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FOUR SEASONS
HOUSING

DOUBLEWIDE INSTALLATION MANUAL

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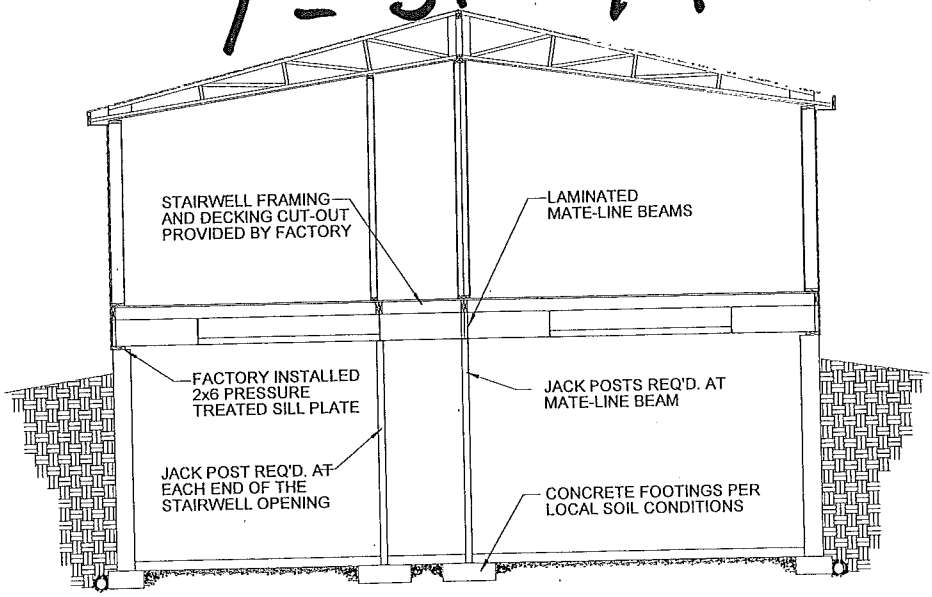
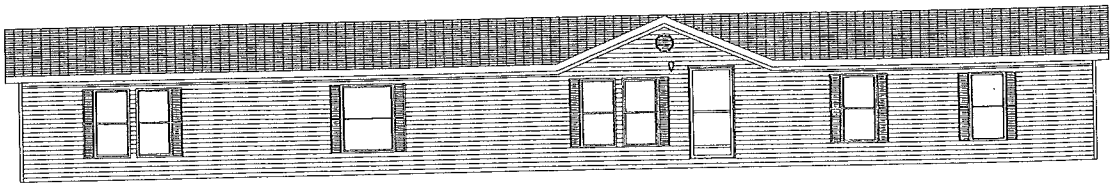




PREFACE ..... Page 1
SECTION 1 INTRODUCTION ..... Page 1
1.1 ABOUT THIS MANUAL ..... Page 1
1.2 PRE-INSTALLATION ..... Page 1
1.3 SAFETY ..... Page 1
SECTION 2 SITE PREPARATION ..... Page 1
2.1 SITE LOCATION AND LAYOUT ..... Page 1
2.1.1 WEATHER ZONE MAPS ..... Page 1
2.1.2 TRANSPORTATION TO SITE ..... Page 2
2.1.3 ADDITIONAL CONSIDERATIONS ..... Page 2
2.2 SOIL CONDITIONS ..... Page 2
2.2.1 SOIL REQUIREMENTS ..... Page 2
2.2.2 BEARING CAPACITY ..... Page 3
2.3 REMOVAL OF VEGETATION ..... Page 3
2.4 DRAINAGE. ..... Page 3
2.4.1 PURPOSE ..... Page 3
2.4.2 REQUIREMENTS ..... Page 3
2.4.3 DRAINAGE STRUCTURES ..... Page 3
2.5 GROUND MOISTURE ..... Page 4
2.5.1 PURPOSE ..... Page 4
2.5.2 REQUIREMENTS ..... Page 4
SECTION 3 FOUNDATIONS ..... Page 4
3.1 TYPES OF FOUNDATIONS. ..... Page 4
3.1.1 PURPOSE ..... Page 4
3.1.2 DESCRIPTION OF FOUNDATIONS. ..... Page 5
3.2 FOOTINGS. ..... Page 5
3.2.1 PURPOSE ..... Page 5
3.2.2 TYPES OF FOOTINGS ..... Page 5
3.2.3 WEATHER CONSIDERATIONS ..... Page 5
3.2.4 FOOTING SIZE ..... Page 6
3.3 PIERS ..... Page 6
3.3.1 PURPOSE ..... Page 6
3.3.2 SELECTION ..... Page 6
3.3.3 FLOOR LIVE LOAD ..... Page 6

3.3.4 LOAD-BEARING CAPACITY ..... Page 6
3.3.5 LAYOUT ..... Page 6
3.3.6 CLEARANCE ..... Page 6
3.3.7 PIER HEIGHT ..... Page 6
3.4 ANCHORING. ..... Page 6
3.4.1 PURPOSE ..... Page 7
3.4.2 ANCHORING DEVICES ..... Page 7
3.4.3 ANCHORING INSTALLATION ..... Page 7
3.5 CRAWLSPACE (CROSS-BEAM) FOUNDATIONS ..... Page 16
3.5.1 BEAM TYPES ..... Page 16
3.5.2 PILASTERS ..... Page 16
3.5.3 REBAR ..... Page 16
3.5.4 POURED CONCRETE WALLS ..... Page 16
3.5.5 UNIT COLUMN SUPPORT (RIDGE-BEAM COLUMN) ..... Page 16
3.5.6 PIERS (JACK POSTS). **Figures 3.0-3.5** for details. ..... Page 16
3.5.7 FOOTINGS ..... Page 16
3.5.8 DRAINAGE ..... Page 16
3.5.9 DAMP-PROOFING ..... Page 16
3.5.10 SHIMS ..... Page 16
3.5.11 CONCRETE BLOCK WALLS ..... Page 16
3.5.12 ACCESS ..... Page 17
3.5.13 VENTILATION ..... Page 17
3.5.14 BACK FILLING ..... Page 17
3.5.15 BEAM POCKETS ..... Page 17
3.5.16 FASTENING ..... Page 17
3.5.17 SILL PLATE (MUD SILL) ..... Page 17
3.6 "PH" FRAME SYSTEM FOUNDATIONS ..... Page 25
3.6.1 BEAM TYPES ..... Page 25
3.6.2 PILASTERS ..... Page 25
3.6.4 REBAR ..... Page 25
3.6.5 POURED CONCRETE WALLS ..... Page 25
3.6.6 UNIT COLUMN SUPPORT (COLUMN SUPPORT) ..... Page 25
3.6.7 PIERS (JACK POSTS) ..... Page 25
3.6.8 FOOTINGS ..... Page 25

3.6.9 DRAINAGE ..... Page 25
3.6.10 DAMP-PROOFING ..... Page 25
3.6.11 SHIMS ..... Page 25
3.6.12 CONCRETE BLOCK WALLS ..... Page 25
3.6.13 ACCESS ..... Page 25
3.6.14 VENTILATION ..... Page 26
3.6.15 BACK FILLING ..... Page 26
3.6.16 FASTENING ..... Page 26
3.6.17 SILL PLATE (MUD SILL) ..... Page 26
3.6.18 STAIRS ..... Page 35
4.1 TRANSPORTING TO SITE ..... Page 35
4.2 LEVELING AND BLOCKING ..... Page 35
4.2.1 JACKS ..... Page 35
4.2.2 PREPARATION OF DOUBLE-WIDE SECTIONS ..... Page 35
4.2.3 PROCEDURE ..... Page 35
4.2.3.1 PIER SET ..... Page 36
4.2.3.2 PERMANENT FOUNDATION ..... Page 36
4.2.4 LEVELING PROCEDURE ..... Page 37
4.2.4.1 USING A WATER LEVEL ..... Page 37
4.2.5 DOUBLE WIDE CLOSING DETAILS ..... Page 37
4.2.5.1 FASTENING ..... Page 38
4.2.5.1.1 RIDGE ..... Page 38
4.2.5.1.2 FLOORS ..... Page 38
4.2.5.1.3 ENDWALLS ..... Page 38
4.2.5.2 CROSS-OVER CONNECTIONS ..... Page 38
4.2.5.3 EXTERIOR FINISHING ..... Page 38
4.2.5.3 INTERIOR FINISHING ..... Page 39
4.2.5.4 STAIRWELLS ..... Page 39
SECTION 5 OPTIONAL FEATURES ..... Page 39
5.1 CAUTION ..... Page 39
5.2 SKIRTING ..... Page 39
5.3 CARPORTS AND AWNINGS ..... Page 39
5.4 ON-SITE ATTACHED STRUCTURES ..... Page 39
5.5 EXHAUST AND VENTING ..... Page 39

5.6 TELEPHONE AND CABLE TELEVISION ..... Page 39
SECTION 6 FINAL ASSEMBLY ..... Page 40
6.1 PURPOSE ..... Page 40
6.2 EXTERIOR LIGHTS ..... Page 40
6.3 CEILING FANS ..... Page 40
6.4 HITCH, WHEEL, AND SUSPENSION REMOVAL ..... Page 40
6.5 MISCELLANEOUS ITEMS ..... Page 40
SECTION 7 APPLIANCES ..... Page 40
7.1 CLOTHES DRYER ..... Page 41
7.2 FUEL BURNING DEVICES (FIREPLACES, ETC.) ..... Page 41
7.2.1 CHIMNEYS ..... Page 42
7.2.2 COMBUSTION AIR INLETS ..... Page 42
7.4 AIR CONDITIONING ..... Page 42
7.5 HEAT PUMP INSTALLATION ..... Page 42
7.6 WATER HEATER ..... Page 42
7.7 FURNACE ..... Page 42
SECTION 8 UTILITY HOOKUP AND TESTING ..... Page 42
8.1 PURPOSE ..... Page 42
8.2 WATER SUPPLY HOOKUP AND TESTING PROCEDURE. ..... Page 42
8.2.1 WATER SUPPLY TESTING ..... Page 43
8.2.2 WATER SUPPLY HOOKUP ..... Page 43
8.2.2.1 PROTECTION FROM FREEZING ..... Page 43
8.3 DRAINAGE SYSTEM HOOKUP AND TESTING ..... Page 43
8.3.1 DRAINAGE SYSTEM TESTING ..... Page 43
8.3.2 DRAINAGE SYSTEM HOOKUP ..... Page 44
8.3.2.1 PROTECTION FROM FREEZING ..... Page 44
8.4 GAS SYSTEM HOOKUP AND TESTING ..... Page 44
8.4.1 GAS SYSTEM TESTING ..... Page 44
8.4.1.1 PIPING SYSTEM TESTING ..... Page 44
8.4.1.2 TOTAL GAS SYSTEM TESTING ..... Page 44
8.4.2 GAS SYSTEM HOOKUP ..... Page 44
8.5 ELECTRICAL SYSTEM HOOKUP AND TESTING. ..... Page 44
8.5.1 ELECTRICAL SYSTEM TESTING ..... Page 44
8.5.1.1 PRE-CONNECTION ELECTRICAL TESTING ..... Page 45

8.5.1.1.1 GROUNDING CONTINUITY TEST ..... Page 45
8.5.1.1.2 CIRCUIT CONTINUITY TEST ..... Page 45
8.5.1.1.3 DIELECTRIC STRENGTH (HI-POT) TEST ..... Page 45
8.5.1.2 POST-CONNECTION TESTING ..... Page 46
8.5.1.2.1 POLARITY TEST ..... Page 46
8.5.1.2.2 OPERATIONAL TEST ..... Page 46
8.5.2 ELECTRICAL HOOK-UP ..... Page 46
8.5.2.1 ELECTRICAL FEEDER AND EQUIPMENT SIZES . Page 46
8.5.2.2 GROUNDING THE HOME ..... Page 47
8.5.2.3 MAST WEATHERHEAD FEEDER ..... Page 47
8.5.2.4 UNDER-FLOOR FEEDER ..... Page 47
SECTION 9 MISCELLANEOUS ..... Page 48
9.1 BOTTOM BOARD PATCHING ..... Page 48
SECTION 10 ANCHOR INSTALLATION INSTRUCTIONS ..... Page 49

PREFACE

YOUR ***FOUR SEASONS*** HOME WAS DESIGNED, CONSTRUCTED AND INSPECTED FOR CONFORMANCE TO *THE FEDERAL MANUFACTURED HOUSING CONSTRUCTION AND SAFETY STANDARDS* IN EFFECT ON THE DATE OF MANUFACTURE. THIS NATIONAL STANDARD SETS FORTH THE REQUIREMENTS OF DESIGN CONSTRUCTION, FIRE SAFETY, PLUMBING, HEATING SYSTEMS AND ELECTRICAL SYSTEMS FOR FACTORY-BUILT HOUSING DESIGNED TO BE USED AS DWELLINGS.

THIS MANUAL CONTAINS INFORMATION ON THE PROPER INSTALLATION OF YOUR ***FOUR SEASONS*** HOME. WE SUGGEST YOU READ THIS MANUAL BEFORE YOUR HOME IS INSTALLED. HOME INSTALLATION IS THE HOMEOWNER'S RESPONSIBILITY!

CONSULT WITH BUILDING OFFICIALS IN YOUR AREA PRIOR TO INSTALLATION TO DETERMINE NECESSARY PERMITS, LICENSES AND INSPECTIONS WHICH ARE REQUIRED FOR THE PROPER AND SAFE INSTALLATION OF YOUR HOME.

THE DRAWINGS CONTAINED IN THIS MANUAL ARE INTENDED TO BE REPRESENTATIVE OF THE PRODUCT. DESIGNS AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. **NEVER** SCALE THE DRAWINGS! ONLY USE THE DIMENSIONS.

THIS MANUAL IS INTENDED TO INSTRUCT AND ASSIST QUALIFIED PERSONNEL ON THE PROPER INSTALLATION OF YOUR ***FOUR SEASONS*** HOME. IT IS **NOT** INTENDED FOR USE BY PERSONS NOT FAMILIAR WITH HOME SET-UP!

IT IS RECOMMENDED BY *THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT* (**HUD**) THAT, SUBSEQUENT TO COMPLETION OF THE INSTALLATION, YOUR HOME IS INSPECTED BY AN INDEPENDENT, QUALIFIED PROFESSIONAL.

DO **NOT** CONTACT ***FOUR SEASONS HOUSING*** ABOUT THE INSTALLATION OF YOUR HOME. CONTACT YOUR **DEALER** AND THEY WILL CONTACT US IF NECESSARY.

FOUR SEASONS HOUSING APPRECIATES YOUR PATRONAGE AND HOPE YOUR HOME WILL BRING MANY YEARS OF HAPPINESS TO YOU AND YOUR FAMILY. ALL COMMENTS AND SUGGESTIONS ARE WELCOME AND MAY BE SENT TO THE MAILING ADDRESS ON THE FRONT COVER.

DEALER NAME:_____

ADDRESS:_____

PHONE:_____

PERSON TO CONTACT:_____

SECTION 1 INTRODUCTION

1.1 ABOUT THIS MANUAL. This manual contains installation instructions for the set-up of your ***FOUR SEASONS*** home. Several charts and figures are included to provide information for proper installation. Careful adherence to this manual by the homeowner ,an experienced set-up crew, and consultation with a registered professional engineer in circumstances not covered by this manual, will ensure a safe and proper installation of your home.

1.2 PRE-INSTALLATION. Before installing or relocating your home, contact the local authority having jurisdiction over the installation of manufactured homes, to see if permits for blocking, anchoring, and utility connections are required. Inspections may be required during or prior to installation of the home. Zoning and development regulations may also apply.

1.3 SAFETY. ONLY SPECIALLY TRAINED CREWS SHOULD ATTEMPT TO INSTALL THE HOME. Installers should follow the instructions provided in this manual as well as all general safety procedures as with any construction endeavor. Remember that the home weighs several tons. Without proper safety blocking and common sense a rollover or collapse can **CAUSE SEVERE INJURY OR DEATH!** Always assume that the home is unstable until it is completely installed. Never allow anyone under the home until **all** support blocking is safely in place. Check all safety equipment for defects before each and every installation.

SECTION 2 SITE PREPARATION

2.1 SITE LOCATION AND LAYOUT

2.1.1 WEATHER ZONE MAPS. The home is designed for certain regional weather conditions. See the zone maps in **figures 2.1.1(a), (b), and (c)** and the data plate installed in the home. Do not install or relocate the home in an area that requires greater wind, roof load, or heating/cooling capacities than the home is designed for. It is, however, safe to locate the home in an area with **less stringent** roof load and/or weather requirements.

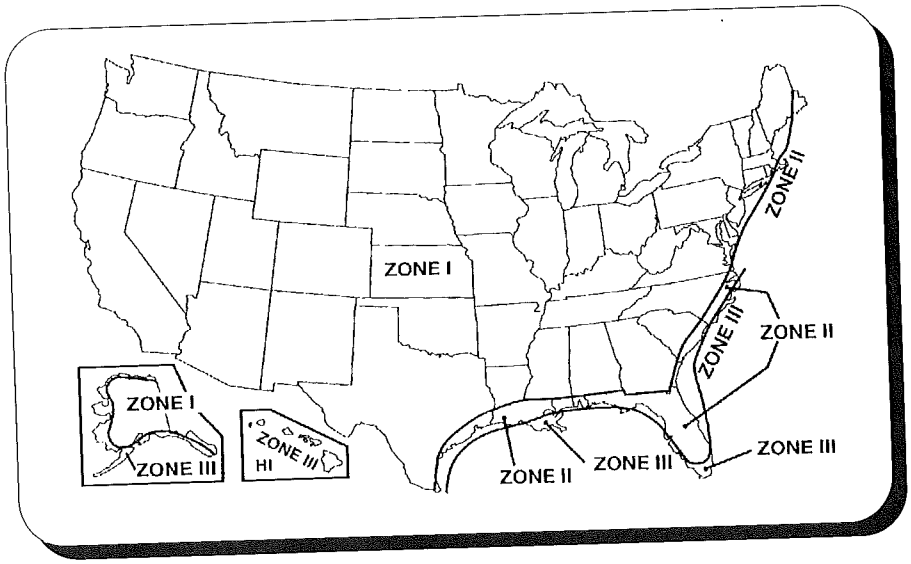


FIGURE 2.1.1 (a)
BASIC WIND ZONE MAP

2.1.2 TRANSPORTATION TO SITE. Make certain that the site is properly prepared and complete. All concrete work is finished and has had adequate time to cure. Site work that may be difficult with the home at the site (such as anchors and ground moisture barriers) is already installed. Before transporting the home to or from the site check to be sure that the shipping equipment can safely reach the site. Be certain of the

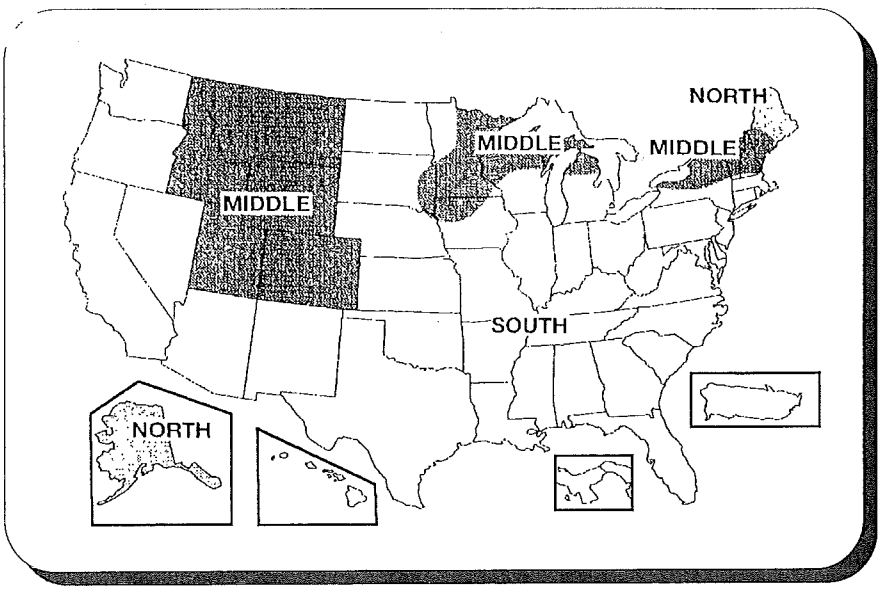


FIGURE 2.1.1 (b)
BASIC ROOF LOAD ZONE MAP

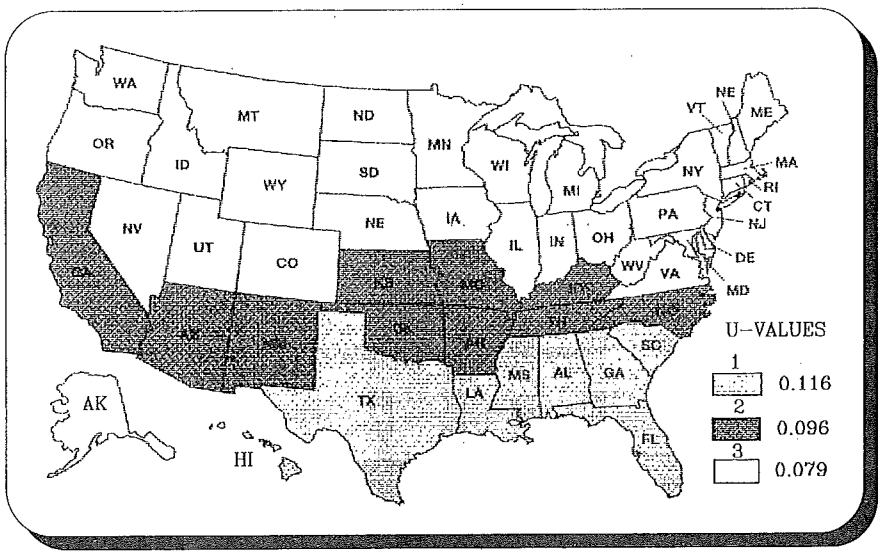


FIGURE 2.1.1 (c)
BASIC U/O VALUE ZONE MAP

minimum clearance that the home requires by doing a site measurement before attempting to ship the home. The roadway should be clear and provide adequate clearance for maneuvering. Take care to avoid overhead lines and branches. If the road surface is uneven, grade and compact the road surface to remove any possibility of the home tipping. Special permits may be required before transporting the home.

2.1.3 ADDITIONAL CONSIDERATIONS. Be sure that all local permits required for the transportation and installation of a manufactured home have been obtained. Obtain information on local laws as to the encroachments in streets, yards, and courts, as well as permissible setback distances from property lines and public roads. The distance between the home and other structures depends on local requirements. On-site attached structures may require that fire separation materials be used between them and the home.

2.2 SOIL CONDITIONS

2.2.1 SOIL REQUIREMENTS. To aid in the prevention of settling, insure that the site is of undisturbed fill that has been compacted to a minimum of 90% of its maximum relative density.

2.2.2 BEARING CAPACITY. The bearing capacity of the soil should be tested after the site has been graded and filled Check with local building code officials for acceptable methods that may be used to test soil bearing capacity. The soil is to be tested at the depth of the footings. If the soil capacity cannot be tested but the type can, then refer to **chart 2.2.2** to obtain the bearing capacity. If neither the soil bearing capacity nor the soil type can be identified, then the lowest value (1,000 lbs./sq. ft.) must be used. If the soil appears to be peat or uncompacted fill, consult a professional engineer before continuing.

SOIL TYPE BASED ON THE UNIFIED CLASSIFICATION SYSTEM	BEARING CAPACITY (LBS. PER SQ. FT.)
ROCK OR HARD PAN	4,000 AND UP
SANDY GRAVEL AND GRAVEL	2,000
SAND, SILTY SAND, CLAYEY SAND, SILTY GRAVEL, OR CLAYEY GRAVEL	1,500
CLAY, SANDY CLAY, SILTY CLAY, OR CLAYEY SILT	1,000
UNCONSOLIDATED FILL	SPECIAL ANALYSIS
PEAT OR ORGANIC CLAYS	SPECIAL ANALYSIS

CHART 2.2.2 SOIL BEARING CAPACITY

This chart is **only** to be used when **none** of the following is available:

1. Soil investigation and analysis of the site
2. Complete local building code information.
3. Recommendation of an engineer or code official

2.3 REMOVAL OF VEGETATION. To reduce the chances of settling and insect/rodent damage remove all organic materials from beneath the home. This includes grass, roots, top soil, wood scraps, etc. Remove tree branches in the vicinity of the home to prevent windstorm damage.

2.4 DRAINAGE.

2.4.1 PURPOSE. Proper site drainage is necessary to prevent excessive humidity under and in the home that may damage building materials or cause them to swell (which will cause problems with the operation of doors and windows).

2.4.2 REQUIREMENTS. The site for your home must be sloped to provide storm drainage. Check local building codes which may specify slope requirements. It is generally recommended that a slope of 1" per 36" be maintained and that the site be evenly graded so that there are no depressions or low-spots where standing water may accumulate, either underneath or outside of the home. Be certain not to grade the home so that there is a drainage ditch beneath the home as soil erosion can result, always crown the site under the home so drainage flows away from the home at all angles.

2.4.3 DRAINAGE STRUCTURES. Depending on the site and local codes, ditches and/or culverts may be required to provide adequate site drainage. If necessary consult a professional engineer.

2.5 GROUND MOISTURE

2.5.1 PURPOSE. To prevent excessive humidity in the home and possible damage.

2.5.2 REQUIREMENTS. If skirting is to be installed, the entire area under the home must be covered with an acceptable type of moisture vapor barrier (ground cover). Use minimum 6 mil polyethylene sheeting or equivalent. Overlap all seams at least 6". Where frost and soil conditions allow the footings to be placed at grade level, place the sheeting directly underneath them.

SECTION 3 FOUNDATIONS

NOTE: ALL APPLICABLE LOCAL CODES MUST BE CONSIDERED WHEN PLANNING AND BUILDING YOUR FOUNDATION.

NOTE: IT IS THE RESPONSIBILITY OF THE HOME INSTALLER TO SITE CHECK ALL FOUNDATION DIMENSIONS PRIOR TO INSTALLATION

3.1 TYPES OF FOUNDATIONS.

3.1.1 PURPOSE. Due to the popularity of Manufactured Homes, additional methods have been provided by ***FOUR SEASONS*** to install your home on a permanent foundation. ***FOUR SEASONS*** even offers a special frame that allows you to place your home on a full basement. There are four (4) foundation plans available from ***FOUR SEASONS*** at this time. Some of these foundations require the expanded frame and/or stairwell system to be installed at the factory.

3.1.2 DESCRIPTION OF FOUNDATIONS.

1. Pier set foundation. This system uses concrete footings supporting piers. The pier set provides a simple, inexpensive way to install a solid foundation. This type of foundation is not permanent and therefore makes relocating the home a simpler process. See **sections 3.1-3.2** for foundation details and **section 4** for set-up details.

2. Cross-beam foundation. The cross-beam foundation (also called "crawlspace") uses steel beams set on pilasters or into the foundation wall to support the main I-beams. This method can be used to provide a more finished look to the home. The cross-beam foundation is more durable and solid than the pier set. It is also possible to create a full basement by increasing the foundation wall height. When using this method a breezeway (or similar type of entry) must be built to gain entry to the home from the basement. The home-owner should be aware that any modifications to the frame or structure of the home will **void the factory warranty**. **DO NOT** cut into the floor or remove, relocate, or modify any part of the frame in an attempt to install a stairwell. Doing so will **void** the factory warranty.

3. The cross-beam foundation may be used in conjunction with the "basement ready" or **"PH"** floor plan offered by ***FOUR SEASONS HOUSING.*** The "Stairwell" floor plan can be ordered with the **82 1/2" standard** frame. This provides a **82 1/2" standard** frame with a stairwell opening already built into the home. This will enable the home-owner to use the cross-beam foundation without having to attach an exterior entrance. The appropriate design must be used with this system to avoid the stairwell from being obstructed by the cross-beams (i.e. do **not** attempt to utilize the standard cross-beam design).

4. "PH" foundation. The **"PH"** floor system is a variation on the standard frame. The main I-beams run the length of the home and out-riggers are located at 4' intervals. The out-riggers are squared-off instead of tapered. The foundation wall supports the outriggers and the main I-beams. The **"PH"** floor system

includes the installation of a laminated mate-line beam on both halves of the home. This beam is attached directly to the outriggers. A pressure-treated 2 x 6 sill plate is installed around the perimeter of the home. The out-riggers are concealed behind an OSB sheathed perimeter knee-wall. The floor system can be attached to the foundation wall by toe-nailing to a field installed sill plate or by using straps embedded in the foundation wall. This system requires the **82 1/2" "PH"** frame system frame.

NOTE: The "PH" frame system can be used with or without the stairwell being installed.
NOTE: The stairwell can be factory installed when using the "PH" or standard 82 1/2" frames.

3.2 FOOTINGS.

3.2.1 PURPOSE. Footings are a key element in the longevity of your home. Improper footings can cause sagging and severe damage to your home.

3.2.2 TYPES OF FOOTINGS. Footings may be pre-cast or site-poured unreinforced concrete at least 4" thick. Reinforced concrete may require a smaller thickness but must be approved by a registered engineer.

3.2.3 WEATHER CONSIDERATIONS. To avoid the effects of frost heave the footings shall be placed below the frost line. Check local building codes to determine a safe depth for the footings. In the absence of local codes use the frost penetration map in **figure 3.2.3** below.

