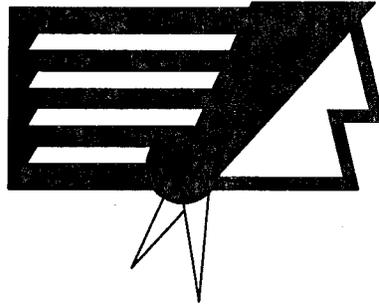


12/15/04

**CHIEF<sup>®</sup> INDUSTRIES, INC.**



***HOUSING DIVISION***

AURORA INDUSTRIAL SITE

West Hwy 34

Aurora, NE

***FIELD INSTALLATION  
MANUAL  
DOUBLE SECTION HOME***

January 2004

DSM01

## FOREWORD

Thank you for choosing Chief® Industries as your home builder. We hope your new home brings you comfort and pleasure for many years to come. This home was engineered, constructed and inspected to comply with the *Federal Manufactured Homes Construction and Safety Standards* in effect on the date of construction. Minimal specifications are required from national standards for the design, construction, thermal protection, heating systems, plumbing systems and electrical systems for HUD homes intended for residential use.

Our intent is to produce a safe and comfortable home for you. Our company standards surpass compliance with national standards. Chief® Industries has highly qualified plant personnel to inspect these standards throughout the construction process.

Before set up can even begin, you must contact the building officials in your area for necessary permits, licenses and inspections required for installation of this home. It is extremely important in preparing your home for its occupancy that it be properly blocked, set and leveled by an experienced HUD home mover, dealer, or installer. Correct procedures in setting your home could prevent any costly future reconstruction.

The following step-by-step instructions were designed to assist you with the installation of your home. *Due to changes that are brought about by Chief® Industries continuing effort to improve our product and provide our customers with a wide variety of features; there may be products in or on your home that are not thoroughly covered by this manual.* **Before starting the set up process, you should go completely through your home owner's information carefully to see if there are supplement details before any attempt is made in setting your home.**

**CHIEF® INDUSTRIES, INC.**  
**HOUSING DIVISION**

**----CONTENTS----**

This booklet contains **Field Installation Specifications**  
for all Chief® Industries, Inc., Housing Division  
Double Section Homes, per category as follows:

**SECTION I      SERVICE LOCATION**

**SECTION II     PIER CONSTRUCTION**

**SECTION III    SUPPORT BLOCKING**

**SECTION IV    PERIMETER FOUNDATION**

**SECTION V     BASEMENT CONSTRUCTION**

**SECTION VI    TYPICAL ANCHORAGE & FOOTAGE INSTRUCTIONS**

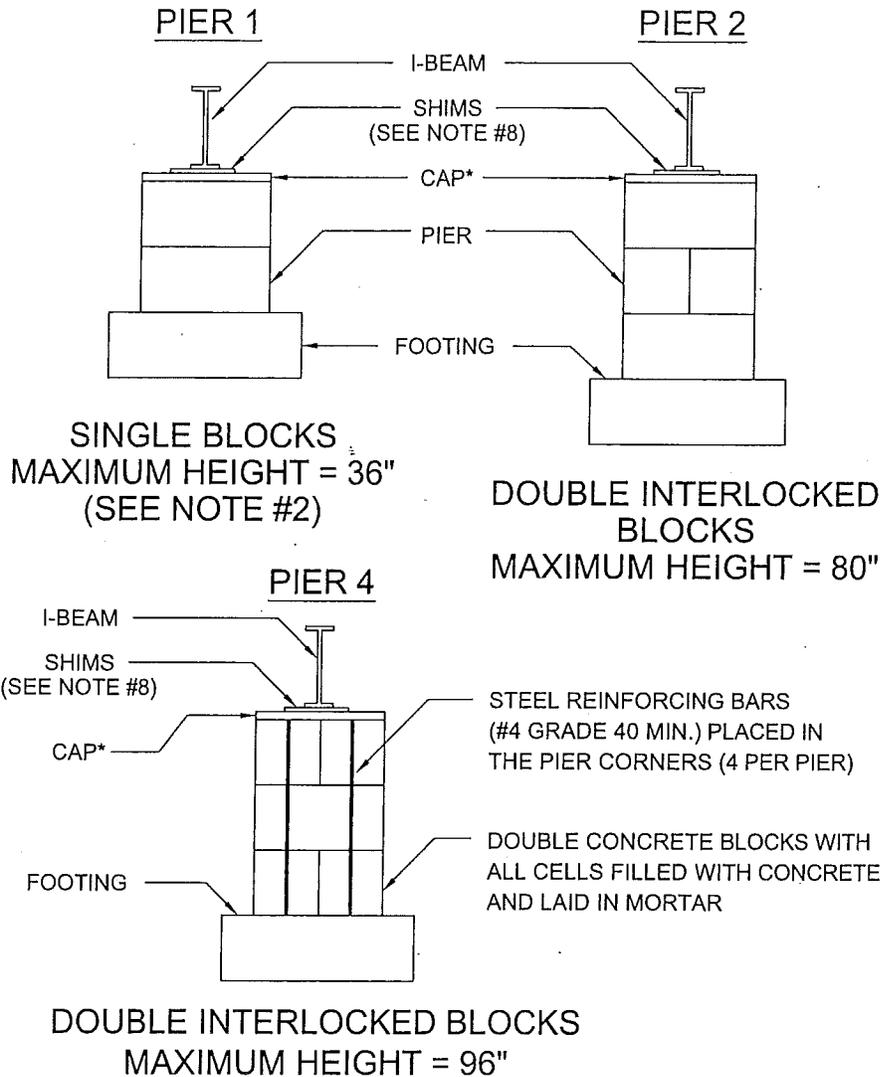
**SECTION VII   SITE ASSEMBLY INSTRUCTIONS**

**SECTION I**  
**SERVICE ENTRANCE LOCATIONS**

**SECTION II**

**PIER CONSTRUCTION**

# TYPICAL PIER CONSTRUCTION



\* CAP IS 4 X 16 X 16 SOLID CONCRETE BLOCK FOR ALL DOUBLE STACKED PIERS AND 2 X 8 X 16" LONG MIN. FOR ALL SINGLE STACKED PIERS (WOOD OR CONCRETE)

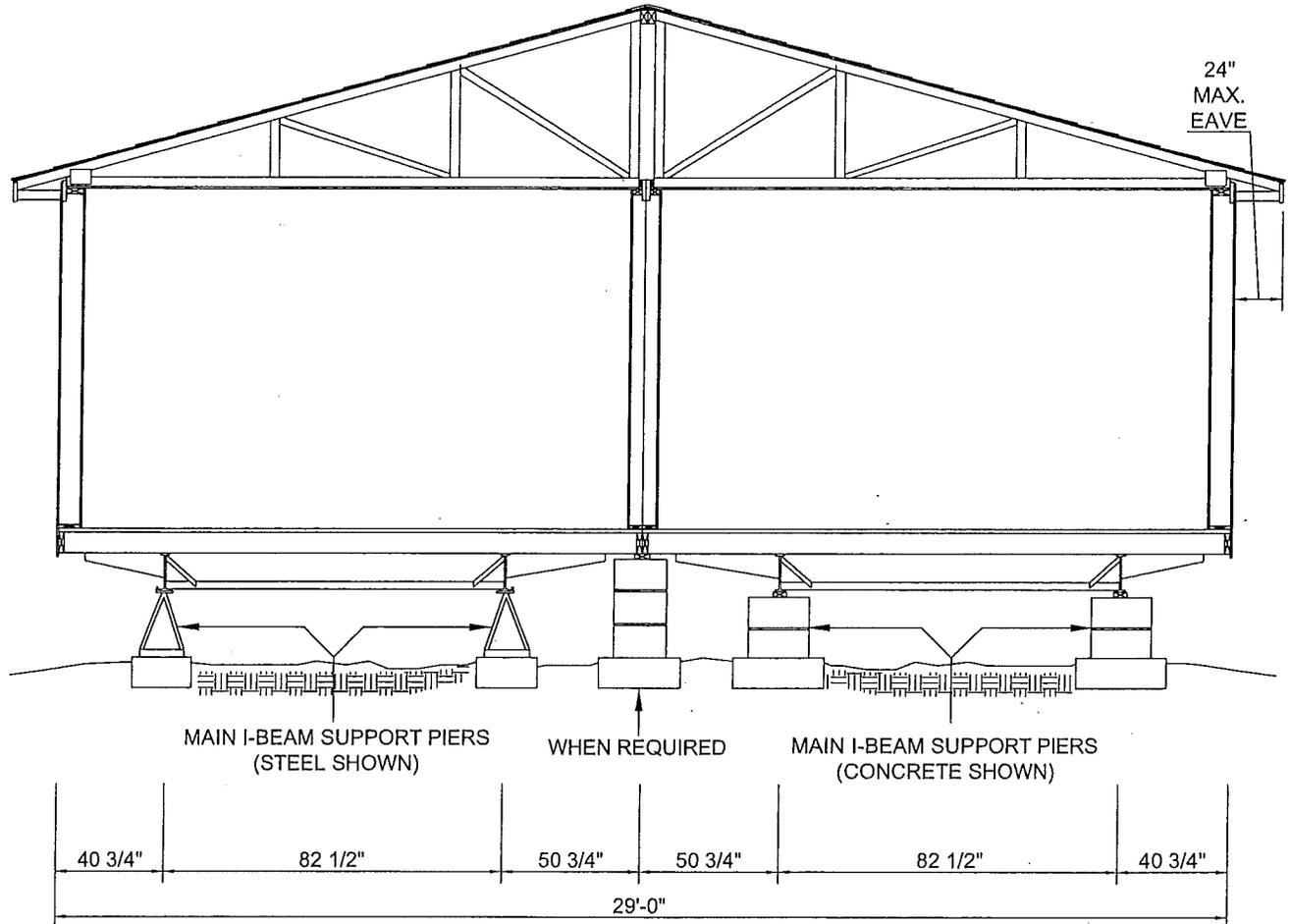
- NOTES:
1. CONCRETE BLOCKS FOR PIERS ARE 8 X 16 X 8 NOMINAL SIZE, HOLLOW CELL LOAD BEARING CMU'S MANUFACTURED IN CONFORMANCE WITH ASTM C90-70, GRADE 'N'. OPEN CELLS ARE VERTICAL.
  2. SINGLE STACKED CONCRETE BLOCKS ARE ORIENTED SO THAT LONG DIRECTION IS PERPENDICULAR TO THE LONG DIRECTION OF THE MAIN BEAM.
  3. FOOTINGS MAY BE PRECAST OR POURED, BUT, IN EITHER CASE, MUST BE LEVEL IN ALL DIRECTIONS.
  4. IT IS RECOMMENDED THAT BOTTOM OF ALL FOOTINGS BE BELOW LOCAL FROST LINE.
  5. PIERS ARE TO BE PLACED ON THE FOOTING APPROXIMATELY CENTERED SO THAT THE FOOTING PROJECTION FROM THE PIER IS EQUAL FROM SIDE-TO-SIDE AND FRONT-TO-BACK. PIERS MUST BE LEVEL VERTICALLY ON ALL SIDES AND SQUARE WITH THE FOOTING.
  6. PREFABRICATED PIERS (TYPE #3) MUST BE CERTIFIED FOR A RATED CAPACITY AT LEAST EQUAL TO THE LOAD DETERMINED FROM THE TABLES & MUST BE INSTALLED ON A FOOTING SIZED FOR SINGLE STACK LOADS.
  7. CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH (F ) OF 3000 PSI AFTER 28 DAYS.
  8. GAP BETWEEN TOP OF PIER AND MAIN FRAME MAY BE A WOOD PLATE (NOT EXCEEDING TWO (2) INCHES IN THICKNESS) AND SHIMS (NOT EXCEEDING ONE (1) INCH IN THICKNESS). SHIMS SHALL BE AT LEAST FOUR (4) INCHES WIDE AND EIGHT (8) INCHES LONG, FITTED AND DRIVEN TIGHT BETWEEN CAP AND MAIN FRAME. WOOD MUST HAVE A DENSITY OF 0.50 (SPECIFIC GRAVITY) OR HIGHER. (SHIMS TO BE PERPENDICULAR TO I-BEAM) TWO (2) INCHES OR FOUR (4) INCHES SOLID CONCRETE BLOCK MAY FILL REMAINDER OF GAP. SEE ALSO FOUNDATION DESIGN : GENERAL NOTES.
  9. PIER HEIGHT MAY BE LIMITED BY THE TIEDOWN SYSTEM. REFER TO TIEDOWN DESIGN IN THIS MANUAL.

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			CHKD. BY:
			SCALE: NONE DSM06

**SECTION III**  
**SUPPORT BLOCKING**

# STANDARD SUPPORT BLOCKING

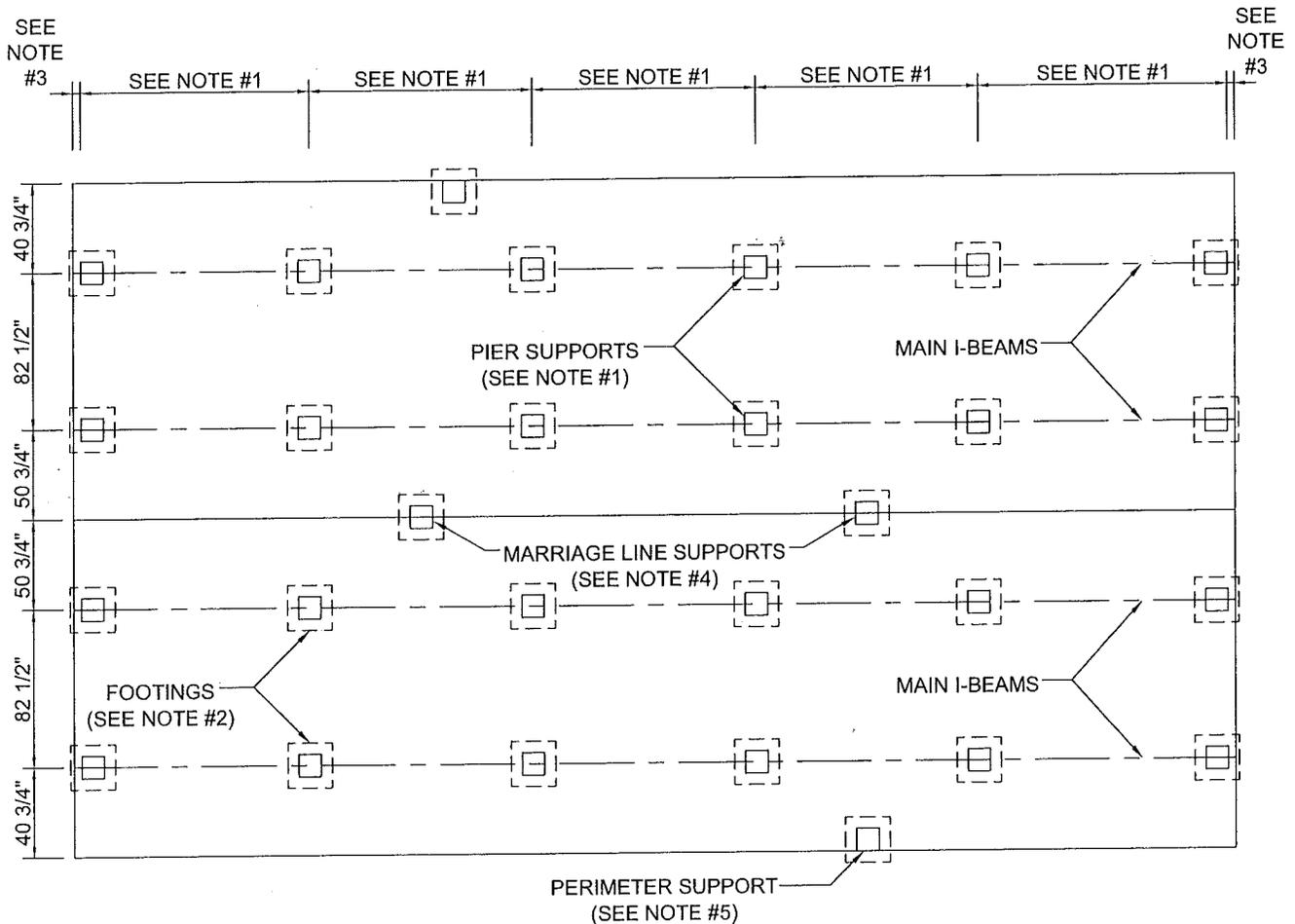
## FOR 30 LB./SQ. FT. ROOF LIVE LOAD



REVISIONS	DATE		DRWG. BY: CES 01/14/04	
			CHIEF® INDUSTRIES	CHKD. BY:
			HOUSING DIVISION	SCALE: NONE DSM08

# TYPICAL BLOCKING LAYOUTS

## STANDARD BLOCKING - 30 LB. ROOF LOAD

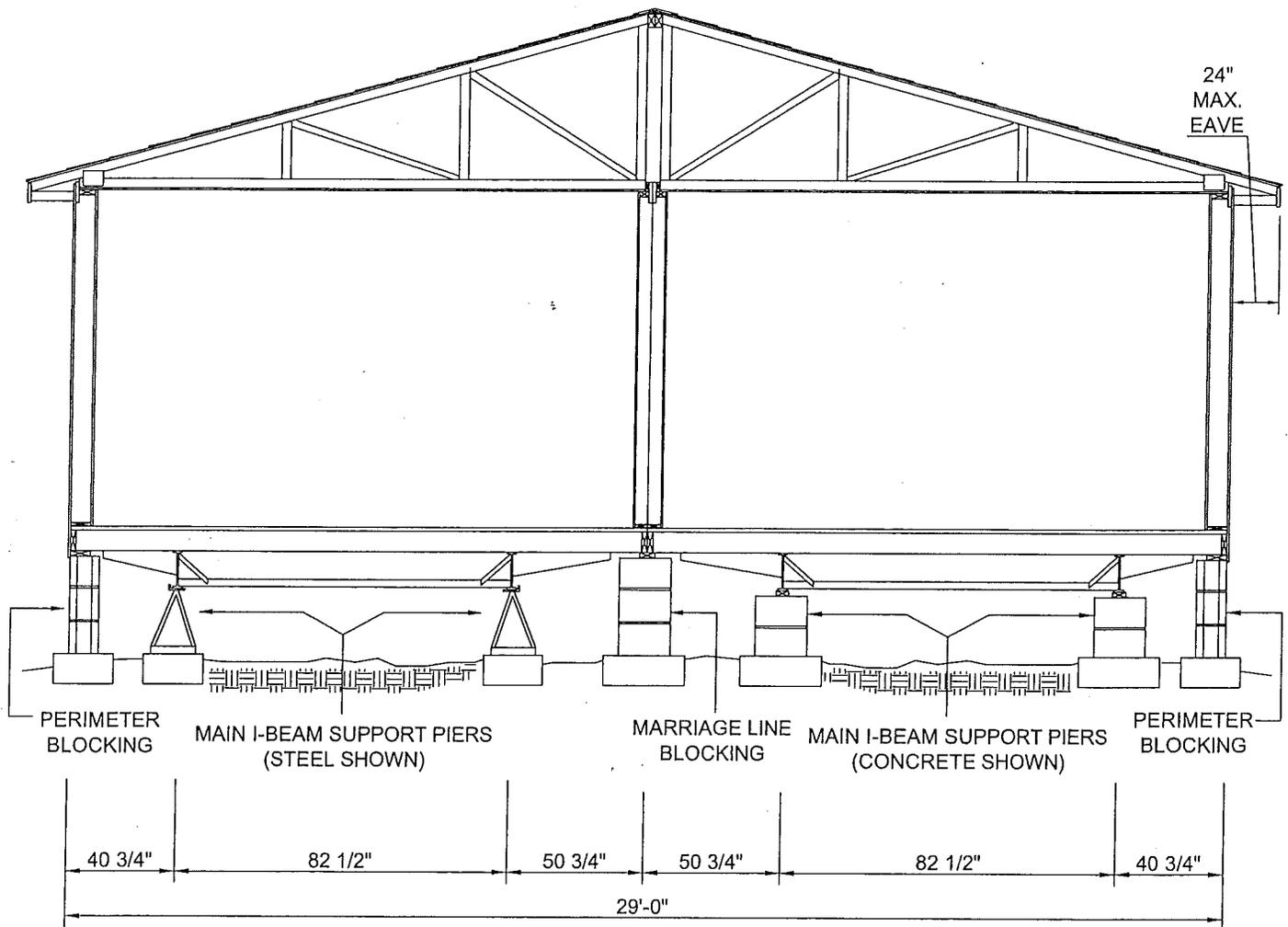


- NOTES:
1. SEE TABLE 3.1 FOR REQUIRED PIER CAPACITY AND SPACING
  2. SEE TABLE 6.1 FOR FOOTING REQUIREMENTS
  3.
    - A. THE EDGE OF THE PIER SHALL BE LOCATED (4 1/2) INCHES IN FROM THE BOTH ENDS OF HOME WITH THE STANDARD FRAME.
    - B. THE EDGE OF THE PIER SHALL BE LOCATED TEN (10) INCH IN FROM THE BOTH ENDS OF HOME WITH THE OPTIONAL TEN (10) INCH RECESSED FRAME.
  4. SEE TABLE 3.2 FOR REQUIRED MARRIAGE LINE PIER CAPACITY
  5. PIERS SHALL BE LOCATED AT THE HINGE SIDE OF ALL EXTERIOR DOORS AND ON BOTH SIDES OF ANY OPENING LARGER THAN (48) INCHES IN WIDTH.
  6. ABOVE DESIGN IS FOR 30 PSF ROOF LIVE LOADS ONLY

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			CHKD. BY:
			SCALE: NONE DSM09

# STANDARD SUPPORT BLOCKING

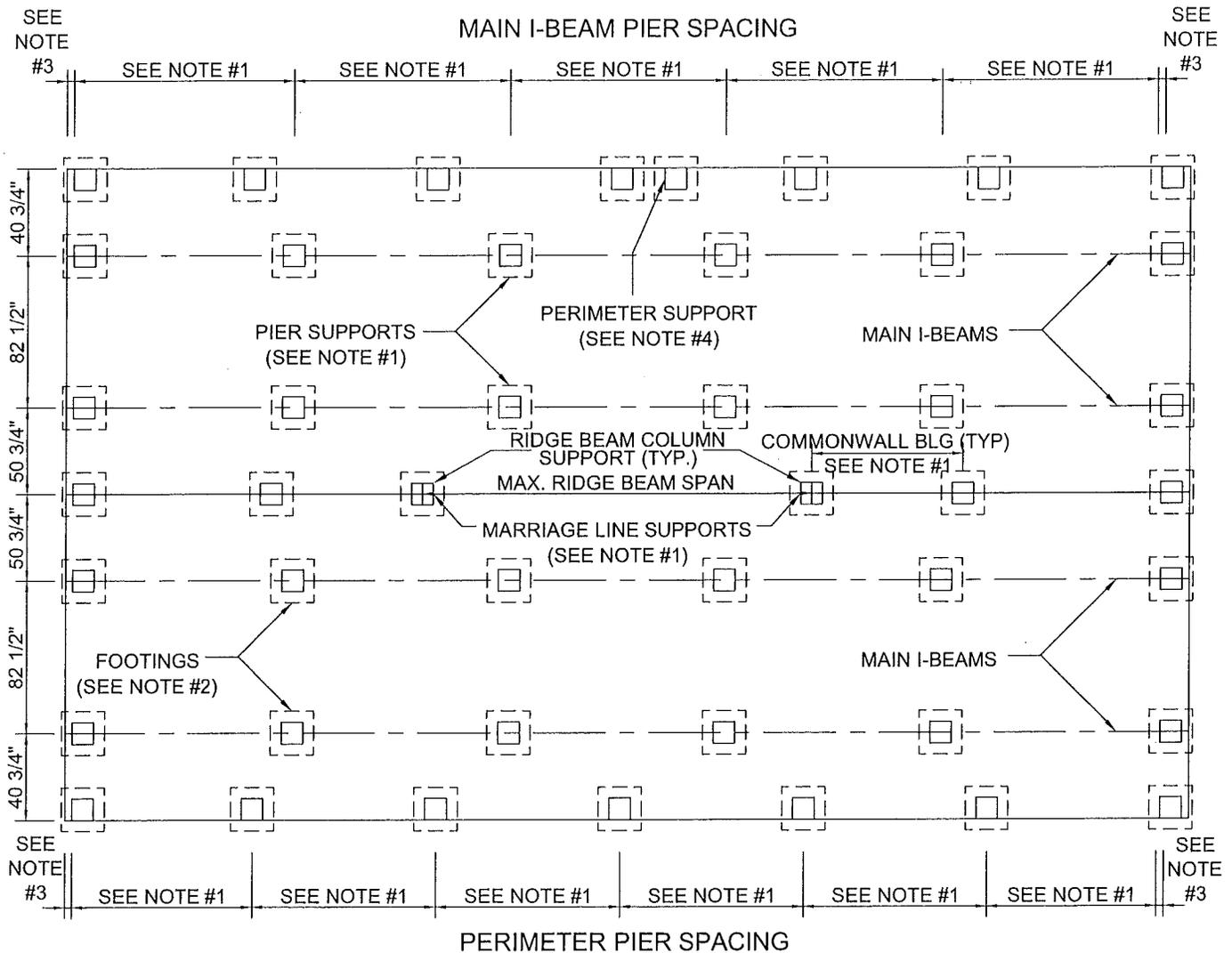
## WITH OPTIONAL ROOF LOADS



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			CHKD. BY:
			SCALE: NONE DSM10

# TYPICAL BLOCKING LAYOUTS

## OPTIONAL ROOF LOADS WITH PERIMETER BLOCKING



- NOTES:
1. A. SEE TABLE 3.3 FOR REQUIRED PIER CAPACITY AND SPACING OF MAIN I-BEAM PIERS
  - B. SEE TABLE 3.4 FOR REQUIRED PIER CAPACITY AND SPACING OF PERIMETER (SIDEWALL) PIERS
  - C. SEE TABLE 3.5 AND 3.6 FOR REQUIRED PIER CAPACITY AND SPACING OF MARRIAGE LINE PIERS
  2. SEE TABLE 6.1 FOR FOOTING REQUIREMENTS
  3. A. THE EDGE OF THE PIER SHALL BE LOCATED (4 1/2) INCHES IN FROM THE BOTH ENDS OF HOME WITH THE STANDARD FRAME.
  - B. THE EDGE OF THE PIER SHALL BE LOCATED (10) INCHES IN FROM THE BOTH ENDS OF HOME WITH THE OPTIONAL TEN (10) INCH RECESSED FRAME.
  4. PIERS SHALL BE LOCATED AT THE HINGE SIDE OF ALL EXTERIOR DOORS AND ON BOTH SIDES OF ANY OPENING LARGER THAN (48) INCHES IN WIDTH.
  5. ABOVE DESIGN IS FOR OPTIONAL ROOF LIVE LOADS ONLY GREATER THAN 30 PSF.

