Liberty
HOMES, INC.

SET UP INSTRUCTION MANUAL FOR SINGLE WIDE HOMES

1941-1992
51
YEARS of LEADERSHIP

KEEP THIS MANUAL WITH YOUR HOME

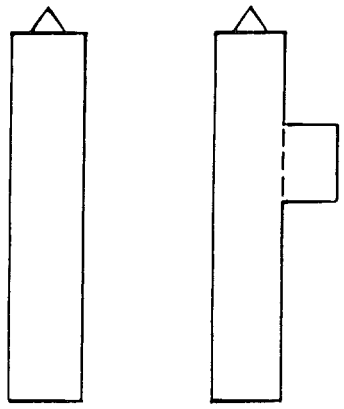
SET UP INSTRUCTIONS FOR SINGLE WIDE HOMES

TABLE OF CONTENTS

The technical content of this Manual has been reviewed by Underwriters' Laboratories, Inc. and found to be in accordance with the Federal Manufactured Home Construction and Safety Standards and Regulations.

LIB 114C
5-1-86

LIBERTY HOMES CANNOT BE RESPONSIBLE FOR ANY DAMAGE RESULTING DIRECTLY OR INDIRECTLY FROM INSTALLATION OF ACCESSORIES, NOR ANY MODIFICATIONS TO THE HOME SUBSEQUENT TO SHIPMENT FROM THE FACTORY. SUCH ALTERATIONS ARE UNDERTAKEN AT THE RISK OF THE INSTALLER OR HOMEOWNER. IMPROPER SET-UP MAY VOID THE LIMITED WARRANTY IN-WHOLE OR IN-PART.



SINGLE WIDE

EXPANDABLE ROOM

RECOMMENDED MINIMUM SET UP TOOLS FOR SINGLE WIDE & EXPANDABLE ROOM HOMES

Two — 10 Ton Hydraulic Jacks
16 oz. Claw Hammer
Drill Motor with ¼", ⅜", and ½" Bits
24" Nail Bar or Carpenter Bar
Molding Saw (Dovetail)
Mitre Box
16' Step Ladder
8" Pliers
26" Hand Saw
4" Awl
10" Crescent Wrench
Standard Metal Cutters
Foundation Supports
50' Garden Hose (for water check of expandable room)
2" Brush (to apply roof coating)
5 Gallons Roof Coating
100' Heavy Duty Extension Cord with Ground
Carpet Heat Bond Tape
6' Carpenter Level
3/32" Nail Set
8" Standard Blade Screw Driver
8" Phillips Screw Driver
16' Steel Measuring Tape
Straight Edge (Carpet Cutting)
Carpet Stretcher
Carpet Heat Bond Seaming Tool (Roberts or Equivalent)
Utility Knife (Carpet Cutting)
Putty Stick Touch-Up Kit
Gas Test Fitting and Pressure Gauge
Electrical High Potential Test Device
Continuity Tester and Polarity Test Device
Wood Wedges
Ceiling Panel Touch-up Paint and Brush

Note:
This manual is not intended to provide instructions for those unfamiliar with home set-up requirements. The intention is to assist and instruct already qualified personnel in the proper set-up installation of a Liberty.

IT IS EXTREMELY IMPORTANT TO PROPERLY SET, BLOCK AND LEVEL YOUR HOME

It is best to have your home prepared for occupancy by a knowledgeable and experienced home set up firm. Such people should have the expertise to properly set up and block your home so that it is level and remains so. If your home is not properly set up and blocked on appropriate foundations, it may undergo unnatural structural strains, which could result in:

1. buckling and/or loosening of walls, partitions, siding, ceilings, doors, floors, linoleum, carpeting, insulation, wiring, sinks, tubs, toilets, weather stripping and miscellaneous fixed original fixtures of the home.
2. leaking windows, doors, roof, ceiling, walls, floor, seams and junctures in general.
3. improper closing, binding and sagging of windows, cabinets and inside and outside doors.
4. malfunctioning of plumbing, water outlets, lighting fixtures, electrical, heating and air conditioning systems.

Unless you are very qualified and capable, it may well be worth the extra expense of not doing it yourself.

Note:

To prevent excessive accumulation of water vapor within the home or building structure, the ground area around and under the home must be sloped to prevent water from accumulating beneath the home.

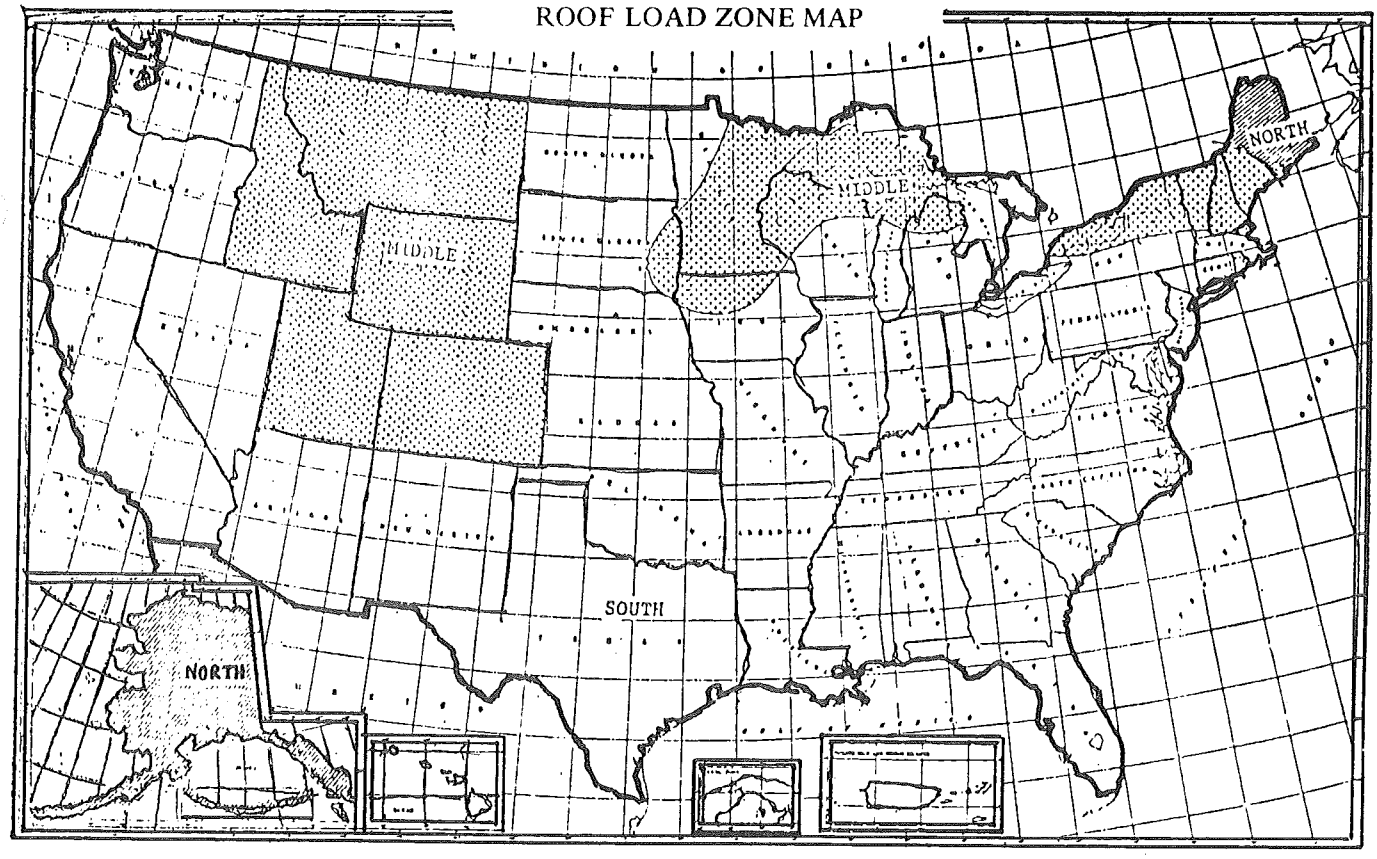
FOUNDATION

It is important that your home have adequate support to give it proper and lasting stability. Therefore, the foundation footings, piers, supports or runners should be installed in accordance with the size and weight of the home. Consideration should be given to the type of soil and frost line conditions where the home is to be located when designing and installing the foundation footings or supports.

We recommend that you contact a reputable local contractor and inquire as to the type of footings required in your area. You may wish to hire the contractor to install the required footings.

The following Roof Load Zone Map will help you to determine what weather zone your home will be located in. After this has been determined, refer to the following section for recommended pier blocking supports.

ROOF LOAD ZONE MAP



REQUIRED FOOTINGS AND PIER BLOCKING
(FOR HOMES LOCATED IN THE SOUTH OR MIDDLE ZONES)

In Tables 1 and 2 below are the design loads used to determine the support structure. 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 the right hand column of these tables.

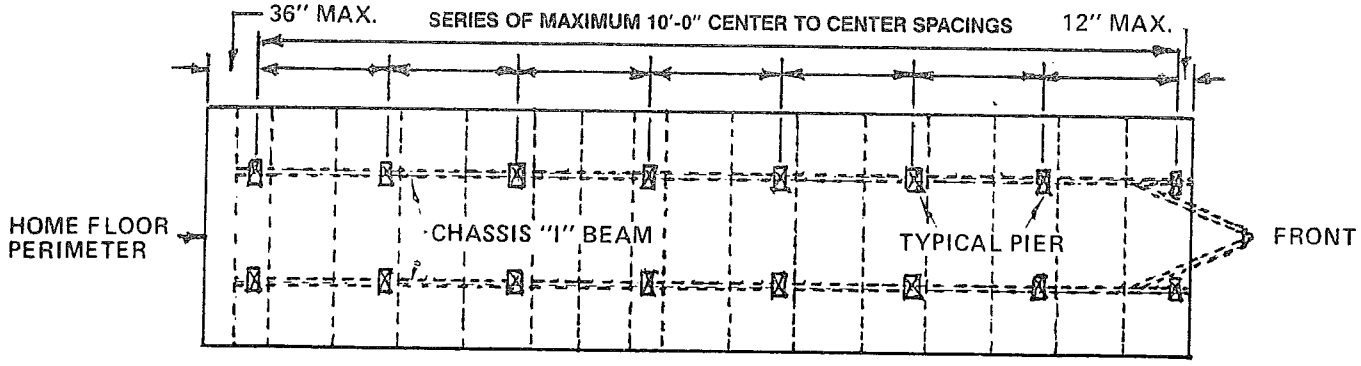
All load bearing pier supports and footings may be subject to approval by the local enforcement agency. As specified in Tables 1 or 2, each pier shall have adequate capacity to support the design loads shown. The required sizes of footings will depend on soil bearing capacity test results. In lieu of soil tes confer with the local building authority for recommended soil bearing capacity in your area. The areas beneath the footings shall have all grass and organic materials removed before installation.

TABLE 1 SOUTH ZONE

Pier Spacing Under Main "I" Beam	Design Roof Live Load	Design Floor Live Load	Total Pier Load		
			12' Wide	14' Wide	16' Wide
4'-0" O.C.	20 PSF	40 PSF	1872	2160	2410
5'-0" O.C.	20 PSF	40 PSF	2340	2700	3015
6'-0" O.C.	20 PSF	40 PSF	2808	3240	3618
7'-0" O.C.	20 PSF	40 PSF	3276	3780	4221
8'-0" O.C.	20 PSF	40 PSF	3744	4320	4824
9'-0" O.C.	20 PSF	40 PSF	4212	4860	5427
10'-0" O.C. Max.	20 PSF	40 PSF	4680	5400	6030

TABLE 2 MIDDLE ZONE

Pier Spacing Under Main "I" Beam	Design Roof Live Load	Design Floor Live Load	Total Pier Load		
			12' Wide	14' Wide	16' Wide
4'-0" O.C.	30 PSF	40 PSF	2107	2435	2722
5'-0" O.C.	30 PSF	40 PSF	2634	3044	3403
6'-0" O.C.	30 PSF	40 PSF	3161	3653	4083
7'-0" O.C.	30 PSF	40 PSF	3688	4262	4764
8'-0" O.C.	30 PSF	40 PSF	4214	4870	5444
9'-0" O.C.	30 PSF	40 PSF	4741	5479	6125
10'-0" O.C. Max.	30 PSF	40 PSF	5268	6088	6805



TOP VIEW

NOTE: PERIMETER PIER BLOCKING MUST BE PROVIDED AT BOTH SIDES OF ANY OPENING IN AN EXTERIOR WALL 4' WIDE OR WIDER (LIKE A PATIO DOOR), IN ALL ZONES.

NOTES: REFERENCE TABLE 1 and 2

1. Spacing of pier supports (left hand column) shall not exceed 10 feet.
2. Footings and pier supports must be designed to support the loads (right hand column) at the selected spacing.
3. The tabulated pier loads include the indicated live loads plus home dead loads.

