

# INSTALLATION MANUAL



**DMH** COMPANY

**D**IVERSIFIED **M**ANUFACTURED **H**OUSING COMPANY

A DIVISION OF NATIONAL GYPSUM CO.

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## INTRODUCTION

This DMH home has been engineered, constructed and inspected in accordance with "The Department of Housing and Urban Development" Mobile Home Construction and Safety Standards as published in the Federal Register pursuant to the requirements of the National Mobile Home Construction and Safety Standards Act of 1974 (Title VI of Pub. L. 93-383, U.S.C. 5401 et seq.) and with proper installation and reasonable care will provide the homeowner with lasting shelter.

This manual outlines the steps required for proper home installation. Copies are provided for use by the installation company and the homeowner, for use in installation of the home. Installation should be performed by a qualified installation company. Local and state regulations may affect the installation of the home and the homeowner should insist the installation company conform to these regulations.

The drawings in this manual are intended to be representative of our product. Designs and specifications of any or all DMH Company homes are subject to change without notice and are made in the interest of product improvement.

Some Definitions - a manufactured home refers to a structure comprised of two or more sections which are built away from the installation site and transported on a permanent chassis and designed to be used as a dwelling with or without permanent foundation, when connected to the required utilities, and includes the plumbing, heating, air-conditioning, and electrical systems contained therein.

A single wide mobile home is a structure consisting of one section built away from the installation site on a permanent chassis which is also completely equipped for use as a dwelling.

## I HOME SITE PREPARATION

The immediate area on which the home is to be installed must be graded and sloped to provide the proper drainage. Of special importance, the area beneath the home must be graded to prevent water accumulation which would weaken the supports and/or foundation.

Support footings must be placed on firm undisturbed soil, properly compacted soil or on concrete slabs designed for mobile home installation. When constructing a foundation for mobile home placement consult the local building officials for required specifications.

## II RECOMMENDED EQUIPMENT REQUIREMENTS FOR MANUFACTURED HOMES INSTALLATION

### Tools:

- 5 ton hydraulic jacks
- 6' carpenters level
- Ratchet and socket wrenches
- Portable electric drill
- Hand winch (come-along)
- Pipe wrenches
- Tin snips
- Ordinary small hand tools

### Other Material:

- 2" X 12" X 12' planks for skids
- Dunnage and wedge-shaped shims
- Lubricant for skids
- 10 pcs. of 2" X 24" steel pipe for rollers

### III MANUFACTURED HOMES INSTALLATION

In the following instructions the sections of the manufactured home are referred to as the "A" half and the "B" half. The "A" half is usually the half in which the utilities have been installed.

Prepare the sections prior to placement by removing the running lights and protective covering from the open sides. Install insulation at the matching endwalls, floors and lower part of roof beam. Secure insulation with masking tape to hold in position until sections are connected. Proper installation of insulation is required to prevent air infiltration.

#### A. THE FOLLOWING INSTRUCTIONS APPLY TO THE INSTALLATION OF THE MANUFACTURED HOME ON PIERS OR BLOCKS

##### 1. Setting "A" Half

- a. Position-"A" section on previously prepared site, spotting for ease of utility hook-up. The connecting points for electric, water, gas, and drain lines are located in the rear one-third of the "A" half for all units.
- b. With the use of the hitch jack and 5-ton hydraulic jacks positioned under the I-beams behind axles, raise the section until the wheels are off the ground.
- \* c. Disconnect the brake wires and remove wheels.
- \* d. Remove axle assemblies by extracting main spring hanger bolts.
- e. Position piers or blocks of desired height and required capacity at the support points. On all units, supports must be installed under both ends of frame not more than one-foot from the ends of the I-beams and immediately ahead and behind the spring hangers under

\* Optional

each I-beam. Remove jacks and lower section to supports.

2. Leveling the "A" Half

- a. With the use of the carpenter's level, adjust the hitch jack to obtain the lengthwise level. Adjust or shim supports to hold level.
- b. Place the level across the I-beam behind the hitch and raise the low side with the jack placed under the I-beam just forward of the spring hangers. Adjust or shim supports to hold level. Repeat with level at rear of home placing jack just behind the spring hangers.
- c. Recheck both longitudinal and transverse levels and adjust as necessary.

3. Setting and leveling "B" Half (Figure 1)

- a. Lay down 2" X 12" planks in line with axles of "A" half for use as skids. A lubricant of some type should be applied to skids for ease of moving "B" toward "A".
- b. With towing vehicle move "B" as close to "A" as possible using extreme care so as not to damage sections. Position so that bottom of rear walls of both halves are in alignment. Wheels of "B" half should be setting on lubricated planks.
- c. Attach come-alongs to I-beams at front and rear and draw "B" snug to "A". Maintain tension on come-alongs.
- d. Level both halves as one unit and place supports as instructed for "A" half.
- e. Remove detachable hitches.

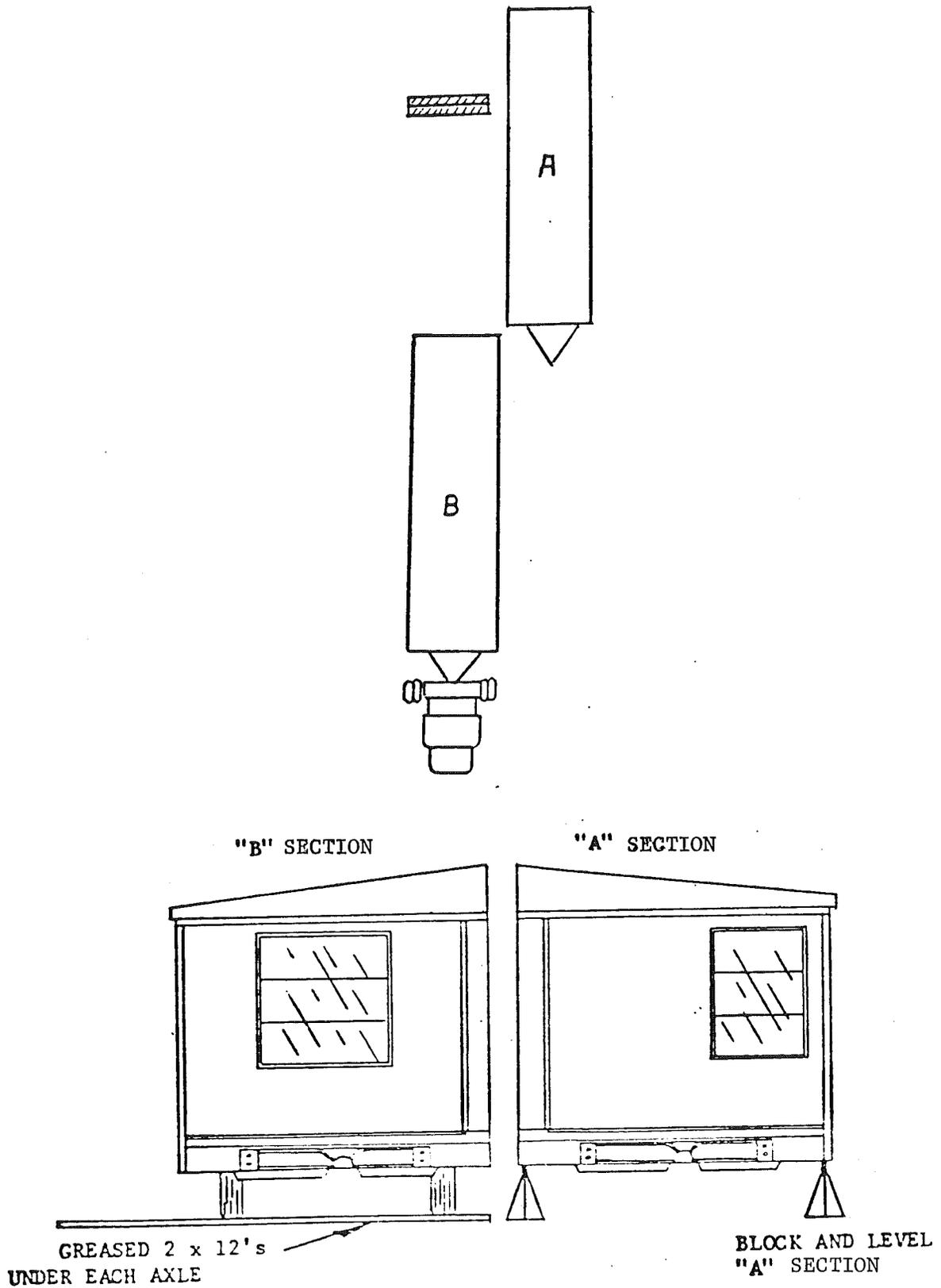


FIGURE 1 - MANUFACTURED HOME PLACEMENT

B. SECURING THE MANUFACTURED HOME

(These instructions apply to installations on piers or foundations.)