REVISIONS

DATE



CHIEF® INDUSTRIES

HOUSING DIVISION

DRWG. BY: CES 01/15/04

CHKD. BY:

SCALE: NONE DSM11

# MINIMUM PIER CAPACITY TABLES

## WITHOUT PERIMETER SUPPORT MAIN I-BEAM BLOCKING

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	MINIMUM PIER CAPACITY (POUNDS)						
		MAXIMUM PIER SPACING (FEET)						
		4'-0"	5'-4"	6'-8"	8'-0"	9'-4"	10'-8"	12'-0"
32 WIDE (29'-0" FLOOR)	30 PSF	3385	4435	5485	6670	7725	8770	9905

TABLE 3.1

NOTES:

1. MAXIMUM EAVE IS (24) INCHES.
2. MAXIMUM SPACING OF PIERS IS 8'-0" O.C. FOR 8" I-BEAM, 10'-0" O.C. FOR 10" I-BEAM & 12'-0" O.C. FOR 12" I-BEAM. APPLIES TO TABLE 3.1 ONLY.

## RIDGE BEAM COLUMN SUPPORT (30 PSF ROOF LIVE LOAD)

SECTION WIDTH (FEET)	MINIMUM PIER CAPACITY (POUNDS)								
	MAXIMUM RIDGE BEAM SPAN								
	4 FT	8 FT	12 FT	16 FT	20 FT	24 FT	28 FT	32 FT	36 FT
32 WIDE (29'-0" FLOOR)	1995	3300	4600	6060	7365	8770	10075	11530	12935

TABLE 3.2

## WITH PERIMETER SUPPORT MAIN I-BEAM BLOCKING

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	MINIMUM PIER CAPACITY (POUNDS)						
		MAXIMUM PIER SPACING (FEET)						
		4'-0"	5'-4"	6'-8"	8'-0"	9'-4"	10'-8"	12'-0"
32 WIDE (29'-0" FLOOR)	ALL LOADS	1725	2215	2705	3200	3685	4180	4670

TABLE 3.3

## ROOF LOAD PERIMETER (SIDEWALL) BLOCKING

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	MIN. PIER CAPACITY (POUNDS)			
		MAXIMUM PIER SPACING (FEET)			
		4'-0"	5'-4"	6'-8"	8'-0"
32 WIDE (29'-0" FLOOR)	40	2780	3620	4470	5310
	60	3515	4600	5700	6930
	80	4250	5585	7070	8400

TABLE 3.4

## WITH PERIMETER BLOCKING ROOF LOAD MARRIAGE LINE

(COMMONWALL) BLOCKING

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	MIN. PIER CAPACITY (POUNDS)			
		MAXIMUM PIER SPACING (FEET)			
		4'-0"	5'-4"	6'-8"	8'-0"
32 WIDE (29'-0" FLOOR)	40	4415	5800	7345	8830
	60	5575	7500	9380	-
	80	6885	9145	-	-

TABLE 3.5

## RIDGE BEAM COLUMN SUPPORTS

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	MINIMUM PIER CAPACITY (POUNDS)								
		MAXIMUM RIDGE BEAM SPAN (FEET)								
		4 FT	8 FT	12 FT	16 FT	20 FT	24 FT	28 FT	32 FT	
32 WIDE (29'-0" FLOOR)	40	6160	7760	9450	11200	12900	14490	16335	17935	
	60	7015	9290	11620	13895	16320	18500	20670	-	
	80	7480	10335	13340	16350	19100	21860	-	-	

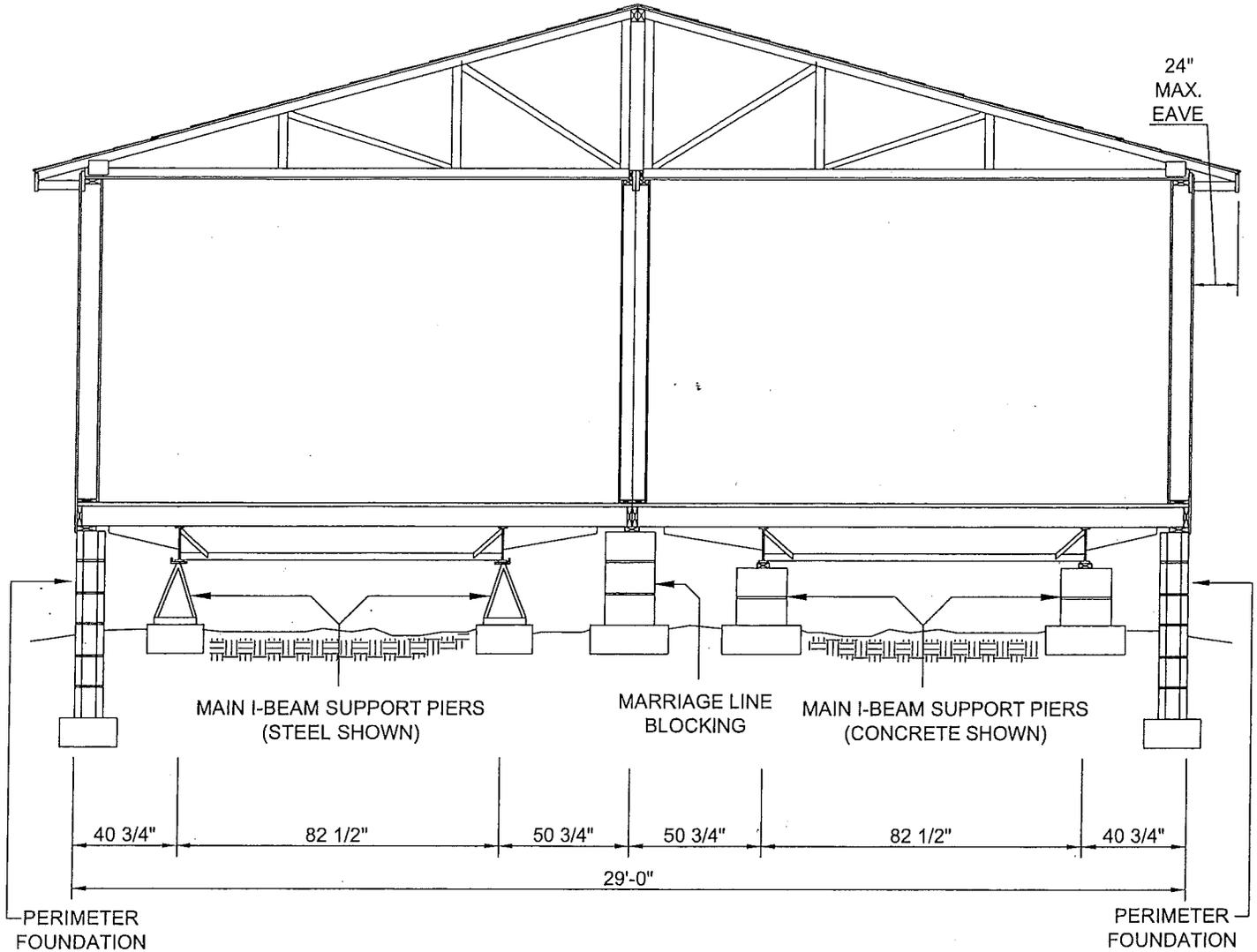
TABLE 3.6

REVISIONS	DATE		<b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/15/04
			CHKD. BY:	
			SCALE: NONE DSM12	

**SECTION IV**

**PERIMETER FOUNDATION**

# PERIMETER FOUNDATION

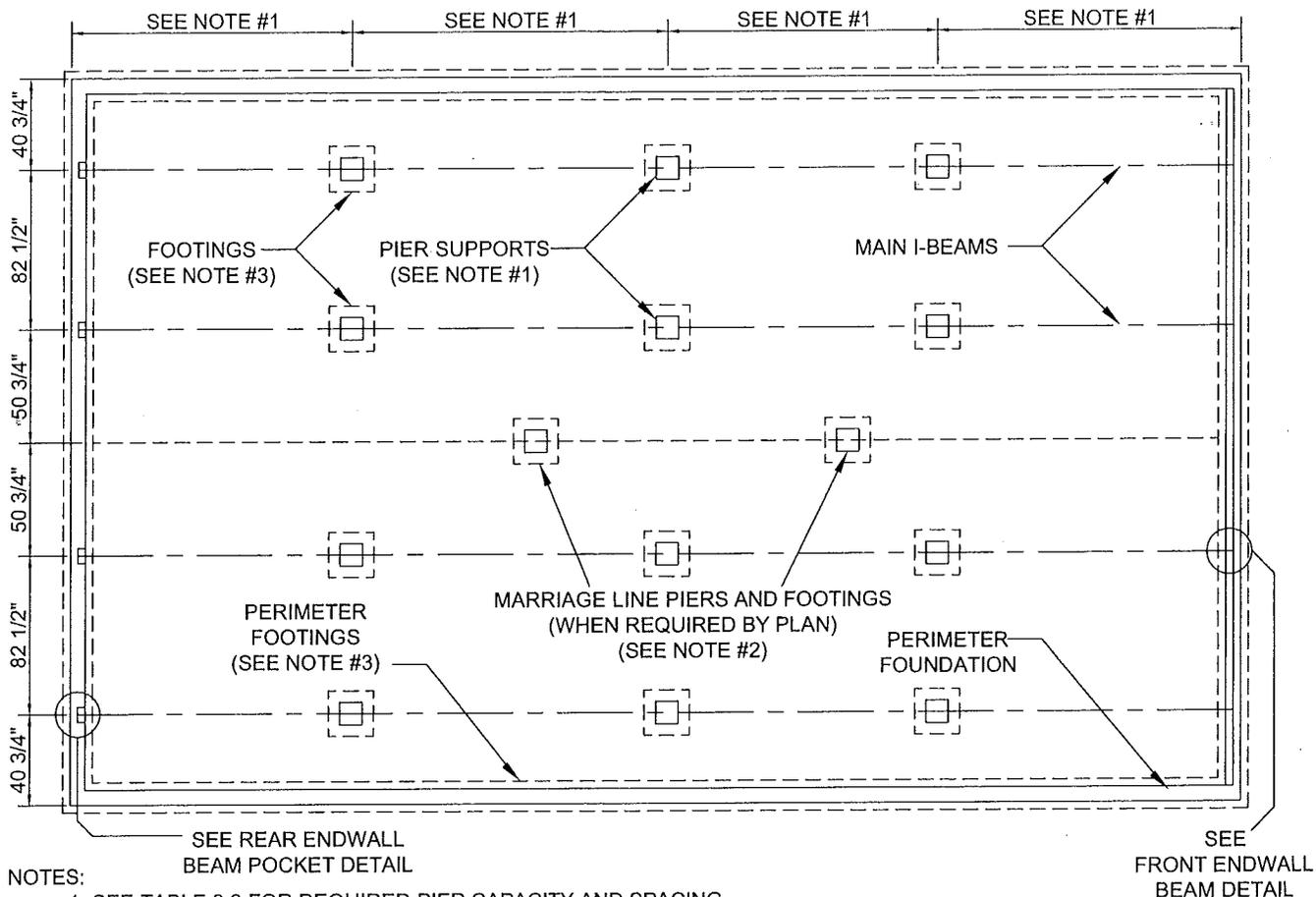


REFER ALSO TO FIG. 4.1 OR 4.2

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/16/04
			CHKD. BY:
			SCALE: NONE DSM14

# TYPICAL BLOCKING LAYOUT

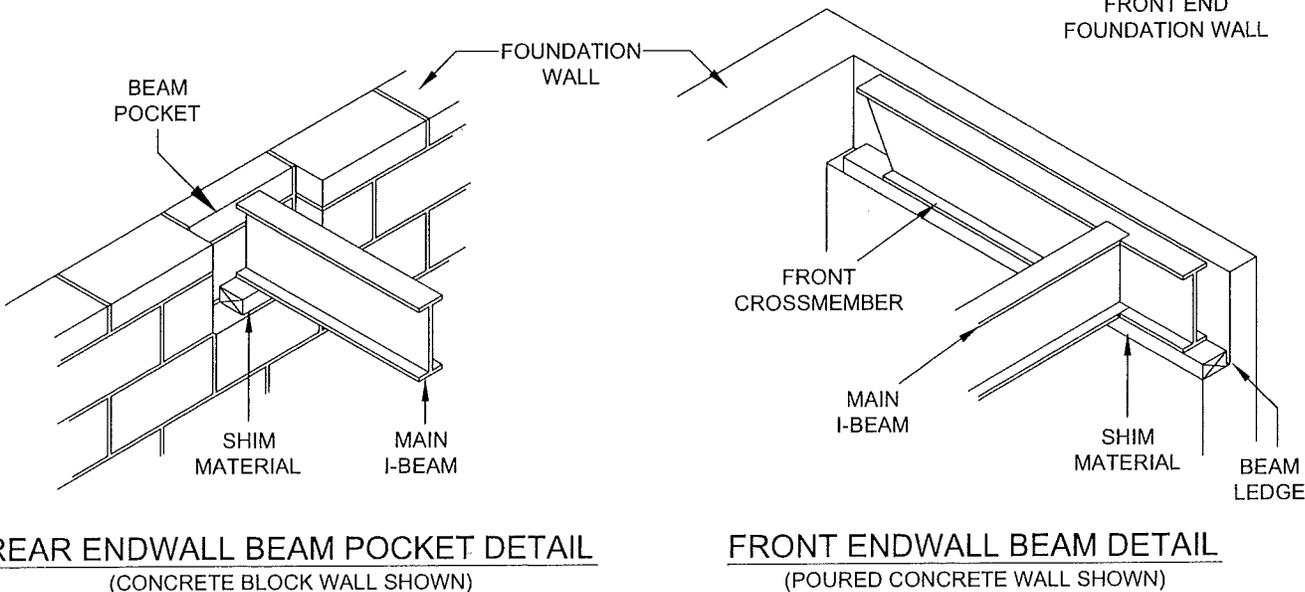
## PERIMETER FOUNDATION - STANDARD



**NOTES:**

1. SEE TABLE 3.3 FOR REQUIRED PIER CAPACITY AND SPACING
2. A. SEE TABLE 3.2 FOR REQUIRED PIER CAPACITY AND SPACING  
B. SEE TABLE 3.5 AND 3.6 FOR REQUIRED PIER CAPACITY AND SPACING
3. SEE TABLE 6.1 FOR FOOTING REQUIREMENTS

\* BEAM LEDGE RUNS ALONG THE ENTIRE FRONT END FOUNDATION WALL

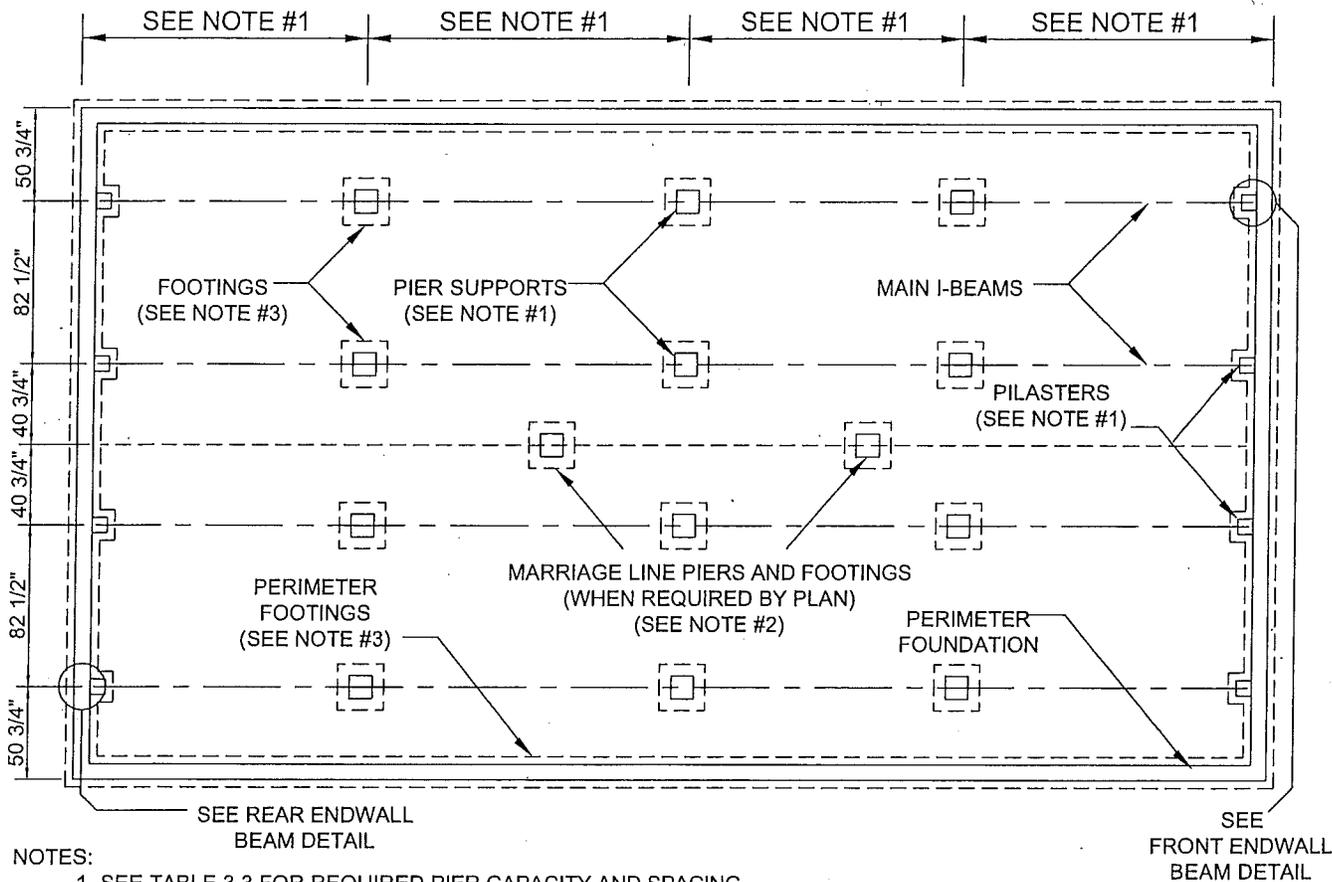


**FIGURE 4.1**

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/16/04
			CHKD. BY:
			SCALE: NONE DSM15

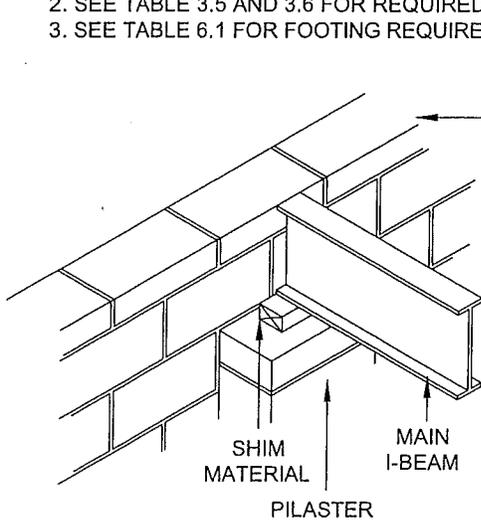
# TYPICAL BLOCKING LAYOUT

## PERIMETER FOUNDATION - 10" RECESSED FRAME

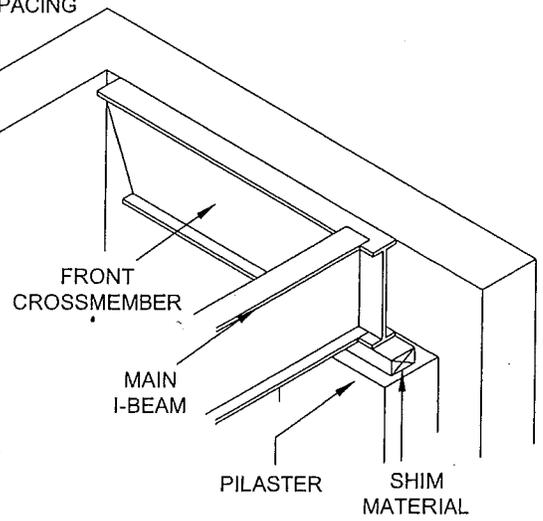


**NOTES:**

1. SEE TABLE 3.3 FOR REQUIRED PIER CAPACITY AND SPACING
2. SEE TABLE 3.5 AND 3.6 FOR REQUIRED PIER CAPACITY AND SPACING
3. SEE TABLE 6.1 FOR FOOTING REQUIREMENTS



**REAR ENDWALL BEAM DETAIL**  
(CONCRETE BLOCK WALL SHOWN)



**FRONT ENDWALL BEAM DETAIL**  
(POURED CONCRETE WALL SHOWN)

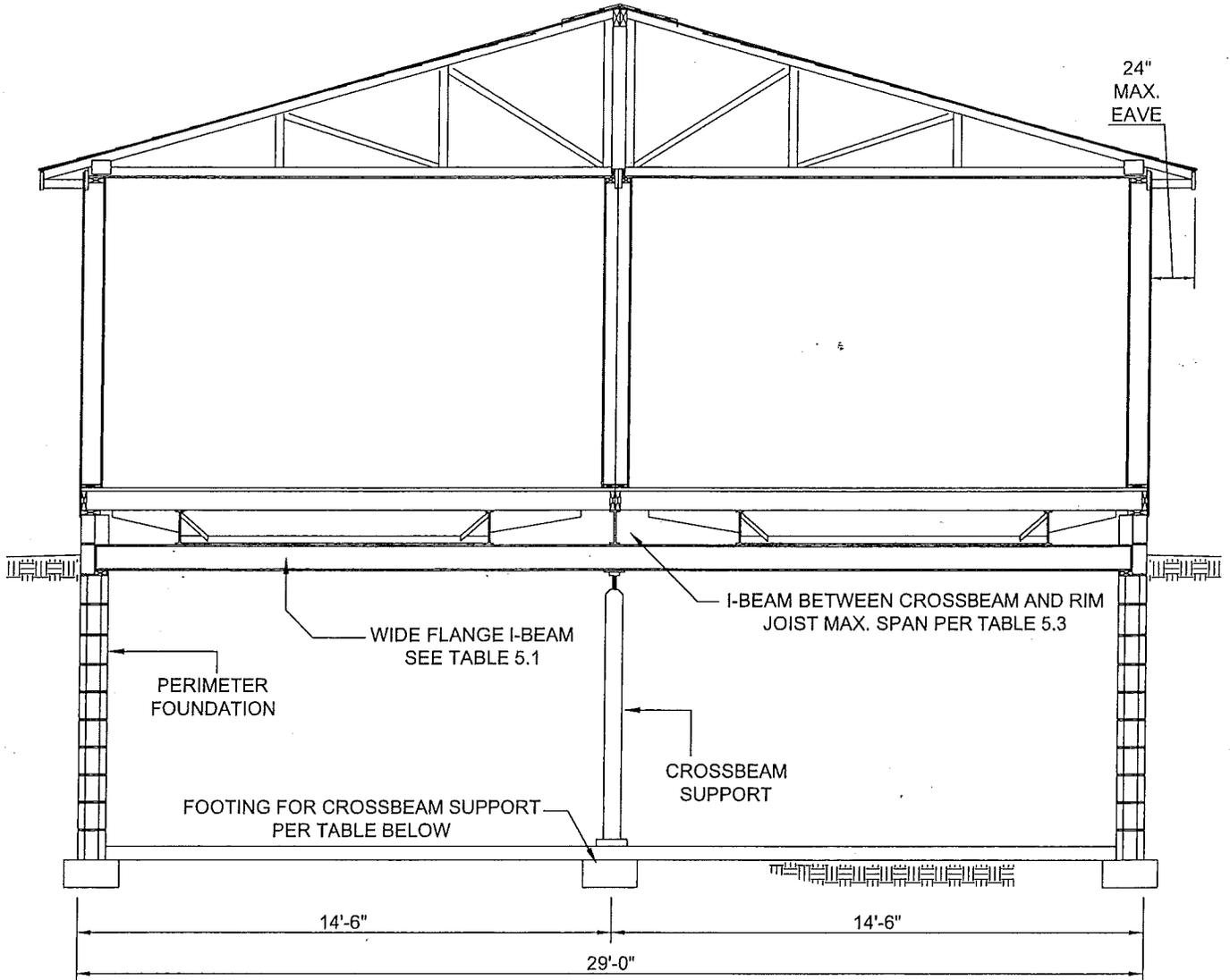
**FIGURE 4.2**

REVISIONS	DATE	<p style="font-size: 1.2em; font-weight: bold; margin: 0;">CHIEF® INDUSTRIES</p> <p style="margin: 0;">HOUSING DIVISION</p>	DRWG. BY: CES 01/16/04
			CHKD. BY:
			SCALE: NONE DSM16