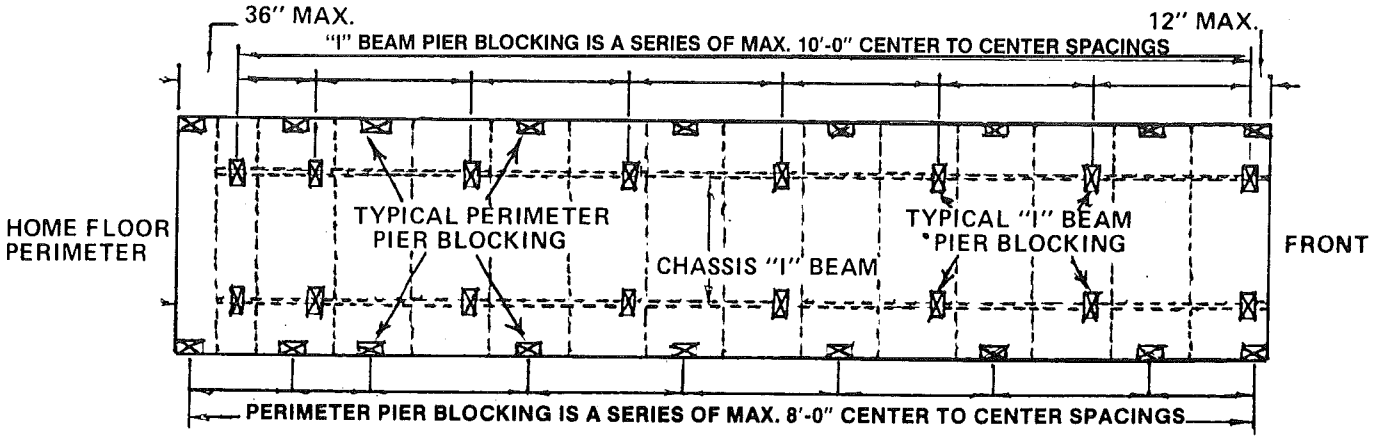
REQUIRED FOOTINGS AND PIER BLOCKING
(FOR HOMES LOCATED IN THE NORTH ZONE)

In Table 3 below are the design loads used to determine the upport structure. The minimum values to be used for pier and rooting design based on the indicated roof live load and a floor live load of 40 pounds per square foot (PSF) are specified in the right hand column of these tables.

All load bearing pier supports and footings may be subject to approval by the local enforcement agency. As specified in Table 3, each pier shall have adequate capacity to support the design loads 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 footings shall have all grass and organic materials removed before installation.

TABLE 3 NORTH ZONE

Pier Spacing Under Main "I" Beam	Design Roof Live Load	Design Floor Live Load	Total Pier Load		
			12' Wide	14' Wide	16' Wide
4'-0" O.C.	40 PSF	40 PSF	2342	2710	3032
5'-0" O.C.	40 PSF	40 PSF	2928	3388	3790
6'-0" O.C.	40 PSF	40 PSF	3513	4065	4548
7'-0" O.C.	40 PSF	40 PSF	4099	4743	5306
8'-0" O.C.	40 PSF	40 PSF	4684	5420	6064
9'-0" O.C.	40 PSF	40 PSF	5270	6098	6822
10'-0" O.C. Max.	40 PSF	40 PSF	5855	6775	7580

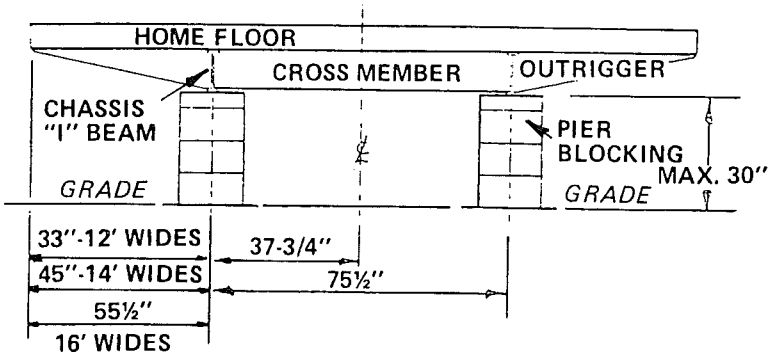


TOP VIEW

NOTE: PERIMETER PIER BLOCKING MUST BE PROVIDED AT BOTH SIDES OF ANY OPENING IN AN EXTERIOR WALL 4' WIDE OR WIDER (LIKE A PATIO DOOR), IN ALL ZONES.

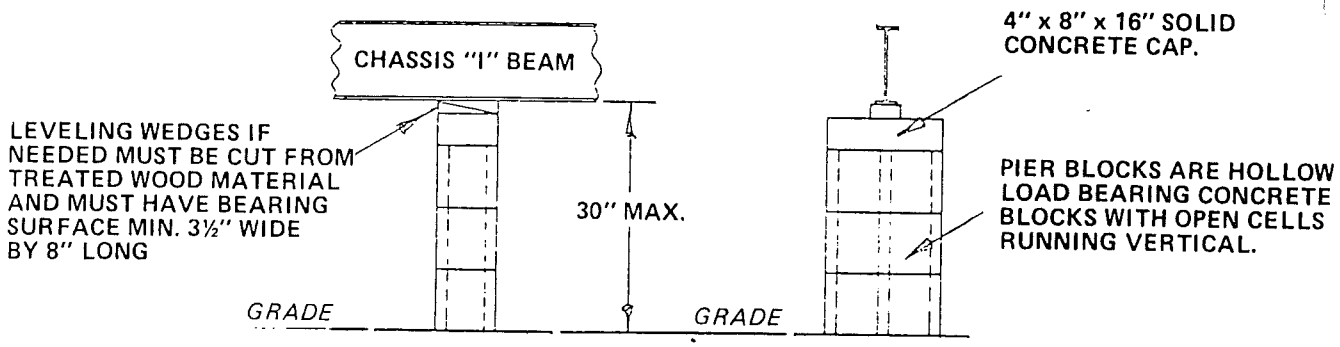
NOTES: REFERENCE TABLE 3

1. Spacing of pier supports (left hand column) shall not exceed 10 feet.
2. Footings and pier supports must be designed to support the loads (right hand column) at the selected spacing.
3. The tabulated pier loads include the indicated live loads plus home dead loads.



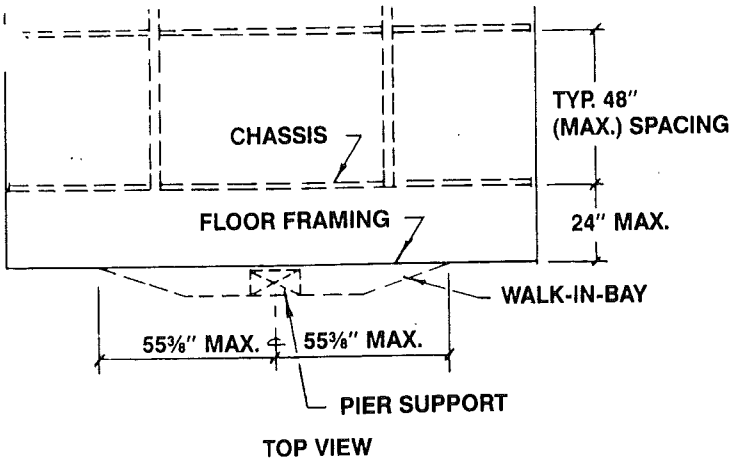
FRONT VIEW

PIER LOCATIONS SIDE TO SIDE
(SINGLE WIDE HOMES)



PIER DETAIL — ALL ZONES

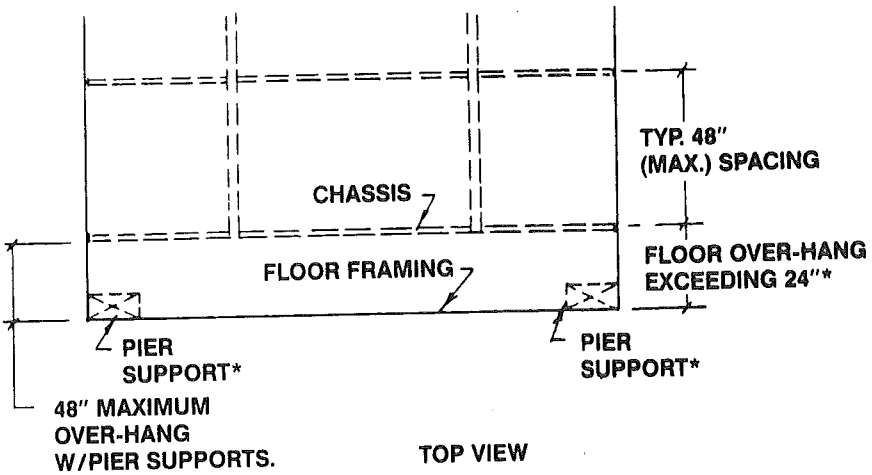
ADDITIONAL PIER BLOCKING WHEN REQUIRED AS NOTED.



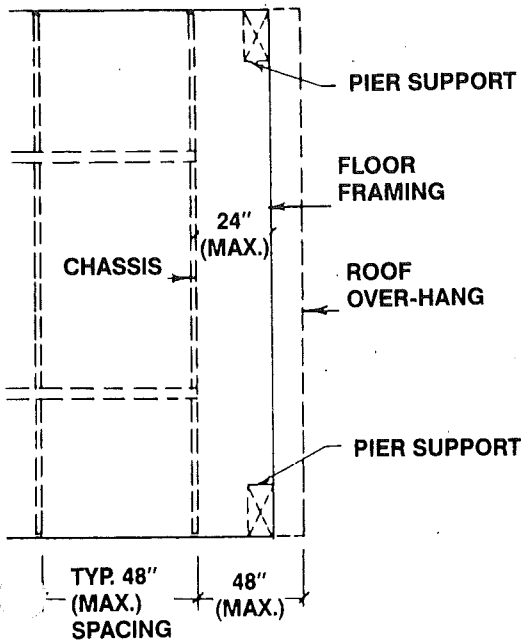
TOP VIEW

TYPICAL PIER SUPPORT FOR WALK-IN-BAYS EXTENDING BEYOND THE 24" MAXIMUM FLOOR OVER-HANG.

TYPICAL UNSUPPORTED FRONT or REAR END FLOOR PIER BLOCKING.
(NOT REQUIRED WITH 24" OR LESS FLOOR TO CHASSIS OVER-HANG)



TOP VIEW



TOP VIEW

TYPICAL PIER SUPPORTS ONLY WHEN THE ROOF OVER-HANG EXTENDS BEYOND THE CHASSIS 24" MAXIMUM.

LEVELING AND BLOCKING YOUR HOME

It is extremely important that your home be level, and properly supported in accordance with the preceding drawings. After the footings are properly dry and you have all the necessary blocking materials and tools, position the home so that it is in the proper position over the footings. Level the home in accordance with the following procedure:

1. Place the 6' level lengthwise on the floor of the home, over the area where the axles are. Turn the jack at the coupler on the front of the home until the floor is level at the axle area.
2. Turn the level crosswise, and see if the home is level from side to side. If not, put a hydraulic jack under the low side I beam at the axle area, and raise the side that is low.
3. Place blocks under the I beams, on each side, immediately ahead of and behind the spring hangers. Insert wedges, as shown on the drawing, so the blocks bear the weight.
4. Work towards either end, placing blocks and wedges under the I beams on both sides, at selected pier spacings. Make continued checks with the level. If you must jack the home to keep it level, jack it only underneath the I beams. Jack it only enough to make it level. If you overjack the home, serious damage may result.