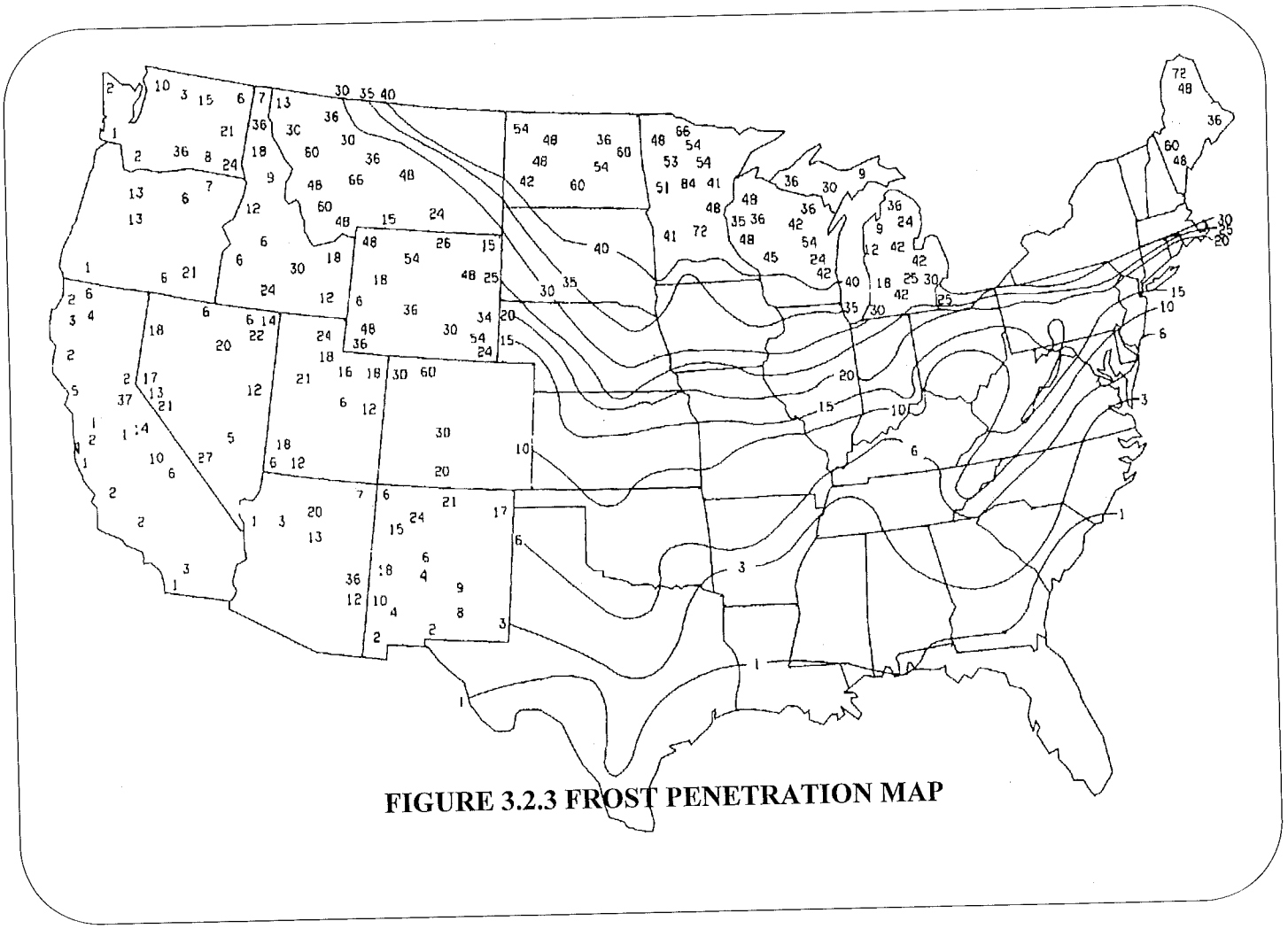


FIGURE 3.2.3 FROST PENETRATION MAP

3.2.4 FOOTING SIZE. The footing size varies depending on the soil bearing capacity (from **section 2.2.2 and chart 2.2.2**)and the pier capacity (from **table 1.0 & 1.2**). Use **table 1.1** to determine footing sizes.

3.3 PIERS

3.3.1 PURPOSE. The piers are a key element in the installation of your home. The piers used must have enough capacity to transmit the vertical load which includes the weight of the home, its furnishings, and temporary roof loading to the foundation below. If the piers or footings are inadequate, sagging floors, walls, and roofs and undue structural stress can result.

3.3.2 SELECTION. Piers may be constructed of concrete blocks capped and shimmed with wedges, adjustable metal or concrete stands, site-poured concrete. Concrete block caps must be the same dimensions as the piers to evenly distribute the weight. They may be constructed of solid hard wood or masonry at least 4" thick or steel. Concrete blocks should have nominal dimensions of at least 8" x 8" x 16" and be arranged with the cells vertically. Capped single stacked concrete blocks have a load-bearing capacity of 10,000 lbs. Regardless of the material used to construct piers and caps they must be able to withstand the required load as found in **table 1.0.** Select adjustable pier height so that the risers do not extend more than 3" when installed.

3.3.3 FLOOR LIVE LOAD. Excessively heavy furniture or appliances, such as pianos, organs, deep freezers, heavy chests, large china cabinets, water beds, etc., require the installation of additional piers along the main beams. When excessive loads are not located in the vicinity of the main beams, additional piers with headers to distribute the weight over several floor joists must be installed. Fireplace

3.3.4 LOAD-BEARING CAPACITY. The required capacity of the piers depends on several factors such as the size of the home, roof live load, and pier spacing. Refer to **tables 1.0, 1.1, and 1.2, and figure 1.1** for information on pier spacing and capacity.

3.3.5 LAYOUT. Figure 1.1 shows a typical pier layout for a ***FOUR SEASONS*** double-wide (your configuration may vary depending on the home and the type of piers used). Perimeter support is not required except at openings. Concrete blocks should have nominal dimensions of at least 8" x 8" x 16" and be arranged with the cells vertically. Capped single stacked concrete blocks have a load-bearing capacity of 10,000 lbs. Piers shall be located a maximum of 2' (24") from the either end of the home. All perimeter and mating wall openings, such as doorways, windows, porches, etc., that are greater than 4' (48") will require additional piers at both ends. Maximum pier spacing is 12'-0" (144") center to center for 12" I-beam frames, 10'-0" (120") for 10" I-beam frames, and 8'-0" (96") for 8" I-beam frames. A model specific pier layout will be provided on request by ***FOUR SEASONS HOUSING*** to assist you in determining the most efficient pier layout.

3.3.6 CLEARANCE. A maximum height of 36" shall be maintained from the bottom of the rim (perimeter) joist to grade when the standard tie-down method is used. A minimum clearance of 12" shall be maintained between the lowest point on the frame and grade to provide access to utility and plumbing connections in the floor. Untreated wood building materials shall be no less than 6" from grade at all times to prevent damage. The tie-down anchors are not to extend beyond the sidewall.
Our height is 36" and we have single stack

3.3.7 PIER HEIGHT. You may use dry-block single-stacked piers up to a height of 30" (double-stacked up to 48") from the bottom of the main frame to grade. When using dry-block piers (single or double stacked) at a height of more than 48" they must be designed by a registered engineer and approved by the local building authorities. Pre-manufactured piers must be approved by a nationally recognized agency and used in accordance with the manufacturers instructions. Site built piers must be approved by the local building authorities if applicable.

3.4 ANCHORING.

See **section 10 (pages 49-61)** for specific anchoring details.
See **section 3.5.16 or section 3.6.16** for anchoring to a permanent foundation.

3.4.1 PURPOSE. Anchoring is necessary to prevent the home from tipping or becoming unstable in extremely windy or stormy conditions. The home is designed for a particular wind zone which is noted on the data plate.

3.4.2 ANCHORING DEVICES. Anchors, tie-down straps, and devices are to have a minimum working load of **3,150#** and an overload of **4,725#**. All anchoring devices must be installed in accordance with the manufacturer's installation instructions and the guidelines provided in this manual. Ground anchors and frame ties shall be capable of resisting a tensile load of **4,725#**. Steel anchoring equipment exposed to the weather shall be protected with at least 0.30 oz. of zinc per square foot of steel. Slit or cut edges of zinc-coated strapping need not be coated with zinc. All anchoring devices must be approved for use as such.

3.4.3 ANCHORING INSTALLATION. See the frame tiedown spacing chart on **figure 1.0** for information on the maximum spacing of the tie-down anchors. When possible locate the tie-downs directly over piers to lessen the effects of frost heave. Make certain that the anchors are installed below the frost line and a minimum of 12" above the water table. Ground anchors must be installed with the manufacturers hardware and instructions. The tie-down straps should be installed around the frame members. Maintain the proper angle when installing the ground anchors (**see figure 2.0**) to prevent undue stress on the anchoring components. Follow these steps when installing the anchoring system.

1. Space anchors according to the chart on **figure 1.0**. Install an anchor a maximum of **2'-0"** from both ends of the home on both sides. Drive the anchors at the angle given on **figure 2.0**.
2. Connect straps to the ground anchors and frame.
3. Tighten the straps to remove slack.
4. After all straps have had the slack removed begin tensioning. Follow the manufacturer's instructions. Do **not** over-tighten or you could force the home off level and reduce the effectiveness of the anchoring system. The best method is to have two persons and tighten the straps at both sides of the home at the same time. Otherwise, you should tension the straps alternately on opposite sides of the home.
5. Recheck the tension of all straps.
6. Never attempt to jack up the home for any reason without relieving the tension on the straps.

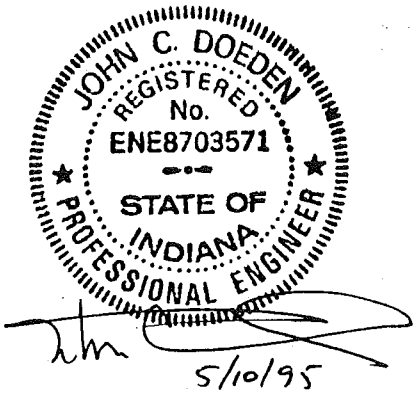
TABLES 1.0, 1.1, 1.2
FIGURES 1.0, 1.1, 2.0
ADDENDUM

PAGE 9 - TABLE 1.0
PAGE 10 - TABLE 1.1
PAGE 11 - TABLE 1.2
PAGE 12 - FIGURE 1.0
PAGE 13 - FIGURE 1.1
PAGE 14 - FIGURE 2.0
PAGE 15 - ADDENDUM

FOUR SEASONS HOUSING
MINIMUM PIER CAPACITY TABLE
(FRAME BLOCKING ONLY)

SECTION WIDTH (FEET)	SIDE OVERHANG (INCHES)	ROOF LIVE LOAD (PSF)	MINIMUM PIER CAPACITY (POUNDS)				
			MAXIMUM PIER SPACING (FEET)				
			4	6	8	10	12
14 (160" FLOOR)	8"	30 40	3040 3330	4370 4810	5700 6270	7035 7770	8370 9370
16 (182" FLOOR)	3"	30 40	3360 3680	4660 5335	6350 6990	7850 8770	9470 10425

MAXIMUM SPAN BETWEEN PIER SUPPORTS FOR FRAME BLOCKING CONDITION IS: 8'-0" ON CENTER FOR 8" I-BEAM, 10'-0" FOR 10" I-BEAM, AND 12'-0" FOR 12" I-BEAM.



NOTES:

1. PIER LOADS BASED ON 10 PSF ROOF DEAD LOAD AND 10 PSF FLOOR DEAD LOAD.
2. PERIMETER BLOCKING IS NOT REQUIRED EXCEPT AS NOTED FOR LARGE OPENINGS.
3. REFERENCE DETAILS IN FIGURES 1.0 AND 1.1 FOR PIER LOCATIONS.

TABLE 1.0
MINIMUM FRAME PIER CAPACITIES

PIER CAPACITY (POUNDS)	MINIMUM FOOTING SIZE (OR EQUAL AREA) (INCHES) SOIL BEARING CAPACITY (PSF)			
	1000	1500	2000	4000
600	12x12	12x12	12x12	12x12
800	12x12	12x12	12x12	12x12
1000	12x12	12x12	12x12	12x12
1500	15x15	12x12	12x12	12x12
2000	17x17	14x14	12x12	12x12
2500	19x19	15x15	13x13	12x12
3000	21x21	17x17	15x15	12x12
3500	22x22	18x18	16x16	12x12
4000	24x24	20x20	17x17	12x12
4500	25x25	21x21	18x18	13x13
5000	27x27	22x22	19x19	13x13
5500	28x28	23x23	20x20	14x14
6000	29x29	24x24	21x21	15x15
6500	31x31	25x25	22x22	15x15
7000	32x32	26x26	22x22	16x16
7500	33x33	27x27	23x23	16x16
8000	34x34	28x28	24x24	17x17
8500	35x35	29x29	25x25	17x17
9000	36x36	29x29	25x25	18x18
9500	37x37	30x30	26x26	19x19
10000	38x38	31x31	27x27	19x19
11000	40x40	32x32	28x28	20x20
12000	42x42	34x34	29x29	21x21
13000	43x43	35x35	31x31	22x22
14000	45x45	37x37	32x32	22x22
15000	46x46	38x38	33x33	23x23
16000	48x48	39x39	34x34	24x24
17000	49x49	40x40	35x35	25x25
18000	51x51	42x42	36x36	25x25
19000	52x52	43x43	37x37	26x26
20000	54x54	44x44	38x38	27x27
21000	55x55	45x45	39x39	28x28
22000	57x57	46x46	40x40	28x28
23000	58x58	47x47	41x41	29x29
24000	59x59	48x48	42x42	30x30
25000	60x60	49x49	43x43	30x30

NOTES:

1. FOOTING SIZES SHOWN ARE FOR SQUARE PADS AND ARE BASED ON THE AREA (SQUARE INCHES) REQUIRED FOR THE LOAD. OTHER FOOTING CONFIGURATIONS, SUCH AS RECTANGULAR, MAY BE USED PROVIDED THE AREA (SQUARE INCHES) IS EQUAL TO OR GRATER THAN THE AREA OF THE SQUARE FOOTING SHOWN IN THE TABLE. FOR EXAMPLE, A 12"x22" (288 SQ. IN.) FOOTING MAY BE USED IN PLACE OF A 16"x16" (256 SQ. IN.) FOOTING. ALSO, TWO 12"x24" PADS MAY BE USED IN PLACE OF ONE 24"x24" PAD. **FOOTER PROJECTION FROM PIER SHALL NOT EXCEED THE THICKNESS.**
2. THE FOLLOWING TABLE SPECIFIES THE MAXIMUM FOOTING SIZE FOR VARIOUS FOOTING THICKNESSES. THIS TABLE IS BASED ON UNREINFORCED FOOTINGS. REINFORCED FOOTINGS MAY REQUIRE A SMALLER THICKNESS THAN THAT LISTED BUT MUST BE DESIGNED BY A LICENSED ENGINEER. ALSO SEE SECTION 4.2.1 FOR ALTERNATIVES.

FOOTING THICKNESS	SINGLE STACKED PIERS (W x L)	DOUBLE STACKED BLOCKS (L x W)
4"	16"x16"	16"x16"
6"	16"x24"	24"x24"
8"	19"x27"	27"x27"
12"	24"x32"	32"x32"
18"	32"x40"	40"x40"

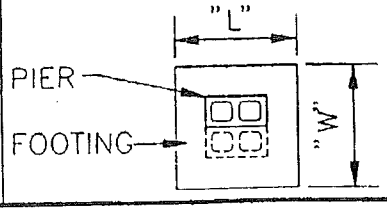


TABLE 1.1
FOOTING SIZES

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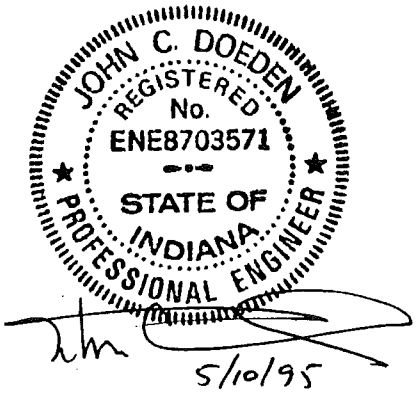
12/2/94

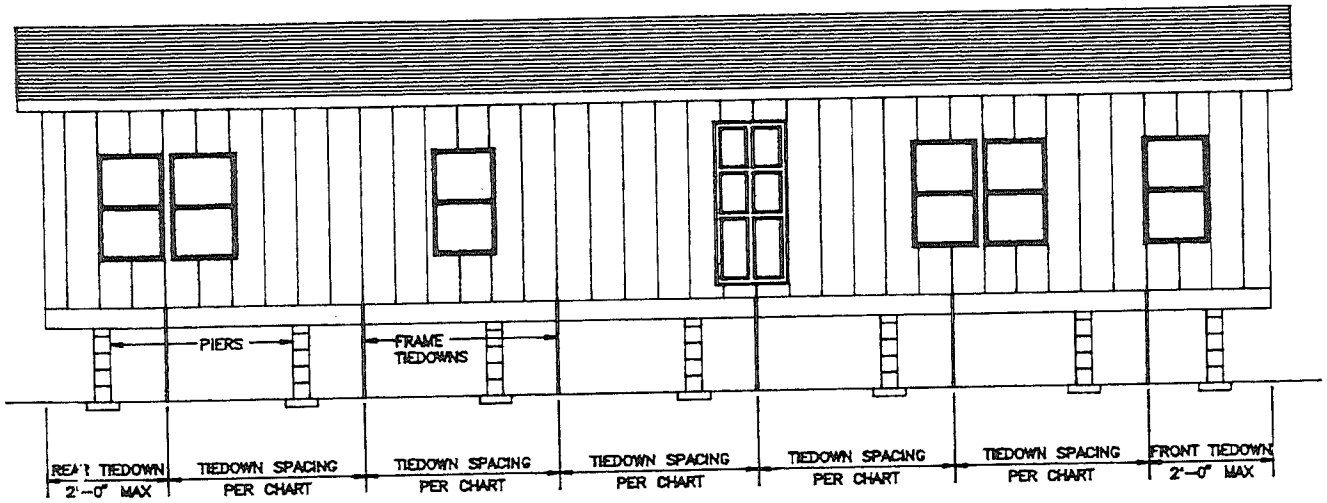
TOTAL WIDTH (FEET)	ROOF LIVE LOAD (PSF)	MINIMUM PIER CAPACITY (POUNDS)								
		MAXIMUM SPAN TO NEXT SUPPORT (FEET)								
		4	8	12	16	20	24	28	32	36
26'-8"	30	1700	2860	4020	5175	6335	7500	8650	9810	10970
	40	2070	3500	4930	6365	7800	9230	10660	12100	13525



NOTES:

1. PIER LOADS BASED ON 10 PSF ROOF DEAD LOAD.
2. HOME WIDTH IS 160" FLOOR EACH SECTION.

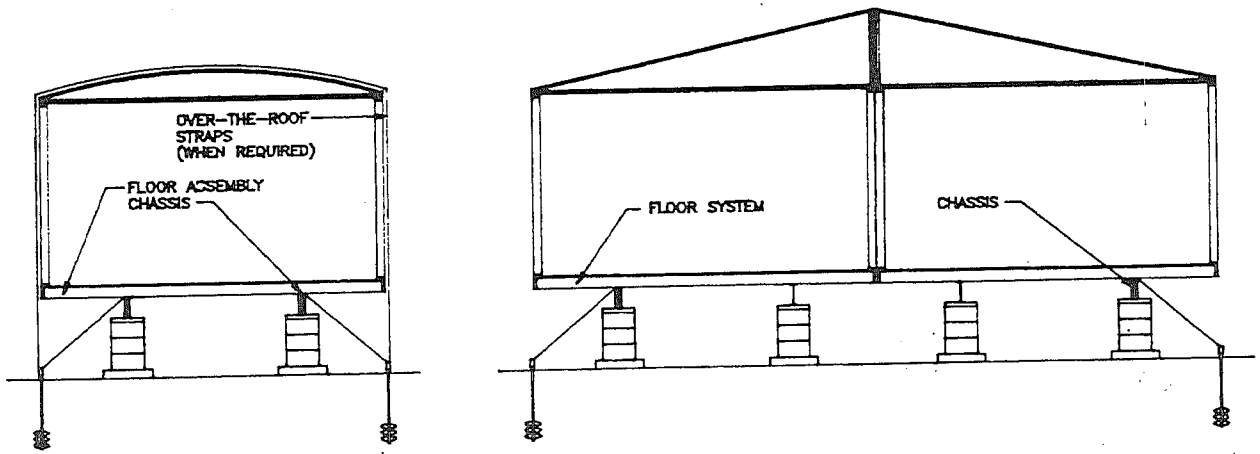
TABLE 1.2
MINIMUM PIER CAPACITY
MULTI-SECTION RIDGEBEAM COLUMN SUPPORT



TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACINGS

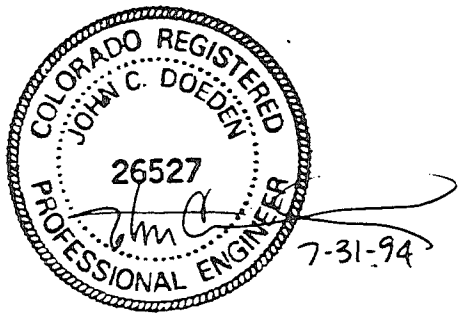
NOTES:

1. FRAME TIE-DOWN SHOULD BE INSTALLED TO PROPERLY SECURE THE HOME.
2. OVER-THE-ROOF TIES ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS. HOWEVER, IF OVER-THE-ROOF TIEDOWNS ARE REQUIRED BY THE LOCAL JURISDICTION, THEY MAY BE INSTALLED.
3. OVER -THE-ROOF TIES (WHEN REQUIRED) MAY BE SECURED TO THE SAME GROUND ANCHORS AS THE FRAME TIEDOWNS.
4. FRAME TIEDOWNS AND ANCHORS ARE NOT SUPPLIED BY FOUR SEASONS HOUSING, INC.
5. OVER-THE-ROOF STRAPS (WHEN REQUIRED) ARE SUPPLIED BY FOUR SEASONS HOUSING, INC. ANCHORS AND END TREATMENTS ARE TO BE SUPPLIED BY OTHERS.
6. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING A TENSILE LOAD OF 4725 POUNDS AND ARE TO BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, BUT ARE NOT TO EXTEND BEYOND THE SIDEWALL OF THE HOME.
7. STEEL ANCHORING EQUIPMENT EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AT LEAST 0.30 OZ. OF ZINC PER SQUARE FOOT OF STEEL.
8. PLACEMENT OF FRAME TIEDOWN STRAPS AND ANCHORS MAY BE OFFSET UP TO FOUR FEET TO ALLOW ALIGNMENT WITH OVER-THE-ROOF STRAPS PROVIDED NO DECREASE IN THE TOTAL NUMBER OF FRAME TIEDOWNS RESULTS.
9. DESIGN BASED ON 99 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 90".

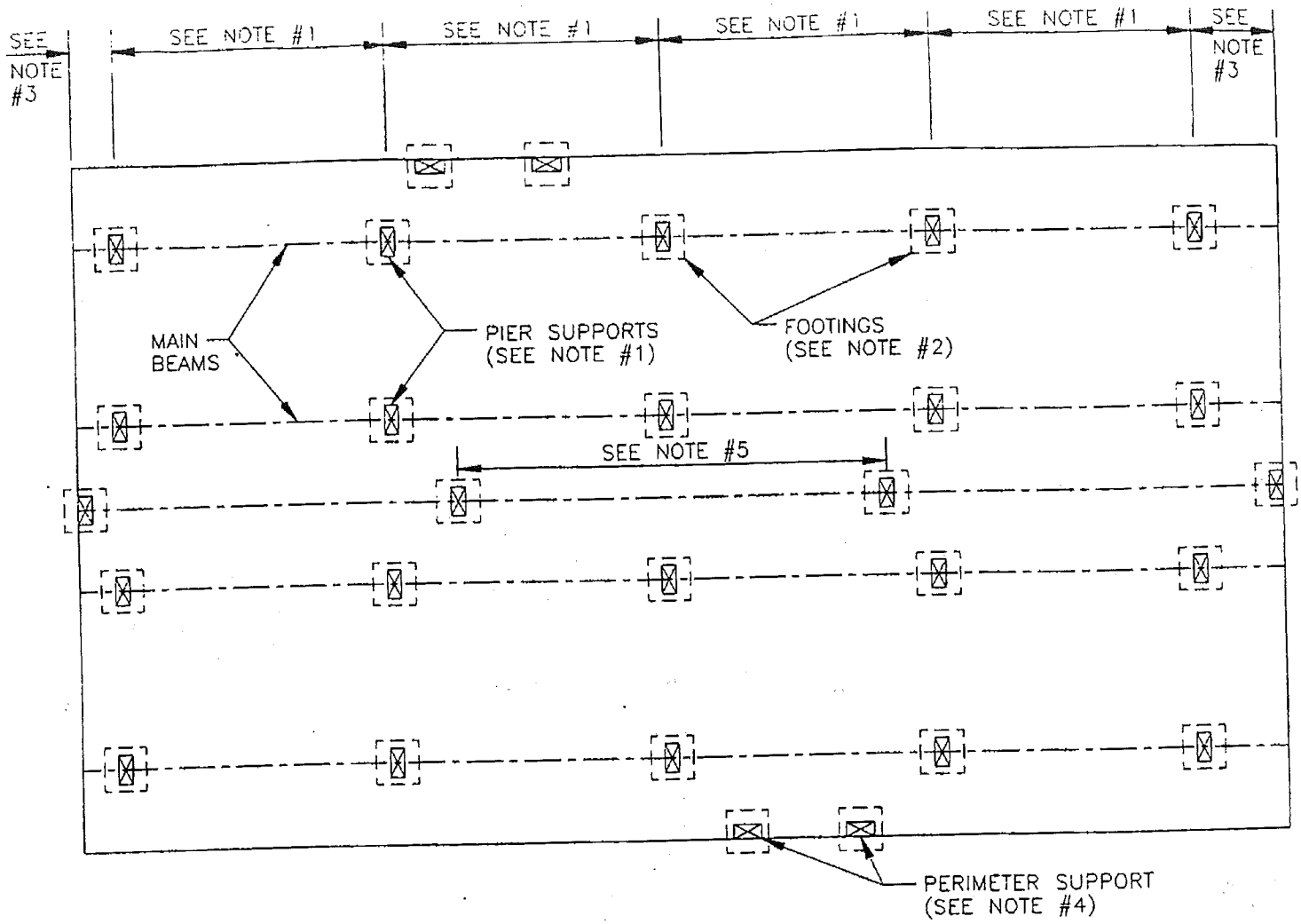


TYPICAL CROSS SECTIONS SHOWING TIEDOWNS

FRAME TIEDOWN SPACING CHART		
FLOOR WIDTH	EAVE OVERHANG	WIND ZONE I (15 PSF)
26'-8"	12"	10'-0"



FOUR SEASONS HOUSING, INC.
FIGURE 1.0
RECOMMENDED TIEDOWN SYSTE



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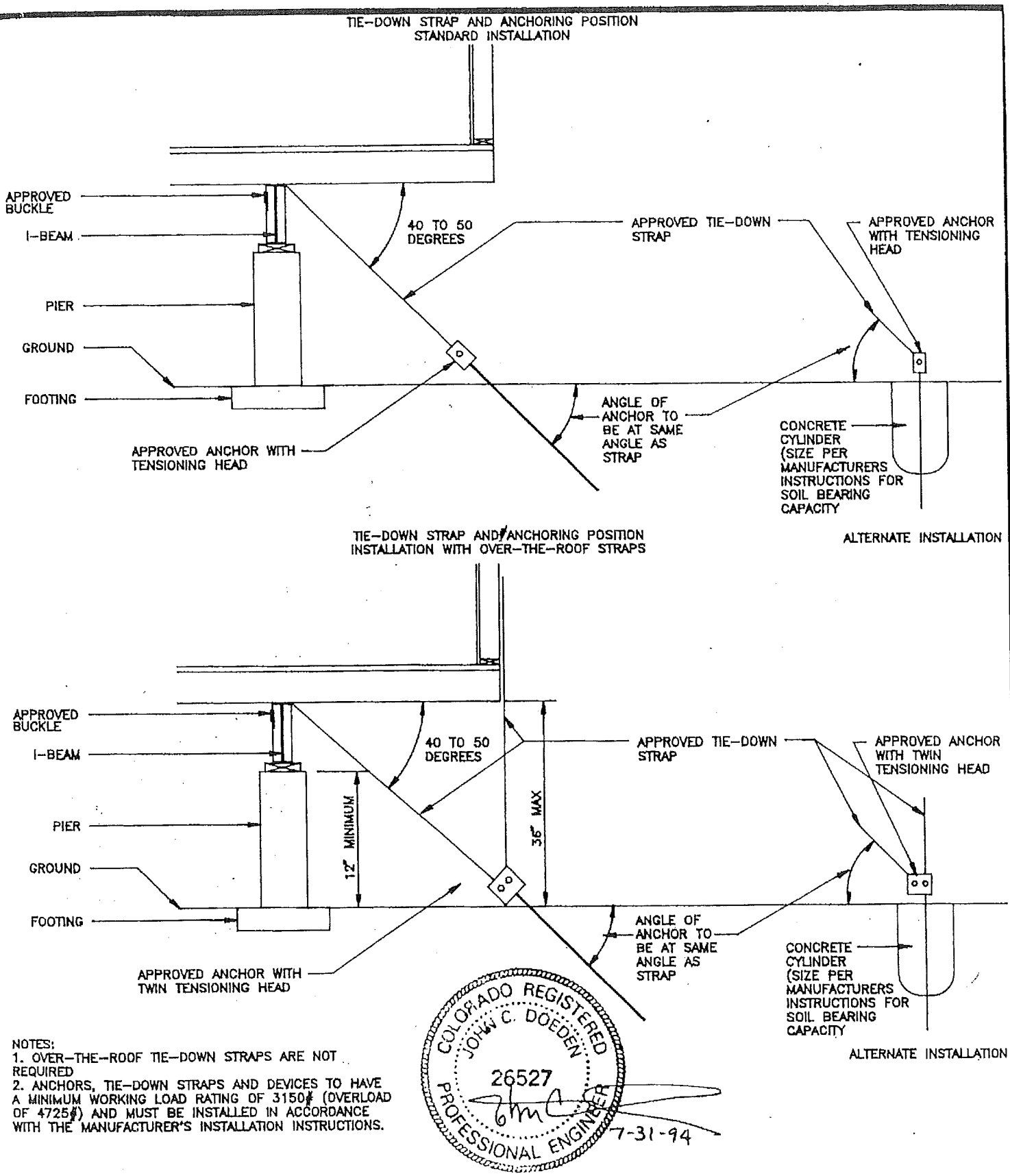
NOTES:

1. SEE TABLE 1.0 FOR REQUIRED PIER CAPACITY AND SPACING.
2. SEE TABLE 1.1 FOR FOOTING REQUIREMENTS.
3. PIERS SHALL BE LOCATED AT A MAXIMUM OF 2 FEET FROM BOTH ENDS.
4. PIERS SHALL BE LOCATED AT EACH SIDE OF ALL PERIMETER OPENINGS (4) FEET OR WIDER IN WIDTH. THIS WILL INCLUDE DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC.
5. SEE TABLE 1.2 FOR PIER CAPACITES AT MARRIAGE LINE OPENINGS.

FIGURE 1.1
TYPICAL BLOCKING LAYOUT FOR MULTI-SECTION HOMES



NOTES:
1. OVER-THE-ROOF TIE-DOWN STRAPS ARE NOT REQUIRED
2. ANCHORS, TIE-DOWN STRAPS AND DEVICES TO HAVE A MINIMUM WORKING LOAD RATING OF 3150# (OVERLOAD OF 4725#) AND MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

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7-31-94

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FIGURE 2.0
TIEDOWN & ANCHORING DETAILS

FOUR SEASONS HOUSING, INC.

