

HOMEOWNER'S MANUAL

615 106

HART HOUSING

**A Division of
Forest River Housing, Inc.**

“Keep this booklet with your manufactured home. Title VI of the Housing and Community Development Act of 1974 provides you with protection against certain construction and safety hazards in your manufactured home. To help assure your protection, the manufacturer of your manufactured home needs the information which the enclosed cards, when completed and mailed, will supply. If you bought your home from a retailer, please be sure that your dealer has completed and mailed a card for you. If you acquired your home from someone who is not a retailer, you should promptly fill out and send a card to the manufacturer. It is important that you keep this booklet and give it to any person who buys the manufactured home from you.”

APPROVED BY
NIA INC.
FEDERAL MANUFACTURED HOME
CONSTRUCTION AND SAFETY COOPERATIVE

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HART HOUSING

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FEDERAL MANUFACTURED HOME
CONSTRUCTION AND SAFETY BOARD

HART HOUSING
1025 E. Waterford
P.O. Box 406
Wakarusa, IN 46573

LIMITED WARRANTY

Hart Housing, 1025 E. Waterford, P.O. Box 406, Wakarusa, IN 46573 (Warrantor) warrants to the original home owner purchaser (consumer) and any subsequent purchaser for a period of one (1) year from the date of purchase by the original purchaser, that this housing structure shall be free of substantial defects in materials and workmanship attributable to the Warrantor. This Warranty only covers components and parts of the body structure manufactured and assembled by the Warrantor.

The Warrantor shall not be held accountable (responsible) for claims relating to routine maintenance such as leveling, adjusting doors and windows, recaulking, tightening screws or maintaining electrically operated equipment, nor is the Warrantor responsible for claims related to mars, scratches, dents, and chips to surfaces or fabrics or broken glass not caused by the Warrantor. All cosmetic claims must be reported to the warrantor in writing by the original purchaser within thirty (30) Days after delivery to be considered warrantor caused.

Additionally, the warrantor shall not be held accountable (responsible) for claims relating to purchased component items which are separately warranted by their manufacturers, but the warrantor will provide reasonable assistance to you in obtaining ministrations.

The purchaser shall notify the Warrantor at the above address in writing of the defect within 7 days time after discovery of the defect. All expenses incurred by purchaser in obtaining warranty remedy shall be born by purchaser. The purchaser can obtain a list of persons authorized to perform warranty remedy by contacting warrantor at the above address.

The Warrantor shall not be held accountable (responsible) for any damage or temporary bother caused by frost heave as a result of the home being set on a pier foundation which has either the piers installed directly on the ground or on a footing which does not extend below the frost line. This warranty is void if a kerosene or other type of fuel burning portable heater has ever been used in this home.

The Warrantor expressly limits with respect to this home the duration of all implied warranties of merchantability and all implied warranties of fitness for a particular purpose to the warranty period of one (1) year. Warrantor expressly disclaims with respect to this home all implied warranties of merchantability and all implied warranties of fitness for a particular purpose after expiration of the warranty period.

Warrantor reserves the right to change the parts and design of its home from time-to-time without notice and with no obligation to maintain spare parts or to make corresponding changes in product previously manufactured.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

The remedies provided in this warranty are the homeowner's exclusive remedies. The manufacturer is not responsible and shall not be held accountable for any undertaking, representation of warranty made by a retailer or other person beyond those expressly set forth in this warranty.



FURNACE SET-UP CHECK LIST

ONLY INDIVIDUALS HAVING PROVEN EXPERIENCE WITH THIS TYPE OF EQUIPMENT SHOULD ATTEMPT TO PERFORM SET-UP.

- HAS ROOF JACK CROWN BEEN CORRECTLY INSTALLED?
- HAS FURNACE GAS VALVE AND BURNER ORIFICE BEEN CORRECTLY CONVERTED FOR L.P. GAS WHERE APPLICABLE?
- HAS FURNACES GAS VALVE BEEN DE-RATED FOR ALTITUDES ABOVE 2000 FEET WHERE APPLICABLE?
- IS HEAT ANTICIPATOR ON THERMOSTAT PROPERLY SET?
- IS GAS LINE OUTLET PRESSURE PROPERLY SET FOR FUEL TYPE?
NATURAL GAS IS 3.5" W.C. L.P. IS 10" W.C.
- OIL FURNACE PUMP PRESSURE IS 100 PSI
- IS PRIMARY AIR PROPERLY ADJUSTED PER INSTALLATION INSTRUCTIONS?
- IS CROSS-OVER TAKE-OFF COLLAR DIRECTLY UNDER FURNACE?
- IS CROSS-OVER DUCT INSTALLED PER INSTALLATION INSTRUCTIONS?
- HAS FURNACE BEEN TEST FIRED, COMPLETING A FULL BURN AND BLOWER CYCLE?
- HAS HOMEOWNER BEEN INSTRUCTED IN THE PROPER OPERATION OF THE FURNACE?

PROPER FURNACE SET-UP AND ADJUSTMENT IS THE RESPONSIBILITY OF THE RETAILER / HOMEOWNER AND IS NOT COVERED UNDER WARRANTY.



CONSUMER INSULATION INFORMATION

BRAND _____ MODEL NO. _____ SERIAL NO. _____

Contains the following insulation specifications:

LOCATION	TYPE OF INSULATION	THICKNESS	"R" VALUE
FLOOR	FIBERGLAS		R _____
EXTERIOR WALLS	FIBERGLAS		R _____
CEILING	CELLULOSE		R _____

This insulation information was furnished by the manufacturer and is disclosed in compliance with the Federal Trade Commission Rule, Labeling, and Advertising of Home Insulation, 16 cfr section 460.16.

DATE: _____ RETAILER SIGNATURE _____

I hereby understand that a copy of this form will be included with my sales contract.
I have received The Ventilation Improvement Information Sheet.

DATE: _____ CUSTOMER'S SIGNATURE _____

Thickness as certified by original supplier of insulation.
Savings vary. Higher R-values mean greater insulating power.



GENERAL INFORMATION

Scope

This Manual has been prepared to acquaint you with general information on the operation and maintenance of your home and to provide important safety information. It is supplemented by other information included with products installed in the home.

We urge you to read all this information carefully and follow the recommendations to help assure enjoyable and trouble free living in your home.

All information, illustrations and specifications contained in this manual and associated material are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

Owner/Dealer Final Acceptance Inspection

After completion of the site installation, your retailer is prepared to finalize all details concerning acceptance and possession of your new home. Prior to acceptance, it is normal procedure to make a final inspection of your home, accompanied by your retailer. For your own protection, you are urged to take advantage of this opportunity for final inspection prior to taking possession of your new home. During this inspection, you and your retailer should carefully note any discrepancies, shortages, damage or other conditions not to your satisfaction — both inside and out — and obtain the retailer's commitment for any needed repairs or replacements. Obtaining such a commitment at this time will preclude possible future misunderstandings.

At this time, your retailer will acquaint you with the location, function, and use of all safety devices and systems — all items that will require attention, care and maintenance, as well as other unique features of your new home, in addition, please read this complete manual as soon as convenient to allow you to better understand and care for your new home.

Warranty Responsibilities & Service Information

Warranty Information

A written Warranty is enclosed in this manual. This Warranty indicates what it covers and for how long. Services to be obtained under the Warranty can be acquired by contacting your retailer, or us at the address listed on the Warranty or the Data Plate.

Warranty exclusions (items not covered by our Warranty or items covered under a separate warranty) are listed on the

Warranty. The Warranty should be read to determine the coverage of the Warranty.

The various devices and appliances in the home are normally covered by separate warranties provided by the manufacturer of the product. You should contact the manufacturer or his authorized agent directly for any Warranty service.

Manufacturer's Responsibilities

In addition to high standards of workmanship and quality materials used in the manufacture of your home, it has been subjected to continuous inspections through the various stages of production. These inspections and tests are performed to assure the compliance with the Federal Standards, in addition to our own rigid quality standards.

We do not manufacture nor supply skirting, steps, patio awnings, carports, storage enclosures, etc. Such items are usually available from your retailer. We recommend you purchase all such items through your retailer in order to insure his supervision of their proper installation to prevent damage to the home. Damage caused by such installation is not covered by our Warranty.

Authorized Retailer's Responsibilities



Your retailer is responsible for the original site installation and set-up, and complete checkout of the home and all systems which includes all utility connections and tests, and for routine on-site repairs. Because each home is carefully inspected prior to shipment, in general, most problems are transit-incurred and very minor in nature. In most instances, such problems are readily identified and repaired on-site by the retailer's personnel. The retailer is responsible to see that all routine repairs are completed promptly and in a professional manner. Should any problems or defects of a substantial nature occur, it should be referred through your retailer to our Service Department for corrective action under the terms of the warranty.

Your retailer is an independent contractor, not our agent and is responsible totally for any alterations, exchanges, additions or attachments made in or to your home after it leaves the factory. Likewise, you are responsible for any such actions effected after you accept possession.

Appliance/Equipment Manufacturer's Responsibilities

Your new home includes appliances and equipment installed but not manufactured by us. Most are warranted by their respective manufacturers. As these warranties are separate from our Warranty, we pass these through directly to you.

Various warranties, care and maintenance instructions, service information and registration forms (or cards) are enclosed in your Home Owner's Information Envelope. In many cases, these warranties may not be recognized until registered, so please complete and mail these registrations to their respective manufacturers as soon as convenient after moving into your new home.

Service for all appliances and equipment covered under separate warranty usually can only be performed by their manufacturer or their authorized service agencies. Should repair or service be required, follow the instructions furnished by each manufacturer. If you are unable to locate a proper service center, check the yellow pages of your local telephone book or call the nearest regional office of that manufacturer for service information.

Neither we nor our dealers generally are authorized to provide service on these items. However, your retailer or our Service Department will attempt to assist you if, for any reason, you have difficulty in obtaining service.

Home Owner's Responsibilities

We, your authorized retailer, and the appliance/equipment manufacturers have specifically defined areas of responsibility — so do *you*, the home owner. Generally speaking, the home owner's responsibility is protective and preventive in nature. The owner is responsible to protect his home from being subjected to either interior or exterior abuse, damage or neglect. Modifications, additions to, or other alterations of the home are not covered by our Warranty and are the responsibility of the home owner, as is damage caused by such actions. It is the responsibility of the owner to promptly report, preferably in writing, defects in material and workmanship to his dealer, and if necessary, to notify us.

WARNING

CAUTION: Certain operations such as those dealing with gas, oil and electrical systems, and the set-up of your home can be hazardous if attempted by someone not qualified or licensed in those fields. To avoid possible damage or injury, contact a qualified technician in these fields.

No adjustment or alteration of any kind is to be made on the gas, oil or electrical systems or appliances except by a qualified and licensed technician, as outlined in the Manufacturer's Guide for that item.

Failure to observe these requirements may void your Warranty and could result in serious injury or death.

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CONSTRUCTION AND SHEET METAL WORKING

Manufactured Home Data Plate

The Manufactured Home Data Plate (See Page 9) This plate is located inside the cabinets located on either side of the rangehood. This Data Plate contains the following information pertinent to your home.

The manufacturer's name and plant address, along with the home's serial number, model number and date of manufacture are listed at the top of the Data Plate.

Under the Factory Installed Equipment section are listed, by manufacturer and model number, the major appliances that were installed in your home at the factory. Elsewhere in this packet is information on the warranties and operating instructions for these appliances. Should the appliances actually in your home at the time it is purchased be different from those on the Data Plate, or be in addition to those on the Data Plate, such appliances and their installation were not provided by us at the factory and are the responsibility of the installer, not the manufacturer of your home.

The Roof Load Zone Map shows which Zone (North, Middle or South) your manufactured home is designed for. Each of these Zones are indicated on the map with the design roof loading for each.

The Wind Zone Map shows which Zone (Standard - Zone 1 or Hurricane - Zone 11) your manufactured home is designed for. Each of these Zones are indicated on the map with the design wind loading for each.

It is important that your home be designed for **AT LEAST** the loads specified for the Zones applicable to the installation site.

NOTE

Because of the important reference value of the Data Plate **IT SHOULD NEVER BE REMOVED.** It is important that you refer to the information presented on the certificate prior to making any alterations, modifications or additions to your home.

Equipment & Appliances Installed

The section designated as "F" on the Data Plate shows the equipment and appliances installed when your home was manufactured. Enclosed separately are the manufacturer's instructions, "Use & Care" booklets, and the manufacturer's warranties and registration cards that come with each item. Read these booklets carefully and follow their instructions.

Be sure the Owner Registration Cards are completed and mailed to each manufacturer to register your warranties, as

this will insure that you will receive any notices of defect these manufacturers may ever send to owners.

Be sure these instructions, booklets and warranties are kept in a safe and convenient location for reference. Should you ever sell your home, this information should be passed on to the new owner.

IMPORTANT

Carefully physically check each piece of equipment and each appliance against the data plate and verify they match those in your home (both by model and serial number) and that you have the respective manufacturer's information.

If you or the retailer made alterations, substitutions, eliminations or additions of/to the equipment or appliances shown on the Data Plate, verify that you have been furnished with the proper manufacturer's information and warranties. Conversely, if you find you have the manufacturer's information and warranties on equipment or appliances which have been removed, return these to your retailer.

We retain a copy of the Data Plate installed in each home when manufactured and assume no liability or responsibility whatsoever for any equipment or appliances altered, exchanged, removed or added, nor for any consequential damage resulting from such alterations.

Heating & Comfort Cooling Certificate

The Heating & Comfort Cooling Certificate is included on the Data Plate. It indicates the Climatic Zone for which your home has been designed in accordance with the Federal Manufactured Home Standards. The make and model of the heating equipment provided in your home is also indicated along with information on the lowest outdoor temperature at which the heating equipment should be able to maintain an average indoor temperature of 70°F when the wind does not exceed 15 mph.

Along with the above information is a statement regarding the highest outdoor winter design temperature which should result in maximum furnace economy. Should the design temperature for your area be higher (warmer) than that indicated on the Certificate, it simply means that the heating equipment may be larger than theoretically required to operate at best economy based on specifications in the Federal Manufactured Home Standards. It also means that the furnace should have reserve capacity to heat your home during abnormal cold spells and/or wind conditions in excess of 15 mph.

If your home is provided with an air conditioner, information is provided on the make, model, and capacity of the

equipment. Information is also provided indicating the orientation of your home and the design outdoor temperature used in designing the system.

When your home includes an air distribution system suitable for the installation of central air conditioning later on, the maximum size of the add on equipment is specified on the Certificate along with information which will permit the installer to determine the required cooling capacity of the equipment.

Should your home not be designed for use with a central air conditioning system the Certificate will indicate this.

The Heating & Cooling Design section will have one of three alternate formats contingent on how your home was designed with respect to central air conditioning. Each of the three alternate formats is shown along with a full explanation of the significance of the information presented. (See page 19)

Important Health Notice

Some of the building materials used in this home emit formaldehyde. Eye, nose, and throat irritation, headache, nausea, and a variety of asthma-like symptoms, including shortness of breath, have been reported as a result of formaldehyde exposure. Elderly persons and young children, as well as anyone with a history of asthma, allergies, or lung problems, may be at greater risk. Research is continuing on the possible long-term effects of exposure to formaldehyde.

Reduced ventilation resulting from energy efficiency standards may allow formaldehyde and other contaminants to accumulate in the indoor air. Additional ventilation to dilute the indoor air may be obtained from a passive or mechanical ventilation system offered by the manufacturer. Consult your retailer for information about the ventilation options offered with this home.

High indoor temperatures and humidity raise formaldehyde levels. When a home is to be located in areas subject to extreme summer temperatures, an air-conditioning system can be used to control indoor temperature levels. Check the comfort cooling certificate to determine if this home has been equipped or designed for the installation of an air-conditioning system.

If you have any questions regarding the health effects of formaldehyde, consult your doctor or local health department.



National Manufactured Home Construction and Safety Standards Act of 1974



The National Manufactured Home Construction and Safety Standards Act of 1974 was enacted to improve the quality and durability of manufactured homes and to reduce the number of injuries and deaths caused by manufactured home accidents. The Federal Manufactured Home Construction and Safety Standards issued under the Act govern how manufactured homes must be constructed. Your home was manufactured to designs judged to be in compliance with the Standards. The Standards cover the planning and construction of your home. They were developed so that you should have a safe, durable home. The Standards do not cover such aspects of the home as furniture, carpeting, certain appliances, cosmetic features of the home and additional rooms or sections of the home not provided as part of the home at the factory.

The Act provides that if for some reason your manufactured home is found not to meet the Standard or to contain safety hazards, the manufacturer of the home must notify you of that fact. In some cases where there is a safety hazard involved, the Act requires the manufacturer to correct the home at no cost to you or to replace the home or refund all or a percentage of the purchase price. If you believe you have a problem for which the Act provides a remedy, you should contact the retailer. Normally, problems that arise in connection with your home can be handled by the retailer. If the problem is not resolved by the retailer then contact the manufacturing facility that actually produced the home. This information will be on the Data Plate located inside the cabinets located on either side of the rangehood.

If for some reason you are still not able to resolve the problem and feel the problem is covered by the Act, then you can contact your State Administrative Agency (SAA) for manufactured homes in your State. If your State does not have an SAA you can contact the Department of Housing and Urban Development (HUD). The addresses of SAA's and HUD are included below.

State Administrative Agencies (SAA)

ALABAMA — State Fire Marshal, Insurance Department, 445 South McDonough Street, Montgomery, Alabama 36130.

ARIZONA — Director, Arizona Division of Building Codes, 1645 West Jefferson, Phoenix, Arizona 85007.

ARKANSAS — Public Health Administrator, Arkansas State Board of Health, Mobile Homes Standards Section,

4815 West Markham Street, Little Rock, Arkansas 72201.

CALIFORNIA — Director, Department of Housing and Community Development, 1807 13th Street, Sacramento, California 95814.

COLORADO — Director, Colorado Division of Housing, Department of Local Affairs, 623 Centennial Building, 1313 Sherman Street, Room 523, Denver, Colorado 80203.

GEORGIA — State Fire Marshal, Office of the Comptroller General, 238 State Capitol, Atlanta, Georgia 30334.

IDAHO — Director, Idaho Department of Labor and Industrial Service, 317 Main Street, Room 400, Boise, Idaho 83720

ILLINOIS — Chief, Illinois Dept. of Public Health, Office of Consumer Health Protection, Division of General Sanitation, 535 West Jefferson Street, Springfield, Illinois 62761.

INDIANA — State Building Commissioner, State of Indiana, Manufactured Building Division, Administrative Building Council, 300 Graphics Art Building, 215 North Senate Avenue, Room 300, Indianapolis, Indiana 46204.

IOWA — State Building Code Commissioner. Office of Planning and Programming State Planning and Programming State Planning Code Section, 523 East 12th Street, Des Moines, Iowa 50319.

KENTUCKY — State Fire Marshal, Mobile Home Section, Capital Plaza, Frankfort, Kentucky 40601.

LOUISIANA — State Fire Marshal, 106 Louisiana State Office Building, New Orleans, Louisiana 70112.

MARYLAND — Director, Codes Administration, Department of Economic and Community Development - Division of Housing, 1748 Forest Drive, Annapolis, Maryland 21401.

MICHIGAN — Executive Director, Construction Code Commission, Department of Labor, 7150 Harris Drive, Lansing, Michigan 48926.

MINNESOTA — Section Chief, State of Minnesota, Building Codes Division, Department of Administration, 408 Metro Square Building, 7th and Robert Streets, St. Paul, Minnesota 55101.

MISSISSIPPI — Director, Mobile Home Inspection Division, Office of the Fire Marshal, 416 Woolfolk Building, P.O. Box 22542, Jackson, Mississippi 39205.

MISSOURI — Director, Mobile Home and Recreational Vehicles Division, Missouri Public Service Commission, P.O. Box 360, Jefferson City, Missouri 65101.

NEBRASKA — Director, Division of Housing and Environmental Health, State Department of Health, Lincoln Building, 3rd Floor, 1003 "O" Street, Lincoln, Nebraska 68508.

NEVADA — State Fire Marshal, State Department of Commerce, Mobile Home Section, 505 East King Street, Room 302, Carson City, Nevada 89701.

NEW JERSEY — Director, Bureau of Housing Inspection, Division of Housing and Urban Renewal, Department of Community Affairs, 363 West State Street, Trenton, New Jersey 08625.

NEW MEXICO — Executive Director, Mobile Housing Commission, State of New Mexico, P.O. Box 5759, Santa Fe, New Mexico 87502.

NEW YORK — Director, Codes Bureau, Division of Housing and Community Renewal, Two World Trade Center, New York, New York 10047.

NORTH CAROLINA — Commissioner of Insurance, North Carolina Department of Insurance, P.O. Box 26387, Raleigh, North Carolina 27611.

OREGON — Chief, Mobile Home and Recreational Vehicle Section, State of Oregon, Department of Commerce, Building Codes Division, 401 Labor and Industries Building, Salem, Oregon 97310.

RHODE ISLAND — State Building Code Commissioner, State of Rhode Island, Building Code Commission, 12 Humbert Street, North Providence, Rhode Island 02904.

SOUTH CAROLINA — Director, Division of Inspections Services, South Carolina Budget and Control Board, 300 Gervais Street, Columbia, South Carolina 29201.

SOUTH DAKOTA — Secretary, Commerce and Consumer Affairs, Division of Consumer Protection, State Capitol, Pierre, South Dakota 57501.

TENNESSEE — Director, State of Tennessee, Department of Insurance, Division of Fire Prevention, 202 Capitol Towers Building, Nashville, Tennessee 37219.

TEXAS — Administrator, Texas Department of Labor and Standards, Mobile Home Division, P.O. Box 12157, Capitol Station, Austin, Texas 78711.

UTAH — Director of Mobile Homes and Recreational Vehicles Division, Department of Business Regulation, State of Utah, 330 East 4th, South, Salt Lake City, Utah 84111.

VIRGINIA — Chief Fire Marshal, State Corporation Commission, Commonwealth of Virginia, 521 Blanton Building, P.O. Box 1157, Richmond, Virginia 23209.

WASHINGTON — Assistant Director, State of Washington, Department of Labor and Industries, Mobile Home and Recreational Vehicles Section, 300 West Harrison Street, Seattle, Washington 98119.

WISCONSIN — Chief, Mobile Home Section, Department of Industry, Labor and Human Relations, P.O. Box 2209, Madison, Wisconsin 53701.

Department of Housing and Urban Development

The Department of Housing and Urban Development is the Federal Agency administering the National Manufactured Home Construction and Safety Standards Act and any questions concerning the Act or your rights under the Act should be directed to HUD.

In order to contact HUD, you should refer to the Department of Housing and Urban Development under listings for the U.S. Government in your phone book. In calling or writing your local HUD office, you should direct your inquiries to the Consumer Complaint Officer at the local HUD or FHA Office.

You may also contact the Central HUD Office directly by writing or calling the Mobile Homes Standards Division, Department of Housing and Urban Development, 451 Seventh Street, SW, Washington, D.C. 20401. (Telephone 202/755-6584).



Manufactured Home Data Plate

Manufacturer Address

Hart Housing
66700 State Road 19
Wakarusa, Indiana 46573

A

Plant Number

Date of Manufacture _____ HUD Label No.(s) _____

B

Manufacturer's Serial Number and Model Unit Designation

C

Design Approval by (D.A.P.I.A.)

D

This manufactured home is designed to comply with the federal manufactured home construction and safety standards in force at time of manufacture.
(For additional information, consult owner's manual.)

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
For heating	_____	_____
For air cooling	_____	_____
For cooking	_____	_____
Refrigerator	_____	_____
Water Heater	_____	_____
Washer	_____	_____
Clothes Dryer	_____	_____
Dishwasher	_____	_____
Garbage Disposal	_____	_____
Fireplace	_____	_____

E

APPROVED BY



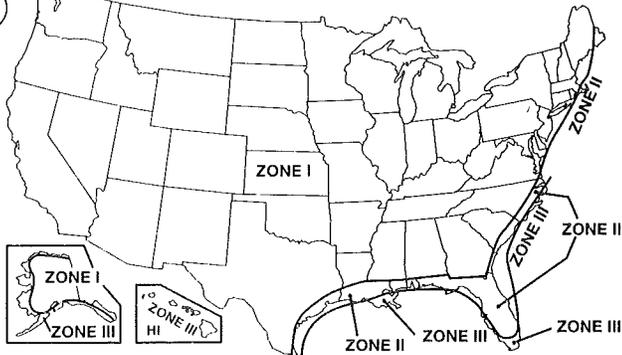
HOME CONSTRUCTED FOR Zone I Zone II Zone III

This home has not been designed for the higher wind pressure and anchoring provisions required for ocean/coastal areas and should not be located within 1500' of the coastline in Wind Zones II and III, unless the home and its anchoring and foundation system have been designed for the increased requirements specified for Exposure D in ANSI/ASCE 7-88.

This home has not been equipped with storm shutters or other protective coverings for windows and exterior door openings. For homes designed to be located in Wind Zones II and III, which have not been provided with shutters or equivalent covering devices, it is strongly recommended that the home be made ready to be equipped with these devices in accordance with the method recommended in manufacturers printed instructions.

F

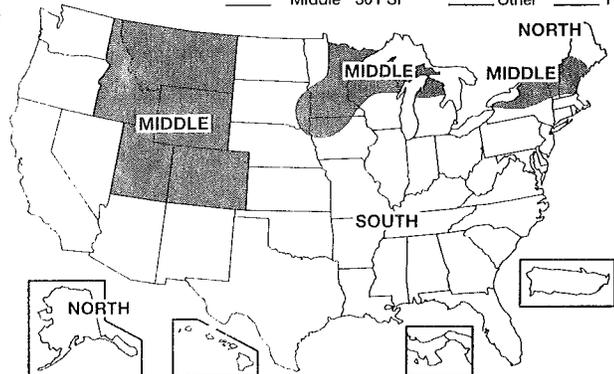
BASIC WIND ZONE MAP



DESIGN ROOF LOAD ZONE MAP

North 40 PSF South 20 PSF
Middle 30 PSF Other _____ PSF

G



H

COMFORT HEATING

This manufactured home has been thermally insulated to conform with the requirements of the federal manufactured home construction and safety standards for all locations

within U/O value zone _____ (See map at bottom)

Heating equipment manufacturer and model (See list at left).

The above heating equipment has the capacity to maintain an average 70° F temperature in

this home at outdoor temperatures of _____°F.

To maximize furnace operating economy, and to conserve energy, it is recommended that this home be installed where the outdoor winter design temperature (97 1/2%) is not higher than

_____ degrees Fahrenheit.

The above information has been calculated assuming a maximum wind velocity of 15 mph at standard atmospheric pressure.

COMFORT COOLING

Air conditioner provided at factory (Alternate I)

Air conditioner manufacturer and model (see list at left).

Certified capacity _____ B.T.U./hour in accordance with the appropriate air conditioning and refrigeration institute standards.

The central air conditioning system provided in this home has been sized assuring an

orientation of the front (hitch end) of the home facing _____. On this basis the system is designed to maintain an indoor temperature of 75° F when outdoor

temperatures are _____°F dry bulb and _____°F wet bulb.

The temperature to which this home can be cooled will change depending upon the amount of exposure of the windows of this home to the sun's radiant heat. Therefore, the home's heat gains will vary dependent upon its orientation to the sun and any permanent shading provided. Information concerning the calculation of cooling loads at various locations, window exposures and shadings are provided in Chapter 22 of the 1989 edition of the ASHRAE Handbook of Fundamentals.

Information necessary to calculate cooling loads at various locations and orientations is provided in the special comfort cooling information provided with this home.

Air conditioner not provided at factory (Alternate II)

The air distribution system of this home is suitable for the installation of central air conditioning.

The supply air distribution system installed in this home is sized for a manufactured home

central air conditioning system of up to _____ B.T.U./hr. rated capacity which are certified in accordance with the appropriate air conditioning and refrigeration institute standards, when the air circulators of such air conditioners are rated at 0.3 inch water column static pressure or greater for the cooling air delivered to the manufactured home supply air duct system.

Information necessary to calculate cooling loads at various locations and orientations is provided in the special comfort cooling information provided with this manufactured home.

Air conditioning not recommended (Alternate III)

The air distribution system of this home has not been designed in anticipation of its use with a central air conditioning system.

To determine the required capacity of equipment to cool a home efficiently and economically, a cooling load (heat gain) calculation is required. The cooling load is dependent on the orientation, location and the structure of the home. Central air conditioners operate most efficiently and provide the greatest comfort when their capacity closely approximates the calculated cooling load. Each home's air conditioner should be sized in accordance with Chapter 22 of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals 1989 edition, once the location and orientation are known.

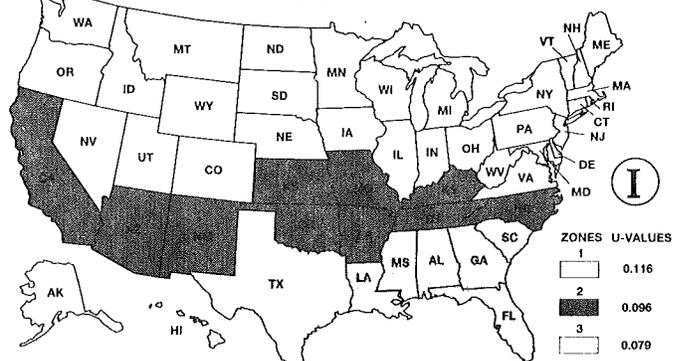
INFORMATION PROVIDED BY THE MANUFACTURER NECESSARY TO CALCULATE SENSIBLE HEAT GAIN

Walls (without windows and doors) "U" _____
 Ceilings and roofs of light color "U" _____
 Ceilings and roofs of dark color "U" _____
 Floors "U" _____
 Air ducts in floor "U" _____
 Air ducts in ceiling "U" _____
 Air ducts installed outside the home "U" _____

The following are the duct areas in this home:

Air ducts in floor sq. ft.
 Air ducts in ceiling sq. ft.
 Air ducts outside the home sq. ft.

U/O VALUE ZONE MAP



I

ZONES	U-VALUES
1	0.116
2	0.096
3	0.079

HH3002

ED-69 ©Dec-O-Art, Inc. REV. 10/94

Manufactured Home Data Plate Legend

- A. Manufacturing plant name and location.
- B. Date your home was manufactured.
- C. Serial number and model unit designation.
- D. Name of agency approving the design of this home.
- E. Manufacturer and model number of all appliances/equipment installed in your home by the home manufacturer. (NOTE: This does not include any appliances/equipment installed by anyone other than the manufacturer of your home.)
- F. The check beside the Design Wind Zones listed shows the zone or zones where your home may be located with respect to the map guide shown. (NOTE: Any zone of a lesser number than the one checked is also approved.)
- G. The check beside the roof loads listed shows the zone or zones where your home may be located. (NOTE: Any zone of a lesser number than the one checked is also approved.)
- H. This section shows the parameters with which your home was designed with respect to the central air conditioning system for heating and cooling.
- I. The zone checked in combination with the printed map shows the zone or zones your home can be located, based upon the climate control design parameters of the home.



SAFETY

Your new home has been designed and constructed with safety as a prime consideration. Each home which we produce is provided with certain safety features with which you should familiarize yourself. These features are explained below.

No amount of built-in safety, however, can completely guard you against the ever-present dangers inherent in home ownership. Therefore, planning, foresight and preparation on the part of you and your family is the best safety defense you have. This Section includes general information intended to help all the members of your family develop a safety-conscious attitude.

Windstorm Protection

The installation of an appropriate tie-down system designed for your home cannot be overstressed. It is of utmost importance. Installation of such a system protects your family's safety and guards against the loss of your personal property.

No matter where your home is located geographically, the installation of tie-downs is well worth the investment and strongly recommended.

Even winds that never become hurricanes or tornadoes can be destructive. The winds that accompany thunderstorms, and even sudden gusts, cause damage and occur in every state and in every month. Wind damage to manufactured homes can be minimized and in most cases prevented with the proper installation of an approved tie-down system.

Our homes are designed for use with frame tie-downs. Specific information on tie-down design and installation is given in Section B of this manual.

Ground Fault Circuit Interrupters

All bathrooms and outdoor receptacles (except the heat tape receptacle) provided by us in your manufactured home are protected by a ground fault circuit interrupter (GFCI).

Should there be a fault in the circuit, the GFCI will trip into the "off" position thus making the receptacle(s) it serves inoperative. The reset button on the GFCI will activate the circuit again.

The GFCI may consist of:

1. A circuit breaker in the Main Electric Panel Box (this breaker is readily distinguished by the "TEST" button).

2. The GFCI breaker may be built-in to the duplex receptacle in the bathroom nearest the Main Panel Box. The remaining bathrooms and the outdoor receptacles (not including the Heat Tape receptacle) are wired from this receptacle with the built-in GFCI.

To assure proper functioning of either GFCI, it should be subjected to a simple ten-second test once a month. Complete test instructions are provided in the Home Owner's packet.

The test procedure consists of the following:

- Insure that GFCI handle is in "ON" position.
- Push "TEST" button. If handle moves to "OFF" position, breaker is functioning. Return handle to "ON" position for normal use.
- If handle does not move to "OFF" when test button is pushed, contact a licensed electrician immediately to restore your ground fault protection.

