Zone I
	16 in	14 ft
	24 in	12 ft
	32 in	10 ft
	40 in	9 ft
	48 in	8 ft

14' WIDE STD.	Pier Hght	Zone I
	16 in	15 ft
	24 in	14 ft
	32 in	12 ft
	40 in	11 ft
	48 in	10 ft

14' WIDE W/ OPT. 12" OVER HANG	Pier Hght.	Zone I
	16 in	10 ft
	24 in	13 ft
	32 in	12 ft
	40 in	11 ft
	48 in	10 ft

24' WIDE	Pier Hght	Zone I
	16 in	14 ft
	24 in	12 ft
	32 in	10 ft
	40 in	9 ft
	48 in	8 ft

24' WIDE (PORCH MODEL)	Pier Hght	Zone I
	16 in	14 ft
	24 in	12 ft
	32 in	10 ft
	40 in	9 ft
	48 in	8 ft

28' WIDE	Pier Hght	Zone I
	16 in	15 ft
	24 in	14 ft
	32 in	12 ft
	40 in	11 ft
	48 in	10 ft

28' WIDE (PORCH MODEL)	Pier Hght	Zone I
	16 in	15 ft
	24 in	14 ft
	32 in	12 ft
	40 in	11 ft
	48 in	10 ft



Evor F. Johns

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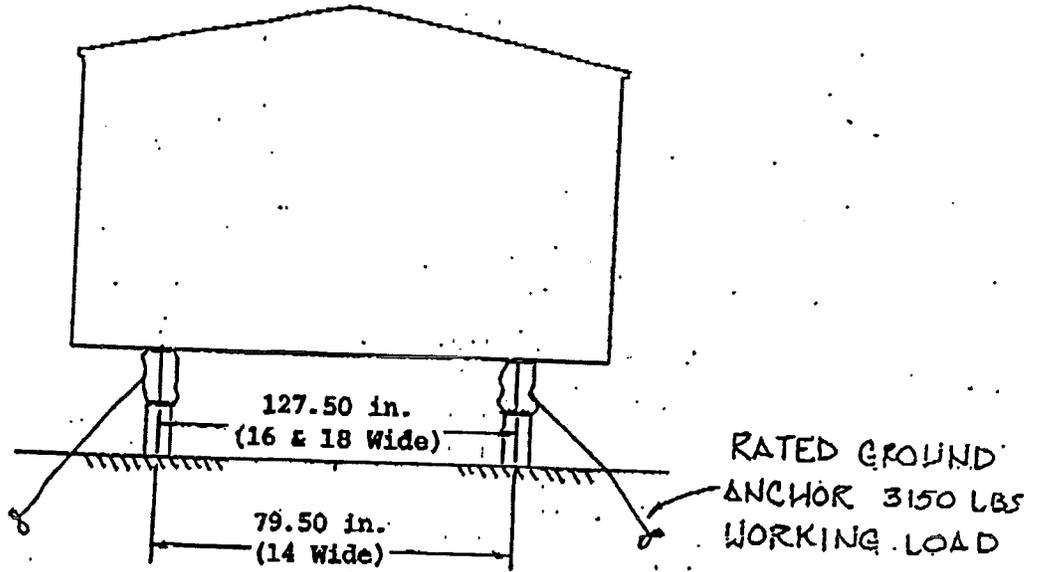
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TYPICAL TIE DOWN SINGLE WIDE



EVOR F. JOHNS
REGISTERED
NO. 01666
STATE OF INDIANA
PROFESSIONAL ENGINEER



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PATIO DOOR INSTALLATION (Swinging or Sliding) W/ HARDBOARD SIDING

After the home has been blocked and leveled, remove siding and any shipping studs from rough opening. Apply Permagum Sealant or equivalent around screw flange on door. Place door in opening and secure with several screws. Check operation of door before installing all of the screws, shimming where necessary (especially at striker plate location). Apply silicone caulking across top and down sides of the exterior edges of the door. Insulate any gaps around door from the interior side. Cut and install interior trim pieces.