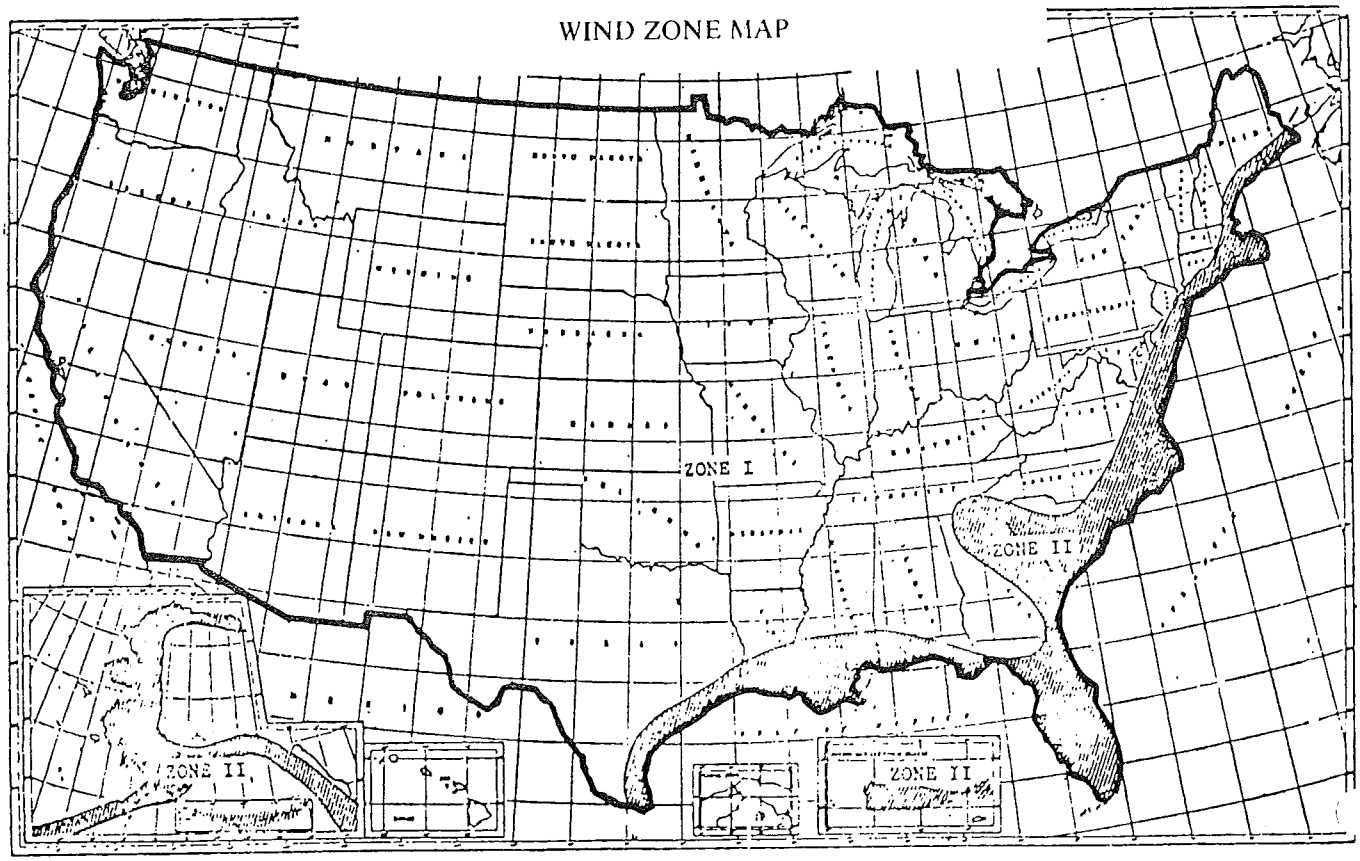
TIE DOWN RECOMMENDATIONS

Because high winds can occur anywhere, we recommend that the home be "tied down" to the ground in order to withstand sliding and/or overturning. (In addition, some states, counties or other jurisdictions may REQUIRE that the home be tied down.)

The home was designed to resist lateral overturning by tying down the home using a frame anchoring system. A recommended product for doing this is the Minute Man anchoring system, shown on the following pages. Anchors, strapping, etcetera are available from Minute Man Anchors, Inc., 305 West Walker Street, East Flat Rock, North Carolina 28726, telephone 704/692-0256.

"Over the roof" tie downs are available as an optional item for additional stability in extreme winds. A recommended anchoring system for over the roof tie-downs is Minute Man Anchoring, Inc. (See paragraph above for required frame anchoring.)

Refer to the Wind Zone Map below and determine which zone your home is in. If your home is in Zone I, the frame ties and anchors should be evenly spaced, no more than 12 feet apart. If your home is in Zone II, the frame ties and anchors should be evenly spaced, no more than eight feet apart. In either Zone I or II, frame ties and anchors should be installed no more than eight feet from each end of the home.



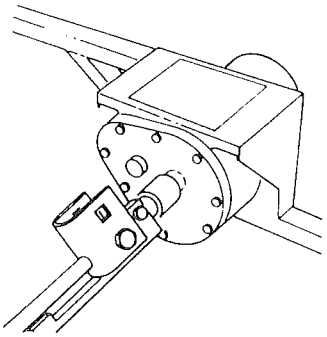
Minute Maranchors®

INSTALLATION

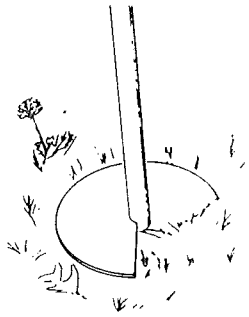
There are two basic methods of installing anchors, each equally effective in properly securing manufactured homes to the ground.

Machine Installation

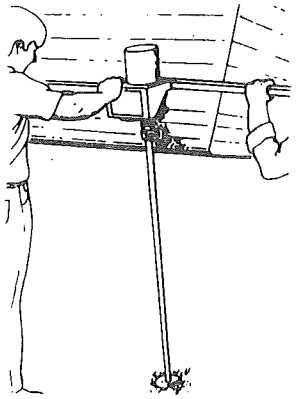
In this method, the anchor is turned the **full depth** of four feet into the ground by an anchor drive machine.



1. Attach anchor to machine.



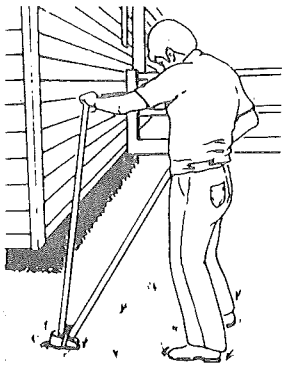
2. Auger is placed in proper position in line with strap, and machine started.



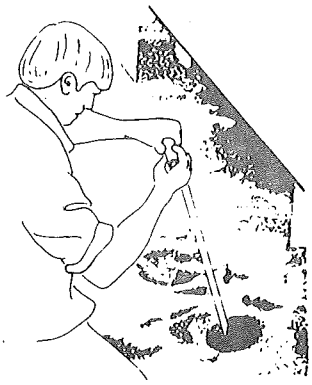
3. Anchor should be installed at a slight angle as shown to assure head being positioned behind future skirting.

Installation with Manual or Mechanical Post Hole Digger

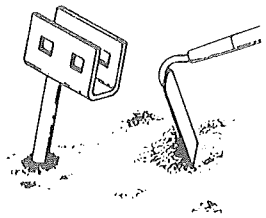
In this method, anchors can be installed with equipment available to the average home owner.



1. A hole is dug to a depth of approximately two feet in the proper position as explained under machine installation.



2. After the hole is dug to 24" depth, the anchor is turned into the ground by hand, using a rod or length of pipe for leverage.



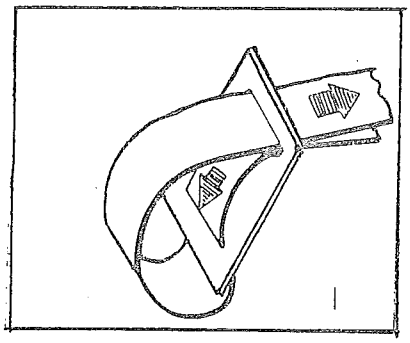
3. After anchor is installed to **full depth,** earth is repacked, six inches at a time.

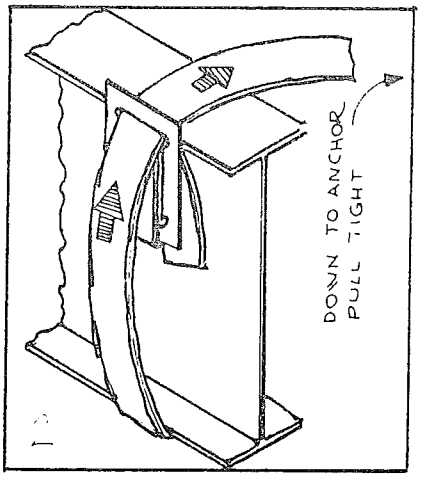
CAUTION: These instructions cover installation for frame ties only. Particular attention should be directed to selecting the proper capacity anchoring system, according to the information on page 14.

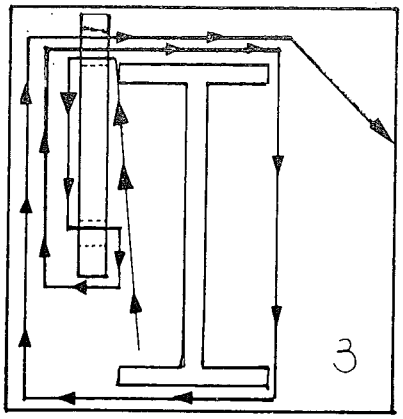
FOR FRAME TIES ONLY

POSITIONING FRAME TIE

FRAME TIE INSTALLATION INSTRUCTIONS

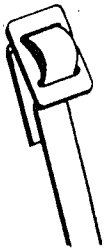






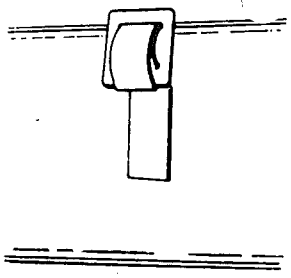
1. Thread 7' length of frame tie strap through buckle as shown.
2. Next, thread long end of strap between frame and floor of home. Bring strap through buckle as shown in diagram and fasten to anchor head.
3. Diagram showing strap in position around frame and through buckle. It is important to remove all slack from system.

1. See step one in installation instructions.

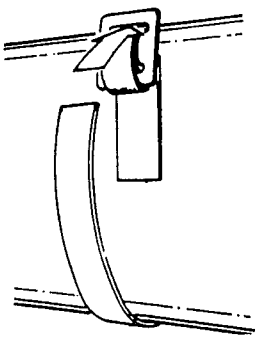


2. Insert strap in position through buckle.

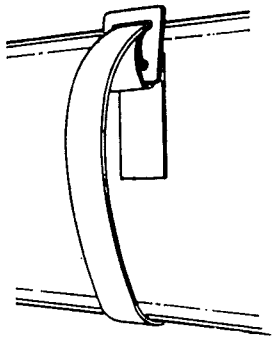
3. Strap should be through buckle in this configuration before installation on frame.



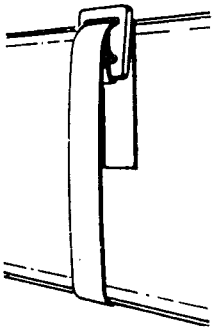
4. Strap should be passed over frame from inside, and buckle pulled into position as shown.



5. Strap should encircle frame and pass through buckle for the second time and over the frame



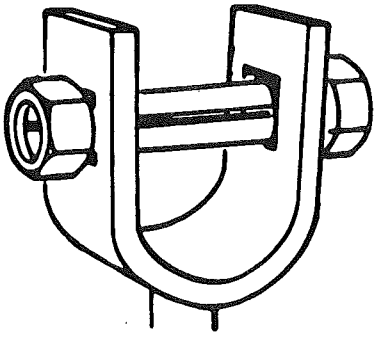
6 Strap is pulled tight from outside, or anchor side of frame



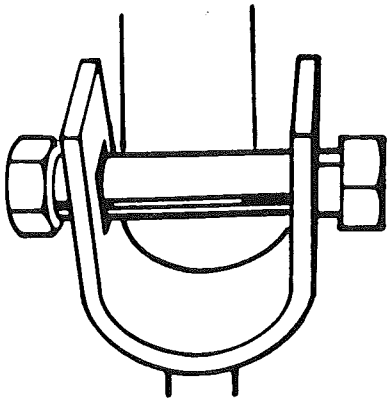
7. Inside of frame tie, properly installed

PROPER TENSIONING OF STRAP TO ANCHOR HEAD

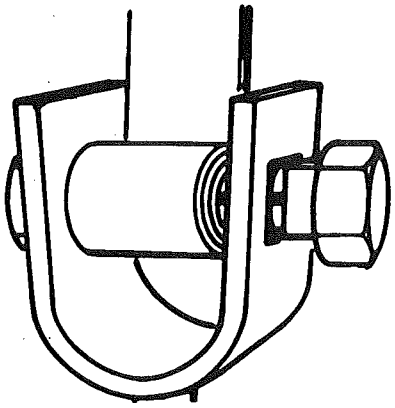
Note: The tensioning bolt can be inserted in the head from either side.



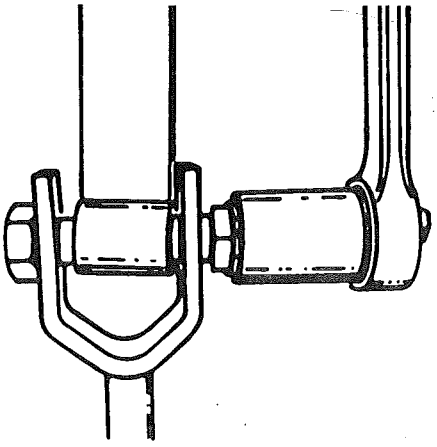
1. Insert bolt into head; attach nut loosely.



