SET UP INSTRUCTION MANUAL

FOR DOUBLE WIDE HOMES

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1983

SET UP INSTRUCTIONS FOR DOUBLE WIDE HOMES

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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.

REVIEWED BY ENGINEERING DEPT.
ISSUED BY FOLLOW-UP SERVICES DEPT.
1 JUN 1 1983
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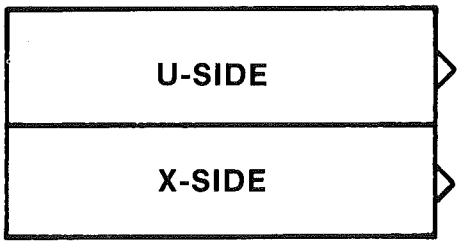
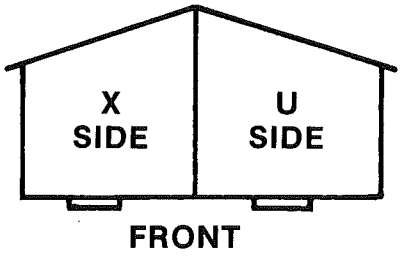




RECOMMENDED MINIMUM SET UP TOOLS FOR DOUBLE WIDE HOMES

Two — 10 Ton Hydraulic Jacks
Two — Chain Come-Alongs
Two — Large "C" Clamps
16 oz. Claw Hammer
Electric Drill with ¼", ⅜", and ½" Bits
Powered Screw Gun with Standard Blade, Phillips and ¼" Hex Head 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
Caulking Gun
Foundation Supports
50' Garden Hose (for water check)
2" Brush (to apply roof coating)
5 Gallons Roof Coating
100' Heavy Duty Extension Cord with Ground
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)
Carpet Heat Bond Tape
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

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.

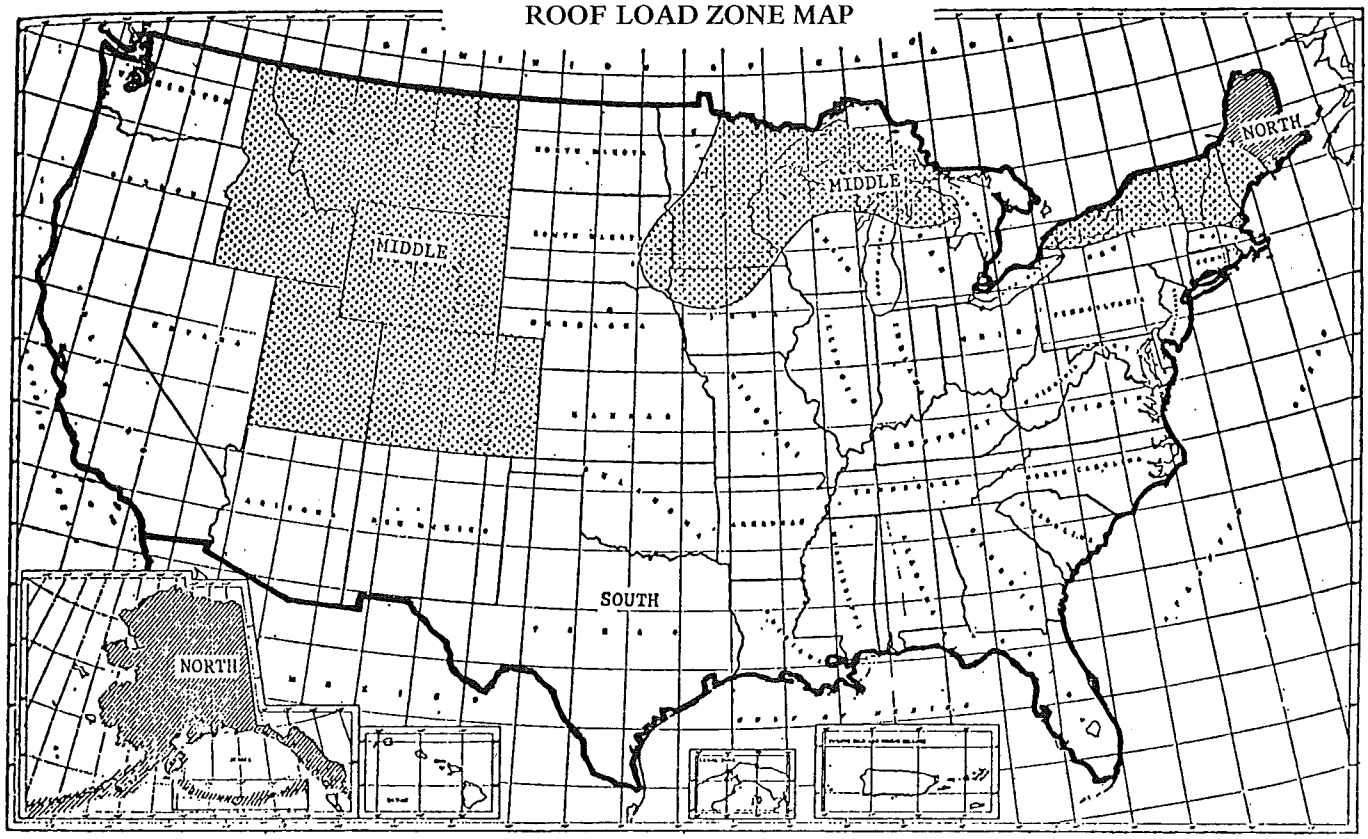
FOUNDATION

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 pages 6 and 7 for information on foundation footings and pier blocking.

ROOF LOAD ZONE MAP



BASEMENT TYPE FOUNDATION

Provision for an inside, basement entry is available as an option in certain models. Other models may be set upon a basement type foundation, utilizing an outside entrance. If you choose to use a basement type foundation, you should retain a qualified, licensed architect or otherwise qualified person to design the foundation, basement walls and supporting piers and beams. The support capability of the basement type foundation must be not less than the foundation footings and pier blocking for the appropriate zone shown on pages 6 and 7. Also, provision should be made for anchoring the home to the foundation, as recommended on page 11.

LEVELING AND BLOCKING YOUR HOME

It is extremely important that your home be level, and properly supported in accordance with the drawings on pages 6 and 7. After the foundations are properly dry and you have all the necessary materials and tools, level the home and fasten the two sides together as follows:

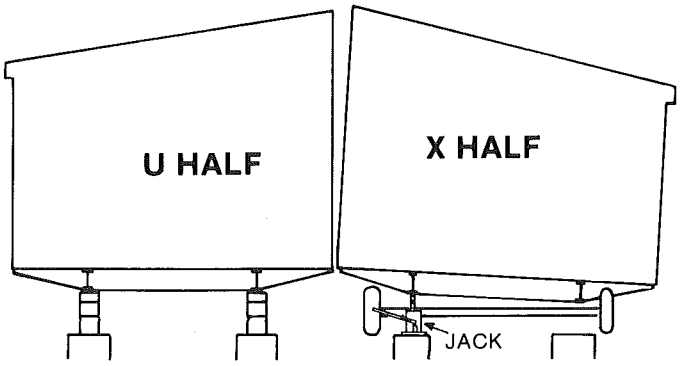
Leveling and Blocking the U Half

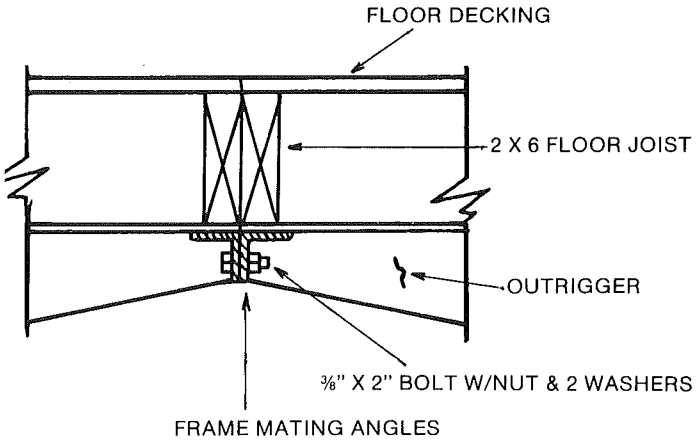
1. Place the U half of the home in its proper position over the foundation.
2. Place the 6' level crosswise on the floor at the axle area. If the floor is not level from side to side, place the 10 ton jack under the low side I beam at the axle area, and carefully raise the I beam until the floor is level. Place blocks under the I beam, on each side, at the foundation points closest to the jack. Insert wedges, as shown on the drawing, so that the blocks bear the weight.
3. Place the 6' level lengthwise on the floor, and working towards each end of the home, place blocks and wedges under both I beams, at no more than 8' intervals. Make continuous checks with the 6' 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.

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:

1. Lay some scrap plywood on the ground next to the U half, where the wheels of the X half will be when it is properly positioned. You are going to slide the X half sideways on this plywood, so put some grease on the plywood to help the tires slide sideways.
2. 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. Slide the X half sideways to the U half by using two come-a-long's, 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.
3. 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 the drawing on page 5.





4. Loosely bolt the X half outriggers to the U half outriggers using the ⅜" x 2" machine bolts. Do not tighten these bolts at this time.

5. Temporarily block the X half inside I beam at 8' intervals, remove the jacks and place them under the X half outside I beam about 1/3 of the floor length from each end.

6. 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 8' intervals. 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 frame. 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.

7. Place a 10 ton jack under each I beam of the X half at the axle area. Carefully adjust the floor of 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.

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

9. Work towards either end, placing blocks and wedges under the I beams on both sides, at no more than 8' intervals. 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 bolts attaching the two halves together, make the floors unlevel, or cause other problems.

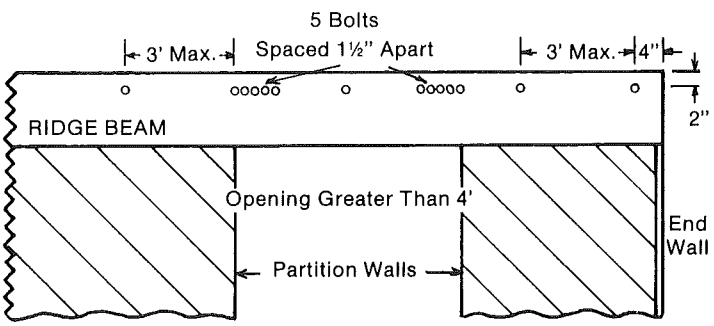
10. Both halves should now be blocked and level. Before tightening the bolts through the outriggers underneath the home, check all alignments. Are the front and rear end walls flush? Are the floors and ceilings flush? Tighten the bolts through the outriggers, starting in the center and working towards each end.

