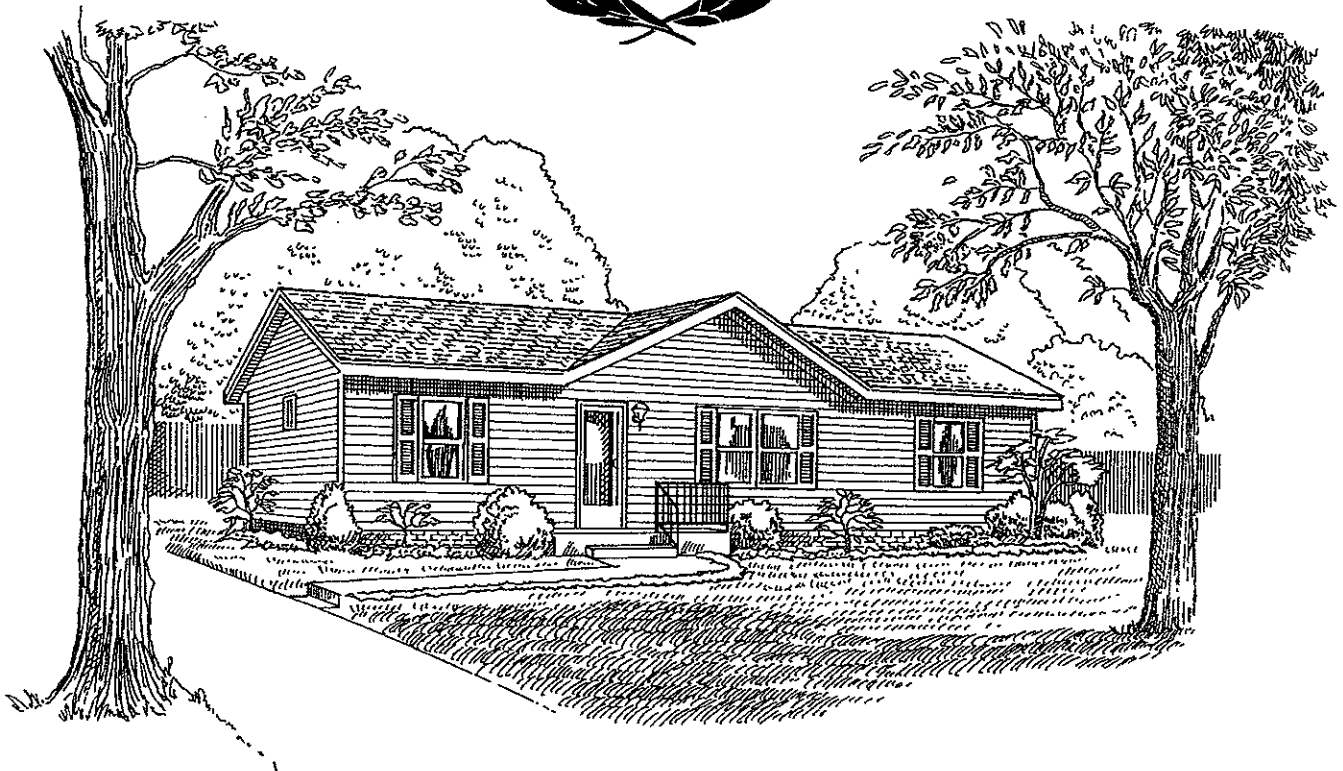


# Manufactured Home Setup and Installation Manual

For Sectional and Singlewide Homes



Manufactured Housing Enterprises, Inc.  
09302 US 6  
Bryan, Ohio 43506  
[www.mheinc.com](http://www.mheinc.com)

# INTRODUCTION

All homes built by Manufactured Housing Enterprises are designed, constructed, and inspected for conformance to the Manufactured Home Construction and Safety Standards in effect at the time of manufacture. The H.U.D. approved Federal Standard sets requirements in regards to design, construction, fire safety, heating systems, and electrical systems.

MHE homes are designed to be supported by individual piers, crawl space or basement, depending on home type, design, and available options. MHE homes are designed to be anchored properly for local conditions. The Compliance Certificate in your home indicates the roof and wind loads that your home has been designed to resist. CAUTION: Do not install your home in a zone that requires greater loads than those posted on the Compliance Certificate.

The foundation system design must also comply with the state and local building codes and regulations applicable to your area, which may vary from the indications on the roof load and wind load maps. The roof load zone determines the configurations of the appropriate foundation system. The wind load zone determines certain structural requirements of the home and may influence the requirements for tie down and anchoring. Consult local building officials in your area to determine necessary permits, licenses, and inspections required for this home.

The importance of correct set up cannot be over emphasized. Proper set up is essential to keep the home in compliance with its warranty. Not following this manual may void the home's warranty. The procedures listed in this manual are intended to assist in proper installation of this home. Any modifications of change to the home may void the warranty and must be approved by a local registered engineer or register architect.

This manual is designed for certified and qualified installers. All site work must be supervised. There are hazards associated with setting this home. Home installers are licensed and must recognize these hazards and be capable of providing safe work practices. MHE is not liable for any damages to the homes or injuries to personnel at the job site.

This manual has been reviewed by NTA Inc. and found to be in compliance with the Federal Manufactured Home Construction and Safety Standards and the Manufactured Home Installation Standards.

**NOTE:**

ALL HOMES PRODUCED BY MHE ARE WIND ZONE 1 ONLY.

HINGED TRUSSES HAVE A MAXIMUM SLOPE LESS THAN 7/12.

THERE ARE NO PENETRATIONS THROUGH THE HINGED PART OF THE ROOF THAT REQUIRE COMPLETION ON SITE.



# INDEX

## Chapter 1- Site Preparation

Zone Maps.....	1
Soil Conditions.....	1
Bearing Capacity.....	1
Organic Material.....	1
Drainage.....	1
Ground Moisture Protection.....	1
Zone Maps Figure 1.....	2

## Chapter 2- Foundations

Piers.....	3
Requirements.....	3
Configuration.....	3
Shims.....	3
Frost Line.....	4
Ground Clearance.....	4
Footings.....	4
Ventilation.....	4
Porches.....	4
Temporary Support of Homes.....	4
Manufactured Pier Detail Figure 2.....	5
Concrete Pier Detail Figure 3.....	5
Singlewide 20/30 Foundation Figure 4.....	6
Sectional 20/30 Foundation Figure 5.....	6
Singlewide 40 PSF Foundation Figure 4.1.....	7
Sectional 40 PSF Foundation Figure 5.1.....	7
14' & 28' Pier Loads.....	8
16' & 32' Pier Loads.....	8
Minimum Footer Size Table 4.....	9

## Chapter 3-Blocking Instructions

General Information.....	10
Installation.....	10

## Chapter 4-Tie Down Instructions

General.....	11
Design Criteria.....	11
Installation.....	11
14' & 28' Anchor Locations Table 5.....	12
16' & 32' Anchor Locations Table 6.....	12
Typical Anchor Detail Figure 6.....	12
Anchor Installation Information.....	13
Anchor Installation.....	14
Anchor Stabilization.....	15
Anchor Stabilization.....	16
Anchor Strap Tensioning.....	17
Anchor Strap Connection.....	18
Anchor Strap Connection.....	19
Anchor Miscellaneous.....	20
Anchor Miscellaneous.....	21
ABS Pad Installation.....	22
Adjustable Outrigger.....	22
Anchor Soil Classification Chart.....	23
Anchor Chart.....	24
Longitudinal Tie Down Requirements.....	25

## Chapter 5-Sectional Setup

Blocking Procedure.....	26
Positioning the Second Half.....	26
Fastening the Halves Together.....	26
Interior Close Up.....	27
Exterior Close Up.....	27
Roof Ridge Detail.....	28

## Chapter 6-Utility Connections

Drainage System.....	29
Water Supply.....	30
Electrical Supply.....	30
Gas Supply.....	31
Bottom Board Repair.....	31
Electrical Supply Requirements Table 7.....	32
Electrical Crossover Detail Figure 9.....	32

## Chapter 7-Miscellaneous Connections

Dryer Venting.....	33
Furnace In Floor Crossover.....	33
Fireplaces.....	33
Air Conditioning.....	33
Skirting Attachment.....	33
Dryer Vent Detail.....	34
Vent Extension Pipe.....	35
Water Heater Drain Pan.....	35
Hinged Truss Detail.....	36
Hinged Ridge Detail 1.....	37
Hinged Ridge Detail 2.....	37.1
Hinged Ridge Detail 3.....	37.2
Hinged Truss Gable Close Up.....	38
Meter Base Installation.....	39

## Chapter 8-Basement and Crawlspace

### Addendum

General Notes.....	40
Typical Foundation.....	41
Crawlspace Details.....	42
Basement Details.....	43
Foundation Details.....	44
Foundation Details.....	45
2 x 10 Perimeter Floor Foundation.....	46
Site Built Stairway Detail.....	47
Piers on 4" Concrete Slabs.....	48
Frost Penetration Map.....	49
Singlewide Slab Foundation Details.....	50
Sectional Slab Foundation Details.....	51
T-Brace Floor Reinforcement.....	52

**Complete Installation Checklist** .....53-55  
(Last 3 Pages)

# CHAPTER 1 – SITE PREPARATION



## 1.1 ZONE MAPS

Your home is designed for certain weather conditions and roof loads. See the zone maps on the home's compliance certificate. Do not site or relocate your home in a zone requiring greater wind, roof load, or heating/cooling capabilities than those for which it was designed. However, it is safe to locate your home in an area with lower load or less thermal requirements. For example, a home designed for a northern roof load of 40 PSF may be sited in the southern 20 PSF roof load zone.

## 1.2 SOIL CONDITIONS

Requirements to help prevent settling or sagging of your home, site on firm, undisturbed soil or fill compacted to at least 90% of its maximum relative density. Installation on loose non-compacted fill will void the home's limited warranty.

## 1.3 BEARING CAPACITY

Test the bearing capacity of the soil at the depth of the footings after completing any grading and filling. A pocket penetrometer or other methods acceptable to local jurisdictions may be used. If you can't test the soil, use the lowest value, 1000 PSF. Under unusual conditions or if the soil appears to be peat or non-compacted fill, consult a local registered engineer or architect.

## 1.4 ORGANIC MATERIAL

To minimize the settling of footings and insect damage, remove all materials that decay such as grass, roots, twigs, and wood scraps from beneath the home in areas where footings are to be placed. Remove shrubs and overhanging branches from the immediate vicinity of the home site to prevent windstorm damage.

## 1.5 DRAINAGE

Proper drainage helps prevent water build up under the home which may cause shifting or settling of the foundation, dampness in the home, damage to the siding and bottom board, buckling of the walls, and floors, problems with the operation of doors and windows, and will void the house warranty. All drainage must be diverted away from the home and slope a minimum of 1/2" per foot away from the foundation for the first 10 feet.

## 1.6 GROUND MOISTURE PROTECTION

If the home is going to skirted or enclosed with other materials, a vapor retarder shall be placed on the ground under the home to minimize the entry of ground moisture into the home. Use polyethylene or its equivalent, at least six mils thick for an acceptable ground cover. Cover the entire area under the home with the sheeting and overlap it at least 12" at all joints. Any tears or voids in the vapor retarder must be repaired. Cover any tears or voids with 6-mil polyethylene and overlap the damaged area 12" in each direction.

# CHAPTER 2 – FOUNDATIONS

## 2.1 PIERS

The piers used must have a capacity great enough to transmit the vertical load, which includes the weight of the home; its furnishings, and temporary roof loading, to the foundation surface below it. The most important part of the home set up is proper pier and footing installation. Incorrect size, location, or spacing of piers may cause serious structural damage to your home. Piers shall be concrete blocks capped and shimmed with wedges or adjustable manufactured metal or concrete piers (see Figure 2 and Figure 3). Manufactured piers shall be listed and labeled for the required load capacity. If the load imposed is greater than the capacity of the pier, then two or more piers may be used. The total capacity of the piers must be equal to or greater than the loads to be transmitted. A single stack of concrete masonry unit will support 8000 lbs. & a double stack will support 16,000 lbs. The foundation plans contained in this manual are not designed to be flood resistant. Piers may be offset up to 6" to allow for utilities.

## 2.2 REQUIREMENTS

The load that each pier must carry depends on factors such as the dimensions of the home, the roof live load, the spacing of the piers, and the way they are used to support the home. Marriage wall blocking is required for multi-section homes. See Tables, 1, 2, and 3 for required pier capacities.

## 2.3 CONFIGURATION

Figure 4 and Figure 5 show the recommended arrangement of piers. Concrete blocks shall have nominal dimensions of at least 8" X 8" X 16". They must be stacked with their hollow cells aligned vertically. When piers are constructed of blocks stacked side by side, every layer shall be at right angles to the previous one. Cap hollow block piers to distribute the structural load evenly across them. Caps shall be of solid masonry or hard wood at least 2" thick or of steel and the same length and width of piers they rest upon. Avoid soft woods and plywood as they may lead to unwanted settling or movement. See Figure 3. The horizontal offset from the top of the pier to the bottom of the pier must not exceed 1/2". Pier heights between 36" to 67" must be double stacked. A PE or Architect must design any pier above 67". Piers used for perimeter support must be installed with the long dimension parallel to the perimeter rail.

## 2.4 SHIMS

Use shims 4" wide X 6" long made of hard wood to level the home and fill any gaps between the base of the I-beam and the top of the pier cap. Always use shims in pairs. Drive them in tightly so they occupy no more than one inch of vertical space. Use hard wood plates no thicker than 2" to fill in any remaining vertical gaps. See Figure 3.

## 2.5 FROST LINE

All piers must rest on footings that either extend below the frost line or are otherwise protected from the frost effects.

## 2.6 GROUND CLEARANCE

Minimum ground clearance of 12" shall be maintained beneath the lowest part of the main frame in the area of the utility connections.

## 2.7 FOOTINGS

Footings in freezing climates shall conform to one of the following:

- A. **Conventional Footings.** Because of the harmful effects of frost heave, footings shall be placed below the frost line. Consult local authorities to determine the frost depth in your area.
- B. **Floating Systems.** When designed by a registered engineer or registered architect and accepted by the local authority, a floating slab system may be used. Tie down requirements of Chapter 4 must be taken into consideration.

Footing materials shall be precast or poured concrete with a 28 day compressive strength of at least 3,000 psi. Other materials approved for use by local authorities may be used such as ABS plastic footer pads. ABS footer pads shall be installed per their installation instructions and certified for the soil classification at the site. Proper sizing of footings depends on the load carrying capacity of both the piers and the soil. The installation of footings may require inspection by the local authorities.

Proper sizing of footings depends upon the load capacity of both the pier and the soil. See Table 4 for recommended footing sizes for your home.

## 2.8 VENTILATION

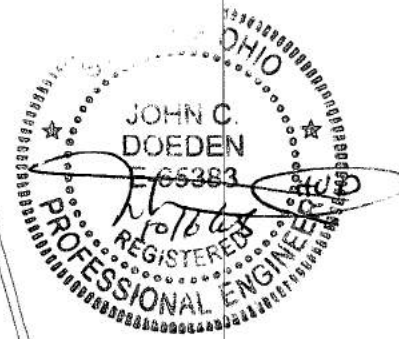
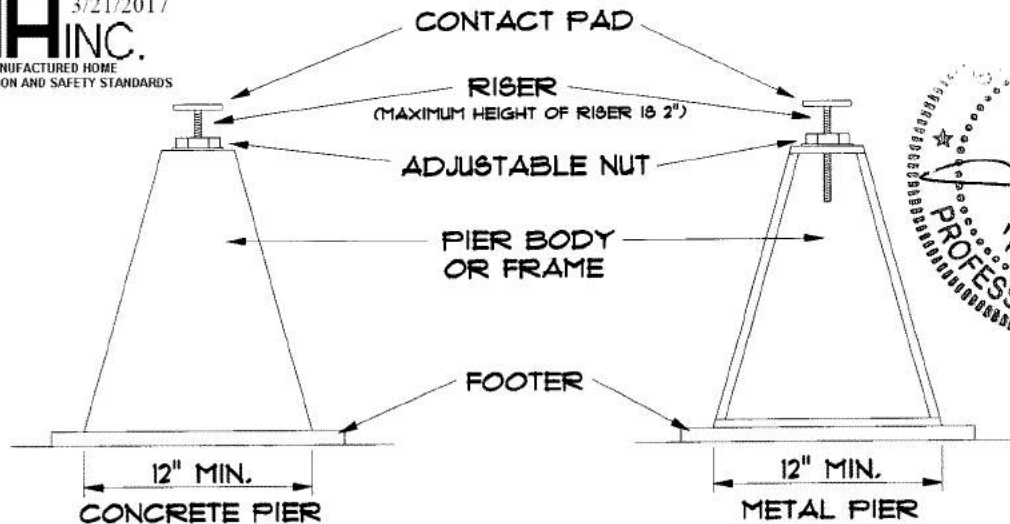
The skirting or crawl space wall must be ventilated to minimize the accumulation of moisture beneath the home. There must be one vent at each corner to aid cross ventilation. With the required 6-mil polyethylene installed as a vapor retarder, the required ventilation is 1 square foot of ventilation per every 1,500 square feet.

## 2.9 PORCHES / RECESSED ENTRIES

All wood porches require perimeter blocking. Locate piers directly under all posts. Recessed entries require perimeter blocking. Pier locations are marked on the bottom board.

## 2.10 TEMPORARY SUPPORT OF HOMES ON RETAIL LOTS

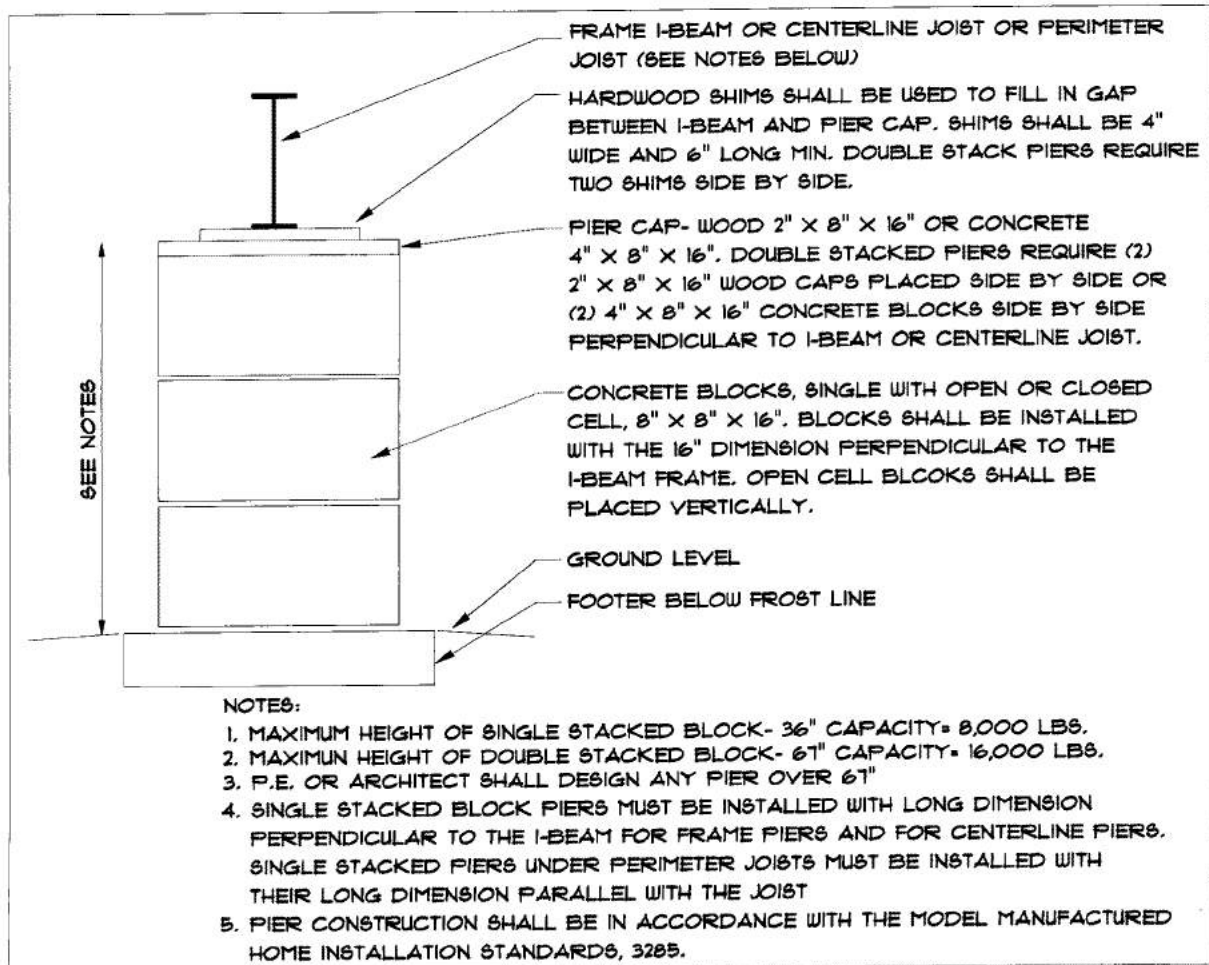
All homes must be supported while on the retail lot. The home shall be level. Locate piers every 10'-0" o.c. maximum and within 24" of each end. Locate piers on the perimeter of home. The required perimeter pier locations are marked on the bottom board.



MUST BE PROTECTED WITH A PROTECTION AGAINST WEATHER DETERIORATION EQUIVALENT TO ZINC ON STEEL WITH A COATING OF 0.30 OZ/SQUARE FOOT OF SURFACE.

PIER TO BE CERTIFIED FOR A LOAD CAPACITY AT LEAST EQUAL TO THE PIER LOAD DETERMINED. SEE LABEL ON PIER.

FIGURE 2



NOTES:

1. MAXIMUM HEIGHT OF SINGLE STACKED BLOCK- 36" CAPACITY= 8,000 LBS.
2. MAXIMUM HEIGHT OF DOUBLE STACKED BLOCK- 61" CAPACITY= 16,000 LBS.
3. P.E. OR ARCHITECT SHALL DESIGN ANY PIER OVER 61"
4. SINGLE STACKED BLOCK PIERS MUST BE INSTALLED WITH LONG DIMENSION PERPENDICULAR TO THE I-BEAM FOR FRAME PIERS AND FOR CENTERLINE PIERS. SINGLE STACKED PIERS UNDER PERIMETER JOISTS MUST BE INSTALLED WITH THEIR LONG DIMENSION PARALLEL WITH THE JOIST
5. PIER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MODEL MANUFACTURED HOME INSTALLATION STANDARDS, 3285.