**SECTION V**

**BASEMENT CONSTRUCTION**

# BASEMENT CONSTRUCTION



## FOOTER SIZES @ 2000 PSF SOIL

### ROOF LIVE LOAD (PSF)

### CROSS BEAM SPACING

	<u>8'-0"</u>	<u>9'-4"</u>	<u>10'-8"</u>	<u>12'-0"</u>
30	28X28X8	31X31X10	33X33X10	35X35X12
40	30X30X10	32X32X10	34X34X10	36X36X12
60	32X32X10	35X35X12	37X37X12	39X39X12
80	35X35X12	37X37X12	39X39X12	-

REVISIONS

DATE



**CHIEF® INDUSTRIES**  
HOUSING DIVISION

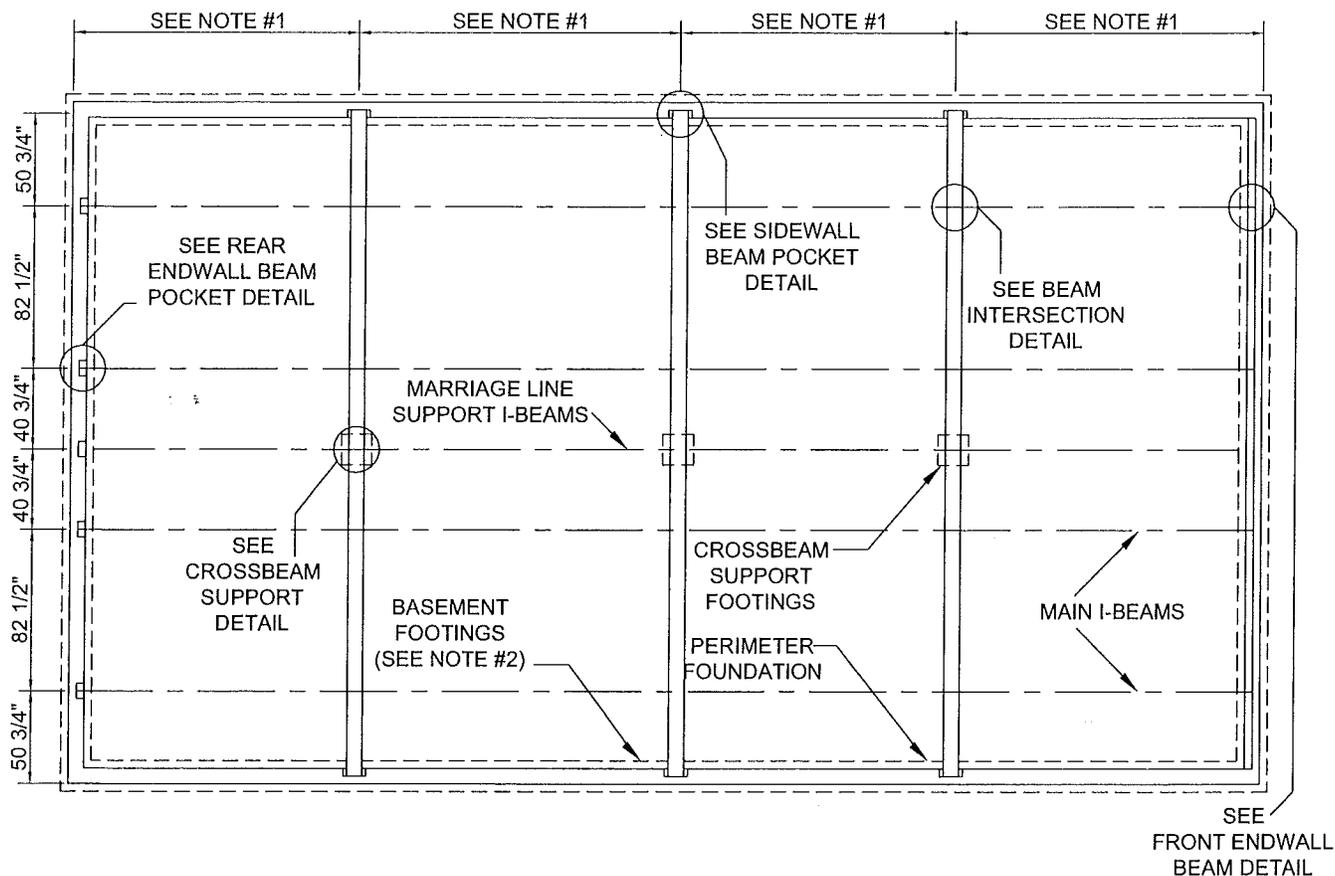
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CHKD. BY:

SCALE: NONE DSM18

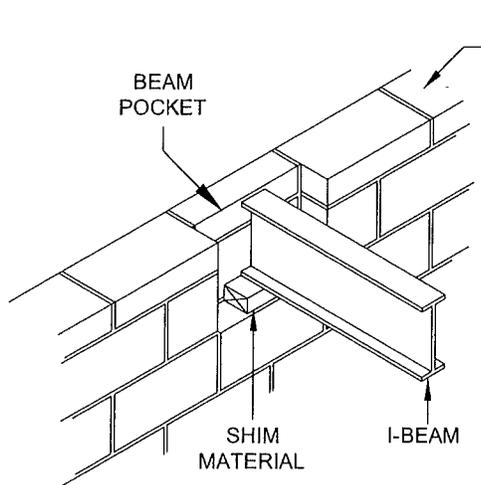
# TYPICAL BASEMENT LAYOUT

## BASEMENT CONSTRUCTION - STANDARD

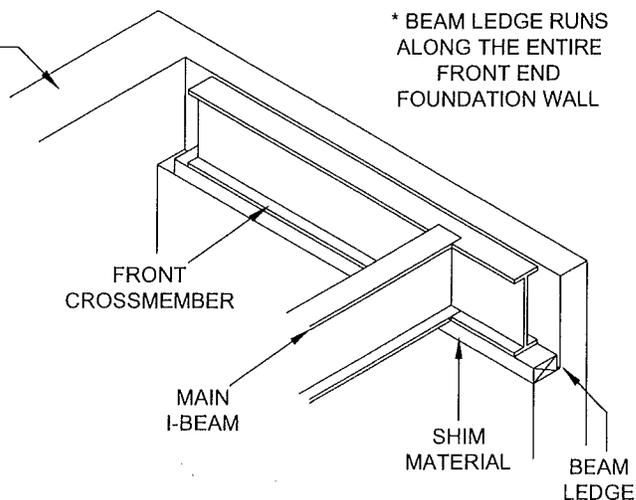


NOTES:

1. SEE TABLE 5.1 FOR REQUIRED BEAM CAPACITY AND SPACING
2. SEE TABLE 6.1 FOR FOOTING REQUIREMENTS



REAR ENDWALL BEAM POCKET DETAIL  
(CONCRETE BLOCK WALL SHOWN)



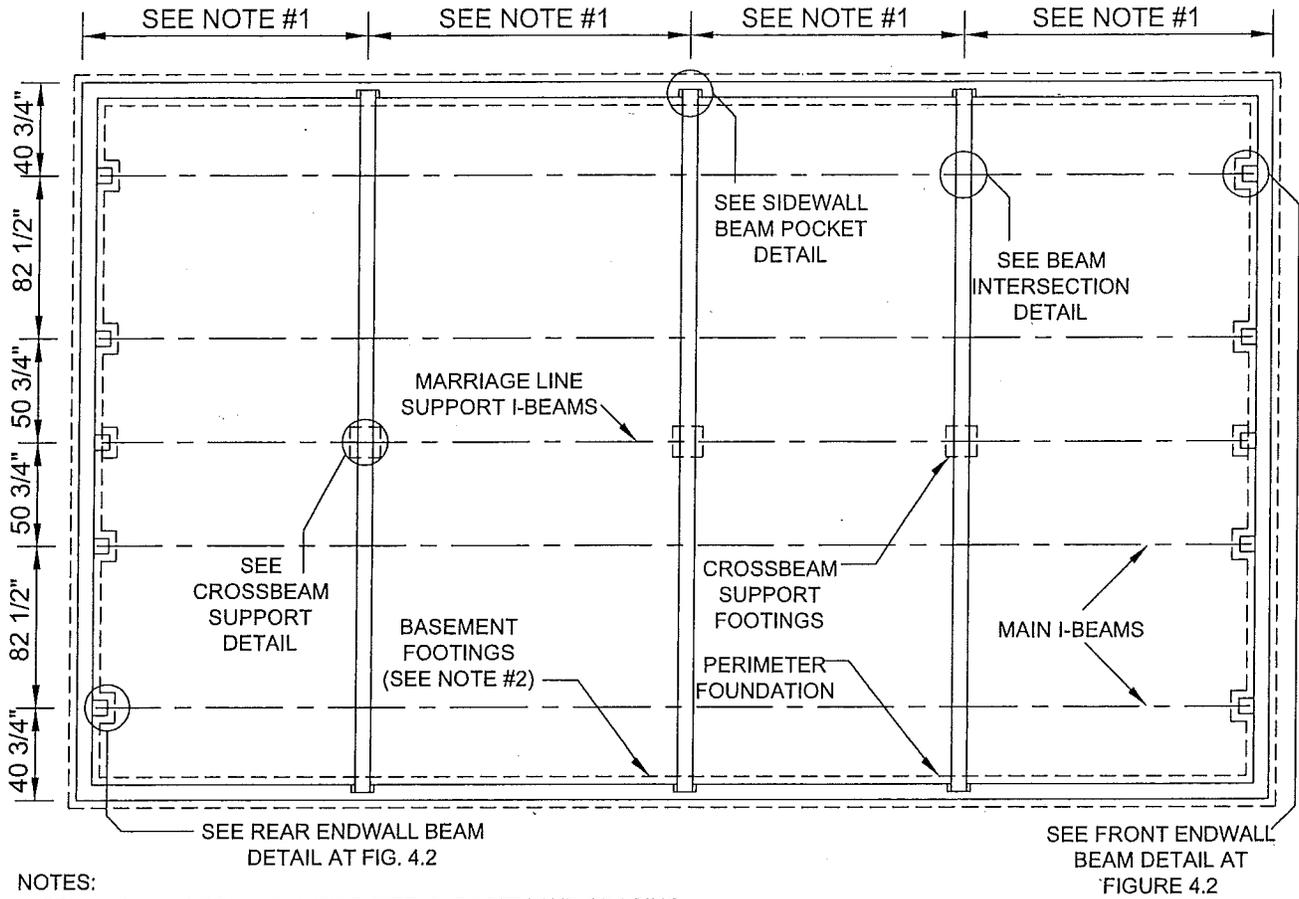
FRONT ENDWALL BEAM DETAIL  
(POURED CONCRETE WALL SHOWN)

FIGURE 5.1

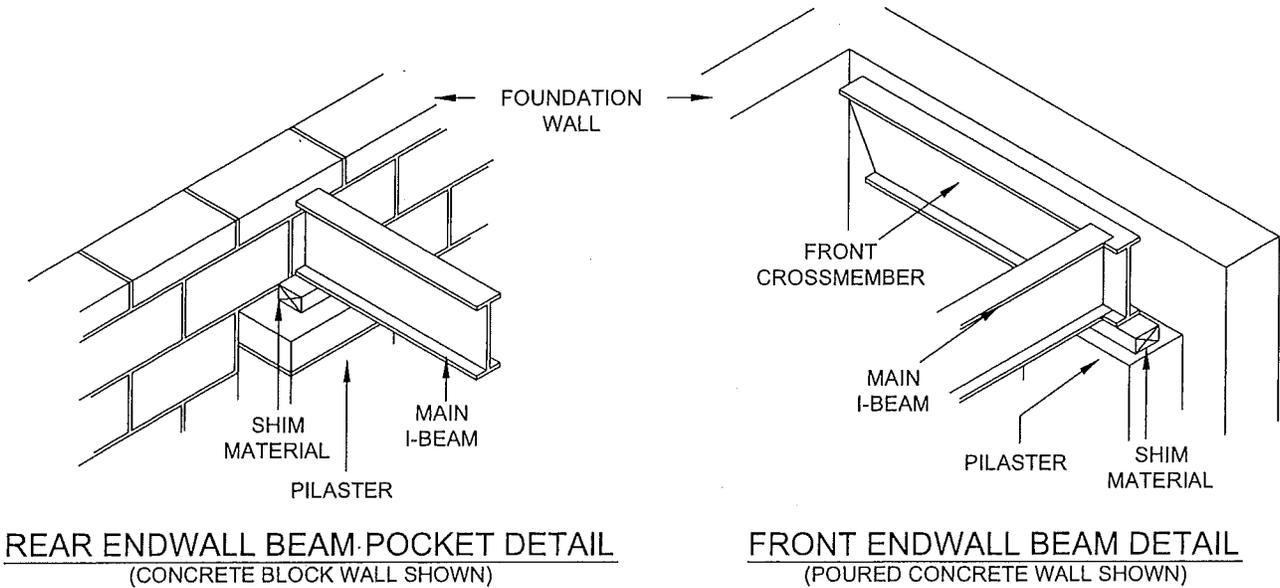
REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/16/04
			CHKD. BY:
			SCALE: NONE DSM19

# TYPICAL BLOCKING LAYOUT

## BASEMENT CONSTRUCTION - 10" RECESSED FRAME



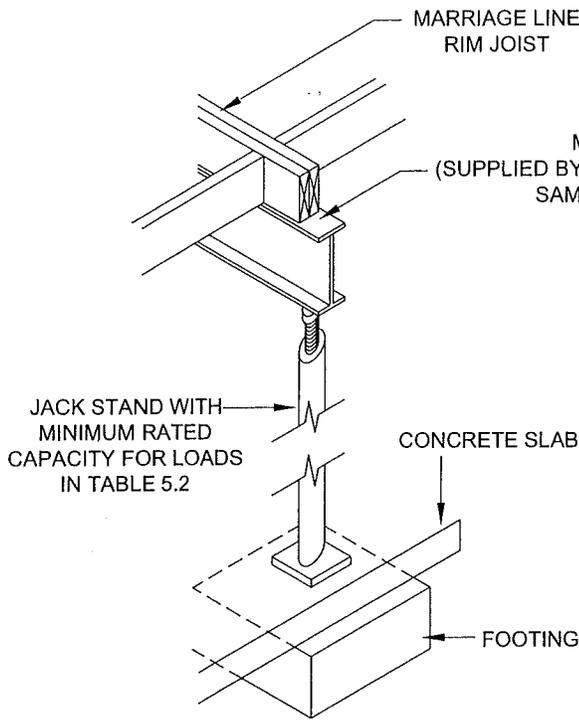
- NOTES:
1. SEE TABLE 3.3 FOR REQUIRED PIER CAPACITY AND SPACING
  2. SEE TABLE 6.1 FOR FOOTING REQUIREMENTS



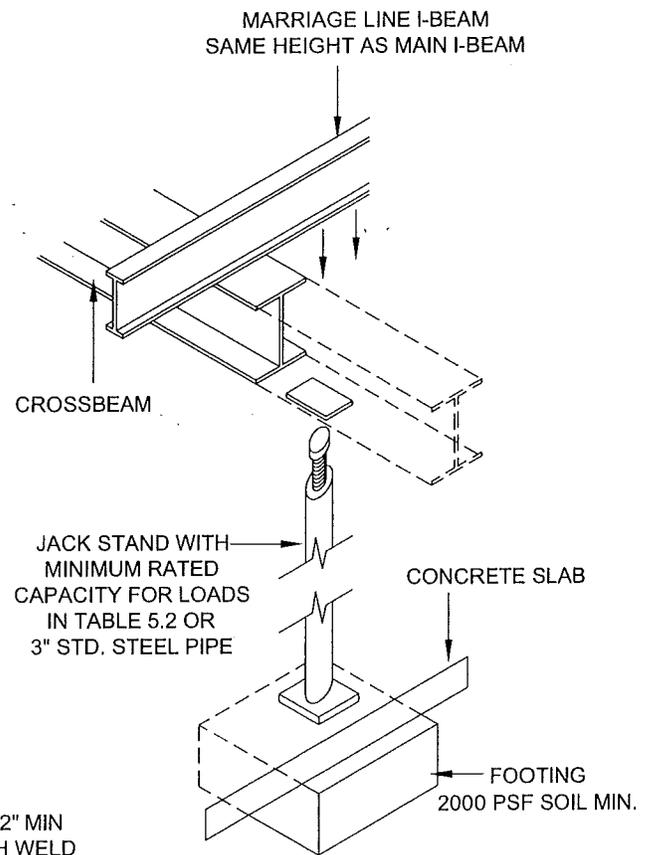
**FIGURE 5.2**

REVISIONS	DATE		<b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/20/04 CHKD. BY: SCALE: NONE DSM20

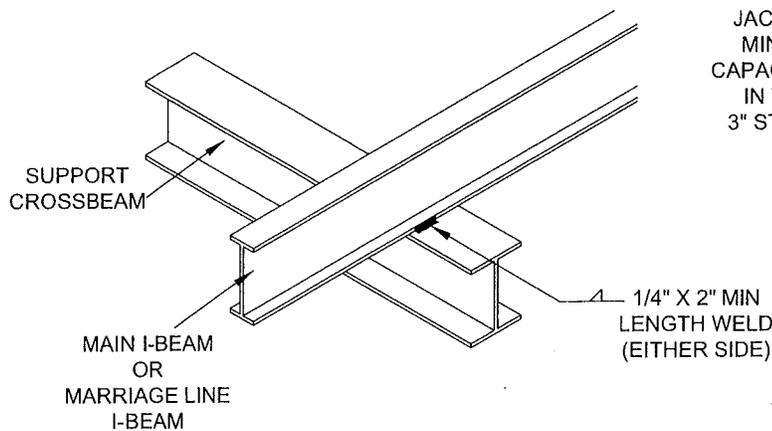
# TYPICAL BASEMENT



**MARRIAGE LINE SUPPORT DETAIL**  
(APPLIES TO BOTH STANDARD AND 10" RECESSED FRAME FOUNDATIONS)



**CROSSBEAM SUPPORT DETAIL**  
(APPLIES TO BOTH STANDARD AND 10" RECESSED FRAME FOUNDATIONS)



**BEAM INTERSECTION DETAIL**  
(APPLIES TO BOTH STANDARD AND 10" RECESSED FRAME FOUNDATIONS)

## FIGURE 5.3

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/16/04
			CHKD. BY:
			SCALE: NONE DSM21

# MINIMUM CROSSBEAM SIZE TABLE

## CROSSBEAM SUPPORT

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	CROSS BEAM DEPTH	MINIMUM CROSSBEAM SIZE			
			MAXIMUM CROSSBEAM SPACING (FEET)			
			8'-0"	9'-4"	10'-8"	12'-0"
32 WIDE (29'-0" FLOOR)	ALL LOADS	6" 8"	W6X16 W8X15	- W8X17	- W8X17	- W8X20

TABLE 5.1

1. USE ANY ONE OF THE BEAMS IN EACH CATEGORY.

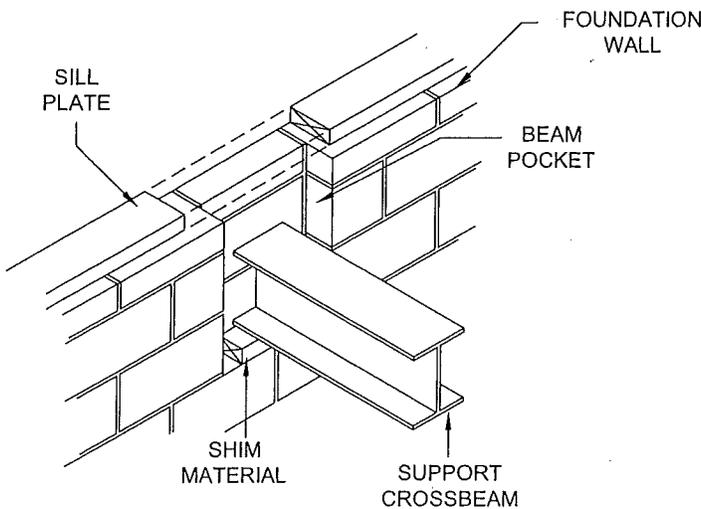
## PIER AND FOOTER CAPACITY (MIN) @ CROSSBEAM SUPPORT(CENTERLINE)

NOTE: POSTS SUPPORTING CROSSBEAMS MUST BE RATED FOR THE APPROPRIATE LOAD  
FLOOR GIRDER MUST BE DESIGNED TO CARRY THE ROOF LOAD AT THE SPECIFIED SPAN

(12) = APPLIES TO ONLY  
12 1/2" MAIN I-BEAM

SECTION WIDTH (FEET)	ROOF LIVE LOAD (PSF)	LOAD @ EACH CROSSBEAM-CENTERLINE SUPPORT			
		CROSSBEAM SPACING (FEET)			
		8'-0"	9'-4"	10'-8"	12'-0"
32 WIDE (29'-0" FLOOR)	30	11000	12750	14560	16375
	40	12000	14000	15950	17915
	60	14000	16330	18670	21000
	80	16050	18725	21400	-

TABLE 5.2



**SIDEWALL BEAM POCKET DETAIL**  
(CONCRETE BLOCK WALL SHOWN)

## DOUBLE-SECTION HOMES CROSSBEAM SUPPORT

MAXIMUM SPAN

SECTION WIDTH (FEET)	MAIN I-BEAM SIZE	ROOF LIVE LOAD (PSF)			
		30	40	60	80
32 WIDE (29'-0" FLOOR)	10"	12'-0"	10'-8"	9'-4"	8'-0"
	12"	12'-0"	12'-0"	12'-0"	10'-8"

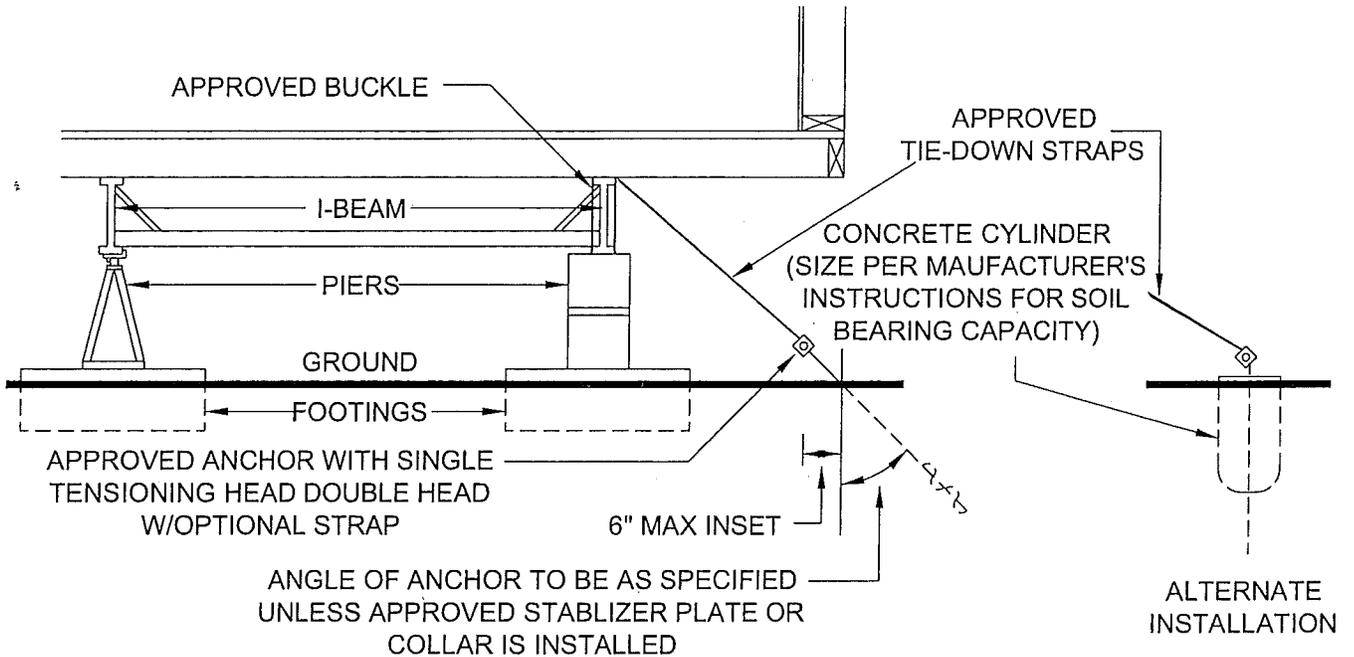
TABLE 5.3

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/16/04
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			SCALE: NONE DSM22