1. With the halves together and the initial leveling completed, check the alignment of the endwalls, interior walls, roof and floor. The joints in the ceiling are an indication of roof position. These joints should run straight from one half to the other when halves are properly positioned. Alignment of ceilings and walls can be accomplished by very carefully raising outside rear corner and lowering the outside front corner of the "B" half until the sections are in alignment or conversely.
2. With the sections in alignment, tie the floors together with 3/8" X 1 1/2" bolts through angle iron at ends of outriggers, (Figure 2).

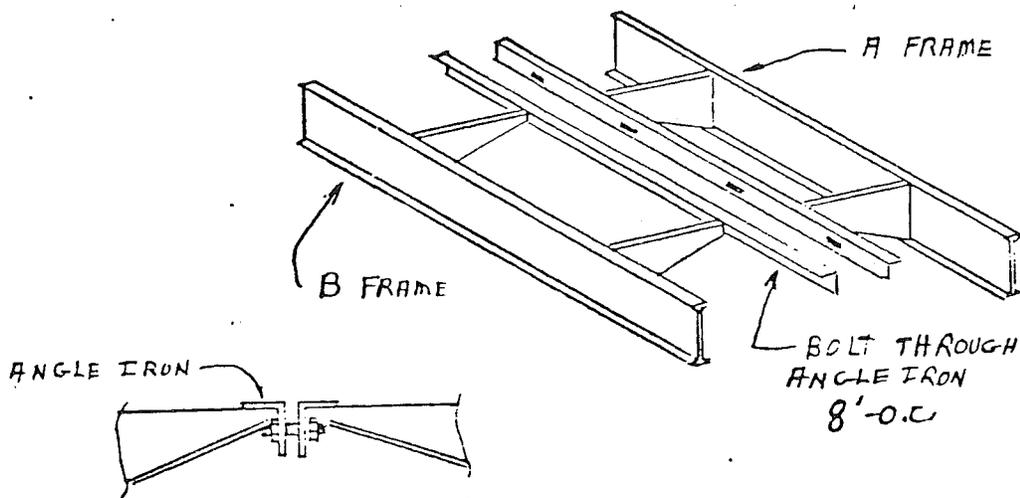


FIGURE 2 - JOINING STEEL FRAME

In homes which have frame tie-bolts provided, fasten the frames together by inserting the tie-bolts through the holes in the I-beams and tightening the nuts until snug. Secure the rim joists with 3" wood screws at 36" spacing.

3. Place jacks under outside I-beam of "B" half and raise enough to bring the roof beams together. Adjust the jacks to provide a tight and flush ceiling joint. If matching halves of ceiling are not flush, use a jack and post with a pad to raise low side until flush prior to fastening roof beam. Place 1/2" X 5" bolts with washers in predrilled holes at 32" spacing and tighten until snug (Figure 3) or install

