

INSTALLATION MANUAL

4/04

Foreword

Congratulations on the purchase of your new manufactured home. This home was designed, engineered and built with great pride and care. Your home is a totally integrated structure; therefore, it is important that these instructions are closely adhered to. With proper setup and maintenance you and your family will enjoy your new home for years to come.

The installation of your new home shall be performed by an experienced and qualified contractor. If the purchase agreement with your dealer does not include the installation of your home, he or she can assist you in locating the proper qualified and trustworthy personnel.

Your home state may have manufactured home installation laws and regulations and the contractor will be required to follow these instructions. Your state may require the setup contractor and/or the utility contractors to be licensed. Your local authorities can provide you with the requirements in your area. If your home state does not have specific regulations, these instructions must be followed or you may void your warranty.

Table of Contents

Chapter 1 - Introduction	1.0	Chapter 4 - Setup Procedures (cont.)	
Chapter 2 - Site Preparation	2.0	Wind Zone 1 Strapping & Anchoring Requirements	4.12
General	2.0	Wind Zones 2 & 3 Strapping & Anchoring Requirements	4.13
Drainage and Grade	2.0	Singlewide Sidewall Tiedown Requirements	4.14
Compliance Certificate	2.0	Singlewide Sidewall Tiedown Requirements	4.15
Structural Wind Zone Map	2.1	Doublewide Sidewall Tiedown Requirements	4.16
Soil Bearing Capacity	2.2	Doublewide Sidewall Tiedown Requirements	4.17
General Description of Soils	2.2	High Pitch/Hinge Roof Tiedown Requirements	4.18
Pocket Penetrometer	2.2	Longitudinal Tiedown Requirements	4.19
Vegetation	2.3	Column Tiedown Brackets for Multi-Section Homes	4.20
Vapor Barrier	2.3	Angle Bracket Details	4.21
Chapter 3 - Foundations	3.0	Tiedowns for Offset Unit	4.22
Pier Capacities	3.0	Tiedowns for Offset Unit	4.22.1
Configuration	3.0	Clerestory Dormer Tiedown Requirements	4.23
Footings	3.0	Triplewide Tiedown System	4.24
Special Conditions	3.1	Covered Corner Porch Tiedowns and Piers	4.25
Alternate Foundation Systems	3.1	Sidewall Porch or Recessed Entry Pier and Tiedowns	4.26
Important Reference Documents	3.1	Uncovered Porch Tiedowns & Pier	4.27
Typical Pier Construction	3.2	Floor Interconnection Marriage Line Sealant	4.28
Footing Design Size & Thickness	3.3	Roof Interconnections & Ridge Beam Close-up	4.29
Pier Capacity Table Single Section Homes	3.4	Wall Interconnections	4.30
Pier Capacity Table Single Section Homes	3.5	Tag Interconnections	4.31
Pier Capacity Table Multi-Section Homes	3.6	Miscellaneous Tag Details	4.31.1
Pier Capacity Table Multi-Section Homes	3.7	Fascia/Drip Edge & Shingle Installation	4.32
Pier Capacities for Ridge Beam Column Supports	3.8	Horizontal Vinyl Siding Installation	4.33
Piers for Doors & Openings over 4 Feet	3.9	Vertical Vinyl Siding	4.34
Perimeter Foundation	3.10	Hardipanel Vertical Siding	4.35
Pier Capacity Requirements for Tag Unit	3.11	LP Vertical Siding	4.35.1
Chapter 4 - Setup Procedures	4.0	ABTCO Vertical Siding	4.36
Moving Home to Location	4.0	Cladwood Hardboard	4.37
Setup Procedures	4.0	Add-on Eave Detail Offset Box	4.38
Singlewide Section Setup Procedure	4.1	Offset Box Corner Eyebrow Details	4.39
Multi-wide Section Setup Procedure	4.2	Hinged Truss Installation Details	4.40
Positioning & Jacking of Home	4.6	Hinged Truss Installation Details	4.41
Leveling the Home	4.7	Chapter 5 - Optional Features	5.0
Positioning & Leveling a Second Section	4.8	Construction of Site Built Structures	5.0
Multi-wide Sections Interior Close-up	4.9	Attached Garages	5.0
Bottom Board Repair	4.9	Skirting and Venting	5.0
Strap Tensioning	4.10	Basements	5.0
Re-Leveling	4.10	Retaining Wall Designs	5.1
Alternate Anchoring Systems	4.10	Typical Basement Details	5.2
Severe Climatic Conditions	4.10	Typical Basement Details	5.3
Exposure 'D' Locations	4.11	Notched Floor Basement Opening Details	5.4

Table of Contents

Chapter 6 - Mechanical	6.0
Clothes Dryer Vent	6.0
Comfort Cooling Systems	6.0
Air Conditioners	6.0
Window Air Conditioner Installation	6.1
Heat Pumps	6.1
Range, Cook Top & Oven Venting	6.1
Furnace Deration	6.1
Ceiling Fans	6.2
Hearth Extension for Fireplace at the Marriage Line	6.2
Fireplace and Wood Stove Chimney & Air Inlets	6.2
Crossover Duct Installation	6.3
In-floor Cross-over Loop Duct System	6.3.1
V-box and Duct Installation	6.4
Heating/Air Conditioning Evaporative Cooler Installation	6.5
Dryer Vent Details & Fireplace Flue Installation	6.6
Ceiling Fan Installation	6.7
Chapter 7 - Utility Connections	7.0
General	7.0
Electrical System	7.0
Feeder Connections and Grounding Conductor Sizes	7.0
Water & Drain Line Connections	7.1
Crossover Plumbing Connections	7.2
Drain Waste (DWV) Pipe Installation	7.3
Drain Pipe Supports	7.4
Electrical & Ground Connections	7.5
Power Connection & Meter Base Installation	7.6
Chapter 8 - Utility Service Test Procedures	8.0
Systems Test	8.0
Gas System Test Procedures	8.0
Water Supply System Test Procedures	8.1
Electrical System Test Procedures	8.1
Drain System Test Procedures	8.2
Oil Piping Hookup & Testing	8.2
Chapter 9 - Final Inspection Checklist	9.0
Chapter 10 - Relocation of the Home	10.0
Chapter 11 - Anchor Manufacturer's Instructions	11.0
Chapter 12 - Hurricane Shutter Design	12.0
Chapter 13 - Blue Nail Drywall Option	13.0

All pages listed in the Table of Contents are third party approved by NTA, Inc.

Chapter 1 - Introduction

This home weighs several tons and qualified, trained and appropriately licensed personnel shall perform the installation. Before beginning any work, the setup contractor shall ensure that proper safety precautions are observed and adhered to.

This manual contains detailed instructions that are required for the proper installation of your new home as well as connections of utilities. Alternate methods may be covered in separate documents. Connection to public utilities shall be performed by utility company personnel or their authorized agent.

The drawings contained in this installation manual are intended to be representative of the product. Design and specifications are subject to change without notice.

Prior to the delivery of this home the homeowner or setup contractor shall contact the appropriate local authorities to determine the requirements for zoning, easements, encroachments, and any restrictions that may apply in your area, as well as the need for permits and inspections.

This home may require special addendum instructions in addition to the instructions in this manual. The manufacturer will provide these "Addendum" pages separately if needed.

All manufactured homes are constructed and inspected to comply with the "Federal Manufactured Home Construction and Safety Standards" and "Regulations" (24 CFR Parts 3280 and 3282 respectively) in accordance with the requirements of the U.S. Department of Housing and Urban Development. A metal certification label is affixed to each home to certify that the home has been constructed and inspected to comply with these Standards. The design plans and in-plant construction of all homes are inspected by independent third party agencies to assure compliance with the Federal Standards.

These installation instructions have also been approved by an independent third party agency. Deviation from the instructions in this manual may void your warranty. Any alterations or changes to this home shall be approved by a registered engineer and may still be subject to warranty violations.

If you (the homeowner) or the setup contractor have any questions or concerns about your home's installation, contact your sales representative. He or she will be best equipped to assist you and can help make the transition into your new home an easy one.

Chapter 2 – Site Preparation

General

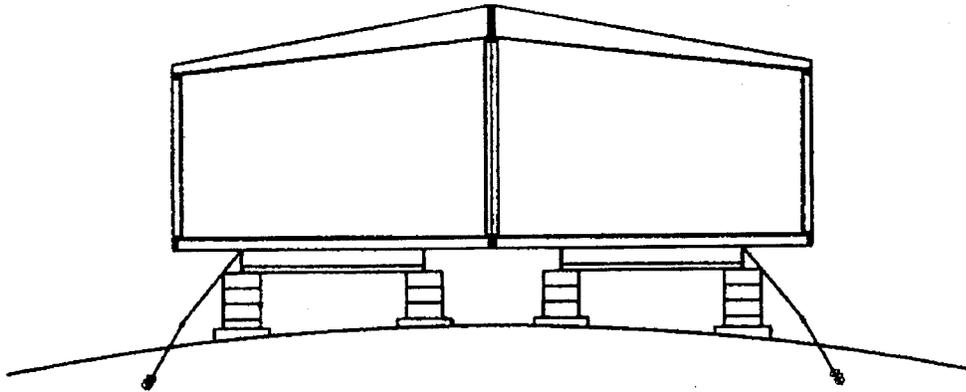
A properly prepared site is absolutely necessary before you begin installation of the home's foundation and anchoring system. It is very important that the following items be considered for site preparation. The condition of the home site must be considered before any apparent foundation related claims are honored.

Drainage and Grade

The area beneath the home must be well drained to ensure the long-term structural integrity of the home. Moisture under the home could lead to condensation problems or structural damage to the floor system and other parts of the home.

IMPORTANT!

The site should be crowned and graded to slope away from the home to prevent moisture from accumulating under the home (See detail below).



The home should also be located away from streams, rivers and other natural drainage areas. If gutters and downspouts are installed, make sure the runoff is directed away from the home.

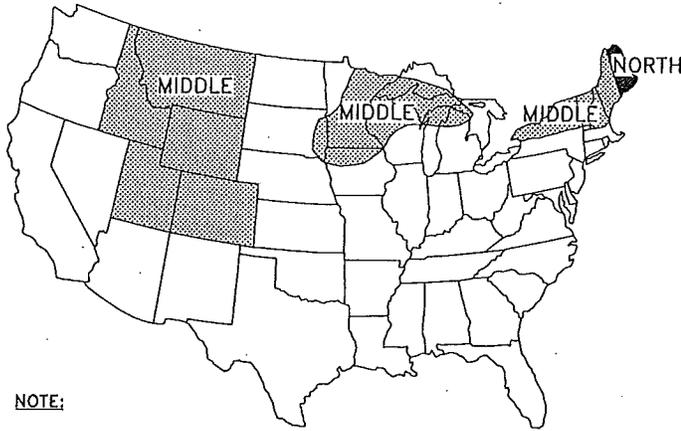
The bottom edge of wood siding must be kept at least six (6) inches above the ground level and at least two (2) inches above any surface where water might collect. Never allow siding to come in contact with the soil, masonry, or concrete.

Compliance Certificate

This home has been designed for certain weather conditions and roof loads. The design criteria for this home is found on the compliance certificate (or data plate), which is located either in one of the bedroom closets, behind the cabinet door under the kitchen sink, or in the laundry area. This document shows the roof load, wind zone, and heating/cooling zone maps and states which zones the home was built to meet.

The installer must verify that the home is not installed in a zone requiring greater wind load, roof load, or heating/cooling capabilities than those for which it was designed. However, it is safe to locate or relocate the home in an area with lower load or weather requirements. The foundation and anchoring system must comply with the requirements of the location in which the home is installed.

NORTH - 40 PSF (SNOW)
 MIDDLE - 30 PSF (SNOW)
 SOUTH - 20 PSF (MINIMUM)

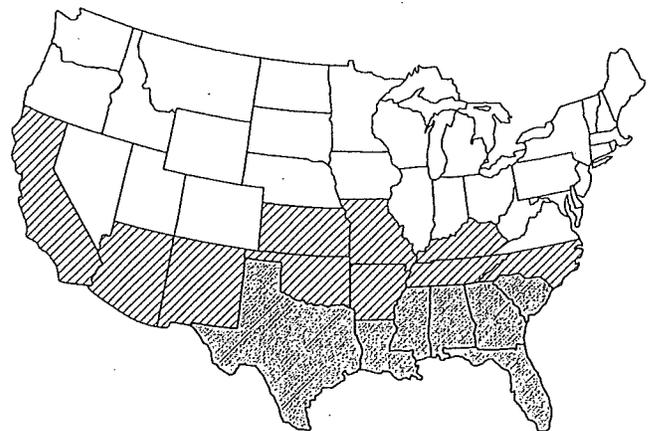


NOTE:

Hawaii, Canal Zone, Puerto Rico and Virgin Islands are South Zone. Alaska is North Zone.

STRUCTURAL ROOF DESIGN MAP

▨ ZONE I - $U_o = 0.116$
 ▩ ZONE II - $U_o = 0.096$
 □ ZONE III - $U_o = 0.079$



A HEATING AND COOLING DESIGN MAP (U_o VALUE ZONES)

WIND ZONE II (100 MPH)

The following local governments listed by state (counties\parishes, unless specified otherwise) are within wind zone II.

ALABAMA

Baldwin, Mobile

FLORIDA

All counties except those identified as being within Wind Zone III.

GEORGIA

Bryan, Glynn, Camden, Liberty, Chatham, McIntosh

LOUISIANA

Acadia, Allen, Ascension, Assumption, Calcasieu, Cameron, East Baton Rouge, East Feliciana, Evangeline, Iberia, Iberville, Jefferson Davis, LaFayette, Livingston, Pointe Coupee, St. Helena, St. James, St. John the Baptist, St. Landry, St. Martin, St. Tammany, Tangipahoa, Vermillion, Washington, West Baton Rouge, West Feliciana.