FIGURE 3

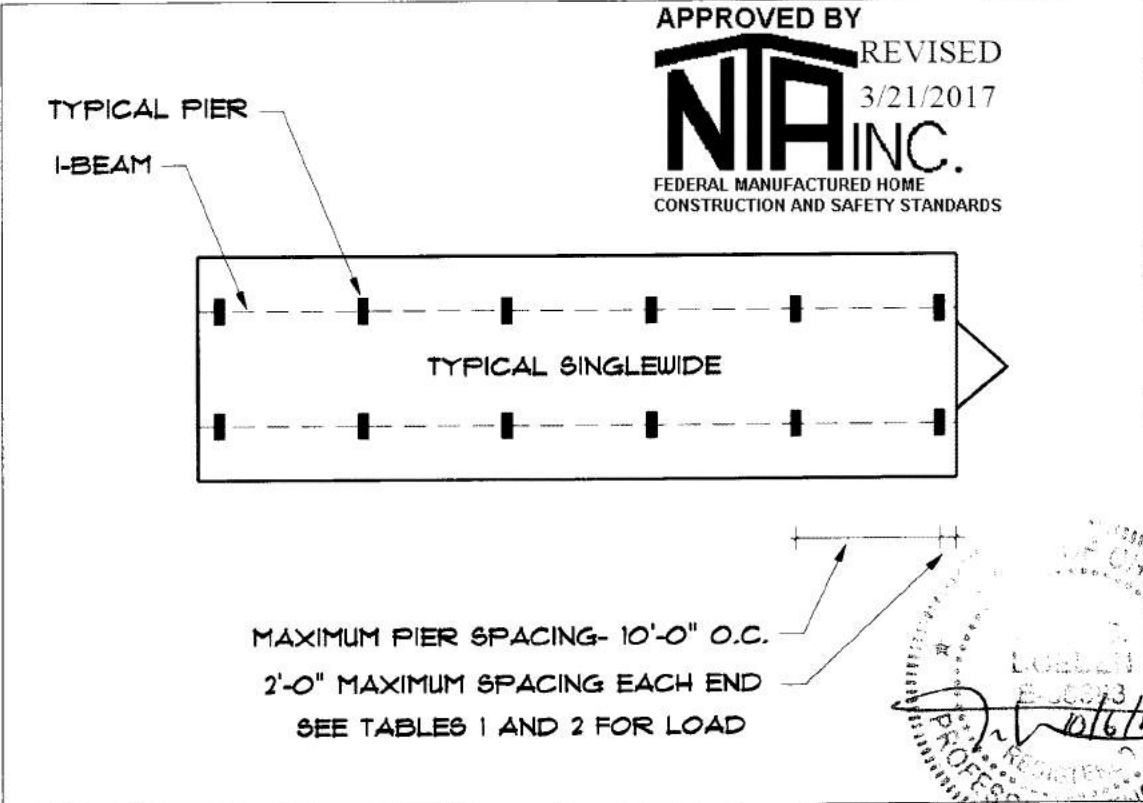


FIGURE 4  
 20 AND 30 PSF ROOF LOAD

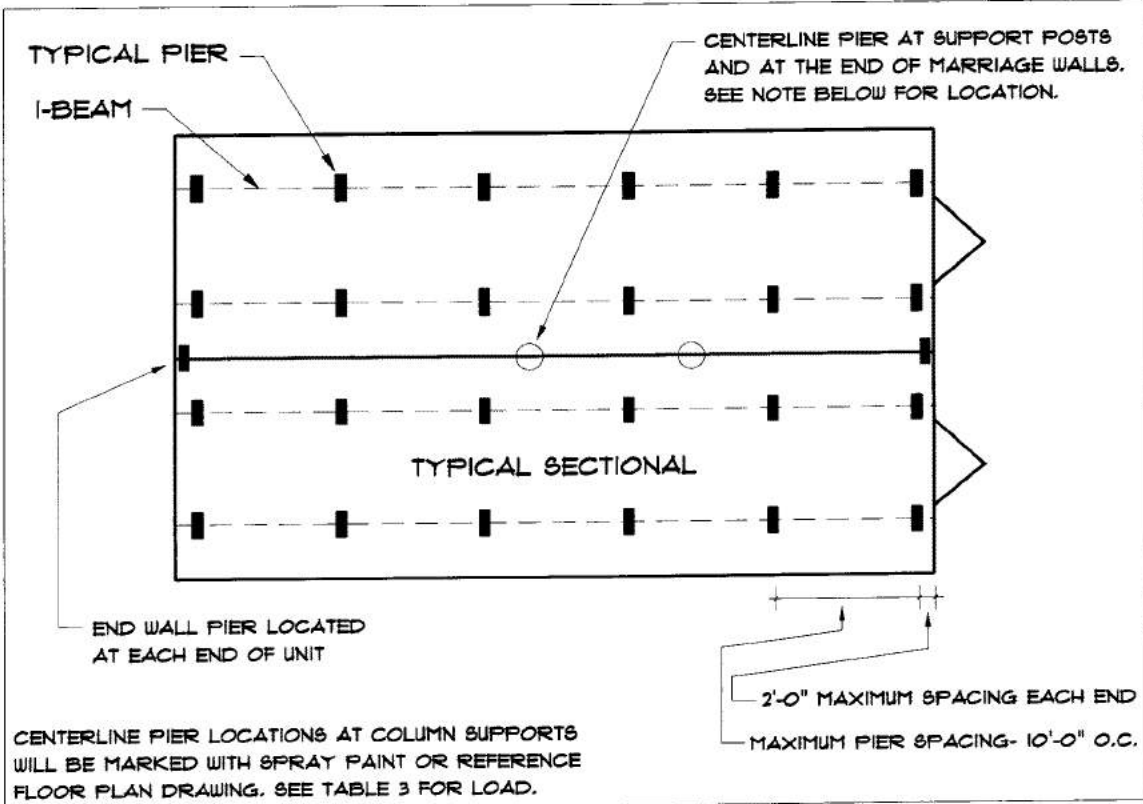


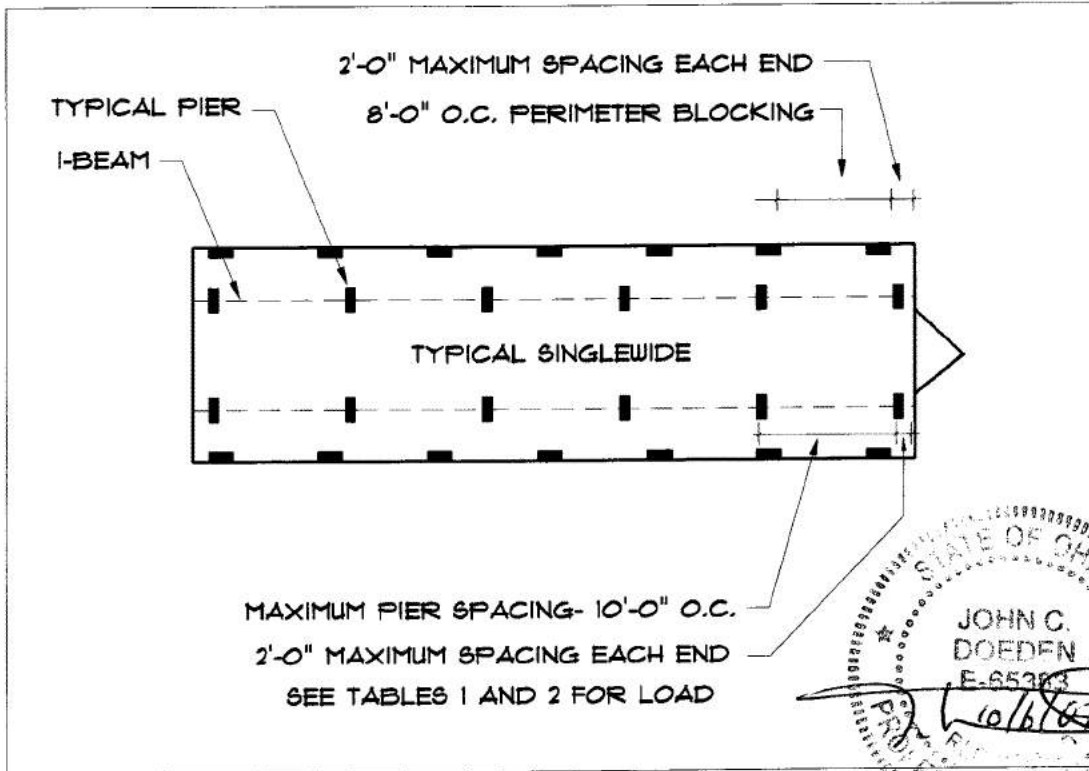
FIGURE 5  
 20 AND 30 PSF ROOF LOAD

NOTE: FIREPLACES LOCATED ON SIDEWALL OR MARRIAGE WALL, DOORS, PATIO DOORS, BAY WINDOWS, OR ANY WINDOW GROUP WIDER THAN 4'-0" REQUIRE PERIMETER BLOCKING FOR PROPER OPERATION. I-BEAM PIERS SHALL BE SPACED NO FURTHER APART THAN 10'-0" O.C.

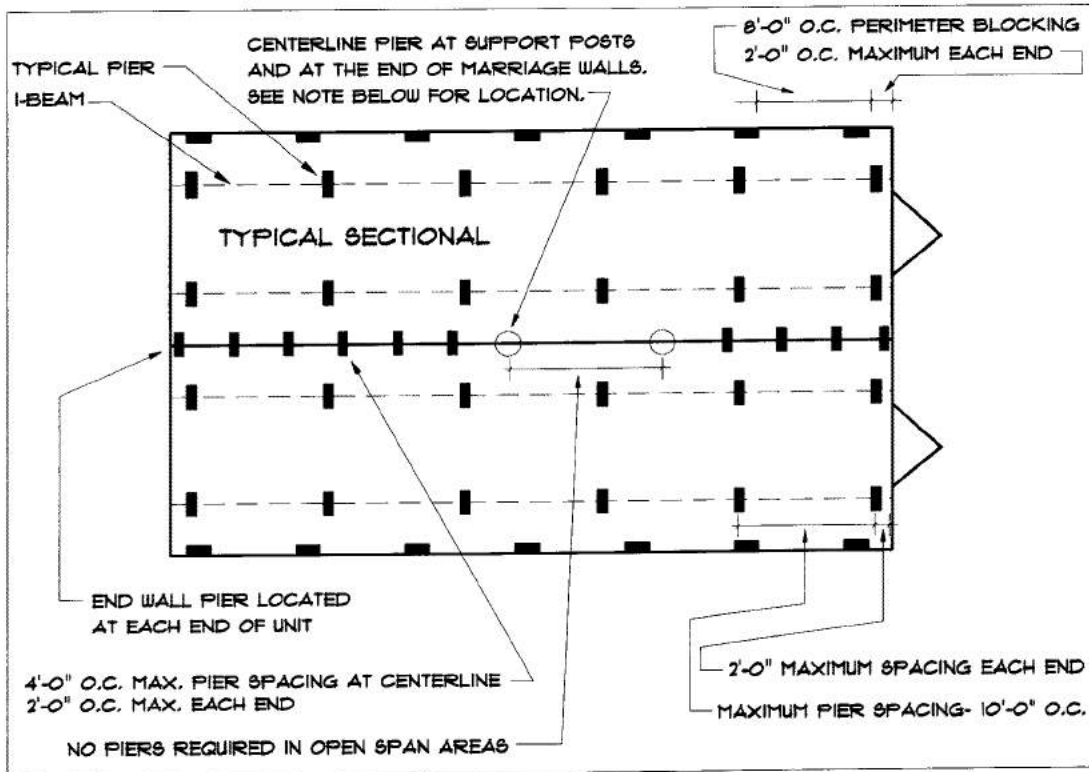


APPROVED BY  
**NIA** INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

REVISED  
 3/21/2017



**FIGURE 4.1**  
**40 PSF ROOF LOAD**



**FIGURE 5.1**  
**40 PSF ROOF LOAD**

CENTERLINE PIER LOCATIONS AT COLUMN SUPPORTS WILL BE MARKED WITH SPRAY PAINT OR REFERENCE FLOOR PLAN DRAWING. SEE TABLE 3 FOR LOAD.

NOTE: FIREPLACES LOCATED ON SIDEWALL OR MARRIAGE WALL, DOORS, PATIO DOORS, BAY WINDOWS, OR ANY WINDOW GROUP WIDER THAN 4'-0" REQUIRE PERIMETER BLOCKING FOR PROPER OPERATION. I-BEAM PIERS SHALL BE SPACED NO FURTHER APART THAN 10'-0" O.C.

**TABLE 1 14' AND 28' PIER LOADS AT I-BEAM**

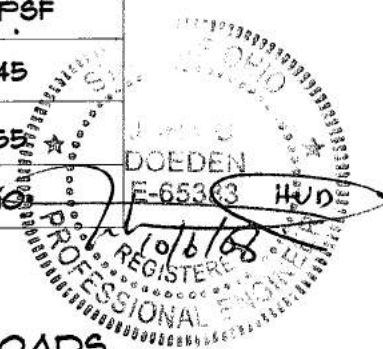
PIER SPACING	ROOF LOAD ZONE		
	20 PSF	30 PSF	40 PSF
8'-0" O.C.	5,200	5,810	2,645
10'-0" O.C.	6,400	7,170	3,205
PERIMETER PIERS*	N/A	N/A	4,325*

\* 8'-0" MAX. SPACING AT SIDEWALLS. 4'-0" O.C. MAX. SPACING AT CENTERLINE

**TABLE 2 16' AND 32' PIER LOADS AT I-BEAM**

PIER SPACING	ROOF LOAD ZONE		
	20 PSF	30 PSF	40 PSF
8'-0" O.C.	5,760	6,425	2,845
10'-0" O.C.	7,105	7,940	3,455
PERIMETER PIERS*	N/A	N/A	4,750*

\* 8'-0" MAX. SPACING AT SIDEWALLS. 4'-0" O.C. MAX. SPACING AT CENTERLINE



**TABLE 3 MARRIAGE WALL COLUMN PIER LOADS**

MARRIAGE WALL OPENING	ROOF LOAD ZONE					
	20 PSF		30 PSF		40 PSF	
	28' WIDE	32' WIDE	28' WIDE	32' WIDE	28' WIDE	32' WIDE
6'	1,830	2,065	2,350	2,660	2,865	3,255
12'	3,195	3,620	4,135	4,700	5,075	5,785
18'	4,560	5,175	5,925	6,745	7,290	8,310
24'	5,925	6,730	7,715	8,785	9,500	10,840
30'	7,290	8,285	9,500	10,825	11,710	13,370
36'	8,655	9,840	11,290	12,870	13,925	15,900
42'	10,020	11,395	13,080	14,910	16,000	N/A

APPROVED BY  
  
 REVISION 3/21/2017  
 FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS

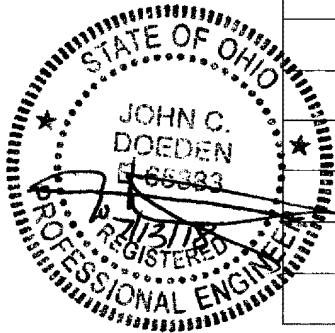
**NOTES:**

1. MARRIAGE WALL OPENING IS THE DISTANCE FROM A COLUMN SUPPORT TO THE NEXT COLUMN. IN THE CASE OF A SINGLE COLUMN BETWEEN TWO SPANS (I.E. POST CONDITION), THE MARRIAGE WALL OPENING IS THE TOTAL OF BOTH SPANS.
2. REFER TO THE FOOTER TABLE FOR FOOTER SIZE REQUIRED.
3. MARRIAGE WALL COLUMN PIERS ARE IN ADDITION TO ANY REQUIRED MARRIAGE WALL SUPPORT PIERS. (40 PSF ROOF LOAD)
4. THE PIER SPACINGS AND LOADS SHOWN IN THE TABLES DO NOT CONSIDER FLOOD OR SEISMIC LOADS. IN FLOOD OR SEISMIC HAZARD AREAS, THE FOUNDATION IS TO BE DESIGNED BY A PROFESSIONAL ENGINEER.

## MINIMUM CONCRETE FOOTER SIZE

PIER LOAD (POUNDS)	MINIMUM FOOTING SIZE BASED ON SOIL CAPACITY				
	1000 P&F	1500 P&F	2000 P&F	3000 P&F	4000 P&F
1000	14" x 14" x 4"	12" x 12" x 4"	12" x 12" x 4"	12" x 12" x 4"	12" x 12" x 4"
1500	17" x 17" x 4"	14" x 14" x 4"	12" x 12" x 4"	12" x 12" x 4"	12" x 12" x 4"
2000	19" x 19" x 4"	15" x 15" x 4"	13" x 13" x 4"	12" x 12" x 4"	12" x 12" x 4"
2500	21" x 21" x 4"	17" x 17" x 4"	15" x 15" x 4"	12" x 12" x 4"	12" x 12" x 4"
3000	22" x 22" x 4"	18" x 18" x 4"	16" x 16" x 4"	13" x 13" x 4"	12" x 12" x 4"
3500	24" x 24" x 4"	20" x 20" x 4"	17" x 17" x 4"	14" x 14" x 4"	12" x 12" x 4"
4000	26" x 26" x 5"	21" x 21" x 4"	18" x 18" x 4"	15" x 15" x 4"	13" x 13" x 4"
4500	27" x 27" x 5"	22" x 22" x 4"	19" x 19" x 4"	16" x 16" x 4"	14" x 14" x 4"
5000	29" x 29" x 5"	23" x 23" x 5"	20" x 20" x 4"	17" x 17" x 4"	14" x 14" x 4"
5500	30" x 30" x 6"	24" x 24" x 5"	21" x 21" x 5"	17" x 17" x 4"	15" x 15" x 4"
6000	32" x 32" x 6"	26" x 26" x 6"	22" x 22" x 5"	18" x 18" x 5"	16" x 16" x 4"
6500	33" x 33" x 6"	27" x 27" x 6"	23" x 23" x 5"	19" x 19" x 5"	16" x 16" x 4"
7000	34" x 34" x 6"	28" x 28" x 6"	24" x 24" x 6"	19" x 19" x 5"	17" x 17" x 5"
7500	35" x 35" x 7"	28" x 28" x 6"	25" x 25" x 6"	20" x 20" x 5"	17" x 17" x 5"
8000	36" x 36" x 7"	29" x 29" x 6"	25" x 25" x 6"	21" x 21" x 6"	18" x 18" x 5"
8500	37" x 37" x 6"	30" x 30" x 5"	26" x 26" x 4"	21" x 21" x 4"	18" x 18" x 4"
9000	38" x 38" x 6"	31" x 31" x 5"	27" x 27" x 4"	22" x 22" x 4"	19" x 19" x 4"
9500	39" x 39" x 6"	32" x 32" x 5"	27" x 27" x 4"	22" x 22" x 4"	19" x 19" x 4"
10000	40" x 40" x 6"	33" x 33" x 6"	28" x 28" x 5"	23" x 23" x 4"	20" x 20" x 4"
11000	42" x 42" x 7"	34" x 34" x 6"	29" x 29" x 5"	24" x 24" x 4"	21" x 21" x 4"
12000	44" x 44" x 7"	36" x 36" x 6"	31" x 31" x 6"	25" x 25" x 4"	22" x 22" x 4"
13000	46" x 46" x 8"	37" x 37" x 7"	32" x 32" x 6"	26" x 26" x 5"	22" x 22" x 4"
14000	48" x 48" x 8"	38" x 38" x 7"	33" x 33" x 6"	27" x 27" x 5"	23" x 23" x 4"
15000	50" x 50" x 8"	40" x 40" x 7"	34" x 34" x 7"	28" x 28" x 6"	24" x 24" x 5"
16000	51" x 51" x 9"	41" x 41" x 8"	35" x 35" x 7"	29" x 29" x 6"	25" x 25" x 5"

APPROVED BY  
 REVISÉD  
 7/18/2018  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS



- 1) FIND PIER LOAD FROM OTHER CHARTS WHICH INCLUDE UNIT WIDTH AND PIER SPACING. THE PIER CAPACITY IN THE CHART ABOVE INCLUDES THE WEIGHT OF THE PIER AND FOOTER.
- 2) FOOTINGS MUST BE PLACED OR Poured LEVEL ON UNDISTURBED SOIL OR FILL COMPACTED TO 90% OF MAXIMUM RELATIVE DENSITY.
- 3) PRECAST CONCRETE FOOTERS MUST BE 4" MINIMUM THICKNESS AND MEET ASTM C90-2a WITH MINIMUM  $F_c = 1200$  PSI AT 28 DAYS.
- 4) Poured IN PLACE CONCRETE FOOTERS MUST BE 6" MINIMUM IN THICKNESS WITH MINIMUM  $F_c = 3,000$  PSI AT 28 DAYS.
- 5) FOOTER THICKNESS BASED ON BLOCK PIERS. FOOTER AREA AND DEPTH BASED ON SINGLE STACK BLOCKS UP TO 8,000# AND DOUBLE STACK ON UP.
- 6) CONCRETE FOOTER DIMENSIONS TABULATED ARE EQUAL SIDES (W x W x D), BUT AN EQUIVALENT FOOTPRINT AREA MAY BE RECTANGLE (UNEQUAL SIDES) PROVIDING THE PROJECTED DISTANCE FROM SIDE OF PIER TO SIDE OF FOOTER IS EQUAL TO OR LESS THAN THE REQUIRED FOOTER DEPTH.
- 7) FOR ABS FOOTERS, REFER TO MANUFACTURER'S INSTRUCTIONS.
- 8) PREFABRICATED PIERS APPROVED FOR THE LOAD MAY BE USED WITH THIS FOOTER CHART WHEN INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND THE PROJECTION DOES NOT EXCEED FOOTER DEPTH.

TABLE 4

## CHAPTER 3 – BLOCKING INSTRUCTIONS

### 3.1 GENERAL INFORMATION

- A. Before doing any jacking, place support piers for the home in their approximate location as selected from Table 1 for 14' and 28' wide homes, and Table 2 for 16' wide homes. See Figure 4 and Figure 5 for typical layouts.
- B. Use only jacks in good condition with a minimum rating of 5 tons.
- C. Use a steel plate (3/8" x 2 1/2" x 5") or hard wood block (4" x 4" x 12") between jack and steel I-beam to distribute the loads.
- D. Use a firm support under the jack to prevent the jack from tipping or settling.
- E. Do not operate jacks while under the home.
- F. Use jacks for raising the home only. Don't rely on the jacks to support the home.
- G. Raise the home slowly and provide additional blocking between the I-beam and piers as the home is raised.
- H. Do not go under the home while the home is supported by jacks.

### 3.2 INSTALLATION

- A. When the home is located in its final position, bring the home approximately to level using the hitch jack.
- B. To jack up one side of the home, place one jack just in front of the front spring hanger and the other jack just behind the rear spring hanger. Operate these two jacks at the same time to raise the home. Install footers and piers just ahead of the front jack, and just behind the rear jack. Do not exceed the spacing you have selected from the blocking table.
- C. Jack the I-beam at the front and install footers and piers within 1'0" of the end of the home.
- D. Repeat steps 2 and 3 for the other side of the home. The home should be approximately level.
- E. Level the home using a water level or similar equipment to reasonable tolerances. The final adjustment shall be made by jacking the I-beam and placing hard wood shims between the beam and piers.
- F. The leveling process is essential for the doors and windows to work properly. Within 90 days, the home should be releveled again if pier settling has occurred. Make sure you loosen all frame ties before you jack the home.

## CHAPTER 4 – TIE DOWN INSTRUCTIONS

### 4.1 GENERAL

- A. The Federal Standards require that each home have provisions to resist the sliding and overturning effects of high winds. All MHE homes are designed for ZONE 1 only.
- B. As the manufacturer of your home, we are required to make provisions for the support and anchoring systems, but not required to provide the anchoring equipment or stabilizing devices.
- C. All homes are designed for frame tie down connections.

### 4.2 DESIGN CRITERIA

- A. The anchoring equipment shall be capable of resisting an allowable working load equal to or exceeding 3,150 pounds and shall be capable of withstanding a 50% overload (4, 725 pounds total).
- B. Ground anchors shall be capable of resisting an allowable load of 3,150 pounds where such load is applied at an angle of 50 degrees maximum.
- C. The main frame shall be used as the points for connection of the tie downs.
- D. Steel straps shall be equivalent of Type 1, Finish 3 grade steel strapping, 1 ¼” wide and .035 inches thick, conforming with ASTM Standard Specification D3953-97. Steel straps shall be zinc coated, a minimum of 0.30 ounces per square foot of surface.
- E. Install all anchoring equipment in accordance with the manufacturer’s installation instructions.
- F. Other approved connectors may be used provided they meet the strength requirements set forth within.

### 4.3 INSTALLATION

- A. The home must be in its final position prior to tying it down.
- B. Use Table 5 or Table 6 and page 14 to determine the tie down anchor locations, based on width of home and wind zone.
- C. Position and install anchors so that the final strap angle will be within the limits shown on the tie down anchor table, see Figure 6 and page 14. Do not exceed the spacing of the anchor shown in the table under the width of the unit according to wind zone.
- D. Connect the straps to the ground anchors and frames.

- E. Tighten the strap according to the anchor installation instructions. Use caution to avoid over tightening the straps. The straps could pull the home off the foundation. It is recommended that a small bit of slack is allowed in each strap until all straps are installed. Then carefully take up the slack by tightening the straps.
- F. Recheck strap tension frequently until all pier settlement is complete. CAUTION: While re-leveling, do not jack against tight straps.
- G. Ground anchors must extend below the frost line, and 12” minimum above the water table.
- H. The steel tie down strap must be protected against damage at sharp bends. Use a tie down bracket with a radius edge or insert a short piece of tie down strap through the bracket to protect the full tie down strap.



TIE DOWN ANCHOR LOCATIONS  
 14 WIDE AND 28 WIDE

TABLE 5

PIER HEIGHT MAXIMUM	WIND ZONE I SPACING	
	20 DEGREE MAX. ROOF	5/12 ROOF PITCH (28 WIDE ONLY)
24"	11'-11" O.C. MAX.	7'-0" O.C. MAX.
36"	9'-6" O.C. MAX.	5'-8" O.C. MAX.
48"	7'-9" O.C. MAX.	4'-7" O.C. MAX.
60"	6'-6" O.C. MAX.	3'-10" O.C. MAX.
72"	5'-6" O.C. MAX.	N/A

TIE DOWN ANCHOR LOCATIONS  
 16 WIDE AND 32 WIDE

TABLE 6

PIER HEIGHT MAXIMUM	WIND ZONE I SPACING	
	20 DEGREE MAX. ROOF	5/12 ROOF PITCH (32 WIDE ONLY)
24"	13'-8" O.C. MAX.	7'-8" O.C. MAX.
36"	11'-9" O.C. MAX.	6'-7" O.C. MAX.
48"	10'-0" O.C. MAX.	5'-8" O.C. MAX.
60"	8'-8" O.C. MAX.	4'-10" O.C. MAX.
72"	7'-7" O.C. MAX.	4'-3" O.C. MAX.

THE ABOVE WIND ZONE I SPACING IS THE MAXIMUM DISTANCE BETWEEN TIE DOWNS ON THE LONG DIMENSION OF THE HOME. SPACING IS BASED ON 96" SIDEWALLS MAX. FOR TIE DOWNS ON THE ENDS OF HOMES SEE THE LONGITUDINAL TIE DOWN REQUIREMENT CHART.

REFER TO THE MANUFACTURED HOUSING ANCHOR INSTALLATION INFORMATION SECTION FOR ACCEPTABLE METHODS OF ANCHORING THE HOME. OTHER METHODS MAY BE USED IF ALL DESIGN CRITERIA IS MET.

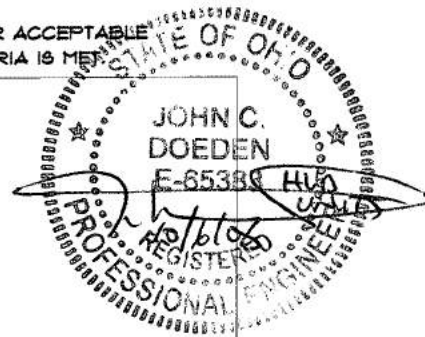
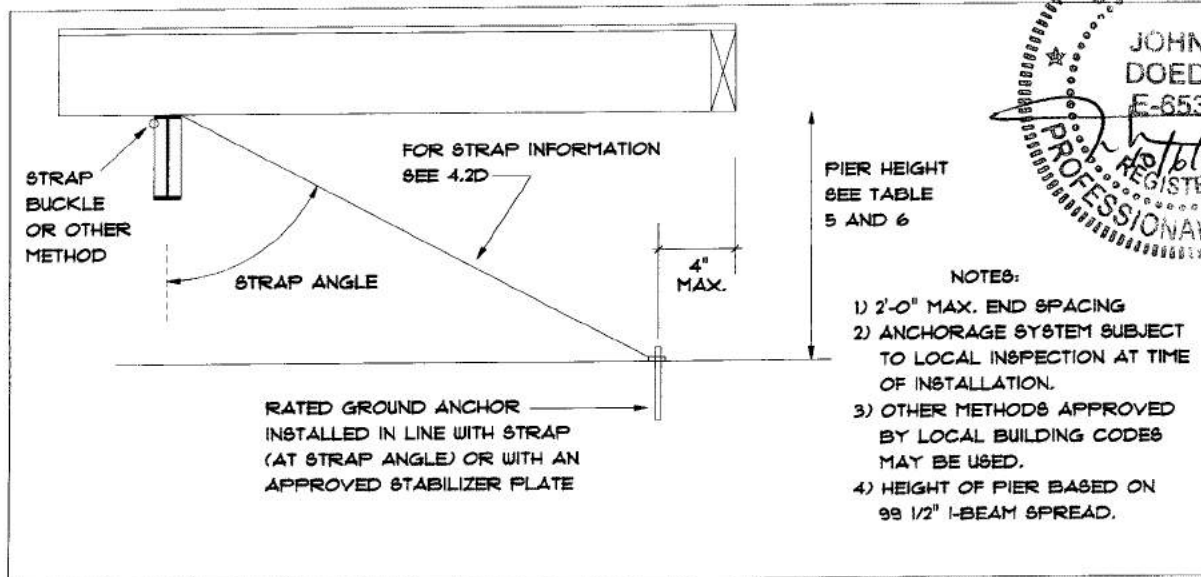


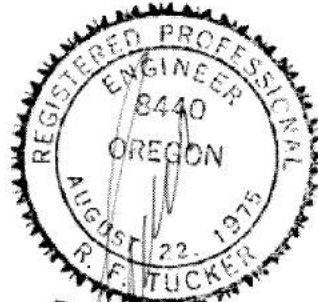
FIGURE 6

APPROVED BY  
REVISED  
3/21/2017  
**NIA** INC.  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS

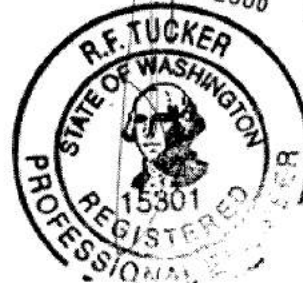
# **Manufactured Housing Anchor Installation Information**

**(Updated: 10/16/06)**

**Provided by**  
**TIE DOWN ENGINEERING**



FEB 08 2008 12 PAGES



I-13

**TIE DOWN ENGINEERING • 5901 Wheaton Drive • Atlanta GA, 30336**  
**www.tiedown.com • (404) 344-0000 • FAX (404) 349-0401**



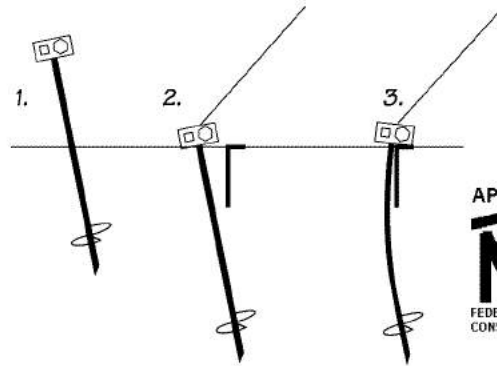
101606.d12



# INSTALLATION INFORMATION

## Anchor Installation

1. Position anchor at a slight back angle (10°) so that when fully installed, the anchor head will be inside any skirting or side wall.
2. Install anchor to +/- 2/3 depth, then install stabilizer vertically, within 3"-4" of anchor shaft, parallel to wall of home.
3. Fully drive anchor, attach strap (see proper strap tensioning), and pretension strap to pull anchor rod against the stabilizer plate.