**SECTION VI**

**TYPICAL ANCHORAGE & FOOTINGS INSTRUCTIONS**

# TIE-DOWN STRAP AND ANCHORING POSITION INSTALLATION WITHOUT VERTICAL TIES



**NOTES:**

1. TIE-DOWN STRAPS AND DEVICES TO HAVE A MINIMUM WORKING LOAD RATING OF 3150# (OVERLOAD OF 4725#) AND MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS
2. PROTECTION SHALL BE PROVIDED AT SHARP CORNERS WHERE THE ANCHORING SYSTEM REQUIRES THE USE OF EXTERNAL STRAPS OR CABLES
3. SEE FIGURE 6.2 FOR ADDITIONAL REQUIREMENTS

**FIGURE 6.1**

REVISIONS	DATE	<p style="margin: 0;"><b>CHIEF® INDUSTRIES</b> HOUSING DIVISION</p>	DRWG. BY: CES 01/19/04
			CHKD. BY:
			SCALE: NONE DSM24

# ANCHORAGE DETAILS

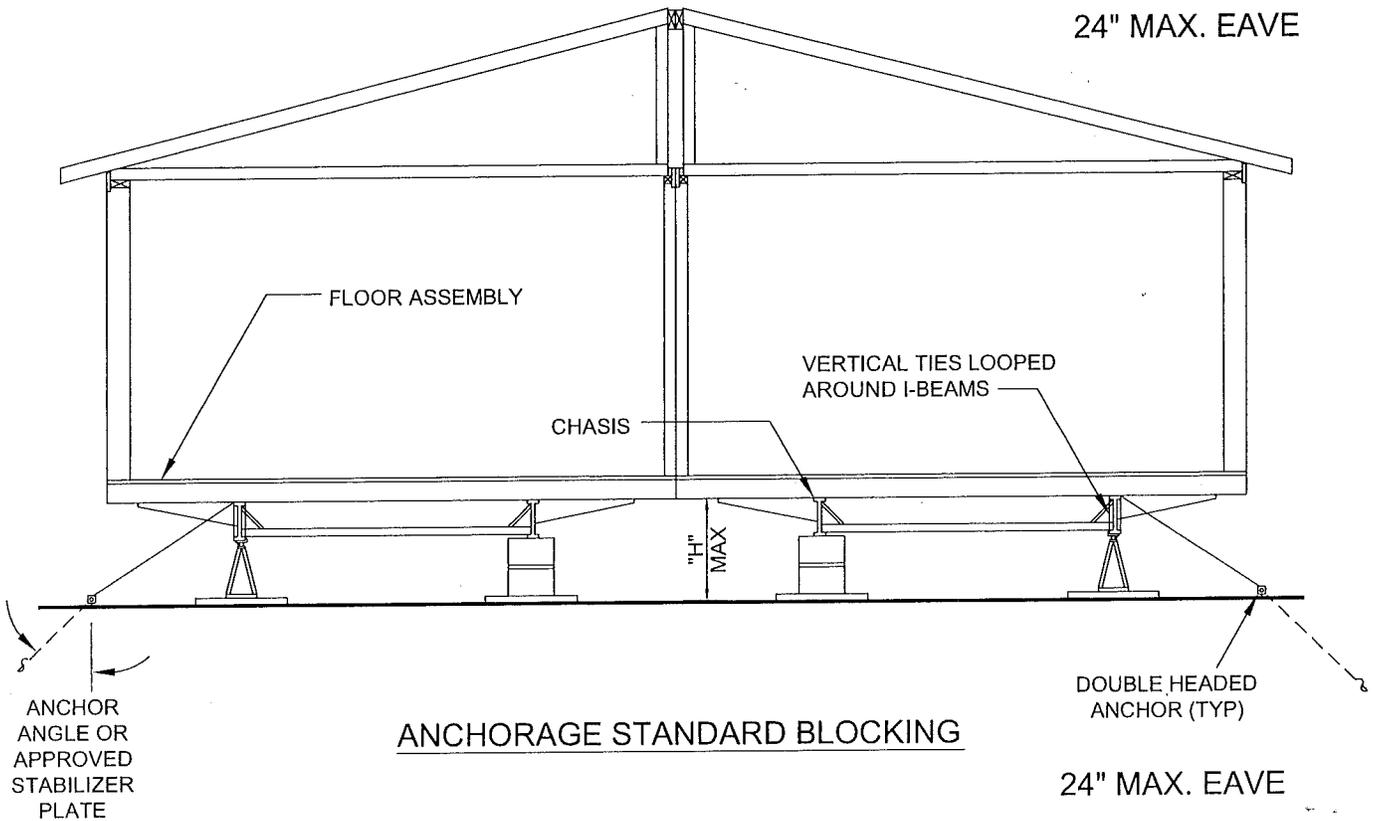
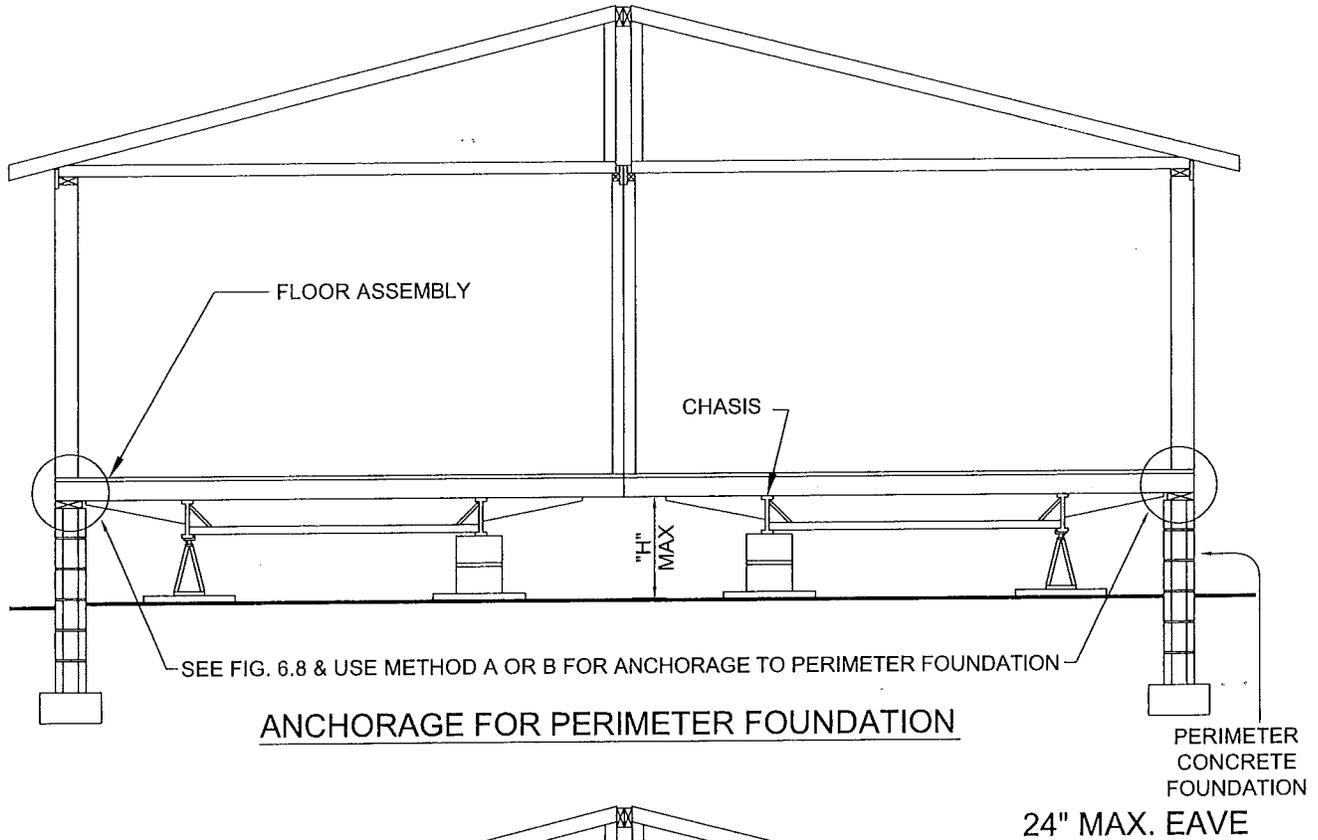
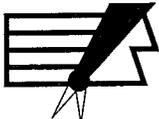
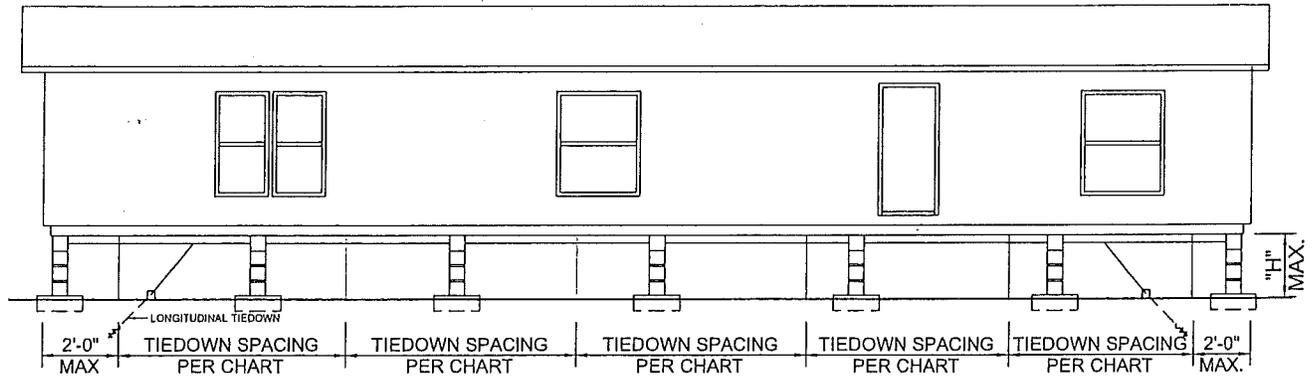


FIGURE 6.2

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/19/04
			CHKD. BY:
			SCALE: NONE DSM25

# RECOMMENDED TIEDOWN SYSTEM - 3:12 PITCH ROOF WIND ZONE 1 / 15 PSF LATERAL



TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

LOADS: HORIZONTAL = 15 PSF X 1.5 SAFETY FACTOR  
UPLIFT = 9 PSF X 1.5 SAFETY FACTOR

FRAME TIE-DOWN SPACING CHART			
FLOOR WIDTH	WIND ZONE 1		
	SPACING	PIER HEIGHT "H" MAX.	ANCHOR ANGLE
29'-0" MIN.	10'-0"	36"	40° - 45°

\* GROUND ANCHORS NOT INSTALLED AT ANGLE SPECIFIED MUST HAVE AN APPROVED STABILIZER PLATE INSTALLED

**NOTES:**

1. FRAME TIE-DOWN SHOULD BE INSTALLED TO PROPERLY SECURE THE HOME.
2. OPTIONAL VERTICAL TIES MAY BE SECURED TO THE SAME GROUND ANCHOR AS THE DIAGONAL TIE-DOWNS WHEN DOUBLE HEADED ANCHOR IS CAPABLE OF RESISTING COMBINED LOADING. 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. DIAGONAL TIE-DOWNS AND ANCHORS ARE NOT SUPPLIED BY CHIEF INDUSTRIES HOUSING DIVISION.
4. ALL TIE STRAPS ARE SUPPLIED BY OTHERS. ANCHORS AND END TREATMENTS ARE TO BE SUPPLIED BY OTHERS.
5. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION LOAD OF 4,725 LBS. AND ARE TO BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, BUT ARE NOT TO EXTEND BEYOND THE SIDEWALL OF THE HOME.
6. STEEL ANCHORING EQUIPMENT EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AT LEAST 0.30 OZ. OF ZINC PER SQUARE FOOT OF STEEL.
7. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0" - MAX. EAVE = 24".
8. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS IN ACCORDANCE WITH THE TABLE AND NOTES 4, 6, & 7.
9. FRAME TIE-DOWNS ARE POSITIONED AT CROSSMEMBER LOCATIONS (WITHIN 3") WHEN STRAP COMES OFF FLANGE OF BEAM WITH APPROVED BUCKLE OR LOOP.
10. ANCHORS SHOULD BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED, WHEN SPECIFIED ANGLE CANNOT BE ACHIEVED.
- \*11. GROUND ANCHORS SHOULD BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE. ANCHORS SHOULD ALSO BE INSTALLED TO THEIR FULL DEPTH, AND STABILIZER PLATES INSTALLED TO PROVIDE RESISTANCE TO OVERTURNING OR SLIDING FORCES.
12. ANCHORING EQUIPMENT SHOULD BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.

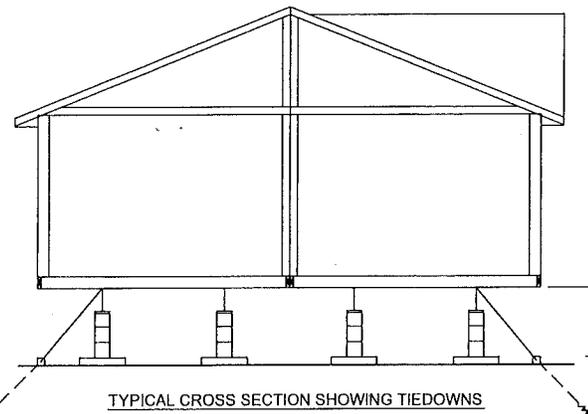
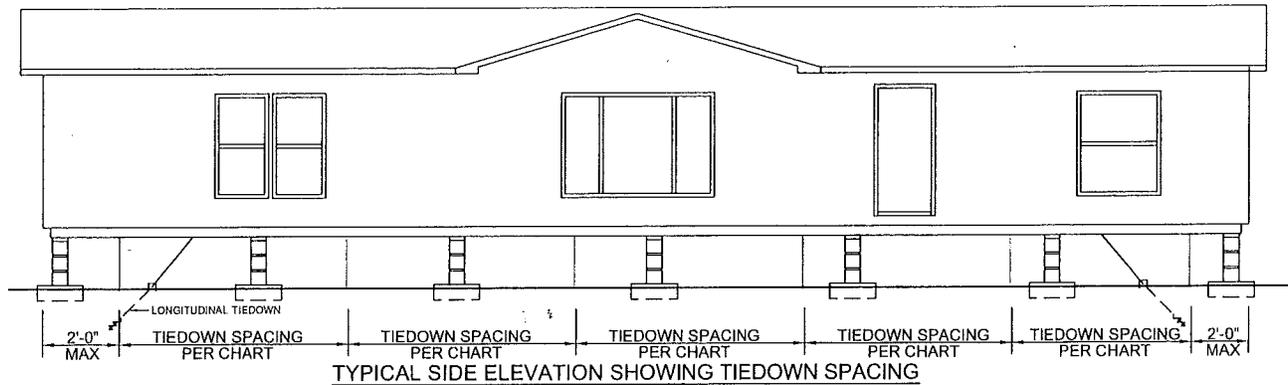
FIGURE 6.3

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES	01/19/04
			CHKD. BY:	
			SCALE: NONE	DSM26

# RECOMMENDED TIEDOWN SYSTEM

## 3:12 ROOF WITH DORMER

### WIND ZONE 1 / 15 PSF LATERAL



FRAME TIE-DOWN SPACING CHART			
FLOOR WIDTH	WIND ZONE 1		
	SPACING	PIER HEIGHT "H" MAX.	STRAP AND ANCHOR ANGLE
29'-0" MIN.	8'-4"	44"	35° - 40°

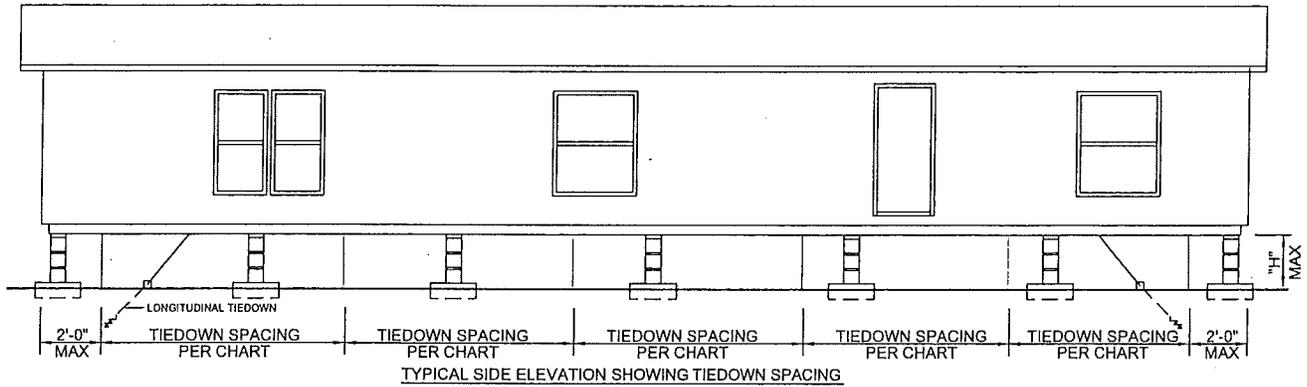
**NOTES:**

1. FRAME TIE-DOWN SHALL BE INSTALLED TO PROPERLY SECURE THE HOME.
2. FRAME TIE-DOWNS AND ANCHORS ARE NOT SUPPLIED BY CHIEF INDUSTRIES HOUSING DIVISION.
3. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING A TENSILE LOAD OF 4,725 LBS. AND ARE TO BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, BUT ARE NOT TO EXTEND BEYOND THE SIDEWALL OF THE HOME.
4. STEEL ANCHORING EQUIPMENT EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AT LEAST 0.30 OZ. OF ZINC PER SQUARE FOOT OF STEEL
5. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0" AT HIGHEST POINT, MAX. EAVE = 24".
6. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
- \*7. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE. ANCHORS SHALL ALSO BE INSTALLED TO THEIR FULL DEPTH, AND STABILIZER PLATES INSTALLED TO PROVIDE RESISTANCE TO OVERTURNING OR SLIDING FORCES, WHEN SPECIFIED ANCHOR ANGLE CANNOT BE ACHIEVED.
8. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
9. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND .035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. THE CHART ABOVE IS ONLY APPLICABLE TO THE VAULTED PORTION OF THE UNIT. FOR TIEDOWN SPACING AND PIER HEIGHTS BEYOND THIS PORTION, REFER TO STANDARD TIEDOWN DESIGNS.

**FIGURE 6.4**

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/19/04
			CHKD. BY:
			SCALE: NONE DSM27

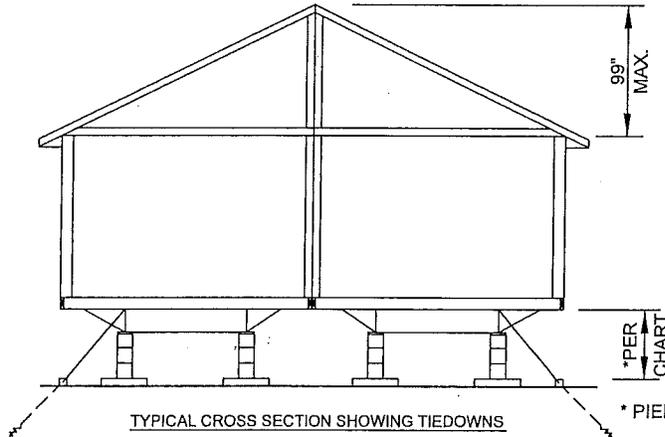
# RECOMMENDED TIEDOWN SYSTEM - 6:12 PITCH ROOF WIND ZONE 1 / 15 PSF LATERAL



FRAME TIE-DOWN SPACING CHART			
WIND ZONE 1			
FLOOR WIDTH	SPACING	MAX. PIER HEIGHT (H MAX)	EAVE OVERHANG
29'-0"	5'-9"	32"	45° - 50°

6:12 ROOF SLOPE (ALTERNATE WITH BLOCK PIERS*)			
FLOOR WIDTH	MINIMUM UNIT LENGTH		NUMBER OF LONGITUDINAL TIES TOTAL EACH END
	SINGLE STACK	DOUBLE STACK	
29'-0"	72'-0"	60'-0"	0
	29'-0"	29'-0"	2

\* FOR USE IN ABOVE TABLES  
SINGLE STACK BLOCK PIERS = 28" MAX HEIGHT  
DOUBLE STACK BLOCK PIERS = 64" MAXIMUM HEIGHT  
MINIMUM STRAP ANGLE (DEGREES) = 40



6:12 ROOF SLOPE		
FLOOR WIDTH	MIN QTY EACH END EACH SECTION	MIN STRAP ANGLE (DEGREES)
29'-0"	2	40°

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

**NOTES:**

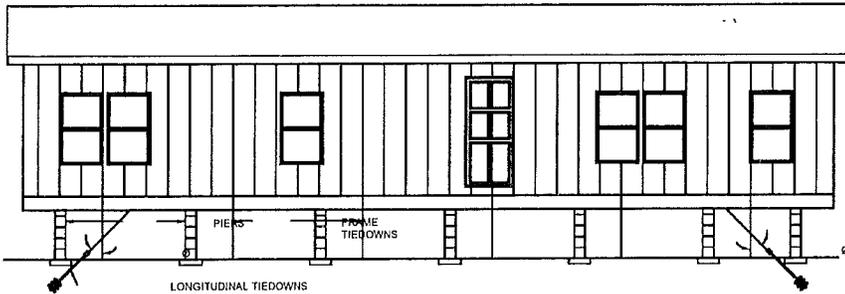
1. FRAME TIE-DOWN SHALL BE INSTALLED TO PROPERLY SECURE THE HOME.
2. FRAME TIE-DOWNS AND ANCHORS ARE NOT SUPPLIED BY CHIEF INDUSTRIES HOUSING DIVISION.
3. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING A TENSILE LOAD OF 4,725 LBS. AND ARE TO BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, BUT ARE NOT TO EXTEND BEYOND THE SIDEWALL OF THE HOME.
4. STEEL ANCHORING EQUIPMENT EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AT LEAST 0.30 OZ. OF ZINC PER SQUARE FOOT OF STEEL.
5. DESIGN BASED ON 82 1/2" I-BEAM SPACING AND A MAXIMUM SIDEWALL HEIGHT OF 9'-0", MAX. EAVE = 24".
6. ANCHORS SHALL BE CERTIFIED FOR THESE CONDITIONS BY A PROFESSIONAL ENGINEER, ARCHITECT OR A NATIONALLY RECOGNIZED TESTING LABORATORY AS TO THEIR RESISTANCE, BASED ON THE INSTALLED ANGLE OF DIAGONAL TIE AND/OR VERTICAL TIE LOADING AND ANGLE OF ANCHOR INSTALLATION, AND TYPE OF SOIL IN WHICH THE ANCHOR IS TO BE INSTALLED.
- \*7. GROUND ANCHORS SHALL BE EMBEDDED BELOW THE FROST LINE AND BE AT LEAST 12" ABOVE THE WATER TABLE. ANCHORS SHALL ALSO BE INSTALLED TO THEIR FULL DEPTH, AND STABILIZER PLATES INSTALLED TO PROVIDE RESISTANCE TO OVERTURNING OR SLIDING FORCES, WHEN SPECIFIED ANCHOR ANGLE CANNOT BE ACHIEVED.
8. ANCHORING EQUIPMENT SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT TO RESIST THESE SPECIFIED FORCES IN ACCORDANCE WITH TESTING PROCEDURES IN ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
9. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1 1/4" WIDE AND .035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM "STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS".
10. ANGLE OF ANCHOR TO BE AT SAME ANGLE AS STRAP UNLESS APPROVED STABILIZER PLATE OR COLLAR IS INSTALLED.

