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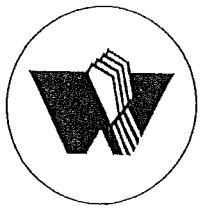
Wick
Building Systems, Inc.

Installation Manual

for Manufactured Homes
3rd Edition



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Installation Manual For Manufactured Homes 3rd Edition

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This *Manual* has been prepared to provide installers with instructions for installation of Wick manufactured homes assembled in accordance with requirements of the U.S. Department of Housing and Urban Development's Manufactured Homes Construction and Safety Standards ("HUD Code"). It applies to all Wick manufactured homes assembled and constructed after October 20, 2008. The instructions provided apply to single section units and multi-sectional homes designed for set on pier foundation systems or perimeter load-bearing wall foundations. It also covers Wick multi-section homes constructed with a Lindsay Unified Floor System® ("Lindsay Floor") which are designed for installation on basement foundations. This *Installation Manual* must stay with the home at all times in the event the home is sold to a new owner or moved to a new location.

NOTE: The terms "manufactured home" and "home" may be used interchangeably throughout this *Manual*. Whenever the terms "shall" or "should" appear, they are synonymous with "must" and indicate a requirement that must be followed.

How to Use This *Manual*

This *Manual* is divided into various sections. Each section pertains to a specific aspect of work involved in setting a Wick manufactured home, from preparing the site through the final inspection for occupancy. Tables and Figures referred to in each section are provided in the appendixes located at the end of the *Manual*. If you are the installer, you should review this *Manual* carefully before beginning the installation process. If there is anything that you do not understand, please contact Wick Building Systems, Inc. for assistance.

Compliance With Federal, State & Local Codes

These DAPIA-approved installation instructions provide protection to occupants of Wick manufactured homes that are consistent with and meet or exceed the Model Installation Standards (MIS) developed by the federal government through the U.S. Department of Housing and Urban Development's Manufactured Home Construction and Safety Standards Program. The installer must adhere to and comply with these instructions and with any additional "supplemental Instructions" that may be provided by Wick Building Systems, Inc.

In addition to compliance with these instructions, the home installer must also comply with any state installation programs, where they exist, including installer licensing requirements and installation inspection requirements. The installer should also check with the Local Authority Having Jurisdiction ("LAHJ") for local requirements that may also apply.

Moisture & Water Intrusion Control

The installer must use all construction means and methods necessary to minimize moisture buildup and water infiltration during and after installation of the home. Failure to install the home in accordance with this *Manual* or applicable industry standards could result in moisture or water intrusion problems. Such problems may cause the growth, release, discharge, dispersal, or presence of mold, mildew, spores and other forms of fungi or bacteria that, at certain levels, may cause deterioration of building materials, damage to property, or unhealthy living conditions for the home occupants.

CAUTION! When setting a home with a porch on a full slab you must create a water stop between the home and the porch to prevent water coming through the porch decking boards from running back under the home. This can be done with a concrete curb, concrete blocks cemented in place, or with a wall built of treated lumber with a water proof sealer between the lumber and the slab. The concrete under the porch must be sloped to allow water to run off.

Safety Consideration

Only licensed, trained crews should install the home. Installers shall adhere to OSHA safety regulations during the installation process. Installers should also take care to follow any and all safety instructions provided in this *Manual.*

Referenced Publications

Specifications, standards and codes of certain organizations are incorporated by reference. The referenced standards have the same force and effect as these instructions, except that whenever a referenced standard and these instructions are inconsistent, these instructions shall prevail. The abbreviations and addresses of organizations issuing referenced standards are listed below. Copies of the actual standard may be obtained directly from the organization noted or from the Office of Manufactured Housing Programs, Room 9164, U.S. Department of Housing and Urban Development, 451 Seventh Street SW, Washington, DC 20410; www.hud.gov; Tel. 800-927-2891.

- ACCA Publications. Air Conditioning Contractors of America, 2800 Shirlington Road, Suite 300, Arlington, VA, 22206; www.acca.org; Tel. 703-575-4477.
- ASHRAE Publications. American Society of Heating, Refrigeration and Air Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329-2305; www.ashrae.org; Tel. 800-527-4723.
- ASTM Publications. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; www.astm.org; Tel. 610-832-9500.
- AWPA Publications. American Wood Preservers' Association, PO Box 361784, Birmingham, AL 35236-1784; www.awpa.com; Tel. 205-733-4077.
- NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471; www.nfpa.org; Tel. 617-770-3000.
- SEI/ASCE Publications. Structural Engineering Institute/American Society of Civil Engineers, 1801 Alexander Bell Dr., Reston, VA 20191; www.asce.org; Tel. 800-548-2723.
- UL Publications. Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062; www.ul.org; Tel. 877-854-3577.
- U.S. Government publications.

This section provides definitions for some of the terms used throughout this *Manual*. The definitions are as follows:

Accessory Building or Structure. A building or structure that is an addition to or supplements the manufactured home. For example, awnings, garages, storage structures, carports, fences, windbreaks, stairs, steps, decks and porches are accessory buildings or structures.

Anchor Assembly. Any device or other means designed to transfer home anchoring loads to the ground.

Anchoring Equipment. Ties, straps and other approved components, including tensioning devices that are used to secure a manufactured home to anchor assemblies.

Anchoring System. A combination of anchoring equipment and anchor assemblies that when properly designed and installed will resist the uplift, overturning, and lateral forces on the manufactured home.

Approved. When used in connection with any material, appliance, or construction, means complying with the requirements of the Department of Housing and Urban Development.

Base Flood. The flood having a one percent chance of being equaled or exceeded in any given year.

Bonding. The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

Chassis. The entire transportation system comprising the following sub-systems: drawbar and coupling mechanism, frame, running gear assembly and lights.

Circuit Breaker. A device designed to open and close a circuit by non-conductive means, and to open the circuit automatically on a predetermined overload of current without injury to itself when properly applied within its rating.

Comfort Cooling Certificate. A certificate permanently affixed to an interior surface of the home specifying the factory design and preparations for air conditioning the manufactured home.

Crawl Space. The area between the bottom of the manufactured home and the ground surface usually enclosed with skirting, concrete blocks, poured concrete walls or other suitable means.

Crossovers. Interconnections in multi-section homes for utility systems that are located where the sections are joined. Crossover connections include heat ducting, electrical circuits, water pipes, drain plumbing and gas lines.

Design Approval Primary Inspection Agency (DAPIA). A state or private organization that has been accepted by the Secretary in accordance with the requirements of Part 3282, Subpart H of the Manufactured Home Construction and Safety Standards which evaluates and approves or disapproves manufactured home designs and quality control procedures.

Dead Load. See "Loads".

Diagonal Tie. A tie intended to primarily resist horizontal forces or shear, but which may resist vertical, uplift, and overturning forces.

Drainage System. All piping within or attached to the structure that conveys sewage or other liquid waste to the drain outlet, not including the drain connector.

Section 2- Definitions

Electrical Distribution Panel Board. A single panel or a group of panel units designed for assembly in the form of a single panel, including buses, and with or without switches or automatic over-current protective devices or both, for the control of light, heat or power circuits of small individual as well as aggregate capacity designed to be placed in a cabinet placed in or against a wall or partition and accessible only from the front.

Feeder Assembly. The overhead or under-chassis feeder conductors, including the grounding conductor, together with the necessary fittings and equipment designed for the purpose of delivering energy from the source of electrical supply to the distribution panel board within the manufactured home.

Flood Hazard Map. A map delineating the flood hazard area and adopted by a LAHJ.

Footing. That portion of the support system that transmits loads directly to the soil.

Foundation. Site-built or site-assembled system of stabilizing devices that is capable of transferring dead loads and lateral and vertical live loads as required by the Manufactured Home Procedural and Enforcement Regulations, and other design loads unique to local home sites that result from wind, seismic and water conditions, or that are imposed by or upon the structure, into the underlying soil without failure, placed at an adequate depth or otherwise adequately designed, to prevent frost damage in areas that are susceptible to frost and constructed of materials acceptable the LAHJ.

Frame. The fabricated rigid substructure which provides considerable support to the affixed manufactured home structure both during transport and on-site; and also provides a platform for securing the running gear assembly, and the drawbar and coupling mechanism.

Ground Anchor. A specific anchoring assembly device designed to transfer home anchoring loads to the ground.

Hurricane Resistive. A manufactured home which meets the wind design load requirements for Zone II in Section 3280. 305(c) (2) of the HUD code.

Installation Instructions. DAPIA approved instructions provided by the home manufacturer that accompany each new manufactured home and detail the home manufacturer requirements for support and anchoring systems, and other work completed at the installation site to comply with the Model Installation Standards in 24 CFR (Code of Federal Regulations) part 3285 and the Manufactured Home Construction and Safety Standards in 24 CFR part 3280.

Labeled. A label, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling is indicated compliance with nationally recognized standards or tests to determine suitable usage in a specified manner.

Listed or Certified. Included in a list published by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

Live Loads. See "Loads".

Loads. "Dead Load" means the weight of all permanent construction including walls, floors, roof, partitions and fixed service equipment. "Live Load" means the weight superimposed by the use and occupancy of the manufactured home, including wind load and snow load, but not including dead load. "Wind Load"means the lateral or vertical pressure or uplift on the manufactured home due to wind blowing in any direction.

Local Authority Having Jurisdiction (LAHJ). The state, city, county, city and county, municipality, utility or organization that has local responsibilities that must be complied with during the installation of a manufactured home and those local responsibilities are outside the coverage of the Manufactured Home Construction and Safety Standards (MHCSS) or the Model Installation Standards (MIS).

Main Frame. The structural component on which is mounted the body of the manufactured home.

Manufactured Home. A structure, transportable in one or more sections, which in the traveling mode, is 8 body feet or more in width or 40 body feet or more in length, or when erected on site, is 320 or more square feet, and which is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air conditioning, and electrical systems contained therein, but does not include any self-propelled recreational vehicle.

Manufactured Home Construction and Safety Standards (MHCSS). The Manufactured Home Construction and Safety Standards established in 24 CFR part 3280.

Manufactured Home Gas Supply Connector. A listed connector designed for connecting the manufactured home to the gas supply source.

Manufactured Home Site. A designated parcel of land designed for the installation of one manufactured home for the exclusive use of the occupants of the home.

Manufactured Home Stand. That area of a manufactured home site on which the manufactured home is placed.

Pier. That portion of the support system between the footing and the manufactured home exclusive of caps and shims. Types of piers include (1) manufactured steel stands, (2) pressure treated wood, (3) manufactured concrete stands, (4) concrete blocks, and (5) portions of foundation walls.

Pile. A column of pre-cast or cast-in-place concrete or wood driven or jutted into the ground to support superimposed loads.

Pile Footing. Concrete or wood piles driven into the ground and used to distribute the loads and support of the pier.

Registered Professional Engineer or Architect. A person licensed to practice engineering or architecture in a state and subject to all laws and limitations imposed by the state's Board of Engineering and Architecture Examiners and who is engaged in the professional practice of rendering service or creative work requiring education, training and experience in engineering sciences and the application of special knowledge of the mathematical, physical and engineering sciences in such professional or creative work as consultation, investigation, evaluation, planning or design and supervision of construction for the purpose of securing compliance with specifications and design for any such work.

Running Gear Assembly. The sub-system consisting of suspension springs, axles, bearings, wheels, hubs, tires, and brakes, with their related hardware.

Sheathing. A material which is applied on the exterior side of a building frame under the exterior weather resistant covering.

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

Skirting. A weather-resistant material used to enclose the perimeter, under the living areas of the home, from the bottom of the manufactured home to grade.

Stabilizing Devices. All components of the anchoring and support systems such as piers, footings, ties, anchoring equipment, anchoring assemblies, or any other equipment, material and methods of construction, that support and secure the manufactured home to the ground.

Support System. Pilings, columns, footings, piers, foundation walls, shims, and any combination thereof that, when properly installed, support the manufactured home.

Tie. A strap or other approved securing device used to connect the manufactured home to anchoring assemblies.

Utility Connection. The connection of the manufactured home to existing utilities that include but are not limited to electricity, water, sewer and gas or fuel oil.

Vertical Tie. A tie intended to primarily resist uplifting and overturning forces.

Wind Load. See "Loads."

Pre-Installation Considerations

Design Zone Maps

All Wick manufactured homes are designed for certain weather conditions including wind loads, roof loads, and outdoor design temperature criteria. The design criteria to which the home is manufactured is contained on a "Data Plate" attached to the door of the main electrical distribution panel board in the home. Maps indicating the design zones are provided at the end of this section. Manufactured homes must not be installed in a wind zone, roof load zone, or thermal zone that exceeds the design zones for which the home has been designed as indicated on the Data Plate. For example, a home designed for a northern roof load of 40 psf may be sited in the southern roof load zone. However, a home designed for a southern load of 20 psf may not be sited in the northern roof load zone. Some counties in some states may have more stringent requirements that must be followed. Zoning or development covenants may also apply and should also be taken into consideration. See Figure 3.1, *Roof Load Design Zone Map,* Figure 3.2, *Wind Load Design Zone Map,* and Figure 3.3, *Heating & Cooling Design Zone Map.*

See Figures 3.1, 3.2 and 3.3

Permits & Licensing

Before you start the installation process, all necessary permits must be obtained and all fees must be paid to the LAHJ. Inspections may be required in conjunction with such permits to help ensure the correct installation of the home with notification to the jurisdiction at different times during the installation process. Many states also require that utilities be connected by licensed technicians. Prior to alteration of the home installation, the LAHJ must be contacted to determine if plan approval and permits are required.

Installation in Flood Hazard Areas

Prior to installation of a new manufactured home, the installer is responsible to determine whether the manufactured home site lies wholly or partly within a special flood hazard area as shown on the LAHJ's Flood Insurance Rate Map, Flood Boundary and Floodway Map, or Flood Hazard Boundary map. Manufactured homes located wholly or partly within special flood hazard areas, flood fringe areas, or wetlands may only be installed if allowed by the LAHJ, and must be installed using methods and practices that minimize flood damage during the base flood in accordance with the LAHJ, 44 CFR (Code of Federal Regulations) 60.3(a) through (e) as applicable and other provisions of 44 CFR referenced by those paragraphs. Refer to FEMA 85-85, Manufactured Home Installation in Flood Hazard Areas.

In flood hazard areas, foundations, anchorings, and support systems must be capable of resisting loads associated with design flood and wind events or combined flood and wind events, and homes must be installed on foundation supports that are designed and anchored to prevent flotation, collapse, or lateral movement of the structure. The foundation specifications for Wick Building Systems' Inc. homes are not designed to address flood loads.

Section 3- Pre-Installation & Site Preparation

Location & Layout of Home

The location and layout of the home on the site is critical to the life-long performance and habitability of the home. The preparation of the site and the manufactured home stand is extremely important as well. If you are responsible for locating the home or for preparing the site, you should be sure to pay careful attention to the following. When planning the location and layout of the home on the site, your plan should take into consideration the topographic conditions of the site including the slope and drainage conditions, the location of trees and other vegetation, access to the site, and whether special grading or other excavation work such as ditches, culverts, or retaining walls will be required.

Access for Transporter

The installation site should have easy access to prevent damage from moving the home onto the site and into position. Before attempting to move the home to the installation site, be sure the transportation equipment can get through. The home should not be toted across fields or through ditches. Remove any overhanging branches and raise any overhead wires.

Encroachment & Setback Issues

Be sure to obey local laws regarding encroachments in streets, yards, and courts, and permissible set back distances from property lines and public roads.

Fire Separation Distance

The distance in which the home must be located from other structures depends on its fire resistance rating. The fire separation distance must be in accordance with the more stringent requirements of either the LAHJ or NFPA 501A, Chapter 6.

Site Preparation

Soil Conditions

The home should be located on the site in an area of the least ground water hazard. To help prevent settling, the home foundation should be sited on firm, undisturbed soil or fill compacted to 90% of its maximum relative density. Do not place the home on loose fill or soil such as gumbo, mud, muck, or bentonite. Choose compacted gravel or sand/ gravel mixtures, loose gravel, or compacted coarse sand for the manufactured home stand.

Grading Design

The grading design for the manufactured home site shall allow drainage of surface water away from the home and off-site while avoiding a concentrated runoff onto neighboring properties where erosion or other damage would be caused. The site grading design shall also minimize erosion and potential earth movement and settlement problems which might adversely affect the home.

Drainage & Sloping

Proper drainage prevents water build-up under the home which can cause settling of the foundation and build up of moisture and condensation in the crawl space and interior of the home. The home stand should be graded and crowned to slope away from the home to provide drainage from beneath the home. Crown and grade the site to slope away from the home. Do not grade the site or set the home so that water collects beneath the home. Natural drainage must be diverted around and away from the home.

The manufactured home stand must be properly graded and sloped to allow for storm drainage runoff. The drainage grade slope is often specified by local building codes. A minimum slope of ½" in 12 inches away from the foundation should be used if a minimum slope is not specified by the LAHJ. Grade and slope the site extending out a minimum of 10 feet around the perimeter of the manufactured home stand. The drainage slope away from the home should include the first 2 feet under the home.

Elimination of Depressions

The manufactured home stand must be prepared so there are no depressions where surface water can accumulate underneath the home or along the perimeter.

Drainage Structures

Depending on the topographic conditions of the lot, ditches and culverts or retaining walls may be used to drain surface water runoff if acceptable to the LAHJ. Such provisions are subject to the requirements of the LAHJ and must be included and considered in the overall site preparation.

Removal of Organic Material

All organic material subject to decay, such as grass, roots, twigs, and wood scraps must be removed from the area where the footings are to be placed.

Ground Moisture Control

To keep ground moisture away from the home, a vapor barrier must be placed on the ground surface in the crawl space area under the home when the crawl space is enclosed with skirting or other material.

Acceptable Types

The vapor barrier must be a minimum of 6 mil plastic polyethylene sheathing or equivalent.

Proper Installation

Cover the entire area under the home except under porches, decks and recessed entries with the sheathing. The sheathing must be overlapped at least 12" at all seams and sealed using a Polypropylene Tape with Water Based Acrylic Adhesive or other approved sealant. The ground cover may be placed directly beneath footings or otherwise placed around footers, anchors, and other obstructions. Any voids, tears or cuts must be repaired using an approved tape matched to the type of poly used, such as Polypropylene Tape with Water Based Acrylic Adhesive or other approved sealant.

CAUTION! A minimum of 6 mil poly vapor barrier must be installed on the ground surface under the home. Failure to install a crawl space vapor barrier could create excessive humidity and/or moisture problems the result of which may cause deterioration of building material, damage to property or unhealthy living conditions for the home occupants.

Gutters & Downspouts

Use gutters and downspouts as appropriate to direct rain water runoff. Downspouts and extensions must be installed in such a way that they direct and drain rain water away from the foundation. All Wick manufactured homes are built ready for installation of rain gutters.

All Wick manufactured homes must be installed on a foundation system that is properly designed and constructed based on site conditions, home design features, and the loads the home is designed to withstand as shown on the home's Data Plate. Be sure to consult with the LAHJ to determine the requirements for construction of the foundation system and comply with that code when you design and install the foundation system. In the absence of state or local codes, you should comply with the following minimum specifications.

CAUTION! If the home is constructed with a Lindsay Floor, the home must be installed on a basement foundation. Installing a Wick manufactured home with a Lindsay Floor on any other type of foundation system could cause damage to the home or affect the structural integrity and/or performance of the home. See Section 6 for basement foundation set information.

Acceptable Types

The foundation system for Wick manufactured homes may consist of piers and footings, floating slabs, insulated foundations, load-bearing perimeter walls, or basement foundations.

Soil Classifications & Bearing Capacity

One of the qualities of soil is its load bearing capacity. Soils that can support fewer pounds per square foot need larger footings to support the same weight as soils that can support more pounds per square foot. The soil classification and bearing capacity must be determined before the foundation is constructed and the home anchored against the wind. The soil classification and bearing capacity can be determined by soil tests that are in accordance with generally accepted engineering practice or soil records on file with the applicable LAHJ. You can also test the bearing capacity of the soil by using a pocket penetrometer available from most engineering supply houses, or you can contact a local geologist or registered professional engineer or architect for soil testing. If the soil class or bearing capacity cannot be determined by any of these methods but its type can be identified, use Table 4.1, *Soil Classifications and Bearing Capacities,* to determine the allowable pressure and torque values.

See Table 4.1

If the soil appears to be composed of peat, organic clays, or un-compacted fill or appears to have unusual conditions, a registered professional geologist, registered professional engineer, or registered architect must be consulted and a report provided to determine the soil classification and maximum allowable soil bearing capacity.

Clearances Under Home

A minimum clearance of 12 inches must be maintained between the lowest member of the main frame (I- beam or channel iron) and the ground under all areas of the home.

Pier & Footing Foundations

If the home is being set on a pier and footing foundation system, the piers and footings must be properly designed and constructed. Piers can be constructed out of solid concrete block or hollow cell load bearing CMU's (open cell concrete blocks) or steel or concrete pre- manufactured piers. CMU blocks must meet ASTM standard C90-02a. All piers must be capable of transmitting the vertical live and dead loads to the footings or foundation below. All piers that are greater than 67" in height must be designed by a registered professional engineer or architect. All other site-constructed piers must meet the following minimum specifications.

Specifications- Main Frame I-Beam Piers

Piers up to 36" High

See Figure 4.1

Piers up to 36" in height may be constructed out of single stacked solid concrete blocks or hollow open cell concrete blocks with nominal dimensions of at least 8"x 8"x16". All corner piers over three (3) blocks high must be constructed out of double interlocked concrete blocks. Mortar is not required. See Figure 4.1, *Typical I-Beam Pier Construction.*

Piers Greater Than 36" & No More Than 67" High

Piers greater than 36" but no more than 67" in height shall be constructed out of double interlocked solid concrete blocks or hollow open cell concrete blocks with nominal dimensions of at least 8"x 8"x16". Horizontal offsets must not exceed ½" from the top to the bottom. Mortar is not required. See Figure 4.1, *Typical I-Beam Pier Construction.*

Piers Greater Than 67" High

Piers greater than 67"in height are allowed only when designed by a registered professional engineer or architect and where permitted by the LAHJ.

Specifications - Perimeter & Mate Line Piers

Piers up to 54" High

Perimeter and mate line piers up to 54" in height may be constructed out of single stacked concrete blocks or hollow open cell concrete blocks with nominal dimensions of at least 8"x 8"x 16" when the design capacity of the block is not exceeded. Piers used for perimeter support must be installed with the long dimension parallel to the perimeter rail. Mortar is not required. See Figure 4.2, *Typical Perimeter & Mate Line Pier Construction.*

See Figure 4.2

Piers Greater Than 54" & No More Than 67" High

Perimeter and mate line piers greater than 54" but not more than 67" in height must be constructed out of double interlocked solid concrete blocks or hollow open cell concrete blocks with a nominal dimension of 8"x 8"x16". Mortar is not required. See Figure 4.2, *Typical Perimeter & Mate Line Pier Construction.*

Piers Greater Than 67" High

Piers greater than 67"in height are allowed only when designed by a registered professional engineer or architect and where permitted by the LAHJ.

Pier Configuration & Orientation

All piers must be placed on footers centered so that the footer projection from the pier is equal from side-to-side and front-to-back. The piers must be level vertically on all sides and square with the footer and plumbed and centered under the contact area at the point of support. Double-stacked blocks must be stacked so each course is stacked at right angles to the previous course. Open cells must be positioned vertically on the footings. Horizontal offsets should not exceed ½" top to bottom. Install single-stacked blocks for frame and mate line piers so that the long side is at right angles to the supported I-beam. Perimeter support piers must be installed with the long dimension parallel to the perimeter rim rail.

See Figure 4.3

Open cell concrete blocks must be capped to distribute the structural load evenly. Caps must be solid masonry, hardwood, or other listed materials. Do not use caps made of plywood or other non-listed material. Caps must be sized the same length and width as the piers they rest upon. Wood caps must be at least 2" thick for single-stacked blocks and 4" thick for double-stacked blocks. Concrete caps must be at least 4" thick. When split caps are used on double-stacked blocks, the caps must be installed with the long dimension across the joint in the blocks below.

NOTE: If concrete caps are used, wood plates and/or wood shims must be placed between the caps and main I-beam so there is no contact between the I-beam and the concrete cap.

Gaps between the top of the pier cap and the bottom of the I-beam can be filled with wood plates or shims. Use wood plates no thicker than 2" to fill the remaining gap. Use hardwood or other listed shims at least 4" wide and 6" long and not more than 1" thick. Shims (when used) must be installed so that all gaps between the home's bearing members (main I-beam or perimeter rim rail) are filled for the length of the pier or required plates. The combination of plates and shims cannot be more than 2". Always use shims in pairs installed from both sides of the I- beam. Shims should be fitted perpendicular to the I-beam and driven tight between the wood plate or pier cap and the I-beam. See Figure 4.3, *Typical Pier Configurations.*

Pre-Manufactured Piers

See Figures 4.1 & 4.2

Pre-manufactured piers must be listed and labeled for the required vertical load capacity and installed to the pier manufacturer's installation instructions. If pre-manufactured piers are used, the pier heights must be selected so that the adjustable risers do not exceed more than 2" when finally positioned or beyond the limits specified by the manufacturer. See Figure 4. 1, *Typical I-Beam Pier Construction* and Figure 4.2, *Typical Perimeter & Mate Line Pier Construction.*

Pier Location & Spacing

Generally, the Wick cross-beam frame is designed to allow for standard spacing of piers at intervals of 8' 0" o.c. (on center). The location and spacing of piers may also depend upon the location of doors and other openings. In certain circumstances, the Wick cross-beam frame also allows for a reduced number of pier rows when applied to the set of a sectional home. Pier spacing for all Wick manufactured homes shall be as follows.

Single Section Home

See Figure 4.4

- A row of piers must be located under both main frame I-beams at intervals of 8' 0" o.c. (at each outrigger location) measuring from the hitch end of the home.
- A pier must be located no more than 1' 6" from each end, measuring from the end of the home, not the I-beam, to the center of the pier.
- Perimeter piers must be located at each side of all openings 4' 0" or greater in width. This includes patio doors, windows, recessed entries and porches.

See Figure 4.4, *Typical Pier Spacing for Single Section Homes.*

Multi-Section Homes- Typical Pier Set

See Figures 4.5 & 4.6

- A row of piers must be located under both main frame I-beams of each section of the home at intervals of 8' 0" o.c. (at each outrigger location) measuring from the hitch end of the home.
- A pier must be located no more than 1' 6" from each end, measuring from the end of the home, not the I-beam, to the center of the pier.
- Perimeter piers must be located at each side of all openings 4' 0" or greater in width. This includes patio doors, windows, recessed entries and porches. See Figure 4.5, *Typical Pier Spacing for Multi-Section Homes.*
- Additional piers must be located under the mate line at each ridge beam column location. The location of ridge beam columns is designated by a paint mark or tag.
- A pier must be located no more than 12"" from each end of the mate line wall.
- Piers must also be located along the mate line wall on both ends of any opening that is 4' 0" or wider.

See Figure 4.5, *Typical Pier Spacing for Multi-Section Homes* and Figure 4.6, *Typical Ridge Beam Column Pier.*

Multi-Section Home- Optional 3-Point Set

The Optional 3-point set allows for the installation of three rows of piers. Generally, they will be located under the outside main I-beam of each section, and under the mate line wall. The Optional 3-Point Set may only be used on those multi-section homes that are less than 31' wide and placed on a foundation system consisting of pile/post frost footings or an engineered slab foundation system. *Pre-fabricated steel or concrete piers cannot be used!*

See Figures 4.2, 4.6 & 4.7

CAUTION! The Optional 3-Point Set can only be utilized on those multi-section homes that are less than 31' wide and where the foundation system utilized is a pile/post frost footing system or an engineered slab foundation system. *Pre-fabricated steel or concrete piers cannot be used!* Failure to comply with these requirements could cause damage to the home or affect the structural integrity and/or performance of the home.

A row of piers must be located under the outside I-beam of each section of the home at intervals of 8' 0" o.c. (at each outrigger location) measuring from the hitch end of the home.

- A pier must be located no more than 1' 6" from each end of the outside I-beam of each section of the home.
- Additional piers must be located at each end of both inside I-beams no more than 1' 6" from the end.
- A perimeter pier must be located at each side of all openings 4' 0" or greater in width. This includes doors, windows, recessed entries and porches.
- A third row of piers must be located under the mate line wall in line with the outrigger bearing blocks (8' 0" o.c.), at each ridge beam column location and at 12" from each end of the home. The location of ridge beam columns is designated by a paint mark or tag. All mate line piers must be constructed out of double interlocked solid concrete blocks or hollow open-cell concrete blocks with nominal dimensions of 8"x 8"x16". Mortar is not required when constructed in accordance with the pier details in this *Manual*.

See Figure 4.2 *Typical Perimeter & Mate Line Pier Construction*, Figure 4.6, *Typical Ridge Beam Column Pier* and Figure 4.7 *Typical Pier Spacing for Multi-Section Homes (Optional 3-Point Set).*

Tag Unit

See Figure 4.8

A Tag unit can be installed with any sectional home placed on a pier foundation system with standard pier spacing or the Optional 3-Point Set pier spacing. However, the location and spacing of piers for the Tag unit must be as specified below regardless of the type of pier spacing utilized for the main sections of the home.

- Piers must be located under both main I-beams at intervals of 8' 0"o.c. (at each outrigger locaction) measuring from the hitch end of the unit. An I-beam pier must be located no more than 1' 6" from each end of the main I-beams.
- A minimum of three (3) perimeter piers must be located at each end of the unit, one at each end wall corner and one at the center of the end wall.
- Perimeter piers must be located at each side of a wall opening if such opening is 4' 0" or greater in width. This includes doors, windows, recessed entries and porches.
- Piers must also be located under the mate line wall between the Tag unit and the main unit on both sides of an opening that is 4' 0" wide or greater. Note that these are the perimeter piers of the main unit.

See Figure 4.8, *Typical Pier Spacing for Tag Units.*

Footings

Every pier must be supported with a properly designed load-bearing footing. The load that each pier must carry depends on such factors as the dimensions of the home(whether the home is a single or a multi-section home), the design dead and live loads, the spacing of the piers, the bearing capacity of the soil, and weather conditions in the area such as the incidence of freezing. Footings can consist of concrete or wood piles, solid concrete slabs, pre-cast or cast-in-place concrete pads, pressure treated lumber, or ABS pre-manufactured pier pads.

General Installation Requirements

Footings must be placed in either undisturbed soil or properly compacted fill. All organic matter under the footing must be removed. Footings must be level in all directions, and all footings must extend below the frost line. To determine the frost depth for the home site, consult the LAHJ or refer to Figure 4.9, *Frost Penetration Map.*

See Figure 4.9

NOTE: When the home is placed on pre-cast or cast-in-place concrete pad footings, the required footing size must be determined before proceeding further.

CAUTION! All foundation footing systems must be constructed to extend below the frost line or otherwise be protected from the effects of ground frost heave. If using "frost protected" type footings (footings not installed below the frost line) the anchoring system must be designed by a registered professional engineer or architect. Failure to install the footing system below the frost line or to otherwise protect the footing system from the effects of ground frost heave could cause damage to the home or affect the structural integrity and/or performance of the home

Pile/Post Frost Footings

These footing systems must be carefully constructed and placed sufficiently deep into the ground to resist all wind, snow, and earthquake forces. Concrete or wood piles should be driven deep enough so they extend below the frost line. Concrete piles should have a 28-day compressive strength of at least 3,000 psi.

Pre-Cast or Cast-in-Place Concrete Pads

Use either square or rectangular shaped pads. Pre-cast pads should be a minimum of 4" in depth and meet or exceed ASTM C90-02a with a 28- day compressive strength of 1,200 psi. Cast-in-place pads should be a minimum of 6" in depth and meet or exceed ASTM C90-02a with a 28- day compressive strength of 3,000 psi. The size of the pad will depend on the distance between piers and the soil bearing capacity of the home site. See Page 18, *How to Determine Footing Size.*

Pressure Treated Lumber

Use either square or rectangular shaped pads. Use two (2) fastened layers, each 2" thick (nominal) of pressure treated wood planks having a 6pcf retention and meeting the requirements of AWPA U1-04, category 4B-1 (for ground contact use). Place the long dimension of the second layer perpendicular to that of the first. Cut edges must be field treated in accordance with AWPA standard M4-02. ACQ treated lumber must not be in contact with steel not protected for contact with ACQ treated lumber.

ABS Pads

ABS pre-manufactured pier pads may be used as an alternative to concrete or treated lumber pads. Be sure to follow and adhere to the manufacturer's installation instructions for proper size and placement of pads.

How to Determine Footing Size

In those situations where the footing system consists of pre-cast or cast-in-place concrete pads, pressure treated lumber or ABS pads, the required size of each footing must be determined before you can proceed with constructing the piers. The size of each footing will depend on the size and weight of the home, the bearing capacity of the soil, the distance between piers, and whether the pier is an I-beam pier, perimeter pier, mate line pier, or ridge beam column pier. The following steps outline the procedure for determining the required footing sizes.

> **NOTE:** You must determine the bearing capacity of the soil before you can determine the footing size. Larger footing sizes may be used, but the footing size for each pier location must be at least the "minimum" calculated. Footings should be round or square. When planning your footing size, plan tie down locations for the anchor system. To determine the required size for ABS pads, consult the manufacturer's installation instructions.

Main Frame I-Beam Piers

The size of footings for all main frame I-beam piers shall be determined as follows:

Step 1.

See Table 4.2

Go to Table 4.2, *Minimum Pier Capacities (Main Frame I-Beam Piers).* Find the width of the unit section in the Section Width column. Find the eave overhang (in inches) in the Maximum Eave Overhang column.

Step 2.

Follow the row for the Section Width and Maximum Eave Overhang to the Minimum Pier Capacity (Pounds) column. This is the minimum capacity (in pounds) required for the pier. Round up to the nearest 500 lbs.

Step 3.

Go to Table 4.7, *Minimum Footing Size.* Find the pier capacity poundage as determined in Step 2 in the Pier Capacity (Pounds) column. Follow the row across to the column for soil bearing capacity of the site and the column for the style of footer (round or square). This is the minimum footing size (in inches) required for the pier.

See Table 4.7

Step 4.

Go to Table 4.8, *Minimum Footing Thickness.* Find the size of the footing as determined in Step 3 in the Pier Footing Size column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of pier (single or double stacked). This is the minimum thickness (in inches) required for the footer.

See Table 4.8

Perimeter Piers

The pier capacity for perimeter piers is based on the width of the home, the roof load, and the spacing between piers.

Step 1.

Go to Table 4.3, *Minimum Pier Capacities (Perimeter Piers)* and Table 4.6 (a), *Minimum Pier Capacities (Mate Line Piers for Perimeter Wall Foundations).* Find the width in the Section Width column. Find the eave overhang (in inches) in the Maximum Eave Overhang column.

See Tables 4.3 & 4.6 (a)

Step 2.

Follow the row for the Section Width and Maximum Eave Overhang to the Maximum Opening Span column (4', 6', 8', 10', 12', 14' or 16' o.c.). This is the minimum capacity (in pounds) required for the pier. Round up to the nearest 500 lbs.

Step 3.

Go to Table 4.7, *Minimum Footing Size.* Find the pier capacity poundage as determined in Step 2 in the Pier Capacity (Pounds) column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of footer (round or square). This is the minimum footing size (in inches) required for the pier.

See Table 4.7

Step 4.

Go to Table 4.8, *Minimum Footing Thickness.* Find the size of the footing as determined in Step 3 in the Pier Footing Size column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of pier (single or double stacked). This is the minimum thickness (in inches) required for the footer.

See Table 4.8

Ridge Beam Column Piers

See Figure 4.10

Footings along the mate line at ridge beam columns are loaded differently than all other piers. The loadings are based upon the distance of the open spans along this area, and whether there is an opening on just one side of the ridge beam column, or on both sides. The location of ridge beam columns is designated at the factory by a paint mark or tag. To determine the footing size for piers at the ridge beam column locations, you will first need to determine the "influence span" for the pier. See Figure 4.10, *Typical Ridge Beam Column Pier.*

Step 1 (A).

In those situations where there is an opening on only one side of the pier (Pier A, B, C, or E on Figure 4.10), determine the distance to the adjacent pier (left and right). Add these distances together. The sum of these is the "influence span" for the pier.

Step 1 (B).

In those situations where there is an opening on both sides of the pier (Pier D on Figure 4.10), determine the distance to each adjacent pier (left and right). Add these distances together. The sum of these is the "influence span" for the pier.

Step 2.

See Table 4.4, 4.4 (a) or 4.4 (b)

Go to Table 4.4, *Minimum Pier Capacities (Ridge Beam Column Piers),* Table 4.4 (a), *Minimum Pier Capacities (Perimeter Wall Foundation),* or Table 4.4 (b), *Minimum Pier Capacities (3-Point Set Foundation).* Find the total width of the home in the Total Width column. Follow the row across to the Maximum Influence Span (Feet) as calculated in Step 1 (A) or (B) rounded up to the next highest number in the Table (Maximum Influence Span- Feet). This is the minimum capacity (in pounds) required for the pier. Round up to the nearest 500 lbs. (1,000 lbs. for loads exceeding 10,000 lbs).

Step 3.

See Table 4.7

Go to Table 4.7, *Minimum Footing Size.* Find the pier capacity poundage as determined in Step 2 in the Pier Capacity (Pounds) column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of footer (round or square). This is the minimum footing size (in inches) required for the pier.

Step 4.

See Table 4.8

Go to Table 4.8, *Minimum Footing Thickness.* Find the size of the footing as determined in Step 3 in the Pier Footing Size column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of pier (single or double stacked). This is the minimum thickness (in inches) required for the footer.

Optional 3-Point Set

When utilizing the Optional 3-Point Set, piers are required every 8' 0" o.c. along the mate line wall, every 8' 0" o.c. under both the "outside" main I-beams of each home section, and at each ridge beam column location.

> **NOTE:** Before proceeding, see Page 15 for additional information about requirements for the installation of the Optional 3-Point Set.

To determine the footing sizes for these piers, do the following:

"Outside" Main I-Beam Piers

Step 1.

Go to Table 4.6 (b) *Minimum Pier Capacities (Optional 3-Point Set).* Find the width of the home section in the Section Width column. Find the eave overhang (in inches) in the Maximum Eave Overhang column.

Step 2.

Follow the row for the Section Width and Maximum Eave Overhang to the category "Piers Under Outside I- Beams" in the Pier Location column. Follow the row to the Minimum Pier Capacity (Pounds). This is the minimum capacity (in pounds) required for the pier. Round up to the nearest 500 lbs.

Step 3.

Go to Table 4.7, *Minimum Footing Size.* Find the pier capacity poundage as determined in Step 2 in the Pier Capacity (Pounds) column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of footer (round or square). This is the minimum footing size (in inches) required for the pier.

See Table 4.7

Step 4.

Go to Table 4.8, *Minimum Footing Thickness.* Find the size of the footing as determined in Step 3 in the Pier Footing Size column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of pier (single or double stacked). This is the minimum thickness (in inches) required for the footer.

See Table 4.8

Mate Line Wall Piers

Step 1.

Go to Table 4.6 (b) *Minimum Pier Capacities (Optional 3-Point Set).* Find the width of the home section in the Section Width column. Find the eave overhang (in inches) in the Maximum Eave Overhang column.

Step 2.

Follow the row for the Section Width and Maximum Eave Overhang to the category "Piers Under Marriage Beams" in the Pier Location column. Follow the row to the Minimum Pier Capacity (Pounds). This is the minimum capacity (in pounds) required for the pier. Round up to the nearest 500 lbs.

Step 3.

Go to Table 4.7, *Minimum Footing Size.* Find the pier capacity poundage as determined in Step 2 in the Pier Capacity (Pounds) column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of footer (round or square). This is the minimum footing size (in inches) required for the pier.

See Table 4.7

Step 4.

Go to Table 4.8, *Minimum Footing Thickness.* Find the size of the footing as determined in Step 3 in the Pier Footing Size column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of pier (single or double stacked). This is the minimum thickness (in inches) required for the footer.

See Table 4.8

> **NOTE:** Two footings may be combined into one larger footing as necessary when a Mate Line Pier and a Ridge Beam Column Pier are located immediately adjacent to each other.

Tag Unit Piers

To determine the required footing sizes for the main I-beam piers and end wall perimeter piers for Wick Tag units, do the following:

Step 1.

See Table 4.5

Go to Table 4.5, *Minimum Pier Capacities (Tag Unit Piers).* Find the width of the Tag unit in the Section Width column. Find the eave overhang of the Tag unit (in inches) in the Maximum Eave Overhang (Inches) column.

Step 2.

Follow the row for the Section Width and Maximum Eave Overhang to the column for the pier you are sizing (perimeter end wall or main I-beam). This is the minimum capacity (in pounds) required for the pier. Round up to the nearest 500 lbs.

Step 3.

See Table 4.7

Go to Table 4.7, *Minimum Footing Size.* Find the pier capacity poundage as determined in Step 2 in the Pier Capacity (Pounds) column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of footer (round or square). This is the minimum footing size (in inches) required for the pier.

Step 4.

See Table 4.8

Go to Table 4.8, *Minimum Footing Thickness.* Find the size of the footing as determined in Step 3 in the Pier Footing Size column. Follow the row across to the column for the soil bearing capacity of the site and the column for the style of pier (single or double stacked). This is the minimum thickness (in inches) required for the footer.

Basement Foundations

Basement foundations must be constructed in accordance with state and local codes and regulations. You should consult with a registered professional engineer or architect if you are responsible for constructing this type of foundation system. The finished foundation must be inspected by a qualified inspector to assure conformance with the plan. Qualified inspectors may include state inspectors, local city or county building officials or other similarly qualified inspectors. Choose a reliable contractor who is familiar with both state and local requirements governing the construction of basement foundations. It is the foundation contractor's responsibility to ensure that the design, construction, waterproofing, insulating, lateral support, and combustion air for heating equipment is in accordance with applicable state and local codes and the soil conditions.

See Figure 4.11

Consideration must be given for attachment of insulation board to the exterior of the foundation walls. In the absence of state or local requirements, use 1" x 4' x 8' (R-5) Styrofoam sheet material installed outside and flush with the top of the foundation wall. Install insulation panels vertically and flush with the top of the foundation wall. This additional 1" of thickness should also be considered when sizing the width and length of the finished foundation walls.
See Figure 4.11, *Typical Basement Foundation Layout- Lindsay Unified Floor System.* ®

CAUTION! All basement foundations must be sized based on the engineered foundation print provided for the home. If you did not receive the engineering print, contact the Engineering Department of Wick Building Systems, Inc. Request a basement print specific to the home based on the home's serial number. Failure to properly size the basement foundation could affect the structural integrity and/or performance of the home.

Perimeter (Load Bearing) Wall Foundations

See Figure 4.12

Perimeter load bearing walls must be constructed in accordance with state and local codes and regulations. You should consult with a registered professional engineer or architect if you are setting the home on this type of foundation system. The finished foundation must be inspected by a qualified inspector to assure conformance with the plan. Qualified inspectors may include state inspectors, local city or county building officials or other similarly qualified inspectors. Choose a reliable contractor who is familiar with both state and local requirements governing the construction of foundations. It is the foundation contractor's responsibility to ensure that the design, construction, waterproofing, insulating, lateral support, and combustion air for heating equipment is in accordance with applicable state and local codes and the soil conditions.

All perimeter load bearing walls must be sized based on the engineered foundation print supplied with the home. If you did not receive the engineering print, contact the Engineering Department of Wick Building Systems, Inc. Please be sure to request a foundation print specific to the home you are setting, based on the home's serial number. See Figure 4.12, *Typical Layout for Perimeter Wall Foundations.*

NOTE: The crawl space shall have a minimum height of 24", a minimum access of 18" x 24", and a minimum of 6 mil poly vapor barrier over the ground. Minimum ventilation must be provided for the crawl space area at a rate of 1/1500 (1 sq. foot for every 1500 sq. feet of the home's total square footage). Post/pier footings must be sized for the applicable soil value.

Floating Slab Foundations

A floating slab system may be used above the frost line only when it is properly designed by a registered professional engineer or architect or designed according to structural analysis in accordance with ASCE-32-01 and acceptable to the LAHJ. Wick can supply professionally engineered, stamped prints upon request.

Insulated Foundations

These foundation systems must be designed by a registered professional engineer or architect or designed according to structural analysis and acceptable to the LAHJ.

The following steps and referenced figures outline the general procedure for the typical set of Wick manufactured homes on pier foundation systems. If you are setting a Wick sectional home with a Lindsay Floor, you must set the home on a basement foundation system. Instructions for setting these homes are provided in *Section 6.* If you are setting the home on a perimeter wall foundation, the instructions for setting the home are the same as for basement sets in *Section 6.* Be sure you refer to Figure 4.12 for the centerline pier specifications. Before you begin setting the home, you should inspect both the interior and exterior for possible damage in transit and immediately report any such damage to the retailer or to Wick.

General Requirements

You should be sure the following items have been completed before you move the home into its final position.

- The site is properly prepared as outlined in *Section 3.*
- All concrete work necessary for the foundation system as outlined in *Section 4* has been completed.
- Utilities to the home site have been installed or are available. Trenching for crossover drain lines or wheels that will be left in place has been completed.
- Items that would be difficult to install after the home had been placed into position, such as ground anchors and vapor barrier, are in place.

During the set process, make sure you adhere to the following safety precautions.

- Use only equipment in good working condition and stable enough to handle the loads.
- You should use two (2) jacks to set a single section home. Four (4) jacks are required for a multi-section home. Each jack should have a rating of at least 12 tons. Use jacks with jacking plates to prevent slipping.
- Use jacks only for raising the home, not to support the home.
- Jack only on the main chassis I-beam. Locate the jack directly under the vertical web of the I-beam.
- Use a firm support under the jack base, a 12" x 12" pad minimum. Use a large 3/8" thick steel plate, C- channel or other equivalent plate between the jack head and the main I-beam to distribute the load.
- Do not go under the home while it is supported on the jacks. Do not operate the jacks while you are under the main I-beams of the home. Place safety piers such as 4"x 6"x 48" (minimum) hardwood timbers between the I-beams and the ground in case of jack failure. Stack safety cribbing in a diamond pattern under the I-beams.
- Raise the home in small increments and provide additional blocking between the home and the piers and safety piers as the home is raised.