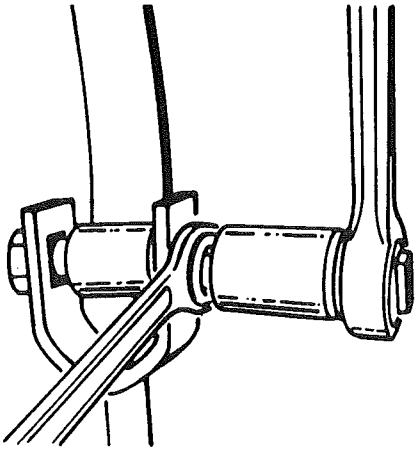
2. Insert strap in slot of bolt 5/8", or until strap is flush with far side of bolt.



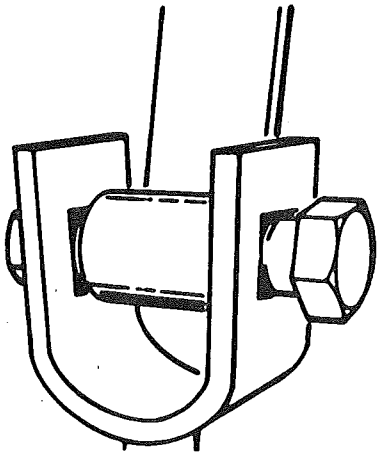
3. Bend strap 90 and take at least four complete turns on bolt until strap is taut.



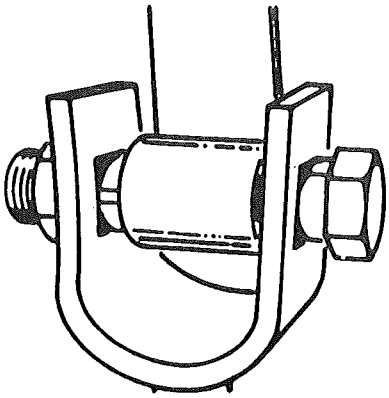
4. Bolt is turned with $^{15}/_{16}$" socket wrench, or adjustable wrench, on hex head.



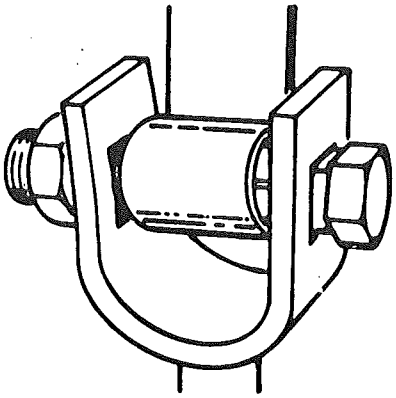
5. To hold bolt under tension while repositioning wrench, an open-end wrench is placed on $^{5}/_{8}$" square shoulders of bolt.



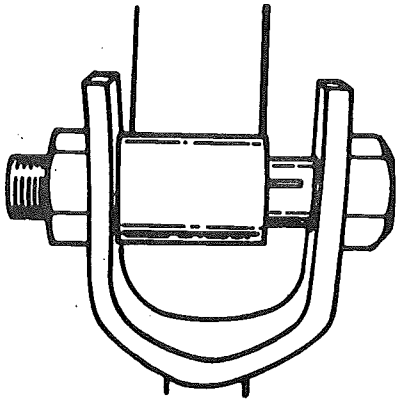
6. Align square shoulders of bolt with square hole in anchor head.



7. Holding hex head of bolt in position, tighten nut to draw square shoulders into square hole.



8. Shoulders are now in locking position; continue to tighten nut.



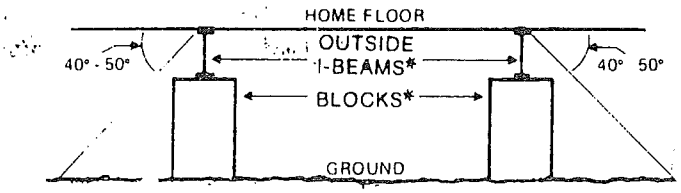
9. Tensioning device is now in locked, secure position.

For clarity tools not shown on most photos above

PROPERLY INSTALLED AND CONNECTED GROUND ANCHOR AND FRAME CONNECTION

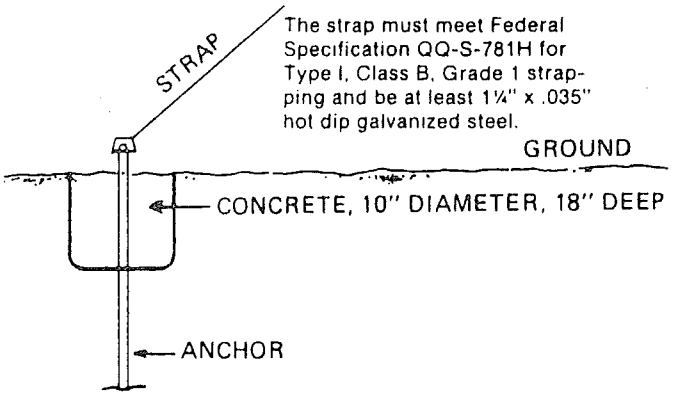
The anchor strap should extend outward and downward from the I beam of the home between a 40° to 50°angle. If possible, the anchors should be installed at the same angle as the anchor strap, so that the "pull" on the anchor is straight. If the pull is not straight you should pour a concrete "collar," approximately 10" in diameter and 18" deep, around the anchor shaft (refer to figures 1 and 2).

NOTE: For those homes which are designed to require only diagonal frame ties, the anchor should be installed in line with the ties. When the load on the anchor is not applied in line with the long axis of the anchor, the magnitude and effect of the horizontal movement of the anchor head should be investigated. The method of restricting lateral deflection shown, is from the Department of Defense, Defense Civil Preparedness Agency publication TR-75, "Protecting Mobile Homes From High Winds": To minimize the deflection or slicing through the soil by the anchor rod at ground level when frame ties are connected to provide a diagonal tension, it is recommended that a concrete cylindrical "collar" (approximately 10" in diameter and 18" deep) be poured around the anchor shaft, if necessary.



*Inside I-beams and pier blocking are not shown on this drawing for simplicity

– FIGURE 1 –



–FIGURE 2 –

MATHESON, HINTZ & ASSOCIATES, INC.
CONSULTING ENGINEERS AND LAND SURVEYORS
ASHEVILLE AIRPORT ROAD FLETCHER, N. C. 28732

April 23, 1976

Mr. C. Denson Hutchinson
Minute Man Anchors, Inc.
305 W. Walker Street
East Flat Rock, North Carolina 26726

Dear Mr. Hutchinson:

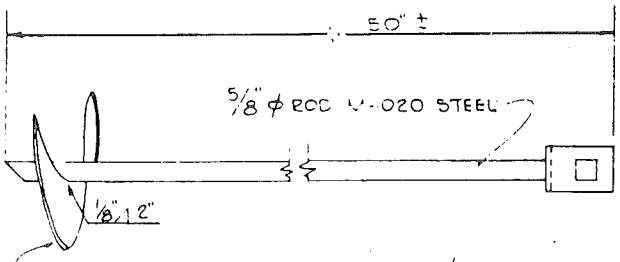
I have analysed design drawings and physical testing reports for those Minute Man Anchors listed in the tabulation attached. My analysis and the physical test reports define the breaking strength of each of these anchors and their components to be in excess of 5,000 pounds. The strapping meets Federal Specification QQ-S-781H for Type I, Class B, Grade 1 strapping. The strapping is 1 1/4 x .035 hot dip galvanized steel.

On file are testing reports of the direct withdrawal strength of these anchors. These tests evaluate the anchorage strength of Minute Man Anchors installed resisting an axially applied withdrawal load. For the anchors listed on the attached sheet the ultimate holding power is not less than 4,725 pounds when installed in accordance with manufacturer instructions in the soil types indicated in the 'table'. If these anchors are to be installed vertically to resist other than direct withdrawal loads the magnitude and effect of horizontal movement of the anchor head should be investigated.

Very truly yours,
MATHESON, HINTZ & ASSOCIATES, INC.
H. C. Abernethy, P.E.

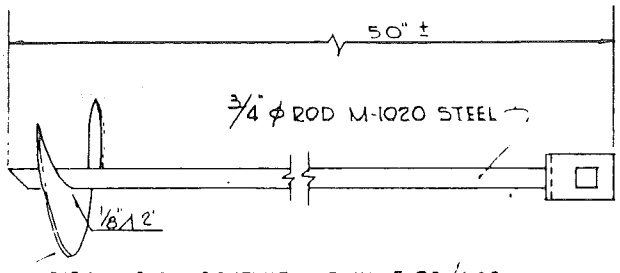
NORTH CAROLINA REG. ENGR. SEAL H. C. ABERNETHY

Attachment
HCA:ps



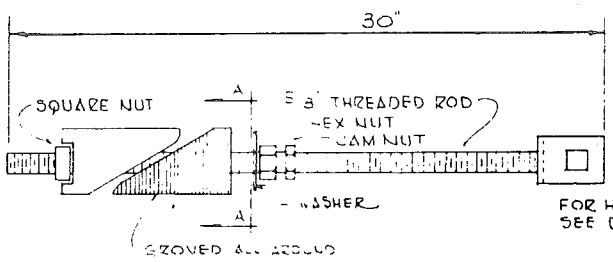
DISC - 8 GA BEVELED HELIX 5.98/6.02
M-1020 STEEL WELDED

650-S



DISC - 8 GA BEVELED HELIX 5.98/6.02

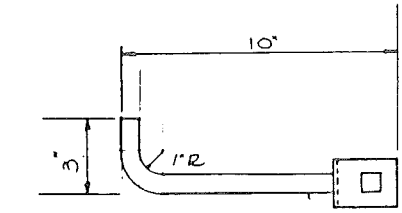
650H-S



FOR HEAD DETAIL
SEE DWG. MMA-SH

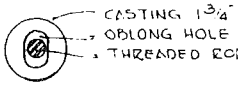
CASTINGS 25,000 PSI
SEMI-STEEL 1 3/4" x 5"
ALL STEEL USED IN ANCHOR ASSEMBLY
CONFORMS TO ASTM A-36

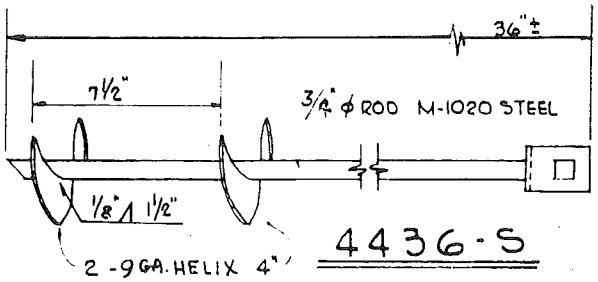
30-ER-S



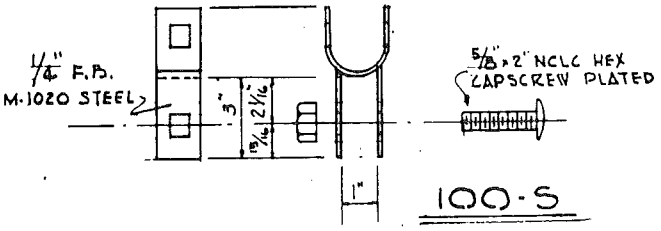
5/8" ϕ ROD M-1020 STEEL

210-P-S

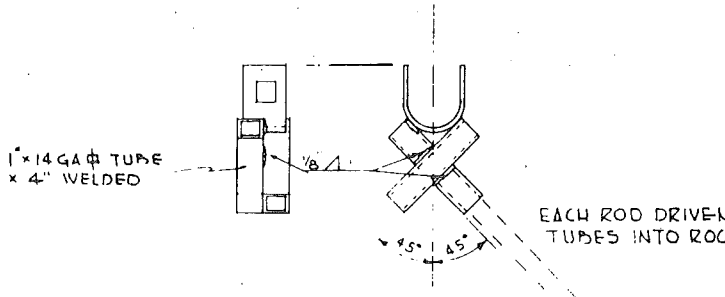




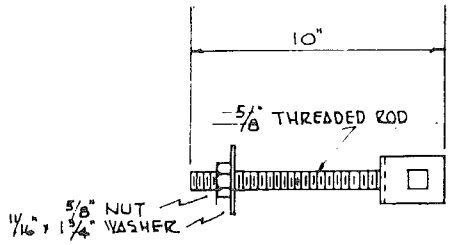
4436-S



100-S

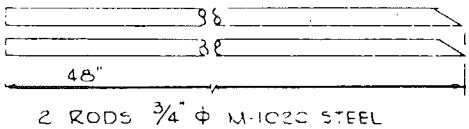


EACH ROD DRIVEN THRU
TUBES INTO ROCK



210-S

ALL STEEL USED IN ANCHOR ASSEMBLY
CONFORMS TO A.S.T.M. A-36



2 RODS 3/4" ϕ M-1020 STEEL

48X-S

ALL ANCHORS & ADAPTERS ALSO AVAILABLE WITH DOUBLE HEADS

Minute Mananchors®

LIST OF CERTIFIED
MINUTE MAN ANCHORS
WITH A MINIMUM HOLDING POWER
OF 4,725 POUNDS (2,143 kg.)