MAINE

Hancock, Washington

MASSACHUSETTS

Barnstable, Bristol, Dukes, Nantucket, Plymouth

MISSISSIPPI

George, Hancock, Harrison, Jackson, Pearl River, Stone

NORTH CAROLINA

Beaufort, Brunswick, Camden, Chowan, Columbus, Craven, Currituck, Jones, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, Washington

SOUTH CAROLINA

Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, Jasper, Williamsburg

TEXAS

Arkansas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, Willacy

VIRGINIA The cities of;

Chesapeake, Norfolk, Portsmouth, Princess Anne, Virginia Beach

WIND ZONE III (110 MPH)

The following local governments listed by state (counties\parishes, unless specified otherwise) are within Wind Zone III.

FLORIDA

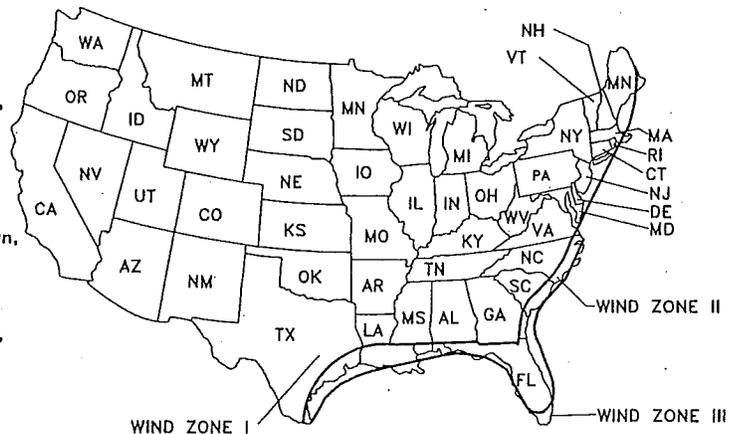
Broward, Charlotte, Collier, Dade, Franklin, Gulf, Hendry, Lee, Martin, Manatee, Monroe, Palm Beach, Pinellas, Sarasota

LOUISIANA

Jefferson, La Fourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. Mary, Terrebonne

NORTH CAROLINA

Carteret, Dare, Hyde



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

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

STRUCTURAL WIND ZONE MAP

C

ZONE MAPS

DRAWN BY: JBM

DATE: 11/30/98

REV: -

HBOS Manufacturing, LP

1-2.1

Soil Bearing Capacity

The portion of your lot or site on which you intend to place your home must be undisturbed soil or compacted fill. If the site is on filled soil, it must be compacted to at least 90% of its maximum relative density. The foundation support system must be able to withstand the loads imposed by the weight of your home and any temporary loads caused by climatic conditions such as snow or wind. The support system must transfer these loads safely to the soil under the home.

The soil bearing capacity must be determined before designing the support system. This capacity is measured in pounds per square foot (psf). A minimum soil bearing capacity of 2000 psf is recommended whenever possible. If you cannot identify the soil, use the lowest value (1000 psf) from the Table below. Under unusual conditions, or if the soil appears to be peat or uncompacted fill, consult a local geologist or professional engineer.

General Description of Soils

Soil type (Based on the Unified Classification System)	Bearing capacity (pounds per square foot) No allowances made for overburden pressure, embedment depth, water table height, or settlement problems.
Rock hard or pan	4,000 and up
Sandy gravel or gravel	2,000
Sand, silty sand, clayey sand, silty gravel, or clayey gravel.	1,500
Clay, sandy clay, silty clay, or clayey silt	1,000
Uncompacted fill	Special analysis is required
Peat or Organic clays	Special analysis is required

Local building officials will often have typical soil bearing capacities for your area. If you are unable to determine the soil bearing capacity from building officials or from a soils investigation analysis using the Table above, then the soil must be tested using a pocket penetrometer or other accepted testing procedures.

Pocket Penetrometer

A pocket penetrometer may be used to determine the allowable soil bearing capacity. Such a method is only an estimate, and the results should be properly interpreted. Follow these steps:

1. Test an area near each of the opposite corners of the home.
2. Dig down to the level of the bottom of the footings and uncover an area of at least one square foot.
3. Using the pocket penetrometer, take at least seven readings.
4. Take an average of the middle five readings, disregarding the highest and lowest readings. Round this average down to the nearest soil bearing value. Use this value for determining minimum footing sizes.
5. Mark the test area so that an inspector will be able to verify the results
6. Verify that test results are in agreement with the description in the soil table.

NOTE!

Depending on the site location you may want to approximately locate footing pads, pier blocks or stands, anchors and tie-down straps that might be difficult to place after the section or sections of the home are in their final position.

Vegetation

Remove all vegetation and other organic material from the area under the home to assist in insect control. Remove all grass and roots from beneath the footings. Overhanging vegetation in the area of the home should be trimmed to prevent damage during installation and inclement weather.

Vapor Retarder

If the crawl space under the home is to be enclosed with skirting or other material, a vapor retarder must be installed. Use at least 6-mil polyethylene or its equivalent and overlap at least six inches at all joints. Vapor retarder may be cut around piers.

Chapter 3 – Foundations

Pier Capacities

Incorrect size, location or spacing of piers can cause serious structural damage to a home. Piers are required to support the home's main I-beams and mating wall column locations. Piers are also required along the home's perimeter under sidewalls and mating wall for roof loads per pages I-3.4 and I-3.7.

The load that each pier must carry depends on factors such as the dimensions of the home, the roof live load, the spacing of the piers, and the way they are used to support the home. Refer to the following drawings for required pier capacities:

Piers under I-beams, perimeter, and mating walls for standard homes – Pages I-3.4 to I-3.7

Piers at each side of mating wall openings greater than four feet – Page I-3.8

Piers for Tag units – Page I-3.11

Piers are required for support at each side of all sidewall openings greater than four feet (such as a recessed entry, bay window or sliding glass door), under porch posts, and under the expected locations of heavy pieces of furniture such as pianos, organs, waterbeds, etc. Endwall doors and openings do not require supports unless one side is at the sidewall or marriage wall.

Configuration

Piers may be concrete blocks or pressure-treated wood, capped and shimmed with wedges, or piers may be adjustable manufactured metal or concrete devices (see page I-3.2 for typical pier configurations). Manufactured piers must be listed and labeled for the required load capacity, and their adjustable risers must not extend more than 3" when finally positioned.

Hollow concrete block piers must be capped to distribute the structural load evenly across them. Caps may be of solid masonry of at least four inches nominal thickness, or hardwood at least two inches nominal thickness, or steel, and of the same nominal dimensions as the piers they rest upon. The grain of hardwood caps shall be perpendicular to the I-beam. Avoid plywood, as it may lead to undesired settling or movement.

Use actual 3 ½" x 6" long hardwood shims to level the home and fill any gaps between the base of the I-beam and the top of the pier cap. Always use shims in pairs and drive them in tightly so they do not occupy more than 1" of vertical space. When the space to be shimmed is less than the minimum thickness of available caps or concrete blocks, filler material of nominal 2x hardwood or 2" nominal solid concrete block may be used between the shims and the pier cap.

Footings

All piers must rest on footings that are protected from the effects of frost heave. Place footings below the frost line according to local requirements or provide insulated skirting to the home sufficient enough to prevent the soil under the home from freezing. All footings must be placed on either undisturbed soil or compacted fill. Proper sizing of footings depends upon the load-carrying capacity of both the piers and the soil. See page I-3.3 for recommended footing sizes for various pier capacities.

Footings may consist of precast or poured-in-place concrete, pads, slabs or ribbons with a 28-day compressive strength of at least 3,000 psi. Unreinforced concrete footings must have a depth according to

page I-3.3. Footings may also consist of two fastened layers of two inch nominal pressure-treated wood planks with the long dimension of the second layer parallel to the first and with cut edges painted or retreated. Another footing alternate is to use (3) 8"x16"x4" thick solid concrete blocks with single stacked piers only. The block footing joints must be perpendicular to the long side of the single stacked pier.

Special Conditions

Flood Prone Areas: It is not recommended to site your home in river or coastal flood-prone areas. Special local regulations or flood insurance provisions may apply. Special elevation and anchoring techniques are required when locating in a flood-prone area. Consult a registered professional or structural engineer to make sure that home design and construction conform to applicable federal, state and local codes and regulations. The FEMA publication listed in the reference documents below contains design and construction recommendations.

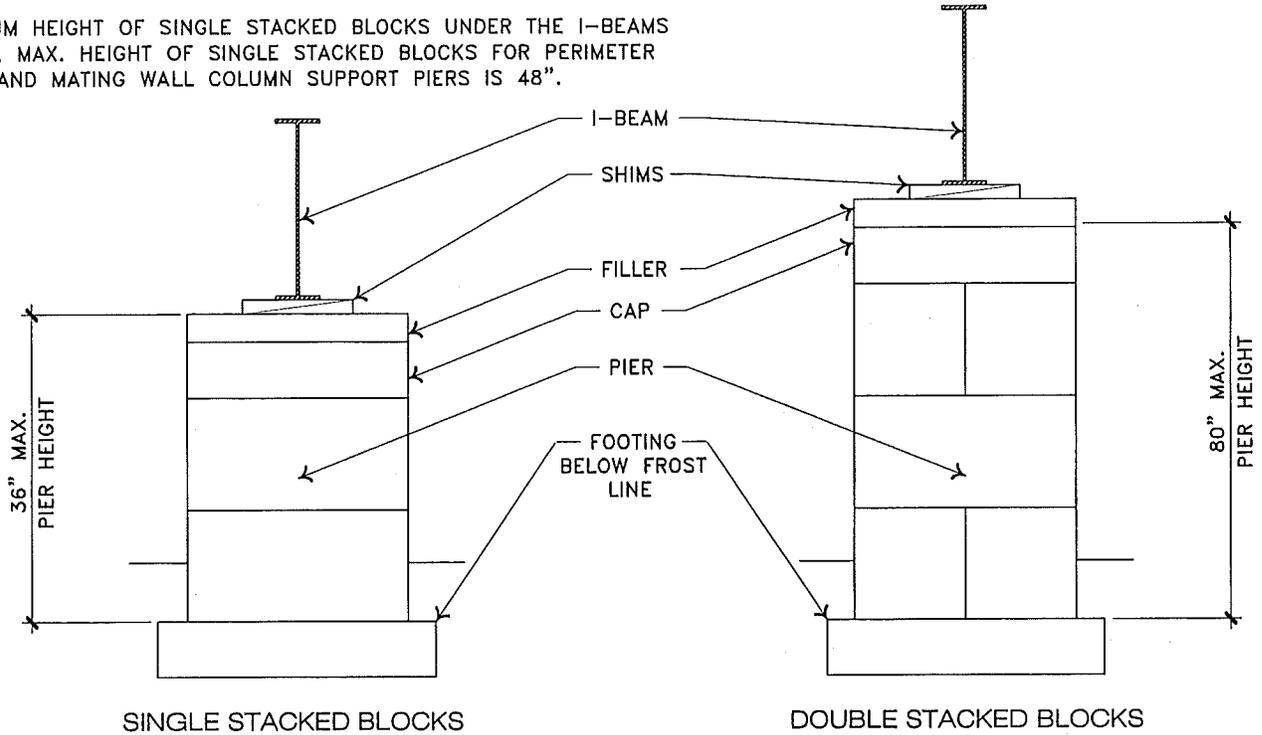
Alternate Foundation Systems

Foundation methods or materials other than those described in this manual may be used provided that they are designed and/or tested by a registered professional engineer, installed according to manufacturer's instructions, and accepted by the local authority having jurisdiction.

Basement Foundations and Retaining Walls

Refer to Chapter 5 – "Optional Features" for special requirements concerning basement foundations and/or retaining wall designs.

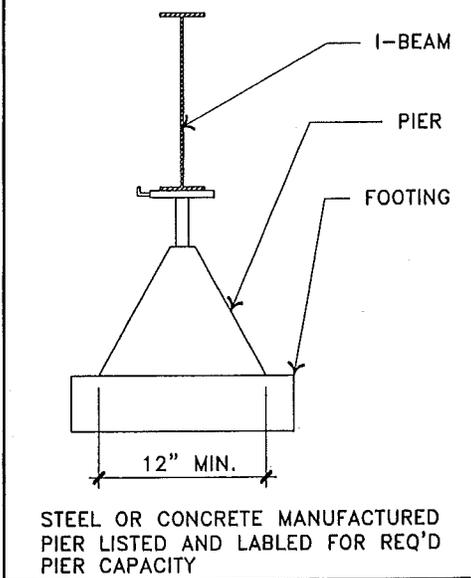
MAXIMUM HEIGHT OF SINGLE STACKED BLOCKS UNDER THE I-BEAMS IS 36", MAX. HEIGHT OF SINGLE STACKED BLOCKS FOR PERIMETER PIERS AND MATING WALL COLUMN SUPPORT PIERS IS 48".