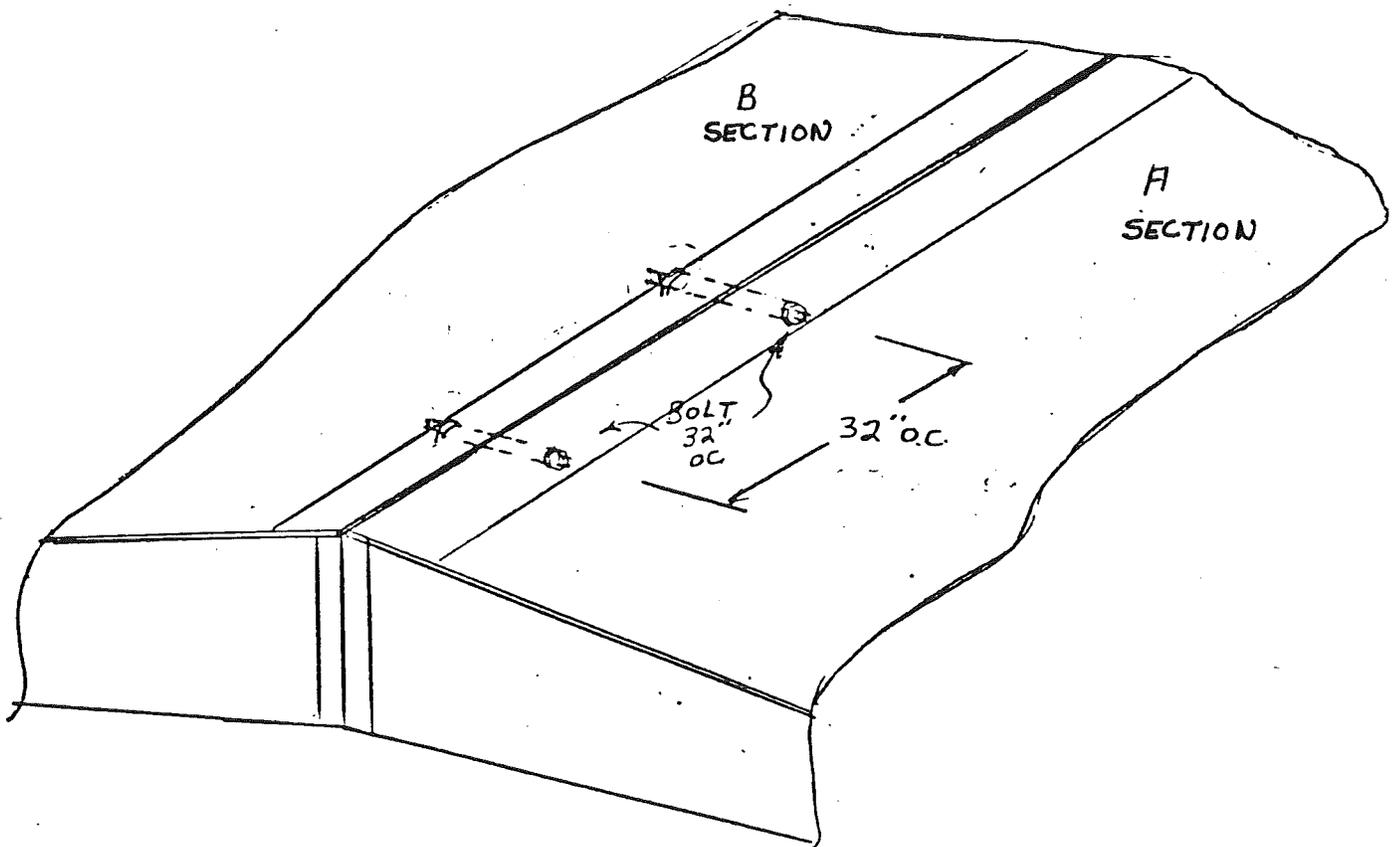


FIGURE 3- JOINING ROOF

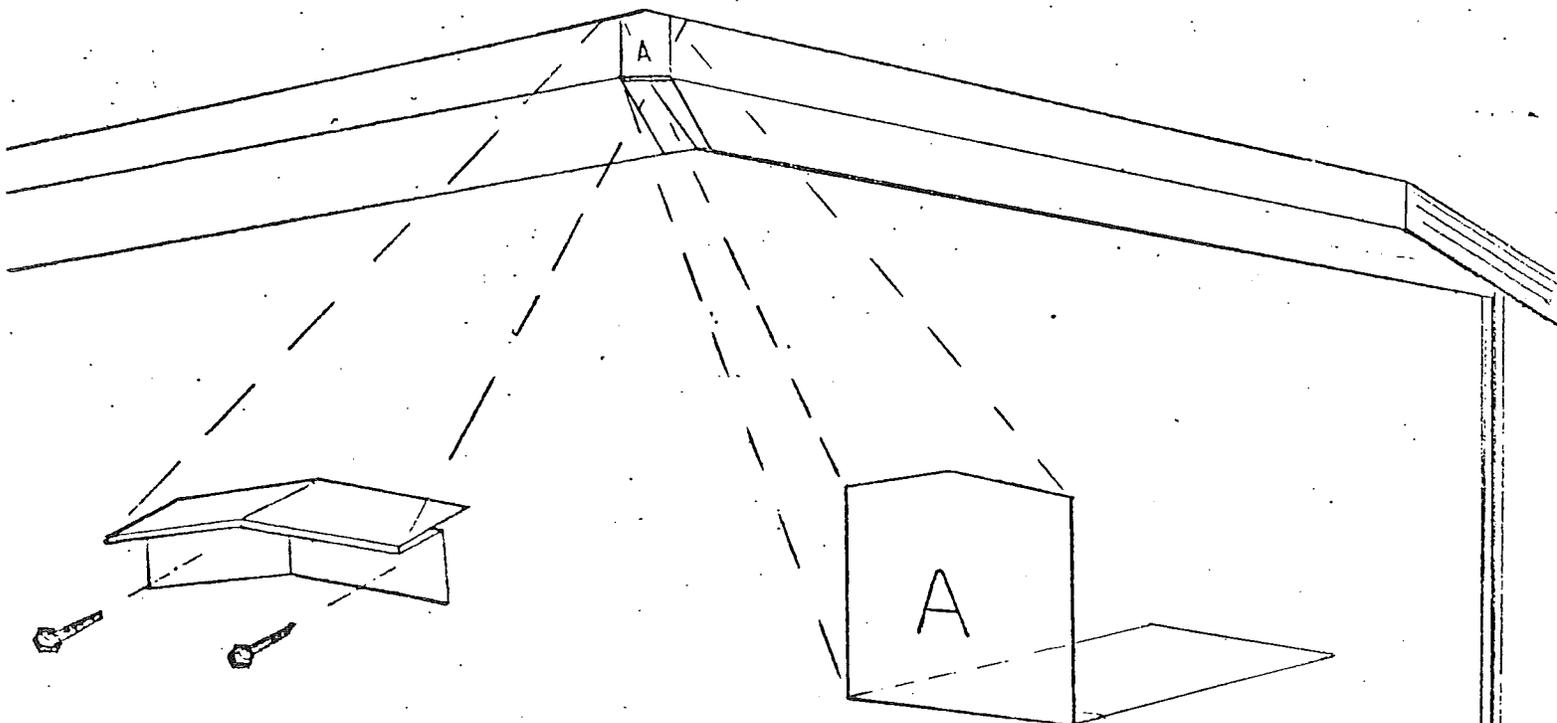
galvanized straps across roof beams on alternate rafters with 8d nails.

4. From the exterior, fasten the endwalls together with 16d nails. Drive the nails in a toe nail manner from alternate sides at 12" spacing so that nails will be spaced at 6" or install 3-1/2" diameter bolts as provided.
5. After the halves are secured, it is necessary to install supports of required capacities and locations as indicated in Table I and relevel the entire unit. First level the halves in both directions beginning in the "A" half and follow by checking and leveling the entire home as a unit. Adjust piers as necessary.

C. SEALING THE MANUFACTURED HOME-

1. Front and Rear Overhang Close-up

Apply putty tape to edges and fasten the fascia cap assembly over the point of joining the sections. Use #8 X 3/4" hex head screws. (Figure 4)



END DRIPE EDGE CAP

FASCIA CAP

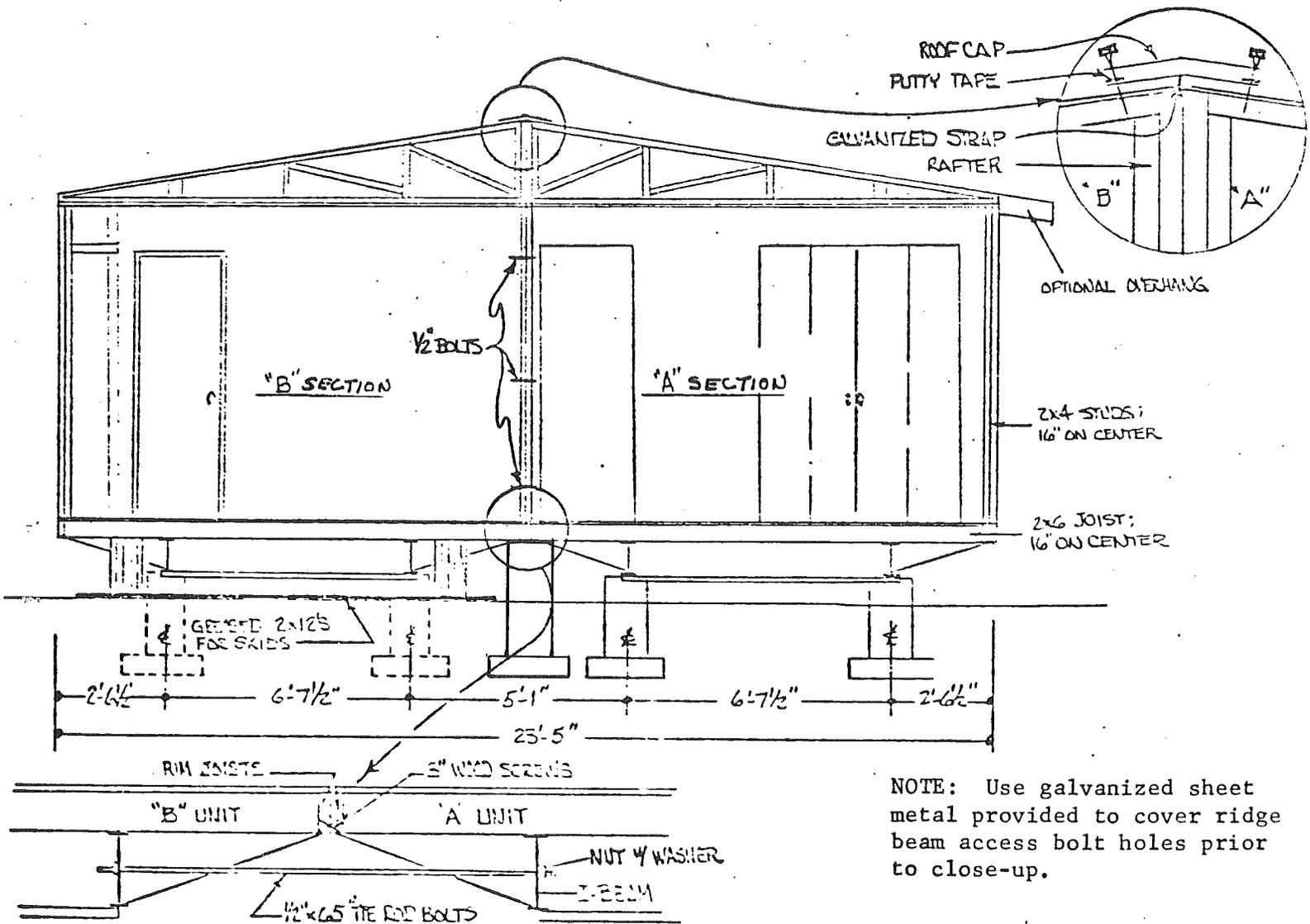
FIGURE 4 - OVERHANG CLOSE UP

2. Roof Ridge Close-up - Metal Roof

Attach ridge cap to the roof joint applying putty tape at edges and cap joints. Use #8 X 3/4" hex head screws with 6" spacing. Apply roof coat to all edges. (Figure 5).

3. Roof Ridge Close-up - Shingled Roof

Nail the last rows of shingles in place at both sides of ridge, let last row of shingles from one side overlap no more than 4" on opposite side or roll out 2 layers of 15 lb felt over entire length of roof joint. Felt not to exceed width of ridge shingles. Cut square ridge shingles (3 or 4 from



NOTE: Use galvanized sheet metal provided to cover ridge beam access bolt holes prior to close-up.

FIGURE 5 - SECURING UNIT

each 36" piece) with a utility knife and lay shingles across the peak evenly spaced on both sides. Begin application of shingles by placing the first ridge shingle with its exposed edge at the end of the roof overhang and nail so that next ridge shingle will cover it. At the last ridge shingle, the nails will not be covered and should be sealed with plastic cement. (Figure 6).

D. EXTERIOR FINISHING

Prior to installing exterior covering, apply the paper sealing strip provided over the full length of the joints in the end walls to prevent air infiltration.

Use roofing nails to hold the strip.