ADDENDUM TO INSTALLATION INSTRUCTIONS MANUAL

In accordance with the FMHCSS effective July 13, 1994, the following anchorage requirements for all Wind Zones are in addition to any requirements covered under the previous Standard:

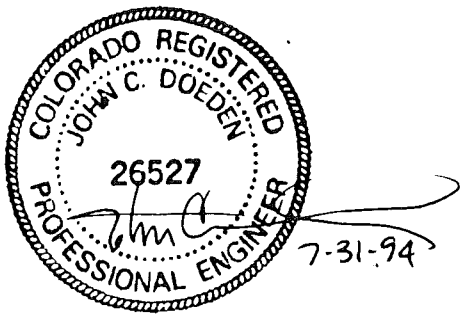
THE DESIGN OF ANCHORS SHOULD BE CERTIFIED FOR THEIR INSTALLATION BY A PROFESSIONAL ENGINEER OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.

GROUND ANCHORS SHOULD BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHOULD BE INSTALLED TO THEIR FULL DEPTH AND STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.

ANCHORING EQUIPMENT SHOULD BE CERTIFIED BY A REGISTERED ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL, AND SEALS".

TIEDOWNS MUST START NO MORE THAN 2'-0" FROM EACH END OF UNIT (i.e. OPEN END ANCHORAGE)

PROTECTION SHALL BE PROVIDED AT SHARP CORNERS WHERE THE ANCHORING SYSTEM REQUIRES EXTERNAL STRAPS OR CABLES.



3.5 CRAWLSPACE (CROSS-BEAM) FOUNDATIONS. See figures 3.0-3.5

NOTE: ALL APPLICABLE LOCAL CODES MUST BE CONSIDERED WHEN PLANNING AND BUILDING YOUR FOUNDATION.

3.5.1 BEAM TYPES. See **figures 3.0-3.5** for additional information. The main I-beam (longitudinal chassis beam) used in the construction of your multi-sectional home can be either a 10" or 12" "junior I-beam". This dimension will affect the height of the pilasters and other materials used in the foundation. It is important that you insure you have obtained the proper beam size before any construction begins. Cross-beams (transverse beams) are to be continuous the full width of unit and field welded to each main beam. The centerline I-beam must be continuous the full length of the home and be welded to each cross-beam. There is a 12'-0" maximum spacing on transverse beams. All I-beam splices are to occur over jack post locations as outlined in **figure 3.0 (17)** to maintain continuity.

3.5.2 PILASTERS. See **figures 3.0-3.5** for additional information. Pilasters are required to aid in the support of the steel beams. Main beams, cross-beams, and center-line beams are to be secured to pilasters using anchor bolts per details. See **figure 3.1** for typical pilaster locations. ***FOUR SEASONS*** will provide model specific foundation prints when requested. Please have the model number when requesting prints.

3.5.3 REBAR. See **figures 3.0-3.5** for additional information. Reinforcing steel bar (rebar) is used to add strength to poured concrete walls or when filling the cells of hollow block. Use the type of rebar specified in the details.

3.5.4 POURED CONCRETE WALLS. When using poured walls follow the instructions given in the details and general notes. See **figure 3.4** for 30 and 40 psf roof live load poured wall details. See **figure 3.5** for 20 psf roof live load poured wall details.

3.5.5 UNIT COLUMN SUPPORT (RIDGE-BEAM COLUMN SUPPORT). See **figures 3.0-3.5** for additional information. Additional piers and footings are required to support the load from the support columns. ***FOUR SEASONS*** locates the cross-beams under the column supports to eliminate the need for an additional support when possible. ***FOUR SEASONS*** will provide model specific foundation prints with the column support locations when requested. Please have the model number when requesting prints.

3.5.6 PIERS (JACK POSTS). Figures 3.0-3.5 for details.

3.5.7 FOOTINGS. See **section 3.2** for details on pier (jack posts) footings and also **figures 3.0-3.5** for foundation footing details.

3.5.8 DRAINAGE. See **figures 3.0 and 3.3** for additional information. The foundation enclosing habitable or useable rooms must be provided with a drainage system per the details in **figure 3.0 (20 & 21) and 3.3**. When building in an area with poor soil drainage, consideration should be given to the installation of a sump pump. Sump pumps are to be installed in accordance with local codes. See **section 2.4** for additional information.

3.5.9 DAMP-PROOFING. Concrete or masonry walls must be damp-proofed in accordance with local codes. In the absence of local codes follow the guidelines given in **figure 3.0 (19)**.

3.5.10 SHIMS. Steel shims must be used when leveling the beams. Do **not** attempt to use hardwood shims underneath the I-beams. The shims must have a 9 sq. in. minimum bearing surface. See **figure 3.4 & 3.5** for additional information.

3.5.11 CONCRETE BLOCK WALLS. Concrete block may be used if it complies with the specifications in **figures 3.0-3.3**. The cells of hollow block must be filled and reinforced in accordance with **figures 3.0-3.3**.

3.5.12 ACCESS. This section is **not applicable** to basement sets where the basement is used as living space. There must be an 18" x 24" minimum access to the underfloor area. This access shall not require any special tools for removal. See **figure 3.0 (16 A)** for details concerning crawlspace sets.

3.5.13 VENTILATION. This section is **not applicable** to basement sets where the basement is used as living space. The underfloor area must be provided with adequate ventilation to prevent accumulation of moisture beneath the home. See **figure 3.0 (16)** for the proper ventilation requirements concerning crawlspace sets.

3.5.14 BACK FILLING. See **figure 3.0 (15)** for information on when it is acceptable to back fill adjacent to the wall.

3.5.15 BEAM POCKETS. The steel beams may be set in beam pockets when a poured wall is used. Follow the guidelines in **figures 3.0, 3.4, & 3.5**.

3.5.16 FASTENING. The home must be fastened to the foundation wall using the methods as described in **figure 3.0-3.5.**

3.5.17 SILL PLATE (MUD SILL). A pressure treated (or equivalent) sill plate must be used when in direct contact with the concrete. Follow the guidelines in **figures 3.0 (13)-3.5** for fastening the sill-plate to the foundation wall.

FIGURES 3.0, 3.1, 3.2, 3.3, 3.4, 3.5

PAGE 19 - FIGURE 3.0
PAGE 20 - FIGURE 3.1
PAGE 21 - FIGURE 3.2
PAGE 22 - FIGURE 3.3
PAGE 23 - FIGURE 3.4
PAGE 24 - FIGURE 3.5

FOUR SEASONS HOUSING, INC.

GENERAL NOTES:

1. THIS FOUNDATION HAS BEEN DESIGNED FOR SITES WITH AN ALLOWABLE SOIL BEARING CAPACITY OF 2000 PSF MINIMUM.
2. FOUNDATIONS TO BE CONSTRUCTED ON SOIL WITH A LOWER BEARING CAPACITY SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE BY A LICENSED ENGINEER TO LOCAL CONDITIONS AND CODES.
3. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS TO BE 3000 PSI MINIMUM.
4. REINFORCING STEEL SPECIFIED TO BE GRADE 60 BARS MEETING ASTM A615, A616 AND A617
5. FOUNDATION WALL MAY BE POURED CONCRETE 8" THICK, REINFORCED WITH #4 REBAR AT 12" OC VERTICAL AND #5 REBAR AT 18" OC HORIZONTAL.
6. UNIT COLUMN SUPPORTS (SEE MODEL PLAN) MUST BE SUPPORTED
BY A PIER AND FOOTING AS REQUIRED IN THE INSTALLATION INSTRUCTIONS MANUAL.
7. CROSSBEAMS ARE CONTINUOUS FULL WIDTH OF UNIT AND FIELD WELDED TO EACH MAIN BEAM AND SECURED AT PILASTER PER DETAILS. SEE CHART FOR REQUIRED SIZES.
8. MAIN BEAMS ARE SECURED AT EACH END IN PILASTER PER DETAILS. WHEN CENTER LINE BEAM IS INSTALLED PILASTER MUST ALSO BE INSTALLED FOR END SUPPORT. SEE CHART FOR REQUIREMENTS.
9. THESE SPECIFICATIONS ARE TYPICAL. LOCAL CODES MAY CONTAIN ADDITIONAL REQUIREMENTS.
10. FOUNDATION WALL STEMS MAY BE CONCRETE OR CONCRETE BLOCK
11. CONCRETE BLOCK SHALL CONFORM TO ASTM C-90.
12. IN CONCRETE BLOCK STEM WALLS A MINIMUM Of (2) #4 REBARS ARE TO BE INSTALLED IN BLOCK WITH MUD SILL ANCHORS. FULLY GROUT EACH CELL CONTAINING REBAR.
13. ALL LUMBER IN CONTACT WITH CONCRETE SHALL BE OF PRESSURE TREATED TYPE OR OF SPECIES APPROVED FOR USE IN DIRECT CONTACT WITH CONCRETE.
14. THE INSTALLATION SITE MUST BE GRADED SO THAT WATER DRAINAGE IS AWAY FROM STRUCTURE AND DOES NOT ACCUMULATE UNDER THE HOME.
15. BACK FILL ADJACENT TO THE WALL SHALL NOT BE PLACED UNTIL THE WALL HAS SUFFICIENT STRENGTH OR HAS BEEN BRACED TO PREVENT DAMAGE.
16. MINIMUM FOUNDATION VENTILATION REQUIREMENTS:
A. 18" x 24" ACCESS CRAWL SPACE TO UNDER FLOOR AREA.
B. 1 1/2 SQUARE FEET OF VENTILATION PER 25 LINEAL FEET OF FOUNDATION WALL.
C. COVER VENT OPENINGS WITH CORROSION-RESISTANT WIRE MESH NOT LESS THAN 1/8" NOR MORE THAN 1/2" IN ANY DIRECTION.
17. I-BEAM SPLICE TO OCCUR OVER SUPPORTS. USE 1/4" x 4" x 4" SPLICE PLATE WELDED OR (2) 1/2" DIAMETER BOLTS EACH SIDE OF SPLICE.
18. WHEN CENTERLINE BEAM IS INSTALLED IT MUST BE CONTINUOUS FOR THE FULL LENGTH OF THE UNIT AND FIELD WELDED TO EACH CROSSBEAM AND SECURED AT EACH END AT POCKET OR PILASTER PER DETAILS. (30 AND 4O PSF ROOF LIVE LOADS ONLY, CROSSBEAMS WITH CENTERLINE BEAM INSTALLED MAY BE W6x16# OR W8x13#).

GENERAL NOTES:

19. DAMP PROOFING OF CONCRETE OR MASONRY WALLS TO BE IN ACCORDANCE WITH LOCAL CODES. IN THE ABSENCE OF CODE REQUIREMENTS THE FOLLOWING SHALL. APPLY:
A. EXTERIOR FOUNDATION WALLS OF MASONRY CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING NOT LESS THAN 3/8" OF PORTLAND CEMENT PARGING; TO IHE WALL FROM THE FOOTING TO THE FINISH GRADE. ME PARGINC SHALL BE COVERED WITH A COAT OF APPROVED BITUMINOUS MATERIAL APPLIED AT THE RECOMMENDED RATE. EXTERIOR FOUNDATION WALLS OF CONCRETE CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING A COAT OF APPROVED BITUMINOUS MATERIAL TO THE WALL FROM THE FOOTING TO THE FINISH GRADE AT THE RECOMMENDED RATE.
B. FOUNDATION WALLS OF HABITABLE ROOMS LOCATED BELOW GRADE SHALL BE WATER PROOFED WITH MEMBRANES EXTENDING FROM THE EDGE OF THE FOOTING TO THE FINISH GRADE LINE. THE MEMBRANE SHALL CONSIST OF EITHER 2-PLY HOT MOPPED FELT, 6-MIL POLYVINYL CHLORIDE, 55-POUND ROLL ROOFING OR EQUIVALENT MATERIAL. THE LAP IN THE MEMBRANE SHALL BE SEALED AND FIRMLY AFFIXED TO THE WALL.
C. FOUNDATION WALLS MAY BE DAMP PROOFED OR WATER PROOFED USING MATERIALS AND METHODS OF CONSTRUCTION OTHER THAN COVERED IN THIS SECTION WHEN APPROVED BY THE LOCAL BUILDING OFFICIAL.
20. DRAINS SHALL BE PROVIDED AROUND FOUNDATIONS ENCLOSING HABITABLE OR USEABLE SPACES LOCATED BELOW GRADE AND WHICH ARE SUBJECT TO GROUND WATER CONDITIONS. DRAINS SHALL BE INSTALLED AT OR BELOW ME AREA TO BE PROTECTED. AND SHALL DISCHARGE BY GRAVITY OR MECHANICAL MEANS INTO AN APPROVED DRAINAGE SYSTEM.
21. THE TOP OF OPEN JOINTS OF DRAIN TILES SHALL BE PROTECTED WITH STRIPS OF BUILDING PAPER AND THE DRAINAGE TILES SHALL BE PLACED ON 2 INCHES OF WASHED GRAVEL OR CRUSHED ROCK ONE SIEVE SIZE LARGER THAN THE TILE JOINT OPENING OR PERFORATION AND COVERED WITH NOT LESS THAN 6 INCHES Of THE SAME MATERIAL.
22. THE DESIGNS ON THIS AND FOLLOWING SHEETS ARE APPLIACABLE TO HORIZONTAL WIND LOADS OF 15 PSF MAXIMUM AND UNITS WHICH HAVE A MAXIMUM WIDTH OF 26'-8". MINIMUM I-BEAM SPACING IS 82 1/2" OR 99 1/2".
23. THE DESIGNS ON THIS AND FOLLOWING SHEETS ARE APPLICABLE
TO SEISMIC ZONES O, 1 AND 2.
24. THIS FOUNDATION DESIGN IS NOT FOR INSTALLATION ON A FLOOD PLAIN. WHEN INSTALLING CRAWLSPACE OR BASEMENT IN AN AREA WITH SOILS HAVING POOR DRAINAGE. CONSIDERATION SHOULD BE GIVEN TO METHODS OF ELIMINATING ACCUMULATION OF WATER IN THE CRAWLSPACE OR BASEMENT, SUCH AS THE USE OF SUMP PUMP(S). INSTALLATION OF SUMP PUMPS TO BE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

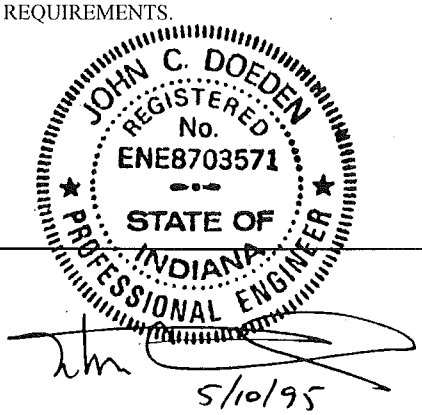
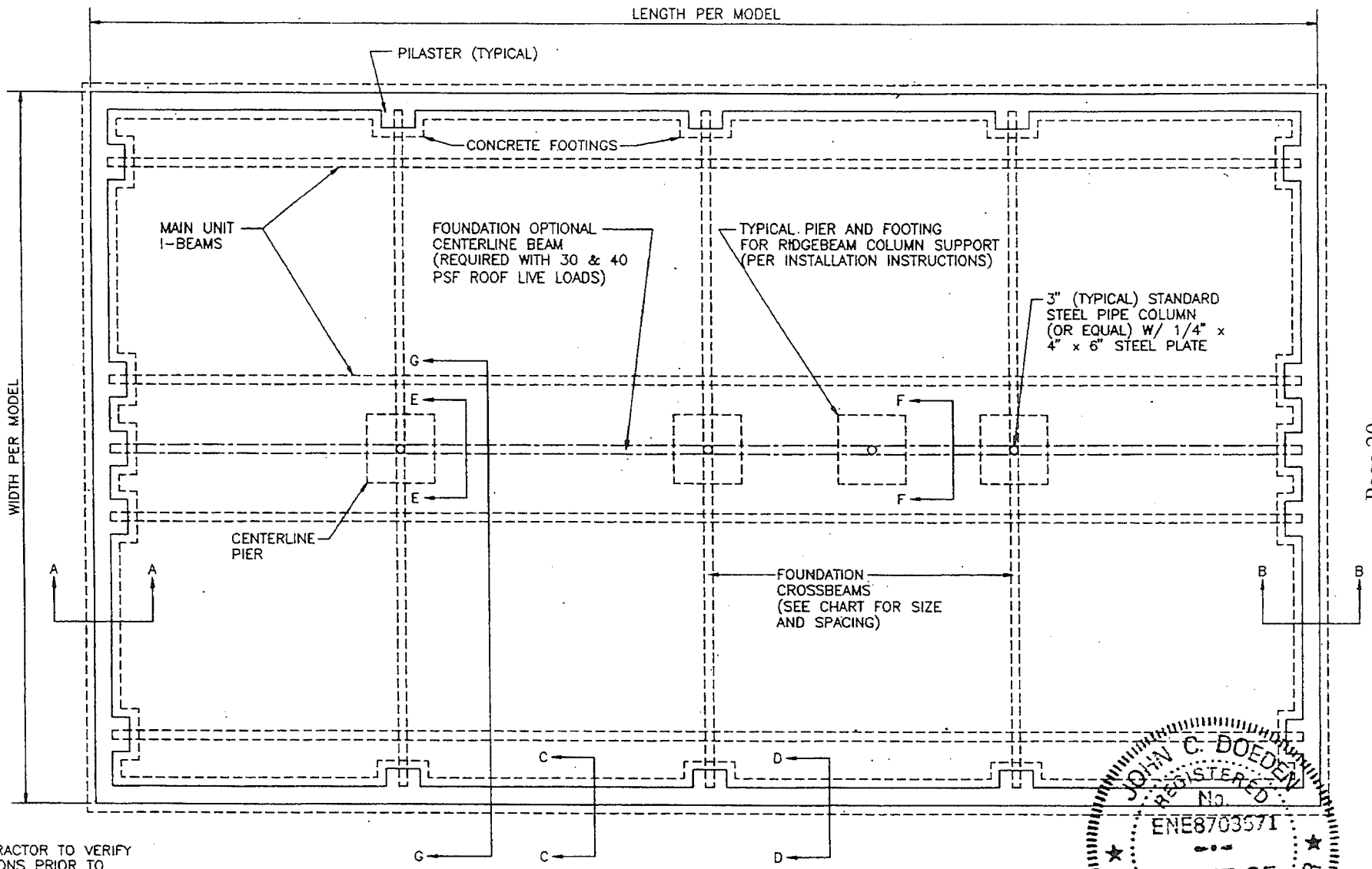


FIGURE 3.0
FOUNDATION NOTES AND CHARTS
PAGE 1 OF 6



NOTE: CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO FOUNDATION CONSTRUCTION.

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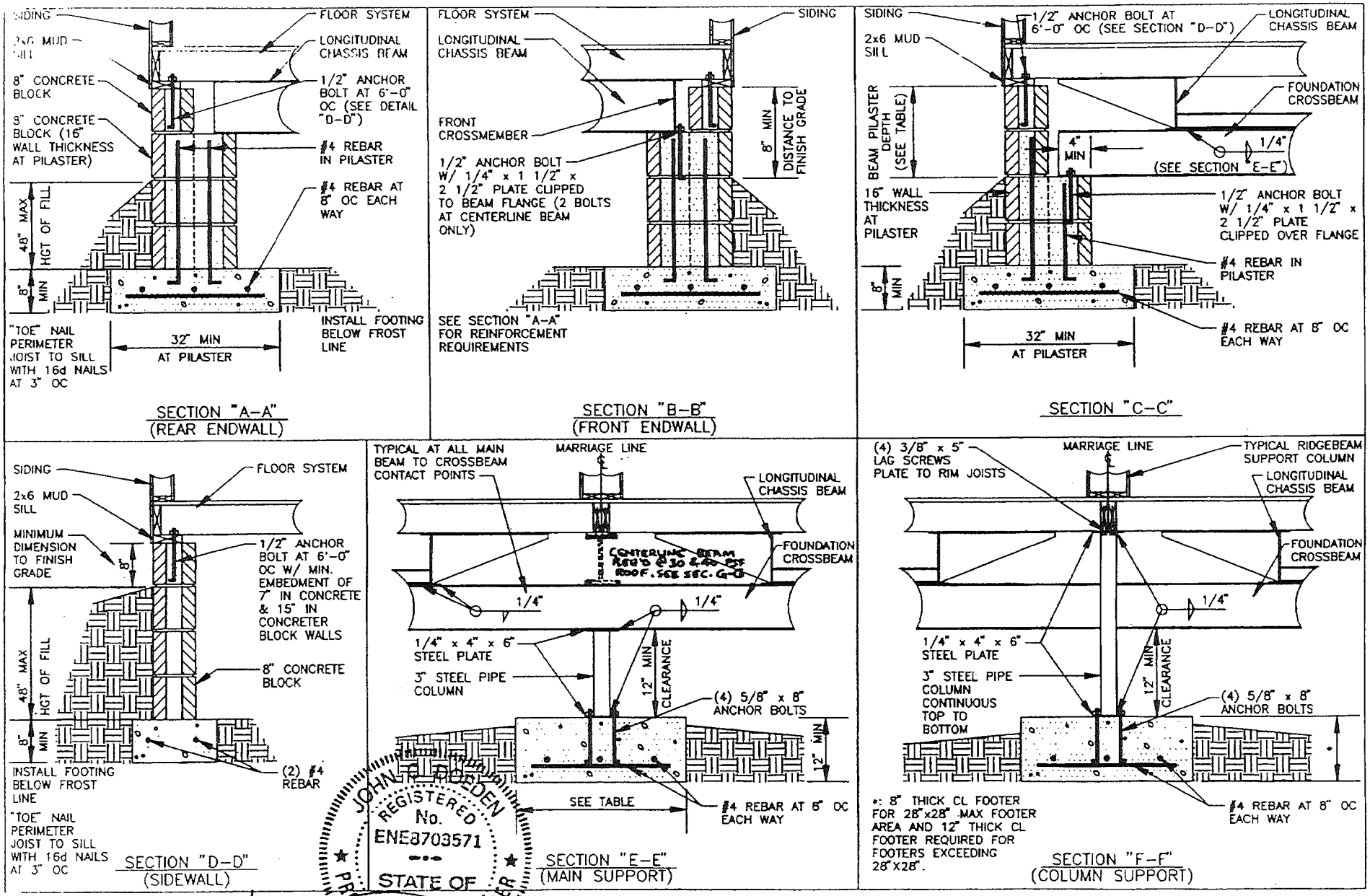
5/10/95

FIGURE 3.1
TYPICAL FOUNDATION (CRAWLSPACE OR BASEMENT) PLAN
PAGE 2 OF 6



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5/10/96

We have no anchors at all.

FIGURE 3.2
CRAWLSPACE DETAILS
PAGE 3 OF 6

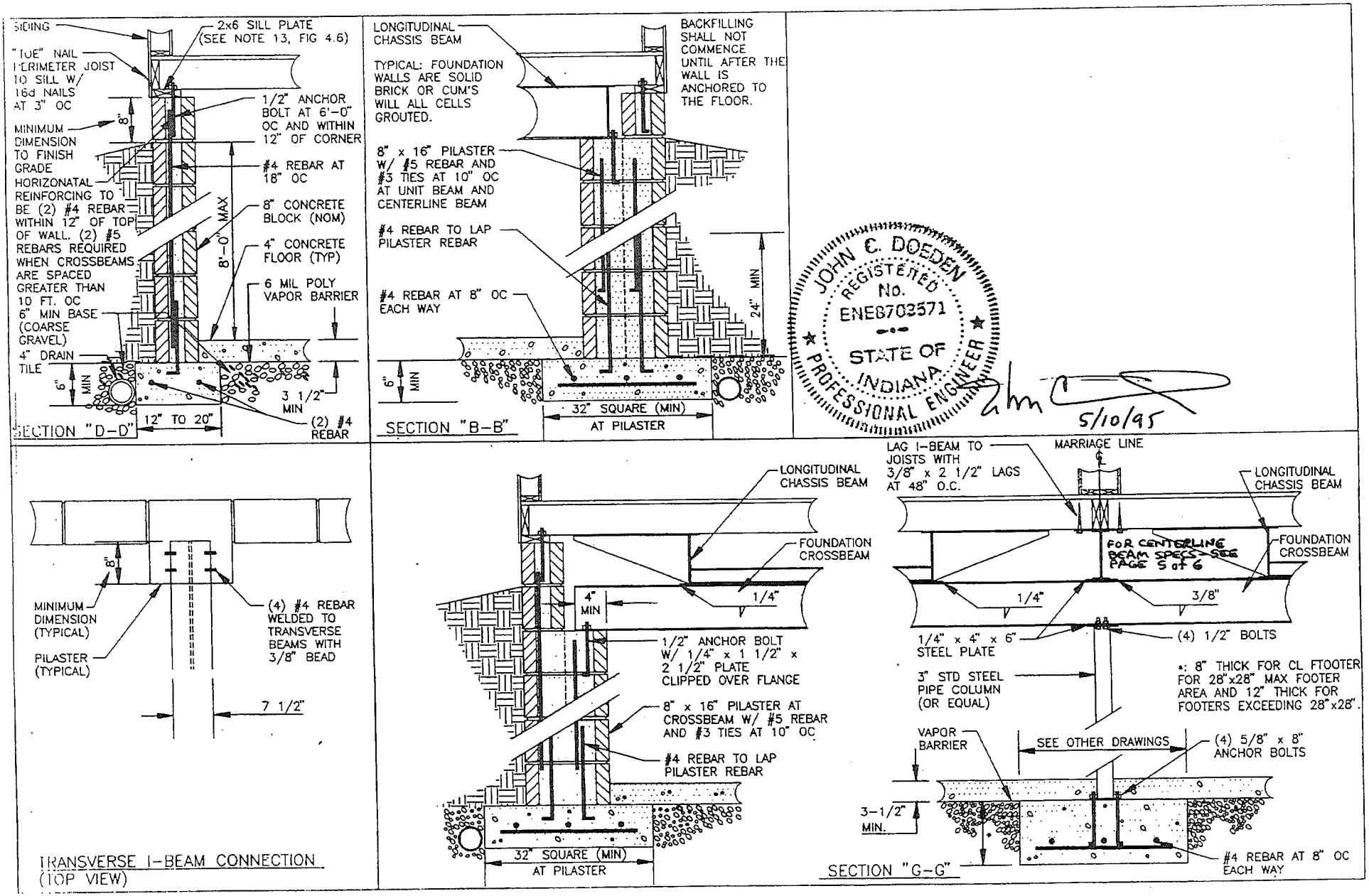


FIGURE 3.3
CRAWLSPACE DETAILS
PAGE 4 OF 6

FIGURE 3.4
CRAWLSPACE DETAILS
PAGE 5 OF 6

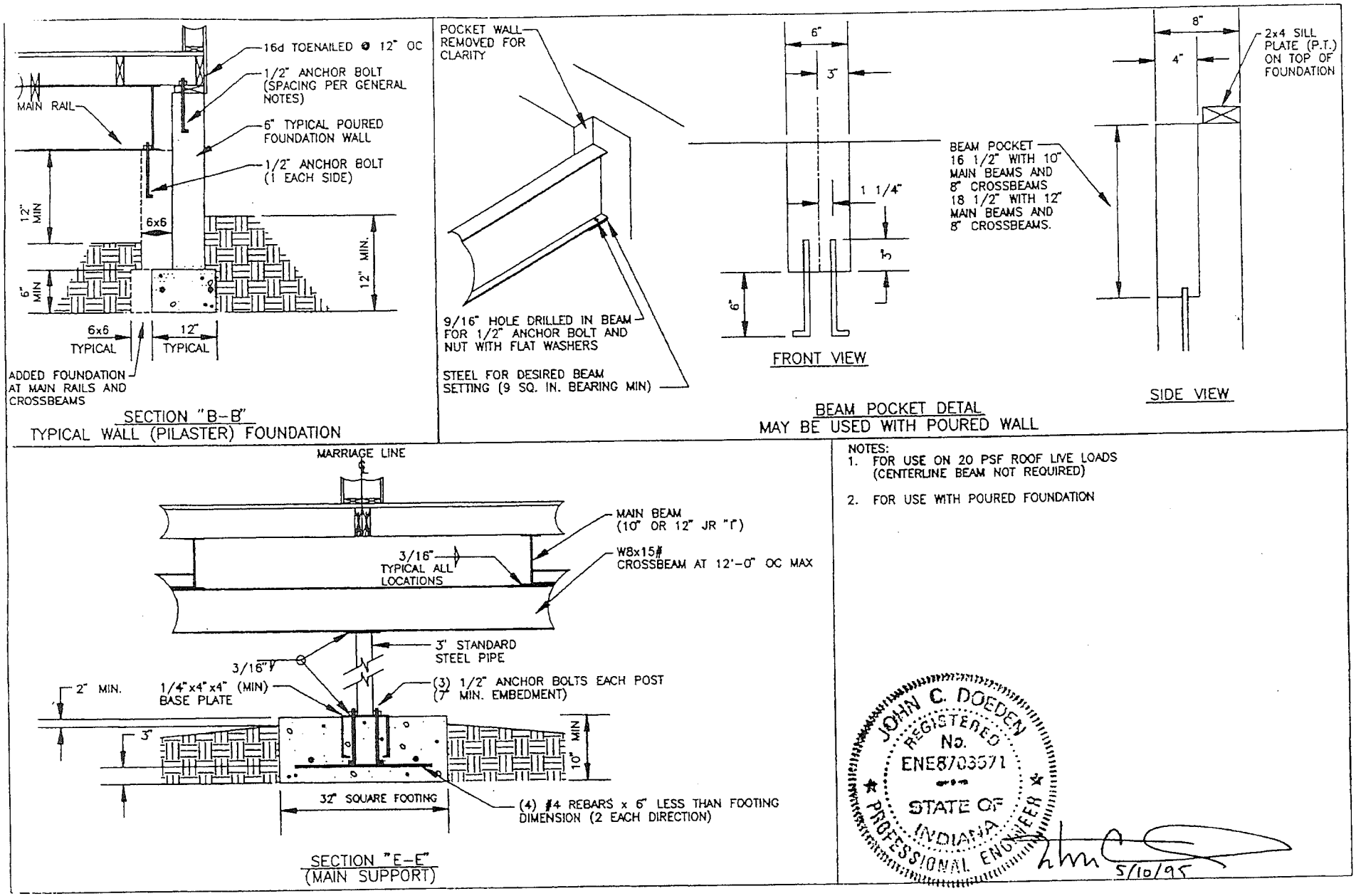


FIGURE 3.5
CRAWLSPACE DETAILS
PAGE 6 OF 6

3.6 "PH" FRAME SYSTEM FOUNDATIONS. See **figures 4.0-4.2 and figure 5.0.**

3.6.1 BEAM TYPES. See **figures 4.0-4.2** for additional information. The main I-beam (longitudinal chassis beam) used in the construction of your multi-sectional home can be either a 10" or 12" "junior I-beam". It is important that you insure you have obtained the proper beam size before any construction begins.