**FIGURE 6.5**

REVISIONS	DATE	 <b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: CES 01/19/04
			CHKD. BY:
			SCALE: NONE DSM28

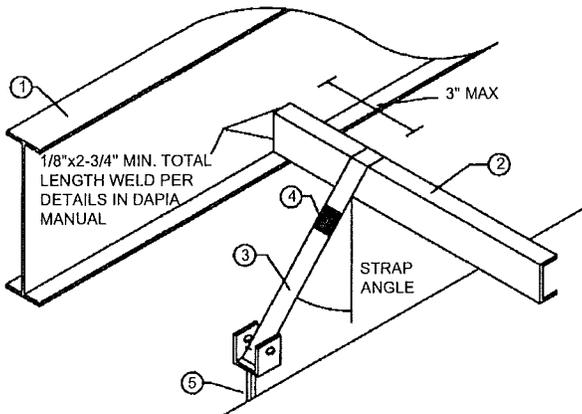
# WIND ZONE 1 (15 PSF LATERAL) RECOMMENDED TIEDOWN SYSTEM (ALTERNATIVE) LONGITUDINAL TIEDOWN REQUIREMENTS

TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING



**ATTACHMENT DETAIL**

- 1: TYPICAL LONGITUDINAL I-BEAM
- 2: TYPICAL FRAME CROSSMEMBER  
(1-1/2"x2"x1-1/2"x13 GA MINIMUM)
- 3: TIEDOWN STRAP
- 4: BANDING SEAL
- 5: GROUND ANCHOR - INSTALLED TO FULL DEPTH OF ANCHOR HEAD



**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 THE KARSTEN COMPANY.
4. GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION LOAD OF 4725# & 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 A MAXIMUM SIDEWALL HEIGHT OF 9'-0" AND 82 1/2" I-BEAM SPACING.
7. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAMS AT CROSSMEMBERS IN ACCORDANCE WITH THE TABLE AND NOTES 3, 4, 5, 13, & 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 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.
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 D3593-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
12. STRAPPING TO BE TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1-1/4" WIDE AND .035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATIONS D3953-91, "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 BEAMS 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 INSTRUCTION WITH AN APPROVED STABILIZING PLATE.
15. LONGITUDINAL TIES ARE INSTALLED JUST INSIDE I-BEAM AT CROSSMEMBERS AT EACH END AND CANNOT BE DOUBLED.

**FIGURE 6.7**

ROOF SLOPE NOT EXCEEDING 20 DEGREES (ALTERNATE WITH BLOCK PIERS*)				ROOF SLOPE NOT EXCEEDING 20 DEGREES NO RESTRICTION AS TO PIER TYPE OR HEIGHT (EXCEPT AS LIMITED BY OTHER DETAILS)		
FLOOR WIDTH	MINIMUM UNIT LENGTH		NUMBER OF LONGITUDINAL TIES (TOTAL EACH END)	FLOOR WIDTH	MINIMUM QUANTITY EACH END OF EACH SECTION	MINIMUM STRAP ANGLE (DEGREES)
	SINGLE STACK	DBL STACK				
29'-0" DOUBLE WIDE	73'-0" 29'-0"	62'-0" 29'-0"	0 2	174" DBL WIDE*	2	40°
* FOR USE IN ABOVE TABLE: SINGLE STACK BLOCK PIERS = 28" MAX. HEIGHT DOUBLE STACK BLOCK PIERS = 64" MAX. HEIGHT MINIMUM ANGLE OF STRAP = 40 DEGREES				** THIS INCLUDES TAG UNITS		* MAY REDUCE TO (0) OR (1) LONGITUDINAL TIE PIER HALF WITH PIER RESTRICTIONS PER CHART TO LEFT

REVISIONS	DATE		<b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: <b>CES</b>	01/19/04
			CHKD. BY:		
			SCALE: NONE	DSM29	

# Sill Plate Connections (Method A & B)

2-10D @ SIDE & 4-10D @ TOP NAILS AT EACH MUD SILL ANCHOR (MASB OR EQUIVALENT) INTO SILL PLATE, 6'-0" O.C.

PRESSURE TREATED SILL PLATE

RIM JOIST

FLOOR JOIST

## Method A

PRESSURE TREATED SILL PLATE

RIM JOIST

## Method B

FLOOR JOIST

1/2" X 8" FOUNDATION ANCHOR @ 6'-0" O.C. AND 12" MAX. IN FROM EACH CORNER

FOUNDATION WALL

\* THESE DETAILS APPLY TO BOTH PERIMETER FOUNDATION WITH PIERS & BASEMENT CONSTRUCTION.

\* ANCHORAGE DESIGNED FOR STANDARD WIND ZONE 1 (15 PSF HORIZONTAL, 9 PSF UPLIFT)

### NOTES FOR METHOD A & B :

- 1) ROOF PITCH UP TO 6/12, MAX. SIDEWALL HEIGHT = 9'-0", MAX. EAVE = 24".
- 2) ALL FASTENERS (INCLUDING ANCHOR BOLTS & WASHERS) IN CONTACT WITH PRESSURE TREATED SILL PLATE TO BE G185 COATED.
- 3) ANCHOR BOLTS & WASHERS TO BE GALVANIZED TO G185 (Z MAX) COATING, MIN. MINIMUM EMBEDMENT INTO CONCRETE IS 7" & MIN INTO MASONRY IS 15"

REVISIONS

DATE



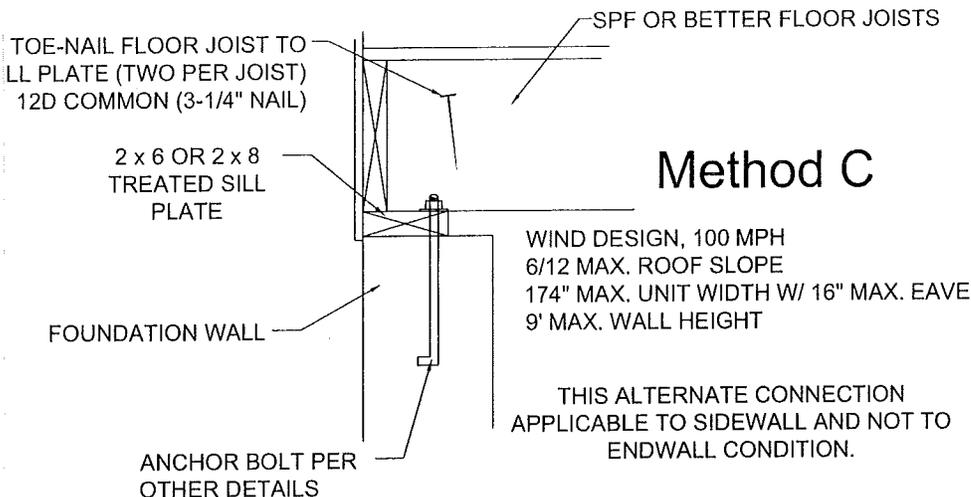
CHIEF® INDUSTRIES  
HOUSING DIVISION

DRWG. BY: CES 12/09/04

CHKD. BY:

SCALE: NONE DSM30

# Joist to Sill Plate Connections (Method C, D & E)



## Method C

WIND DESIGN, 100 MPH  
6/12 MAX. ROOF SLOPE  
174" MAX. UNIT WIDTH W/ 16" MAX. EAVE  
9' MAX. WALL HEIGHT

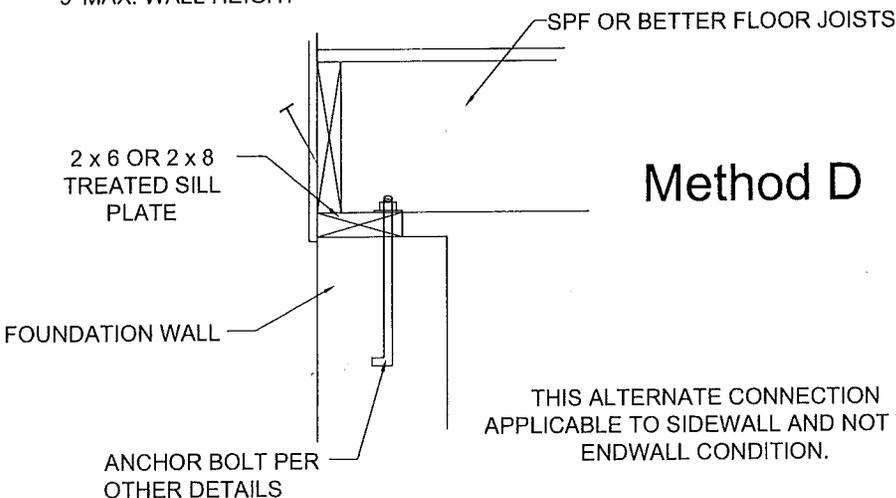
THIS ALTERNATE CONNECTION APPLICABLE TO SIDEWALL AND NOT TO ENDWALL CONDITION.

\* THESE DETAILS APPLY TO BOTH PERIMETER FOUNDATION WITH PIERS & BASEMENT CONSTRUCTION.

\* ANCHORAGE DESIGNED FOR STANDARD WIND ZONE 1 (15 PSF HORIZONTAL, 9 PSF UPLIFT)

**NOTES FOR METHOD A, B & C :**  
1) ROOF PITCH UP TO 6/12, MAX. SIDEWALL HEIGHT = 9'-0", MAX. EAVE = 24".  
2) ALL FASTENERS (INCLUDING NAILS) IN CONTACT WITH PRESSURE TREATED SILL PLATE TO BE G185 COATED.

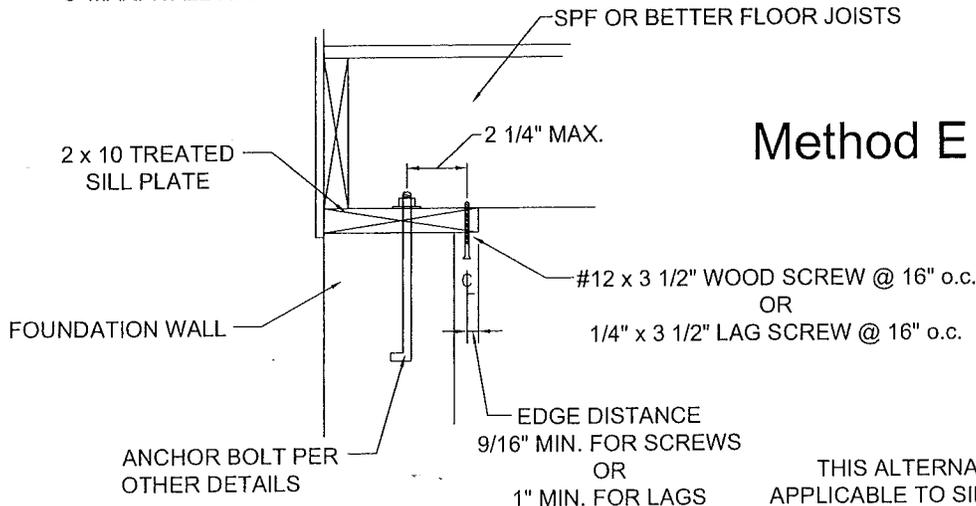
WIND DESIGN, 100 MPH  
6/12 MAX. ROOF SLOPE  
174" MAX. UNIT WIDTH W/ 16" MAX. EAVE  
9' MAX. WALL HEIGHT



## Method D

THIS ALTERNATE CONNECTION APPLICABLE TO SIDEWALL AND NOT TO ENDWALL CONDITION.

WIND DESIGN, 100 MPH  
6/12 MAX. ROOF SLOPE  
174" MAX. UNIT WIDTH W/ 16" MAX. EAVE  
9' MAX. WALL HEIGHT



## Method E

THIS ALTERNATE CONNECTION APPLICABLE TO SIDEWALL AND NOT TO ENDWALL CONDITION.

REVISIONS

DATE



CHIEF® INDUSTRIES

HOUSING DIVISION

DRWG. BY: CES 12/09/04

CHKD. BY:

SCALE: NONE DSM31

## MINIMUM FOOTING SIZES

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

**NOTES:**

1. FOOTING SIZES SHOWN ARE FOR SQUARE PADS AND ARE BASED ON THE AREA (SQUARE INCHES) REQUIRED FOR THE LOAD. OTHER FOOTING CONFIGURATIONS, EQUAL TO OR GREATER THAN THE AREA OF THE SQUARE FOOTINGS SHOWN IN THE TABLE. FOR EXAMPLE, A 12" X 22" (288 SQ. IN.) FOOTING MAY BE USED IN PLACE OF A 16" X 16" (256 SQ. IN.) FOOTING. ALSO, TWO 12"X24" PADS MAY BE USED IN PLACE OF ONE 24" X 24" PAD.
2. THE FOLLOWING TABLES 6.2 SPECIFIES THE MAXIMUM FOOTING SIZE FOR VARIOUS FOOTING THICKNESSES. THIS TABLE IS BASED ON UNREINFORCED FOOTINGS. REINFORCED FOOTINGS MAY REQUIRE A SMALLER THICKNESS THAN THAT LISTED BUT MUST BE DESIGNED BY A LICENSED ENGINEER.
3. THE PIER CAPACITY LOADS LISTED IN THIS MANUAL ALSO INCLUDE THE WEIGHT OF THE PIER AND FOOTER. NOTE: WEIGHT OF CONCRETE IS APPROXIMATELY 150 PSF, EXAMPLE FOR FOOTER WEIGHT OF CONCRETE IS APPROXIMATELY 150 PSF EXAMPLE FOR FOOTER WEIGHT: 12" X 12" X 4" = 50#, 36" X 36" X 6 1/2" = 731#.

TABLE 6.1

REVISIONS	DATE		<b>CHIEF® INDUSTRIES</b> HOUSING DIVISION	DRWG. BY: <b>CES</b> 01/19/04
				CHKD. BY:
				SCALE: <b>NONE</b> DSM32

PIER FOOTING SIZE	MINIMUM THICKNESS OF FOOTERS FOR SINGLE AND DOUBLE STACKED PIERS (INCHES)																			
	SOIL BEARING CAPACITY (PSF)																			
	1000			1500			2000			2500			3000			3500			4000	
	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE		
16 x 16	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
17 x 17	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
18 x 18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
19 x 19	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
20 x 20	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
21 x 21	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
22 x 22	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
23 x 23	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
24 x 24	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
25 x 25	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
26 x 26	4 1/4	4	4	4	4 3/8	4	4	4	4	4 3/8	4	4	4	4 3/8	4	4	4	4 3/8		
27 x 27	4 3/8	4	4	4	4 3/4	4	4	4	4	4 3/4	4	4	4	4 3/4	4	4	4	4 3/8		
28 x 28	4 3/4	4	4	4	5	4	4	4	4	5 5/8	4	4	4	4	4	4	4	4 3/8		
29 x 29	4 7/8	4	4	4	5 3/8	4	4	4	4	5 7/8	4	4	4	4	4	4	4	4 3/8		
30 x 30	5 1/8	4	4	4	5 5/8	4	4	4	4	-	4	4	4	4	4	4	4	4 3/8		
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52 x 52	-	8 3/8	4	4	6 3/8	4	4	4	4	6 3/8	4	4	4	4 7/8	4	4	4	4 3/8		

TABLE 6.2

NOTES:  
 1. THE THICKNESSES IN THE CHART ABOVE ARE DESIGNED FOR SINGLE AND DOUBLE STACKED CONCRETE BLOCKS (CMU'S) CENTERED ON THE FOOTER.  
 2. POURED FOOTERS ARE TO HAVE A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.  
 3. THIS TABLE IS BASED ON UNREINFORCED FOOTINGS. REINFORCED FOOTINGS MAY ALLOW FOR A SMALLER THICKNESS THAN THAT LISTED BUT MUST BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.

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			CHKD. BY:
			SCALE: <b>NONE</b> DSM33

# FOUNDATION DESIGN: GENERAL NOTES

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 EIGHT (8) INCHES THICK, REINFORCED WITH #4 REBAR AT (12) INCHES O.C. VERTICAL AND #5 REBAR AT 18" O.C. HORIZONTAL.
6. UNIT COLUMN SUPPORTS FOR CENTERLINE RIDGE BEAMS REQUIRE ADDITIONAL PIER SUPPORTS UNDER CENTERLINE BEAM LOCATIONS PER FLOOR PLAN.
7. THESE SPECIFICATIONS ARE TYPICAL. LOCAL CODES MAY CONTAIN ADDITIONAL REQUIREMENTS.
8. FOUNDATION WALL STEMS MAY BE CONCRETE OR CONCRETE BLOCK.
9. CONCRETE BLOCK SHALL CONFORM TO ASTM C-90.
10. IN CONCRETE BLOCK STEM WALLS A MINIMUM OF (2) - #4 REBARS ARE TO BE INSTALLED IN BLOCK WITH MUD SILL ANCHORS. FULLY GROUT EACH CELL CONTAINING REBAR.
11. ALL LUMBER IN CONTACT WITH CONCRETE SHALL BE OF PRESSURE TREATED TYPE OR OF SPECIES APPROVED FOR USE IN DIRECT CONTACT WITH CONCRETE. STEEL (FASTENERS, CONNECTORS, OR BEAMS) MUST BE EITHER ISOLATED FROM ANY CONTACT WITH LUMBER CONTAINING COPPER PRESERVATIVES OR MUST BE ZINC PLATED TO MEET G185 COATING RATING.
12. THE INSTALLATION SITE MUST BE GRADED SO THAT WATER DRAINAGE IS AWAY FROM STRUCTURE AND DOES NOT ACCUMULATE UNDER THE HOME.
13. BACK FILL ADJACENT TO THE SHALL NOT BE PLACED UNTIL THE WALL HAS SUFFICIENT STRENGTH OR HAS BEEN BRACED TO PREVENT DAMAGE.
14. MINIMUM FOUNDATION VENTILATION REQUIREMENTS:
  - A. 18" X 24" ACCESS CRAWL SPACE TO UNDER FLOOR AREA.
  - B. 1 1/2 SQUARE FEET OF VENTILATION PER 25 LINEAL FEET OF FOUNDATION WALL.
  - C. COVER VENT OPENINGS WITH CORROSION-RESISTANT WIRE MESH NOT LESS THAN 1/8" NOR MORE THAN 1/2" IN ANY DIRECTION.
15. THIS FOUNDATION SYSTEM FOR USE WITH FLOOR SYSTEMS WHICH ARE DESIGNED TO SPAN FROM PERIMETER WALL TO CENTERLINE SUPPORTS.
16. DAMP PROOFING OF CONCRETE OR MASONRY WALLS TO BE IN ACCORDANCE WITH LOCAL CODES. IN THE ABSENCE OF CODE REQUIREMENTS, THE FOLLOWING SHALL APPLY:
  - A. EXTERIOR FOUNDATION WALLS OF MASONRY CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP PROOFED BY APPLYING NOT LESS THAN 3/8" OF PORTLAND CEMENT PARGING TO THE WALL FROM THE FOOTING TO THE FINISH GRADE. THE PARGING SHALL BE COVERED WITH A COAT OF APPROVED BITUMINOUS MATERIAL APPLIED AT THE RECOMMENDED RATE. EXTERIOR FOUNDATION WALLS OF CONCRETE CONSTRUCTION ENCLOSING BASEMENTS SHALL BE DAMP ROOFED BY APPLYING A COAT OF APPROVED BITUMINOUS MATERIAL TO THE WALL FROM THE FOOTING TO THE FINISH GRADE AT THE RECOMMENDED RATE.

GENERAL NOTES:

- B. FOUNDATION WALL OF HABITABLE ROOMS LOCATED BELOW GRADE SHALL BE WATER PROOFED WITH MEMBRANES EXTENDING FROM THE EDGE OF THE FOOTING TO THE FINISH GRADE LINE. THE MEMBRANE SHALL CONSIST OF EITHER 2-PLY HOT MOPPED FELT, 6-MIL POLYVINYL CHLORIDE, 55 LB. ROLL ROOFING OR EQUIVALENT MATERIAL. THE LAP IN THE MEMBRANE SHALL BE SEALED AND FIRMLY AFFIXED TO THE WALL.
- C. FOUNDATION WALLS MAY BE DAMP PROOFED OR WATER PROOFED USING MATERIALS AND METHODS OF CONSTRUCTION OTHER THAN COVERED IN THIS SECTION WHEN APPROVED BY THE LOCAL BUILDING OFFICIAL.
17. DRAINS SHALL BE PROVIDED AROUND FOUNDATIONS ENCLOSING HABITABLE OR USEABLE SPACES LOCATED BELOW GRADE AND WHICH ARE SUBJECT TO GROUND WATER CONDITIONS. DRAINS SHALL BE INSTALLED AT OR BELOW THE AREA TO BE PROTECTED AND SHALL DISCHARGE BY GRAVITY OR MECHANICAL MEANS INTO AN APPROVED DRAINAGE SYSTEM.
18. 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.
19. THE DESIGNS ON THIS AND ACCOMPANYING SHEETS ARE APPLICABLE TO SEISMIC ZONES 0, 1, AND 2.
20. THIS FOUNDATION DESIGN IS NOT FOR INSTALLATION ON A FLOOD PLAIN. WHEN INSTALLING CRAWL SPACE OR BASEMENT IN AN AREA WITH SOILS HAVING POOR DRAINAGE, CONSIDERATION SHOULD BE GIVEN TO METHODS OF ELIMINATING ACCUMULATION OF WATER IN THE CRAWL SPACE OR BASEMENTS, SUCH AS THE USE OF SUMP PUMP(S). INSTALLATION OF SUMP PUMPS TO BE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

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					SCALE:	NONE DSM34

**SECTION VII**

**SITE ASSEMBLY INSTRUCTIONS**

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## Summary

## General

### Introduction

Thank you for choosing Chief® Industries as your home builder. We hope your new home brings you comfort and pleasure for many years to come. This home was engineered, constructed and inspected to comply with the *Federal Manufactured Homes Construction and Safety Standards* in effect on the date of construction. Minimal specifications are required from national standards for the design, construction, thermal protection, heating systems, plumbing systems and electrical systems for HUD homes intended for residential use.

Our intent is to produce a safe and comfortable home for you. Our company standards surpass compliance with national standards. Chief® Industries has highly qualified plant personnel to inspect these standards throughout the construction process.

Before set up can even begin, you must contact the building officials in your area for necessary permits, licenses and inspections required for installation of this home. It is extremely important in preparing your home for its occupancy that it be properly blocked, set and leveled by an experienced HUD home mover, dealer, or installer. Correct procedures in setting your home could prevent any costly future reconstruction.

The following step-by-step instructions were designed to assist you with the installation of your home. *Due to changes that are brought about by Chief® Industries continuing effort to improve our product and provide our customers with a wide variety of features; there may be products in or on your home that are not thoroughly covered by this manual. Before starting the set up process, you should go completely through your home owner's information carefully to see if there are supplement details before any attempt is made in setting your home.*

Data describing the roof and wind loads for which your home was designed may be found on the data plate in your home. Load zone maps of the United States showing roof load, wind load and thermal zones are also included in the Homeowners Manual. The support system must resist all vertical loads from the weight of your home, plus temporary extra roof loading and it must resist side loads imposed on the structure by wind gust.

All HUD home installers shall comply with the requirements of local zoning ordinances and conditional use permits established by local authorities pertaining to any health and/or safety codes.

**IMPORTANT:** The HUD label attached to the exterior of the home needs to remain visible. Do not obstruct the view and/or permanently remove. If siding needs to be repaired or replaced make sure to reattach the HUD label in the same or equivalent method. The HUD label should be located on the endwall at the rear of the home 12" in from the left side and 12" up from the bottom of the home. The label looks like the picture following:

NEB 000000

## Set Up Responsibility

Many local codes require that your home must be set up by a dealer, installer or home mover specially licensed for this procedure. If your dealer is not licensed himself, he will make the arrangements with a contractor who is licensed. It is strongly recommended that the home be set and leveled by professional persons experienced in the construction of HUD homes.

## Site Implications

When selecting a site some items to be considered are as follows:

- Is your site suitable for its intended use?
- Does this intended use act in accordance with any jurisdiction over it? (Federal, State, and Local laws)
- Have you considered inherent potential hazards?

Considering such things as:

- proximity to flood plains or water features; these might cause flooding, excessive humidity, erosion, and sediment deposition.
- proximity to noise and air pollution such as industrial sites, construction sites, landfills, traffic ways and airports.
- "hidden" factors such as groundwater table level, soil composition and bearing capacity, frost line and possible termite infestation.

Once all problems encountered on your site are addressed with corrective work, you will be able to begin site preparation.

## Home Installation

### Site Preparation

The process of supporting your home for occupancy has three initial steps -- site preparation, setting and blocking, and leveling. These are the first of many important steps to be seriously adhered to in order to prevent costly reconstruction measures you may encounter in the future. If you intend to place the home on a site of your own, some work will be necessary.

Normally, the area of the site where you will locate the home should be relatively level. However, the area beneath the home should have enough slope to allow for good water

drainage. The recommended slope is one (1) inch for every four (4) feet. The rest of the site should be graded in a manner that rainwater and melting snow will be diverted from the support or foundation of the house. A vapor barrier, such as a layer of polyethylene plastic sheeting or similar material must be placed on the ground under the home. Supports must rest on undisturbed soil or on fill that has been compacted and fully settled.

In addition, provision for utilities must be made before the home is set. Installation of lines and equipment supplying water, electricity and fuel, plus sewage disposal systems must be completed and ready for connection in accordance with all local codes and regulations. Your county engineer, building inspector or local utility company officials can advise you on the requirements in your community.