1. Front and Rear End Walls - Close-up

a. Metal Exterior

Set in bottom starter of required width over joint and fasten with nails. Trim vertical metal to desired width

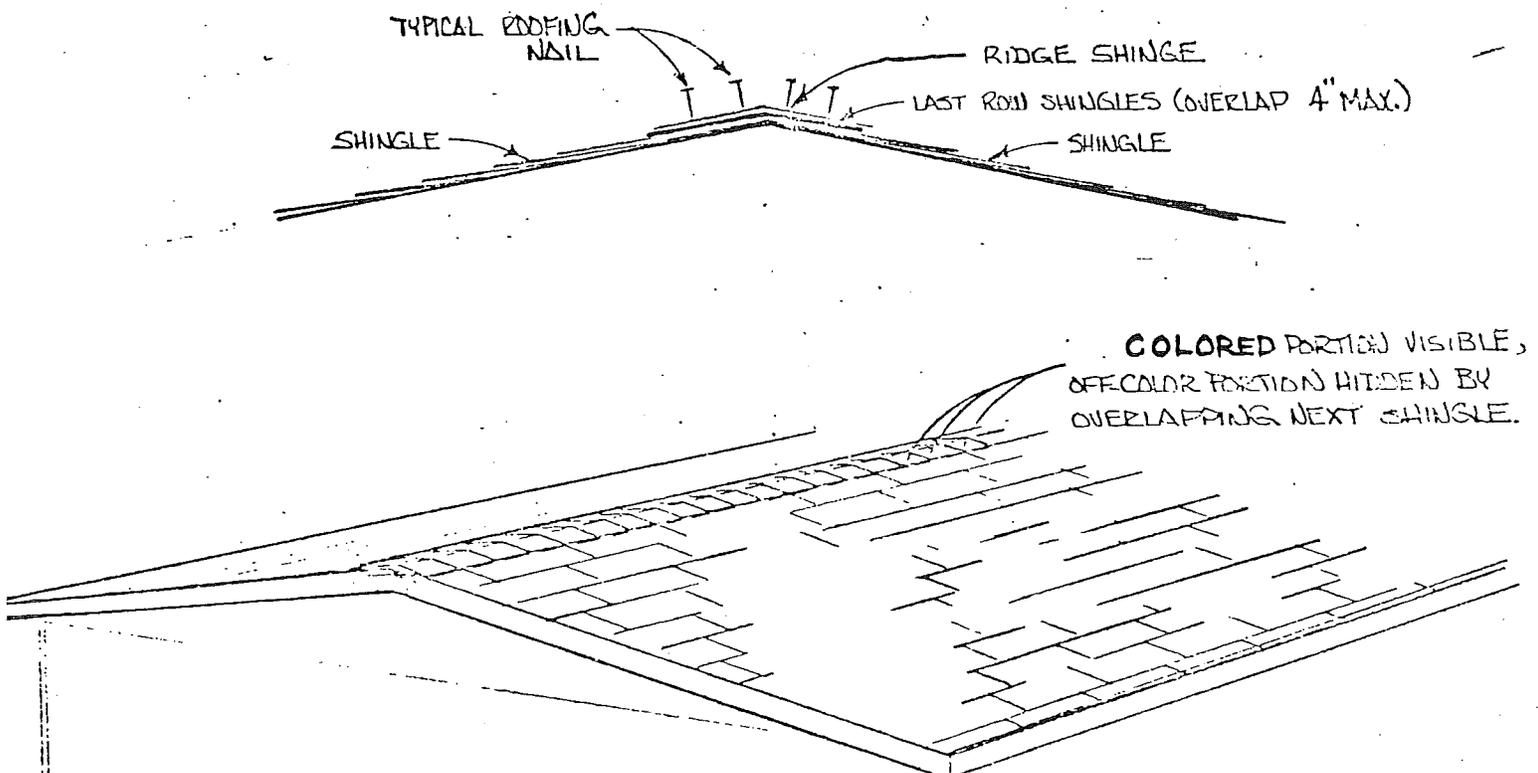


FIGURE 6 - SHINGLED ROOF CLOSE UP

and snap into S-locks of adjoint panels. Fasten with hex head metal acrews along the screw lines. (Figure 7).

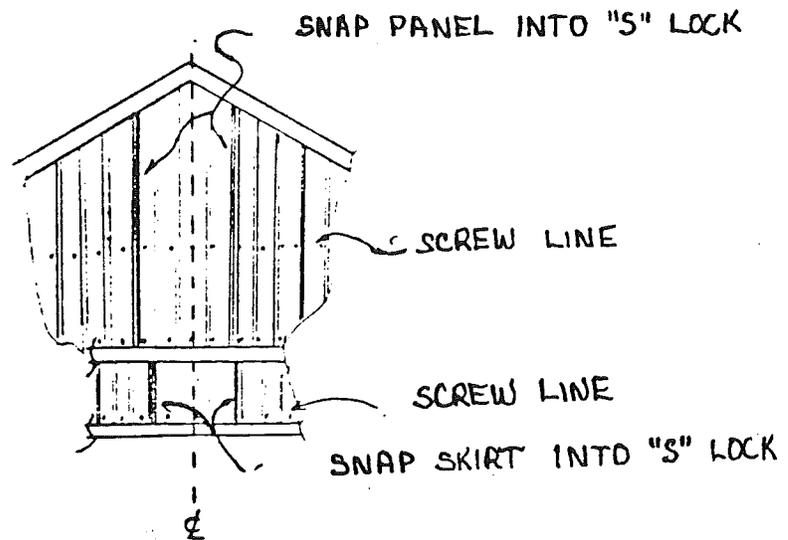


FIGURE 7 METAL ENDWALL CLOSE UP

b. Vertical Siding

Install vertical close-up piece provided to cover joints on front and rear end walls. Also install trim on horizontal joints if not factory installed. Use nails provided and touch-up paint and caulking as needed for minor repairs and sealing.

c. Lap Siding

Lap siding is shipped loose for installation after "A" and "B" sections are joined. Using nails included apply siding starting with first row installed in the metal track at bottom. Work upwards overlapping with succeeding pieces and staggering the joints for best appearance. Use moulding provided at joints and corners.

E. INTERIOR FINISHING

1. Ceiling

Install white ceiling close-up beam over joint or ceiling board, as provided, with nails. When using ceiling board, install white outside corner with white nails to edges. (Figure 8).

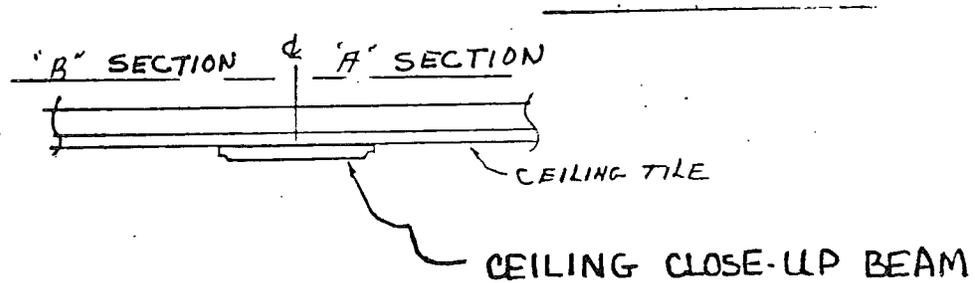


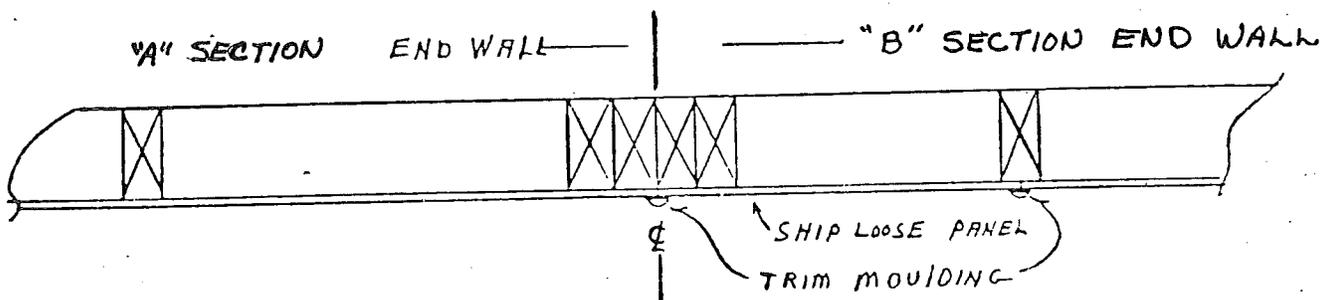
FIGURE 8 - CEILING JOINT

2. Front and Rear End Walls

Install matching panel to cover and apply moulding at joints in panel. (Figure 9).