APPROVED BY  
**NIA** INC.  
REVISÉD  
3/21/2017  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS

## Manual Anchor Installation

1. Dig holes to a depth of 2/3 of the anchor length. Install anchor with rod or length of pipe for leverage.
2. Replace earth in hole after anchor/plate is installed at full depth. Pack dirt with a tamping rod every 6 inches of fill.
3. Testing may be required in loose soil conditions to check that anchor has proper holding power.

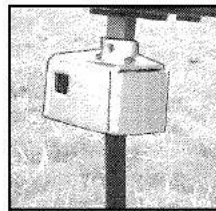
### Important:

**Anchor must be installed to full depth. Anchor head must be at ground level or at the top of the stabilizer plate which is fully installed to ground level.**

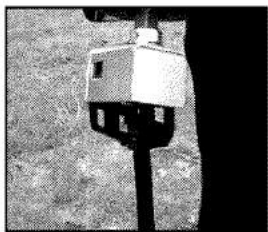
## Electric Drive Machine Installation

### Operating Instructions:

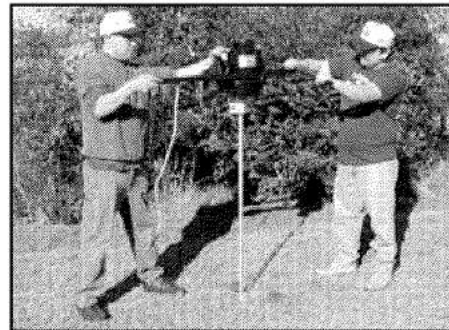
1. Attach adapter head to shaft of the EDM motor, tighten set screw.
2. Place extension handle in the end of the EDM if needed.
3. Place anchor head into adapter, line up anchor shaft with EDM shaft, for easier installation.
4. Flip forward/reverse switch to forward.
5. Place anchor tip in location where anchor is to be buried. Hold on/off switch to install.



Adapter fits anchors and Soil Test Probe



EDM Adapter Head.



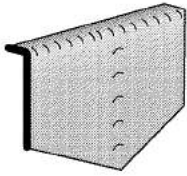
Two man operation makes easy work of anchor installation

### Electric Drive Machine Cautions and Warnings:

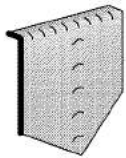
- Before installation of any ground anchor, determine that the ground anchors to be installed will not be near any underground electrical cables, phone lines, water lines, sewer pipes, or gas lines. Failure to do so may result in serious injury or death
- The EDM is designed for operation by two people.
- Do not allow the EDM to be wedged against the home or other solid objects, when operating the EDM.
- Electrical cord must be a minimum of 14-2 wire size w/ground up to 25 ft. of cord. Longer cords must be 12-2 wire size w/ground or lower.
- Never operate the EDM in wet or rainy conditions.
- Frayed or patched electrical cords should never be used with the EDM.
- Care should be taken to keep electrical cords away from anchors.
- Never operate drive machine without the GFI power cord. Damage to motor and injury to operator can result from by passing the GFI.
- The GFI will shut off power when a ground fault is detected. The GFI will also shut off power when it detects low voltage improper amps required to drive the motor. Many times the problem will be the use of an extension cord that is too long or is too light in gage.

# INSTALLATION INFORMATION

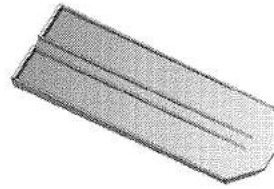
## Stabilization Plates



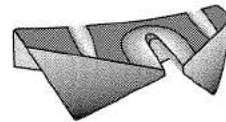
**Class 4B Stabilizer Plate**  
17-1/2" x 13-1/2"  
Galvanized: Part # 59286



**12" wide Stabilizer Plate**  
Black Paint: Part #59292



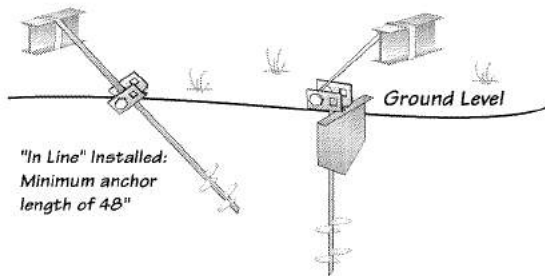
**ABS Stabilizer Plate**  
10" x 24"  
Part # 59293



**Quik-Set Stabilizer Plate**  
Black Paint: Part #59291

## Anchor Stabilizer

In order to prevent lateral movement of manufactured homes subjected to high wind loads and to comply with HUD's Wind Zone I, II, & III requirements, all lateral frame ties must be attached to a properly stabilized ground anchor. (Two approved methods illustrated below.)

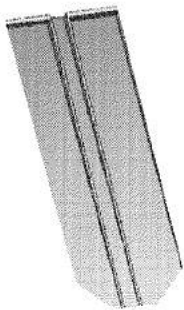


### Stabilizer Plate Installation

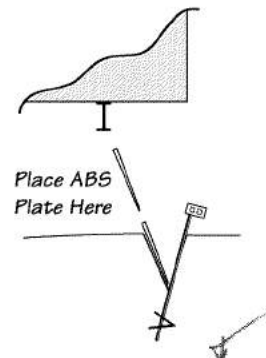
1. Refer to any and all local, state and federal regulations.
2. Use the Soil Test Probe at the anchor location in order to match soil class with the anchor/stabilizer.. (See Page 11)
3. Partially install anchor to allow 14" to 16" remaining above ground level.
4. Utilizing oversized hammer, vertically install stabilizer plate, nesting anchor rod in between formed channels on outside of stabilizer plate (between anchor and frame).
5. Fully install anchor so that head is at the surface of the soil (1" tolerance, if necessary) and pretension anchor until touching stabilizer plate.

## ABS Stabilizer Plate

Part # 59293



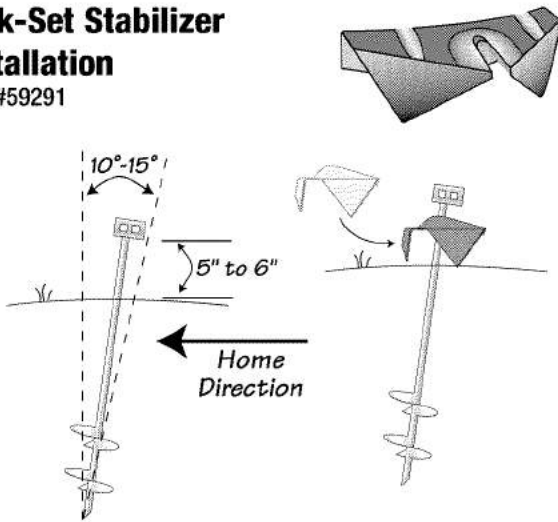
1. Determine correct anchor to be used with the home installation and use the manufacturer instruction for installation, following all safety precautions.
2. Using an electric drive machine, install anchor to a depth of approximately 28 inches at a slight back angle.
3. Dig out an 8" wide area so that the ABS stabilizer will be placed on undisturbed soil at a 10 to 15 degree angle toward the home. The bottom center of the plate should be touching the anchor rod.
4. Complete the installation of the ground anchor until the bottom of the anchor head is flush with the ground.
5. Attach proper strap and tension strap until anchor head is flush against the ABS plate and strap is tight. At this point, soil should be tamped into the vacant area behind the anchor rod, tamping approximately 6" and repeating until the vacant area is flush with the surface of the surrounding ground.



# INSTALLATION INFORMATION

## Quik-Set Stabilizer Installation

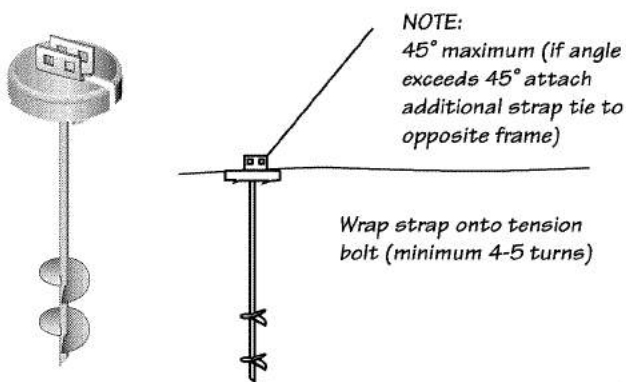
Part #59291



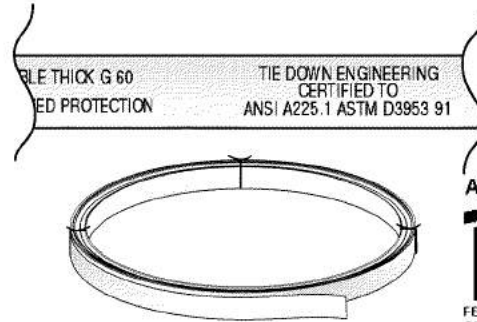
1. Install ground anchor inside skirting line at a slight back angle of 10° - 15°.
2. While anchor head is still 5" to 6" above ground level: install Quik Set stabilization plate around anchor shaft, referring to the direction imprinted on the top of the plate.
3. Install ground anchor until Quik-Set plate is fully set. Hammering may be required at the corners to insure plate being fully driven.
4. Install strap(s) to anchor head and pretension according to approved methods. Maximum anchor load in conjunction with the "Quik-Set" device is 4725 lbs. (ultimate).

## Deepset Anchor/Stabilizer Instructions

1. Confirm soil classification using standard torque probe at 36" below ground surface, make certain readings meet or exceed 350 in lbs. (Class 2 and 3 soils) at the depths of 12" & 36".
2. Clear loose vegetation where anchor will be installed. Install anchor vertically to its' full depth. Stabilizer plate at the top of anchor must be fully embedded into soil.
3. Pull strap past anchor head and cut strap so that there is 12" to 15" of strap to wrap onto anchor bolt insuring 4 to 5 wraps minimum.
4. Insert strap into anchor bolt flush with opposite side of bolt. Tighten bolt/strap until tight. Secure anchor bolt with nut.



## Certified Galvanized Strapping\*



APPROVED BY  
**NIA** INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS  
 REVISED  
 3/21/2017

The steel strapping by Tie Down Engineering for the manufactured housing industry has been tested to, and conforms to, the HUD Code as referenced in Part 3280 of the Manufactured Home Construction and Safety Standards:

**3280.306(f) Anchoring equipment – load resistance.**  
 Anchoring equipment shall be capable of resisting an allowable working load equal to or exceeding 3,150 pounds and shall be capable of withstanding a 50 percent overload (4,725 pounds total) without failure of either the anchoring equipment or the attachment point on the manufactured home.

**3280.306(g) Anchoring Equipment – weatherization.**  
 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 do not need to be zinc coated.
- (2) Type 1, Finish B, Grade 1 steel strapping, 1-1/4 inches 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.

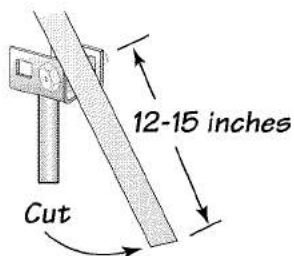
The above specification of a minimum coating of 0.30 ounces per square foot equates to a designation of "G30." Tie Down strapping exceeds this minimum requirement with a coating of 0.60 (G60) or 1.20 (G120) ounces as per above. Similarly, Tie Down strapping exceeds, in testing, the minimum load requirements of 3,150 pounds design (working) load and 4,725 pounds (ultimate) overload.

\* Available with G60 or G20 galvanized coatings.

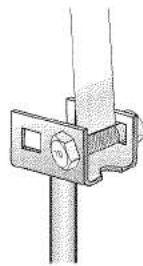


# INSTALLATION INFORMATION

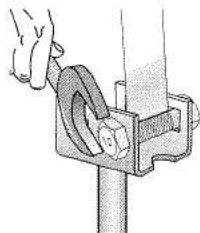
## Proper Strap Tensioning



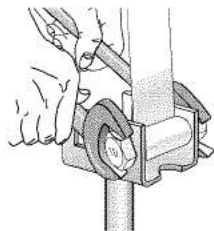
1. Insert slotted bolt into anchor head, attach loosely. Pull strap past bolt head and cut strap so that 12-15 inches of strap are available to wrap onto the slotted bolt.



2. Insert the strap end into the slot in bolt until flush with opposite side of bolt.



3. Using 15/16" wrench or socket, turn the bolt, winding the strap so that a minimum of four to five complete turns are made, and the strap is adequately tensioned.



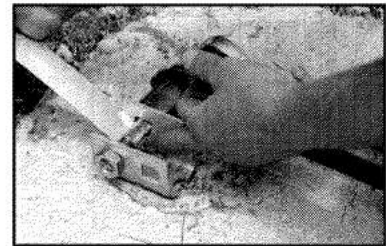
4. Hold the bolt under tension while tightening the nut, drawing the head of the bolt into the recess. After the bolt is within the recess, continue to tighten the nut until securely fastened.

**Tip: TIE DOWN'S SPEED WRENCH cuts time required to tension strap in half!**

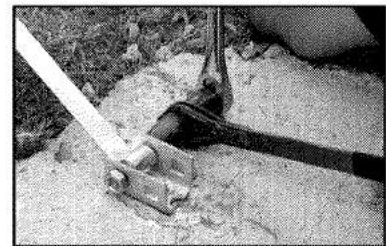
## Strap Tensioning - Speed Wrench

Tie Down's SPEED WRENCH simplifies anchor installation with a design that allows for one handed operation for installing slotted bolts and tensioning strap. The SPEED WRENCH has a 15/16" impact socket on one side and a 15/16" "nut" on the other. Combine this with your own ratchet and 15/16" socket and you have the fastest way to tighten slotted bolts!  
Part # 48900

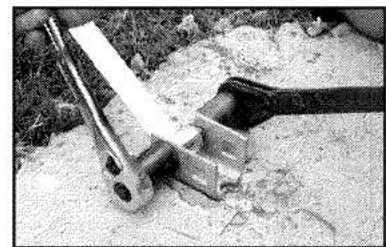
1. Place Speed Wrench over the bolt head. Insert the strap end into the slot in bolt until flush with opposite side of bolt.



2. Hold Speed Wrench in place, tighten bolt with socket wrench on outside of Speed Wrench (bolt head side).



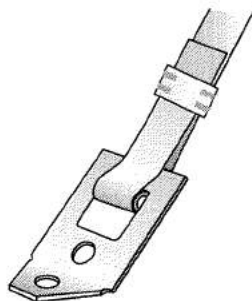
3. Move socket to the opposite (nut) side. Hold Speed Wrench in place. Use socket wrench to tighten nut.



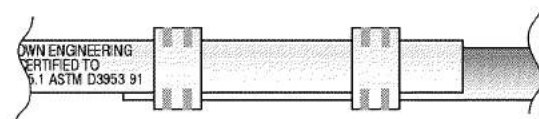
APPROVED BY  
**NIA** INC.  
REVISÉD  
3/21/2017  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS

## Strap Attachment

One crimp seal is used when strap is attached to a sidewall bracket or a strap connector. If the bracket does not have a radius edge, a radius clip (short "U" shaped piece of strap) must be placed between the strap and contact point to protect the strap from sharp edges. Verify state requirements for number of crimp seals required.



## Strap Splice



2 Seals - 2 Crimps per seal

To lengthen strap in the field, a double crimp seal splice is required. Overlap strap approximately 12 inches and use two crimp seals evenly spaced, with 2 crimps per seal.



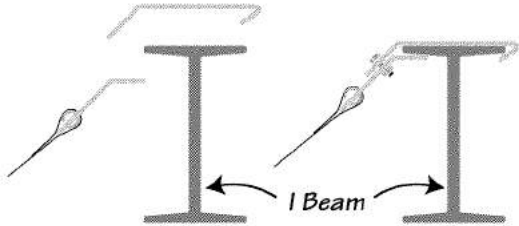
101606.d12

# INSTALLATION INFORMATION

1. Refer to local, State, and Federal regulations prior to installation in order to assure compliance.
2. Soil Test Probe the anchor location prior to installation in order to match the soil classification with the proper anchor/stabilizer combination.
3. Install tested and approved Tie Down Engineering anchor products.

## Universal Swivel Strap Connector

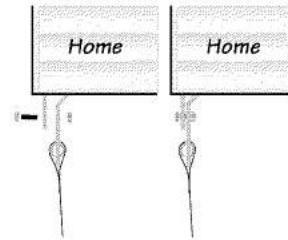
Best Method:



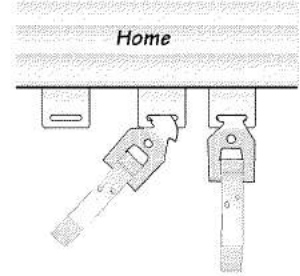
1. Frame ties attach to the beam with a swivel frame connector. This method provides the strongest and safest connection.
2. Attach the swivel frame connector beam hook to the top of the I-beam from either the front or the back side. The angled or hook end of the beam hook should be snug against the inside top I-beam flange.
3. Attach the swivel connector to the underside of the flange and frame hook with a 1/2" grade 5 bolt and nut. This allows the swivel connector to pivot and lock onto the I-beam.

## Universal Swivel Strap Connector

Other Methods:



**Sidewall w/Nut & Bolt**  
Attach strap connector to sidewall connector with nut & bolt, then attach to ground anchor.



**Sidewall & Longitudinal Slotted**  
Insert strap connector at a 45 degree angle. Return to 90 degree angle, pull down and attach to ground anchor. (Slotted connections must be straight pull. Bolted connections can have 15 degree max. angle.)

## Gator Beam Clamp

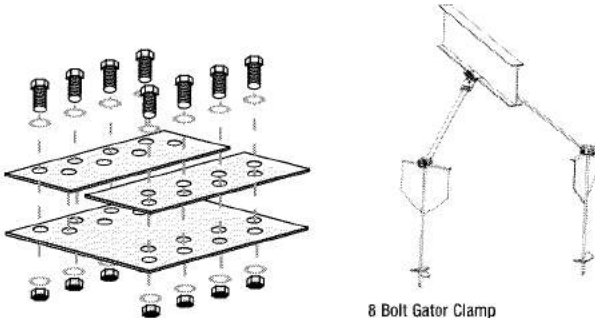
4 Bolt Gator Clamp (Wind Zone 1,2 & 3)

#58999

8 Bolt Gator Clamp (Wind Zone 3 - and Florida)

#59011

**NOTE:** Gator Beam Clamps must be attached with a Swivel Strap Connector #59002. One crimp seal is used when strap is attached strap connector.

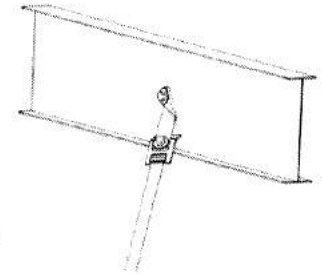


8 Bolt Gator Clamp  
(Florida set up shown)

1. Determine anchor/stabilizer plate location and bracket location on I-beam to insure a 45° or lower strap angle.
2. Attach beam clamp with 1/2" Grade 5 bolts and nuts as shown.
3. Connect swivel connector and strap to bolt nearest to anchor with a 1/2" Grade 5 bolt and nut.

## Angle Frame Bracket

Part #59009



1. Determine anchor/stabilizer plate location and bracket location on I-beam to insure a 45° or lower strap angle .
2. Drill a 1/2" hole, centered in the I-beam as shown. Hole must be a minimum of 4" from any edge of the I-beam.
3. Connect the two Frame Brackets (R & L) with a 1/2" Grade 5 bolt and nut.
4. Attach swivel connector and strap to Angle Frame Brackets with 1/2" Grade 5 bolts and nuts. Tighten all bolts.

**NOTE:** Frame Brackets must be attached with a Swivel Strap Connector #59002.

APPROVED BY  
  
 REVISOR  
 3/21/2017  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

I-18



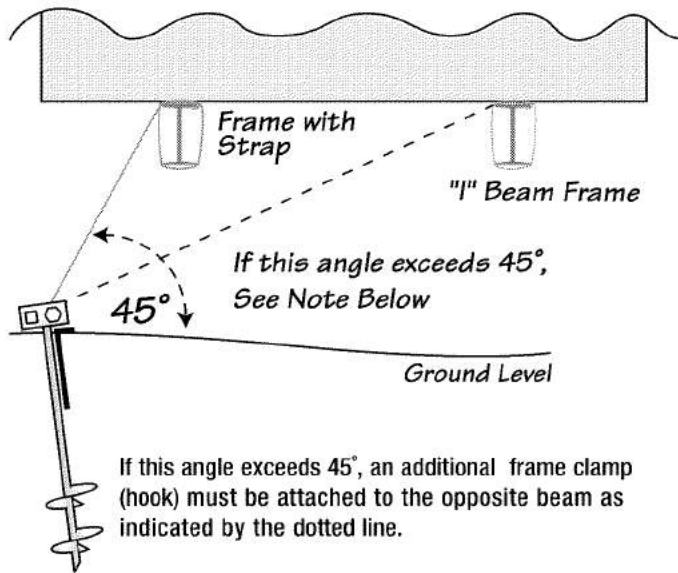
1016006.d12

18

~ 6 ~

# INSTALLATION INFORMATION

## Frame Tie to Anchor



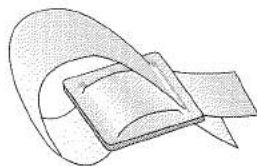
If this angle exceeds 45°, an additional frame clamp (hook) must be attached to the opposite beam as indicated by the dotted line.

A Stabilizer Plate must be installed on all frame Ties. (or alternate method of stabilizing ground anchor.)

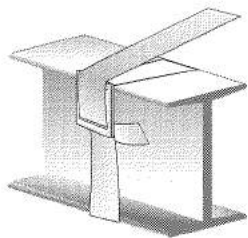
Select proper anchor for soil conditions using the Soil Test Probe, or other approved method of determining soil classification.

APPROVED BY  
**NIA** INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS  
 REVISED  
 3/21/2017

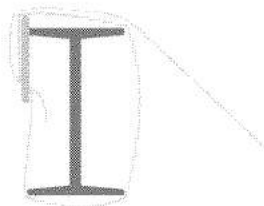
## Strap Buckle - MBU



- Thread length of frame tie strap through strap buckle as shown.

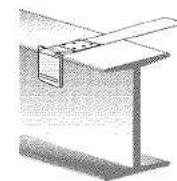


- Next, thread long end of strap between frame and floor of home. Bring strap through buckle as shown in diagram and fasten to anchor head.

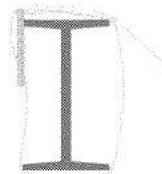


- Diagram shows strap in position around frame and through buckle. It is important to remove all slack from system.

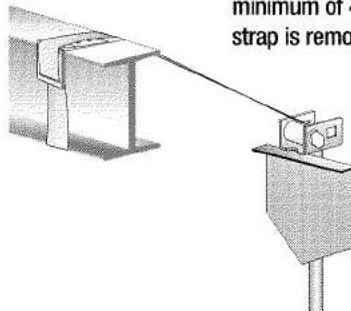
## Frame Tie with Buckle



1. Install strap by pushing the end between the inside of the frame "I" beam and the floor.

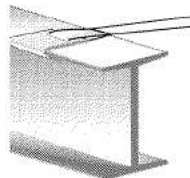


2. Position the buckle at upper end of the "I" beam frame. Wrap the end of the strap around the "I" beam. Thread the end of the strap through the slot in the buckle as shown. Push the end of strap in-between "I" beam and floor.



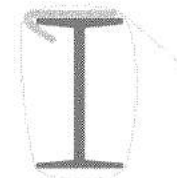
3. Pull the strap, making certain the buckle stays in position. Thread loose end of strap thru slotted tensioning bolt attached to tension head of anchor. Tighten slotted tensioning bolt a minimum of 4 to 5 full turns until all slack in strap is removed.

## Frame Tie with Hook

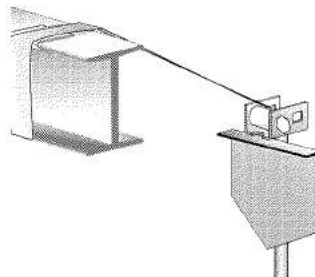


1. Attach frame hook to top inboard location of "I" beam.

2. Keeping in line with the hook, wrap galvanized strap completely around "I" beam.



3. Thread loose end of strap through slotted tensioning bolt attached to tension head of anchor. (Anchor must be properly installed into the ground before proceeding with step #4.)

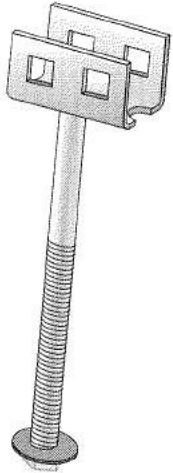


4. Tighten slotted tensioning bolt a minimum of 4 to 5 full turns until all slack in strap is removed.

# INSTALLATION INFORMATION

## Patio Slab Anchor\*

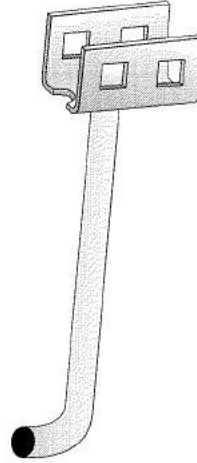
This anchor is designed to be inserted through a 3/4" hole drilled or formed into an existing concrete slab.



- Concrete must be a 2500 PSI minimum slab with 4" minimum thickness and 6/6 x 10/10 wire mesh or fiber mesh installed.
- Concrete slab must allow 4725 lbs of vertical tension on anchor without lifting. This assumes that the concrete weighs 150 lbs per cu. ft.
- Minimum distance from the anchor shaft to one edge of the slab is 4 in. from one edge and 2 ft. from any other edge.
- If installed in a 4" slab at minimum distances from edges, an additional layer of 6/6 x 10/10 mesh is recommended.

## Concrete Anchor\*

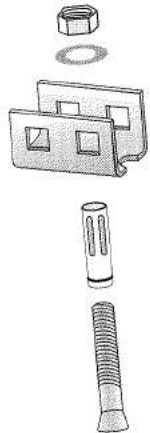
The MIJ2 is designed to be installed into a concrete slab at the time the concrete is being poured.