PIER CONSTRUCTION

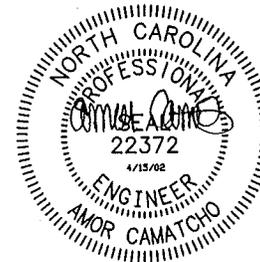
NOTES:

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, GRADE "N". OPEN CELLS ARE ALIGNED VERTICALLY. MORTAR IS NOT REQUIRED.
2. SINGLE STACKED CONCRETE BLOCKS ARE ORIENTED SO THAT LONG DIRECTION IS PERPENDICULAR TO THE LONG DIRECTION OF THE MAIN BEAM.
3. DOUBLE STACKED BLOCKS MUST BE ARRANGED SO THAT EACH LAYER IS AT RIGHT ANGLES TO THE PREVIOUS ONE. THE TOP LAYER OR THE CONCRETE CAP BLOCKS SHALL BE PERPENDICULAR TO THE MAIN I-BEAM.
4. FOOTERS MUST BE LEVEL IN ALL DIRECTIONS. PIERS ARE TO BE PLACED ON THE FOOTER APPROXIMATELY CENTERED SO THAT THE FOOTER 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 FOOTER.
5. CAP BLOCKS MAY BE 2x NOMINAL HARDWOOD, STEEL, OR 4" NOMINAL SOLID CONCRETE BLOCK. INDIVIDUAL LENGTHS OF CAP BLOCKS SHALL BE PERPENDICULAR TO THE I-BEAM. ALL CAPS SHALL BE OF THE SAME NOMINAL DIMENSIONS AS THE PIERS THEY REST UPON.
6. OPTIONAL FILLER MATERIAL MAY BE OF 2x NOMINAL HARDWOOD OR 2" NOMINAL SOLID CONCRETE BLOCK. INDIVIDUAL LENGTHS OF THE FILLER MATERIAL SHALL BE PERPENDICULAR TO THE I-BEAM. ALL FILLER MATERIAL SHALL BE OF THE SAME NOMINAL DIMENSIONS AS THE CAP THEY REST UPON.
7. SHIMS SHALL BE OF HARDWOOD, AT LEAST ACTUAL 3 1/2" WIDE x 6" LONG AND ARE NOT TO EXCEED 1" IN THICKNESS. SHIMS SHALL BE PERPENDICULAR TO THE I-BEAM, FITTED AND DRIVEN TIGHT BETWEEN I-BEAM FRAME AND CAP OR FILLER. SHIMS SHALL NOT OCCUPY MORE THAN 1" OF VERTICAL SPACE.
8. MAINTAIN A MIN. CLEARANCE OF 18" BENEATH THE HOME'S FLOOR JOISTS. NO MORE THAN 25% OF THE HOME'S MAIN I-BEAMS SHALL BE LESS THAN 12" ABOVE GRADE. MAINTAIN A MIN. CLEARANCE OF 12" BENEATH THE I-BEAMS IN THE AREA OF UTILITY CONNECTIONS (WASTE PLUMBING, HEAT DUCT, ETC.)
9. PIER HEIGHTS MAY NOT EXCEED THE MAXIMUM HEIGHTS CALLED OUT IN THE TIEDOWN CHARTS.



STEEL OR CONCRETE MANUFACTURED PIER LISTED AND LABELED FOR REQ'D PIER CAPACITY

MANUFACTURED PIER CONSTRUCTION B



TYPICAL PIER CONSTRUCTION

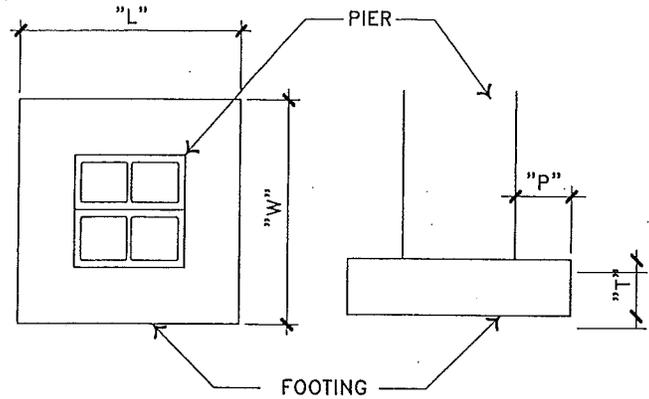
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DATE: 11/30/98	
REV: 1/30/03	
I-3.2	

**MINIMUM FOOTING SIZE (SQUARE INCHES)
PER ALLOWABLE SOIL BEARING CAPACITY**

PIER CAPACITY (POUNDS)	1000 PSF	1500 PSF	2000 PSF	2500 PSF	3000 PSF	4000 PSF
1000	144	125	125	125	125	125
1200	173	125	125	125	125	125
1400	202	134	125	125	125	125
1600	230	154	125	125	125	125
1800	259	173	130	125	125	125
2000	288	192	144	125	125	125
2200	317	211	158	127	125	125
2400	346	230	173	138	125	125
2600	374	250	187	150	125	125
2800	403	269	202	161	134	125
3000	432	288	216	173	144	125
3100	446	298	223	179	149	125
3200	461	307	230	184	154	125
3300	475	317	238	190	158	125
3400	490	326	245	196	163	125
3500	504	336	252	202	168	126
3600	518	346	259	207	173	130
3700	533	355	266	213	178	133
3800	547	365	274	219	182	137
3900	562	374	281	225	187	140
4000	576	384	288	230	192	144
4100	590	394	295	236	197	148
4200	605	403	302	242	202	151
4300	619	413	310	248	206	155
4400	634	422	317	253	211	158
4500	648	432	324	259	216	162
4600	662	442	331	265	221	166
4700	677	451	338	271	226	169
4800	691	461	346	276	230	173
4900	706	470	353	282	235	176
5000	720	480	360	288	240	180
5200	749	499	374	300	250	187
5400	778	518	389	311	259	194
5600	806	538	403	323	269	202
5800	835	557	418	334	278	209
6000	864	576	432	346	288	216
6200	893	595	446	357	298	223
6400	922	614	461	369	307	230
6600	950	634	475	380	317	238
6800	979	653	490	392	326	245
7000	1008	672	504	403	336	252
7200	1037	691	518	415	346	259
7400	1066	710	533	426	355	266
7600	1094	730	547	438	365	274
7800	1123	749	562	449	374	281
8000	1152	768	576	461	384	288
8500	1224	816	612	490	408	306
9000	1296	864	648	518	432	324
9500	1368	912	684	547	456	342
10000	1440	960	720	576	480	360
10500	1512	1008	756	605	504	378
11000	1584	1056	792	634	528	396
11500	1656	1104	828	662	552	414
12000	1728	1152	864	691	576	432
12500	1800	1200	900	720	600	450
13000	1872	1248	936	749	624	468
13500	1944	1296	972	778	648	486
14000	2016	1344	1008	806	672	504
14500	2088	1392	1044	835	696	522
15000	2160	1440	1080	864	720	540
15500	2232	1488	1116	893	744	558
16000	2304	1536	1152	922	768	576

MAXIMUM PIER CAPACITIES:

- 8"x16" SINGLE STACKED = 5,760 LBS.
- 16"x16" DOUBLE STACKED = 11,520 LBS.
- 24"x16" TRIPLE STACKED = 17,280 LBS.



MAX. FOOTING SIZES (L x W)			
T	P (MAX.)	SGL STACKED BLOCKS	DBL STACKED BLOCKS
4"	4"	16"x24"	24"x24"
6"	6"	20"x28"	28"x28"
8"	8"	24"x32"	32"x32"
12"	12"	32"x40"	40"x40"

THIS TABLE APPLIES TO UNREINFORCED CONCRETE FOOTINGS.

REQUIRED FOOTING THICKNESS

FOOTING SIZE	AREA, SQ. IN.
SQUARE FOOTING	
16"x16"	256
20"x20"	400
24"x24"	576
28"x28"	784
32"x32"	1024
40"x40"	1600
RECTANGULAR FOOTING	
16"x24"	384
20"x28"	560
24"x32"	768
32"x40"	1280
CIRCULAR FOOTING	
20" DIAMETER	314
24" DIAMETER	452
30" DIAMETER	707

TYPICAL FOOTING AREAS

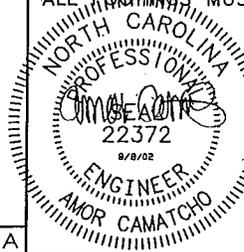
NOTES:

FOOTINGS MAY CONSIST OF PRECAST OR POURED IN PLACE CONCRETE, AND A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI. UNREINFORCED FOOTINGS MUST HAVE A DEPTH ACCORDING TO DETAIL 'B'.

ALT. TO USE (2) FASTENED LAYERS OF 2" NOMINAL PRESSURE TREATED PLANKS WITH THE LONG DIMENSION OF THE SECOND LAYER PERPENDICULAR TO THE FIRST.

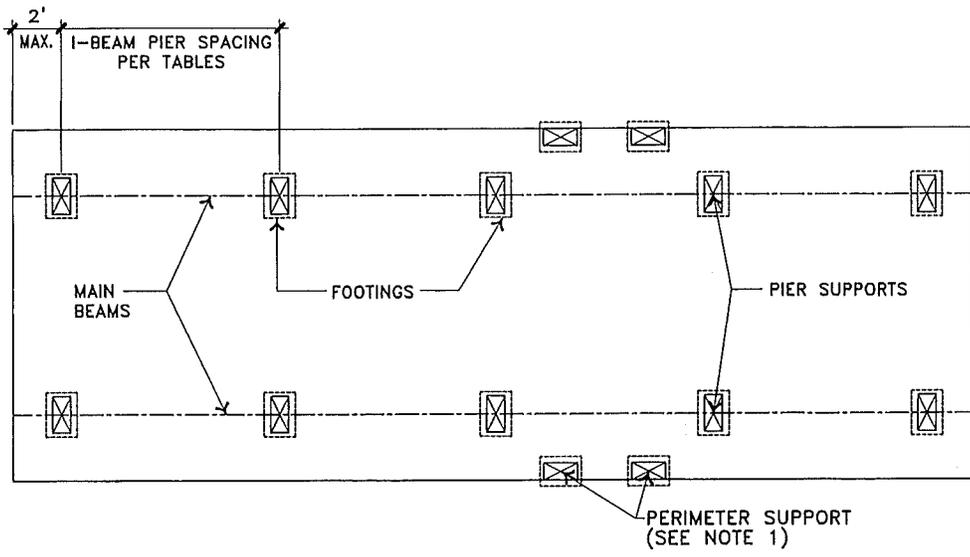
ALT. TO USE (3) 8"x16"x4" THICK SOLID CONCRETE BLOCKS W/ JOINTS PERPENDICULAR TO USE WITH SINGLE STACKED PIERS ONLY; FOOTING AREA OF 385 SQ. IN.

ALL FOOTINGS MUST BE PLACED BELOW THE FROST LINE.



FOOTING DESIGN SIZE AND THICKNESS	
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DATE: 12/2/98	
REV: 8/8/02	
I-3.3	

REQUIRED FOOTING AREA



BLOCKING LAYOUT - FRAME BLOCKING ONLY

MAXIMUM HOME WIDTH	MAXIMUM SIDE OVERHANG	ROOF LIVE LOAD (PSF)	MAXIMUM PIER CAPACITY (POUNDS)				
			MAXIMUM PIER SPACING (FEET)				
			4	6	8	10	12
14 WIDE 168" FLOOR	1-1/2"	20 PSF	2789	3984	5178	6373	7567
		30 PSF	3067	4401	5735	7068	8402
16 WIDE 190" FLOOR	1-1/2"	20 PSF	3086	4429	5772	7115	8458
		30 PSF	3401	4902	6402	7903	9403
18 WIDE 208.5" FLOOR	4"	20 PSF	3415	4922	6430	7937	9444

SINGLE WIDE PIER/CAPACITY CHART - 20 AND 30 PSF ROOF LIVE LOAD - FRAME BLOCKING ONLY

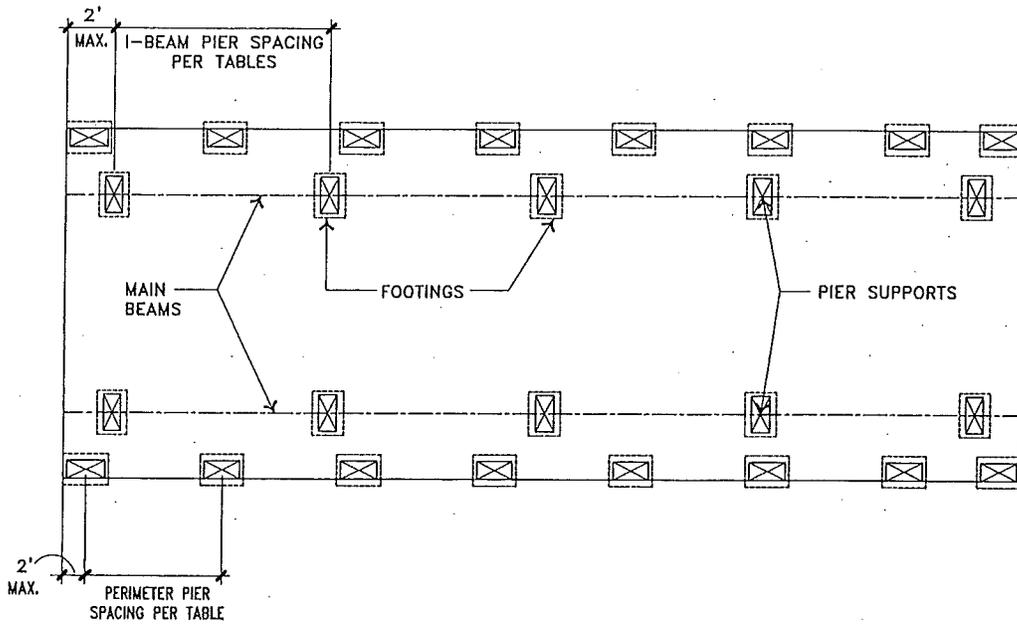
NOTES:

- PIERS SHALL BE LOCATED AT EACH SIDE OF ALL SIDEWALL OPENINGS GREATER THAN 4'-0" (BAY WINDOWS, PORCHES, RECESSED ENTRIES, ETC.). DOORS AND OPENINGS ON ENDWALLS DO NOT REQUIRE PIERS. (SEE PAGE I-3.9).
- MAX. PIER SPACING IS ALSO LIMITED BY I-BEAM SIZE: 8'-0" MAX. SPACING FOR 8" I-BEAM SIZE, 10'-0" MAX. SPACING FOR 10" I-BEAM SIZE, 12'-0" MAX. SPACING FOR 12" I-BEAM SIZE.
- REFER TO PAGE I-3.3 FOR FOOTING TABLES. ROUNDING FOOTING SIZES DOWN FOR HOMES WITH 2x6 EXTERIOR WALLS IS NOT ALLOWED.
- REFER TO PAGE I-3.2 FOR PIER CONSTRUCTION.
- ALL HOMES WITH 30 PSF ROOF LIVE LOADS AND FLOOR JOIST @ 16" O.C. DO NOT REQUIRE PERIMETER PIERS UNDER SIDEWALL, U.O.N. SET-UP CONTRACTOR TO VERIFY.