INTERIOR FINISH TRIM

FIGURE 9 - END WALL TRIM

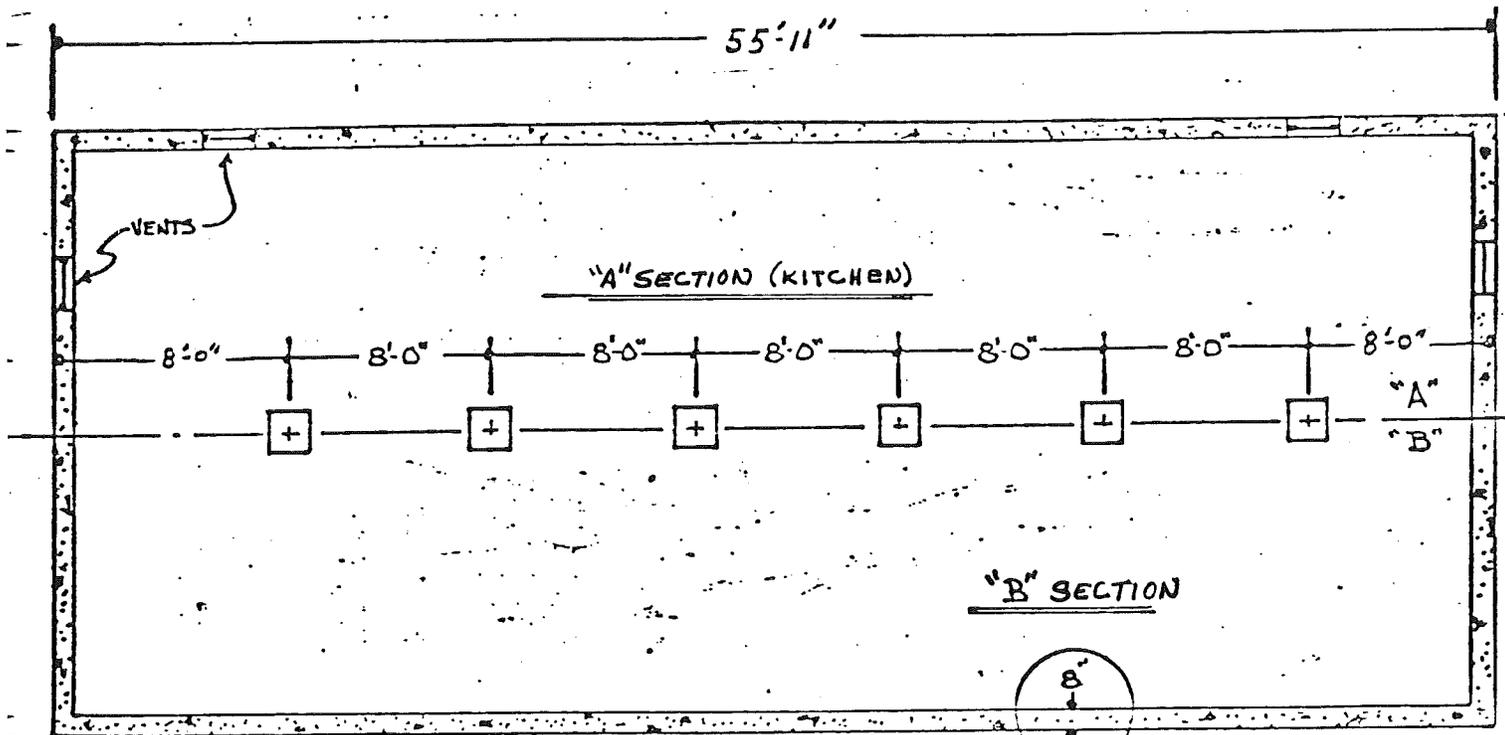


3. Interior Walls

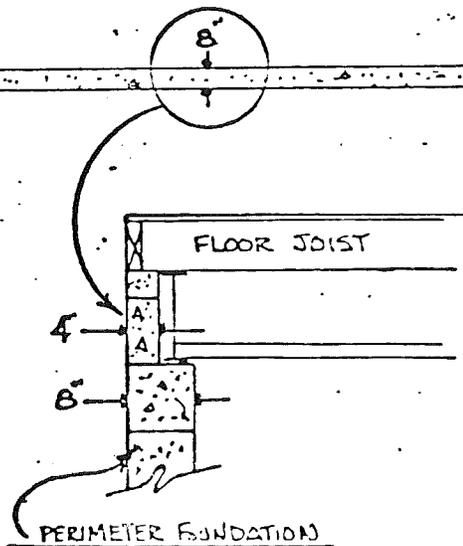
- a. Cover joints when walls are joined at center with moulding provided.
- b. At end of common joint wall, install panel caps and corner mould.

F. THE FOLLOWING INSTRUCTIONS APPLY TO THE INSTALLATION OF THE MANUFACTURED HOME ON A PERIMETER FRAME FOUNDATION:

For proper installation the foundation must be level and laid to the proper specifications in regard to size and load bearing capacity, an approved method should be provided in the foundation for anchoring the home (See Figure's 10 and 11 for suggested foundation configuration.)



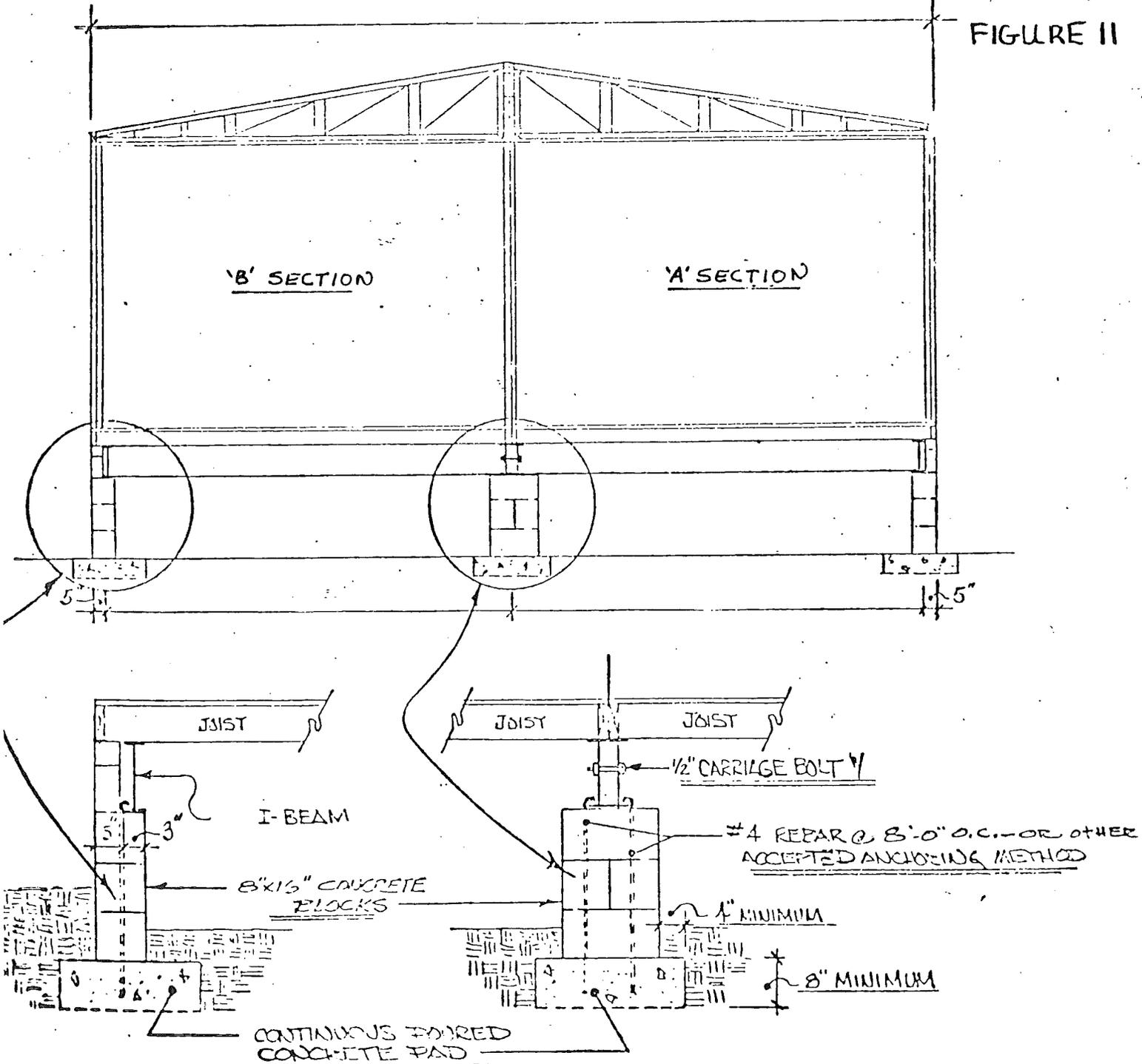
TYPICAL PERIMETER FOUNDATION  
FIGURE 10



8" MINIMUM Poured CONCRETE OR CONCRETE BLOCK WITH 4" BLOCKS @ TOP ROW.