- Concrete must be a 2500 PSI minimum slab with 4" minimum thickness.
- Concrete slab must allow 4725 lbs of vertical tension on anchor without lifting. This assumes that the concrete weighs 150 lbs per cu. ft.
- Minimum distance from the anchor shaft to one edge of the slab is 4 in. from one edge.
- If installed in a 4" slab at minimum distances from edges, an additional layer of 6/6 or 10/10 mesh is recommended.
- Slab must be 8 in. minimum thickness at location under any anchor to allow 5 in. embedment of anchor "J" rod.

## Concrete Slab Anchor\*

This anchor is designed to be bolted to an expansion sleeve in an existing concrete slab.



- After reviewing restrictions listed to the right, drill a 5/8 in x 3 in. hole in the slab where the anchor head is to be located.
- Place steel expansion sleeve over bolt and place into the drilled hole.
- Place the washer onto the expansion bolt.
- Thread nut onto expansion bolt and tighten until maximum expansion of steel expansion sleeve has been achieved.
- Remove nut and washer and place anchor head over exposed bolt.

- Place washer and nut onto bolt to attach anchor head, tighten nut.
- Concrete must be a 2500 PSI minimum slab with 4" minimum thickness.
- Concrete slab must allow 4725 lbs of vertical tension on anchor without lifting. This assumes that the concrete weighs 150 lbs per cu. ft.
- Minimum distance from the anchor shaft to one edge of the slab is 4 in. from one edge and 6" from any other edge.
- If installed in a 4" slab at minimum distances from edges, an additional layer of 6/6 or 10/10 wire mesh or fiber mesh is recommended.

### \*NOTE:

- Maximum load per anchor is 4725 lbs.
- Minimum slab area per anchor:

4" Thick Slab: 95 S. F.

6" Thick Slab: 65 S. F.

8" Thick Slab: 48 S. F.

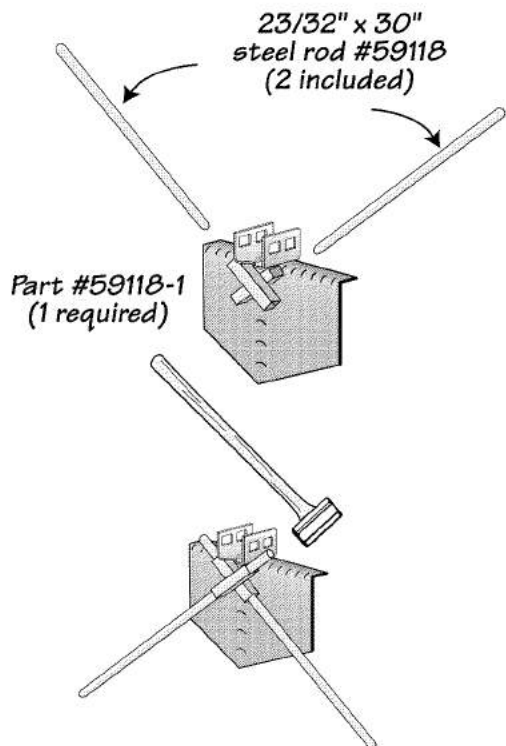
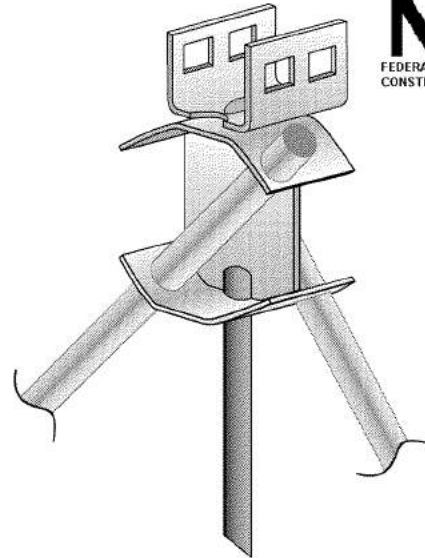
# INSTALLATION INFORMATION

## Cross Drive Rock Anchor - MRA

Engineered for installation into solid rock within 1 in. from bottom of the anchor base. Exact alignment is achieved with the swivel tensioning head.

- Drill 5/8" diameter hole 5-1/2" deep in center of anchor location. Insert pilot stud into hole.
- Drill two 3/4" diameter holes, (the length of the rods) into the rock at 45° angles, using the anchor head as a locating guide.
- Place rod through top and corresponding bottom web flange and into 45° hole. Drive rod into rock. Rod must be driven into rock at least 80% of it's length to achieve minimum allowable pullout resistance. Repeat using 2nd rod.
- Maximum pullout resistance is developed when ground surface is solid rock. Maximum distance from lowest edge of anchor flange to rock surface is 1 in.

APPROVED BY  
**NIA** INC.  
 REVISED  
 3/21/2017  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS



**X-Plate Anchor**  
 X-Plate for Soil Class 2  
 2 - 23/32" x 30" rods included.  
 Part # 59118

## X-Plate Anchor with Stabilization Plate

Engineered for installation into difficult ground conditions that, when tested with a soil test probe, exceed 500 in. lbs. (see notes below).

Using a soil test probe, determine the soil classification. Place the X-Plate parallel to the building being secured with the flat plate to the inside. Pound the plate into the ground so that the upper lip is ground level. Using a heavy hammer or electric hammer gun, pound rods into the ground through the box tubing guides welded onto the back side of the stabilizer plate. Rods should be installed until maximum 2" above the box tubing. Install strap as required.

### Notes:

1. For Wind Zone 1 use only, max working load of the X-Plate is 2,200 lb. (3,300# ultimate).
2. Difficult Soils Only - Defined as "Extremely hard soil preventing the installation of an auger anchor to its full depth using a 1/2 HP Drive Machine". Torque probe readings at 12" to 18" of the surface must be 500 "/# min.
3. Cross drive anchor is NOT rated or intended to be used for direct pull in vertical direction. Angle of resultant load must be at 40-50 degrees from vertical. This anchor may not be appropriate for shear wall or column anchorage.



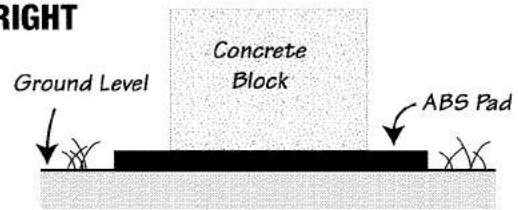


# INSTALLATION INFORMATION

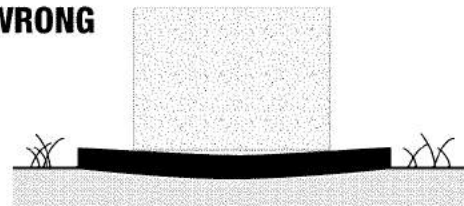
## Installation Instructions for ABS Pads

1. Pier spacing must be in accordance with the Home Manufacturer's Installation Manual and/or State or Local requirements.
2. Clear all vegetation and debris from the area where the ABS pads are to be placed.
3. Ground under ABS pads must be leveled and evenly compacted.
4. Place ABS pad with grid side up, smooth side down. Center blocks on ABS pad and complete pier.

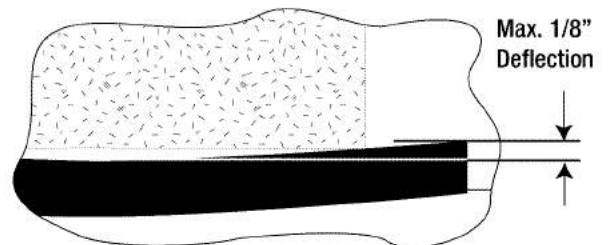
**RIGHT**



**WRONG**



Unlevel or poorly compacted soil



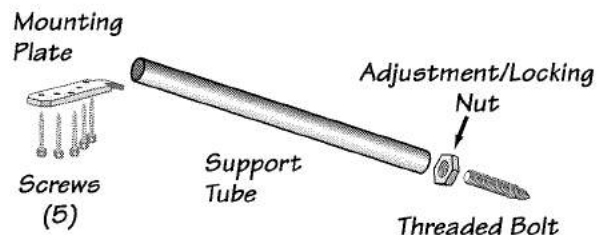
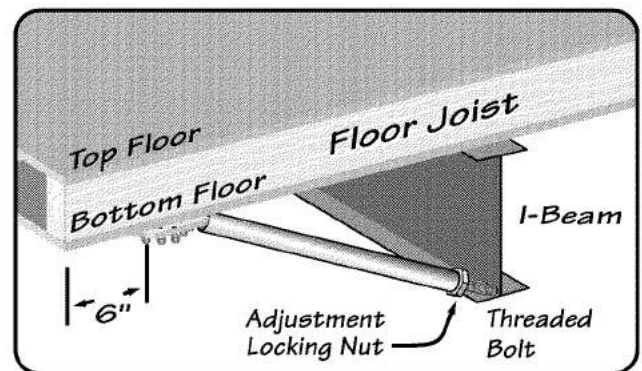
Deflection is measured from the highest point to the lowest point of the top side of the pad.

### Pad Bearing Capacity

ABS Pad Size	Part#	1000 lbs. Soil	2000 lbs. Soil	3000 lbs. Soil
16" x 18" - <b>2 Sq. Ft</b> 288 Sq. In.	59300	2,000 lbs.	4,000 lbs.	6,000 lbs.
16" x 22.5" - <b>2.5 Sq. Ft.</b> 260 Sq. In.	59301	2,500 lbs.	5,000 lbs.	7,500 lbs.
17" x 25" - <b>3 Sq. Ft</b> 432 Sq. In.	59302	3,000 lbs.	6,000 lbs.	N/A
24" x 24" - <b>4 Sq. Ft</b> 576 Sq. In.	59303	4,000 lbs.	8,000 lbs.	N/A

## Adjustable Outrigger/Diagonal Strut Installation Instructions

1. Determine floor joist area needing support.
2. Set mounting plate on floor joist and secure with 5 (#12x2") screws provided. Approx. 6" from outer rim joist.
3. Insert threaded bolt in support tube and adjust so it clears I-beam flange when mounting plate is inserted and chisel end of bolt is placed against the frame. If support tube is too long, simply cut square to desired length.
4. Raise floor joist with jack to desired level before tightening the nut on the threaded bolt, snug fit to 1/4 turn past.
5. Replaces perimeter piers required for window and door support and alignment, except as required by the home manufacturer for larger openings.
6. For manufactured homes only, built to Federal Manufactured Home Construction & Safety Standards.
7. The total allowable load is 864 pounds, (liveload 665 pounds), which is the load at each side of a 46-1/2" sidewall opening in a 30 PSF roof zone for a roof tributary of 8'-6" (e.g. a 180" unit width a 12' eaves).



**Do not use on homes while being transported.**

**NOTE: This component is not designed or intended to replace any foundation supports required by the home's manufacturer and is not a repair for damaged joists.**

22

~ 10 ~

# Soil Classification Chart

Ground anchors are designed for different soil classifications: longer models for loose soils, shorter models for harder soils. Prior to installing any ground anchor model, the soil must be tested (with a Soil Test Probe) in order to match approved ground anchor model with site soil class.

**WARNING:** Before ground anchor installation, determine that the anchor locations around home will not be close to any underground electrical cables, water lines or sewer piping. Failure to determine the location of electrical cables may result in serious personal injury.

## Soil Test Probe

The Soil Test Probe is used to determine the soil conditions below the surface near the anchor's helix. Using the Soil Test Probe will ensure maximum anchor holding strength by indicating the proper anchor model for each soil condition.

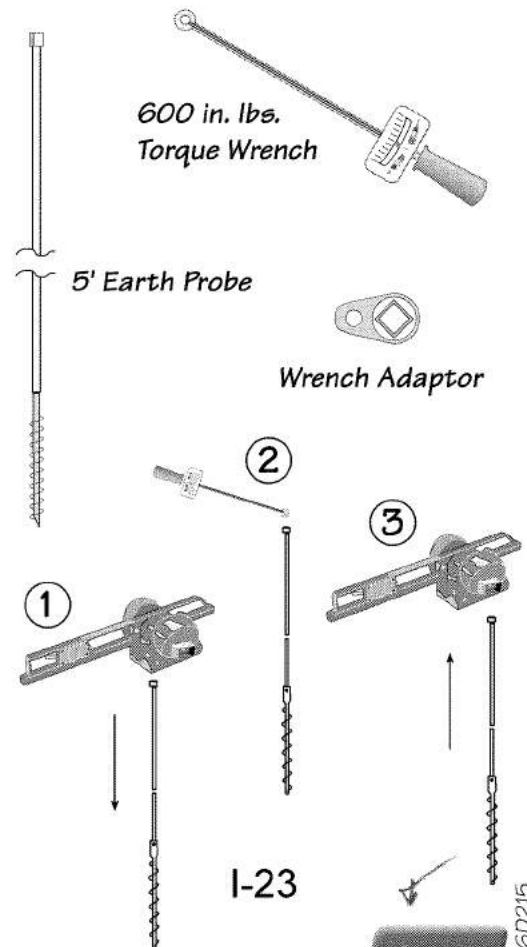
Using the chart provided, a probe reading can be converted to the recommended anchor for every soil condition.

## Instructions

- Place probe tip into ground where you intend to place the anchor. Using a 15/16" hex socket with a ratchet or breaker bar, rotate the probe in a clockwise direction. (An electric drive machine with an adaptor head may also be used)
- Drive (rotate) the torque probe into the soil until reaching a depth equal to the length of the anchor being installed.
- To determine the soil classification:
  - Place wrench adaptor onto torque wrench.
  - Insert hex portion of wrench adaptor onto the earth probe.
  - Support probe shaft with one hand, while rotating probe steadily with the wrench. (Do not exceed 600 in. lbs.)
  - Read the torque wrench while rotating probe clockwise.
  - Use the soil classification chart to cross reference probe readings. Color codes match those printed on Tie Down's torque probe.
- If probe reading does not match the anchor for that depth, rotate probe to next anchor depth and check reading. Continue until reading on probe matches anchor length for depth of reading.
- To remove probe, use wrench or electric drive machine in reverse (counter clockwise).

Soil Class	Test Value (in. lbs.)	Soil Description
<b>1</b>	N/A	Sound hard rock.
<b>2</b>	550 +	Very dense and/or cemented sands, coarse gravel, cobbles, preloaded silts, clays and coral.
<b>3</b>	350 to 550	Medium dense coarse sands sandy gravels very stiff silts and clays.
<b>4a</b>	275 to 350	Loose to medium dense sands, firm to stiff clays and silts, alluvial fill.
<b>4b</b>	175* to 275	Loose sands, firm clays and silts, alluvial fill.

\* Below 175 in. lbs., a professional engineer should be consulted



**NOTE:** Each State, County or Municipality may require a specific anchor from the groups shown for each soil classification. Check local and State regulations first.

**TIE DOWN ENGINEERING • 5901 Wheaton Drive • Atlanta GA, 30336**  
**www.tiedown.com • (404) 344-0000 • FAX (404) 349-0401**



050806D215

# Anchor Chart

Soil Class & Test Values (in. lbs.)	Recommended Anchor / Stabilizers	TDE Part Number
<b>1</b> N/A	Cross Drive Rock Anchor	59110 & 59111
<b>2</b> Blue 550 lbs +	30" X 5/8" rod / 2 - 4" helix 30" X 3/4" rod / 2 - 4" helix 60" X 3/4" rod / 2 - 4" helix All anchors above should use one of the following when subjected to lateral loads: 12" Stabilizer Plate Quik-Set Stabilization Plate ----- X-Plate Anchor with 2-23/32" Rods	59090 59095 & 59079 59097 59292 59291 ----- 59118
<b>3</b> Yellow 350 to 550 lbs.	48" X 5/8" rod / 1 - 6" helix 48" X 3/4" rod / 1 - 6" helix 36" X 3/4" rod / 1 - 6" helix & 1 - 4" helix All anchors above should use one of the following when subjected to lateral loads: 12" Stabilizer Plate Quik-Set Stabilization Plate ----- Deepset Anchor 30" X 5/8" rod / 2 - 4" helix	59080 & 59081 59085 & 59094 59250 59292 59291 ----- 59091
<b>4a</b> Green 275 to 350 lbs.	48" X 5/8" rod / 1 - 6" helix 48" X 3/4" rod / 1 - 6" helix 36" X 3/4" rod / 1 - 6" helix & 1 - 4" helix 3/4" rod, 42" long, 2- 4" helix, Class 4A 3/4" rod, 48" long, 2-4" helix, Class 4A All anchors above should use one of the following when subjected to lateral loads: 12" Stabilizer Plate 17 -1/2" Stabilizer Plate (Florida Only) Quik-Set Stabilization Plate ABS Stabilization Plate (Florida Only) ----- Deepset Anchor 36" X 3/4" rod / 4" & 6" helix	59080 & 59081 59085 & 59094 59250 59128 59086 59292 59286 59291 59293 ----- 59092
<b>4b</b> Red 175 to 275 lbs.	60" X 3/4" rod / 1 - 7" helix All anchors above should use one of the following when subjected to lateral loads: 17 -1/2" Stabilizer Plate ABS Stabilization Plate	59099 59286 59293

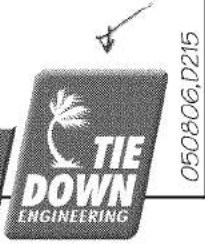
APPROVED BY  

 REVISED 3/21/2017  
 FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS

**NOTE:** Each State, County or Municipality may require a specific anchor from the groups shown for each soil classification. Check local and State regulations first.

I-24

**TIE DOWN ENGINEERING • 5901 Wheaton Drive • Atlanta GA, 30336**  
**www.tiedown.com • (404) 344-0000 • FAX (404) 349-0401**



050806.D215

M.H.E. HOMES  
WIND ZONE 1 (15 PSF LATERAL)  
RECOMMENDED TIEDOWN SYSTEM  
LONGITUDINAL TIEDOWN REQUIREMENTS

TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACINGS



APPROVED BY  
**NIA INC.**  
REVISOR  
3/21/2017  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS

ATTACHMENT DETAIL

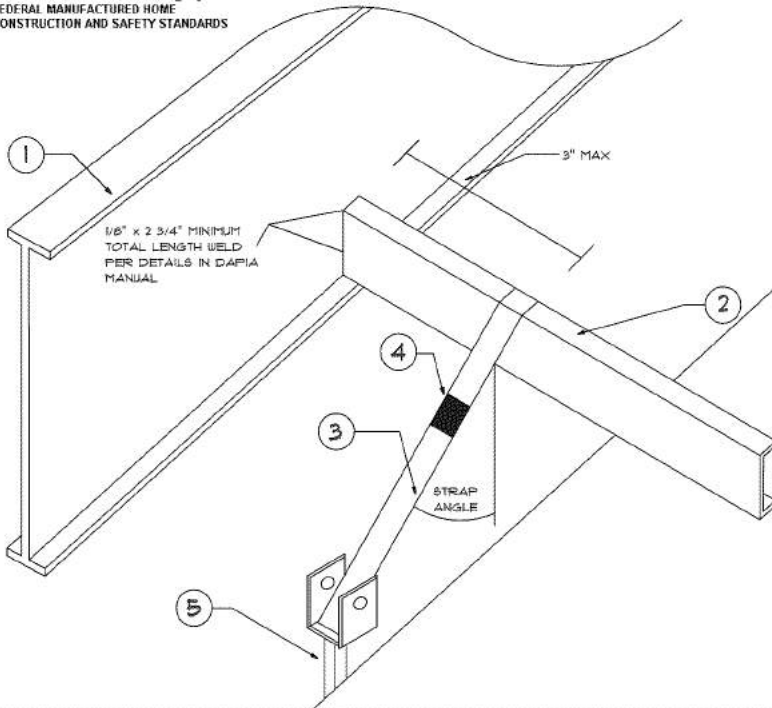
1. TYPICAL LONGITUDINAL I-BEAM
2. TYPICAL FRAME CROSSMEMBER (1 1/2" X 2" X 1 1/2" X 13" GA MINIMUM)
3. TIEDOWN STRAP
4. BANDING SEAL
5. GROUND ANCHOR - INSTALLED TO FULL DEPTH OF ANCHOR HEAD

3/1/2017



NOTES

1. SEE OTHER DRAWINGS FOR FRAME TIEDOWN REQUIREMENTS. THIS DETAIL IS FOR LONGITUDINAL TIEDOWN DESIGN ONLY.
2. 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.
3. LONGITUDINAL TIEDOWNS AND ANCHORS ARE NOT SUPPLIED BY M.H.E. HOMES.
4. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION LOAD OF 4125# 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.
6. DESIGN BASED ON MAXIMUM SIDEWALL HEIGHT OF 8'-0".
7. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS IN ACCORDANCE WITH THE TABLE AND NOTES 3, 4, 5, 13 AND 14.
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 THE 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
10. GROUND ANCHORS SHALL BE INSTALLED TO THEIR FULL DEPTH AND STABILIZER PLATES SHOULD BE INSTALLED TO PROVIDE ADDED RESISTANCE TO OVERTURNING OR SLIDING FORCES.
11. 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 D3553-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
12. STRAPPING TO BE TYPE L FINISH B, GRADE I STEEL STRAPPING, 1/4" WIDE AND .035 INCHES IN THICKNESS. CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3553-91, STANDARD SPECIFICATION FOR STRAPPING FLAT STEEL AND SEALS.
13. SELECT A CROSSMEMBER WHERE PIERS DO NOT INTERFERE WITH THE REQUIRED ANGLE OF THE STRAP. INSTALL THE STRAP JUST INSIDE THE MAIN BEAM'S LOOPED AROUND THE CROSSMEMBER AND TIE TO AN ANCHOR LOCATED DIRECTLY UNDER THE MAIN BEAM AT THE ANGLE SPECIFIED IN THE CHART BELOW (SEE DETAIL).
14. WHEN THIS ANCHOR ANGLE IS NOT ATTAINABLE INSTALL ANCHOR PER MANUFACTURER'S INSTRUCTIONS WITH AN APPROVED STABILIZING PLATE.
15. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAM AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.
16. DESIGN BASED ON 6/12 ROOF SLOPE FOR DOUBLE WIDES & 3/12 ROOF SLOPE FOR SINGLE WIDES.



FLOOR WIDTH (MAX)	ROOF SLOPE PER NOTE #16 (ALTERNATE WITH BLOCK PIERS)		NUMBER OF LONGITUDINAL TIES (TOTAL EACH END)	ROOF SLOPE PER NOTE #16 NO RESTRICTION AS TO PIER TYPE OR HEIGHT (EXCEPT AS LIMITED BY OTHER DETAILS)		
	MINIMUM UNIT LENGTH SINGLE STACK	MINIMUM UNIT LENGTH DOUBLE STACK		FLOOR WIDTH (MAX)	MINIMUM QUANTITY EACH END OF EACH SECTION	MINIMUM STRAP ANGLE (DEGREES)
26'-8" DOUBLE WIDE	55'-0"	42'-0"	0	160" DOUBLE WIDE*	2	35
	32'-0"	32'-0"	2	160" SINGLE WIDE*	2	25
30'-8" DOUBLE WIDE	71'-0"	66'-0"	0	184" SINGLE WIDE*	2	28
	41'-0"	38'-0"	2	184" DOUBLE WIDE*	2	43
15'-4" SINGLE WIDE	69'-0"	41'-0"	0			
13'-4" SINGLE WIDE	45'-0"	35'-0"	0			

\* 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

## CHAPTER 5 – SECTIONAL SET UP

### 5.1 BLOCKING PROCEDURE

- A. Start out by positioning the B half, or wet half, in its desired position. This will be the stationary unit, and the first half to be blocked. Follow the procedures under Blocking Instruction to block and level the B half. See Figure 5 for a typical blocking layout. Table 3 shows the pier capacity for the centerline blocking.
- B. With the B half set, blocked, and leveled, if a weather gasket isn't installed in the factory, install a 4" to 6" strip of insulation on the mating end walls, floor, and ridge beam. This will act as a weather gasket.

### 5.2 POSITIONING THE SECOND HALF (A HALF)

- A. Check the mating surface of both halves for obstructions and remove any that are found.
- B. Position the A half as near as possible to the B half, being sure the floor ends line up.
- C. Move the A half tight to the B half.

### 5.3 FASTENING THE HALVES TOGETHER

- A. With the floors together and the front and rear ends lined up, repeat the blocking and leveling procedure on the A half. Make sure that the interior walls and doorways along the marriage wall also line up. For your convenience, alignment stickers are placed at doorways and support posts. Both halves should be flush and level with each other.
- B. When the floors are flush and level, the halves shall be secured to each other by using the following procedure.
- C. With the floors together and the front and rear ends lined up, lag or bolt floors together at the hitch end, using a 3/8" x 6" lag screw or equal.
- D. Once the floors are secured at the hitch end, the far ends of the ridge beam must be secured to one another. In the event they don't align, follow the steps below.
- E. Locate jacks properly and raise opposite corners evenly until roof line matches and both sections meet. NOTE: It is sometimes necessary to jack the halves slightly beyond even to allow for settling and to assure an even fit when jack pressure is released.
- F. Fasten the roof ends together using 2 – #8 x 4" screws or equal at each end. Toe-screw these screws at a 45 degree angle maximum. See the fastening detail. After the roof ends are fastened together, release the jack pressure slowly and evenly until the interior ceiling line is flush. This may occur at different times at

different points along the ceiling seam. Once the ceiling is flush, install the screws in the remainder of the roof per the fastening detail.

- G. Finish securing the floors together per the fastening detail.
- H. Secure the end walls together by toe-nailing #8 x 3" screws per the fastening detail
- I. Gaps between the ridge, wall or floor (1 ½" maximum) shall be closed up with lumber and/or plywood shims. All fasteners in the shimmed portion shall be increased in length to ensure they fully penetrate the structural members.

#### 5.4 INTERIOR CLOSE UP

All the material required to trim out the interior of the home is shipped with each home. The trim can be identified by matching it with the trim installed by the manufacturer. All gaps in exterior walls shall be filled with caulk or insulation before applying trim. Some wall panels may have been shipped loose to achieve a more desirable appearance when installed on site.

#### 5.5 EXTERIOR CLOSE UP

Remove the shipping plastic from all walls completely and also the hitch end soffit overhang. The siding and all accessories have been shipped loose. Install siding according to the instructions shipped with the home. Figure 8 shows a typical installation.

NOTE: See Chapter 8 for alternate sectional foundations.