CAUTION

Tripping of the GFCI breaker is usually attributable to one of three causes:

1. **Overload:** Connection of too many or too large devices to the circuit.
2. **A short:** Direct contact between both wires of the circuit or a "hot" wire accidentally touching the ground.
3. **Leakage:** Moisture, wet wires or partial grounding of equipment being used.

If the cause of tripping is readily apparent and the cure is obvious (i.e., disconnecting some devices from an overloaded circuit), the breaker may be turned "ON" again after the cure is accomplished. However, if breaker tripping is a recurrent problem, or the breaker trips immediately after being turned "ON", leave it "OFF" and call a licensed electrician to remedy the problem.

Remember that electricity is extremely dangerous and no amount of safety devices can afford as much protection from electrical shock as fore-thought and caution on the part of you and your family whenever handling any sort of electrical device.

NOTE

Because the outdoor receptacles in your home are on a GFCI protected circuit which also serves receptacles in a bathroom, you can easily monitor the circuit to determine if the power is off or on by use of a small night light plugged into a bathroom receptacle.



Smoke Detectors

To provide you and your family with early warning in case of fire, your new home is equipped with at least one smoke detector.

A smoke detector is designed to sense a fire or a potential fire in its early stages, before smoke density reaches a dangerous concentration. When smoke is detected, the device sounds an alarm, giving your family time to escape to safety.

All detectors are equipped with an “ON” light indicating that the detector is properly energized. Should this light go off, check the main electrical power distribution panel for a tripped breaker. If all breakers are “ON”, consult the manufacturer’s instructions for the smoke detector, which can be found in your Home Owner’s packet.

In addition to the “ON” light, each detector has a test mechanism, which, when operated, will simulate smoke entering the detector’s sensing chamber. (Consult the manufacturer’s instructions.) It is recommended that each detector be tested upon moving into your home, in the presence of all family members, allowing them to become familiar with the sound of the detector’s alarm. Thereafter, each unit should be tested once a week to insure that it is functioning properly.

Generally, the only maintenance that smoke detectors require, is to vacuum around the detector’s smoke entrances once or twice a year. Specific test procedures, maintenance requirements and a detailed description of the operating principle for the detector(s) installed in your home can be found in the detector manufacturer’s instructions. Please read these instructions to completely familiarize yourself and all members of your family with the specific smoke detector(s) in your home.

Emergency Exits

In an emergency, every member of your family should know exactly what to do, based on a well-rehearsed family evacuation plan. The first step in developing such a plan is to become completely familiar with all available emergency exits from your home.

Your home has at least two egress (exit) doors which are “remote” from each other to insure that a fire in any one part of the home will not render both doors useless. The door latch hardware is designed for quick opening, without the use of a key. This fact should be kept in mind if you are planning on installing additional locks on your doors. You should make sure that the hardware you select lends itself to quick operation in emergency situations, that it is mounted at a height within reach of all family members, and that all members are aware of its precise operation.

In addition to the two remote doors, each bedroom of your

home has one egress (exit) window or door. Egress windows are designed in accordance with Federal requirements specifically for the purpose of providing means for rapid exit in emergency situations. Instructions for operation of the windows are attached to the windows by the window manufacturer and **SHOULD NOT BE REMOVED**. It is imperative that all members of the family are fully aware of the location and operation of the egress (exit) windows.

The following additional facts should be kept in mind with regard to egress windows.

- Make sure that all shipping clips on screens are removed.
- Arrange your furniture so as to keep the egress windows accessible. An egress window blocked by a heavy chest of drawers or a headboard does not allow for rapid exit.
- Make sure exterior areas around and below egress windows are unobstructed to allow evacuation of your family.

Evacuation Plan

Each smoke detector in your home is designed to give you early warning of potential fire. The emergency exit facilities in your home provide you with means of escape. These provisions built into your home, however, cannot alone guarantee your family’s safe escape. That responsibility rests with you. Planning ahead and preparation is the best course of action toward fulfilling that responsibility.

Following are some suggestions that might be helpful in developing a family emergency evacuation plan:

- Sketch a floorplan of your home showing all available emergency exits and plot the possible alternate exit routes for each family member if a fire should break out in a particular section of the home.
- If your family includes members who would be incapable of evacuating the home by themselves in an emergency situation, assign someone the responsibility now of helping them. This will minimize confusion should an emergency arise.
- Determine a meeting place outside the home for your family to gather after evacuation so all members can be quickly and easily accounted for.
- Don’t wait until fire strikes to see if your plan works. Hold periodic family fire drills. This practice will supply you with information to revise and refine your plan.

In addition to a well-rehearsed evacuation plan, a basic understanding of the nature of fire is essential for all members of your family to help them act quickly and decisively in an emergency situation



FOREWORD

Your Hart Housing home has been built with great care. It meets or exceeds the Federal Standards for Manufactured Housing as established by the Department of Housing and Urban Development.

The Federal Standard governs body and frame design construction requirements, and installation of plumbing, heating and electrical systems.

Your home was designed and built as a totally integrated structure. Therefore, it is important that these instructions are closely adhered to and followed if you are to enjoy a comfortable, safe and trouble-free home.

Because the proper installation (set-up) of your new home is of such importance, it should be performed by an experienced and qualified set-up crew. If your purchase agreement with your dealer does not include installation or set-up of your home, he can assist you in locating qualified personnel.

If your state of residence has a manufactured home installation law or regulation, they will generally require your dealer or set-up crew to follow these instructions. Additionally, your state or local regulations may require that the installer be licensed. Many states also require that utilities be connected by a licensed technician. The State Administrative Agency can provide you with this information. See the list of State Administrative Agencies in your Homeowners Manual for the appropriate agency in your state.

If your state does not have an installation law or regulation, you should insist that your dealer or set-up crew follow these instructions.

Before attempting to set up the home, these instructions must be studied so that all work to be performed is clearly understood. Failure to follow these instructions can void your warranty.

If you have any questions or further clarification is desired, please contact your dealer or the factory which produced your home.



IMPORTANT HEALTH NOTICE

SOME OF THE BUILDING MATERIALS USED IN THIS HOME EMIT FORMALDEHYDE. EYE, NOSE, AND THROAT IRRITATION, HEADACHE, NAUSEA, AND A VARIETY OF ASTHMA-LIKE SYMPTOMS, INCLUDING SHORTNESS OF BREATH, HAVE BEEN REPORTED AS A RESULT OF FORMALDEHYDE EXPOSURE. ELDERLY PERSONS AND YOUNG CHILDREN, AS WELL AS ANYONE WITH A HISTORY OF ASTHMA, ALLERGIES OR LUNG PROBLEMS, MAY BE AT GREATER RISK. RESEARCH IS CONTINUING ON THE POSSIBLE LONG-TERM EFFECTS OF EXPOSURE TO FORMALDEHYDE.

REDUCED VENTILATION RESULTING FROM ENERGY EFFICIENCY STANDARDS MAY ALLOW FORMALDEHYDE AND OTHER CONTAMINANTS TO ACCUMULATE IN THE INDOOR AIR. ADDITIONAL VENTILATION TO DILUTE THE INDOOR AIR MAY BE OBTAINED FROM A PASSIVE OR MECHANICAL VENTILATION SYSTEM OFFERED BY THE MANUFACTURER. CONSULT YOUR DEALER FOR INFORMATION ABOUT THE VENTILATION OPTIONS OFFERED WITH THIS HOME.

HIGH INDOOR TEMPERATURES AND HUMIDITY RAISE FORMALDEHYDE LEVELS. WHEN A HOME IS TO BE LOCATED IN AREAS SUBJECT TO EXTREME SUMMER TEMPERATURES, AN AIR-CONDITIONING SYSTEM CAN BE USED TO CONTROL INDOOR TEMPERATURE LEVELS. CHECK THE COMFORT COOLING CERTIFICATE TO DETERMINE IF THIS HOME HAS BEEN EQUIPPED OR DESIGNED FOR THE INSTALLATION OF AN AIR-CONDITIONING SYSTEM.

IF YOU HAVE ANY QUESTIONS REGARDING THE HEALTH EFFECTS OF FORMALDEHYDE, CONSULT YOUR DOCTOR OR LOCAL HEALTH DEPARTMENT.

APPROVED BY



CHAPTER 1 — INTRODUCTION

- 1.1 **How to use this manual.** This manual contains detailed installation instructions, including specifications and procedures for erection and hookup of your manufactured home. It has been written in an objective and easy-to-understand manner so it can be understood by people without extensive technical training. It discusses the set-up of the home from preparing the site through final inspection. It includes many tables and figures giving important data for proper set-up. Careful adherence to this manual by the homeowner and installation crew will assure you of a quality, safe and affordable home for many years to come. Consult a registered professional or structural engineer for cases not covered in this manual.
- 1.2 **Pre-installation consideration.** Prior to locating or relocating your home, contact the local authority having jurisdiction for installation to see if permits for such procedures as blocking, anchoring, or utility connections are required. Inspections may be required during installation. On private property, zoning or development covenants may apply and should be taken into consideration. **NOTE: Preparation of the site, when accomplished by other than home installer, may not be in accordance with these instructions.**
- 1.3 **Safety.** Only trained crews should install the home. Installers should follow the safety instructions provided in this manual.

THIS HOME WEIGHS SEVERAL TONS

USE ENOUGH TEMPORARY WOOD BLOCKING TO SUPPORT THE HOME DURING SET-UP. No one should be allowed under the home unless it is securely in place, even if it is not moving.

- 1.4 **Consumer information card.** Fill out the CONSUMER INFORMATION CARD and return it to **Hart Housing** so that you may be notified of revised instructions or new products.



CHAPTER 2 — DEFINITIONS

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

Anchoring System. A combination of ties, anchoring equipment, and ground anchors that will, when properly designed and installed, resist the wind's tendency to push and overturn the home.

Footing. That part of the support system that sits directly on the ground at, below or partly below grade (or below the frost line where applicable) to support the piers.

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

1. Manufactured steel stands;
2. Manufactured concrete stands;
3. Concrete blocks.

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

Stabilizing System. A combination of properly installed anchoring and support systems.

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

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



CHAPTER 3 — SITE PREPARATION

3.1 Location and Layout

- 3.1.1 **Use of zone maps.** Your home is designed for certain weather conditions and roof loads. (See zone maps on data plate.) Do not site or relocate your home in a zone requiring greater wind, roof load, or heating/cooling capabilities than those for which it was designed. However, it is safe to locate your home in an area with lower load or weather requirements. For example, a home designed for a northern roof load of 40 psf may be sited in the southern roof load zone.
- 3.1.2 **Access to site.** Before attempting to move your home to the installation site, be sure it can get through. Remove any overhanging branches and raise any overhead wires. Special transportation permits may be required from state, county or city officials.
- 3.1.3 **Encroachments and setback distances.** Obey local laws regarding encroachments in streets, yards and courts, and permissible setback distances from property lines and public roads. Consider future additions, such as awnings and screen rooms.
- 3.1.4 **Issuance of permits.** Be sure that all necessary local permits have been obtained and fees paid.

3.2 Soil Conditions

- 3.2.1 **Requirements.** To help prevent settling of your home, site it on firm, undisturbed soil or fill compacted to at least 90% of its maximum relative density. Installation on loose, uncompacted fill may invalidate the home's limited warranty.
- 3.2.2 **Bearing capacity.** Test the bearing capacity of the soil at the depth of the footings after completing any grading and filling (see 3.2.3). If you can't test the soil but can identify its type, use the foundation bearing pressures shown in Figure 3.2 as a guide. If you cannot identify the soil, use the lowest value (1,000 psf) from Figure 3.2. Under unusual conditions, or if the soil appears to be peat or uncompacted fill, consult a local geologist or professional engineer.
- 3.2.3 **Soil bearing testing methods and equipment.** A pocket penetrometer (available from engineering supply houses) or other methods acceptable to local jurisdictions may be used.
- 3.3 **Removal of organic material.** Remove all decayable material such as grass, roots and wood scraps from beneath the home, especially in areas where footings are to be placed, to minimize settling of footings and insect damage. Remove shrubs and overhanging branches from the immediate vicinity of the homesite to prevent windstorm damage.

3.4 Drainage

- 3.4.1 **Purpose.** Drainage prevents water buildup under the home which may cause settling of the foundation, dampness in the home, damage to siding and bottom board, buckling of walls and floors, problems with the operation of doors and windows, AND WILL VOID YOUR WARRANTY.
- 3.4.2 **Elimination of depressions.** Grade the homesite to permit water to drain from under and away from the home.
- 3.4.3 **Drainage structures.** Depending on the local landscape, ditches and culverts may be needed to drain surface runoff. If so, consult a registered professional engineer.

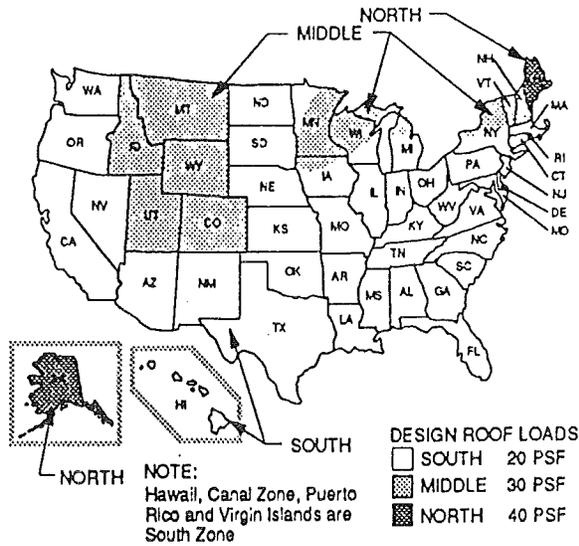


3.5 **Ground moisture control**

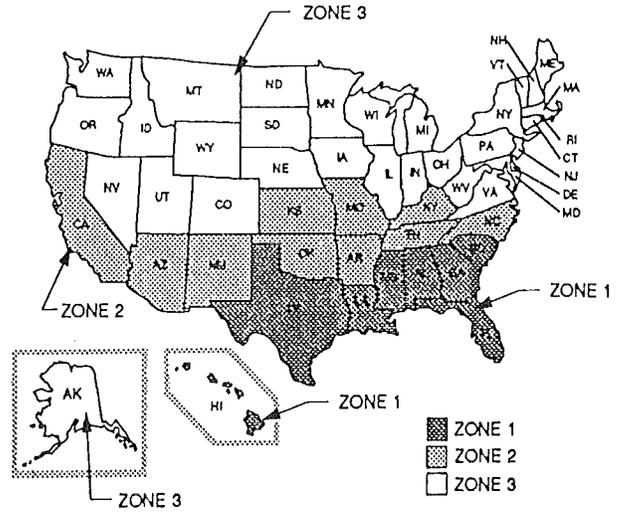
- 3.5.1 **Importance.** If the crawl space under the home is to be enclosed with skirting or other material, a vapor retarder that keeps ground moisture out of the home must be installed. Failure to place a vapor retarder beneath the home will void the warranty.
- 3.5.2 **Acceptable types of ground cover.** Use polyethylene sheeting or its equivalent, at least six mils thick.
- 3.5.3 **Proper installation.** Cover the entire area under the home with the sheeting and overlap it at least 6' at all joints. Where soil and frost conditions permit placement of footings at grade level, place the sheeting directly beneath them.



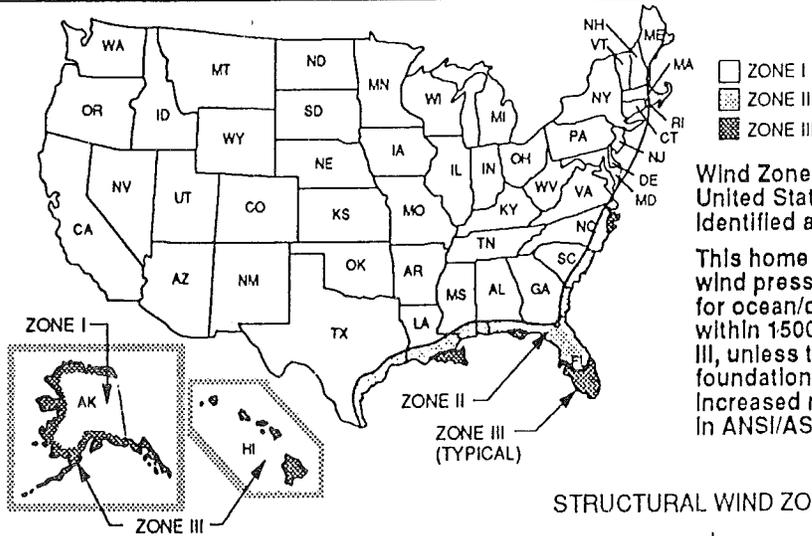
ZONE MAPS OF THE UNITED STATES



STRUCTURAL ROOF DESIGN MAP



HEATING & COOLING DESIGN MAP
(U_o VALUE ZONES)



Wind Zone I consists of those areas of the United States and its territories that are not identified as being in Wind Zone II or III.

This home has not been designed for the higher wind pressure and anchoring provisions required for ocean/coastal areas and should not be located within 1500' of the coastline in Wind Zones II and III, unless the home and its anchoring and foundation system have been designed for the increased requirements specified for Exposure D in ANSI/ASCE 7-88.

STRUCTURAL WIND ZONE DESIGN MAP

WIND ZONE II (100 MPH)

The following local governments listed by state (counties / parishes, unless specified otherwise) are within Wind Zone II:

Alabama Baldwin	Mobile	North Carolina Beaufort Brunswick Camden Chowan Columbus Craven Currituck Jones	New Hanover Onslow Pamlico Pasquotank Pender Perquimans Tyrrell Washington
Florida All counties except those identified as being within Wind Zone III		South Carolina Beaufort Berkeley Charleston Colleton Dorchester	Georgetown Horry Jasper Williamsburg
Georgia Bryan Camden Chatham	Glynn Liberty McIntosh	Texas Arkansas Brazoria Calhoun Cameron Chambers Galveston Jefferson Kenedy	Kleberg Malagorda Nueces Orange Religio San Patricio Willacy
Louisiana Acadia Allen Ascension Assumption Calcasieu Cameron East Baton Rouge East Feliciana Evangeline Iberia Iberville Jefferson Davis LaFayette	Livingston Pointe Coupee St. Helena St. James St. John the Baptist St. Landry St. Martin St. Tammany Tangipahoa Vermilion Washington West Baton Rouge West Feliciana	Virginia - The cities of: Chesapeake Norfolk Portsmouth	Princess Anne Virginia Beach
Maine Hancock	Washington		
Massachusetts Barnstable Bristol Dukes Middlesex George Hancock Harrison	Nantucket Plymouth Jackson Pearl River Stone		

WIND ZONE III (110 MPH)

The following local governments listed by State (counties / parishes, unless specified otherwise) are within Wind Zone III:

Florida Broward Charlotte Collier Dade Franklin Gulf Hendry	Lee Martin Manatee Monroe Palm Beach Pinellas Sarasota
Louisiana Jefferson La Fourche Orleans Plaquemines	St. Bernard St. Charles St. Mary Terrebonne
North Carolina Carteret Hyde	Dare

The following states and territories are within Wind Zone III:

State of Hawaii

Alaska, coastal regions between the 90 mph isotach on ASCE 7-88 wind map and the coast

U.S. Territories:

America Samoa
Northern Mariana Islands
Trust Territory of Pacific Islands
Guam
Puerto Rico
U.S. Virgin Islands



GENERAL DESCRIPTION OF SOILS	
SOIL TYPE Based on the Unified Classification System.	ALLOWABLE PRESSURE (Pounds per square foot.) No allowances made for overburden pressure, embedment depth, water table height, or settlement problems.
ROCK OR HARD PAN	4000 AND UP.
SANDY GRAVEL AND GRAVEL	2,000
SAND, SILTY CLAY, CLAYEY SAND, SILTY GRAVEL, OR CLAYEY GRAVEL.	1,500
CLAY, SANDY CLAY, SILTY CLAY, OR CLAYEY SILT.	1,000
UNCOMMITTED FILL.	SPECIAL ANALYSIS IS REQUIRED.
PEAT OR ORGANIC CLAYS.	SPECIAL ANALYSIS IS REQUIRED.
<p>NOTE:</p> <p>To be used only when none of the following is available:</p> <ol style="list-style-type: none"> Soils investigation and analysis of the site. Compliance with the local building code. Competent opinion by a local engineer, or building official. 	



Figure 3.2
General Description of Soils.

CHAPTER 4 — FOUNDATIONS

4.1 Piers

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

4.1.2 **Acceptable types.** Piers may be concrete blocks or pressure-treated wood, capped and shimmed with wedges, or adjustable manufactured metal or concrete devices (see Figure 4.1). Adjustable devices are more accurate. Manufactured piers should be listed and labeled for the required load capacity.

4.1.3 Design requirements

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

See Tables 4.1 and 4.2 for pier capacities. Manufactured piers must be rated at least these capacities, and locally-constructed piers must be designed to transmit these loads safely (see 4.1.3.2).

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

Cap hollow block piers as shown in Figure 4.1 to distribute the structural load evenly across them. Caps may be of solid masonry or hard wood, at least 4" thick, or of steel, and of the same length and width as the piers they rest upon. Avoid plywood, as it may lead to unwanted settling or movement.

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

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

All piers must rest on footings (see paragraph 4.2) that either extend below the frost line or are otherwise protected from frost effects, and are placed on either undisturbed soil or compacted fill.

4.1.4 Design procedures

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

4.1.4.2 **Piers 54" to 80" high.** Construct all piers between 54" and 80" high, as indicated in Figure 4.1.



- 4.1.4.3 **Piers over 80" high.** Where permitted by local codes, lay them in concrete mortar with steel reinforcing bars inserted in the block cells and fill the cells with concrete. Where such construction is not permitted by local codes, have piers over 80" high designed by a registered professional or structural engineer.
- 4.1.5 **Location and spacing.** The location and spacing of piers depends upon the dimensions and weight of the home, the roof load zone, the type of construction (single- or multisection), and other factors such as the locations of doors or other openings and heavy pieces of furniture.
- 4.1.5.2 **Multisection homes.** Figure 4.3 shows the recommended location and spacing of piers for your multisection home.
- 4.2.5.3 **Under doors and heavy furniture.** Place piers on both sides of all exterior doors and other sidewall openings 4' or wider (such as recessed entries, bay windows and sliding glass doors), under porch posts, fireplaces and wood stoves, and under the expected locations of heavy pieces of furniture such as pianos, organs, waterbeds, etc.
- 4.2.5.4 **Multisection Ridgebeam Support Piers.** In addition to piers located along main beams and at exterior openings, piers should be placed at each ridgebeam column location. These piers are necessary to transfer concentrated roof loads safely to the ground. The location of these piers are shown by dimensioned drawings provided by your dealer.
- 4.2 **Footings.** Support every pier with a properly designed footing, as follows
- 4.2.1 **Acceptable types of footings**
- 4.2.1.1 **Concrete.** Footings may consist of precast or poured-in-place concrete, pads, slabs or ribbons with a 28-day compressive strength of at least 3,000 psi.
- 4.2.2 **Placement in freezing climates**
- 4.2.2.1 **Conventional Footings.** To preclude the harmful effects of ground frost heave, footings must be placed below the frost line. Consult local authorities to determine frost penetration.
- 4.2.2.2 **Floating Slab Systems.** When properly engineered by a registered professional engineer, compatible with the anchorage requirements of section 5.4, and acceptable to the local authority having jurisdiction, "floating slab system" may be used above the frost line.
- 4.2.3 **Proper sizing of footings.** Proper sizing of footings depends upon the load-carrying capacity of both the piers and the soil. See Tables 4.1 & 4.2 for recommended footing sizes for various pier capacities.
- 4.3 **Special Conditions (See also Section 5.4.3)**
- 4.3.1 **Flood-prone areas.** HART HOUSING does not recommend your home in river or coastal flood prone areas. Special local regulations or flood insurance provisions may apply. Special elevation and anchoring techniques are required when locating in a flood-prone area. Consult a registered professional or structural engineer to make sure that home design and construction conform to applicable federal, state and local codes and regulations.
- 4.3.2 **Special snow load conditions.** Homes designed for and located in heavy snowfall areas or subject to other extreme loading conditions will require special piers or footings. See Figure 4.4.
- 4.4 **Basement Foundations.** If you desire your home to be placed on a perimeter foundation wall without I-Beam piers, refer to Figures 4.5, 4.6 & 4.5(a) for recommended footings and piers. Individual pier plans are available through your dealer.

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MINIMUM PIER CAPACITY TABLE (FRAME BLOCKING ONLY)

Table A – 30 psf Roof Live Load

Pier Spacing Ft.	Load Lbs.	Pier Size in. x in.	Footing Sizes (L x W x D, in inches) Allowable Soil Bearing			
			1500 psf	2000 psf	2500 psf	3000 psf
4	2587	8x16 16x16	16X16X4 16x16X4	14x16x4 16x16x4	13x16x4 16x16x4	12x16x4 16x16x4
6	3880	8x16 16x16	20x20x6 20x20x4	17x17x5 17x17x4	15x16x4 16x16x4	14x16x4 16x16x4
8	5173	8x16 16x16	23x23x8 23x23x4	20x20x6 20x20x4	18x18x5 18x18x4	16x16x4 16x16x4
10	6467	8x16 16x16	25x25x9 25x25x5	22x22x7 22x22x4	20x20x6 20x20x4	18x18x5 18x18x4

Table B – 40 psf Roof Live Load

Pier Spacing Ft.	Load Lbs.	Pier Size in. x in.	Footing Sizes (L x W x D, in inches) Allowable Soil Bearing			
			1500 psf	2000 psf	2500 psf	3000 psf
4	2893	8x16 16x16	17x17x5 17x17x4	15x16x4 16x16x4	13x16x4 16x16x4	12x16x4 16x16x4
6	4340	8x16 16x16	21x21x7 21x21x4	18x18x5 18x18x4	16x16x4 16x16x4	15x16x4 16x16x4
8	5787	8x16 16x16	24x24x8 24x24x4	21x21x7 21x21x4	19x19x6 19x19x4	17x17x5 17x17x4
10	7233	8x16 16x16	27x27x10 27x27x6	23x23x8 23x23x4	21x21x7 21x21x4	19x19x6 19x19x4

Notes:

- 1 - Applies to homes that do not require perimeter blocking along the side walls.
- 2 - The minimum footing is 4 inches, if precast of 2500 psi.
- 3 - All footing sizes are based upon the pier load listed, plus a pier weight of 400 lbs. (min.).
- 4 - Based on a box width of 160 inches and a 12 inch eave.
- 5 - All footing must rest on undisturbed soil at or below the frost line.
- 6 - Consult the local jurisdiction for the allowable soil bearing.

TABLE 4.1: MINIMUM FRAME PIER CAPACITIES

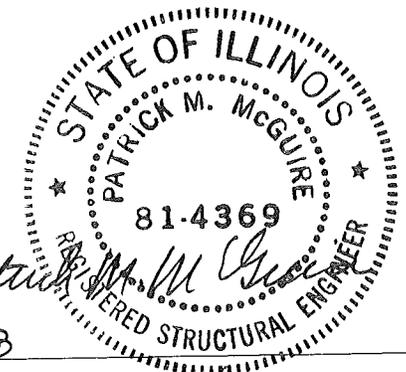


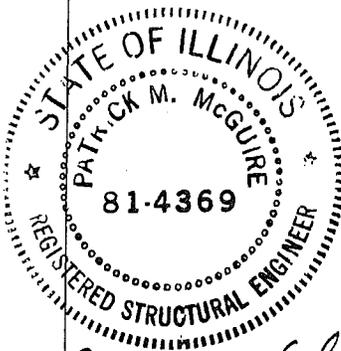
Table A - 30 psf Roof Live Load

Column Span Ft.	Load Lbs.	Pier Size in. x in.	Footing Sizes (LxWxD, in inches) Allowable Soil Bearing			
			1500 psf	2000 psf	2500 psf	3000 psf
4	2133	16x16	16x16x4	16x16x4	16x16x4	16x16x4
6	3200	16x16	18x18x4	16x16x4	16x16x4	16x16x4
8	4267	16x16	21x21x4	18x18x4	16x16x4	16x16x4
10	5333	16x16	23x23x4	20x20x4	18x18x4	16x16x4
12	6400	16x16	25x25x5	22x22x4	20x20x4	18x18x4
14	7467	16x16	27x27x6	24x24x4	21x21x4	19x19x4
16	8533	16x16	29x29x7	25x25x5	23x23x4	21x21x4
18	9600	16x16	31x31x8	27x27x6	24x24x4	22x22x4
20	10667	16x16	32x32x8	28x28x6	25x25x5	23x23x4
22	11733	16x16	34x34x9	30x30x7	26x26x5	24x24x4



Table B - 40 psf Roof Live Load

Column Span Ft.	Load Lbs.	Pier Size in. x in.	Footing Sizes (LxWxD, in inches) Allowable Soil Bearing			
			1500 psf	2000 psf	2500 psf	3000 psf
4	2667	16x16	16x16x4	16x16x4	16x16x4	16x16x4
6	4000	16x16	20x20x4	17x17x4	16x16x4	16x16x4
8	5333	16x16	23x23x4	20x20x4	18x18x4	16x16x4
10	6667	16x16	26x26x5	22x22x4	20x20x4	18x18x4
12	8000	16x16	28x28x6	24x24x4	22x22x4	20x20x4
14	9333	16x16	30x30x7	26x26x5	24x24x4	22x22x4
16	10667	16x16	32x32x8	28x28x6	25x25x5	23x23x4
18	12000	16x16	34x34x9	30x30x7	27x27x6	24x24x4
20	13333	16x16	36x36x10	31x31x8	28x28x6	26x26x5
22	14667	16x16	38x38x11	33x33x9	30x30x7	27x27x6

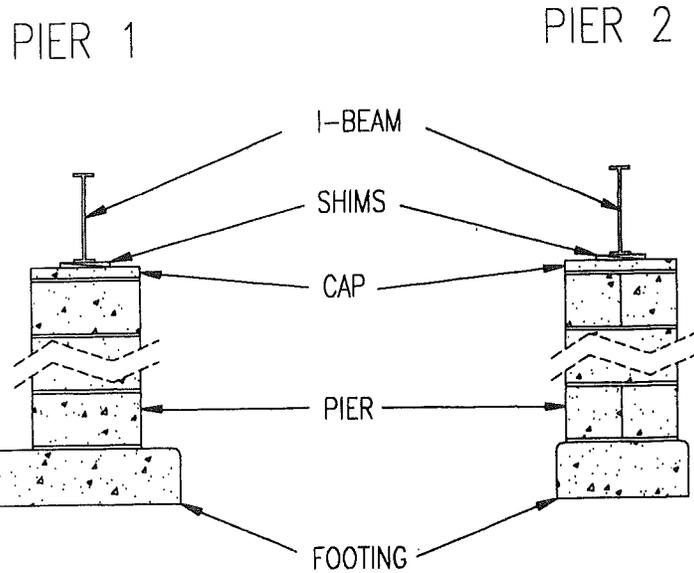


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1.16.98

Notes:

- 1 - Applies to homes that do not require perimeter blocking along the side walls.
- 2 - The minimum footing depths for precast footings are as follows (Min. concrete strength (fc) of 2500 psi):
4 inches if precast.
- 3 - All footing sizes are based upon the pier load listed, plus a pier weight of 400 lbs. (min.).
- 4 - Based on a box width of 160 inches and a 12 inch eave.
- 5 - All footings must rest on undisturbed soil at or below the frost line.
- 6 - Consult the Local Jurisdiction for the allowable soil bearing.

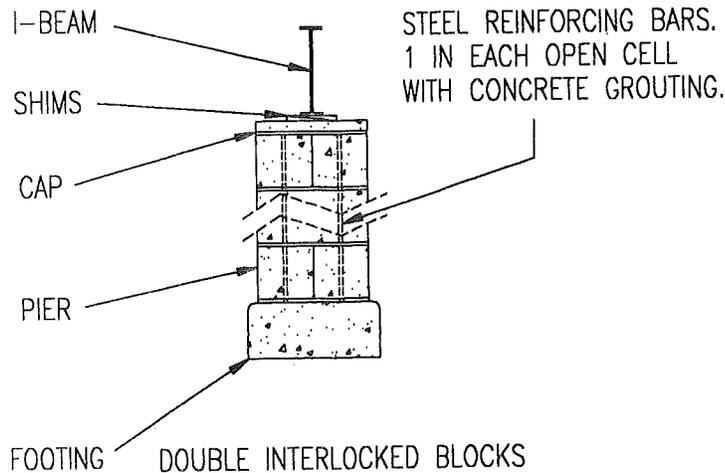
TABLE 4.2: MINIMUM PIER CAPACITY
MULTI-SECTION RIDGE BEAM COLUMN SUPPORT



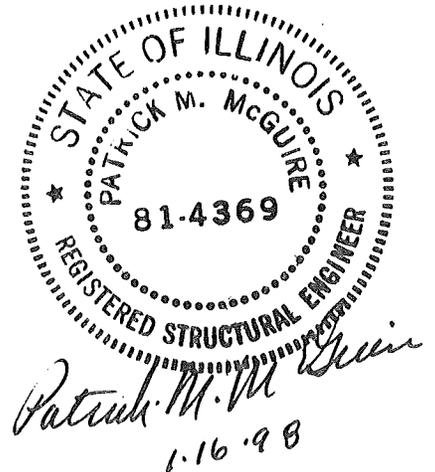
SINGLE BLOCKS WITH
MAXIMUM HEIGHT OF 36 INCHES.