Single Section Home

If the home is being placed on a pre-constructed footing system such as a poured concrete slab, cast-in-place concrete pads or pile/post footings, move the home into position and lay out the pier blocks close to where they will be used. If the home is being placed on pre-cast pad footers, mark the location of the corners of the home before moving it into the final position. Plan the pier spacing layout and calculate the required footing sizes. Install the footings where they will be used, and then move the home into position.

NOTE: During the set-up procedure you will be leveling the home at the same time. This will be a "rough" level only. The final leveling will come later after the home is in its final position and all piers are constructed in place. See *Section 4* to determine the required spacing of piers, pier construction, and footing size requirements. Additional main I-beam piers may be required when extra heavy furniture or appliances such as water beds or freezers will be placed in the home.

Step 1.

Place two (2) jacks under the main I-beam closest to the front door side of the home, ¼ of the way in from each end of the main I-beam. Using both jacks simultaneously, carefully lift that side of the home. Install piers under the I-beam at the required locations. Install pier caps and rough level.

Step 2.

Slowly lower both jacks simultaneously onto the completed piers.

Step 3.

Place two (2) jacks under the opposite side main I-beam as outlined above in Step 2. Using both jacks simultaneously, carefully lift the home. Install piers under the main I-beam at the required locations. Install pier caps and rough level.

Step 4.

Slowly lower both jacks simultaneously onto the completed piers.

After all the piers have been installed, the home should be roughly level. You are now ready to do the final leveling and adjustments as outlined on the next page.

Final Leveling & Adjustments

Make the final adjustments to the leveling of the home using a standard water level. Work from front to rear to obtain level conditions throughout the home. Please remember that each individual pier support should be snug and in contact with the main I-beam. The final height adjustment may be obtained by slightly jacking the main I-beam and placing shims between the piers and I-beam or other approved methods such as adjustment of the rise on pre-manufactured piers. A tolerance of no more than ¼" difference from level is allowed between adjacent piers. See *Section 4* for proper shimming instructions.

CAUTION! During the leveling process, be sure to loosen the frame or over-the-roof ties, if any, before jacking the home. Failure to loosen the frame and/or over-the-roof ties before jacking could cause damage to the home.

After the final leveling is completed, be sure to check for and make all necessary adjustments to those items that might have gone out of proper alignment during transit or during the set-up procedure as outlined below.

- ☐ Check and adjust all interior passage doors for proper operation and alignment.
- ☐ Check and adjust all exterior doors for proper operation and alignment. Make sure they lock and unlock easily and properly and that the door is installed square with the frame.
- ☐ Check and adjust all windows to open and close easily.
- ☐ Check and adjust all closet doors for proper alignment and operation.
- ☐ Check and realign cabinet doors as necessary.
- ☐ Check and adjust drawers to open and close easily.
- ☐ Check and reattach loose mouldings, panel connections, and trim.
- ☐ Check and retighten 'p' trap fittings as necessary.

After all piers are installed, the home is leveled properly and all adjustments have been made, you will need to proceed with the remaining installation systems outlined in this *Manual*. This includes installing the anchoring system, preparing the appliances and mechanical equipment, hookup and testing of the utility systems, final finish interior and exterior work and the clean-up and final inspection of the home.

Section 5- Typical Pier Set

Multi-Section Home – Typical Pier Set

You will need a roller system, come-a-longs, and a minimum of four (4) jacks to set a sectional home. In some situations, such as the set on a perimeter wall foundation, you may need the use of a crane to position the home. If so, see *Section 6* for proper crane lifting procedures. Prepare the home for set by removing the plastic material used to protect the open (marriage wall) sides of each section during storage and shipping. Do not remove the wood supports holding up the ceilings on the marriage wall sides. Do not remove the marriage wall banding straps until both halves are set.

If the home is being placed on a pre-constructed footing system such as a poured concrete slab, cast-in-place concrete pads or pile/post footings, move the home into position and lay out the pier blocks close to where they will be used. If the home is being placed on pre-cast footers, mark the location of the corners of the home before moving it into its final position. Plan the pier spacing layout and calculate the required footing sizes. Install the footings where they will be used and move the home into position.

NOTE: During the set up procedure you will be leveling the home at the same time. This will be a "rough" level only. The final leveling will come later after the home is in its final position and all piers are constructed in place. See *Section 4* to determine the required spacing, construction and configuration of piers, and footing size requirements. Additional main frame I-beam piers may be required when extra heavy furniture or appliances such as water beds or freezers will be placed in the home. An insulation seal gasket has been installed at the factory along the marriage wall beam, end walls, and floor line. If this gasket is damaged or missing, it must be repaired or replaced before connecting the sections together.

Step 1.

Position one section of the home (either the 'A' or 'B' section) onto its final location. Install piers and level this section of the home as described for Single Section homes including the final leveling adjustments outlined earlier in this section.

NOTE: Do not proceed with the set up of the second section until the first section is properly blocked and completely level.

Step 2.

Position the other section of the home (the 'B' section assuming you started with the 'A' section) on the roller system as close as possible to the first section. Slide the second section on the roller system sideways to the first section, using at least two (2) come-a-longs, one at the front and one at the rear. Use additional come-a-longs at interim locations, if necessary.

Step 3.

Place two (2) jacks under the "inside" main I-beam, ¼ of the way in from each end of the I-beam. Place two (2) jacks under the "outside" main I-beam, ¼ of the way in from each end of the I-beam.

Step 4.

Using the jacks simultaneously, carefully lift the inside I-beam until the floor edge is even and level with the floor edge of the first section. Install piers under the inside I-beam at the required locations. Install pier caps and rough level. Slowly lower both jacks simultaneously onto the completed piers.

Step 5.

Using the jacks simultaneously, carefully lift the outside I-beam to a roughly level position. Close any gaps between the two halves at the center of the ridge beam by raising the outside I-beam as necessary. Install piers under the outside I-beam at the required locations. Install pier caps and rough level. Slowly lower the jacks simultaneously onto the completed piers.

Step 6.

Install support piers at the mate line wall as required.

Step 7.

Make the final adjustments as outlined in *Final Leveling & Adjustments* on Page 27.

Step 8.

Attach the floors of both sections as shown in Figure 5.1 Pre-drill ¼" pilot holes in the floor rim joist to prevent splitting the joist before inserting lag screws. Tighten the lag screws at the floor rim joist, securely fastening the floors together. See Figure 5.1, *Floor Marriage Connection.*

See Figure 5.1

Step 9.

Secure the two sections at the ridge beam support using two (2) #10 x 5" wood screws staggered 24"o.c. at a maximum 30 degree angle. See Figure 5.3, *Roof Marriage Connection.*

See Figure 5.3

Step 10.

Connect each end wall by using #10 x 5" wood screws staggered 9" o.c. at a maximum 30 degree angle. Add fiberglass batt insulation as necessary to seal gaps where the end walls join. Install OSB filler pieces (shipped loose with the home) to fill the gap between the two sections. Install house wrap material over the connection, if applicable. See Figure 5.4, *End Wall Marriage Connection.*

See Figure 5.4

You are now ready to proceed with the exterior close-up procedures, crossover connections for the utility systems, the interior marriage wall close up and other finish work described later in this section.

Multi-Section Home- Optional 3-Point Set

The Wick cross-beam frame system will allow for a reduced number of pier rows for setting a multi-section home. However, the Optional 3-Point Set can only be utilized on homes that are less than 31' wide and where the home is being installed on a foundation system, or a slab designed according to structural analysis and acceptable to the LAHJ. *See Page 15 for more information about the Optional 3-Point Set.*

Section 5- Typical Pier Set

You will need a roller system, come-alongs, and a minimum of four (4) jacks to set the home. In some situations, you may need the use of a crane to position the home. If so, see *Section 6* for proper crane lifting procedures. Prepare the home for set by removing the plastic material used to protect the open (marriage wall) sides of each section during storage and shipping. Do not remove the wood supports holding up the ceilings on the marriage wall sides. Do not remove the marriage wall banding straps until both halves are set.

NOTE: During the set up procedure you will be leveling the home at the same time. This will be a "rough" level only. The final leveling will come later after the home is in its final position and all piers are constructed in place. See *Section 4* to determine the required spacing, construction and configuration of piers, and footing size requirements. Additional main frame I- beam piers may be required when extra heavy furniture or appliances such as water beds or freezers will be placed in the home. An insulation seal gasket has been installed at the factory along the marriage beam, end walls, and floor line. If this gasket is damaged or missing, it must be repaired or replaced before connecting the sections together.

CAUTION! Use of the Optional 3-Point Set is allowed only on those homes that are less than 31' wide, and where the home is installed on pile/post frost footings, an engineered slab foundation, or a slab system designed according to structural analysis and acceptable to the LAHJ. Use of the Optional 3-Point Set in any other situation could cause damage to the home or affect the structural integrity and/or performance of the home.

Step 1.

First, position one section (either the 'A' or the 'B') on its intended foundation.

Step 2.

Place two (2) jacks under the "outside" main I-beam ¼ of the way in from each end of the I-beam. Using both jacks simultaneously, carefully lift the outside I-beam. Install piers under the outside I-beam at the required locations. Install pier caps and rough level. Slowly lower both jacks simultaneously onto the completed piers.

Step 3.

Place two (2) jacks under the "inside" main I-beam ¼ of the way in from each end of the I-beam. Using both jacks simultaneously, carefully lift the inside I-beam. Install two (2) safety blocks under the inside I-beam, one at each jack location.

CAUTION! Safety blocks must be used during the set and leveling procedure. The safety blocks must remain under the home until both sections are fully set. Failure to use safety blocks or removal of the safety blocks prematurely could result in serious injury or loss of life.

Step 4.

Install mate line piers at the required locations. The mate line piers must be set to the outside edge of the bearing block. Install caps and rough level. Slowly lower both jacks simultaneously until the bearing blocks rest on the completed piers.

Step 5.

Position the other section of the home (the 'B' section assuming you started with the 'A' section) on the roller system as close as possible to the first section. Slide the second section on the roller system sideways to the first section, using at least two (2) come-a-longs, one at the front and one at the rear. Use additional come-a-longs at interim locations, if necessary.

Step 6.

Place two (2) jacks under the "inside" main I-beam ¼ of the way in from each end of the I-beam. Place two (2) jacks under the "outside " main I- beam, ¼ of the way in from each end of the I-beam. Using both jacks simultaneously, carefully lift the inside I-beam until it is slightly higher than the first section. Be sure to raise the inside I-beam higher than the first section to clear the centerline piers.

Step 7.

Using the jacks simultaneously, carefully lift the "outside" main I-beam to a roughly level position. Close any gap between the two halves at the center of the ridge beam by raising the "outside" main I-beam as necessary. Install piers under the "outside" main I-beam at the required locations. Install pier caps and rough level. Carefully lower the outside jacks simultaneously onto the completed piers.

Step 8.

Remove the safety blocks installed under the first section.

Step 9.

Make the final leveling and adjustments as outlined in *Final Leveling and Adjustments* on Page 27.

Step 10.

Attach the floors of both sections as shown in Figure 5.1. Pre-drill ¼ " pilot holes in the floor rim joist to prevent splitting the joist before inserting lag screws. Tighten the lag screws at the floor rim joist, securely fastening the floors together, but *do not over-tighten* resulting in pulling the rim joist away from the floor joists. See Figure 5.1, *Floor Marriage Connection.*

See Figure 5.1

Step 11.

Secure the two sections at the ridge support using two (2) #10 x 5" wood screws staggered 24" o.c. at a maximum 30 degree angle. See Figure 5.3, *Roof Marriage Connection.*

See Figure 5.3

Step 12.

Connect each end wall by using #10 x 5" wood screws staggered 9" o.c. at a maximum 30 degree angle. Add fiberglass batt insulation as necessary to seal gaps where the end walls join. Install OSB filler pieces (shipped loose with the home) to fill the gap between the two sections. Install housewrap material over the connection, if applicable. See Figure 5.4, *End Wall Marriage Connection.*

See Figure 5.4

You are now ready to proceed with the exterior close-up procedures, crossover connections for the utility systems, the interior marriage wall close up and other finish work described later in this section.

Tag Units

The manufactured home you are setting may include a third section. This additional section is referred to as a "Tag" unit. You will need a roller system and come-a-longs to set the Tag unit. Before you begin, both sections of the main unit must be completely blocked and leveled. Prepare the Tag unit for set by removing the plastic close-up material used to protect it during storage and shipping. Cut out and remove the OSB sheathing installed over the Tag connection opening on the mating wall of the main unit.

NOTE: During the set up procedure you will be leveling the Tag unit at the same time. This will be a "rough" level only. The final leveling will come later after the home is in its final position and all piers are constructed in place. See *Section 4* to determine the required spacing, construction and configuration of piers, and footing size requirements. Additional main frame I- beam piers may be required when extra heavy furniture or appliances such as water beds or freezers will be placed in the home. An insulation seal gasket has been installed at the factory along the marriage beam, end walls, and floor line. If this gasket is damaged or missing, it must be repaired or replaced before connecting the Tag unit to the main unit.

Step 1.

Position the Tag unit on the roller system as close as possible to the main unit. Slide the Tag unit on the roller system sideways to the main unit using at least two (2) come-a-longs, one at the front and one at the rear.

Step 2.

Place two (2) jacks under the "inside" main I-beam of the Tag unit, ¼ of the way in from each end of the I-beam.

Step 3.

Using the jacks simultaneously, carefully lift the "inside" I-beam of the Tag unit until it is aligned with the main unit at the roof. Install the piers under the "inside" I-beam at the required locations. Install pier caps and rough level. Slowly lower both jacks simultaneously onto the completed piers.

Step 4.

Using the jacks simultaneously, carefully lift the "outside" main I-beam of the Tag unit to a roughly level position. Close any gaps at the roof line by raising the "outside" I-beam as necessary. Install piers under the "outside" I-beam at the required locations. Install pier caps and rough level. Slowly lower both jacks simultaneously onto the completed piers.

Step 5.

Install the end wall perimeter piers as required.

Step 6.

Make the final leveling adjustments as outlined in *Final Leveling and Adjustments* on Page 27.

Step 7.

Attach the floors of both sections as shown in either Figure 5.1 or 5.2. Pre-drill ¼" pilot holes in the floor rim joist to prevent splitting the joist before inserting lag screws. Tighten the lag screws at the floor rim joist, securely fastening the floors together, but *do not over-tighten* resulting in pulling the rim joist away from the floor joists. See Figure 5.1, *Floor Marriage Connection.*

See Figure 5.1

Step 8.

Secure the roof of the Tag unit to the roof of the main unit using #10 x 5" wood screws toe-screwed at 18" o.c. See Figure 5.5, *Tag Unit Roof Line Connection (Flush),* Figure 5.6, *Tag Unit Roof Line Connection (Offset),* and Figure 5.7, *Tag Unit Roof Line Connection (Eaves).*

See Figures 5.5, 5.6 &5.7

Step 9.

Ensure that all sill seal insulation is in place and connect the Tag unit mating wall to the main unit sidewall as shown in Figure 5.8. Extend the housewrap material (if applicable) through the corners and staple. See Figure 5.8, *Tag Unit Corner Wall Connection.*

See Figure 5.8

You are now ready to proceed with the exterior close-up procedures, crossover connections for the utility systems, the interior marriage wall close up and other finish work.

Exterior Close-Up- Sectional Homes

Complete the close-up of the roof line, exterior end walls, and underbelly as follows:

Roof Line

Install the ridge vent shipped loose with the home. The ridge vent must be installed and fastened according to the manufacturer's installation instructions. Shingles for the ridge have also been shipped loose with the home. These shingles are 3-tab type. Follow the instructions provided on the shingle packaging for proper installation. Wick has provided enough shingles for a 5" exposure.

Hinged Roof

If the home you are installing has an optional hinged roof, refer to the supplemental instructions provided for proper installation. If you did not receive these supplemental instructions, contact the Engineering Department of Wick Building Systems, Inc.

End Wall

Exterior sheathing is installed at the factory on the end wall surfaces of Wick sectional homes. However, a portion of the end wall sheathing at the marriage wall sides is omitted and must be field installed to fully close the gap at the end walls. Additional sheathing and exterior siding is shipped with the home. Additional pieces of fascia, soffit, and roof edging are also provided. Follow common building practices for the installation of these items. Be sure to follow any additional instructions provided, including the nailing instructions provided by the siding manufacturer. If shutters are provided, be sure to take care to install the shutters to allow for expansion of the siding.

Underside

An insulation seal gasket is installed along the mate line at the factory. Additional pieces of insulation should be added to seal any gaps at the mate line of the floor. Install tape or bottom board patching material along the underside of the floor mate line area to prevent air infiltration. *Do not use duct tape!* It will not adhere properly to the bottom board material. *See Page 45 for information regarding proper bottom board sealing and repair.*

Exterior Close-Up- Tag Units

Complete the close-up of the roof line, exterior end walls and underbelly as follows:

Roof Line

See Figures 5.5, 5.6 & 5.7

Install the close-up materials (shingle underlayment and flashing) for the roof, and install shingles as specified on the shingle packaging. See Figure 5.5, *Tag Unit Roof Line Connection (Flush),* Figure 5.6, *Tag Unit Roof Line Connection (Off-Set),* and Figure 5.7, *Tag Unit Roof Line Connection (Eaves).*

End Wall

See Figure 5.8

Exterior sheathing is installed at the factory on the end wall surfaces of Wick Tag units. Note that the siding on the main unit is installed in a "stepped" fashion to allow for the connection of the Tag to the main unit. Siding and trim accessories, and fascia, soffit, and roof edging are shipped loose for installation on site. Follow common building practices for the installation of these items. Be sure to follow any additional instructions provided, including the nailing instructions provided by the siding manufacturer. If shutters are also provided, be sure to take care to install the shutters to allow for expansion of the siding. See Figure 5.8, *Tag Unit Corner Wall Connection.*

Underside

An insulation seal gasket is installed along the mate line at the factory. Additional pieces of insulation should be added to seal any gaps at the mate line of the floor. Install tape or bottom board patching material along the underside of the floor mate line area to prevent air infiltration. *Do not use duct tape!* It will not adhere properly to the bottom board material. *See Page 45 for information regarding bottom board sealing and repair.*

The Wick manufactured home you are setting may be designed and constructed with a Lindsay Floor. The Lindsay Floor was developed to provide a combination floor/transportation system compatible for installation on basement foundations without the removal of the chassis used to transport the home. This unique system utilizes conventional wood floor framing members with permanently attached steel framing and transport members. If you are responsible for setting a Wick manufactured home with a Lindsay Floor, you must comply with the following instructions in the set and installation of the home.

CAUTION! All Wick manufactured homes designed and constructed with a Lindsay Floor must be installed on a basement foundation. Installing a home constructed with the Lindsay Floor on any other type of foundation system could cause damage to the home or affect the structural integrity and/or performance of the home.

Foundation

The design and construction of the basement foundation must comply with the state and local codes where the home is being set. If you are responsible for the design and/or construction of the basement foundation, it is your responsibility to ensure that the design, construction, waterproofing, insulating, lateral support and combustion air for heating equipment are in accordance with applicable state and local codes.

Positioning on the Foundation

If you are responsible for installing the home, you should examine the foundation for appropriate size (length, width, and diagonally) and to ensure that the home can be placed without problems. Prepare the home for set by removing the plastic material used to protect the open (marriage wall) sides of each section during storage and shipping. Do not remove the wood supports holding up the ceilings on the marriage walls. Do not remove the marriage wall banding straps until both halves are set. All Wick manufactured homes constructed with the Lindsay Floor are designed to be placed on the basement foundation using either a roller system or crane. (Craning is the most common method). See Figure 6.1, *Typical Basement Set– Lindsay Unified Floor System®*.

See Figure 6.1

CAUTION! Extreme care must be exercised when lifting the home onto the foundation walls. Failure to do so could cause damage to the home or affect the structural integrity and/or performance of the home.

Crane Lift Cable Locations

The cable pick-up locations for crane lifting the home should be located at approximately 25% of the floor length (from each end). The crane cables should be located as near as possible to a floor truss, and the home should be protected against damage at the crane cable locations. Use doubled up wood members wrapped in carpet scraps as spacers between the cables and the overhangs of the home. Do not attach the cables to the bottom of the OSB sheathing. Remove siding at the rim joist area. Notch the sheathing and use angle irons (3" x 3" x ¼" x 3' minimum) held in place with four (4) 3" lag screws. Be sure the crane cable locations allow for proper balance of the floor sections when lifting onto the foundation. If the home does not balance, move the pick-up points to new locations that will allow for proper balancing.

CAUTION! Before lifting the home, you must ensure that the home is protected against damage at the crane lift cable locations. Failure to do so could cause damage to the rim joist, sheathing, siding, or roof overhangs.

End Wall "Draw Strapping"

Once each section of the home has been craned (or rolled) onto the foundation, use come-a-longs to draw each unit tight to the other. Use either metal strapping loops, angle irons with holes, irons with "eyes" or similar devices attached to each end wall at the floor level near the mating wall areas.

NOTE: An insulation seal gasket has been installed at the factory along the marriage beam, end walls, and floor line. If this gasket is damaged or missing, it must be repaired or replaced before connecting the sections together.

Fastening to the Foundation

Once both sections have been placed on the basement foundation and pulled tightly together at the mate line, the home must be fastened to the foundation.

Sill Plate Connections

See Figure 6.2

A pressure treated mud sill plate should have been installed on the foundation walls by the foundation contractor per state and local building code requirements. The floor should be fastened to the "end wall" sill plates using either 16d galvanized or stainless steel nails, toe-nailed from the outside at 3" o.c., or #8 x 3" galvanized or stainless steel screws, toe-screwed from the outside at 3"o.c. Nails and screws should be driven at an angle of approximately 30 degrees with the member and started approximately 1/3 the length of the nail or screw from the member edge. See Figure 6.2, *Sill Plate Connections.*

Fasten the floor truss to the "side wall" sill plate using Simpson A23 lateral load connectors, or equivalent, fastened at all truss bottom chords (2 connectors per truss, 8 nails per connector). Simpson truss connectors and nails are supplied by Wick. See Figure 6.2 *Sill Plate Connections.*

Marriage Beam Floor Connections

The LVL marriage beams must be lagged to each other at the area just above each basement beam support post (jack post) at 32" o.c. maximum, using ⅜" x 7" lag screws. Pre-drill ¼" pilot holes to prevent damage to the beam. Lag screws are provided by Wick.
See Figure 6.3, *Marriage Beam Connections.*

See Figure 6.3

Basement Beam Post Connections

Basement beam support posts (jack posts) used to support the center line beam area must be a minimum of 3" in diameter adjustable screw-type steel, FHA listed and rated for a 10,500 lb. minimum loading. Jack posts are not supplied by Wick. Be sure to follow the foundation print for proper jack post size and spacing. Jack posts must be installed with the screw jack downward. If posts are installed before the concrete floor is poured, they will be buried below the concrete floor surface. Prior to pouring the floor, wrap scrap roofing paper or plastic sheeting around the lower area of the post. This will allow for future adjustments, if needed. If posts are installed after the concrete floor is poured, they must be adequately anchored to prevent lateral displacement. Use a minimum of two (2) ⅜" x 3 ½" anchor bolts per column installed at opposite corners of the steel plate. Fasten the steel plates to the top of each jack post securely to the marriage beams using four (4) 5/16" x 3" lag screws. Pre-drill ¼" pilot holes to prevent damage to the beams.
See Figure 6.4, *Basement Beam Support Post Connections.*

See Figure 6.4

NOTE: An additional jack post may be required for special stairwell configurations. For example, when the stairwell runs from an exterior wall toward the mate line wall and placement of a jack post interferes with the stairwell opening, the post should be moved to the side of the opening. An additional post must be placed at the opposite side of the opening.

CAUTION! If the basement floor is poured after the home is set, proper ventilation for removal of moisture from the curing of the concrete must be provided. Failure to do so could cause excessive humidity and/or moisture problems, the result of which may cause deterioration of building materials, damage to property, or unhealthy living conditions for the home occupants.

CAUTION! If a hydronic heat system has been installed in the concrete floor and the basement beam posts are installed after the concrete floor is poured, caution must be used when anchoring the beam posts to the floor to prevent damage to the heating system.

Rim Joist Insulation

See Figure 6.5

The perimeter rim joists of the exterior walls must be insulated to the same R-value as the sidewalls of the home. The side walls of Wick sectional homes are insulated with R-19 fiberglass batt insulation. Extra insulation with an R-19 value has been shipped loose with the home. Install the batts vertically. If the insulation is damaged or missing, be sure to purchase additional insulation locally ensuring that it is non-vapor barrier type and has an R-19 rating. See Figure *6.5, Rim Joist Insulation.*

Hitch, Axle & Spring Hangers

Hitches on homes with a Lindsay Floor are attached to the main I-beam steel in a manner similar to a conventional frame system. Remove the hitch. Spring hangers are mounted on the I-beam and are integral to the floor system. The spring hangers and hitch plates will remain with the home. Remove the springs from the hangers, but do not bend the hangers out of the way to obtain additional basement clearance. Remove and discard the plastic bottom board material stapled to the underside area of the floor in the tire and axle areas. Remove the axles and store as necessary.

Stairwells

The main frame I-beam crossing the stairwell area has been removed at the factory. Therefore, no cutting of the I-beam on site will be necessary. In addition, no additional basement beam posts are required at the ends of the stairwell I-beam. Stairs must be constructed to comply with the requirements of the state and/or the LAHJ.

Exterior Close-Up

Complete the close-up of the exterior roof line, end walls, and underside of the home as outlined in *Section 5.* Complete the interior finish and trim work as described in *Section 8.*

Optional Cross-Beam Frame Basement Set

Those homes with the Wick patented cross beam frame system may also be set on basement foundations. However, to facilitate basement installation, the home must be ordered with the Option 3 Package (optional bearing blocks and saddles). Steel "bearing blocks" are welded to the frame at the factory along the exterior side walls and end walls of the home. Steel "saddles" are shipped loose for field installation at the mate line.

NOTE: Stock units that are not pre-ordered with the Option 3 Package may only be retrofitted for basement set by ordering the bearing blocks and saddles from Wick. Do not attempt to set a home with the cross-beam frame on a basement foundation in any other manner.

NOTE: When using a crane to set the home, the home must be protected against damage at the crane cable lift locations. Do not attach the lift cables at the bottom of the OSB sheathing. Remove siding at the cable lift locations. Notch the sheathing and use protective angle irons. Use doubled up wood members wrapped in carpet scraps as spacers between the cables and the overhangs of the home. See *Crane Lift Cable Locations* on Page 36 for further information.

Sill Plate Connections

The home must be fastened to the sill plate at each bearing block location. Four (4) holes are pre-drilled at the factory along the bottom plate on each side of each block. Fasten the home to the sill plate using three (3) #12 x 2" lag screws, minimum, at each side of each bearing block (6 total minimum per block) along the side walls and both end walls of the home. The required fasteners are supplied by Wick. See Figure 6.6, *Sill Plate Connections (Optional Bearing Blocks for Cross- Beam Frame).*

See Figure 6.6

Basement Beam Support Post Connections

See Figure 6.7

The steel saddles that are shipped loose with the Option 3 Package are provided for installation at the top of the basement jack posts at the mate line of the home. Place a saddle on the top of each support post centered under each bearing block. After all saddles are in place, and the home is lagged together and leveled, tack weld the saddles to the bottom of the bearing block and to the top of the support post to prevent lateral displacement. See Figure 6.7, *Basement Beam Support Post Connections (Optional Saddles for Cross-Beam Frame).*

CAUTION! Welding must be performed by an experienced welder, and extreme care must be used to keep heat or sparks generated by the welding away from the wood framing members and bottom board material. Failure to do so could create a fire hazard and result in damage to the home, serious injury, or loss of life.

NOTE: If the basement beam support posts are installed before the concrete floor is poured, they will be buried below the floor surface. Prior to pouring the floor, wrap scrap roofing paper or plastic sheeting around the lower area of the post to allow for future adjustments, if needed. If the support posts are installed after the concrete floor is poured, they must be adequately anchored to prevent lateral displacement. See Page 37 for proper anchoring methods.

Rim Joist Insulation

The perimeter rim joists of the exterior walls must be insulated to the same R-value as the sidewalls of the home. The side walls of Wick sectional homes are insulated with R-19 fiberglass batt insulation. Extra insulation with an R-19 value has been shipped loose with the home. Cut the batts to size and install horizontally. If the insulation is damaged or missing, be sure to purchase additional insulation locally ensuring that it is non-vapor barrier type and has an R-19 rating. See Figure 6.5, *Rim Joist Insulation.*

Hitch, Axle & Spring Hangers

Remove the hitch, spring hangers, and springs and axles. The spring hangers and hitch plates will remain with the home. Remove the springs from the hangers, but do not bend the hangers out of the way to obtain additional basement clearance

Basement Access Stairwell

Homes with the Wick cross-beam frame system may be ordered with a stairwell opening parallel with the marriage wall. The main frame I-beam crossing the stairwell area will have been removed at the factory. When the home is placed on the foundation, a support wall must be constructed under the marriage wall adjacent to the stairwell opening. Be sure to follow the supplementary instructions provided on the foundation print for building this wall. Stairs must be constructed to comply with state and/or LAHJ requirements.

CAUTION! If a home with the Option 3 Package is not ordered with an interior stairwell, a stairwell cannot be added at a later date. In this case, access to the basement must be provided from the exterior of the home. Do not cut through the floor or the steel I-beams to create a stairwell opening from inside the home. Cutting through the floor system or steel I-beams could cause damage to the home or affect the structural integrity and/or performance of the home. Stairs for exterior basement access must be constructed to comply with state and/or LAHJ requirements.

The home must be secured against high winds after blocking and leveling has been completed. All anchoring equipment used to secure the home must be certified by a registered professional engineer or architect or a nationally recognized testing lab as to resistance based on the maximum angle of diagonal and/or vertical tie loading, the angle of anchor installation, and the type of soil in which the anchor is to be installed. The general requirements for securing the home against damage from high winds is provided in the instructions, drawings, and specifications that follow. Be sure to consult with the LAHJ to determine if there are specific requirements for anchoring in your area.

NOTE: All manufactured tie-down systems from manufacturers such as Tie Down Engineering, Vector Systems, Minute Man or others must have a stamped approval from the manufacturer for the state that the system will be used in. All instructions from the manufacturer must be followed. All installation requirements from Wick Building Systems, Inc. must also be taken into consideration when using these systems. When these systems are to be used, you must have approval from your local building inspector or LAHJ.

General Requirements for Anchoring

- Anchoring equipment must be certified by a registered professional engineer or architect as to resistance based on the installed angle of diagonal and/or vertical tie loading and angle of anchor installation and the type of soil in which the anchor is installed. Consult with the LAHJ for those proprietary systems that are approved for use in your area. Any proprietary system must be installed according to the manufacturer's installation instructions.

- Ground anchors must be embedded below the frost line and be at least 12" above the water table. Ground anchors should be installed to their full depth. Stabilizer plates should be installed to provide added resistance to overturning or sliding forces.

- Manufactured homes in Wind Zone I require diagonal frame ties placed along the main frame I-beams and below the outer side walls. In addition, longitudinal frame ties may need to be located on each main frame I-beam, front and rear. Diagonal frame ties should be as evenly spaced as practicable along the length of the home with no more than two (2) feet open-end spacing on each end. If required, longitudinal frame ties should be placed at or near the first cross member connection to the main frame I-beam.

- Protection shall be provided at sharp corners where the anchoring system requires the use of external straps to minimize damage to siding by the straps.

- Anchoring equipment must be capable of resisting an allowable working load equal to or exceeding 3,150 lbs. and shall be capable of withstanding a 50% overload (4,725lbs. total) without failure of either the anchoring equipment or the attachment point on the home.

- Anchoring equipment exposed to weathering shall have a resistance to weather deterioration at least equivalent to that provided by a coating of zinc on steel of not less than 0.30 ounces per square foot of surface coated, and in accordance with the following: (1) Slit or cut edges of zinc-coated steel strapping does not need to be zinc coated; and (2) Frame tie strapping material must be Type 1, Finish B, Grade 1 steel strapping, 1¼" wide and 0.035" in thickness and certified by a registered professional engineer or architect as conforming with ASTM Standard Specification D3953-97, Standard Specification for Strapping, Flat Steel, and Seals. The number of frame ties required varies with the length of the home.

Diagonal Frame Ties

Tie-Down Spacing

See Figure 7.1

If the home has a roof pitch of 4.3/12 or less, refer to the chart contained in Figure 7.1, *Recommended Tie-Down System Diagonal Frame Ties- Wind Zone I (Roof Pitch 4.3/12 or Less)* to determine the maximum spacing of diagonal frame ties. A diagonal frame tie must be located no more than 2' 0" from each end of the I-beam. Space all other ties as shown in Figure 7.1.

See Figure 7.2

If the home has a roof pitch greater than 4.3/12, refer to the chart contained in Figure 7.2, *Recommended Tie-Down System Diagonal Frame Ties- Wind Zone I (Roof Pitch Greater than 4.3/12*) to determine the maximum spacing of diagonal frame ties. A diagonal frame tie must be located no more than 2' 0" from each end of the I-beam. Space all other ties as shown in Figure 7.2.

See Figures 7.9 & 7.10

For Tag units, diagonal frame ties must be located at 10' 0" o.c. maximum spacing. A diagonal frame tie must be located no more than 2'0" from each end of the I-beam. See Figure 7.9, *Recommended Tie- Down System –Single Section With Tag Unit* and Figure 7.10, *Recommended Tie- Down System –Multi- Section With Tag Unit.*

Tie-Down Installation

Step 1.

Determine the location of frame ties required as described on the previous page. Install single-headed ground anchors and frame ties at the required tie- down locations with the anchor under the perimeter of the home. *Do not tighten!*
See Figure 7.4 (a), *Tie-Down Attachment Details, Diagonal Frame Ties.*

See Figure 7.4 (a)

Step 2.

If the home is equipped with optional over-the-roof ties, install a separate ground anchor under the rim of the home on each side of the home. Anchors must be inset from the exterior line of the home to accommodate skirting installation. Connect the over-the-roof ties to the anchors. *Do not tighten!*
See Figure 7.4 (b), *Tie-Down Attachment Details, Over-The-Roof Ties.*

See Figure 7.4 (b)

Step 3.

With one person on each side of the home, start at the front of the home and simultaneously tighten straps on both sides.

NOTE: See Figures 7.4 (a) and (b) for methods in common use and effective for securing the home against high winds. These illustrations are general anchoring methods. Be sure to consult with the LAHJ for other appropriate or required methods.

CAUTION! Straps must be tightened simultaneously on both sides of the home. Do not tighten straps on only one side of the home at a time. Failure to tighten the straps simultaneously on both sides could cause the home to slide off the piers resulting in damage to the home, serious injury or loss of life.

Longitudinal Frame Ties

Tie-Down Spacing

See Figures 7.5, 7.6 & 7.7

When required, a longitudinal frame tie must be located at or near the first cross member connection to the main frame I-beam, front and rear, on each unit(s). See Figure 7.5, *Recommended Tie-Down System- Longitudinal Frame Ties, Single Section Homes*, Figure 7.6, *Recommended Tie-Down System- Longitudinal Frame Ties, Multi- Section Homes (Roof Pitch 4.3/12 or Less),* and Figure 7.7, *Recommended Tie-Down System- Longitudinal Frame Ties, Multi- Section Homes (Roof Pitch Greater Than 4.3/12).*

See Figures 7.9 & 7.10

When required for Tag units, one (1) longitudinal frame tie must be located at each end of the unit. The ties may be located anywhere along the length of the unit so long as the strap directions are opposite from each other. See Figure 7.9, *Recommended Tie- Down System-Single Section With Tag Unit* and Figure 7.10, *Recommended Tie- Down System –Multi- Section With Tag Unit.*

Tie-Down Installation

See Figure 7.8

Select a cross member where piers do not interfere with the required angle of the strap. Install the strap just inside the main frame I- beams looped around the cross member and tied to an anchor located directly under the main frame I-beam at the angle specified. If the angle cannot be obtained, install the anchor with an approved stabilizing plate. See Figure 7.8, *Tie-Down Attachment Details, Longitudinal Frame Ties.*

NOTE: See Figure 7.8 for methods in common use and effective for securing the home against high winds. This illustration is a general anchoring method. Be sure to consult with the LAHJ for other appropriate or require methods.

Exterior Finish Work

Shingled Roof

All Wick manufactured home roofs are sealed around vents, stacks, and other flashings prior to shipment from the factory. These areas must be examined and resealed, if necessary, to prevent leaks that can result from vibration experienced during transit of the home. The shingle hold-down straps should be removed, and all penetrations from staples or other fasteners should be sealed. If the home was constructed with a specialty roof design that requires completion on site, be sure to follow the supplemental instructions provided.

Bottom Board Repair

Check plumbing 'p' traps to ensure that they are well insulated and covered. The bottom board material covering the underside of the home must be inspected for any rips, tears, or other damage that may have occurred during shipment or set-up and repaired as necessary. *Do not use duct tape!* It will not adhere properly to the bottom board material. The following tapes are compatible with and approved by the manufacturer (Raven Industries) of the bottom board material (Canvex CW600): 2" wide Polyken #223 or Polyken #281 and United Tape #UT-145-C and/or equivalent. The area to be repaired must be clean and dry. For tears larger than the width of the repair tape, use a patch consisting of the same or equivalent bottom board material cut a minimum of three (3) inches larger in each dimension than the damaged area. Attach with an approved tape centered over the patch at each side. Alternatively, an approved bottom board patching material, such as Canvex Seal patching and sealing material may be used. Cut the patch material a minimum of three (3) inches larger in each dimension than the size of the damaged area. Be sure to thoroughly clean and dry the bottom board before application of patching materials. Peel off the paper backing as the patch is applied to assure proper adhesion. Best results are obtained when temperatures are between 50° and 120° F.

Patches and/or repair tapes can also be applied using a contact adhesive, such as 3M High Strength #90 spray adhesive. Be sure to thoroughly clean and dry the bottom board before application of patching materials. Cut the patch a minimum of three (3) inches larger in each dimension than the damaged area. Two coats of adhesive should be sprayed on both the patch material and the bottom board, with the second coat applied perpendicular to the first. Allow the adhesive to set for several minutes, then carefully apply to the repair area. Press firmly to assure proper adhesion and to remove as many air pockets and wrinkles as possible.

Skirting Installation

Skirting should be secured as necessary to assure stability. In frost-susceptible areas, the installation should allow for frost heave ground movement. An access should be provided and located so that water supply and sewer drain connections can be inspected or repaired when necessary. Before you skirt the crawl space, remember to install a vapor barrier on the ground under the home.

Vinyl Skirting

If you install vinyl skirting such as the T-Lok ® brand skirting on vinyl-sided homes, a 2" opening should be provided where fasteners pass through the siding to allow room for expansion and contraction of the siding.

If the bottom row of siding is cut to accommodate installation of the top trim mounting piece, the mounting piece must be installed so that the nail slots are located "below" the cut edge of the bottom of the siding. Do not nail the lower 1" flange of the vinyl to the sheathing, and do not drive the nails directly into the siding.

If the bottom row of siding is not cut to accommodate installation of the top trim mounting piece, pre-drill ½" to ¾" slots or holes in the siding where nails will pass through the mounting piece and the siding. Do not install the fasteners directly into the siding and top trim piece. Nails must be installed through the slots provided in the top trim mounting piece and the pre-drilled holes made in the siding, and they must be driven loosely.

CAUTION! When attaching skirting to vinyl sided homes, do not install fasteners directly into the siding and top trim mounting piece. Slots for fasteners must be pre-drilled in the siding to allow for normal expansion and contraction of the siding. Fasteners must be installed through the slots. Failure to do so could cause the siding to buckle or otherwise affect the appearance of the siding.

Wood, Aluminum or Fiberglass Skirting

If you install wood, aluminum or fiberglass type skirting, a skirt rail should be installed at the bottom of the floor for attachment of the skirting. This skirt rail should be set in at least 1½" to 1¾" from the edge of the siding. (Generally, the siding will extend below floor level). When the home is sided with wood type siding products, the skirting must be attached in a manner that does not allow water to become trapped between the siding and receiver strip.

Crawl Space Ventilation

The crawl space skirting or foundation walls must provide adequate ventilation to prevent moisture accumulation under the home. The amount of ventilation obtained from your venting will depend on the type and size of the vent installed and the type of covering over the vent opening, such as wire mesh, screen or louvers. Some vinyl skirting products offer pre-vented skirting panels. You should refer to the skirting or vent manufacturer's specifications to determine the amount of free area your ventilation system will provide.

Ventilation openings should be installed as "high" as reasonably practicable, but not higher than the bottom of the floor of the home. To assure cross ventilation, the openings or pre-vented skirting panels should be installed within three (3) feet of each corner of the home and spaced equally along the side walls and end walls.

Ventilation openings should be covered with a corrosion resistant wire mesh or with screened or louvered openings to prevent entry of dry vegetation, waste materials or rodents. The minimum amount of ventilation required is one (1) square foot of free area ventilation for every 1,500 square feet of crawl space area. To compute the total amount of required free area ventilation, divide the total square footage of the home by 1,500, and always round up! See Figure 8.1, *Crawl Space Ventilation.*

See Figure 8.1

An opening must be provided in the skirting to allow access for maintenance of all utility connections located under the home. The access opening must be a minimum of 18" wide and 24" high and be a minimum of three (3) square feet in area.

CAUTION! A poly vapor barrier must be installed on the ground in the crawl space. Failure to install a crawl space vapor barrier could cause excessive humidity and/or moisture problems the result of which may cause deterioration of building materials, damage to property, or create unhealthy living conditions for the home occupants.

Example Ventilation Calculations:

Assuming the home is a 15' 6" x 80':
15' 6" x 80'= 1240 sq. ft. of crawl space area
1240 ÷ 1500 = .83 sq. ft. (round up to 1.0)
1.0 x 144 = 144 sq. in.

Assuming the home is a 27' 4" x 56':
27' 4" x 56' = 1526 sq. ft. of crawl space area
1526 ÷ 1500 = 1.02 sq. ft. (round up to 1.5)
1.5 x 144 = 216 sq. in.

Interior Finish Work

Complete interior marriage wall close-up and other interior finish work as described below.

Marriage Wall Close-Up (Archway Without Swinging Door)

Prior to trimming, some minor shimming may be necessary to level up one marriage wall with the other. Panel strips are provided for this purpose. Using a bar clamp, draw together or shim apart the walls at the doorway opening as necessary to make the opening uniform from top to bottom. Tie the marriage walls together using short pieces of the metal banding material cut from the doorway openings. Install three (3) bands per side, fastened with four (4) 2" roofing nails per band.

Marriage wall archways are finished with a three (3) piece capped jamb assembly except for those homes ordered with drywall close up. Drywall close-up will have drywall pieces and either metal mesh or plastic bullnose corners shipped loose for finishing on site. Complete the close up finish work using the supplemental instructions provided.

Marriage Wall Close-Up (With Swinging Door)

Doorway openings for interior passage doors at marriage walls will have factory installed swinging doors and trim on one section of the home. The other section will arrive without any completed trim work. Using a bar clamp, draw together or shim apart the walls at the doorway opening as necessary to make the opening uniform from top to bottom. Tie the marriage walls together using short pieces of the metal banding material cut from the doorway openings. Install three (3) bands per side, fastened with four (4) 2" roofing nails per band.

Door jamb material is shipped loose with the home. Cut the door jamb material to size and install according to the supplemental instructions provided. If the home is ordered with laminate flooring, the marriage wall passage doors will be either shipped loose or temporarily installed for final installation after the floor is completed on site. If installed temporarily, they must be reinstalled after the flooring is completed.

Mate Line Floor Decking Close-Up

Before any floor covering connections can be completed at the marriage wall of multi-section homes, the floor decking between each section must be prepared. The floor decking will be cut back at the archway and door openings. Remove those pieces that have been pre-cut. Measure the width of the opening and cut to size the pieces of decking shipped with the home. Install the decking pieces at the floor line using minimum 1½" screws, 1½" staples, 8d nails or equivalent fasteners. See Figure 8.2, *Marriage Wall Floor Decking Close-Up.*

See Figure 8.2

Floor Connection- Carpet-to-Carpet

Most homes will have carpets fully installed in each section of the home with seaming necessary only at the marriage line area. You may have to add to or cut off the carpet pad at the marriage line to ensure a tight fit. Tape or staple the carpet pad together to secure it in place. Carefully cut the carpets at the marriage line area and seam the splice (seam tape is not provided by Wick). After the splice has been seamed, remove the temporary scrap material that was installed at the factory to hold the carpet in place, taking care not to damage the carpet.

Floor Connection- Carpet-to-Vinyl

For those homes featuring carpet-to-vinyl at the marriage line, mark a line where the desired finished carpet edge will lie. Fold an approximate 1" edge of carpet and staple to the vinyl flooring using carpet staples. Be sure the pad under the carpet is lined up near but not directly under the folded area.

Floor Connection- Vinyl-to-Vinyl

For those homes featuring areas where vinyl flooring meets vinyl flooring at the marriage line, install the wood threshold shipped with the home over the center of the splice.

Floor Connection- Laminate-to-Laminate, Vinyl or Carpet

For those homes with laminate flooring, complete the finish work following the flooring manufacturer's installation instructions provided with the shipped loose flooring.

General Interior Trim

Baseboard mouldings along the floor area of the marriage wall may require onsite installation. These additional mouldings will either be "tacked" to the adjacent wall or shipped loose with the home. Whenever possible, replace an existing moulding as opposed to splicing short lengths of moulding.