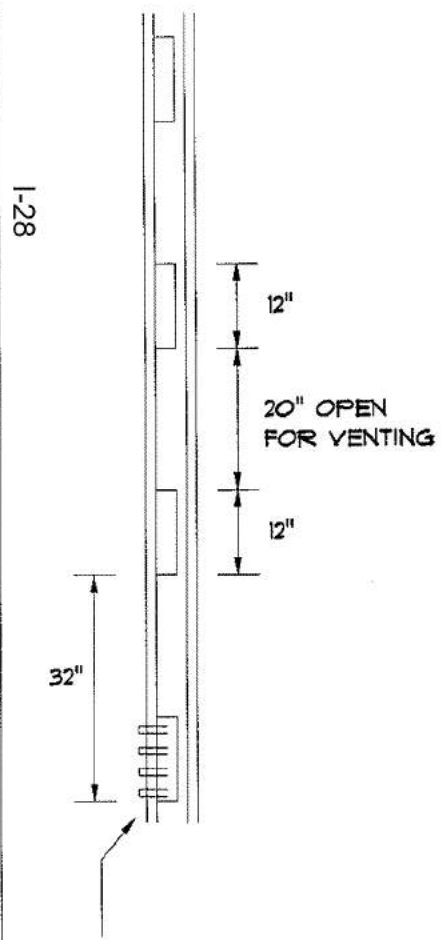


## UTILITY CONNECTION WARNING!

**WARNING: IMPROPER CONNECTION, TESTING OR UNAUTHORIZED MODIFICATION OF GAS OR ELECTRICAL SYSTEMS MAY RESULT IN SERIOUS INJURY OR DEATH. ONLY QUALIFIED PERSONS SHOULD PERFORM WORK ON THESE SYSTEMS.**

**CAUTION: THE WATER HEATER MUST BE FILLED FULL OF WATER BEFORE POWER TO THE WATER HEATER IS TURNED ON. DAMAGE MAY OTHERWISE OCCUR THAT IS NOT COVERED BY WARRANTY. IT CAN TAKE UP TO 3 WEEKS FOR A DRY FIRED ELEMENT TO QUIT WORKING. ELEMENTS ARE NOT COVERED UNDER WARRANTY.**

TOP VIEW



ROOF SHEATHING TO 1 X 3 RAILS  
W/ 7/16" X 1 1/2" X 16 GA. STAPLES  
AT 6" O.C.- FOR 5/12 PITCH USE 4"  
O.C. SPACING

#8 X 4" SCREW OPPOSITE SIDE OF BLOCK  
(2) SCREWS EACH BLOCK  
FOR 5/12 28W USE (5) EACH BLOCK  
FOR 5/12 32W USE (4) EACH BLOCK

45° ANGLE ON SCREW

2 X 3 X 12" BLOCK  
INSTALLED 32" O.C.

1 X 3 RAIL TO EACH TRUSS WITH  
(2) 7/16" X 1 3/4" X 16 GA. STAPLES

WALL TO WALL - #8 X 4" SCREW 12" O.C.

RIM JOIST TO RIM JOIST - 3/8" X 3" LAG 24" O.C.

APPROVED BY  
**NIA** INC. 3/21/2017  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS

1 X 3 RAIL FASTENED ONE SIDE TO EACH BLOCK  
IN FACTORY W/ (4) 7/16" X 1 3/4" X 16 GA.  
FOR 5/12 ROOF PITCH USE (8) STAPLES.

CALC. PER CA-X-6.0, CA-X-1.7.3

MANUFACTURED HOUSING ENTERPRISES, INC.  
09302 STATE ROUTE 6 - BRYAN, OH 43506

UNIT-INTERCONNECTION

PAGE: 1-19

SERIES:

DATE: 5-5-10

REV: 1-31-17

BY: JB



## CHAPTER 6 – UTILITY CONNECTIONS

### 6.1 DRAINAGE SYSTEM

Properly joined, ABS pipe and fitting produce pressure tight joints, either in shop or in the field. However, skill and knowledge are required in order to obtain good quality joints. The following is an installation procedure that when followed closely will help insure a pressure tight joint when using ABS DWV fittings. Your home may have ABS or PVC drain lines installed. The onsite drainage system must be per DAPIA approved drawings.

Drain piping shall be supported just as any other piping system. Ordinary hanger straps may be used for suspending below floor systems. The light weight of ABS pipe may lead one to believe that wider spacing could be permitted. Four foot spacing is required with proper support at the base of each stack. Since the drain pipe is non-metallic, it is not as “stiff” as its metal counterpart, therefore, the installer must exercise care to assure proper alignment of required grades. Hanger straps shall not be so tight as to compress, distort, cut, or abrade the piping.

Installation instructions are as follows:

- A. Cut pipe square. Use saw and miter box or plastic tube cutter. Remove all burrs from both the inside and outside of the pipe with a knife, file, or reamer. Remove dirt, grease, and moisture. A thorough wipe with a clean rag is usually sufficient. Check dry fit. For proper fit, pipe should go easily into fitting  $\frac{1}{4}$  to  $\frac{3}{4}$  of the way in.
- B. Using a suitable applicator, apply a moderate even coat of cement to the fitting socket. (Care should be taken not to allow solvent cement to puddle in fitting socket.) Apply a liberal coat of cement to the pipe equal to the depth of the fitting socket. Cement must be applied in sufficient quantities to fill the joint.
- C. Without delay, assemble while cement is still wet. Use sufficient force to ensure that pipe bottoms in socket. If possible, twist the pipe or fitting  $\frac{1}{8}$  to  $\frac{1}{4}$  turn as assembled. Hold together about 30 seconds to make sure the joint does not separate. With a rag, wipe off excess cement. Avoid disturbing the joint.
- D. Make sure all connections maintain a  $\frac{1}{4}$ ” per 1’0” slope. Make sure all fittings are properly connected. The drain system is designed for only one outlet. After assembling the drain system, test for leaks as follows.
- E. The manufactured home shall be in a level position, all fixtures shall be connected, and the entire system shall be filled with water to the rim of the toilet bowl. Tub and shower drains shall be plugged. After all trapped air has been released, the test shall be sustained for not less than 15 minutes without evidence of leaks. Then the system shall be unplugged and emptied. The waste piping above the level of the toilet bowl shall then be tested and show no indication of leakage when the high fixtures are filled with water and emptied simultaneously to obtain the maximum possible flow in to the drain piping. P-traps must be inspected to be sure they are properly covered with insulation with no leaks. Tub and shower p-traps are accessible by opening the access panel.



## 6.2 WATER SUPPLY

The water system is designed for an inlet pressure of 80 psi. When installed in areas that exceed 80 psi, a pressure reducing valve must be used. The inlet connection is a ¾" MPT. A master shut off valve not supplied with the home shall be installed. The valve must be a full flow gate or ball valve. Sectional homes with plumbing in both halves have waterline crossovers that must be connected. Locate the crossovers and connect by attaching the male to the female fitting. After connecting, re-insulate and repair the bottom board. After making all connections, turn on all faucets and allow the water to run to remove any foreign particles that might cause an unpleasant taste. The exposed water lines should be protected from freezing in cold climates. Use a heat tape that is listed for use with manufactured homes and installed to the instructions from the manufacturer. To test the water system, make sure the water heater is full of water. Pressurize the system with 100 psi, then isolate the home from the pressure. The home must hold 100psi for 15 minutes without loss of pressure. If pressure drops, find source of leak, repair and repeat test. Anti-Scald devices have been installed at all tubs, showers and tub/showers in the home. Adjust the devices per the manufacturer's instructions to ensure a maximum temperature of 120 degrees F.

## 6.3 ELECTRICAL SUPPLY

This home is designed to be connected to a service nominally rated 120/240 volts, 3-wire AC, with a grounded neutral. All electrical work shall be performed by qualified personnel only. This home has an under-chassis feeder. A raceway is provided from the distribution panel to the underside of the home. A junction box must be installed on the exposed end of the raceway. The minimum junction box size and conduction sizes are shown in Table 7. The home must be grounded according to the National Electric Code. Test the home according to the following instructions. Complete the ground continuity tests before connecting the home to electrical power.

### A. GROUNDING CONTINUITY

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

1. Appliance enclosures
2. Fixture enclosures
3. Metal siding and roofs
4. Gas lines
5. Metal ducts
6. Home's frame

### B. POLARITY OF FIXTURES

With the receptacles and light fixtures energized, check the polarity and grounding of each 120-volt receptacle and light socket. Use a polarity tester capable of determining a correct wiring configuration. A conversion device may be used to check different bulb sizes and outlet configurations. Investigate any reversed polarity, open grounds, or shorts and correct them.

## C. OPERATIONAL TEST

Check all light fixtures by placing a light bulb in each socket and turn the switch on and off. Make sure all 120 volt receptacles work. Using a pigtail light, check all 240 volt receptacles to determine if both legs of the circuit are powered. Investigate any failure of the wiring and correct.

Sectional homes have a bonding wire at the rear that must be connected to each half of the home before starting the above tests. There will be electrical crossovers. Locate the crossovers and connect accordingly to Figure 9. The connectors are marked for proper connection. Re-insulate and repair the bottom board.

## 6.4 GAS SUPPLY

For all gas burning appliances, the vents must be inspected to ensure the penetration through the roof is sealed and the connections are proper. The gas piping supply system has been designed for a maximum pressure of 14 inches water column (1/2 psi). For safe and effective operation, the gas supply pressure shall be between 14 and 7 inches water column. Sectionals may have a gas line crossover. It is equipped with a flexible metal connector and a quick disconnect device. Remove the plastic covers from the quick disconnect device and snap the two halves together to complete the connection. Test the system as follows:

- A. Using an ounce gauge, check the system for leaks. Close all appliance controls and all appliance pilot light valves (see appliance instructions shipped with the home).
- B. Open the gas shut off valve on the supply line to each appliance.
- C. Attach the ounce gauge on the main gas inlet to the home.
- D. Carefully pressurize the system to between 5 and 8 ounces of pressure. Pressure in excess of 8 ounces may damage the appliance.
- E. Apply an ammonia free soapy water solution to the joints at both ends of the appliance connector. If bubbles are found, tighten connector until bubbles disappear. Rinse the soapy water off all joints.

## 6.5 BOTTOM BOARD REPAIR

The bottom board must be inspected and repaired after the home is installed. Use CP-1 pressure sensitive type or equivalent. Make sure the insulation is in place before repairing.



### Electrical Supply Requirements

Main Breaker (Service) Size (Amps)	Conductor Size (AWG)*		Grounding Conductor Size (AWG)		Factory Installed Feeder Raceway Trade Size (In.)*	Minimum Junction Box Size
	CU	AL	CU	AL		
100	#4	#2	#8	#6	1 1/2"	12" x 12" x 4"
200	#2/0	#4/0	#6	#4	2"	14" x 14" x 4"

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

TABLE 7

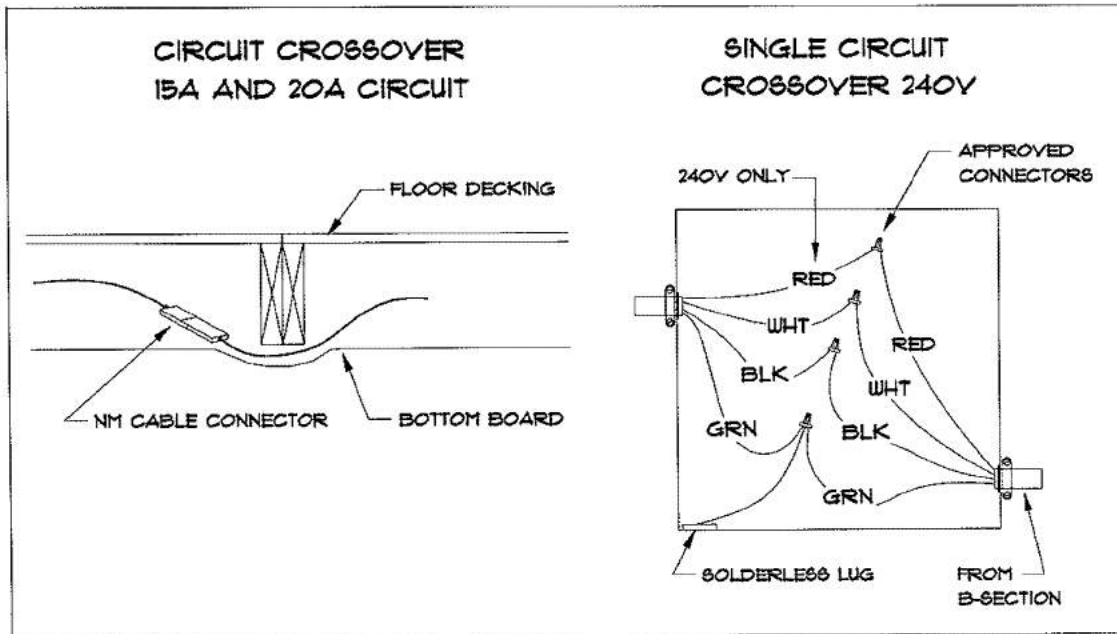


FIGURE 9

23  
23

## CHAPTER 7 – MISCELLANEOUS CONNECTIONS

### 7.1 DRYER VENTING

Your home is supplied with a sidewall dryer vent or a roughed in floor vent. Homes supplied with a sidewall dryer vent require that the dryer is connected to the sidewall vent according to the dryer manufacturer's installation instructions. If your home is equipped with a roughed in floor vent the following must be performed to install a dryer:

- A. Remove the floor vent cover.
- B. Push the metal flexible duct (not provided) through the floor.
- C. Connect the duct to the dryer according to the dryer installation instructions.
- D. The dryer vent must not terminate under the home. The duct must be connected to a termination fitting attached to the skirting or crawl space wall. Do not let snow block this vent. See the dryer vent detail.

### 7.2 FURNACE IN FLOOR CROSSOVER DUCT

This hookup procedure is basically the same for all sectional homes. The method of installation is as follows:

- A. Included in the ship loose material are gaskets for the (2) 5" x 12" crossover ducts. Before the home can be set in its final location, remove the shipping plastic and install the gaskets at the (2) crossover ducts. Gaskets may be installed at the factory.
- B. Following this manual, set the two units together. The gasket will seal the crossover connections. Turn the furnace fan on and check the registers for proper air flow.

### 7.3 FIREPLACES

Fireplaces require on-site installation of supplied fireplace chimney pipe and round top termination. These must be installed per the fireplace installation instructions. The fireplace chimney is not installed through the hinged portion of the roof. The fireplace air inlet is installed below the fireplace by the manufacturer. Make sure this vent isn't blocked and that the space under the home is vented properly.

### 7.4 AIR CONDITIONING

The BTU rating of the air conditioner can not exceed the BTU rating of the duct system. The BTU rating of the duct system is located on the compliance certificate, which is located under the kitchen sink. MHE does not supply air conditioning units.

### 7.5 SKIRTING ATTACHMENT

Skirting must be installed in a manner that allows the vinyl skirting to expand and contract.

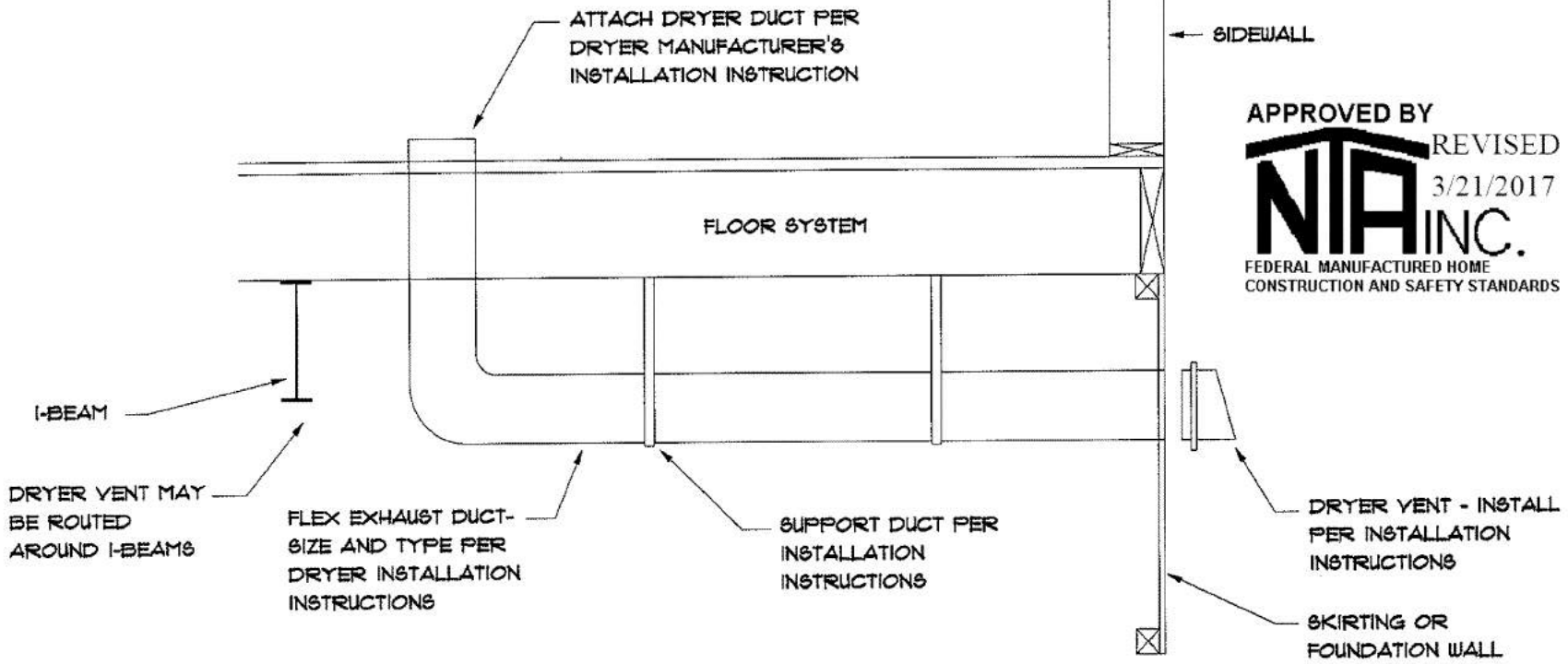
## 7.6 GUTTER AND DOWNSPOUTS

A gutter and downspout system may be installed on all MHE homes.

## 7.7 WATER HEATER DRAIN PAN

Under the water heater is a drain pan. The drain for the pan is ¾" PVC routed through the floor. Located in the ship loose items will be the material required to run the drain to the exterior of the home. Install the coupler with the rodent/insect screen at the exterior.





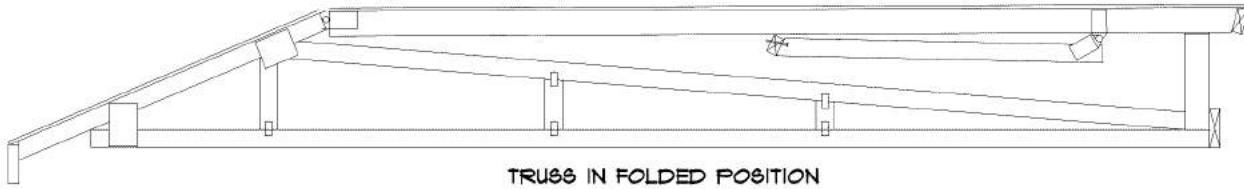
APPROVED BY  
**NIA** INC. REVISED  
 3/21/2017  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

**WARNING**

DO NOT TERMINATE DRYER EXHAUST VENT BENEATH THE HOME. VENT MUST BE TERMINATED TO THE OUTSIDE OF THE HOME. SEVERE MOISTURE DAMAGE MAY RESULT TO YOUR HOME AND YOUR WARRANTY MAY BE VOIDED IT THESE INSTRUCTIONS ARE NOT FOLLOWED.

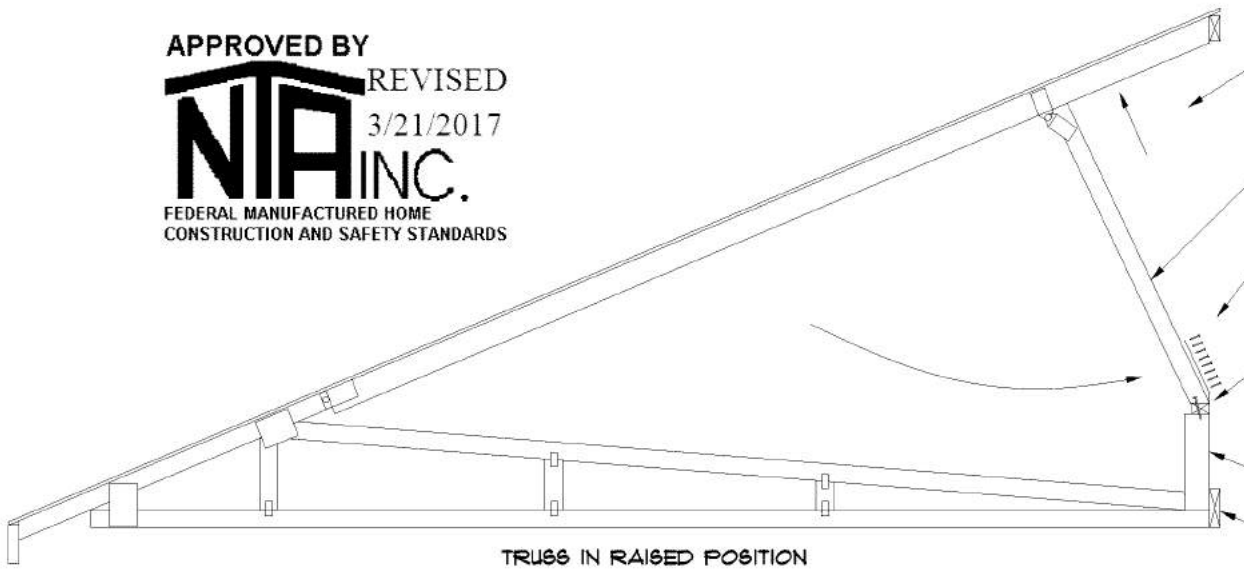
**MANUFACTURED HOUSING ENTERPRISES**  
 DRYER EXHAUST VENT INSTALLATION

DATE: 3-24-96 REV. 9-26-08 BY: JB



APPROVED BY  
**NIA** INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

REVISED  
 3/21/2017



- LIFT ROOF UP AND SWING OUT THE HINGED KING POST
- HINGED QUEEN POST
- SECURE UPLIFT STRAP TO HINGED KING POST WITH (8) 7/16" X 1 1/4" X 16 GA. STAPLES OR (9) ROOFING NAILS
- AFTER THE HINGED QUEEN POST IS SWUNG OUT, SECURE IT TO THE FIXED KING POST WITH (1) #8 X 3" SCREWS EACH SIDE OF EACH TRUSS.
- FIXED KING POST
- RIDGE BEAM

**\*\*\* NOTICE \*\*\***

THE SETTING OF A HINGED ROOF SHOULD BE PERFORMED BY A QUALIFIED AND EXPERIENCED SET UP CREW. INJURY OR DEATH MAY OCCUR IF THE ROOF IS NOT PROPERLY SUPPORTED DURING THE SETTING OF A HINGED ROOF SYSTEM.

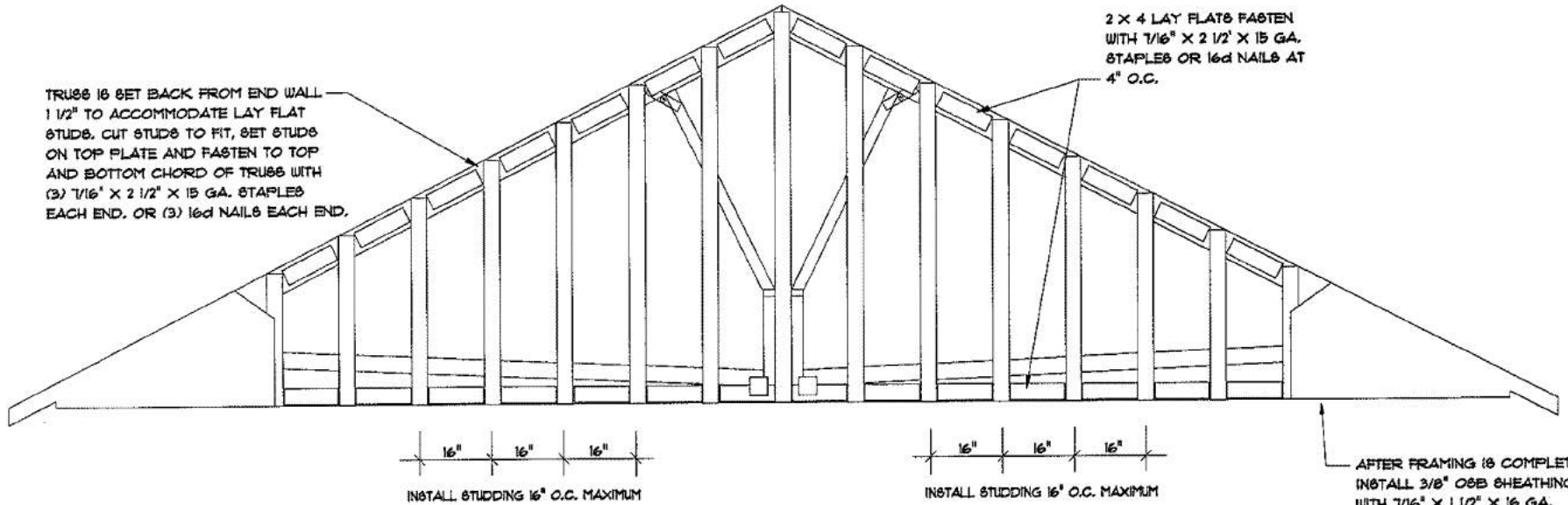
THE METHOD OR EQUIPMENT USED TO LIFT THE ROOF IS NOT THE RESPONSIBILITY OF MANUFACTURED HOUSING ENTERPRISES, INC.

MANUFACTURED HOUSING ENTERPRISES, INC. IS NOT LIABLE FOR ANY ACCIDENT OR DAMAGE DURING THE SET UP OF ANY HOME.

**MANUFACTURED HOUSING ENTERPRISES**  
 HINGED TRUSS DETAIL TYPICAL

DATE 2-19-98 REV. 1-30-17 BY: JB

APPROVED BY  
**NIA** INC.  
 REVISED  
 3/21/2017  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS



I-37

CALC. PER X-4.14

NOTES:

OSB SHEATHING IS SHIPPED LOOSE FOR THE GABLE ENDS.  
 2 X 4'S ARE SHIPPED LOOSE TO FRAME THE GABLE ENDS.

MANUFACTURED HOUSING ENTERPRISES, INC. 09302 STATE ROUTE 6 - BRYAN, OH 43506			
HINGED TRUSS GABLE CLOSE UP TYPICAL			
PAGE:	FRAME SIZE:		
SERIES:			
DATE:	10-12-04	REV:	9-29-08 BY: JB



NOTE: SECURE METER ENCLOSURE TO 2X FRAMING MEMBER, OR 2X BACKERS FASTENED TO STUDS

APPROVED BY  
**NIA** INC. REVISED  
 3/21/2017  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

CONDUCTOR SIZE TABLE

Main Breaker (Service) Size (Ampe)	Conductor Size (AUG.)		Grounding Conductor Size (AUG.)		Factory Installed Feeder Raceway Trade Size (in.)	Minimum Junction Box Size
	CU	AL	CU	AL		
100	#4	#2	#6	#6	1 1/2"	12" X 12" X 4"
200	#2/0	#4/0	#6	#4	2"	16" X 16" X 4"

\*Conductor size and feeder raceway sized for T5 C. rated conductors, types RH, RHH, RHW, without outer covering, THW or XHHW, two line and one neutral.