DOUBLE INTERLOCKED BLOCKS
MAXIMUM HEIGHT OF 54 INCHES.

PIER 3

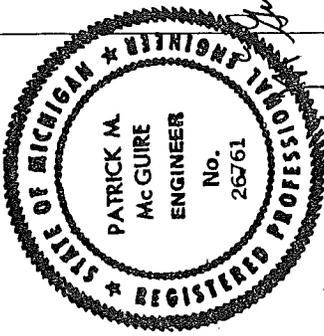


DOUBLE INTERLOCKED BLOCKS
FOR HEIGHTS GREATER THAN 54 INCHES,
BUT LESS THAN 80 INCHES.

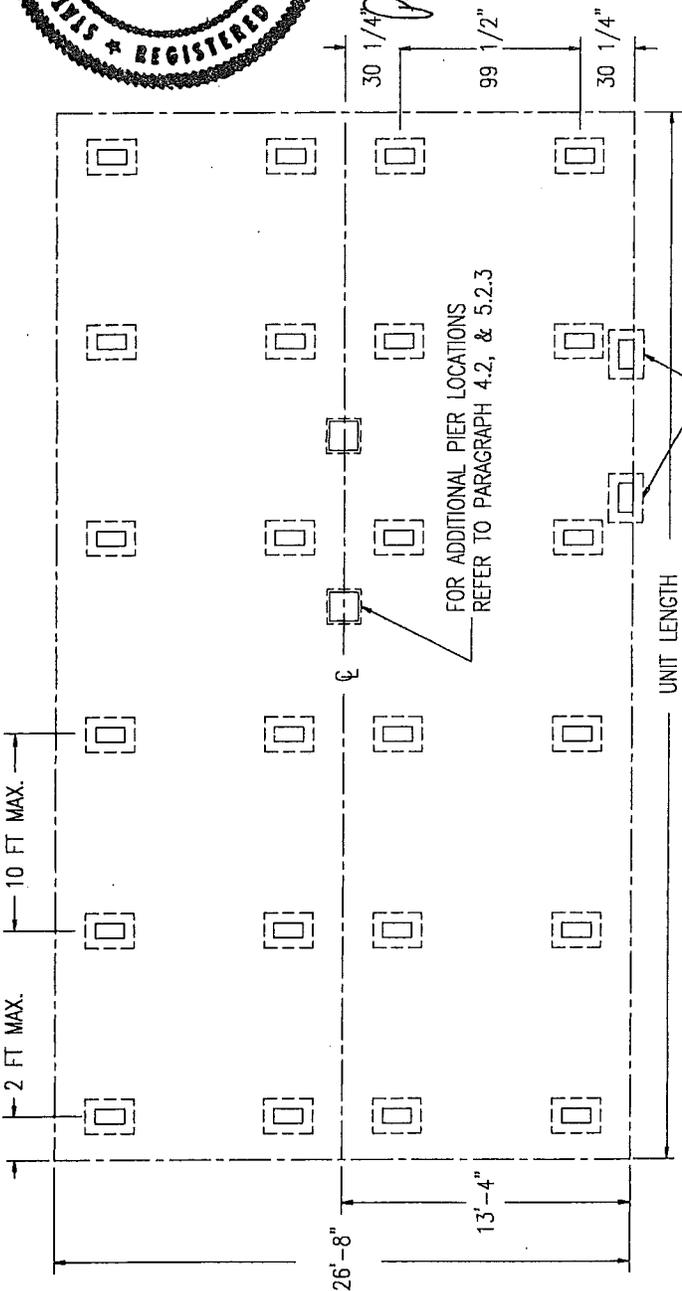


TYPICAL FOOTING AND PIER INSTALLATION

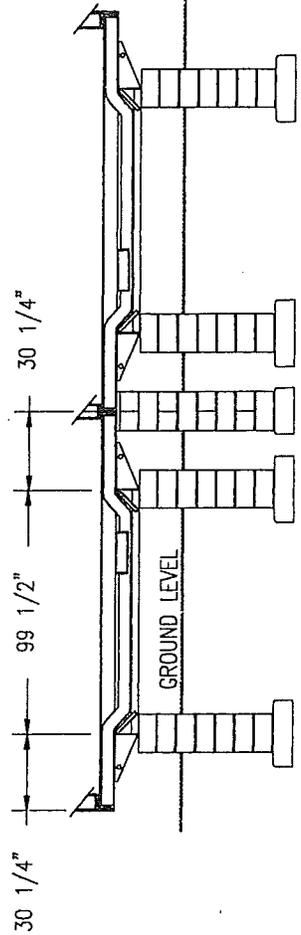
FIGURE 4.1



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 1-21-98



SEE NOTE #10

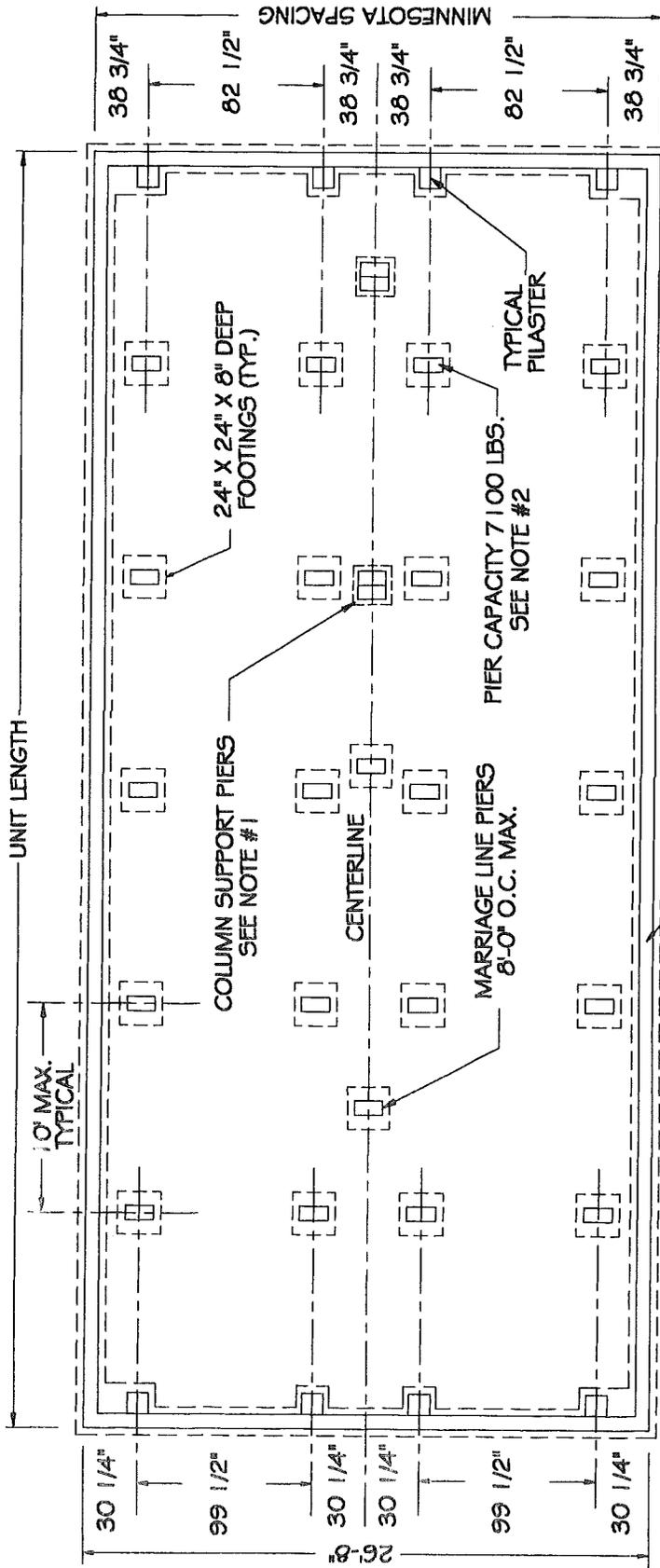


PIER PLAN - MULTI-SECTION
 FIGURE 4.3

NOTES:

- 1: THE FOUNDATION PLAN SHOWN IS GENERAL AND FURNISHED ONLY TO DEMONSTRATE THE PROPER LOCATION OF PIERS OR OTHER SUPPORT DEVICES. TITLED "TYPICAL CONCRETE BLOCK PIERS" DETAILS TYPICAL PIER CONSTRUCTION TO BE USED UNDER NORMAL CONDITIONS. WHEN ADVERSE CONDITIONS OCCUR SUCH AS REGULATORY FLOOD PLAINS, COASTAL HIGH HAZARD AREAS, OCEAN HAZARD AREAS OF QUESTIONABLE SOIL CONDITIONS, THE SUPPORT MUST BE DESIGNED BY A LOCAL QUALIFIED REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT. IN ALL CASES THE SUPPORT SYSTEM MAY BE SUBJECT TO REVIEW AND APPROVED BY LOCAL BUILDING OFFICIALS.
- 2: STABILIZING ANCHOR EQUIPMENT SHALL BE CAPABLE OF RESISTING AN ALLOWABLE WORKING LOAD OF 3150 LBS. AND SHALL BE CAPABLE OF WITHSTANDING A 50% OVERLOAD (4725 LBS. TOTAL).
- 3: THE STABILIZING SYSTEM IS DESIGNED TO USE DIAGONAL FRAME TIES ONLY. OVER THE ROOF TIES ARE NOT REQUIRED.
- 4: DISTANCE BETWEEN INTERMEDIATE TIE-DOWNS SHALL NOT EXCEED 9 FT. O.C.
- 5: WHEN THE HOME IS INSTALLED SO THAT THE BOTTOM OF THE MAIN FRAME MEMBERS ARE MORE THAN 3 FT ABOVE GROUND LEVEL, THE STABILIZING SYSTEM SHALL BE DESIGNED BY A LOCAL QUALIFIED REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT. IN ALL CASES THE STABILIZING SYSTEM MAY BE SUBJECT TO REVIEW AND APPROVAL BY LOCAL BUILDING OFFICIALS.
- 6: MINIMUM SOIL BEARING CAPACITY 2000 PSF.
- 7: SEE TIE-DOWN SECTION FOR LOCATION & METHOD.
- 8: CONSULT LOCAL PROFESSIONAL ENGINEER FOR APPROVED DESIGNED IF ANY DEVIATIONS TO THESE INSTRUCTIONS ARE INCURRED.
- 9: PIERS SHALL BE LOCATED AT EACH SIDE OF ALL PERIMETER OPENINGS 4 FT OR WIDER IN WIDTH. THIS WILL INCLUDE DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC.
10. FOR 1-BEAM SPACING AT 82 1/2", PERIMETER PIERS ARE REQ'D AT 8 FT. O.C. MAX.

FOR SPECIFIC PIER LOCATIONS REFER INDIVIDUAL MODEL PIER LAYOUT.

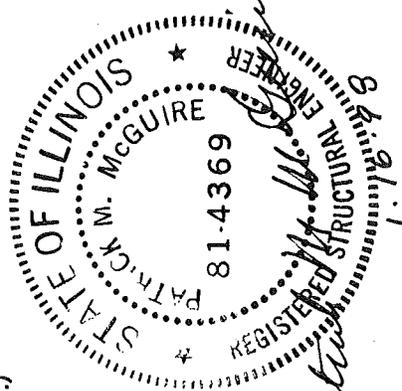


(CONTINUOUS FOUNDATION WALL REQUIRED FOR 40# ROOF LOAD ONLY.)

NOTES:

- #1 - COLUMN SUPPORT TO BE SIZED IN ACCORDANCE WITH TABLE 4.2
- #2 - PIERS MUST EXTEND 6' BEYOND CENTERLINE OF THE FRAME MEMBER.
- #3 - CALCULATIONS BASED ON A SOIL CAPACITY OF 2000 PSF.
- #4 - SUPPORTS REQUIRED FOR ALL OPENINGS OVER 4 FT.

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HART HOUSING

TITLE: TYPICAL PIER LAYOUT FOR 40 LB. ROOF LOAD 1-5-98

FIGURE 4.4

TYPICAL FOUNDATION WALL AND
BASEMENT COLUMN SUPPORT DETAILS.

ADJUST BASEMENT WALL HEIGHT FOR
MIN. CLEARANCE FOR STAIRS (TO BE
SUPPLIED AND SITE INSTALLED PER LOCAL
BUILDING CODE BY OTHERS).

EXTERIOR WALL

MATING WALLS.

LAMINATED MATING BEAMS.

2"x6" TREATED SILL PLATE.

PRE-DRILL 1/4" PILOT HOLE IN
MATING BEAMS AND INSTALL
(4) 3/8" X4" LAG SCREWS AT
EACH COLUMN LOCATION.

ATTACH SUPPORT
COLUMN TO I BEAM
(AT STAIRWELL LOCATION)
WITH (4) 5/16" DIA. BOLTS.

1/2" DIA. ANCHOR BOLTS SPACED 12" FROM CORNERS
& 6'-0" O.C. FIELD. INSTALL 1/2" X15" ANCHOR BOLTS
PER CONCRETE BLOCK WALL OR INSTALL 1/2" X7"
ANCHOR BOLTS PER POURED WALL OR EQUAL
USING STEEL STRAPS EQUIVALENT TO ANCHOR
BOLTS. *(SEE INSET AT UPPER RIGHT).

BITUMINOUS BARRIER
REQUIRED ON EXTERIOR
SIDE OF FOUNDATION
WALL.

8" CONCRETE BLOCK OR
POURED WALL.

BASEMENT COLUMN SUPPORT
3" DIA. SCHEDULE 40 STEEL
PIPE @ 8'-0" O.C.
(REFER TO PIER DIAGRAM).

MIN. 8" X16" FOOTER

3/8" CONTINUOUS
WELD COLUMN TO
PLATE (TYP).

MIN. 4" CONCRETE SLAB OVER
COMPACTED SAND.

CONTINUOUS CRUSHED GRAVEL
OVER CONTINUOUS 4" DRAIN.

MAX. ROOF LOAD 40 PSF.
MAX. FLOOR LOAD 40 PSF.

NOTE:

DETAILS SHOWN ARE TO BE MINIMUM
REQUIREMENTS ONLY. ALL SITE
WORK MUST MEET LOCAL BUILDING CODES.

SIMPSON
MAS
ANCHOR

SIMPSON
MAS
BRACKET

ALTERNATE MUDSILL ANCHORS



36" X36" X16" FOOTER, 2000 PSF MIN. SOIL BEARING
CAPACITY FOR COLUMN SPACING.

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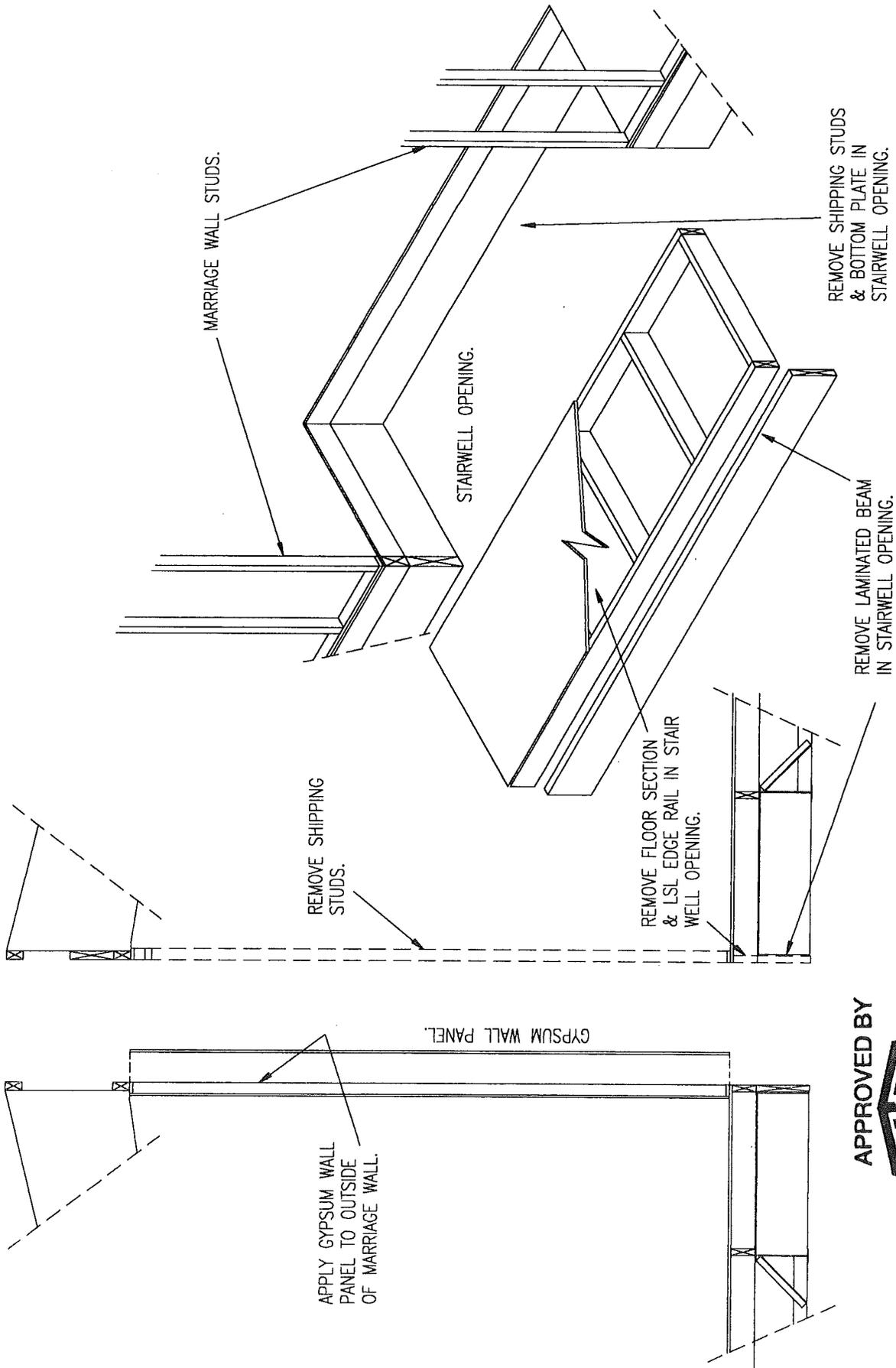


FASTEN COLUMN TO FOOTER WITH
(2) 5/8" X8" ANCHOR BOLTS.
OR EQUAL RATED FOR 1560# TENSION TOTAL.

HART HOUSING
DETAILS FOR BASEMENT WALL & COLUMN SUPPORTS. FIGURE 4.5

NOTE:

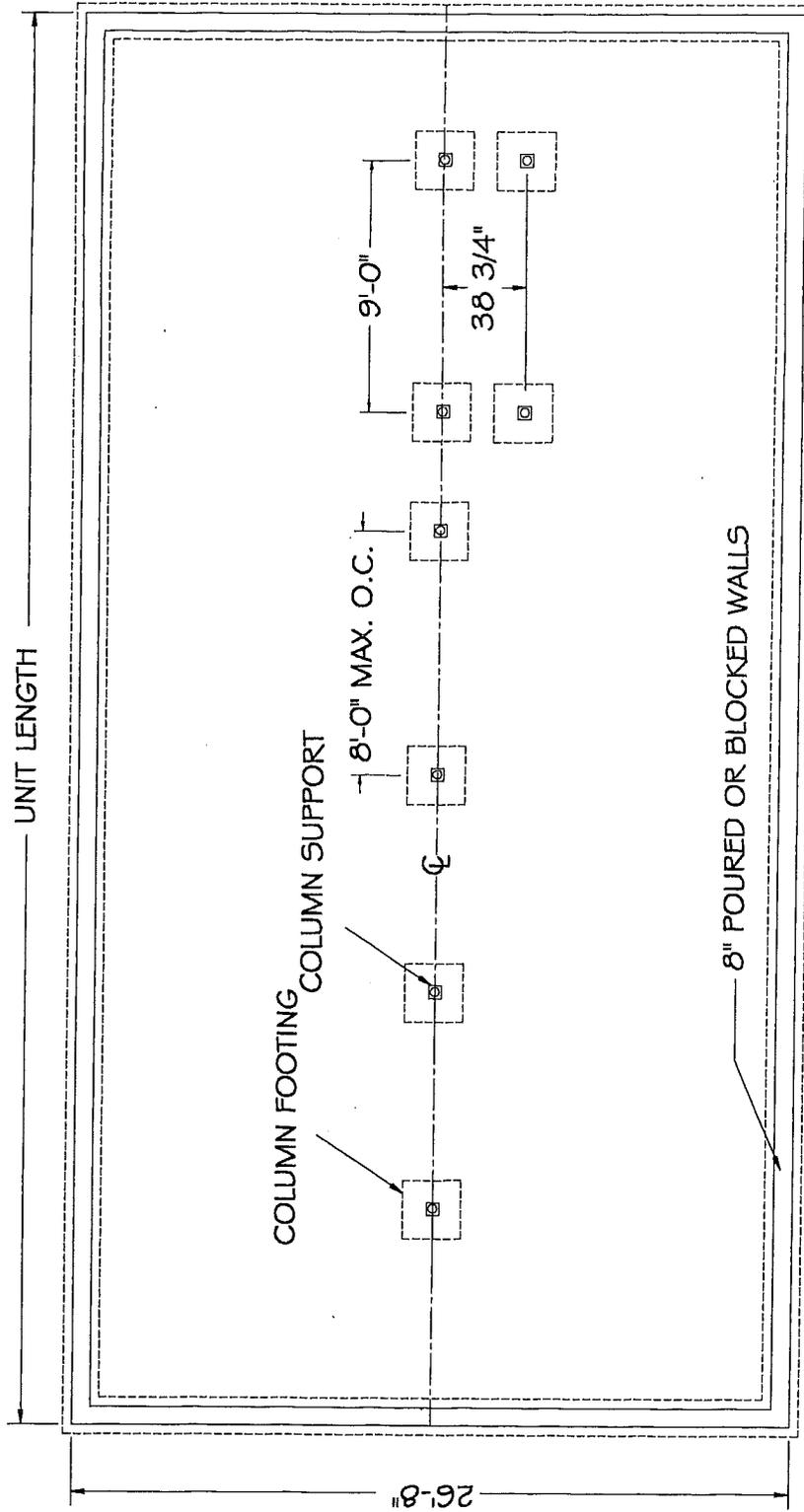
IT IS SUGGESTED THAT THE EDGE RAIL & LAMINATED BEAM BE REMOVED PRIOR TO MATING OF THE UNITS.



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 CONSTRUCTION AND SAFETY STANDARDS

HART HOUSING
 DETAILS FOR BASEMENT SET-UP

FIGURE 4.5 (a)



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 CONSTRUCTION AND SAFETY STANDARDS

HART HOUSING
 BASEMENT PLAN
 FIGURE 4.6

STATE OF ILLINOIS
 PATRICK W. MCGUIRE
 31-4369
 REGISTERED STRUCTURAL ENGINEER
Patrick W. McGuire
 1.16.98

CHAPTER 5 — SETUP PROCEDURES

- 5.1 **Moving home to location.** Make sure the following items are completed before placing the home:
- The site is properly prepared. See Chapter 3.
 - All concrete work necessary to setting the home is finished.
 - Utilities are installed or available.
 - Any trenching, for crossover drain lines or for wheels that will be left in place, is complete.
 - Items that could be difficult to install after the home is sited (such as anchors and ground moisture retarders) are in their proper locations.

CAUTION: THE HOME WEIGHS SEVERAL TONS. USE ADEQUATE TEMPORARY SUPPORT BLOCKING TO SAFEGUARD WORKERS. HART HOUSING RECOMMENDS WOOD BLOCKING.

5.2 **Setup Procedure Instructions**
Please Read Carefully

- 5.2.1 It is important that these instructions and precautions are adhered to closely if you are to enjoy the comfortable, safe and trouble free home that has been designed and built for you. The following four items apply to the set-up of all homes. Each step should be checked off as it is completed. The set-up crew should consist of a minimum of two experienced set-up members.

In following the procedures below for set-up, it is recommended that your home be installed as close as possible to the ground as local codes permit, yet still providing a crawl space for periodic inspection. This may require that wheels and tires be removed and that the ground in the axle hub and drum area be “dug out” so the drums can be set lower.

1. After selecting the foundation system desired, select the footing area and load capacity from the information contained in Chapter 4, Foundations, by relating the information in Chapter 4 to the structural load zone for which your home was designed and will be set up in.
2. If the support foundation or tiedown types selected cannot be installed when the home is in its final position, these portions of the support foundation system must be installed before the home is positioned in its final desired location. For example, ground anchors required for a tiedown system normally must be installed before the home is placed in its final position.
3. Upon delivery of your new home, and before placing in its final position, you should inspect both interior and exterior for possible shipment damage. Any damage should immediately be reported to your dealer.
4. Prior to set-up of your home, the soil beneath the final home location should be prepared as outlined in Chapter 3.

5.2.3 **Multiwide Set-up Procedure: Pier Foundation**

1. Strip plastic and wood braces from both units (weather proof covering and temporary supports). Be sure all exposed nails and staples are removed.
2. Position one-half (usually the heaviest half) of the home in its proper final location.
3. “Rough” level this half of your home as outlined in Steps 2 through 12 of the Single Wide Set-Up Procedures. (See Figure 4.3 for spacing and location of individual support piers.)
4. Place an additional support foundation under the floor rim joist at each ridge beam column location (See Figure 4.3)



5. Once the first half of the home is in place, a strip of sill-seal insulation should be attached per Figure 5.1 to the marriage joint of the first half. The sill-seal insulation will fill any gaps between the two halves of the home and help prevent air infiltration.
6. Position second unit along side the first unit being careful not to jar the first unit. Approximately six inches or less should separate the floors. Bring the two floors together using jacks or similar devices. Draw the floors together tight (at this stage the ceiling will usually be open at the center.)
7. Loosely attach the floors together (See Figure 5.2). Pre-drill holes in the floor rim joist and insert the lag screws. Do not fully tighten.
8. Starting with the inside main beam, rough level the second floor as detailed in the single wide set-up procedure, steps 2 through 11.
9. Close the gap in the center of the ridge beam halves by raising the outside of the second unit. Connect the top of the ridge beam using one of the methods shown in Figure 5.6 It may be necessary to adjust the ceiling joint flush before installing the connections. A jack and tree is used to raise which ever ceiling is low. Start in the front and work through the home to the rear.
10. Tighten the lag screws to securely fasten the floors together.
11. Make a final level adjustment of the home using a standard bubble level or manometer type level. Work from front to rear and side to side to obtain final level conditions throughout the home. Each individual support foundation should be snug and in contact with the home.
12. To finish the roof, install the roll of starter strip along the entire length of the unit and tack in place. The strips are to be overlapped 4" at each seam. Cut the shingles to be used for the ridge cap into (3) sections. Bend the shingle lengthwise so as to have an equal exposure on each half of the ridge. Begin at either end of the ridge and lay the shingle over the top edge and secure on each side with a nail located 11" from the exposed end and 1" up from the edge. Lay the succeeding shingles so as to expose 5".

NOTE! In cold weather, warm the shingles before bending them; field installed shingles and ridge caps must be hand tabbed using an approved tar and sealer.

13. Connect gas line flex connector (crossover) where applicable. (See Figure 8.7)
14. Connect electrical crossovers as required with the material provided. (See Figure 8.12)
15. Connect duct crossover. Flexible crossover must be supported so that it does not rest on the ground. (See Figure 5.8)
16. Connect waste line crossover where applicable.
17. Connect hot and cold water line crossover connectors where applicable.
18. The tiedown system must be connected as discussed in Section 5.3 of these instructions, and in accordance with the instructions of the tiedown and anchor manufacturer.
19. In the event of a slight settlement any time after the initial installation, releveling can be accomplished by following the procedures detailed above for "final" leveling.
20. Install all light shades and light fixtures as needed.
21. After connection of utilities is complete test utility systems (electrical, water, drain lines and gas lines, as applicable) as detailed in Chapter 8.



22. Install the ridge beam molding (or finish) over the center joint in the ceiling.
23. Install carpet, carpet padding and molding where applicable.
24. Check and adjust the entire home for items which may have become misaligned in transit or during set up, such as the following:
 - a. Adjust passage doors to close easily with proper alignment.
 - b. Realign cabinet doors.
 - c. Adjust drawers to open and close easily.
 - d. Adjust closet doors, aligned and square with walls.
 - e. Adjust exterior doors to close easily and be square with frame, and to lock and unlock easily.
 - f. Adjust all windows to open and shut easily.
 - g. Adjust drapes to operate easily and completely close.
 - h. Recaulk over the top of all windows and doors and other seams as necessary.
 - i. Retack any loose moldings, panel connections, and trim.
 - j. Retighten "p" trap fittings.
25. On some fireplaces and furnaces it may have been necessary to ship loose appliance vent piping to assure the pipe's safe transportation to the final site. Check all appliances to confirm that all venting is installed per the appliance installation instructions. See Chapter 7.
26. Install and/or connect all other parts and items shipped loose with the home.
27. Conduct final clean-up operation in the home.
28. Your HART HOUSING Multi-Section Home is ready for occupancy.

5.3.1 **Anchoring Instructions.** After blocking and leveling, the installer must secure the home against the wind.

5.3.1.1 **Number of location of anchors.** Select the amount of anchors required based on 14' max spacing between the tie downs. See Figure 5.0. Use only listed and approved ground anchors capable of resisting at least the minimum loads indicated.

5.3.1.2 **Installation of anchors.** Install the anchors at the locations selected, following the anchor manufacturer's instructions. Install double head anchors at each location except for the four(4) vertical anchors at each end, for shear wall tie down. (See Figure 5.0.2) Also single head anchors are required at all openings, in the mating wall, over four feet. (See Figure 5.0.1) Line up the angle brackets (shipped loose in the home) with the ground anchors and secure to rim joist with (2) 5/16" x 3" full thread lag screws also provided. (See Figure 5.0.3) Repeat this procedure for the angle brackets required at the mating wall.

5.3.1.3 **Strap Tensioning.** If your home is releveled at some date after the initial tensioning of the anchoring straps, the straps must be retensioned as specified in the anchor manufacturer's installation instructions. Check straps periodically to assure proper tension.

5.3.3 **Severe climatic conditions**

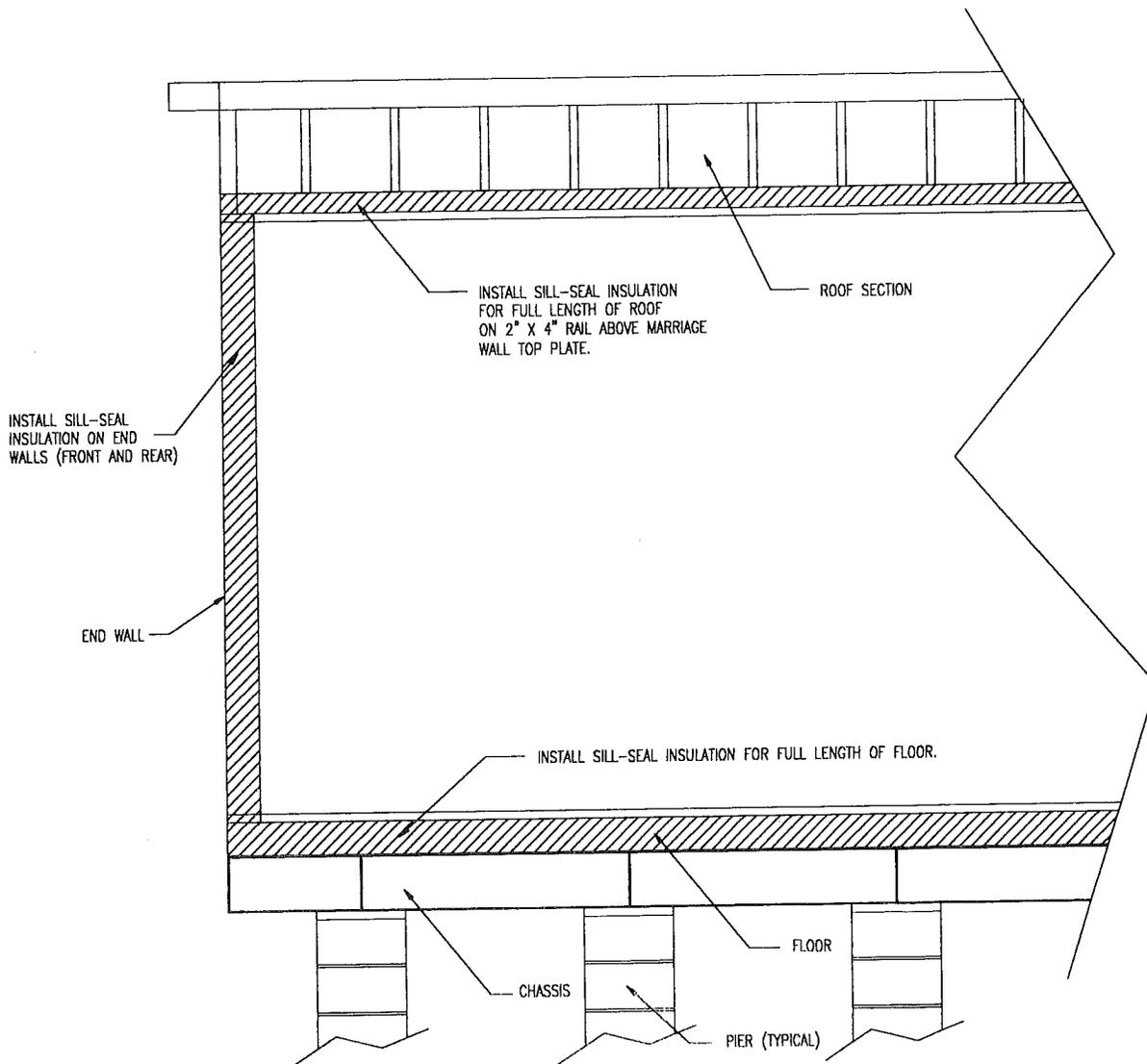
5.3.3.1 **Freezing Climates.** Be sure anchor augers are installed below the frost line. During periods of frost heave, be prepared to adjust tension on the straps to take up slack.