3.6.2 PILASTERS. See **figures 4.0-4.2** for additional information. Pilasters are required to aid in the support of the centerline laminated beams. See **figure 4.1** for typical pilaster locations. ***FOUR SEASONS*** will provide model specific foundation prints when requested. Please have the model number when requesting prints.

3.6.4 REBAR. See **figures 4.0-4.2** for additional information. Reinforcing steel bar (rebar) is used to add strength to poured concrete walls or when filling the cells of hollow block. Use the type of rebar specified in the details.

3.6.5 POURED CONCRETE WALLS. When using poured walls follow the instructions given in the details and general notes.

3.6.6 UNIT COLUMN SUPPORT (RIDGE-BEAM COLUMN SUPPORT). See **figures 4.0-4.2** for additional information. Additional piers and footings are required to support the load from the support columns. ***FOUR SEASONS*** will provide model specific foundation prints with the column support locations when requested. Please have the model number when requesting prints.

3.6.7 PIERS (JACK POSTS). See **figures 4.0-4.2** for details.

NOTE: Jack posts are required at splice locations of the centerline laminated beam.

3.6.8 FOOTINGS. See **figures 4.0-4.2 and table 1.1 & 1.2** for details on pier footings and **figures 4.0-4.2** for foundation footing details.

3.6.9 DRAINAGE. See **figures 4.0 and 4.2** for additional information. The foundation enclosing habitable or useable rooms must be provided with a drainage system per the details in **figure 4.0 and 4.2**. When building in an area with poor soil drainage, consideration should be given to the installation of a sump pump. Sump pumps are to be installed in accordance with local codes. See **section 2.4** for additional information.

3.6.10 DAMP-PROOFING. Concrete or masonry walls must be damp-proofed in accordance with local codes. In the absence of local codes follow the guidelines given in **figure 4.0 (17)**.

3.6.11 SHIMS. Hard wood shims may be required at sill plate and laminated centerline beam pilasters.

3.6.12 CONCRETE BLOCK WALLS. Concrete block may be used if it complies with the specifications in **figures 4.0-4.2**. The cells of hollow block must be filled and reinforced in accordance with **figures 4.0-4.2**.

3.6.13 ACCESS. This section is **not applicable** to basement sets where the basement is used as living space. There must be an 18" x 24" minimum access to the underfloor area. This access shall not require any special tools for removal. See **figure 4.0 (14 A)** for details concerning crawlspace sets.

3.6.14 VENTILATION. This section is **not applicable** to basement sets where the basement is used as living space. The underfloor area must be provided with adequate ventilation to prevent accumulation of moisture beneath the home. See **figure 4.0 (14)** for the proper ventilation requirements concerning crawlspace sets.

3.6.15 BACK FILLING. See **figure 4.0 (13)** for information on when it is acceptable to back fill adjacent to the walls.

3.6.16 FASTENING. The home must be fastened to the foundation wall using one of the two methods as described in **figure 4.0-4.2, and figure 5.0.**

3.6.17 SILL PLATE (MUD SILL). A pressure treated (or equivalent) sill plate must be used when in direct contact with the concrete. ***FOUR SEASONS*** has pre-installed a 2 x 6 pressure treated sill plate to the bottom of the home (**"PH"** frame system only). This sill plate can be used in conjunction with a site-installed sill plate to provide a means of fastening the home to the foundation wall. Follow the guidelines in **figures 4.0-4.2 and figure 5.0** for fastening the sill-plate(s) to the foundation wall.

3.6.18 STAIRS. See **figures 6.0-6.2** for typical stair framing details.

FIGURES 4.0, 4.1, 4.2, 5.0, 6.0, 6.1, 6.2

PAGE 28 - FIGURE 4.0
PAGE 29 - FIGURE 4.1
PAGE 30 - FIGURE 4.2
PAGE 31 - FIGURE 5.0
PAGE 32 - FIGURE 6.0
PAGE 33 - FIGURE 6.1
PAGE 34 - FIGURE 6.2

FOUR SEASONS HOUSING, INC.

GENERAL NOTES:

1. THIS FOUNDATION HAS BEEN DESIGNED FOR SITES WITH AN ALLOWABLE SOIL BEARING CAPACITY OF 2000 PSF MINIMUM.
2. FOUNDATIONS TO BE CONSTRUCTED ON SOIL WITH A LOWER BEARING CAPACITY SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE BY A LICENSED ENGINEER TO LOCAL CONDITIONS AND CODES.
3. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS TO BE 3000 PSI MINIMUM.
4. REINFORCING STEEL SPECIFIED TO BE GRADE 60 BARS MEETING ASTM A615, A616 AND A617
5. FOUNDATION WALL MAY BE POURED CONCRETE 8" THICK, REINFORCED WITH #4 REBAR AT 12" OC VERTICAL AND #5 REBAR AT 18" OC HORIZONTAL.
6. UNIT COLUMN SUPPORTS FOR CENTERLINE RIDGEBEAMS REQUIRE ADDITIONAL PIER SUPPORTS UNDER CENTERLINE BEAM LOCATIONS PER FLOOR PLAN
7. THESE SPECIFICATIONS ARE TYPICAL. LOCAL CODES MAY CONTAIN ADDITIONAL REQUIREMENTS.
8. FOUNDATION WALL STEMS MAY BE CONCRETE OR CONCRETE BLOCK
9. CONCRETE BLOCK SHALL CONFORM TO ASTM C-90.
10. IN CONCRETE BLOCK STEM WALLS A MINIMUM Of (2) #4 REBARS ARE TO BE INSTALLED IN BLOCK WITH MUD SILL ANCHORS. FULLY GROUT EACH CELL CONTAINING REBAR.
11. ALL LUMBER IN CONTACT WITH CONCRETE SHALL BE OF PRESSURE TREATED TYPE OR OF SPECIES APPROVED FOR USE IN DIRECT CONTACT WITH CONCRETE.
12. THE INSTALLATION SITE MUST BE GRADED SO THAT WATER DRAINAGE IS AWAY FROM STRUCTURE AND DOES NOT ACCUMULATE UNDER THE HOME.
13. BACK FILL ADJACENT TO THE WALL SHALL NOT BE PLACED UNTIL THE WALL HAS SUFFICIENT STRENGTH OR HAS BEEN BRACED TO PREVENT DAMAGE.
14. MINIMUM FOUNDATION VENTILATION REQUIREMENTS:
A. 18" x 24" ACCESS CRAWL SPACE TO UNDER FLOOR AREA.
B. 1 1/2 SQUARE FEET OF VENTILATION PER 25 LINEAL FEET OF FOUNDATION WALL.
C. COVER VENT OPENINGS WITH CORROSION-RESISTANT WIRE MESH NOT LESS THAN 1/8" NOR MORE THAN 1/2" IN ANY DIRECTION.
15. I-BEAM SPLICE TO OCCUR OVER SUPPORTS. USE 1/4" x 4" x 4" SPLICE PLATE WELDED OR (2) 1/2" DIAMETER BOLTS EACH SIDE OF SPLICE.
16. THIS FOUNDATION SYSTEM FOR USE WITH FLOOR SYSTEMS WHICH ARE DESIGNED TO SPAN FROM PERIMETER WALL TO CENTERLINE SUPPORTS.

GENERAL NOTES:

17. DAMP PROOFING OF CONCRETE OR MASONRY WALLS TO BE IN ACCORDANCE WITH LOCAL CODES. IN THE ABSENCE OF CODE REQUIREMENTS THE FOLLOWING SHALL. APPLY:
A. EXTERIOR FOUNDATION WALLS OF MASONRY CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING NOT LESS THAN 3/8" OF PORTLAND CEMENT PARGING; TO IHE WALL FROM THE FOOTING TO THE FINISH GRADE. ME PARGINC SHALL BE COVERED WITH A COAT OF APPROVED BITUMINOUS MATERIAL APPLIED AT THE RECOMMENDED RATE. EXTERIOR FOUNDATION WALLS OF CONCRETE CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING A COAT OF APPROVED BITUMINOUS MATERIAL TO THE WALL FROM THE FOOTING TO THE FINISH GRADE AT THE RECOMMENDED RATE.
B. FOUNDATION WALLS OF HABITABLE ROOMS LOCATED BELOW GRADE SHALL BE WATER PROOFED WITH MEMBRANES EXTENDING FROM THE EDGE OF THE FOOTING TO THE FINISH GRADE LINE. THE MEMBRANE SHALL CONSIST OF EITHER 2-PLY HOT MOPPED FELT, 6-MIL POLYVINYL CHLORIDE, 55-POUND ROLL ROOFING OR EQUIVALENT MATERIAL. THE LAP IN THE MEMBRANE SHALL BE SEALED AND FIRMLY AFFIXED TO THE WALL.
C. FOUNDATION WALLS MAY BE DAMP PROOFED OR WATER PROOFED USING MATERIALS AND METHODS OF CONSTRUCTION OTHER THAN COVERED IN THIS SECTION WHEN APPROVED BY THE LOCAL BUILDING OFFICIAL.
18. DRAINS SHALL BE PROVIDED AROUND FOUNDATIONS ENCLOSING HABITABLE OR USEABLE SPACES LOCATED BELOW GRADE AND WHICH ARE SUBJECT TO GROUND WATER CONDITIONS. DRAINS SHALL BE INSTALLED AT OR BELOW ME AREA TO BE PROTECTED. AND SHALL DISCHARGE BY GRAVITY OR MECHANICAL MEANS INTO AN APPROVED DRAINAGE SYSTEM.
19. THE TOP OF OPEN JOINTS OF DRAIN TILES SHALL BE PROTECTED WITH STRIPS OF BUILDING PAPER AND THE DRAINAGE TILES SHALL BE PLACED ON 2 INCHES OF WASHED GRAVEL OR CRUSHED ROCK ONE SIEVE SIZE LARGER THAN THE TILE JOINT OPENING OR PERFORATION AND COVERED WITH NOT LESS THAN 6 INCHES Of THE SAME MATERIAL.
20. THE DESIGNS ON THIS AND FOLLOWING SHEETS ARE APPLIACABLE TO HORIZONTAL WIND LOADS OF 15 PSF MAXIMUM AND UNITS WHICH HAVE A MAXIMUM WIDTH OF 26'-8". MINIMUM I-BEAM SPACING IS 82 1/2" OR 99 1/2".
21. THE DESIGNS ON THIS AND FOLLOWING SHEETS ARE APPLICABLE
TO SEISMIC ZONES O, 1 AND 2.
22. THIS FOUNDATION DESIGN IS NOT FOR INSTALLATION ON A FLOOD PLAIN. WHEN INSTALLING CRAWLSPACE OR BASEMENT IN AN AREA WITH SOILS HAVING POOR DRAINAGE. CONSIDERATION SHOULD BE GIVEN TO METHODS OF ELIMINATING ACCUMULATION OF WATER IN THE CRAWLSPACE OR BASEMENT, SUCH AS THE USE OF SUMP PUMP(S). INSTALLATION OF SUMP PUMPS TO BE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

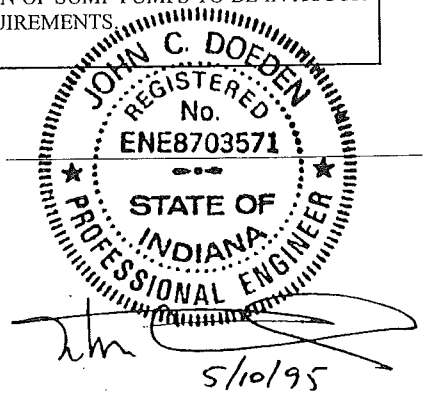


FIGURE 4.0
FOUNDATION NOTES AND CHARTS
PAGE 1 OF 3

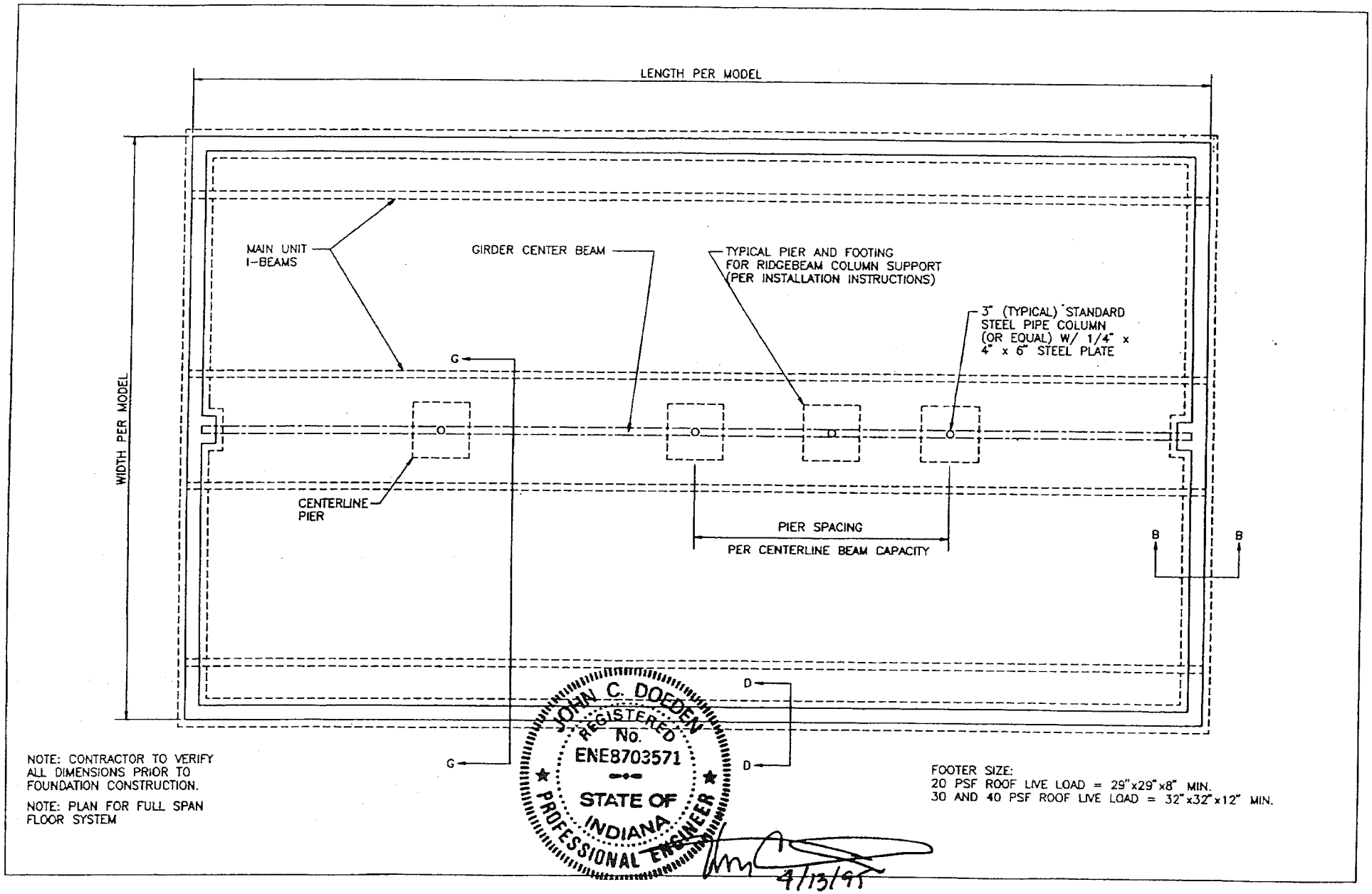


FIGURE 4.1
TYPICAL FOUNDATION (CRAWLSPACE OR BASEMENT) PLAN
PAGE 2 OF 3

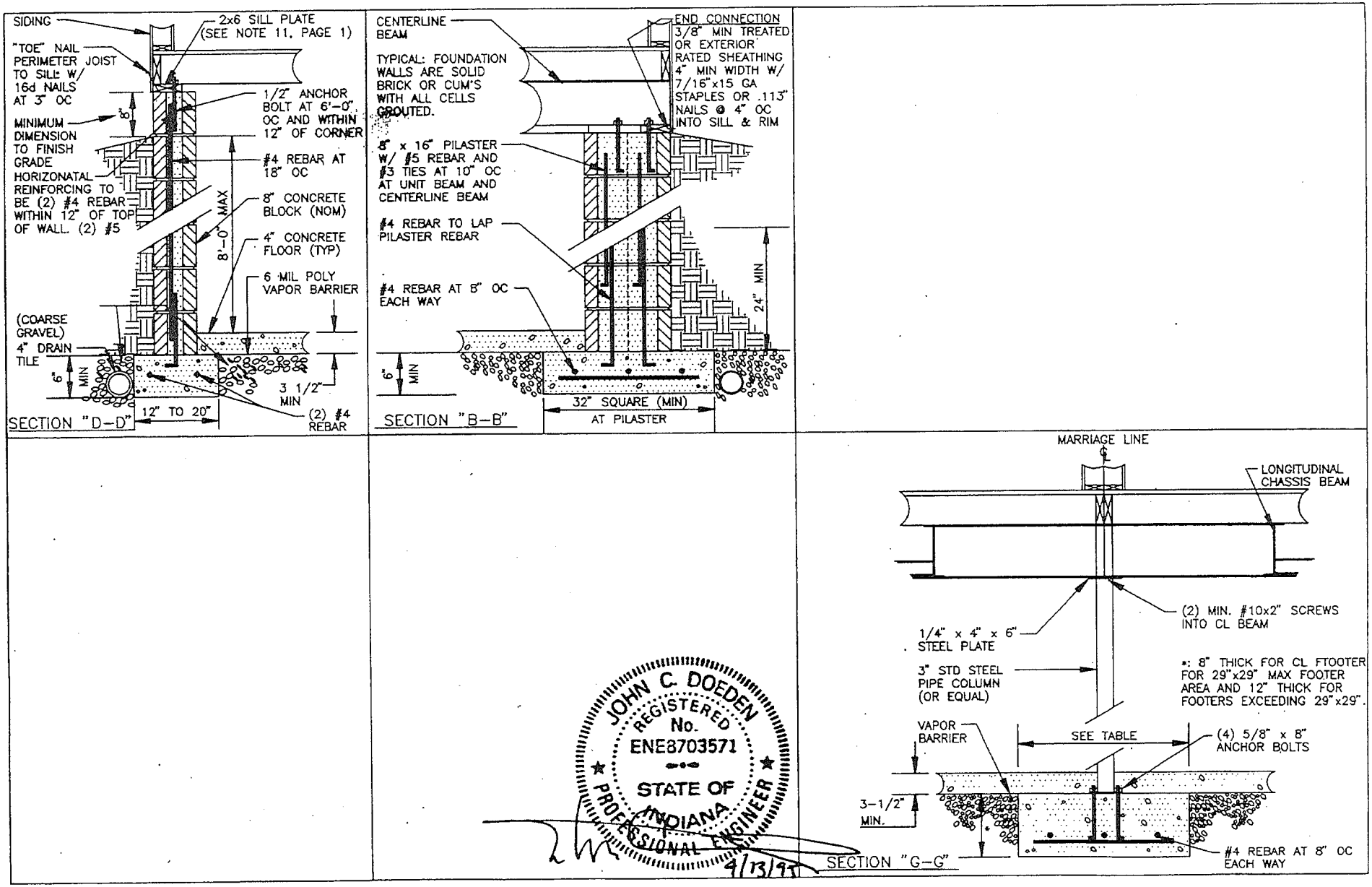
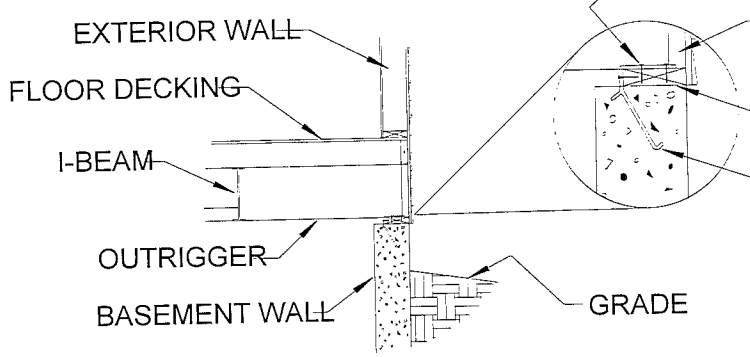


FIGURE 4.2
BASEMENT DETAILS
PAGE 3 OF 3

FIGURE 5.0
SILL FASTENING DETAIL

WIND ZONE I



SIMPSON (OR EQUAL) MAS CONNECTOR SPACED AT 8'-0" O.C. (MAX.) AND 2'-0" IN FROM CORNERS (MAX.)

KNEEWALL

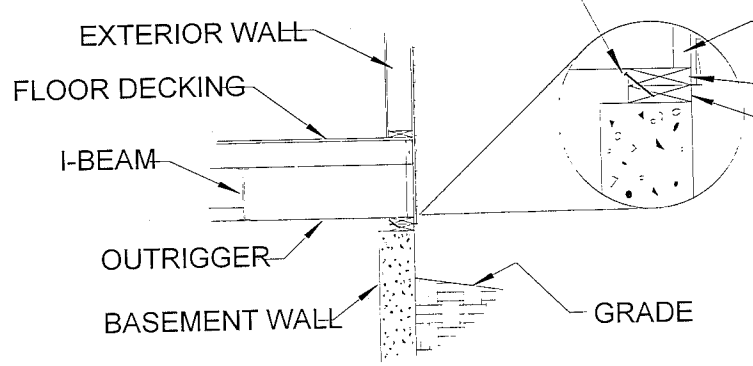
2 X 6 MUDSILL (PRESSURE TREATED) (SEE NOTE A)

MUDSILL ANCHOR

NOTE A: THE MUDSILL IS FACTORY INSTALLED AND CONNECTED TO THE KNEEWALL WITH 7/16 x 2 1/2 x 15 GA. GALVANIZED STAPLES AT 8" O.C. MAX SPACING ALL AROUND THE PERIMETER.

COLORADO REGISTERED PROFESSIONAL ENGINEER
JOHN C. DOEDEN
26527
7-31-94

WIND ZONE I



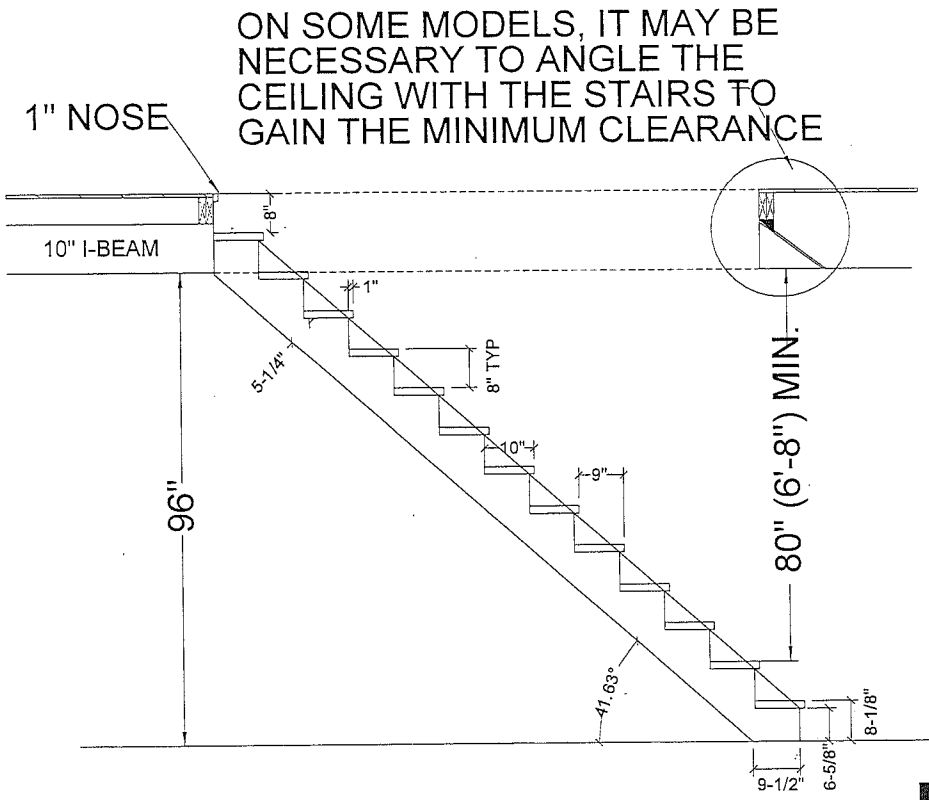
0.131" x 3" NAILS AT 3" O.C. (MAX.) TO ATTACH SILL PLATES. TOE-NAILING ALLOWED.

KNEEWALL

2 X 6 RIM PLATE (PRESSURE TREATED) (SEE NOTE B)

2 X 6 MUDSILL (PRESSURE TREATED) ATTACHED TO FOUNDATION WALL WITH 1/2" ANCHOR BOLTS AT 6'-0" (MAX) AND 2'-0" IN FROM CORNERS.

NOTE B: RIM PLATE IS FACTORY INSTALLED AND CONNECTED TO THE KNEEWALL WITH 7/16 x 2 1/2 x 15 GA. GALVANIZED STAPLES AT 8" O.C. MAX SPACING ALL AROUND THE PERIMETER.


ON SOME MODELS, IT MAY BE NECESSARY TO ANGLE THE CEILING WITH THE STAIRS TO GAIN THE MINIMUM CLEARANCE
1" NOSE
10" I-BEAM
8"
1"
8" TYP
5-1/4"
10"
9"
96"
80" (6'-8") MIN.
41.63°
8-1/8"
6-5/8"
9-1/2"

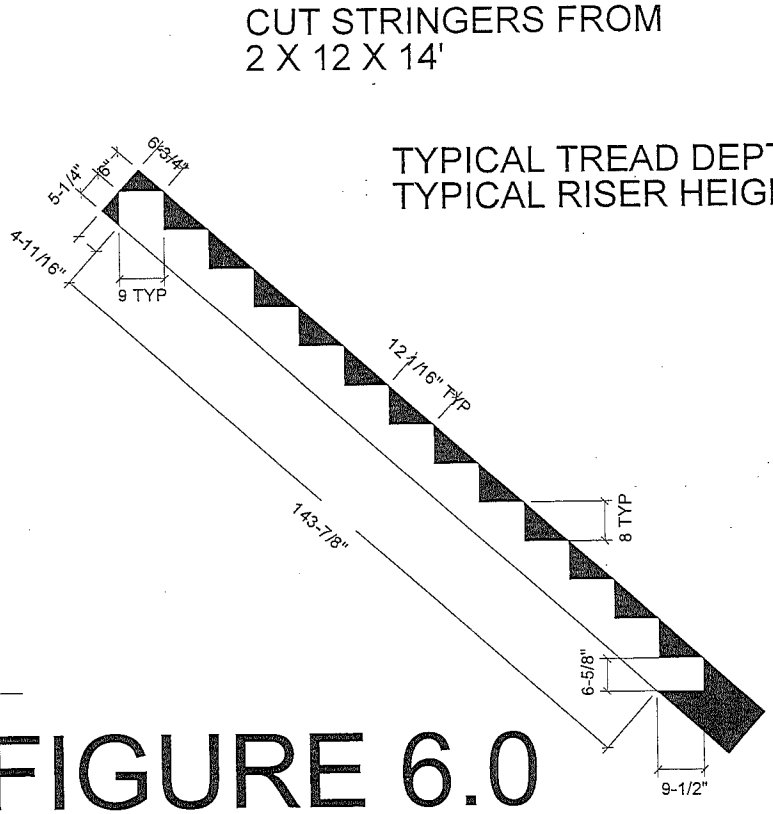

CUT STRINGERS FROM
2 X 12 X 14'
TYPICAL TREAD DEPTH IS 9"
TYPICAL RISER HEIGHT IS 8"
6-3/4"
5-1/4"
8"
4-11/16"
9 TYP
12-1/16" TYP
143-7/8"
8 TYP
6-5/8"
9-1/2"