PERIMETER FRAME FOUNDATION

FIGURE 11



1. Setting the First Half

- a. Position half to be set on rear of foundation at side of foundation, generally the "A" unit.
- b. Place blocking and jacks at each end and at even spacing to allow 4 supports under each side of section. Raise section to relieve weight on axle springs. Remove axles and A-Frame.\* Raise section until the bottom of perimeter frame is above level of foundation.
- c. Place 2" X 8"s on top of foundation width.
- d. Position blocking under section up to the foundation level so that (2) 2" X 12"s laid on top will be flush with 2" X 8"s laying on foundation thus forming a bridge. This bridging must support the full weight of the section. Use sufficient blocking under the 2" X 12"s to hold the weight.
- e. Place 24" pieces of 2" diameter pipes on bridging and lower section onto pipes; 10 pcs. of pipe should suffice.
- f. To move section across foundation use two come-alongs attached to a deadman anchor. The come-alongs must move in unison. To maintain alignment with the foundation as it moves across bridging and the foundation, the pipes can be angled on the sides of section, and changing direction of travel. This can be done by striking them with a sledge hammer. When the section is back in alignment, the pipes can be adjusted so that travel will continue in the desired direction.
- g. Remove pipes as the section passes over them and place them ahead of the unit so that section is continually on the pipe. Start pipes at 36" intervals for rolling unit.
- h. When the section is properly positioned, block, remove pipe and boards, and lower to foundation.

\* Optional

## 2. Setting Last Half

- a. Follow procedure as in SECTION F-1-a thru h
- b. Use the first half as an anchor when moving the second half until within four feet of joining. At this point a deadman anchor must be used.
- c. When halves are adjacent secure and seal as described in Section II. Use 1/2" X 9" bolts provided to tie interior frames together.
- d. Anchor frame with an approved anchoring system.
- e. For basement installation, supports must be installed at center I-beams to support interior framing.

## IV SINGLE-WIDE MOBILE HOME INSTALLATION

To set-up the single-wide unit on piers or blocks follow the procedure as described in Section I-A page 3 "Setting the "A" Half" on piers or blocks. See Table II for required support capacities and locations. See Table III for tiedown instructions.

## V UTILITY HOOK UP AND TESTING

All utility connections must be made by qualified service personnel who are knowledgeable of local and state regulations. Testing of all utilities must be satisfactorily performed before occupancy.

Utility connections in single-wide mobile homes are located in the rear half of the unit.

### A. GAS

The factory installed gas piping has been designed for a pressure not exceeding 14 inch water column (1/2 PSI) and not less than 7 inch water column (1/4 PSI). Check with the gas supplier to assure your pressure is within these limits.

Locate the tag affixed to the mobile home at the gas supply connection and follow the instructions carefully for proper hookup, and testing.

For double-wide units with gas appliances located in both sections, locate the "quick-disconnect" fitting and the flexible crossover at the rear half of the home and connect the fittings. Do not use tools on the quick-disconnect device.

#### B. WATER

This home has been designed for an inlet water pressure of 80 PSI. If this home is installed in an area when the water pressure exceeds 80 PSI, a pressure reducing valve should be installed.

A tag affixed to the exterior of the home will indicate the location of the fresh water connection. If the home is not equipped with a master water-shut valve, a full flow valve must be installed on the water supply line in an accessible location adjacent to the home. Remove the plug on the inlet and connect the fresh water supply line. For manufactured homes having a water supply to both sections the water crossover is located under the rear of the house. Remove the caps and connect the matching colored fittings for hot and cold water supply. After completing connections, turn on all faucets until water flows full at all hot and cold outlets. Shut off all faucets and check for leaks. Any leaks should be easily repaired with minor tightening at joints.

Exposed water and drain lines must be wrapped with insulation or protected with heat tape to prevent freezing. If heat tape is used, it must be listed for use with homes and installed in accordance with manufacturer's instructions.

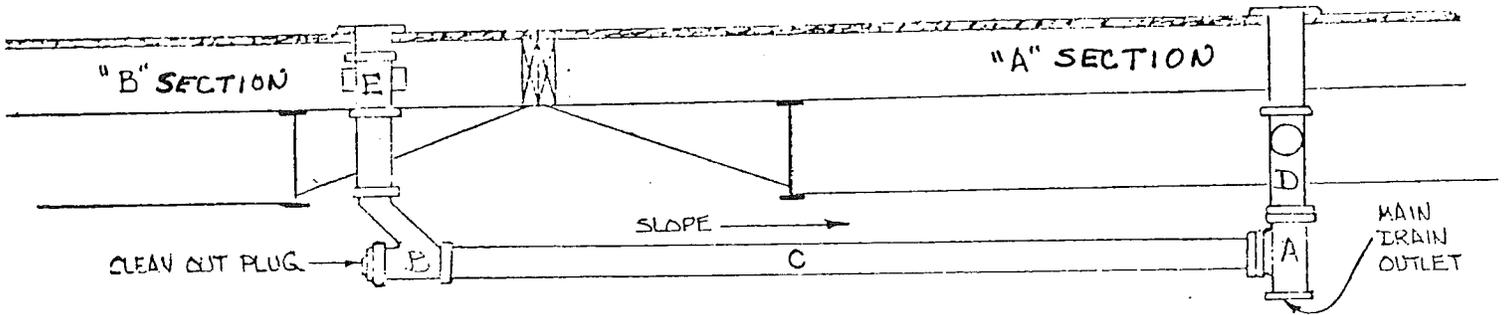
#### C. DRAIN

Remove the cap and connect the home drain outlet to the drain inlet at the site with the flexible coupling provided or with the required length of drain pipe, fittings and cement.

In manufactured homes with plumbing fixtures in both sections connect the drain lines between the sections with material provided. (Figure 12).

FIGURE 12

DRAIN LINE HOOKUP



When connecting drain lines always maintain a uniform slope of not less than 1/4 inch per foot toward the drain outlet.

D. ELECTRICAL

The metal nameplate adjacent to the feeder assembly entrance indicates the ampere rating of the mobile home's electrical system. The electrical connection should be made only by qualified personnel using the materials listed below for the Feeder Entrance Assembly installed in the unit:

<u>Feeder Entrance Assembly Rating</u>	<u>Conduit Size</u>	<u>Conductor Size (3 Conductors)</u>	<u>Grounding Conductor Size</u>	<u>Junction Box Size</u>
100 amp	1-1/2"	#3	#8	10" x 10" x 4"
125 amp	1-1/2"	1	6	10" x 10" x 4"
150 amp	1-1/2"	1/0	6	10" x 10" x 4"
200 amp	2"	3/0	6	10" x 12" x 4"

The feeder assembly is designed for use with three 75°C rated copper conductors. Types THW or XHHW and a bare copper grounding conductor.

For manufactured homes, to connect electrical from "A" section to "B" section:

1. Connect wire in front endwall from "A" section to receptacle in this wall in "B" section.
2. In the common wall locate junction box and connect wires from "A" and "B" sections with wire nuts in the junction box.

3. Connect romex to receptacles having no wires with nearest wire in common wall to complete circuit.

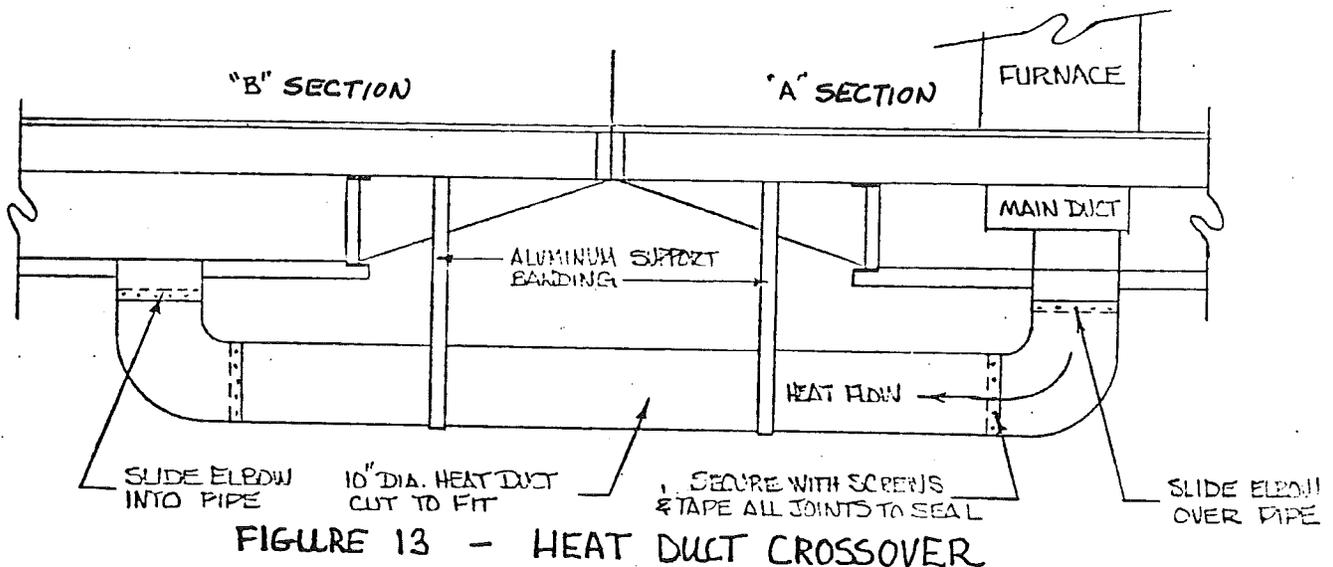
In some manufactured homes only one main crossmember is provided and should be connected by joining like colored wires to the junction box installed with wire nuts or splice lugs.