5.3.3.2 **Severe wind zones.** HART HOUSING does not recommend installing your home in an area known to experience severe winds, or in any zone that requires greater wind-resisting capabilities than those for which it was designed (See data plate).



- 5.3.3.3 **Flood-prone areas.** HART HOUSING does not recommend setting manufactured homes in flood-prone areas. Unconventional anchorage and tie-down often are needed in designing and constructing the special elevated foundations that may be required in flood-prone areas. Consult a registered professional or structural engineer.
- 5.4 **Installation of on-site attached structures.** Design all attached buildings and structures to support all of their own live and dead loads, and to have fire separation as required by state or local ordinances.
- 5.4.1 **Attached garages.** Attached garages must be installed according to all applicable local codes. They must be supported independently of the factory-built portion of the home. Electrical circuits in garages should be provided with ground fault interruption.
- 5.4.2 **Porches.** Site-constructed porches must be constructed and inspected according to applicable local building codes.
- 5.4.3 **Steps, stairways and landings.** Steps, stairways and landings must be constructed and inspected according to applicable local building codes.
- 5.5 **Skirting.** Skirting installed around the home must have nonclosing vents located at or near each corner and as high as possible to cross-ventilate the entire space under the home. Vent free area must be equal to at least one square foot for every 150 square feet of the home's floor area, and this area must be further increased when insect screens, slats, etc. are used over the open vent area. In freezing climates, install skirting so as to accommodate 1-2 inches of frost heave uplift to prevent buckling of floors. Take care that rainwater cannot be channeled or trapped between the skirting and siding.
- 5.6 Due to varying soil conditions which may exist on your homesite, some initial settling may occur. It is recommended that your home be releveled after 90 days of initial set up and checked periodically.





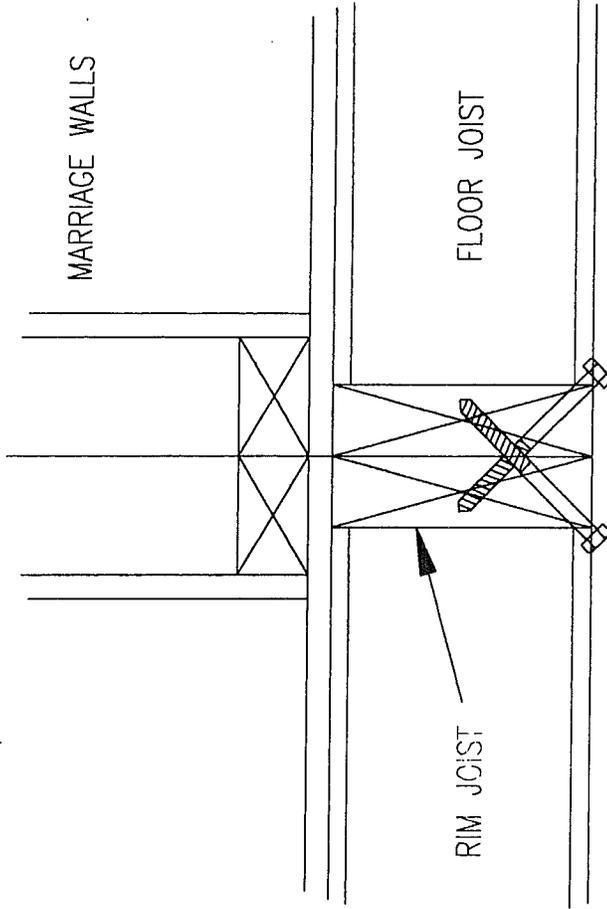
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AFTER THE FIRST SECTION OF HOME IS IN PLACE, A STRIP OF SILL-SEAL INSULATION SHOULD BE INSTALLED PER THE DETAIL ABOVE. THIS SILL-SEAL INSULATION WILL FILL ANY GAPS BETWEEN THE TWO SECTIONS OF THE HOME AND ASSIST IN PREVENTING AIR INFILTRATION AND HEAT LOSS OR GAIN.

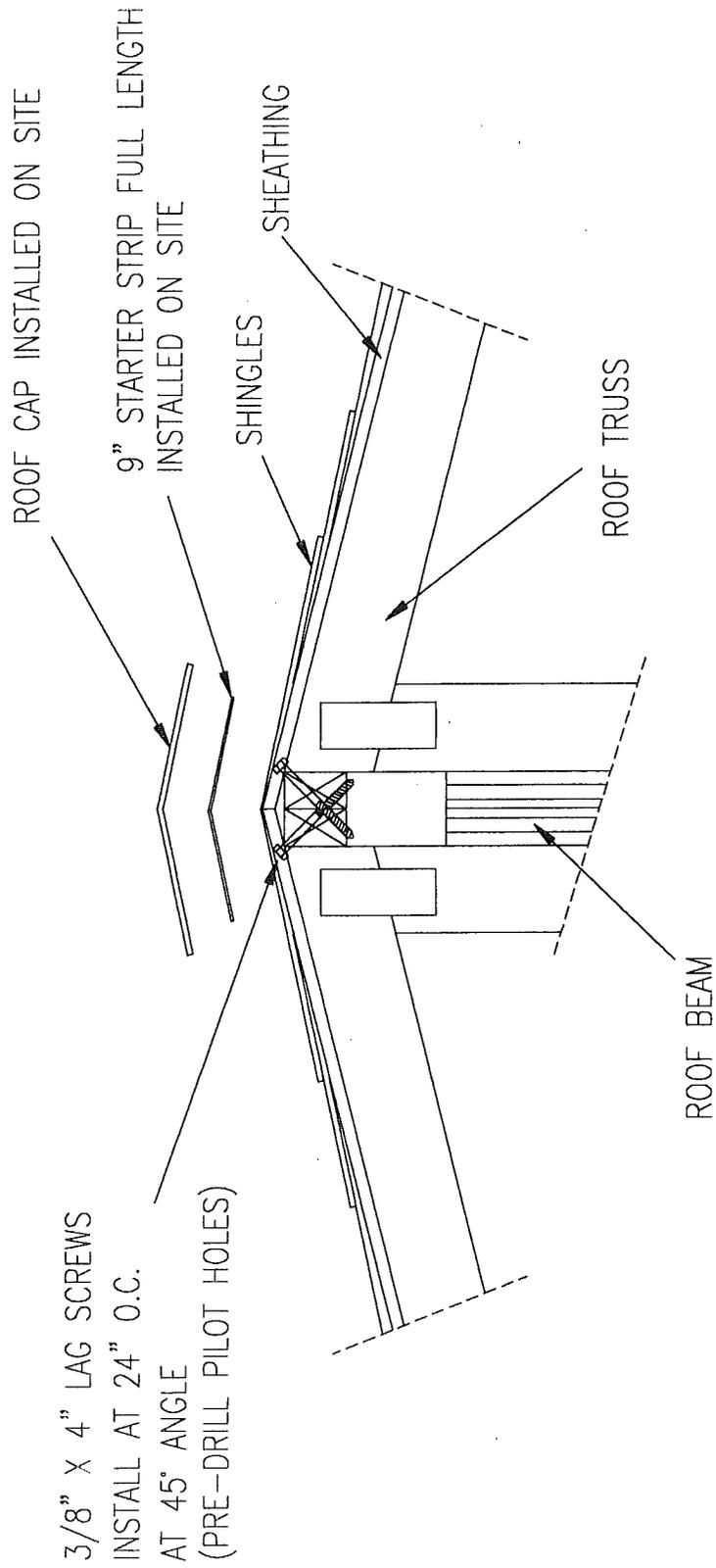
MARRIAGE LINE INFILTRATION BARRIER

FIGURE 5.1



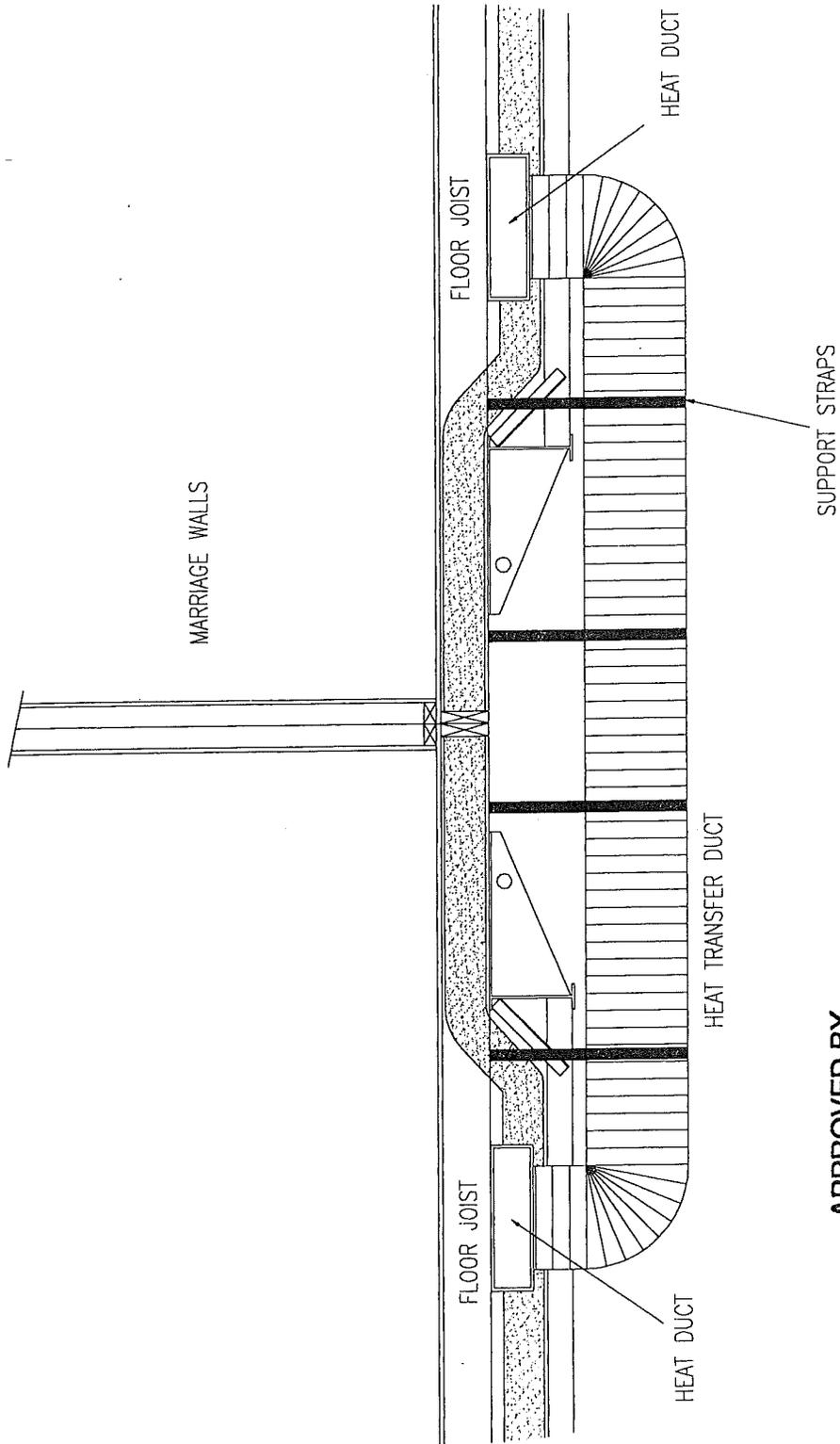
1/2" X 4" LAG SCREWS AT 2'-6" O.C.
 FIELD INSTALLED (AT 45° ANGLE)
 IN PREDRILLED 1/4" PILOT HOLES



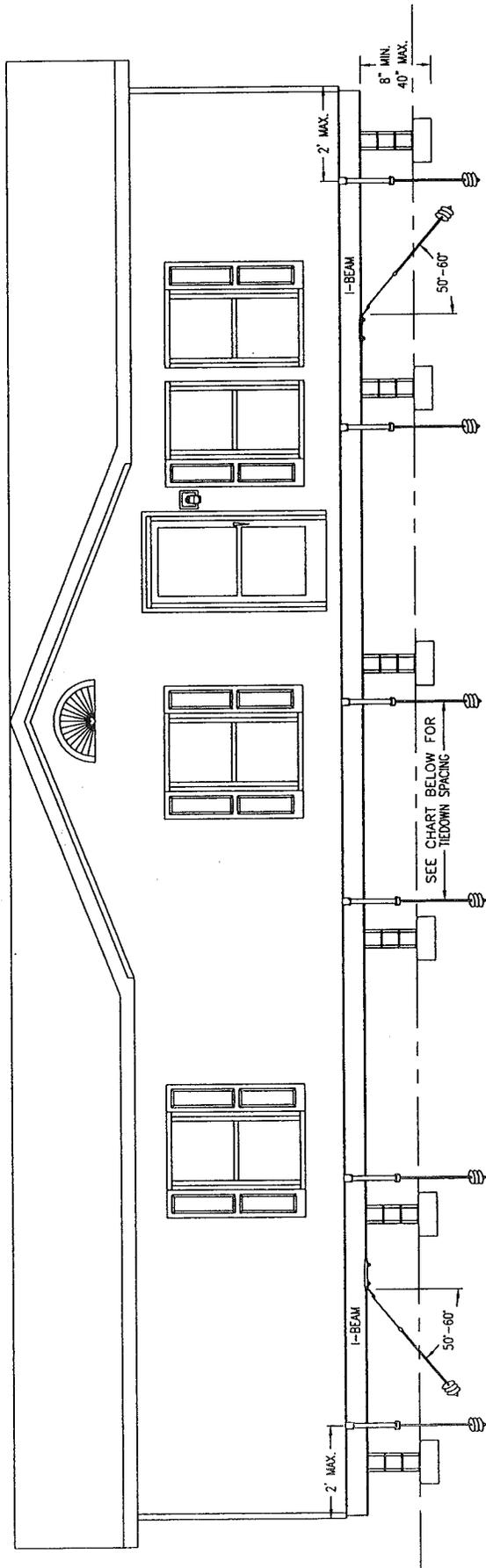


ROOF MARRIAGE CONNECTION

FIGURE 5.6



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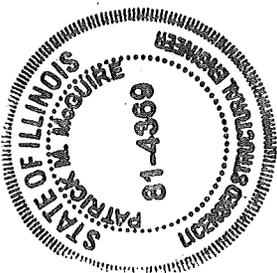
TYPICAL SIDE ELEVATION
SHOWING TIEDOWN LOCATIONS
WIND ZONE - 1

NOTES:

1. Use this sheet for TIEDOWN information only. Pier construction shall be as specified elsewhere in this manual.
2. Refer to the Data Plate installed in the home to determine which wind zone the home has been designed for. Space TIEDOWNS for this zone as the charts specify.
3. Ground anchors and frame ties shall be certified by a Professional Engineer, registered Architect, or nationally recognized testing agency, as capable of resisting ultimate tension loads of 3150 lbs. for straps and 6000 lbs. for anchors when tested in accordance with ASTM D3593-91.
4. Ground anchors and frame ties shall be installed in accordance with manufacturer's instructions, and shall be appropriate for the soil conditions at the home site.
5. Ground anchors shall be embedded below the maximum frost penetration depth and 12" above the water table. Ground anchors shall be installed to their full depth and stabilizer plates shall be installed to provide added resistance to overturning and/or sliding.
6. Vertical and diagonal frame ties may be installed to the same ground anchor by using the equipment and installation methods specified by the anchor manufacturer.
7. Any foundation or TIEDOWN system not in accordance with this manual shall be designed and certified by a licensed Professional Engineer familiar with local conditions.
8. Steel anchoring equipment exposed to the weather shall be protected with a coating of at least .3 ounces of zinc per square foot, or equivalent.
9. Four longitudinal tie downs are required at each end. Tie down straps to be attached to main I-beam using a Vector gator beam clamp #59011 or equal.

UNIT WIDTH	MAXIMUM SPACING
13'-4"	14'-0"
15'-0"	10'-6"

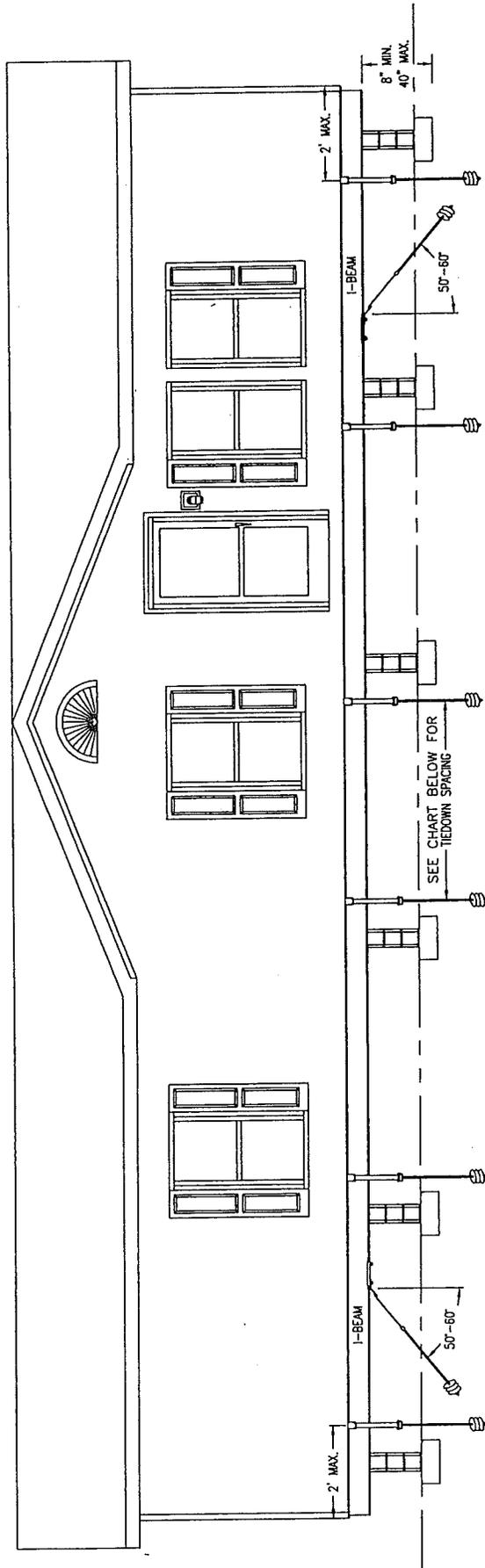
NOTE:
ALL HOMES WITH A 5/12 ROOF PITCH
SHALL NOT EXCEED 5'-0" SPACING.



HART HOUSING
Robert M. M. Linn 6-5-06

STANDARD PIER CONFIGURATION
& TIE-DOWN PLACEMENT

FIGURE 5.0



TYPICAL SIDE ELEVATION
SHOWING TIEDOWN LOCATIONS
WIND ZONE - III

NOTES:

1. Use this sheet for TIEDOWN information only. Pier construction shall be as specified elsewhere in this manual.
2. Refer to the Data Plate installed in the home to determine which wind zone the home has been designed for. Space TIEDOWNS for this zone as the charts specify.
3. Ground anchors and frame ties shall be certified by a Professional Engineer, registered Architect, or nationally recognized testing agency, as capable of resisting ultimate tension loads of 3150 lbs. for straps and 6000 lbs. for anchors when tested in accordance with ASTM D3593-91.
4. Ground anchors and frame ties shall be installed in accordance with manufacturer's instructions, and shall be appropriate for the soil conditions at the home site.
5. Ground anchors shall be embedded below the maximum frost penetration depth and 12" above the water table. Ground anchors shall be installed to their full depth and stabilizer plates shall be installed to provide added resistance to overturning and/or sliding.
6. Vertical and diagonal frame ties may be installed to the same ground anchor by using the equipment and installation methods specified by the anchor manufacturer.
7. Any foundation or TIEDOWN system not in accordance with this manual shall be designed and certified by a licensed Professional Engineer familiar with local conditions.
8. Steel anchoring equipment exposed to the weather shall be protected with a coating of at least .3 ounces of zinc per square foot, or equivalent.
9. Four longitudinal tie downs are required at each end. Tie down straps to be attached to main I-beam using a Vector gator beam clamp #59011 or equal.

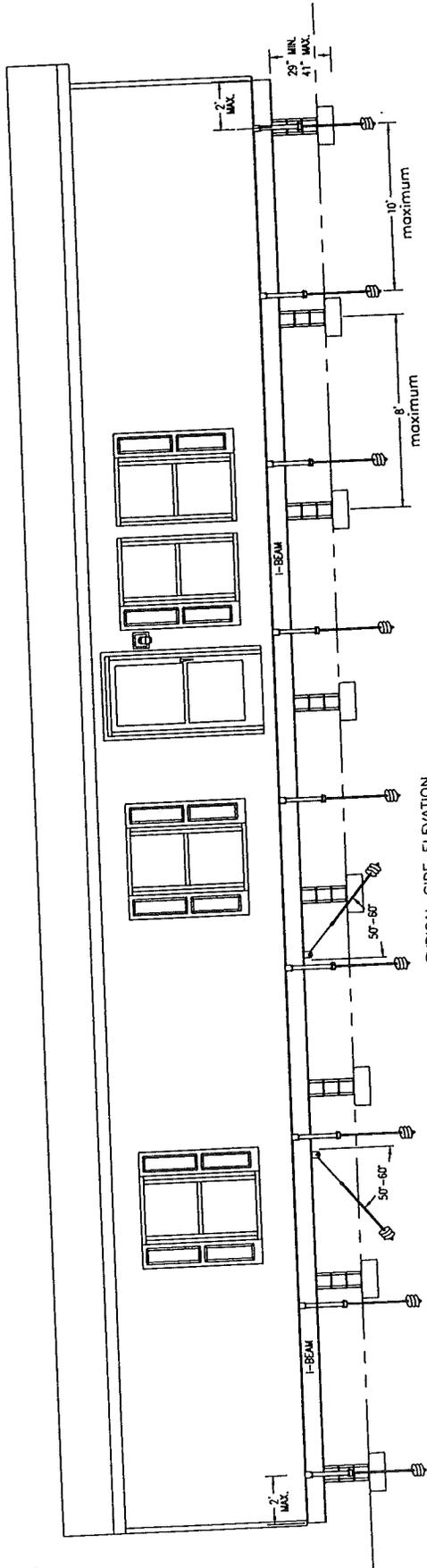
UNIT WIDTH	MAXIMUM SPACING
13'-4"	6'-6"



HART HOUSING
Patrick M. McGinnis 6-5-06

STANDARD PIER CONFIGURATION
& TIE-DOWN PLACEMENT

FIGURE 5.0.4

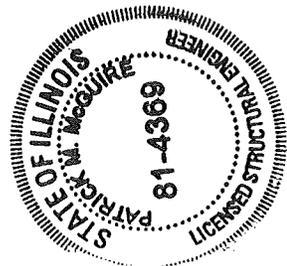


TYPICAL SIDE ELEVATION
SHOWING TIEDOWN LOCATIONS
WIND ZONE - 1

NOTES:

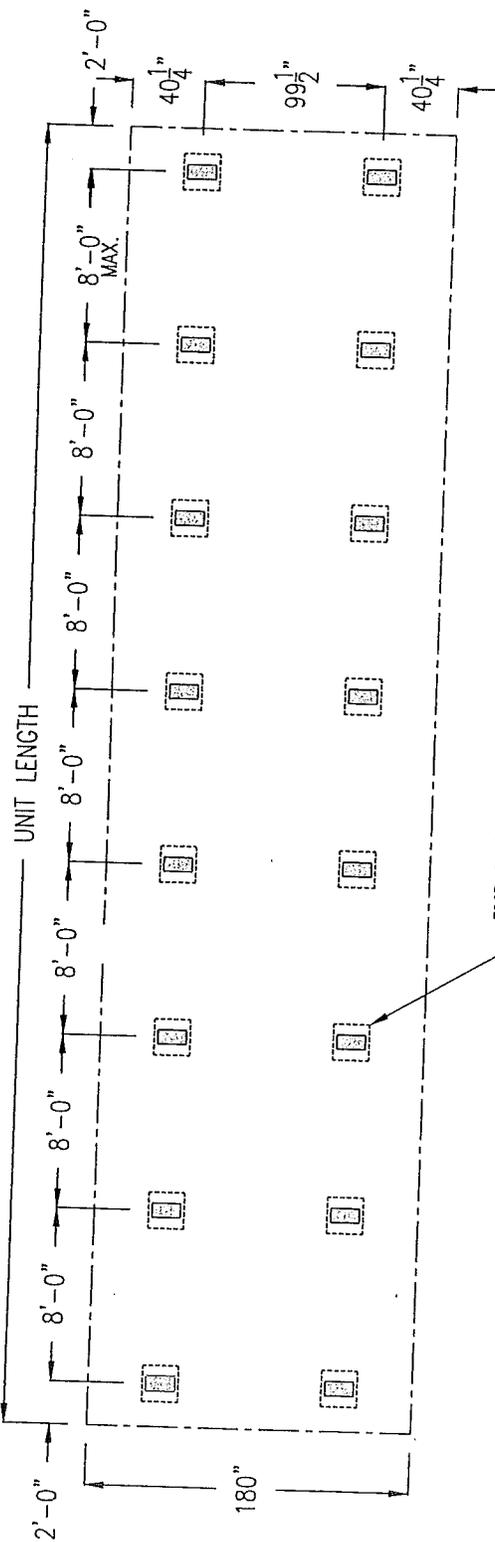
1. Use this sheet for TIEDOWN information only. Pier construction shall be as specified elsewhere in this manual.
2. Refer to the Data Plate installed in the home to determine which wind zone the home has been designed for. Space TIEDOWNS for this zone as specified.
3. Ground anchors and frame ties shall be certified by a Professional Engineer, registered Architect, or nationally recognized testing agency, as capable of resisting ultimate tension loads of 3150 lbs. for straps and 6000 lbs. for anchors when tested in accordance with ASTM D3593-91.
4. Ground anchors and frame ties shall be installed in accordance with manufacturer's instructions, and shall be appropriate for the soil conditions at the home site.
5. Ground anchors shall be embedded below the maximum frost penetration depth and 12" above the water table. Ground anchors shall be installed to their full depth and stabilizer plates shall be installed to provide added resistance to overturning and/or sliding.
6. Vertical and diagonal frame ties may be installed to the same ground anchor by using the equipment and installation methods specified by the anchor manufacturer.
7. Any foundation or TIEDOWN system not in accordance with this manual shall be designed and certified by a licensed Professional Engineer familiar with local conditions.
8. Steel anchoring equipment exposed to the weather shall be protected with a coating of at least .3 ounces of zinc per square foot, or equivalent.
9. Two longitudinal tie downs are required at each end. Tie down straps to be attached to main I-beam using the front and rear spring hanger and bolt in the axle area.

UNIT WIDTH	MAXIMUM SPACING
15'-0"	10'-0"
13'-8"	10'-0"

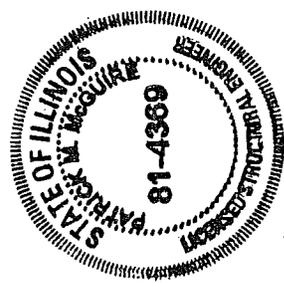


STANDARD PIER CONFIGURATION
& TIE-DOWN PLACEMENT
05-30-06

HART HOUSING
D-1 in MI - Green 6-5-06



FOOTING SIZES TO BE 20" X 20" X 7" DEEP WITH SINGLE 8" X 8" X 16" BLOCK PIERS ORIENTED LONG SIDE PERPENDICULAR TO LENGTH OF HOME AS SHOWN.



HART HOUSING
Patrick M. McGuire 6-5-06

THIS PIER PLAN TYPICAL FOR 30# ROOF LOAD FOR 1' BEAM SPACINGS OF 99 1/2" O.C.

PIER PLAN - SINGLE-SECTION

09-26-05

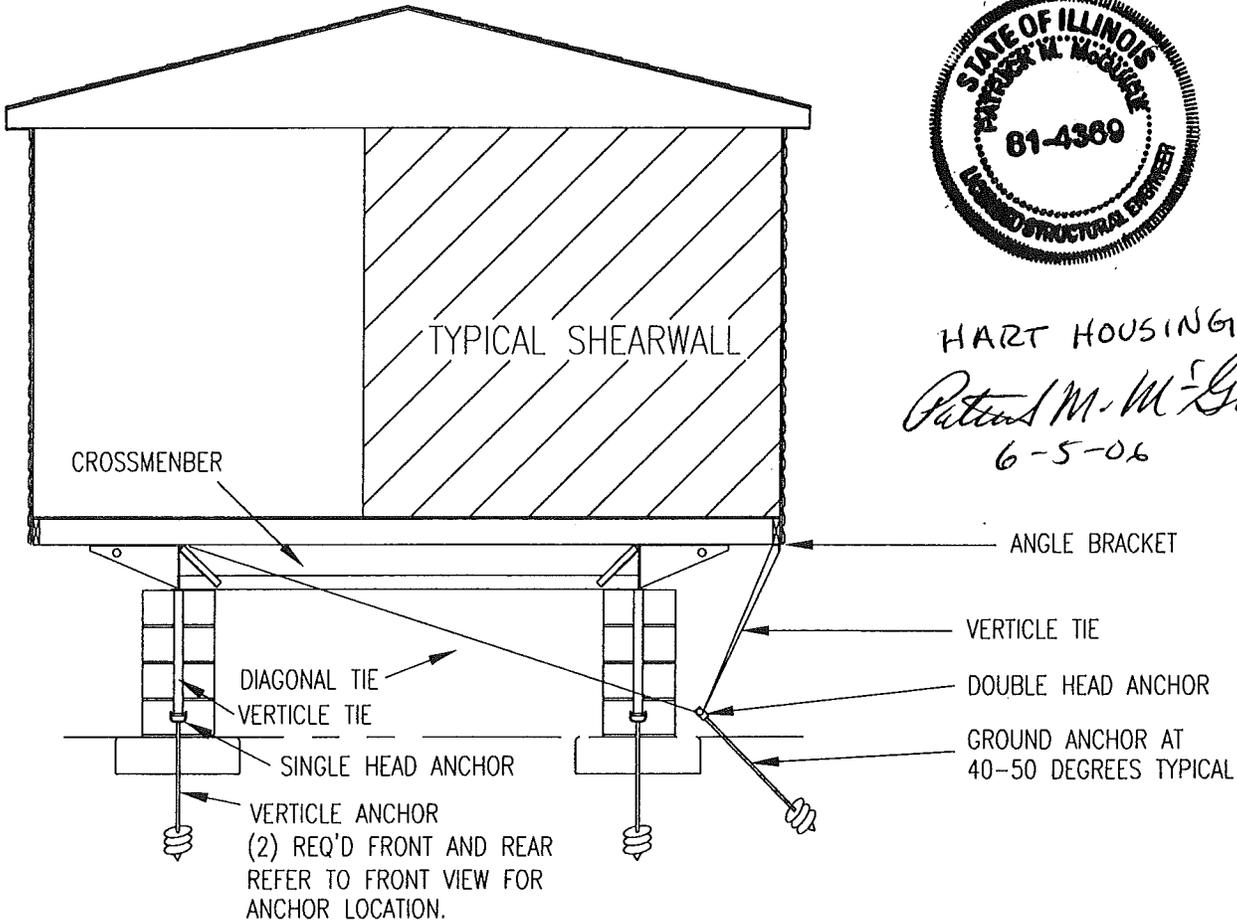
NOTES:

1. THE FOUNDATION PLAN SHOWN IS GENERAL AND FURNISHED ONLY TO DEMONSTRATE THE PROPER LOCATION OF PIERS OR OTHER SUPPORT DEVICES. TITLED "TYPICAL CONCRETE BLOCK PIERS" DETAILS TYPICAL PIER CONSTRUCTION TO BE USED UNDER NORMAL CONDITIONS. WHEN ADVERSE CONDITIONS OCCUR SUCH AS REGULATORY FLOOD PLAINS, COASTAL HIGH HAZARD AREAS, OCEAN HAZARD AREAS OF QUESTIONABLE SOIL CONDITIONS, THE SUPPORT MUST BE DESIGNED BY A LOCAL QUALIFIED REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT. IN ALL CASES THE SUPPORT SYSTEM SHALL BE SUBJECT TO REVIEW AND APPROVED BY LOCAL BUILDING OFFICIALS.
2. STABILIZING ANCHOR EQUIPMENT SHALL BE CAPABLE OF RESISTING AN ALLOWABLE WORKING LOAD OF 3150 LBS. AND SHALL BE CAPABLE OF WITH STANDING A 50% OVERLOAD (4725 LBS. TOTAL).
3. THE STABILIZING SYSTEM IS DESIGNED TO USE DIAGONAL FRAME TIES ONLY. OVER THE ROOF TIES ARE NOT REQUIRED.
4. DISTANCE BETWEEN INTERMEDIATE TIE-DOWNS SHALL NOT EXCEED 7 FT. O.C. SO THAT THE BOTTOM OF THE MAIN FRAME MEMBERS ARE MORE THAN 3 FT ABOVE GROUND LEVEL. THE STABILIZING SYSTEM SHALL BE DESIGNED BY A LOCAL QUALIFIED REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT. IN ALL CASES THE STABILIZING SYSTEM MAY BE SUBJECT TO REVIEW AND APPROVAL BY LOCAL BUILDING OFFICIALS.
6. MINIMUM SOIL BEARING CAPACITY 2000 PSF.
7. SEE TIE-DOWN SECTION FOR LOCATION & METHOD.
8. CONSULT LOCAL PROFESSIONAL ENGINEER FOR APPROVED DESIGN IF ANY DEVIATIONS TO THESE INSTRUCTIONS ARE INCURRED.
9. PIERS SHALL BE LOCATED AT EACH SIDE OF EACH EXTERIOR DOOR AND ADDITIONAL PIERS SHALL BE REQUIRED AT EACH SIDE OF OPENINGS 4 FEET OR WIDER. THIS WILL INCLUDE DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC.