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

RIDGE BEAM FASTENING

CAUTION! — If the home has a metal roof, you should not walk directly on it, because you may strain the roof or its seams. On a metal roofed home, lay some planks or plywood on the roof, spanning several rafters, and keep your weight on these.

1. Go inside the home and be sure that the end walls are flush and that the ceiling panel joints line up.
2. Go up on the roof, at either end, and using a C clamp, clamp the two ridge beams together. Drill a 7/16" hole through the ridge beams, 2" from the top and 4" in from the end. Install a ⅜" carriage bolt with washers and a nut. Leave the nut finger tight.
3. Go down the ridge beam, installing ⅜" carriage bolts 2" from the top, every three feet. Only tighten finger tight. Use the C clamps about six feet ahead of where you are working. Leave the bolts finger tight. IMPORTANT! Whenever the ridge beam spans a length of more than four feet unsupported by partition walls inside the home, you must install five bolts, 1½" apart, spaced towards the clear span area, at each end of the clear span area, as shown below:



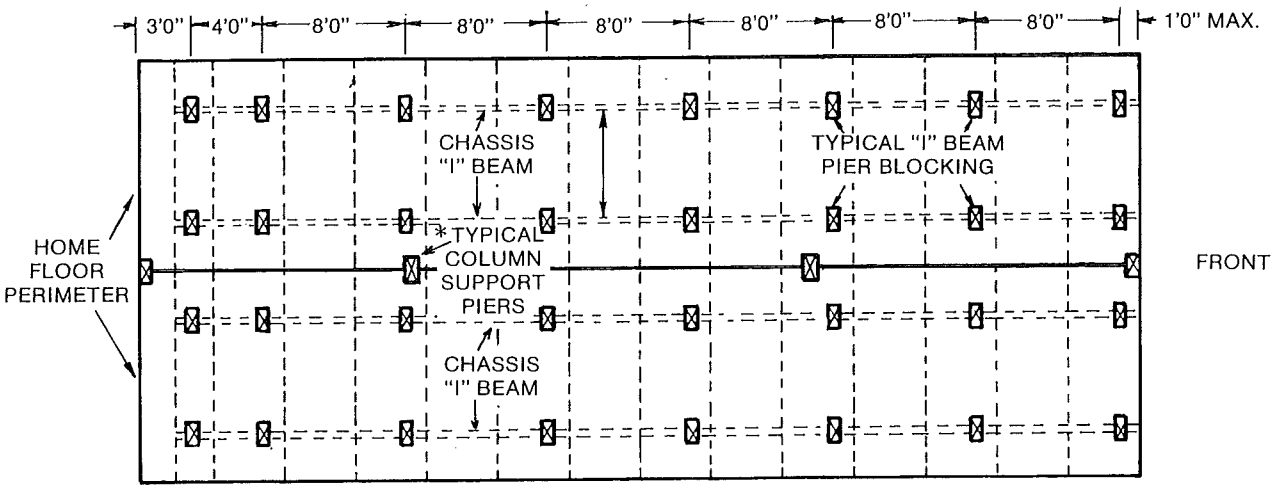
The last bolt must be 4" in and 2" down from the end wall opposite from where you started.

4. Tighten each nut completely, starting at the center of the beam and working towards each end.

REQUIRED FOUNDATION FOOTINGS AND PIER BLOCKING

(For Homes Located in the Middle or South Zones)

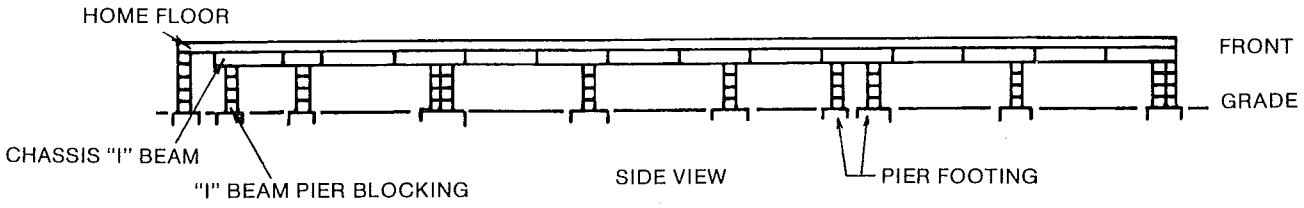
PIER SPACING IS MAXIMUM 8' CENTER TO CENTER



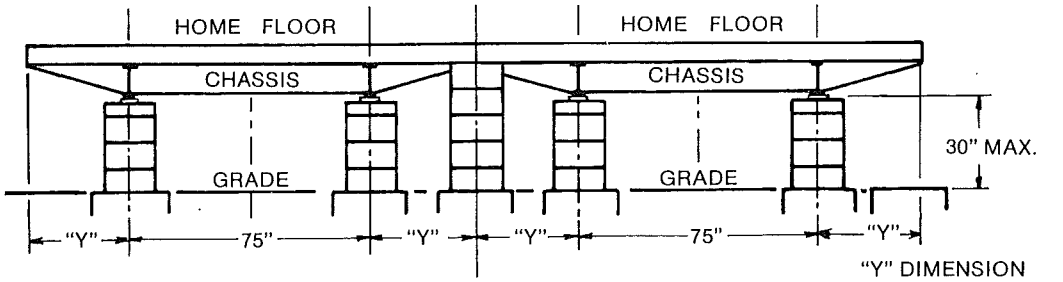
TOP VIEW

*COLUMN SUPPORT PIERS, LOCATE **ONLY** AT BOTH SIDES OF CENTER WALL OPENINGS.

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.



SIDE VIEW

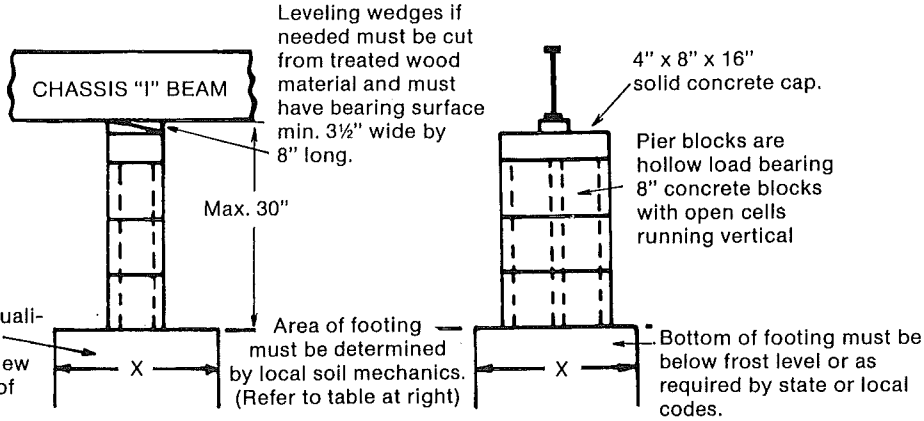


FRONT VIEW

"Y" DIMENSION

24' WIDE = 33"
28' WIDE = 45"

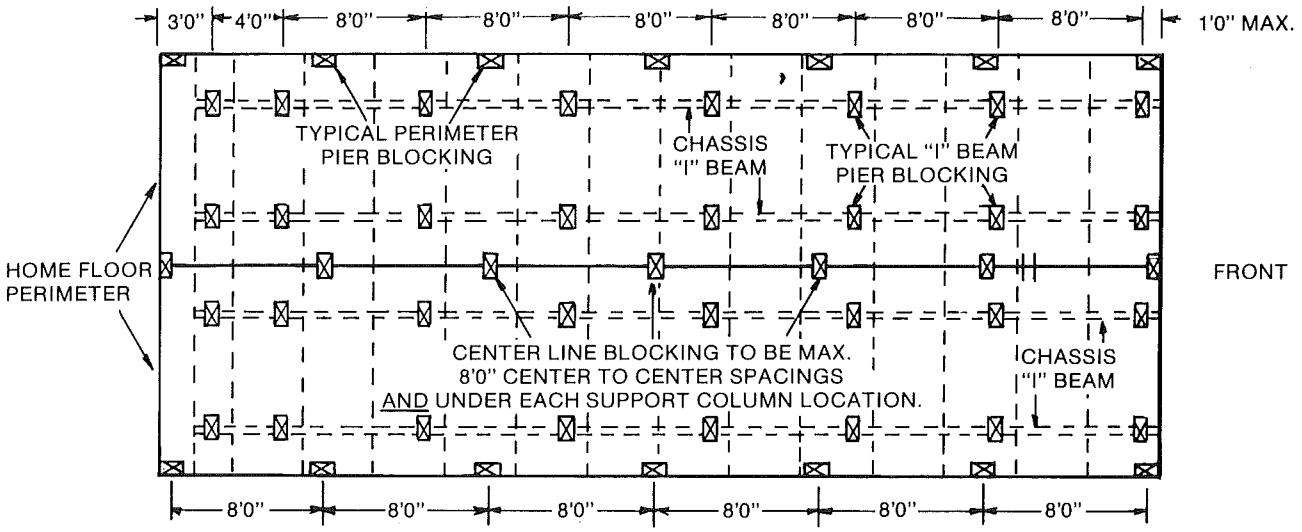
PIER DETAIL



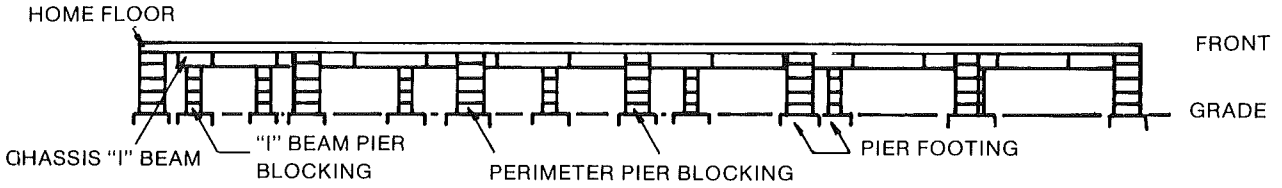
Poured concrete footing. Concrete must have min. compressive strength of 2000 lbs. P.S.I. at 28 days. Footings other than poured concrete may be used provided that all applicable building codes and load bearing capacities are met. We recommend that a qualified contractor, architect or civil engineer, familiar with applicable building codes, review and approve the type, size and installation of the footing system used.