PIER CAPACITY TABLE
 Frame Blocking Only
 Single Section Homes

DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 4/16/03	
I-3.4	



BLOCKING LAYOUT - PERIMETER PIER DESIGN

A

MAXIMUM HOME WIDTH	MAXIMUM SIDE OVERHANG	PIER LOCATION	ROOF LIVE LOAD (PSF)	MAXIMUM PIER CAPACITY (POUNDS)				
				MAXIMUM PIER SPACING (FEET)				
				4	6	8	10	12
14 WIDE 168" FLOOR	1-1/2"	MAIN BEAMS	ALL ROOF LOADS	1794	2491	3188	3885	4582
	1-1/2"	PERIMETER PIERS UNDER SIDEWALLS	30 PSF	1673	2310	2947	N/A	N/A
			40 PSF	1952	2728	3503	N/A	N/A
			60 PSF	2508	3563	4617	N/A	N/A
			80 PSF	3065	4398	5730	N/A	N/A
100 PSF	3622	5233	6843	N/A	N/A			
16 WIDE 190" FLOOR	1-1/2"	MAIN BEAMS	ALL ROOF LOADS	1981	2772	3562	4353	5143
	1-1/2"	PERIMETER PIERS UNDER SIDEWALLS	30 PSF	1820	2530	3240	N/A	N/A
			40 PSF	2135	3003	3870	N/A	N/A
			60 PSF	2765	3948	5130	N/A	N/A
			80 PSF	3395	4893	6390	N/A	N/A
100 PSF	4025	5838	7650	N/A	N/A			

SINGLE WIDE PIER/CAPACITY CHART - 30 TO 100 PSF ROOF LIVE LOAD

B

NOTES:

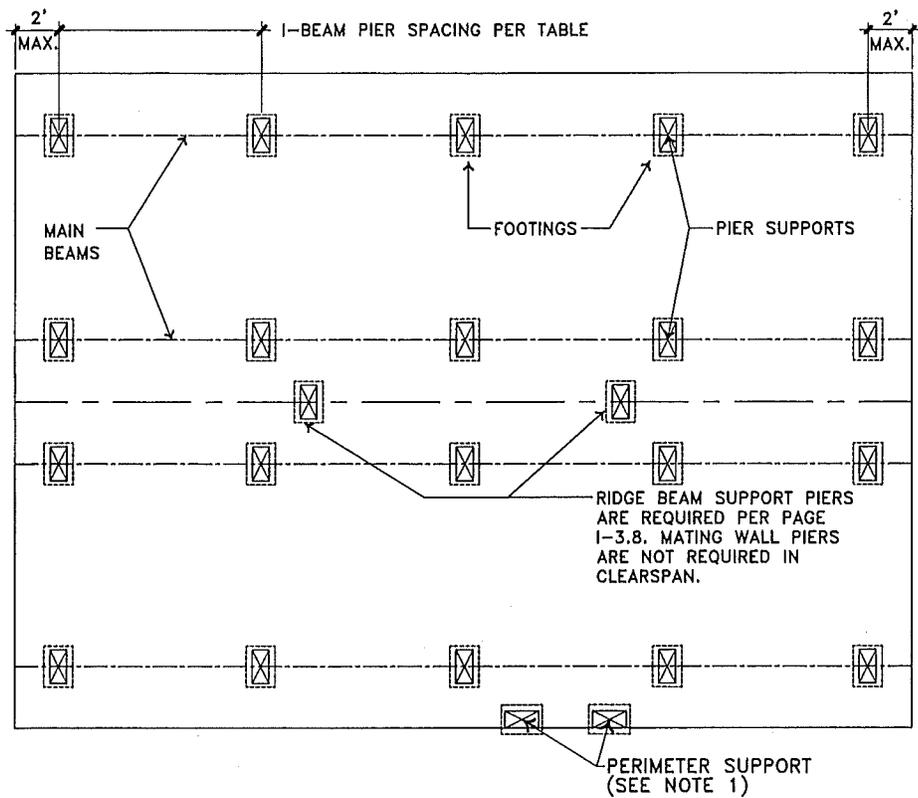
- PIERS SHALL BE LOCATED AT EACH SIDE OF ALL SIDEWALL OPENINGS GREATER THAN 4'-0" (BAY WINDOWS, PORCHES, RECESSED ENTRIES, ETC.). DOORS AND OPENINGS ON ENDWALLS DO NOT REQUIRE PIERS. (SEE PAGE I-3.9).
- MAX. PIER SPACING IS ALSO LIMITED BY I-BEAM SIZE: 8'-0" MAX. SPACING FOR 8" I-BEAM SIZE, 10'-0" MAX. SPACING FOR 10" I-BEAM SIZE, 12'-0" MAX. SPACING FOR 12" I-BEAM SIZE.
- REFER TO PAGE I-3.3 FOR FOOTING TABLES. ROUNDING FOOTING SIZES DOWN FOR HOMES WITH 2x6 EXTERIOR WALLS IS NOT ALLOWED.
- REFER TO PAGE I-3.2 FOR PIER CONSTRUCTION.
- ALL FLOORS WITH 30 PSF ROOF LIVE LOADS AND FLOOR JOIST @ 16" O.C. DO NOT REQUIRE PERIMETER PIERS UNDER SIDEWALL, U.O.N. SET-UP CONTRACTOR TO VERIFY.



PIER CAPACITY TABLE
Perimeter Pier Design
Single Section Homes

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
I-3.5



DOUBLE WIDE BLOCKING LAYOUT - FRAME BLOCKING ONLY

A

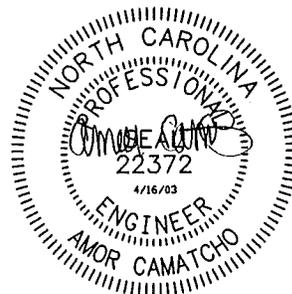
MAXIMUM HOME WIDTH	MAXIMUM SIDE OVERHANG	PIER LOCATION	ROOF LIVE LOAD (PSF)	MAXIMUM PIER CAPACITY (POUNDS)				
				MAXIMUM PIER SPACING (FEET)				
				4	6	8	10	12
24 WIDE 144" FLOOR	12"	MAIN BEAMS	20 PSF	2570	3655	4740	5825	6910
			30 PSF	2843	4065	5287	6508	7730
28 WIDE 168" FLOOR	12"	MAIN BEAMS	20 PSF	2840	4060	5280	6500	7720
			30 PSF	3147	4520	5893	7267	8640
32 WIDE 186" FLOOR	12"	MAIN BEAMS	20 PSF	3083	4424	5766	7108	8449
			30 PSF	3450	4975	6500	8025	9550

DOUBLE WIDE PIER/CAPACITY CHART - 20 AND 30 PSF ROOF LIVE LOAD

B

NOTES:

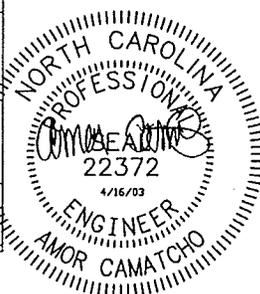
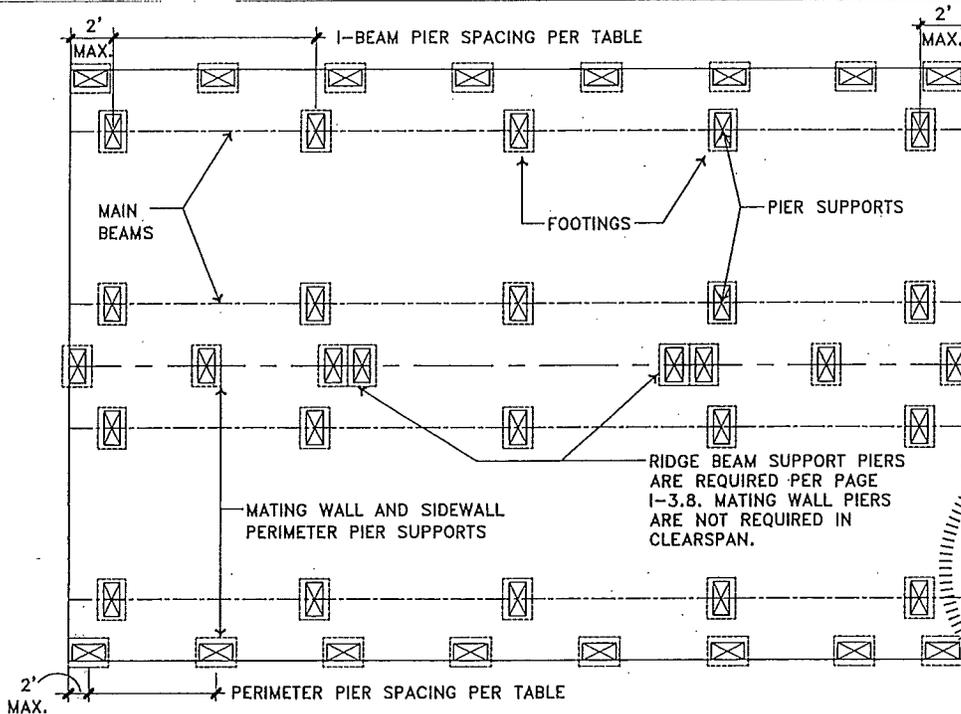
- PIERS SHALL BE LOCATED AT EACH SIDE OF ALL SIDEWALL AND MATING WALL OPENINGS GREATER THAN 4'-0" (BAY WINDOWS, PORCHES, RECESSED ENTRIES, ETC.). DOORS AND OPENINGS ON ENDWALLS DO NOT REQUIRE PIERS. (SEE PAGE I-3.9).
- MAX. PIER SPACING IS ALSO LIMITED BY I-BEAM SIZE: 8'-0" MAX. SPACING FOR 8" I-BEAM SIZE, 10'-0" MAX. SPACING FOR 10" I-BEAM SIZE, 12'-0" MAX. SPACING FOR 12" I-BEAM SIZE.
- REFER TO PAGE I-3.3 FOR FOOTING TABLES. ROUNDING FOOTING SIZES DOWN WITH 2x6 EXTERIOR WALL IS NOT ALLOWED.
- REFER TO PAGE I-3.2 FOR PIER CONSTRUCTION.
- ALL HOMES WITH 30 PSF ROOF LIVE LOADS AND FLOOR JOIST @ 16" O.C. DO NOT REQUIRE PERIMETER PIERS UNDER SIDEWALL, U.O.N. SET-UP CONTRACTOR TO VERIFY.
- FOR 36 WIDES, USE THE 24 WIDE CHARTS. FOR 42 WIDES, USE THE 28 WIDE CHARTS. FOR 45 WIDES, USE THE 32 WIDE CHARTS.
- HOMES WITH A PARAPET ROOF SHALL BE SET ON FOUNDATIONS AS NOTED ON PAGE I-3.7.



PIER CAPACITY TABLE
 Frame Blocking Only
 Multi-Section Homes

DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 4/16/03	

I-3.6



BLOCKING LAYOUT - PERIMETER PIER DESIGN

B

MAXIMUM SECTION WIDTH	PIER LOCATION	ROOF LIVE LOAD (PSF)	MAXIMUM PIER CAPACITY (POUNDS)					MAXIMUM SECTION WIDTH	PIER LOCATION	ROOF LIVE LOAD (PSF)	MAXIMUM PIER CAPACITY (POUNDS)				
			MAXIMUM PIER SPACING (FEET)								MAXIMUM PIER SPACING (FEET)				
			4	6	8	10	12				4	6	8	10	12
24 WIDE 144" 12" EAVE	MAIN BEAMS	ALL	1590	2185	2780	3375	3970	28 WIDE 168" 12" EAVE	MAIN BEAMS	ALL	1760	2440	3120	3800	4480
	PERIMETER PIERS UNDER SIDEWALLS	40 PSF	1927	2690	3453	N/A	N/A		PERIMETER PIERS UNDER SIDEWALLS	40 PSF	2093	2940	3787	N/A	N/A
		60 PSF	2473	3510	4547	N/A	N/A			60 PSF	2707	3860	5013	N/A	N/A
		80 PSF	3020	4330	5640	N/A	N/A			80 PSF	3320	4780	6240	N/A	N/A
		100 PSF	3566	5150	6733	N/A	N/A			100 PSF	3933	5700	7466	N/A	N/A
	PERIMETER PIERS UNDER MATING WALLS	40 PSF	2893	4140	5387	N/A	N/A		PERIMETER PIERS UNDER MATING WALLS	40 PSF	3227	4640	6053	N/A	N/A
		60 PSF	3827	5540	7253	N/A	N/A			60 PSF	4293	6240	8187	N/A	N/A
		80 PSF	4760	6940	9120	N/A	N/A			80 PSF	5360	7840	10320	N/A	N/A
		100 PSF	5693	8340	10986	N/A	N/A			100 PSF	6426	9440	12453	N/A	N/A

NOTES:

- PIERS SHALL BE LOCATED ALONG THE SIDEWALL AND MATING WALL, AND AT EACH SIDE OF ALL SIDEWALL AND MATING WALL OPENINGS GREATER THAN 4'-0" (BAY WINDOWS, PORCHES, RECESSED ENTRIES, ETC.). MATING WALL PIERS ARE NOT REQUIRED IN CLEARSPAN. DOORS AND OPENINGS ON ENDWALLS DO NOT REQUIRE PIERS, SEE PAGE I-3.9. PIERS SHALL BE LOCATED AT INFLOOR CROSSMEMBER DUCTS PER PAGE I-6.3.1.
- MAX. PIER SPACING IS ALSO LIMITED BY I-BEAM SIZE: 8'-0" MAX. SPACING FOR 8" I-BEAM SIZE, 10'-0" MAX. SPACING FOR 10" I-BEAM SIZE, 12'-0" MAX. SPACING FOR 12" I-BEAM SIZE.
- REFER TO PAGE I-3.3 FOR FOOTING TABLES. ROUNDING FOOTING SIZES DOWN FOR HOMES WITH 2x6 EXTERIOR WALLS IS NOT ALLOWED.
- REFER TO PAGE I-3.2 FOR PIER CONSTRUCTION.
- HOMES WITH A PARAPET ROOF SHALL BE SET ON FOUNDATIONS DESIGNED AS FOLLOWS:
 - A HOME LOCATED IN A 20 PSF (SOUTH) ROOF LIVE LOAD AREA SHALL HAVE A FOUNDATION DESIGNED TO THE 20 PSF (SOUTH) REQUIREMENTS, MINIMUM.
 - A HOME LOCATED IN A 30 PSF (MIDDLE) ROOF LIVE LOAD AREA SHALL HAVE A FOUNDATION DESIGNED TO THE 40 PSF (NORTH) REQUIREMENTS.
 - A HOME LOCATED IN A 40 PSF (NORTH) ROOF LIVE LOAD AREA SHALL HAVE A FOUNDATION DESIGNED TO THE 60 PSF REQUIREMENTS.
- FOR 36 WIDES, USE THE 24 WIDE CHARTS. FOR 42 WIDES, USE THE 28 WIDE CHARTS. FOR 45 WIDES, USE THE 32 WIDE CHARTS.