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Only qualified service personnel, familiar with local codes and licensed where required, should make utility connection and conduct tests. Be sure to consult with the LAHJ for any specific requirements before installing and connecting utility systems.

Heat Duct Crossover

Heat Duct Crossover– Cross-Beam Frame

For those sectional homes where the furnace is installed at the factory, it is a down draft type installed on the main floor of one section of the home. It is connected to the main heat duct for the entire length of the home. All heat ducts to the opposite section of the home must be connected using the 12" crossover flex duct shipped loose with the home. The main drop form the crossover will be located under the furnace. This drop has been covered at the factory with a piece of aluminum for shipping purposes. Remove this temporary piece and slide the flex duct over the collar. Fasten with a minimum of three (3) #8 x ½" galvanized screws and a draw strap (shipped loose) to hold it in place. Pull the insulation wrap up tight to the bottom board material and use a draw strap to fasten tight to the collar. Complete the same procedure on the other section of the home. Never allow the flex duct to come in contact with the ground or the concrete slab. Place some Styrofoam or other type of sheathing between the duct and the ground as necessary. If space allows, construct a support using 1 x 3's or 2 x 3's placed under the heat duct work and fastened to the underside to prevent sagging. See Figure 9.1, *Heat Duct Crossover- Cross-Beam Frame.*

See Figure 9.1

Heat Duct Crossover- Tag Unit

You will find the heat duct crossovers under the main body of the home and on the Tag unit next to the marriage beams. These flex ducts have been connected to the main duct at the factory. Pull the ducts together and connect using the collars and draw bands shipped loose with the home. Be sure to pull the ducts tight and cut off any excess duct material. In the ship loose parts you will also find an insulated wooden box to cover the exposed duct work. With the insulation in place, install the box over the duct work and push up tight to the rim joist. Screw in place through the wood flange using #8 x 3" galvanized or stainless steel screws, minimum two (2) on each side. See Figure 9.2, *Heat Duct Crossover- Tag Units.*

See Figure 9.2

Heat Duct Crossover-Lindsay Floor

If the furnace is factory installed, it will be a down draft type installed on the main floor and completely hooked up to one section of the home. The flex ducts for the opposite section will be coiled up at the marriage wall for on-site installation. Feed the ducts through the cut-outs in the marriage beam filler board and fasten to the main heat duct on the opposite section of the home using the ship loose draw straps. Be sure to pull the ducts tight and cut off any excess duct material. See Figure 9.3, *Heat Duct Crossover- Lindsay Unified Floor System.®*

See Figure 9.3

Water & Drainage System Crossovers

Plumbing lines are run inside the framing of the floor trusses. In some situations where the plumbing pitch cannot be achieved inside the framing of the floor, small lengths of plumbing will extend beneath the floor. Many models have plumbing lines that must cross over from one section to the other. In some cases, it may simply be a water line. In other cases, it may be both water and drain lines. Holes have been precut through the filler board above the center beam in either case. Fittings for the connection of the water lines are already connected to stub lines. Fittings for the connection of the drainage and waste lines are shipped loose for assembly on site. Complete the crossover connections for the water lines and drainage and waste system as outlined below.

Water Line Crossover

See Figure 9.4

Water lines are capped off and will require hook-up on site. Remove the shipping caps from the water lines and install the crossover connectors as required. Be sure the hot and cold water lines are not cross-connected. See Figure 9.4, *Water Line Crossover.*

Drain Line Crossover

See Figure 9.5

The crossover drainage pipe and fittings are provided with the home. Connect this piping using the appropriate pipe cement. See Figure 9.5, *Drain Line Crossover.*

NOTE: Some drain line crossovers may occur through the mate line rim joist and are visible only through an access panel at the rim joist area.

Water & Drain System Connection & Testing

The water and drainage systems in all Wick manufactured homes are tested for leaks at the factory. When connected at the site, or following any move, they must be retested for leaks that could result from road vibration experienced during transport. All visible water lines, drain lines, and 'p' traps should be checked to ensure that they are free from leaks. All sinks, basins, showers, tubs, and toilets should be checked to verify that they operate properly. The hot and cold water lines should also be checked to verify that they are properly connected to fixtures. If the home is a multi-section, make sure the crossover connections have been completed before you proceed.

CAUTION! Failure to properly connect and test the water and drainage system could result in leaks or flooding that can cause deterioration of building materials, damage to property or unhealthy living conditions for the home occupants.

Water System Maximum Supply Pressure & Reduction

The water system in Wick manufactured homes is designed and intended to operate at pressures not exceeding 80 psi. If the local water supply exceeds 80 psi, a pressure-reducing valve must be installed at the water inlet.

Connection Procedures

The water system can be connected to any safe, reliable water source through the ¾" inlet pipe fitting under the home. The inlet pipe is identified by a tag on the outside of the home. An accessible shut-off valve must be installed between the water supply and the inlet. The shut-off valve must be a full-flow gate or ball valve or equivalent. To prevent sagging, the connecting water lines must be supported at 3' 0" maximum intervals.

Testing Procedures

Even though the water system was tested at the factory, it must be tested again for leaks at the installation site. The recommended test by the manufacturer of the Zurn PEX plumbing system utilized by Wick is with pressurized water. This is the best and safest method for testing on this type of system. However, this does not prohibit the installer from choosing to perform an air test instead of a water test. Before testing, close all water faucets, spigots, and stool tank float valves.

Hydrostatic (Water) Test

Be sure the water heater tank is full of water. Pressurize the system with water at 100 psi, and then isolate it from the pressure source. The system must hold this pressure for at least 15 minutes without any loss of pressure. If the pressure falls off, re-pressurize the system and locate and correct all leaks.

Pneumatic (Air) Test

Hook the cold inlet and hot outlet lines on the water heater tank together. Connect an air pump and pressure gauge to the water inlet and pressurize the system to 100 psi. The maximum test pressure with air should not exceed 125 psi. Isolate the pressure source from the system. The gauge must stand for at least 15 minutes with no drop in pressure. Locate and correct any leaks using ultrasonic leak detection instruments or the following liquid leak detector solution. "Dilute no more than two (2) ounces of green Ultra Palmolive ® Original Scent Concentrated dishwashing liquid in one gallon of potable water." Spray this solution on all fitting connections to locate leaks. After all leaks have been located and corrected, reconnect the water heater and water supply.

CAUTION! When performing the pneumatic test procedure, you must bypass the water heater tank by hooking its cold inlet and hot outlet lines together. Failure to do so could cause damage to the water heater. With air testing there are significant safety hazards, and the installer must use adequate safety precautions to protect everyone in or around the system during testing. Do not use Palmolive ® dishwashing liquid full strength or other chemical solutions on Zurn Pex plumbing systems.

Freezing Protection

In areas where temperatures drop to freezing and below, the water supply system should be installed below the frost line, and all exposed sections of the water supply piping, connections, shut-off valves, and pressure reducers must be protected from freezing by wrapping with insulation or with the installation of a heat tape.

Heat tapes, either automatic or non-automatic, can be used to protect exposed plumbing from freezing. Use only heat tapes listed by a nationally recognized testing laboratory for use with manufactured homes. Heat tapes must be installed in accordance with the manufacturer's instructions.

CAUTION! Failure to install a heat tape which is approved for use in manufactured homes could create a fire hazard, the result of which may cause damage to the home, serious injury or loss of life.

Automatic Heat Tape

Use automatic heat tape that is approved for installation on all types of water pipe, including non-metallic type. Secure it to the pipe, and insulate and weatherproof it according to the manufacturer's instructions.

Non-Automatic Heat Tape

Non-automatic heat tape may not be suitable for non-metallic type pipes unless it is left exposed with no outer insulation wrap. Check with the manufacturer to assure that it is approved for use with non-metallic pipe and for the proper installation method.

Drainage System

Piping from the outlet to the site connection of the drainage system must be installed with sufficient slope to prevent the possibility of water standing in the pipe. If the home is a multi-section, make sure the cross-over connection has been completed before you proceed.

Connection Procedures & Proper Slopes

Materials and instructions to complete the drainage system may be shipped loose with the home if portions were not completed at the factory. Start at the most remote end and work toward the outlet, supporting the piping with temporary blocking to achieve the desired slope. Drain lines must slope at least ¼" per foot of run. Check for proper slope using a level. When a clean-out is installed at the upper end of the run, ⅛" per foot slope is allowed. Connect the main drain line to the site sewer hookup using an approved elastomer coupler. When the entire system has been completed, install permanent drain line supports at 4' 0" o.c. See Figure 9.6, *Drain Line Sewer Connection.*

See Figure 9.6

Solvent Welding Procedure

The solvent cement used to connect any site-installed drain lines must be compatible with the pipe installed in the home. Follow the manufacturer's instructions on the container.

Protection From Freezing

Wick has insulated fittings in the drainage system subject to freezing, such as 'p' traps in the floor. Be sure to replace this insulation if removed during assembly or testing. Wick recommends insulating any drain lines installed below the bottom board in areas subject to extreme freezing temperatures.

Drainage System Testing

Even though the drainage system was tested at the factory, it must be checked again for leaks before making the final connection to the site sewer.

Gas Fuel Supply System

All Wick manufactured homes with gas fuel supply systems are shipped natural gas ready. Special orifices and regulators are required for the use of LP gas at altitudes above 3,000 feet. See the instructions accompanying each gas-fueled appliance for modifications. Before making any connection to the site supply, check the inlet orifice to all gas appliances to ensure that they are correctly set up for the type of fuel to be supplied. If the home is a multi-section, make sure the gas line crossover connection has been completed before you proceed.

NOTE: Where LP gas is utilized for the fuel supply, use only LP gas or butane cylinders or "bottles" bearing the approval marking of either the U.S. Department of Transportation (DOT) or the American Society of Mechanical Engineers (ASME). DOT cylinders are acceptable in most states. Consult with your local LP gas supplier for requirements in your state concerning the proper cylinder to use.

Gas Line Crossover

See Figure 9.7

Connect the gas line flex connector where applicable. Do not use tools to connect or remove the flexible connector quick disconnect. See Figure 9.7, *Gas Line Crossover.*

Proper Supply Pressure

All Wick manufactured homes are designed for a gas supply pressure range of at least 7" and not greater than 14" of water column. If gas from any supply source exceeds this pressure, a regulator may need to be installed as required by the LAHJ.

Gas Conversion

All gas fueled appliances must be carefully adjusted to accommodate the type of fuel being used by installing the proper orifice for the appliance. Orifices are attached to each appliance and should be installed in accordance with the instructions provided by the appliance manufacturer.

CAUTION! Failure to properly adjust or convert a gas fueled appliance to accommodate the type of fuel being used could cause damage to the home or result in serious injury or loss of life.

Connection Procedure

The gas system should only be connected to the gas supply by an authorized representative of the gas company. Before connecting to the site supply, inspect all gas fueled appliance vents to ensure proper connection to the appliance. Make sure roof jacks and stacks have not come loose during transport, or that they are properly installed on-site if they were not installed at the factory.

NOTE: Certain specialty roof systems such as hinged roofs may require on-site installation of stacks and roof jacks before connection to the supply source.

Testing Procedure

The gas supply systems in Wick manufactured homes are tested for leaks at the factory. The gas supply system must be retested for leaks or loose connections that could result from vibration during transport when the system is connected to the main gas supply at the site. Before connecting to the main gas supply, conduct one of the following two tests when air and piping temperatures are nearly equal and will remain stable.

CAUTION! Failure to properly test the gas supply system, including the incoming fuel lines, connections, and appliance valves and controls, could cause damage to the home or result in serious injury or loss of life.

Piping Only Test

Close all appliance shut-off valves. Attach a pressure gauge calibrated in ounces at the gas inlet. Pressurize the system with air to at least 3 psi (48 oz). Isolate the pressure source from the system. The gauge must stand for at least 10 minutes with no drop in pressure. If any pressure loss occurs, check all joints in the piping system and at all shut-off valves with a non-corrosive solution such as Oatey All Purpose Leak Detector, until leaks(s) are located. Repair any leaks found and retest until the pressure holds.

System Test

Close all gas equipment controls and pilot light valves according to the individual gas equipment manufacturer's instructions. Assure that gas shut-off valves for all gas equipment are in the OPEN position. Attach a pressure gauge calibrated in ounces to the gas inlet. Pressurize the system with air to at least 6 oz. Check all gas shut-off valves and flex line connections to valves and appliances for leaks using a non-corrosive solution such as Oatey All Purpose Leak Detector. Repair any leaks found and retest the system. Upon completion of the test, close all equipment shut-off valves.

NOTE: Never bubble-check brass fittings with solutions containing ammonia. The instructions for testing the gas system are printed on a tag near the gas supply inlet. Some local jurisdictions or utility companies may have additional requirements for testing the gas supply system. Consult with the LAHJ for any other testing requirements in your area.

Gas Appliance Start Up

One at a time, open each equipment shut-off valve, light pilots and adjust burners according to each appliance manufacturer's instructions. Check the operation of the furnace and water heater thermostats and set them to the desired temperatures.

CAUTION! The water heater tank must be completely filed with water before lighting the pilot. Failure to do so could cause damage to the tank or the heating element.

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The design of the electrical system in all Wick manufactured homes complies with the requirements of the National Manufactured Home Construction and Safety Standards (HUD code) and the applicable sections of the National Electrical Code (NEC). All service equipment and electrical connections must meet the requirements of these codes and be installed by a qualified electrician who is familiar with them.

CAUTION! Failure to comply with applicable electrical codes in the installation of electrical service equipment and connection of the electrical power supply could create a fire hazard and result in damage to the home or the electrical system, serious injury, or loss of life.

An electrical power supply large enough to meet the needs of the home must be available at the site. The current rating of the home (in amperes) can be found on a tag located outside the home next to the feeder or service entrance, and on the electrical distribution panel board. If the home is a multi-section or includes a Tag unit, make sure you have completed the electrical crossover connections and bonding of the frames before you proceed.

CAUTION! Failure to provide the proper size power supply for the home could result in improper operation of the electrical system. If the home is a multi-section or includes a Tag unit, be sure to complete the electrical crossover connections and bonding of the frames before supplying power to the home. Failure to do so could create a fire hazard and result in damage to the home or the electrical system, serious injury, or loss of life.

Electrical Crossover

The crossover locations can be distinguished by access cover panels at the mate line wall. Remove these panels and connect the enclosed wires. Certain electrical crossovers simply plug together and do not require junction boxes. These circuits are pre-wired to special snap-loc devices that snap together for quick hook up of each circuit. Those homes with #10 wire or larger crossovers will require connections through an approved junction box. See Figure 10.1, *Electrical Crossover.*

See Figure 10.1

Telephone & Other Wiring Crossovers

Other wiring, such as telephone, doorbell and stereo speaker wire crossovers, are also accessible at the mate line wall electrical access panel. Tie all such wiring, as necessary, per the wire color coding. For those homes ordered with CAT5E phone line cables, complete the crossover connections as shown in Figure 10.2. See Figure 10.1, *Electrical Crossover*, and Figure 10.2, *CAT5E Phone Line Crossover.*

See Figures 10.1 & 10.2

Chassis Bonding

See Figure 10.3

After the electrical and other wiring crossovers have been completed, complete the bonding of the steel frames between each section of the home. See Figure 10.3, *Bonding of Multi-Section Chassis.*

Smoke Alarms

See Figure 10.4

For those homes designed with the Lindsay Floor system or the Optional Cross Beam Frame Basement Set (Option 3 Package), a smoke alarm for the basement is provided with the ship loose materials. A pre-wired junction box interconnecting the basement level smoke alarm with those on the main level is temporarily attached to the LVL beam or the bottom chord of one of the floor trusses. Install the junction box and alarm on a framing member near the stairwell. Connect the basement alarm to the main electrical service by connecting the wires in the junction box; black-to-black, white-to-white, and yellow-to-red; to complete the signal to the other alarms in the home. For all other homes, smoke alarms are pre-connected at the factory and no further connections are required. See Figure 10.4, *Basement Smoke Alarm Connection.*

Exterior Light Fixtures

See Figure 10.5

To install exterior light fixtures, remove the junction box covers and make wire-to-wire connections using wire nuts. Connect wires, black to-black, white-to-white, and ground–to-ground. Push wires into box and secure the fixture to the junction box. Install the light bulb and attach the globe. Exterior grade caulking must be applied around the base of the light fixture to ensure a water-tight seal to the side wall. See Figure 10.5, *Exterior Light Installation.*

Ceiling Fans

Optional ceiling fans are shipped loose for on-site installation. Follow the installation instructions provided with the unit for proper mounting and wiring connections. Ceiling fans must be installed so that the trailing edges of the paddle blades are at least 6' 4" above the finished floor. When a fan is located at a marriage archway (for sectional homes) an exposed length of NM electrical wire will be visible at the area of the archway. A hardwood block with a pre-drilled hole for the fan junction box will be included with the ship loose material. Install the hardwood block at the fan location and butt the archway close-up material to the block. Be sure to attach the hardwood block and the metal junction box to the framing of the archway so the unit is well secured. Discard this block if the close-up is drywall.

Basement Light

For those homes designed with the Lindsay Floor system or the Optional Cross Beam Frame Basement Set (Option 3 Package), a length of NM electrical wire connected to a three-way switch in an electrical box is provided for use in the basement. The switch is temporarily attached to the bottom chord of one of the floor trusses near the stairwell. Install the switch on the support wall at the bottom of the stairs. Stairs and support walls must be constructed to comply with state and/or LAHJ requirements.

Rating of House Wiring

All Wick manufactured homes are equipped for 100 amp service or greater and designed for connection to an electrical system wiring rated at 120/240 volt AC. The connection will be a "feeder" type requiring wiring at the site. All wiring must be U.L. listed. Conductors and raceways are sized for copper 4-wire service. The following paragraphs describe the wiring and grounding of the electrical feeders. Consult the current National Electrical Code, Section on Manufactured Homes, for further information.

Feeder Conductors

The label on the electrical distribution panel board gives the feeder capacity in amperes. The ampere rating of the service panel must not exceed the power supply assembly rating. The provisions of the NEC require manufactured home feeder conductors to be permanently installed feeder consisting of a listed cord or four color-coded insulated conductors that must be identified in accordance with the National Electrical Code. Do not use a three-wire feeder system that does not connect to the ground bar in the electrical distribution panel board.

CAUTION! Feeder conductors for manufactured homes must consist of four insulated color-coded conductors identified in accordance with the National Electrical Code. Do not use a three-wire feeder system that does not connect to the ground bar. The neutral and ground must be kept separate. Failure to use the proper feeder system could create a fire hazard and result in damage to the home or the electrical system, serious injury, or loss of life.

Connection Procedures

See Table 10.1 & Figure 10.6

All Wick manufactured homes come with an under-the-floor entrance with a permanently attached conduit raceway that runs from the electrical distribution panel board to a point under the floor. Install properly sized conductors from the main power supply to the distribution panel board. Determine the required feeder size using Table 10.1. Protect conductors emerging from the ground from a minimum of 18" below grade to 8' above grade, or to the point of entrance to the home. The distance measured from the top surface of a buried cable, conduit or raceway to the finished grade must meet minimum burial requirements outlined in the National Electrical Code. Use a moisture-proof bushing at the end of the conduit from which the buried cable emerges. See Table 10. 1, *Electrical Wire Feeder & Junction Box Size* and Figure 10.6, *Typical Meter Base Connection.*

Service Entrance Equipment (Meter Base)

See Figure 10.6

Wick does not supply the service entrance equipment (meter base). All equipment provided must be weatherproof, and conductors must be suitable for use in wet locations. The meter base must be free-standing and cannot be attached to the home. See Figure 10.6, *Typical Meter Base Connection.*

CAUTION! The service entrance equipment (meter base) for manufactured homes must be free-standing and cannot be attached to the home. Failure to properly install the service entrance equipment (meter base) could create a fire hazard and result in damage to the home or the electrical system, serious injury, or loss of life.

Electrical Panel Board Grounding

See Figure 10.6

The electrical distribution panel board in the home is wired with the grounding system insulated from the neutral system. Both the electrical and non-electrical metal parts of the home must be grounded properly through the ground bar. Neither the frame of the home nor the frame of any appliance shall be connected to the grounded circuit conductor (neutral) in the home.

The neutral (white) conductor must not be connected to the equipment ground. Insulate the grounded circuit conductor (white wire) from the grounding conductors (green wires) and from equipment enclosures and other grounded parts. Insulate neutral circuit terminals in the distribution panel board, and in ranges, clothes dryers, and counter- mounted cooking units, from the equipment enclosure. Bonding screws, straps, or buses in the distribution panel board or in appliances must be removed and discarded. This is typically already done at the manufacturing facility. See Figure 10.6, *Typical Meter Base Connection.*

NOTE: Grounding is not required on the inlet of a non-metallic water system or on plumbing fixtures such as tubs, faucets, shower risers, and metal sinks when they are connected only to non-metallic water and drain piping.

CAUTION! Never use the neutral conductor of the feeder cable as a ground wire. Do not ground the neutral bar in the electrical distribution panel. Failure to properly ground the electrical system could create a fire hazard and result in damage to the home or the electrical system, serious injury, or loss of life.

Meter Base Grounding

See Figure 10.7

The following information describes one method of grounding the meter base. Be sure to check state and local codes and the LAHJ for other grounding methods that may be required in your area. Wick does not supply the service entrance equipment (meter base), grounding electrode or grounding conductors. The grounding electrode should be either a ½" diameter stainless steel, copper clad steel or copper rod, ¾" diameter galvanized pipe or conduit, or ⅝" diameter iron or steel rod. The electrode shall be installed so that at least 8 feet of length is in contact with the soil and driven to a depth of not less than 8 feet, except that, where rock bottom is encountered, the electrode shall be driven at an oblique angle not to exceed 45 degrees from the vertical or shall be buried in a trench that is at least 2½ feet deep. The upper end of the electrode shall be flush with or below ground level unless the above ground end and the grounding electrode conductor attachment are protected against physical damage. Connect the grounding conductor wire to the grounding electrode with a grounding clamp. See Figure 10.7, *Example- Meter Base Grounding Method.*

System Testing & Equipment

The electrical system in all Wick manufactured homes is inspected and tested at the factory. Before the electrical system is connected to the main power supply at the site, the following tests must be conducted using approved testing equipment.

Pre-Connection Tests

Conduct the following tests *before* electrical power is supplied to the home:

Grounding Continuity Test

Using a continuity tester, test all non-current carrying metal parts to assure continuity to ground. The parts to be checked include:

- ☐ Appliance enclosures, including fans
- ☐ Fixture enclosures and canopies
- ☐ Metal gas lines
- ☐ Metal ducts (except foil-covered insulated ducts)
- ☐ Frame of the home.

Circuit Conductor Continuity Test

Conduct a continuity test by placing all branch circuit breakers and switches controlling individual outlets in the ON position. This test should give no evidence of a connection between any of the supply conductors (including the neutral) and the grounding circuit. A flashlight-type continuity tester may be used.

Post-Connection Tests

After the electrical system has been connected to the main electrical power supply, turn on the main circuit breaker and each individual circuit breaker, and conduct the following tests:

CAUTION! Be sure to fill the water heater tank completely with water before activating the water heater circuit. Failure to do so could cause damage to the water heater tank or heating element.

Polarity and Grounding of Receptacles

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

Ground Fault Circuit Interruption (GFCI)

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

Operational Checks

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

Smoke Alarm Operational Test

After the electrical crossover connections have been completed and the home is connected to the main power supply, all smoke alarms must be tested as follows:

- ☐ Observe the green LED. A constant green indicates the smoke alarm is receiving power.
- ☐ Firmly depress the "Push to Test" button for at least 5 seconds. The smoke alarm will beep and all interconnected smoke alarms should beep within 3 seconds after any test button has been pushed.

Repeat this test from all smoke alarm locations. If a smoke alarm does not beep during the test, check for proper connection to the power and/or refer to the troubleshooting section of the alarm manufacturer's written instructions. Retest the alarm. If it still doesn't beep, replace the alarm with the same brand and model number, and test the new alarm until it works as described above.

Air Conditioner

If the air distribution system has been designed for central air, all site-installed equipment must be listed or certified by a nationally recognized testing agency and must not exceed the BTU/hr. rating shown on the HUD Data Plate. Site- installed air conditioning equipment must be sized to meet the home's heat gain requirement, in accordance with Chapter 28 of the 1997 ASHRAE Handbook of Fundamentals or ACCA Manual J. The electrical system may contain optional factory-installed circuits for air conditioning. The maximum full load ampere draw for the desired unit must not exceed the circuit rating shown. If the electrical circuits are not sized for the additional load of non-factory installed air conditioning, a separate outside electrical supply may have to be provided. Local codes will determine the acceptability of the equipment, rating, location of disconnect, circuit protection type, and connections to the equipment. 'A' coil units must be compatible and listed for use with the furnace in the home. Follow the manufacturer's installation instructions for all site-installed cooling systems, heat pumps and related equipment. Be sure to direct condensation runoff away from the home by connecting a hose to the equipment runoff outlet or by other means specified by the manufacturer.

Factory-Installed Furnace

The roof cap for factory installed furnaces is shipped loose with the home. Install the roof cap according to the manufacturer's installation instructions. The instructions are provided on a tag attached to the furnace. In some home situations, such as the site completion of a hinged roof, portions of the furnace stack may also have to be installed on site. Be sure to follow the manufacturer's installation instructions for proper installation methods. When a home is located at 4,500 feet or more above sea level, gas furnaces must be de-rated for the altitude by a qualified serviceman or licensed technician. Check with the LAHJ for further information on the proper method for de-rating the furnace.

CAUTION! Failure to properly install the furnace roof cap and/or stacks could cause smoke or soot accumulation or create a fire hazard resulting in property damage, serious injury, or loss of life.

CAUTION! Failure to de-rate gas furnaces in altitudes of 4,500 feet or greater can cause the furnace to overheat, operate poorly, or cause excessive soot and/or dangerous levels of carbon monoxide.

Site-Installed Furnace

See Figure 11.1

When the furnace is shipped loose for basement installation on-site, it will be an updraft direct vent-type furnace. The furnace provided must be installed by a qualified HVAC installer. The installation of the furnace and all connections and fittings must be in accordance with the manufacturer's written installation instructions provided with the appliance. The heat duct crossovers must also be completed as outlined in *Section 9*. See Figure 11.1, *Basement Installed Gas Furnace.*

NOTE: Only furnaces provided by Wick may be installed. Do not install furnaces obtained from other sources.

Fireplaces

Wood Burning Fireplace

See Figure 11.4

Fireplaces vented through the roof will require installation of the termination cap and storm collar assembly. To assure proper operation, be sure to follow the written installation instructions provided by the fireplace manufacturer when installing the chimney pipe and cap and when making all final connections and when testing. (The fireplace installation instructions are located inside the fireplace). Some units may also require on-site installation of additional section(s) of chimney pipe and/or the air intake vent. To assure sufficient draft for proper operation, extend the finished chimney at least 3' above the highest point where it penetrates the roof, and at least 2' higher than any building or other obstruction located within a horizontal distance of 10'. If the site has obstructions extending higher than the home's peak within 10' of the chimney, an additional section of chimney pipe may have to be installed on-site to assure proper operation of the fireplace. See Figure 11.4, *Gas or Wood Fireplace Chimney and Air Intake Installation.*

CAUTION! Failure to follow the manufacturer's instructions when installing chimney pipes and roof caps and when making all final connections and testing of wood burning fireplaces could cause smoke or soot accumulation or create a fire hazard resulting in property damage, serious injury or loss of life.

Gas Fireplace

See Figure 11.4

Gas fireplaces will be vented either through the side wall of the home or the roof. If the fireplace is vented through the roof, the termination cap and additional sections of pipe may have to be installed on-site. To assure proper operation, be sure to follow the written installation instructions provided by the fireplace manufacturer when installing the chimney cap and when making all final connections and testing. (The fireplace installation instructions are located inside the fireplace). See Figure 11.4, *Gas or Wood Fireplace Chimney and Air Intake Installation.*

CAUTION! Failure to follow the manufacturer's installation instructions when installing chimney pipes and roof caps and when making all final connections and testing of gas fireplaces could cause smoke or soot accumulation or create a fire hazard resulting in property damage, serious injury or loss of life.

Water Heater

On certain installations where the roof jack supplied with the water heater is installed below the peak of the roof, or in areas where high winds occur, a roof jack extension should be installed. Follow the manufacturer's installation instructions provided with the extension pipe. Extension pipes can be ordered through the Wick Service Department.

When the home is set on a crawl space (foundation walls or skirted), the water heater drain pan pipe should not be allowed to terminate under the home. Additional drain lines must be installed to extend the drain pipe to the outside of the skirting or foundation walls. The materials for extending the drain pan pipe are shipped loose with the home, except for the solvent cement. Make certain the solvent cement used is compatible with the pipe material supplied. See Figure 11.2, *Water Heater Drip Pan Drain Pipe Installation.*

See Figure 11.2

CAUTION! Failure to extend the water heater drain pan pipe outside the skirting or foundation walls could cause excessive humidity or moisture problems in the crawl space area the result of which may cause deterioration of building materials, damage to property or unhealthy living conditions for the home occupants.

When the home is installed on a basement foundation, the water heater on the main level has a temperature/pressure relief valve installed at the side of the tank. A plastic tube at the end of this valve extends through the main floor. This tube must be extended so that it terminates within 6" of the basement floor so that any hot water released is directed where it will not cause injury to anyone below the open tube. An extension pipe and connection fitting are shipped loose with the home. Install this overflow extension pipe to the nearest floor or plumbing drain.

Before turning on the electrical power or gas supply, be sure the water heater tank is completely filled with water to prevent damage to the tank or the heating element.

CAUTION! Failure to install the extension tube for the water heater temperature/pressure relief valve could create a scalding hazard to anyone below the open tube should the valve dispense water.

CAUTION! The water heater tank must be completely filled with water before turning on the electrical power or gas supply. Failure to do so could cause damage to the tank or the heating element even if power is energized for just a short period of time.

Clothes Dryer

See Figures 11.3 (a) and (b)

When ordered with a clothes dryer, the dryer and all vent ducting will be completely installed to the outside of the walls of the home. If the clothes dryer is to be installed on site, it must be vented to the outside of the skirting or foundation walls of the home or any attached structure. Vent openings are located in either the exterior wall or the floor. If vented through the floor of a home with a standard cross-beam frame system, the vent ducting material must be installed under the bottom of the floor- *do not cut through the floor rim joists to install the duct material!* If vented through the floor of a home with a Lindsay Floor system the vent ducting material may be installed through the *top member* of the rim joist. Be sure to follow the manufacturer's installation instructions for both the clothes dryer and the duct material. Hold the duct in place with metal straps spaced 2' 0" o.c., and secured to the bottom of the floor joists or frame. After the duct is installed, seal the openings around the vent, both inside and outside. See Figures 11.3 (a) and (b), *Dryer Venting Methods.*

CAUTION! The exhaust for clothes dryers must be vented outside the skirting or foundation walls or any attached structures. Clothes dryer vents must not be allowed to terminate under the home, into the basement, or into a garage or other attached structure. Failure to properly vent the clothes dryer could create excessive humidity and/or moisture problems, the result of which may cause deterioration of building materials, damage to property, or unhealthy living conditions for the home occupants.

Range & Oven

Remove the straps, blocks, and screws used to secure the range during transport. Seal penetrations in the wall as necessary.

Refrigerator

Remove the straps, blocks, and screws used to secure the refrigerator during transport. Seal penetrations in the wall as necessary. If the refrigerator is equipped with an automatic ice-maker, check the water lines for loose connections and tighten as necessary.

Garages

Garages that will be attached to the home or located near it must be designed and constructed according to applicable state and/or local building codes. This is very important for both electrical and other fire safety reasons. For example, if the garage is attached to the home, an approved fire wall must be located between the home and the garage. The access door(s) between the home and the garage must be fire rated as well. If the garage is not attached to the home, typically the distance between the home and garage will determine the fire safety measures that must be taken. For example, in Wisconsin, if the garage is located less than five (5) feet from the home, there are specific fire safety precautions that must be followed. Requirements may vary, so you must consult with the proper building authorities. In all cases, garages must be designed to support their own weight and electrical circuits must be provided with approved ground fault circuit interruption.

CAUTION! Failure to follow state and/or local building codes with respect to electrical and other fire safety precautions in the design and construction of garages, both attached and detached, could create a fire hazard the result of which could cause property damage, serious injury, or loss of life.

Awnings & Carports

When carports are installed, they must be free-standing with columns to support their own weight and separation as required by state or local building codes. The roof of the adjacent structure must not exceed the height of the roof of the home. Flash roof line valleys as necessary to prevent damage from rain water.

Breezeways

All breezeways must be designed and constructed according to state and local building codes. Among other things, this is very important for fire safety reasons. For example, the access doors to the breezeway from the home and/or the garage may need to be approved fire-rated doors. Certain walls may need to be fire-rated, and approved ground fault circuit interruption protected receptacles will be required under certain conditions. Requirements may vary, so you must consult with the proper building authorities. Breezeways may be attached to the home, but the breezeway structure must be designed to support its own loads, and the roof connections and valleys must be properly flashed to prevent damage from rain water.

CAUTION! Failure to follow state and/or local building codes with respect to design and construction of breezeways may create a fire hazard the result of which could cause property damage, serious injury, or loss of life.

Porches, Decks & Railings

Site-constructed porches, decks, and railings must be designed and constructed to meet the requirements of applicable local building codes. Porches and decks must be designed to support their own weight and approved ground fault interruption protection must be provided in electrical circuits, if any.

Steps, Stairways & Landings

All site-constructed steps, stairways, landings, and wall or railing enclosures must be designed and constructed in accordance with state and local codes and/or the requirements of the LAHJ.

Temporary Storage & Display

All homes that are stored as inventory on retailer's sales lots or used for display as "model homes" must be temporarily set by blocking and leveling to prevent deflection of the floor and possible structural damage. All construction means and methods necessary to minimize moisture build-up and/or water infiltration during temporary storage or display must be utilized.

CAUTION! Failure to properly block and level any home temporarily stored or set for display purposes could cause damage to the home or affect the structural integrity and/or performance of the home.

CAUTION! Failure to use all construction means and methods necessary to minimize moisture build-up and/or water infiltration during the storage or display of Wick manufactured homes could result in deterioration of building materials, damage to the home, or unhealthy living conditions for the home occupants.

Temporary Storage with Cross-Beam Frame

Less Than 30 days

All Wick manufactured homes constructed with the Wick Cross-Beam Frame stored at the retailer's sales lot for ***less than 30 days*** must be leveled front-to-rear using the 'A' frame (hitch) jack stand and blocking under each I-beam at the rear of the home.

More Than 30 Days

All Wick manufactured homes constructed with the Wick Cross-Beam Frame stored at ~~the~~ retailer's sales lot for ***more than 30 days*** must be blocked and leveled using a minimum of three (3) piers per section. Piers must consist of concrete blocks or other approved manufactured piers. Piers must be placed under each main I-beam at the approximate center of the home and no more than 2' 0" from each end of the home. Piers can be single-stacked with a minimum pad footing of 16" x 16". Open cell concrete blocks (CMU's) should be capped and shimmed as necessary to achieve an approximate level condition. Piers can be placed on ground level (during temporary storage or display only). No tie-down straps or anchors are required.

Display with Cross-Beam Frame

All Wick manufactured homes constructed with the Wick Cross-Beam Frame and set for display purposes (model homes) must be blocked and leveled as described in *Section 5* of this *Manual.* Pier supports must be provided as described in *Section 4*, with the following exceptions: Pier footings can be placed at ground level. No tie-down straps or anchors are required. Close up the floor, roof, and end walls with #10 x 5" wood screws installed at 36"o.c.

Display with Lindsay Floor

Homes constructed with the Lindsay Floor set for display as "model homes" must be ordered as a stock unit. A blocking print for setting the home must also be ordered. When ordered as a stock unit, the home will be constructed with the bottom of the floor completely covered with a water/moisture proof bottom board material. Check the bottom board material and repair any rips, tears, or other damage caused by shipping or setting the home as described in *Section 5.*

The home must be supported on the perimeter and on the marriage beam rim every 8' 0"o.c. starting from the hitch end, and every 10' 0"o.c. on all main I-beams. Piers can be single stacked concrete CMU's with minimum 16" x 16" footers placed at ground level. The piers must be capped and shimmed to achieve an approximate level condition. Connect the floor, roof, and end walls using #10 x 5" wood screws installed at 36"o.c.

CAUTION! Homes designed and constructed with the Lindsay Floor cannot be set for display unless the home is ordered with bottom board installed complete. Displaying a home with the Lindsay Floor that does not have the bottom board materials installed to protect the underside could cause damage to the home or affect the structural integrity and/or performance of the home.

Transporting the Home

Wick recommends using a professional home transporter when the home is moved to a new location. A professional transporter knows the applicable highway department regulations and is equipped to obtain the necessary permits and arrange for escort vehicles, if necessary. There are a number of precautions that should be followed before moving the home. Below are some of the important items that will need attention in arranging for and preparing the home for any move.

General Preparation

Secure doors and install appropriate shipping braces. Lock all doors. To secure storm doors, insert a screw in the side of the flange on the exterior frame of the door. Look for the screw hole provided in the flange that lines up with the screw hole in the side of the door. Brace sliding doors with wood wedges at the bottom and tape securely in position. Disassemble and pack hanging light fixtures and ceiling fans where applicable.

Multi-Section Homes

Reinstall temporary structural supports and bracing materials before moving the home. Place ridge beam supports in open areas at a maximum of 4' 0"o.c. Cover open sides (marriage walls) of each section with weatherproof material such as 6 mil poly sheathing.

Transportation System

Check tires for general condition and proper inflation. Be sure tires have at least 1/16" tread and do not have any cracks or splits. Check the wheel bearings for sufficient grease packing. Check the operation of the brakes making sure the wires are properly attached to drums, axles, and frame members. Check wheel lug nuts for tightness at the start of the trip and after the home has been on the road for 25 or 30 miles and at each stop thereafter. If the original tires or axles have been removed, they must be replaced with similar equipment designed and rated to safely carry the loads.

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After installation of the home is completed, a final inspection should be conducted. To assist you, we have prepared this inspection checklist identifying the key items you should consider. The final inspection should be conducted prior to occupancy and before the home is transferred to the purchaser/owner. You should keep a copy of the completed checklist for your records. This will assist you in responding to complaints by the purchaser/owner if any are made.

Foundation

- ☐ Footings are the proper size and construction for soil conditions.
- ☐ Pier spacing is in accordance with specifications.
- ☐ Pier construction and configuration meets specifications.
- ☐ Bottom board is fastened securely around the perimeter of the home and rips or tears have been properly repaired.
- ☐ The undercarriage, frame and floor joists are free from damage or defect.
- ☐ (For multi-section homes and homes with Tags). The floor mate wall beams have been fastened as required.
- ☐ Basement and perimeter wall foundations are designed and constructed according to state and/or LAHJ requirements.

Anchoring

- ☐ An approved anchoring system was used and installed according to the manufacturer's listing for approval.
- ☐ Anchoring certificate or seal(s) have been issued and installed.
- ☐ (Basement and perimeter wall foundations). The home is properly secured to the foundation ~~sill plate~~ and the required support posts have been properly installed and secured against lateral displacement.

Skirting & Other Crawl Space Enclosures

- ☐ Skirting is installed according to the manufacturer's specifications.
- ☐ Skirting is installed to adjust for frost movement in areas where it occurs.
- ☐ The minimum amount of "free area" venting has been provided and vents are constructed and placed in the proper locations.
- ☐ Poly vapor barrier is installed on the ground in the crawl space.
- ☐ (Basement foundations). Rim joist area has been insulated properly.

Section 14- Final Inspection Checklist

Water & Drain System

- ☐ The proper materials for water and drain lines have been used
- ☐ (For multi-section homes and homes with Tags). Crossover connections for the water and drainage system are properly made.
- ☐ Supports are made of proper material and are properly spaced.
- ☐ Proper slope has been maintained on all drain lines.
- ☐ Water lines are protected from freezing in areas where it occurs.
- ☐ The water heater drip pan drain pipe has been extended to the outside of the crawl space skirting or foundation walls.
- ☐ All visible water and drain lines and 'p' traps are free from leaks.
- ☐ All sinks, basins, tubs, showers and toilets operate properly
- ☐ All hot and cold water lines are properly connected to fixtures, dispense water as labeled and operate properly.
- ☐ All required tests have been conducted and leaks, if any detected, are corrected.
- ☐ (For basement foundations). The water heater temperature relief discharge has been extended to where it will not cause a scalding hazard.

Gas System

- ☐ Correct materials and fittings have been used.
- ☐ (For multi-section homes and homes with Tags). Crossover connections are made properly with access as required.
- ☐ The gas system pressure test has been properly conducted.
- ☐ The main incoming fuel line has been properly connected and tested by a qualified technician.
- ☐ All appliances have been converted, if necessary, to accommodate the type of fuel supply (LP or natural gas).

Electrical System

- ☐ The meter base has been installed and grounded properly.
- ☐ The main power supply has been properly connected and tested by a licensed electrician using the required 4-phase wiring.
- ☐ The panel amperage matches the connection to the home.
- ☐ The electrical panel board has been properly grounded.

- ☐ (For multi-section homes and homes with Tags). Electrical crossover connections are properly made and access covers are in place.
- ☐ (For multi-section homes and homes with Tags). Frame (chassis) has been properly bonded.
- ☐ (For multi-section homes and homes with Tags). Crossover connections for the phone, door bell, and stereo speaker wiring have been completed and all such equipment operates properly.
- ☐ (For homes installed on basements). Basement smoke alarm has been properly installed and tested.
- ☐ The required pre-connection and post-connection tests of the electrical system have been completed and problems, if any, corrected.
- ☐ Exterior light fixtures have been installed and operate properly.
- ☐ Ceiling paddle fans have been installed and operate properly.
- ☐ Smoke alarms have been tested and operate properly.
- ☐ All receptacles, switches, and light fixtures have been tested and operate properly.
- ☐ Ground fault circuit interrupter receptacles have been tested and operate properly.

Appliances, Equipment & Venting

- ☐ Temporary shipping screws and blocking have been removed and screw holes filled with suitable exterior grade sealant as necessary.
- ☐ Water heater and furnace roof caps and/or stack extensions have been installed according to the manufacturer's instructions.
- ☐ (For solid fuel burning fireplaces). Fresh air intake is properly installed.
- ☐ (For all fireplaces). Chimney stack extension(s) and roof cap has been installed in accordance with the manufacturer's instructions and the combustion air intake is not obstructed.
- ☐ (For multi-section homes and homes with Tags). Heat duct crossover connections are properly completed.
- ☐ (For basement installed furnaces). The furnace has been installed according to the manufacturer's instructions.
- ☐ Appliance venting is in accordance with the manufacturer's instructions.
- ☐ Clothes dryer venting terminates to the outside of the crawl space, basement, garage, or other adjacent structure.
- ☐ Kitchen and bath exhaust fan(s) are operational with correct airflow.

Section 14- Final Inspection Checklist

Windows & Doors

- ☐ All temporary shipping hardware has been removed from windows and doors.
- ☐ All windows open, close, and latch properly.
- ☐ Windows meeting egress requirements have operation instruction labels on them.
- ☐ All interior and exterior doors have been adjusted and open, close, and latch properly.

Interior

- ☐ Ceilings and walls are free of visible damage and defects.
- ☐ (For multi-section homes and homes with Tags). The mate line floor decking close-up has been properly completed.
- ☐ (For homes installed on basement foundations). Basement stairs and railings have been constructed meeting local, state and/or LAHJ requirements.
- ☐ Carpeting is properly attached and seamed.
- ☐ Cabinets and countertops are free of visible damage or defect.
- ☐ All trim and mouldings are installed properly and are free of visible damage or defect.
- ☐ All plumbing fixtures are free of visible damage or defect.
- ☐ All appliances and interior furnishings are free of visible damage or defect.
- ☐ All window coverings are free of visible damage or defect.
- ☐ HUD Data Plate is intact and legible.

Exterior

- ☐ The roof is free of visible damage or defect, and there are no missing or loose shingles.
- ☐ All shingle hold-down straps have been removed, and all staple holes have been properly sealed with an exterior grade sealant.
- ☐ (For homes with specialty roof systems). Hinged style and/or other specialty roofs are properly completed per the instructions provided.
- ☐ (For multi-section homes and homes with Tags). All required on-site flashing has been provided and ridge cap has been installed properly.
- ☐ Penetrations at roof stacks, vents, and chimneys have been properly sealed with an exterior grade sealant.
- ☐ Drip edge and fascia are properly installed and free of visible damage or defect.

- ☐ (For multi-section homes and homes with Tags). All end wall and side wall/corner wall connections and close-up have been properly completed and field required installation of siding and shutters completed.
- ☐ (Where applicable). Porches, decks, and railings have been constructed and/or installed meeting the requirements of the LAHJ.
- ☐ Steps, stairs and landings have been designed and constructed in accordance with state and local codes and/or the requirements of the LAHJ.
- ☐ Siding is free of visible damage or defect.
- ☐ Gutters and downspouts are installed to divert rain water away from the home.
- ☐ HUD label(s) has not been damaged, removed, or covered by skirting.

Miscellaneous

- ☐ Carbon monoxide alarm batteries have been inserted into the alarms. The alarms have tested and operate properly. (Note: alarms are battery powered only).
- ☐ (For homes requiring state inspections). Inspection of the installation is completed and all certificates or seals have been issued.
- ☐ Wick *Homeowner's Manual* and warranty packets are available in the home.
- ☐ (When applicable). Keys have been provided to the purchaser/owner.

Notes

Appendix A- Tables

All Tables referenced in this *Manual* are provided on the following pages.