APPROVED METER BASE  
 100 AMP OR 200 AMP

FOR CONDUCTOR SIZE,  
 SEE TABLE ABOVE

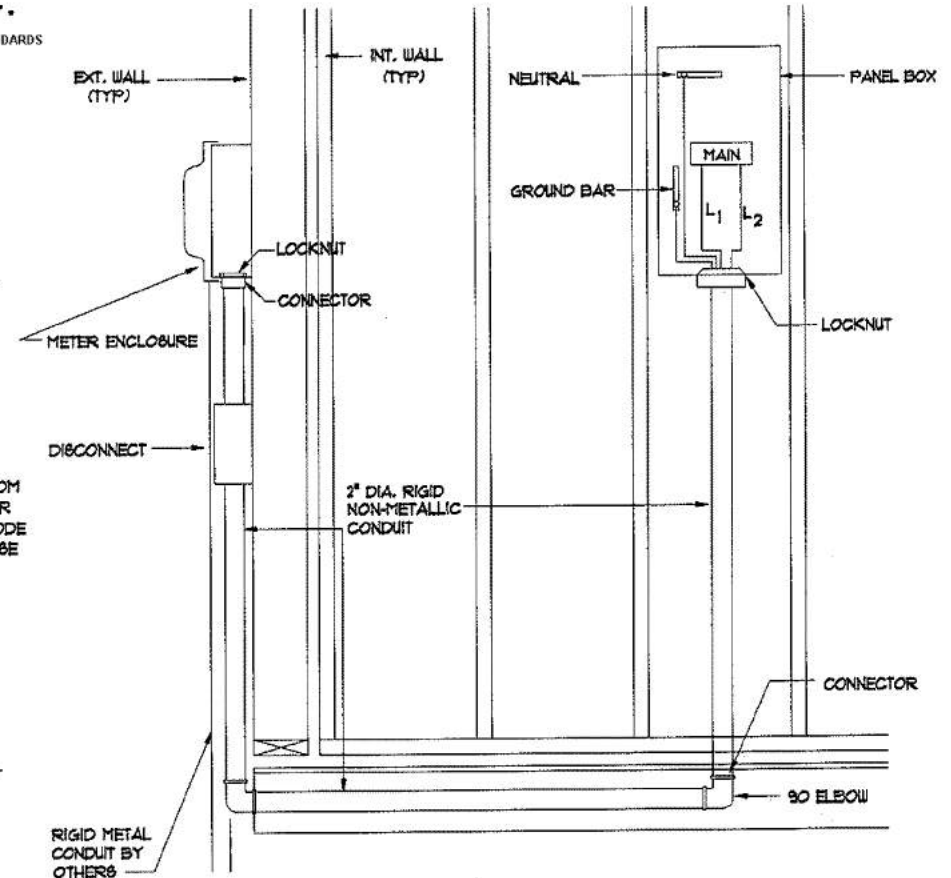
APPROVED GROUNDING CLAMP  
 BY OTHERS

GROUNDING ELECTRODE  
 BY OTHERS SHALL BE 1/2"  
 MINIMUM DIAMETER COPPER  
 CLAD STEEL DRIVEN TO A  
 DEPTH OF NOT LESS THAN  
 8'-0"

30" MINIMUM FROM  
 BOTTOM OF FLOOR  
 UNLESS LOCAL CODE  
 STATES OTHERWISE

WARNING LABEL TO BE INSTALLED  
 PER 3280.803 (K)(3)(VI) TO READ:

DO NOT PROVIDE ELECTRICAL POWER UNTIL THE  
 GROUNDING ELECTRODE IS INSTALLED AND  
 CONNECTED (SEE INSTALLATION INSTRUCTIONS)



MANUFACTURED HOUSING ENTERPRISES, INC. 08302 STATE ROUTE 6 - BRYAN, OH 43306		
METER BASE INSTALLATION		
DATE: 10-21-92	REV: 5-12-00	BY: JB

1-38

2-9

# CHAPTER 8 – BASEMENT AND CRAWLSPACE ADDENDUM

### GENERAL NOTES:

1. THIS FOUNDATION HAS BEEN DESIGNED FOR SITES WITH AN ALLOWABLE SOIL BEARING CAPACITY OF 2000 PSF MINIMUM.
2. FOUNDATIONS TO BE CONSTRUCTED ON SOIL WITH A LOWER BEARING CAPACITY SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE BY A LICENSED ENGINEER TO LOCAL CONDITIONS AND CODES.
3. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS TO BE 3000 PSI MINIMUM.
4. REINFORCING STEEL SPECIFIED TO BE GRADE 60 BARS MEETING ASTM A615, A616 AND A617.
5. FOUNDATION WALL MAY BE POURED CONCRETE 8" THICK, REINFORCED WITH #4 REBAR AT 12" OC VERTICAL AND #5 REBAR AT 18" OC HORIZONTAL.
6. UNIT COLUMN SUPPORTS (SEE MODEL PLAN) MUST BE SUPPORTED BY A PIER AND FOOTING AS REQUIRED IN THE INSTALLATION INSTRUCTIONS MANUAL.
7. CROSSBEAMS ARE CONTINUOUS FULL WIDTH OF UNIT AND FIELD WELDED TO EACH MAIN BEAM AND SECURED AT PILASTER PER DETAILS. SEE CHART FOR REQUIRED SIZES.
8. MAIN BEAMS ARE SECURED AT EACH END IN PILASTER PER DETAILS. WHEN CENTER LINE BEAM IS INSTALLED PILASTER MUST ALSO BE INSTALLED FOR END SUPPORT. SEE CHART FOR REQUIREMENTS.
9. THESE SPECIFICATIONS ARE TYPICAL. LOCAL CODES MAY CONTAIN ADDITIONAL REQUIREMENTS.
10. FOUNDATION WALL STEMS MAY BE CONCRETE OR CONCRETE BLOCK.
11. CONCRETE BLOCK SHALL CONFORM TO ASTM C-90.
12. IN CONCRETE BLOCK STEM WALLS A MINIMUM OF (2) #4 REBARS ARE TO BE INSTALLED IN BLOCK WITH MUD SILL ANCHORS, FULLY GROUT EACH CELL CONTAINING REBAR.
13. ALL LUMBER IN CONTACT WITH CONCRETE SHALL BE OF PRESSURE TREATED TYPE OR OF SPECIES APPROVED FOR USE IN DIRECT CONTACT WITH CONCRETE.
14. THE INSTALLATION SITE MUST BE GRADED SO THAT WATER DRAINAGE IS AWAY FROM STRUCTURE AND DOES NOT ACCUMULATE UNDER THE HOME.
15. BACK FILL ADJACENT TO THE WALL SHALL NOT BE PLACED UNTIL THE WALL HAS SUFFICIENT STRENGTH OR HAS BEEN BRACED TO PREVENT DAMAGE.
16. MINIMUM FOUNDATION VENTILATION REQUIREMENTS:  
A. 18" x 24" ACCESS CRAWL SPACE TO UNDER FLOOR AREA.  
B. 1 1/2 SQUARE FEET OF VENTILATION PER 25 LINEAL FEET OF FOUNDATION WALL.  
C. COVER VENT OPENINGS WITH CORROSION-RESISTANT WIRE MESH NOT LESS THAN 1/8" NOR MORE THAN 1/2" IN ANY DIRECTION.
17. I-BEAM SPLICE TO OCCUR OVER SUPPORTS. USE 1/4" x 4" x 4" SPLICE PLATE WELDED OR (2) 1/2" DIAMETER BOLTS EACH SIDE OF SPLICE.
18. WHEN CENTERLINE BEAM IS INSTALLED IT MUST BE CONTINUOUS FOR THE FULL LENGTH OF THE UNIT AND FIELD WELDED TO EACH CROSSBEAM AND SECURED AT EACH END AT POCKET OR PILASTER PER DETAILS. (REQUIRED FOR 30 & 40 PSF ROOF LIVE LOADS ONLY. CROSSBEAMS WITH CENTERLINE BEAM INSTALLED MAY BE PER TABLE ON PAGE 5 OF 6). FOR 20 PSF ROOF LOADS CENTERLINE BEAM IS NOT REQUIRED AND CROSSBEAM SIZE MUST BE PER TABLE ON PAGE 6 OF 6.

### GENERAL NOTES:

19. DAMP PROOFING OF CONCRETE OR MASONRY WALLS TO BE IN ACCORDANCE WITH LOCAL CODES. IN THE ABSENCE OF CODE REQUIREMENTS THE FOLLOWING SHALL APPLY:  
A. EXTERIOR FOUNDATION WALLS OF MASONRY CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING NOT LESS THAN 3/8" OF PORTLAND CEMENT PARING TO THE WALL FROM THE FOOTING TO THE FINISH GRADE. THE PARING SHALL BE COVERED WITH A COAT OF APPROVED BITUMINOUS MATERIAL APPLIED AT THE RECOMMENDED RATE.  
B. EXTERIOR FOUNDATION WALLS OF CONCRETE CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING A COAT OF APPROVED BITUMINOUS MATERIAL TO THE WALL FROM THE FOOTING TO THE FINISH GRADE AT THE RECOMMENDED RATE.  
C. FOUNDATION WALLS OF CONCRETE CONSTRUCTION ENCLOSING HABITABLE OR USABLE SPACES LOCATED BELOW GRADE SHALL BE WATER PROOFED WITH MEMBRANES EXTENDING FROM THE EDGE OF THE FOOTING TO THE FINISH GRADE LINE. THE MEMBRANE SHALL CONSIST OF EITHER 2-PLY HOT MOPPED FELT, 6-MIL POLYVINYL CHLORIDE, 55-POUND ROLL ROOFING OR EQUIVALENT MATERIAL. THE LAP IN THE MEMBRANE SHALL BE SEALED AND FIRMLY AFFIXED TO THE WALL.  
D. FOUNDATION WALLS MAY BE DAMP PROOFED OR WATER PROOFED USING MATERIALS AND METHODS OF CONSTRUCTION OTHER THAN COVERED IN THIS SECTION WHEN APPROVED BY THE LOCAL BUILDING OFFICIAL.
20. DRAINS SHALL BE PROVIDED AROUND FOUNDATIONS ENCLOSING HABITABLE OR USABLE SPACES LOCATED BELOW GRADE AND WHICH ARE SUBJECT TO GROUND WATER CONDITIONS. DRAINS SHALL BE INSTALLED AT OR BELOW THE AREA TO BE PROTECTED, AND SHALL DISCHARGE BY GRAVITY OR MECHANICAL MEANS INTO AN APPROVED DRAINAGE SYSTEM.
21. THE TOP OF OPEN JOINTS OF DRAIN TILES SHALL BE PROTECTED WITH STRIPS OF BUILDING PAPER AND THE DRAINAGE TILES SHALL BE PLACED ON 2 INCHES OF WASHED GRAVEL OR CRUSHED ROCK ONE SIEVE SIZE LARGER THAN THE TILE JOINT OPENING OR PERFORATION AND COVERED WITH NOT LESS THAN 6 INCHES OF THE SAME MATERIAL.
22. THE DESIGNS ON THIS AND FOLLOWING SHEETS ARE APPLICABLE TO HORIZONTAL WIND LOADS OF 15 PSF MAXIMUM AND UNITS WHICH HAVE A MAXIMUM WIDTH OF 26'-8" FOR 28 WIDES AND 30'-4" FOR 32 WIDES. MINIMUM I-BEAM SPACING IS 9@ 1/2".
23. THE DESIGNS ON THIS AND FOLLOWING SHEETS ARE APPLICABLE TO SEISMIC ZONES 0, 1 AND 2.
24. THIS FOUNDATION DESIGN IS NOT FOR INSTALLATION ON A FLOOD PLAIN. WHEN INSTALLING CRAWLSPACE OR BASEMENT IN AN AREA WITH SOILS HAVING POOR DRAINAGE, CONSIDERATION SHOULD BE GIVEN TO METHODS OF ELIMINATING ACCUMULATION OF WATER IN THE CRAWLSPACE OR BASEMENT, SUCH AS THE USE OF SLUMP PUMP(S). INSTALLATION OF SLUMP PUMPS TO BE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

### GENERAL NOTES:

25. THIS FOUNDATION DESIGN QUALIFIES AS A PERMANENT FOUNDATION AS DEFINED BY THE HUD "PERMANENT FOUNDATIONS GUIDE FOR MANUFACTURED HOUSING", SEPT 1996 AND COMPLIES WITH THE FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS.
26. DESIGN BASED ON ASCE 7-93, 80 MPH WIND, EXPOSURE C AND FMHCS WIND ZONE 1.
27. DESIGN BASED ON 3/4" MAXIMUM ROOF PITCH. SHEARWALLS LOCATED AT END OF HOME ONLY, BOTH HALVES.
28. CONNECTION AT CENTERLINE MATING JOINT TO BE PER M.H.E.'S HUD SET-UP MANUAL.

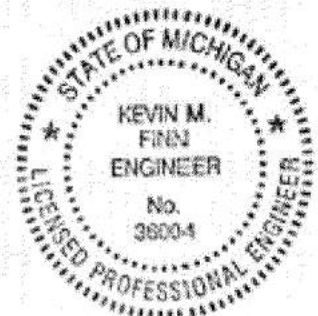
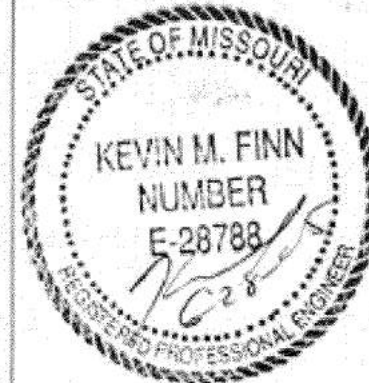
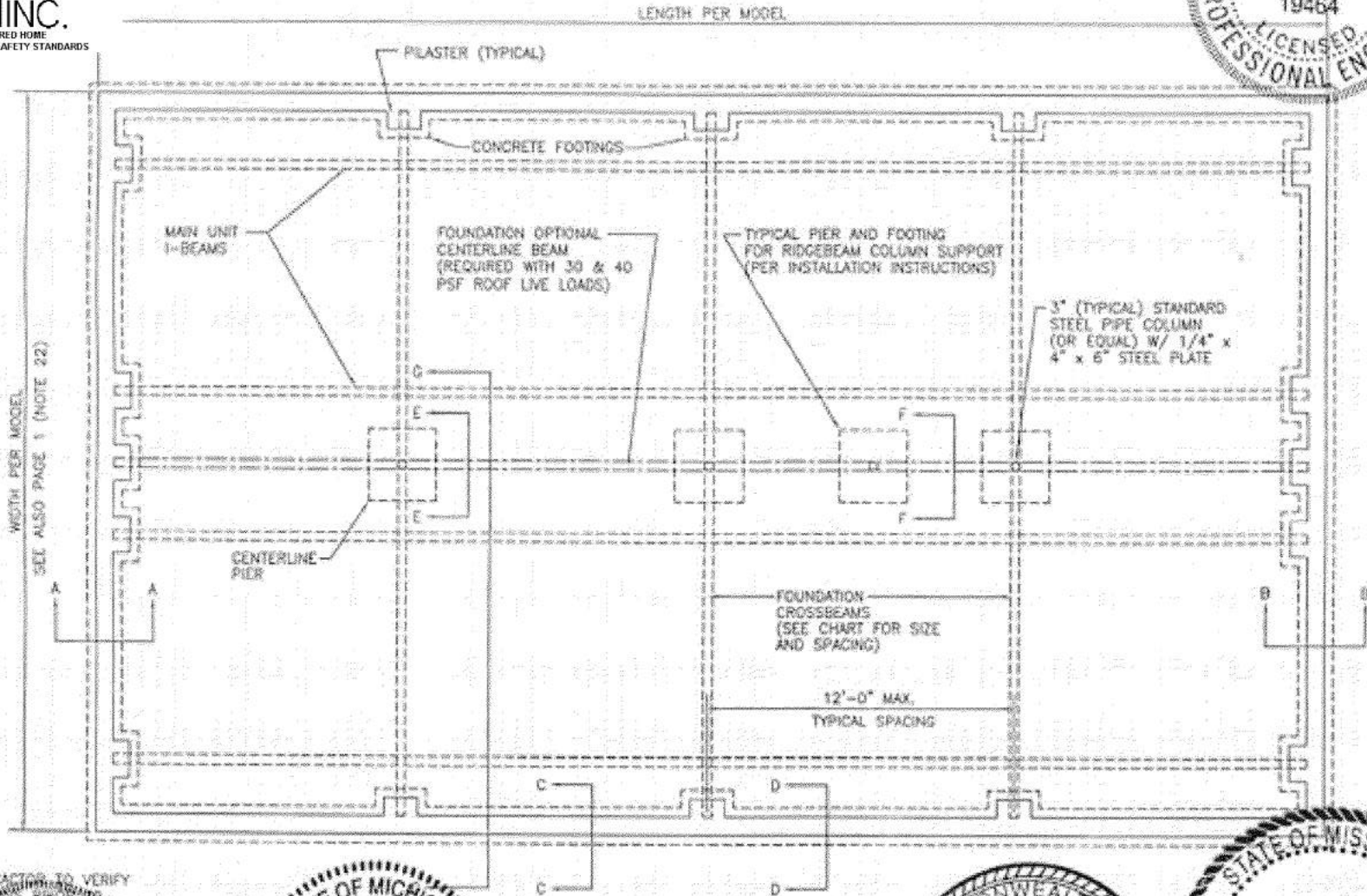


FIGURE 1.0  
FOUNDATION NOTES AND CHARTS  
PAGE 1 OF 6

M.H.E., INC.

APPROVED BY  
REVISOR  
3/21/2017  
**NIA** INC.  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS



NOTE: CONTRACTOR TO VERIFY ALL DIMENSIONS AND FOUNDATION CONDITIONS

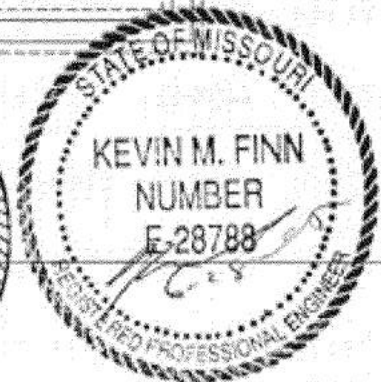
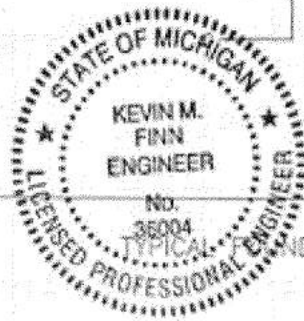
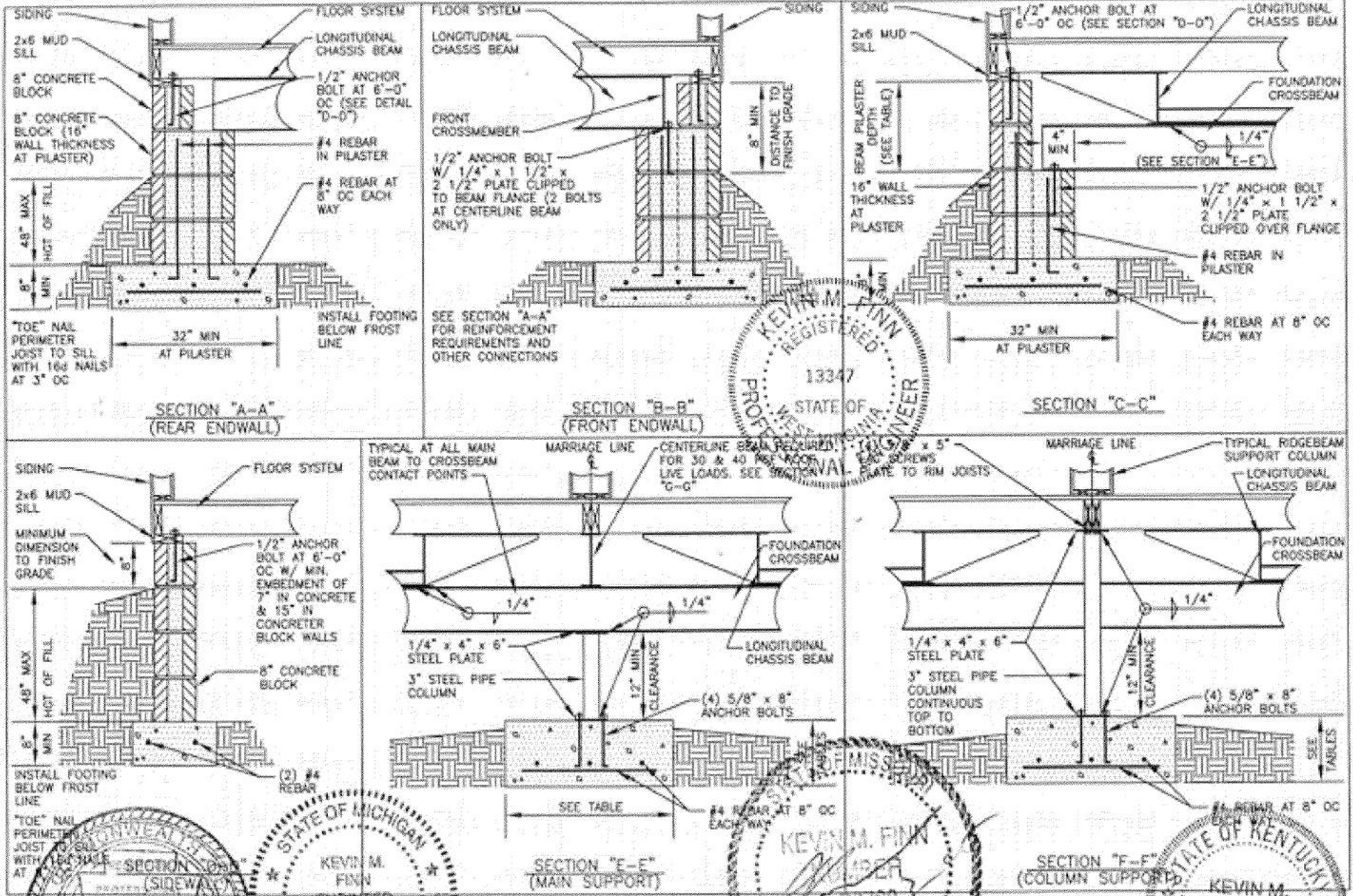


FIGURE 1.1  
TYPICAL FOUNDATION (CRAWLSPACE OR BASEMENT)  
PAGE 2 OF 6

M.H.E., INC.



REGISTERED PROFESSIONAL ENGINEER  
 KEVIN M. FINN  
 STATE OF PENNSYLVANIA  
 13347

STATE OF PENNSYLVANIA  
 KEVIN M. FINN  
 ENGINEER  
 No. PE-051768-E

STATE OF MICHIGAN  
 KEVIN M. FINN  
 ENGINEER  
 No. 36004  
 LICENSED PROFESSIONAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER  
 KEVIN M. FINN  
 STATE OF KENTUCKY  
 19464

STATE OF KENTUCKY  
 KEVIN M. FINN  
 19464  
 LICENSED PROFESSIONAL ENGINEER

FIGURE 1.2  
 CRAWLSPACE DETAILS  
 PAGE 3 OF 6

M.H.E., INC.

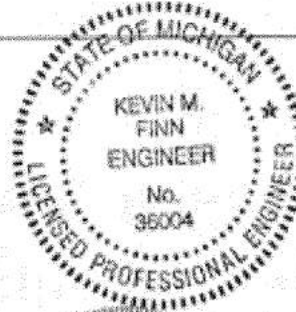
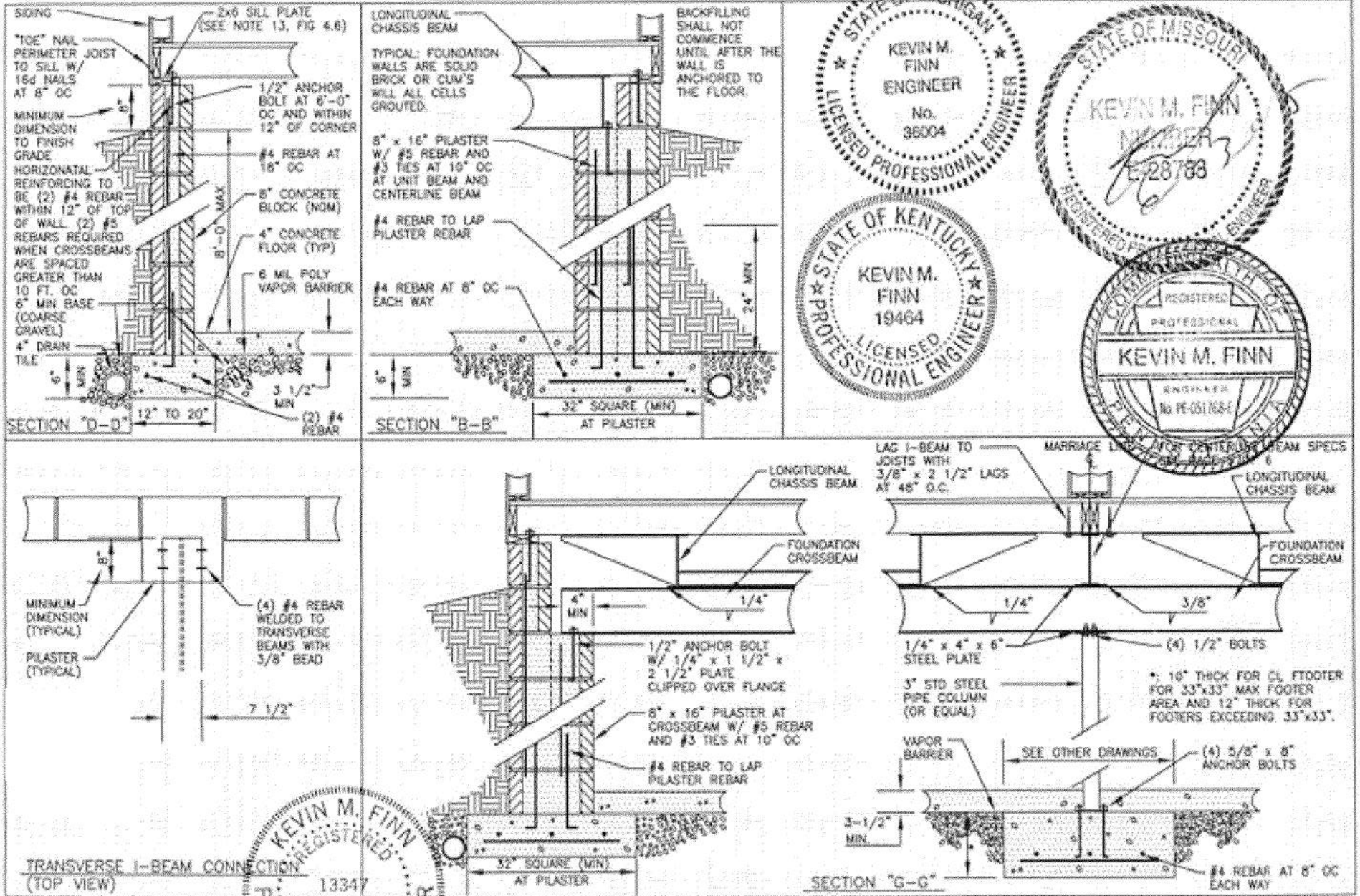
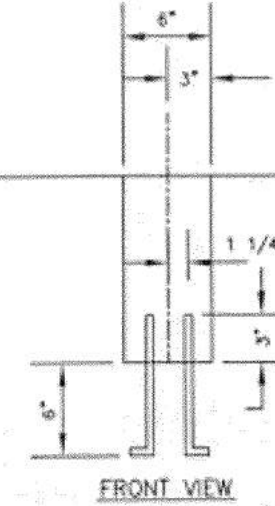
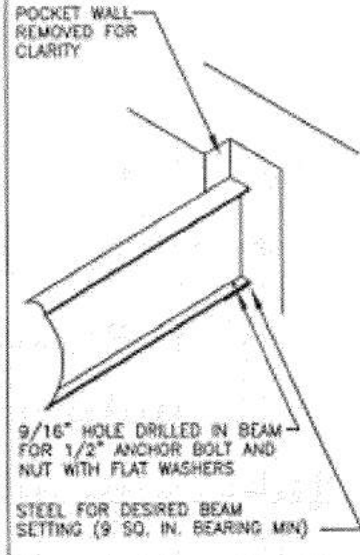
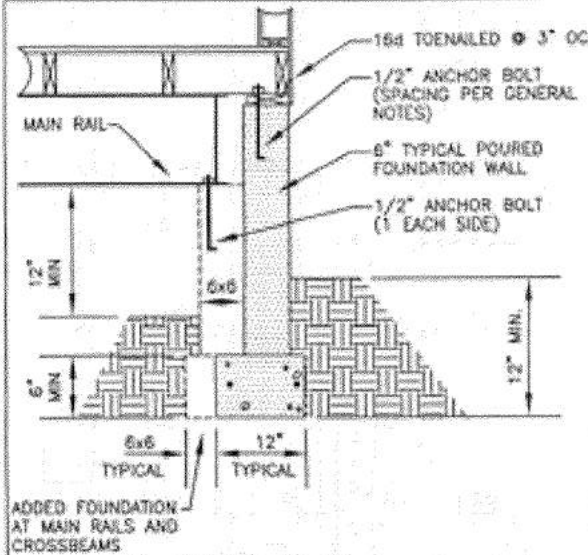


FIGURE 1.3  
 BASEMENT DETAILS  
 PAGE 4 OF 6

APPROVED BY  
 NIA INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS  
 REVISED  
 3/21/2017

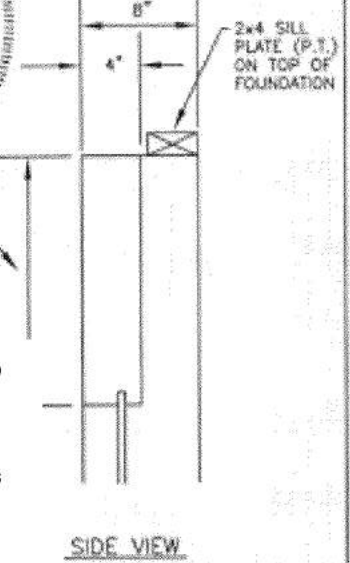
M.H.E., INC.