FIGURE 6.0

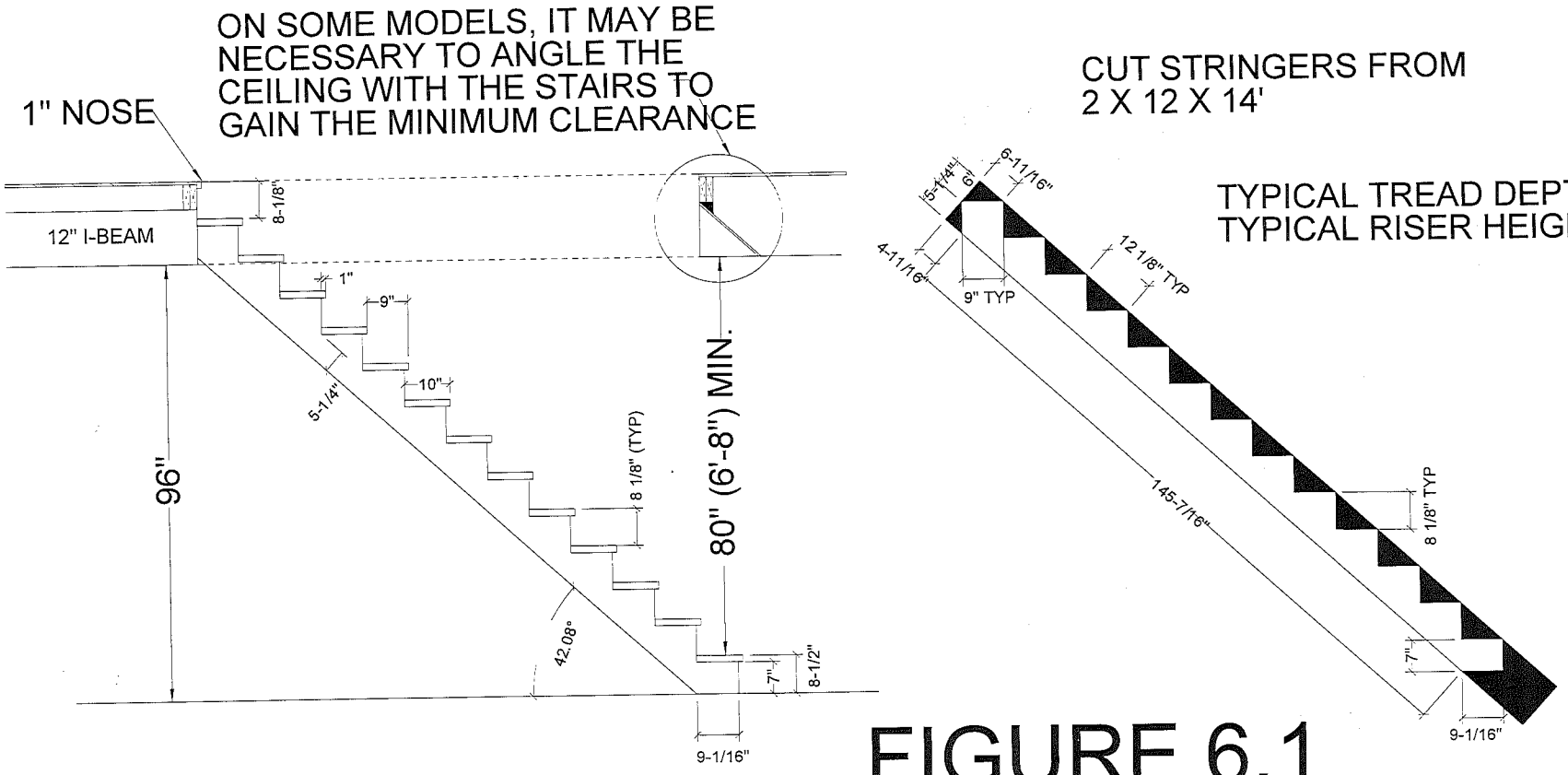
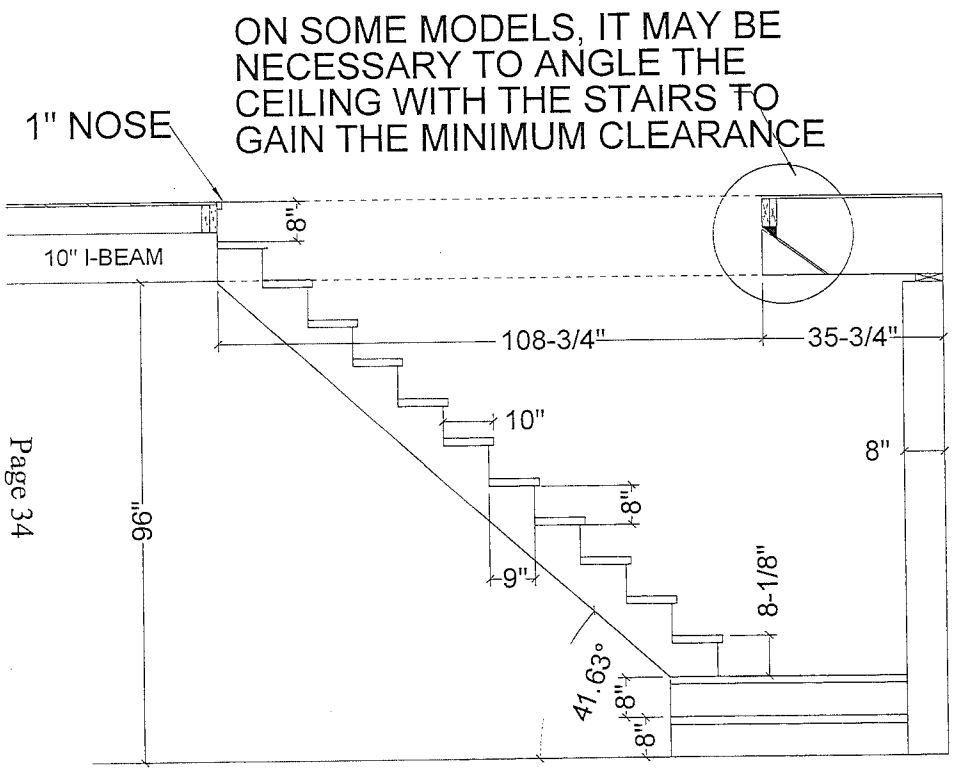

ON SOME MODELS, IT MAY BE NECESSARY TO ANGLE THE CEILING WITH THE STAIRS TO GAIN THE MINIMUM CLEARANCE
1" NOSE
12" I-BEAM
8-1/8"
1"
9"
10"
5-1/4"
96"
8 1/8" (TYP)
80" (6'-8") MIN.
42.08°
7"
8-1/2"
9-1/16"
CUT STRINGERS FROM
2 X 12 X 14'
TYPICAL TREAD DEPTH IS 9"
TYPICAL RISER HEIGHT IS 8 1/8"
5-1/4"
6"
6-11/16"
4-11/16"
9" TYP
12 1/8" TYP
145-7/16"
8 1/8" TYP
7"
9-1/16"

FIGURE 6.1



CUT STRINGERS FROM
2 X 12 X 12'

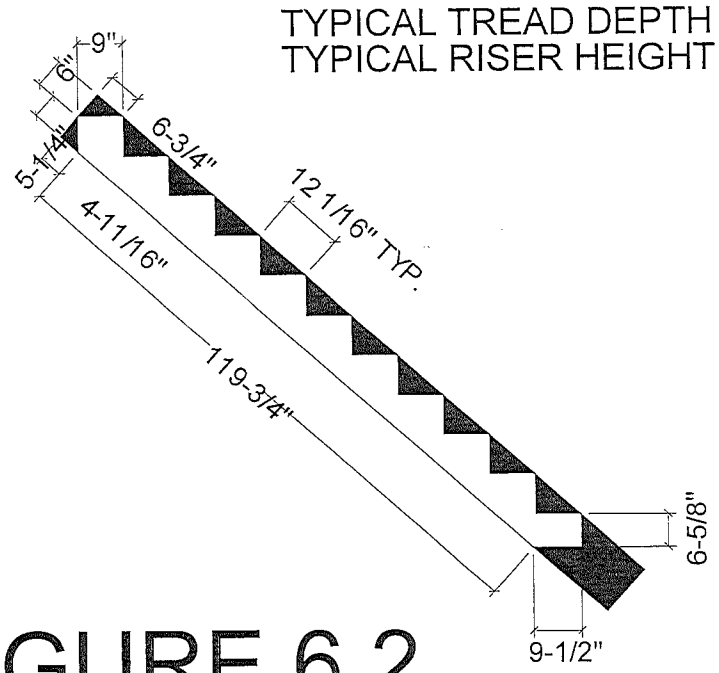


FIGURE 6.2

SECTION 4 SET-UP PROCEDURES

4.1 TRANSPORTING TO SITE. See **section 2.1.2.**

4.2 SET-UP. See **section 1.3** before continuing!

4.2.1 JACKS. 1. Use steel plates with a minimum size of 3/8" x 2-1/2" x 5" between the jack and the main beams to distribute the load and prevent damage to the beams.
2. Use jacks that have a minimum 10 ton rating and are in good working condition.
3. Use a firm support underneath the jacks to prevent tipping or settling.

4.2.2 PREPARATION OF DOUBLE-WIDE SECTIONS. Remove all shipping materials and items that stick out from the mating surfaces of both sections. Locate the cross-over locations for electrical, gas (if applicable), water (if applicable). The water cross-overs are through the rim joist. All 120 volt electrical cross-overs are located in the end-walls. All 220 volt cross-overs are made through a junction box. The junction boxes for 220 volt cross-overs are located on the breaker (panel box) half of the home on the rim joist. Review the locations of the utility connections. This will include the sewer drop, electrical drop, gas inlet (if applicable), and water inlet. Insure that the site utility connections are in the proper location and there will be plenty of wire, pipe, etc. to make the connection. Double check that all closing materials are present. Some models require that portions of the sewer system are shipped loose. Compare this list with what is present in the home. Some materials may have been shipped separately due to availability at the time the home was manufactured.

4.2.3 PROCEDURE. Follow these step-by-step procedures to avoid placing undue stress on structural members of the home.

4.2.3.1 PIER SET. Follow this procedure when setting the home on a pier foundation. Follow the instructions in **section 4.2.3.**

1. Locate the approximate location of the home. Lay out the support devices in their approximate locations. Maneuver the first section of the home into position over the site.
2. Level the home from front to rear by means of the hitch jack. Use safety blocking in the event the jack or hitch fails.
3. Place one jack just forward of the front spring hanger and another just behind the rear spring hanger under the same main beam.
4. Operating the two jacks simultaneously, raise the home slightly higher than its final position.
5. Jack up the next main beam using the same method for the first.
6. Place the piers at the proper locations and level them with the methods described in **section 4.2.4.** Remember to install any additional piers that may be required due to excessive floor live load or perimeter/mating wall openings wider than 4' (48").
7. Lower the section onto the piers (reverse **steps 2-5**).
8. Complete the leveling procedure by adjusting all pier heights per **section 4.2.4.**
9. Recheck the soundness of all piers and adjust as required. Check all doors and windows to assure that they operate properly.
10. Install insulating material to the mating surfaces of the walls, ceilings, and floors to prevent air infiltration.
11. Position the second unit within a few inches of the first. Line up the two sections.
12. Using a roller system designed for setting manufactured homes, raise the second section as described in **steps 2-5.** The second section should now be raised onto the roller system.
13. Position and level the piers. Follow the instructions in **step 6.**

14. Lower the section onto the piers. Follow the instructions in **step 7.**
15. Level the unit as described in **section 4.2.4.**
16. Follow the instructions under **section 4.2.5** for closing details.

4.2.3.2 PERMANENT FOUNDATION. follow this procedure when setting the home on a permanent foundation. Prepare the home as described in **section 4.2.3.**

NOTE: A ROLLER SYSTEM DESIGNED FOR SETTING MANUFACTURED HOMES MUST BE USED FOR THE TYPE OF SET DESCRIBED BELOW. FOLLOW THE MANUFACTURER'S INSTRUCTIONS WHEN USING THE EQUIPMENT.

1. Level the home from front to rear by means of the hitch jack. Use safety blocking in the event the jack or hitch fails.
2. Place one jack just forward of the front spring hanger and another just behind the rear spring hanger under the same main beam.
3. Operating the two jacks simultaneously, raise the unit slightly higher than the foundation wall plus the transverse roller beams height.
4. Jack up the next main beam using the same method for the first.
5. Place proper safety blocking (cribs) under the main I-beams.
6. Place the transverse roller beams on the foundation wall (or see **figure 4.2** for alternate) and install the jack supports. Level the beams.
7. Lower the unit onto the transverse roller beams (reverse **steps 2-4**). Do not remove the safety blocking.
8. The unit should be rolled into place using a come-along (hand winch). Do not exceed the working load of the device.
9. Raise the unit off of the transverse roller beams by using basement jacks specially designed for this purpose.
10. Place all support jacks in their proper locations and level them.
11. Remove the transverse beams.
12. Lower the home onto the cross-beams (or foundation wall) and ridge beam support piers.
13. Level the unit as described in **section 4.2.4.**
14. Install insulating material to the mating edges of the walls, ceilings, and floors to prevent air infiltration. Place sealant on all mating surfaces.
15. Repeat **steps 1-12** for the second half of the home.
16. It may be necessary to raise a portion of the home to properly align the roof and ceiling at the endwalls.
17. See **section 4.2.5** for closing details.

4.2.4 LEVELING PROCEDURE. Use 4" x 6" hardwood (or 9 sq. in. min. steel on permanent foundations) shims driven in tightly and not to occupy more than 1" vertical space. Use 2" x 8" x 16" hardwood (steel plates on permanent foundations) plates to fill any vertical voids greater than 1". Do not lower the home until all piers have been leveled to avoid placing undue stress on the piers, footings, and frame. Use one of the following methods for leveling the home.

1. Transit (optical or laser type)- used by a trained and competent operator.
2. Water level - see **section 4.2.4.1** for instructions on using a water level.
This is the method recommended by ***FOUR SEASONS*** due to its simplicity and accuracy.

4.2.4.1 USING A WATER LEVEL. A typical water level is 100' of 3/8" or 1/2" clear plastic hose that is connected to the bottom of a water-filled container. Dye should be added to the water to aid in the removal of air bubbles and allow the water to be visible. The container must have a vent hole which can be sealed when it is not in use. A shut-off valve should be installed on the opposite end of the tube. The water in the tube will remain level with the water in the container as long as the vent and shut-off valve are fully open. To use a water level to level a home follow these step-by-step instructions.

1. Locate the container so that the tubing can easily reach any corner of the home. Raise the container on a firm level surface so that the water in the container is at the height of the bottom of the I-beam.
2. Check for air bubbles in the tubing. To remove air bubbles remove the vent seal on the container and place the entire length of tubing below the water level in the container and open the valve on the tubing to let all the bubbles flow out. When all the bubbles are out close the valve.
3. With the tubing valve and vent seal fully open check the water level in the tubing with the water level in the container. Make certain that the tubing is kink free. Check the height of each pier location against the water in the tube and adjust as necessary.
4. Repeat with all piers and then recheck all piers before continuing.

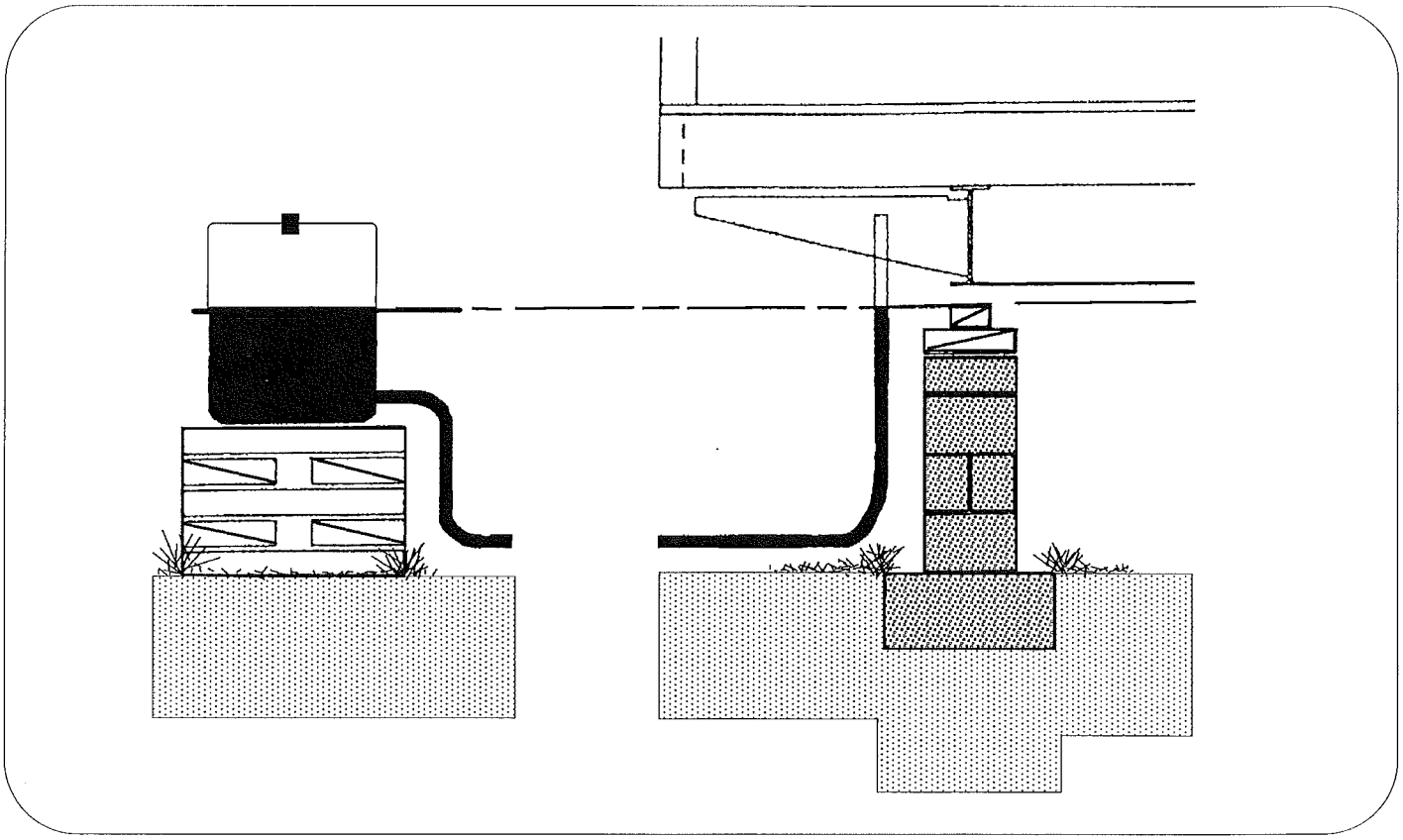


FIGURE 4.2.4.1 TYPICAL WATER LEVEL

4.2.5 DOUBLE WIDE CLOSING DETAILS.

4.2.5.1 FASTENING. The units must be secured together as described in this section.

4.2.5.1.1 RIDGE. The ridge must be fastened using 3/8" x 5" lag screws driven in at a 45 degree angle. Stagger the lag bolts when installing them. Space the lags at 48" O.C. for wind zone I. It may be necessary to raise one end of the home slightly to get the endwalls and ceiling to line up.

4.2.5.1.2 FLOORS. Do **not** use the lags to pull the sections together! Fasten the perimeter floor joists (or the laminated beam with the "PH" floor system may be substituted) together with 5/16" x 3" lag bolts with washers spaced at 48" O.C. Stagger the lag bolts when installing them. If one half of the home is not flush with the other, use a basement jack to raise one side up to be flush with the other. Any cuts made in the bottom board must be repaired per **section 9.1.**

4.2.5.1.3 ENDWALLS. Fasten the endwalls using #8 x 3" screws at 12" O.C.

LOCATION	FASTENER	SPACING
PERIMETER JOIST	5/16" X 3" LAG BOLT W/ WASHER	48" O.C.
RIDGE	3/8" X 5" LAG BOLT @ 45 DEGREES	48" O.C. ZONE I
ENDWALLS	#8 X 3" SCREW	12" O.C.

TABLE 4.2.5.1
CLOSURE FASTENING SCHEDULE

4.2.5.2 CROSS-OVER CONNECTIONS. Connect water, furnace, sewer, gas, and electrical cross-overs. **Section 8** describes the utility tests and procedures for connecting to site utilities. See **section 4.2.3** for electrical cross-over locations. When making gas and water connections, make note of the flow. Some of the sewer lines may have to be installed on site. Be sure to use an adequate slope of 1/4" per ft. when installing drain lines. Support drain lines at 48" O.C.. Some models require the installation of a v-boot at the furnace plenum. Do not allow the furnace cross-over to rest on the ground. Install the duct cross-over with the provided clamps (tie-straps), and seal the connections with duct tape. Flexible cross-over duct is to be supported at 48" O.C..

4.2.5.3 EXTERIOR FINISHING. Remove all of the shipping materials from the end walls. The starter strip and the channels for the siding are already installed. Install the vinyl siding sections by interlocking the s-strips. Fasten the siding on a stud using corrosion resistant fasteners that penetrate at least 1" into the receiving member. Fasten the siding in the center of the slots to allow for expansion. Do not install the siding tight against the channels. Allow 1/4" gap to prevent buckling. Remove all shipping materials from the roof. Any visible holes left by the shipping material fasteners must be filled with roofing cement. Cover the roof ridge joint with roofing paper. A few inches of roofing paper is folded over on each side of the roof. Pull this paper over the joint and staple in place. Cut ridge cap shingles from 36 x 12 shingles (supplied by ***FOUR SEASONS***). Start shingles from the end that is opposite the direction of the prevailing winds. Overlap each shingle 6".

4.2.5.3 INTERIOR FINISHING. All materials needed to finish off the interior of the home have been shipped with it. Some materials may have been shipped separately due to supply problems. Fill all gaps in the exterior walls with fiberglass or latex caulking. Staple or nail the trim in place. Colored putty can be used to fill nail and staple holes. Some sections of wall paneling may have been shipped loose to add a more finished look to the home. These panels must be glued and stapled to the studs. The carpet/linoleum seam

should be finished by an experienced carpet/linoleum installer. The interior doors at the mating wall will need to be hung. Do not hang the doors until the home is set and level in its final position.

4.2.5.4 STAIRWELLS. It is **not** permissible to modify the floor, frame, or walls of your home to accommodate a stairwell. Typical stair details are included to aid you in the design and construction of your stairs. All local building codes must be considered when designing and building the stairs. See **figures 6.0-6.2** for typical stair details. All typical stair prints assume an 8'-0" wall height. Some models (such as the JJ1) may require the installation of a landing to provide proper stair clearances.

SECTION 5 OPTIONAL FEATURES

5.1 CAUTION. ***FOUR SEASONS INC.*** cannot be held responsible for any damage resulting from the installation of accessories or any modifications to the home subsequent to shipment from the factory. All alterations must comply with the *Federal Manufactured Housing Construction and Safety Standards* and are at the risk of the installer and/or owner. Local building officials should be consulted prior to making any alterations to the home to insure compliance with all applicable codes and requirements.

5.2 SKIRTING. Skirting not only increases the value of your home but has other benefits as well. Skirting helps keep the floors warm in the winter, cool in the summer, and helps prevent plumbing freeze-ups. You can purchase skirting from your dealer. Install skirting according to the manufacturer's instructions. You must allow for an access panel and venting when installing skirting. The access panel must be no less than 18" in any dimension and no less than 3 square feet in area. The access shall be located so that the water supply and sewer drains are accessible for inspection and no special tools shall be required to remove them. Ventilation shall be provided in the form of non-closing vents located at each corner and as high as possible. The venting area shall be equal to no less than one square foot for every 150 square feet of the home's floor area. This area should be increased when insect screen and slats are installed. In freezing climates allow 3-4" for frost heave to prevent buckling. The vents must be located to provide cross-ventilation to the entire system under the home. Before skirting is installed a ground moisture vapor barrier must be installed . See **section 2.5** for information on the vapor barrier. Never vent the clothes-dryer under the home. If the home is equipped with a fuel burning sealed combustion appliance with a fresh air intake under the home a vent must be placed in the skirting adjacent to the fresh air inlet of the appliance.

5.3 CARPORTS AND AWNINGS. The best choice for carports and awnings would be free-standing units that are designed to support their own weight. Never attach a structure to your home that will add additional stress or weight to the framing or any other portion of the home.

5.4 ON-SITE ATTACHED STRUCTURES. When a home that is installed on a foundation is to have additional buildings or structures attached or located immediately adjacent to it, the building ordinance may require fire separation techniques and materials to be used. Most building ordinances require a minimum of a one hour fire wall to be installed between garages, zero lot line homes, workshops, etc. When required, the fire separation wall must be approved by a recognized agency. All attached structures must be designed to support all of its own live and dead loads without placing additional stress or weight on any portion of your home.

5.5 EXHAUST AND VENTING. All ***FOUR SEASONS*** homes have a Miller/Nordyne active fresh air ventilation system standard. Instructions on its use are provided with the furnace.

5.6 TELEPHONE AND CABLE TELEVISION. Use care when adding any wiring to your home. The walls, floors, and ceilings contain electrical wiring and plumbing. Careless installations could damage your home or cause **severe personal injury or death.** If in doubt contact a trained professional to perform such installations.

SECTION 6 FINAL ASSEMBLY

6.1 PURPOSE. FOUR SEASONS, INC. ships some parts of your home "loose" (not attached) that will need to be installed after the home has been properly set-up. This section describes the procedure for installing these items.

6.2 EXTERIOR LIGHTS. Disconnect power at main electrical box. Remove covers and any protective shipping materials. Complete wiring connections using the appropriate size and type wire nuts. Use silicon base caulk (or equivalent) to provide a water-tight seal. Attach fixture to outlet box with provided hardware. Attach globe and correct wattage light bulb. See **figure 6.2** for wiring details.

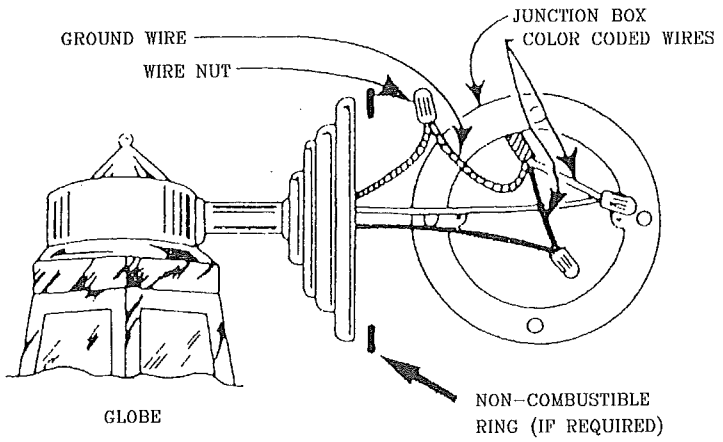


FIGURE 6.2 EXTERIOR LIGHT DETAIL

6.3 CEILING FANS. Install ceiling fans with the blades no lower than 76" off the floor. Follow the instructions provided with the fan.

6.4 HITCH, WHEEL, AND SUSPENSION REMOVAL. The front hitch used for transporting the home has been designed to be removed after the home is installed. The hitch should be stored with the house in the event the home is ever relocated. Common practice is to store the hitch under the home where it will be protected from the elements and concealed by the skirting. The axles and complete suspension system can also be removed. After removal, hub surfaces should be coated with heavy grease to resist rust and corrosion. The tires, wheels, and suspension system are designed only for use to transport your particular home and are not intended for any other purpose.

6.5 MISCELLANEOUS ITEMS. Install the glass globes for interior and exterior lighting fixtures. Install the toilet tank lid. Attach bathroom exhaust vent covers.

SECTION 7 APPLIANCES

7.1 CLOTHES DRYER. Your home has been equipped with attachments to ease the installation of an electric or gas clothes dryer. The power, gas (when applicable), and drainage systems are installed at the factory. The venting system has been roughed in and must be completed after the home has been set-up. If your home has not been equipped with a gas clothes dryer, installing one requires significant alteration of the home. Under no circumstances should the framing (rafters, joists, studs, etc.) be cut to create room for gas lines or any other item. Only qualified personnel should install a gas dryer. To complete the dryer vent installation follow these steps. See **figure 7.1** for details.

1. Remove any covers over the venting holes (interior and exterior).
2. Install a flexible dryer duct compatible with the type of dryer being installed. Be sure to obtain enough ducting to reach the outer edge of the home.
3. Secure the termination fitting to the outside edge of the floor. Be sure not to vent the dryer under the home.
4. Secure the duct to the termination fitting with clamps. Don't use screws or other devices which extend into the duct.

5. Seal the duct hole with a high quality grade of silicon caulk or tape.
6. Connect the duct to the dryer.

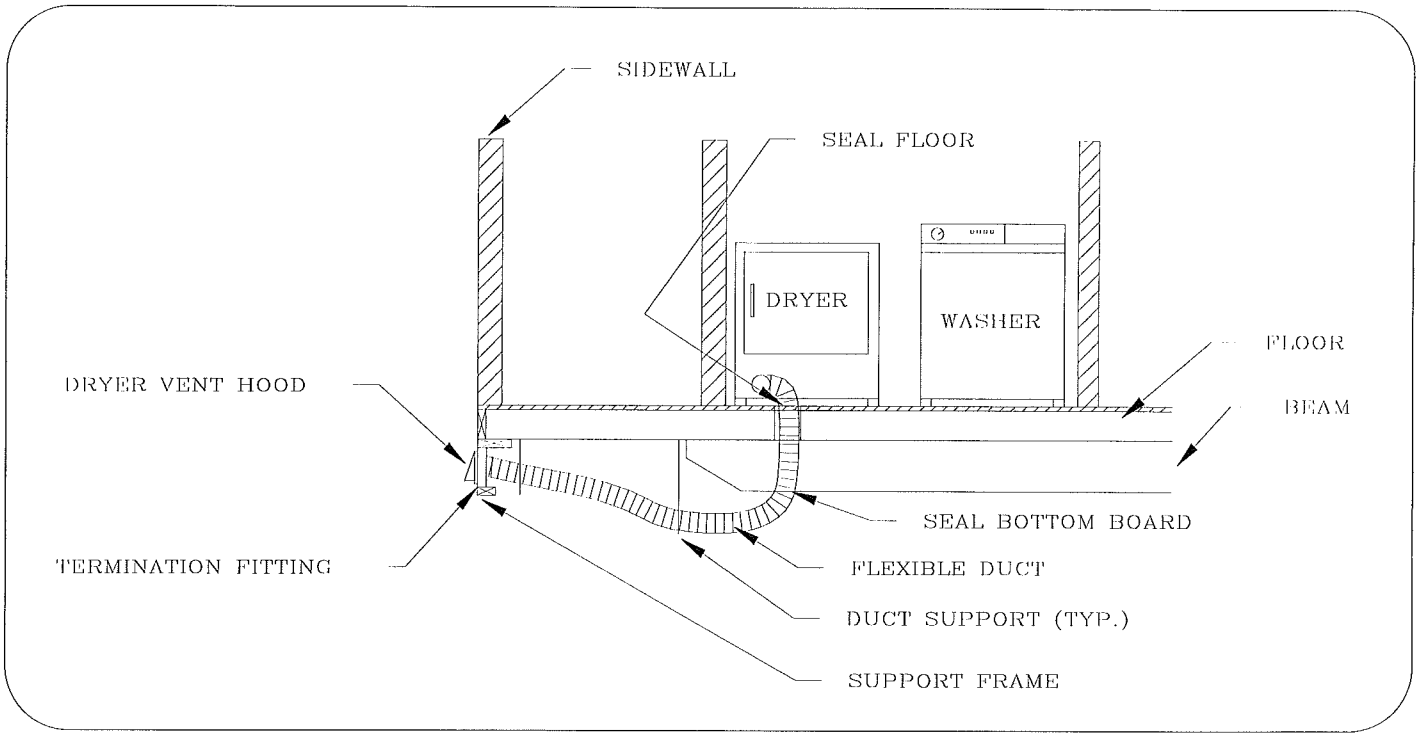


FIGURE 7.1 TYPICAL DRYER VENT INSTALLATION

7.2 FUEL BURNING DEVICES (FIREPLACES, ETC.)

7.2.1 CHIMNEYS. Some homes equipped with fireplaces require that the installation of additional section(s) of chimney pipe and a rain cap assembly be done on site. To insure sufficient draft for the fireplace, the chimney must extend 3 feet above the highest point where it penetrates the roof and be at least 2 feet higher than any other building or obstruction within 10 feet. Parts necessary to complete the installation are provided. Note, however, that the chimney section(s) provided will be of sufficient length to meet requirements for the home only (not additional structures within 10 feet). Chimney installation must be in accordance with the fireplace manufacturers instructions. See **figure 7.2** for details. A typical installation is as follows.