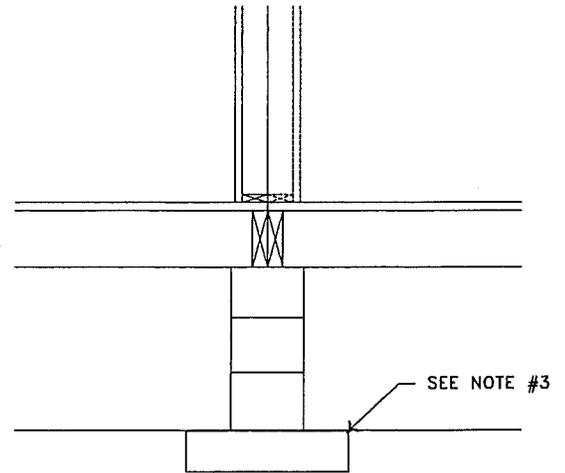
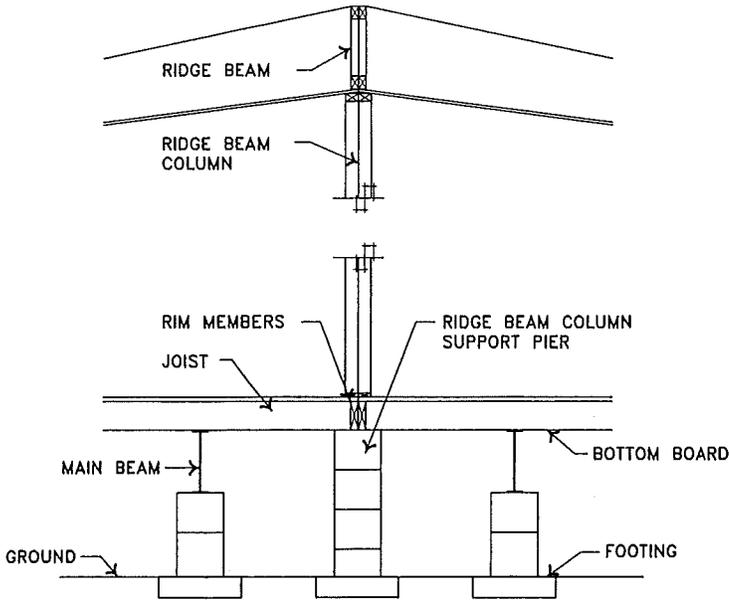
MAXIMUM SECTION WIDTH	PIER LOCATION	ROOF LIVE LOAD (PSF)	MAXIMUM PIER CAPACITY (POUNDS)				
			MAXIMUM PIER SPACING (FEET)				
			4	6	8	10	12
32 WIDE 186" 12" EAVE	MAIN BEAMS	ALL	1913	2670	3426	4183	4939
	PERIMETER PIERS UNDER SIDEWALLS	40 PSF	2243	3165	4087	N/A	N/A
		60 PSF	2917	4175	5433	N/A	N/A
		80 PSF	3590	5185	6780	N/A	N/A
		100 PSF	4263	6195	8126	N/A	N/A
	PERIMETER PIERS UNDER MATING WALLS	40 PSF	3527	5090	6653	N/A	N/A
		60 PSF	4713	6870	9027	N/A	N/A
		80 PSF	5900	8650	11400	N/A	N/A
		100 PSF	7086	10430	13773	N/A	N/A

PIER CAPACITY TABLE
Perimeter Pier Design
Multi-Section Homes

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
I-3.7

B



TYPICAL RIDGE BEAM COLUMN SUPPORT

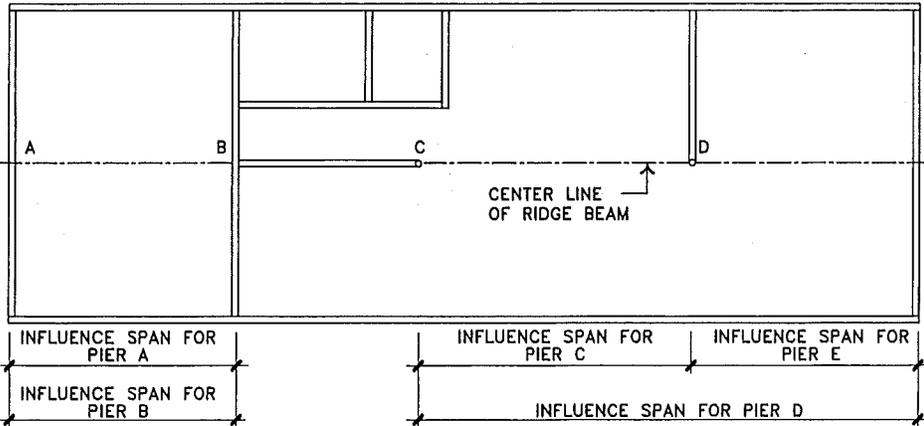
A MULTI-SECTION RIDGE BEAM COLUMN SUPPORT PIER

B

MAXIMUM SECTION WIDTH	ROOF LIVE LOAD (PSF)	MINIMUM PIER CAPACITY (POUNDS)									
		MAXIMUM INFLUENCE SPAN TO NEXT SUPPORT (FEET)									
		4	8	12	14	16	18	20	24	28	32
24 WIDE 144" BOX	20	1100	1800	2500	2850	3200	3550	3900	4600	5440	6160
	30	2267	3200	4133	4600	5067	5533	6000	6933	8080	9040
	40	2733	3900	5067	5650	6233	6817	7400	8567	10000	11200
	60	3667	5300	6933	7750	8567	9383	10200	11833	13840	15520
	80	4600	6700	8800	9850	10900	11950	13000	15100	17680	19840
100	5533	8100	10667	11950	13233	14517	15800	18367	21520	24160	
28 WIDE 168" BOX	20	1200	2000	2800	3200	3600	4000	4400	5200	6280	7120
	30	2533	3600	4667	5200	5733	6267	6800	7867	9360	10480
	40	3067	4400	5733	6400	7067	7733	8400	9733	11600	13000
	60	4133	6000	7867	8800	9733	10667	11600	13467	16080	18040
	80	5200	7600	10000	11200	12400	13600	14800	17200	20560	23080
100	6267	9200	12133	13600	15067	16533	18000	20933	25040	28120	
32 WIDE 186" BOX	20	1290	2180	3070	3515	3960	4405	4850	5740	6980	7920
	30	2773	3960	5147	5740	6333	6927	7520	8707	10427	11680
	40	3367	4850	6333	7075	7817	8558	9300	10783	12933	14500
	60	4553	6630	8707	9745	10783	11822	12860	14937	17947	20140
	80	5740	8410	11080	12415	13750	15085	16420	19090	22960	25780
100	6927	10190	13453	15085	16717	18348	19980	23243	27680	31090	

PIER CAPACITY CHART

C



TYPICAL INFLUENCE SPANS

D

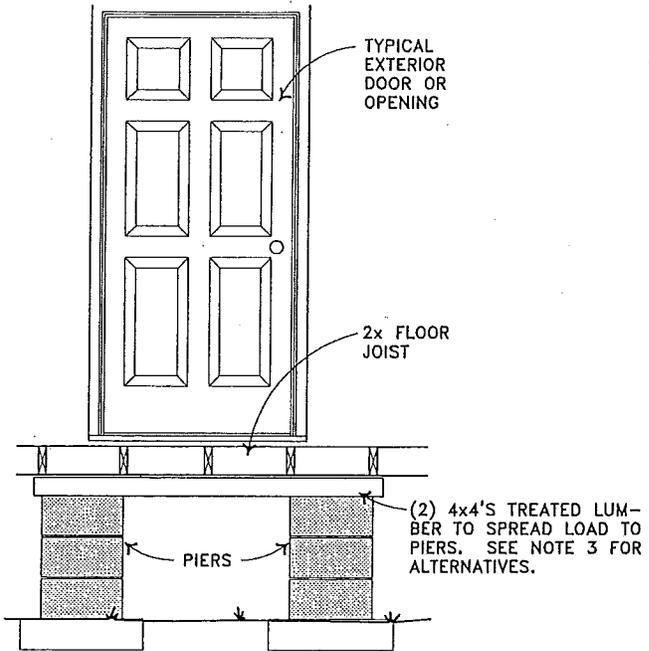
NOTES:

- PIERS SHALL BE LOCATED AT EACH SIDE OF ALL MATING WALL OPENINGS GREATER THAN 4'-0".
- PIER LOADS ARE BASED ON 10 PSF ROOF DEAD LOAD. REFER TO PAGE I-3.3 FOR FOOTER DESIGN.
- LOADS TABULATED ARE TOTAL FOR BOTH HALVES AT COLUMN SUPPORT.
- FOR 36 WIDES, USE THE 24 WIDE CHARTS. FOR 42 WIDES, USE THE 28 WIDE CHARTS. FOR 45 WIDES, USE THE 32 WIDE CHARTS.

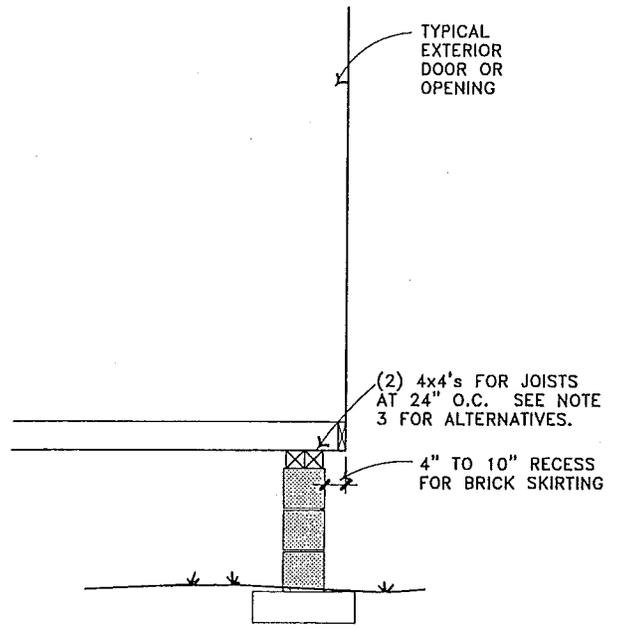
PIER CAPACITY TABLE
Ridge Beam Column
Supports

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
I-3.8



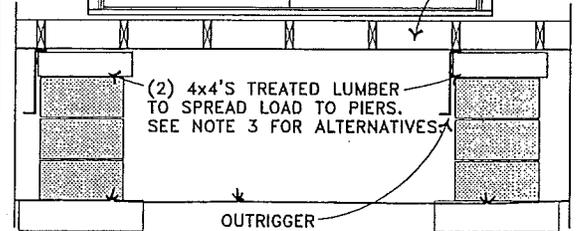
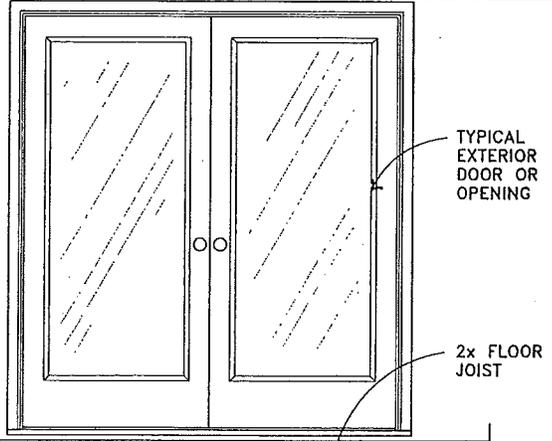
FRONT ELEVATION OF SIDEWALL OPENING



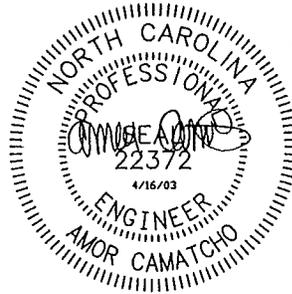
SECTION OF SIDEWALL OPENING

NOTES:

1. PIERS SHALL BE LOCATED UNDER EACH SIDE OF ALL OPENINGS GREATER THAN 4 FEET SUCH AS ENTRY AND SLIDING GLASS DOORS.
2. PIERS ARE NOT REQUIRED UNDER DOORS OR OPENINGS ON THE ENDWALLS EXCEPT WHEN A DOOR OR OPENING IS WITHIN 12" OF THE SIDEWALL OR MARRIAGE WALL, REQUIRING A PIER.
3. AS AN ALTERNATE FOR SPREADING LOADS TO PIERS, (4) 2x4 SPF #2 NAILED TOGETHER AT 16" O.C. MAY BE SUBSTITUTED FOR (2) 4x4'S. (1) 2x6 FLAT MAY BE USED FOR JOIST AT 16" O.C.
4. ALL LUMBER INSTALLED BELOW THE BOTTOM BOARD MATERIAL MUST BE TREATED LUMBER.
5. ADJUSTABLE OUTRIGGERS SHALL NOT BE USED IN PLACE OF TYPICAL SIDEWALL PIER SPACING AS SHOWN IN THE TABLES ON PAGES I-3.5 AND I-3.7 FOR HOMES WITH 30 TO 100 PSF ROOF LIVE LOADS, UNLESS OTHERWISE NOTED.