(NOTE: All Minute Man Anchors tensioning devices are certified and tested to 7,100 pounds - 3,220 kg.)

The anchor type to be used depends on the type of soil at the home site. The following Minute Man components should be used for the indicated soil:

Mark	Model	Description	Use in Soil Type*
MMA-1	650-S	Single Head, Earth Auger Anchor 5/8" Shaft	2,3,4
MMA-2	650-DH-S	Double Head, Earth Auger Anchor 5/8" Shaft	2,3,4
MMA-3	650-H-S	Single Head, Earth Auger Anchor 3/4" Shaft	2,3,4
MMA-4	650-H-DH-S	Double Head, Earth Auger Anchor 3/4" Shaft	2,3,4
MMA-5	4436-S	Double Head, Double Disk, Earth Auger Anchor, 5/8" Shaft	2
MMA-6	4436-DH-S	Double Head, Double Disk, Earth Auger Anchor, 5/8" Shaft	2
MMA-7	48-X-S	Single Head Drive Anchor	2
MMA-8	48-C-DH-S	Double Head Drive Anchor	2
MMA-9	36-S	Single Head Coral Anchor	CORAL
MMA-10	36-DH-S	Double Head Coral Anchor	CORAL
MMA-11	210-S	Single Head Tension Device for Slab	SLAB
MMA-12	210-DH-S	Double Head Tension Device for Slab	SLAB
MMA-13	210-P-S	Single Head Tension Device for Concrete	SLAB
MMA-14	210-P-DH-S	Double Head Tension Device for Concrete	SLAB
MMA-15	30-ER-S	Single Head Expand Rock Anchor	1
MMA-16	30-ER-DH-S	Double Head Expand Rock Anchor	1
MMA-17	TH-S	Single Tension Head	SLAB
MMA-18	TH-DH-S	Double Tension Head	SLAB
MMA-21	100-S	Single Head Tension Device Adapter	CONNECT
MMA-22	100-DH-S	Double Head Tension Device Adapter	CONNECT

*SOIL TYPE

1. Sound hard rock.

2. Very dense and/or cemented sands, coarse gravel and cobbles, preloaded silts, clays and corals. (Probe torque value range -- greater than 550 inch pounds.)

3. Medium-dense coarse sands, sandy gravels, very stiff silts and clays. (Probe torque value range 350-550 inch pounds.)

4 .Loose to medium dense sands, firm to stiff clays and silts, aluvian fill. (Probe torque value range 200-349 inch pounds.)

***NOTE:** Many anchors are designed for particular soil conditions and are unacceptable for use in other type soils. We have therefore, listed the soils for which each anchor is designed and approved. Soil classifications are taken from the "STANDARD FOR THE INSTALLATION OF MOBILE HOMES" NFPA 501A 1975/ANSI A119.3 1976.

CONNECTING UTILITIES

FRESH WATER SUPPLY

The water inlet is located underneath the home and is marked with a label fastened to the side of the home. You must install a shut-off valve in the supply line, adjacent to the home. Connect the supply line to the water inlet.

CAUTION — The water distribution system in this home was designed for a maximum water pressure of 80 pounds per square inch (psi) at the inlet. Pressures in excess of this can cause burst pipes, leaky faucets, etcetera. If the water pressure exceeds 80 psi, you must install a pressure reducing valve at the inlet. IMMEDIATELY after connecting the water supply and turning the water on you must check the entire home for any possible water leaks which may have occured. (Over the road vibrations, etcetera may have loosened a joint.)

CAUTION — Do not start the water heater (either electric or gas) until the water supply has been connected and water heater has been filled.

If the home is located in an area where pipes may freeze, the exposed water pipe should be wrapped with a heat tape labelled by U.L. for manufactured home use. The heat tape should be installed in accordance with its manufacturer's instructions. An electrical receptacle is located on the underside of the home, near the water inlet, where the heat tape may be plugged in.

DRAINING THE WATER LINES

Follow these steps in order to drain the water lines in your home:

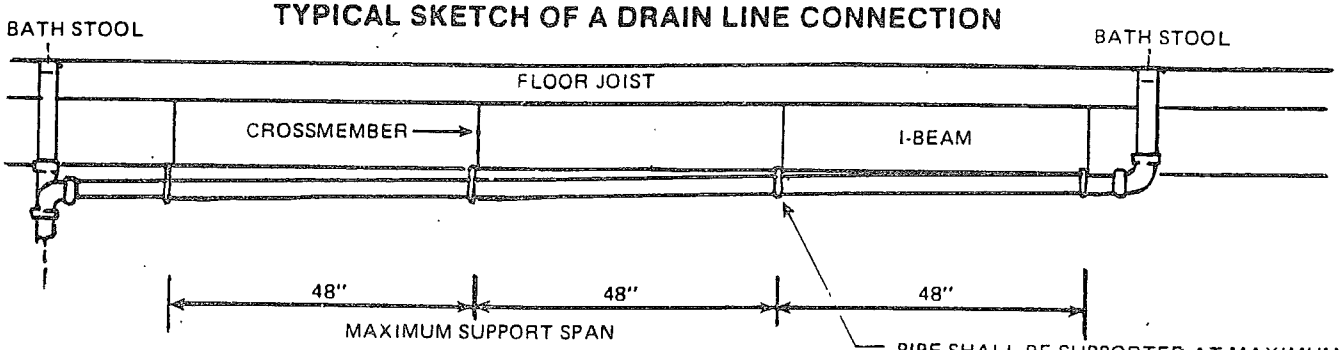
a. Turn off water supply.
b. Open all faucets throughout home.
c. Disconnect water supply inlet.
d. Open water heater drain valve, after attaching a hose to the valve so the water drains outside the home.
e. Let water supply system and water heater drain completely.
f. Flush toilets and drain water tanks completely.
g. Close all water faucets with the exception of one.
h. Connect 30 to 50 pounds per square inch air supply to water inlet connection.
i. With the air supply on the system, open one faucet at a time throughout the home.
j. After entire system has been drained of all water, disconnect the air supply and close off water inlet valve.
k. Pour antifreeze solution into all drain traps, including sinks, tubs, and toilets.

DRAIN LINES

The drain line system in your home terminates in a standard 3" waste connection, located directly under the toilet in a bathroom. All homes with more than one bathroom require additional drain connections underneath the home. Necessary pipe and fittings to make this connection were shipped loose in the home from the factory. A typical sketch of this connection is shown below.

Connect the main drain to the sanitary sewer or septic tank, using minimum 3" pipe, in accordance with local requirements. All drain piping should be run in as straight a line as possible, and should have a uniform grade of at least ¼" per foot. (If necessary, the grade may be as little as ⅛" per foot only if a full size cleanout is installed at the upper end.)

TYPICAL SKETCH OF A DRAIN LINE CONNECTION



ALL PIPING AND FIXTURES SUBJECT TO FREEZING TEMPERATURES SHALL BE INSULATED OR PROTECTED TO PREVENT FREEZING, UNDER NORMAL OCCUPANCY.

NOTES:

A. Materials: (Shipped Loose)

1. Pipe and fittings - ABS
2. Pipe fitting cement - Must be ASB compatible.

B. Length of ABS pipe and fittings are provided.

C. All pipe and fittings noted on the following typical details will be either factory installed or field installed.

D. ⬭ = Denotes the drain line and fittings that extends out through the bottom side of the home.

INSTRUCTIONS:

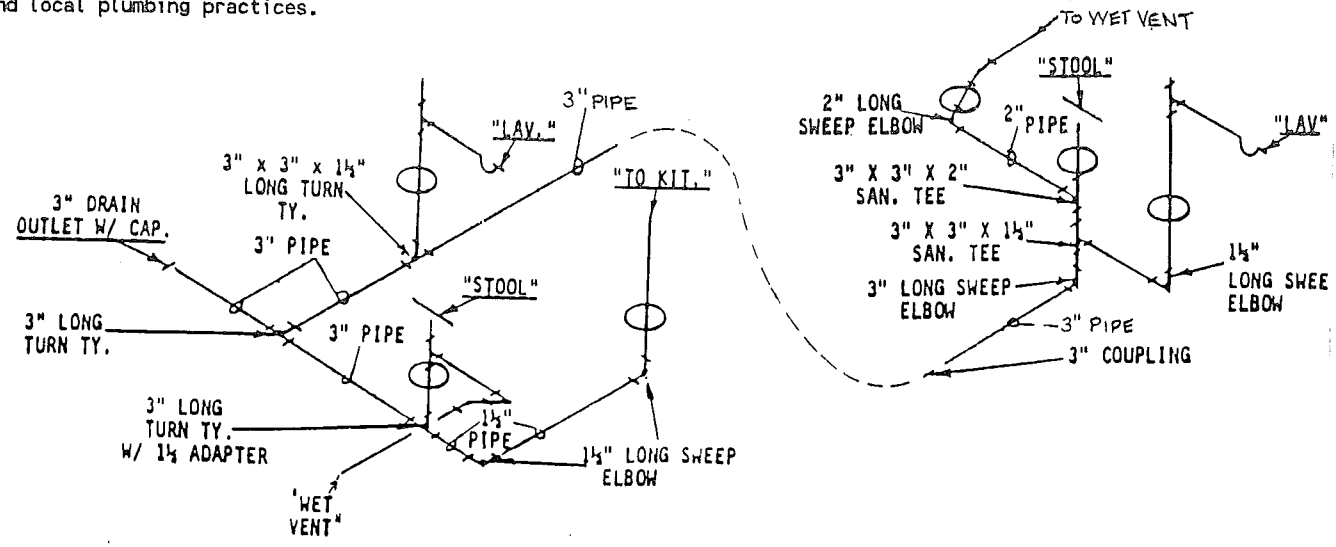
1. Cut pipe to proper length and square at each end. Use saw and miter box or plastic tube cutter. Removal all burrs from both the inside and outside of the pipe. Pipe and fittings must be free of dirt, grease, and moisture.

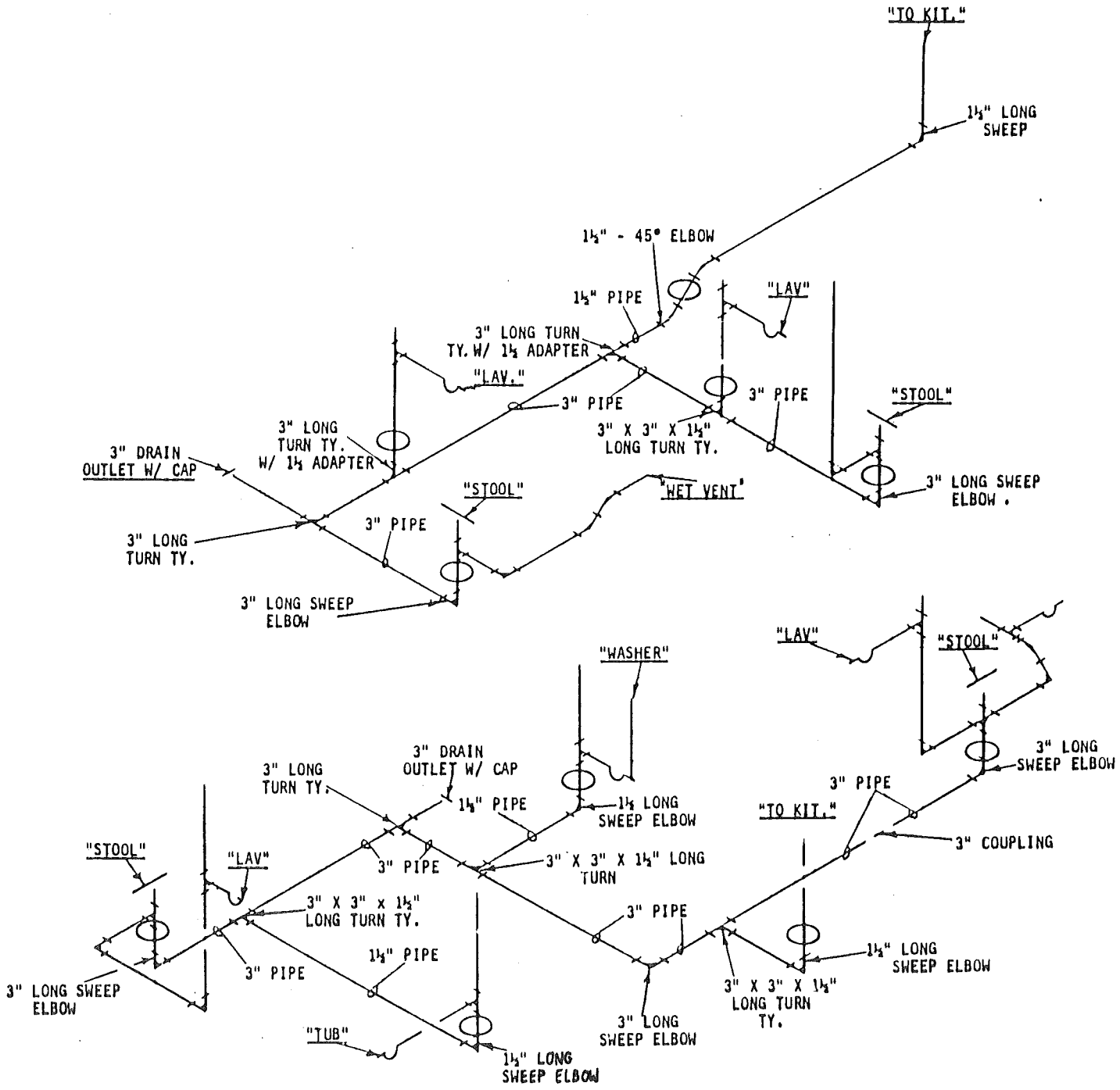
2. Using a suitable applicator, apply a moderate even coat of cement to the fitting socket and a liberal coat to the pipe equal to the depth of the fitting socket.