MAXIMUM ROOF SLOPE
LESS THAN 20 DEGREES.



HART HOUSING
Patrick M. McGuire
6-5-06



NOTES:

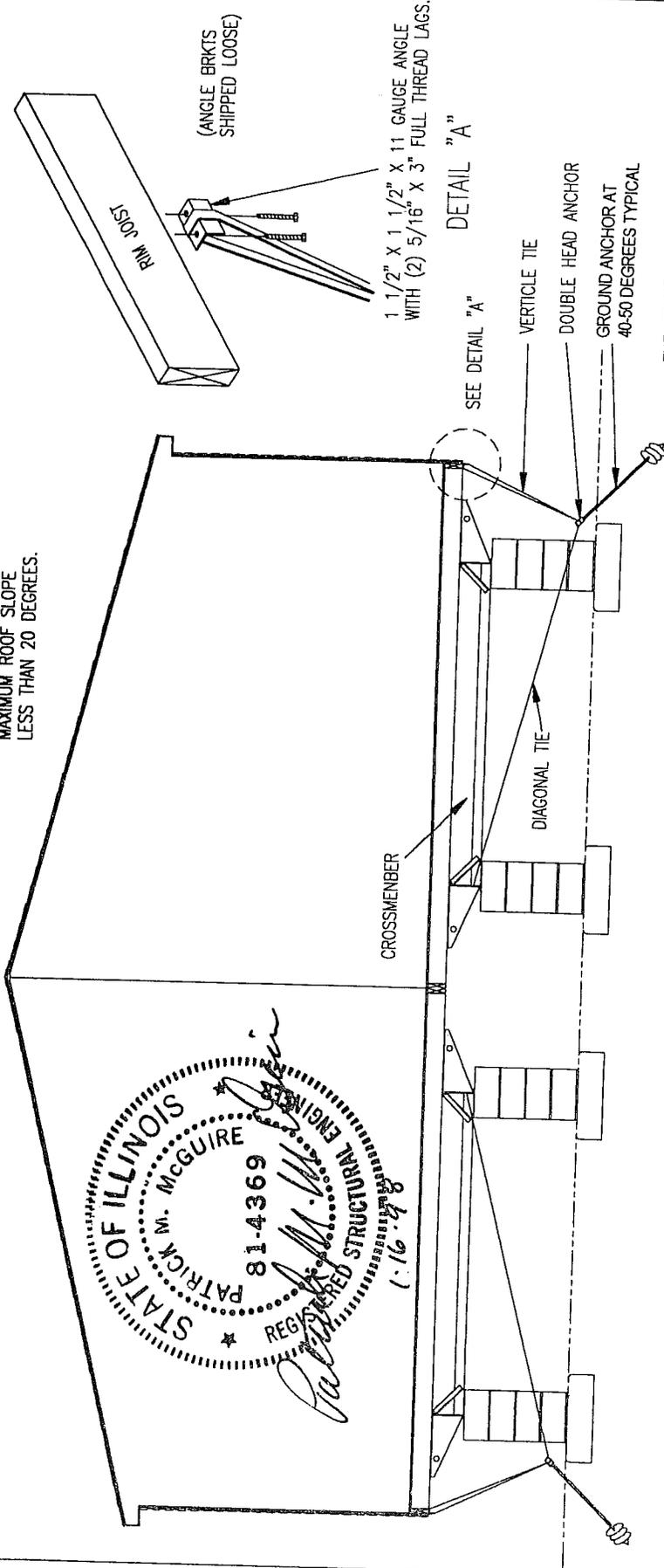
TIE-DOWNS REQUIRED AS SHOWN WITHIN TWO FEET OF EACH END OF EACH HALF.

TIE-DOWN ANCHORS INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND RATED FOR 3150 LBS. ALLOWABLE TENSION.

STABILIZER PLATES SHALL BE INSTALLED AS SPECIFIED BY THE ANCHOR MANUFACTURER.

VERTICAL ANCHOR
WIND ZONE I
04-25-06

MAXIMUM ROOF SLOPE
LESS THAN 20 DEGREES.



THE FRAME TIES AND GROUND ANCHOR HEAD SHALL NOT EXTEND BEYOND THE WALL LINE OF THE HOUSE.

TIE-DOWN ANCHORS INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND RATED FOR 3150 LBS. ALLOWABLE TENSION. STABILIZER PLATES SHALL BE INSTALLED AS SPECIFIED BY THE ANCHOR MANUFACTURER.

HOUSE SPECIFICATIONS:

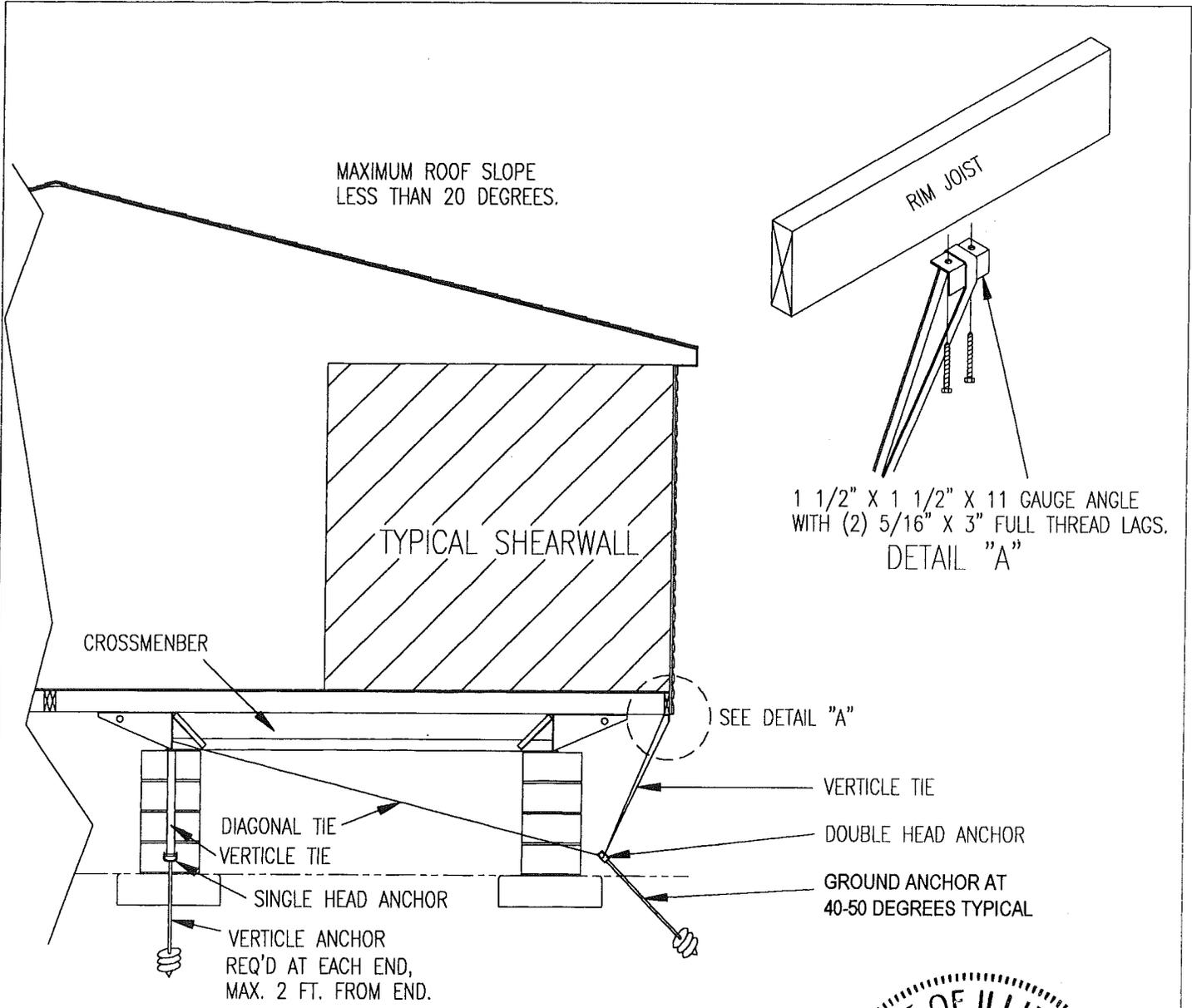
HOME WIDTH - 160 INCHES, EACH HALF.
SIDE OVERHANG - 12 INCHES MAX.
I-BEAM SPACING - 99 1/2 INCHES O.C.
SIDEWALL HEIGHT - 84 INCHES.
WIND ZONE ONE.
MAX. O.C. TIE-DOWN SPACING - 14'-0".

NOTES:

1. DISTANCE BETWEEN SHEARWALLS NOT TO EXCEED 76'-0"
2. ANCHOR CAPACITY SHALL BE CERTIFIED BY THE MANUFACTURER.
3. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
4. DOUBLE HEAD ANCHORS REQUIRED WITH DOUBLE STRAPS.
5. 4000LB. MINIMUM ANCHOR CAPACITY REQUIRED UNLESS OTHERWISE NOTED.

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FEDERAL MANUFACTURED HOME
CONSTRUCTION AND SAFETY STANDARDS

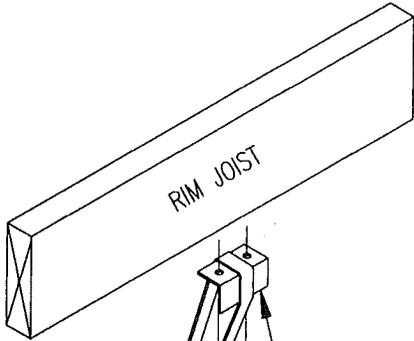
TYPICAL CROSS SECTION TIE-DOWN DESIGNS FIGURE 5.0.3



MAXIMUM ROOF SLOPE
LESS THAN 20 DEGREES.

TYPICAL SHEARWALL

CROSSMEMBER



1 1/2" X 1 1/2" X 11 GAUGE ANGLE
WITH (2) 5/16" X 3" FULL THREAD LAGS.
DETAIL "A"

SEE DETAIL "A"

VERTICLE TIE
DOUBLE HEAD ANCHOR
GROUND ANCHOR AT
40-50 DEGREES TYPICAL

DIAGONAL TIE
VERTICLE TIE
SINGLE HEAD ANCHOR
VERTICLE ANCHOR
REQ'D AT EACH END,
MAX. 2 FT. FROM END.



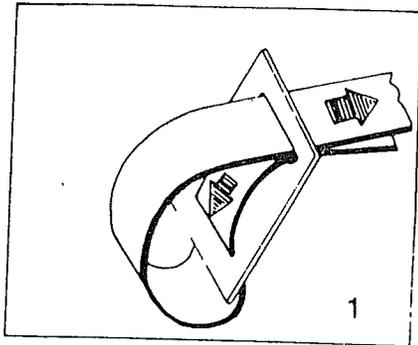
NOTES:
TIE-DOWNS REQUIRED AS SHOWN WITHIN
TWO FEET OF EACH END OF EACH HALF.
TIE-DOWN ANCHORS INSTALLED PER
MANUFACTURER'S INSTRUCTIONS AND
RATED FOR 3150 LBS. ALLOWABLE TENSION.
STABILIZER PLATES SHALL BE
INSTALLED AS SPECIFIED BY
THE ANCHOR MANUFACTURER.



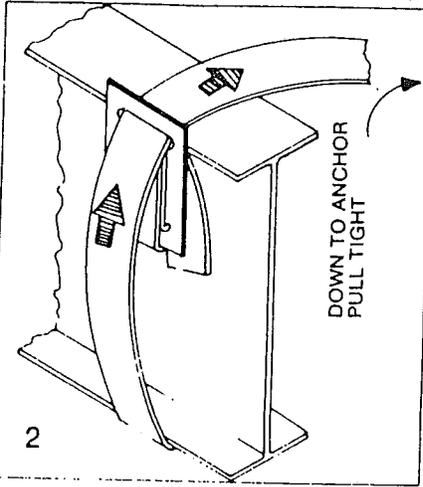
TYPICAL SHEAR WALL TIE-DOWN DESIGN FIGURE 5.0.2

POSITIONING FRAME TIE (WITH DOUBLE-SLOT BUCKLE)

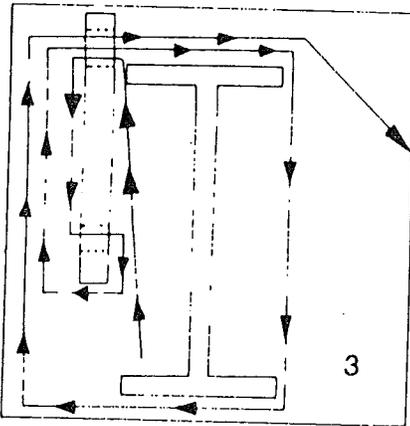
FRAME TIE INSTALLATION INSTRUCTIONS



1



2



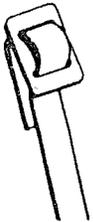
3

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.

APPROVED BY



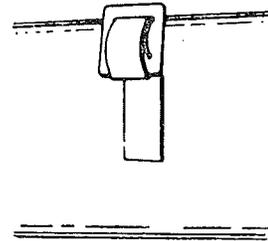
1. See step one in installation instructions.



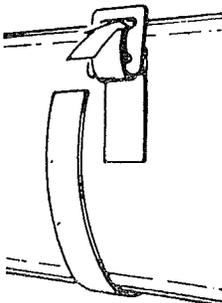
2. Insert strap in position through buckle.



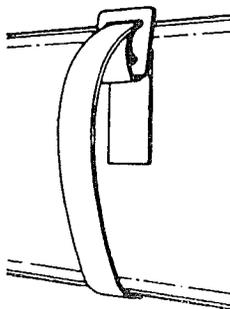
3. Strap should be through buckle in this configuration before installation on frame.



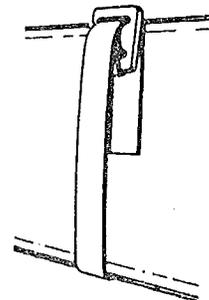
4. Strap should be passed over frame from inside, and buckle pulled into position as shown.



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.

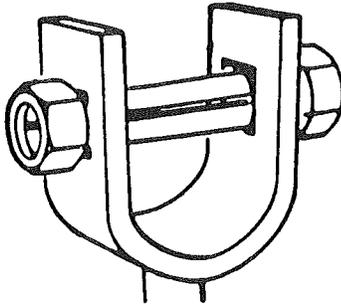


7. Inside of frame tie, properly installed.

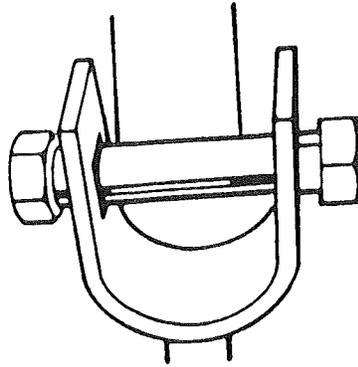
PROPER TENSIONING OF STRAP TO ANCHOR HEAD

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

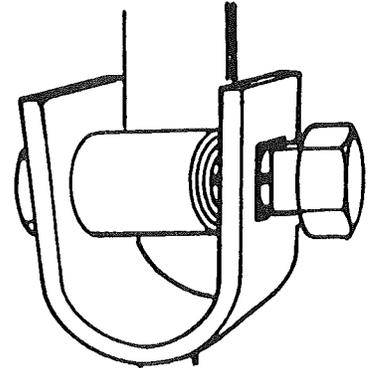
Notice: In areas of severe cold weather where possible damage could occur from frost heave, the homeowner should release some of the tension from the vertical tie each fall.



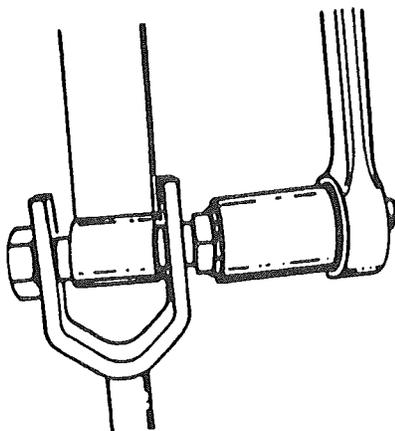
1. Insert bolt into head; attach nut loosely.



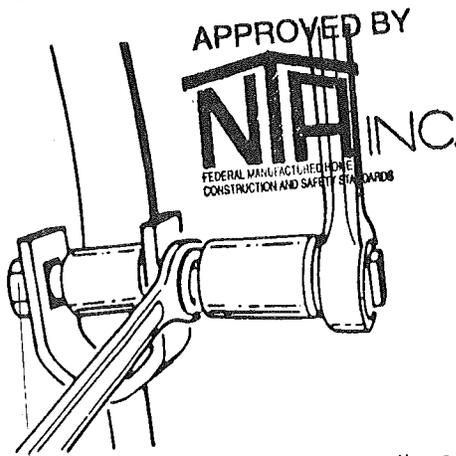
2. Insert strap in slot of bolt 5/8", or until strap is flush with far side of bolt.



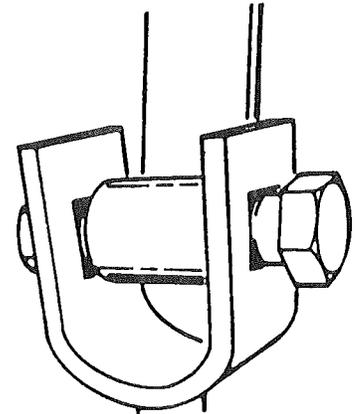
3. Bend strap 90° and take at least two complete turns on bolt until strap is taut.



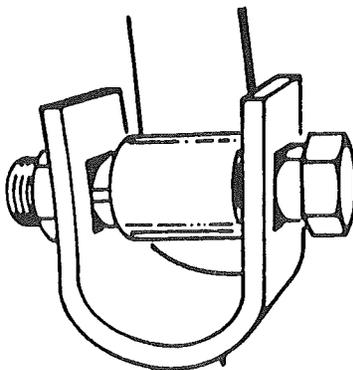
4. Bolt is turned with 15/16" socket wrench, or adjustable wrench, on hex head.



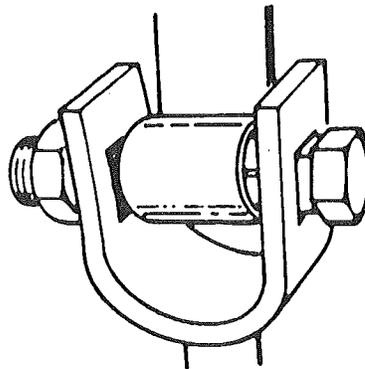
5. To hold bolt under tension while re-positioning wrench, an open-end wrench is placed on 5/8" square shoulders of bolt.



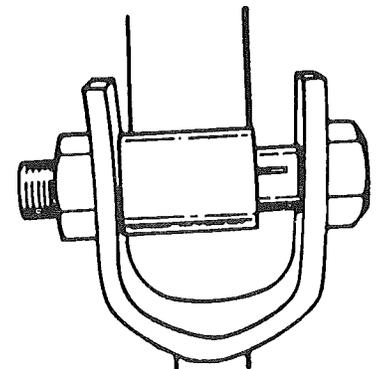
6. Align square shoulders of bolt with square hole in anchor head.



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.



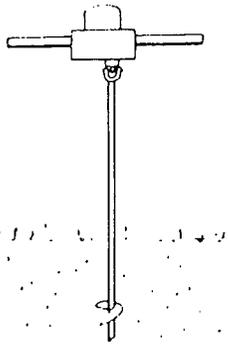
9. Tensioning device is now in locked, secure position.

For clarity, tools not shown on most photos above.

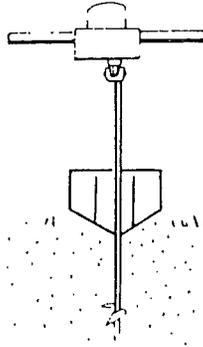
MINUTE MAN ANCHORS, INC.

INSTRUCTIONS FOR USING MINUTE MAN STABILIZING DEVICE

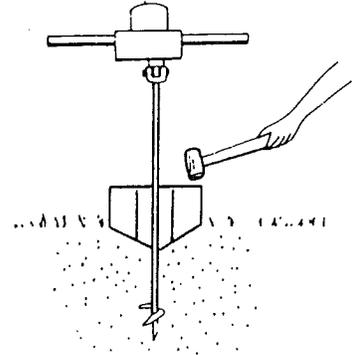
Minute Man stabilizing devices are designed for use with Minute Man anchors and intended to restrict movement of the anchor laterally through the soil.



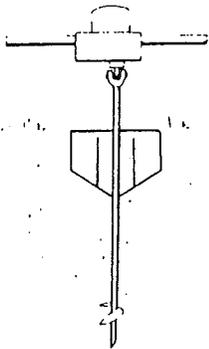
1 Install the anchor into the ground leaving 12"-18" of the shaft exposed



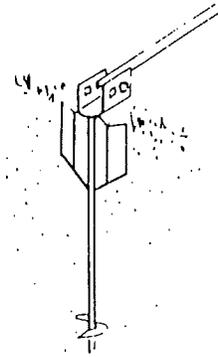
2 Place the stabilizing device next to the shaft in the direction of pull



3 Drive the stabilizing device into the ground.



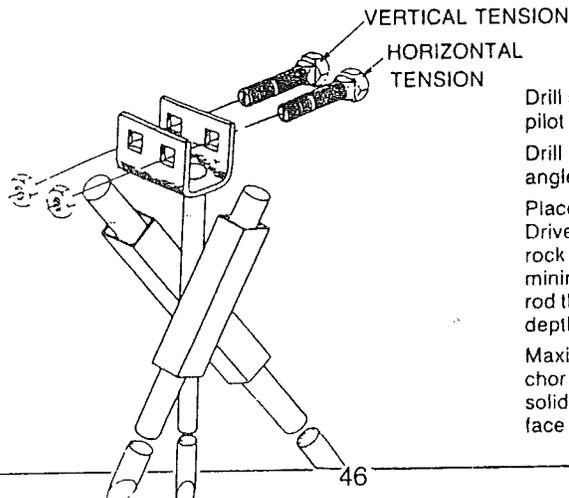
4 The anchor is then turned in the rest of the way into the soil until the head of the anchor is flush with the stabilizing device



5 As the frame tie is tightened the anchor will be snugged against the stabilizing device for safe, secure protection against lateral movement.



Installation Instructions for Cross Drive Rock Anchor



INSTALLATION INSTRUCTIONS

Drill 5/8" diameter hole 5 1/2" deep for pilot stud. Insert pilot stud into hole.

Drill 2 - 3/4" diameter holes in rock at 45 degree angles, using anchor head as a locating guide.

Place rod through top of (1) square tube and into hole. Drive rod to desired depth. (Rod must be driven into rock at least 80% of its length in order to achieve minimum allowable pullout resistance.) Place second rod through top of remaining tube. Drive rod to desired depth to lock.

Maximum pullout resistance is developed when anchor head is low as possible and ground surface is solid rock. Distance from square tubing to rock surface should not exceed 1".

E-Z Anchor Installation Methods

There are two basic methods for installing the E-Z Anchor. Each method equally effective. The two methods are: (1) Machine Installation (2) Manual Installation.

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

1. Machine Installation

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

For the E-Z Anchor/Stablizer to achieve full potential, install the anchor vertically with no deviation greater than 10 degrees. See Figure A. Note: a slightly greater angle may be used to start anchor to avoid contact with the home and straightened as anchor is ground set. The split-bolt is inserted, strap fastened, and tightening adjustment made.

2. Manual Installation

Manual installation can be achieved by placing a rod long enough for sufficient leverage, in the anchor tension head and turning clockwise into the soil. Positioning and setting of the anchor will then flow as noted in machine installation. See Manual Installation elsewhere in manual of instruction.

For additional information, copies of engineering test(s) and reports, contact Minute-Man Anchors, Inc.

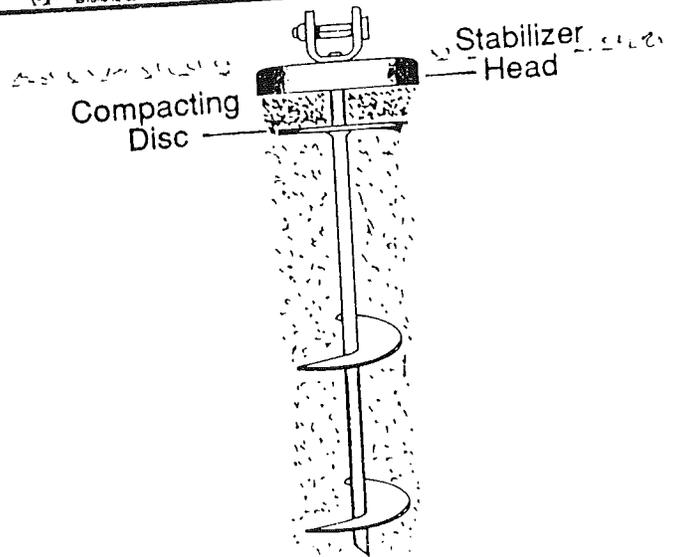
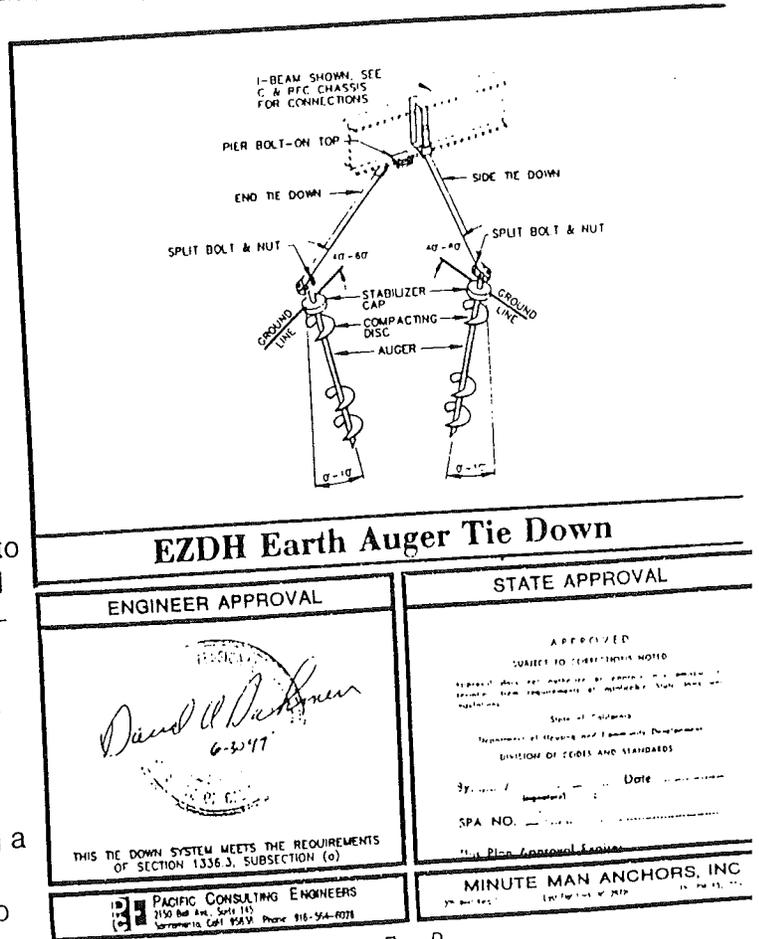


Figure A.



**PROPERLY INSTALLED AND CONNECTED
GROUND ANCHOR AND FRAME CONNECTION**

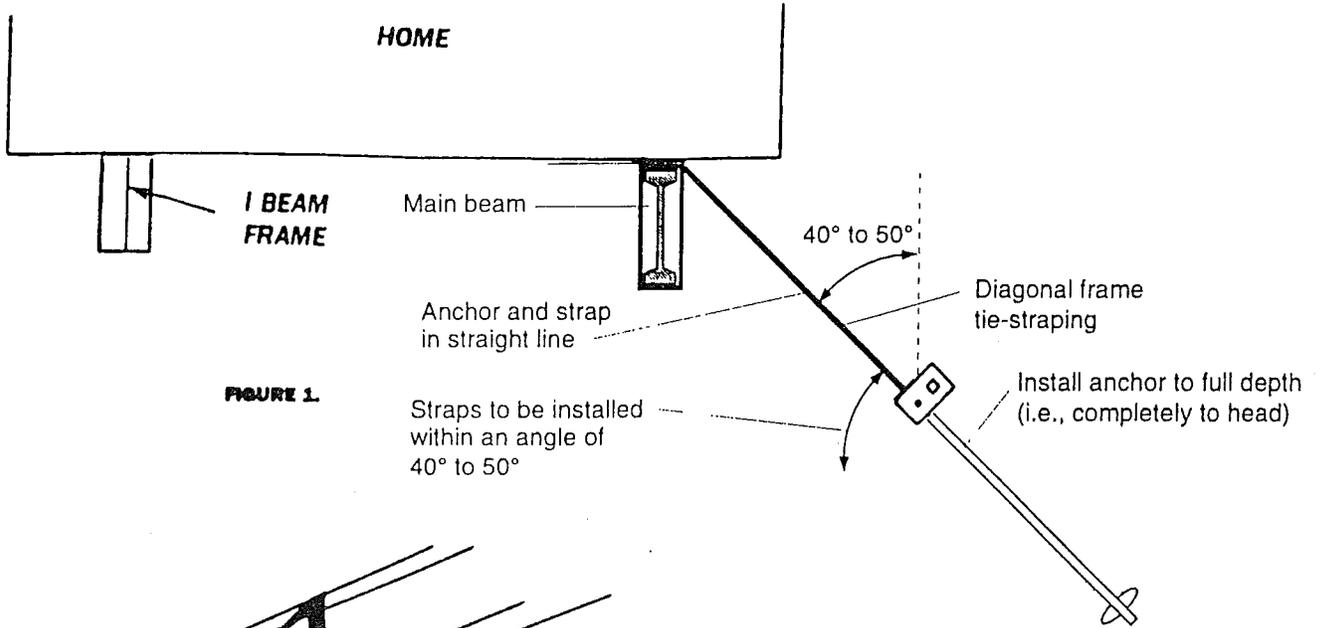


FIGURE 1.