BEAM POCKET  
 16 1/2" WITH 10" MAIN BEAMS AND 8" CROSSBEAMS  
 18 1/2" WITH 12" MAIN BEAMS AND 8" CROSSBEAMS.

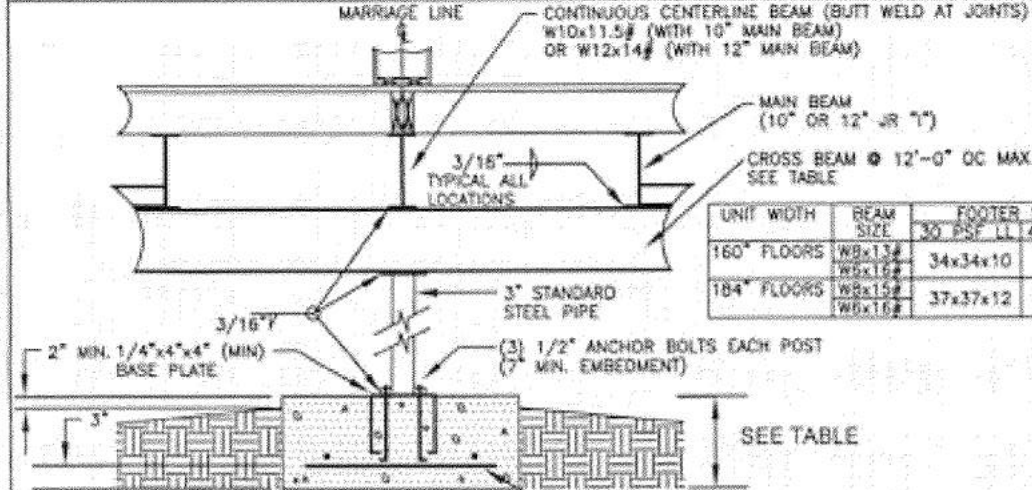
APPROVED BY  
**NIA** INC.  
 FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS

REVISOR  
 3/21/2017

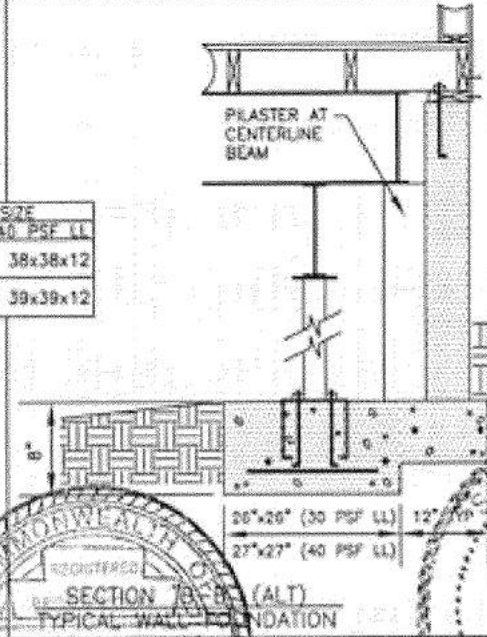


SECTION "B-B"  
 TYPICAL WALL (PILASTER) FOUNDATION

BEAM POCKET DETAIL  
 MAY BE USED WITH POURED WALL



UNIT WIDTH	BEAM SIZE	FOOTER SIZE	
		30 PSF LL	40 PSF LL
160" FLOORS	WBx134 WBx132 WBx128	34x34x10	38x38x12
184" FLOORS	WBx154 WBx152 WBx148	37x37x12	39x39x12



NOTES

1. FOR USE ON HOMES SET UP IN THE 30 AND 40 PSF ROOF LINE LOAD ZONES.
2. FOR USE WITH POURED FOUNDATION.
3. AS AN ALTERNATE TO INSTALLING PILASTERS TO SUPPORT THE CHASSIS MAIN RAILS, A CROSSBEAM MAY BE INSTALLED DIRECTLY BEHIND THE CROSSMEMBER IN ACCORDANCE WITH DETAILS FOR CROSSBEAM INSTALLATION. (SEE DETAIL TO LEFT).

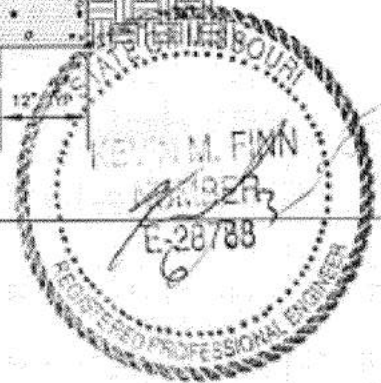
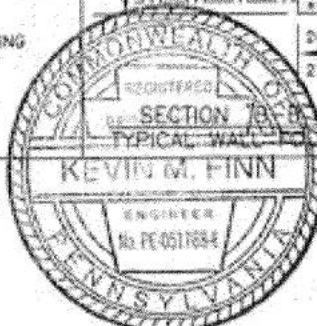
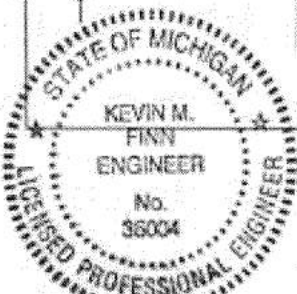
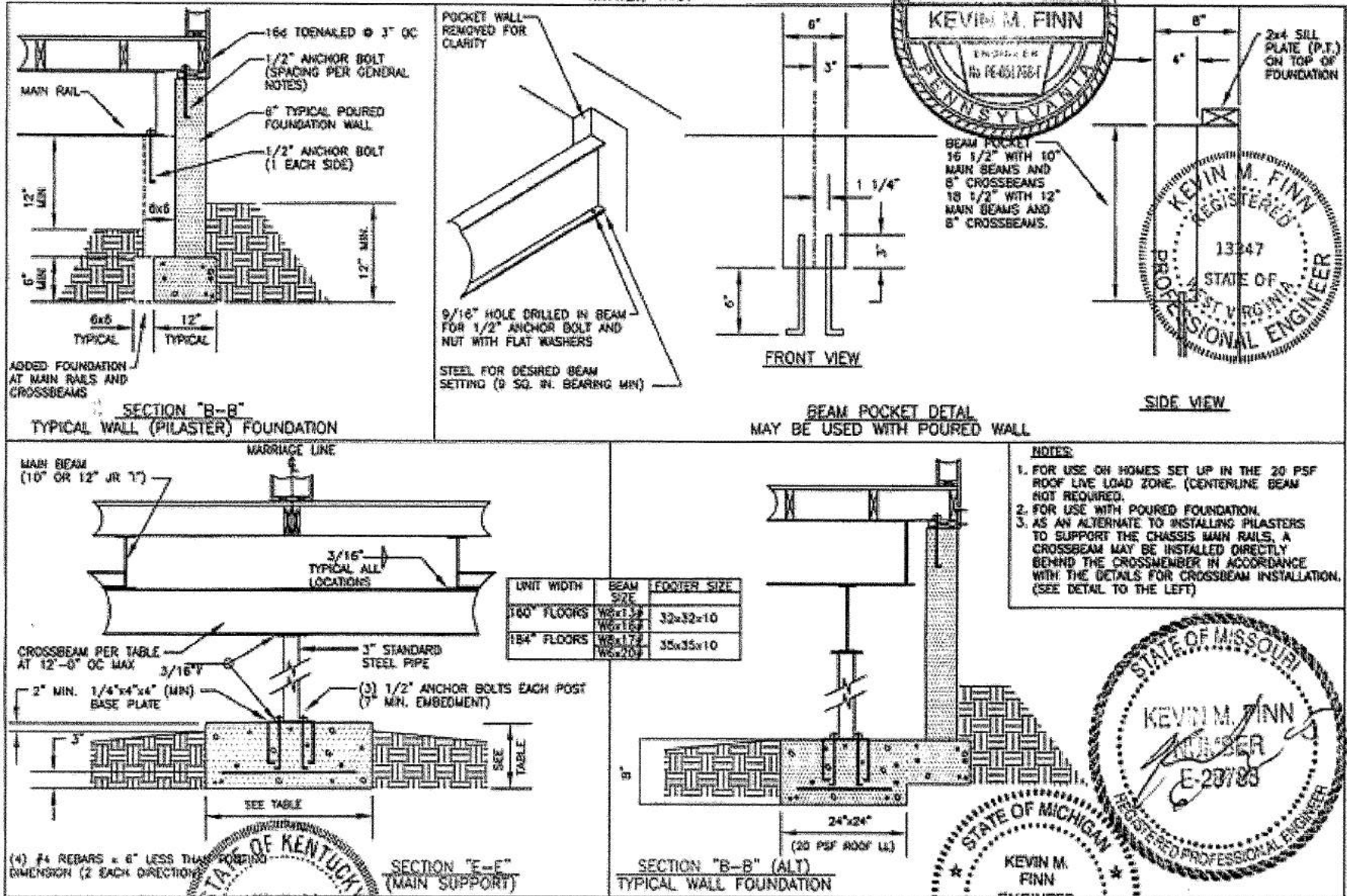


FIGURE 1.4  
 FOUNDATION DETAILS  
 PAGE 5 OF 6

M.H.E., INC.



APPROVED BY  
**NA** INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

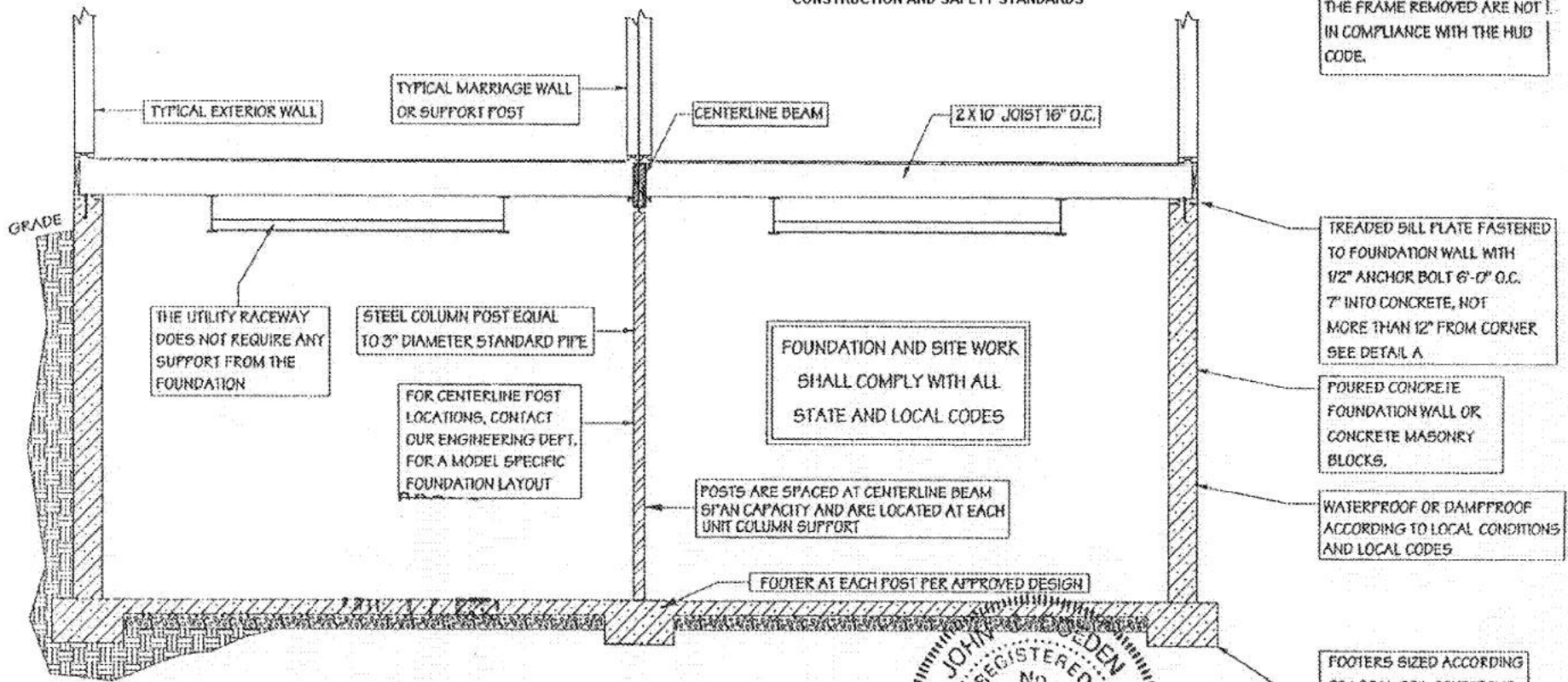
STATE OF KENTUCKY  
 KEVIN M. FINN  
 19404  
 LICENSED PROFESSIONAL ENGINEER

FIGURE 1.5  
 FOUNDATION DETAILS  
 PAGE 6 OF 6

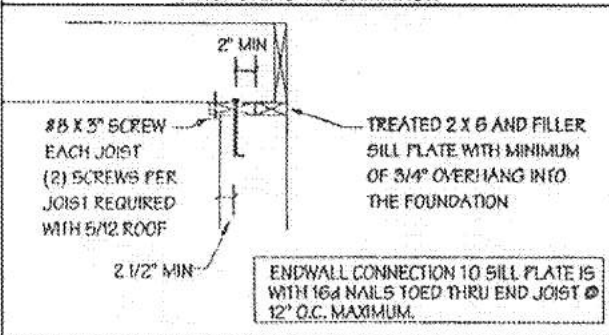
APPROVED BY  
**NIA** INC.  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

REVISED  
 3/21/2017

MANUFACTURED HOMES WITH THE FRAME REMOVED ARE NOT IN COMPLIANCE WITH THE HUD CODE.

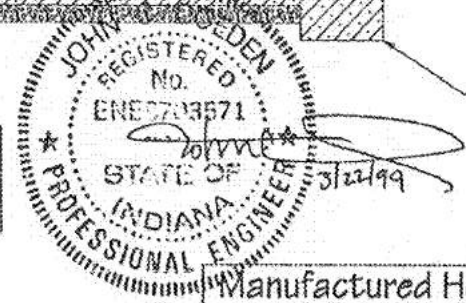


**DETAIL A**  
 ANCHORING INFORMATION



**NOTE**  
 TYPICAL BASEMENT SHOWN, HOME MAY BE SET ON A CRAWLSPACE FOUNDATION WITH CONCRETE CENTERLINE PIERS

**NOTE**  
 IN THE ABSENCE OF LOCAL CODES, USE THE ONE & TWO FAMILY DWELLING CODE OR THE ANSI A-223.1 MANUFACTURED HOME INSTALLATIONS, 1982.



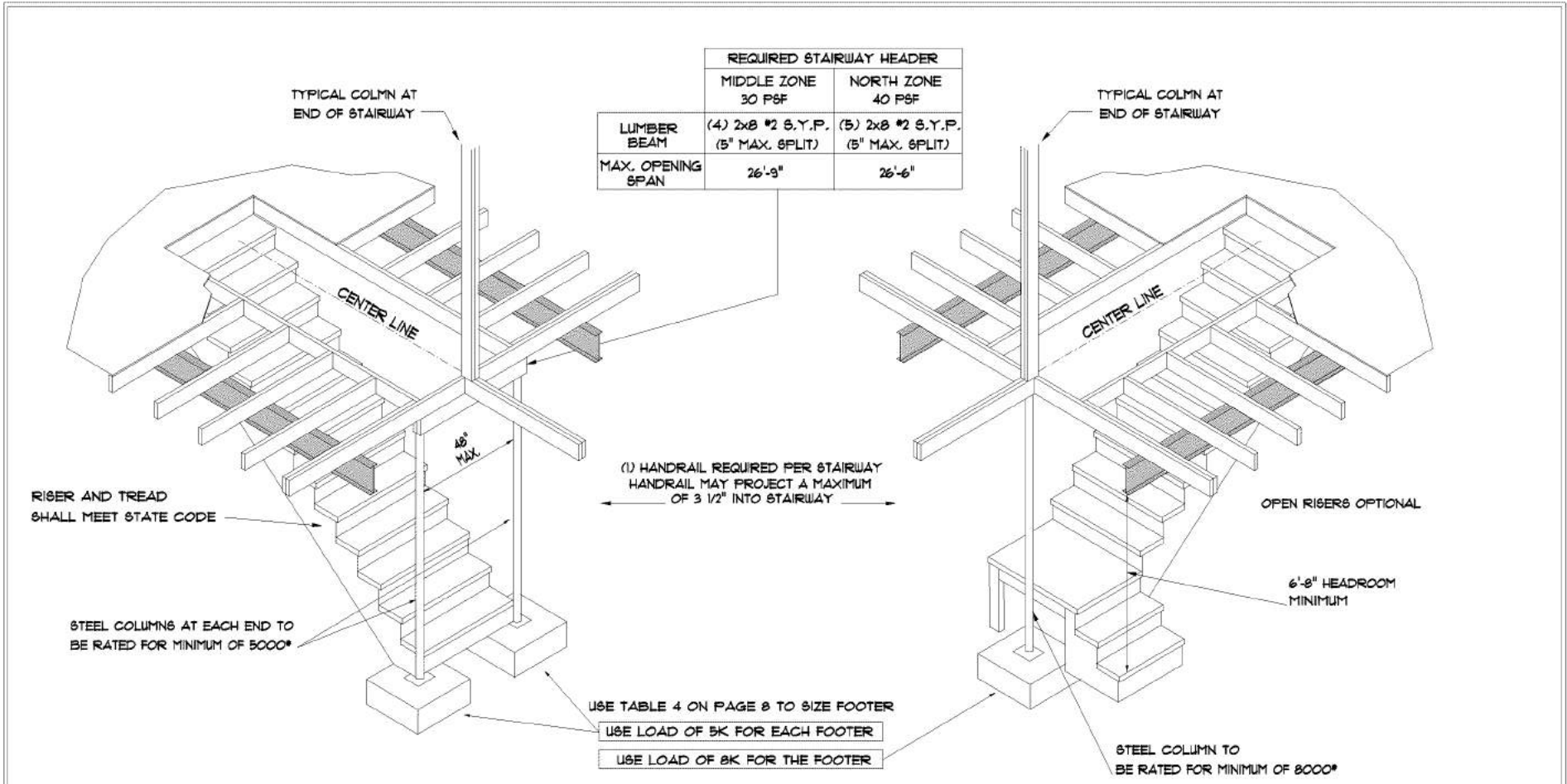
Manufactured Housing Enterprises, Inc.  
 09302 State Route 6 Bryan, Oh. 43506

FOUNDATION CROSS SECTION WITH 2 X 10 FLOOR JOISTS

TYPICAL ANCHORING INFORMATION

Scale:	Page Number:
Date: 7-15-98	Rev: 3-12-99
	By: BH

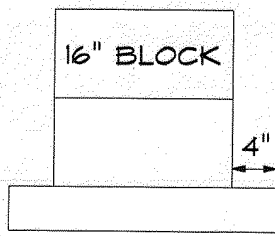




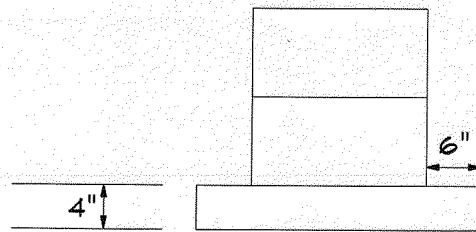
REQUIRED STAIRWAY HEADER		
	MIDDLE ZONE 30 PSF	NORTH ZONE 40 PSF
LUMBER BEAM	(4) 2x8 #2 S.Y.P. (5" MAX. SPLIT)	(5) 2x8 #2 S.Y.P. (5" MAX. SPLIT)
MAX. OPENING SPAN	26'-9"	26'-6"

APPROVED BY  
**NIA** INC. REVISED  
 3/21/2017  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

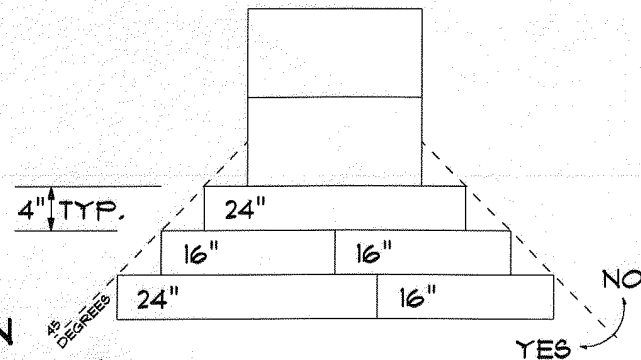
**MANUFACTURED HOUSING ENTERPRISES**  
 TYPICAL STAIRWAY DETAIL  
 SITE BUILT BASEMENT STAIRWAY  
 DATE: 5-24-96 REV. 2-23-178 BY: JB



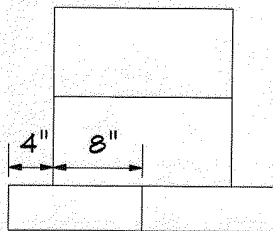
**YES** FOOTING EXTENDS BY ITS THICKNESS OR LESS



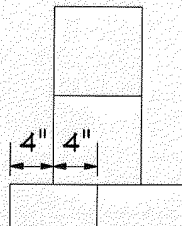
**NO** FOOTING EXTENDS BY MORE THAN ITS THICKNESS



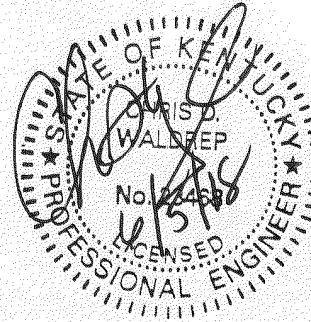
**MAXIMUM ALLOWABLE FOOTING PROJECTION**



**YES** SPLIT FOOTING EXTENDS LESS THAN ONE THIRD ITS WIDTH

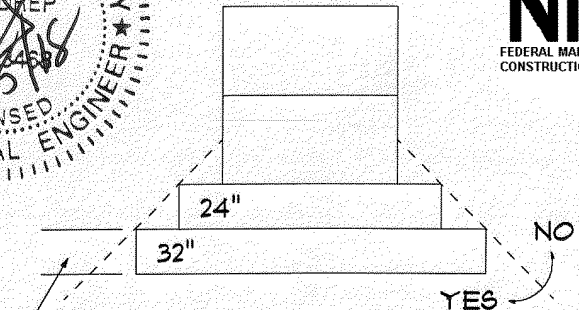


**NO** SPLIT FOOTING EXTENDS MORE THAN ONE THIRD ITS WIDTH



APPROVED BY  
**NIA** INC. 6/8/2018  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

**ALLOWABLE SPLIT FOOTING CONFIGURATION**



PRECAST OR Poured FOOTING WHICH EXTENDS BEYOND ALLOWABLE PROJECTION MAY NOT BE INCLUDED IN BEARING AREA

**NOTES:**

- 1) A HOME MAY BE INSTALLED ON AN EXISTING CONCRETE SLAB OR FOOTINGS 4" THICK OR GREATER.
- 2) USE DETAILS HERE TO DETERMINE FOOTINGS/PIER CAPACITIES.
- 3) SEE ADDITIONAL INFORMATION ON SHEET 2
- 4) SLAB MUST BE LOCATED ON NON-FROST SUSCEPTIBLE SOIL TO THE FROST LINE, OR PROTECTED FROM FROST BY A PE SEALED FROST PROTECTED FOUNDATION SYSTEM (INSULATED FOUNDATION) APPROVED BY MHE & THEIR DAFIA.
- 5) SEE THE MANUFACTURED HOUSING ENTERPRISES, INC. INSTALLATION MANUAL FOR ADDITIONAL PIER AND FOOTING INFORMATION.
- 6) ALL OTHER ASPECTS OF THE SETUP SHALL CONFORM TO THE MANUFACTURED HOUSING ENTERPRISES, INC. INSTALLATION MANUAL.