REQUIRED FOUNDATION FOOTINGS AND PIER BLOCKING

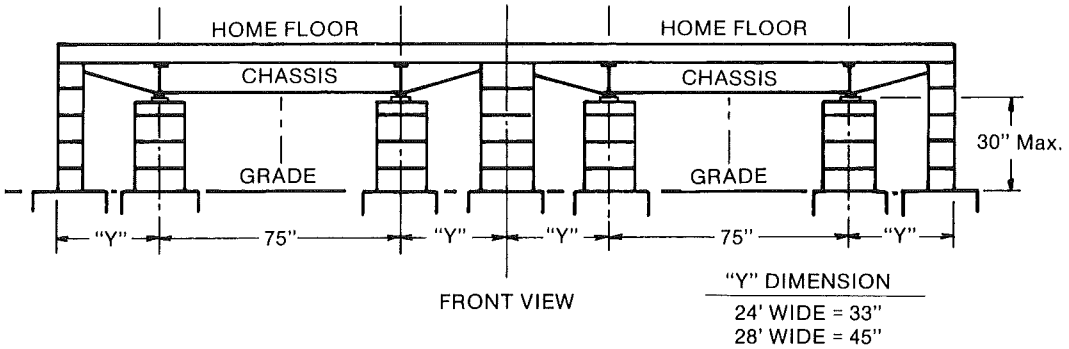
(For Homes Located in the North Zone)



TOP VIEW



SIDE VIEW



FRONT VIEW

"Y" DIMENSION

24' WIDE = 33"
28' WIDE = 45"

— ALL ZONES

"X" FOOTING SIZE with
PIER CAPACITY of 5,700 LBS.

Soil Bearing Capacity per Sq. Ft.	"X" Footing Size in Inches
1000	27
1500	22
2000	20
3000	16
4000	16

END WALL FASTENING

1. Secure the end wall studs, where the two halves come together, by driving 16d nails every 6" into both sides of the matching end wall studs.

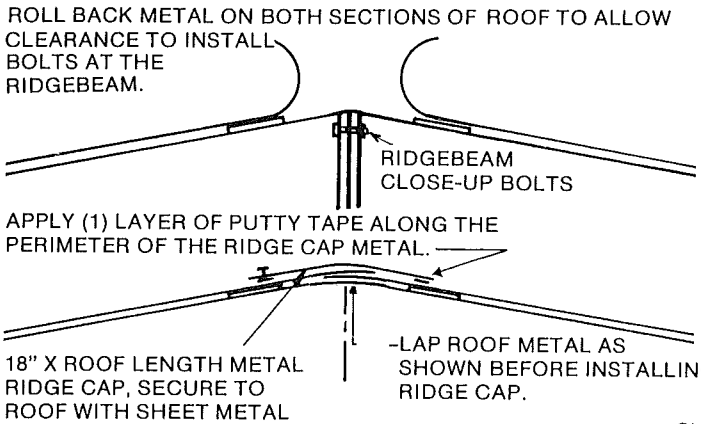
The home should now be level, properly blocked and properly and securely fastened together.

CAUTION! Once again, use the six foot 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.

METAL ROOF CLOSE-UP

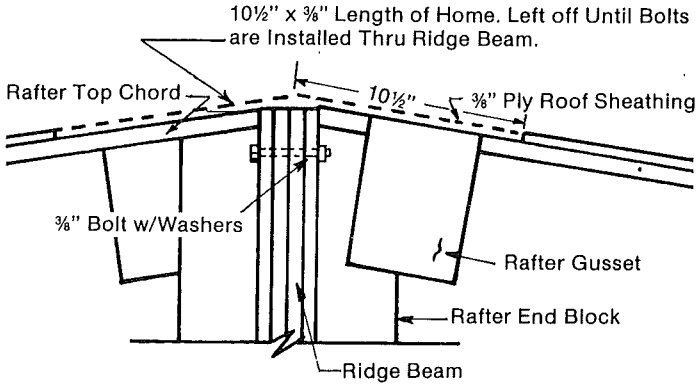
If this home has a shingled roof, skip to the shingled roof close-up section.

1. Roll the metal roofs back over the ridge beam, as shown in the drawing below, being sure that the metal roofs are overlapped.
2. Install putty tape and the metal ridge cap as shown.
3. Seal the edges of the ridge cap with roof coating.

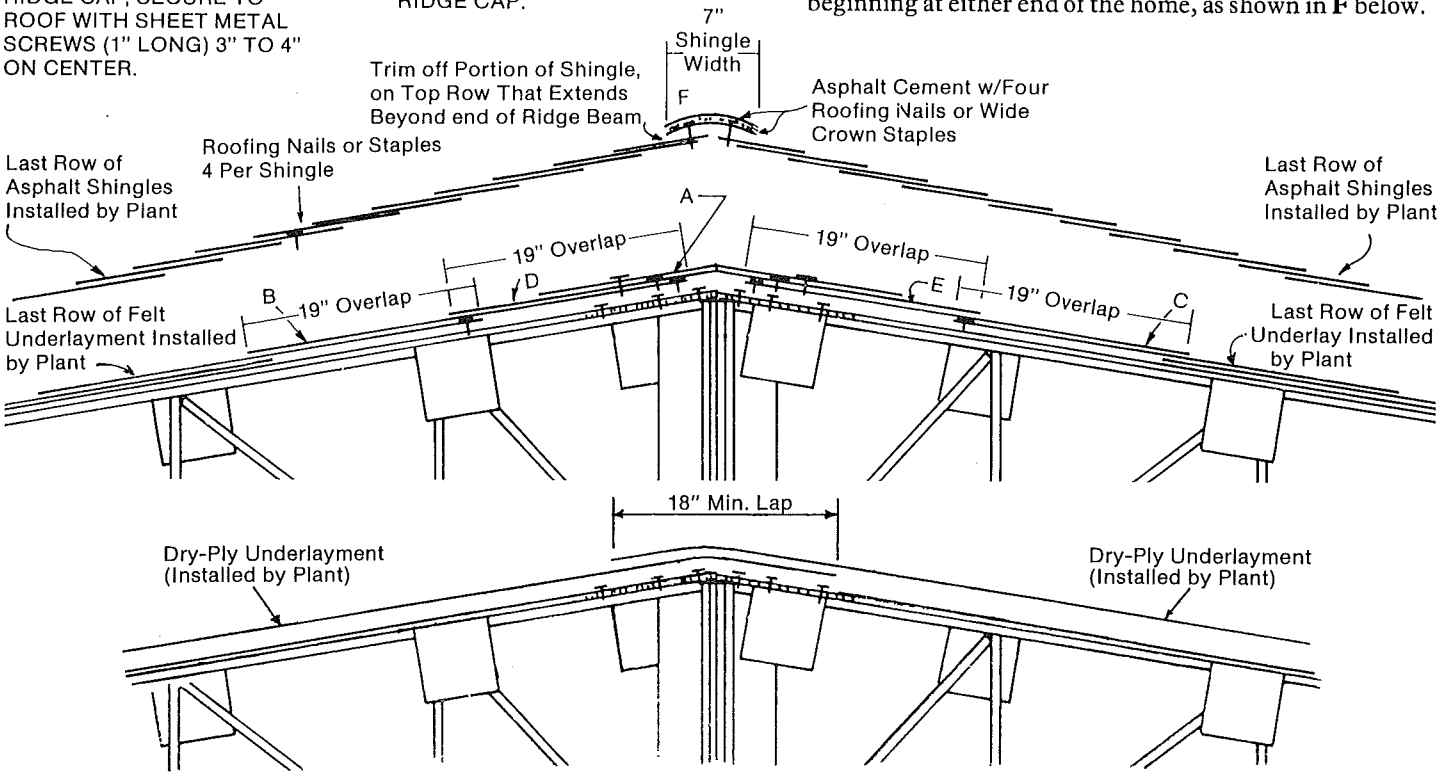


SHINGLED ROOF CLOSE-UP

1. Install ⅜" x 10½" x 8' pieces of roof sheathing along both sides of ridge beam using 3-2d nails or 3-1" staples at each rafter, as shown below:



2. Install one row of roof underlayment on each side, as shown below at **B** and **C**. Nail only enough to hold it in place until the shingles are applied.
3. Install two more rows of roof underlayment, over the peak of roof, as shown below at **D** and **E**. Fasten as in step two above.
4. Install one more row of roof underlayment over the ridge, as shown below at **A**.
5. Install the remaining metal roof drip edge along the edge of the roof, at both ends, nailing every 8".
6. Install shingles in accordance with the instructions on the bundle, working towards the roof peak.
7. Install 7" x 12" pieces of shingle along the roof peak, beginning at either end of the home, as shown in **F** below.



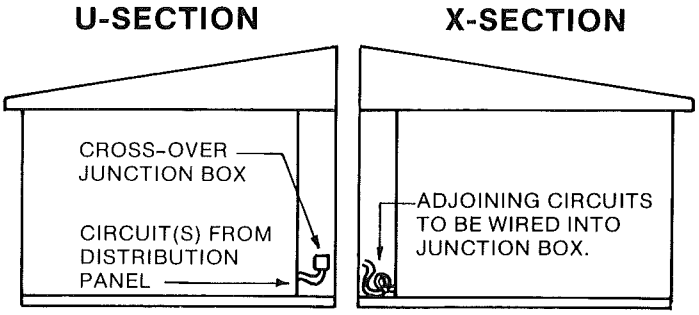
ALTERNATE UNDERLAYMENT CLOSE-UP

(Notes No. 1, 5, 6 and 7 are applicable to this alternate.)