After the electrical connection has been completed, the following tests should be conducted using approved test equipment:

1. Continuity test of circuit conductors.
2. Polarity test.
3. Continuity test of electrical grounding system.

#### E. CROSSOVER AIR DUCTS IN MANUFACTURED HOMES

Install crossover heat duct as shown below (Figure 13). Secure joints with duct tape and wrap with insulation provided. Cover with polyethylene moisture barrier and support as shown to hold at least 4 inches above ground level.



For those models with cold air return ducts, install in same manner.

When flexible ducts are provided, they are prewrapped and require supports only.

T A B L E I

MANUFACTURED HOME SUPPORT REQUIREMENTS

Zone	Minimum Support Capacities In Pounds			
	24' Wide		26' Wide	
	Chassis Supports	Interior Beam Beam Supports	Chassis Supports	Interior Beam Beam Supports
SOUTH Roof Load 20 PSF	3650	5000	4200	5450
<u>MIDDLE</u> Roof Load 30 PSF	<u>4100</u>	<u>6950</u>	4800	7500
NORTH Roof Load 40 PSF	4600	8850	5350	9600

For Outrigger Frame:

Chassis supports must be installed under both ends of the frame not more than one foot from the ends and immediately ahead and behind the spring hangers under each beam. Additional supports must be installed under each beam so that spacing between adjacent supports will not exceed 8 feet.

Center beam supports must be installed at the marriage line of the two sections to provide support for the roof ridge beam. Within one foot of each end of marriage line, install supports of same capacity as placed under chassis and install interior center beam supports where indicated with markers on marriage line joists. To achieve required large support capacity two supports closely placed with a total capacity equal to or exceeding the required capacity may be used. (See Exhibit A)

For Perimeter Frame Placed On Supports:

Chassis supports must be installed under both ends of the frame not more than one foot from the ends. Spacing between supports under the outside frame members must not exceed 8 feet. Spacing between interior (marriage line) frame members must not exceed 4 feet and must have a wide top surface to support the full width

T A B L E I (Continued)

of both frame members. (See Exhibit A)

All supports (piers and blocks) must be placed on supporting structures of proper size and capacity.

T A B L E II

SINGLE WIDE MOBILE HOME SUPPORT REQUIREMENTS

Minimum Support Capacities In Pounds

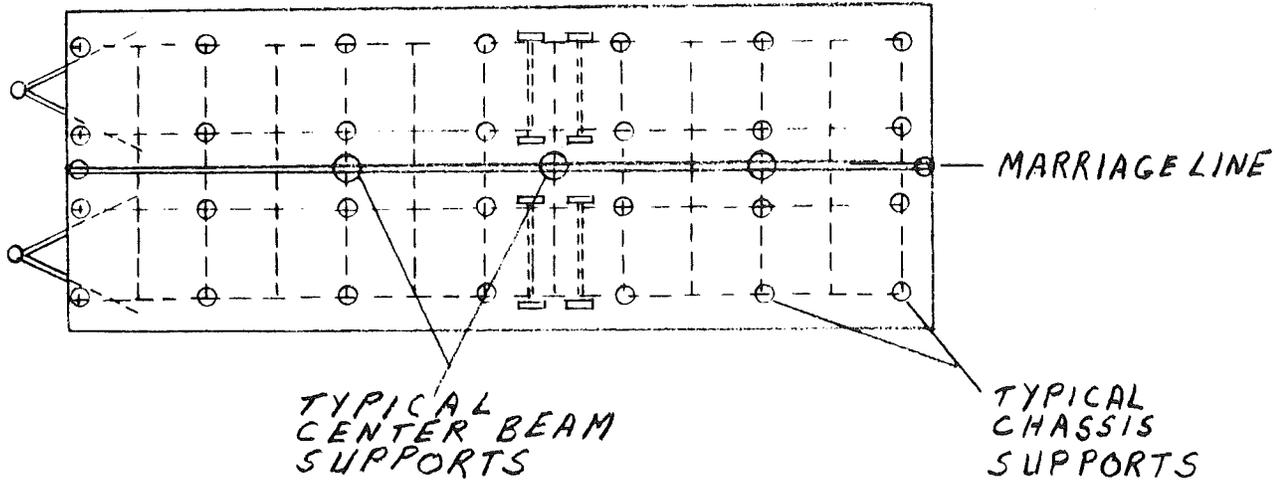
<u>Zone</u>	<u>12' Wide</u>	<u>14' Wide</u>
SOUTH Roof Load 20 PSF	3800	4360
MIDDLE Roof Load 30 PSF	4260	4950
NORTH Roof Load 40 PSF	4800	5500

Chassis supports must be installed under both ends of the frame not more than one foot from the ends and immediately ahead and behind the spring hangers under each beam. Additional supports must be installed under each beam so that spacing between adjacent supports will not exceed 8 feet. (See Exhibit A)

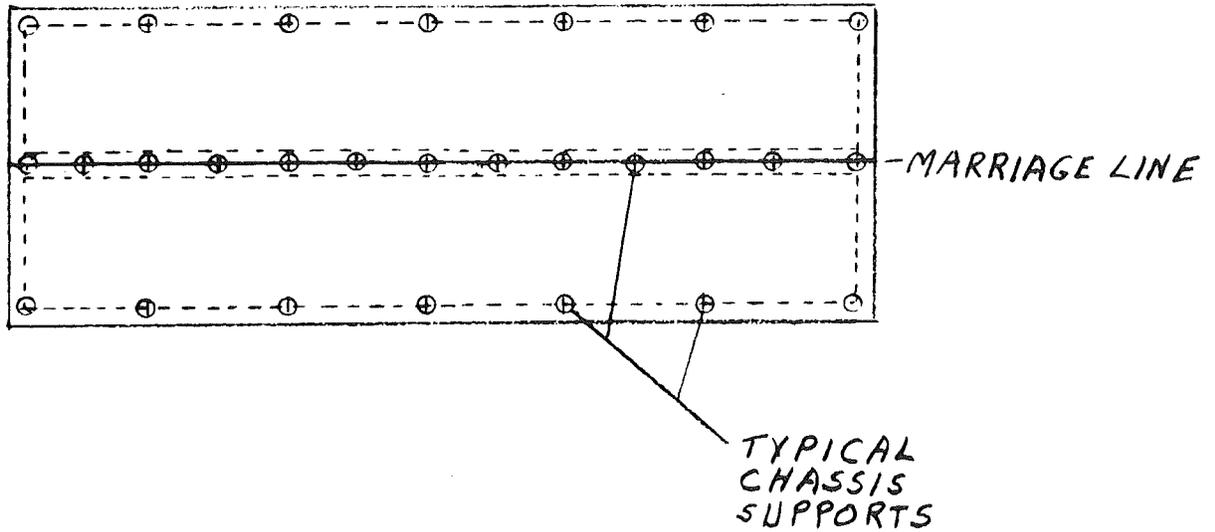
All supports (piers and blocks) must be placed on supporting structures of proper size and capacity.