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PATIO DOOR INSTALLATION (Swinging or Sliding) W/ VINYL SIDING

After the home has been blocked and leveled, carefully remove vinyl siding at area of rough opening. Remove sheathing and any shipping studs from rough opening. Apply Permagum Sealant or equivalent around screw flange on door. Place door in opening and secure with several screws. Check operation of door before installing all of the screws, shimming where necessary (especially at striker plate location). Install vinyl door trim across top and down sides of door and vinyl finish trim across bottom edge. Apply silicone caulking at joint between door and vinyl trim. Reapply vinyl siding around door per manufacturers installation instructions included. Insulate any gaps around door from the interior side. Cut and install interior trim pieces.

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IMPORTANT

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When installing vinyl siding, follow the five (5) important application details listed below:

1. Nail or Staple Vinyl Siding Through Center of Slot Only to allow for normal expansion and contraction. Secure panels by stapling into every stud.
2. Do Not Drive Nails Tight. Head of nail or fastener should never touch vinyl siding. Siding should be hung on nails allowing for normal expansion and contraction; When nails are driven too tight, it can distort the siding, making it unsightly and difficult to properly lock the succeeding panels.
3. Space Vinyl Panels 1/4" from all stops and internal surface of J-channel, window channel and corner post to allow for normal expansion and contraction with changes in temperature. Each vinyl siding piece must be free to move 1/4" side to side. Check each piece as it is hung.
4. Lap Vinyl Siding Panels 1" or One-Half of the Factory Pre-notched End. Never overlap the panels more than 1". Always overlap away from point of greatest traffic. For best appearance, stagger end laps a minimum of 3 feet so that one is not directly above the other, unless separated by three courses. Caution: Never overlap panels more than 1".
5. Never Force Saw Through Vinyl. Cut with a fine tooth blade (24 teeth per inch). Mount blade in reverse position.

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REMEMBER: Vinyl expands and contracts with changes in temperature. Check each piece to make certain that it moves to allow for expansion.

Contact the manufacturer of this home for additional installation information.

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 **ALCOA**

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 **Mastic**[®]

SITE PREPARATION

The site selected to place the home should be properly graded to prevent the accumulation of water under the home. Enclosed crawl spaces shall be cross ventilated with a free air space of at least 1/150 of the floor area. Internal moisture control is the responsibility of the home owner by controlling the humidity levels in the home. (See Condensation Control information provided in the warranty information).

WARRANTY INFORMATION

Refer to manufacturers warranty information included in the warranty package for periodic maintainance and general upkeep information on items such as exterior siding, shingles, appliances, windows, doors, floor coverings, etc...

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CUT CEILING OPENING

WARNING

Disconnect all electrical power to the mobile home at the main electrical panel before cutting into the roof and ceiling cavity.

Contact with hot electrical wires could cause equipment damage, fire, personal injury or death.

When cutting into roof and ceiling area extreme care should be taken not to damage any electrical wiring that may be hidden underneath the roof or behind the ceiling.

If alternate source of power is not available, use battery powered or hand tools to cut openings.

An opening in the ceiling must be cut to accommodate the flex duct and control wiring harness.

1. Scribe a 6-7" dia. circle in the ceiling approximately centered above the damper tube assembly. The ceiling hole location may have to be adjusted to miss ceiling joist or other obstructions in the roof cavity.
2. Once the location has been selected, cut the opening in the ceiling.

NOTE: If the Deluxe Blend Air II system is being installed during the construction of the home, avoid dropping sawdust, wood particles or insulation on top of the furnace. The operation of gas and oil furnaces can be affected by contamination within the roof jack openings.