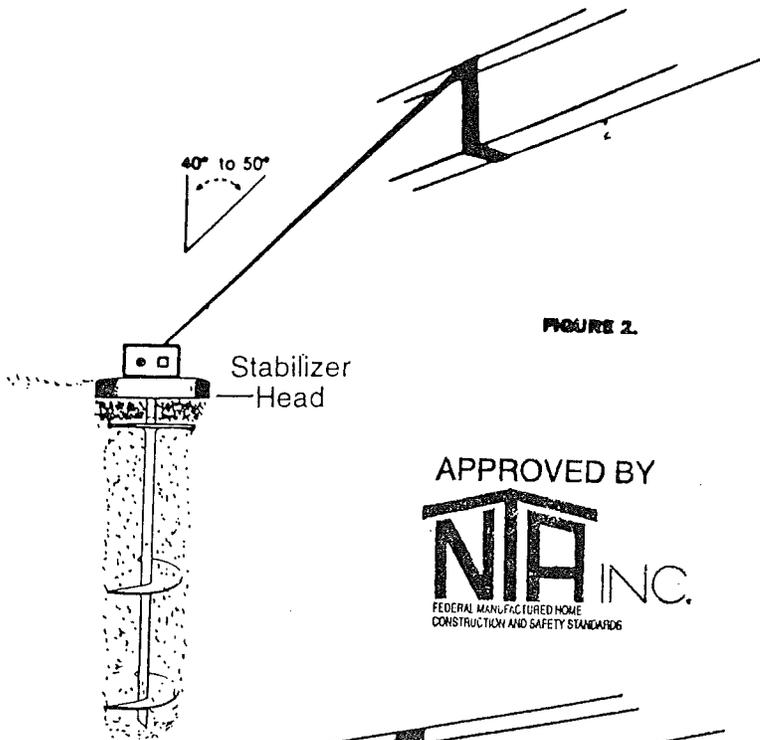


FIGURE 2.

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NIA INC.
FEDERAL MANUFACTURED HOME
CONSTRUCTION AND SAFETY STANDARDS

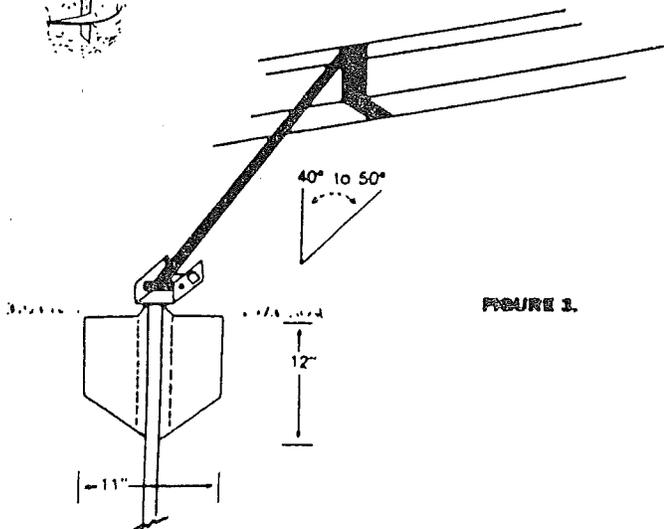


FIGURE 3.

For those homes which are designed to require only diagonal frame ties, the anchor is to be installed in line with the ties. FIGURE 1. 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 is to be investigated.

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

FOLLOWING IS A LIST OF MINUTE-MAN ANCHORS WITH A MINIMUM
HOLDING POWER OF 4,725 POUNDS (2143 kg.).

MARK	MODEL	DESCRIPTION	USE IN SOIL TYPE
MMA-2	650-DH 5/8	6" DISC, 50" ANCHOR	2,3,4
MMA-4	650-DH 3/4	6" DISC, 50" ANCHOR	2,3,4
MMA-38	650-DH 11/16	6" DISC, 50" ANCHOR	2,3,4
MMA-40	636-DH 5/8	6" DISC, 36" ANCHOR	2,3,4
MMA-28	636-DH 3/4	6" DISC, 36" ANCHOR	2,3,4
MMA-30	4430-DH 5/8	DOUBLE 4" DISC, 30" ANCHOR	2
MMA-36	4430-DH 11/16	DOUBLE 4" DISC, 30" ANCHOR	2
MMA-6	4430-DH 3/4	DOUBLE 4" DISC, 30" ANCHOR	2
MMA-35	36-XDH	36" CROSS DRIVE ANCHOR	1
MMA-8	48-XDH	48" CROSS DRIVE ANCHOR	1
MMA-37	38-XDH	38" CLASS 2 CROSS DRIVE	2
MMA-40	636-DH 5/8	6" DISC, 36" ANCHOR	2,3,4
MMA-28	636-DH 3/4	6" DISC, 36" ANCHOR	2,3,4
MMA-65	660-DH 3/4	6" DISC, 60" ANCHOR	2,3,4
MMA-75	660-DH 3/4 5GA	6" DISC, 60" ANCHOR	2,3,4
MMA-84	662-DH 3/4	6" DISC, 62" ANCHOR	2,3,4
MMA-67	668-DH 3/4	6" DISC, 68" ANCHOR	2,3,4
MMA-66	672-DH 3/4	6" DISC, 72" ANCHOR	2,3,4
MMA-44	850-DH 5/8	8" DISC, 50" ANCHOR	2,3,4
MMA-45	850-DH 11/16	8" DISC, 50" ANCHOR	2,3,4
MMA-46	850-DH 3/4	8" DISC, 50" ANCHOR	2,3,4
MMA-85	860-DH 3/4	8" DISC, 60" ANCHOR	2,3,4
MMA-71	1060-DH 3/4	10" DISC, 60" ANCHOR	4b (Fla.)
MMA-52	4636-DH 3/4	4" & 6" DISC, 36" ANCHOR	2,3,4
MMA-50	4442-DH 5/8	DOUBLE 4" DISC, 42" ANCHOR	2,3,4
MMA-53	4450-DH 5/8	DOUBLE 4" DISC, 50" ANCHOR	2,3,4
MMA-54	4450-DH 11/16	DOUBLE 4" DISC, 50" ANCHOR	2,3,4
MMA-55	4450-DH 3/4	DOUBLE 4" DISC, 50" ANCHOR	2,3,4
MMA-91	4430-EZDH 5/8	DOUBLE 4" DISC, 30" EZ ANCHOR	2,3
MMA-92	4430-EZDH 3/4	DOUBLE 4" DISC, 30" EZ ANCHOR	2,3



MARK	MODEL	DESCRIPTION	USE IN SOIL TYPE
MMA-94	636-EZDH 3/4	6" DISC, 36" EZ ANCHOR	2,3
MMA-95	660-EZDH 3/4	6" DISC, 60" EZ ANCHOR	2,3
MMA-18	THDH	DOUBLE HEAD TENSION DEVICE	SLAB
MMA-18	THDHLS	DOUBLE HEAD TENSION DEVICE W/LAG	SLAB
MMA-10	36-DH	CORAL ANCHOR	CORAL
MMA-12	210-DH	CONCRETE ANCHOR	SLAB
MMA-14	210-PDH	WET CONCRETE ANCHOR	SLAB
MMA-42	210-JDH	SWIVEL HEAD WET CONCRETE ANCHOR	SLAB
MMA-22	100-DH	DOUBLE HEAD TENSION ADAPTER	CONNECT
MMA-SDA2		STABLIZER	
MMA-29	FCIIW/S	FRAME CLAMP II W/STRAP	
MMA-29	FCIW/S	FRAME CLAMP I W/STRAP	
MMA-32	BUC/WS	BUCKLE W/STRAP	
MMA-71	CT/WS	CORNER TIE W/STRAP	
MMA	SBN	STRAP BOLT & NUT	
MMA-25	22 BUCKLE	DOUBLE SLOT BUCKLE	
MMA-32	SS BUCKLE	SINGLE SLOT BUCKLE	
	44 RB	4X4" ROOF BRACKET	
	66 RB	6x6" ROOF BRACKET	
	PERIMETER JACK	PERIMETER JACK	
	JACKING PLATE	I BEAM JACKING PLATE	
MMP-6	6" PIER	STANDARD MOBILE HOME PIER	
MMP-8	8" PIER	STANDARD MOBILE HOME PIER	
MMP-10	10" PIER	STANDARD MOBILE HOME PIER	
MMP-12	12" PIER	STANDARD MOBILE HOME PIER	
MMP-14	14" PIER	STANDARD MOBILE HOME PIER	
MMP-16	16" PIER	STANDARD MOBILE HOME PIER	
MMP-18	18" PIER	STANDARD MOBILE HOME PIER	
MMP-20	20" PIER	STANDARD MOBILE HOME PIER	
MMP-22	22" PIER	STANDARD MOBILE HOME PIER	
MMP-24	24" PIER	STANDARD MOBILE HOME PIER	
MMP-26	26" PIER	STANDARD MOBILE HOME PIER	
MMP-28	28" PIER	STANDARD MOBILE HOME PIER	
MMP-30	30" PIER	STANDARD MOBILE HOME PIER	



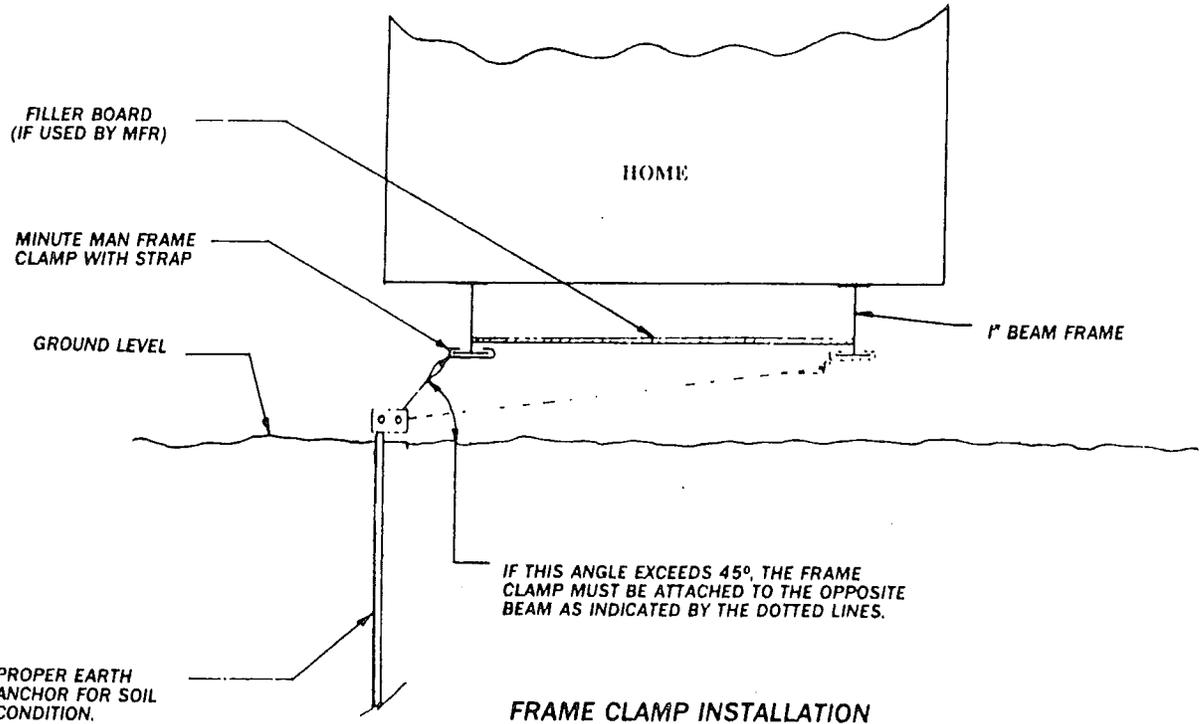
Propane Anchoring & Tethering Components/Stainless Steel Strapping

NOTE: MANY ANCHORS ARE DESIGNED FOR PARTICULAR SOIL CONDITION(S) AND ARE UNACCEPTABLE FOR USE IN OTHER TYPE SOILS. WE HAVE LISTED THE SOILS FOR WHICH EACH ANCHOR IS DESIGNED AND APPROVED. SOIL CLASSIFICATIONS ARE TAKEN FROM THE "STANDARD FOR THE INSTALLATION OF MOBILE HOMES". EACH ANCHOR LISTED MEETS ANSI A225.1 AND ASTM 3953.91 CODES.

SOIL CLASS	SOIL DESCRIPTION	BLOW COUNT (ASTM D1586)	TEST PROBE VALUE	RECOMMENDED MINUTE MAN ANCHOR
1	Sound hard rock	NA	NA	Cross Drive or Rock Anchor
2(a)	Very dense &/or cemented sands, coarse gravel and cobbles, caliche, preloaded silts, and clays.	40-up	550 lb. in up	4430DH 650DH
2(b)	Coral	40-up	550 lb. in up	4430DH 650DH
3	Medium dense coarse sands sandy gravels, very stiff silts, and clays	24-39	350 to 550 lb. in.	650DH
4(a)	Loose to medium dense sands, firm to stiff clays and silts alluvial fill	18-23, 3	276 to 350 lb. in.	650DH
4(b)	VERY loose to medium dense sands, firm to stiff clays and silts, alluvial fill	12-17	175 to 275 lbs. in.	1060DH

REMEMBER, THAT EACH STATE, COUNTY OR MUNICIPALITY MAY REQUIRE A SPECIFIC ANCHOR FROM THE GROUPS SHOWN FOR EACH SOIL CLASSIFICATION. CHECK LOCAL REGULATIONS FIRST.





FRAME CLAMP INSTALLATION

PROPER EARTH ANCHOR FOR SOIL CONDITION.

IF THIS ANGLE EXCEEDS 45°, THE FRAME CLAMP MUST BE ATTACHED TO THE OPPOSITE BEAM AS INDICATED BY THE DOTTED LINES.

FILLER BOARD (IF USED BY MFR)

MINUTE MAN FRAME CLAMP WITH STRAP

GROUND LEVEL

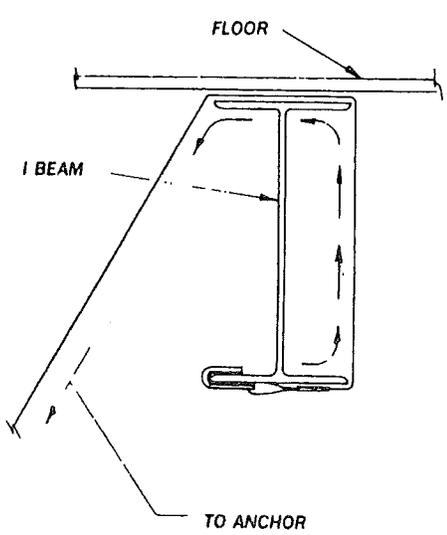
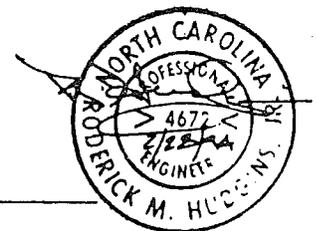
1" BEAM FRAME

HOME

APPROVED BY

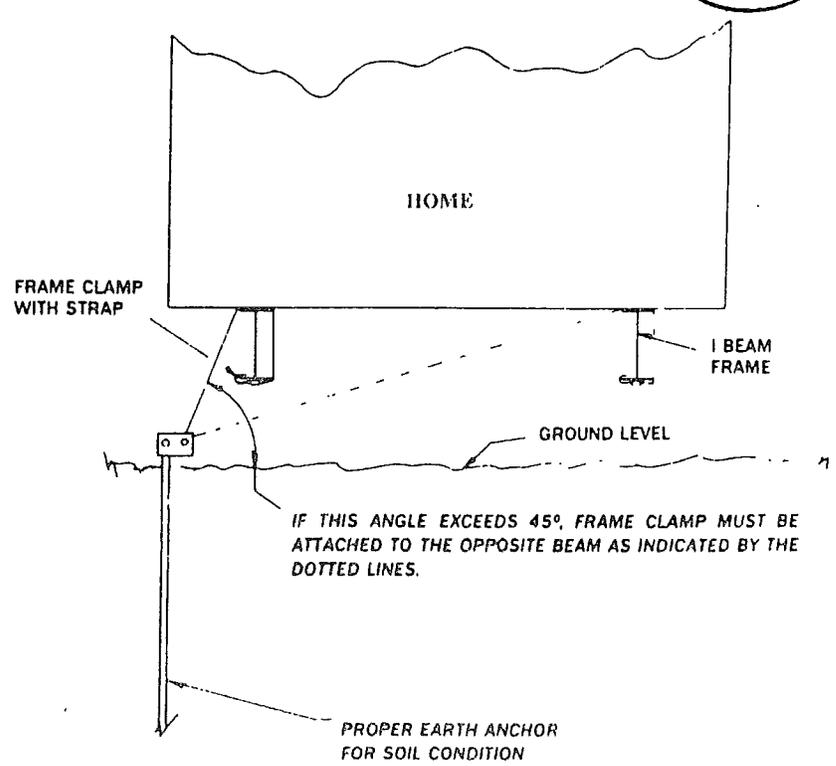


MODEL FCW/S



ENLARGED VIEW OF FRAME BEAM

HOOK FRAME CLAMP ON OUTSIDE BOTTOM FLANGE OF HOME FRAME. PLACE STRAP BETWEEN FRAME AND HOME AS SHOWN IN SKETCH. PULL STRAP TIGHT AND ATTACH TO ANCHOR TENSION HEAD.



FRAME CLAMP WITH STRAP INSTALLATION

PROPER EARTH ANCHOR FOR SOIL CONDITION

IF THIS ANGLE EXCEEDS 45°, FRAME CLAMP MUST BE ATTACHED TO THE OPPOSITE BEAM AS INDICATED BY THE DOTTED LINES.

GROUND LEVEL

I BEAM FRAME

FRAME CLAMP WITH STRAP

HOME

FLOOR

I BEAM

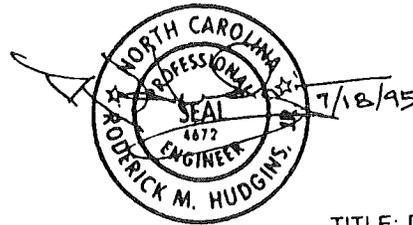
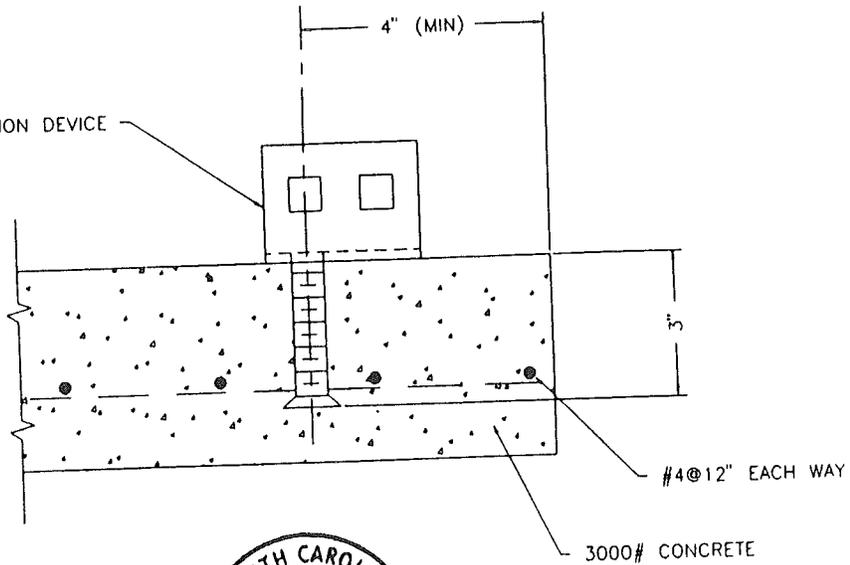
TO ANCHOR

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

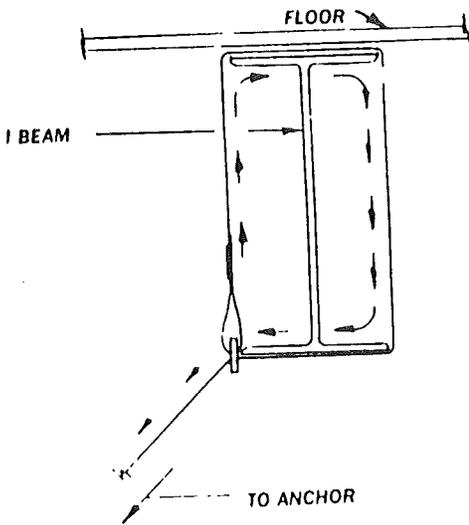
INSTALLATION NOTE

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

DOUBLE HEAD TENSION DEVICE

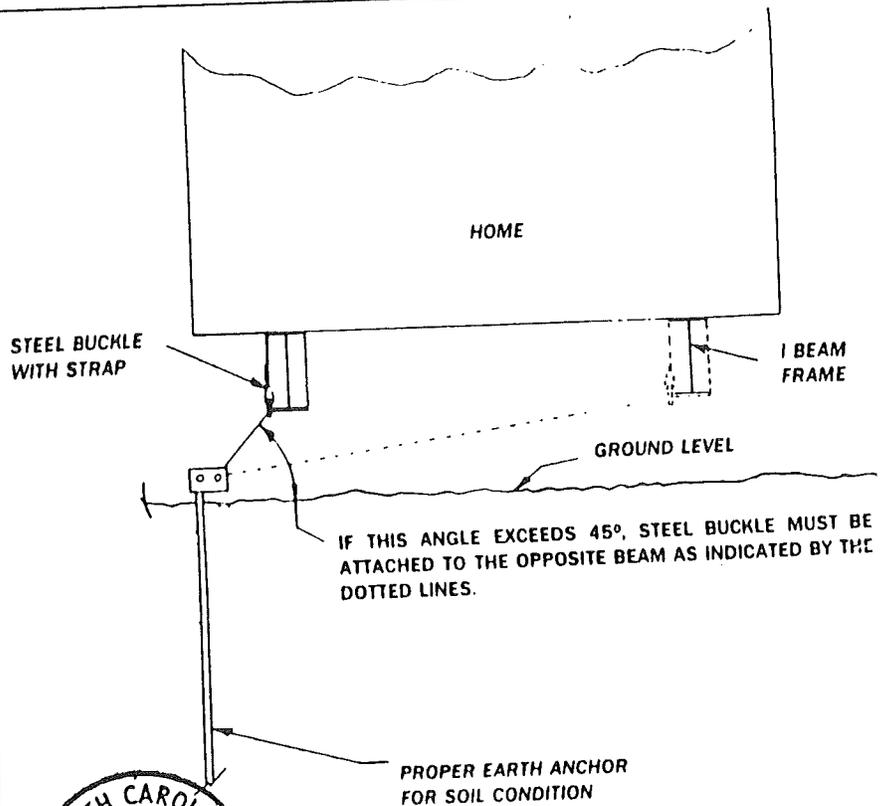


TITLE: DOUBLE HEAD TENSION DEVICE
 MODEL: THDHL5



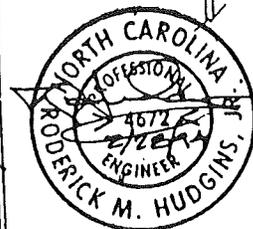
ENLARGED VIEW OF FRAME BEAM

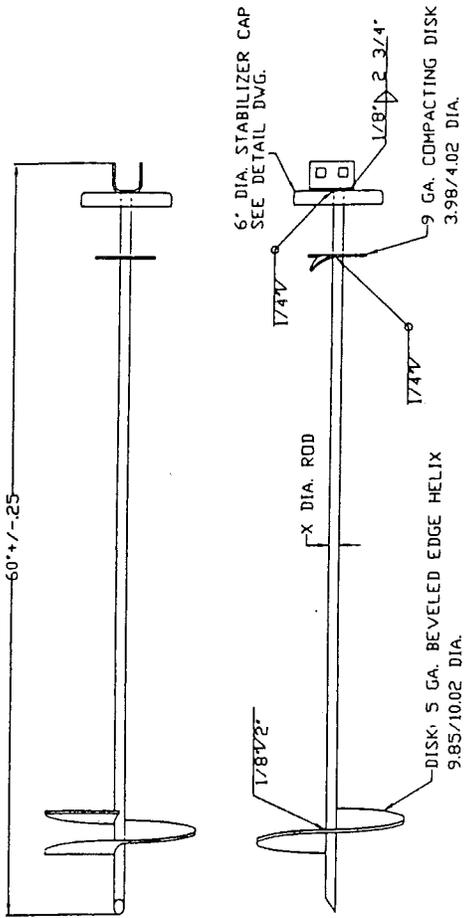
PUSH STRAP END BETWEEN FRAME "I" BEAM AND FLOOR LEAVE BUCKLE AT LOWER END OF BEAM. THREAD END OF STRAP BACK THRU BUCKLE AS SHOWN. PULL STRAP TAKING CARE TO KEEP BUCKLE IN POSITION ATTACH STRAP END TO ANCHOR TENSION HEAD.



STEEL BUCKLE WITH STRAP INSTALLATION

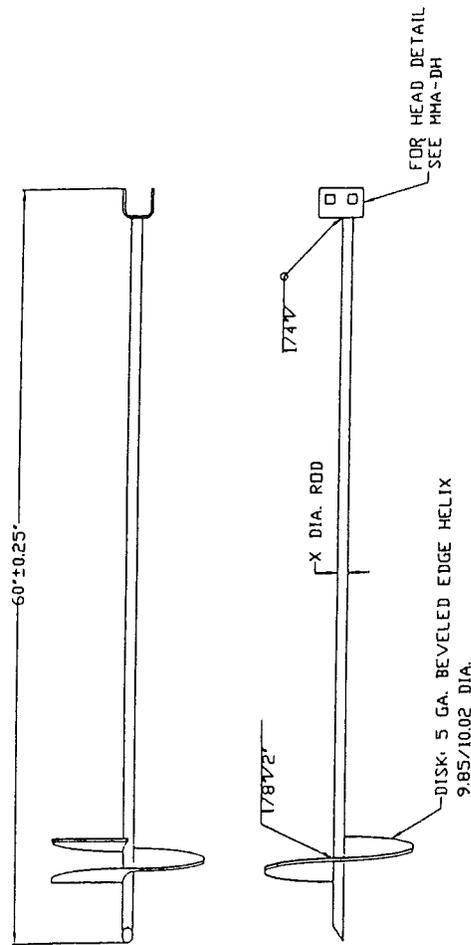
MODEL BUC. W/S





NOTES:
 1. ALL STEEL USED IN ANCHOR ASSY. CONFORMS TO ASTM A-36 M1020
 2. X IN MARK
 709-755 MMA 72
 3. U.S. PAT. NO. 4,923,165

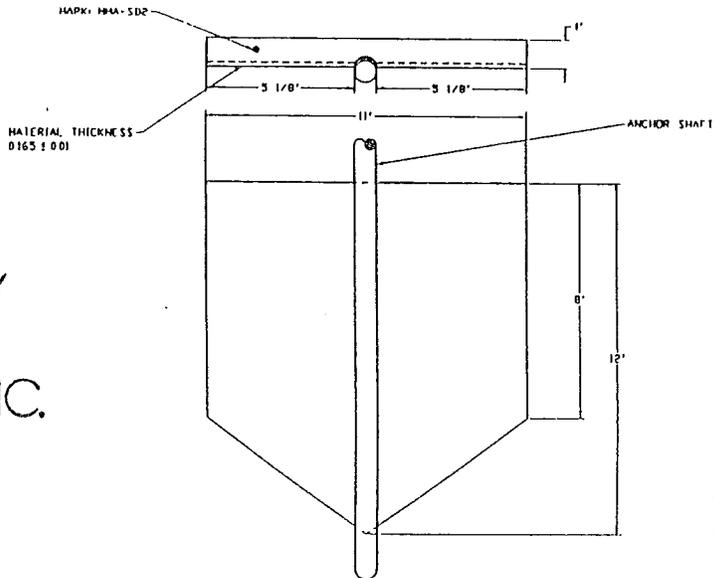
REV	DESCRIPTION OF CHANGE DATE	MINUTE MAN ANCHORS, INC. 285 WEST KING STREET JACKSONVILLE, FLORIDA 32204 PHONE: (904) 822-8254 FAX: (904) 822-8258	TITLE: GROUND STABILIZER NEAR DISC CL EARTH ANCHOR MODEL: MMA-72 - 6204	DATE: 11/25/95	BY: [Signature]	PRODUCT TESTING, INC. 1000 W. 10TH STREET JACKSONVILLE, FLORIDA 32204 PHONE: (904) 344-2800 FAX: (904) 344-2804
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NOTES:
 1. ALL STEEL USED IN ANCHOR ASSY. CONFORMS TO ASTM A-36 M1020
 2. X IN MARK
 709-755 MMA 71

REV	DESCRIPTION OF CHANGE DATE	MINUTE MAN ANCHORS, INC. 285 WEST KING STREET JACKSONVILLE, FLORIDA 32204 PHONE: (904) 822-8254 FAX: (904) 822-8258	TITLE: GROUND STABILIZER NEAR DISC CL EARTH ANCHOR MODEL: MMA-71	DATE: 11/25/95	BY: [Signature]	PRODUCT TESTING, INC. 1000 W. 10TH STREET JACKSONVILLE, FLORIDA 32204 PHONE: (904) 344-2800 FAX: (904) 344-2804
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NIA INC.
 FEDERAL MANUFACTURED HOME
 CONSTRUCTION AND SAFETY STANDARDS



11/25/95

REV	DESCRIPTION OF CHANGE DATE	MINUTE MAN ANCHORS, INC. 285 WEST KING STREET JACKSONVILLE, FLORIDA 32204 PHONE: (904) 822-8254 FAX: (904) 822-8258	GROUND STABILIZER PLATE TYPE 1045D2	DATE: 11/25/95	BY: [Signature]	PRODUCT TESTING, INC. 1000 W. 10TH STREET JACKSONVILLE, FLORIDA 32204 PHONE: (904) 344-2800 FAX: (904) 344-2804
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CHAPTER 6 — INSTALLATION OF OPTIONAL FEATURES

- 6.3 **Miscellaneous Lights and Fixtures.** Some exterior lights, ceiling fans and chain-hung fixtures may not yet be installed when the home is delivered. All of these fixtures must be grounded by a fixture-grounding screw or wire. For chain-hung fixtures, use both methods. When fixtures are mounted on combustible surfaces such as hardboard, install a noncombustible ring to completely cover the combustible surface exposed between the fixture canopy and the wiring outlet box. If siding has not been installed at a fixture location, remove the outlet box and install the siding with a hole for the outlet box. Then reinstall the outlet box and proceed as for other fixtures.
- 6.3.1 **Exterior lights.** Remove the junction box covers and make wire-to-wire connections using wire nuts. Connect wires black to black, white, and ground to ground. Caulk around the base of the light fixture to ensure a water-tight seal to the sidewall. Push the wires into the box and secure the light fixture to the junction box. Install the light bulb and attach the globe. Refer to Figure 6.1 (a).
- 6.3.2 **Ceiling fans.** To reduce the risk of injury, install ceiling fans with the trailing edges of the blades at least 6'4" above the floor. Follow the manufacturer's instructions. If no instructions are available, connect the wiring as shown in Figure 6.1 (b).
- 6.4 **Ventilation Options.** See ventilation improvement option instructions provided with your home.
- 6.6 **Special Set-up Manual Addendums/and Supplements.** Your home may require special Dapia Approved instructions in addition to those included in this manual to properly set-up the home. Listed below are several of the most common special options. These are provided by HART HOUSING separately.
- Installation Manual Supplement (Special Pier/Footing Designs)
- Basement Foundation Designs
- 6.7 **Manufacturer Installation Instructions.** Provided separately are Dapia Approved Installation Instructions provided by the anchoring devices manufacturer which must be followed. The instructions provided may not be the same as the anchoring devices you are using. If this is the case, use the instructions which are provided with you anchors.



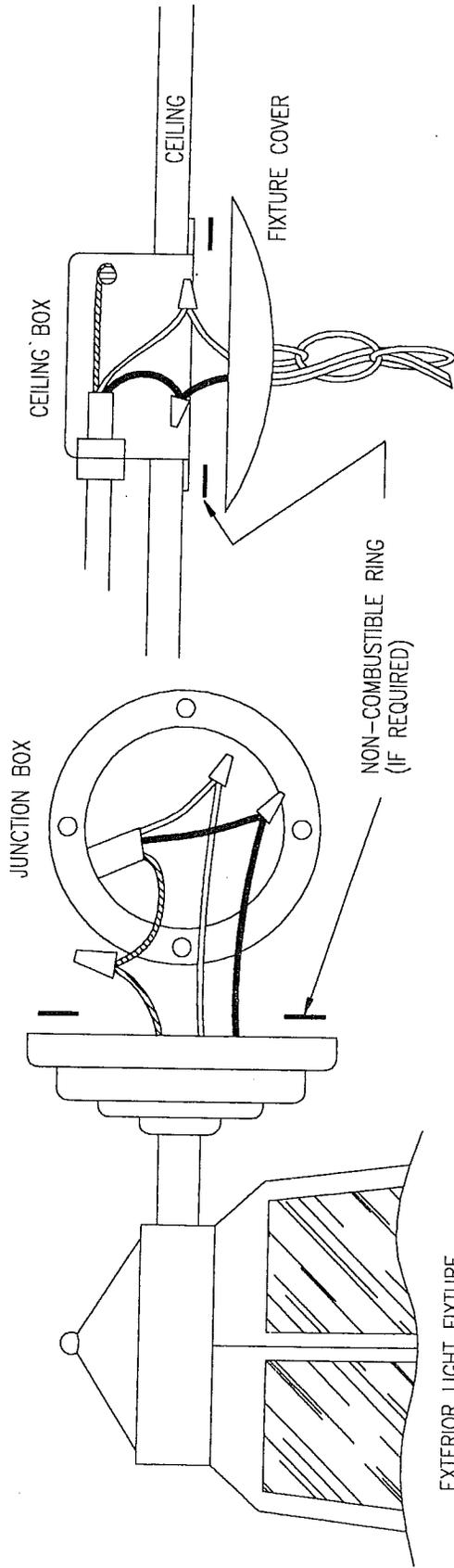


FIGURE 6.1 (a)

FIGURE 6.1 (b)

CHAIN HUNG FIXTURE
OR CEILING FAN

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 FEDERAL MANUFACTURED HOME
 CONSTRUCTION AND SAFETY STANDARDS

CHAPTER 7 — PREPARATION OF APPLIANCES

- 7.1 **Clothes dryer vent.** Your clothes dryer must exhaust to the exterior of the home, or of any perimeter skirting installed around it, through a moisture-lint exhaust system, as shown in Figure 7.1. **IMPORTANT! Do NOT let the exhaust system end under the home where excess moisture or flammable material can accumulate.** Vent openings are located in either the wall or the floor. After the duct is installed, seal the openings both inside and outside. Follow the dryer manufacturer's instructions for installing the exhaust system. Failure to follow these instructions will void your warranty.