1. Remove shipping coverings from the chimney
2. Install the required chimney sections and secure.
3. Install spark arrestor.
4. Install rain cap

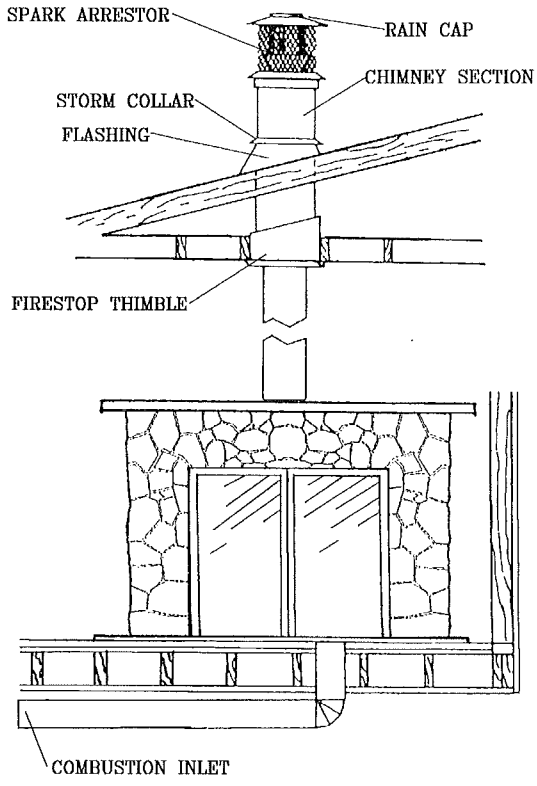


FIGURE 7.2 TYPICAL FIREPLACE

7.2.2 COMBUSTION AIR INLETS. The air intake ducts for fireplaces and other fuel burning devices must be completed after the home is installed. Follow the manufacturer's instructions provided with the device. Do not terminate the duct beneath the floor of the home. Do not allow the combustion air inlet to dispense material beneath the home. See **figure 7.2** for details.

7.4 AIR CONDITIONING. Your home has been designed to accommodate a central air conditioning system. Installation of an air conditioning system should only be made by qualified personnel. The completed installation must comply with the *National Electric Code* and all applicable local codes. When installing an air conditioning system follow the manufacturer's installation instructions. The maximum allowable B.T.U./hr. rating must not exceed that which is indicated on the data plate. ***FOUR SEASONS, INC.*** does not recommend the installation of window air conditioning units. Select an air conditioner that is intended for a manufactured home and is compatible with the home's heating system.

7.5 HEAT PUMP INSTALLATION. When installing an add-on heat pump, follow all applicable codes and the manufacturer's installation instructions. The maximum allowable B.T.U./hr. rating must not exceed that which is indicated on the data plate. Select a heat pump that is intended for use in a manufactured home and is compatible with the home's heating system.

7.6 WATER HEATER. Do **not** operate the water heater until it has been completely filled with water or the unit will be damaged. ***FOUR SEASONS, INC.*** cannot be responsible for damage to the water heater by failure to fill it before operation.

7.7 FURNACE. The furnace manufacturer and model number are listed on the home's data plate. ***FOUR SEASONS, INC.*** installs the proper orifice for burning natural gas at the factory (orifices for L.P. gas are included with the furnace). The furnace is designed to accommodate the installation of a central air conditioning system.

SECTION 8 UTILITY HOOKUP AND TESTING

8.1 PURPOSE. This section deals with connecting the water, gas, drainage, oil, and electrical systems of the home to the site services. Regulations governing the utility connections vary with location; thus, the authorities having jurisdiction must be consulted to insure the connections are in accordance with all applicable regulations. Connections must be made only by experienced, qualified personnel who are familiar with local codes. The utility systems for all ***FOUR SEASONS*** homes. are subject to stringent tests before leaving the factory. This, however, cannot provide a guarantee against possible damage in transit. For this reason, it is imperative that the tests for each of the utility systems be carried out as described in this manual. Upon completion of your utility system it is important to provide access to connections for periodic inspections and possible future service.

8.2 WATER SUPPLY HOOKUP AND TESTING PROCEDURE.

8.2.1 WATER SUPPLY TESTING. The water supply system was tested at the factory, however, it is essential that it be rechecked at the site for leaks that may have been caused during transit. Close all water faucets, spigots and toilet supply valves. The water heater must be bypassed during this test. This type of test involves use of pressurized air which can permanently damage or rupture the water heater causing **severe injury.** By-pass the water heater by disconnecting the cold water inlet and the hot water outlet and then connecting them together through the use of an appropriate fitting. Pressurize the entire system to 100 P.S.I., then isolate it from the pressure source. The system must hold steady at 100 P.S.I. for at least 15 minutes. If the system fails this test locate and repair any leaks (repressurize the system and use a soapy solution to aid in finding leaks).

Retest after properly repairing leaks. Reconnect the water heater. Operate all water faucets, showers, etc. to clear any air blocks.

8.2.2 WATER SUPPLY HOOKUP. Water inlet is usually located near the water heater compartment through the floor or adjacent to the water heater compartment near the sidewall through the floor. The location of the water supply inlet is labeled on the lowest row of siding. Connection is made via a 3/4" threaded nipple. Install a master shut-off valve (if not factory installed). Install a pressure reducer if site pressure exceeds 80 P.S.I. Site connections must meet local codes.

8.2.2.1 PROTECTION FROM FREEZING. If the home is installed in an area subject to freezing conditions it is necessary to protect any exposed (not insulated) portions of the water supply system. The use of a thermostatically controlled heat tape is recommended by ***FOUR SEASONS, INC.***. An electrical receptacle has been factory installed for use as a power source for electric heat tape. The receptacle is not GFI protected so the heat tape's power will not be interrupted. The receptacle is within 2'-0" of the water inlet. The heat tape used must be listed by a nationally recognized testing laboratory as for use with manufactured homes. Install heat tape in accordance with the manufacturer's instructions.

8.3 DRAINAGE SYSTEM HOOKUP AND TESTING.

8.3.1 DRAINAGE SYSTEM TESTING. The drainage system was tested at the factory, however, it is essential that it be rechecked at the site for leaks that may have been caused during transit. The following procedure is for conducting a flood level test.

1. Cap off the stool drop(s) underneath the home with a water tight seal.
2. Plug the tub/shower drains.
3. Fill the entire system to the level of the toilet bowl rim(s).
4. Open the shower/tub drains to release trapped air.
5. Close as soon as water begins to be expelled from the shower/tub drains, and trapped air is released.
6. Replug the shower/tub drains.
7. Refill to rim of toilet.
8. Let stand undisturbed for 15 minutes.
9. Check for evidence of water leaks.
10. Check level of water in toilet to determine any loss of fluid.
11. Repair any leaks and retest.
12. Remove the caps on the stool drops and allow the system to drain.
13. If the home is be left unheated in a freezing climate, remove the water from the traps or add antifreeze to prevent damage.

8.3.2 DRAINAGE SYSTEM HOOKUP. Some portions of the drainage system may not be assembled in an effort to protect the system from damage during shipping and/or the installation process. ***FOUR SEASONS, INC.*** provides the necessary materials to complete the drainage system up to the main drop. Completion of the drainage system should be performed by persons trained in the use of ABS pipe and plumbing. The location of the main sewage drop is labeled on the lowest row of siding. When completing the system start at the outermost point and work toward the main drop. Cut all pipe square and deburr any rough edges inside and out. Maintain a 1/4" per foot slope on all piping. Dry assemble the entire system before using any solvent to assure proper fit and alignment. Attach supports at 4 feet or less.

8.3.2.1 PROTECTION FROM FREEZING. If the home is installed in an area subject to freezing conditions it is necessary to protect any exposed (not insulated) portions of the drainage system. This can be accomplished by insulating these areas.

8.4 GAS SYSTEM HOOKUP AND TESTING.

8.4.1 GAS SYSTEM TESTING. The gas system was tested at the factory, however, it is essential that it be rechecked at the site for leaks that may have been caused during transit. Before a test is begun the ambient air temperature and the temperature of the gas piping should be approximately the same. Conduct the test when the air temperature is to remain stable. Do **not** apply more pressure than specified as it can damage the gas valves and/or regulators. The gas system must be tested two ways; **1.** The piping only - with the appliances isolated. **2.** The entire system - with appliances.

8.4.1.1 PIPING SYSTEM TESTING. To conduct a test of the gas piping system follow these steps.

1. Isolate all gas appliances from the system by closing all shut-off valves.
2. At the gas inlet, attach a pressure gauge.
3. Pressurize the system with air to 3 P.S.I. (48 ounces).
4. Isolate the pressure source from the system.
5. The pressure must remain stable for at least 10 minutes.
6. If the system fails this test locate and repair any leaks (repressurize the system and use a soapy solution to aid in finding leaks). It is not permissible to repair fittings or piping. Any defective pipe of fittings must be replaced. Retest.

8.4.1.2 TOTAL GAS SYSTEM TESTING. To conduct a test of the completed gas system (including appliances) follow these steps. Do **not** bubble check brass fittings with solutions containing ammonia.

1. Open all appliance shut-off valves.
2. At the gas inlet, attach a pressure gauge.
3. Turn off all pilot lights (if possible).
4. Pressurize and maintain the system with air at no less than 0.5 P.S.I. (8 ounces).
5. Apply a soapy solution to the gas fittings between the shut-off valves and appliances. There should be no evidence of leakage.
6. If the system fails this test locate and repair any leaks. It is not permissible to repair fittings or piping. Any defective pipe of fittings must be replaced. Retest.

8.4.2 GAS SYSTEM HOOKUP. The gas piping system is complete and installed when the home leaves the factory. Prior to connecting to site service, gas inlet orifices of appliances (oven, stove, furnace, etc.) must be checked to insure they are the correct type for the kind of gas (liquefied petroleum or natural) being used at the site. The gas supply pressure should not exceed 7" to 14" water column. Only trained and qualified persons should attempt to attach the home's gas system to the site supply. The location of the gas inlet is labeled on the lowest row of siding.

8.5 ELECTRICAL SYSTEM HOOKUP AND TESTING.

8.5.1 ELECTRICAL SYSTEM TESTING. The electrical system was tested at the factory, however, it is essential that it be rechecked at the site for defects that may have been caused during transit. There are two sections of electrical tests that are to be performed. One section (**section 8.5.1.1** pre-connection tests) deals with electrical tests that are to be completed before the home's electrical system is connected to the site service. The other section (**section 8.5.1.2** post-connection tests) deals with tests that are to be performed after the home's

electrical service is connected to the site service. Make certain that the water heater is filled with water before activating the water heater circuit.

8.5.1.1 PRE-CONNECTION ELECTRICAL TESTING. There are two tests that **must** be completed before the home's electrical service is connected to the site service. They are the grounding continuity and circuit continuity tests. The dielectric strength (or hi-pot) test is not required, but can be done if the proper equipment and a trained technician are available.

8.5.1.1.1 GROUNDING CONTINUITY TEST. When conducting the ground continuity test follow these steps.

1. Before beginning the test make certain that all the appliances are installed and hooked up and all electrical fixtures have been properly installed.
2. Using a continuity tester, connect one test lead to the ground bus.
3. The other test lead (which must be long enough to reach all portions of the home) will be used to test all exposed non-current carrying metal parts. Which include, but is not limited to, the following.
    - **a.** Metal gas piping.
    - **b.** Light and fan fixture canopies (the metal parts that mount the fixture to the wall or ceiling).
    - **c.** The steel frame.
    - **d.** All metal appliances (appliances must be plugged-in).

    NOTE: Continuity to ground is not required on metal plumbing parts that are connected to a plastic piped water distribution and/or drainage system. If, however, the fixture is connected to electric power it must be properly grounded.

4. If a defect is found during the test, the problem must be corrected and repaired, and the entire system rechecked.

8.5.1.1.2 CIRCUIT CONTINUITY TEST. The circuit continuity test is accomplished by placing all branch circuit breakers and switches in the "on" position. Using a continuity tester check for any indication of a connection between any of the supply conductors (including neutral) and the ground circuit.

8.5.1.1.3 DIELECTRIC STRENGTH (HI-POT) TEST. This test should only be conducted by qualified individuals. Follow the testing equipment's instructions and these steps. This test involves the use of high voltage electricity and careless or improper use can result in **serious injury or death.**

1. Check that the testing equipment cord is plugged into a 115 volt power source.
2. Turn the power switch "on". Touch the probes together to verify that the machine indicates a short.
3. Turn the voltage to zero.
4. Apply the **ground** lead of the hi-pot to **ground** terminal of the panel box.
5. Attach the **high voltage** terminal of the hi-pot to one of the **hot** terminals of the panel box.
6. Set the hi-pot voltage to 1,080 volts, hold for one second. **OR**
7. Set the hi-pot voltage to 900 volts, hold for one minute.
8. Remove the **high voltage** lead from the **hot** terminal and attach it to the **neutral** terminal of the panel box.
9. Repeat steps **6 or 7.**
10. Remove the **high voltage** lead from the **neutral** terminal and attach it to the **other hot** terminal on the panel box.

11. Repeat steps **6 or 7.**
12. If the testing equipment indicates a problem, it must be corrected and then the entire system rechecked.

8.5.1.2 POST-CONNECTION TESTING. Complete the procedures in **section 8.5.2** before conducting any of these tests. After the home has been connected to the site power supply, the following tests must be completed. Make sure that the water heater is filled before it is energized.

8.5.1.2.1 POLARITY TEST. After the power system has been energized, turn on all the breakers and switches to lights and/or receptacles. Using a circuit testing device capable of detecting and identifying wiring problems, test **every** light socket and receptacle. If the testing equipment indicates a problem, it must be corrected and then the entire system rechecked.

8.5.1.2.2 OPERATIONAL TEST. After the power system has been energized, turn on all the breakers (and switches to receptacles). Make sure that the water heater is filled before it is energized. Install light bulbs/tubes in all light fixtures (do **not** switch the lights on while installing the bulbs/tubes). Make certain that each fixture is operational by switching it on. Check the operation of all motorized appliances (furnace blower, bathroom vents, garbage disposal, etc.). Check the operation of all ,smoke detectors. Check the operation of all G.F.I. receptacles by manually tripping the test buttons.

8.5.2 ELECTRICAL HOOK-UP. The tests in section **8.5.1.1 & 8.5.1.2** must be completed before connecting the home to site power. Use the information in these sections to complete the connection of the home's electrical distribution system to the site supply.

8.5.2.1 ELECTRICAL FEEDER AND EQUIPMENT SIZES. ***FOUR SEASONS, INC.*** does not install weatherhead masts and/or meterbases. We do condone the instalation of such equipment to our homes provided the equipment is installed in accordance with all applicable requirements of the *National Electric Code.* To determine the proper feeder size amperage, see the main breaker and the label on the electrical distribution panel. Using this information, determine the required feeder size from **table 8.5.2.1**. Feeder sizes are in accordance with the *National Electric Code*, table 310-16, and do not take voltage drop into consideration. Allowable ampacities are based on an ambient temperature of 30 degrees C. (86 degrees F.).

ELECTRICAL FEEDER AND EQUIPMENT SIZES							
FEEDER SIZE (AMPS)	MAXIMUM NEUTRAL FEEDER LOAD (AMPS)	MINIMUM EQUIPMENT SIZES		FEEDER WIRE SIZES (AWG) BASED UPON USE OF 75 DEGREE C. COPPER CONDUCTORS			GROUNDING ELECTRODE CONDUCTORS
		CONDUIT (INCHES)	JUNCTION BOX (INCHES)	POWER (RED OR BLACK)	NEUTRAL (WHITE)	GROUND (BARE OR GREEN)	(BARE OR GREEN)
100	100	1-1/2"	10x12x4	#3 THW	#3 THW	#8	#8
150	115	2"	12x16x6	#1/0 THW	#1/0 THW	#6	#6
200	130	2"	12x16x6	#3/0 THW	#3/0 THW	#4	#4

TABLE 8.5.2.1
ELECTRICAL FEEDER AND EQUIPMENT SIZES CHART

8.5.2.2 GROUNDING THE HOME. The grounding bar in the main electrical distribution panel box must be grounded by qualified personnel in accordance with applicable sections of the *National Electrical Code* as well as any applicable requirements imposed by local authorities.

8.5.2.3 MAST WEATHERHEAD FEEDER. The installation of the service drop must meet local codes. ***FOUR SEASONS, INC.*** designs the electrical distribution panel to accept any type of feeder connection. Install according to *NEC* articles **230-24 and 230-26.** See **figures 8.5.2.3(a), (b), and 8.5.2.4** for installation details.

8.5.2.4 UNDER-FLOOR FEEDER. The installation of the service drop must meet local codes. ***FOUR SEASONS, INC.*** designs the electrical distribution panel to accept any type of feeder connection. Install according to *NEC* articles **230-24 and 230-26.** See **figure 8.5.2.4** for installation details.

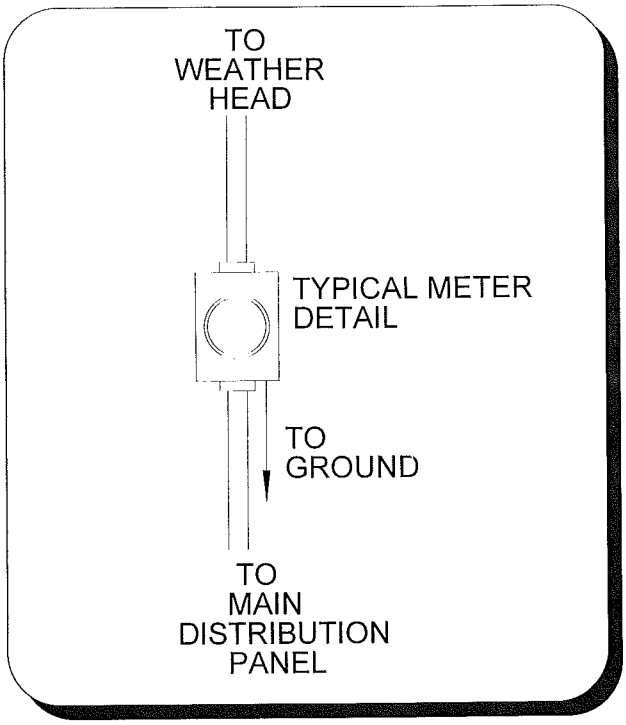


FIGURE 8.5.2.3 (a)
TYPICAL METER DETAIL

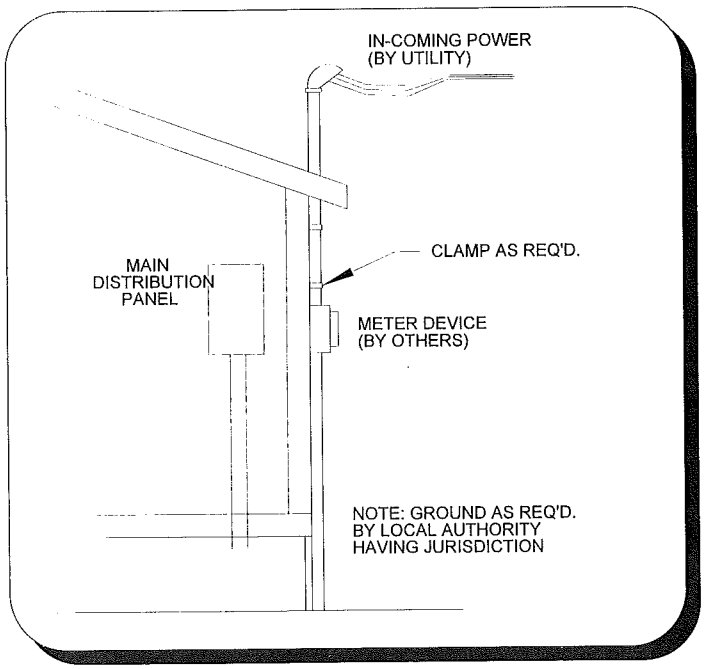


FIGURE 8.5.2.3 (b)
WEATHERHEAD INSTALLATION

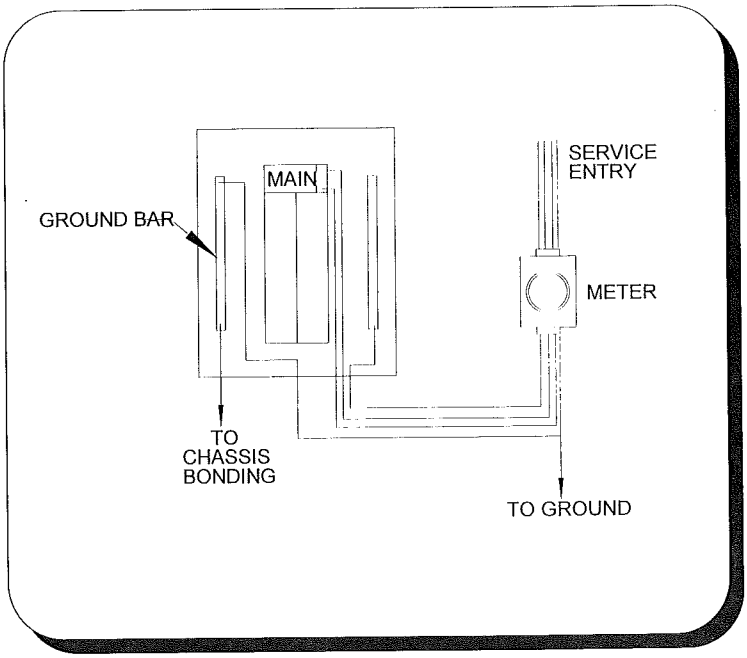


FIGURE 8.5.2.4
MAIN DISTRIBUTION PANEL HOOKUP

SECTION 9 MISCELLANEOUS

9.1 BOTTOM BOARD PATCHING. The bottom of your home has been covered with a vinyl-coated plastic material. It is important that any tears or holes in this covering be repaired. To repair rips, tears, and small holes can be repaired using a special bottom board tape. ***FOUR SEASONS, INC.*** recommends **CS-12** from Sheperd Products of Kalamazoo, Michigan or **#620** from First Line Corporation in Valdosta, Georgia. Large holes must be repaired with a patch. The patch should first be affixed with one of the types of tape listed above. Then secure with 1" x 5/8" x 16 gauge staples at 3" intervals.

SECTION 10
ANCHOR INSTALLATION INSTRUCTIONS

PAGES 50-61

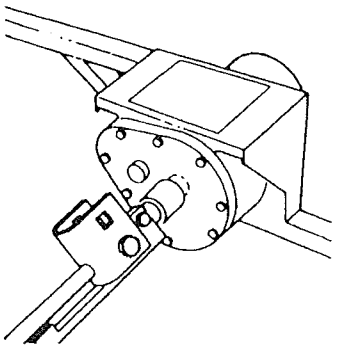
Minute Maranchors®

INSTALLATION

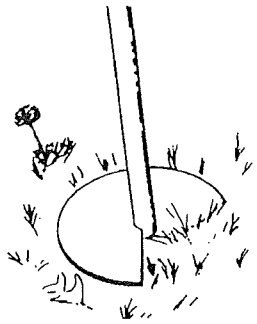
There are two basic methods of installing anchors, each equally effective in properly securing mobile homes to the ground.

MACHINE INSTALLATION

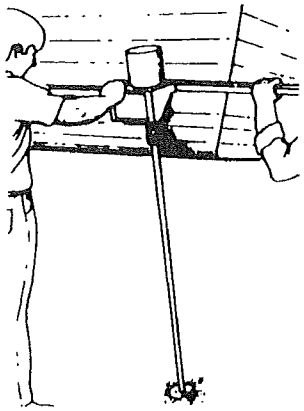
In this method, the anchor is turned four feet (or to full depth) into the ground by an anchor drive machine.



1. Attach anchor to machine.



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

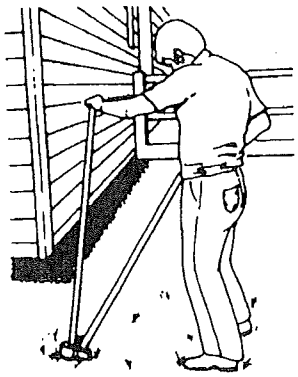


3. Anchor should be installed at a slight angle as shown to assure head being positioned behind future skirting.

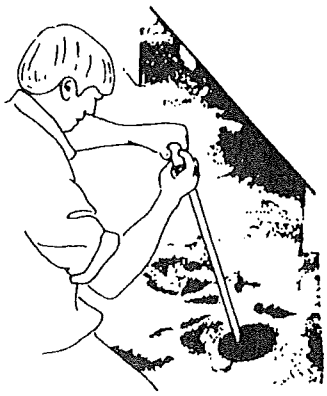
CAUTION: The installation of anchors with a drive machine is a two person operation.

INSTALLATION WITH MANUAL OR MECHANICAL POST HOLE DIGGER

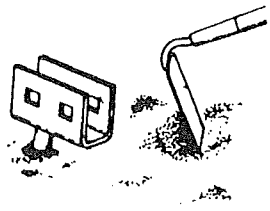
In this method, anchors can be installed with equipment available to the average homeowner.



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



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

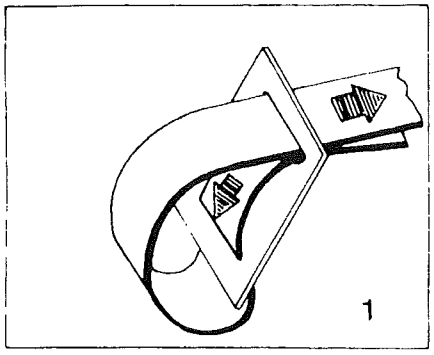


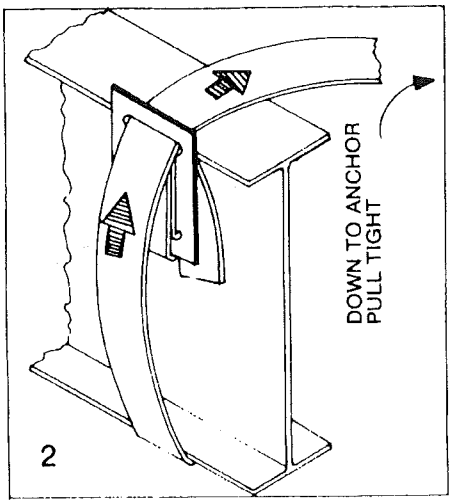
3. After anchor is installed to **full depth** earth is repacked, six inches at a time

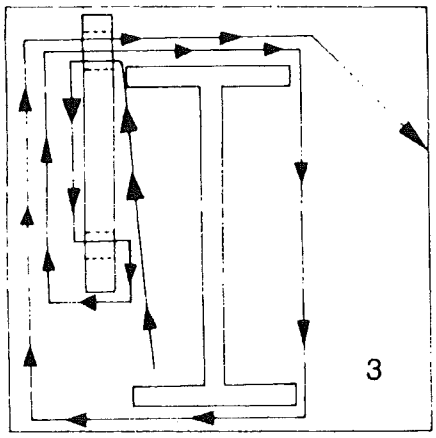
WARNING: Be careful to avoid underground water lines, phone lines and power lines using either method.

POSITIONING FRAME TIE

FRAME TIE INSTALLATION INSTRUCTIONS

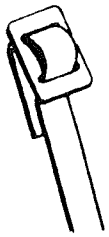






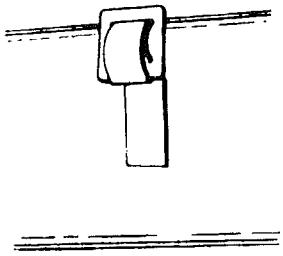
1. Thread 7' length of frame tie strap through buckle as shown.
2. Next, thread long end of strap between frame and floor of home. Bring strap through buckle as shown in diagram and fasten to anchor head.
3. Diagram showing strap in position around frame and through buckle. It is important to remove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

1. See step one in installation instructions.

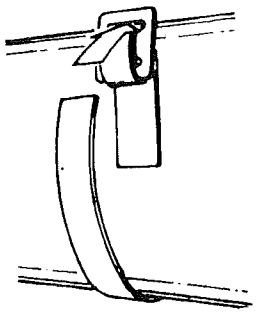


2. Insert strap in position through buckle.

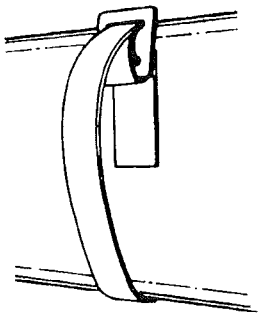
3. Strap should be through buckle in this configuration before installation on frame.



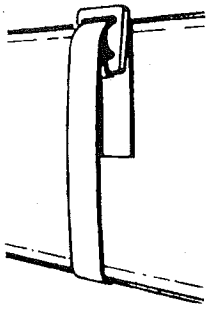
4. Strap should be passed over frame from inside, and buckle pulled into position as shown.



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



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

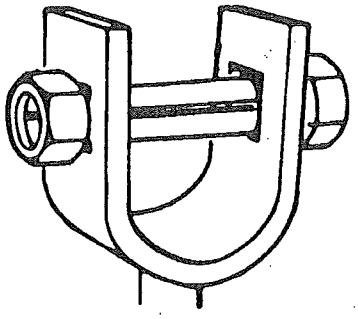


7. Inside of frame tie, properly installed.

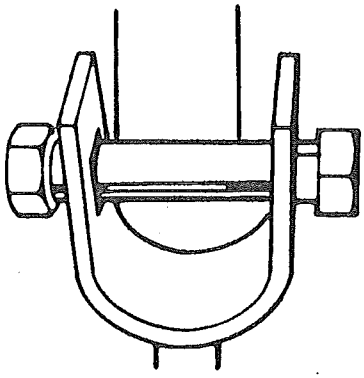
PROPER TENSIONING OF STRAP TO ANCHOR HEAD

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

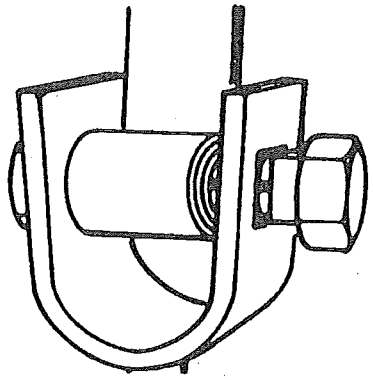
Notice: In areas of severe cold weather where possible damage could occur from frost heave, the homeowner should release some of the tension from the vertical tie. each fall.



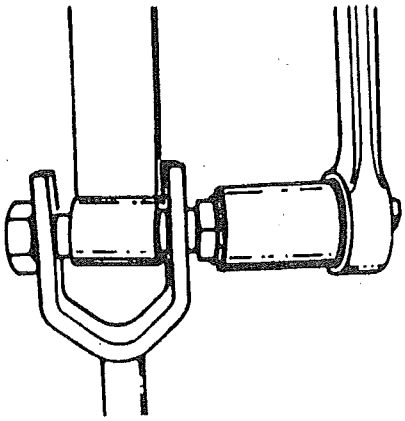
1. Insert bolt into head; attach nut loosely.



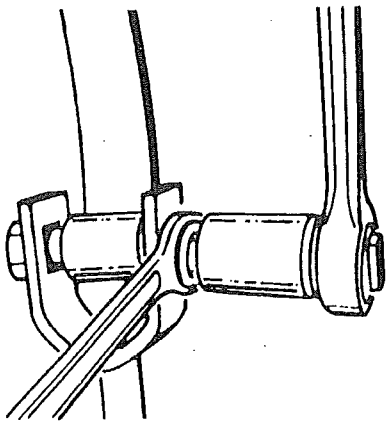
2. Insert strap in slot of bolt 5/8", or until strap is flush with far side of bolt.