TABLE 4.1
SOIL CLASSIFICATIONS & BEARING CAPACITIES

Soil Classification		Soil Description	Allowable Pressure (psf)[1]	Blow Count ASTM D1586	Torque probe[3] value[4] (inch-pounds)
Classification No.	ASTM D2487 or D2488				
1.....	.....	Rock or hard pan	4000+	.....	.....
2.....	GW, GP, SW, SP, GM, M.....	Sandy gravel and gravel; very dense and/or cemented sands; course gravel/cobbles; preloaded silts, clays and oral.....	2000	40+	(6)
3.....	GC, SC, ML, L.....	Sand; silty sand; clayey sand; silty gravel; medium dense course sands; sandy gravel; and very stiff silt, sand clays.....	1500	24-39	351-550
4A.....	CG, H[2].....	Loose to medium dense sands; firm to stiff clays and silts; alluvial fills.....	1000	18-23	276-350
4B.....	CH, H[2].....	Loose sands; firm clays; alluvial fills.....	1000	12-17	175-275
5.....	OL, OH, T.....	Uncompacted fill; peat; organic clays.....	(7)	0-11	(5)

NOTES:

1. The values provided in this table have not been adjusted for overburden pressure, embedment depth, water table height, or settlement problems.
2. For soils classified as CH or MH without either torque probe values or blow count test results, selected anchors must be rated for a 4B soil.
3. The torque test probe is a device for measuring the torque value of soils to assist in evaluating the holding capacity of the soil in which the ground anchor is placed. The shaft must be suitable length.
4. The torque value is a measure of the load resistance provided by the soil when subject to the turning or twisting force of the probe.
5. Less than 175.
6. More than 550.
7. Refer to 3285.202(b).

TABLE 4.2
MINIMUM PIER CAPACITIES
(Main Frame I-Beam Piers)

Section Width	Maximum Eave Overhang (Inches)	Roof Live Load (PSF)	8' 0" Maximum Pier Spacing Minimum Pier Capacity (Pounds)
14' (164" Actual)	0"	30	5615#
	12"	30	5935#
	24"	30	6250#
15' (182" Actual)	12"	30	6475#
16' (186" Actual)	0"	30	6270#
	12"	30	6590#

NOTES:
1. See Figures 4.4 and 4.5 for Pier Locations.
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness.

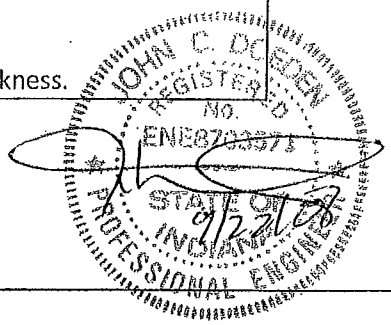


TABLE 4.3
MINIMUM PIER CAPACITIES
(Perimeter Piers)

Section Width	Maximum Eave Overhang (Inches)	Roof Live Load (PSF)	Maximum Opening Span (Feet) Minimum Pier Capacity (Pounds)						
			4' 0"	6' 0"	8' 0"	10' 0"	12' 0"	14' 0"	16' 0"
14' (164" Actual)	24"	30	3130#	3600#	4072#	4543#	5015#	5486#	5957#
15' (182" Actual)	12"	30	3173#	3651#	4130#	4608#	5087#	5566#	6045#
16' (186" Actual)	12"	30	3295#	3794#	4294#	4793#	5292#	5791#	6290#

NOTES:
1. This Table is for use with Perimeter Wall openings of 4' 0" wide or greater.
2. See Figures 4.4, 4.5,4.7 and 4.8 for Pier locations.
3. See Tables 4.7 and 4.8 for required Footing Size and Thickness.
4. Design assumes pier replaces a standard pier on 8' 0" increment.

TABLE 4.4
MINIMUM PIER CAPACITIES
(Ridge Beam Column Piers)

Total Width	Roof Live Load (PSF)	Maximum Influence Span (Feet) / Minimum Pier Capacity (Pounds)								
		4'	8'	12'	16'	20'	24'	28'	32'	36'
27' 4" (Actual)	30	1790#	3010#	4230#	5450#	6675#	7895#	9115#	10335#	11555#
30' 4" (Actual)	30	1960#	3305#	4655#	6000#	7350#	8695#	10045#	11390#	12740#

NOTES:
1. See Figure 4.5 for Pier Locations.
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness.

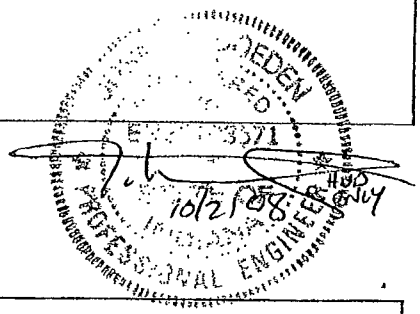


TABLE 4.4 (a)
MINIMUM PIER CAPACITIES- RIDGE BEAM SPAN
(Perimeter Wall Foundation)

Total Width	Roof Live Load (PSF)	Maximum Influence Span (Feet) of Ridge Beam / Minimum Pier Capacity (Pounds)							
		8'	12'	16'	20'	24'	28'	32'	36'
27' 4" (Actual)	30	10,805#	11,955#	13,105#	14,260#	15,410#	16,560#	17,710#	18,865#
30' 4" (Actual)	30	11,915#	13,195#	14,470#	15,750#	17,025#	18,300#	19,580#	20,860#

NOTES:
1. See Figure 4.10 for Influence Span Measurement and Figure 4.12 for Pier Locations.
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness.
3. Design assumes pier replaces a pier on 8' increment (worst case).
4. Pier loads in excess of 16,000 pounds require a 3" minimum diameter standard steel pipe (**NOTE: *NOT* an adjustable-type jack post!**) or a fully grouted and filled concrete block pier designed by a registered professional engineer. Piers with loads less than 16,000 pounds may be dry stacked blocks constructed according to details in this *Manual*.

TABLE 4.4 (b)
MINIMUM PIER CAPACITIES
(3-Point Set Foundation)

Total Width	Roof Live Load	Maximum Influence Span (Feet) of Ridge Beam / Minimum Pier Capacity (Pounds)							
	(PSF)	8'	12'	16'	20'	24'	28'	32'	36'
27' 4" (Actual)	30	6047#	7141#	8234#	9328#	10422#	11515#	12610#	13700#
30' 4" (Actual)	30	6422#	7635#	8850#	10062#	11276#	12490#	13703#	14917#

NOTES:
1. See Figure 4.7 for Pier Locations and Figure 4.10 for Influence Span Measurement.
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness.
3. Design assumes pier replaces a pier on 8' 0" increment (worst case).

TABLE 4.5
MINIMUM PIER CAPACITIES
(Tag Unit Piers)

Section Width	Maximum Eave Overhang (Inches)	Roof Live Load (PSF)	8' 0" Maximum Pier Spacing / Minimum Pier Capacity (Pounds)	
			Perimeter Endwall ("A" Piers)	Main I-Beams ("B" Piers)
14' (164" Actual)	12"	30	3730#	2800#

NOTES:
1. See Figure 4.8 for Pier Locations
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness

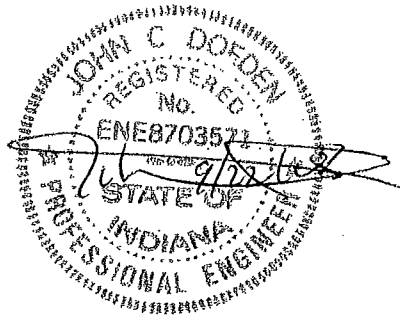


TABLE 4.6 (a) MINIMUM PIER CAPACITIES (Mate Line Piers for Perimeter Wall Foundations)			
Section Width	Maximum Eave Overhang (Inches)	Roof Live Load (PSF)	Minimum Pier Capacity (Pounds) 8' 0" Maximum Pier Spacing
14' (164" Actual)	NA	30	9850#

NOTES:

1. See Figure 4.12 for Pier Locations.
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness.
3. Design is based on piers supporting girder at each joint. See Figure 4.12.

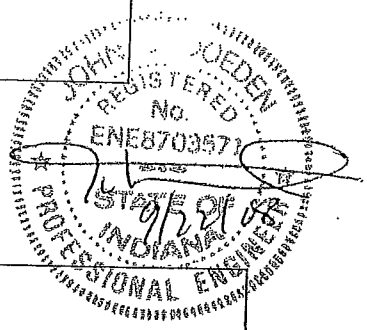


TABLE 4.6 (b) MINIMUM PIER CAPACITIES (Optional 3-Point Set)				
Section Width	Maximum Eave Overhang (Inches)	Roof Live Load (PSF)	Pier Location	8' 0" Maximum Pier Spacing Minimum Pier Capacity (Pounds)
14' (164" Actual)	22"	30	Piers under outside I-beams	7525#
		30	Piers under marriage beams	7740#
15' (182" Actual)	12"	30	Piers under outside I-beams	8555#
		30	Piers under marriage beams	8730#

NOTES:

1. See Figure 4.12 for Pier Locations.
2. See Tables 4.7 and 4.8 for required Footing Size and Thickness.
3. Maximum spacing on marriage line piers is 8' 0" o.c.
4. Design is based on 82 1/2" I-beam spacing (minimum).
5. Piers are located at spacing indicated along outside I-beams only and along marriage beams.
6. Applicable only to floors designed for this foundation.

TABLE 4.7
MINIMUM FOOTING SIZE

PIER CAPACITY (POUNDS)	SOIL BEARING CAPACITY MINIMUM FOOTING SIZE (INCHES)													
	1000		1500		2000		2500		3000		3500		4000	
	Square	Round	Square	Round	Square	Round	Square	Round	Square	Round	Square	Round	Square	Round
600	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
800	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
1000	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
1500	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
2000	17 x 17	20	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
2500	19 x 19	22	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
3000	21 x 21	24	17 x 17	20	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
3500	22 x 22	26	18 X 18	20	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
4000	24 x 24	26	20 X 20	24	17 x 17	20	16 x 16	18	16 x 16	18	16 x 16	18	16 x 16	18
4500	25 x 25	28	21 X 21	24	18 X 18	20	17 x 17	20	16 x 16	18	16 x 16	18	16 x 16	18
5000	27 x 27	30	22 x 22	26	19 x 19	22	17 x 17	20	16 x 16	18	16 x 16	18	16 x 16	18
5500	28 x 28	N/A	23 X 23	26	20 X 20	24	18 X 18	20	17 x 17	20	16 x 16	18	16 x 16	18
6000	29 X 29	N/A	24 x 24	28	21 X 21	24	19 x 19	22	17 x 17	20	16 x 16	18	16 x 16	18
6500	31 X 31	N/A	25 x 25	28	22 x 22	26	20 X 20	24	18 X 18	20	17 x 17	20	16 x 16	18
7000	32 X 32	N/A	26 X 26	30	22 x 22	26	21 X 21	24	19 x 19	22	17 x 17	20	16 x 16	18
7500	33 X 33	N/A	27 x 27	30	23 X 23	26	21 X 21	24	19 x 19	22	18 X 18	20	16 x 16	18
8000	34 X 34	N/A	28 x 28	N/A	24 x 24	28	22 x 22	26	20 X 20	24	19 x 19	22	17 x 17	20
8500	35 X 35	N/A	29 X 29	N/A	25 x 25	28	23 X 23	26	21 X 21	24	19 x 19	22	17 x 17	20
9000	36 X 36	N/A	29 X 29	N/A	25 x 25	28	23 X 23	26	21 X 21	24	20 X 20	24	18 X 18	20
9500	37 X 37	N/A	30 X 30	N/A	26 X 26	30	24 x 24	28	22 x 22	26	20 X 20	24	19 x 19	22
10,000	38 X 38	N/A	31 X 31	N/A	27 x 27	30	24 x 24	28	22 x 22	26	21 X 21	24	19 x 19	22
11,000	40 X 40	N/A	32 X 32	N/A	28 x 28	N/A	26 X 26	30	23 X 23	26	22 x 22	26	20 X 20	24
12,000	42 X 42	N/A	34 X 34	N/A	29 X 29	N/A	27 x 27	30	24 x 24	28	23 X 23	26	21 X 21	24
13,000	43 X 43	N/A	35 X 35	N/A	31 X 31	N/A	28 x 28	N/A	25 x 25	28	24 x 24	28	22 x 22	26
14,000	45 X 45	N/A	37 X 37	N/A	32 X 32	N/A	29 X 29	N/A	26 X 26	30	24 x 24	28	22 x 22	26
15,000	46 X 46	N/A	38 X 38	N/A	33 X 33	N/A	30 X 30	N/A	27 x 27	30	25 x 25	28	23 X 23	26
16,000	48 X 48	N/A	39 X 39	N/A	34 X 34	N/A	31 X 31	N/A	28 x 28	N/A	26 X 26	30	24 x 24	28
17,000	49 X 49	N/A	40 X 40	N/A	35 X 35	N/A	32 X 32	N/A	29 X 29	N/A	27 x 27	30	25 x 25	28
18,000	51 X 51	N/A	42 X 42	N/A	36 X 36	N/A	33 X 33	N/A	30 X 30	N/A	28 x 28	N/A	25 x 25	28
19,000	52 X 52	N/A	43 X 43	N/A	37 X 37	N/A	34 X 34	N/A	31 X 31	N/A	28 x 28	N/A	26 X 26	30
20,000	54 X 54	N/A	44 X 44	N/A	38 X 38	N/A	34 X 34	N/A	31 X 31	N/A	29 X 29	N/A	27 x 27	30
21,000	55 X 55	N/A	45 X 45	N/A	39 X 39	N/A	35 X 35	N/A	32 X 32	N/A	30 X 30	N/A	28 x 28	N/A
22,000	57 X 57	N/A	46 X 46	N/A	40 X 40	N/A	36 X 36	N/A	33 X 33	N/A	31 X 31	N/A	28 x 28	N/A
23,000	58 X 58	N/A	47 X 47	N/A	41 X 41	N/A	37 X 37	N/A	34 X 34	N/A	31 X 31	N/A	29 X 29	N/A
24,000	59 X 59	N/A	48 X 48	N/A	42 X 42	N/A	38 X 38	N/A	34 X 34	N/A	32 X 32	N/A	30 X 30	N/A
25,000	60 X 60	N/A	49 X 49	N/A	43 X 43	N/A	38 X 38	N/A	35 X 35	N/A	33 X 33	N/A	30 X 30	N/A

NOTES:

1. Footing sizes are for either square or round pads and are based on the area (in square inches) required for the load.
2. See also Tables 4.2, 4.3, 4.4, 4.4 (a), 4.4 (b), 4.5, 4.6 (a) and 4.6 (b) for pier capacities.
3. For minimum thickness of footings, see Table 4.8.

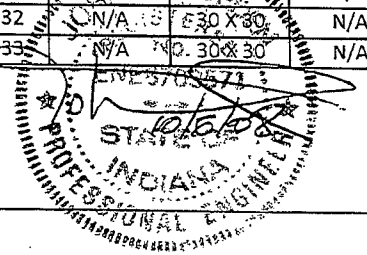


TABLE 4.8
MINIMUM FOOTING THICKNESS

PIER FOOTING SIZE (INCHES)	Soil Bearing Capacity (PSF)													
	Minimum Footing Thickness for Single and Double Stacked Piers (Inches)													
	1000		1500		2000		2500		3000		3500		4000	
	Single	Double	Single	Double	Single	Double	Single	Double	Single	Double	Single	Double	Single	Double
16x16	4	4	4	4	4	4	4	4	4	4	4	4	4	4
17x17	4	4	4	4	4	4	4	4	4	4	4	4	4	4
18x18	4	4	4	4	4	4	4	4	4 1/8	4	4 1/2	4	4 3/8	4
19x19	4	4	4	4	4	4	4 1/8	4	4 1/2	4	4 7/8	4	4 7/8	4
20x20	4	4	4	4	4	4	4 1/2	4	4 7/8	4	5 3/8	4	5 1/4	4
21x21	4	4	4	4	4 3/8	4	4 7/8	4	5 3/8	4	5 3/4	4	5 3/4	4
22x22	4	4	4	4	4 3/4	4	5 1/4	4	5 3/4	4	6 1/4	4	6 1/8	4
23x23	4	4	4 3/8	4	5	4	5 5/8	4	6 1/8	4	6 5/8	4	6 5/8	4
24x24	4	4	4 5/8	4	5 3/8	4	5 7/8	4	6 1/2	4	7	4	7 1/8	4
25x25	4	4	4 7/8	4	5 5/8	4	6 3/8	4	6 7/8	4	7 1/2	4	7 1/2	4
26x26	4 1/4	4	5 1/4	4	6	4	6 3/4	4	7 3/8	4 1/8	7 7/8	4 1/2	8	4 3/8
27x27	4 3/8	4	5 3/8	4	6 3/8	4	7	4 1/8	7 3/4	4 1/2	8 3/8	4 7/8	8 3/8	4 7/8
28x28	4 3/4	4	5 3/4	4	6 5/8	4	7 3/8	4 1/2	8 1/8	4 7/8	8 3/4	5 3/8	8 7/8	5 1/4
29x29	4 7/8	4	6	4	6 7/8	4 3/8	7 7/8	4 7/8	8 1/2	5 3/8	8 1/4	5 3/4	9 3/8	5 3/4
30x30	5 1/8	4	6 3/8	4	7 3/8	4 3/4	8 1/8	5 1/4	8 7/8	5 3/4	9 5/8	6 1/4	9 7/8	6 1/8
31x31	5 3/8	4	6 5/8	4 3/8	7 5/8	5	8 1/2	5 5/8	9 3/8	6 1/8	10	6 5/8	10 3/8	6 5/8
32x32	5 5/8	4	6 7/8	4 5/8	7 7/8	5 3/8	8 3/4	5 7/8	9 3/4	N/A	10 1/2	7	N/A	N/A
33x33	5 7/8	4	7 1/8	4 7/8	8 1/4	5 5/8	9 1/4	6 3/8	10 1/8	N/A	10 7/8	7 1/2	N/A	N/A
34x34	6 1/8	4 1/4	7 3/8	5 1/4	8 5/8	6	9 5/8	6 3/4	10 1/2	N/A	N/A	N/A	N/A	N/A
35x35	6 3/8	4 3/8	7 3/4	5 3/8	8 7/8	6 3/8	9 7/8	7	10 7/8	N/A	N/A	N/A	N/A	N/A
36x36	6 1/2	4 3/4	8	5 3/4	9 1/4	6 5/8	10 3/8	7 3/8	N/A	N/A	N/A	N/A	N/A	N/A
37x37	6 3/4	4 7/8	8 3/8	6	9 1/2	6 7/8	10 3/4	7 7/8	N/A	N/A	N/A	N/A	N/A	N/A
38x38	7	5 1/8	8 1/2	6 3/8	9 7/8	7 3/8	11	8 1/8	N/A	N/A	N/A	N/A	N/A	N/A
39x39	7 1/4	5 3/8	8 3/4	6 5/8	10 1/4	7 5/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40x40	7 3/8	5 5/8	9 1/8	6 7/8	10 1/2	7 7/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
41x41	7 3/4	5 7/8	9 3/8	7 1/8	10 3/4	8 1/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
42x42	7 7/8	6 1/8	9 3/4	7 3/8	11 1/4	8 5/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43x43	8 1/8	6 3/8	9 7/8	7 3/4	11 1/2	8 7/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
44x44	8 3/8	6 1/2	10 1/4	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
45x45	6 5/8	6 3/4	10 1/2	8 3/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
46x46	8 3/4	7	10 3/4	8 1/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
47x47	9	7 1/4	11 1/8	8 3/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48x48	9 3/8	7 3/8	11 3/8	9 1/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
49x49	9 1/2	7 3/4	11 5/8	9 3/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
51x51	10	8 1/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
52x52	10 1/4	8 3/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
54x54	10 5/8	8 3/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
55x55	10 7/8	9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
57x57	11 3/8	9 1/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
58x58	11 5/8	9 3/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
59x59	11.3/4	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60x60	12	10 1/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:

1. The thickness is designed for both single and double stacked concrete blocks (CMU's) centered on the footer.
2. Poured footers must have a 3000 PSI compressive strength at 28 days. Minimum thickness of poured footings is six (6) inches.
3. This table assumes footings that are not reinforced. Reinforced footings may allow for a smaller thickness than listed but must be designed by a registered professional engineer.

TABLE 10.1
ELECTRICAL WIRE FEEDER & JUNCTION BOX SIZE

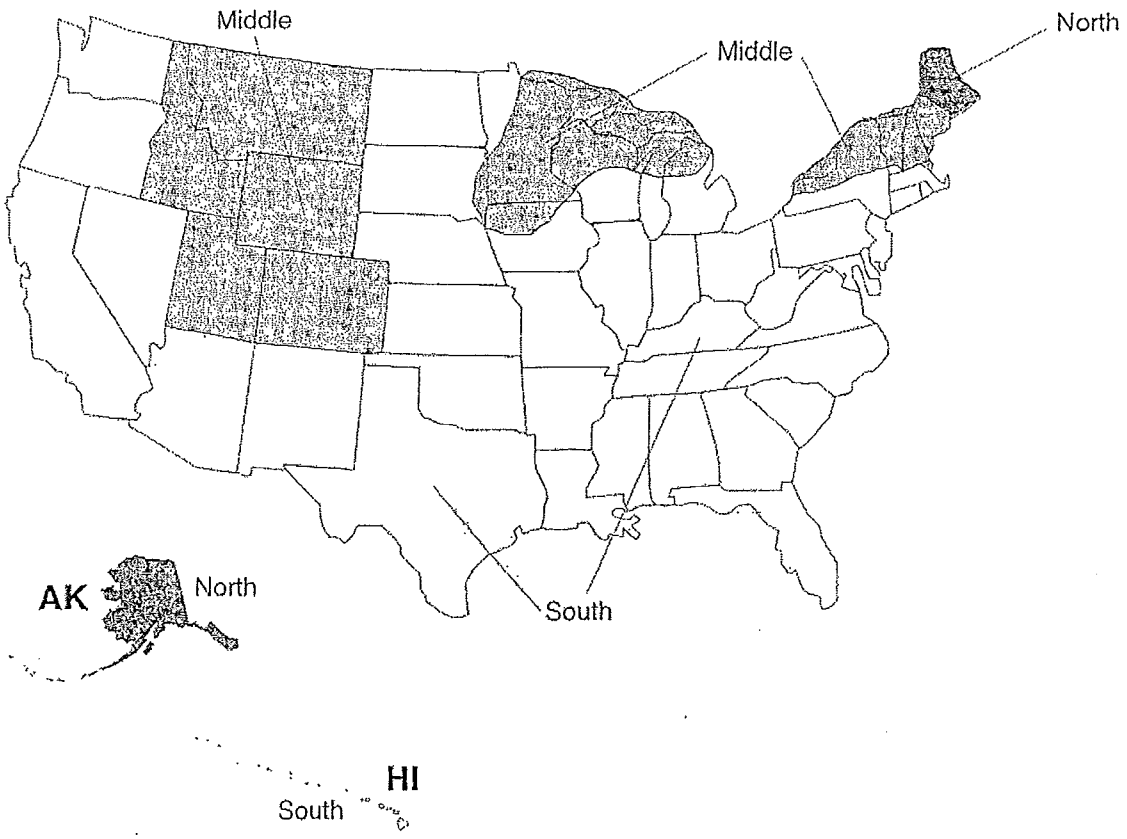
Main Breaker (Service) Size (AMPS)	Conductor Size (AWG)*		Grounding Electrode Conductor Size (AWG)		Factory Installed Feeder Raceway Trade Size (in.)*	Minimum Junction Box Size
	CU	AL	CU	AL		
100	#4	#2	#8	#6	1½"	12"x12"x4"
200	#2/0	#4/0	#6	#4	2"	16"x16"x4"

NOTE:

* Conductor size and feeder raceway sized for 75 C. rated conductors, types RH, RHH, RHW, without outer covering, THW or XHHW, two line and one neutral.

Appendix B- Figures

All Figures referenced in this *Manual* are provided on the following pages.

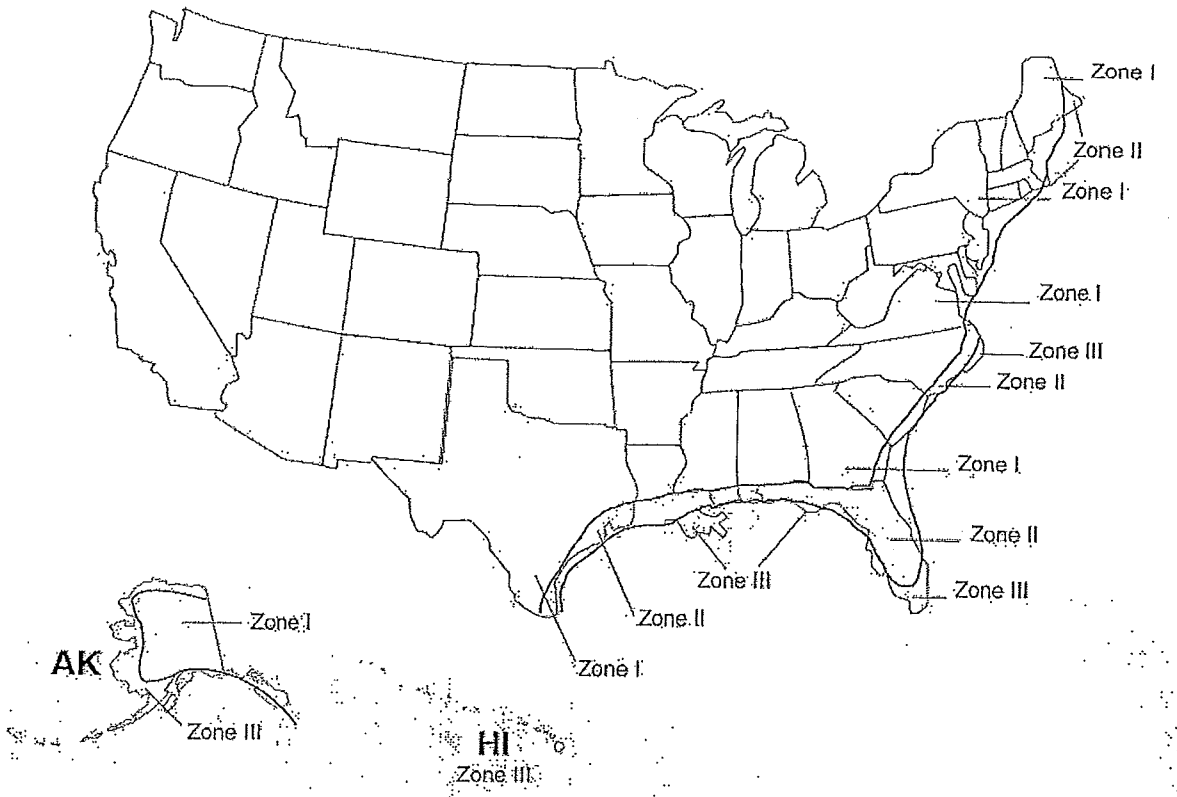


Design Roof-load Zones:

South	20 psf (pounds per square foot) minimum
Middle	30 psf (snow)
North	40 psf (snow)

Reference -- Manufactured Home Construction and Safety Standards (MHCSS) 24 CFR 3280.506, latest edition

FIGURE 3.1
ROOF LOAD DESIGN ZONE MAP



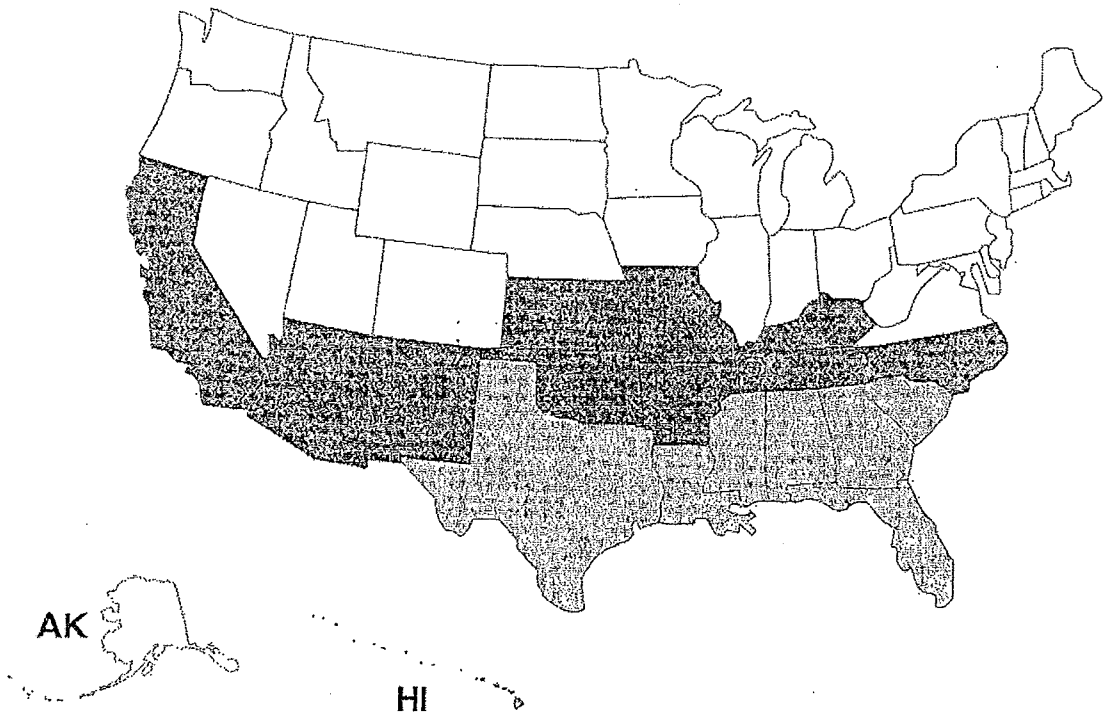
Design Wind-load Zones:

Standard Wind	Zone I	15 psf Horizontal	9 psf uplift*
Hurricane	Zone II	±39 psf Horizontal	27 psf uplift
Hurricane	Zone III	±47 psf Horizontal	32 psf uplift

* net uplift

Note:
psf; pounds per square foot

FIGURE 3.2
WIND LOAD DESIGN ZONE MAP

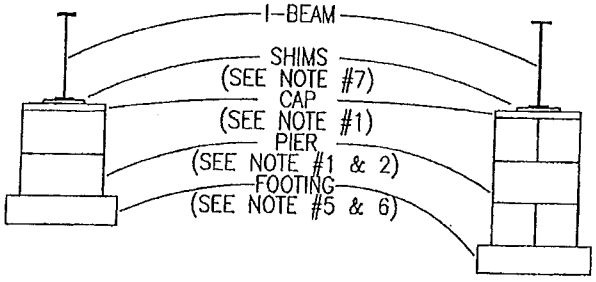


Zone	1	2	3
U-value	0.116	0.096	0.079

Reference -- Manufactured Home Construction and Safety Standards (MHCSS) 24.CFR 3280.506, latest edition

FIGURE 3.3
HEATING AND COOLING DESIGN ZONE MAP

PIER 1

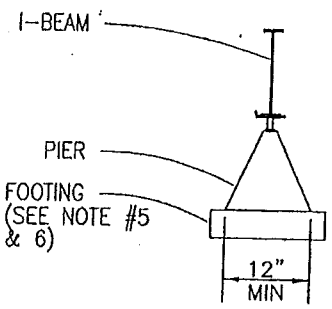


SINGLE STACKED BLOCKS
MAXIMUM HEIGHT = 36"
(SEE NOTE #2)

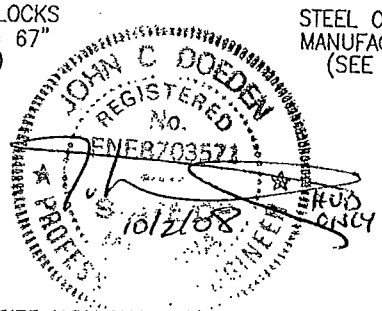
PIER 2

DOUBLE STACKED BLOCKS
MAXIMUM HEIGHT = 67"
(SEE NOTE #2)

PIER 3



STEEL OR CONCRETE
MANUFACTURED PIER
(SEE NOTE #4)

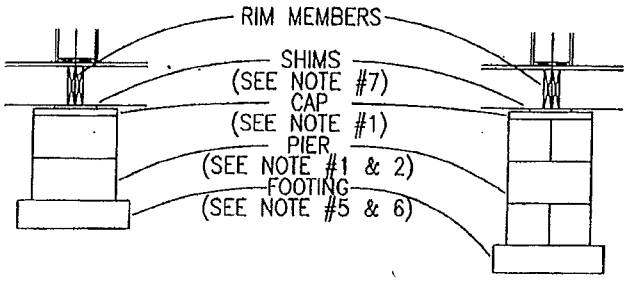


NOTES:

1. CONCRETE BLOCKS FOR PIERS ARE 8" X 8" X 16" NOMINAL SIZE, HOLLOW CELL LOAD BEARING CMU'S MANUFACTURED IN CONFORMANCE WITH ASTM C90-02a, GRADE 'N'. OPEN CELLS ARE VERTICAL AND MUST BE CAPPED WITH MINIMUM 4" THICK SOLID MASONRY OR NOMINAL 2" THICK MINIMUM HARDWOOD.
2. SINGLE STACKED CONCRETE BLOCKS ARE ORIENTED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE LONG DIRECTION OF THE MAIN FRAME I-BEAM. MAXIMUM CAPACITY FOR SINGLE STACKED BLOCK PIERS IS 8,000 POUNDS. MAXIMUM CAPACITY FOR DOUBLE STACKED BLOCK PIERS IS 16,000 POUNDS.
3. PIERS ARE TO BE PLACED ON THE FOOTING APPROXIMATELY CENTERED SO THAT THE FOOTING PROJECTION FROM THE PIER IS EQUAL FROM SIDE-TO-SIDE AND FRONT-TO-BACK. PIERS MUST BE LEVEL VERTICALLY ON ALL SIDES AND SQUARE WITH THE FOOTING.
4. PREFABRICATED PIERS (TYPE #3) MUST BE CERTIFIED FOR A RATED CAPACITY AT LEAST EQUAL TO THE LOAD DETERMINED FROM THE TABLES. PREFABRICATED PIERS MUST BE PROVIDED WITH PROTECTION AGAINST WEATHER DETERIORATION AND CORROSION AT LEAST EQUIVALENT TO THAT PROVIDED BY A COATING OF ZINC ON STEEL OF 0.30 OZ. /SF OF SURFACE COATED.
5. FOOTINGS MAY BE PRECAST OR POURED. IN EITHER CASE, FOOTINGS MUST BE LEVEL IN ALL DIRECTIONS AND INSTALLED BELOW THE FROST LINE.
6. CONCRETE FOOTINGS TO HAVE A MINIMUM COMPRESSIVE STRENGTH (Fc') OF 3,000 PSI AFTER 28 DAYS.
7. GAP BETWEEN TOP OF PIER (CAP) AND MAIN FRAME I-BEAM MAY BE FILLED WITH A WOOD PLATE NOT EXCEEDING 2" IN THICKNESS AND/ OR SHIMS NOT EXCEEDING 1" IN THICKNESS. SHIMS SHALL BE HARDWOOD , AT LEAST 4" WIDE AND 6" LONG, FITTED AND DRIVEN TIGHT BETWEEN THE WOOD PLATE OR PIER CAP AND MAIN FRAME I-BEAM. WEDGES USED FOR SHIMS ARE TO BE PERPENDICULAR TO THE I-BEAM AND INSTALLED IN PAIRS FROM BOTH SIDES OF THE I- BEAM.
8. ALL PIERS GREATER THAN 67" IN HEIGHT MUST BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT.

FIGURE 4.1
TYPICAL I- BEAM PIER CONSTRUCTION

PIER 1

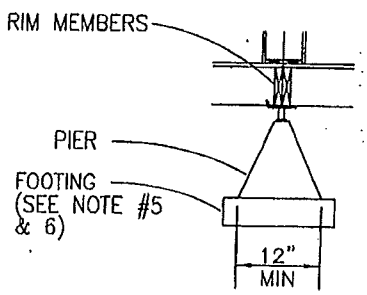


SINGLE STACKED BLOCKS
MAXIMUM HEIGHT = 54"
(SEE NOTE #2)

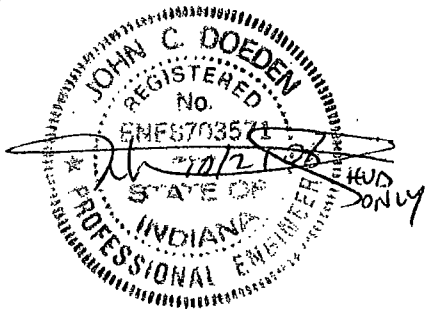
PIER 2

DOUBLE STACKED BLOCKS
MAXIMUM HEIGHT = 67"
(SEE NOTE #2)

PIER 3



STEEL OR CONCRETE
MANUFACTURED PIER
(SEE NOTE #4)



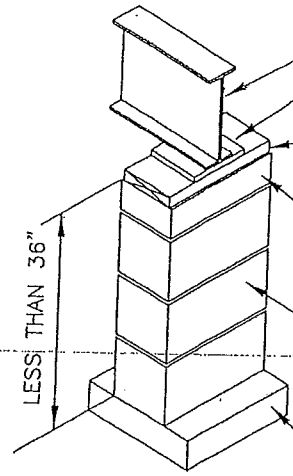
NOTES:

1. CONCRETE BLOCKS FOR PIERS ARE 8" X 8" X 16" NOMINAL SIZE HOLLOW CELL LOAD BEARING CMU'S MANUFACTURED IN ACCORDANCE WITH ASTM C90-02a, GRADE 'N'. OPEN CELLS ARE VERTICAL AND MUST BE CAPPED WITH MINIMUM 4" THICK SOLID MASONRY OR NOMINAL 2" THICK MINIMUM HARDWOOD.
2. SINGLE STACKED CONCRETE BLOCKS ARE ORIENTED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE CENTERLINE RIM MEMBERS AND PARALLEL TO THE PERIMETER RIM MEMBERS WHEN INSTALLED AT THE PERIMETER WALL. MAXIMUM CAPACITY FOR SINGLE STACKED BLOCK PIERS IS 8,000 POUNDS. MAXIMUM CAPACITY FOR DOUBLE STACKED BLOCK PIERS IS 16,000 POUNDS.
3. PIERS ARE TO BE PLACED ON THE FOOTING APPROXIMATELY CENTERED SO THAT THE FOOTING PROJECTION FROM THE PIER IS EQUAL FROM SIDE-TO-SIDE AND FRONT-TO-BACK. PIERS MUST BE LEVEL VERTICALLY ON ALL SIDES AND SQUARE WITH THE FOOTING.
4. PREFABRICATED PIERS (TYPE #3) MUST BE CERTIFIED FOR A RATED CAPACITY AT LEAST EQUAL TO THE LOAD DETERMINED FROM THE TABLES. PREFABRICATED PIERS MUST BE PROVIDED WITH PROTECTION AGAINST WEATHER DETERIORATION AND CORROSION AT LEAST EQUIVALENT TO THAT PROVIDED BY A COATING OF ZINC ON STEEL OF 0.30 OZ. /SF OF SURFACE COATED.
5. FOOTINGS MAY BE PRECAST OR POURED. IN EITHER CASE, FOOTINGS MUST BE LEVEL IN ALL DIRECTIONS AND INSTALLED BELOW THE FROST LINE.
6. CONCRETE FOOTINGS TO HAVE A MINIMUM COMPRESSIVE STRENGTH (Fc') OF 3,000 PSI AFTER 28 DAYS.
7. GAP BETWEEN TOP OF PIER (CAP) AND MAIN FRAME I-BEAM MAY BE FILLED WITH A WOOD PLATE NOT EXCEEDING 2" IN THICKNESS AND/ OR SHIMS NOT EXCEEDING 1" IN THICKNESS. SHIMS SHALL BE HARDWOOD AT LEAST 4" WIDE AND 6" LONG, FITTED AND DRIVEN TIGHT BETWEEN THE WOOD PLATE OR PIER CAP AND CENTER LINE JOISTS. WEDGES USED FOR SHIMS ARE TO BE PERPENDICULAR TO THE I-BEAM AND INSTALLED IN PAIRS FROM BOTH SIDES OF THE I-BEAM.
8. ALL PIERS GREATER THAN 67" IN HEIGHT MUST BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT.

FIGURE 4.2

TYPICAL PERIMETER AND MATE LINE PIER CONSTRUCTION

SINGLE STACKED CONCRETE BLOCKS



MAIN I–BEAM

SHIMS, 4" WIDE X 6" LONG, MINIMUM NOT EXCEEDING 1" IN THICKNESS

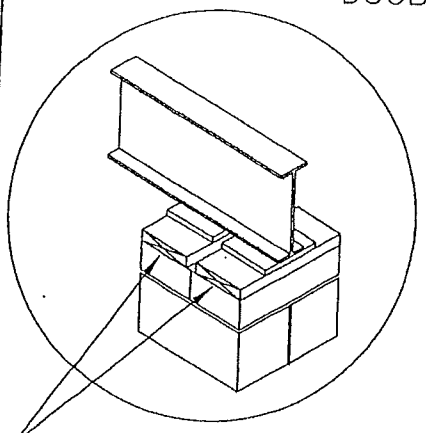
WOOD PLATES OR OTHER LISTED MATERIALS NOT EXCEEDING 2" IN THICKNESS x 8" WIDE FOR LOADS UP TO 8000#

CAPS, SOLID MASONRY (MINIMUM 4"X8"x16"), HARDWOOD (NOMINAL MINIMUM 2"x8"x16") OR OTHER LISTED MATERIAL

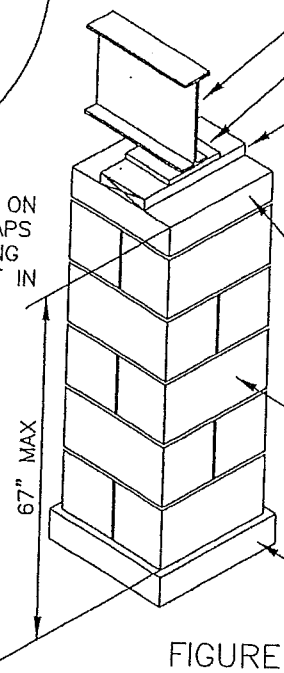
SINGLE OPEN OR CLOSED CONCRETE BLOCKS 8"x8"x16" INSTALLED WITH 16" DIMENSION PERPENDICULAR TO THE MAIN I–BEAM. OPEN CELLS ARE PLACED VERTICALLY ON FOOTING. MORTAR IS NOT REQUIRED UNLESS SPECIFIED

TYPICAL FOOTING INSTALLED BELOW FROST LINE

DOUBLE STACKED CONCRETE BLOCKS



WHEN SPLIT CAPS ARE USED ON DOUBLE STACKED BLOCKS, CAPS MUST BE INSTALLED WITH LONG DIMENSION ACROSS THE JOINT IN THE BLOCKS BELOW.