**ADDENDUM TO INSTALLATION MANUAL**

I-47



**MANUFACTURED HOUSING ENTERPRISES, INC.**  
 09302 STATE ROUTE 6 - BRYAN, OH 43506

PIERS ON 4" CONCRETE SLABS

SHEET 1 OF 2

DATE: 12-07-2018

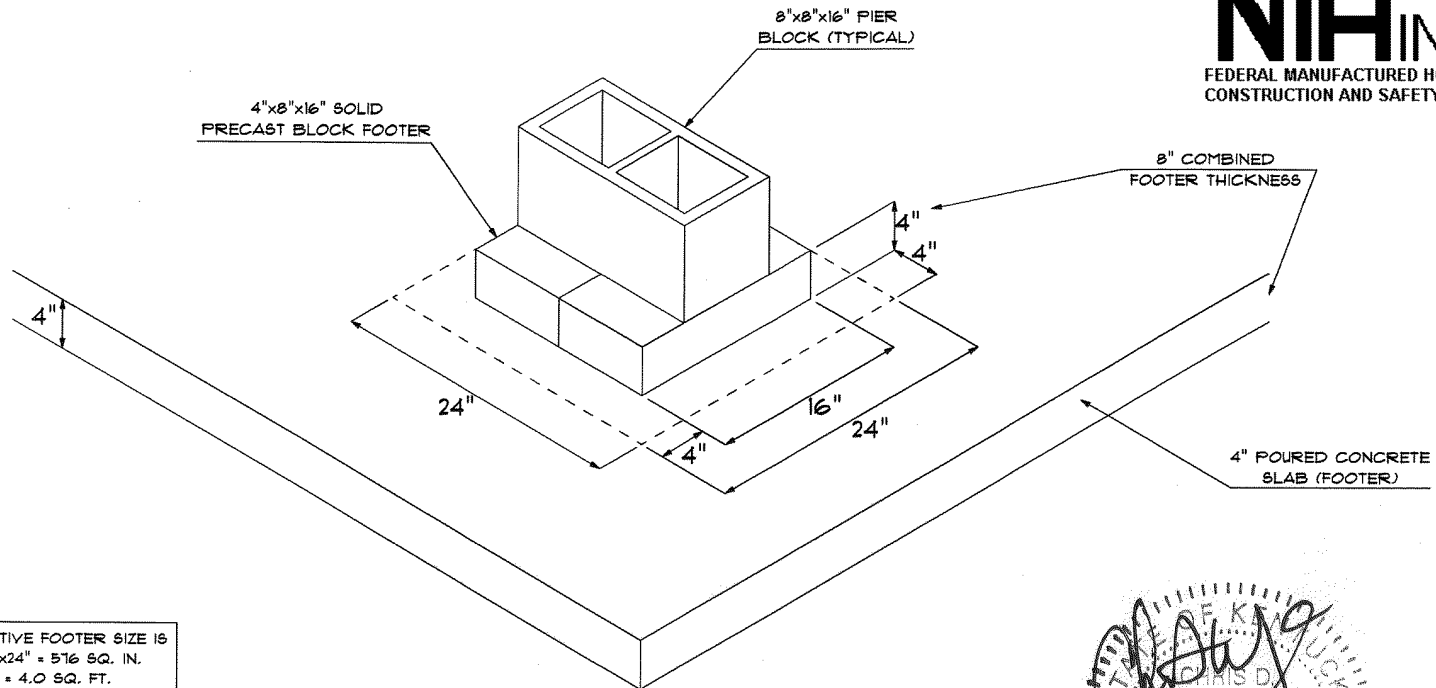
REV: 06-05-2018

BY: WP

APPROVED BY

**NIA** INC. 6/8/2018

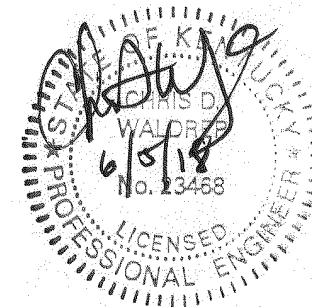
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS



EFFECTIVE FOOTER SIZE IS  
24"x24" = 576 SQ. IN.  
= 4.0 SQ. FT.

SOIL BEARING CAPACITY (PSF)	FOOTER CAPACITY (LBS)	PIER CAPACITY (LBS)
1000	4000	3600
1500	6000	5600
2000	8000	7600

\*PIER CAPACITY IS FOOTER CAPACITY MINUS CONCRETE SELF WEIGHT (150 PCF)



ADDENDUM TO INSTALLATION MANUAL

I-48



MANUFACTURED HOUSING ENTERPRISES, INC.  
09302 STATE ROUTE 6 - BRYAN, OH 43506

PIERS ON 4" CONCRETE SLABS

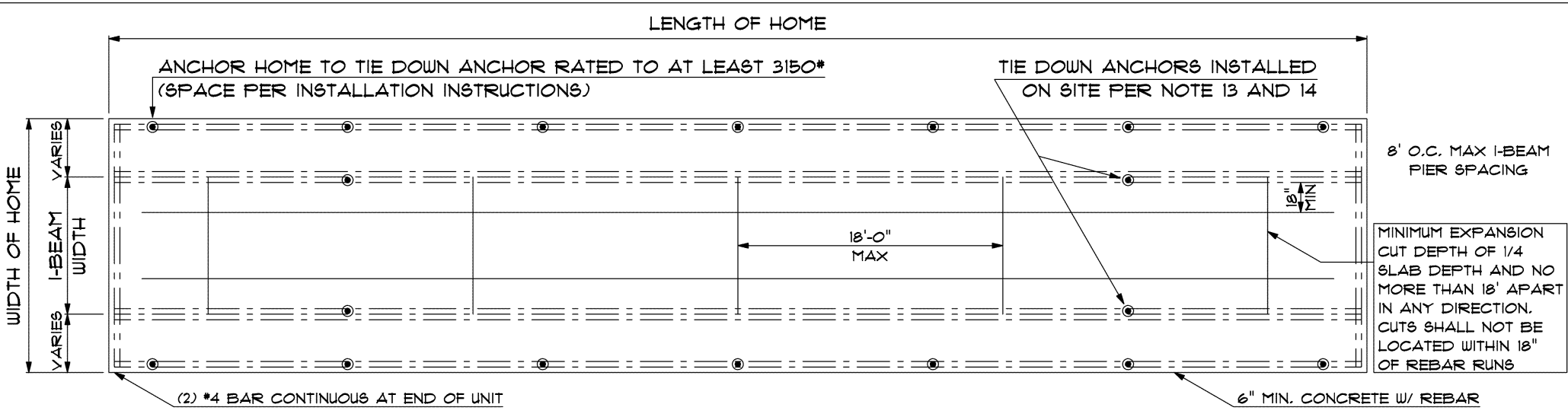
SHEET 2 OF 2

DATE: 12-07-2018

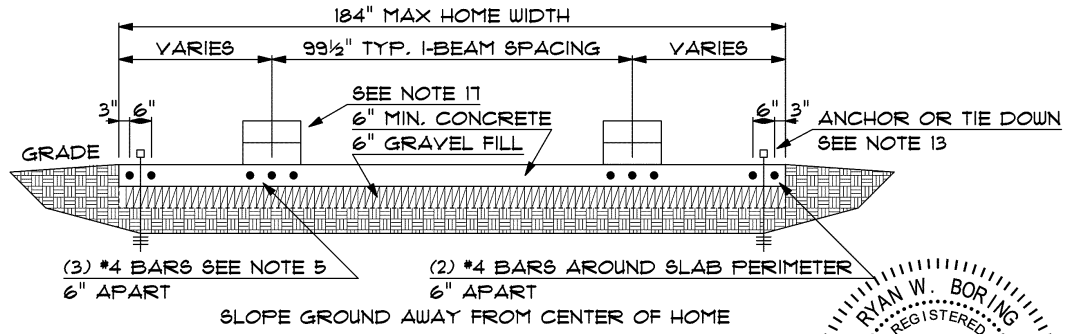
REV: 06-05-2018

BY: WP





- 1) MIN SOIL BEARING CAPACITY IS 1500 PSF
- 2) CONCRETE TO HAVE A MIN. COMPRESSIVE STRESS OF 3000 PSI IN 28 DAYS AND WORK IS TO CONFORM TO LATEST CRS1 AND PCA SPECIFICATIONS
- 3) ALL REINFORCING STEEL TO BE GRADE 40 PER ASTM SPECIFICATIONS
- 4) ALL MATERIALS MUST BE APPROVED BY LOCAL JURISDICTION AND LISTED FOR THEIR INTENDED USE
- 5) ALL REBAR MUST OVERLAP AT LEAST 12", HAVE AT LEAST 3" CLEAR COVER FROM SLAB BOTTOM, AND AT LEAST 1-1/2" CLEAR COVER FROM SLAB TOP
- 6) REFER TO INSTALLATION MANUAL FOR ALL OTHER APPLICABLE INSTALLATION REQUIREMENTS UNLESS NOTED OTHERWISE
- 7) SLAB FOUNDATION DESIGNS ARE SUSCEPTIBLE TO FROST HEAVE AND SHOULD NOT BE PLACED ON EXPANSIVE SOILS. NON-FROST SUSCEPTIBLE SOILS ARE DEFINED BY ASCE 32 AS A GRANULAR SOIL WITH LESS THAN 6% BY WEIGHT PASSING A NUMBER 200 SIEVE. CONSULT WITH LOCAL JURISDICTION
- 8) NOTED SLAB DEPTH IS MINIMUM. SLAB BASE AND GRAVEL FILL MUST BE BELOW FROST LINE. CONSULT LOCAL JURISDICTION FOR FROST LINE DEPTH
- 9) DRAINAGE MUST BE PROVIDED FROM UNDER SLAB TO PERIMETER. CONSULT LOCAL BUILDING CODE FOR REQUIREMENTS
- 10) FILL MATERIAL UNDER BEARING LOCATIONS MUST BE A MATERIAL APPROVED BY LOCAL JURISDICTION AND COMPACTED TO 95% STD. PROCTOR
- 11) MAX ROOF LIVE LOAD IS 40PSF
- 12) MAX HOME WIDTH IS 15'-4". MAX OVERHANG IS 12"
- 13) ALL TIE DOWN ANCHORS MUST BE INSTALLED PER INSTALLATION MANUAL
- 14) LONGITUDINAL TIE DOWN QUANTITIES PER INSTALLATION MANUAL
- 15) DO NOT POUR CONCRETE ON FROZEN GROUND
- 16) TO REDUCE CRACKING, USE A LOW WATER TO CEMENT RATIO ALONG WITH PROPER CURING AND WATER RETAINING METHODS
- 17) SINGLE STACK PIERS FOR CHASSIS AND MATING PIERS SHALL BE PLACED WITH LONG BLOCK LENGTH PERPENDICULAR TO REBAR
- 18) THESE SOIL PREPARATION CONDITIONS ARE ADEQUATE FOR FOOTINGS INSTALLED ABOVE THE FROST LINE OR FLOATING SLAB SYSTEMS WHEN INSTALLED WITH GRAVEL BACKFILL PROVIDED THE SOIL BENEATH THE GRAVEL IS WELL DRAINED WITH MINIMAL MOISTURE CONTENT
- 19) FINAL DETERMINATION OF THE APPROPRIATE APPLICATION OF THE FOOTING ABOUT THE FROST LINE OR FLOATING SLAB IS BY THE LOCAL AUTHORITY FAMILIAR WITH ACTUAL SOIL CONDITIONS. BASED UPON ACTUAL SOIL CONDITIONS, DETERMINATION OF THE PROPER FOOTING DESIGN CAN BE MADE



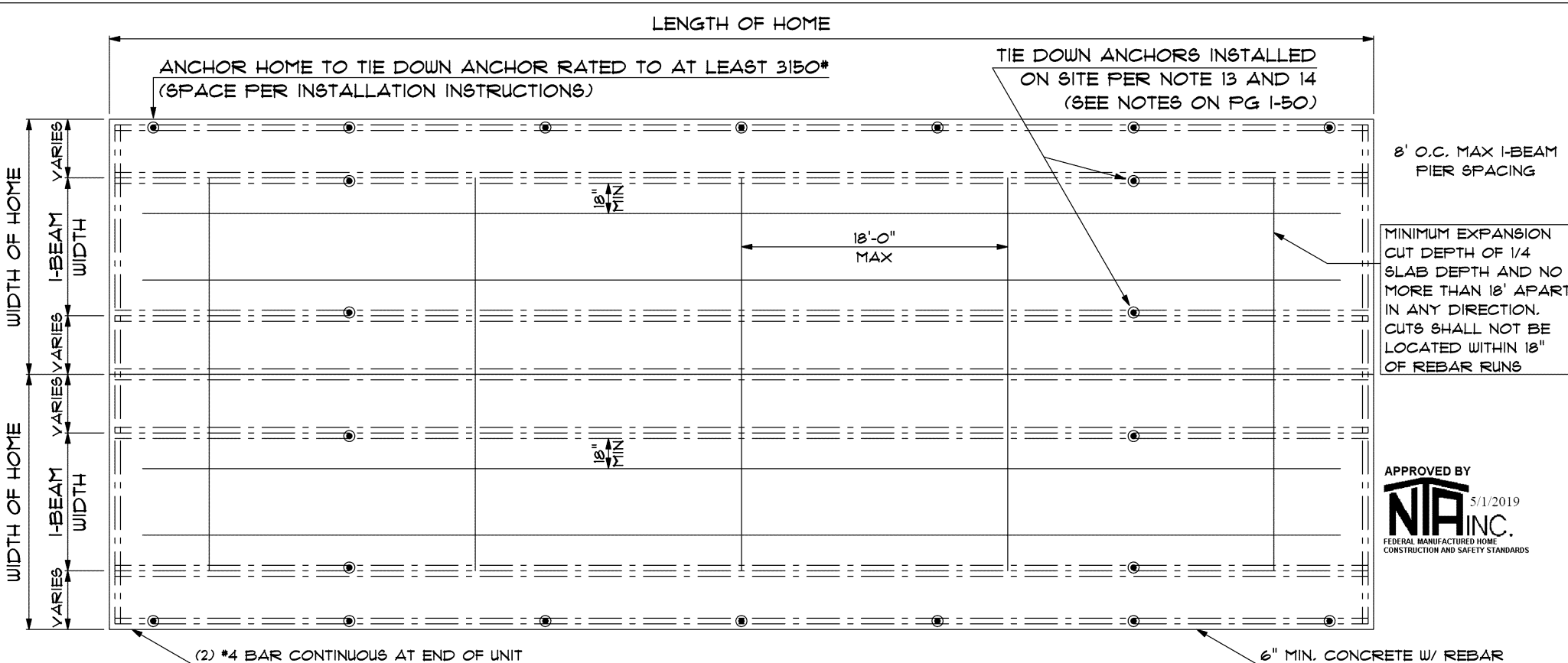
APPROVED BY  
**NIA INC.**  
5/1/2019  
FEDERAL MANUFACTURED HOME  
CONSTRUCTION AND SAFETY STANDARDS

RYAN W. BORING  
REGISTERED  
No. 11100023  
STATE OF  
INDIANA  
PROFESSIONAL ENGINEER

I-50

Apr 25, 2019

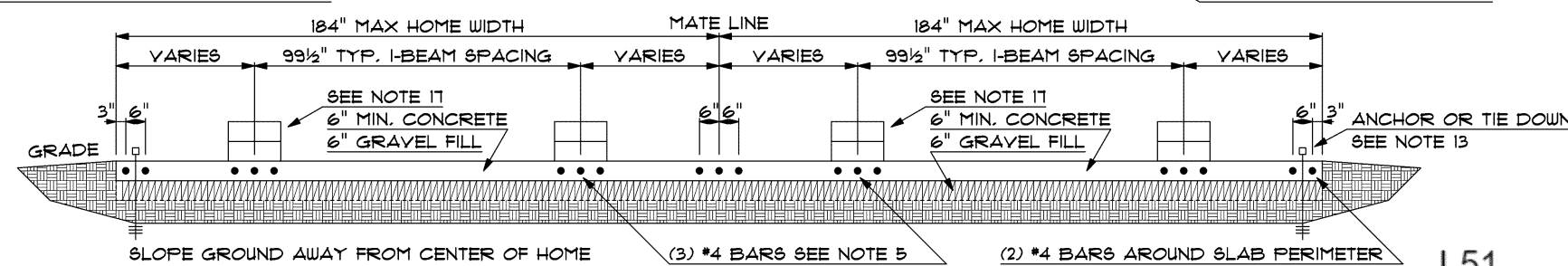
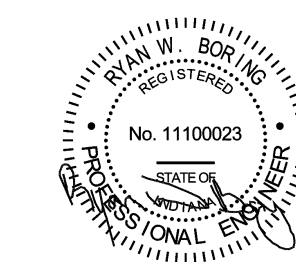
Revision Log		<b>MANUFACTURED HOUSING ENTERPRISES, INC.</b> 09302 US 6 - BRYAN, OH 43506	
		<b>FOUNDATION DETAIL</b> SINGLEWIDE - SLAB	DATE: 4-17-19 REV:
			I-50 BY: WP



8' O.C. MAX I-BEAM PIER SPACING

MINIMUM EXPANSION CUT DEPTH OF 1/4 SLAB DEPTH AND NO MORE THAN 18' APART IN ANY DIRECTION. CUTS SHALL NOT BE LOCATED WITHIN 18" OF REBAR RUNS

APPROVED BY  
**NIA** INC.  
FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS  
 5/1/2019



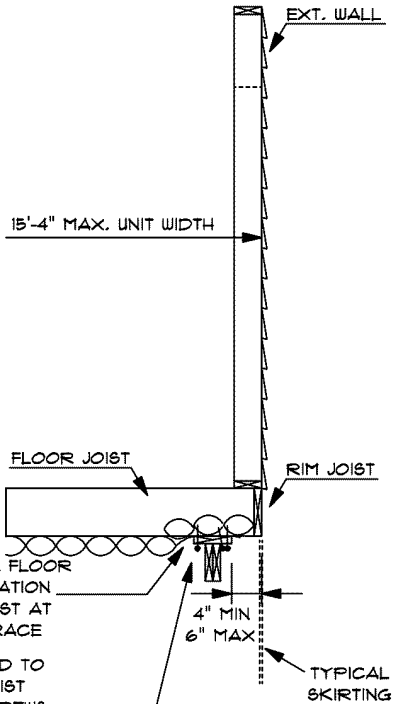
- 1) SEE PAGE I-25 FOR GENERAL SLAB FOUNDATION NOTES UNLESS OTHERWISE NOTED
- 2) MAX ROOF LIVE LOAD IS 40PSF
- 3) MAX BOX WIDTH IS 15'-4"
- 4) MAX OVERHANG IS 12"
- 5) USE 16"x16" CMU MARRIAGE WALL PIERS AT EACH END OF SPANS GREATER THAN 48"
- 6) MAXIMUM MARRIAGE WALL SPAN OR COMBINATION OF TWO ADJACENT SPANS IS 21'-8"

Revision Log



<b>MANUFACTURED HOUSING ENTERPRISES, INC.</b> 09302 US 6 - BRYAN, OH 43506			
FOUNDATION DETAIL	DATE: 4-17-19	REV:	I-51
SECTIONAL - SLAB			BY: WP

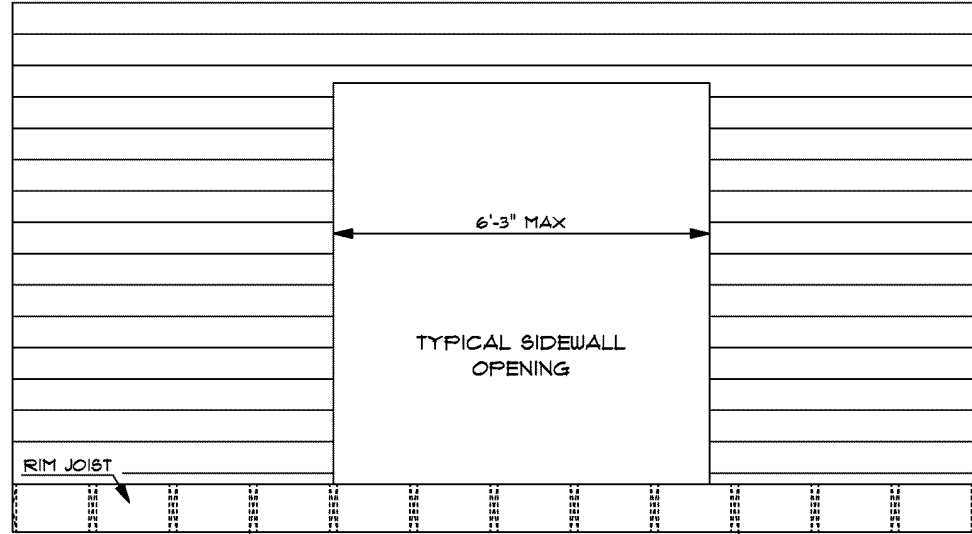
I-51



T-BRACE FASTENED TO EACH FLOOR JOIST WITH (3) #8 x 3" SCREWS INTO T-BRACE (FASTENERS MUST BE TREATED FOR APPLICATION)

- NOTES :
1. T-BRACE EXTENDS PAST AT LEAST ONE JOIST EACH SIDE OF EXTERIOR OPENING.
  2. RIM JOIST MUST BE SET LEVEL.
  3. #30 ROOF
  4. \*MATERIAL FOR BRACE IS EITHER TREATED OR PAINTED

THIS T-BRACE DETAIL CAN BE USED IN PLACE OF DOOR PIERS. THIS METHOD WILL EQUALIZE THE DEFLECTION AT THE PERIMETER JOIST SO THE FLOOR ARE WILL DEFLECT EQUALLY.



16" O.C. FLOOR JOISTS

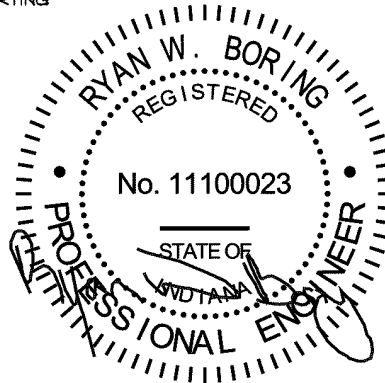
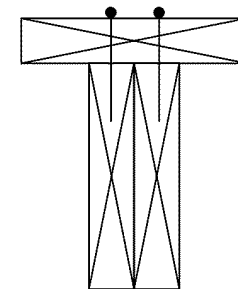
T-BRACE EXTENDS PAST AT LEAST ONE JOIST EACH SIDE OF EXTERIOR OPENING

**ASSEMBLY OF T-BRACE**

\*\*TREATED MATERIAL

SECTION WIDTH	MINIMUM JOIST
13'-4" or 15'-4"	(2) #2 SYP 2 x 6
TOP MEMBER	(1) #2 SYP 2 x 6

MEMBERS FASTENED 6" O.C. WITH #8 x 3" SCREWS FASTENERS MUST BE TREATED FOR APPLICATION



3/29/19

Revision Log



**MANUFACTURED HOUSING ENTERPRISES, INC.**  
 09302 STATE ROUTE 6 - BRYAN, OH 43506

T- BRACE FLOOR REINFORCEMENT FOR EXT. OPENINGS  
 FC-4.1 DATE: 01-09-2019 REV: 3-27-19 BY: WFP

## Complete Installation Checklist

Follow these steps for final inspection and completion of the home.

### FOUNDATION SUPPORT

- Footings properly sized and constructed for the soil conditions
- Pier spacing per data plate and applicable table and roof load zone
- Piers properly constructed and vertical
- Perimeter blocking installed (if required)
- Piers at each side of openings 48” or larger
- Piers beneath all outside exterior doors (except when T-Brace is installed under the door)
- Center line piers installed at columns
- Shims in place and tight

### ANCHORS

- Approved anchors are used
- Proper anchors installed based on soil conditions
- Anchors are installed at correct angles
- Anchor spacing and installation correct
- Longitudinal ties installed (if required)
- Anchor straps are tensioned



### UNDER THE HOME

- Moisture retarder installed
- The ground under and around the home has been properly graded to prevent water from collecting or flowing beneath the home
- Fireplace combustion air intake free and unrestricted
- No holes or tears in bottom board
- Skirting has been installed per manufacturer’s instructions with proper venting and provision for frost heave
- Skirting has been attached in a manner that does not cause water to be trapped between the siding and trim and cannot be forced up into the wall cavity
- Dryer vent, range/cook top exhaust, water heater temperature and pressure overflow pipe and A/C condensate drain installed to perimeter of crawlspace

### EXTERIOR

- Shingled roofs are free of visible damage and serious defects and there are no missing or loose shingles
- Shingle close-up and ridge cap have been completed per applicable details
- All roof shipping protection have been removed and holes in shingles properly sealed
- Penetrations at roof stacks, vents and chimneys have been properly sealed
- Siding and trim is free of gaps, voids, missing fasteners, damage and serious defects. Hardboard seams and edges are sealed.
- Drip edge and fascia is properly installed and free of damage and serious defects
- Gutters and downspouts are installed properly such that water is diverted away from the home



- Trees and bushes have been trimmed to prevent brushing against the home in windy conditions or under snow loads
- The HUD label is exposed, intact and legible
- The exterior of the home and immediate surroundings is clean of construction materials, dust and debris

## **INTERIOR**

- Ceilings, walls and floor covering are free from damage and serious defects
- Carpeting is properly stretched and seamed
- All trim and molding is installed properly and free of damage and defects
- All cabinets, countertops, plumbing fixtures, appliances, furnishings and window coverings are free of damage and defects
- All cabinet doors and drawers work properly
- All interior and exterior doors and windows open, close and latch properly
- One window in each bedroom meets emergency egress requirements, has operating instructions labels on it and operates properly
- All temporary shipping hardware/material has been removed
- Floors are level
- The data plate is intact and legible
- Smoke alarms have been tested
- The interior of the home is clean, clear of materials, dust and debris



## **WATER AND DRAIN SYSTEMS**

- Crossover and service connection and splices have been properly made with correct materials
- Water and drain lines are insulated or otherwise protected from freezing
- Pipe supports are installed and properly spaced
- Proper slope has been maintained on all drain lines
- All necessary inspections and tests have been performed
- All sinks, basins, tubs and toilets operate properly
- All hot and cold water lines are properly connected to fixtures, dispense water as labeled and operate
- Tub, tub/shower and shower outlets have been verified to ensure the outlet water temperature does not exceed 120°F (49°C)

## **ELECTRICAL SYSTEMS**

- The panel amperage matches the connection to the home
- The home has been properly grounded
- The main power supply has been properly connected and tested by a licensed electrician
- Continuity test has been conducted
- Polarity test has been conducted
- Operation test has been conducted
- All electrical crossovers have been connected
- All receptacles, switches and light fixtures operate properly

- Ground fault circuit interrupters operate properly
- All exterior lights have been properly installed

#### **GAS/FUEL OIL SYSTEMS**

- The gas system pressure test has been conducted
- Connections between units are properly made with an access as required
- The main fuel line has been properly connected and tested by a qualified technician

#### **APPLIANCE OPERATING AND VENTING**

- All appliances are working properly
- Appliance venting is in accordance with the manufacturer's instructions
- Fresh air intakes are properly installed
- Whole house, kitchen and bath exhaust fan operation are correct
- Fireplace chimney stack extension and roof cap have been installed in accordance with the manufacturer's instructions
- Air conditioner/heat pump is sized properly
- Air conditioner condensate line is properly trapped and terminates outside of the skirting

#### **MISCELLANEOUS**

- Installation/anchoring certificates or seals have been issued and installed (if required)
- Owner's and operation manuals are available for all appliances (see homeowner's packet)
- This installation manual is left with home
- Marriage line gasket has been installed and inspected