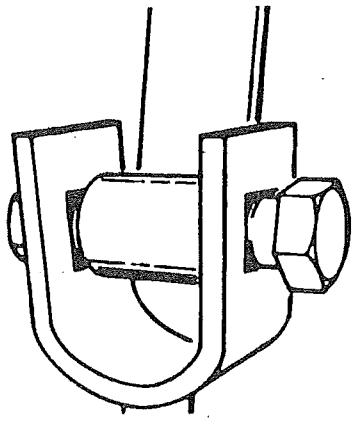
3. Bend strap 90° and take at least four complete turns on bolt until strap is taut.



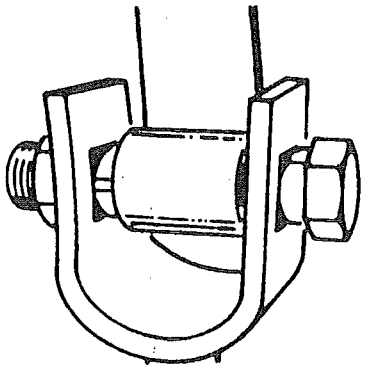
4. Bolt is turned with 15/16" socket wrench, or adjustable wrench, on hex head.



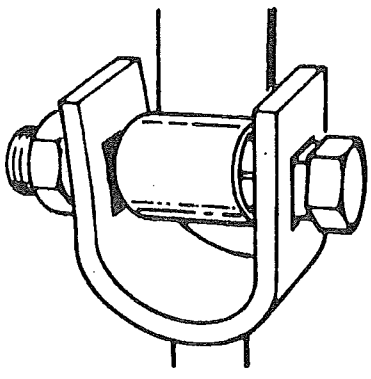
5. To hold bolt under tension while re-positioning wrench, an open-end wrench is placed on 5/8" square shoulders of bolt.



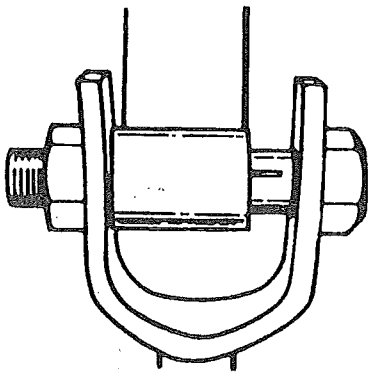
6. Align square shoulders of bolt with square hole in anchor head.



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.

PROPERLY INSTALLED AND CONNECTED GROUND ANCHOR AND FRAME CONNECTION

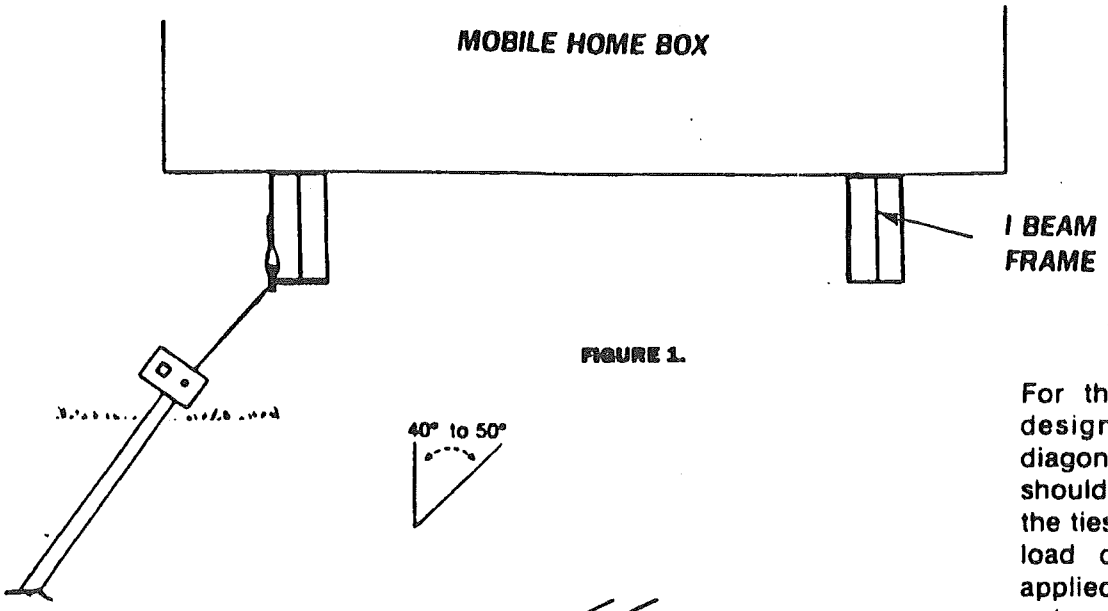


FIGURE 1.

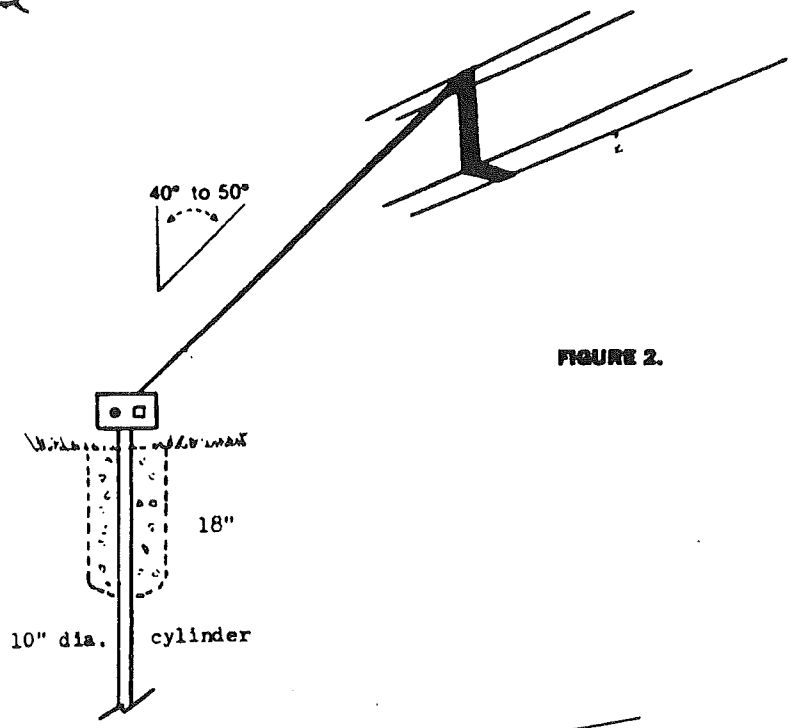


FIGURE 2.

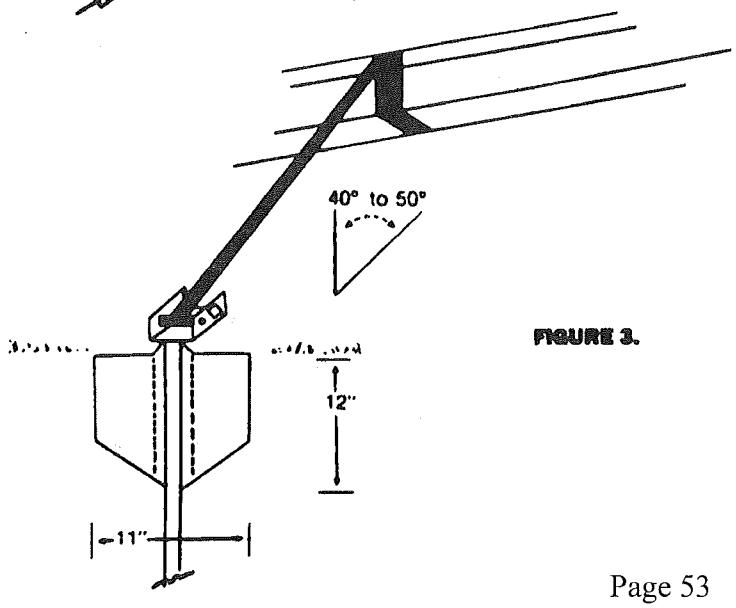


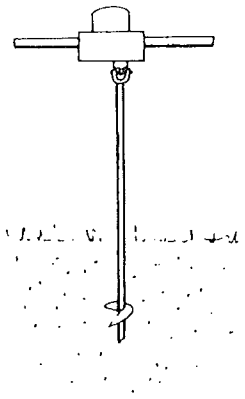
FIGURE 3.

For those homes which are designed to require only diagonal frame ties, the anchor should 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 should be investigated. One method of restricting lateral deflection is shown in (FIGURE 2.) This is from the Department of Defense, Defense Civil Preparedness Agency publication TR-75. "Protecting Mobile Homes From High Winds". To minimize the deflection or slicing through the soil by the anchor rod at ground level when frame ties are connected to provide a diagonal tension it is recommended that a concrete cylindrical "collar" (approximately 10" in diameter and 18" deep) be poured around the anchor shaft. Another accepted way to limit lateral deflection is by use of a tested and approved "Metal Stabilizing Device" (Figure 3). This plate is driven in front of the anchor's direction of pull and will act to minimize rod deflection.

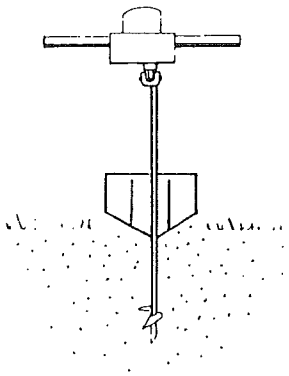
MINUTE MAN ANCHORS, INC.

INSTRUCTIONS FOR USING MINUTE MAN STABILIZING DEVICE

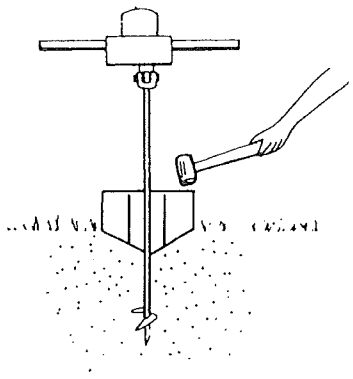
Minute Man stabilizing devices are designed for use with Minute Man anchors and intended to restrict movement of the anchor laterally through the soil.



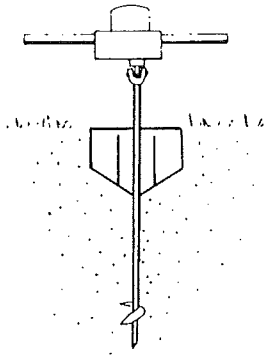
1. Install the anchor into the ground leaving 12"-18" of the shaft exposed.



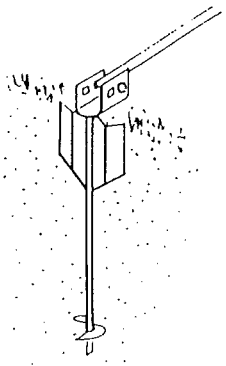
2. Place the stabilizing device next to the shaft in the direction of pull.



3. Drive the stabilizing device into the ground.

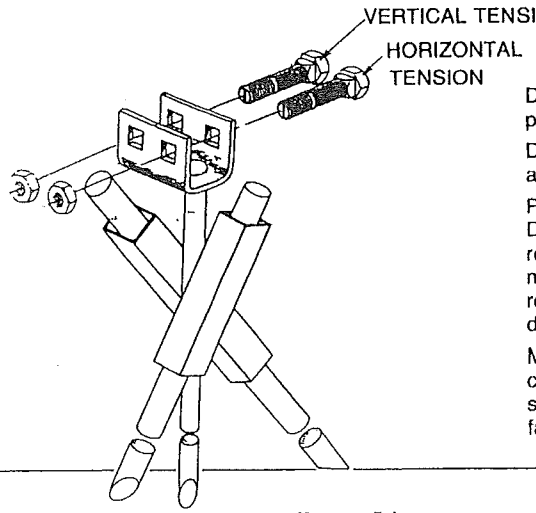


4. The anchor is then turned in the rest of the way into the soil until the head of the anchor is flush with the stabilizing device.



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



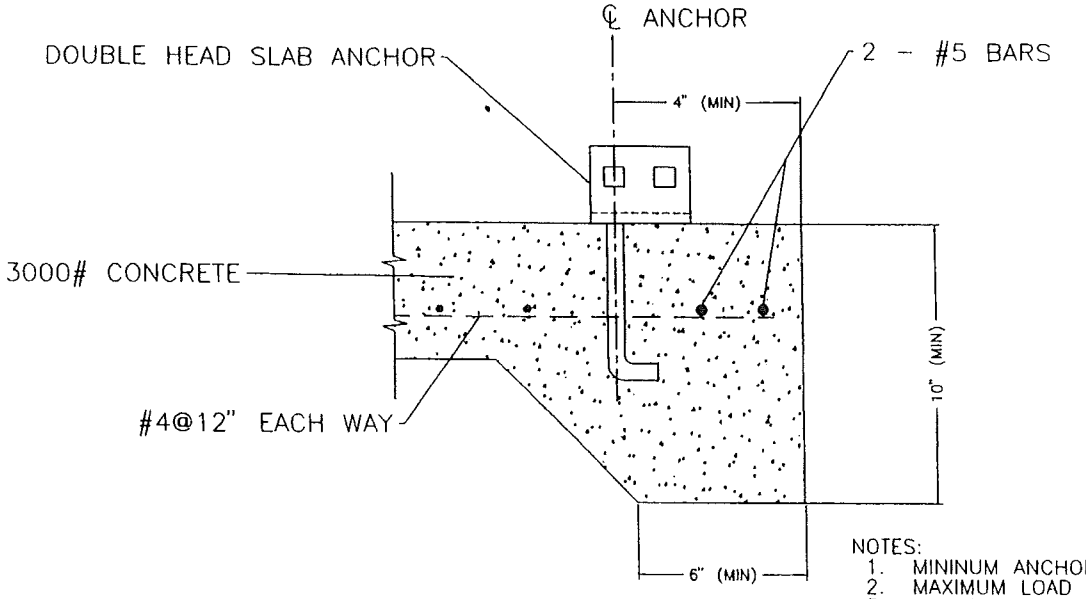
INSTALLATION INSTRUCTIONS

Drill 5/8" diameter hole 5½" 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.

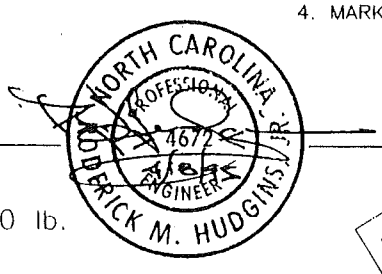
Maximum pullout resistance is developed when anchor head is low as possible and ground surface is solid rock. Distance from square tubing to rock surface should not exceed 1".



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

TITLE: DOUBLE HEAD SLAB ANCHOR

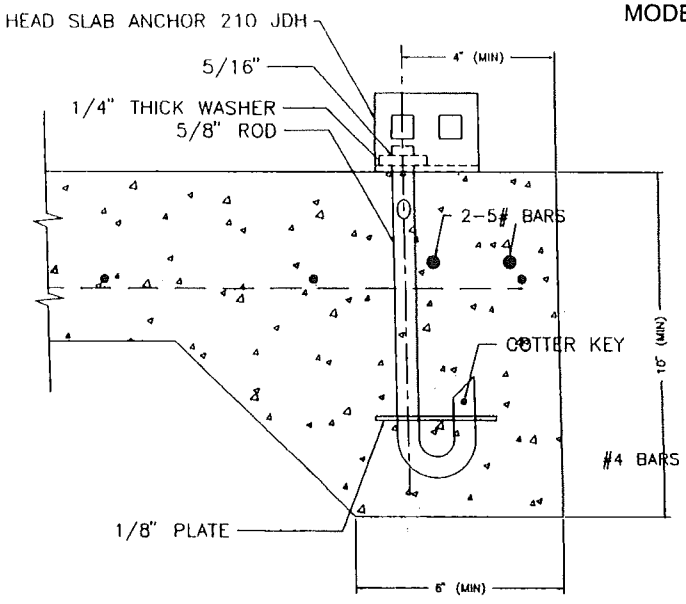
MODEL: 210 - PDH



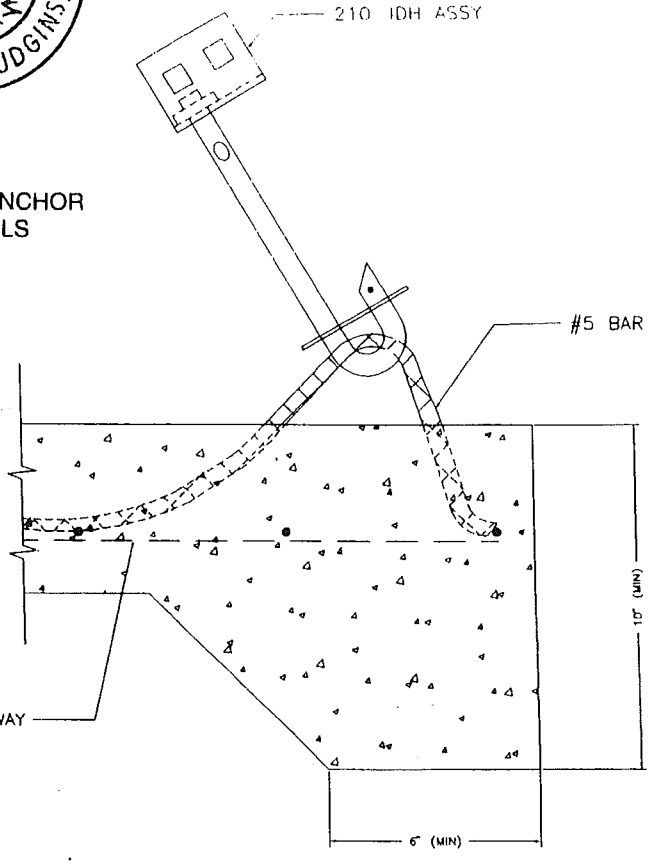
NOTE!
1. MININUM ANCHOR EMBEDMENT = 6"
2. MAXIMUM LOAD PER ANCHOR = 4750 lb.
3. MINIMUM SLAB PER ANCHOR:
   4" SLAB = 95 S.F.
   6" SLAB = 65 S.F.
   8" SLAB = 48 S.F.
4. MARK: MMA 42

TITLE: DBL. HEAD SLAB ANCHOR INSTALLATION DETAILS

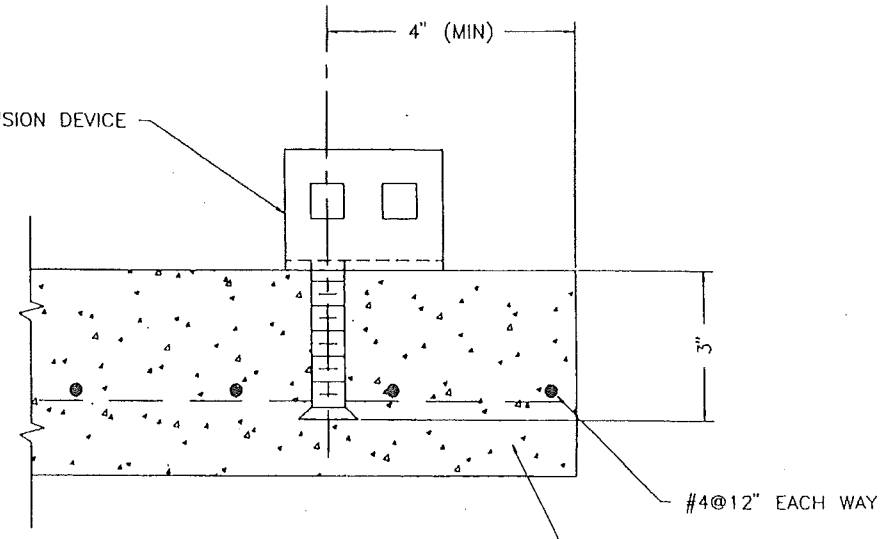
MODEL: 210 JDH



ALT.#1 - ANCHOR PLACED IN FRESH CONCRETE



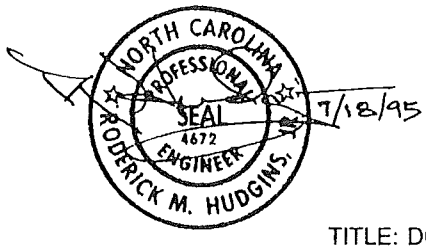
ALT.#2 - ANCHOR HOOKED TO REBAR LOOP



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

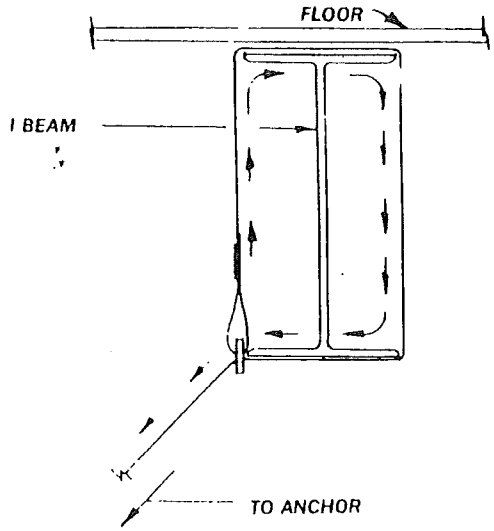
INSTALLATION NOTE

1. DRILL 21/32" 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



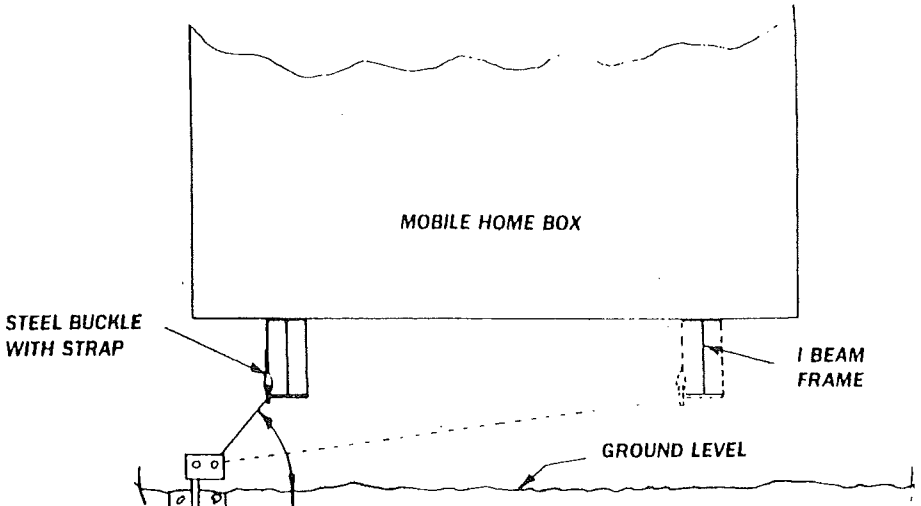
TITLE: DOUBLE HEAD TENSION DEVICE

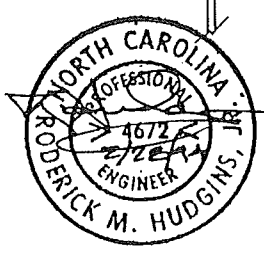
MODEL: THDHLS



ENLARGED VIEW OF FRAME BEAM

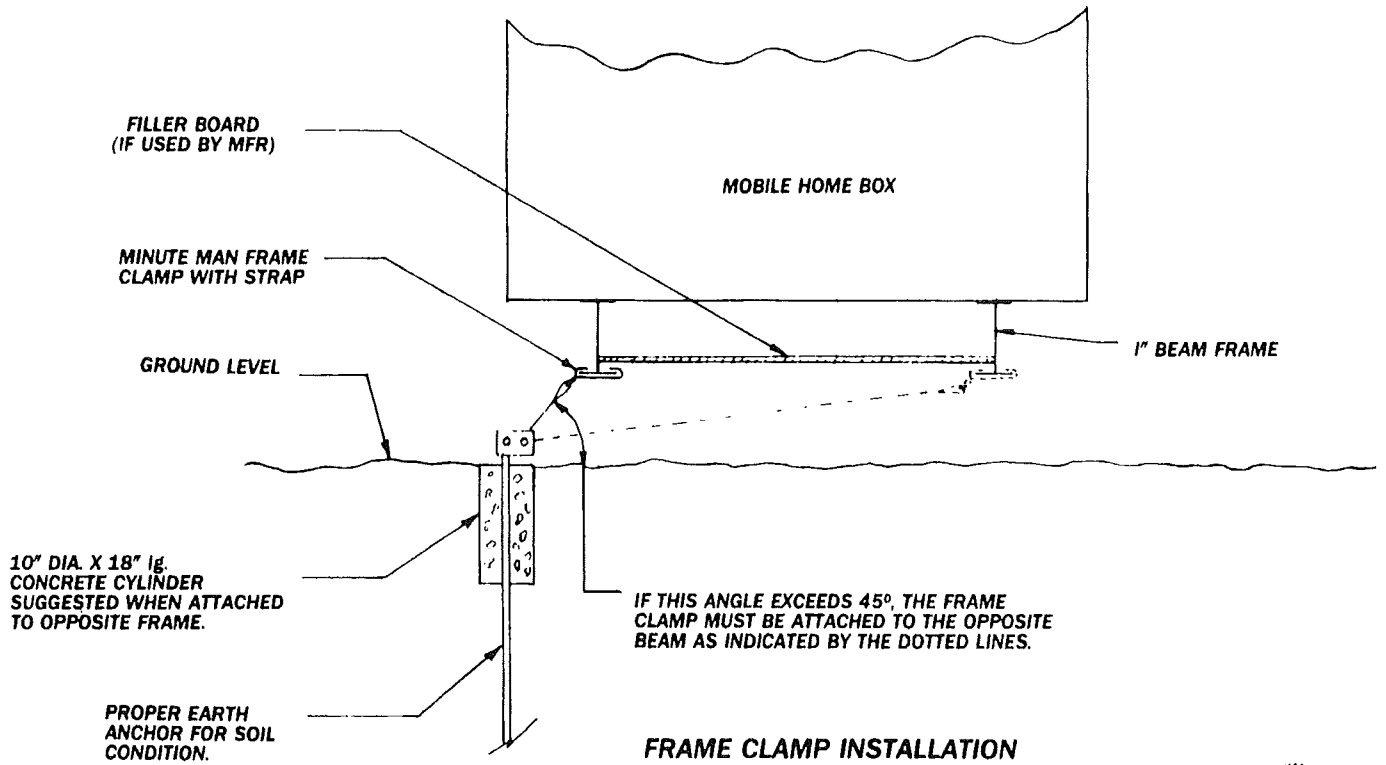
PUSH STRAP END BETWEEN FRAME "I" BEAM AND FLOOR. LEAVE BUCKLE AT LOWER END OF BEAM. THREAD END OF STRAP BACK THRU BUCKLE AS SHOWN. PULL STRAP TAKING CARE TO KEEP BUCKLE IN POSITION. ATTACH STRAP END TO ANCHOR TENSION HEAD.