MAIN I–BEAM

SHIMS, 4" WIDE X 6" LONG, MINIMUM NOT EXCEEDING 1" IN THICKNESS

WOOD PLATES OR OTHER LISTED MATERIALS NOT EXCEEDING 2" IN THICKNESS. 8" MINIMUM WIDTH UP TO 11500#. LOAD DETERMINED FROM TABLES. USE SPLIT CAP PER DETAIL FOR HIGHER LOADS (16000# MAXIMUM)

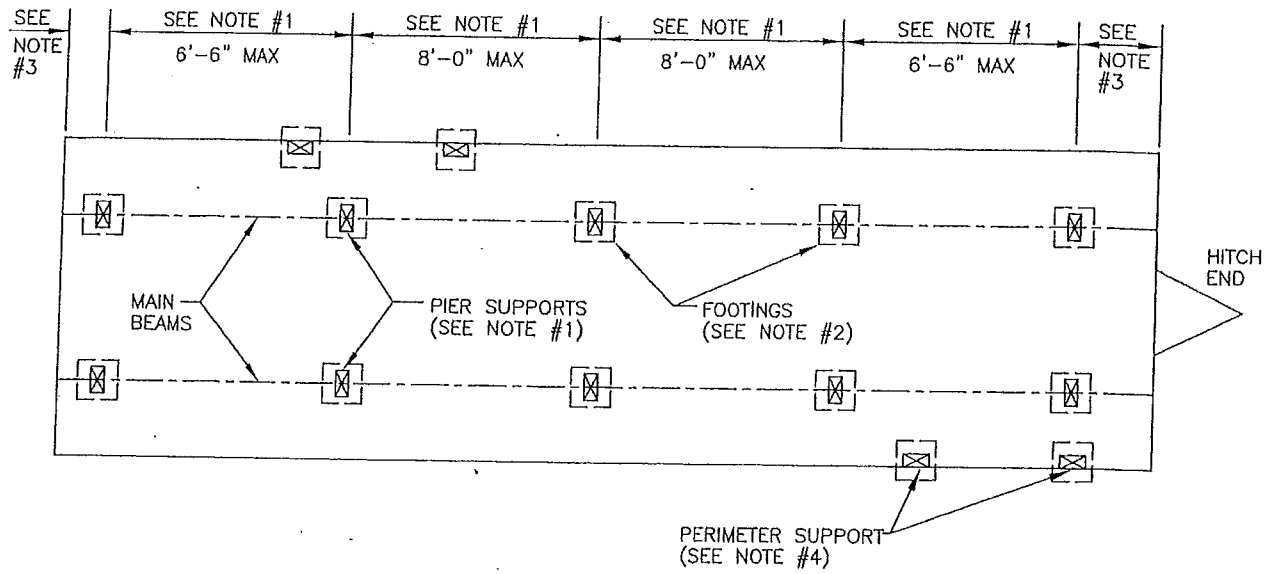
CAPS, SOLID MASONRY (MINIMUM 4"X8"x16"), HARDWOOD (NOMINAL MINIMUM 4"x8"x16") OR OTHER LISTED MATERIAL

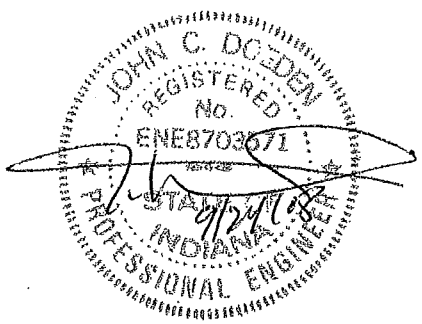
DOUBLE STACKED CONCRETE BLOCKS, SOLID OR CELLED. EACH LAYER IS INTERLOCKED WITH LAYER BELOW AS SHOWN. MORTAR IS NOT REQUIRED UNLESS SPECIFIED

TYPICAL FOOTING INSTALLED BELOW FROST LINE

JOHN C. DOEDEN REGISTERED No. ENE9703E78 STATE OF INDIANA PROFESSIONAL ENGINEER

FIGURE 4.3
TYPICAL PIER CONFIGURATIONS

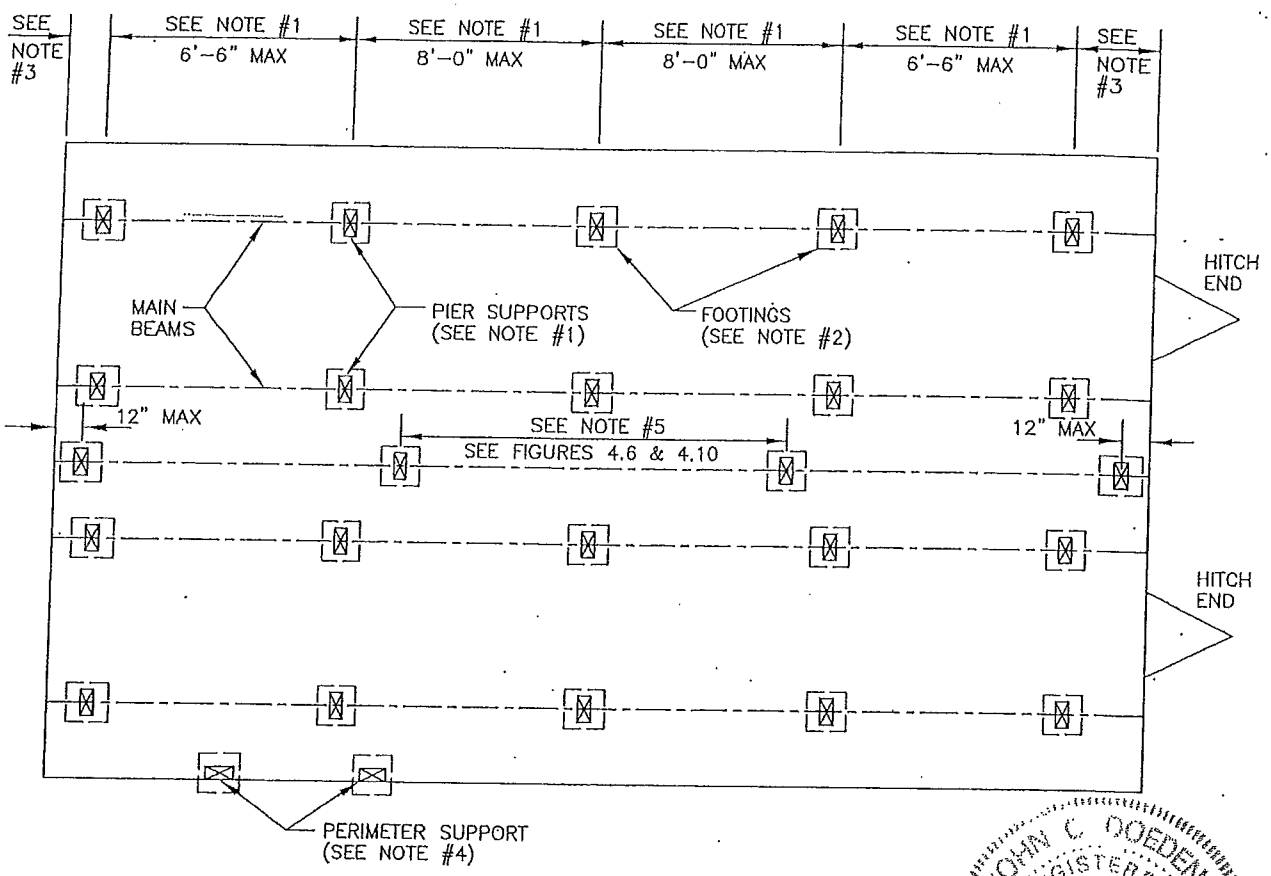


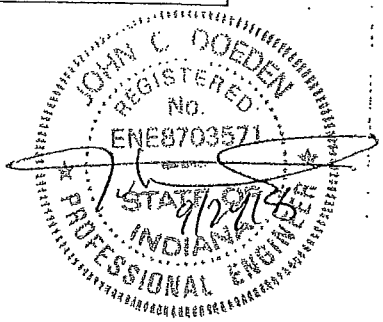


NOTES:

1. SEE TABLE 4.2 FOR REQUIRED MINIMUM PIER CAPACITY OF MAIN FRAME I-BEAM PIERS.
2. SEE TABLES 4.7 AND 4.8 FOR MINIMUM FOOTING SIZE AND THICKNESS.
3. I-BEAM PIERS SHALL BE LOCATED NO MORE THAN 1' 6" FROM EACH END.
4. PERIMETER PIERS SHALL BE LOCATED AT EACH SIDE OF ALL OPENINGS 4' 0" OR GREATER IN WIDTH. THIS INCLUDES DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC. SEE TABLE 4.3 FOR PIER CAPACITY REQUIREMENTS.

FIGURE 4.4
TYPICAL PIER SPACING FOR SINGLE SECTION HOMES





NOTES:

1. SEE TABLE 4.2 FOR REQUIRED MINIMUM PIER CAPACITY OF MAIN FRAME I-BEAM PIERS.
2. SEE TABLES 4.7 AND 4.8 FOR MINIMUM FOOTING SIZE AND THICKNESS.
3. I-BEAM PIERS SHALL BE LOCATED NO MORE THAN 1' 6" FROM EACH END. MATE LINE PIERS SHALL BE LOCATED NO MORE THAN 12" FROM EACH END.
4. PERIMETER PIERS SHALL BE LOCATED AT EACH SIDE OF ALL OPENINGS 4' 0" OR GREATER IN WIDTH. THIS INCLUDES DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC. SEE TABLE 4.3 FOR PIER CAPACITY REQUIREMENTS.
5. SEE TABLE 4.4 FOR MINIMUM PIER CAPACITIES AT RIDGE BEAM COLUMNS.

FIGURE 4.5
TYPICAL PIER SPACING FOR MULTI- SECTION HOMES

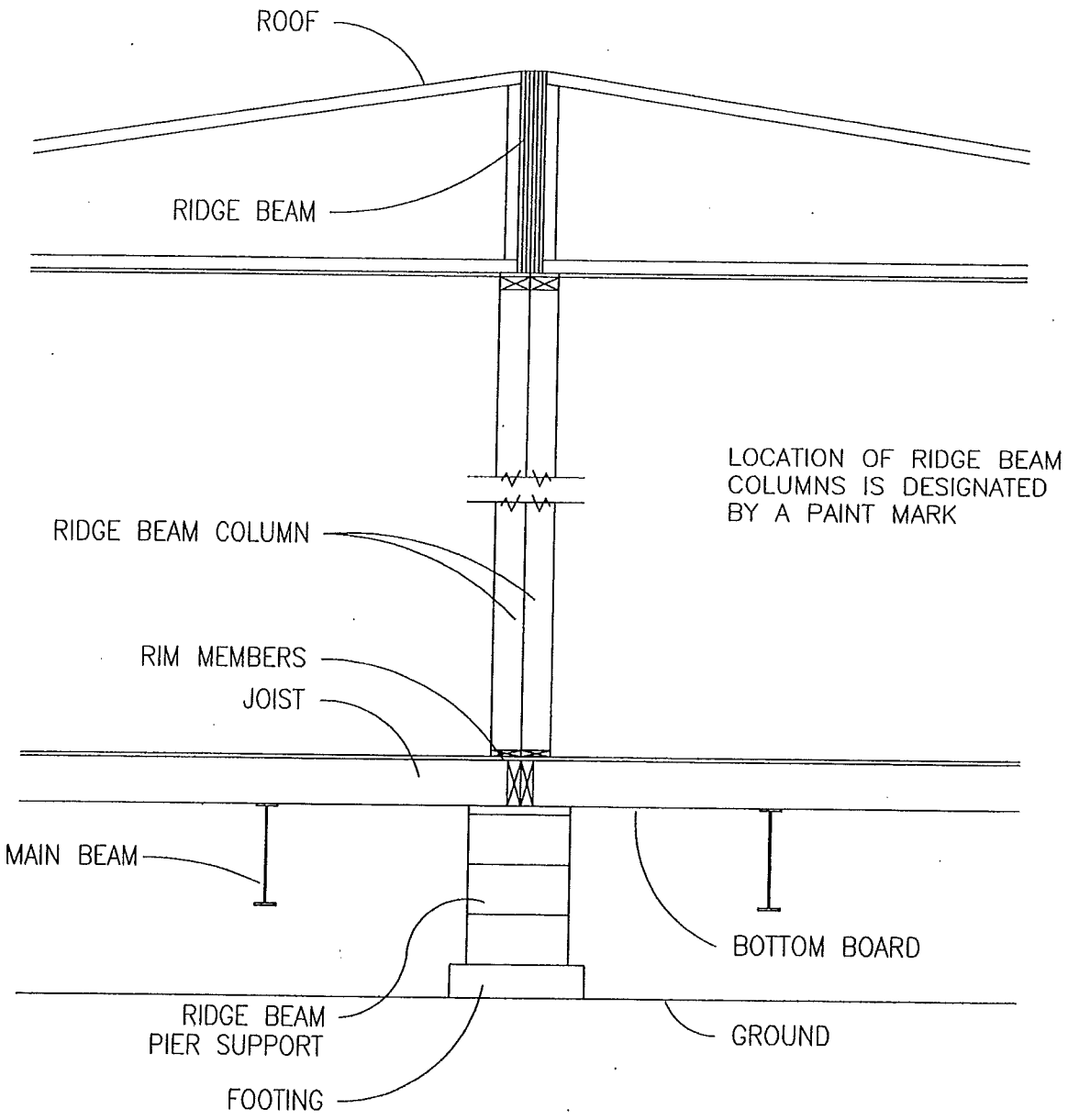
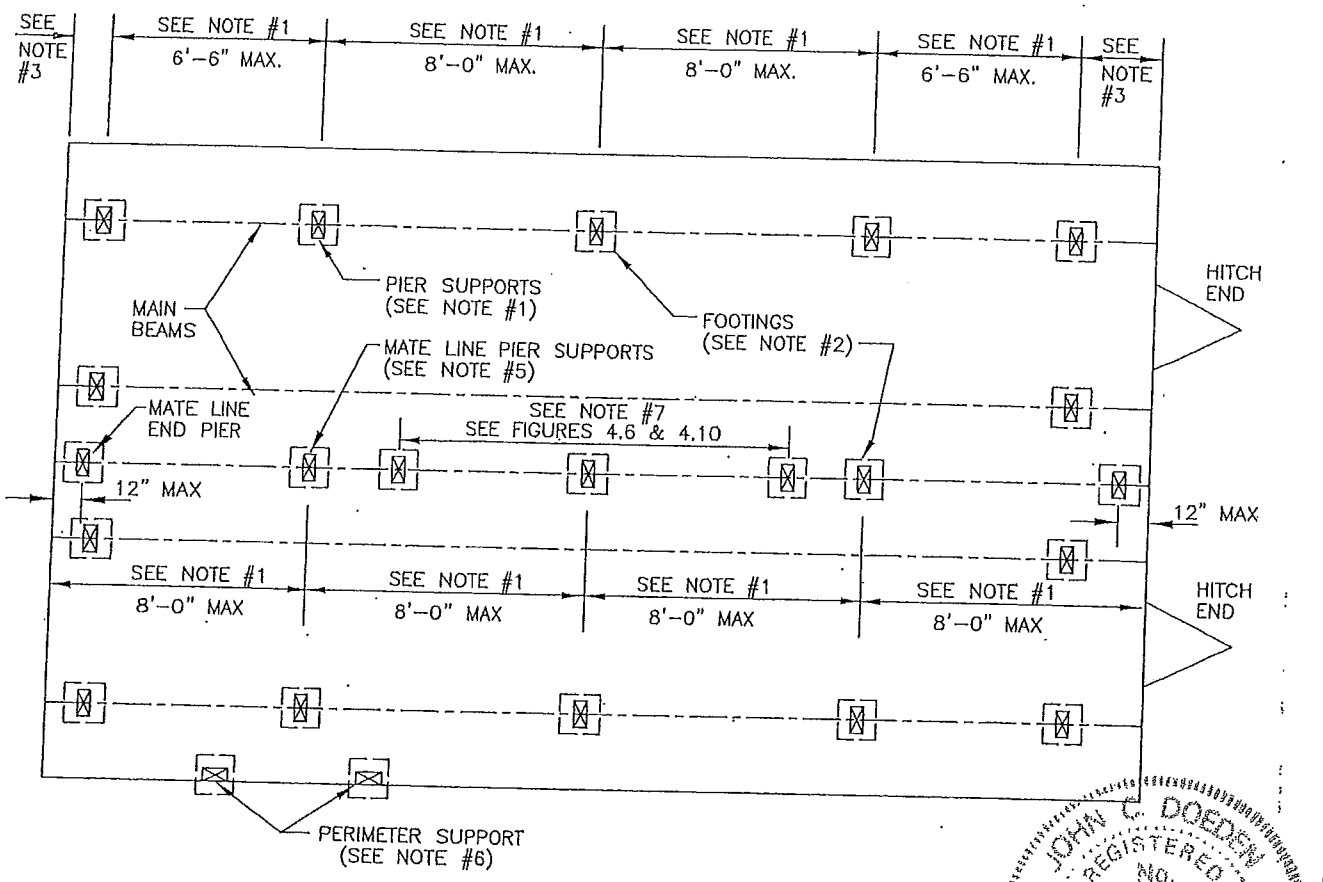
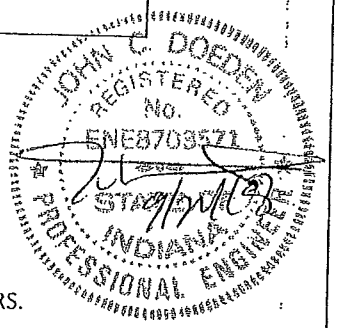


FIGURE 4.6
TYPICAL RIDGE BEAM COLUMN PIER

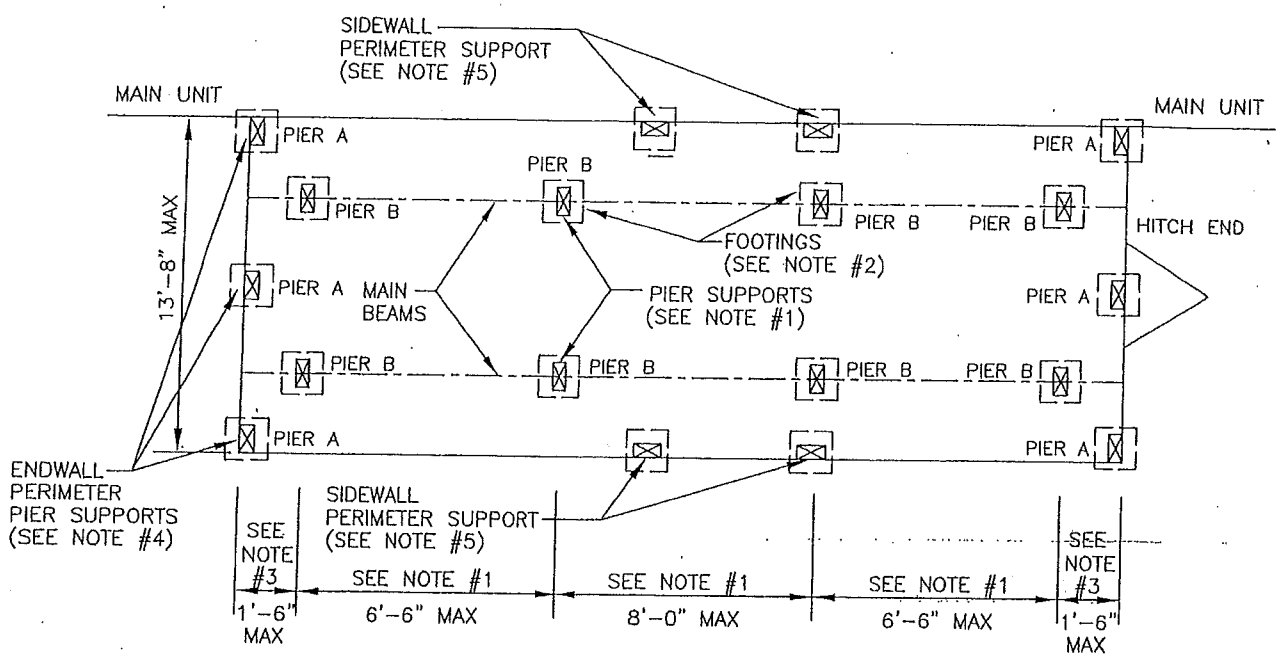


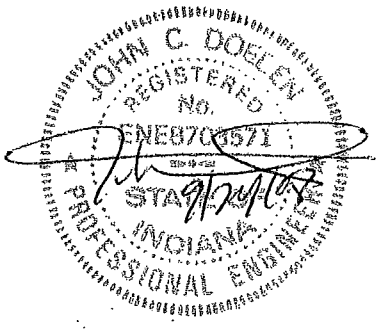


NOTES:

1. SEE TABLE 4.6(b) FOR REQUIRED MINIMUM PIER CAPACITY OF MAIN FRAME I-BEAM PIERS.
2. SEE TABLES 4.7 AND 4.8 FOR MINIMUM FOOTING SIZE AND THICKNESS.
3. I-BEAM PIERS SHALL BE LOCATED NO MORE THAN 1' 6" FROM EACH END. MATE LINE PIERS SHALL BE LOCATED NO MORE THAN 12" FROM EACH END.
4. AN I-BEAM PIER SHALL BE LOCATED AT THE END OF EACH "INSIDE" I-BEAM NO MORE THAN 1' 6" FROM EACH END.
5. SEE TABLE 4.6(b) FOR REQUIRED MINIMUM PIER CAPACITY AT MATE LINE PIERS. MATE LINE PIERS MUST BE INSTALLED AT OUTRIGGER LOCATIONS FOR PROPER SUPPORT OF THE FLOOR.
6. PERIMETER PIERS SHALL BE LOCATED AT EACH SIDE OF ALL OPENINGS 4' 0" OR GREATER IN WIDTH. THIS INCLUDES DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC. SEE TABLE 4.3 FOR PIER CAPACITY REQUIREMENTS.
7. SEE TABLE 4.4(b) FOR MINIMUM PIER CAPACITIES AT RIDGE BEAM COLUMNS.

FIGURE 4.7
TYPICAL PIER SPACING FOR MULTI- SECTION HOMES
(OPTIONAL 3-POINT SET)

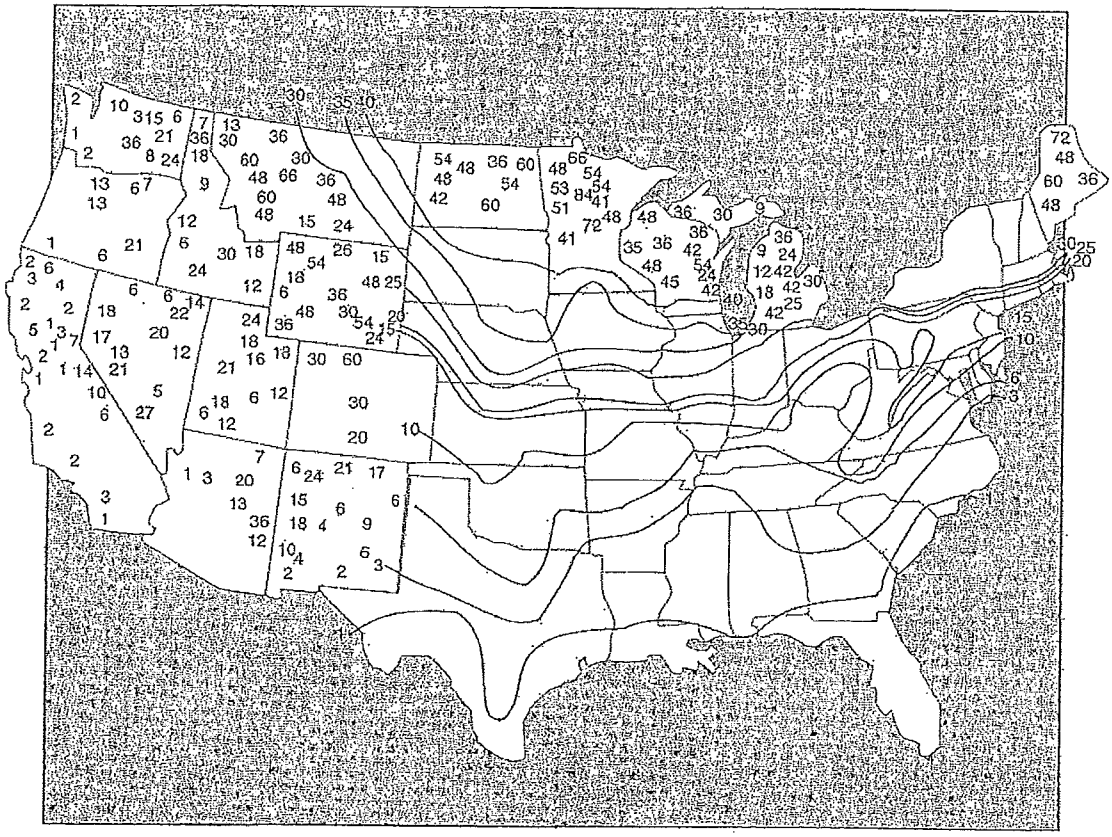




NOTES:

1. SEE TABLE 4.5 FOR MINIMUM PIER CAPACITY REQUIREMENTS OF MAIN I-BEAM PIERS.
2. SEE TABLES 4.7 AND 4.8 FOR MINIMUM FOOTING SIZE AND THICKNESS.
3. I-BEAM PIERS SHALL BE LOCATED NO MORE THAN 1' 6" FROM EACH END.
4. A MINIMUM OF THREE (3) PERIMETER PIERS MUST BE LOCATED AT EACH END OF THE UNIT. SEE TABLE 4.5 FOR MINIMUM PIER CAPACITY REQUIREMENTS.
5. ADDITIONAL PERIMETER PIERS SHALL BE LOCATED ON EACH SIDE OF ALL OPENINGS 4' 0" OR GREATER IN WIDTH. THIS INCLUDES DOORS, WINDOWS, RECESSED ENTRIES, PORCHES, ETC. SEE TABLE 4.3 FOR MINIMUM PIER CAPACITY REQUIREMENTS.

FIGURE 4.8
TYPICAL PIER SPACING FOR TAG UNITS



Average Depth of Frost Penetration
in Inches

Source: U.S. Department of Commerce
Weather Bureau

FIGURE 4.9
FROST PENETRATION MAP

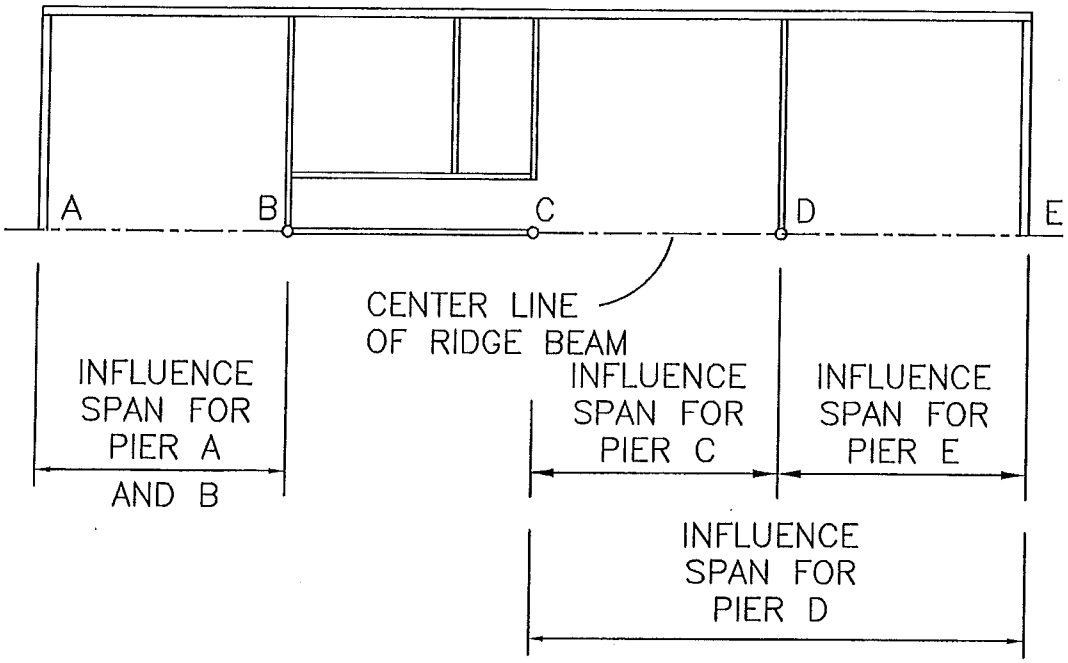
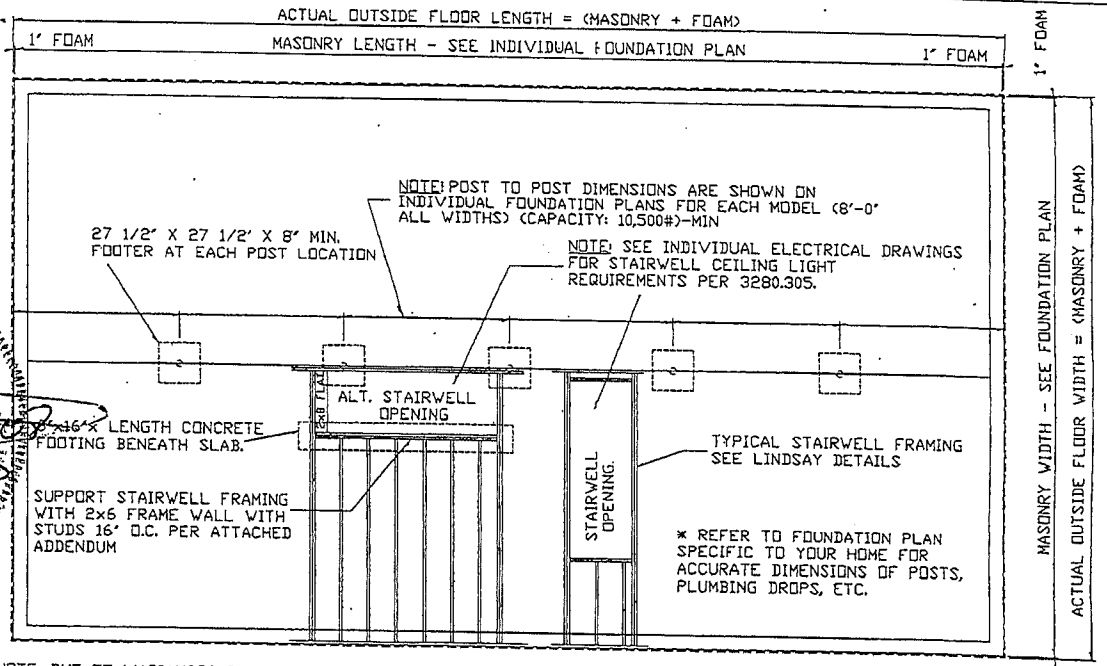


FIGURE 4.10
INFLUENCE SPAN – RIDGE BEAM COLUMN PIERS

NOTE:
1. DESIGN AND CONSTRUCTION MUST COMPLY WITH ALL APPLICABLE STATE AND/OR LOCAL CODES.
2. SPECIFICATIONS FOR 2000 PSF SOIL CAPACITY 30 PSF ROOF LIVE LOAD (10 PSF DEAD). AND 40 PSF FLOOR LIVE LOAD.
3. ALL DIMENSIONS MUST BE CHECKED IN THE FIELD FOR ACCURACY
4. FOUNDATION DESIGN AND CONSTRUCTION SUBJECT TO APPROVAL AND INSPECTION BY STATE AND/OR LOCAL AUTHORITIES
5. INSTALL PILASTERS AS REQUIRED BY SOIL CONDITIONS AND STATE OR LOCAL CODES.
6. DESIGN FOOTINGS BASED ON LOADS AT EACH COLUMN, CONCRETE CAPACITY AND SOIL BEARING CAPACITY OF THE SITE.
7. THE SPECIFICATIONS PROVIDED HEREON ARE RECOMMENDATIONS ONLY AND ARE NOT MEANT TO SUPERCEDE STATE OR LOCAL REQUIREMENTS.

NOTICE TO CONTRACTORS!!!
INCREASE STOOP PROJECTION TO ACCOMMODATE EXTRA HEIGHT REQUIRED FOR LINDSAY FLOOR SYSTEM. SEE DIMENSIONS SHOWN BELOW. THIS DIMENSION IS FROM THE TOP OF TREATED SILL PLATE TO THE BOTTOM OF THE EXTERIOR DOOR THRESHOLD.

JOHN C. DOEDEN REGISTERED NO ENE87[illegible] STATE OF INDIANA PROFESSIONAL ENGINEER HUD ONLY



NOTE: DUE TO VARIANCES IN LOCAL CODES, SOIL CONDITIONS, AND FROST LEVELS, ALL FOUNDATIONS AND FOOTINGS TO BE DESIGNED BY A LOCAL ENGINEER AND APPROVED BY LOCAL OFFICIALS.

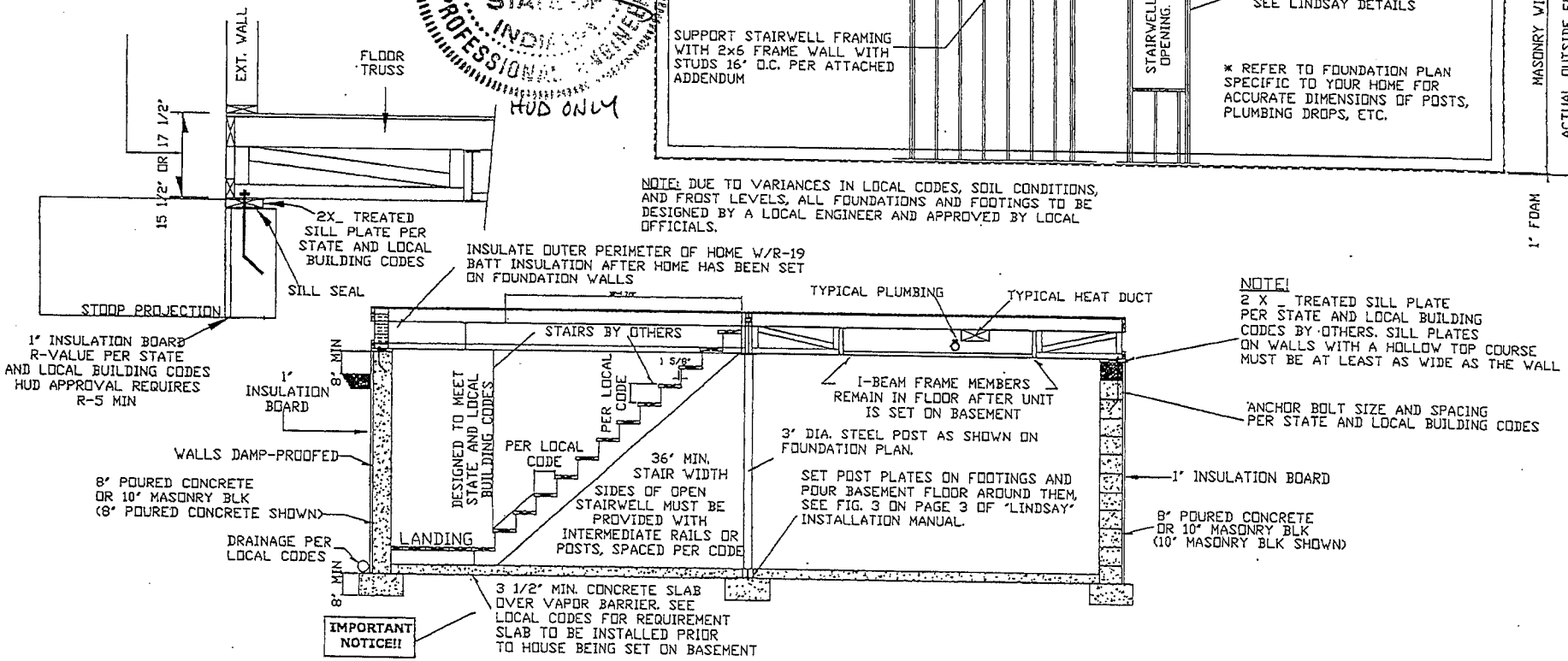
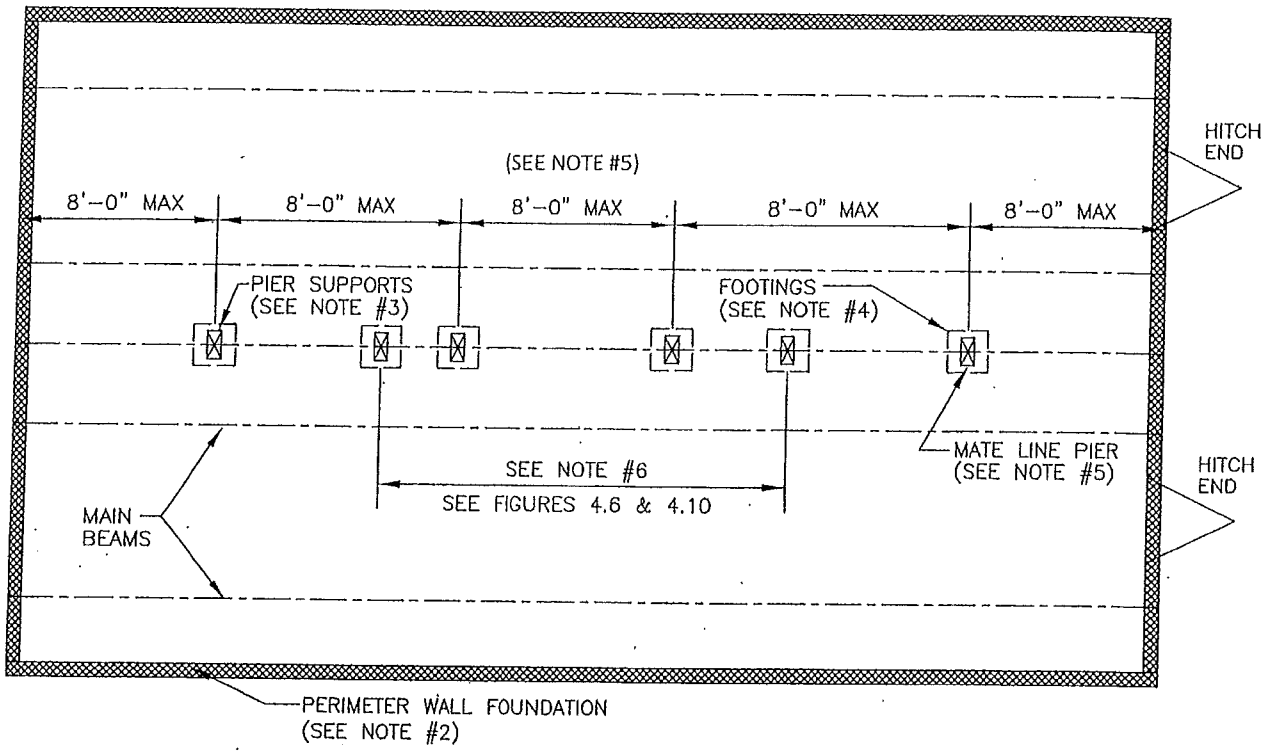
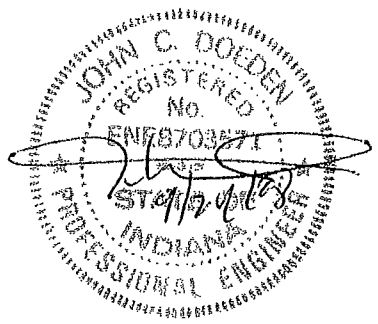


FIGURE 4.11
TYPICAL BASEMENT FOUNDATION LAYOUT - LINDSAY UNIFIED FLOOR SYSTEM





NOTES:

1. DESIGN IS BASED ON PERIMETER WALL FOUNDATION WITH FLOOR SYSTEM SPANNING FROM PERIMETER TO MATING LINES.
2. FOUNDATION WALL AND FOOTINGS TO BE DESIGNED FOR LOCAL SOIL CONDITIONS PER THE LOCAL AUTHORITY HAVING JURISDICTION OR BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT.
3. FOR CRAWL SPACE SETS, SEE TABLE 4.6(a) FOR MINIMUM PIER CAPACITY REQUIREMENTS FOR MATE LINE PIERS. FOR BASEMENT SETS, JACK POSTS MUST BE A MINIMUM OF 3" IN DIAMETER ADJUSTABLE SCREW-TYPE STEEL, FHA LISTED AND RATED FOR A 10,500 LBS. MINIMUM LOADING.
4. SEE TABLES 4.7 AND 4.8 FOR MINIMUM FOOTING SIZE AND THICKNESS.
5. MATE LINE PIERS AT 8' 0" O.C. (AT BEARING BLOCK LOCATIONS) MEASURING FROM THE HITCH END.
6. SEE TABLE 4.4 FOR MINIMUM PIER CAPACITY REQUIREMENTS AT RIDGE BEAM COLUMNS.

FIGURE 4.12
TYPICAL LAYOUT FOR PERIMETER WALL FOUNDATION

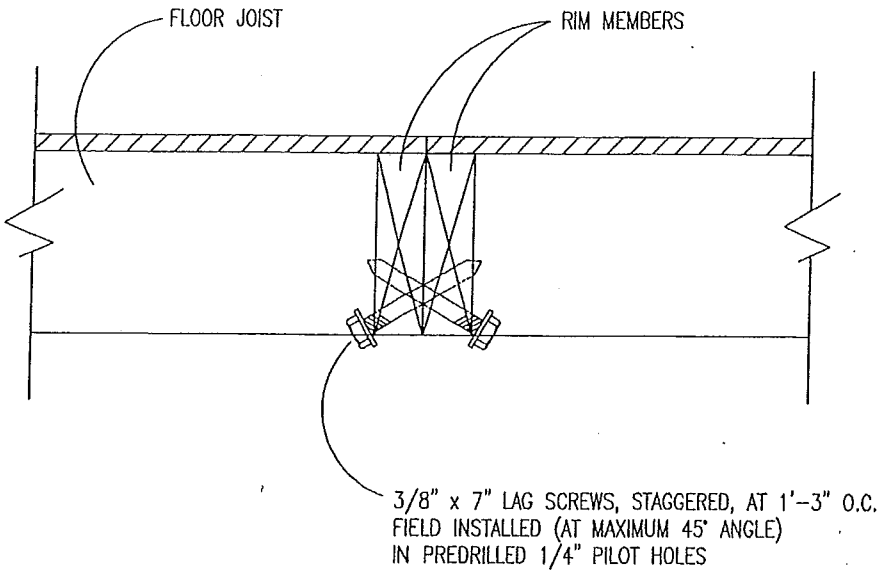


FIGURE 5.1
FLOOR MARRIAGE CONNECTION

THIS SPACE INTENTIONALLY LEFT BLANK

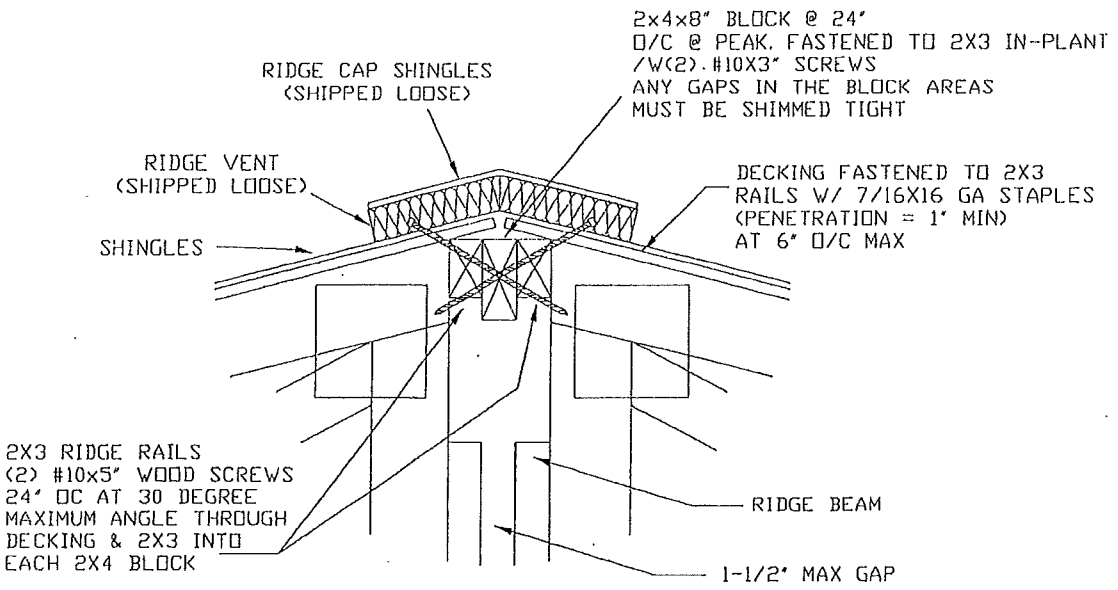


FIGURE 5.3
ROOF MARRIAGE CONNECTION

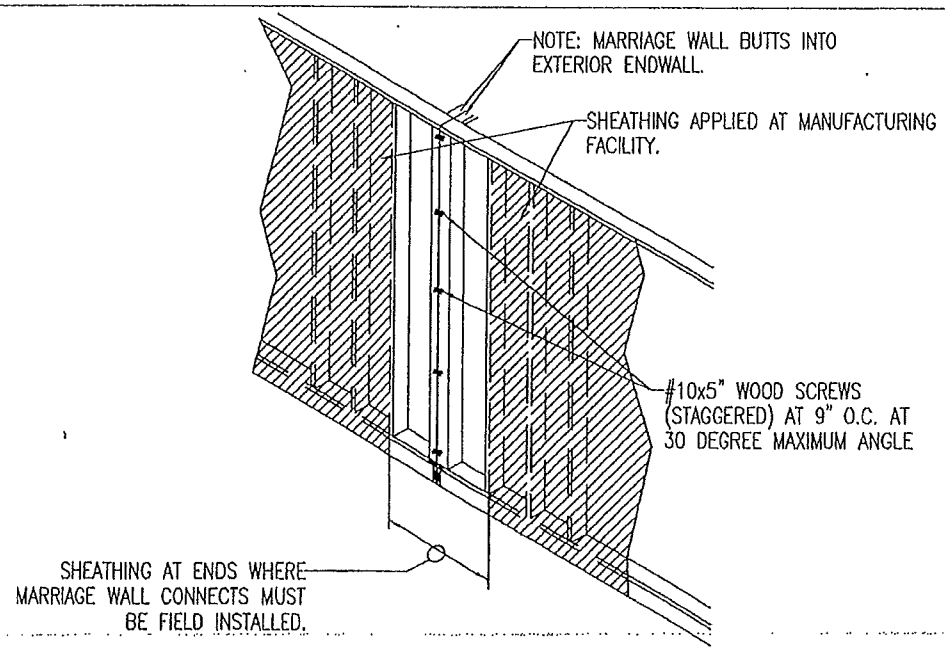
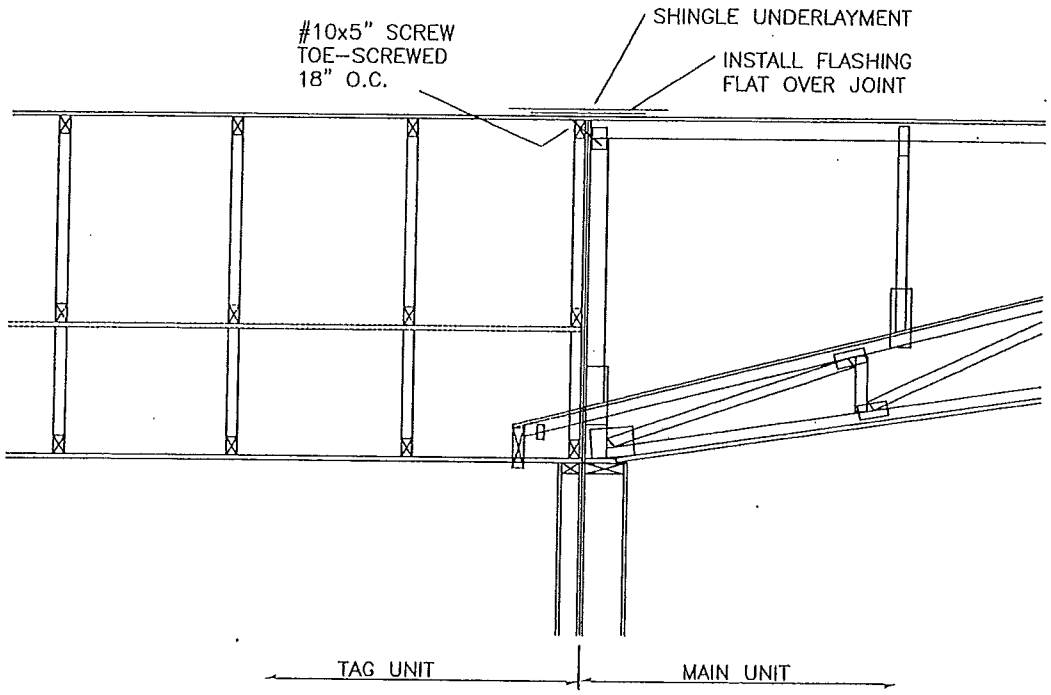
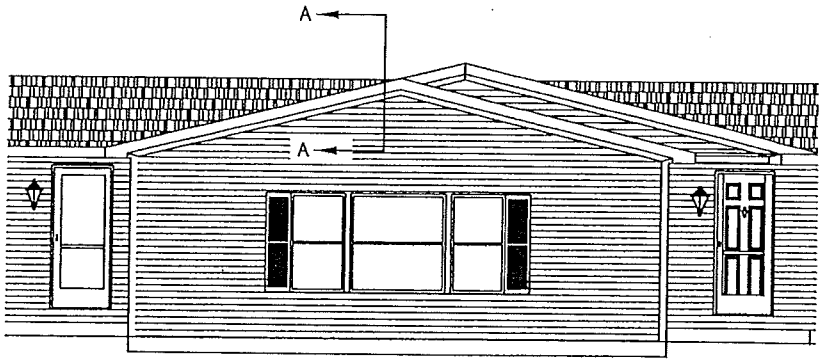


FIGURE 5.4
END WALL MARRIAGE CONNECTION

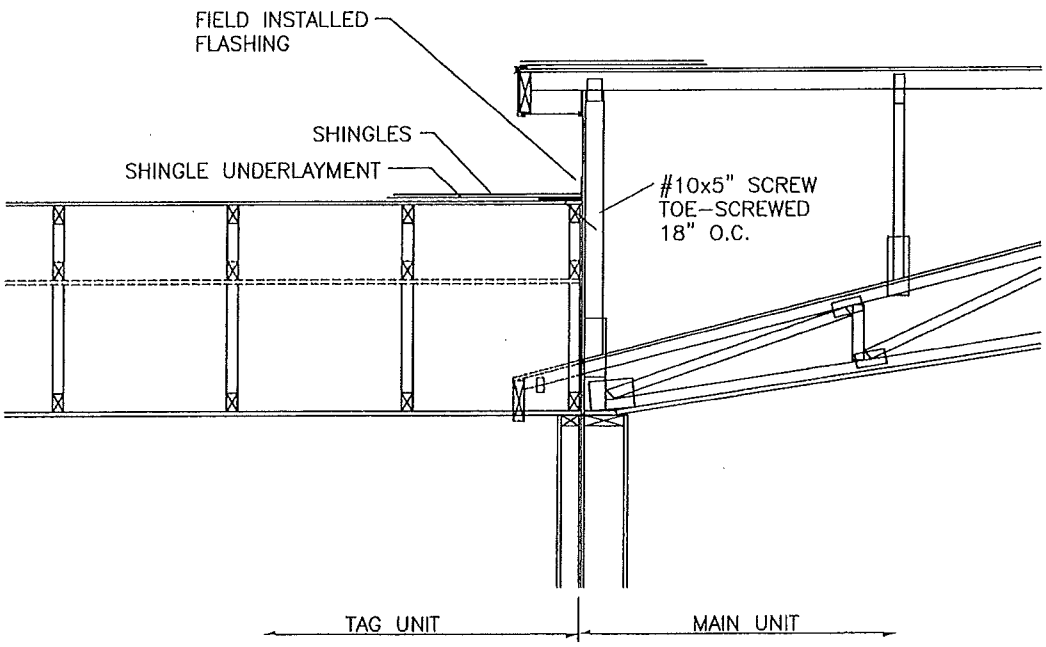


SECTION A–A

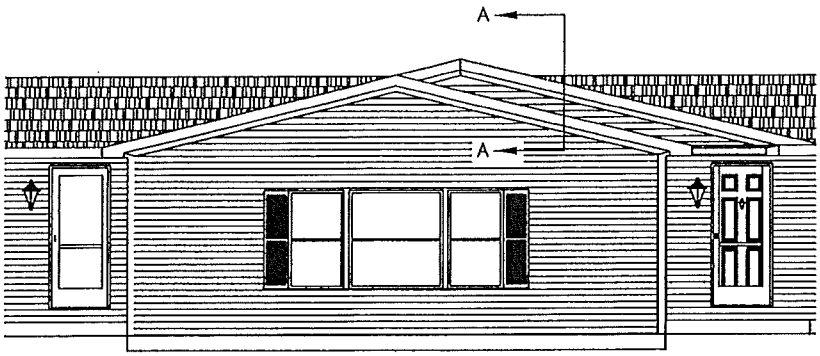


NOTES:
1. TIE TAG UNIT TO MAIN UNIT AT FLOOR USING 3/8"x7" LAG SCREWS STAGGERED AT 1'–3" O.C. IN PREDRILLED 1/4" PILOT HOLES OR USING MARRIAGE CLIPS (SEE FIGURE 5.1 OR 5.2).
2. INSTALL ROOFING CLOSE–UP (UNDERLAYMENT, FLASHING, ETC.), INSTALL SHINGLES AS SPECIFIED BY SHINGLE MANUFACTURER'S INSTALLATION INSTRUCTIONS (BACK OF SHINGLE BUNDLE).