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

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

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

Electrical circuits within the home may not have been sized for the additional load of non-factory installed air conditioning, and a separate, outside electrical supply may have to be provided.

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

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

- 7.3 **Fireplace and wood stove chimneys and air inlets.** Fireplaces and wood stoves require on-site installation of additional section(s) of approved, listed chimney pipe, a spark arrestor and a storm collar. See Figure 7.4.

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

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

- 7.3.3 **Assembly and sealing sequence.** Assemble and seal your fireplace or wood stove chimney per fireplace manufacturer's instruction.

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

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

7.5 **Window Air Conditioner Installation.** Do not plug a window air conditioner unit into one of your home's lighting or appliance circuit receptacles. The majority of window air conditioners require that a separate circuit be installed for the connection of the unit. See the air conditioner manufacturer's installation instructions for the electrical requirements for your specific model. The circuits installed in the home are for standard lighting and small appliance fixtures only.

CAUTION: Use of these receptacles for other purposes may cause an overload and the possibility of a potential fire hazard arises.

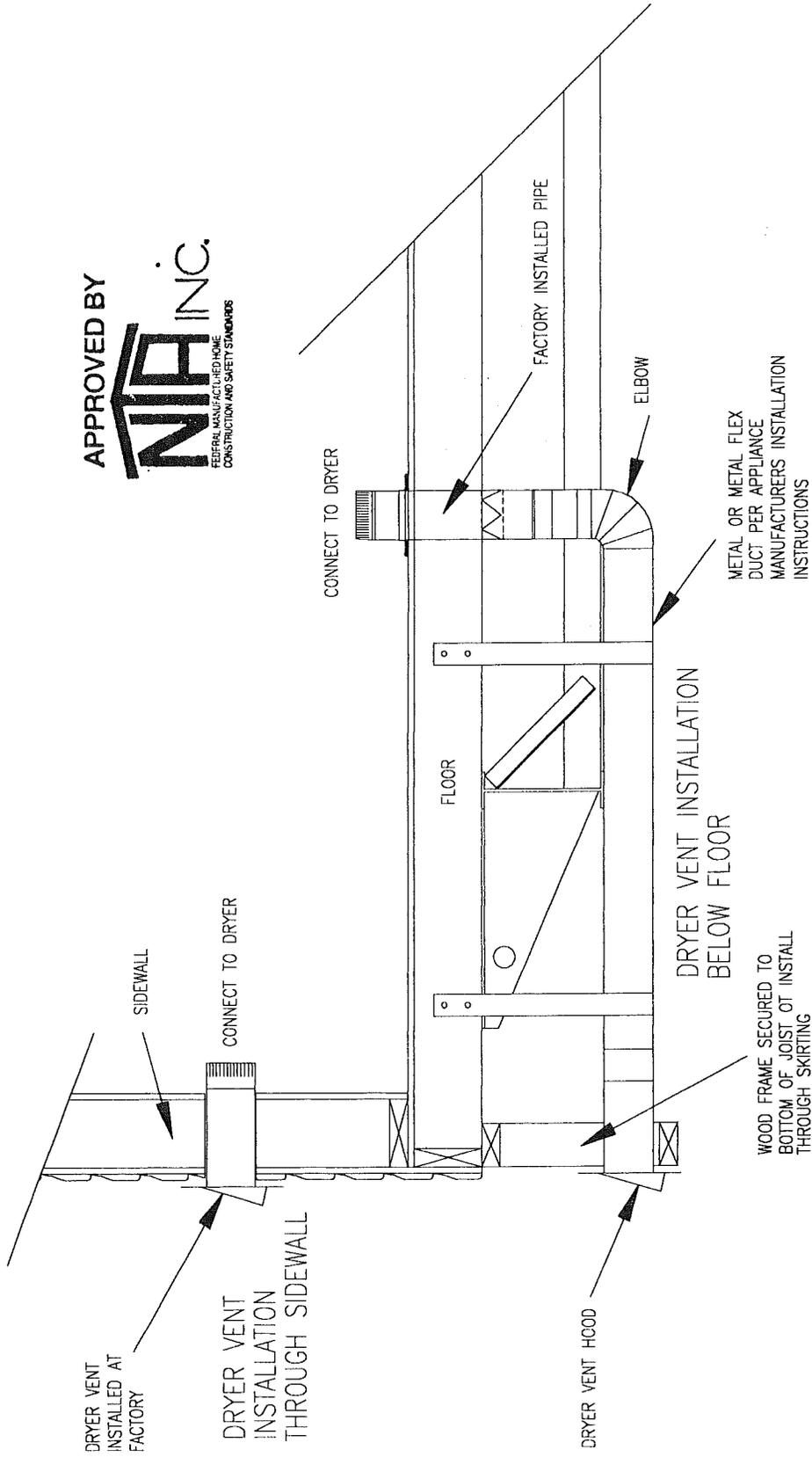
The only exception to the above is if there is a separate circuit installed and labeled in the main panel box as being for the use of an air conditioner unit. All wiring which is to be installed for an air conditioner unit must be performed by an authorized electrician and in conformance with all applicable codes.

7.6 **Furnace Deration.** If your home is located at 4500 feet or more above sea level, or as indicated in the manufacturer's instructions, your gas furnace must be derated for the altitude. This must be done by a qualified serviceman. A licensed technician may be required. Check with your local authorities.

CAUTION: Failure to derate the furnace can cause the furnace to over-heat, operate poorly and cause excessive sooting. Dangerous levels of carbon monoxide could accumulate in the home.

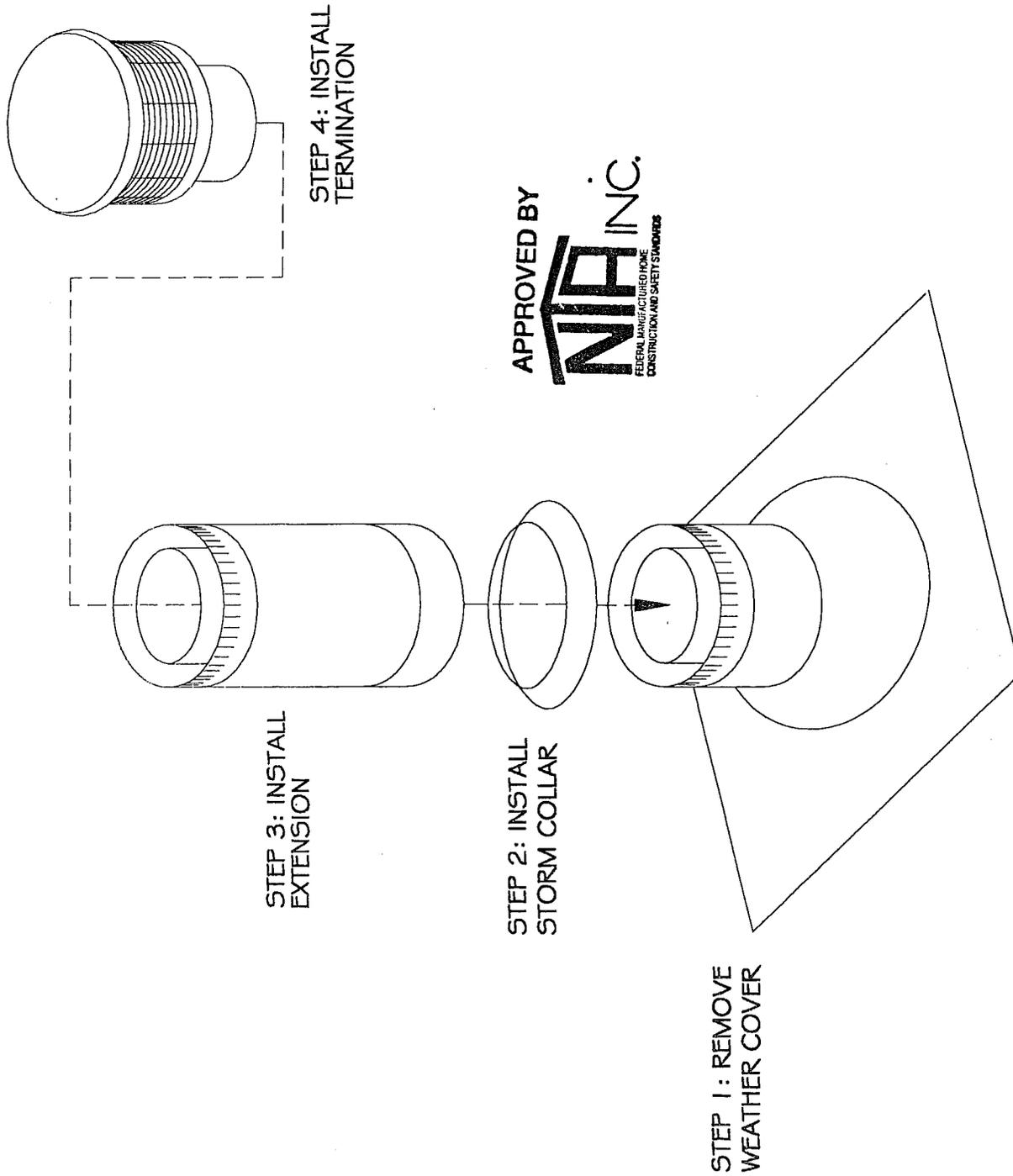


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 FEDERAL REGISTERED HOME
 CONSTRUCTION AND SAFETY STANDARDS



DRYER VENT INSTALLATION

FIGURE 7.1



FIREPLACE CHIMNEY ASSEMBLY
 FIGURE 7.4

CHAPTER 8 — UTILITY SYSTEM CONNECTION AND TESTING

- 8.1 **Proper Procedures.** Consult local, county or state authorities before connecting any utilities. Only qualified service personnel, familiar with local codes and licensed where required, should make utility connections and conduct tests.
- 8.2 **Water Supply**
- 8.2.1 **Maximum supply pressure and reduction.** The water systems of your home were designed for a maximum inlet pressure of 80 psi. **If you are located in a water district where the local water supply pressure exceeds 80 psi, install a pressure-reducing valve.**
- 8.2.2 **Connection procedures**
- 8.2.2.1 **To supply main.** Connect the home's water system to the water source through the inlet located under the home, usually below the water heater compartment. A tag on the side of the home marks its location.
- 8.2.2.2 **Mandatory Shutoff Valve.** You must install an accessible shutoff valve between the water supply and the inlet, as shown in Figure 8.1. It must be a full flow gate or ball valve.
- 8.2.2.3 **Crossovers.** Multisection homes with plumbing in both sections require water line cross-connections, as shown in Figure 8.2. Remove the shipping caps from the water lines and install the crossover connectors provided with the home.
- 8.2.3 **Freezing protection**
- 8.2.3.1 **Necessity.** In areas subject to subfreezing temperatures, protect exposed sections of water supply piping, shut-off valves and pressure reducers, and pipes in water heater compartments with uninsulated doors, from freezing. Otherwise, burst pipes and costly damage may result.
- 8.2.3.2 **Use of Heat tapes.** Heat tapes (either automatic or non-automatic) can protect exposed plumbing from freezing. **USE ONLY HEAT TAPES LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY FOR USE WITH MOBILE HOMES, AND INSTALL THEM ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.** Plug the 3-wire, grounded cordset of the heat tape into the outlet located under the home near the water supply inlet (Figure 8.1).
- 8.2.3.2.1 **Automatic Heat Tape.** This tape (with a thermostat) is approved for installation on all types of water pipe, including plastic. Secure it to the pipe, insulate it, and weatherproof it, according to the manufacturer's instructions.
- 8.2.3.2.2 **Non-Automatic Heat Tape.** This tape (without a thermostat), may not be approved for plastic pipe unless it is left exposed, with no outer wrap of insulation. Installation is otherwise the same as with automatic heat tape.
- 8.2.3.3 **Freezing Protection for Unoccupied Homes.** If the home is to be left unheated in cold weather, drain the water lines and blow them clear with compressed air to prevent damage from freezing. **NOTE:** Leaving home unheated will cause floor problems.
- 8.2.4 **Testing procedures.** Even though the water system was tested at the factory, **it must be rechecked** for leaks at the installation site. Close all water faucets, spigots and stool tank float valves, and use one of the following procedures:

- 8.2.4.1 **Hydrostatic.** Be sure the water heater tank is full of water. Pressurize the system with water at 100 psi, and then isolate it from the pressure source. The system must hold this pressure for at least 15 minutes without any loss. If the pressure falls off, repressurize the system and locate and correct leaks.
- 8.2.4.2 **Pneumatic. CAUTION: IF THIS PROCEDURE IS USED, YOU MUST BYPASS THE HOT WATER TANK BY HOOKING ITS COLD INLET AND HOT OUTLET LINES TOGETHER. THIS PROCEDURE WILL PROTECT THE APPLIANCE FROM DAMAGE AND PROTECT THOSE INVOLVED IN THE TEST FROM POSSIBLE INJURY.** Connect air pump and pressure gauge to the water inlet and pressurize the system to 100 psi. Isolate the pressure source from the system. The gauge must stand for at least 15 minutes with no drop in pressure. Correct any leaks indicated by bubbles from soapy water, repeating the procedure until all have been eliminated. Reconnect the water heater and the water supply.

8.3 Drainage system

- 8.3.1 **Assembly and support.** If portions of the drainage system were not installed at the factory, all materials and diagrams required to complete it have been shipped as loose items in the home. Assemble the drainage system following the specific instructions and diagrams provided with the home. Start at the most remote end and work toward the outlet, supporting the piping with temporary blocking to achieve the proper slope (see paragraph 8.3.2) When the entire system has been completed, install permanent drain line supports at 4' on center, as shown in Figure 8.3.
- 8.3.2 **Proper slopes and connector sizes.** Drain lines must slope at least 1/4" fall per foot of run unless otherwise noted on the schematic diagram (see Figure 8.4). **Exception:** 1/8" fall per foot is allowed when a cleanout is installed at the upper end of the run. Connect the main drain line to the site sewer hookup using an approved elastomer coupler.
- 8.3.3 **Crossovers.** Connect multisection home drainage line crossovers as shown in Figure 8.4.
- 8.3.4 **Solvent welding procedures.** The solvent cement used to connect drain lines must be compatible with the pipe installed in the home. Follow the manufacturer's instructions on the container.
- 8.3.5 **Protection from freezing.** HART HOUSING has insulated fittings in the drainage system subject to freezing, such as P-traps in the floor. Replace this insulation if removed during assembly or testing. Insulate drain lines installed below the bottom board in areas subject to freezing (optional). If the home is to be left unheated in cold weather, pour an approved antifreeze into P-traps at all fixtures and stools. Antifreeze used must not be corrosive to plastic or fixture material.
- 8.3.6 **Flood level test procedure.** You must conduct a flood level test on the completed drainage system before connecting it to the site sewer. With the home in a level position, all fixtures connected, and all tub and shower drains plugged, connect the drainage piping system to the site water inlet and fill the system with water to the rim of the toilet bowl. Release all trapped air. Allow the system to stand for at least 15 minutes. Check for leaks. Drain the system. Plug all fixtures, sinks, showers and tubs, and fill with water. Release the water in each fixture simultaneously to obtain the maximum possible flow in the drain piping. Check all P-traps and the drain system for possible leaks. Repair any leaks and retest.

8.4 Gas supply

- 8.4.1 **Type of gas system furnished with home.** All gas appliances in this home, including the heating system, are equipped for natural (or LP) gas. If LP (or natural) gas is to be used as the supply instead, a qualified service person must convert the appliances to LP (or natural) gas following the instructions provided by each appliance manufacturer.



- 8.4.2 **Proper supply pressure. THE GAS PIPING SYSTEM IN YOUR HOME HAS BEEN DESIGNED FOR A PRESSURE NOT TO EXCEED 14" OF WATER COLUMN (8 OZ. OR 1/2 PSI). IF GAS FROM ANY SUPPLY SOURCE EXCEEDS, OR MAY EXCEED, THIS PRESSURE, YOU MUST INSTALL A PRESSURE REDUCING VALVE.** To operate gas appliances safely and efficiently, do not exceed the design pressure limitations. For natural gas systems, the incoming gas pressure should remain between 6" and 8" of water column. For LPG systems, the pressure should lie between 12" and 14" of water column.
- 8.4.3 **Orificing for specific gases. SPECIAL ORIFICES AND REGULATORS ARE REQUIRED FOR EACH KIND OF GAS, AND AT ALTITUDES ABOVE 3,000 FEET. SEE THE INSTRUCTIONS ACCOMPANYING EACH GAS-BURNING APPLIANCE FOR MODIFICATION INSTRUCTIONS. BEFORE MAKING ANY CONNECTIONS TO THE SITE SUPPLY, CHECK THE INLET ORIFICES OF ALL GAS APPLIANCES TO ENSURE THEY ARE CORRECTLY SET UP FOR THE TYPE OF GAS TO BE SUPPLIED.**
- 8.4.4 **Crossovers.** Install the gas line crossover in multisection homes as shown in Fig. 8.7 before performing any system tests or connecting the system to the gas supply. All crossovers and fittings are factory installed on the supply side and are listed for manufactured housing exterior use. Do not use tools to connect or remove the flexible connector quick disconnect.
- 8.4.5 **Testing prior to connection to mains.** Even though the gas system was tested at the factory, it is essential that it be rechecked for leaks at the site. **DO NOT APPLY PRESSURE IN EXCESS OF THOSE SPECIFIED BELOW OR YOU MAY DAMAGE GAS VALVES AND/OR PRESSURE REGULATORS.** Conduct one of the following two tests when the air and piping temperatures are nearly equal and will remain stable.
- 8.4.5.1 **Piping Only Test.** Close all appliance shut-off valves. Attach a pressure gauge calibrated in ounces at the home gas inlet. Pressurize the system with air to at least 3 psi (48 oz.). Isolate the pressure source from the system. The gauge must stand for at least 10 minutes with no drop in pressure. If any pressure loss occurs, check all joints in the piping system and at all shut-off valves with soapy water for bubble solution until the leaks are located. Repair the leaks and retest until the pressure holds.
- 8.4.5.2 **Test of Entire System.** Close all gas equipment controls and pilot light valves according to the individual gas equipment manufacturer's instructions. Assure that gas shut-off valves for all gas equipment are in the OPEN position. Attach a pressure gauge calibrated in ounces at the home gas inlet. Pressurize the system with air to at least 6 oz. Check all gas shut-off valves and flex line connections to valves and appliances for leaks, using soapy water or bubble solution. **DO NOT BUBBLE CHECK BRASS FITTINGS WITH SOLUTIONS CONTAINING AMMONIA.** Repair any leaks found and retest. Close all equipment shut-off valves upon completion of testing.
- 8.4.6 **Connection procedures.** Inspect gas appliance vents to ensure they have been connected to the appliance, and make sure that roof jacks are installed and have not come loose during transit. Some furnace roof caps have been left off at the factory for transportation purposes. A warning label at the furnace will tell you that the venting system is incomplete. The roof cap (supplied by the Home Manufacturer) must be installed using the installation instructions and reference to Figure 8.8. Have the gas system connected to the gas supply only by an authorized representative of the gas company.
- 8.4.7 **Gas appliance startup procedures.** One at a time, open each equipment shut-off valve, light pilots and adjust burners according to each appliance manufacturer's instructions. **MAKE SURE THE WATER HEATER IS FILLED WITH WATER BEFORE LIGHTING ITS PILOT.** Check the operation of the furnace and water heater thermostats and set them to the desired temperatures.
- 8.5 **Heating oil systems.** Homes equipped with oil-burning furnaces must have their oil supply tankage and piping installed on site. These items are not supplied by the manufacturer. Consult the oil furnace manufacturer's instructions for proper pipe sizing and installation procedures. **ALL OIL STORAGE TANK AND PIPING INSTALLATIONS MUST MEET ALL APPLICABLE LOCAL REGULATIONS AND SHOULD BE MADE ONLY BY EXPERIENCED, QUALIFIED PERSONNEL.**

- 8.5.1 **Tank installation requirements.** Unless the home is installed in a community with a centralized oil distribution system, you must install an oil storage tank outside the home. Locate the tank where it is accessible for service and supply and safe from fire and other hazards.
- 8.5.1.1 **Vaporizing (gravity-fed) furnaces.** Install oil tanks that feed vaporizing-type oil furnaces so that oil flows freely by gravity. To achieve efficient gravity flow, install the tank so that its bottom is at least 8" above the level of the furnace's oil control and its top is within 8' of the oil control level.
- 8.5.1.2 **Gun (pump-fed) furnaces.** Since the furnace includes a fuel pump, the tank may be installed above or below ground. For tanks installed below ground, do not exceed the lifting capacity of the pump, and extend the filler neck 1' above grade and provide a 1-1/4" diameter minimum vent pipe extending at least 2' above grade.
- 8.5.1.3 **Sloping and draining requirements.** Regardless of the type of oil furnace or the tank location, install the tank to provide a gradual slope toward the fill end or drain plug (if so equipped). This facilitates pumping or draining of water or sludge.
- 8.5.2 **Shut-off valve and fuel line filter.** Install an accessible and approved manually-operated shut-off valve at the oil tank outlet. Hart Housing also recommends installing a suitable filter in the fuel line near the tank to trap dirt and water.
- 8.5.3 **Leak test procedure.** Before operating the system, check for leaks in the tank and supply piping. Fill the tank to capacity with fuel and examine all joints in the system for leakage.
- 8.6 **Electricity.** A large enough power supply must be available at the site. An inadequate power supply may result in improper operation of, and possible damage to, motors and appliances. It may also increase your electricity costs. The current rating in amperes of your home can be found on the tag located outside next to the feeder or service entrance and also on the electrical distribution panel.
- 8.6.1 **Description and rating of house wiring.** Your home is designed for connection to an electrical wiring system rated at 115/230 volt AC. **PROPER AND SAFE CONNECTION DEPENDS ON THE TYPE OF SUPPLY SYSTEM YOUR HOME IS EQUIPPED WITH.** The connection to this home is a feeder requiring wiring at the site, or, the connection to this home is a factory-installed service meter base. The following paragraphs describe the wiring and grounding of electrical feeders; if your home is equipped with a service meter base, skip directly to section 8.6.4.4.
- 8.6.2 **Proper feeder wire and junction box material and size.** The main breaker and the label on the electrical distribution panel give the feeder current capacity in amperes. Using this information, determine the required feeder size from the following tables. These sizes are based on an ambient temperature of 86°F. and do not take voltage drop into consideration.
- 8.6.2.1 **Overhead Feeders.** Homes equipped with overhead (mast weatherhead) feeder entrances contain all necessary conduit to the electrical distribution panel and feeder conductors. Refer to Figure 8.11.
- 8.6.2.2 **Underside Feeders.** Homes with an under-the-floor entrance come with a permanently-attached conduit raceway that runs from the electrical distribution panel to a point under the floor. Install an approved conduit fitting or junction box at the termination point. Refer to Figure 8.9.
- 8.6.3 **Grounding of homes with feeder connections**
- 8.6.3.1 **Necessity.** The home must be grounded properly to protect the occupants. The only safe and approved method of grounding your feeder-connected home is through the grounding bar in the electrical distribution panel. This bar grounds all noncurrent-carrying metal parts of the electrical system at a single point.

- 8.6.3.2 **Procedure.** The ground conductor of the power supply feeder cable connects the grounding bar to a good electrical ground. Follow the feeder connection procedures described in 8.6.4.1, -.2, -.3 to achieve proper grounding. (**Exception: When a meter base is installed on the home it must be grounded differently.** Refer to the specific instructions in 8.6.4.4 if applicable).

Insulate the grounded circuit conductor (neutral or white wire) from the grounding conductors (green wires) and from equipment enclosures and other grounded parts. Insulate neutral circuit terminals in the distribution panel board — and in ranges, clothes dryers, and counter-mounted cooking units — from the equipment enclosure. Bonding screws, straps or buses in the distribution panel board or in appliances should have been removed and discarded at the manufacturing facility.

- 8.6.3.3 **Unacceptable methods of grounding homes.** Grounding to a rod, a water pipe, or through the home's hitch caster will not satisfy the important grounding requirement. Never use the neutral conductor of the feeder cable as a ground wire. Do not ground the neutral bar in the electrical distribution panel.

- 8.6.4 **Connection procedures.** Connections should be made only by a qualified electrician using one of the following methods:

- 8.6.4.1 **50 A feeder cord.** Your home may be equipped with a permanently-connected 50 amp. feeder cord stored in a compartment under the floor. If so, it is ready to be plugged into a 50 amp., 3-pole, 4-wire, 120/240 volt grounding service receptacle after electrical tests have been completed (see 8.6.6). **WARNING: MANY HOMES ARE EQUIPPED FOR 100 AMP. OR GREATER SERVICE. UNLESS YOUR HOME IS EQUIPPED FOR ONLY 50 AMP. SERVICE, DO NOT ATTEMPT TO USE A FEEDER CORD OR "PIGTAIL" CONNECTION.** Connect homes equipped for 100 amp. or greater service by one of the three following methods:

- 8.6.4.3 **Underside junction box feeder.** A raceway from the main panelboard to the underside of the home allows for installing an approved junction box or fitting, which must be used to connect it to the supply raceway. Install properly-sized conductors from the main power supply to the panelboard. Refer to Figure 8.10 (a) and (b) for conductor and junction box requirements. The homeowner or installer must provide the supply connection including the feeder conductors, junction box and raceway connectors. Protect conductors emerging from the ground from a minimum of 18" below grade to 8' above grade, or to the point of entrance to the home. The distance measured from the top surface of a buried cable, conduit or raceway to the finished grade must meet minimum burial requirements outlined in the National Electric Code. Use a moisture-proof bushing at the end of the conduit from which the buried cable emerges.

- 8.6.4.4 **Service equipment meter base.** Either an overhead or underground entrance may be provided. The exterior equipment and enclosure must be weatherproof, and conductors must be suitable for use in wet locations. When a meter base is installed on the home, a main bonding jumper is to be installed to connect the equipment grounding conductor and the service-equipment enclosure to the grounded conductor of the system within the service equipment. The main bonding jumper may be a wire, bus, or a screw. A grounding electrode conductor shall be used to connect the equipment grounding conductors, the service-equipment enclosures and the grounded service conductor to the grounding electrode as shown in Figure 8.11. The homeowner must provide the grounding electrode conductor(s) which should be #4 (minimum) copper in one piece (not spliced). The grounding electrode should be an 8 foot length of 1/2 inch diameter copper rod or 3/4 inch galvanized steel pipe. Drive it into the ground at least 12 inches below the surface and 2 feet from the foundation, or bury it horizontally in a 2-1/2 foot deep trench. Connect the grounding conductor wire to the grounding electrode with a grounding clamp and cover with 12 inches (min.) of earth. For added protection, homes with metal frames or siding should be connected to the earth by means of additional bonding jumper ground fault return paths to underground metallic water pipes, ground-rings, additional ground rods, etc. to prevent the buildup of hazardous voltages.

8.6.5 **Crossover connections.** Refer to Figure 8.12 (a) & (b) for typical crossover wiring connections, for multisection homes (located along the centerline between the sections). Crossover locations can be distinguished by metal junction boxes or access cover panels. Remove these panels and connect the enclosed wires as illustrated.

8.6.6 **System test procedures and equipment**

8.6.6.1 **Pre-connection tests.** Conduct both of the following tests before any electrical power is supplied to the home:

8.6.6.1.1 **Circuit conductor continuity.** Conduct a continuity test by placing all branch circuit breakers and switches controlling individual outlets in the "on" position. The test should give no evidence of a connection between any of the supply conductors (including the neutral) and the grounding circuit. You may use a flashlight continuity tester.

8.6.6.1.2 **Grounding continuity.** Using a continuity tester, test all noncurrent-carrying metal parts to assure continuity to ground. The parts to be checked include:

- appliance enclosures, including fans;
- fixture enclosures and canopies;
- metal siding and roofs;
- metal water supply and gas lines;
- metal ducts (except foil-covered insulated ducts);
- the home's frame.

On multisection units, perform this test only after completing all electrical and bonding connections between the units. **NOTE: GROUNDING IS NOT REQUIRED ON THE METAL INLET OF A PLASTIC WATER SYSTEM OR ON PLUMBING FIXTURES SUCH AS TUBS, FAUCETS, SHOWER RISERS, AND METAL SINKS WHEN THEY ARE CONNECTED ONLY TO PLASTIC WATER AND DRAIN PIPING.**

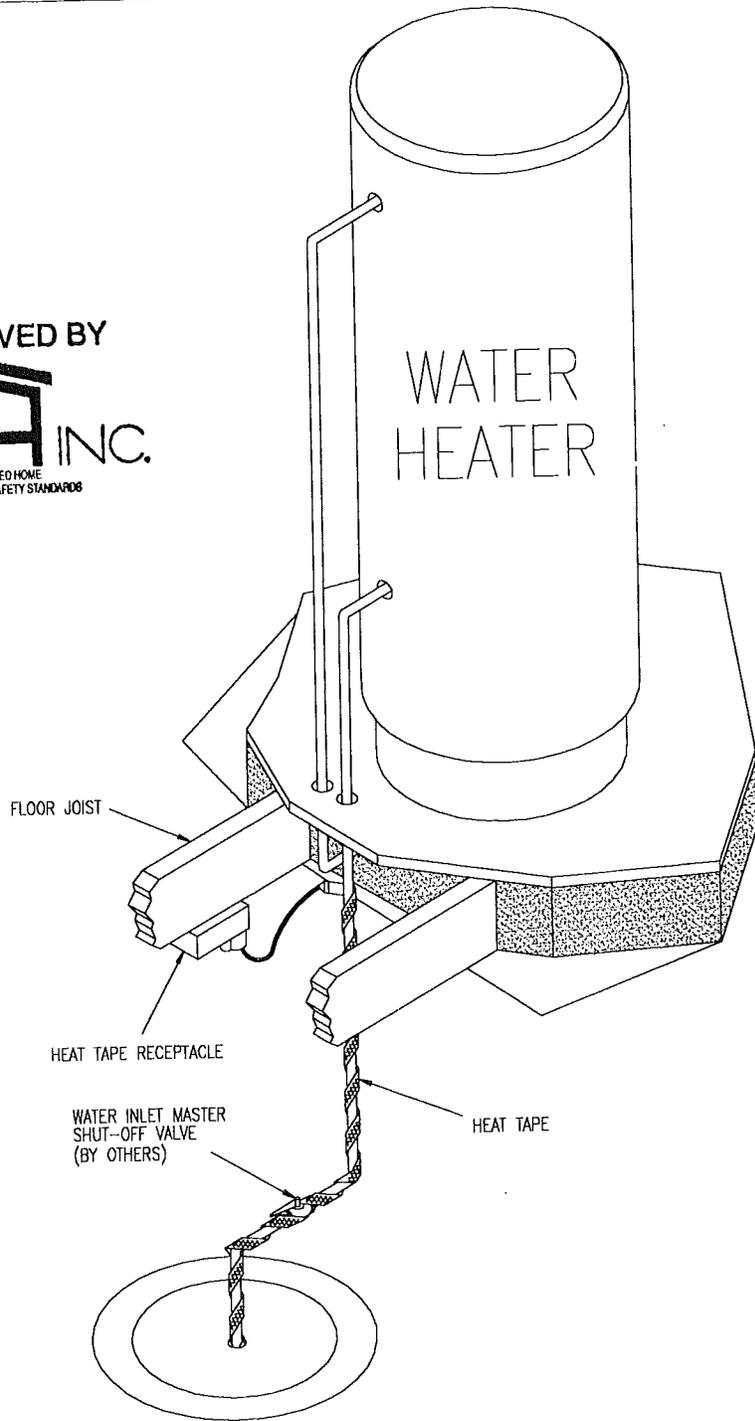
8.6.6.2 **Post-connection tests.** Conduct the following three tests after turning on the main circuit breaker and each individual circuit breaker. **CAUTION: ALLOW THE WATER HEATER TO FILL COMPLETELY BEFORE ACTIVATING THE WATER HEATER CIRCUIT. FAILURE TO DO SO WILL CAUSE THE WATER HEATER ELEMENT TO BURN OUT, AN EVENT NOT COVERED BY THE WARRANTY.**

8.6.6.2.1 **Polarity and grounding of receptacles.** With receptacle and lighting circuits energized, check the polarity and grounding of each 120 volt receptacle and light socket using a polarity tester capable of determining an incorrect wiring configuration. A conversion device may be required to test various fixture bulb sizes and outlet configurations. Investigate any indication of reversed polarity, open grounds or shorts and correct it.