ELECTRICAL CROSS-OVER CONNECTION BETWEEN THE X AND U HALF

The electrical system in each half must be connected together before the exterior siding is applied to the ends of the home. CAUTION! Make the electrical cross-over connection BEFORE the main electrical distribution panel in the U half is connected to the electrical source.

1. Wiring runs from the distribution panel in the U half to a junction box mounted in the U half rear end wall, near the centerline of the home. The number of circuits will vary with the design of the home.
2. Coiled up in the end wall of the X half is the wiring to be connected to the U half wiring.

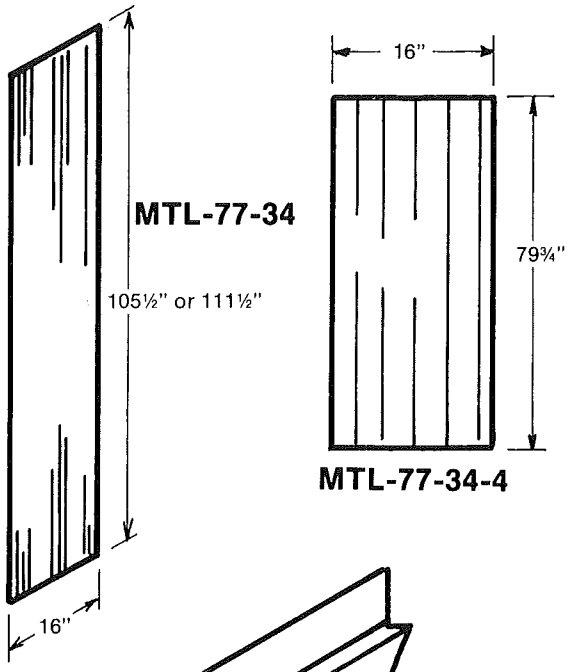


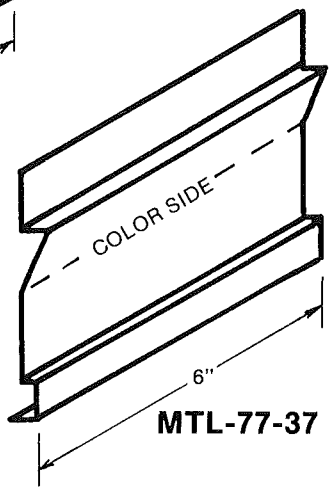
3. Run the wires from the X half through openings in the studs to the junction box in the U half. From inside the home, use a proper wire clamp and feed the wires into the junction box. Connect the black wires to the black wires, the white wires to the white wires and the bare ground wires to the bare ground wires. Only connect one wire to one wire. DO NOT CONNECT WIRES OF A DIFFERENT COLOR! Install the cover plate over the junction box.

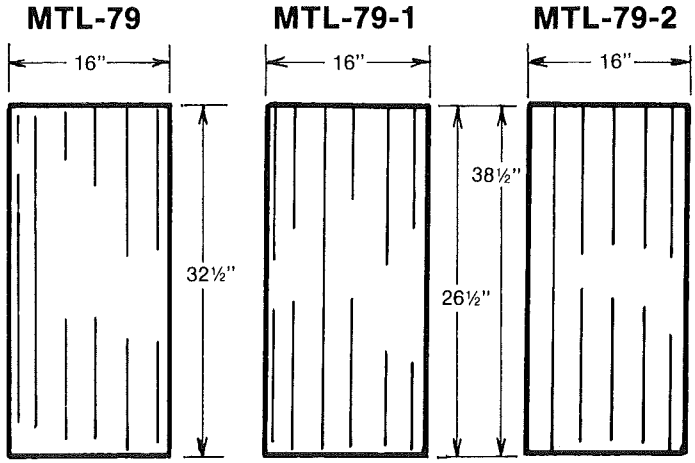
STANDARD METAL EXTERIOR END WALL CLOSE-UP

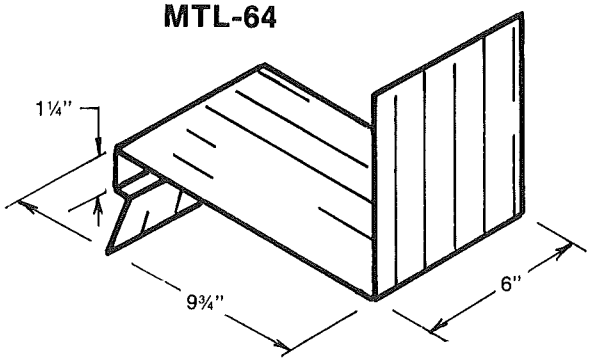
(If the home has either wood-type or house-type lap siding, skip this section and go to the proper one.)

1. Collect the necessary painted aluminum exterior end wall close-up parts which were furnished with the home. Examples of the parts are shown in the following drawings. [The proper parts will vary depending whether the home end wall exterior is a) all the same color, or b) the gable end and bottom trim pieces are a different color from the other exterior siding pieces.]



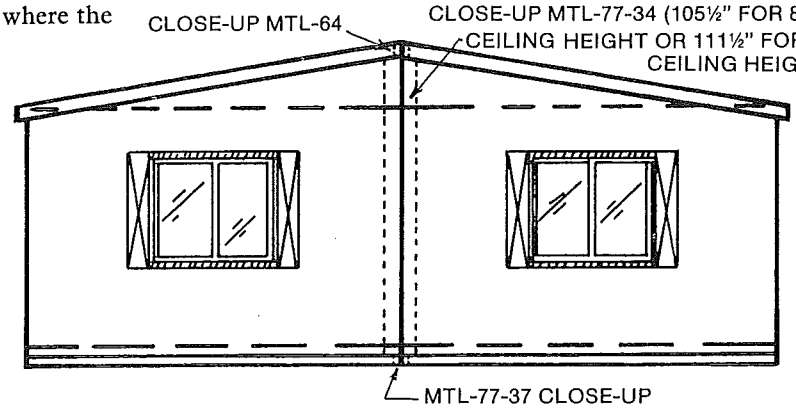




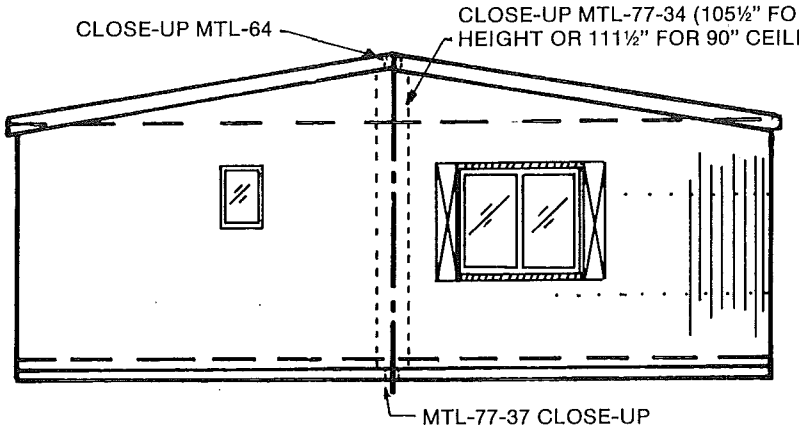


2. Match the end wall bottom trim pieces (part MTL-37), apply putty tape at the seams and fasten to the end walls with ¾" hex head screws.
3. Lay up the vertical panels (part MTL-77-34-4 or part MTL-77-34), slip the joints together and fasten with ¾" hex head screws.
4. Secure the top trim pieces using ¾" hex head screws, 2" on center. Use putty tape at all seams and overlaps.

The following drawing shows a typical close-up where the exterior end walls are all the same color metal:

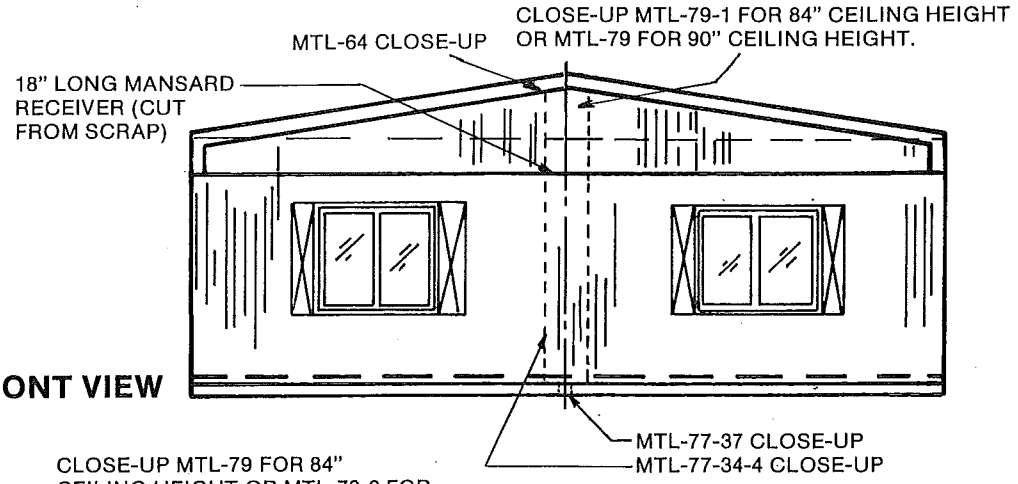


TYPICAL FRONT VIEW

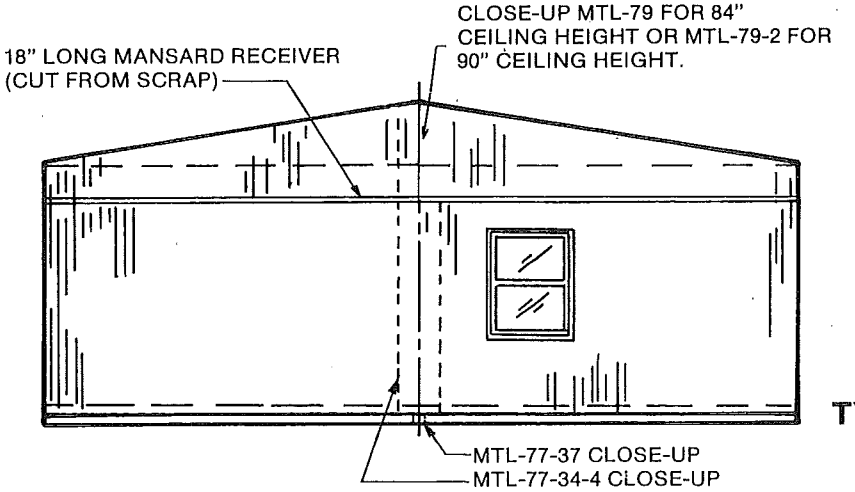


TYPICAL REAR VIEW

The following drawing shows a typical close-up where the gable end and bottom trim pieces are a different color from the other exterior siding pieces:



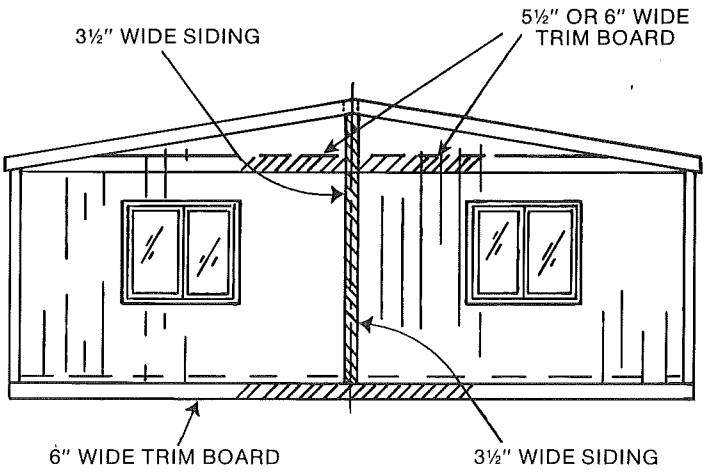
TYPICAL FRONT VIEW



TYPICAL REAR VIEW

WOOD-TYPE SIDING
EXTERIOR END WALL CLOSE-UP

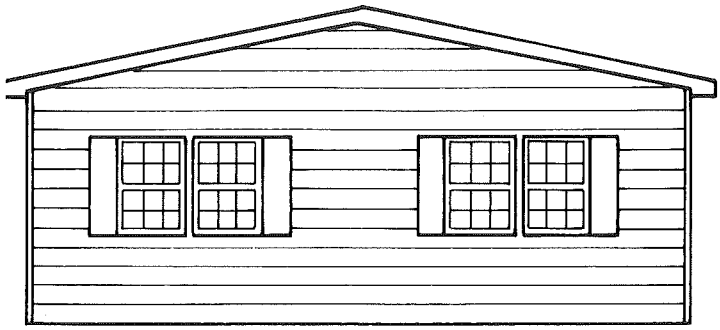
1. Locate the wood-type siding, color matched nails and caulking materials supplied with the home.
2. Install the horizontal trim boards w/2-layers of caulk tape on backside of top edge using proper color nails. After fastening trim boards, use the tube caulking provided and seal joint at top of trim board and siding. Also seal butt joints at end of boards. I.E. factory installation.
3. Cut-to-fit vertical siding pieces as required and install (centered over joint) with caulk tape on each side and nailed with proper color of nails as provided. Fill all joints with tube caulking.
4. Fill joints on the front and rear (if applicable) overhangs at the soffit and facia with tube caulking.



TYPICAL FRONT OR REAR VIEW

HOUSE-TYPE LAP SIDING
EXTERIOR END WALL CLOSE-UP

1. The house-type exterior lap siding 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.
2. Seal with caulking all joints at windows and outside corners.



TYPICAL FRONT OR REAR VIEW

NOTE — Some models may have the end wall house-type exterior lap siding installed at the factory. If so, locate the metal molding, painted the same color as the siding, and using putty tape and 3" No. 8 screws, fasten the trim piece over the seam where the end walls come together. Caulk as necessary.

INTERIOR FINISH WORK

1. **Carefully** remove the ridge beam supports used to brace the ridge beam during shipment. Do not damage the ceiling.
2. Install the center ceiling beam which was furnished with the home.
3. 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 may want to stretch the carpet up to the seam and tack it down temporarily until you get the carpet seamed.)
4. Install interior trim moldings, as necessary.
5. Adjust for proper operation all cabinet doors, interior and exterior doors and sliding or folding doors, as necessary.

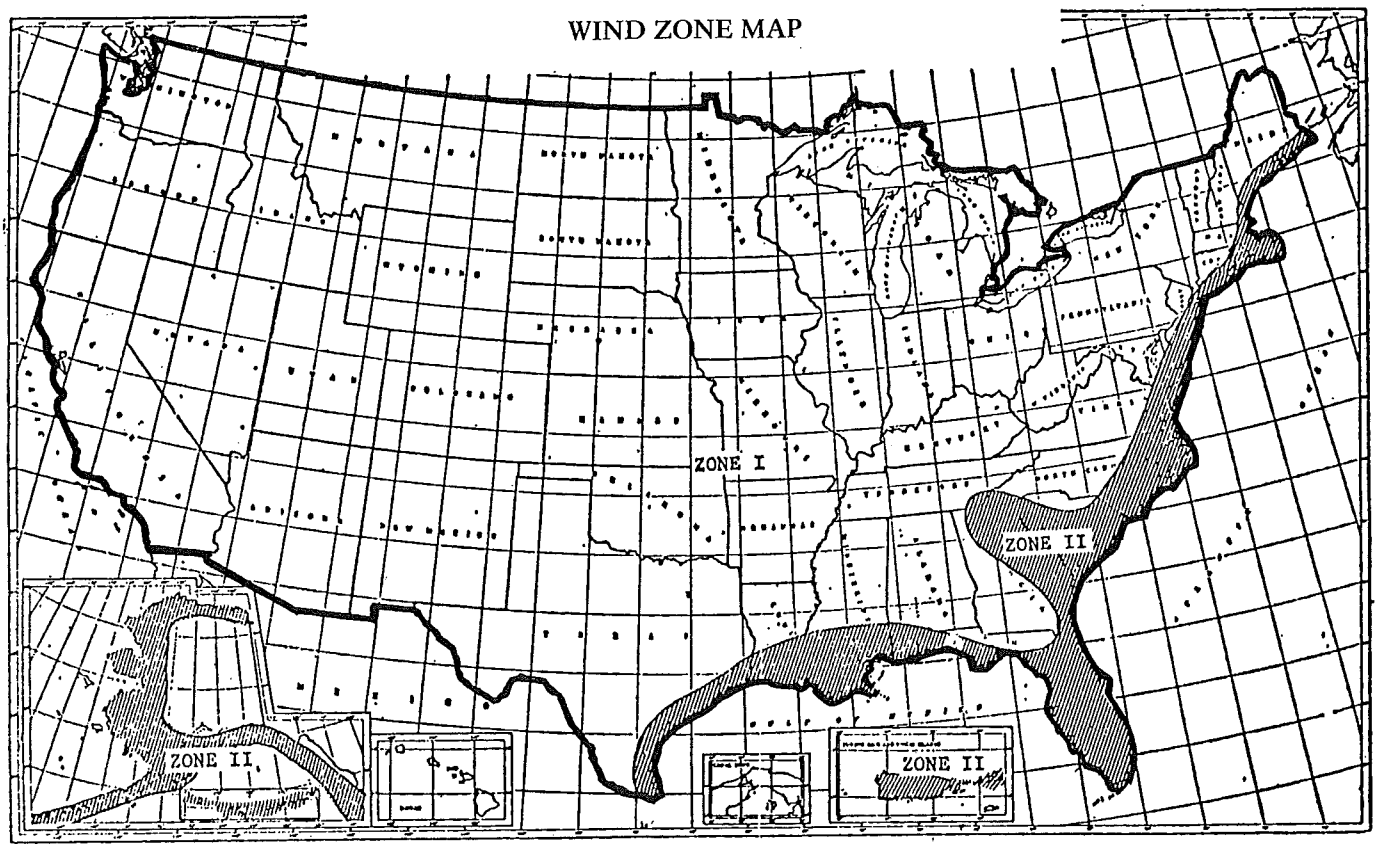
TIE DOWN RECOMMENDATIONS

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.)

WIND ZONE MAP



Refer to the Wind Zone Map 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 Man anchors®

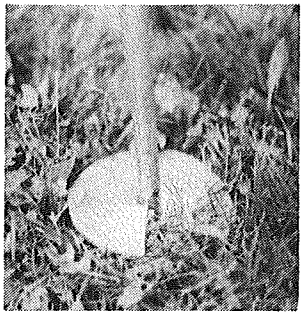
INSTALLATION

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.

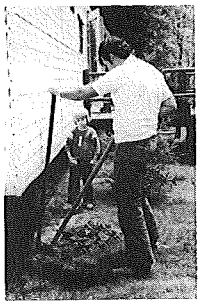


2. Auger is placed in proper position in line with strap, and machine started.

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

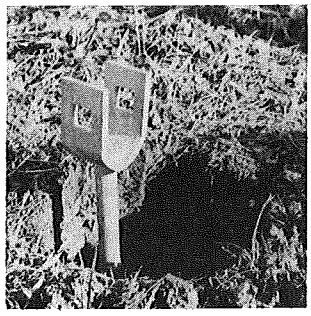
Installation with Manual or Mechanical Post Hole Digger

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.



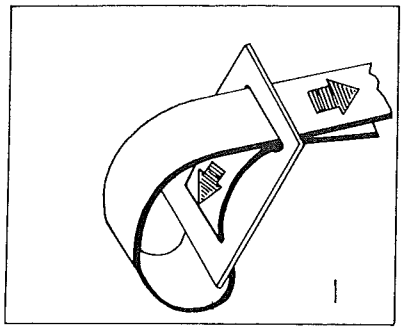
3. After anchor is installed to **full depth,** earth is repacked, six inches at a time.