FIGURE 5.5
TAG UNIT ROOF LINE CONNECTION (FLUSH)

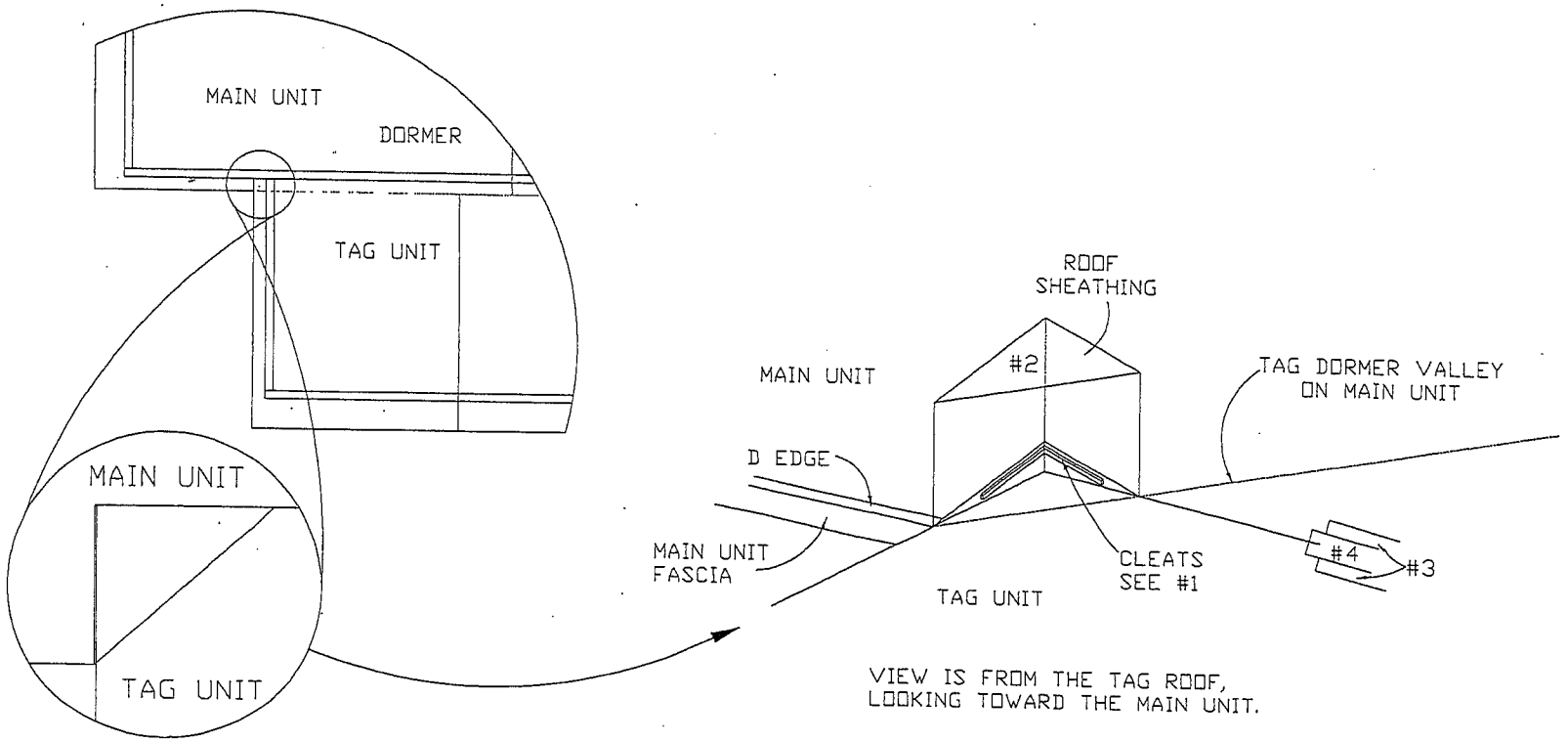


SECTION A–A



NOTES:
1. TIE TAG UNIT TO MAIN UNIT AT FLOOR USING 3/8"x7" LAG SCREWS STAGGERED AT 1'–3" O.C. IN PREDRILLED 1/4" PILOT HOLES OR USING MARRIAGE CLIPS (SEE FIGURE 5.1 OR 5.2).
2. INSTALL ROOF VALLEY FLASHING (4" MINIMUM).
3. INSTALL UNDERLAYMENT, DRIP RAILS AND SHINGLES AS SPECIFIED BY SHINGLE MANUFACTURER'S INSTALLATION INSTRUCTIONS (BACK OF SHINGLE BUNDLE).
4. INSTALL FASCIA INTO UNDERSILL TRIM AND F–CHANNEL (PROVIDED).

FIGURE 5.6
TAG UNIT ROOF LINE CONNECTION (OFF SET)



1. CUT SCRAP WOOD SUPPORT CLEATS AND INSTALL FLUSH TO UNDERSIDE OF MAIN BODY ROOF SHEATHING.
2. CUT SCRAP PIECE OF ROOF SHEATHING TO BRIDGE GAP AT OVERHANG CONNECTION AREA (THE VALLEY) BETWEEN MAIN UNIT AND TAG UNIT ROOF CONNECTIONS. FASTEN WITH 1 1/2" ROOFING NAILS OR STAPLES. NOTE: THIS PIECE WILL BE TRIANGULAR SHAPED. WHEN PROPERLY FINISHED, THIS PIECE WILL PROVIDE A CONTINUATION OF THE VALLEY THROUGH TO THE MAIN UNIT UNIT ROOF OVERHANGS.
3. FOLD BACK THE EXTRA ROOFING PAPER PROVIDED AT THE MAIN UNIT AND TAG ROOFS AT THE CONNECTION AREA.
4. LAY THE SHIP LOOSE PIECE OF METAL FLASHING CENTERED OVER THE MAIN UNIT AND TAG UNIT ROOF CONNECTION, FROM THE PEAK THROUGH THE VALLEY. MARK BOTH SIDE OF THE FLASHING AND REMOVE. PLACE A BEAD OF ROOF CEMENT ABOUT 1/2" IN FROM EACH EDGE OF THE METAL FLASHING LOCATION. PLACE THE METAL FLASHING INTO POSITION AND FASTEN WITH 1 1/2" ROOFING NAILS OR STAPLES SPACED APPROXIMATELY EVERY 6" ALONG BOTH SIDES OF THE FLASHING.
5. FOLD ROOFING PAPER BACK OVER METAL FLASHING AND FASTEN WITH 1 1/2" ROOFING NAILS OR STAPLES. INSTALL VALLEY UNDERLAYMENT AND SHINGLES PER THE MANUFACTURER'S INSTRUCTIONS.

FIGURE 5.7
TAG UNIT ROOF LINE CONNECTION (EAVES)

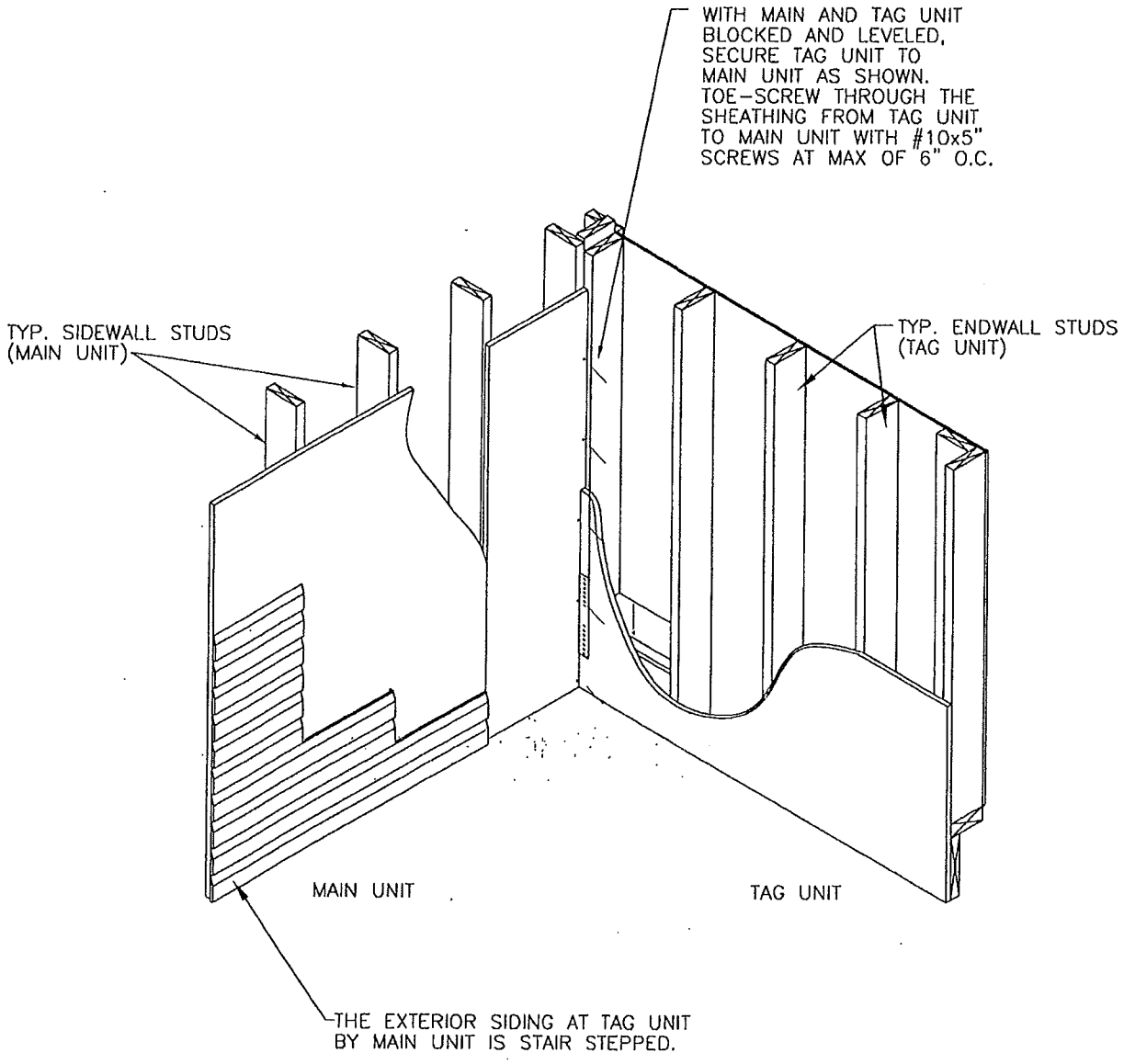


FIGURE 5.8
TAG UNIT CORNER WALL CONNECTION

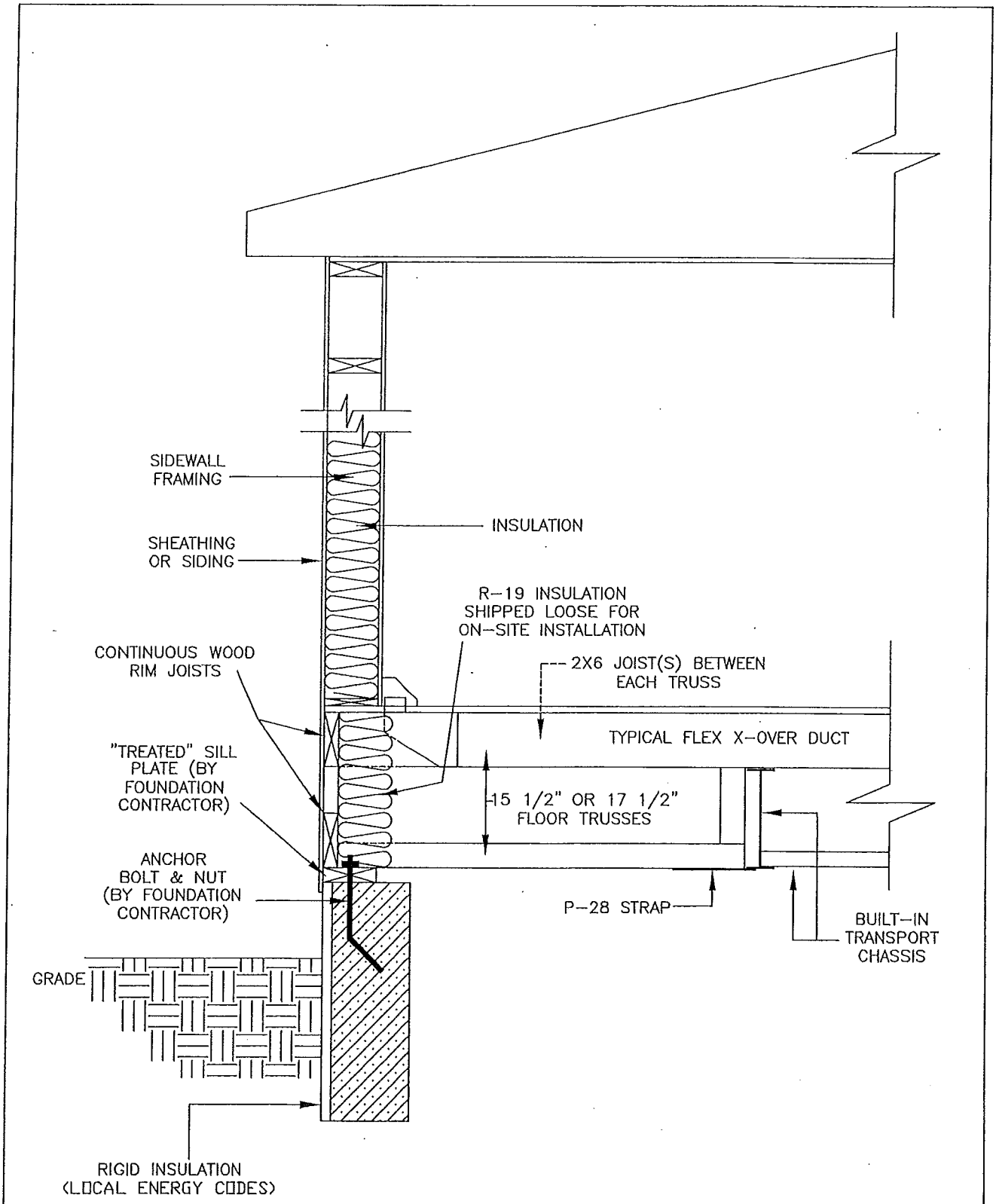


FIGURE 6.1
TYPICAL BASEMENT SET – LINDSAY UNIFIED FLOOR SYSTEM

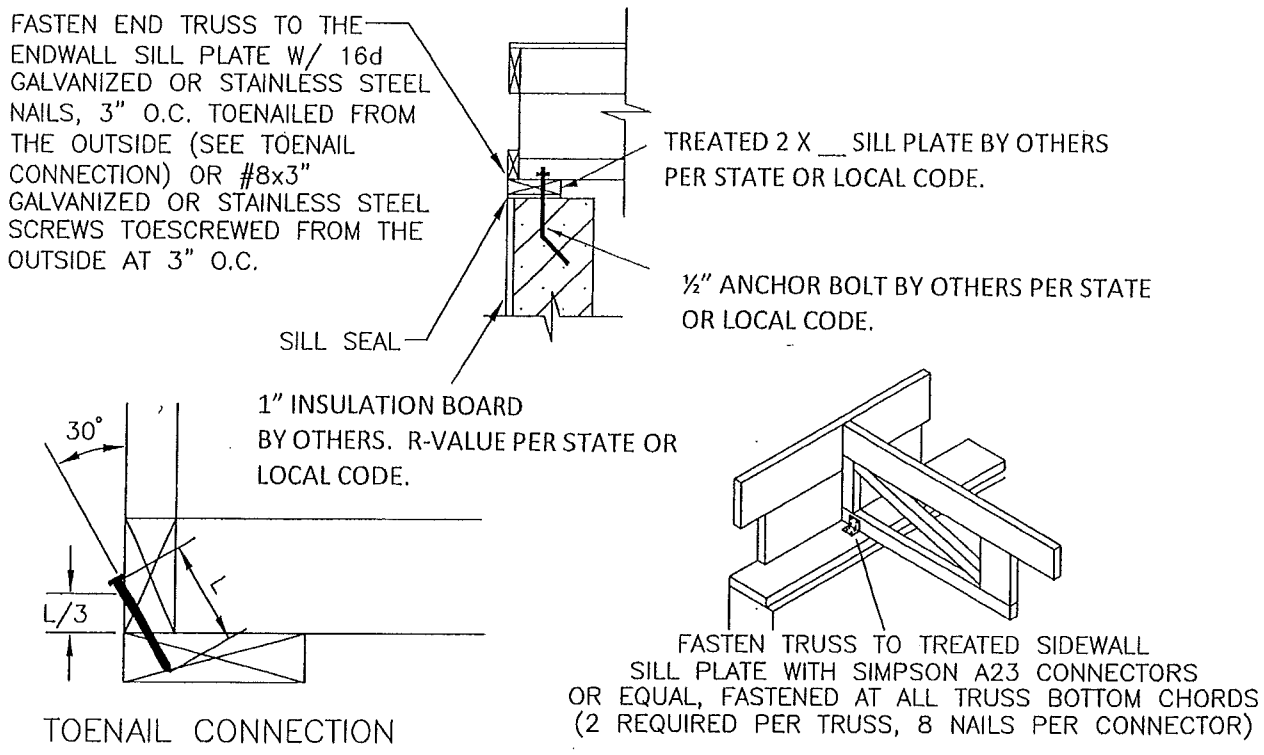


FIGURE 6.2
SILL PLATE CONNECTIONS

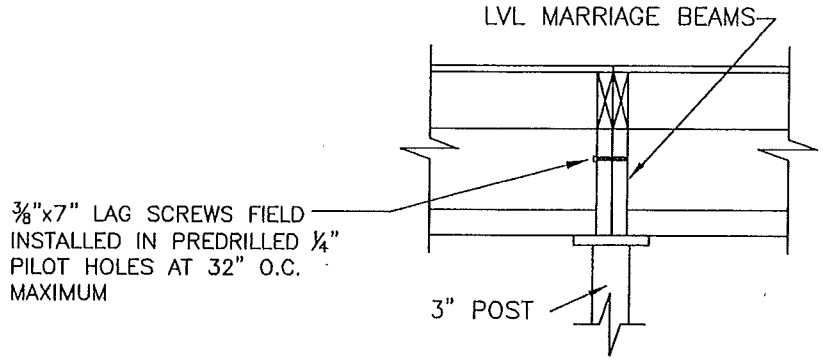


FIGURE 6.3
MARRIAGE BEAM CONNECTIONS

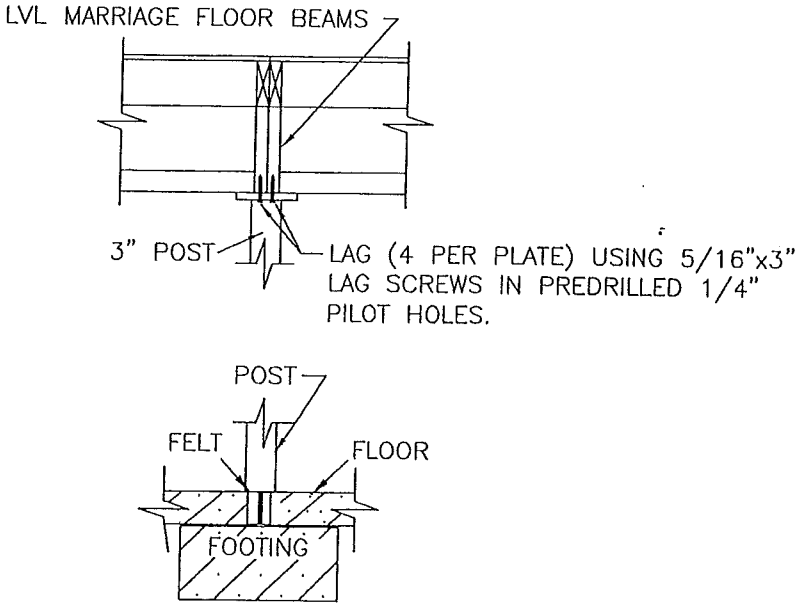


FIGURE 6.4
BASEMENT BEAM SUPPORT POST CONNECTIONS

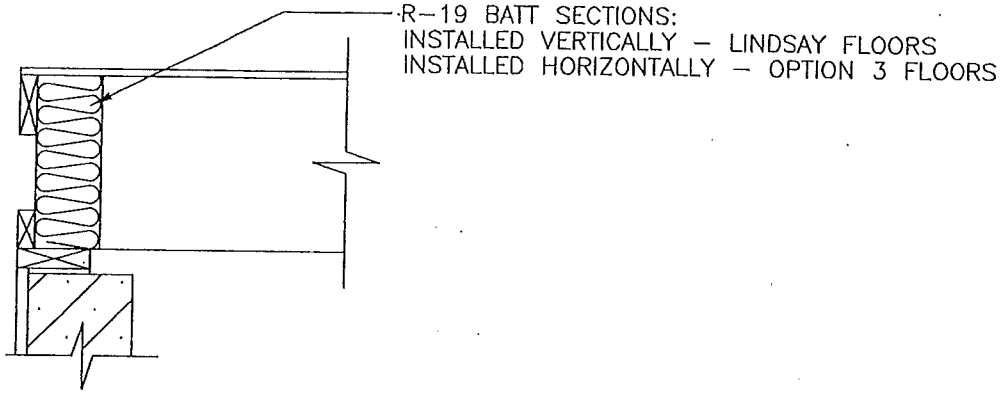


FIGURE 6.5
RIM JOIST INSULATION

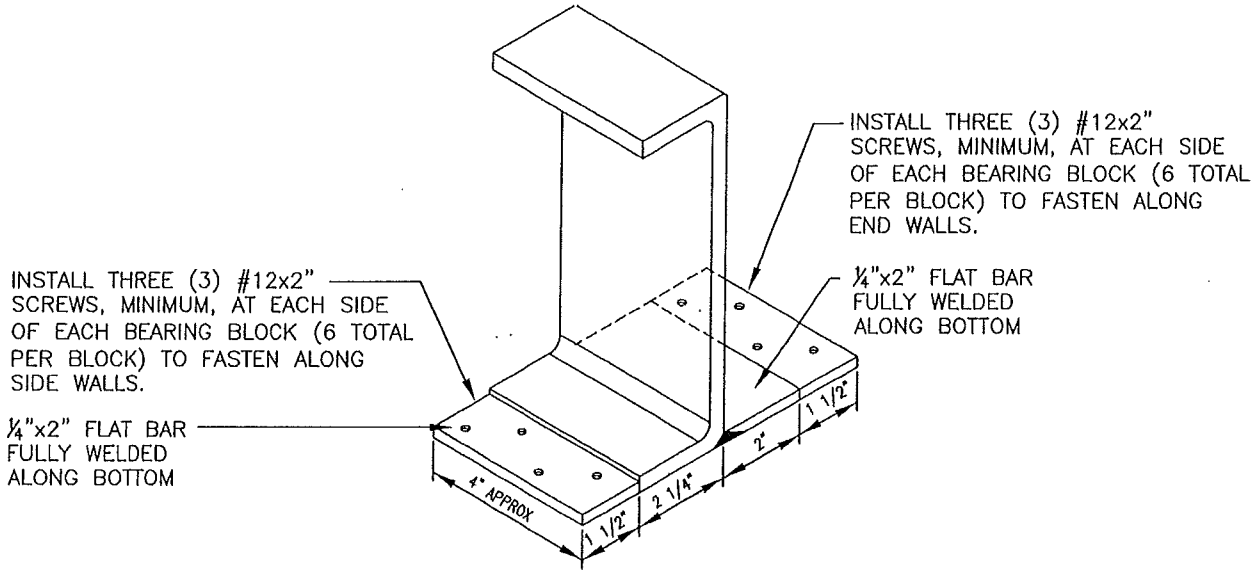


FIGURE 6.6
SILL PLATE CONNECTIONS
(OPTIONAL BEARING BLOCKS FOR CROSS BEAM FRAME)

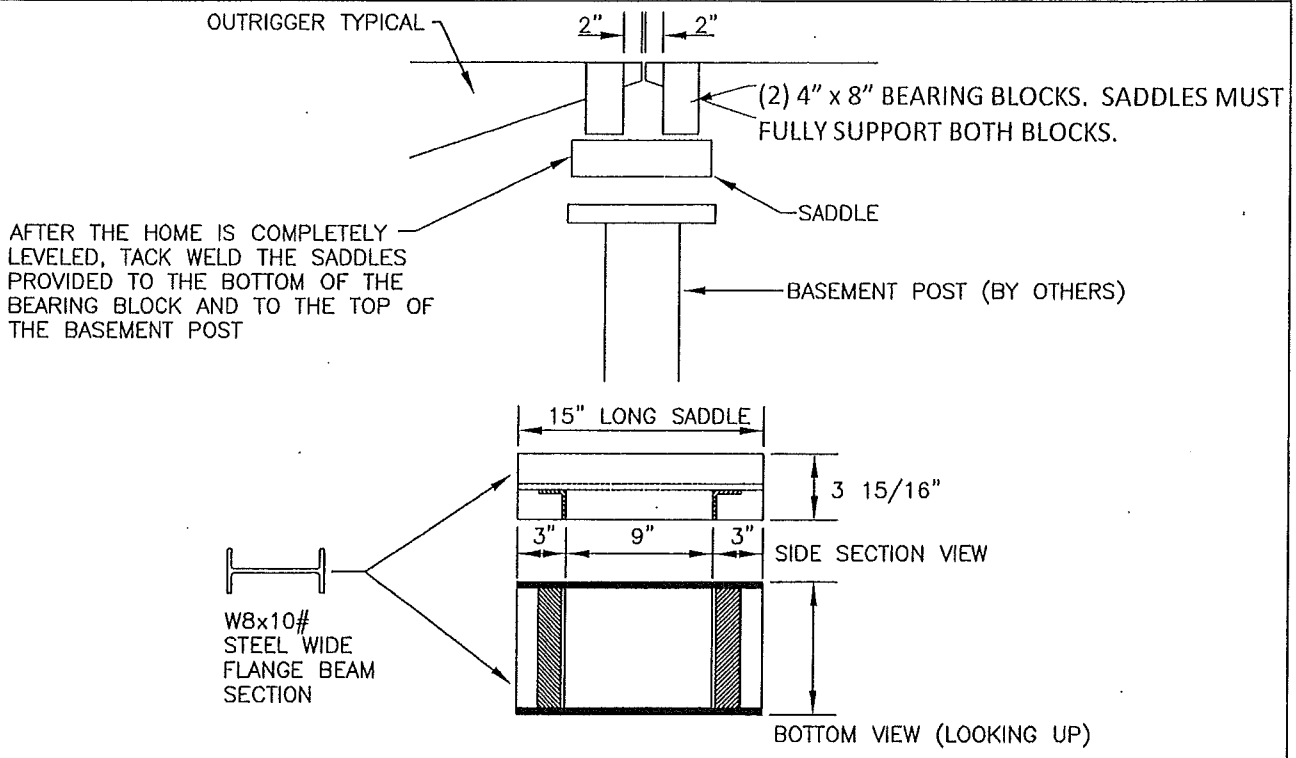
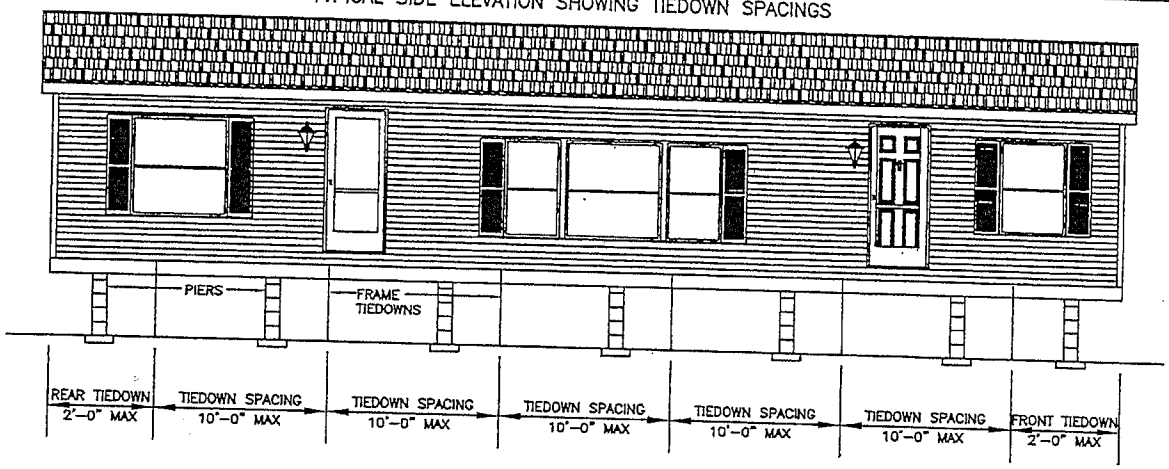
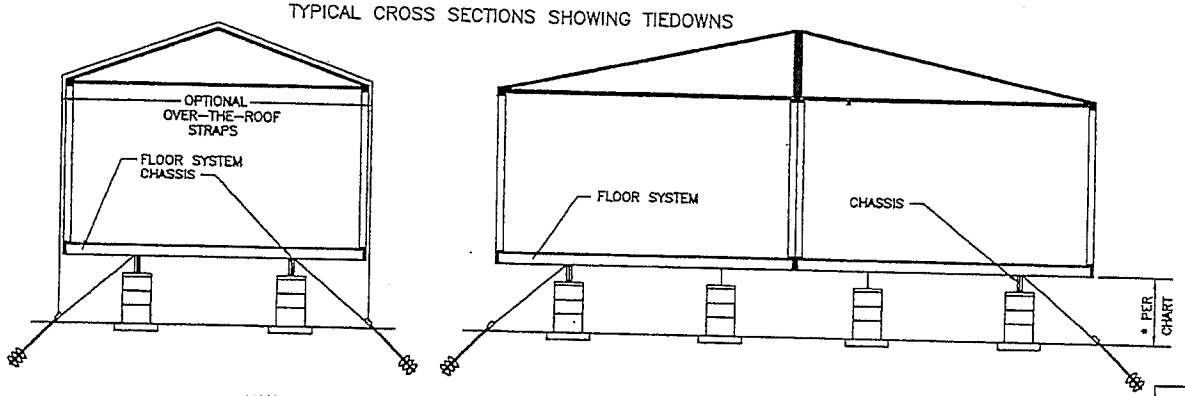


FIGURE 6.7
BASEMENT BEAM SJPPORT POST CONNECTIONS
(OPTIONAL SADDLES FOR CROSS BEAM FRAME)

TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACINGS



TYPICAL CROSS SECTIONS SHOWING TIEDOWNS



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I–BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT PER CHART.
3. OVER–THE–ROOF TIES ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
4. OVER–THE–ROOF TIES (WHEN REQUIRED) MAY BE SECURED TO THE SAME GROUND ANCHORS AS THE FRAME TIEDOWNS.
5. OVER–THE–ROOF STRAPS (WHEN REQUIRED) ARE SUPPLIED BY WICK. ALL OTHER ANCHORING EQUIPMENT 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. SLIT OR CUT EDGES DO NOT NEED TO BE ZINC COATED.
8. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
9. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
10. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953–91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
11. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953–91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
12. FOR PIER HEIGHTS GREATER THAN THOSE SHOWN IN THE FRAME TIEDOWN SPACING CHART, YOU MUST CONSULT WITH A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT.

FRAME TIEDOWN SPACING CHART

WALL HEIGHT	FLOOR WIDTH	EAVE OVERHANG	TIEDOWN SPACING	* MAXIMUM PIER HEIGHT (INCLUDES DEPTH OF BEAM)
8'–0" MAX	13'–8" SINGLE	3" MAX	10'–0"	46"
	15'–6" SINGLE	3" MAX	10'–0"	60"
	27'–4" DOUBLE	24" MAX	10'–0"	46"
	30'–4" DOUBLE	10" MAX	10'–0"	56"
9'–0" MAX	13'–8" SINGLE	3" MAX	10'–0"	32"
	15'–6" SINGLE	3" MAX	10'–0"	50"
	27'–4" DOUBLE	24" MAX	10'–0"	38"
	30'–4" DOUBLE	10" MAX	10'–0"	46"

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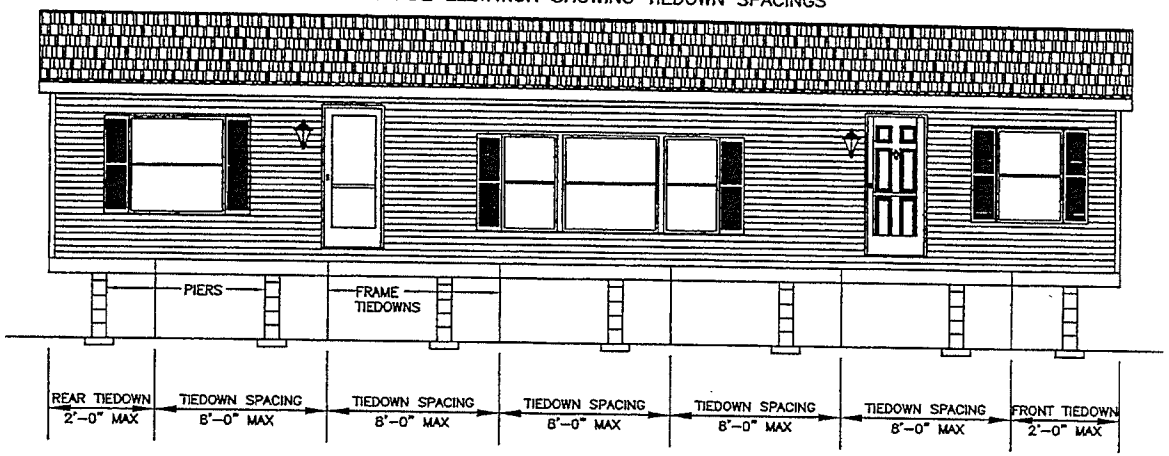
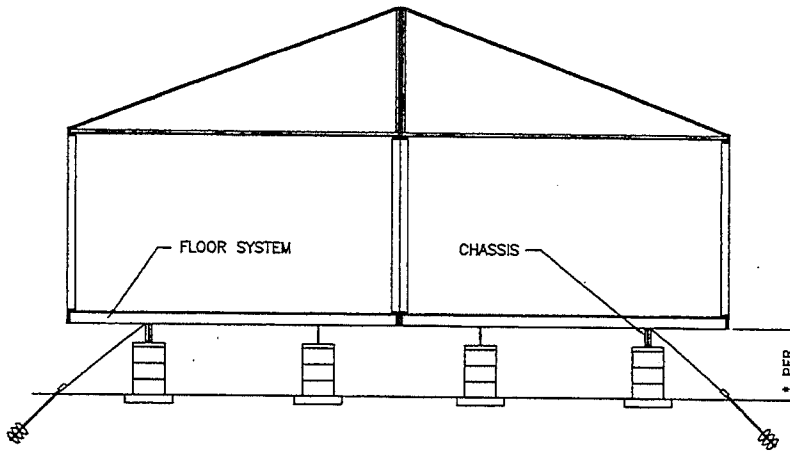
FIGURE 7.1
RECOMMENDED TIEDOWN SYSTEM
DIAGONAL FRAME TIES – WIND ZONE I
(ROOF PITCH 4.3/12 OR LESS)

TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACINGS



TYPICAL CROSS SECTION SHOWING TIEDOWNS



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT PER CHART.
3. OVER-THE-ROOF TIES ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
4. OVER-THE-ROOF TIES (WHEN REQUIRED) MAY BE SECURED TO THE SAME GROUND ANCHORS AS THE FRAME TIEDOWNS.
5. OVER-THE-ROOF STRAPS (WHEN REQUIRED) ARE SUPPLIED BY WICK. ALL OTHER ANCHORING EQUIPMENT 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. SLIT OR CUT EDGES DO NOT NEED TO BE ZINC COATED.
8. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
9. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
10. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
11. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
12. FOR PIER HEIGHTS GREATER THAN THOSE SHOWN IN THE FRAME TIEDOWN SPACING CHART, YOU MUST CONSULT WITH A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT.

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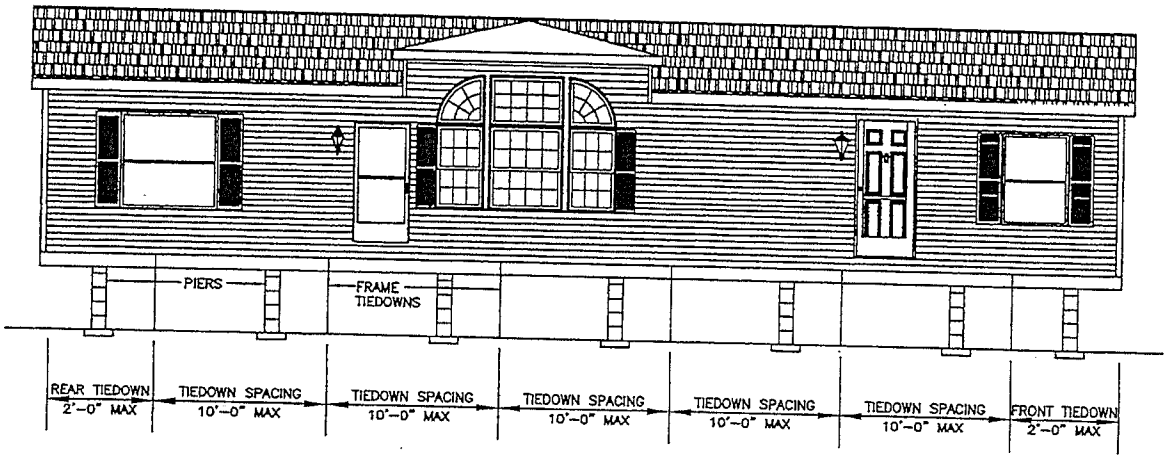
FRAME TIEDOWN SPACING CHART

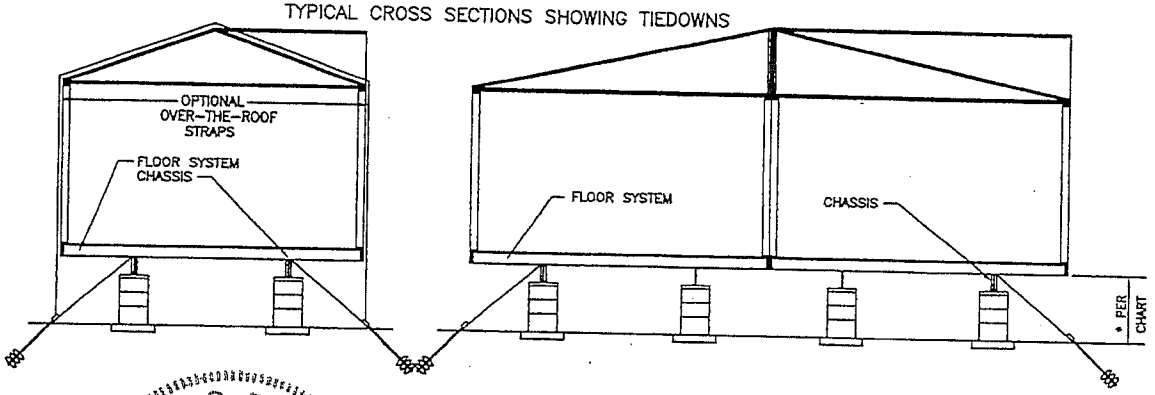
WALL HEIGHT	FLOOR WIDTH	EAVE OVERHANG	TIEDOWN SPACING	* MAXIMUM PIER HEIGHT (INCLUDES DEPTH OF BEAM)
8'-0" MAX	27'-4" DOUBLE 30'-4" DOUBLE	24" MAX 10" MAX	8'-0" 8'-0"	40" 46"

FIGURE 7.2
RECOMMENDED TIEDOWN SYSTEM
DIAGONAL FRAME TIES - WIND ZONE 1
(ROOF PITCH GREATER THAN 4.3/12)

TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACINGS



TYPICAL CROSS SECTIONS SHOWING TIEDOWNS



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT PER CHART.
3. OVER-THE-ROOF TIES ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
4. OVER-THE-ROOF TIES (WHEN REQUIRED) MAY BE SECURED TO THE SAME GROUND ANCHORS AS THE FRAME TIEDOWNS.
5. OVER-THE-ROOF STRAPS (WHEN REQUIRED) ARE SUPPLIED BY WICK. ALL OTHER ANCHORING EQUIPMENT 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. SLIT OR CUT EDGES DO NOT NEED TO BE ZINC COATED.
8. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
9. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
10. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
11. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
12. FOR PIER HEIGHTS GREATER THAN THOSE SHOWN IN THE FRAME TIEDOWN SPACING CHART, YOU MUST CONSULT WITH A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT.