8.6.6.2.2 **Ground Fault Circuit Interruption (GFCI).** Make certain that all receptacles requiring GFCI protection are in fact on the correct circuit(s). Check each ground fault circuit interrupter device by pushing the test button to determine if the power route to the receptacle has been interrupted, or follow the manufacturer's instructions. Replace any GFCI that does not operate properly.

8.6.6.2.3 **Operational checks.** Check all light fixtures by placing a bulb in the socket and turning the switch on and off. Using a pigtail light, check all 240-volt receptacles to determine if both legs of the circuit are powered. Check all 120-volt receptacles to be sure that each is operational. Switched receptacles require the switch to be turned on and off. It is not necessary to check appliances, but their power sources must be assured. Failure of electrical wiring or fixtures requires repair and retesting.

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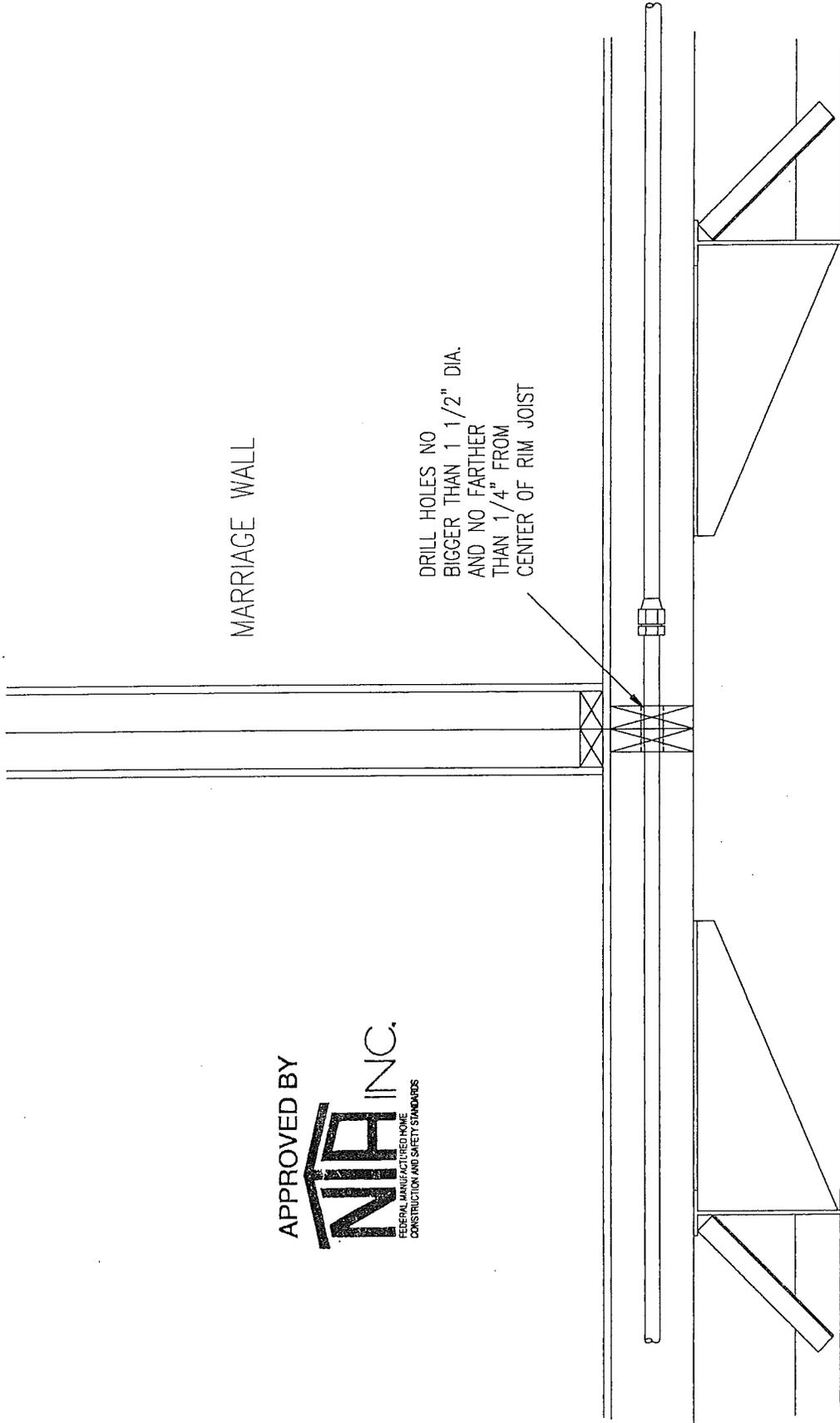
TYPICAL WATER LINE HEAT TAPE HOOK-UP

FIGURE 8.1

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MARRIAGE WALL

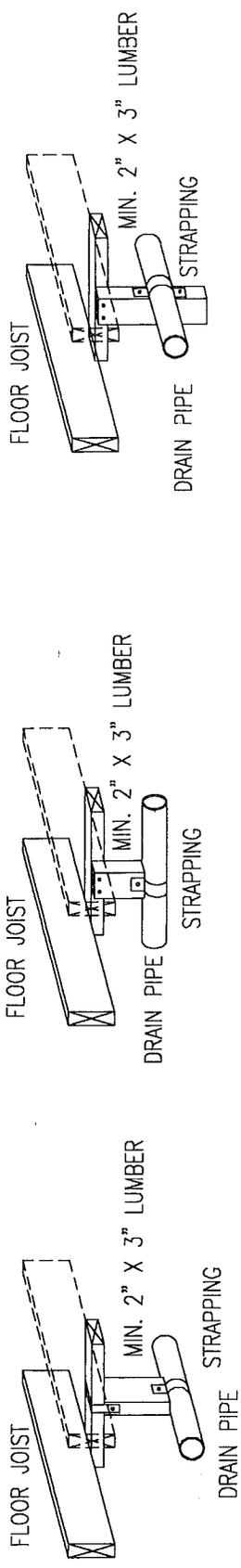
DRILL HOLES NO
BIGGER THAN 1 1/2" DIA.
AND NO FARTHER
THAN 1/4" FROM
CENTER OF RIM JOIST



WATER LINE CROSSOVER CONNECTION

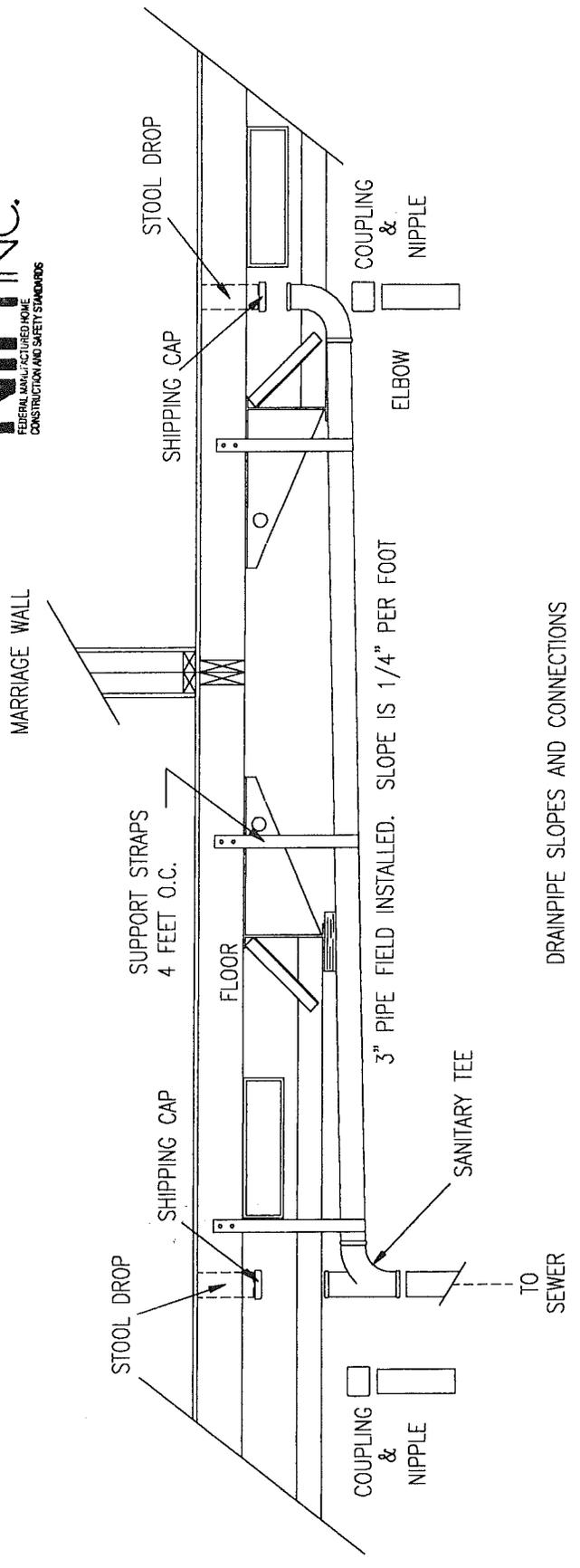
MARRIAGE WALL

FIGURE 8.2



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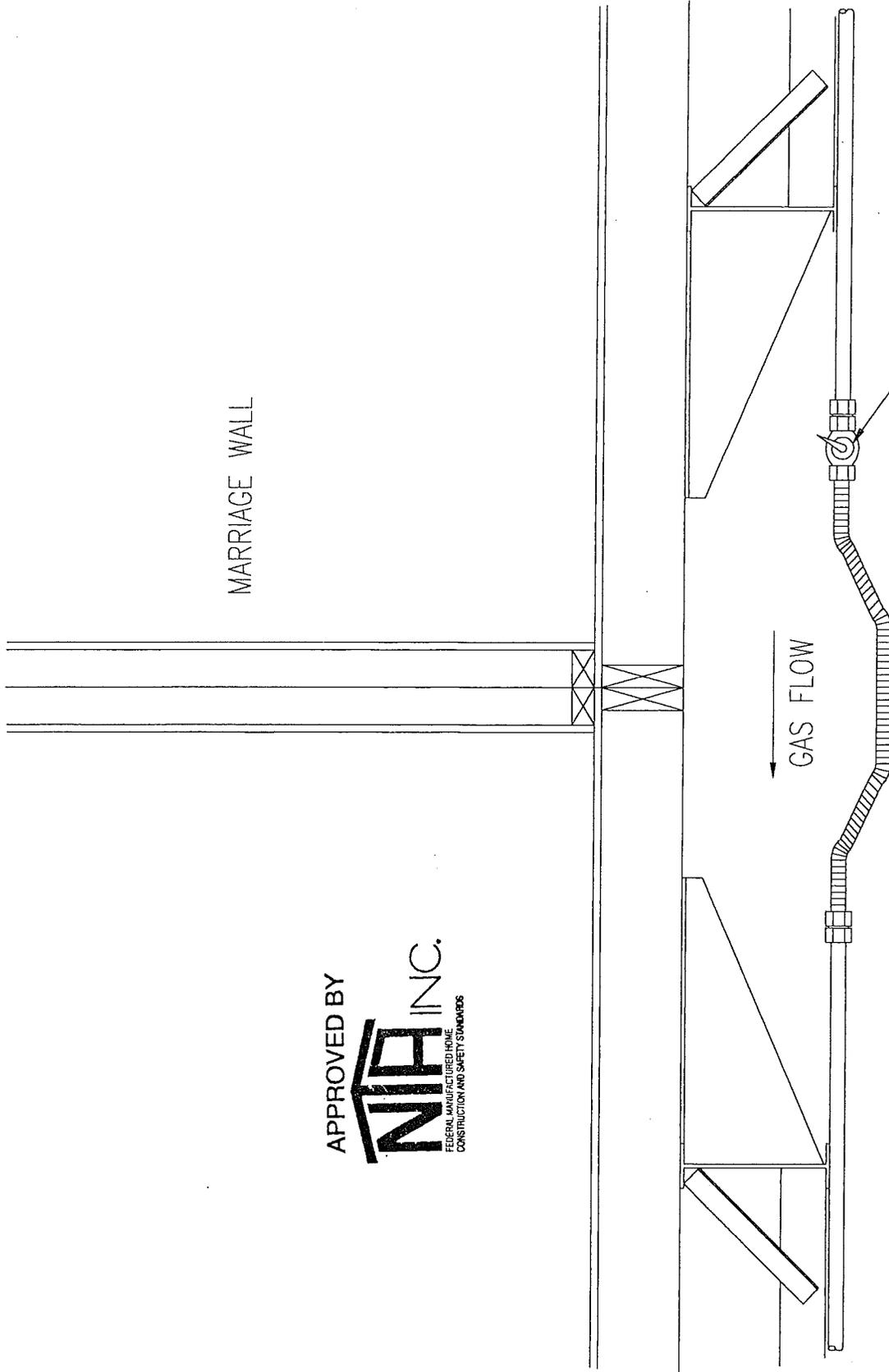
DRAINPIPE SUPPORT METHODS
 FIGURE 8.3



DRAINPIPE SLOPES AND CONNECTIONS
 FIGURE 8.4

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MARRIAGE WALL



CROSSOVER TO BE LISTED
FOR EXTERIOR USE.

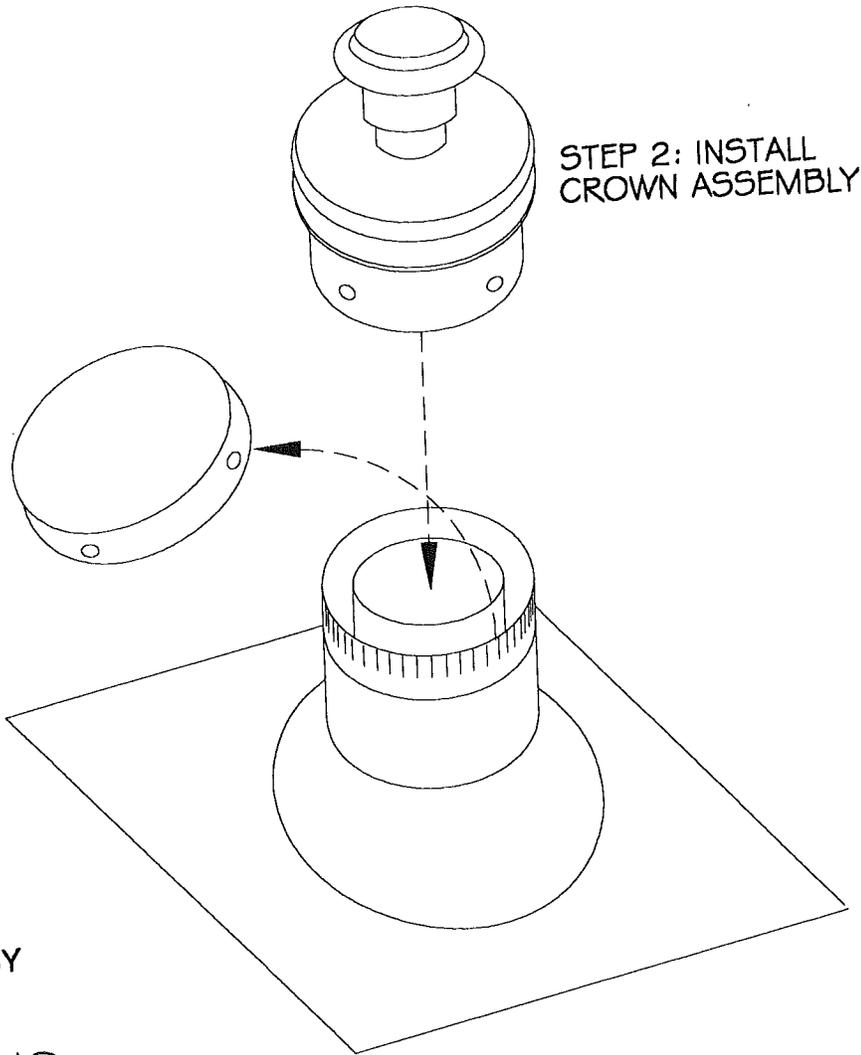
CROSSOVER TO BE THE
SAME SIZE AS GAS PIPING

SHUT-OFF VALVE

GAS LINE CROSSOVER CONNECTION

FIGURE 8.7

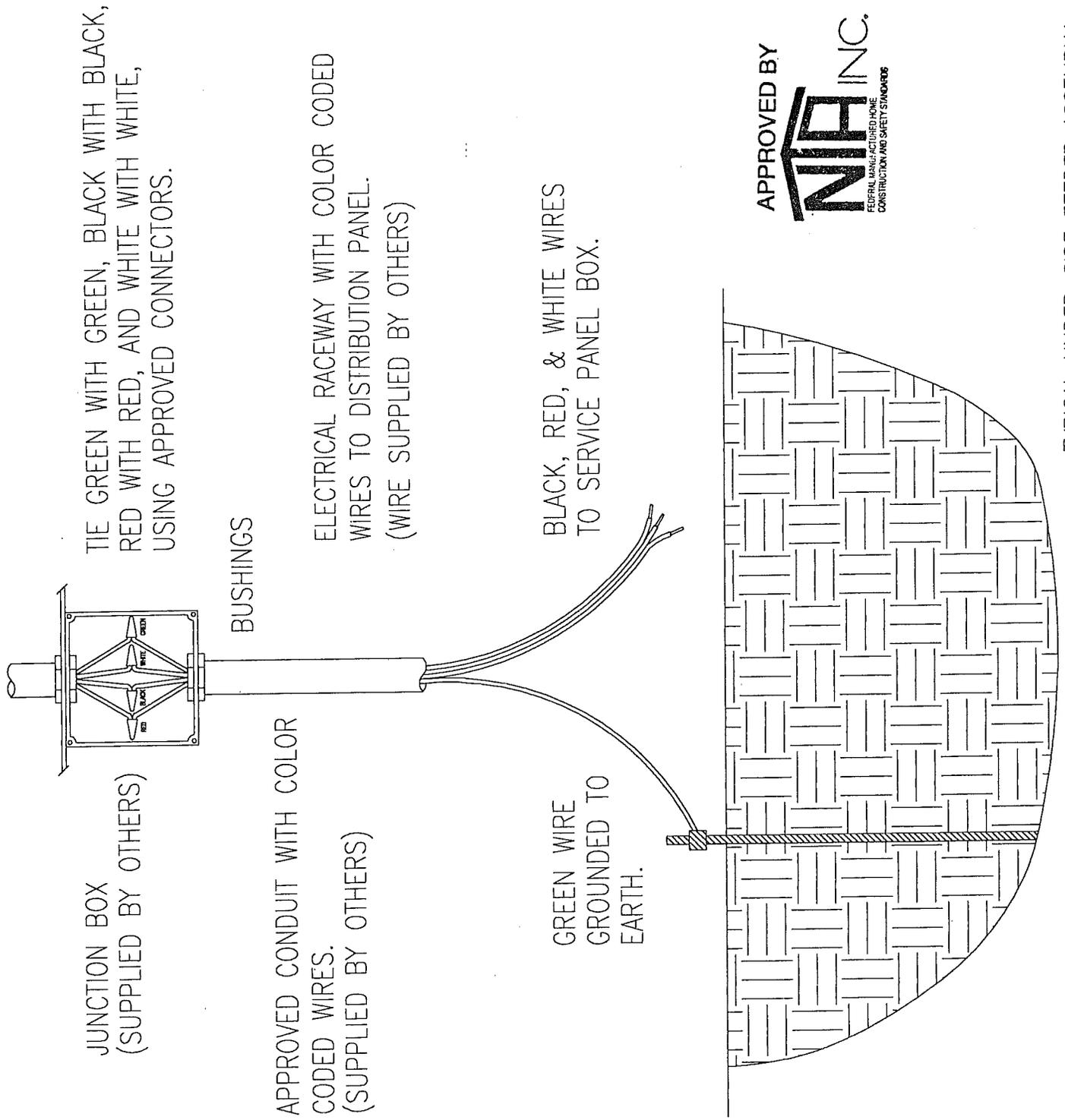
STEP 1: REMOVE
WEATHER COVER



STEP 2: INSTALL
CROWN ASSEMBLY

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FURNACE CROWN ASSEMBLY
FIGURE 8.8



JUNCTION BOX
(SUPPLIED BY OTHERS)

TIE GREEN WITH GREEN, BLACK WITH BLACK,
RED WITH RED, AND WHITE WITH WHITE,
USING APPROVED CONNECTORS.

BUSHINGS

APPROVED CONDUIT WITH COLOR
CODED WIRES.
(SUPPLIED BY OTHERS)

ELECTRICAL RACEWAY WITH COLOR CODED
WIRES TO DISTRIBUTION PANEL.
(WIRE SUPPLIED BY OTHERS)

GREEN WIRE
GROUNDED TO
EARTH.

BLACK, RED, & WHITE WIRES
TO SERVICE PANEL BOX.

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SERVICE-ENTRANCE CONDUCTORS

SERVICE AMPS	FEEDER	WIRE SIZE		CONDUIT SIZE	BOX SIZE
		GROUND	NEUTRAL		
100	#4	#8	#8	1 1/4"	10 X 10 X 4
125	#2	#8	#4	2"	10 X 12 X 4
150	#1	#6	#3	2"	10 X 12 X 4
200	#2/0	#6	#1	2"	10 X 12 X 4

Refer to notes 1 & 2 for minimum box size.
 All service cable to be copper conductor and shall be a 75°C (Minimum) temperature rating. Figure 8.10 (a).
 Conductor Types: RH-RHH-RHW-THHW-THW-THWN-THHN-XHHW-USE

JUNCTION BOX SIZE



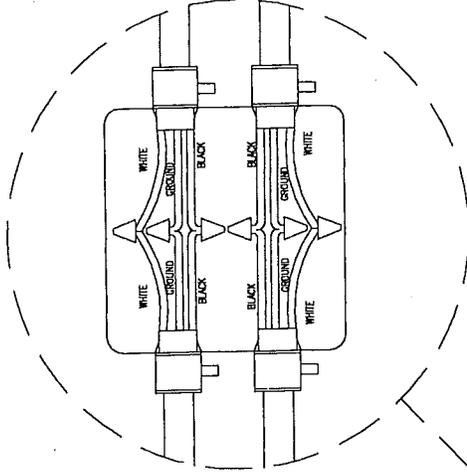
Notes:

- 1: For straight pulls the length of the box shall not be less than eight times the trade diameter of the largest raceway.
- 2: For angle pulls the distance between each raceway entry inside the box and the opposite wall of the box shall not be less than six times the trade diameter of the largest raceway.

SIZE OF FEEDER CONDUCTORS TO BE INSTALLED, AWG, OR MCM	DISTANCE RACEWAY ENTRY TO WALL OR BARRIER
4 - 3	2"
2	2 1/2"
1	3"
1/0 - 2/0	3 1/2"
3/0 - 4/0	4"
250	4 1/2"
300 - 350	5"

Figure 8.10 (B)

FIGURE 8.12 (b)



DRILL HOLES NO
 BIGGER THAN 1" DIA.
 AND NO FARTHER
 THAN 1/4" FROM
 CENTER OF RIM JOIST

MARRIAGE WALL

NOTE: TO ENSURE CIRCUIT
 CONTINUITY, CONNECT MATCHING
 COLOR CODED WIRES WITH
 APPROVED SPlicing DEVICES
 OR METHODS PER NEC.

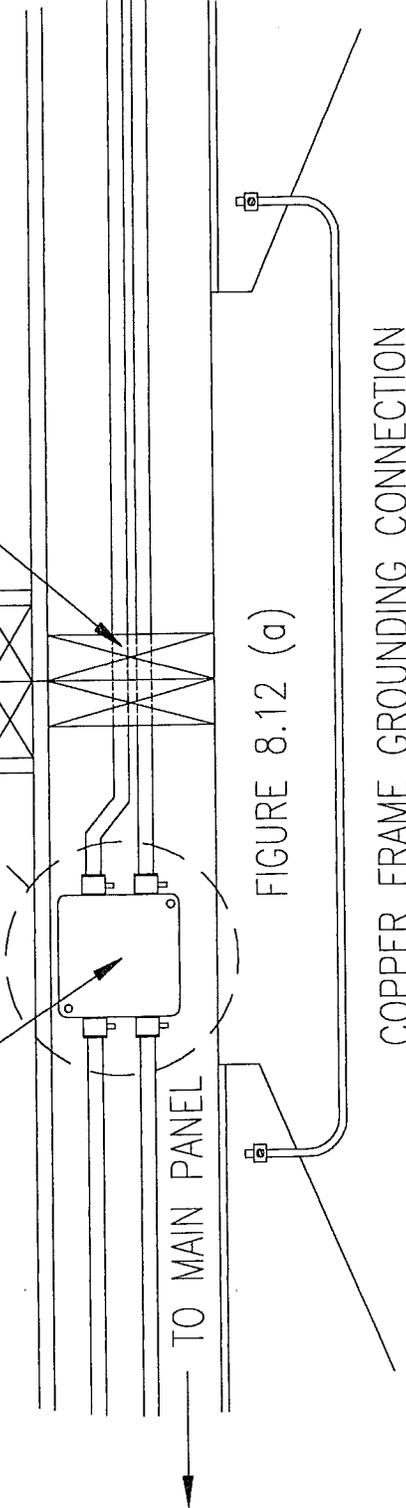


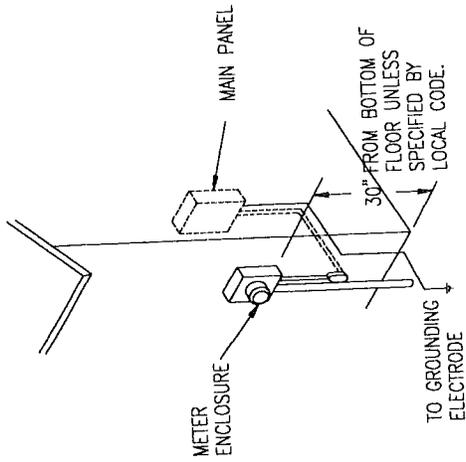
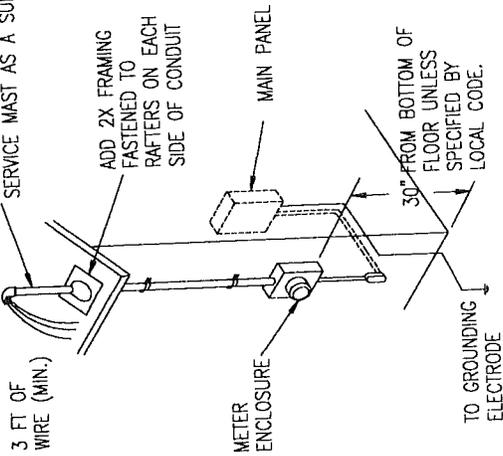
FIGURE 8.12 (a)

ELECTRICAL CROSSOVER CONNECTIONS

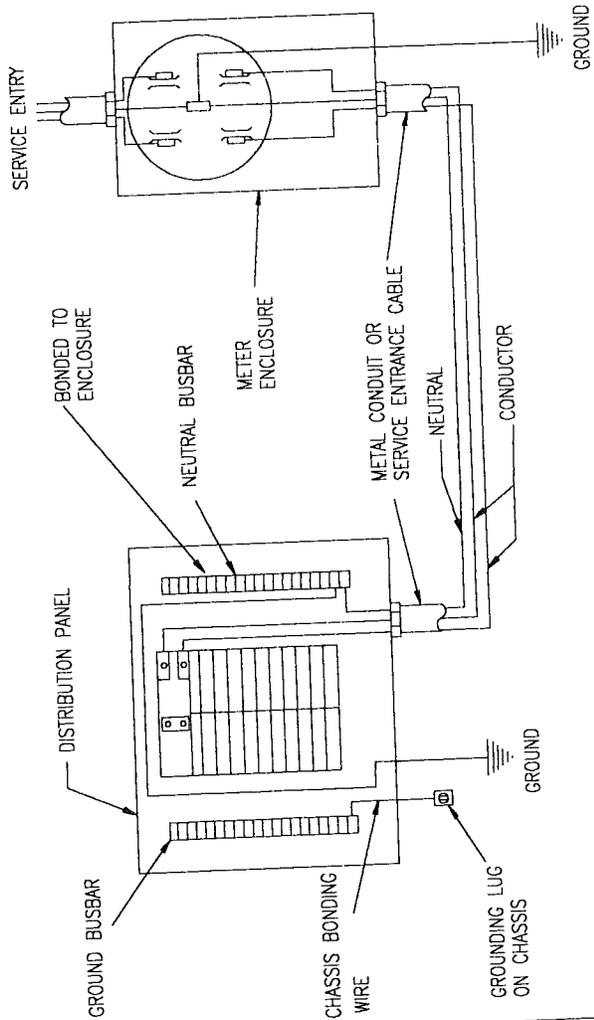
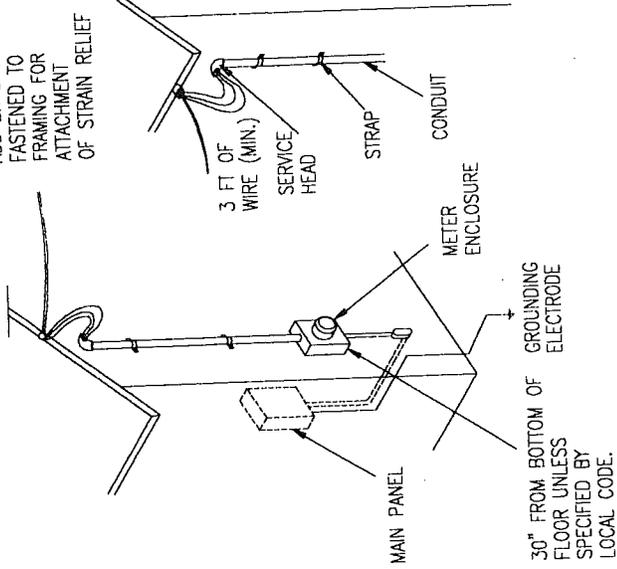
FIGURE 8.12

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REFER TO NEC 230-28 FOR
 SERVICE MAST AS A SUPPORT



ADD 2X BACKERS FASTENED TO FRAMING FOR ATTACHMENT OF STRAIN RELIEF



SERVICE EQUIPMENT INSTALLED ON THE MANUFACTURED HOME

FIGURE 8.11

CHAPTER 9 — FINAL INSPECTION

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

- 9.1 **Water and drain systems.** All water and drain systems work properly and do not leak.
- 9.2 **Appliance function and operation.** Appliances have been tested and work properly.
- 9.3 **Windows, doors and drawers.** All windows, doors and drawers work properly.
- 9.4 **Exit windows.** One window in each bedroom is designated as secondary exit to be used in case of emergency. Each exit window is labeled as such with operating instructions. All shipping hardware should be removed and the window should operate as explained in the window manufacturer’s instructions.
- 9.5 **Exterior siding and trim.** There are no gaps, voids, or missing fasteners, and all seams are sealed.
- 9.6 **Stack heads and vent pipe flashings on roof.** All stack head or vent pipe flashings are properly attached and sealed.
- 9.7 **Composition roof.** All shingles are properly attached, none are loose or missing, and all holes are filled.
- 9.8 **Skirt venting.** The skirting around the home has nonclosing vents, located at or near each corner as high as possible to cross-ventilate the entire space under the home. The free area of these vents must be equal to at least one square foot for every 150 square feet of floor area of the home. The vent size must be increased to allow for insect screens, slats, louvers, etc., used over the open vent area.
- 9.9 **Low-hanging trees and bushes.** If there are any low-hanging trees or bushes near your home, trim or cut them. Think about the plants’ possible movement during windy conditions or under snow or ice loads in limiting their future growth.
- 9.10 **Exhaust fan operation and air flow.** Check all exhaust fans for proper operation and air flow.
- 9.11 **Bottom board.** Carefully inspect the bottom covering of the home for loosening or tears from installation of pipes or wires. Seal openings around the floor perimeter, pipes or pipe hangers and splits or tears with weather-resistant tape. See bottom board manufacturers patching and repair instructions for proper methods (separately provided with this manual).
- 9.12 **Ground cover.** Repair any cuts or tears in the ground cover with tape.
- 9.13 **Anchors and straps.** Be sure the correct number of anchors have been installed at the proper angle, and that all straps have been tightened.
- 9.14 **Interior details.** Inspect for, and correct, all interior finishing details, such as loose molding, carpet seams, etc.

The retailer’s representative should inspect the home with the homeowner, give the homeowner a copy of the Homeowner’s Manual, and brief the homeowner about maintaining the home.



BOTTOM BOARD REPAIR

Repairs — small cuts or tears may be repaired by using CP-1 pressure sensitive tape or equivalent. For larger holes use additional pieces of Mobile Flex which extend at least 2” beyond the damaged area. Secure the large patch with either a mechanical fastener, CP-1 pressure sensitive tape, High Tack Adhesive 76 manufactured by 3M contact cement or equivalent.



NOTES