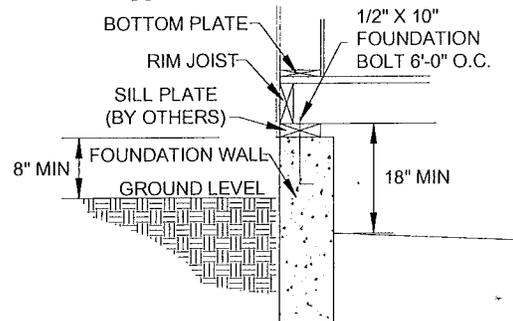
## Foundations & Footings

Proper support for your home includes footings and blocking. The purpose of supports is to distribute the load of your home as evenly as possible on the footings, and to provide a sturdy base. The footings carry and distribute the weight of the home placed on the blocking. Piers are usually built or appropriate support stands on individual footings. We recommend two types of piers: concrete block, or steel jacks. These piers can also be used in combination with a concrete perimeter foundation.

Support piers are generally constructed of standard 8" x 8" x 16" concrete blocks. Blocking must be tall enough to raise the under side of the frame at least (12) inches off ground level and to keep the under sides of the floor joist at least (18) inches off the ground. On sloped sites where tall piers are unavoidable, many codes require a permanent supporting structure, such as piers of poured or block concrete.

Adjustable steel jacks make excellent supports, and simplify the job of leveling. Any manufactured supports that you use should be listed and labeled by an approved testing agency. Your setup contractor or your local building inspector can advise you on the best supports to use.

The perimeter foundation could be constructed of either poured or block concrete. This type of perimeter support allows the I-beam piers to be spaced at larger intervals. This versatile foundation setup allows for either a crawlspace setup or a basement application.



TYPICAL PERIMETER FOUNDATION  
DSM37  
Section VII, Page 2

Even though Chief® recommends footings installed below frost level, footings maybe installed shallower. You will have fewer problems maintaining a level home if the footings lie below the frost line in your community. This minimizes the heave and fall of the piers during the freeze and thaw cycle. To determine the size of piers and footings, refer to the sections dealing with pier construction and footing instructions.

Pre-cast footings can be substituted for poured concrete footings. They simplify the process of blocking. These should be listed and labeled by an approved testing agency.

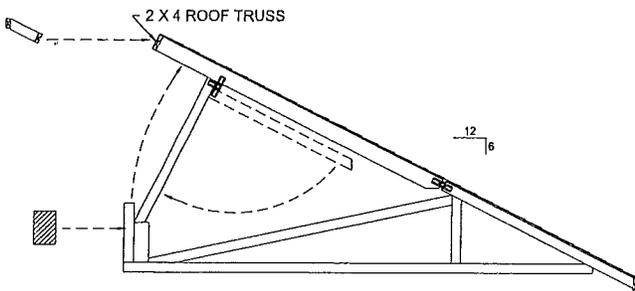
*\*\*This next set of instructions is specifications is specifically for finishing a tip-up roof application. This feature is an option and is not included with a standard specification house.\*\**

### Tip-Up Roof Trusses

All requirements listed as “shall” is a requirement by BonnaVilla® Homes. It indicates a specific requirement which will be accomplished by the materials or procedure specified. If the installation persons wish to deviate from these specifications, it is their responsibility to have all substitution of materials and procedures approved by a Professional Engineer or Architect. Statements using the word “should” are recommendations which are not requirements, but are procedures or materials highly recommended by BonnaVilla® Homes.

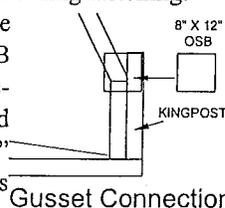
Follow all directions carefully and use extreme care in completing construction of these designs. Avoid twisting or forceful maneuvering of truss members. This could result in damage to the truss itself. The truss is designed with a hinge on one chord and an “extension build-up” that is to be attached to the truss top chord to complete the roof.

- 1) When the home is on site, remove the protective shipping plastic from the area of the home above the marriage wall roof line.



- 2) After removing the plastic protecting the marriage walls, raise the first roof section into place. Using roof jacks, lift the hinged section to its appropriate height “uniformly” to prevent damage to hinges and sub-sheathing fastening.

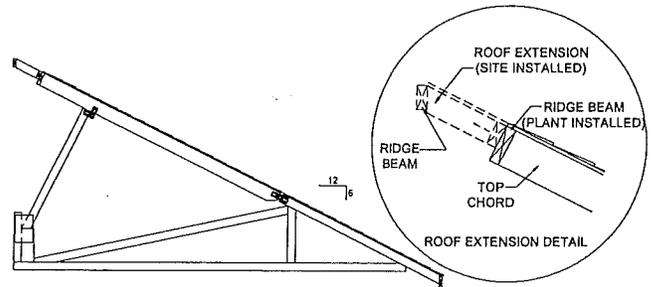
- 3) Swing the hinged truss web down to the kingpost and apply a 3/8”x 8”x 12” OSB gusset to one side of the joint. The gusset shall be fastened with six (6) - 8d nails OR eight (8) - 16 gauge x 7/16” crown x 1-1/2” leg staples, six (6) nails



Gusset Connection

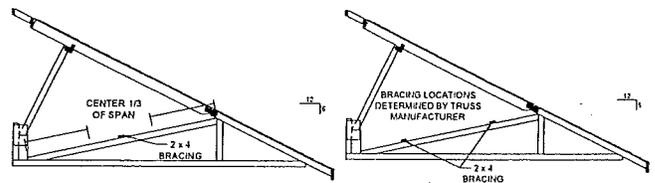
OR eight (8) staples in each framing member of the joint (18 nails OR 24 staples total).

- 4) Next, remove the roof extensions from inside the home. The extensions shall be secured to the end of the truss with #10 x 2-1/2 inch wood screws, (16) inches on center. After both sections are set in place, stitch the two (2) sections of the home together at the marriage line ridge beam with #10 x 2-1/2 inch wood screws, eight (8) inches on center, staggered each side of the ridge beam. Complete the roof sub-sheathing to the ridge of the home. Secure sheathing with 16 gauge x 7/16 inch crown x 1-1/2 inch leg staples, six (6) inches on center in the field and four (4) inches on center at seams.



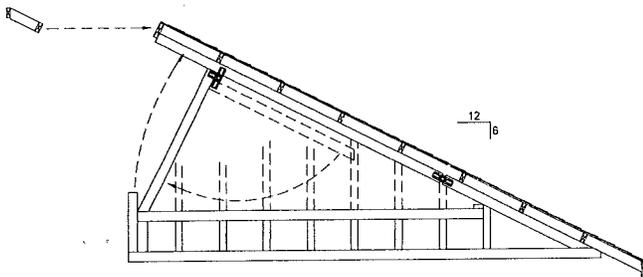
- 5) The next step of construction is the addition of wood bracing to the trusses. In some designs, a truss may require longitudinal bracing (parallel to the length of the home). If bracing is required, tags will be secured to each truss at the location of the bracing. BonnaVilla® Homes will install bracing in the plant if it does not interfere with the movement of the hinged components. In cases where the bracing interferes with the movement of the hinged members, the bracing will be required to be installed on site after the hinged top chord shall not be twisted or forced into place to the point that damage may occur to the hinged metal plates.

The number of wood braces depends upon the design of the truss. Some truss designs require only one wood brace. The location of the wood bracing shall be in the center third section of the horizontal (diagonal) member. Other truss designs may require two (2) wood braces. These braces are to be installed as near the truss manufacturers’ designated locations as possible. Each brace shall be secured to each truss with two (2) - 16 gauge x 7/16” crown x 2-1/2” leg staples at each connection (alternate fastening will be two (2) - 0.131” x 3-1/8” leg nails).



- 6) The final required framing is to add framing above the gable end truss on each end of the home. Studs shall be installed (16) inches on center to provide adequate support for OSB and exterior siding. Studs are to be secured to the truss top chord and gable end truss with three (3) - 12d nails at each connection. Complete all underlayment,

shingling, sub-sheathing and exterior siding as detailed in the remaining sections of the Double Section Set-Up Manual. All shingle applications shall be in accordance with shingle manufacturers installation instructions, and the "Residential Asphalt Roofing Manual", published by the Asphalt Roofing Manufacturers Association. OSB sheathing is to be installed to the American Plywood Association's installation instructions. Assemble all truss chords and diagonals in a manner to prevent bowing and twisting. When framing work is completed, replace any insulation that has been disrupted during the setup process. If necessary, add additional insulation to replace insulation that has been disturbed during construction. It is important to ensure that insulation depths are compliance with all Federal Trade Commission's guidelines for accurate insulation disclosure.



Set-up personnel should refer to the Double Section Setup Manual to complete the installation of the home. In some jurisdictions, this type of construction may require further inspections to ensure proper construction. If so, pre-arrange inspections at the appropriate times.

**\*\*This next set of instructions is specifically for a snow load roof option. This option is not included with a standard specification house.\*\***

### Snow Load Designed Roofs

In order to support the snow load applied to the home, perimeter blocking becomes a necessity. To accommodate this additional blocking prints are provided with your installation manual.

- 1) The blocking prints provided will demonstrate proper pier spacing for you situation. Refer to the appropriate section for information on the foundation type that you have chosen
- 2) Pier size and construction are also listed on the charts for pier loading.
- 3) Continue set up per foundation type.

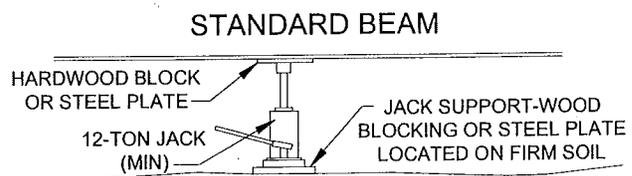
### Lifting Considerations

By following this information you will minimize the setup related problems you may have during the installation of your home.

**WARNING:** Sitting under a home when it is suspended on jacks is dangerous. If the home slips off of the jack(s), you or someone else could be seriously or even fatally injured.

If it is ever necessary to be underneath the home, make sure that there is sufficient blocking to safely carry the load of the home. If the home is being moved by rollers or beams, make sure there are timbers or other safety blocking material supports in place so as to safely limit the distance the home can fall or unexpectedly move. Never suspend a home more than four (4) inches above safety supports. Always follow the six **minimum** safety precautions when lifting a home:

- 1) Use only jacks in good condition with a (12) ton minimum rating.
- 2) Provide a firm support such as wood blocking or a steel plate underneath the jack bases to prevent them from tipping.
- 3) Leave tires and axles on the unit until all blocking is in place in order to reduce the hazard from collapse.



### SAFE JACK SUPPORT

- 4) Using a minimum of 3 jacks along each length of I-beam distribute the concentrated loads created by the jacks by using 3/8" x 4" x 12" steel plates or 4" x 4" x 12" hardwood blocks between the jacks and the main I-Beam.
- WARNING:** Never apply the jack directly to the I-Beam or other structural member. Such a concentrated load may cause the I-Beam or structural member to fail resulting in the home sliding off the jack.
- 5) Position safety support beneath solid members such as I-Beams or floor joists and never under an axle or other spring-mounted member.
  - 6) Avoid overstressing structural members.

### Pre-Foundation Home Set-Up

Any items which could be difficult to place after the home is set should be dealt with now. If you are using only the Crawlspace with Standard Blocking, it is much easier to place the moisture barrier before the house is set. It can be left folded up and then unfolded after pads and support piers have been positioned under the frame members.

### Setting, Blocking & Positioning

#### General

**NOTE:** Excessive nonuniform lifting during the leveling process can cause the home to be racked and twisted. This could result in serious structural damage to the home, thus voiding your warranty.

**\*\*\*This next section involves lists for setting your home on its foundation. There are three (3) different sets of instructions for their corresponding foundation types, you must find the set that is descriptive of your particular circumstance. At the end of these set of lists, there will be a checklist for post-foundation or finish setup.\*\*\***

It is imperative that you provide a legal drain tile or other approved method for draining water away from the foundation footing. You must also provide a means of interior support for a basement wall until the backfilled earth on the exterior of the wall has stabilized. It is the responsibility of the homeowner to see that this support is done and not removed until the proper time.

**NOTICE:** These are Chief®'s recommended lists for home setup. Other methodology may be employed, provided that these allow for complete structural integrity during the entire setting process.

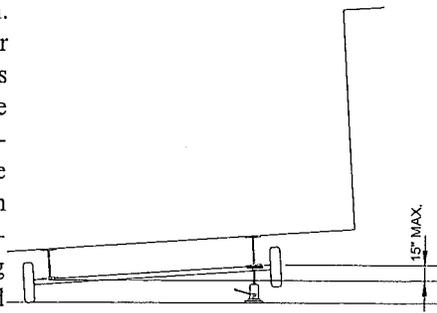
**List of Sets:**

- Crawlspace with Standard Blocking
- Crawlspace with Perimeter Foundation
- Perimeter Foundation with Crossbeam

**Crawlspace with Standard Blocking**

- 1) The supports footings must be completed.
- 2) Carefully remove plastic material covering the marriage wall from both halves. Make certain the marriage wall gasket material on the one half remains firmly secured around the perimeter of the living area. Should this material be loose, it should be reattached to the home using (1-1/4) inch roofing nails.
- 3) Appropriately position the first section of home by aligning the main I-beams over the support footings. Once the section is aligned longitudinally and over the support footings, block the sets of tires at the front and rear to prevent the unit from moving.
- 4) Along one of the main I-beams, place your jacks one in from each end approximately ten (10) feet with the remaining jacks spaced evenly between the end jacks. On longer homes, you will be better served by using four (4) jacks along each beam. When attempting to evenly space your jacks, should a location be in an axle area, place the jack just outside of the axles.
- 5) Operating these jacks simultaneously, raise the I-beam to a position approximately two (2) inches higher than its final position.

Concrete or metal piers should now be placed into position under the beam and on top of the footings, adhering to the specified spacing. Level

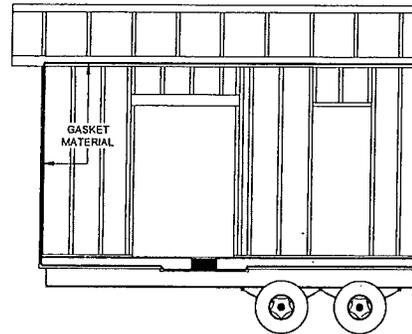


HOME LEVELING

DSM40

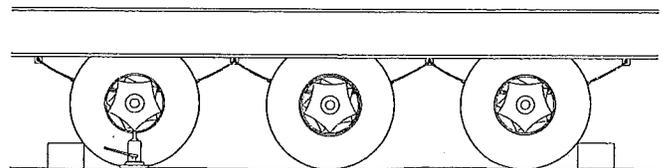
each pier and slowly lower each beam onto the support piers. Some methods for leveling are listed at the end of this section.

- 6) Once the first beam has been set, move the jacks to the other I-beam, repeating steps 4 and 5.
- 7) Before moving the second half into position, make certain that the connection seal for the duct system as well as the marriage wall gasket is in place prior to joining the two (2) halves. **CAUTION: The joint formed by the connection of the two (2) halves should be tight to resist any air infiltration.** Special care should be taken to assure that this step is performed.
- 8) To prevent damage to electrical wiring and interior floor coverings (carpet and linoleum) in marriage wall openings, temporarily fasten away from edge of home to prevent material from being caught between the sections.



MARRIAGE WALL GASKET PLACEMENT

- 9) Move the second section of the home into position along side of the first (within approximately 10" - 12"). It is recommended that a dollie device utilizing steel rollers to be used for this purpose. The dollies are constructed to carry hydraulic jacks that can be positioned under the frame members in order to produce less resistance moving the house laterally. Most service crews and installers have this equipment. It will minimize any possibility of frame damage which could void your warranty. After the two sections are side by side, the dollie devices are placed behind the axles and approximately midway in the front span. **If the floor length of your house is 60'-0" or longer, we recommended the use of three beams for setting the house.**
- 10) Repeat steps 5 through 6 for second half.
- 11) By using a hand winch attached to the main I-Beams the two sections can be pulled tightly together.
- 12) **When aligning halves keep exterior endwalls flush, do not judge by interior doorways.** This will allow the exterior endwalls to be sided with minimal shimming.
- 13) If the tires and axles are going to be removed, this should now be done once the unit is set in it's final position. It would be wise to position a jack or a support under each end of the axle before removing the bolts from the spring hangers to keep them from a sudden drop that could end in an injury.



JACK PLACEMENT FOR AXLE REMOVAL

- 14) Piers should be placed under the rim joist of the sidewalls wherever there are exterior doors. This is to be done so as to provide greater support for your floor system to ensure long-term, proper operation of your doors. This type of pier should be placed at the hinge side of any steel, swinging door and on both sides of any sliding glass or swinging patio doors.
- 15) Depending on the design of your home, there may be the need for pier supports along the marriage line rim joist. These are piers that provide support for concentrated loads created by large openings in the marriage wall. The foundation/blocking plan, provided by BonnaVilla® Homes will locate these piers should there be a need for any.

### Crawlspace Completion

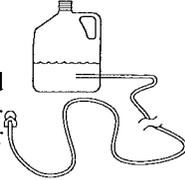
Keep in mind when completing the skirting around the perimeter of the home (if it is not set on a perimeter foundation) that you must allow for ventilation underneath the house. There should be vents as close to the corners as possible to prevent "dead air pockets." One square foot of venting is required for every (150) square feet of floor space.

Example: a (32' x 80') house with actual dimensions of (29'-0" x 76'-0") equals 2204 square feet. Divide 2204 square feet by (150) which equals 14.69 square feet. Round up to (15) square feet of venting area within the crawlspace skirting.

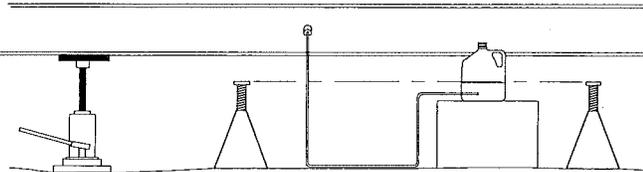
### Leveling

There are many commonly accepted methods for leveling homes. One of our recommended methods of leveling is: a "water level" system.

A "water level" system is simply a plastic reservoir holding colored water with approximately (75) feet of plastic hose attached. This device operates on the principle that water seeks its own level.



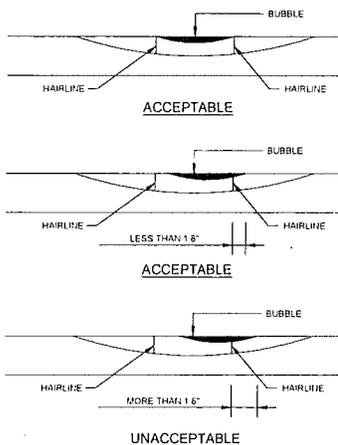
WATER LEVEL



WATER LEVEL SYSTEM

Position the water level in the reservoir exactly at the height of the bottom of the steel frame when it will be in its final position. By placing a shut-off valve at the end of the plastic tubing, the liquid will be prevented from escaping when the hose is placed below the level of the fluid in the reservoir. Pull the end of the plastic tube to the first pier and holding the end well above the top of the pier, open the valve. When this operation is complete, then each succeeding pier is leveled in the same manner.

Another method of leveling is using a bubble level that is at least four (4) feet long. A deviation from level where part of the bubble is less than (1/8) inch outside one hairline, is usually acceptable as long as the reading is not the aforesaid consistently throughout the length of the home. Any deviation



BUBBLE LEVEL READING

greater than (1/8) inch would suggest that the house should be leveled.

To achieve the best results, your home must stand as level as possible on its supports. If it does not, here are some of the problems that can result:

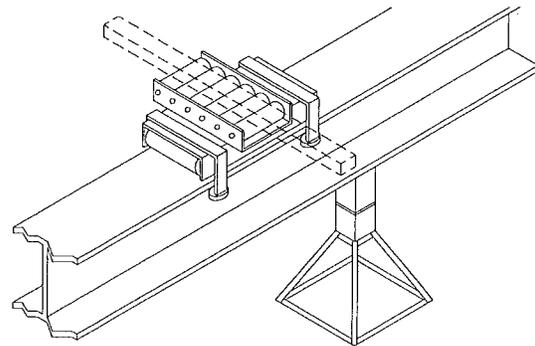
- Walls, partitions, and floors that buckle.
- Leaks around windows, doors, seams in the roof, ceiling, and walls.
- Cabinet doors and drawers won't shut properly.
- Loose materials on walls, partitions, and ceilings.
- Floor covering can wrinkle.
- Floor structure can loosen enough to feel soft and spongy under foot.
- Exterior siding can wrinkle or crack.
- Piping and wiring can snap under tension.

To prevent these non-warranted problems, your setup contractor should check and adjust the level of your home during the entire blocking process.

Keep in mind that you are obligated to check the level of your home once a month for the first three months and twice a year thereafter. Check after the spring thaw (when frost is out of the ground), and check again when the ground refreezes. The freeze-thaw cycle could cause your home to heave or settle.

### Perimeter Foundation with Crossbeams

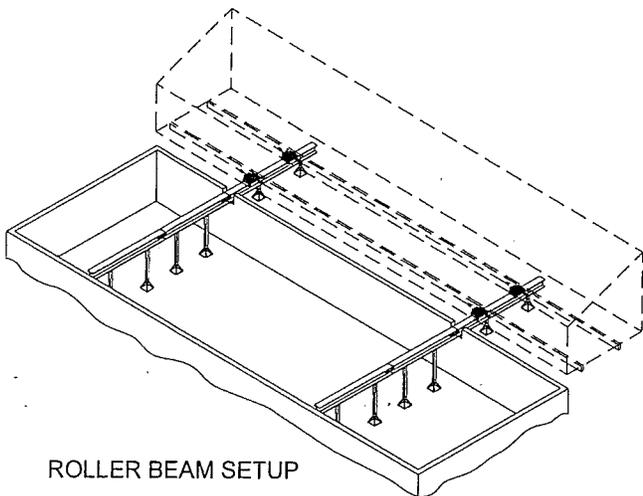
- 1) The perimeter foundation and support footings must be completed prior to setting the home. A (2 x 8) pressure treated sill plate must be secured to the foundation wall with one (1) - (1/2" x 10") foundation anchor bolt every six (6) feet on center beginning one (1) foot (maximum) from each corner.
- 2) Carefully remove the plastic material covering the marriage wall from both halves. If applicable, remove temporary flooring over stairwell area. Make certain the marriage wall gasket material on the one half remains firmly secured around the perimeter of the living area. Should any of this material be loose, it should be re-attached to the home using (1-1/4) inch roofing nails.
- 3) Set up the "Roller Beam" or I-Beam within the foundation walls per *Setting System* manufacturer guidelines. Place roller devices on the proper devices to help distrib-



### ROLLER DEVICE ON BEAM

ute the weight of the home evenly. Make sure that appropriate jacks or temporary blocking is spaced as listed. If the floor length of your house is 60'-0" or longer, we recommended the use of three beams for setting the house. Space the beams along the length of the house.

- 4) Move and align the appropriate half of house parallel to the foundation wall.
- 5) Using the method described in steps 4 and 5 of crawlspace with standard blocking, raise the house high enough to slide "Roller Beam" under the frame leaving a height allowance for the roller device used for sliding the home. Also leave enough room for the "building support" that will disperse the weight of the home evenly on the rollers. In order to prohibit excess shear stress to the main structural members, distribute concentrated loads by using plate or smaller beam.
- 6) Lower the home onto the support beams.
- 7) Slide section to final position over foundation.



ROLLER BEAM SETUP

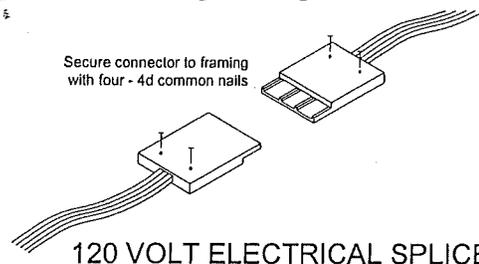
- 8) To prevent damage to electrical wiring and interior floor coverings (carpet and linoleum) in marriage wall openings, temporarily fasten away from edge of home to prevent materials from getting caught between the two sections.
- 9) Before moving the second half into position, make certain that the connection seal for the duct system as well as the marriage wall gasket is in place to joining the two halves. **CAUTION: The joint formed by the connection of the two halves should be tight to resist any air infiltration.** Special care should be taken to assure that this step is performed.
- 10) Repeat steps 4 - 10 for the second half of home. Slide the second section to within a few inches of the first section.
- 11) Pull halves as tight as possible together with hand winch.
- 12) When aligning halves keep exterior endwalls flush DO NOT judge by interior doorways. This will allow the exterior endwalls to be sided with minimal shimming.
- 13) Lower sections simultaneously to the foundation.
- 14) Secure flooring system to sill plate in one of these manners: (refer to details on pages DSM30 & DSM31)
  - a) Along the sidewalls, toe-nail two - (12d) common nails from each floor joist into sill plate. At the endwalls, toe-nail one - (12d) common nail every eight (8) inches on center along the length of each front and rear rim joist. Toe-nails should be driven at an angle of approximately (30) degrees with the joist. Start the nailing from the end of the joist.
  - b) For this method of nailing floor system to sill plate, the home must be ordered with the lower siding trim shipped loose. After the home has been set into place, toe-nail one - (12d) common nail every eight (8) inches on center around the entire perimeter of the home, from the rim joist into the foundation sill plate.