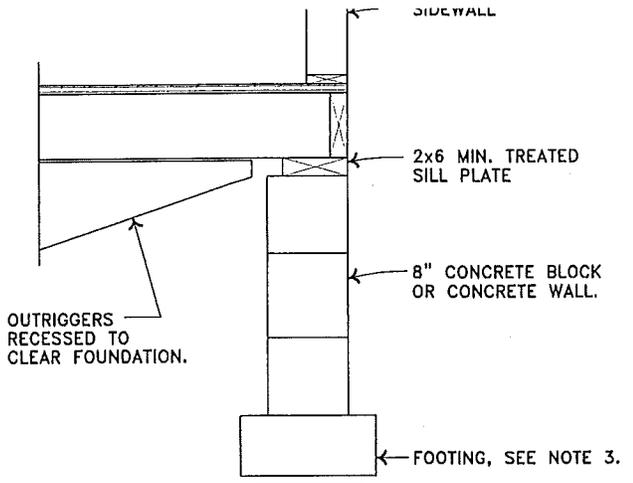
RECESSED BLOCKING AROUND OUTRIGGERS



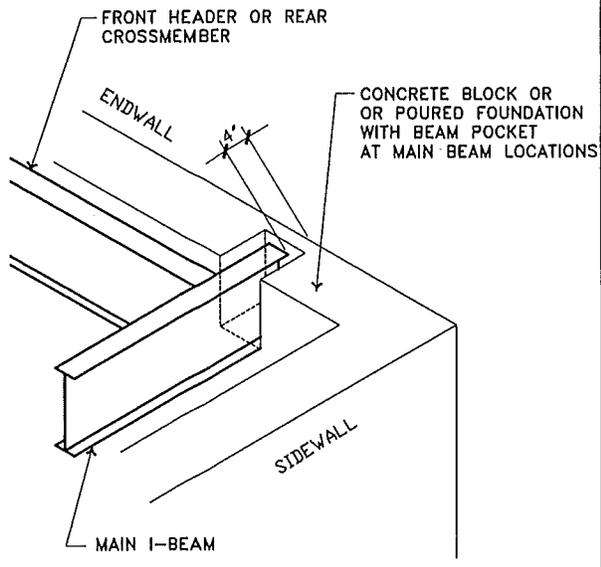
PIER SUPPORT FOR OPENINGS & DOORS OVER FOUR FEET

DRAWN BY: JBM
 DATE: 11/30/98
 REV: 4/16/03

HBOS Manufacturing, LP
 I-3.9

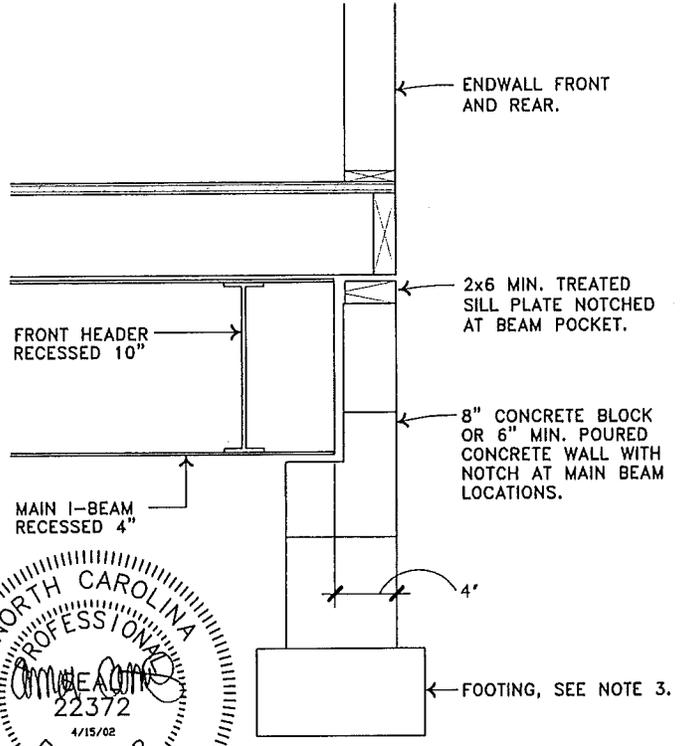


SECTION AT SIDEWALL A



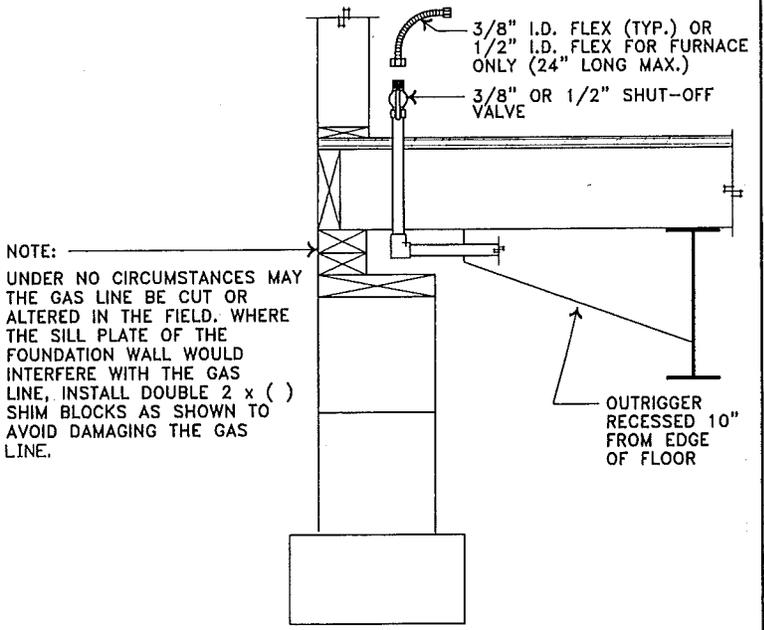
BEAM POCKET DETAIL AT ENDWALLS C

- NOTES:**
1. THIS DRAWING REPRESENTS A TYPICAL DESIGN TO SHOW HOW A BRICK OR BLOCK CURTAIN WALL OR BASEMENT WALL CAN BE CONSTRUCTED WITHOUT CUTTING OR ALTERING ANY PART OF THE HOME'S CHASSIS. OTHER DESIGNS MAY BE USED PROVIDED THAT THEY ARE APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION AND THAT THE HOME'S CHASSIS IS NOT CUT OR ALTERED.
 2. THE PERIMETER CURTAIN WALL IS NOT REQUIRED TO SUPPORT THE HOME PROVIDED THAT THE PIERS/FOOTINGS UNDER THE MAIN I-BEAMS ARE CONSTRUCTED PER CHAPTER 3 OF THIS MANUAL (20 PSF MAX ROOF LOAD). THE PERIMETER MASONRY WALL CAN SUBSTITUTE FOR PIERS UNDER EXTERIOR DOORS.
 3. PERIMETER MASONRY WALLS OR BASEMENT DESIGNS THAT ARE USED FOR THE PERIMETER BLOCKING REQUIREMENTS FOR DESIGN ROOF LOADS OF 30 PSF OR GREATER MUST COMPLY WITH FOOTING SIZE REQUIREMENTS IN CHAPTER 3 OR BE CONTINUOUS 12" WIDE, 6" DEEP.
 4. ALL GRADING, DRAINAGE, MASONRY CONSTRUCTION AND CONNECTIONS MUST BE ACCEPTED/APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
 5. STRAPPING AND ANCHORING MUST BE INSTALLED PER CHAPTER 4 OF THIS MANUAL UNLESS A REGISTERED ENGINEER DESIGNS THE FOUNDATION TO RESIST ALL LATERAL AND UPLIFT WIND LOADS. MASONRY MUST BE NOTCHED OUT TO ALLOW INSTALLATION OF VERTICAL TIEDOWNS IN WIND ZONES 2 AND 3.
 6. IF THE FOOTING FOR THE MASONRY WALL INTERFERES WITH THE MAXIMUM INSET DISTANCE OF GROUND ANCHORS, THEN CONCRETE ANCHORS MUST BE EMBEDDED IN THE FOOTING. THE CONCRETE ANCHORS, FOOTING, AND REINFORCING MUST BE INSTALLED PER ANCHOR MANUFACTURER'S INSTRUCTIONS AND MUST BE RATED FOR A 3,150# WORKING LOAD (4,725# ULTIMATE LOAD).



A 6 INCH OR LARGER MASONRY WALL ALONG THE SIDEWALL MAY INTERFERE WITH MAXIMUM INSET DISTANCE FOR ANCHORS. IF THIS IS THE CASE, THE FOUNDATION OR BASEMENT MUST BE DESIGNED BY A REGISTERED ENGINEER. SEE NOTES 5 & 6.

PROFILE AT FRONT & REAR ENDWALLS B



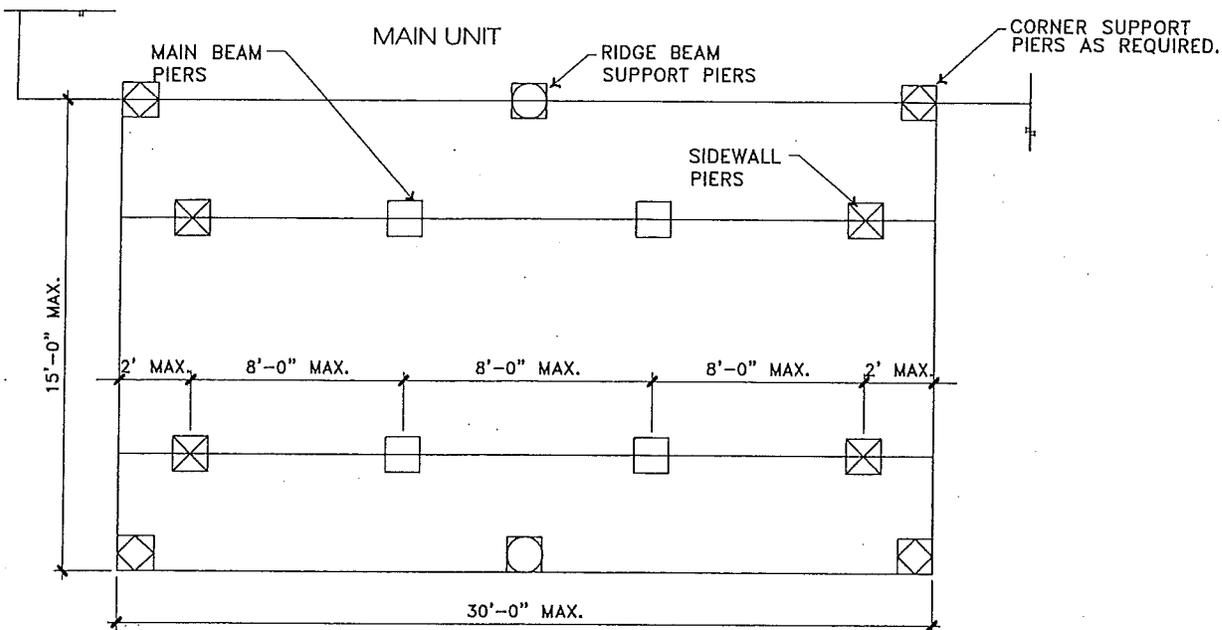
NOTE:
UNDER NO CIRCUMSTANCES MAY THE GAS LINE BE CUT OR ALTERED IN THE FIELD. WHERE THE SILL PLATE OF THE FOUNDATION WALL WOULD INTERFERE WITH THE GAS LINE, INSTALL DOUBLE 2 x () SHIM BLOCKS AS SHOWN TO AVOID DAMAGING THE GAS LINE.

SHIMMING DETAIL AT GAS LINE INTERFERENCE D

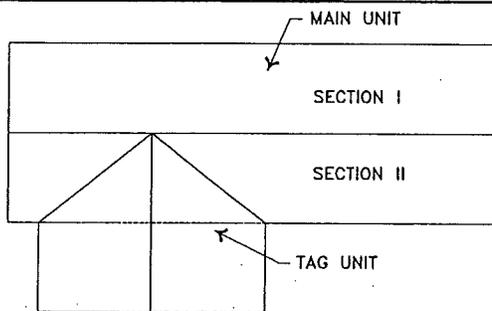
PERIMETER FOUNDATION DESIGN FOR 10" RECESSED FRAME

DRAWN BY: MJE
DATE: 2/9/00
REV: 8/21/01

HBOS Manufacturing, LP
I-3.10



PIER DIAGRAM FOR TAG UNIT



PLAN VIEW

SYMBOL	PIER TYPE	MAX. TAG LENGTH	REQUIRED PIER CAPACITY PER ROOF LOAD				
			UNBLOCKED PERIMETER		BLOCKED PERIMETER		
			20	30	30	40	60
□	MAIN BEAM PIERS	27'-8"	3443	3443	3443	3443	3443
		30'-0"	3700	3700	3700	3700	3700
⊠	SIDEWALL PIERS	27'-8"	4636	5183	4406	4864	5781
		30'-0"	5125	5763	4750	5267	6301
◻	RIDGE BEAM PIERS	27'-8"	3270	4227	4227	5184	7097
		30'-0"	2775	4900	4900	6025	8275
⊞	CORNER SUPPORT PIERS	27'-8"	N/A	N/A	1358	1467	1687
		30'-0"	N/A	N/A	1599	1742	2027

PIER CAPACITY CHART FOR TAG UNIT

NOTES:

- ALL OVERHANGS ARE 12" MAX.
- PIERS ARE CONSTRUCTED PER PAGE I-3.2, FOOTINGS ARE CONSTRUCTED PER PAGE I-3.3. ROUNDING FOOTING SIZES DOWN FOR HOMES WITH 2x6 EXTERIOR WALLS IS NOT ALLOWED.
- OPENINGS GREATER THAN 4' BETWEEN THE TAG AND MAIN UNIT REQUIRE PIERS WITH CAPACITIES PER CHARTS ON PAGE I-3.8. IF THE SAME PIER SUPPORTS THIS OPENING AND THE RIDGE BEAM SUPPORT COLUMN, THE CAPACITY MUST BE DESIGNED TO SUPPORT BOTH LOADS. (ADD CAPACITIES TOGETHER).
- ALL HOMES WITH 30 PSF ROOF LIVE LOAD AND FLOOR JOIST @ 16" O.C. DO NOT REQUIRE CORNER SUPPORT PIERS. SET-UP CONTRACTOR TO VERIFY.