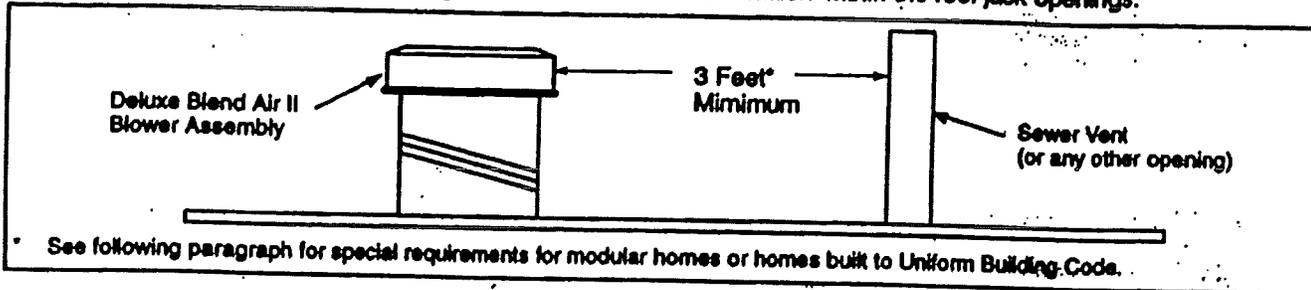


Figure 5 — Air Induction Clearances

CUT AIR INDUCTION OPENING

1. Homes built in accordance with H.U.D. standards: H.U.D. requires that the fresh air intakes on the roof are located at least three (3) feet away from any roof opening, i.e., roof jack, sewer vent, bathroom exhaust, etc.
2. For optimum operation, the induction opening is recommended to be located no less than 1/3 length of the house toward centers. However, the air delivery requirement is still met if placed less than the recommended.

NOTE: For double wide models with continuous sheathing between the marriage wall, Air Induction should be located so that one end of air outlet expels air toward the minimum 100 square inches opening.

The opening should be located between rafters and away from the bedroom below.

3. Mark the selected location. Cut an 11 inch diameter hole through the roof and into the roof cavity.

ROUTE FLEX DUCT AND CONTROL CABLE

1. Route the flex duct from the opening in the roof, through the attic area, into the furnace compartment, passing through the 6-7" diameter opening in the ceiling.
2. Route the low voltage control cable in the same fashion. Pass control cable through the 7/8" hole

in furnace top and use the plastic strain relief (provided in small parts package) to protect the cable assembly.

3. Install inner flex duct to damper tube assembly using one large wire tie, as shown in Figure 6. Pull down insulation and outer flex duct. (Avoid over-tightening of strap.)
4. Observe approved methods of fire-stop requirements for flex duct where it passes through the ceiling. Accessory ceiling rings (P/N 7660-2841) are approved for this purpose.

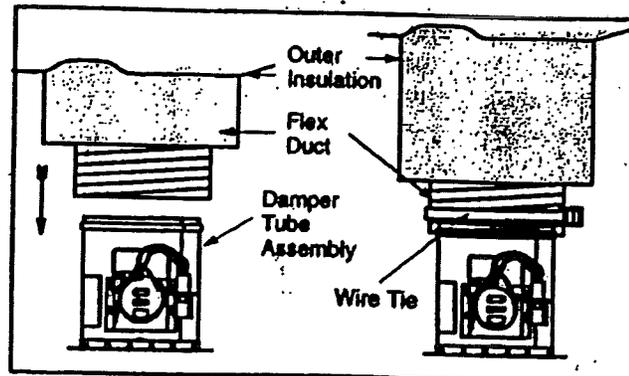


Figure 6 — Wire Tie Installation

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BLEND AIR

Install the cap with the screws provided. Turn cap with lower end of seam facing peak of home. Caulk base and seam with butyl caulk.

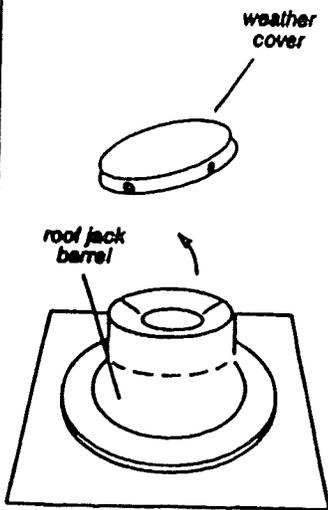
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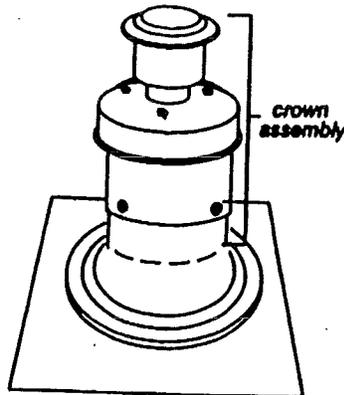
INSTALLATION OF EXTERIOR ROOF JACK EXTENSION ON 4000-7XXX SERIES ROOF JACK, AND REMOVABLE CROWN 4000-8XXX SERIES ROOF JACKS

STEP 1: Remove Weather Cover.