After the home has been secured to the foundation, apply lower trim batten. Caulk all horizontal siding joints, then paint to match home.

- 15) Lag together the rim joist located directly underneath the marriage wall. "method describe"
- 16) Place columns along marriage wall line spaced as shown on the *Foundation* print. After columns have been placed as outlined, then remove the temporary house supports.

## Post Foundation (Finish) Setup

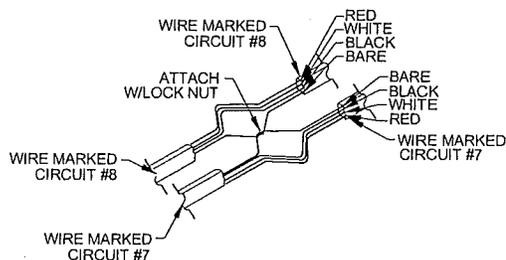
- 1) Each 120V wire that crosses the marriage line has been fitted with a special cable splicing device. Orient the splices so the mating ends align.



**WARNING: Before connecting the electrical wires, be positive the power has been disconnected.**

Slide the splices together until the locking latch is engaged. Once coupled, the splices are NOT to be uncoupled. Finally, nail the coupled splices to a floor joist with four 4d common nails. **CAUTION!! Do not use oversized nails or drive nail heads into the splice!!**

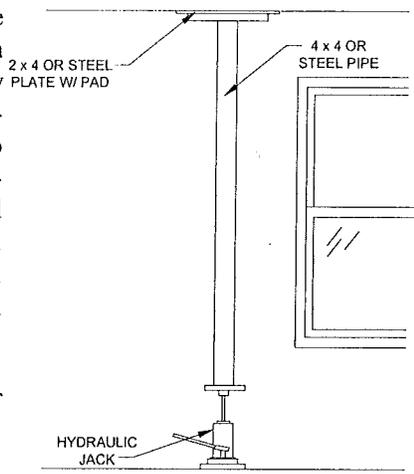
- 2) Each 240V wire that crosses the marriage line has been fit into a covered junction box. Using a cutting blade, split the cable sheathing back approximately (1-1/8) inch. Remove the sheathing back to the cable split. Attach the two (2) "black" wires together with locknut. Repeat this step for the two (2) "red" wires, two (2) "white" wires and the two (2) "bare" wires. Remember to replace junction box cover after wiring completion.



## 240 VOLT ELECTRICAL SPLICE

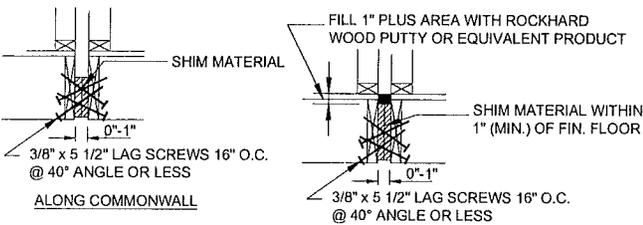
- 3) To level all ceiling sections set a jack at the lower section. Carefully raise the jack until the two (2) ceiling sections are flush. Then finish fastening the two (2) ridge beams together in the attic space of the home with (#10 x 3-1/2") woodscrews at (12) inches on center, for the entire length of the home. This procedure should be followed at each location if one part of the ceiling is low. By carefully

inspecting the ceiling or using a straight edge, low points can be determined. To raise the low portion, use a wood member such as a 4x4 or a steel pipe placed on the top of a hydraulic jack. A second piece of 2x4 properly padded is placed on top of the vertical posts and directly underneath the low point.



INTERIOR JACK PLACEMENT

- 4) Remove shipping walls. Be aware of the potential damage when the studs fall. **(Do not remove prior to setting home.)**
- 5) The ceiling panels and the endwalls on each half must align on the inside of the house. If the halves are not in proper alignment they may be adjusted by raising the back corner on one half. It should be noted that the opposite end of the home should be blocked while raising one end. This lift will cause the ceiling to move forward.

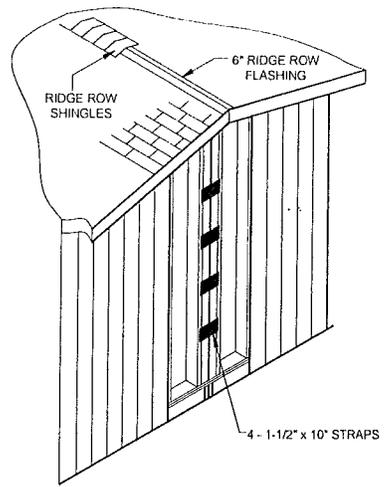


AT COMMONWALL OPENINGS

### SECURING FLOOR SECTIONS

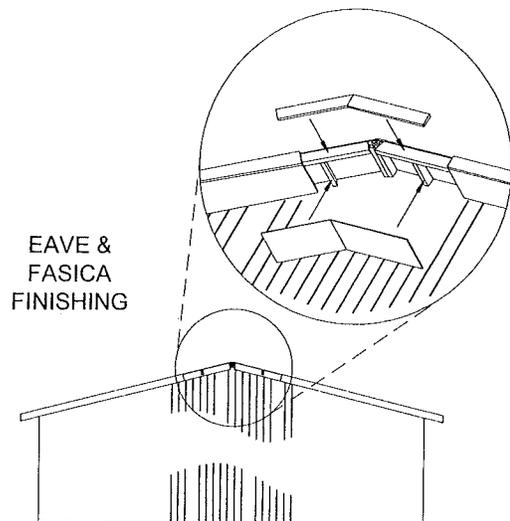
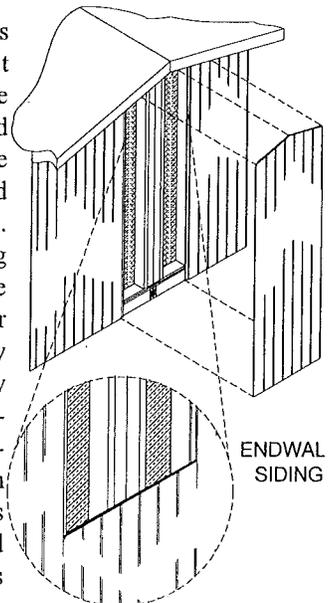
- 6) When aligning the floor sections, sections should fit tightly together. Gapping between sections may occur, however, the gaps should be no more than one (1) inch. Should the spacing be up to one (1) inch, shim with lumber. Using 3/8" x 5-1/2" lag screws at (16) inches on center throughout the length of the home. Alternate angles of 40° or less for every screw installed ensuring the screws run through any shim material that may be used. To properly fill gaps at the floor line in the commonwall openings use shimming material to within one (1) inch min. of finished floor. Fill this one (1) inch plus area above shimming material with *Rockhard Wood Putty* or equivalent product. After completion of this task, repair the moisture barrier with the sealing tape provided.
- 7) The front and rear endwalls should now be fastened and finished. The home will be shipped to you with the endwall sheathing or hardboard siding held back from the marriage line approximately (16) inches. To secure the sections, use the four strips of 1-1/2" x 10" metal strips. Space the metal along the height of the endwall, fastening to the

studs with (1-1/4) inch galvanized roofing nails every eight (8) inches along both edges. To finish securing, cut a piece of sheathing or siding large enough to cover the remaining uncovered portion of the endwall. With OSB sheathing, leave about an (1/8) inch gap at the seams to allow



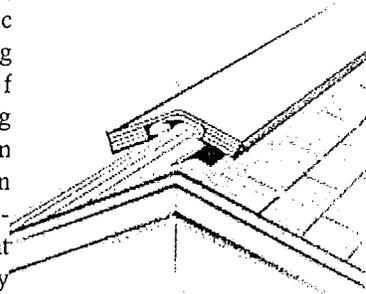
ENDWALL & ROOFING FINISHING

- 8) Once the home is set in its final position, fasten at (12) inches on center the 6" x 10' pieces of angled ridge metal along the ridge line with the galvanized roofing nails provided. Next, apply roofing underlayment the entire length of the home. After this, complete the ridge by fastening ridge row shingles. For finishing asphalt shingled roofs, secure ridge shingles with galvanized roofing nails provided. Start at the end and overlap the shingles until they meet the opposite end. Complete eave by securing the fascia near the ridge.

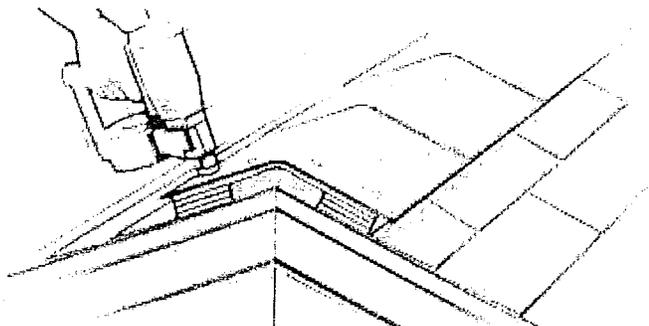
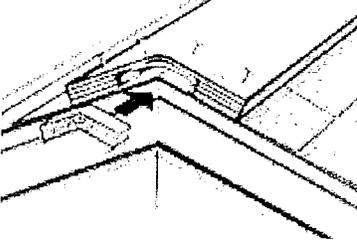
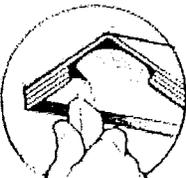


9) **Optional Vented Ridge Cap**

- a) Roll out the vent, Storm Stop fabric side down, along entire length of slot also covering the 6" minimum uncut ridge on both ends. Multiple length of vent can be joined by inserting an end cap at the end of each roll (see step #2) and butting the rolls tightly together.



- b) For End Cap Installation, pull apart a precut section of the foam end cap found between the layers of roll. Using a utility knife, make a cut in the Storm Stop material each side of the vent, back from the end of the roll. (See illustration) Attach vent to the roof deck by driving a nail in each of the two corners on both ends of the vent. Also, drive two nails through the vent and foam end cap to hold foam in place on the ends of the ridge only.



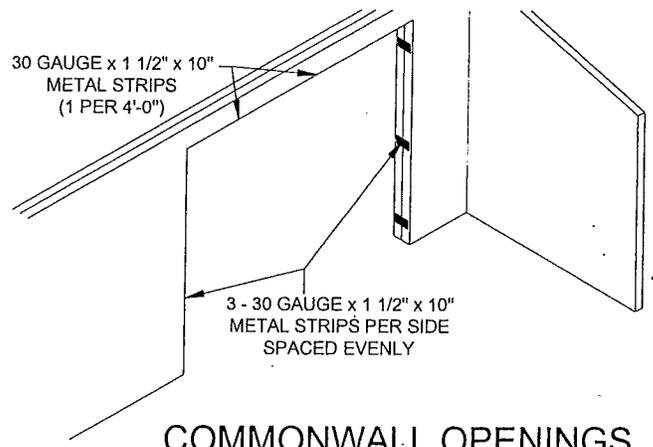
- c) Nail ridge cap shingles with 1-1/2" roofing nails in a common overlapping pattern. It is important when installing this vent that you maintain the pitch of the roof. The vent has been installed properly if the bottom of the vent is flat on the roof and the peak is slightly rounded.

- 10) **For Cedar Siding**--- If your home has cedar siding, endwalls will need to be completely sided. The first step will be to remove all shipping plastic that may remain on the endwalls. Start a row of siding at the bottom of the endwall. Subsequent rows of siding should be applied up the endwall with a one (1) inch overlap. Fasten siding through the sheathing and into the studs at (16) inches on

center using the two (1/2) inch stainless steel nails provided.

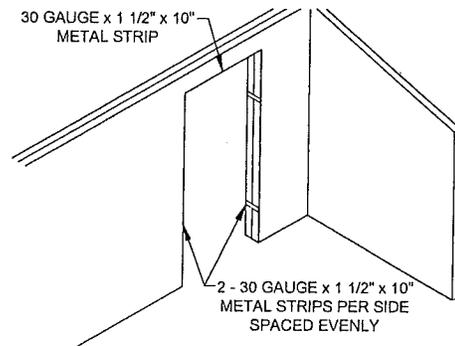
**For Vinyl Siding** --- The endwalls will need to be completely sided. To begin, nail a vinyl starter strip to the bottom edge of the wall. The corner trim piece will already be in place when the home is shipped. Trim will need to be fitted next to the soffit before pieces can go up to the peak of the wall. Start a piece of siding by snapping it into place and then nailing it about every eight (8) inches to allow for expansion and contraction of the vinyl.

- 11) All openings in the commonwall should be secured with 1/2" x 10" strips of 30 gauge metal. The metal should be secured with 1-1/4 inch galvanized roofing nails. One strip of metal per four (4) feet of opening should be used for the top of the archway as well as three pieces on each side.



**COMMONWALL OPENINGS**

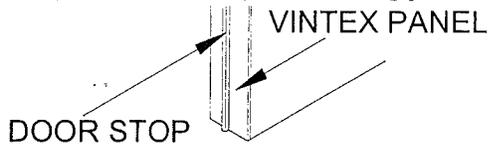
- 12) Openings that have a door installed should be secured with 1-1/2" x 10" straps. Three on the side jambs and a piece on the top jamb.



**DOOR OPENING IN COMMONWALL**

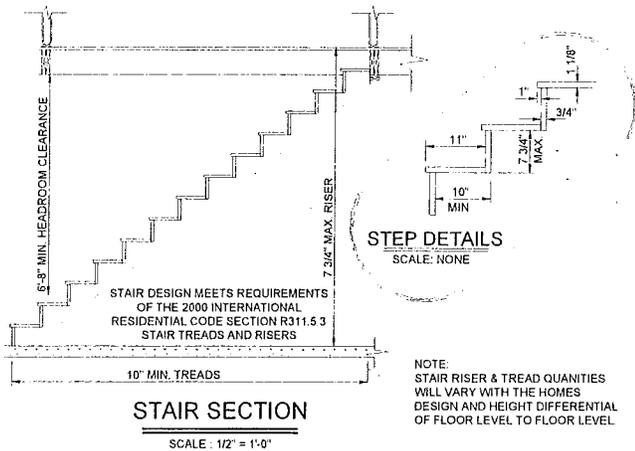
- 13) Doors in the marriage wall that have been installed will now be completed. After securing opening, as outlined in step 12, apply the 10" x 1/2" Vintex panel or *Ash trim jamb assembly* directly to stud on hinge side of opening. Now mount door on hinge side of opening, allowing ample space on top and bottom of door. After door has been mounted, apply the 10" x 1/2" Vintex panel or *Ash trim jamb assembly* directly to the remaining side, shimming where necessary. This will complete the sides of the door framing. Now complete top of door framing with the same

steps as for the side jambs. After door jambs have been completely installed, locate and secure molding to be used as a door stop, except if your home has *Ash trim option*. Finally trim the doorway with molding provided.



**\*\* EXCEPTION: ASH TRIM JAMB ASSEMBLY**

- 14) All archway openings should now be sheetrocked, and bullnosed with the material provided. These openings will then need to be taped and textured.
- 15) Completion of all plumbing should be made. Check all work for leaks, improper sizing or slope with instructions provided in owners manual.
- 16) The electrical system should be wired to supply and then checked for operation.



**Anchorage Instructions**

In accordance with the *Federal Manufactured Housing Construction and Safety Standard* in effect on date of construction, the following anchorage requirements for all Wind Zones are in addition to any requirements covered under the previous standard:

Design of anchors should be certified for their installation by a professional engineer of a nationally recognized testing laboratory as to their resistance based on the installed angle of diagonal tie and/or vertical tie loading and type of soil in which the anchor is to be installed.

Anchoring equipment should be certified by a registered engineer or architect to resist these specified forces in accordance with testing procedures in ASTM specification D3953-91; "Standard Specification for Strapping, Flat Steel, and Seals."

Tie Downs must start no more than two (2) feet from each end of unit.

Protections shall be provided at sharp corners where the anchoring system requires external straps or cables.

Strapping to the Type 1, Finish B, Grade 1 steel strapping, 1.25 inches wide and .035 inches in thickness, certified by a registered professional engineer or architect as conforming with aforesaid ASTM specifications.

**Utility Connections**

**General**

Before connecting any utility systems, it is recommended that local, county and state authorities be consulted for compliance with local requirements.

**CAUTION:** It must be possible to gain access to utility hookups, either by removable sections of skirting or through access doors.

**Heating, Ventilation, and Air Conditioning**

It is imperative that you read and understand the owner's manual provided by the manufacturer of each piece of equipment in the house. In the event that there is a discrepancy between this manual and the appliance manufacturers' provided manual, follow the instructions given by the manufacturer of the appliance.

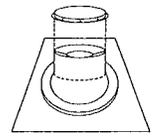
It is mandatory that the combustion air and flue tube assembly be fully engaged at back sides and front, and combustion air tube securely fastened to the furnace with sheet metal screws in the screw holes provided.

**CAUTION:** Vent piping must be insulated with R-5 insulation if it will be subjected to freezing temperatures such as routing through unheated areas.

The combustion air pipe should also be insulated when it passes through a warm, humid space.

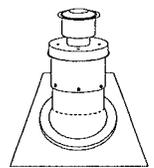
**Installation of Exterior Roof Jack Extension**

- 1) Remove weather cover. Remove the three screws that secure the weather cover to the roof jack barrel. Remove and discard the cover.
- 2) Install crown assembly. Slide the crown assembly over the roof jack barrel. Secure with the three screws previously removed from the weather cap, using the prepunched holes as guides.



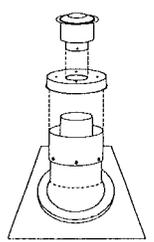
STEP 1

- 3) Remove upper and lower caps. Remove the two screws that secure the upper cap to the crown assembly base and remove the upper cap. Next, remove the three screws that secure the lower cap to the crown assembly base. Set both caps aside for later use.



STEP 2

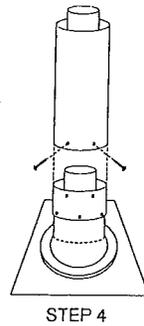
- 4) Install Extension. Place the roof jack extension on top of the crown assembly base, pushing down firmly to assure a snug fit.



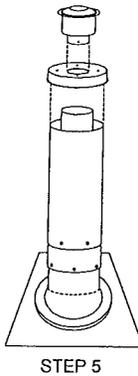
STEP 3

**IMPORTANT:** Make sure that the pipes are connected. Using the four holes at the base of the extension as a guide, drill four holes (1/8) inch in diameter into the crown assembly base. Se-

- cure the extension to the crown assembly base with the four screws provided.
- 5) Reinstall Upper and Lower Cap to Extension. Install the lower cap on top of the extension so that the center pipe sticks through the hole in the lower cap. Using the three screws removed in step 3, attach the lower cap to the extension bracket. Install the upper cap over the center pipe of the extension. Using the two holes located at the base of the upper cap as guides, drill two holes (1/8) inch diameter into the center pipe. Finally, attach the upper cap to the center pipe using the two screws removed in step 3 to center the pipe.

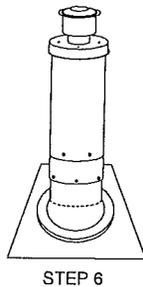


Use (1/2) inch blunt or sharp end metal screws to fasten roof jack combustion air pipe to furnace combustion air collar. Screw holes are provided in the pipe and collar. Excessively long screws may extend to the flue pipe and puncture it. Screws are not to exceed (1-1/2) inches in length.



Combustion air tube and flue pipe are part of the same assembly. Only the combustion air tube need be fastened to the furnace.

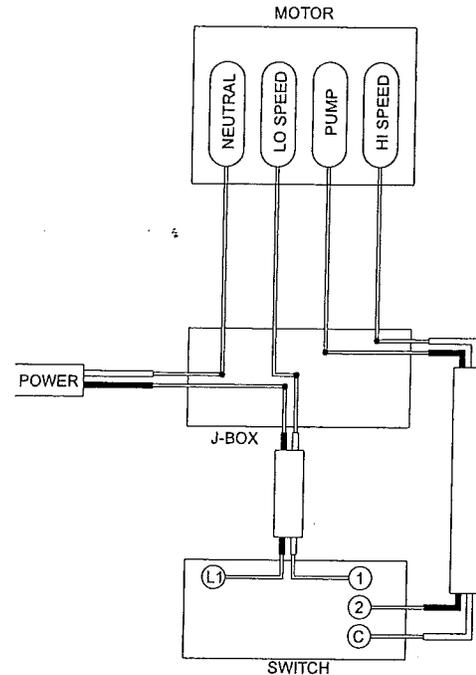
- 1) Check to be certain that the flue pipe and combustion air tube are present.
- 2) Pull the telescoping flue tube and combustion air tube assembly down from the roof jack. Slide the flue tube/combustion air tube assembly down firmly over the furnace outlet and combustion air collar. Insure that the back side, and front of combustion air tube collar is fully engaged. Fasten the combustion air tube to the furnace combustion air collar using two (1/2) inch sheet metal screws. (Screw holes are provided in combustion air tube and furnace combustion air collar.)



At this time have all the gas connections checked for air pressure and the flue checked for tightness. A serviceman can then light the pilot. Change the furnace filter as often as needed. Clean the air distribution system regularly to prevent the motor from overheating. Keep up maintenance on the air distribution system as defined in the manufacturer's instructions. Check the flue pipe regularly for soot, rust or corrosion.

On double-section homes, the flow of heat from one section to the other is accomplished by a crossover duct system. This crossover system consists of a rigid duct that connects the two main duct trunks. This rigid crossover duct is sealed together at the commonwall line with insulation. Be sure that the commonwall insulation that is placed when setting the house is not constricting the air flow between the two halves.

OPTIONAL: Branch circuits are installed at the factory for the purpose of energizing an exterior air conditioning panel through the floor. You must connect the air conditioning equipment according to the instructions given in the owners manual provided by the equipment manufacturer. The supports or slab built for the air conditioner must be freestanding. The condensation tubing for the air conditioner must drain to the exterior of the house.



5 WAY SWITCH TO EVAPORATE COOLER WIRING

Check all air intakes and outlets regularly to make sure that they are completely free from any constrictions. Be sure to check the return air filter which must also be kept clean.

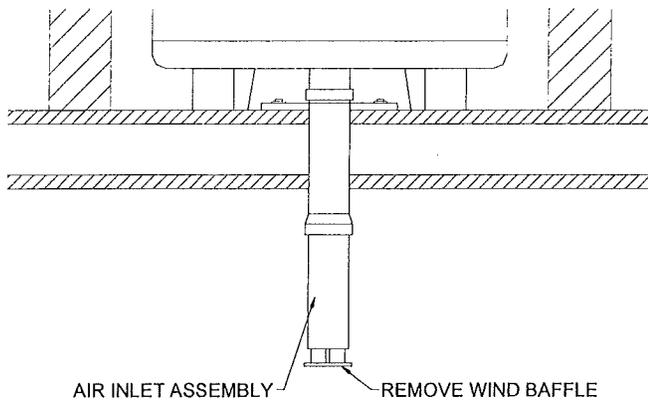
### Water Heater Side Wall Air Inlet Set - For Field Installation Over Basement or Crawl Space ONLY!

**WARNING:** This is a Direct Vent Appliance, and care must be taken to ensure that the installation of the water heater and this kit are airtight!

1. **LOCATE AIR DIVERTER:** Determine which outside wall the Air Diverter Base will be located on.

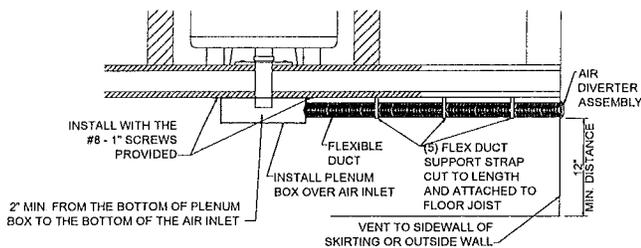
**CAUTION:** Location of the Air Diverter Base must take into consideration the 16 foot maximum length of Flexible Duct allowed between the Air Diverter Base and Air Inlet Plenum. The Air Diverter Assembly must be located a minimum of 12" from ground level. Refer to Figure 3. The Flexible Duct must be run reasonable straight (no turns).

2. **AIR INLET ASSEMBLY:** Remove the screws, which attach the wind baffle to the existing air inlet vent pipe located underneath the home. Refer to Figure 1. Discard the wind baffle and screws as they are no longer required with this field installation set.



**FIGURE 1**

3. **CHECK LENGTH OF AIR INLET PIPE:** It may be necessary to trim the length of the 3" air inlet pipe so that the pipe fits into the plenum box without touching the bottom of the box. The 3" air inlet pipe should fit into the plenum box about 2" from the bottom of the box. Refer to Figure 3.