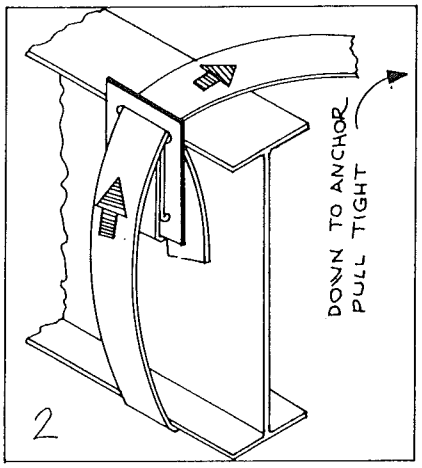
CAUTION: These instructions cover installation for frame ties only. Particular attention should be directed to selecting the proper capacity anchoring system, according to the information on page 15.

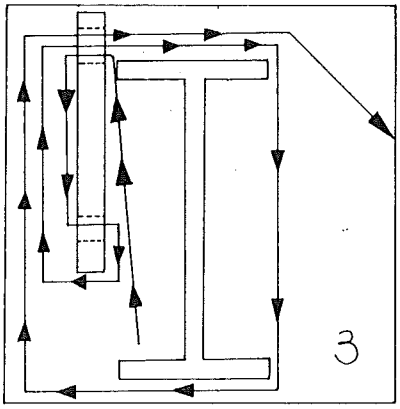
FOR FRAME TIES ONLY

POSITIONING FRAME TIE

FRAME TIE INSTALLATION INSTRUCTIONS

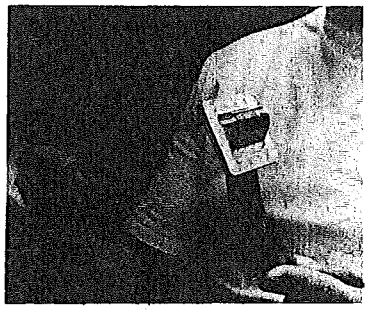




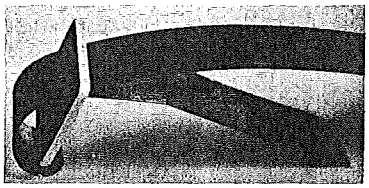


1. Thread 7' length of frame tie strap through buckle as shown.
2. Next, thread long end of strap between frame and floor of home. Bring strap through buckle as shown in diagram and fasten to anchor head.
3. Diagram showing strap in position around frame and through buckle. It is important to remove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

1. See step one in installation instructions.

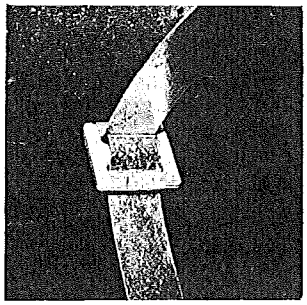


2. Insert strap in position through buckle.

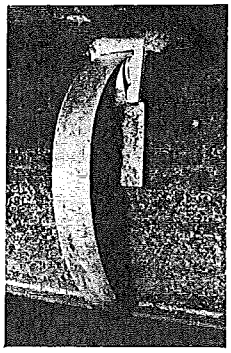


3. Strap should be through buckle in this configuration before installation on frame.

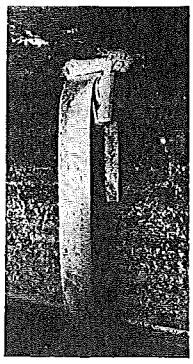
4. Strap should be passed over frame from inside, and buckle pulled into position as shown.



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



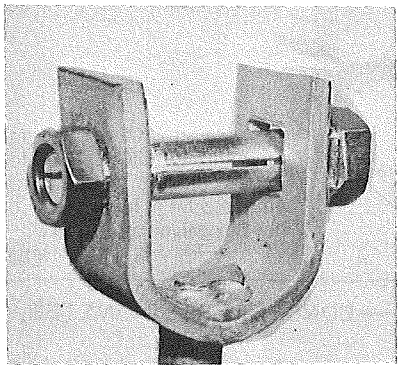
6. Strap is pulled tight from outside, or anchor side, of frame.



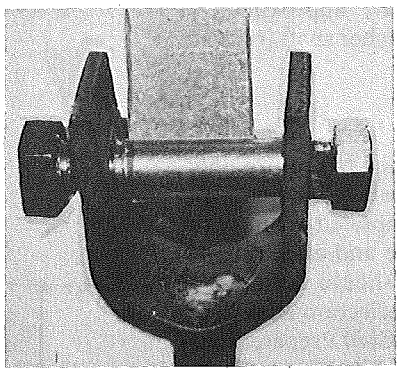
7. Inside of frame tie, properly installed.

PROPER TENSIONING OF STRAP TO ANCHOR HEAD

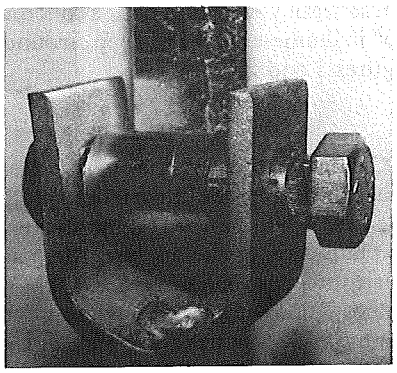
Note: The tensioning bolt can be inserted in the head from either side.



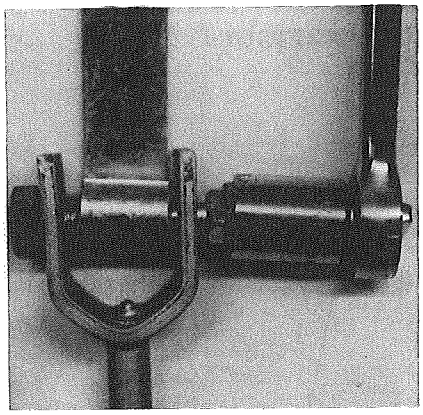
1. Insert bolt into head; attach nut loosely.



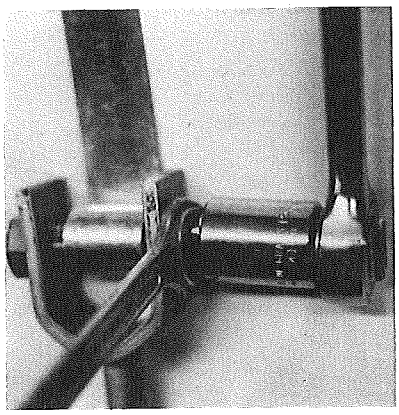
2. Insert strap in slot of bolt 5/8", or until strap is flush with far side of bolt.



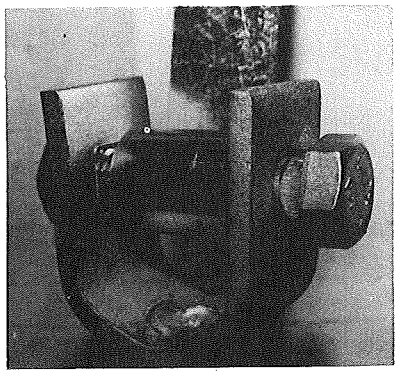
3. Bend strap 90° and take at least four complete turns on bolt until strap is taut.



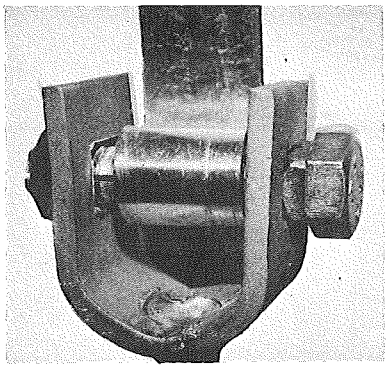
4. Bolt is turned with $^{15}/_{16}$" socket wrench, or adjustable wrench, on hex head.



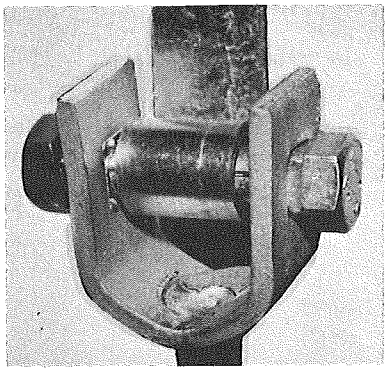
5. To hold bolt under tension while repositioning wrench, an open-end wrench is placed on $^{5}/_{8}$" square shoulders of bolt.



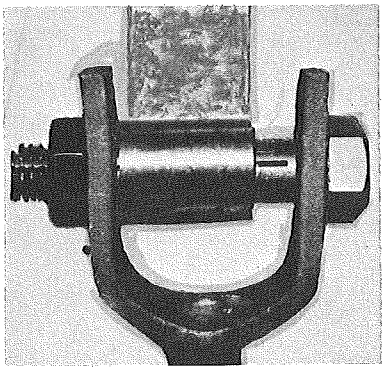
6. Align square shoulders of bolt with square hole in anchor head.



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.



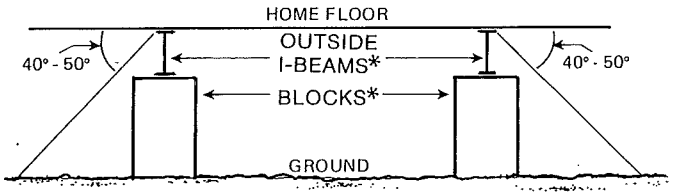
9. Tensioning device is now in locked, secure position.

For clarity, tools not shown on most photos above.

PROPERLY INSTALLED AND CONNECTED GROUND ANCHOR AND FRAME CONNECTION

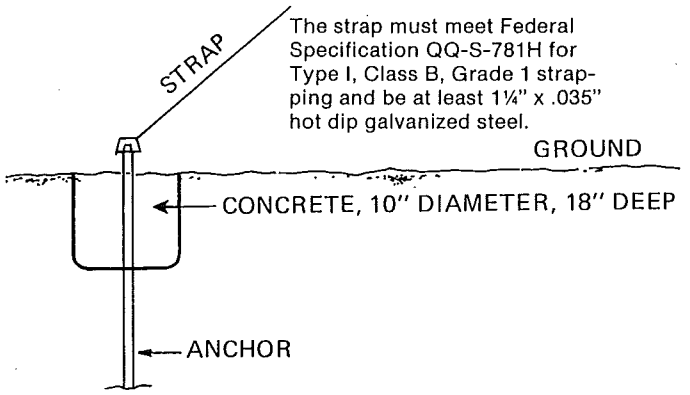
The anchor strap should extend outward and downward from the I beam of the home between a 40° to 50° angle. If possible, the anchors should be installed at the same angle as the anchor strap, so that the "pull" on the anchor is straight. If the pull is not straight you should pour a concrete "collar," 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.