PIER CAPACITY REQUIREMENTS FOR TAG UNIT	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 4/16/03	I-3.11

Chapter 4 – Setup Procedures

Moving Home to Location

Make sure the following items are completed before placing the home:

1. The site is properly prepared -- see Chapter 2.
2. All concrete work necessary for setting the home is finished.
3. Utilities are installed or available.
4. Any trenching is complete for crossover drain lines or for wheels that will be left in place.
5. Items that could be difficult to install after the home is sited (such as anchors or ground moisture retarders) are in their proper locations.

CAUTION!

The polyethylene sheathing covering exterior walls must be completely removed prior to installing the siding for multi-section homes. Failure to do so can cause condensation to build up in the walls and roof and damage the home.

If the exterior siding is installed on the front and rear walls, make sure the close-up strips of exterior siding material are fastened securely and both edges of the strips are sealed with a water-proof sealant.

Setup Procedures Please Read Carefully

The setup crew should consist of a minimum of two experienced setup members. The home should be installed as close as possible to the ground (as local codes and clearance requirements permit – see page I-3.2) while still providing a crawl space for periodic inspection. The following four items apply to the installation of all homes. Each step should be checked off as it is completed.

1. When the home is delivered, inspect both the interior and the exterior for possible shipment damage before placing it in its final position. Any damage should immediately be reported to your dealer. All framing and chassis members are not allowed to be removed on-site unless DAPIA approved such as removable hitches and floor inserts.
2. Prior to installing the home, the soil beneath the final home location should be prepared as outlined in Chapter 2. Determine the soil bearing capacity.
3. After selecting the foundation system desired, select the pier spacing and footing areas from the information contained in Chapter 3, Foundations, by comparing these requirements to the structural load zone in which the home is installed.
4. If the support foundation or tie-down system selected cannot be installed when the home is in its final position, these portions of the support foundation system must be installed before the home is positioned in its final desired location. For example, ground anchors required for a tie-down system may need to be installed before the home is placed in its final position.

Singlewide Section Setup Procedure:

1. Position your home in its desired location.
2. Using an adequate jack at the hitch (min. 12-ton rating), "rough" level the home. This is only a "rough" level and not the "final" level (see page I-4.6).
3. Placing the individual support foundations under the home in the correct sequence is very important and should be done as follows: Place the first lifting jack under the chassis main beam, just forward of the front spring shackle. Locate the lifting jack so that a pier can be placed next to the front spring shackle.
4. Position a second lifting jack under the same chassis' main beam just behind the rear spring shackle.
5. Using both jacks uniformly, lift one side of the home and place a pier (using appropriate sized footings for each pier as referenced in Chapter 3) next to the front spring shackle.
6. Place a second pier within 8 feet of the first or, if necessary, immediately behind the rear spring shackle. On units with three or more axles where these two piers could be further apart than the desired spacing, place a third pier between axles spaced as evenly as possible between the first two piers.
7. Place one additional pier at each end of the chassis main beam within 2 feet of the extreme end of the home.
8. Lift the opposite side main beam as outlined above and "rough" level by placing piers directly opposite those placed on the first side.
9. Complete the "rough" leveling from front to rear and side to side by adjusting the pier heights as required.
10. Evenly space intermediate support piers under the main beams so that the home is supported as required (See pages I-3.4 and I-3.5).
11. Place additional supports at each side of doors and openings in the sidewall greater than four feet.
12. Additional support foundations are desirable under chassis' main beams or floor joists where extra heavy furniture or appliances are located.
13. Make a "final" level adjustment of the home using a standard bubble level or a manometer type level (see page I-4.7). Work from front to rear and side to side to obtain "final" level conditions throughout the home. All piers should be snug and in contact with the home.
14. The tie-down system must be installed according to the details in this chapter and the instructions of the tie-down and anchor manufacturer (See pages I-4.12 to I-4.15 and I-4.19).
15. In the event of a slight settlement any time after the initial installation, releveling can be accomplished by following the procedures detailed above for "final" leveling.

16. Install all light shades and light fixtures as needed.
17. Install all waste plumbing according to the plumbing print that may be shipped with the home. Be sure to connect all drain lines and dropouts per this print (see also pages I-7.3 and I-7.4).
18. After connection of utilities is complete, test utility systems (electrical, water, drain lines and gas lines, as applicable) as described in Chapter 8.
19. Verify proper operation on all smoke alarms by performing the following steps:
 - a. Determine that the power source is connected.
 - b. Visually check for proper connection to the power source.
 - c. Manually depress the check button.
 - d. A "sound" indicates a working smoke alarm.
 - e. In the absence of a "sound", install a replacement smoke alarm and repeat items a thru e.
 - f. All switches are to be in the off position when testing the smoke alarm(s).
20. Check and adjust the entire home for items which may have become misalign in transit or during setup, such as the following:
 - a. Adjust passage doors to close easily with proper alignment.
 - b. Realign cabinet doors.
 - c. Adjust drawers to open and close easily.
 - d. Adjust closet doors, aligned and square with walls.
 - e. Adjust exterior doors to close easily and be square with frame, and to lock and unlock easily.
 - f. Adjust all windows to open and shut easily.
 - g. Adjust drapes to operate easily and completely close.
 - h. Re-caulk over the top of all windows and doors and other seams as necessary.
 - i. Re-tack any loose moldings, panel connections, and trim.
 - j. Retighten "p" trap fittings.
21. On some models, it may have been necessary to ship loose appliance vent piping to assure the pipe's safe transportation to the final site. Check all appliances to confirm that all venting is installed per the appliance installation instructions.
22. Install and/or connect all other parts and items shipped loose with the home.
23. The inside and the outside of the home should be thoroughly cleaned before the installation is considered complete. Remove all trash and excess materials from both the inside and outside of the home. Any dirt or stains in the home should be cleaned up and the carpet should be vacuumed.

Multi-wide Section Setup Procedure:

1. Strip all the plastic, metal strapping, and wood braces from both units (weatherproof covering and temporary supports). The plastic weatherproofing material installed underneath the roof shingles is not required to be removed. Be sure all exposed nails and staples are removed.
2. Position one-half of the home in its desired location.

3. Placing the individual support foundations under the home in the correct sequence is very important and should be done as follows: Place the first lifting jack under the chassis main beam, just forward of the front spring shackle. Locate the lifting jack so that a pier can be placed next to the front spring shackle (see page 4.6).
4. Position a second lifting jack under the same chassis main beam just behind the rear spring shackle.
5. Using both jacks uniformly, lift one side of the home and place a pier (using appropriate sized footings for each pier as referenced in Chapter 3) next to the front spring shackle.
6. Place a second pier within 8 feet of the first or, if necessary, immediately behind the rear spring shackle. On units with three or more axles where these two piers could be further apart than the desired spacing, place a third pier between axles spaced as evenly as possible between the first two piers.
7. Place one additional pier at each end of the chassis main beam within 2 feet of the extreme end of the home.
8. Lift the opposite side main beam as outlined above and "rough" level by placing support piers directly opposite those placed on the first side.
9. Complete the "rough" leveling from front to rear and side to side by adjusting the pier height as required.
10. Space intermediate support piers under the main beams so that the home is supported as required (See pages I-3.6 and I-3.7).
11. Once the first half of the home is in place, check to make sure that a strip of insulation has been installed in the plant around the marriage joint. The insulation will fill any gaps between the two halves of the home and help prevent air infiltration. If the insulation was not factory installed, apply it now.
12. Position the second unit along side the first unit being careful not to jar the first unit. Approximately six inches or less should separate the floors. Bring the second unit to the first unit using rollers, jacks, or similar devices. Draw the floors together tight (at this stage the ceiling will usually be open at the center).
13. Loosely attach the floors together (See page I-4.28). Pre-drills holes in the floor rim joist if necessary and insert the lag screws. Do not fully tighten.
14. Starting with the inside main beam, rough level the second floor as detailed in Steps 2 through 10.
15. Place additional supports at each side of openings in the sidewall greater than four feet if additional outrigger supports are not present.
16. Additional piers are desirable under chassis main beams or floor joists where extra heavy furniture or appliances are located.
17. Place additional piers under the floor rim joist at each ridge beam column location (see page I-3.8). A pier location strap or tag may be found on the underside of the floor at each required location.

18. Close the gap at the roofline by raising the outside of the second unit. Connect the top of the ridge beam or edge rails by using one of the methods shown (See page I-4.29). It may be necessary to adjust the ceiling joint flush before installing the connections. A jack and tee is used to raise whichever ceiling is low (see page I-4.8). Start in the front and work through the home to the rear.
19. Tighten the lag screws to securely fasten the floors together.
20. Make a final level adjustment of the home using a standard bubble level, laser, or a water type level (see page I-4.7). Work from front to rear and side to side to obtain final level conditions throughout the home. All piers should be snug and in contact with the home.
21. To finish the roof install two layers of 15# felt along the length of the home's ridgeline and tack in place. The felt layers are to be overlapped 6" at each seam, with the top layer seams offset a minimum of 48" from the bottom seams. The overlapped felt must be cemented in wind zones 2 and 3. Install the top courses of shingles on each half with 4 shingle nails, positioned 5/8" above the rain slot and not in or above the self-sealing strip (use 6 nails for wind zones 2 and 3). The nails are to be placed as required by the instructions on the shingle bundle wrapper. Cut shingles in thirds at the rain slots to be used for the ridge cap. Rotate the cut shingles 90 degrees and bend the shingle lengthwise so as to have an equal exposure on each half of the ridge. Begin at the end of the ridge facing the prevailing wind and lay the shingle over the top edge and secure it on each side with a nail located 5-1/2" from the exposed end and 1" up from the edge. Lay succeeding shingles so as to expose 5" (refer to ARMA guidelines and page I-4.32).

IMPORTANT!

In cold weather, warm the shingles before bending them, field installed shingles and ridge caps must be hand tabbed, using approved roof cement.

22. Connect gas line flex connector (crossover) where applicable (See page I-7.2).
23. Connect electrical crossover as required with the material provided (See page I-7.5).
24. Connect duct crossover. Flexible crossover must be supported so that it does not rest on the ground (See page I-6.3).

IMPORTANT!

Do not leave exposed metal on the duct collar – this could result in condensation problems. Cover the collar with the insulation wrap.

25. Install all waste plumbing according to the plumbing print that may be shipped with the home. Be sure to connect all drain lines and dropouts per this print (see also pages I-7.3 and I-7.4).
26. Connect hot and cold water line crossover connectors where applicable (See page I-7.2).
27. The tiedown system must be installed according to the details in this chapter and the instructions of the tiedown and anchor manufacturer (See pages I-4.12 through I-4.24).
28. In the event of a slight settlement any time after the initial installation, releveling can be accomplished by following the procedures detailed above for "final" leveling.
29. Install all light shades and light fixtures as needed.

30. After connection of utilities is complete test utility systems (electrical, water, drain lines and gas lines, as applicable) as detailed in Chapter 8.
31. Verify proper operation on all smoke alarms by performing the following steps:
 - a. Determine that the power source is connected.
 - b. Visually check for proper connection to the power source.
 - c. Manually depress the check button.
 - d. A "sound" indicates a working smoke alarm.
 - e. In the absence of a "sound", install a replacement smoke alarm and repeat items a thru e.
 - f. All switches are to be in the off position when testing the smoke alarm(s).
32. Complete all interior and exterior close-up as described in the following pages.
33. Install the ridge beam molding or finish over the center joint in the ceiling (See page I-4.29).
34. Install carpet, carpet padding and molding where applicable.
35. Check and adjust the entire home for items which may have become misarranged in transit or during setup, such as the following:
 - a. Adjust passage doors to close easily with proper alignment.
 - b. Realign cabinet doors.
 - c. Adjust drawers to open and close easily.
 - d. Adjust closet doors, aligned and square with walls.
 - e. Adjust exterior doors to close easily and be square with frame, and to lock and unlock easily.
 - f. Adjust all windows to open and shut easily.
 - g. Adjust drapes to operate easily and completely close.
 - h. Recaulk over the top of all windows and doors and other seams as necessary.
 - i. Retack any loose moldings, panel connections, and trim.
 - j. Retighten "p" trap fittings.
36. On some models, it may have been necessary to ship loose appliance vent piping to assure the pipe's safe transportation to the final site. Check all appliances to confirm that all venting is installed per the appliance installation instructions.
37. Install and/or connect all other parts and items shipped loose with the home.
38. The inside and the outside of the home should be thoroughly cleaned before the installation is considered complete. Remove all trash and excess materials from both the inside and outside of the home. Any dirt or stains in the home should be cleaned up and the carpet should be vacuumed.

POSITIONING AND JACKING OF THE HOME

WITH THE SITE PREPARATION COMPLETE, FOOTING AND PIER TYPES SELECTED YOU CAN NOW START THE INITIAL INSTALLATION OF THE HOME.