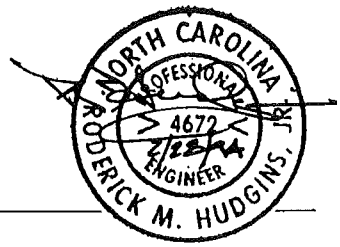
STEEL BUCKLE WITH STRAP INSTALLATION

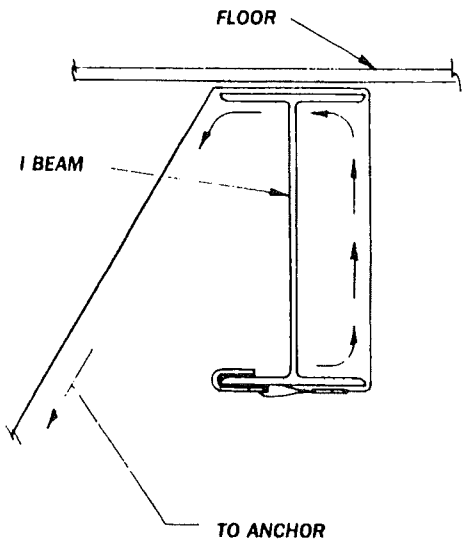
MODEL BUC. W/S



FRAME CLAMP INSTALLATION

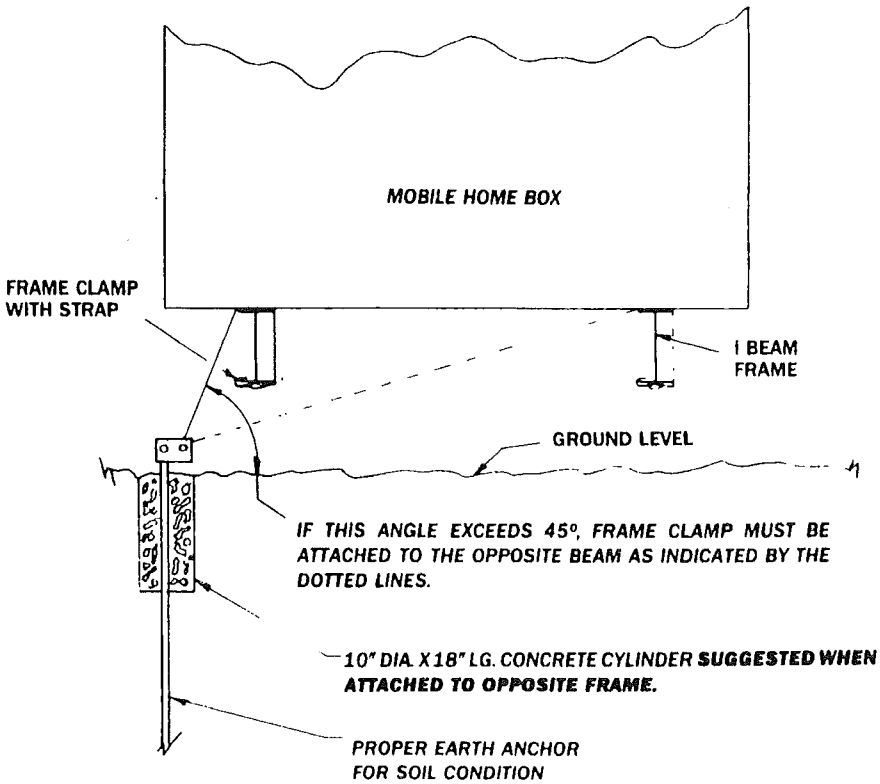
MODEL FCW/S





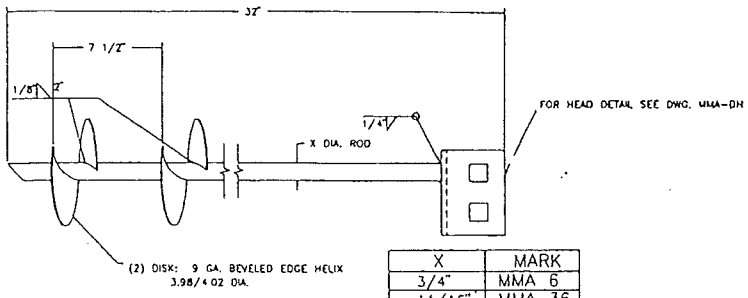
ENLARGED VIEW OF FRAME BEAM

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



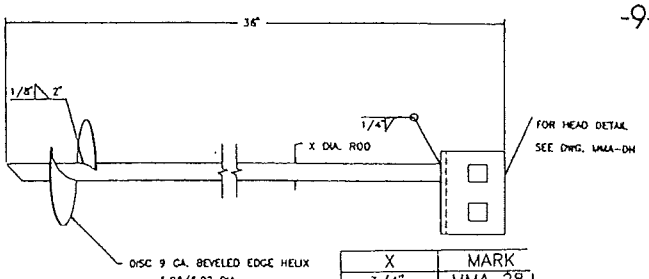
FRAME CLAMP WITH STRAP INSTALLATION

MODEL FCIIW/S



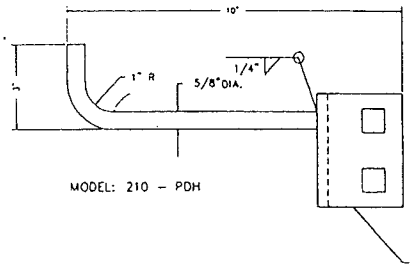
X	MARK
3/4"	MMA 6
11/16"	MMA 36
5/8"	MMA 30

MODEL: 4430 - DH



X	MARK
3/4"	MMA 28
5/8"	MMA 40

MODEL: 636 - DH



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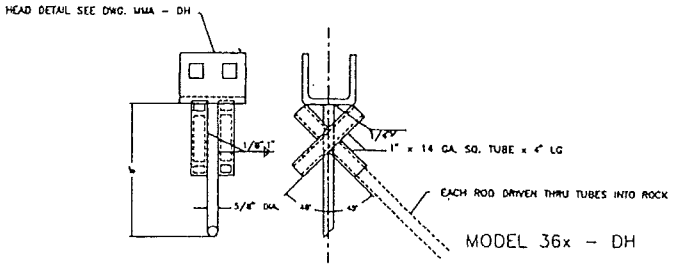
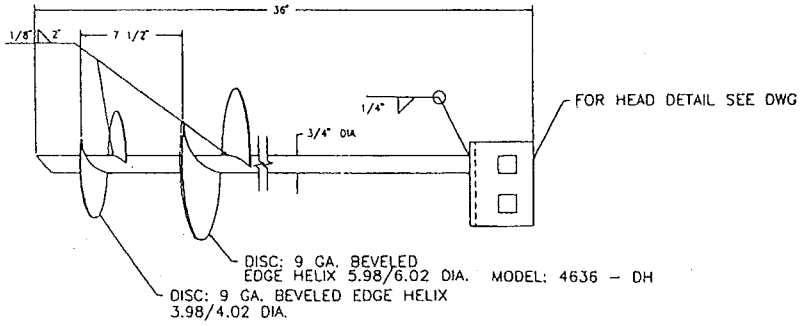
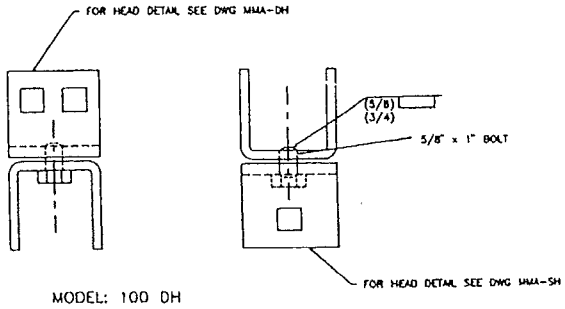


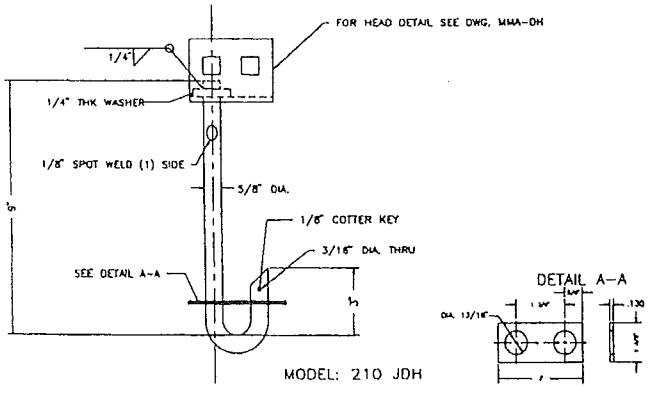
MODEL 36x - DH



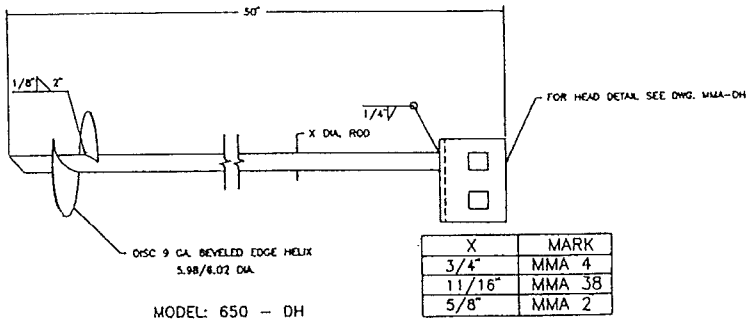
MODEL: 4636 - DH



MODEL: 100 DH

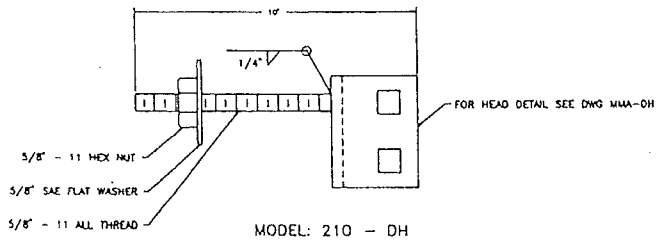


MODEL: 210 JDH

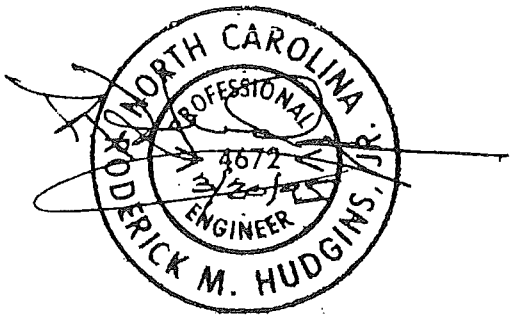


X	MARK
3/4"	MMA 4
11/16"	MMA 38
5/8"	MMA 2

MODEL: 650 - DH



MODEL: 210 - DH



Minute Maranchors®

R.M. Hudgins, Jr., P.E.
P.O. Box 5070
Asheville, N.C. 28813
704-274-9244

August 3, 1994

Mr. Tom Hackney
Minute Man Anchors, Inc.
305 West King Street
East Flat Rock, N.C. 28726

Dear Mr. Hackney:

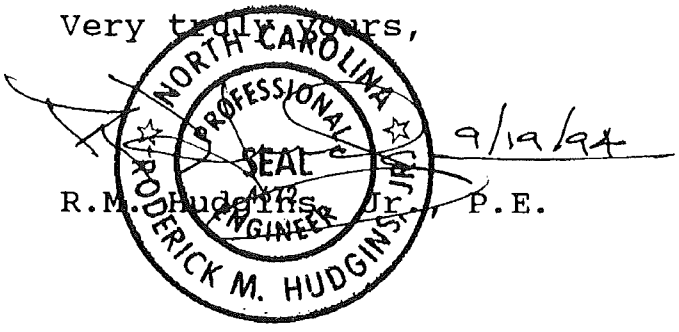
I have analyzed design drawings,physical testing reports, and installation instructions for the Minute Man products listed below:

650-DH 5/8	4636-DH 3/4	36X-DH	THDH
650-DH 3/4	4430-DH 5/8	48X-DH	THDHLS
650-DH 11/16	4430-DH 11/16	36-DH	FCI W/S
636-DH 5/8	4430-DH 3/4	210-DH	FCII W/S
636-DH 3/4	4450-DH 5/8	210-PDH	BUC W/S
672-DH 3/4	4450-DH 11/16	210-JDH	SBNB
860-DH 3/4	4450-DH 3/4	100-DH	MMASD2
			MMA STRAP

My analysis and the physical test reports define the breaking strength of each of these anchors and their components to be in excess of 5,000 pounds. The strapping meets Federal Specification QQ-S-781H for Type I, Class B, Grade 1 strapping. The strapping also meets with ANSI 225.1 standards and ASTM D 3953-91 standards. The strapping is 1 1/4 X .035 minimum, hot dip galvanized steel.

On file are testing reports of the direct withdrawal strength of these anchors. These tests evaluate the anchorage strength of Minute Man Anchors installed resisting an axial and 45 degree angle applied withdrawal load. For the anchors listed on the attached sheet, the average ultimate holding power is not less than 5,433 pounds when installed in accordance with manufacturer instructions in the soil types indicated in the "table".

Very truly yours,



9/19/94

R.M. Hudgins, Jr., P.E.

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

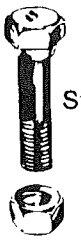
1. Sound Hard Rock.
2. Very-dense and/or cemented sands, coarse gravel and cobbles, preloaded silts, clays, and corals. (Probe torque value range-greater than 550 inch pounds).
3. Medium-dense coarse sands, sandy gravels, very-stiff silts and clays, (Probe torque value range- 350-550 inch pounds).
4. Loose to medium dense sands, firm to stiff clays and silts, alluvium fill. (probe torque value range- 200-349 inch pounds).

MARK	MODEL	DESCRIPTION	USE IN SOIL TYPE*
MMA-2	650-DH 5/8	Double Head, Earth Auger Anchor	2,3,4
MMA-4	650-DH 3/4	Double Head, Earth Auger Anchor	2,3,4
MMA-38	650-DH 11/16	Double Head, Earth Auger Anchor	2,3,4
MMA-40	636-DH 5/8	Double Head, Earth Auger Anchor	2,3,4
MMA-28	636-DH 3/4	Double Head, Earth Auger Anchor	2,3,4
MMA-30	4430-DH 5/8	Double Head, Double Disk, Earth Auger Anchor	2
MMA-36	4430-DH 11/16	Double Head, Double Disk, Earth Auger Anchor	2
MMA-6	4430-DH 3/4	Double Head, Double Disk, Earth Auger Anchor	2
MMA-52	4636-DH 3/4	Double Head, Double Disk, Earth Auger Anchor	2,3,4
MMA-53	4450-DH 5/8	Double Head, Double Disk, Earth Auger Anchor	2,3
MMA-54	4450-DH 11/16	Double Head, Double Disk, Earth Auger Anchor	2,3
MMA-55	4450-DH 3/4	Double Head, Double Disk, Earth Auger Anchor	2,3
MMA-35	36-XDH	36" Double Head Cross Drive Anchor	1
MMA-8	48-XDH	48" Double Head Cross Drive Anchor	1
MMA-18	THDH	Double Tension Head	SLAB
MMA-18	THDHLS	Double Tension Head W/Lag & Shield	SLAB
MMA-10	36-DH	Double Head Coral Anchor	CORAL
MMA-12	210-DH	Double Head Threaded Concrete Anchor	SLAB
MMA-14	210-PDH	Double Head Anchor for Concrete	SLAB
MMA-42	210-JDH	Swivel Double Head Anchor W/base for Concrete	SLAB
MMA-22	100-DH	Double Head Tension Device Adaptor	CONNECT
MMA-SD2		Stabilizing Device	2,3,4

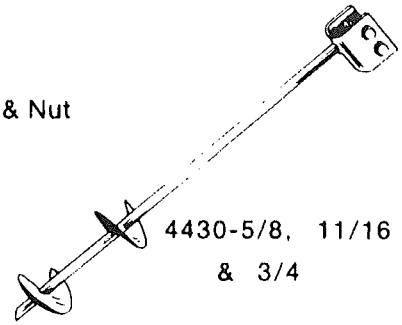
*NOTE: MANY ANCHORS ARE DESIGNED FOR PARTICULAR SOIL CONDITIONS AND ARE UNACCEPTABLE FOR USE IN OTHER TYPE SOILS. WE HAVE THEREFORE LISTED THE SOILS FOR WHICH EACH ANCHOR IS DESIGNED AND APPROVED. SOIL CLASSIFICATIONS ARE TAKEN FROM THE "STANDARD FOR THE INSTALLATION OF MOBILE HOMES".THE ANCHORS LISTED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

Minute Man® anchors

All anchors are "DH" type for use with either one or two tension bolts. Anchors are priced without tension bolt and nut—they must be ordered separately. Tension bolts and nuts will be packed separately from anchors.

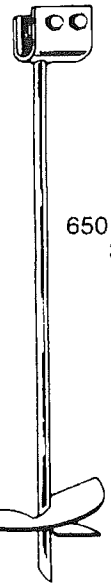


Strap Bolt & Nut

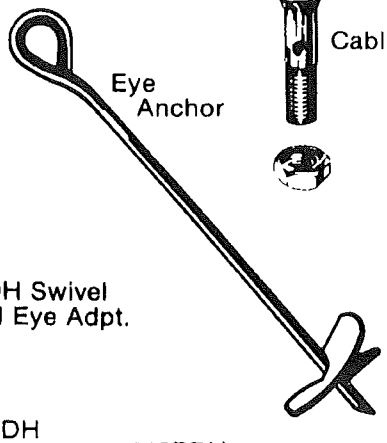


4430-5/8, 11/16 & 3/4

Cable Bolt & Nut

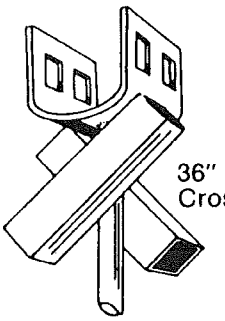


650 5/8, 11/16 & 3/4

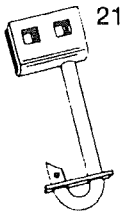


Eye Anchor

100DH Swivel Head Eye Adpt.



36" & 48" Cross Drive

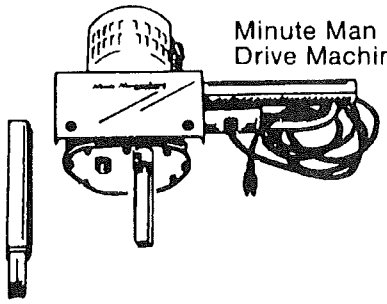


210JDH

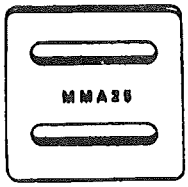
210PDH

210DH

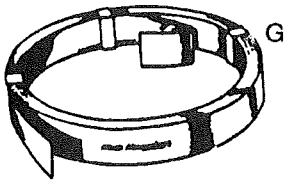
THDHLS



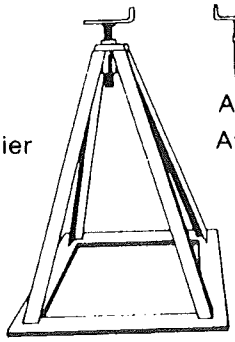
Minute Man Anchor Drive Machine



STRAP BUCKLE



Galvanized Strapping



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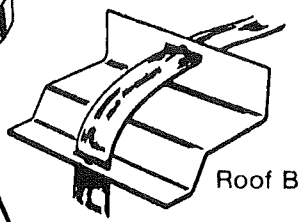
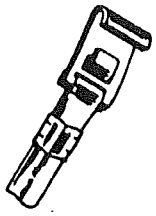
Also Available

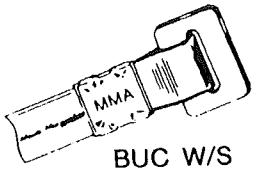


Roof Bracket

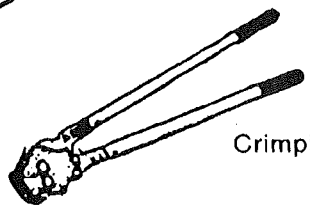


FC W/S

FC II W/S



BUC W/S



Crimping Tool

305 West King Street • East Flat Rock, North Carolina 28726 • Telephone 704/692-0256

Index

A

ABOUT THIS MANUAL, PAGE 1
ACCESS, PAGE 17, PAGE 25
ACCESS PANEL, PAGE 39
ACTIVE FRESH AIR VENTILATION SYSTEM, PAGE 39
ADD-ON HEAT PUMP, PAGE 42
ADDITIONAL PIERS, PAGE 6
ADJUSTABLE PIERS, PAGE 6
AIR CONDITIONING, PAGE 42
AIR INLET, PAGE 42
AIR INTAKE DUCTS, PAGE 42
AIR VENTILATION SYSTEM, PAGE 39
ALLOWABLE AMPACITIES, PAGE 46
AMMONIA, PAGE 44
ANCHOR BOLTS, PAGE 16
ANCHORING, PAGE 6
ANCHORING DEVICES, PAGE 7
ANCHORING INSTALLATION, PAGE 7, PAGE 49
ANCHORS, PAGE 7
APPLIANCES, PAGE 40
ATTACHED STRUCTURES, PAGE 39
AWNINGS, PAGE 39
AXLES, PAGE 40

B

BACK FILLING, PAGE 17, PAGE 26
BASEMENT, PAGE 4
BASEMENT READY, PAGE 4
BATHROOM EXHAUST VENT COVERS, PAGE 40
BEAM POCKETS, PAGE 17
BEAM TYPES, PAGE 16, PAGE 25
BEARING CAPACITY, PAGE 2
BLOCK, PAGE 16
BLOCKING, PAGE 35
BOTTOM BOARD PATCHING, PAGE 48
BRASS FITTINGS, PAGE 44
BREEZEWAY, PAGE 4

C

CABLE TELEVISION, PAGE 39
CARPET/LINOLEUM SEAM, PAGE 38
CARPORTS, PAGE 39
CEILING FANS, PAGE 40
CENTER-LINE BEAMS, PAGE 16
CENTRAL AIR CONDITIONING SYSTEM, PAGE 42
CHART 2.2.2, PAGE 3
CHIMNEY PIPE, PAGE 41
CHIMNEYS, PAGE 41
CIRCUIT CONTINUITY TEST, PAGE 45
CLOSING DETAILS, PAGE 37
CLOSURE FASTENING SCHEDULE, PAGE 38
CLOTHES DRYER, PAGE 40
CODES, PAGE 16
COMBUSTION AIR INLETS, PAGE 42
CONCRETE BLOCK, PAGE 6
CONCRETE BLOCK WALLS, PAGE 17, PAGE 25
CONCRETE BLOCKS, PAGE 6
CONDITIONING SYSTEM, PAGE 42
CRAWLSPACE, PAGE 16
CRAWLSPACE, PAGE 4
CROSS-BEAM, PAGE 16
CROSS-BEAM FOUNDATION, PAGE 4
CROSS-OVER CONNECTIONS, PAGE 38
CROSS-OVER LOCATIONS, PAGE 35
CULVERTS, PAGE 3

D

DAMP-PROOFING, PAGE 16, PAGE 25
DATA PLATE, PAGE 7, PAGE 42
DIELECTRIC STRENGTH, PAGE 45
DIELECTRIC STRENGTH (HI-POT) TEST, PAGE 45
DISTRIBUTION PANEL, PAGE 47
DITCHES, PAGE 3
DOUBLE WIDE CLOSING DETAILS, PAGE 37
DRAINAGE, PAGE 3, PAGE 16, PAGE 25
DRAINAGE STRUCTURES, PAGE 3
DRAINAGE SYSTEM HOOKUP, PAGE 43
DRAINAGE SYSTEM TESTING, PAGE 43
DRY-BLOCK PIERS, PAGE 6
DRYER, PAGE 40
DRYER VENT, PAGE 40

E

ELECTRIC CLOTHES DRYER, PAGE 40
ELECTRIC HEAT TAPE, PAGE 43
ELECTRICAL DISTRIBUTION PANEL, PAGE 47
ELECTRICAL FEEDER AND EQUIPMENT SIZES, PAGE 46
ELECTRICAL FEEDER AND EQUIPMENT SIZES CHART, PAGE 46
ELECTRICAL HOOK-UP, PAGE 46
ELECTRICAL SYSTEM TESTING, PAGE 44
ELECTRICAL TESTS, PAGE 44
EXCESSIVE LOADS, PAGE 6
EXHAUST, PAGE 39
EXHAUST VENT COVERS, PAGE 40
EXTERIOR FINISHING, PAGE 38
EXTERIOR LIGHT DETAIL, PAGE 40
EXTERIOR LIGHTS, PAGE 40

F

FANS, PAGE 40
FASTENING, PAGE 17, PAGE 26, PAGE 37
FIGURE 2.1.1 (B), PAGE 2
FIGURE 2.1.1 (C), PAGE 2
FIGURE 3.2.3, PAGE 5
FIGURE 8.5.2.3 (A), PAGE 47
FINAL ASSEMBLY, PAGE 40
FIRE SEPARATION, PAGE 39
FIRE WALL, PAGE 39
FIREPLACES, PAGE 41
FIREPLACES, PAGE 42
FLEXIBLE CROSS-OVER DUCT, PAGE 38
FLEXIBLE DRYER DUCT, PAGE 40
FLOOD LEVEL TEST, PAGE 43
FLOOR FEEDER, PAGE 47

Index

FLOOR LIVE LOAD, PAGE 6
FLOORS, PAGE 38
FOOTING SIZE, PAGE 5
FOOTINGS, PAGE 5, PAGE 16, PAGE 25
FOUNDATION PRINTS, PAGE 16, PAGE 25
FOUNDATIONS, PAGE 4
FRAME, PAGE 4
FRAME TIES, PAGE 7
FREEZING CONDITIONS, PAGE 43
FRESH AIR VENTILATION SYSTEM, PAGE 39
FROST HEAVE, PAGE 5
FROST PENETRATION MAP, PAGE 5
FUEL BURNING DEVICES, PAGE 41
FURNACE, PAGE 42
FURNITURE, PAGE 6

G

GAS CLOTHES DRYER, PAGE 40
GAS INLET, PAGE 44
GAS INLET ORIFICES, PAGE 44
GAS PIPING SYSTEM, PAGE 44
GAS SYSTEM HOOKUP, PAGE 44
GAS SYSTEM TESTING, PAGE 44
GLASS GLOBES, PAGE 40
GRADING, PAGE 3
GROUND ANCHORS, PAGE 7
GROUND MOISTURE, PAGE 3
GROUNDING CONTINUITY TEST, PAGE 45
GROUNDING THE HOME, PAGE 47

H

HARDWOOD SHIMS, PAGE 36
HEAT PUMP, PAGE 42
HEAT TAPE, PAGE 43
HEAVY FURNITURE, PAGE 6
HI-POT, PAGE 45
HITCH, PAGE 40
HITCH, WHEEL, AND SUSPENSION REMOVAL, PAGE 40
HOLLOW BLOCK, PAGE 16
HUD,

I

I-BEAM SPLICES, PAGE 16
INTERIOR DOORS, PAGE 39
INTERIOR FINISHING, PAGE 38
INTRODUCTION, PAGE 1

J

JACK POSTS, PAGE 25
JACKING PROCEDURE, PAGE 35
JACKS, PAGE 35

K

KNEE-WALL, PAGE 5

L

L.P. GAS, PAGE 42
LAGS, PAGE 38
LEAKS, PAGE 42, PAGE 44
LEVELING, PAGE 35
LEVELING PROCEDURE, PAGE 36
LIGHTS, PAGE 40
LIQUEFIED PETROLEUM, PAGE 44
LONGITUDINAL CHASSIS BEAM, PAGE 16

M

MAIN I-BEAM, PAGE 16
MAST WEATHERHEAD FEEDER, PAGE 47
MATE-LINE BEAM, PAGE 4
MAXIMUM PIER HEIGHT, PAGE 6
MAXIMUM PIER SPACING, PAGE 6
MISCELLANEOUS ITEMS, PAGE 40
MOISTURE VAPOR BARRIER, PAGE 4
MUD SILL, PAGE 17, PAGE 26

N

NATURAL GAS, PAGE 44
NATURAL GAS, PAGE 42

O

ON-SITE ATTACHED STRUCTURES, PAGE 39
OPERATIONAL TEST, PAGE 46
OPTIONAL FEATURES, PAGE 39
ORIFICE, PAGE 42
OUT-RIGGERS, PAGE 4

P

PATCHING, PAGE 48
PERIMETER SUPPORT, PAGE 6
PERMANENT FOUNDATION, PAGE 36
PERMANENT FOUNDATION, PAGE 4
PERMITS, PAGE 2
PH FLOOR PLAN, PAGE 4
PH FRAME SYSTEM FOUNDATIONS, PAGE 25
PIER CAPACITY, PAGE 5
PIER FOUNDATION, PAGE 35
PIER HEIGHT, PAGE 6
PIER LAYOUT, PAGE 6
PIER LOAD-BEARING CAPACITY, PAGE 6
PIER SELECTION, PAGE 6
PIER SET, PAGE 35
PIER SET FOUNDATION, PAGE 4
PIER SPACING, PAGE 6
PIERS, PAGE 6
PIERS (JACK POSTS), PAGE 16, PAGE 25
PILASTERS, PAGE 16, PAGE 25
PILASTERS, PAGE 16
PILOT LIGHTS, PAGE 44
PIPING SYSTEM TESTING, PAGE 44
PLUMBING SUPPORTS, PAGE 43
POLARITY TEST, PAGE 46
POST-CONNECTION TESTING, PAGE 46
POURED CONCRETE WALLS, PAGE 25
POURED CONCRETE WALLS, PAGE 16
PRE-CONNECTION ELECTRICAL TESTING, PAGE 45
PRE-INSTALLATION, PAGE 1
PRE-MANUFACTURED PIERS, PAGE 6
PREFACE,
PREPARATION OF

Index

DOUBLE-WIDE SECTIONS, PAGE 35
PROTECTION FROM FREEZING, PAGE 43, PAGE 44
PUTTY, PAGE 38

R

RAIN CAP, PAGE 41
REBAR, PAGE 16, PAGE 25
REINFORCING STEEL, PAGE 16
REMOVAL OF VEGETATION, PAGE 3
REQUESTING PRINTS, PAGE 16, PAGE 25
RIDGE, PAGE 38
RIDGE-BEAM COLUMN, PAGE 25
RIDGE CAP SHINGLES, PAGE 38
ROLLER SYSTEM, PAGE 36

S

SAFETY, PAGE 1
SERVICE DROP, PAGE 47
SET-UP PROCEDURES, PAGE 35
SETBACK DISTANCES, PAGE 2
SHIMS, PAGE 17, PAGE 25
SHIMS, PAGE 36
SHINGLES, PAGE 38
SHIPPING, PAGE 1
SHIPPING MATERIALS, PAGE 35
SILL PLATE, PAGE 4
SILL PLATE (MUD SILL), PAGE 17, PAGE 26
SITE, PAGE 1
SITE BUILT PIERS, PAGE 6
SITE DRAINAGE, PAGE 3
SITE LOCATION, PAGE 1
SITE PREPARATION, PAGE 1
SITE SLOPE, PAGE 3
SKIRTING, PAGE 39
SKIRTING, PAGE 4
SOIL BEARING CAPACITY, PAGE 5
SOIL BEARING CAPACITY CHART, PAGE 3
SOIL CAPACITY, PAGE 3
SOIL CONDITIONS, PAGE 2
SOIL EROSION, PAGE 3
SOIL REQUIREMENTS, PAGE 2
SOIL TYPE, PAGE 3
SPARK ARRESTOR, PAGE 41
SPLICE LOCATIONS, PAGE 25
SPLICES, PAGE 16
STAIR CLEARANCES, PAGE 39
STAIRS, PAGE 26
STAIRWELL SYSTEM, PAGE 4
STAIRWELLS, PAGE 39
STARTER STRIP, PAGE 38
STEEL ANCHORING EQUIPMENT, PAGE 7
STORM DRAINAGE, PAGE 3
STRAPS, PAGE 5
SUMP PUMP, PAGE 16
SUPPORT COLUMNS, PAGE 16, PAGE 25
SUSPENSION, PAGE 40

T

TABLE 4.2.5.1, PAGE 38
TABLE 8.5.2.1, PAGE 46
TELEPHONE, PAGE 39
TELEVISION, PAGE 39
TENSILE LOAD, PAGE 7
TIE-DOWN ANCHORS, PAGE 7
TIE-DOWN STRAPS, PAGE 7
TIEDOWN SPACING, PAGE 7
TOILET TANK LID, PAGE 40
TOTAL GAS SYSTEM TESTING, PAGE 44
TRANSIT, PAGE 36
TRANSPORTATION, PAGE 1
TRANSPORTING TO SITE, PAGE 35
TRANSVERSE BEAMS, PAGE 16
TRANSVERSE ROLLER BEAMS, PAGE 36
TREE BRANCHES, PAGE 3
TRIM, PAGE 38
TYPES OF FOOTINGS, PAGE 5
TYPES OF FOUNDATIONS, PAGE 4
TYPICAL METER DETAIL, PAGE 47
TYPICAL WATER LEVEL, PAGE 38

U

UNDER-FLOOR FEEDER, PAGE 47
UNHEATED IN A FREEZING CLIMATE, PAGE 43
UNIT COLUMN SUPPORT, PAGE 16, PAGE 25
USING A WATER LEVEL, PAGE 37
UTILITY HOOKUP AND TESTING, PAGE 42

V

VAPOR BARRIER, PAGE 4, PAGE 39
VEGETATION, PAGE 3
VENTILATION, PAGE 17, PAGE 25
VENTILATION, PAGE 39
VENTILATION SYSTEM, PAGE 39
VENTING, PAGE 39
VINYL SIDING, PAGE 38
VOLTAGE DROP, PAGE 46

W

WARRANTY, PAGE 4
WATER BEDS, PAGE 6
WATER HEATER, PAGE 42
WATER HEATER, PAGE 42
WATER INLET, PAGE 43
WATER LEVEL, PAGE 36
WATER SUPPLY HOOKUP, PAGE 43
WATER SUPPLY HOOKUP AND TESTING, PAGE 42
WATER SUPPLY SYSTEM, PAGE 42
WATER SUPPLY TESTING, PAGE 42
WEATHER CONDITIONS, PAGE 1
WEATHER CONSIDERATIONS, PAGE 5
WEATHER ZONE MAPS, PAGE 1
WEATHERHEAD FEEDER, PAGE 47
WHEEL, PAGE 40
WIND ZONE, PAGE 7
WIND ZONE MAP, PAGE 1
WINDOW AIR CONDITIONING UNITS, PAGE 42
WINDSTORM DAMAGE, PAGE 3
WOOD BUILDING MATERIALS, PAGE 6
WORKING LOAD, PAGE 7

Z

Index

ZERO LOT LINE HOMES, PAGE 39
ZINC-COATED STRAPPING, PAGE 7