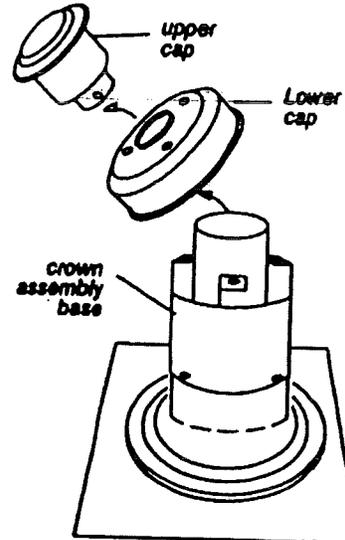
Remove the 3 screws that secure the weather cover to the roof jack barrel. Remove and discard the cover.

STEP 2: Install Crown Assembly.



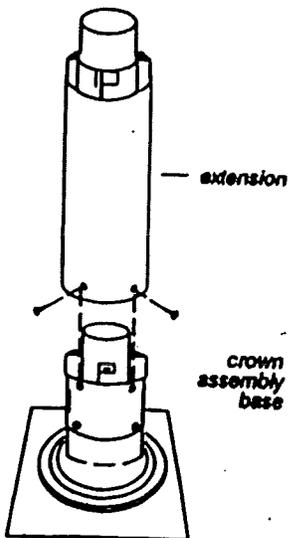
Slide the crown assembly over the roof jack barrel. Secure with the 3 screws previously removed from the weather cap, using the pre-punched holes as guides.

STEP 3: Remove Upper & Lower Caps.
Start here if 4000-7XXX is used.



Remove the 2 screws that secure the upper cap to the crown assembly base and remove the upper cap. Next, remove the 3 screws that secure the lower cap to the crown assembly base. Set both caps aside for later use.

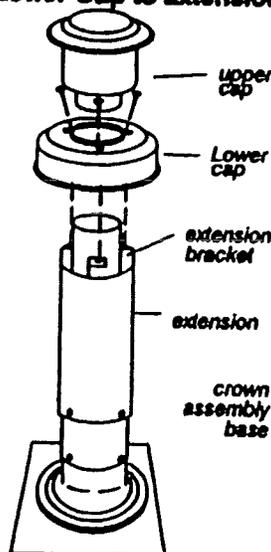
STEP 4: Install Extension



Place the roof jack extension on top of the crown assembly base, pushing down firmly to assure a snug fit. **IMPORTANT:** Make sure that the pipes are connected.

Using the 4 holes at the base of the extension as a guide, drill 4 holes 1/8" diameter into the crown assembly base. Secure the extension to the crown assembly base with the 4 screws provided.

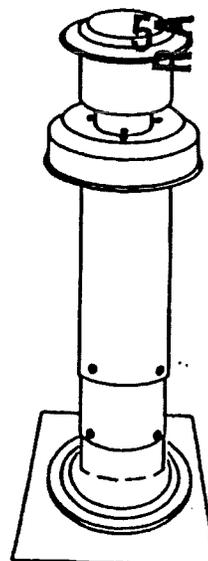
STEP 5: Reinstall Upper & Lower Cap to Extension.

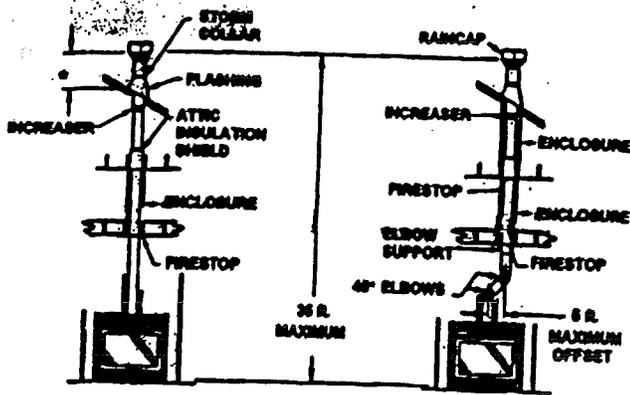


Install the lower cap on top of the extension so that the center pipe sticks through the hole in the lower cap. Using the 3 screws removed in step 3, attach the lower cap to the extension bracket. Install the upper cap over the center pipe of the extension. Using the 2 holes located at the base of the upper cap as guides, drill 2 holes 1/8" diameter into the center pipe. Finally, attach the upper cap to the center pipe using the 2 screws removed in step 3 to the center pipe.