JOHN C. DOEDEN REGISTERED No. ENE8703571 STATE OF INDIANA PROFESSIONAL ENGINEER

FIGURE 7.3
RECOMMENDED TIEDOWN SYSTEM
DIAGONAL FRAME TIES – WIND ZONE 1
(CLERESTORY ROOF DESIGN)

FRAME TIEDOWN SPACING CHART

WALL HEIGHT	FLOOR WIDTH	EAVE OVERHANG	TIEDOWN SPACING	* MAXIMUM PIER HEIGHT (INCLUDES DEPTH OF BEAM)
10'-1" MAX	13'-8" SINGLE	3" MAX	10'-0"	29"
	15'-6" SINGLE	3" MAX	10'-0"	37"
	27'-4" DOUBLE	24" MAX	10'-0"	29"
	30'-4" DOUBLE	10" MAX	10'-0"	37"

NOTES:
1. WIND ZONE I (15 PSF LATERAL)
2. OVER-THE-ROOF TIE-DOWNS ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
3. 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.
4. PROTECTION SHALL BE PROVIDED AT SHARP CORNERS WHERE THE ANCHORING SYSTEM REQUIRES THE USE OF EXTERNAL STRAPS OR CABLES.

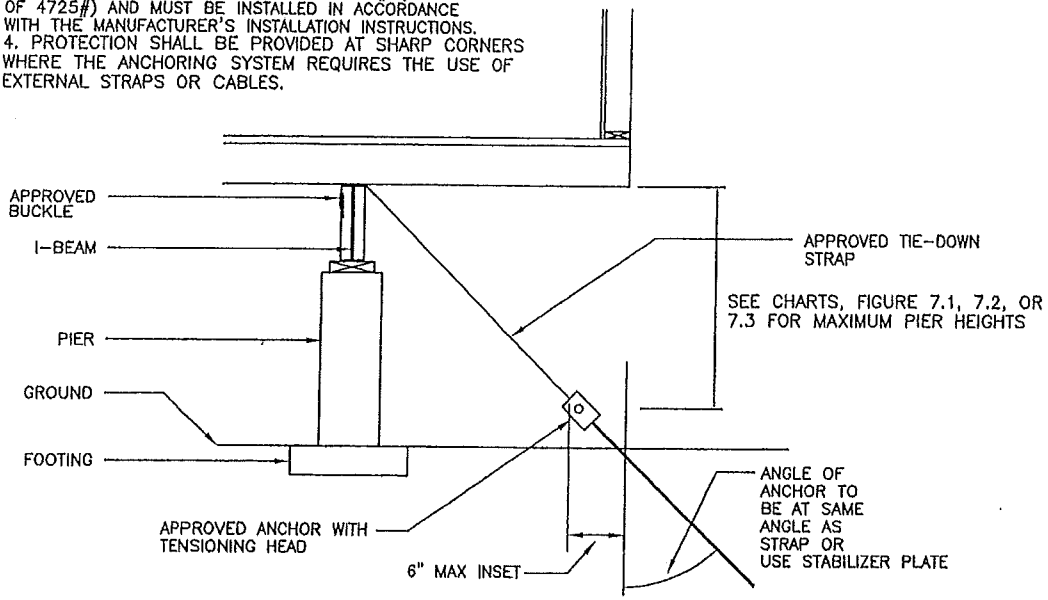
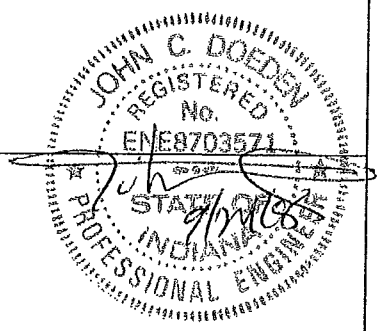


FIGURE 7.4(a)
TIEDOWN ATTACHMENT DETAILS
DIAGONAL FRAME TIES



NOTES:
1. WIND ZONE I (15 PSF LATERAL)
2. OVER-THE-ROOF TIE-DOWNS ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
3. 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.
4. PROTECTION SHALL BE PROVIDED AT SHARP CORNERS WHERE THE ANCHORING SYSTEM REQUIRES THE USE OF EXTERNAL STRAPS OR CABLES.

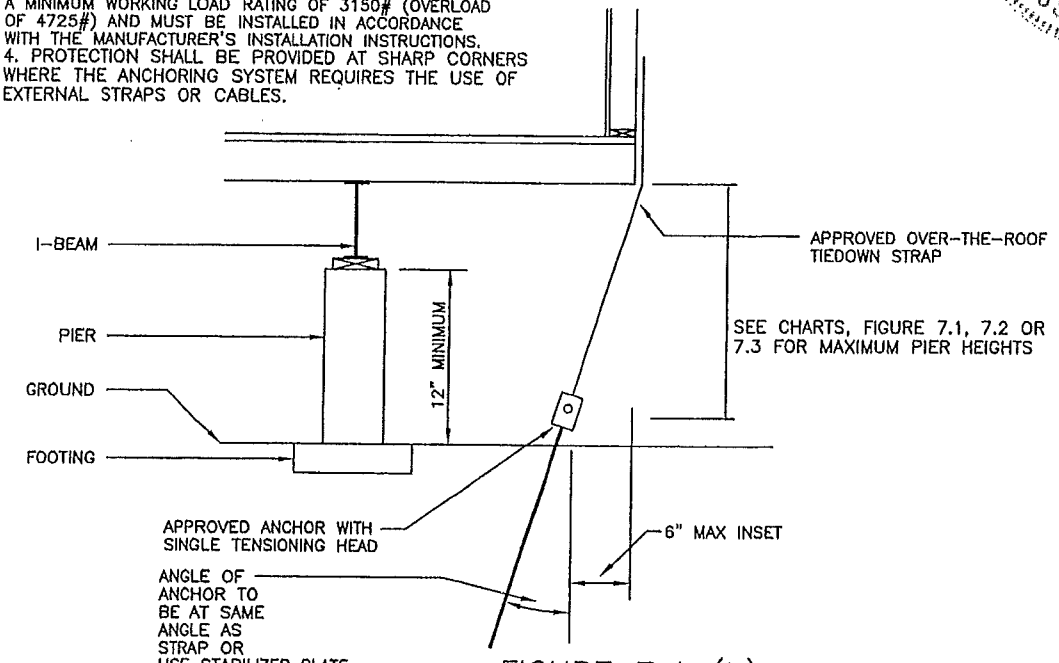
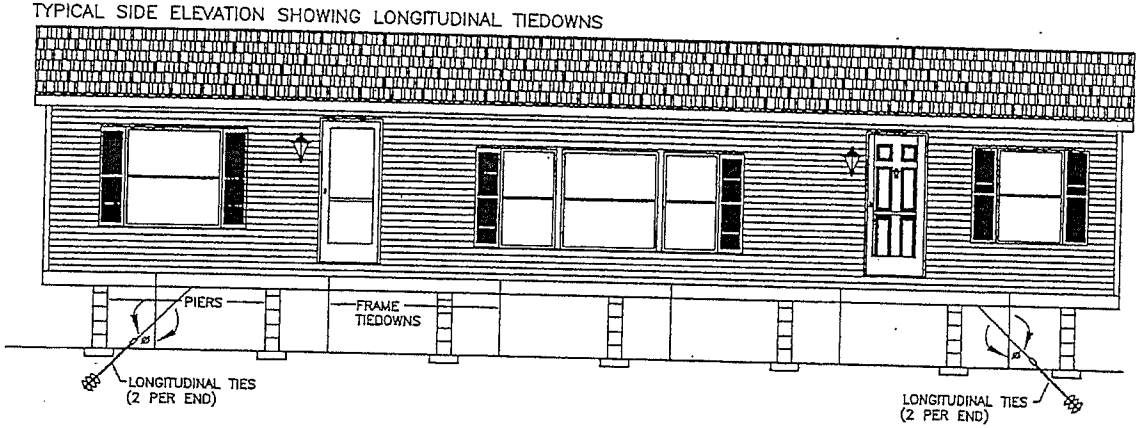


FIGURE 7.4 (b)
TIEDOWN ATTACHMENT DETAILS
OVER-THE-ROOF TIES

TYPICAL SIDE ELEVATION SHOWING LONGITUDINAL TIEDOWNS



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0".
3. ANCHORING EQUIPMENT IS NOT PROVIDED BY WICK.
4. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION 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.
5. 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 DO NOT NEED TO BE ZINC COATED.
6. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
7. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
8. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
9. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.
11. SELECT A CROSSMEMBER WHERE PIERS DO NOT INTERFERE WITH THE REQUIRED ANGLE OF THE STRAP. INSTALL THE STRAP JUST INSIDE THE MAIN I-BEAMS LOOPED AROUND THE CROSSMEMBER AND TIE TO AN ANCHOR LOCATED DIRECTLY UNDER THE MAIN I-BEAM AT THE ANGLE SPECIFIED IN THE CHART BELOW.
12. WHEN ANCHORS ARE NOT INSTALLED AT THE ANGLE SPECIFIED IN THE TABLE, A STABILIZER PLATE MUST BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTRUCTIONS.
13. SEE DETAIL 7.8 FOR LONGITUDINAL TIEDOWN ATTACHMENT.

ROOF SLOPE NOT EXCEEDING 20 DEGREES NO RESTRICTION AS TO PIER TYPE OR HEIGHT (EXCEPT AS LIMITED BY OTHER DETAILS)		
FLOOR WIDTH	MINIMUM QUANTITY EACH END OF EACH SECTION	MINIMUM STRAP ANGLE (DEGREES)
164" SINGLE WIDE	2	32
188" SINGLE WIDE	2	39

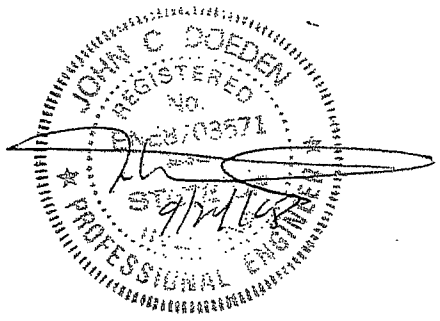
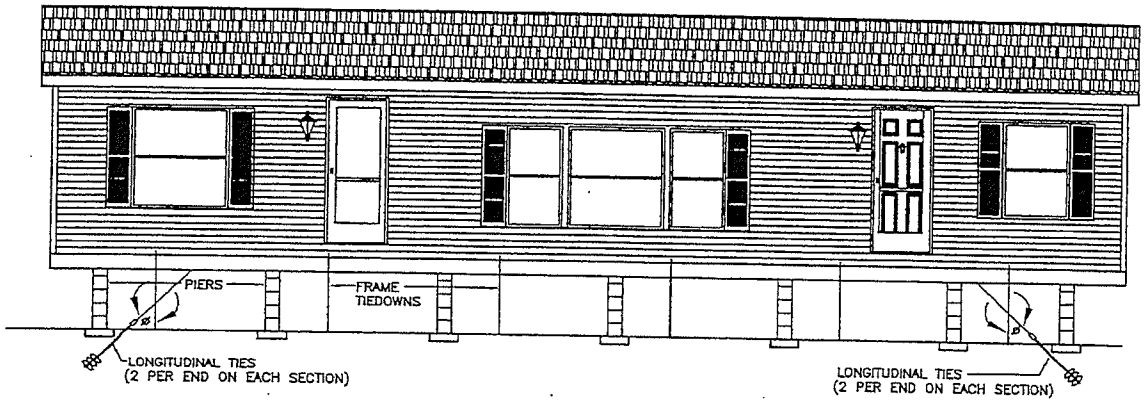


FIGURE 7.5
RECOMMENDED TIE DOWN SYSTEM
LONGITUDINAL FRAME TIES SINGLE SECTION HOMES

TYPICAL SIDE ELEVATION SHOWING LONGITUDINAL TIEDOWNS



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0".
3. ANCHORING EQUIPMENT IS NOT PROVIDED BY WICK.
4. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION 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.
5. 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 DO NOT NEED TO BE ZINC COATED.
6. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
7. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
8. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
9. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.
11. SELECT A CROSSMEMBER WHERE PIERS DO NOT INTERFERE WITH THE REQUIRED ANGLE OF THE STRAP. INSTALL THE STRAP JUST INSIDE THE MAIN I-BEAMS LOOPED AROUND THE CROSSMEMBER AND TIE TO AN ANCHOR LOCATED DIRECTLY UNDER THE MAIN I-BEAM AT THE ANGLE SPECIFIED IN THE CHART BELOW.
12. WHEN ANCHORS ARE NOT INSTALLED AT THE ANGLE SPECIFIED IN THE TABLE, A STABILIZER PLATE MUST BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTRUCTIONS.
13. SEE DETAIL 7.8 FOR LONGITUDINAL TIEDOWN ATTACHMENT.

ROOF SLOPE NOT EXCEEDING 20 DEGREES DOUBLE WIDE UNITS (ALTERNATE WITH BLOCK PIERS*)				ROOF SLOPE NOT EXCEEDING 20 DEGREES NO RESTRICTION AS TO PIER TYPE OR HEIGHT (EXCEPT AS LIMITED BY OTHER DETAILS)		
	MINIMUM UNIT LENGTH		NUMBER OF LONGITUDINAL TIES (TOTAL EACH END)			
FLOOR WIDTH	SINGLE STACK	DOUBLE STACK		FLOOR WIDTH	MINIMUM QUANTITY EACH END OF EACH SECTION	MINIMUM STRAP ANGLE (DEGREES)
27'-4" DOUBLE WIDE	66'-0"	60'-0"	0	164" DOUBLE WIDE*	2	37
	32'-0"	32'-6"	2	182" DOUBLE WIDE*	2	43
30'-4" DOUBLE WIDE	NA	64'-0"	0			
	49'-0"	34'-0"	2			

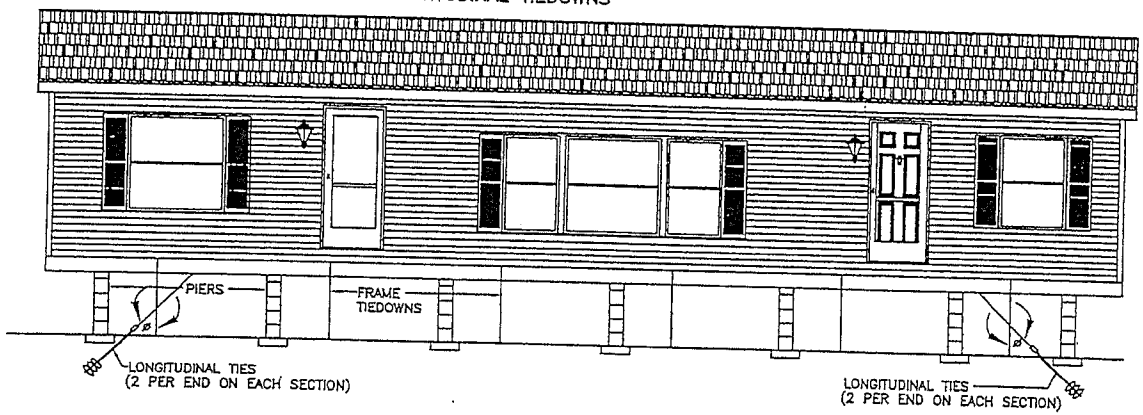
* FOR USE IN ABOVE TABLE:
SINGLE STACK BLOCK PIERS = 28" MAXIMUM HEIGHT
DOUBLE STACK BLOCK PIERS = 63" MAXIMUM HEIGHT
MINIMUM ANGLE OF STRAP = 40 DEGREES.

*MAY REDUCE TO 0 OR 1 LONGITUDINAL TIE PER HALF WITH PIER RESTRICTIONS PER CHART TO LEFT

JOHN C. DOEDEN
REGISTERED
No.
ENG8703571
STATE OF
INDIANA
PROFESSIONAL ENGINEER

FIGURE 7.6
RECOMMENDED TIE DOWN SYSTEM
LONGITUDINAL FRAME TIES – MULTI SECTION HOMES
(ROOF PITCH 4 3/12 OR LESS).

TYPICAL SIDE ELEVATION SHOWING LONGITUDINAL TIEDOWNS



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0".
3. ANCHORING EQUIPMENT IS NOT PROVIDED BY WICK.
4. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION 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.
5. 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 DO NOT NEED TO BE ZINC COATED.
6. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
7. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
8. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
9. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.
11. SELECT A CROSSMEMBER WHERE PIERS DO NOT INTERFERE WITH THE REQUIRED ANGLE OF THE STRAP. INSTALL THE STRAP JUST INSIDE THE MAIN I-BEAMS LOOPED AROUND THE CROSSMEMBER AND TIE TO AN ANCHOR LOCATED DIRECTLY UNDER THE MAIN I-BEAM AT THE ANGLE SPECIFIED IN THE CHART BELOW.
12. WHEN ANCHORS ARE NOT INSTALLED AT THE ANGLE SPECIFIED IN THE TABLE, A STABILIZER PLATE MUST BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTRUCTIONS.
13. SEE DETAIL 7.8 FOR LONGITUDINAL TIEDOWN ATTACHMENT.

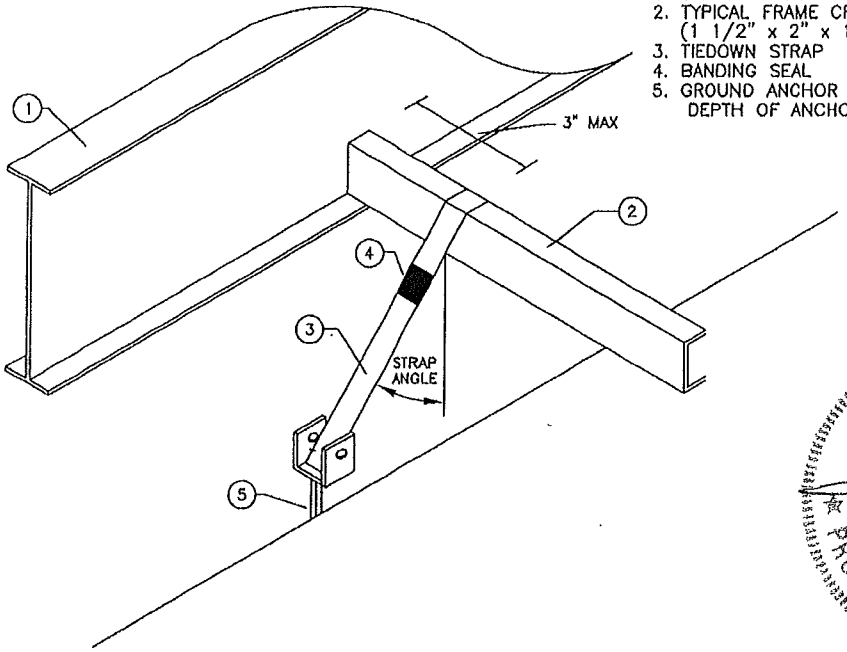
ROOF SLOPE UP TO 6 ON 12 DOUBLE WIDE UNITS (ALTERNATE WITH BLOCK PIERS*)				ROOF SLOPE UP TO 6 ON 12 NO RESTRICTION AS TO PIER TYPE OR HEIGHT (EXCEPT AS LIMITED BY OTHER DETAILS)		
	MINIMUM UNIT LENGTH		NUMBER OF LONGITUDINAL TIES (TOTAL EACH END)			
FLOOR WIDTH	SINGLE STACK	DOUBLE STACK		FLOOR WIDTH	MINIMUM QUANTITY EACH END OF EACH SECTION	MINIMUM STRAP ANGLE (DEGREES)
27'-4" DOUBLE WIDE	72'-0"	54'-0"	0	164" DOUBLE WIDE*	2	39
	36'-0"	32'-0"	2	182" DOUBLE WIDE*	2	48
30'-4" DOUBLE WIDE	NA	69'-0"	0			
	56'-0"	39'-0"	2			

* FOR USE IN ABOVE TABLE:
SINGLE STACK BLOCK PIERS = 28" MAXIMUM HEIGHT
DOUBLE STACK BLOCK PIERS = 63" MAXIMUM HEIGHT
MINIMUM ANGLE OF STRAP = 40 DEGREES.

*MAY REDUCE TO 0 OR 1 LONGITUDINAL TIE PER HALF WITH PIER RESTRICTIONS PER CHART TO LEFT

JOHN C. DOEDEN REGISTERED NO. ENE870357 STATE OF INDIANA PROFESSIONAL ENGINEER

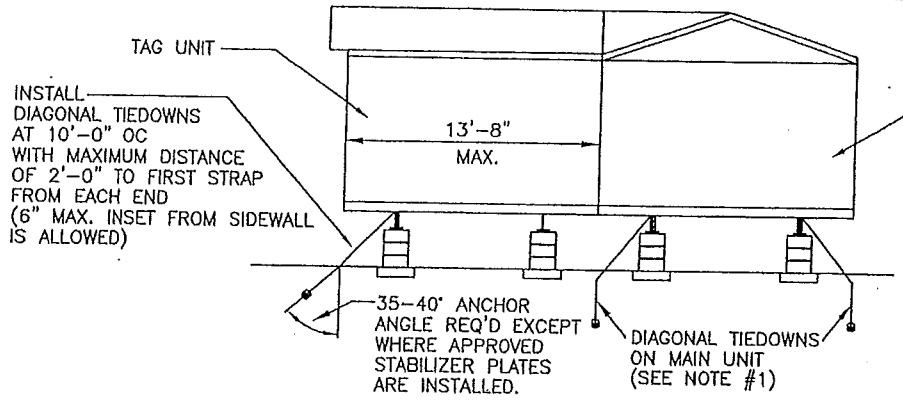
FIGURE 7.7
RECOMMENDED TIE DOWN SYSTEM
LONGITUDINAL FRAME T[illegible] – MULTI SECTION HOMES
(ROOF PITCH GREATER THAN 4:3/12)

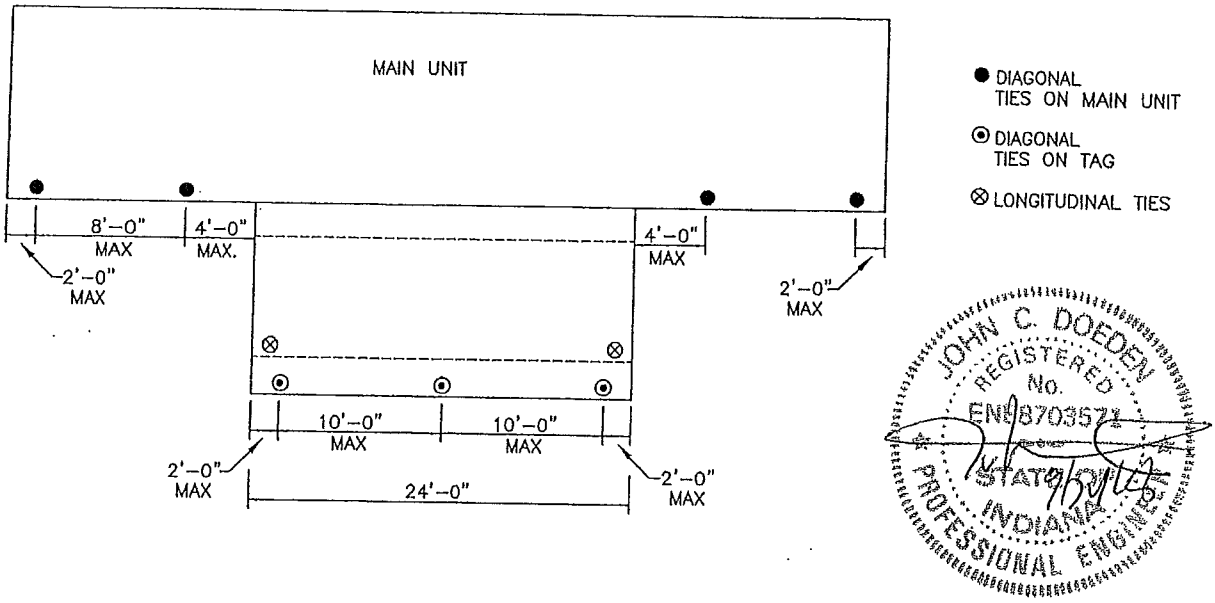


NOTES:
1. TYPICAL LONGITUDINAL I-BEAM
2. TYPICAL FRAME CROSSMEMBER (1 1/2" x 2" x 1 1/2" x 13 GA MINIMUM)
3. TIEDOWN STRAP
4. BANDING SEAL
5. GROUND ANCHOR – INSTALLED TO FULL DEPTH OF ANCHOR HEAD

FIGURE 7.8
TIEDOWN ATTACHMENT DETAILS
LONGITUDINAL FRAME TIES

THIS SPACE INTENTIONALLY LEFT BLANK

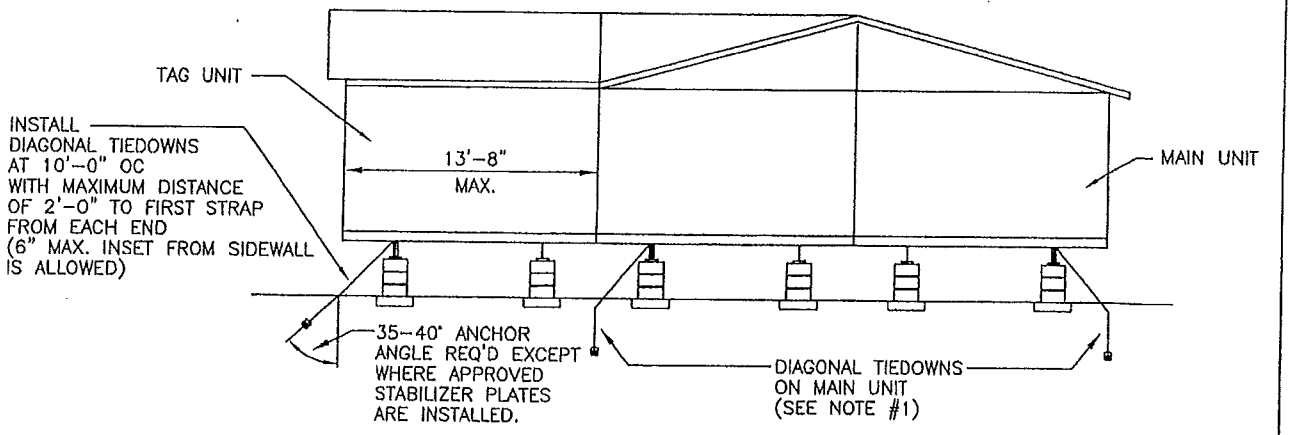


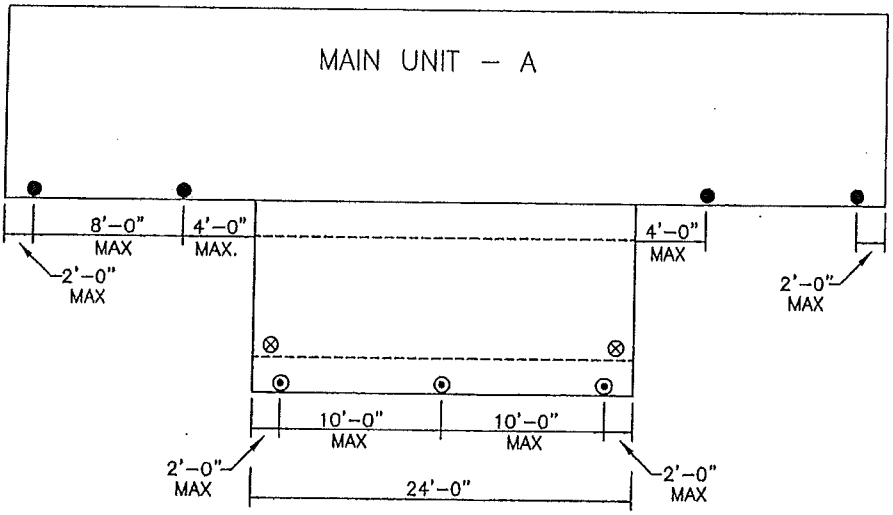


NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0".
3. OVER-THE-ROOF TIES ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION. OVER-THE-ROOF TIES (WHEN REQUIRED) MAY BE SECURED TO THE SAME GROUND ANCHORS AS THE FRAME TIEDOWNS.
4. OVER-THE-ROOF STRAPS (WHEN REQUIRED) ARE SUPPLIED BY WICK. ALL OTHER ANCHORING EQUIPMENT SUPPLIED BY OTHERS.
5. 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.
6. 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 DO NOT NEED TO BE ZINC COATED.
7. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
8. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
9. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
11. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.
12. SELECT A CROSSMEMBER WHERE PIERS DO NOT INTERFERE WITH THE REQUIRED ANGLE OF THE STRAP. INSTALL THE STRAP JUST INSIDE THE I-BEAMS LOOPED AROUND THE CROSSMEMBER AND TIE TO AN ANCHOR LOCATED DIRECTLY UNDER THE I-BEAM AT THE ANGLE SPECIFIED.
13. WHEN ANCHORS ARE NOT INSTALLED AT THE ANGLE SPECIFIED, A STABILIZER PLATE MUST BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTRUCTIONS.
14. SEE FIGURES 7.1, 7.2, 7.3, 7.5, 7.6 AND 7.7 FOR MAIN UNIT TIE DOWN REQUIREMENTS.

FIGURE 7.9
RECOMMENDED TIE DOWN SYSTEM
SINGLE SECTION WITH TAG UNIT

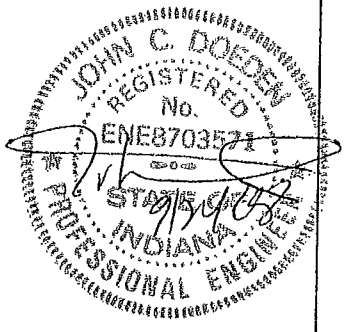




● DIAGONAL TIES ON MAIN UNIT

⊙ DIAGONAL TIES ON TAG

⊗ LONGITUDINAL TIES



NOTES:

1. WIND ZONE 1 DESIGN (15 PSF LATERAL).
2. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0".
3. OVER-THE-ROOF TIES ARE NOT REQUIRED WITH PROPERLY SPACED AND INSTALLED FRAME TIEDOWNS UNLESS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION. OVER-THE-ROOF TIES (WHEN REQUIRED) MAY BE SECURED TO THE SAME GROUND ANCHORS AS THE FRAME TIEDOWNS.
4. OVER-THE-ROOF STRAPS (WHEN REQUIRED) ARE SUPPLIED BY WICK. ALL OTHER ANCHORING EQUIPMENT SUPPLIED BY OTHERS.
5. 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.
6. 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 DO NOT NEED TO BE ZINC COATED.
7. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
8. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE AND SHALL BE INSTALLED TO THEIR FULL DEPTH. STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
9. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91 "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
11. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.
12. SELECT A CROSSMEMBER WHERE PIERS DO NOT INTERFERE WITH THE REQUIRED ANGLE OF THE STRAP. INSTALL THE STRAP JUST INSIDE THE I-BEAMS LOOPED AROUND THE CROSSMEMBER AND TIE TO AN ANCHOR LOCATED DIRECTLY UNDER THE I-BEAM AT THE ANGLE SPECIFIED.
13. WHEN ANCHORS ARE NOT INSTALLED AT THE ANGLE SPECIFIED, A STABILIZER PLATE MUST BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTRUCTIONS.
14. SEE FIGURES 7.1, 7.2, 7.3, 7.5, 7.6 AND 7.7 FOR MAIN UNIT TIE DOWN REQUIREMENTS.

FIGURE 7.10
RECOMMENDED TIE DOWN SYSTEM
MULTI SECTION WITH TAG UNIT

NOTES:
1. MIN. 6 MIL. POLY VAPOR BARRIER REQUIRED.
2. ONE SQ. FT. OF VENTING PER EVERY 1500 SQ. FT. OF CRAWLSPACE.
3. 16" x 8" VENTS TO BE A MIN. OF 50 SQ. IN OF FREE AIR.

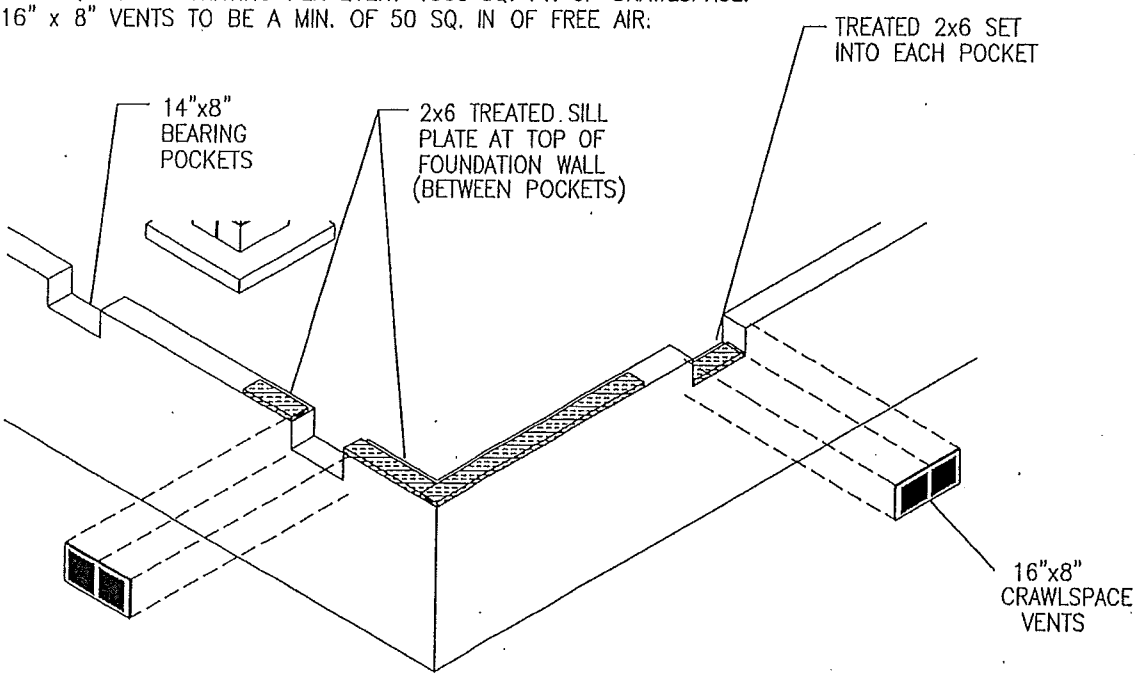


FIGURE 8.1
CRAWL SPACE VENTILATION

CUT 4" SHIP LOOSE DECKING STRIPS (PROVIDED BY WICK) TO WIDTH AND INSTALL USING 1½" SCREWS, 1½" STAPLES OR 8d NAILS BEFORE COMPLETING FLOOR COVERING CROSSOVERS.

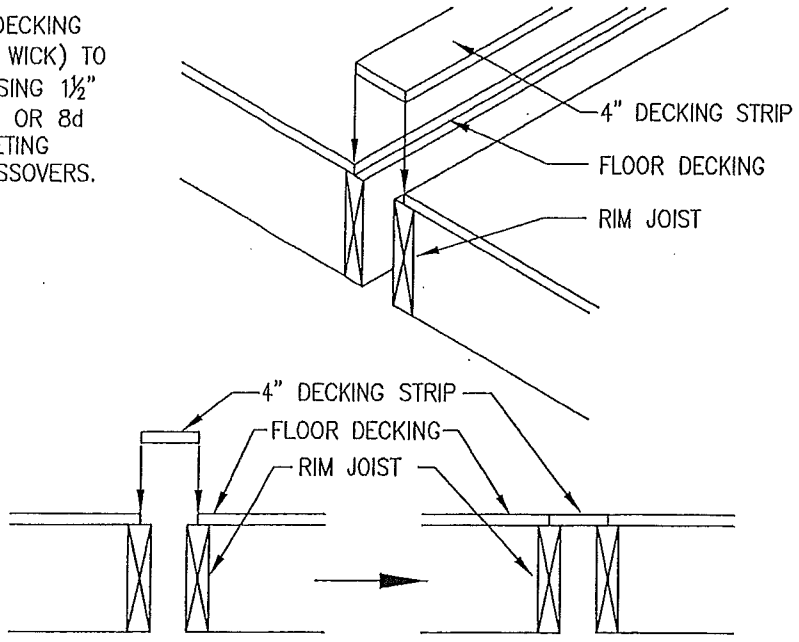
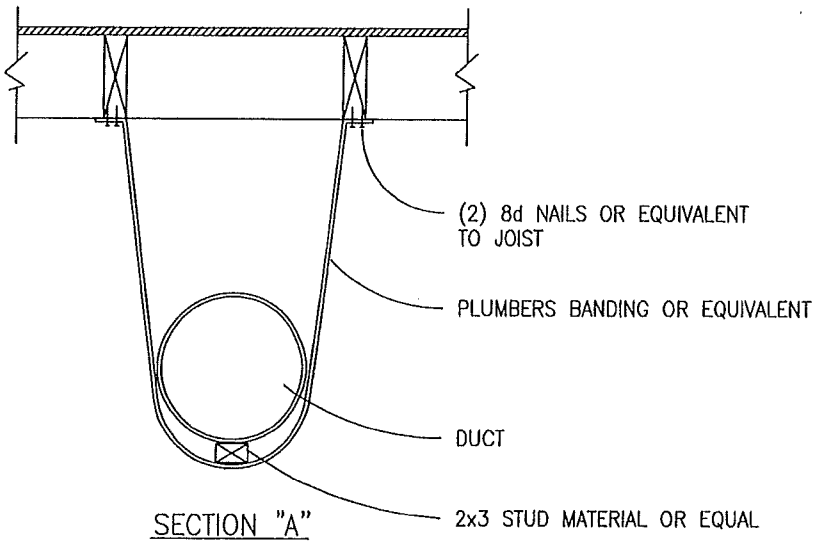


FIGURE 8.2
MARRIAGE WALL FLOOR DECKING CLOSE-UP

NOTE:
IF A REMOTE AIR CONDITIONER IS INSTALLED, DAMPERS MUST BE PROVIDED PER SECTION 3280.709(e)(7) OF THE FEDERAL STANDARDS FOR MANUFACTURED HOUSING



SECTION "A"

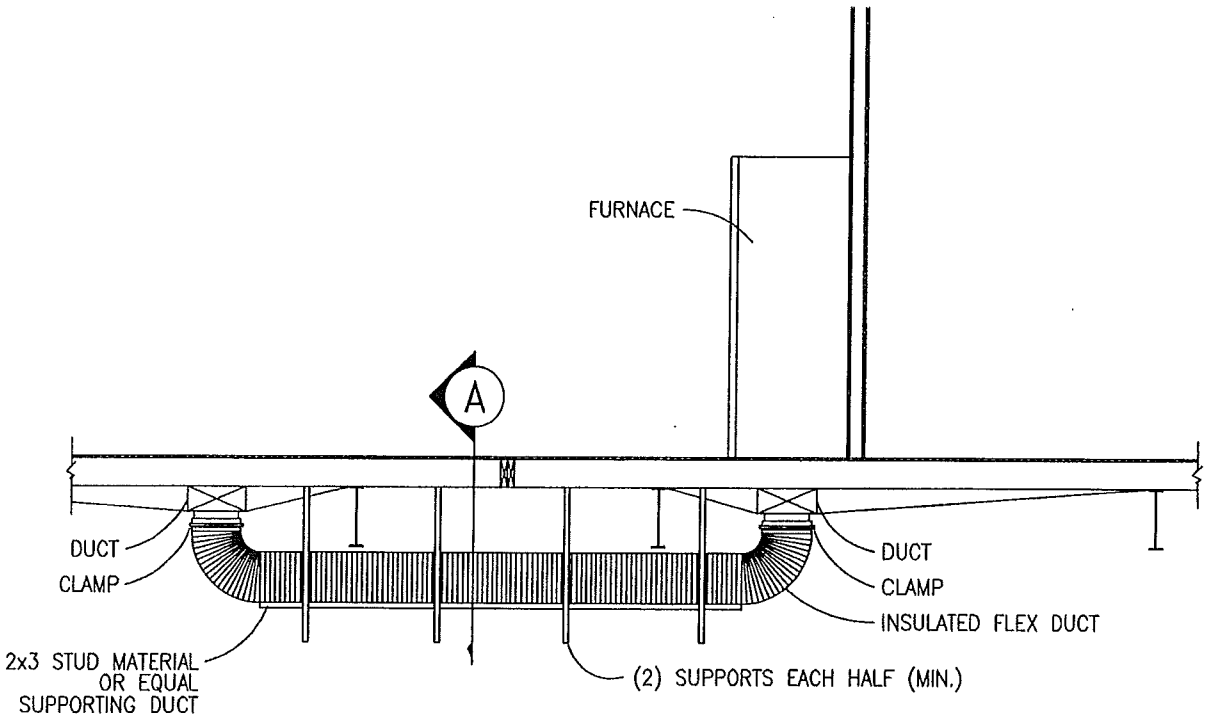


FIGURE 9.1
HEAT DUCT CROSSOVER – CROSS–BEAM FRAME

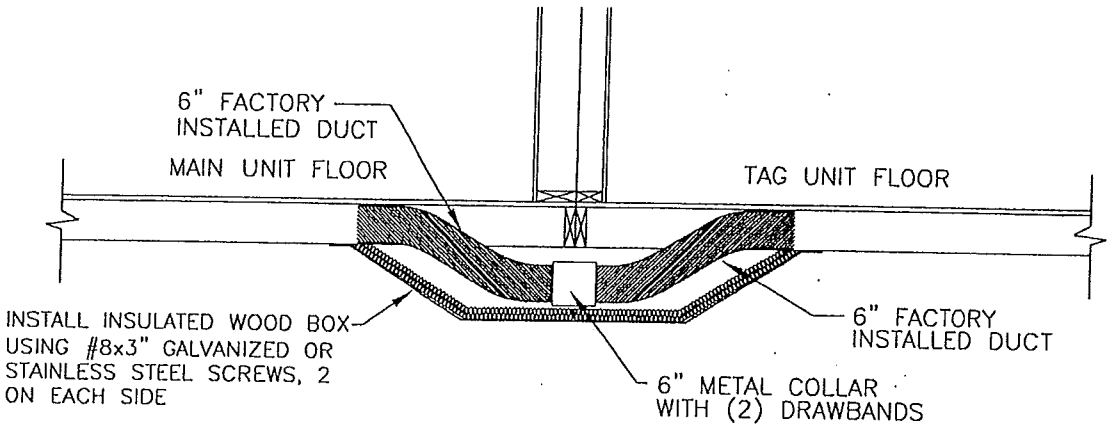
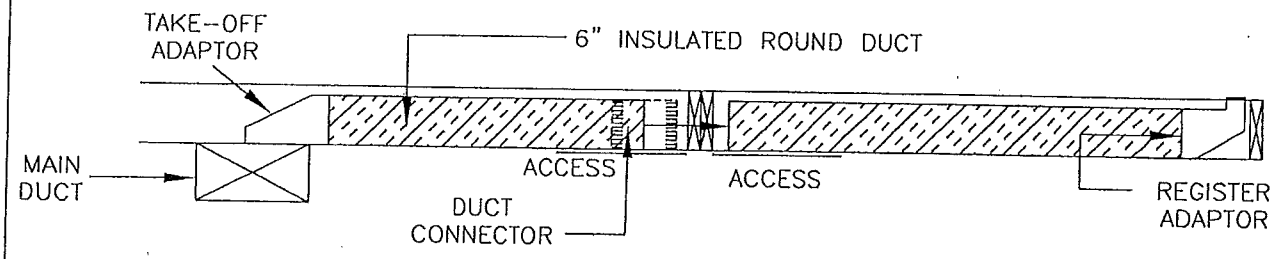
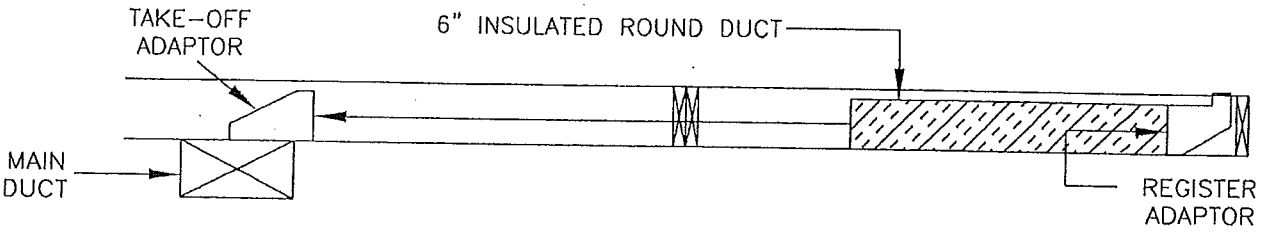


FIGURE 9.2
HEAT DUCT CROSSOVER – TAG UNITS

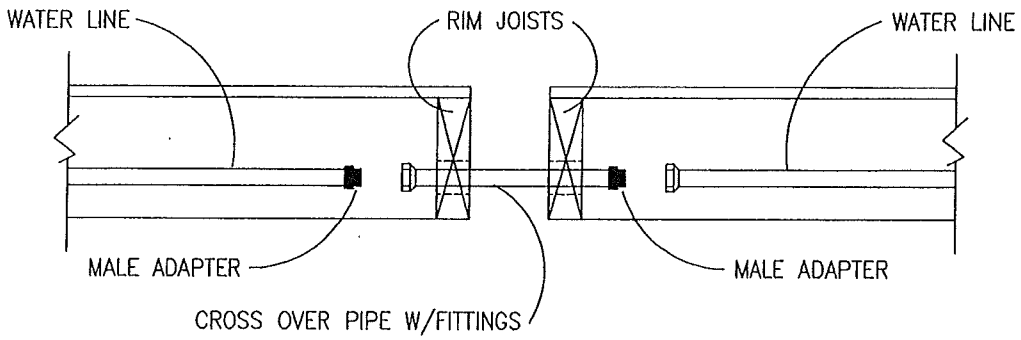


WITH FLOOR INSULATION



WITHOUT FLOOR INSULATION

FIGURE 9.3
HEAT DUCT CROSSOVER – LINDSAY UNIFIED FLOOR SYSTEM



NOTES:
1. IF FREEZING CONDITIONS EXIST, WRAP CONNECTION WITH INSULATION.