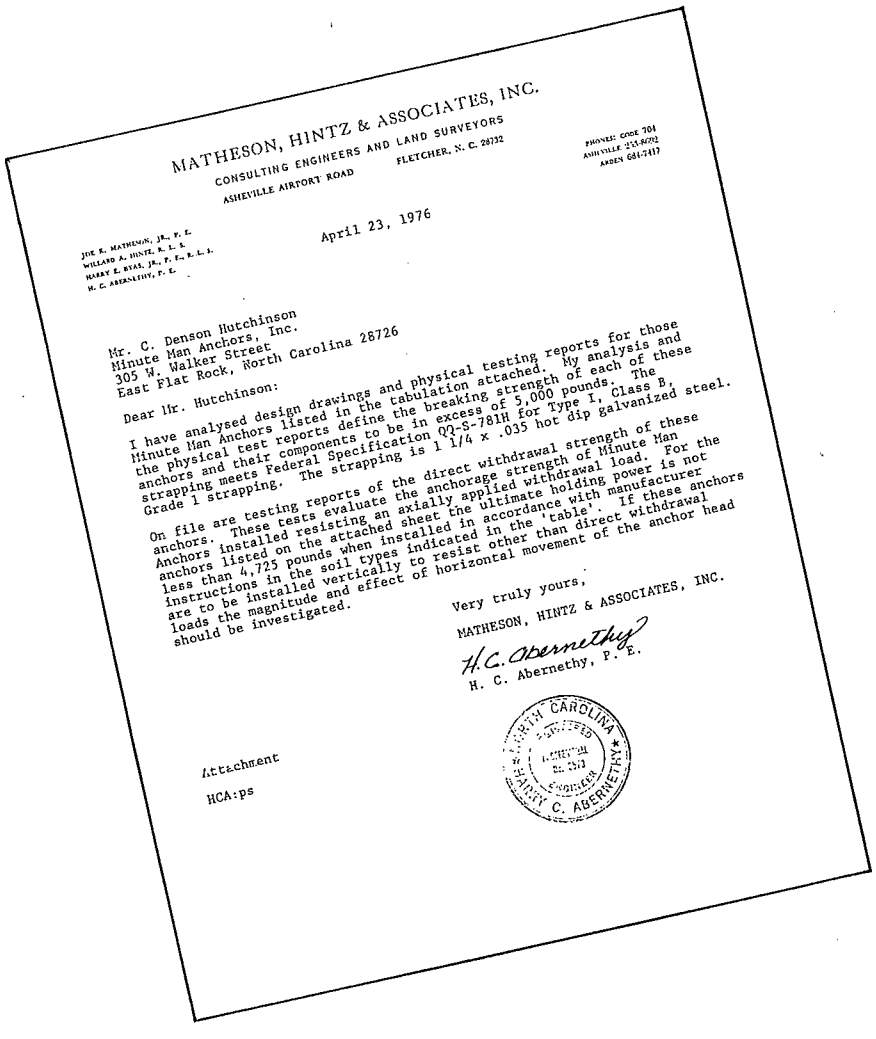


*Inside I-beams and pier blocking are not shown on this drawing for simplicity.

– 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 28726

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.

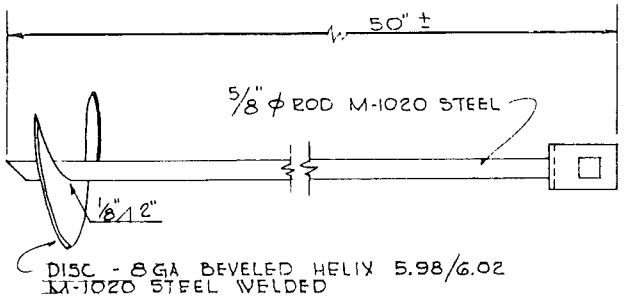
Very truly yours,

MATHESON, HINTZ & ASSOCIATES, INC.

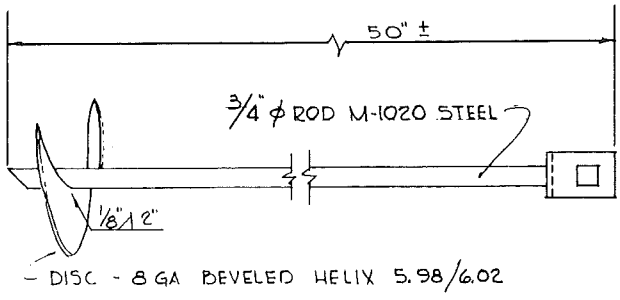
H. C. Abernethy, P. E.

Attachment

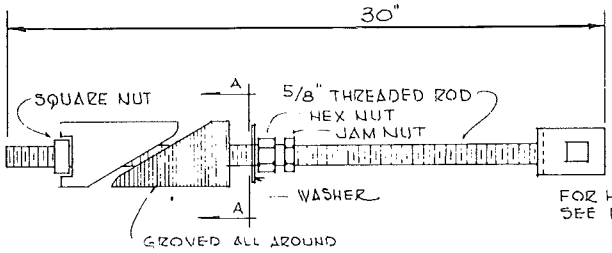
HCA:ps



650-S

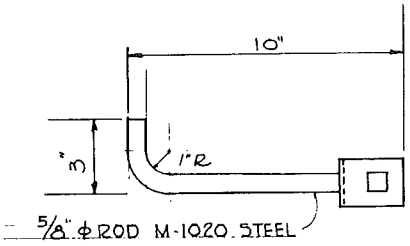


650H-S

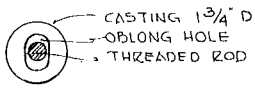


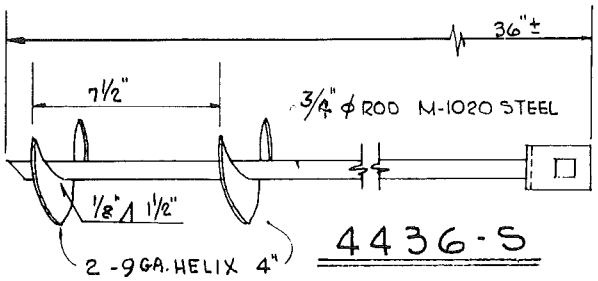
CASTINGS 25,000 PSI
SEMI-STEEL 1 3/4" x 5"
ALL STEEL USED IN ANCHOR ASSEMBLY
CONFORMS TO ASTM A-36

30-ER-S

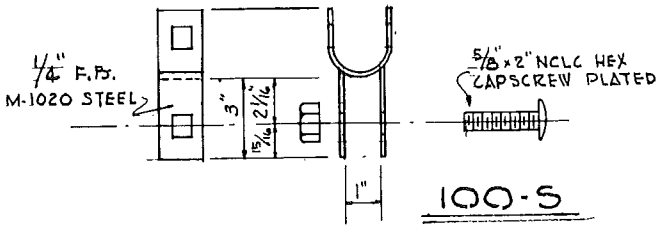


210-P-S

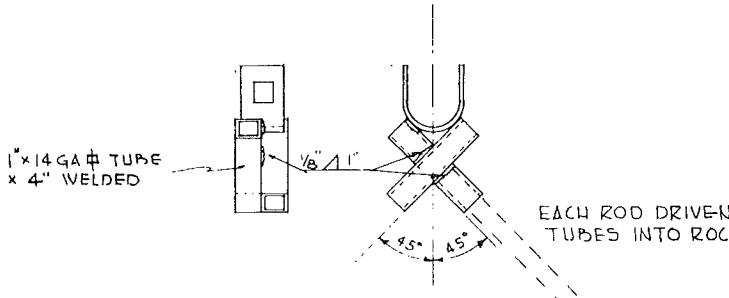


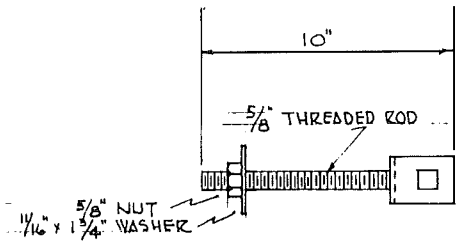


4436-S



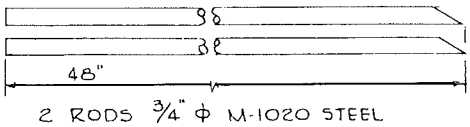
100-S





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 (2143 kg.)

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

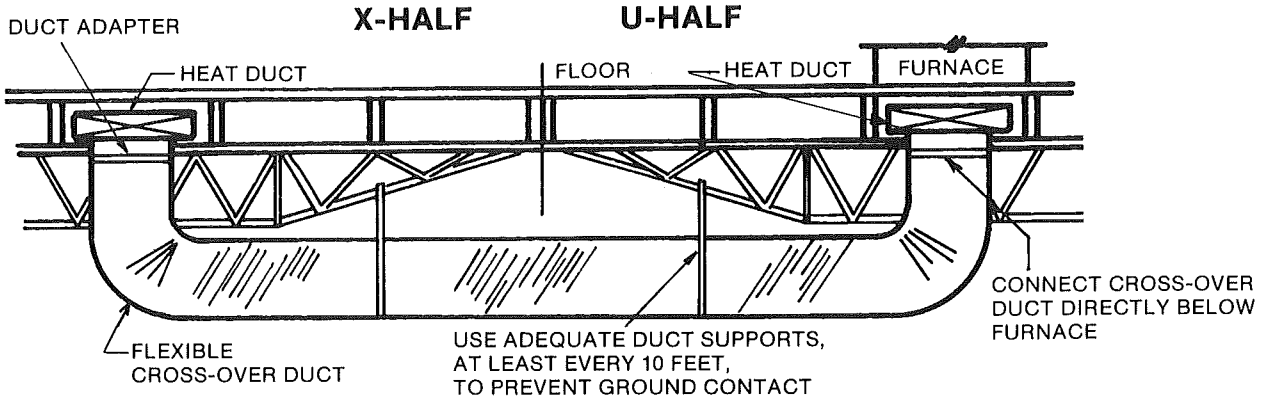
The anchor type to be used depends on the type of soil at the home site. The following Minute Man components should be used for the indicated soil:

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	Single 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-X-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.