**FIGURE 3**

4. **ATTACH FLEX DUCT TO PLENUM:** Place one of the clamps provided over one end of the 5" flex duct and attach flex duct to air inlet plenum box 5" diameter collar. Ensure that the flex duct wire is pulled over and past the collar flush with the wall of the air inlet plenum box. Tighten the clamp to secure the flex duct to the collar. Tighten securely but do not over tighten.
5. **ATTACH PLATE (3-1/8" HOLE) TO PLENUM BOX:** Make sure plate covers 5-7/8" hole with flange on inside of plenum box. Attach plate with 3-1/8" hole to plenum box using the (4) #8 - 1/2" sheet metal screws provided.
6. **POSITION PLENUM:** Align the 3/1-8" hole in the plenum box with 3" air inlet vent pipe located underneath the home. Position the air inlet plenum box so that the 5" diameter collar faces the proposed direction of the air inlet diverter.
7. **INSTALL PLENUM:** The air inlet plenum box side flanges should be positioned so that they can attach to the underside of the floor joists. Once in place, securely attach the air inlet plenum box to the underside of the floor joists using the #8 - 1" self-tapping screws provided through the flanges into the floor joists. (Use at least three screws on each side of the plenum box.)
8. **AIR DIVERTER BASE:** Cut a 5" to 5-1/2" opening in sidewall of skirting or outside wall to allow entrance of air diverter tailpiece and 5" flexible duct.

Attach air diverter base to outside wall using the #8 - 1" screws provided. Be sure that the screw holes are aligned so that the air diverter cap can be installed with screw holes on top. The air diverter base must be located a minimum of 12" from ground level.

9. **CUT FLEX DUCT TO LENGTH:** Extend flex duct from the collar of the air inlet plenum box to the outside wall location of the air diverter base must be located a minimum of 12" from ground level.
10. **SUPPORT FLEXIBLE DUCT:** Support must be provided for the flexible duct at a minimum of 4' intervals. Use the 1" wide support strap and fasten with screws, staples, or nails to support the duct.
11. **ATTACH AIR DIVERTER CAP:** Attach the air diverter cap to the air diverter base using the tamper proof fasteners provided.
12. **INSPECT COMPLETE ASSEMBLY:** Inspect the complete assembly to ensure that all procedures have been completed.

#### Collar Installation through Exterior

Determine the location of the opening in the rim joist and cut a (3-3/4) inch hole 30 or 40 gallon or (4-3/4) inch hole 50 gallon through the rim joist.

The three (3) inch or four (4) inch PVC, ABC, or CPVC Schedule 40 vent pipe, whichever is the most convenient, can be run from the water heater. The vent pipe must extend a minimum of (1-1/2) inch through the exterior wall. Note that the inside collar must be slipped over the vent piping before locating the pipe through the wall. Before securing the inside and the outside collars to the wall, use a silicone sealer between the pipe and opening to insure a water tight seal.

**WARNING:** A gas water heater cannot operate properly without the correct amount of air for combustion. Provide ventilation and combustion air by means of floor and wall openings as shown in the drawing. Never obstruct the flow of combustion and ventilation air. If you have any doubts or questions at all, call your gas company. Failure to provide the proper amount of combustion air can result in a fire or explosion and can cause property damage, serious bodily injury, or even death.

#### Air Quality Improvement System

Federal standards require that an air quality improvement system be made available to all prospective home purchasers. The Coleman Blend-Air system is offered in the Chief® Industries protect line, which has been explained to you by your dealer.

If you purchased the Blend-Air system with your home, the operation of this system is completely automatic. The Blend-Air Environmental System is designed to work in conjunction with the home's heating system to introduce fresh air to the living area. Federal standards require that a mechanical air quality device have the capacity to introduce fresh air

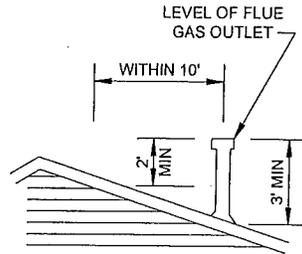
to the living area. Federal standards require that a mechanical air quality device have the capacity to introduce a minimum of (25) cubic feet of air per minute (cfm) into the living area. The Blend-Air Environmental System can help reduce the level of humidity in your home. There is a general consensus that higher levels of humidity can result in higher levels of indoor air pollution.

The Blend-Air Environmental System should be maintained as outlined in the owners manual provided by the manufacturer.

### Fireplace Installation

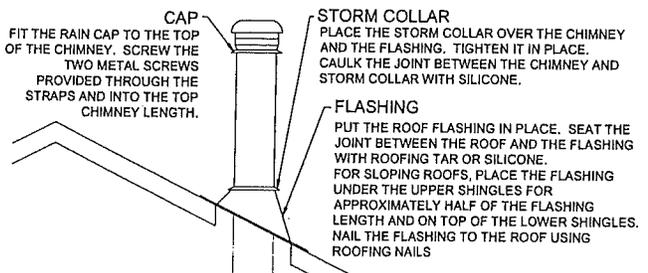
Once the home is set and leveled, finish the chimney for the fireplace. All chimney extensions must extend a minimum of three (3) feet above the

highest point where it passes through the roof and must be at least two (2) feet above the roof peak if within a (10) foot horizontal span from the peak. **IMPORTANT: If an exposed portion of chimney is greater than four (4) feet above the roof line, use support wires to keep chimney secure.**



### CHIMNEY CLEARANCES

passes through the roof and must be at least two (2) feet above the roof peak if within a (10) foot horizontal span from the peak. **IMPORTANT: If an exposed portion of chimney is greater than four (4) feet above the roof line, use support wires to keep chimney secure.**



The support wires may be attached to the outer pipe of the chimney with screws, provided the screws do not penetrate the inner flue pipe.

When starting a fire in the fireplace remember to fully open the glass doors and flue damper for sufficient air combustion. Always keep the fire from coming into contact with the glass doors. Clean the glass with any commercial glass cleaner or soap and water. Do **NOT** use any abrasive material to clean glass. Do **NOT** clean glass with cool water if it is still hot from fire.

The damper control lever should be located inside the fire chamber. Pull down to close, push up to open. The damper must be open when lighting a fire, not doing so will cause smoke spillage into the room. When the fireplace is not in use, close the damper to prevent downdrafts to enter the room.

The grate in the fire chamber is there to provide air combustion space beneath the solid fuel. Remember to keep the ashes cleaned out for this reason.

### Electrical System

Your home is typically designed to be connected to an electrical supply source rated at 240V, 3 pole, 4-wire includ-

ing ground system. If an option was purchased for an overhead mast or meter hub, the home may have been designed as a 240V, 3 pole, 4-wire including ground system. Refer to name plate on exterior of home to determine type of system.

In making the feeder connections to this power source, it is extremely important that wire of the correct size be used. If the wire is incorrectly sized, the ampacity for that wire may be exceeded and you will experience a voltage drop to your home. Ampacity is the safe carrying capacity of a wire expressed in amperes. The greater the amperes flowing, the greater the heat produced.

Moreover, if the amperage is allowed to become too great, the wire may become so hot that it will damage the insulation or even cause a fire. A voltage drop in your home can cause a drop in the efficiency of all lights as well as appliances. Motors may burn out and you may be paying for electricity that you do not use. Refer to the following table to determine recommended conductor type and size for the size of panel box.

SERVICE AMPS	WIRE SIZE			CONDUIT SIZE
	FEEDER	GROUNDING CONDUCTOR	GROUNDING ELECTRODE CONDUCTOR	
100	#4	#8	#8	1-1/2"
150	#1	#6	#6	2"
200	#2/0	#4	#4	2"
225	#3/0	#4	#4	2"

COPPER CONDUCTOR TYPES: RH-, RHH, -RHW, -THHN, -THW, -THWN, -XHHN

It is also critical for the protection of the occupants of the home that all non-current-carrying metal parts be properly grounded. The only safe and approved method of grounding your home is through an electrical-isolated grounding bar in the manufactured home power supply panel which grounds all non-current-carrying metal parts to the electrical system in your home at a single point.

The ground conductor of the power supply feeder cable connects the grounding bar to a good electrical ground. Insulate the grounded circuit conductor (neutral or white) wire from the grounding conductors (green wires) and from equipment enclosures and other grounded parts. Bonding screws, straps or buses in the distribution panel board should have been removed and discarded at the manufacturing facility.

Homes with a factory-installed service meter base must be grounded differently. The exterior equipment and enclosure must be waterproof, and conductors must be suitable for use in wet locations. When a meter is provided on the home, connect the neutral (white) conductor to the system grounding (green) conductor on the supply side of the main disconnect. The grounding electrode conductor is run from the meter to the grounding electrode conductor(s). The grounding electrode should be an eight (8) foot length of (1/2) inch diameter copper rod or bury it horizontally in a (2-1/2) inch deep trench. Connect the grounding conductor wire to the grounding electrode with a grounding clamp.

**WARNING: On a 3 pole, 4 wire feed it is extremely important that the neutral connector not be grounded in or on the manufactured home or the home service entrance cabinet.**

Electric crossovers between halves of section homes are located along the center line between the sections. The crossover wires will be located in the first floor joist cavity from either end of the home. These crossover locations can be distinguished by access cover panels. Remove these panels and connect the enclosed wires using the numbered splicing devices, connecting them to their corresponding numbered device on the adjacent section.

### Smoke Alarm Installation and Testing

In the floor system, in the second floor joist cavity in from either/both end(s) of the home there will be an electrical box with the wiring to connect the home's smoke alarm system. Connect the wires from one section to the other by tying the wires black to black, white to white, red to red, and bare to bare.

Once the wiring is connected, press the test button on each alarm individually. As you test, be sure that the alarm sounds on every mechanism in the system. Should any of the alarms you are testing not sound, check all wiring connections. If necessary replace the alarm with a new and similar mechanism. If necessary, replace the alarm with a new and similar mechanism. Perform another operational test on all alarms.

When your home is designed to be placed over a basement, it is required that this lower level be protected by a smoke alarm(s). You should check with your local authority to see if other alarms may be required due to the design of your basement.

A smoke alarm with a battery back up will be sent with the home and should be inter-connected with the other alarms on the main level of the home. This is done so that it will sound when any of the other alarms on the main level of the home. This is done so that it will sound when any of the other alarms are triggered. The following are steps that need to be taken to connect this lower level smoke alarm to the remainder of the system.

Towards the front or rear of the home electrical crossover is located in the floor system, there will be an electrical box with the wiring to connect to the smoke alarm. Connect the wires on the alarm to the wiring in the box tying the wires black to black, white to white, green to green, and the yellow wire on the alarm to the red wire in the box.

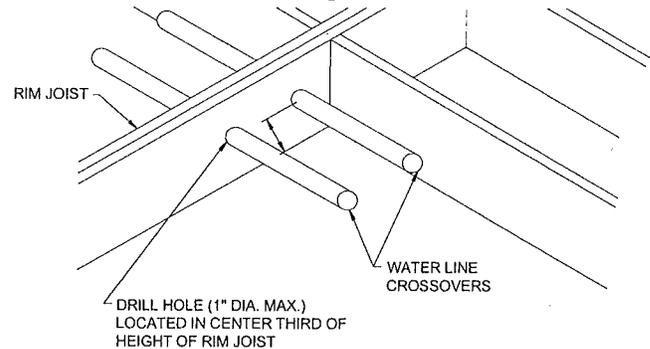
Once the wiring is connected and the alarm secured in place, press the test button on each alarm (including those on the main level) individually. As you test, be sure that again, the alarm sounds on every mechanism in the system. Should the alarm(s) you are installing or the others in the system you are testing not sound, check your wiring connections. If necessary, replace the alarm with a new and similar mechanism. Perform another operational test on all alarms.

### Phone and Television Hookups

If you have ordered phone and television hookups, these will be located in the third floor joist cavity from the rear of the house. These will be (12) inches away from the marriage wall on each section. If there are hookups on both sections of the house you will have to connect these at the marriage wall line.

### Water System

A (3/4) inch threaded inlet is provided by the manufacturer for the water supply systems connection. This inlet is located below the home and usually near the water heater compartment. A tag on the side of the home indicates the location of the water inlet. A shutoff valve must also be installed between the water supply and the house inlet. The valve must be a full port gate valve or a full port ball valve.

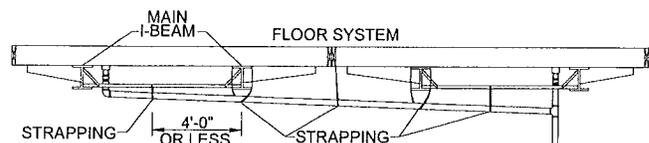


**CAUTION:** The main shutoff valve is not supplied by the manufacturer, but must be installed on the system to comply with the federal construction and safety standards.

If your home has fixtures that require water located on both sections, there will be proper pieces and fittings provided for connecting the water lines. A (1/2) inch water line that crosses the marriage wall line uses a single fitting. On one side the line is cut back while the corresponding line on the other half will have extra length to compensate. A (3/4) inch water line that crosses the marriage wall line will have (12) inch sections of line equipped with the appropriate fittings to connect to the water lines that are cut back from the marriage line on both sections. The dimensions to the crossover will be listed on the *Water Line* print (assuming presence of crossover).

### Drain, Waste, and Vent

If there are plumbed fixtures on both halves, there will be drain pipe and fittings provided by the manufacturer in order to complete the entire drain line. An enclosed *Drain Line* print will specify how to assemble the fittings and drain pipe provided.



### DRAIN LINE STRAPPING DIAGRAM

Due to the possibility of transportation damage, the manufacturer has provided the drain line fittings, the drain line pipe sections and the assembly instructions (shown on the *Drain Line* print in dashed lines) and are shipped loose to complete the plumbing system at the setup site.

The drain line shall be assembled using the pipe, cement,

and supports shipped with the home. Assembly of the system shall be in accordance with state and local codes.

Final drain connections are made at the three (3) inch outlet located in the center portion of the home. Approved three (3) inch connectors should be used at both ends when connecting this drain outlet to the main sewer system. The drain lines installed on the home must have a slope of (1/4) inch per foot. In order to support the connecting drain line, fittings, pipe, strapping, and glue has been provided by the manufacturer. This support strapping should be spaced at intervals not greater than four (4) feet apart.

After the system has been connected, all the fixtures in the home should be filled with water and allowed to drain through the newly installed system. Check all joints for any visible leaks.

## Gas System

The heating system in your home may have been designed to operate on natural gas. If your energy source is LP (liquid propane) modifications must be made to each gas appliance in the house. Check with each respective appliance manual for conversion standards, these conversions are to be done by qualified individuals.

On some sectional homes which locate gas appliances in both halves, the gas crossover line will be provided between the home sections. This crossover line will be located below the floor structure and near to the center line. It will be equipped with an approval flex connector and a shutoff valve. The final connection of the crossover is made after the dust cover on the shutoff valve has been removed and connected (screw type) on to the two halves, completing the connection.

After the gas system has been installed, it must be checked over meticulously to insure absence of leaks.

To avoid possible damage to associated gas valves and regulators incorporated on appliances, do not pressurize the gas line in excess of eight (8) ounces maximum after final connections are made.

After final testing of the gas lines, the home can be connected by using a listed gas connector of the capacity indicated on the label by the gas inlet.

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## Interior Finishing

### Large Light Fixtures

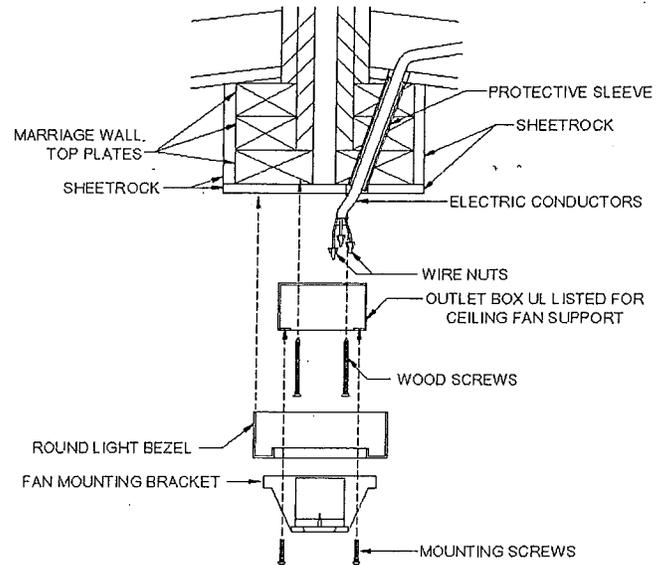
If your home has large light fixtures or ceiling fans, you will have to complete their installation on site. The light fixtures will be shipped loose with the home. Locate the junction box that has been placed where your light fixture will be attached. Remove the cover plate from the junction box, this will expose the wires for assembly.

Remove the wire nuts from the end of the wires and complete as follows:

- 1) Connect wires together according to color (i.e. black to black) using a wire nut. Note: Grounding wires may be either bare or color coded green.
- 2) Grounding of the mounting bracket must be made by attaching the grounding conductor to the bracket grounding screw or if no screw exists, a listed clamp must be used. This connection must be made prior to the connection of the fixture.
- 3) Place fixture over junction box, secure it with the bracket supplied by the fixture manufacturer.

### Ceiling Fan on Marriage Wall Beam (Cathedral Option Only)

If you have ordered a ceiling fan that should be placed on the marriage wall beam, of a cathedral ceiling your home has been constructed with provisions for the installation of the fan. This installation shall be completed following the setting and fastening of your home. This fan shall be installed as follows:



- 1) Once the sections have been fastened together, you should make sure the electricity has been turned off at the circuit breaker of panel box to reduce the risk of electrical shock.
- 2) Remove the wire nuts from the electrical conductors and take the electrical box from the bottom of the marriage wall beam before removing shipping wall components. This should allow the conductors to pass through as the shipping wall top plate is removed.
- 3) Finish the marriage wall opening as detailed, but remember to allow electrical conductors to pass through the finish material.
- 4) Open one of the knock-out holes in the top of the electrical box that is provided. (This electrical box must be UL listed for ceiling fan support.) Feed the electrical conductors through this hole, and slide the electrical box up to the beam. Secure the box to the marriage wall beam with a minimum of three (#8 x 2-1/2") screws that are provided.
- 5) Once the electrical box is solidly fastened into place,

slide the round light bezel over the box. Using the mounting screws provided, fasten the fan mounting bracket to the electrical box. This will hold the ends of the electrical conductors into the center of the mounting bracket.

- 6) From this point, there are several options in mounting your ceiling fan. Consult the ceiling fan manufacturer's installation instructions, decide which ceiling fan mounting you will use, and proceed with the appropriate instructions per their manual. Where necessary, each section will note the different procedures for the various types of mounting and wiring.

## Appliance Installation

### General

A gas or electric clothes dryer installed in the home must be exhausted on the outside by a moisture lint exhaust duct and termination fittings. If your dryer sits along an exterior wall, the appliance will have already been properly rented through this exterior wall. However, if your dryer doesn't sit along an exterior wall, you will need to complete the means of renting after the home has been set.

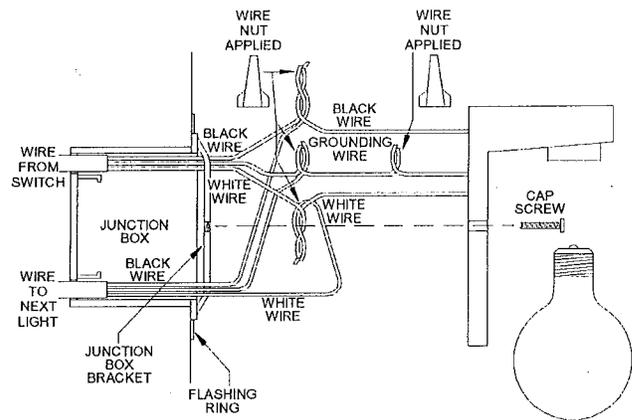
### Clothes Dryer

If your home has been constructed with provisions for a dryer vent, this installation shall be completed on site, prior to the use of your appliance. The dryer vent shall be installed as follows:

- 1) A four (4) inch diameter access has been provided in the floor directly behind the dryer. The access hole has been covered with a plywood cover.
- 2) Select a length of four (4) inch dryer duct to complete the vent. **This duct will be required to exhaust to the outside of the home. The vent can not terminate underneath the home.**
- 3) Secure the duct to the vent of the dryer. Feed the duct through the access hole, through the protection membrane covering the underside of the home, and out to the exterior of the home.
- 4) Install a louvered vent termination kit on the exterior of the home. (This kit is not provided as part of the home and is the responsibility of the homeowner.)
- 5) Completion of the vent shall be the sealing of the outer membrane at the point the duct exits the membrane. Several types of tape sealant are available on the market locally that would adequately seal the membrane from entrance of moisture and/or rodents.

may be either bare or color coded green.

- 3) Grounding of the junction box bracket must be made by attaching the grounding conductor to the bracket grounding screw or if no screw exists, a listed clamp must be used. This connection must be made prior to the connection of the fixture.
- 4) Fold wires over the junction box bracket back into junction box.
- 5) Place light fixture over junction box and using a cap screw, secure the fixture into the threads in the junction box bracket.
- 6) Caulk the top of the light fixture to complete weather seal.
- 7) Furnish bulb and attach globe.



EXTERIOR LIGHT CONNECTION

## Porches & Steps

Porches and steps must be designed and built to the specifications of any local authority having jurisdiction over the site. It is the responsibility of the homeowner to ensure compliance. These must **NOT** use any part of the home for structural bearing or support. The home was designed and built to meet specific loading requirements; any alteration to this loading will void the structural warranty and any problems thereafter are the responsibility of the homeowner.

## Home Extensions & Additions

Addition or extension design, construction, and acceptance is the responsibility of the state, city, or municipality having jurisdiction. The home was designed and built to meet specific loading requirements; any alteration to this loading will void the structural warranty and any problems thereafter are the responsibility of the homeowner.

## Exterior Finishing

### Exterior Light Connection

- 1) Remove junction box cover.
- 2) Connect wires together according to color (i.e. black to black) using a wire nut. Note: Grounding wires

## Final Inspection

### General

After your home has been completely set up, it is imperative to have a final inspection to insure no items have been

overlooked. Any missed step could cause a service problem. Special emphasis should be placed on the following items:

### **Air Infiltration Barrier**

A special material is fastened to the bottom side of your new home. It was installed at the factory to protect against moisture, rodents and unconditioned air. This covering was inspected at the factory, but could have been damaged during transit. It is important that the areas that are damaged be resealed.

Using vinyl patching tape designed to repair tears or holes. If a hole is large, use a patch of the same or similar material as the bottom covering and tape the edges for an airtight seal. Specifications for the sealing tape are listed in the Homeowner's Packet.

### **Exterior Siding and Trim**

A thorough check should be made of all portions of the exterior siding to make certain that it is not cracked, split, buckled, or loose in any manner. Any siding observed to be in this condition should be repaired or replaced.

All fasteners that are loose should be retightened or replaced.

All decorative trim pieces or moulding strips should have special attention to make certain there are no gaps or voids in the sealant tapes or caulking material. If any such places are observed, they should be resealed.

Should your home be constructed with cedar siding, please be aware of that the home comes to you with the cedar unfinished. It is highly recommended that before or immediately after you have completed setting your home, you treat the siding with a wood preserving stain or sealant. It is also recommended that you repeat this finishing treatment at a time duration recommended by the preservative's manufacturer.

Cedar siding, being a natural product, will experience some natural expanding and contracting due to atmospheric conditions. To best protect your home you should annually check for any gaps or areas that may need to be recaulked.

It is highly recommended that you employ the use of gutters and downspouts to help preserve your exterior siding. The downspouts, if done correctly, will make most water flow away from the foundation of the house.

### **Roofs**

The roof should be checked to make certain that all vent pipe flashings are in place, properly attached, and properly sealed.

The shingles should be checked for proper attachment, making certain that none are loose or have been displaced during transit.

### **Clearances**

If there are any low-hanging trees or bushes adjacent to your home which could cause damage the exterior or the roof,

they should be trimmed out or cut accordingly. Future growth of these bushes or trees should be considered in connection with possible movement during wind conditions or under snow or ice loads.

### **Caulking**

There are many good brands of caulking material and roof sealers which can be purchased from local retail stores. Whatever brand of caulking and/or sealer is purchased, the instructions regarding application should be read closely. This will include any special preparation of the surface to be coated. Observe the labeling on this material for any notes concerning resistance to running or streaking the sides of the home. This can be very unsightly and in many cases extremely difficult to remove.

### **Interior**

At this time, all furniture, carpet, fixtures, or other loose items should be installed. All clamps or brackets installed on windows and doors for shipping purposes should be removed and the operation of these items checked. After initial leveling, recheck doors, cabinet doors and windows for square and re-square as needed.



### **Summary**

Once you are initially finished with this manual, remember to store it with all your home related manuals for future reference.

This concludes the setup portion in preparing your home for residence. We hope you enjoy your new investment for many years to come. Thank you for choosing Chief® Industries to assist you in making your dream a reality!

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