3. Without delay, assemble while cement is still wet. Use sufficient force to insure that pipe bottoms in socket. If possible, twist the pipe or fitting 1/8 to 1/4 turn to help set as assembled.

4. Upon completion of the drain line system, a floor level test must be conducted (cap drain outlet and floor entire system) for a period of 15 minutes without leak(s).

NOTE: We recommend that the installation be preformed by a qualified plumber in accordance with acceptable and local plumbing practices.





ELECTRICAL CONNECTION

The home was completely wired at the factory, up to and including the service panel containing the main circuit breaker and individual branch circuit breakers. The electrical system in the home is 115/230 volt, 3-pole, 4-wire, including ground. Conduit from the service panel to the outside of the home, in which to run the electrical supply wires, has also been installed at the factory.

The main electrical supply lines, outside conduit, disconnects, etcetera have not been supplied with the home since requirements vary from location to location, and the connection must conform to all local requirements.

The following table shows the proper size wire to be used in connecting the main service panel in your home to the electrical source (proper wire size depends on the type of wire and the electrical demand of the home):

SIZE OF TWO PHASE (POSITIVE) AND ONE NEUTRAL WIRES, AWG OR MCM

Size of Main Circuit Breaker, in Home, in Amperes	*60°C Rated Copper, Type T, TW or RUW*		*75°C Rated Copper, Type RH, RHH, RHW without Outer Covering THW or XHHW*		*Size of Grounding Wire*
	Phase	*Neutral*	*Phase*	*Neutral*	
50	6	8	*	*	8
100	1	4	1	4	8
150	3/0	1	1	2	6
200	250	2/0	2/0	1/0	6

**75°C rated wire should not be used when the main circuit breaker installed in the home is 50 amperes.*

The electrical supply wires generally should be run in conduit from the home to the electrical source. The following table shows the proper size junction box and conduit to use, which depends on the type of wire used and the electrical demand of the home:

MINIMUM JUNCTION BOX AND CONDUIT SIZE, IN INCHES

Size of Main Circuit Breaker, In Home in Amperes	*60°C Rated Copper, Type T, TW or RUW*	*75°C Rated Copper, Type RH, RHH, RHW without Outer Covering THW or XHHW*	*Junction Box*
50	1¼	N/A	*6 x 6 x 4*
100	1¼	1¼	*8 x 8 x 4*
150	2	1½	*10 x 10 x 4*
200	2	2	*12 x 12 x 4*

CAUTION! Several things are very important concerning the electrical connection to your home.

- Only a qualified electrician should perform the electrical hook-up, or make any extensions or changes in the electrical system. Unqualified people could cause serious or fatal accidents.
- Be sure that the electrical power supply available at your homesite is adequate to supply the electrical demand of your home. Inadequate wiring supplying electricity to your home can be hazardous.
- It is very important that proper polarity be maintained when the electricity is connected to your home. The white (neutral) wire should NEVER be connected to, or come in contact with, either one of the black or red (positive or "hot") wires. In addition, the white (neutral) wire should NEVER be connected to, or come in contact with, the green (ground) wire.
- The home must be properly grounded, by running a proper sized wire from the grounding bar in the main service panel through the conduit to the outside of the home, and attaching it to a proper copper rod driven full length into the ground.
- Installation of any type of telephone wiring, TV antenna, or other service which includes penetrating the exterior siding and/or exterior side or end wall or interior partitions of the home should only be done by a qualified person, observing the following procedures:
  1. Disconnect the main circuit breaker, in the service panel.
  2. Do not pierce the side or end walls more than 12" from the bottom edge of the home, and do not pierce interior partitions more than 5" from the top of the floor.
  3. After completing the installation, complete a dielectric strength test of the entire electrical system in the home.
  4. Return the main circuit breaker to "On."
  5. Test all light fixtures, electrical receptacles and appliances for proper operation.

GAS CONNECTION

If your home was built at the factory with a gas burning furnace, range or water heater, the inlet for the gas pipe is located underneath the home and is marked with a label fastened to the side of the home. The gas piping system of the home was tested for leaks at the factory; however, because of over the road vibration, etcetera the entire system should again be pressure tested for leaks by a qualified person. The gas piping system for this home has been designed for the following pressures:

Natural gas — pressure of at least 7 inches of water column, but not more than 10½ inches of water column.

LP gas — pressure of at least 11 inches of water column, but not more than 14 inches of water column.

After the system has been determined to be leak free, the gas pipe should be connected to the gas supply, in accordance with local requirements.

CAUTION! Several things are important concerning the gas connection to your home.

- If the home has a gas burning hot water heater installed at the factory, with the flue pipe and roof cap NOT installed but furnished with the home, do not operate the water heater until the protective covering has been removed from the roof and the flue pipe and cap have been properly installed in accordance with the water heater manufacturer's instructions. The water heater flue pipe and cap (when not installed, but furnished with the home) was not installed at the factory to prevent possible damage during shipment.
- Only a qualified person should check the system for leaks and connect it to the supply. Unqualified people could cause serious or fatal accidents.
- Install a gas shut off valve outside the home when connecting the system to the supply.
- In most cases, the orifices or settings included in the gas burning appliances (including furnaces and water heaters) at the factory are for NATURAL gas only. If you intend to use LP gas, a qualified person must convert the appliance in accordance with its manufacturer's instructions. Be sure to check all connections for leaks after the appliances have been converted.
- After the supply is connected, the installer should light the pilot light (if any) on each appliance and determine that the appliance is working properly.

INSTALLING FLUE ON OPTIONAL WOOD BURNING FIREPLACE

CAUTION! If the home includes an optional wood burning fireplace installed at the factory, DO NOT START A FIRE IN IT until the protective covering has been removed from the top of the chimney and the remaining sections of the flue pipe and the round flue top assembly have been properly installed in accordance with the fireplace manufacturer's installation instructions. The flue pipe and top assembly, which are furnished with the home, were not installed at the factory because of the possibility of damage while in transit.

CAUTION! Be sure to use the optional wood burning fireplace only in accordance with the fireplace manufacturer's instructions.

INSTALLING CENTRAL AIR CONDITIONING

This home is suitable for installation of a central air conditioner, provided the electrical supply panel and electrical service is large enough to carry the load. A qualified heating/cooling company will be able to determine if the electrical supply is adequate, and by referring to the information on the comfort cooling certificate located in the home, a qualified heating/cooling company can determine the proper sized air conditioner that will be needed.

If a self contained central air conditioning unit is to be used an automatic damper (to prevent cooled air from blowing up into the furnace) may have to be installed in the furnace base. Depending on the furnace installed in your home, this damper

may already have been installed at the factory, or in some cases, the furnace may be of a type which is labeled as suitable for use with air conditioning without such a damper. In addition, the ducts carrying cooled air from the air conditioning unit into the home and return air from the home to the air conditioning unit must contain dampers, or be installed in such a way so that when the furnace runs, heated air does not blow through these ducts into the air conditioning unit.

A combination heating/cooling thermostat will also have to be installed, to prevent simultaneous operation of the furnace and the air conditioner.

The duct carrying cooled air from the air conditioner to the home should be connected to the bottom of the main duct located in the floor of the home. The connection should be located so that an equal number of floor registers are on each side of the connection. The floor joists running lengthwise within the floor of the home should not be notched or cut into in any way when installing the air conditioner supply duct.

A duct carrying return air from the home back to the air conditioning unit will probably be necessary. If so, the return air register should be located so that air passage is not restricted, and it should be located between the floor joists running lengthwise within the floor. The floor joists must not be notched or cut into in any way when installing the return air duct.

INSTALLING A SEPARATE, EXTERNAL HEATING AND/OR COOLING DEVICE

It is possible that the home was manufactured at the factory, with the furnace omitted, if so ordered that way by the dealer. If so, a duct adaptor has been installed at the factory in the duct within the floor, for connecting to the external heating and/or cooling device. In addition, a return air grill, to return air from the home to the external device, has also been installed at the factory. The following items must be complied with in the installation of an external heating and/or cooling device:

- The installation should only be done by a qualified heating/cooling company. The device must be properly sized for the home, and it must be installed in accordance with its manufacturer's instructions. The installer should leave the manufacturer's installation and operating instructions with you.
- A qualified electrician should connect the device in conformity with local requirements, **after** being sure that the electrical supply is adequate for the load.
- The device should be installed in such a fashion that it is readily accessible for inspection, service, repair and/or replacement.
- The ducts carrying air from the device to the home, and returning air to the device, must be designed and manufactured so as to comply with Section 280.715 of the Federal Mobile Home Construction and Safety Standard.
- The installer should complete the appropriate portion of the heating certificate, which is located on the wall of the rear bedroom wardrobe.

INSTALLING CLOTHES DRYER VENT

If the home was ordered with optional wiring for an electric clothes dryer, a hole was cut through the floor (and temporarily resealed) at the dryer area, through which the vent tube is to be run. The vent tube was not supplied with the home, unless an electric clothes dryer was installed in the home at the factory. If an electric clothes dryer was installed at the factory, the necessary vent tube and outlet fitting were shipped loose inside the home from the factory, and must be installed when the home is set up. (The vent tube and external fitting were not installed at the factory because of possible damage while the home was being delivered and set up.)

To install the duct, first remove the temporary patches covering the hole in the floor. Push the vent tube into the hole, and attach the end inside the home to the outlet on the rear of the dryer. From underneath the home, pull the vent tube through the floor so it is snug, and extend it to the side of the home. DO NOT allow the vent tube to terminate underneath the home. Fasten the termination fitting to the end of the vent tube, and fasten the fitting at the edge of the home. Support the vent tube as necessary, and seal around the opening in the bottom board (underneath the home) as appropriate.

WARNING! Do not use a clothes dryer in this home unless it has been properly vented to the outside. If you use a clothes dryer which is not properly vented, you will introduce a substantial amount of water into the air inside the home, which could cause condensation, which could damage your home.

WARNING! If your home was not wired for an electric clothes dryer at the factory, do not install one until a qualified electrician determines that the electrical service is adequate for the increased demand. Any additional wiring should only be done by a qualified electrician. The dryer must be vented in accordance with the foregoing instructions, but you will have to cut the hole for the vent tube in the floor, because this wasn't done at the factory.

VENTILATION IMPROVEMENT OPTIONS:

The following ventilation option is designed to improve indoor air quality and may be located in the ceiling of your home.

Ceiling fan option No. V-2062 is activated by an on and off wall switch and should be activated when relative humidity levels reach 55% and turned off at 46%. Use of a humidistat is recommended.

The fan is listed 115V. motor with output 100 CFM.

Installation:

1. See manufacturer's installation instructions.
2. Junction to general lighting circuit.

Note: Electrical connections should be performed by a qualified electrician.

INSTALLING A ROOF-MOUNTED EVAPORATIVE COOLER

If the home was ordered with the optional wiring and construction for a roof-mounted evaporative cooler, a hole has been made in the roof into which the cooler should be installed, and the necessary wiring has been provided. To install the cooler, first remove the temporary cover. Inspect the area for damage, screw holes, etcetera and repair any before installing the cooler. The cooler must be installed in accordance with its manufacturer's instructions, by a person qualified to do so. All electrical connections must be made by a qualified electrician. The installer should seal all potential water leak areas with a high quality roof sealer. The installer should leave the manufacturer's installation and operating instructions with you.

WARNING! Do not install a roof-mounted evaporative cooler unless the roof alteration was done at the factory. Unless the necessary alterations were done at the factory, the roof may not be capable of bearing the weight of the cooler, which could cause substantial damage to your home.