# EXHIBIT A

## OUTRIGGER FRAME - MANUFACTURED HOME



## PERIMETER FRAME - MANUFACTURED HOME



## SINGLE-WIDE MOBILE HOME

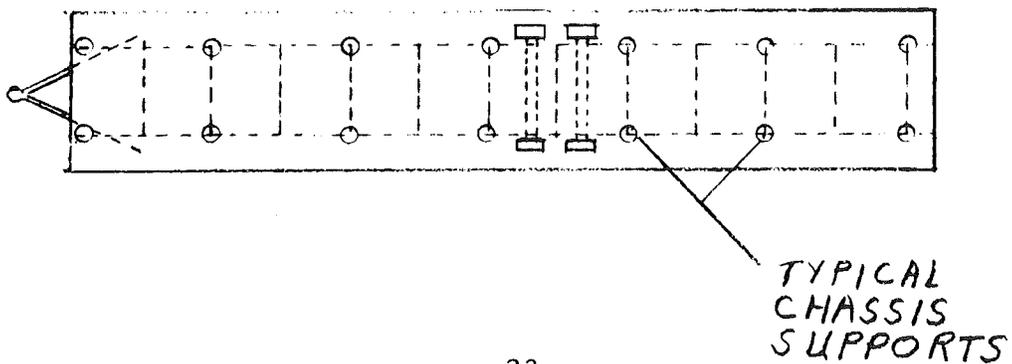
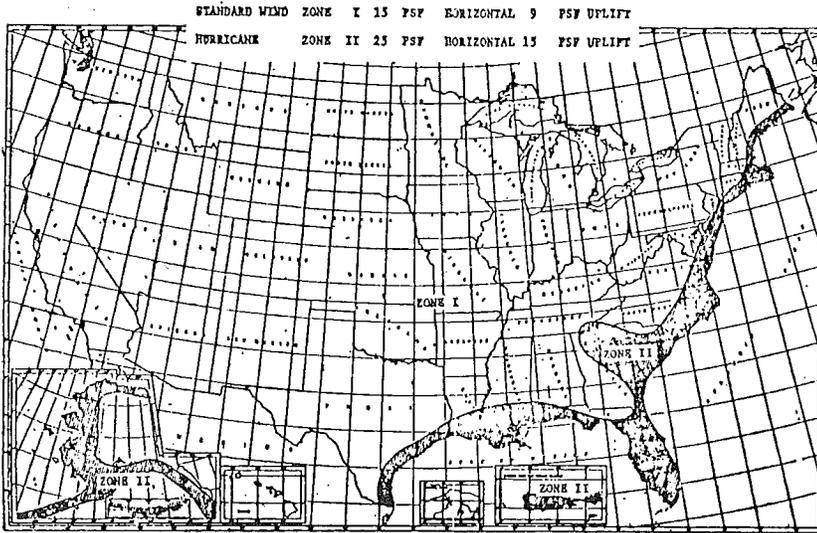


TABLE III  
TIE-DOWN INSTRUCTIONS

The home is to be anchored using the following information. Consult the wind zone requirements. Units built for Zone I and/or Zone II have the over-the-roof ties and frame attachment clips and/or anchor holes in the frame, factory installed for your convenience. Consult the appropriate zone table for the proper amount of over-the-roof ties and/or diagonal ties to use. You will find a method of anchoring the home to the ground provided by Minute Man Anchors, Inc. This information provides the set-up crew and homeowner an approved method.

Wind Zone Map



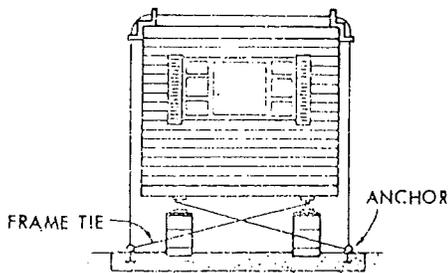
Wind Zone I Requirements

	Length Of Mobile		
	Up to 40'	41' to 60'	61' to 82'
Diagonal ties per side	3	5	6
Over-the-roof ties	2	3	3
Minimum number of anchors per home	6	10	12

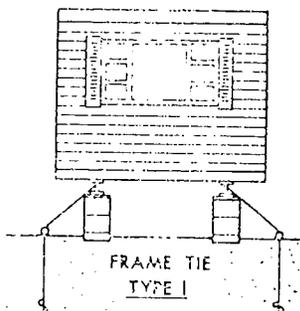
Wind Zone II Requirements

	Length Of Mobile		
	Up to 40'	41' to 60'	61' to 82'
Diagonal ties per side	4	6	8
Over-the-roof ties	2	3	4
Minimum number of anchors per home	8	12	18

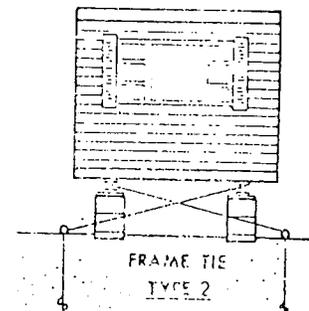
Multiple-wide mobile homes shall have diagonal ties and anchors as required above for single-wide mobile homes. No over-the-roof ties shall be required.



Over-The-Top Tie-Down



Diagonal Frame Tie-Down



Tie-Down Method Which Will Prevent Sliding But Not Turnover.

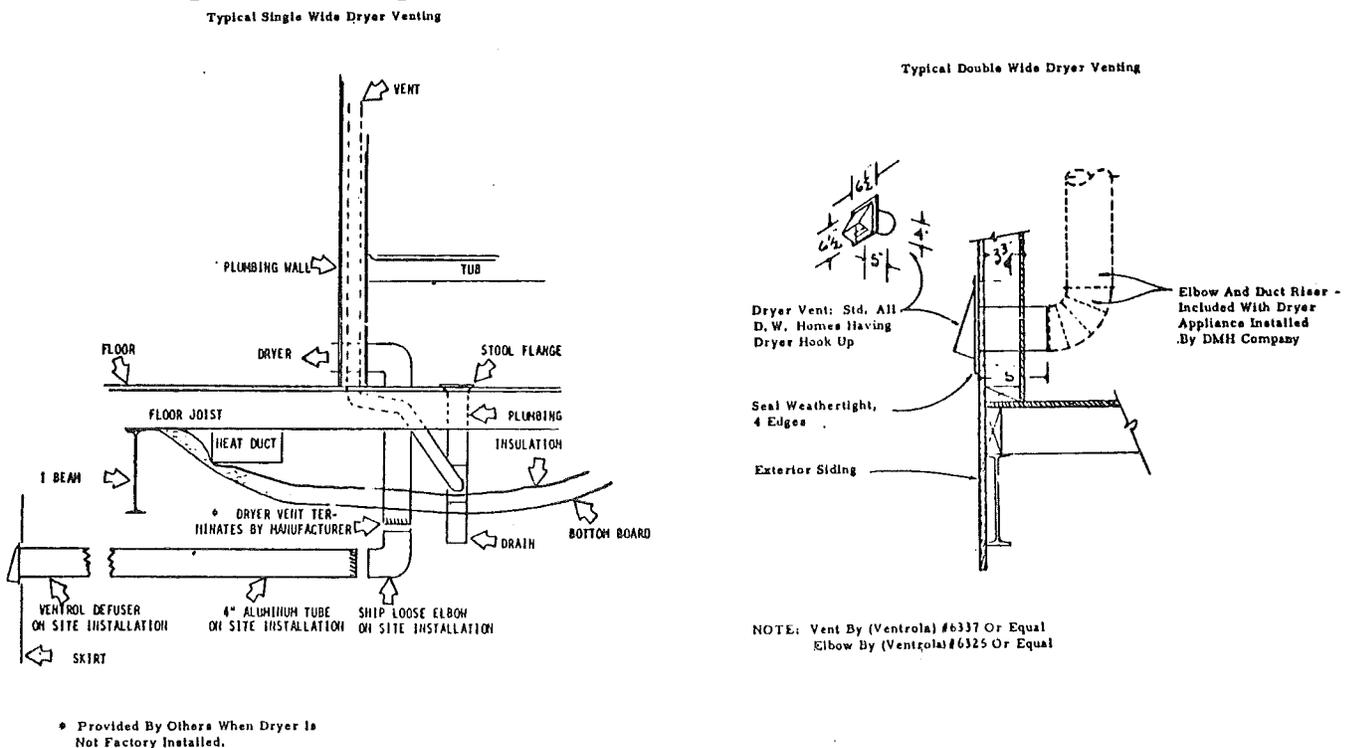
## VI BOTTOM BOARD PATCH INSTRUCTIONS

The following recommended procedures should be followed for repair of bottom board material:

1. Holes Or Punctures In Bottom Board - Apply seal-tite #360, #520, #740 or equivalent tape over area, insuring a complete seal around the area.
2. Cuts Or Rips In Bottom Board Required For Maintenance Work - Draw edges together with 4" strips of tape perpendicular to the direction of opening every 4" - 6". Finish applying lengthwise strips of tape over the joined edges insuring a complete edge seal.
3. Large Holes Or Cutouts - A patch may be cut from bottom board material and taped in place per item 2 above. Large patches may require stapling to adjacent joists to ensure the patch will stay in place. In either case, edge taping should be done should there be any question of not having an edge seal.
4. Should bottom board material or tape not be available, .019 inch thick aluminum may be nailed, stapled or screwed over damaged area and putty or caulk used to ensure an edge seal.

## DRYER VENTING INSTRUCTIONS

The following drawing is provided for use in venting of clothes dryers:



The aluminum tube and/or elbows may be replaced with a flexible vent duct, intended for this purpose, after consulting the appliance manufacturer's installation instructions and only in accordance with these instructions.