HEAT DUCT CROSS-OVER CONNECTION

See above illustration

1. All necessary materials have been furnished with the home.
2. Install the two round adapter rings into the heat ducts. BE SURE THAT THE CONNECTION IS DIRECTLY BELOW THE FURNACE.
3. Connect the flexible, insulated crossover duct to the adapter rings, using the hose clamps.
4. Use adequate supports to prevent the duct from laying on the ground.

CONNECTING UTILITIES

FRESH WATER SUPPLY

The water inlet is located underneath the home and is marked with a metal tag 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 should check the entire home for any possible water leaks which may have occurred. (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 the 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

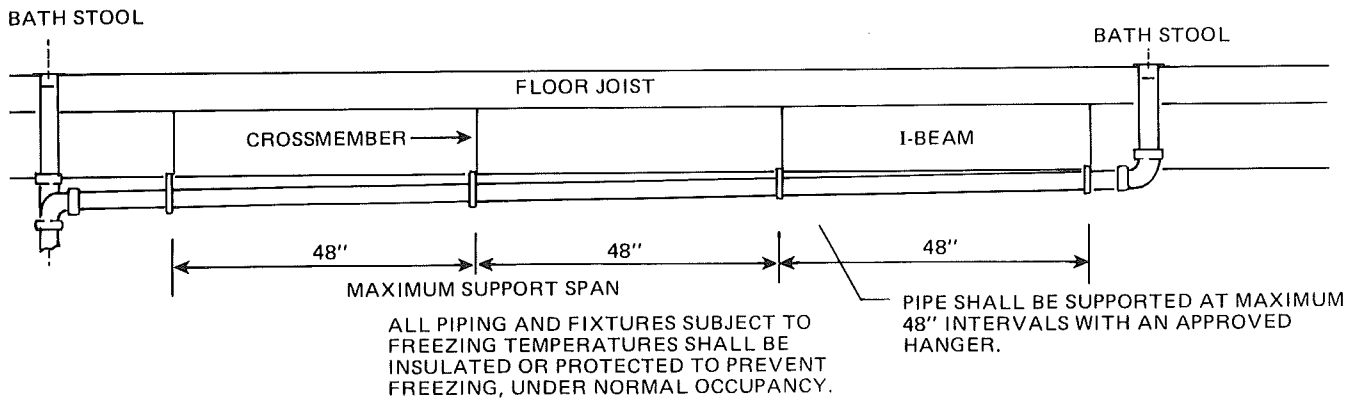
Follow these steps in order to drain the water lines in your home:

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 immediately under the toilet in a bathroom. Homes with more than one bathroom may require additional drain connections underneath the home. If so, the 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, but only if a full size cleanout is installed at the upper end.)



WATER PRESSURE LINES

If the home has pressure water supplied to each half, you will have to connect the hot and cold pressure supply lines in the U half to those in the X half. Go under the home, and locate the access panels in the underside of the home, where the two halves are joined together. Remove the coverings, and feed both pressure lines from one side to the other, through the opening in the floor joists. (If the opening is not large enough, drill it out until it is.) Connect the couplings together, being sure to connect hot to hot and cold to cold. After the water supply has been turned on, check the couplings for leaks and be sure that the hot to hot and cold to cold connections are proper. Replace the access panel coverings, being sure to properly seal all edges and openings.

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 conduit and junction box 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.

Depending on the type of furnace installed in your home at the factory, an automatic damper (to prevent cooled air from blowing up into the furnace) may have to be installed at the time the air conditioner is installed.

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 is 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 adapter 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 Manufactured 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 or sidewall (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 vent, first remove the temporary patches covering the hole in the sidewall or 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 outside the home, pull the vent tube through the wall or 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 covering (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.

(continued on next page)

WARNING! If your home was not wired for an electric 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 or wall, because this wasn't done at the factory.

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.

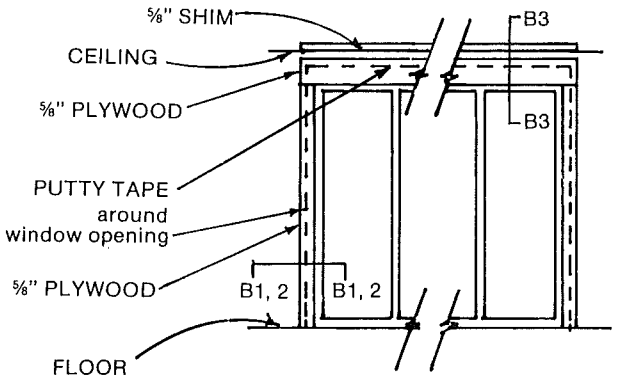
INSTALLING A TIP-A-BAY WINDOW

(2 Sizes: 76" and 131")

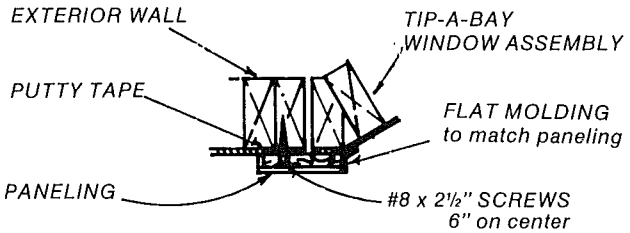
You should not attempt to install a tip-a-bay window (which is an optional item) until the home has been completely leveled and blocked in accordance with the earlier described procedures. After this has been done, you should perform the following steps, in the order indicated:

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.

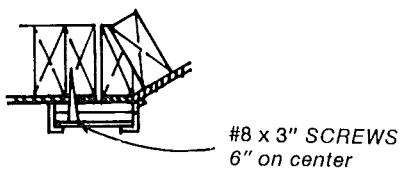
DRAWING A
INTERIOR VIEW OF
TIP-A-WAY BAY WINDOW



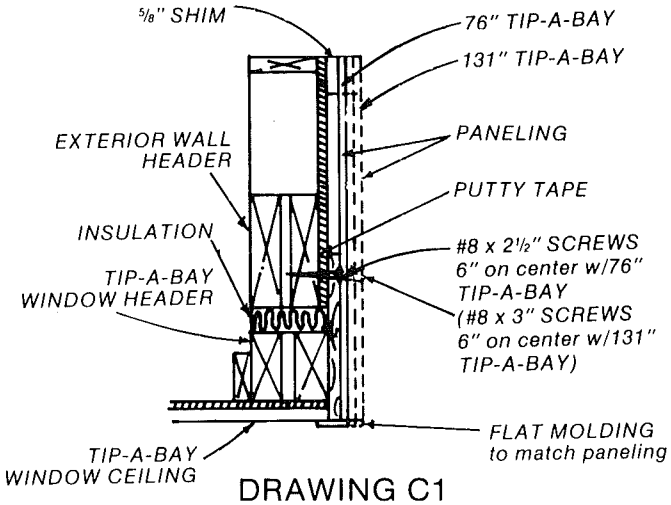
DRAWING B1
INTERIOR TRIM DETAILS
(76" TIP-A-BAY)



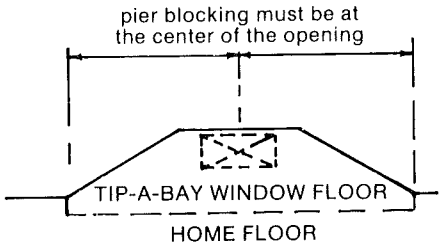
DRAWING B2
(131" TIP-A-BAY)



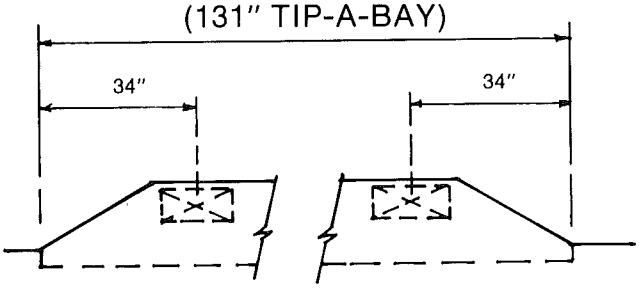
DRAWING B3
INTERIOR TRIM DETAILS
(76" and 131" TIP-A-BAYS)



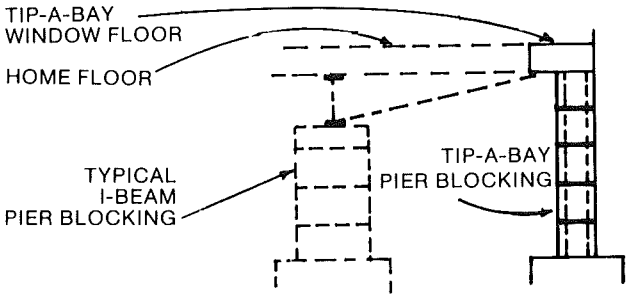
DRAWING C1
FOUNDATION AND PIER BLOCKING LOCATION
(76" TIP-A-BAY)



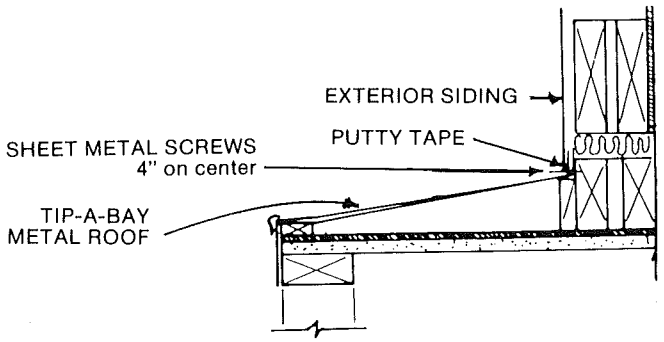
DRAWING C2
(131" TIP-A-BAY)



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



DRAWING D
TIP-A-BAY ROOF CLOSE-UP



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.