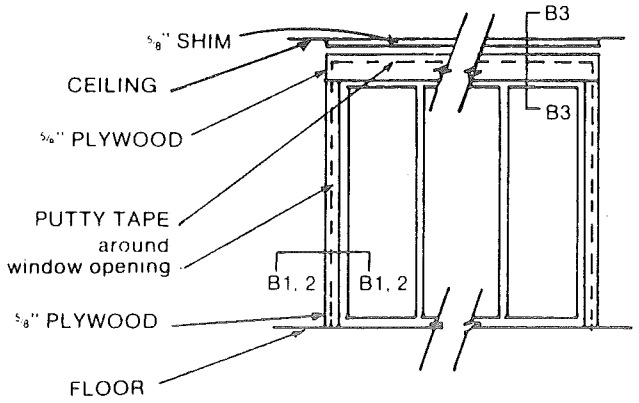
INSTALLING A TIP-A-BAY WINDOW

(2 Sizes: 76" and 131")

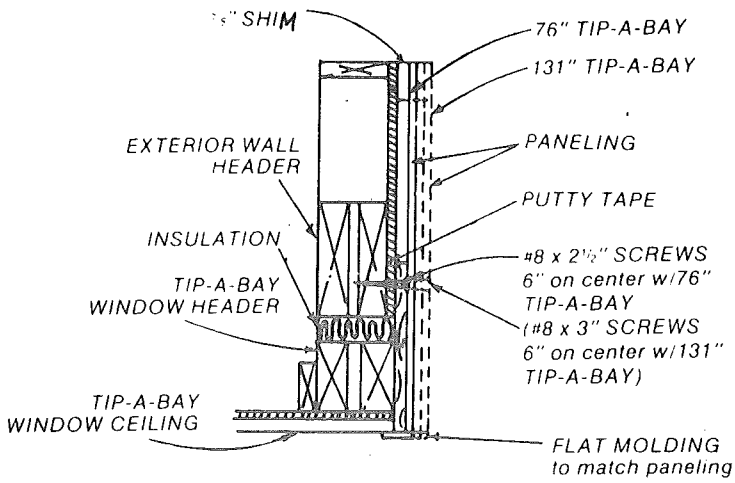
You should not attempt to install a tip-a-bay window (which is an optional item) until the home has been completely leveled and blocked in accordance with the earlier described procedures. After this has been done, you should perform the following steps, in the order indicated:

1. Remove the wood blocking and protective shipping cover from the tip-a-bay window opening in the exterior wall of the home.
2. From inside the home, apply putty tape on the wall (both sides and the top) around the tip-a-bay window opening. See Drawing A.
3. The tip-a-bay window is hinged at the bottom, and is laying on the floor. Lay insulation on top of the tip-a-bay window header, and carefully lift the tip-a-bay window assembly from the top (at both corners and the center) and push it into the exterior wall opening. Be sure that the insulation fills the area between the tip-a-bay window header and the header in the exterior wall window opening.
4. Secure the entire tip-a-bay window assembly to the exterior wall, at both sides and the top, using 2½" x #8 wood screws for the 76" tip-a-bay (3" x #8 for 131" tip-a-bay), every six inches.
5. Install trim pieces, as appropriate, around the tip-a-bay window opening. See Drawing B.
6. It is possible that a ceiling light fixture in the house was not installed at the factory because it would hang down and interfere with lifting the tip-a-bay window into position. If so, the wiring and light box are in place, and the light fixture was shipped loose. Install the light fixture, using proper electrical procedures.
7. A pier blocking arrangement must be installed under the outside edge of the tip-a-bay window, as shown. See Drawing C. The footing, pier blocks, shims, etc. must conform to the requirements for these items as shown at the section "Required Foundation Footings and Pier Blocking," appearing earlier in this manual.
8. From the outside of the home, install the exterior metal siding and/or trim pieces, as appropriate. The necessary pieces have been shipped with the home, and will vary depending on the type of siding used. Be sure to use putty tape and/or caulking at all appropriate places.
9. Complete the tip-a-bay roof close-up by slipping the lip on the tip-a-bay metal roof up and **behind** the exterior siding of the home. Be sure that putty tape is between the exterior siding and the lip of the tip-a-bay metal roof. Fasten with sheet metal screws, 4" on center, and seal the area with roof coating. After the area is dry, use the water hose and check the roof and exterior wall close-up for water leaks. See Drawing D.

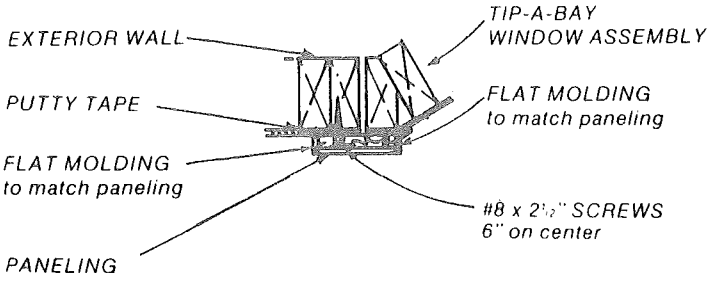
DRAWING A
INTERIOR VIEW OF
TIP-A-WAY BAY WINDOW



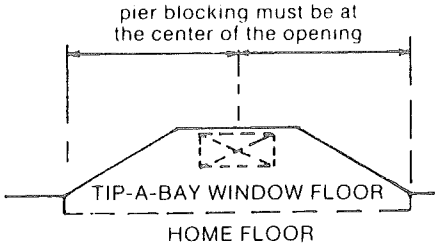
DRAWING B3
INTERIOR TRIM DETAILS
(76" and 131" TIP-A-BAYS)

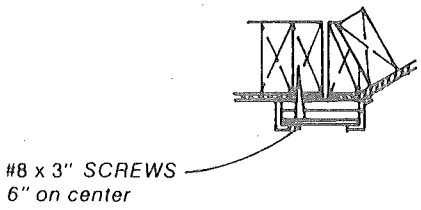


DRAWING B1
INTERIOR TRIM DETAILS
(76" TIP-A-BAY)



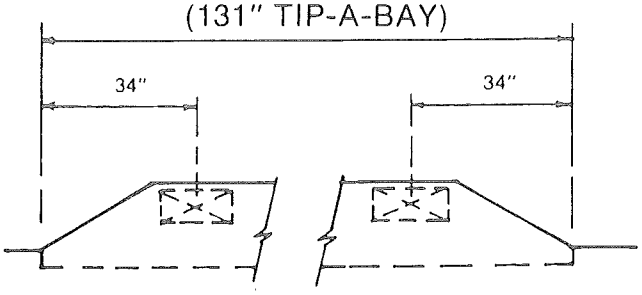
DRAWING C1
FOUNDATION AND PIER
BLOCKING LOCATION
(76" TIP-A-BAY)



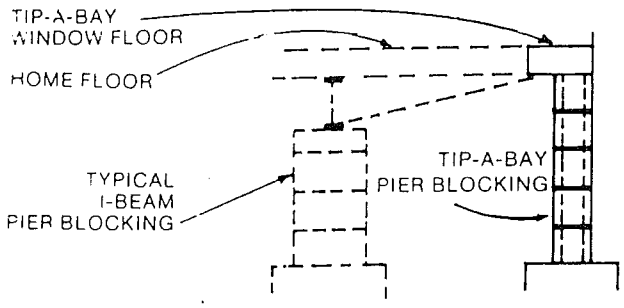


DRAWING B2
(131" TIP-A-BAY)

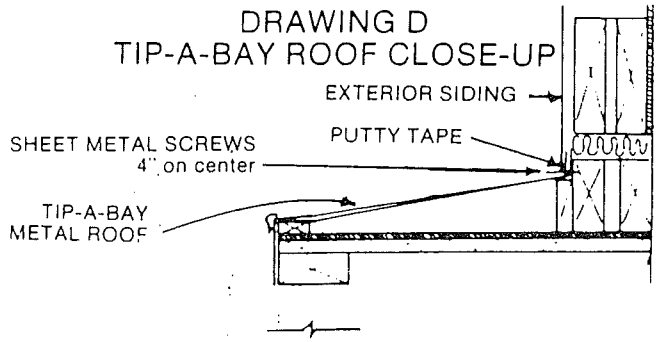
DRAWING C2
(131" TIP-A-BAY)



DRAWING C3
FOUNDATION AND PIER
BLOCKING ELEVATION
(76" and 131" TIP-A-BAYS)



DRAWING D
TIP-A-BAY ROOF CLOSE-UP

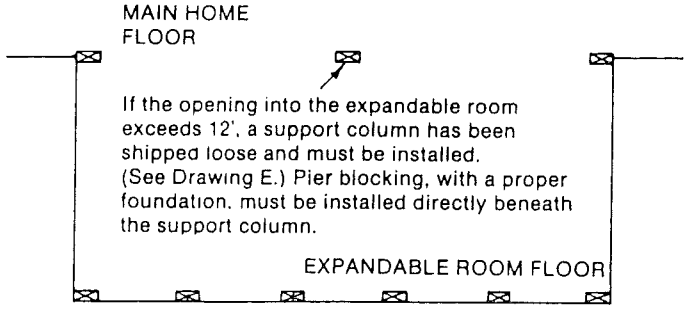


SETTING UP EXPANDABLE ROOM

You should not attempt to set up an expandable room (which is an optional item) until the home has been completely leveled and blocked in accordance with the earlier described procedures. After this has been done, you should perform the following steps, in the order indicated:

1. Remove the protective shipping cover from the large opening in the home sidewall, and remove the protective shipping cover from the recessed area of the floor in the main portion of the home.
2. Remove the shipping brackets from around the outer edge of the sidewall opening. (Remove the lower brackets last.)
3. Lower the expandable unit floor (it is hinged where it fastens to the main floor) and block it at a position level with the main floor. Drawing A shows the location of the required foundation footings and pier blocking. Determine the appropriate zone, and refer to pages 4 and 5 or 6 and 7 for details as to types of foundations and blocking.
4. Remove shipping blocks from expandable room.
5. The expandable room has rollers built into the bottom of its sidewalls. Pull the expandable room out from the main home (on its rollers) and align it on the expandable room floor at the outer corners.
6. Lag screw the expandable room floor to the bottom of the expandable room sidewalls, using ⅛" x 6" lag screws, spaced no more than 32" on center. You should pre-drill a hole for each lag screw. See Drawing B.
7. Be sure the main home floor is still level. Adjust blocking under the expandable room floor so that the edges of the expandable room sidewalls are aligned with the openings in the main home sidewall.
8. An over-the-roof tie down strap has been provided at the end of the expandable room. Following the instructions for anchoring the main home, install an appropriate anchor at the two outside corners, and secure the over-the-roof strap to the anchors. See Drawing C.
9. From inside the home, install the shims between the bottom of the header of the main home sidewall and the top of the header of the expandable room. See Drawing C. Install trim at top and sides of entry into the expandable room. See Drawing D. (On some models, some cabinetry, light boxes, etc. may have been shipped loose, and must be appropriately installed.) If the entry into the expandable room exceeds 12', install the support [illegible]. See Drawing E. Remember that appropriate pier blocking must be placed underneath the home directly below this support post. See Drawing A.
10. The electrical connections should now be made, but only by a qualified electrician. Disconnect the electricity by switching the main circuit breaker in the main panel to the "off" position. Remove the cover from the junction box in the wall of the main home near the opening into the expandable room. See Drawing G. From the outside of the home, uncoil the wire located in the expandable room sidewall, and feed it through the [illegible]s in the wall studs, into the junction box in the main home sidewall. Go inside the home and connect the black wire to the black wire, the white wire to the white wire, and the bare ground wire to the bare ground wire. Reinstall junction box covers, turn on electricity and check polarity of receptacles in the expandable room.
11. From the outside of the home, fill the area between the main home sidewall and the expandable room sidewall with insulation. See Drawing D. Install the exterior metal siding and/or trim pieces as appropriate. The necessary materials have been shipped with the home, and will vary depending on the type of siding used. Be sure to use putty tape and/or caulking at all appropriate places.
12. Complete the roof close-up by slipping the flashing up under the main home exterior metal siding, and let it down until it touches the expandable room metal roof. Be sure that putty tape is behind the flashing, at both top and bottom. Fasten with sheet metal screws, 4" on center, and seal the area with roof coating. After the area is dry, use the water hose and check the roof and sidewall close-up for water leaks. See Drawing F.
13. Install carpet, curtains, rods, etc., as appropriate.
14. Refer to Drawing H, and connect the flexible heat duct from the heat duct in the floor of the main home to the register in the floor of the expandable room, as follows:
    a. Install the round adapter rings into the register [illegible]t adapters. The underside of the home has been marked to locate the duct adapters.
    b. Connect the flexible heat duct to the round adapters, using hose clamps.