FIGURE 9.4
WATER LINE CROSSOVER

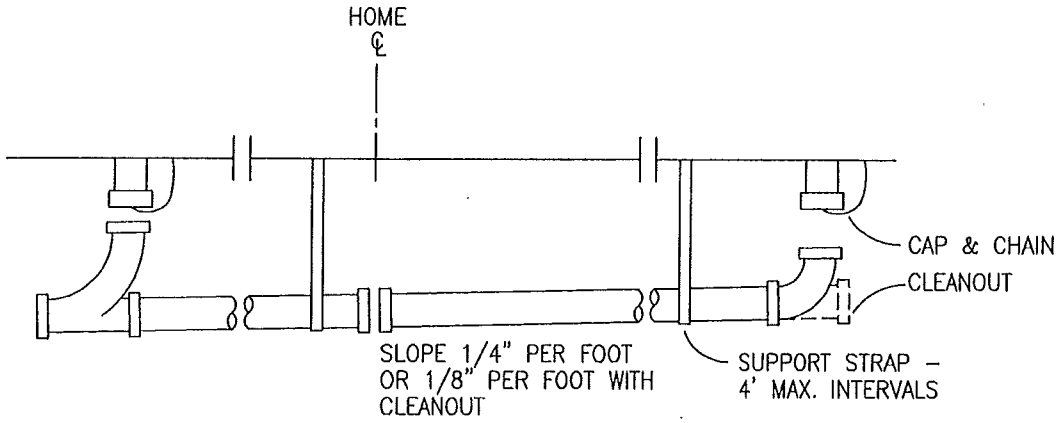


FIGURE 9.5
DRAIN LINE CROSSOVER

NOTE:
FITTINGS IN THE DRAINAGE SYSTEM SUBJECT TO FREEZING SUCH AS P-TRAPS IN THE FLOOR HAVE BEEN PROTECTED WITH INSULATION BY THE MANUFACTURER. INSULATION MUST BE REPLACED IF REMOVED FOR ACCESS TO THE P-TRAP.

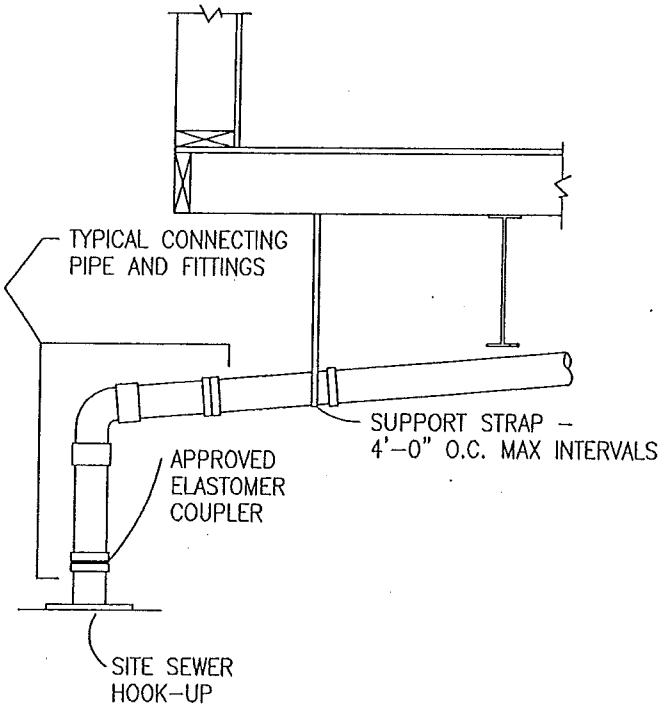
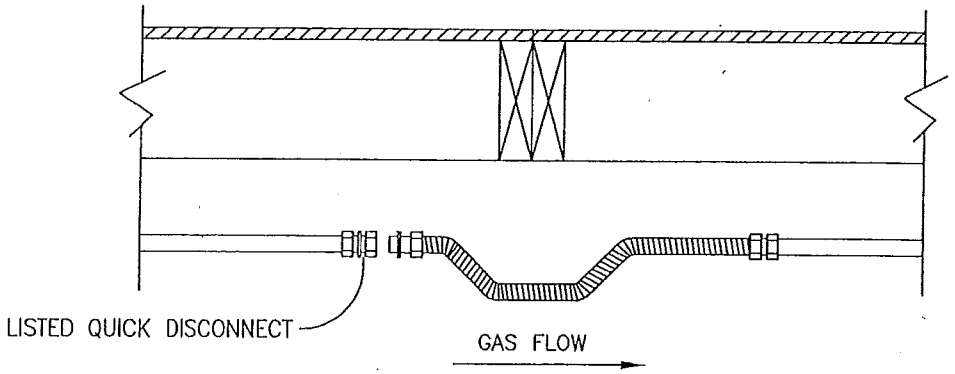


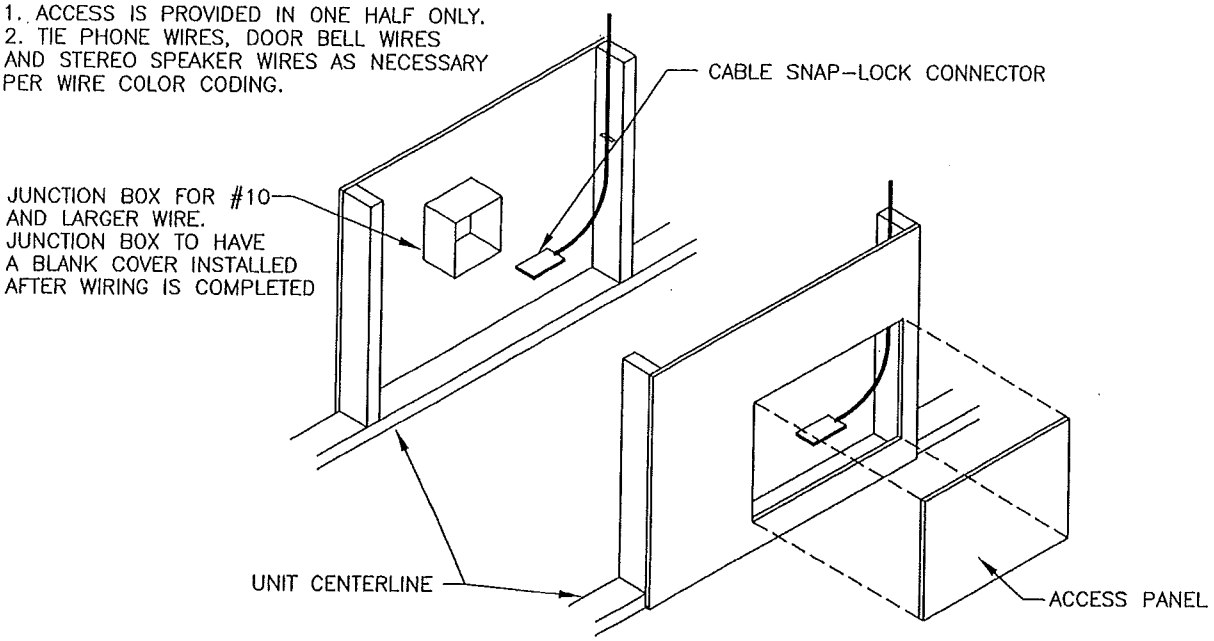
FIGURE 9.6
DRAIN LINE SEWER CONNECTION

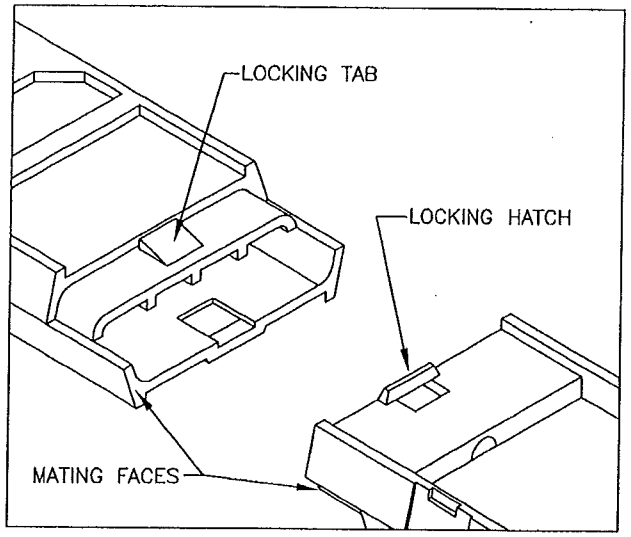


NOTES:
1. REMOVE DUST CAPS BEFORE CONNECTING.
2. CROSSOVER TO BE LISTED FOR EXTERIOR USE.
3. CROSSOVER TO BE SAME SIZE AS GAS PIPING.
4. USE GAS CONNECTORS SUPPLIED BY MANUFACTURER.

FIGURE 9.7
GAS LINE CROSSOVER

NOTES:
1. ACCESS IS PROVIDED IN ONE HALF ONLY.
2. TIE PHONE WIRES, DOOR BELL WIRES AND STEREO SPEAKER WIRES AS NECESSARY PER WIRE COLOR CODING.





DETAIL OF SNAP–LOCK CONNECTOR

COUPLING SPLICES:
1. ORIENT THE SPLICES SO THE MATING ENDS ALIGN WITH EACH OTHER SHOWN IN THE FIGURE.
2. SLIDE THE SPLICES INTO EACH OTHER UNITL THE LOCKING LATCHES ENGAGE THE LOCKING TABS. ONCE COUPLED, THE SPLICES ARE NOT TO BE UNCOUPLED.

THIS COMPLETES THE ASSEMBLY OF THE CABLE SPLICING DEVICE.

MOUNTING SPLICES:
1. COUPLED SPLICES SHOULD BE MOUNTED TO STUDS OR POSTS WITH 4d COMMON NAILS.

CAUTION — DO NOT USE OVERSIZE NAILS OR DRIVE NAIL HEADS INTO SPLICE.

CAUTION — DO NOT UNCOUPLE SPLICES ONCE THEY HAVE BEEN MATED.

CAUTION — DO NOT RE–USE SPLICES.

FIGURE 10.1
ELECTRICAL CROSSOVER

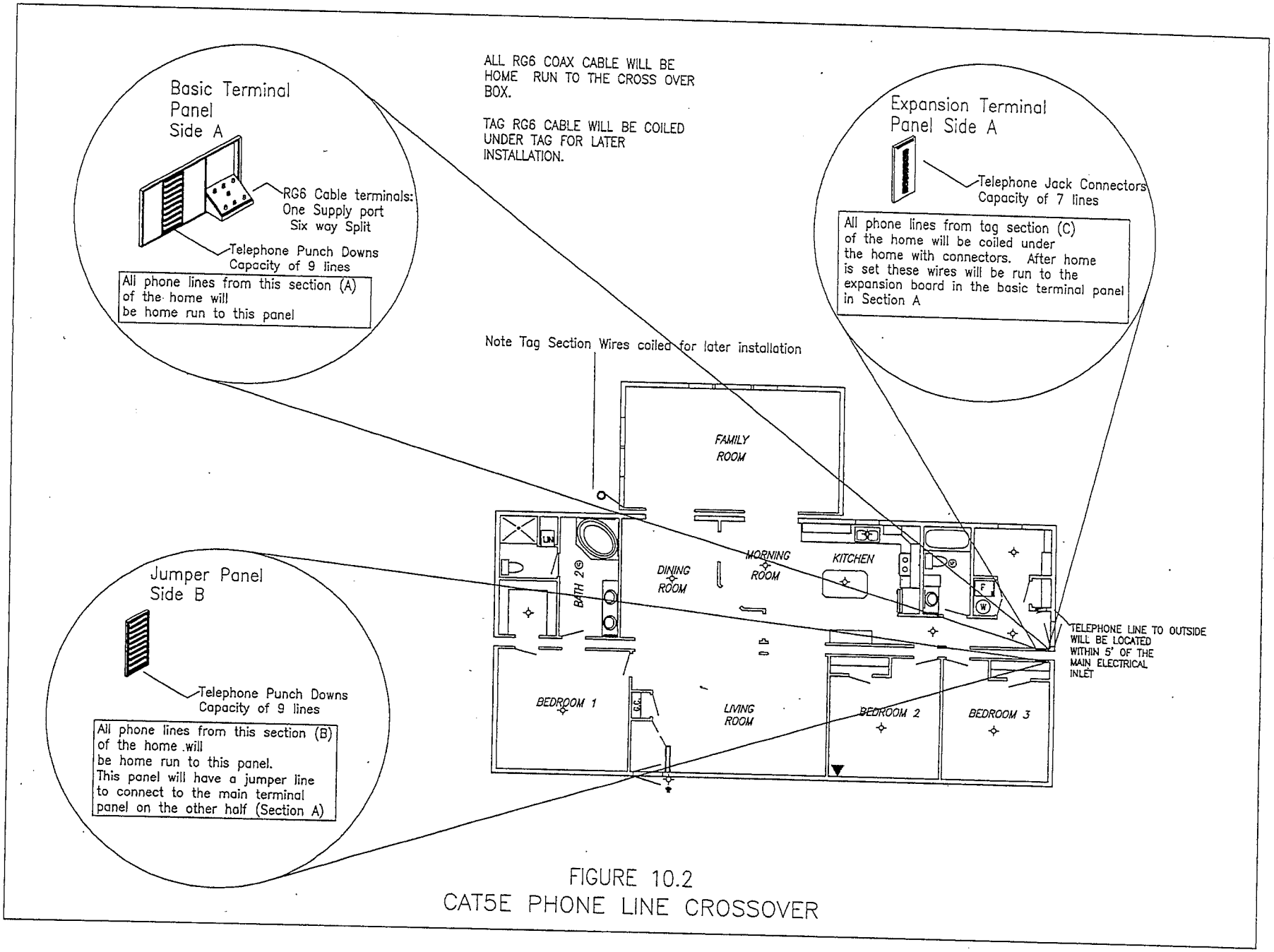


FIGURE 10.2
CAT5E PHONE LINE CROSSOVER

NOTES:
1. INSTALL COPPER WIRE IN GROUND LUG ON OPPOSING CROSSMEMBER AND TIGHTEN FIRMLY.

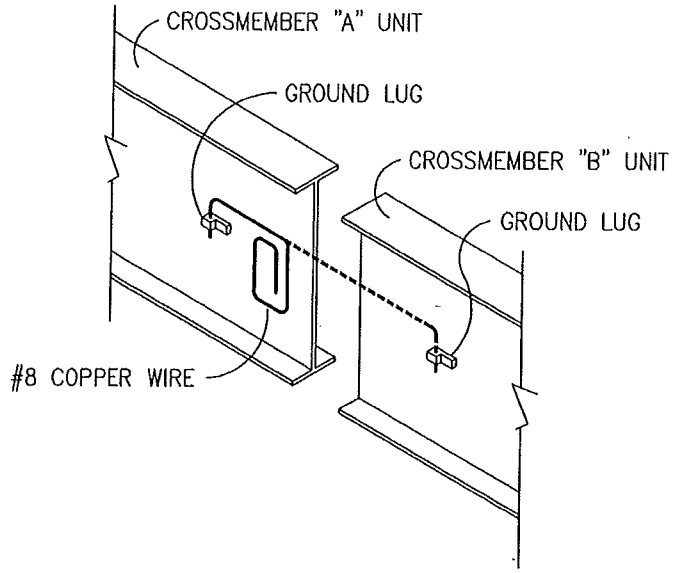


FIGURE 10.3
BONDING OF MULTI SECTION CHASSIS

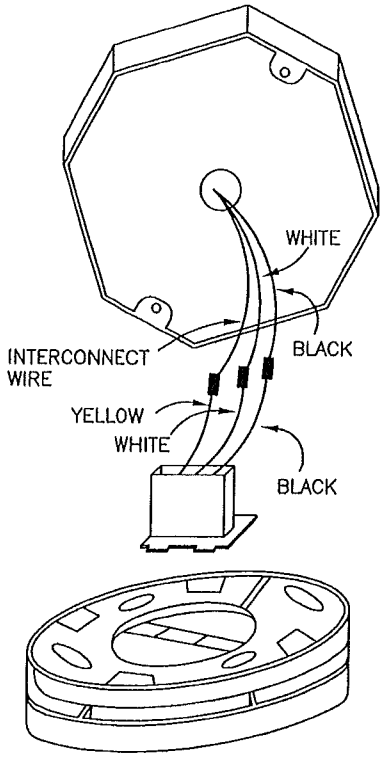


FIGURE 10.4
BASEMENT SMOKE ALARM CONNECTION

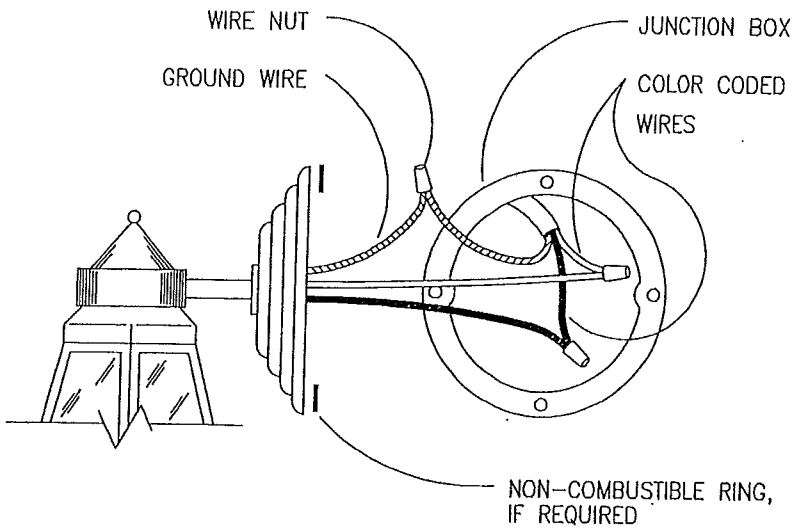
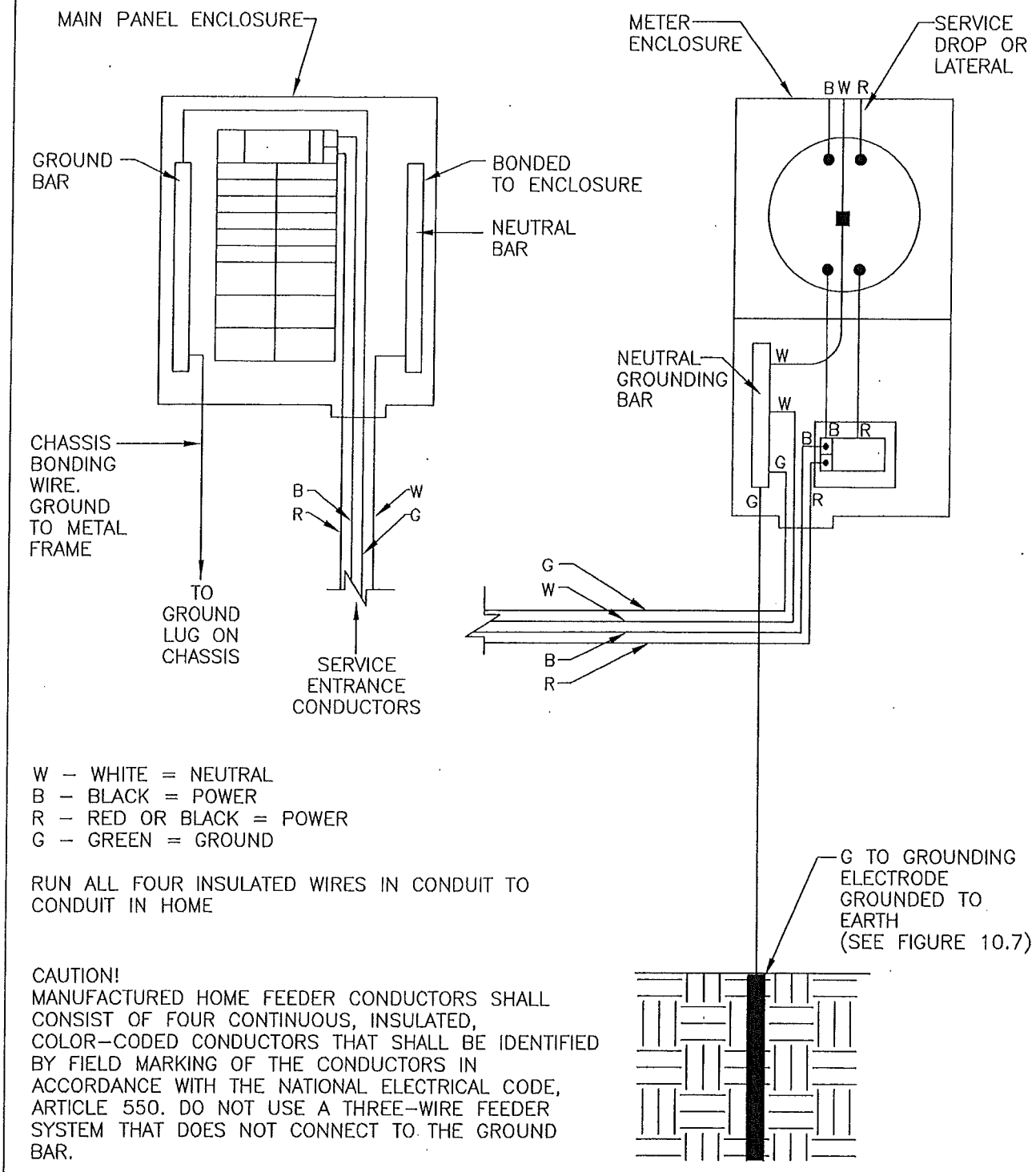


FIGURE 10.5
EXTERIOR LIGHT INSTALLATION

THIS SPACE INTENTIONALLY LEFT BLANK



W – WHITE = NEUTRAL
B – BLACK = POWER
R – RED OR BLACK = POWER
G – GREEN = GROUND

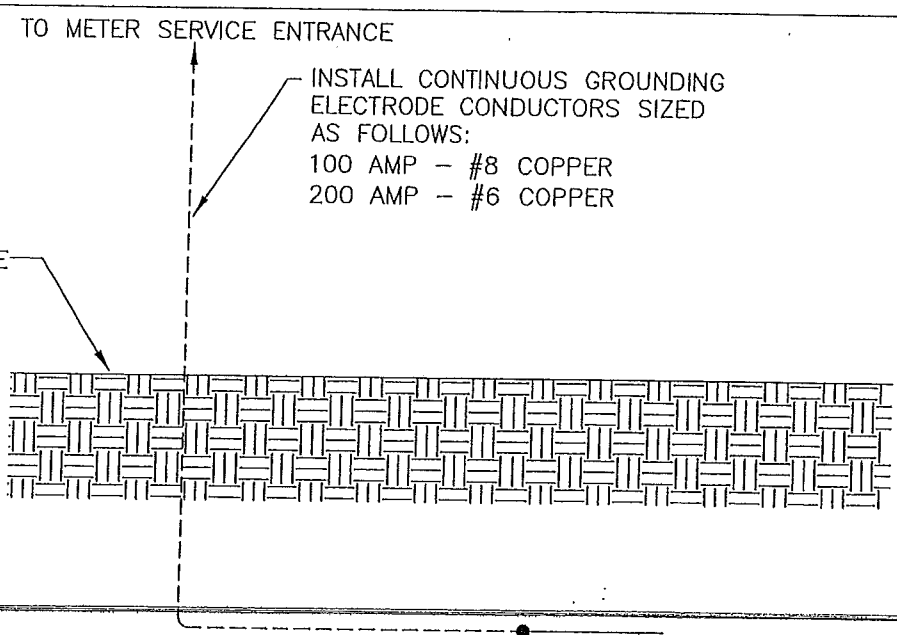
RUN ALL FOUR INSULATED WIRES IN CONDUIT TO CONDUIT IN HOME

CAUTION!
MANUFACTURED HOME FEEDER CONDUCTORS SHALL CONSIST OF FOUR CONTINUOUS, INSULATED, COLOR–CODED CONDUCTORS THAT SHALL BE IDENTIFIED BY FIELD MARKING OF THE CONDUCTORS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, ARTICLE 550. DO NOT USE A THREE–WIRE FEEDER SYSTEM THAT DOES NOT CONNECT TO THE GROUND BAR.

BE SURE TO KEEP THE NEUTRAL AND GROUND SEPARATE.

SEE TABLE 10.1 FOR PROPER WIRE SIZES.

FIGURE 10.6
TYPICAL METER BASE CONNECTION



1. ELECTRODES OF PIPE OR CONDUIT SHALL NOT BE SMALLER THAN ¾" TRADE SIZE AND WHERE OF IRON OR STEEL, SHALL HAVE THE OUTER SURFACE GALVANIZED OR OTHERWISE METAL–COATED FOR CORROSION PROTECTION.
2. ELECTRODES OF RODS OF IRON OR STEEL SHALL BE AT LEAST ⅝" (16mm) IN DIAMETER. STAINLESS STEEL RODS LESS THAN ⅝" (16mm) IN DIAMETER. NONFERROUS RODS, OR THEIR EQUIVALENT, SHALL BE LISTED AND SHALL NOT BE LESS THAN ½" (13mm) IN DIAMETER.
3. ROD AND PIPE ELECTRODES SHALL NOT BE LESS THAN 8 FT. (2.44m) IN LENGTH.
4. ELECTRODES OF IRON OR STEEL PLATES AT LEAST ¼" IN THICKNESS. ELECTRODES OF NONFERROUS METAL SHALL BE AT LEAST 0.06" (1.5mm) IN THICKNESS.

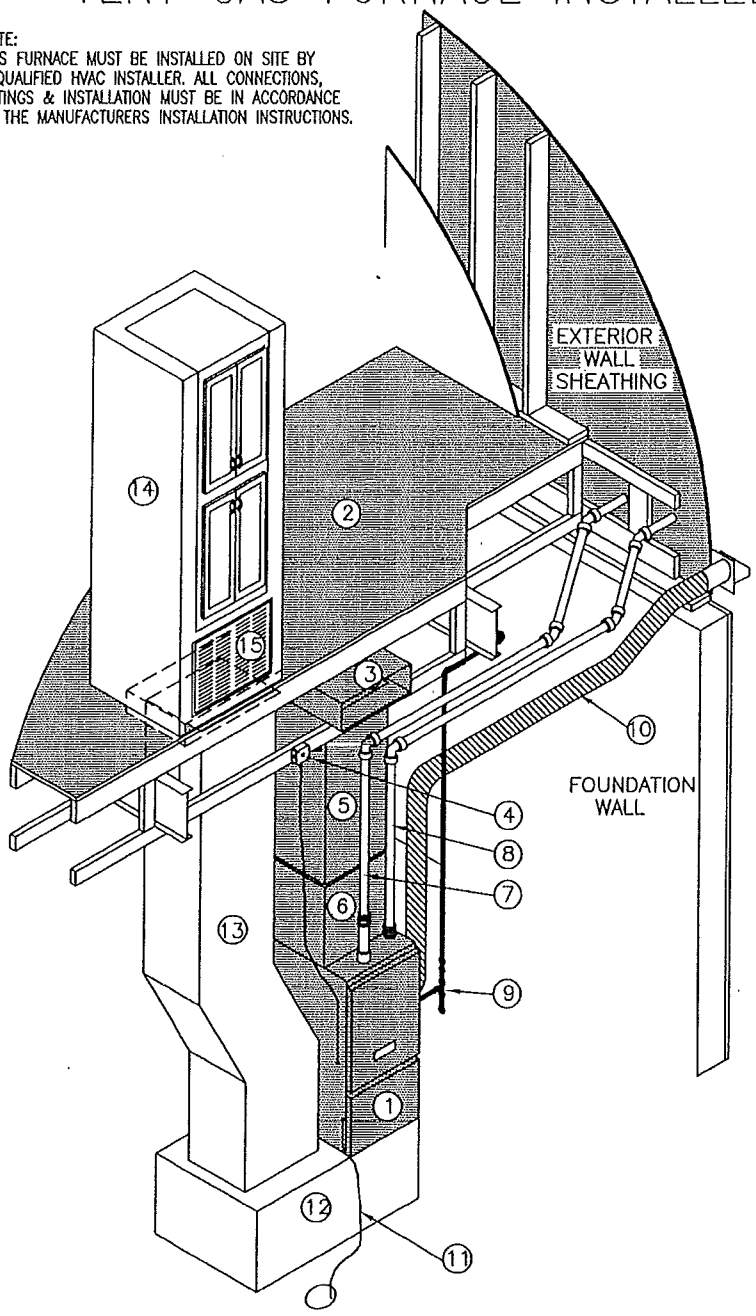
NOTE: THIS IS AN EXAMPLE OF A METER BASE GROUNDING METHOD. BE SURE TO CHECK STATE AND LOCAL CODES AND THE LAHJ FOR OTHER GROUNDING METHODS THAT MAY BE REQUIRED IN YOUR AREA.

NOTES:
1. ROD AND PIPE ELECTRODES SHALL BE INSTALLED SUCH THAT AT LEAST 8 FT. (2.44m) OF LENGTH IS IN CONTACT WITH THE SOIL. IT SHALL BE DRIVEN TO A DEPTH OF NOT LESS THAN 8 FT (2.44m) EXCEPT THAT, WHERE ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM THE VERTICAL OR SHALL BE BURIED IN A TRENCH THAT IS AT LEAST 2–1/2 FEET (750mm) DEEP. THE UPPER END OF THE ELECTRODE SHALL BE FLUSH WITH OR BELOW GROUND LEVEL UNLESS THE ABOVE GROUND END AND THE GROUNDING ELECTRODE CONDUCTOR ATTACHMENT ARE PROTECTED AGAINST PHYSICAL DAMAGE. SEE NEC, 2005 EDITION, SEC. 250–53(G).
2. EACH PLATE ELECTRODE SHALL EXPOSE NOT LESS THAN 2 SQ. FT. (0.186sq.m) OF SURFACE TO EXTERIOR SOIL. PLATE ELECTRODES SHALL BE INSTALLED NOT LESS THAN 2–1/2 FT. (750mm) BELOW THE SURFACE OF THE EARTH. SEE NEC, 2005 EDITION, SEC. 250–53(H).

FIGURE 10.7
EXAMPLE METER BASE GROUNDING METHOD

NORDYNE M2 SERIES HIGH EFFICIENCY / DIRECT VENT GAS FURNACE INSTALLED IN BASEMENT

NOTE:
THIS FURNACE MUST BE INSTALLED ON SITE BY A QUALIFIED HVAC INSTALLER. ALL CONNECTIONS, FITTINGS & INSTALLATION MUST BE IN ACCORDANCE TO THE MANUFACTURERS INSTALLATION INSTRUCTIONS.



1. NORDYNE M2RC SERIES 90+ CONDENSING GAS FURNACE SHIPPED LOOSE AND INSTALLED BY QUALIFIED HVAC INSTALLER.
2. UNINSULATED LINDSAY UNIFIED FLOOR SYSTEM
3. FACTORY INSTALLED MAIN DUCT. DUCT CONNECTOR LOCATION INDICATED ON MAIN DUCT.
4. ELECTRICAL JUNCTION BOX FOR FURNACE. ELECTRICAL HOOK-UP & WIRE STRAPPING DONE ON-SITE PER LOCAL CODE REQUIREMENTS.
5. HEAT DUCT CONNECTOR PROVIDED BY INSTALLER
6. AC COIL BOX
7. PVC OR ABS AIR INTAKE PIPE & FITTINGS PROVIDE BY INSTALLER, STRAP AS REQUIRED.
8. PVC OR ABS EXHAUST VENT PIPE & FITTINGS PROVIDE BY INSTALLER, STRAP AS REQUIRED.
9. VERTICAL IRON PIPE GAS LINE WITH SHUT-OFF & SEDIMENT TRAP PROVIDED BY INSTALLER
10. VENTILAIRE AIR INTAKE DAMPER FACTORY INSTALLED. FLEX HOSE SHIPPED LOOSE.
11. CONDENSATION DRAIN LINE PROVIDED BY INSTALLER.
12. 30" X 50" x 18" HIGH RETURN AIR PLAT FORM BY INSTALLER
13. MIN. 350 SQ. IN. RETURN AIR DUCT SUPPLIED BY INSTALLER
14. LINEN CABINET REPLACING STANDARD FURNACE LOCATION
15. MIN. 350 SQ. IN RETURN AIR GRILLE

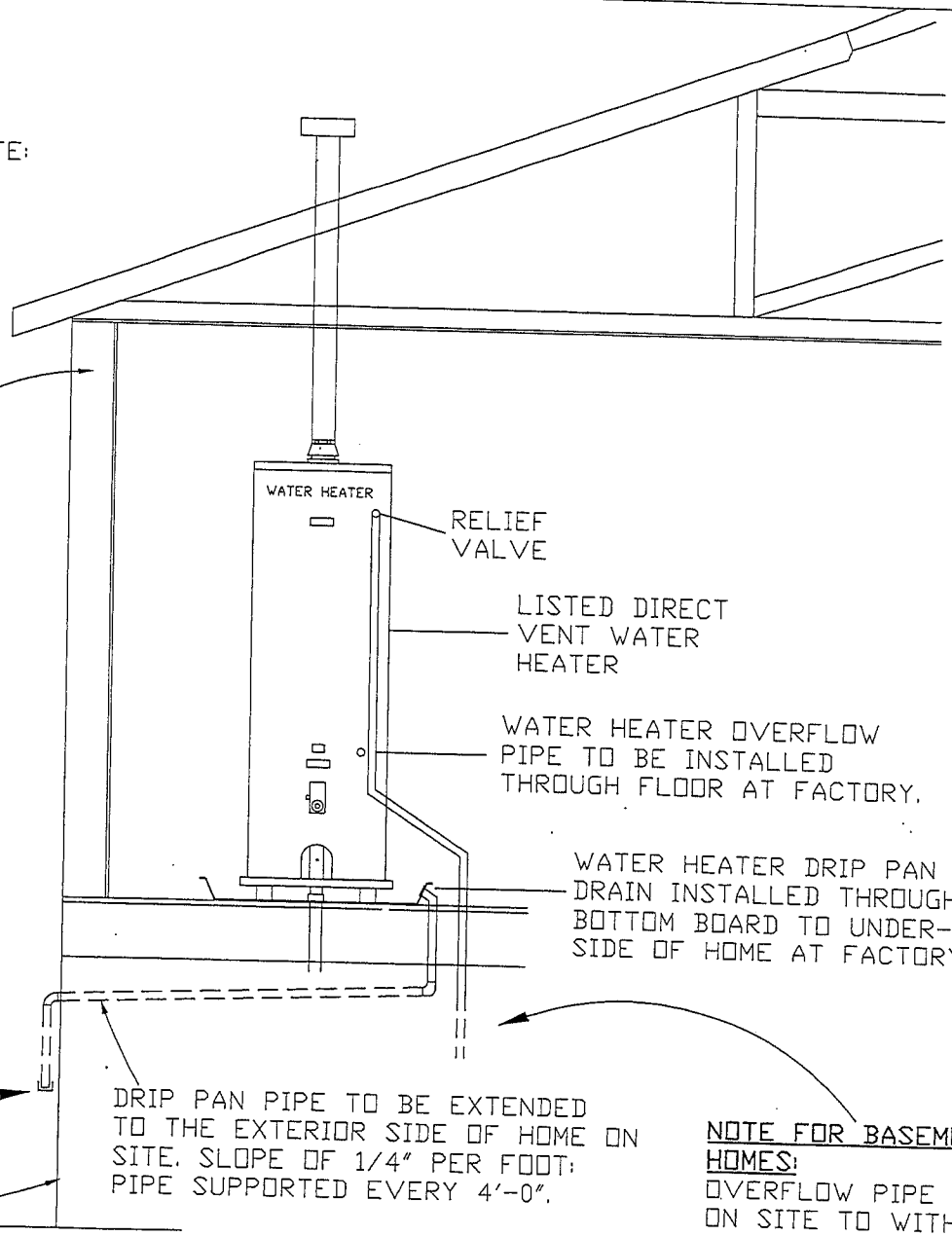
FIGURE 11.1
BASEMENT INSTALLED GAS FURNACE

NOTE:

THE FOLLOWING ITEMS HAVE BEEN SHIPPED LOOSE TO COMPLETE INSTALLATION OF THE WATER HEATER DRAIN PAN PLUMBING ON SITE:

1-15'x1" INSIDE DIAMETER PIPE
2-1" 90 DEGREE PVC ELBOWS
1-2" HOSE CLAMP
1-PIECE OF SCREEN MATERIAL

USE A PVC COMPATABLE PRIMER AND GLUE TO ATTACH THE ELBOWS TO THE PIPE.



NOTE FOR BASEMENT SET HOMES:
OVERFLOW PIPE TO BE EXTENDED ON SITE TO WITHIN 6" OF BASEMENT FLOOR OR IN ACCORDANCE WITH STATE OR LOCAL BUILDING CODES. OVERFLOW PIPE MATERIAL MAY BE CPVC, QESTPEX OR EQUAL. EXTENSION MATERIAL NOT PROVIDED BY WICK.

FIGURE 11.2
WATER HEATER DRIP PAN DRAIN PIPE INSTALLATION

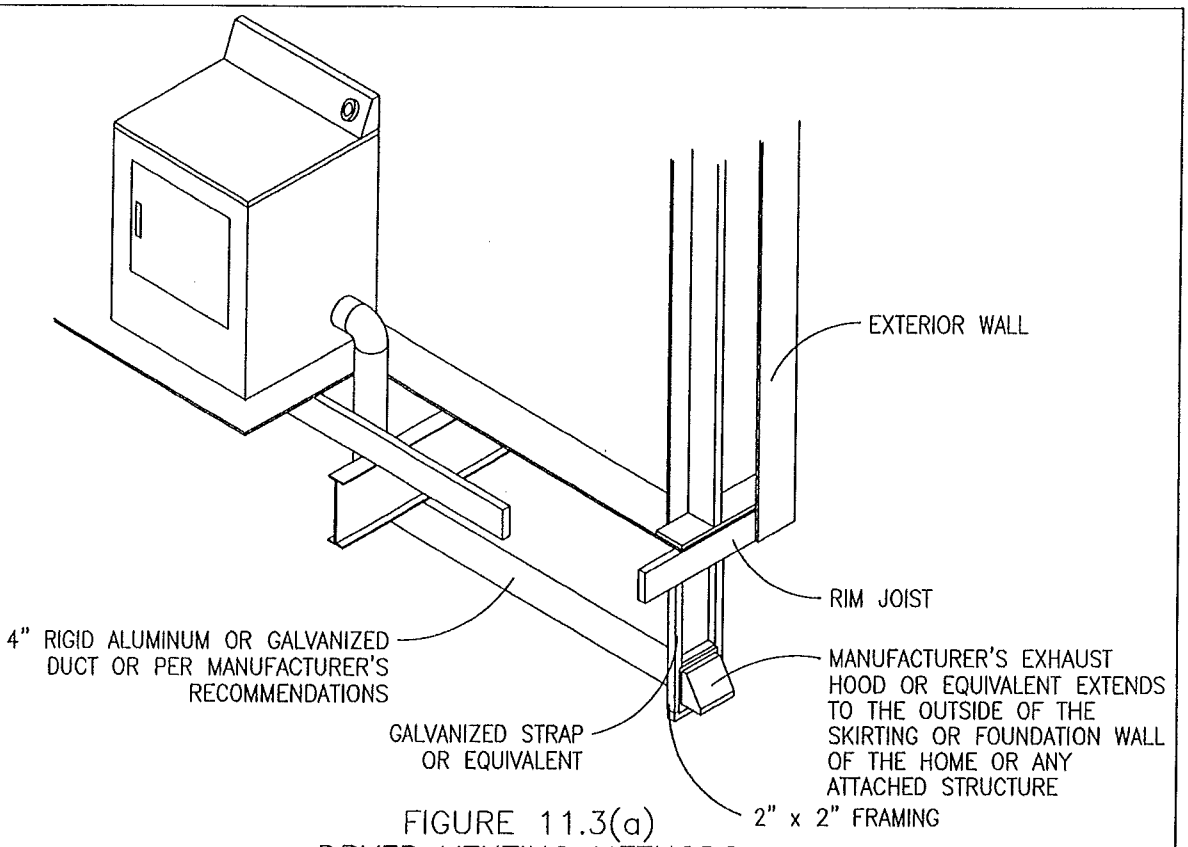


FIGURE 11.3(a)
DRYER VENTING METHODS

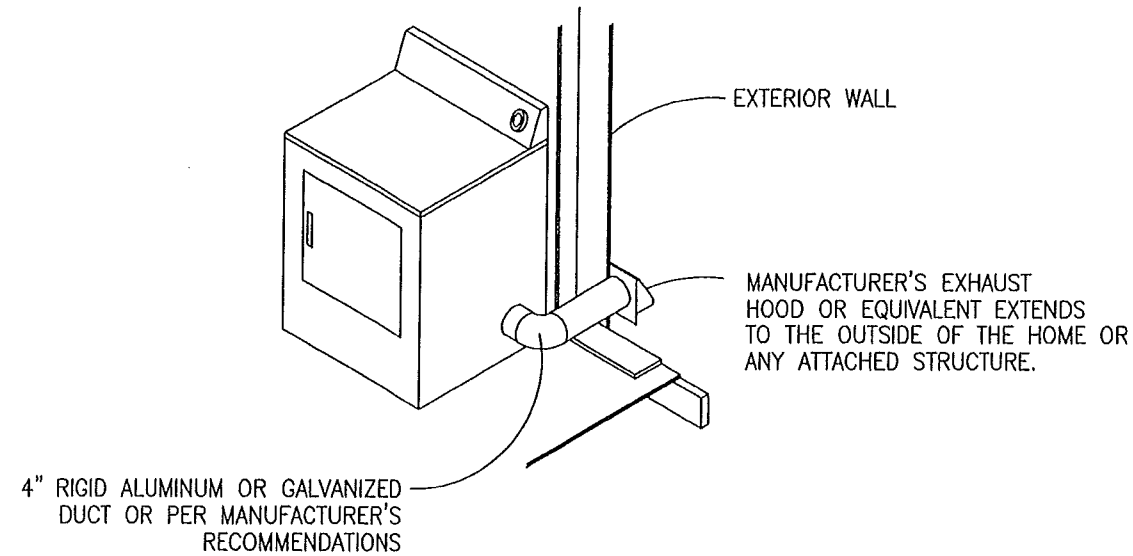


FIGURE 11.3(b)
DRYER VENTING METHODS

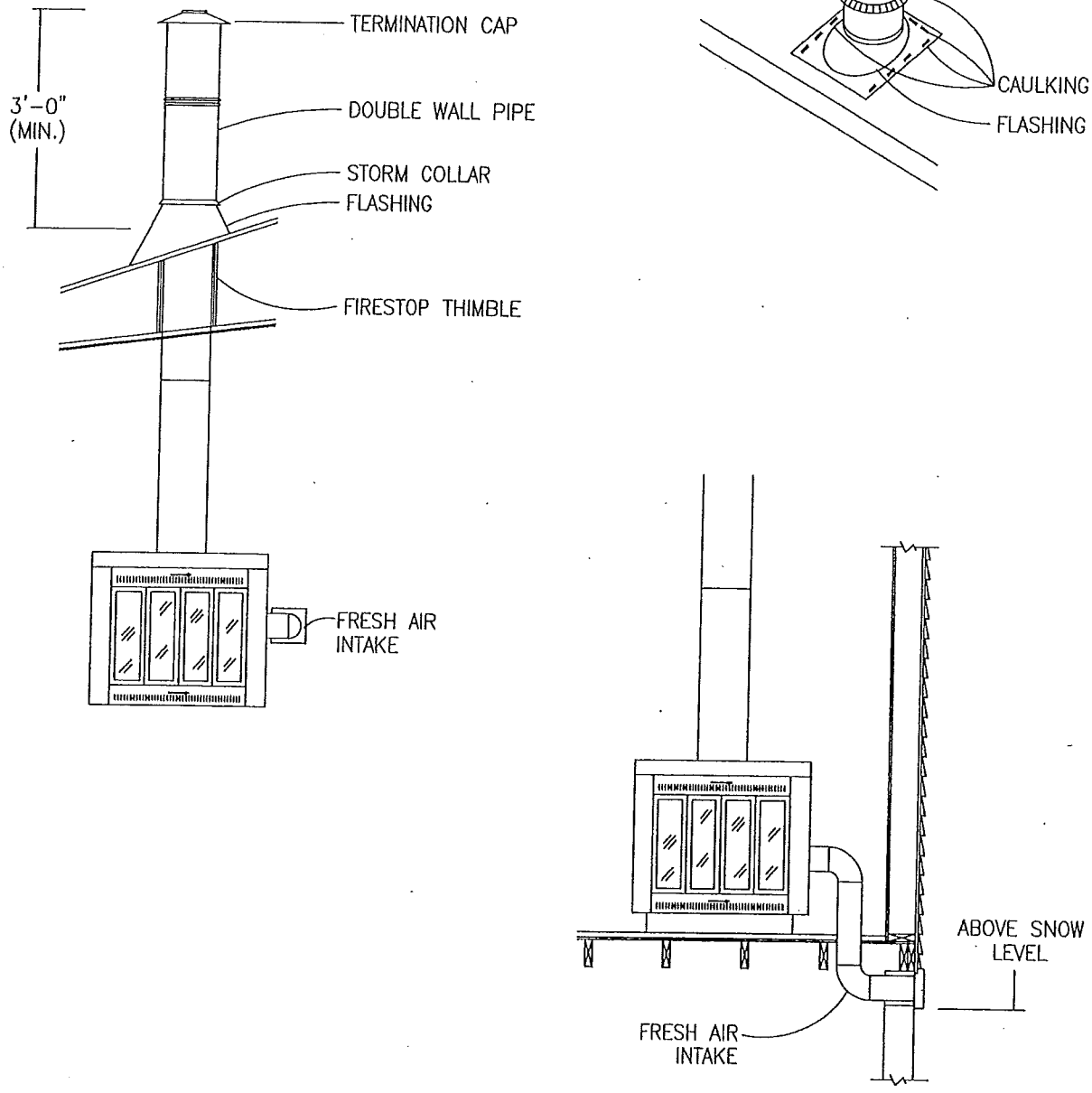


FIGURE 11.4
GAS OR WOOD FIREPLACE
CHIMNEY AND AIR INTAKE INSTALLATION

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