STEP 6: REINSTALL UPPER & LOWER CAP TO EXTENSION.
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Steps For Installation of Vertical

STEP 1: Locate the fireplace.

* - REFER TO VERTICAL TERMINATION LOCATION CHART

STEP 2: Mark ceiling above unit where flex will come through.

STEP 3: Ceiling opening should be a minimum of 9.5" x 9.5" (242mm x 242mm) and framed to that size.

STEP 4: Mark opening in roof and cut a hole minimum 10.5" x 10.5" (267mm x 267mm) and frame to that size.

STEP 5: Place fireplace in proper location and secure to the floor.

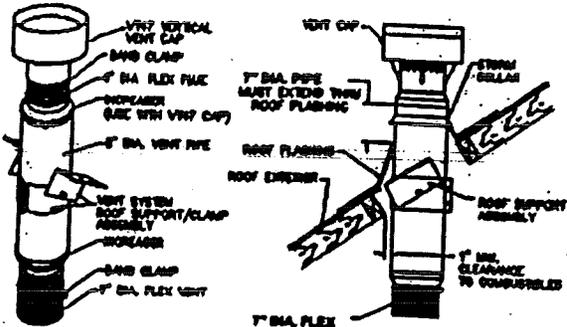
STEP 6: Install firestops and/or a freestop thimble assembly at the ceiling level(s) as follows:

- (a) If a room is located above the ceiling, a standard firestop should be secured to the underside of the ceiling joists.
- (b) If an attic space (insulated or not) is located above the ceiling, a combination firestop/thimble assembly such as a GFSH7 or equivalent must be used. This should be secured to the underside of the ceiling joists as well.

Note: If offset is required, the upper 45° bend (elbow) must be supported with an offset support. Support flex every 3 feet when vertical venting.

STEP 7: Rigid pipe section included with vertical termination must be used in conjunction with the roof support so that the termination is secure in winds. Attach increaser to the bottom of rigid section.

Install roof support, rigid section of pipe and flashing. Make sure vent cap will be in accordance with the vertical termination location chart above the roof, and the flashing below the shingles.



STEP 8: Install storm collar and caulk around the pipe.

STEP 9: Install flex at unit and bring up to termination. It will be necessary to remove 30 inches of flex from the 7" outer to make up for the rigid piece. Attach 4" flue to termination (clamp). Screw termination to rigid pipe. Clamp flex to rigid pipe.

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Unit Adjustment & Maintenance

Once installed, the unit should be operated at least 3 times to ensure that it is in working order. Note: Manufacturing pile will smoke during initial firing of appliance. Open windows for ventilation.

Unit Adjustment

Before leaving, the installer should make the following checks:

(a) BTU Input/Gas pressure

The fireplace input is marked on the Rating Plate. The gas valve comes factory preset to the proper rated pressure and adjustment should not be necessary. If there is any question of input, then it may be necessary to check manifold pressure.

Manifold pressure can be measured by using a 5/16" I.D. hose. In the right hand side of the valve and connecting a manometer.

Two test gage ports are accessible for test gage connection:

(i) Tap on the left side of the valve will give inlet supply pressure.

(ii) Tap on the right side of the valve will give manifold pressure.

Loosen screw in test port 1/2 turn to measure pressure. Tighten screw when measurement is complete.

Pressure ranges are as listed below:

	Gas Supply Pressure (inches w.c.)		
	Minimum	Normal	Maximum
Natural Gas	4.5	7.0	14.0
L.P. (Propane)	10.8	11.0	14.0

	Manifold Pressure (inches w.c.)	
	Normal (HI)	(LOW)
Natural Gas	3.5	1.6
L.P. (Propane)	10.0	6.3

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