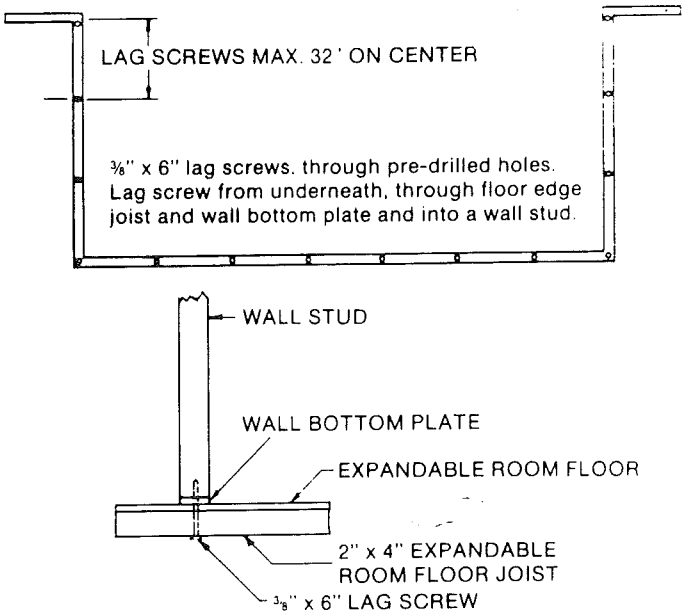
DRAWING A
FOUNDATION AND
PIER BLOCKING LOCATIONS



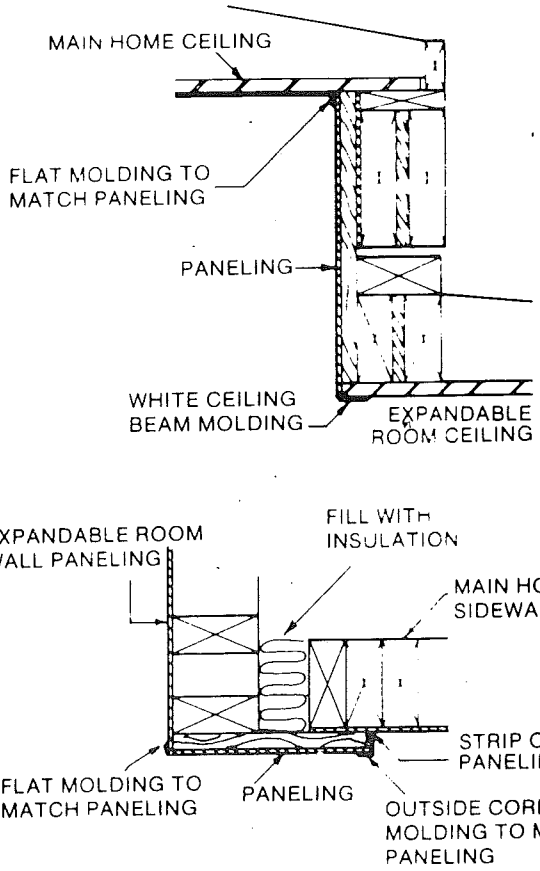
PIER BLOCKING IS A SERIES OF MAX. 4'-0" CENTER TO CENTER SPACINGS.

c. Support the flexible heat duct at appropriate intervals so that it runs as straight as possible, and is not on the ground. Be sure it is not kinked or pinched at angles.
d. The flexible heat duct should be insulated with material having a minimum thermal resistance of R-4.0 and with a continuous vapor barrier having a perm rating of not more than 1.0 perm.

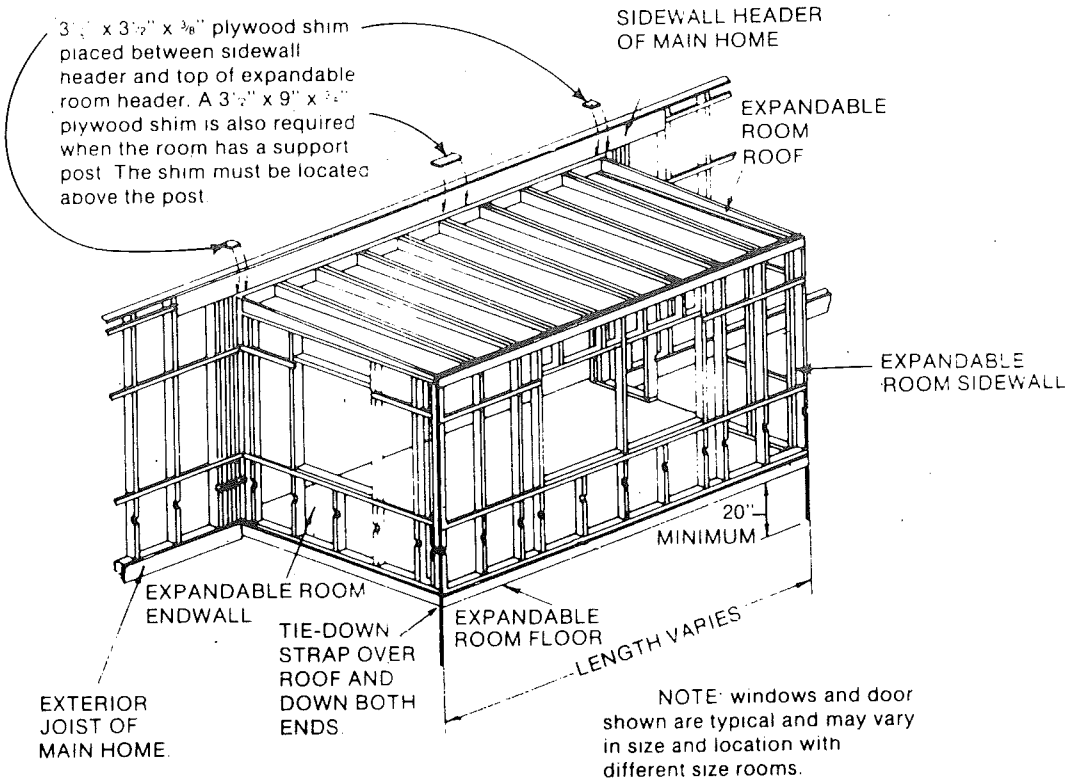
DRAWING B
FASTENING EXTERIOR WALLS TO THE FLOOR



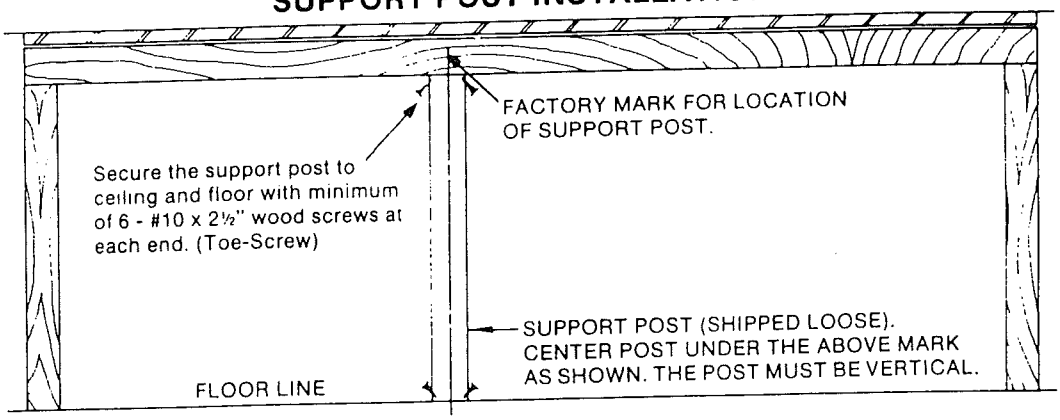
DRAWING D
INTERIOR TRIM DETAILS



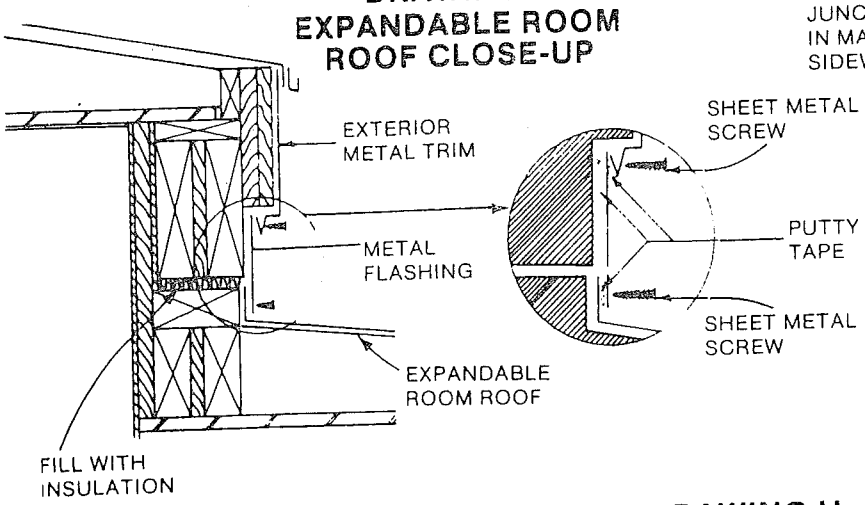
DRAWING C
EXPANDABLE ROOM TIE-DOWN AND HEADER SHIMS



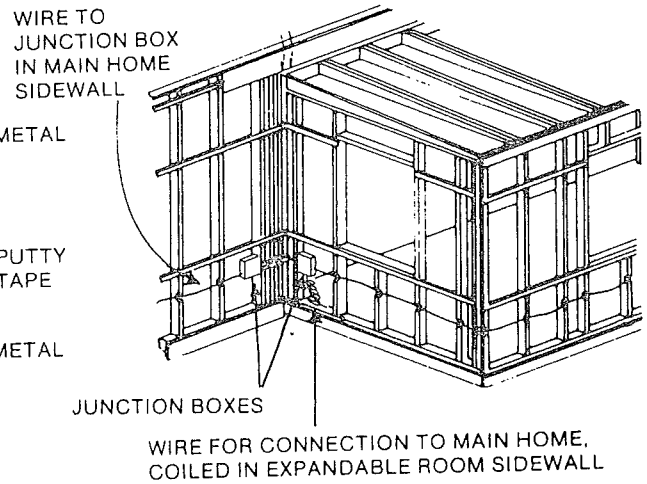
DRAWING E
SUPPORT POST INSTALLATION



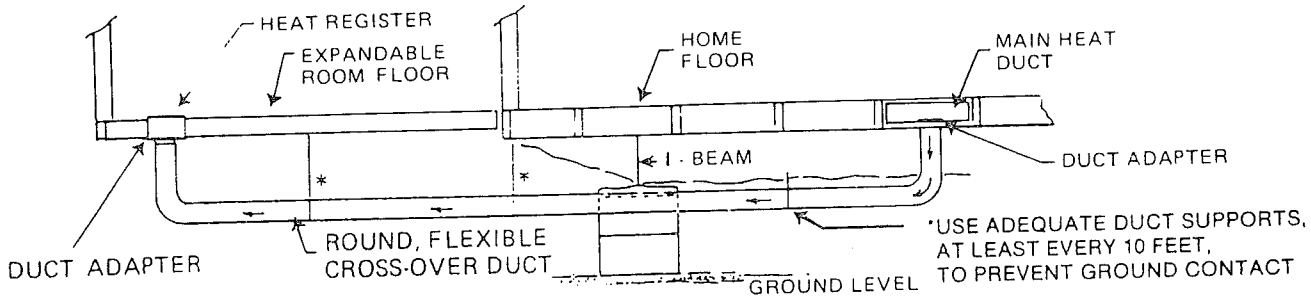
DRAWING F
EXPANDABLE ROOM ROOF CLOSE-UP



DRAWING G
ELECTRICAL CONNECTION



DRAWING H
FLEXIBLE HEAT DUCT CONNECTION



PATCHING THE BOTTOM COVERING

It is important that any holes, tears, etcetera in the bottom covering underneath your home be promptly repaired. Following are three alternative methods for doing this:

- Cut the patch to size out of any suitable material. Use a double-faced tape such as 3M No. 950) and affix the sticky side to the patch. Remove the paper from the other side of the tape, and apply the patch to the area under repair.
- Use pressure sensitive tape, such as Tuck No. 91B, to mend occasional small holes, tears or cuts.
- Cut the patch to size out of any suitable material, and tape it in place. Use an air-operated outward flare tacker (Senco Products, Inc. — Model LN 3045) and fasten the perimeter of the patch at 3" intervals.

INSTALLING SKIRTING AROUND YOUR HOME

Skirting installed around the perimeter of your home will enhance its appearance, and help keep heating costs down in the winter time. Several types of skirting are available, and may be found in the yellow pages under "Mobile Homes." If you have skirting installed around your home, be sure that the clothes dryer vent (if any) terminates OUTSIDE the skirting. Vents should be installed in the skirting to provide adequate ventilation of the crawl space and proper fresh air supply for appliances when required. Proper ventilation should be maintained throughout the winter months. It is recommended that in high moisture areas, a ground cover such as Visqueen be placed under the home prior to installing the skirting.

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