WARNING

THE HOME'S STRUCTURE WEIGHS SEVERAL TONSI ADEQUATE SUPPORT BLOCKING MUST BE USED TO SAFEGUARD PERSONNEL AND THE STRUCTURE DURING ALL INSTALLATION PROCEDURES. PERSONNEL SHOULD NOT BE PERMITTED TO WORK UNDER THE HOME WHERE THEY MIGHT BE INJURED IF THE HOME ACCIDENTALLY SLIPS DURING THE INSTALLATION PROCESS.

DURING LEVELING CARE MUST BE TAKEN TO AVOID DISTORTING THE HOME. EXCESSIVE AND/OR NONUNIFORM JACKING DURING THE LEVELING PROCESS WILL CAUSE THE HOME TO BE RACKED AND TWISTED. THIS MAY RESULT IN DAMAGE TO THE HOME.

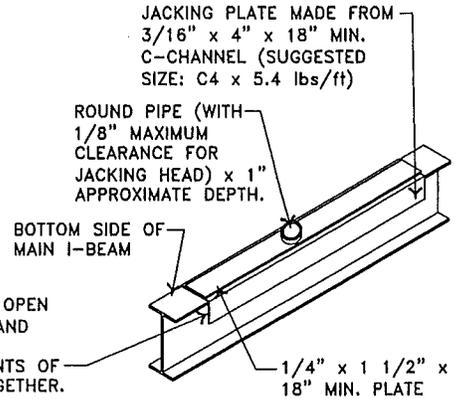
WARNING

USE JACKING PLATES WHEN JACKING THE FRAME MAIN I-BEAM TO AID IN PREVENTING THE HOME FROM SLIPPING OFF THE JACK. THIS PROCEDURE WILL ALSO AVOID DAMAGE TO THE BEAM AND VOIDING OF THE WARRANTY. OTHER EQUIVALENT MEANS MAY BE USED TO PREVENT THE HOME FROM SLIPPING OFF THE JACK AND TO ADEQUATELY DISTRIBUTE THE CONCENTRATED LOAD OF THE JACK HEAD TO THE FRAME MEMBERS. (SEE DETAIL FOR RECOMMENDED JACKING PLATE ASSEMBLY).

MAIN BEAM JACKING PLATE ASSEMBLY IS NOT PROVIDED BY THE HOME MANUFACTURER

ON MULTI-SECTION HOMES REMOVE ALL THE PLASTIC COVERING AND ALL SHIPPING BRACES FROM THE OPEN SIDE OF THE FIRST SECTION. (YOU MAY ELECT AT THIS TIME TO REMOVE ALL THE PLASTIC COVERING AND BRACES FROM THE OTHER SECTION OR SECTIONS).

WARNING: NEVER CRAWL UNDER THE HOME WHEN HOME IS SUPPORTED BY TOW BAR JACK ONLY.



WELD (3) COMPONENTS OF JACKING PLATES TOGETHER.

MAIN BEAM JACKING PLATE ASSEMBLY

A

MOVING THE SINGLE SECTION OR THE FIRST SECTION OF THE HOME INTO ITS DESIRED FINAL POSITION.

JACKING

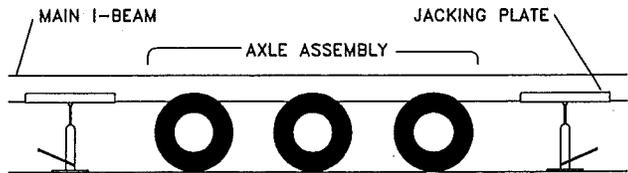
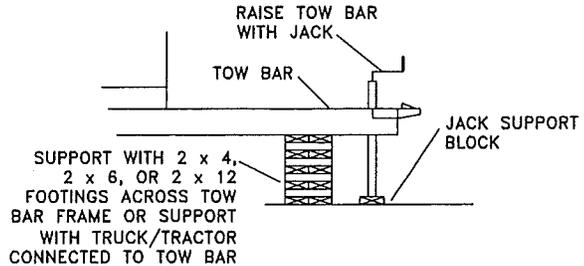
USING THE TOW BAR JACK, RAISE THE TOW BAR HEIGHT SLIGHTLY HIGHER THAN THE INTENDED HEIGHT OF THE FOOTINGS AND PIERS. BLOCK UNDER THE TOW BAR WITH 2 x 4, 2 x 6, OR 2 x 12 FOOTINGS OR ATTACH TOW BAR TO TRUCK/TRACTOR TO PREVENT THE SECTION FROM FALLING IF THE JACK FAILS. (RAISE HIGHER WITH HYDRAULIC JACK IF ADDITIONAL HEIGHT IS REQ'D).

PLACE MINIMUM 12 TON RATED HYDRAULIC JACKS IN FRONT AND BEHIND THE AXLE ASSEMBLY UNDER BOTH MAIN I-BEAMS. MAKE SURE THESE JACKS HAVE JACKING PLATES UNDER THE BOTTOM MAIN BEAM FLANGES AND HAVE A FIRM BASE UNDER THE JACKS BEFORE RAISING THE REMAINDER OF THE SECTION SLIGHTLY HIGHER THAN THE INTENDED HEIGHT OF THE FOOTERS AND PIERS. OPERATE ALL JACKS SIMULTANEOUSLY TO PREVENT EXCESSIVE STRESS ON THE MAIN BEAMS.

NOTE:

IN ORDER TO LEVEL THE SECTION, IT IS RECOMMENDED TO USE THE WATER LEVEL METHOD TO ENSURE ALL PIER SUPPORTS ARE AT THE SAME HEIGHT BEFORE LOWERING THE SECTION TO IT'S FINAL SUPPORTED POSITION. (SEE THE FOLLOWING PAGE FOR THE PROCEDURE ON USING A WATER LEVEL.)

WARNING: NEVER CRAWL UNDER THE HOME WHEN HOME IS SUPPORTED BY TOW BAR JACK ONLY.



LEVELING

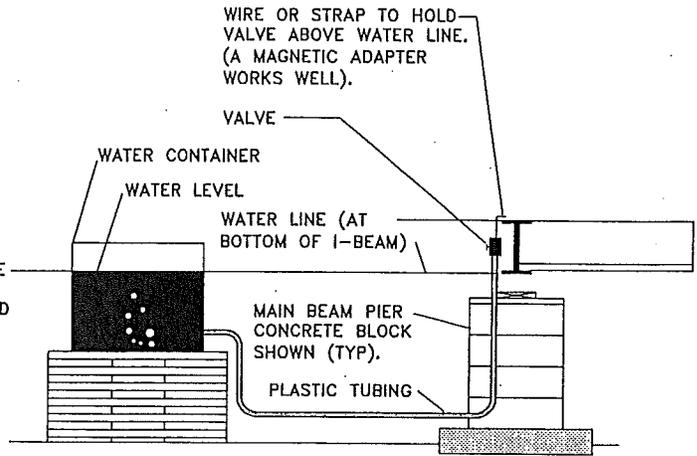
B



POSITIONING & JACKING OF HOME	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 7/31/00	
I-4.6	

PROCEDURE FOR USING A WATER LEVEL

1. POSITION WATER CONTAINER ADJACENT TO THE SECTION THAT PERMITS LENGTH OF PLASTIC TUBING AND VALVE TO REACH ALL PIER LOCATIONS.
2. LAY OUT PLASTIC TUBING, AWAY FROM TRAFFIC AREAS, CHECKING TO MAKE SURE IT IS NOT COMPRESSED OR KINKED. MAKE SURE INSTALLATION MATERIALS ARE NOT PLACED ON TUBING.
3. FILL CONTAINER WITH WATER.
4. HOLD THE VALVE BELOW THE LEVEL OF THE WATER CONTAINER, OPEN THE VALVE TO BLEED OUT ANY AIR. CLOSE VALVE.
5. LOCATE THE TUBING ADJACENT TO A PIER THAT IS SET TO THE DESIRED FINAL HEIGHT OF THE HOME. POSITION THE VALVE ABOVE THE PIER AND OPEN THE VALVE. MOVE THE WATER CONTAINER UP OR DOWN TO WHERE THE WATER LEVEL IN THE TUBING IS AT THE DESIRED FINAL HEIGHT OF THE PIER (IDEALLY, AT THE BOTTOM OF THE I-BEAM). MAINTAIN THE WATER CONTAINER AT THAT POSITION. CLOSE VALVE.
6. MOVE TUBING TO THE NEXT PIER. LOCATE THE VALVE ABOVE THE PIER AND OPEN THE VALVE. SET THE PIER HEIGHT TO THE LEVEL OF THE WATER IN THE TUBING. CLOSE THE VALVE. REPEAT THIS STEP UNTIL ALL PIERS ARE AT THE SAME LEVEL.
7. LOWER SECTION ONTO PIERS.



WATER LEVEL APPLICATION

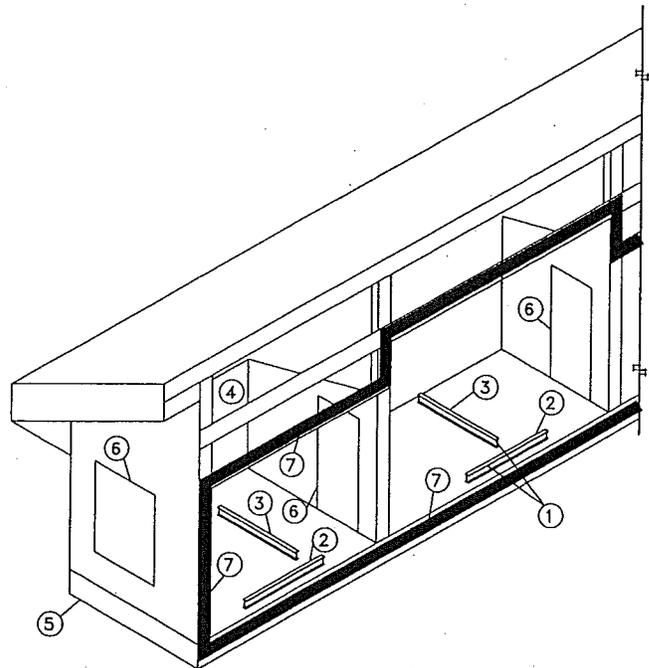
A

PROCEDURE:

1. USING A MINIMUM 4 FOOT LONG SPIRIT LEVEL, CHECK "EACH" ROOM FOR LEVEL AND PLUMB AS SHOWN.
2. CHECK LEVEL OF FLOOR FROM FRONT TO REAR DIRECTION.
3. CHECK LEVEL OF FLOOR ACROSS THE SECTION WIDTH.
4. CHECK PLUMB OF SIDE WALL.
5. RAISE SECTION AND ADJUST PIER WEDGES IN ALL AREAS NOT LEVEL OR PLUMB.
6. AFTER LEVELING IS COMPLETE CHECK ALL WINDOWS, INTERIOR AND EXTERIOR DOORS TO MAKE SURE THEY OPERATE FREELY WITHOUT BINDING.
7. **CAUTION:** SPECIAL CARE MUST BE TAKEN TO ENSURE THAT THIS MATING LINE JOINT IS TIGHT TO RESIST AIR INFILTRATION AND MINIMIZE CONDENSATION. FILL ANY GAPS WITH EXTRA STRIPS OF SILL SEALER OR FOAM SEALANT.

NOTE:

DUE TO FRAME CAMBER, IT IS OFTEN NOT POSSIBLE TO ACHIEVE PERFECT LEVEL IN ALL DIRECTIONS. WHAT IS MOST IMPORTANT IS TO ACHIEVE A LEVEL WHERE DOORS AND WINDOWS FUNCTION PROPERLY.



SINGLE OR MULTI-SECTION INTERIOR LEVELING

B



LEVELING THE HOME	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 7/31/00	I-4.7

Multi-wide Sections Interior Close-up

Remove all shipping blocking, strapping or bracing from appliances, windows, and doors. Install all loose items packaged or attached for shipping. Review any supplemental pages stapled to the flap in the back of the manual. These pages outline special features that are not included in the manual.

All interior wall paneling omitted at the manufacturing facility and shipped loose to facilitate interior close up shall be installed as follows: Use a ¼" bead of PVA adhesive on all framing members and fasten wall panels with a minimum 1 inch long staples or nails at 6" on center along all panel edges and at 12" on center on field framing members. For tape and texture homes, interior wall paneling shall be fastened to wall framing members with drywall screws or nails.

Additional molding has been provided to finish the close up at ceilings, mating line walls, front and rear end walls and in some cases molding around passageway doors. Moldings and trim work requiring special attention has been detailed by the manufacturing facility and is provided in this manual. All moldings and trim work should be installed with fine gage wire staples or pin nails. Attention should be made to any mitered corners and seam work to assure a tight fit.

Blue-nail Drywall Finish Option (Multi-sectional Homes Only)

If this home comes with the unfinished drywall option, the installer must finish the drywall and complete the rest of the interior after the home is installed on site. Follow all instructions described on page 13.0.

Unfinished Gypsum Board

Homes shipped with unfinished gypsum board walls and/or ceilings shall be finished on site. The interior finishes shall have the maximum flame spread ratings measured in accordance with ASTM E 84-91a (table 2.0):

Flame Spread Ratings

Area	Rating
Ceilings	75
Walls:	
General	200
Adjacent to cooking range	50
Adjacent to or enclosing a furnace or Water heater	25

Multi-wide Sections Exterior Close-up

The exterior siding on the front and rear end walls and exposed mating line walls may have been shipped loose by the manufacturing facility with the home. The insulation and vapor retarder have been installed at the manufacturing facility. Exterior siding shall be installed in accordance with the manufacturers installation instructions.

Bottomboard Repair

Fastened to the underside of the floor of the home is a special covering designed to protect against rodents and moisture as well as to isolate the floor cavity from outside air. This covering was inspected before the home left the manufacturing facility. It is important that any areas damaged or torn during transportation or installation be resealed.

Entry of outside air into the home's floor cavity is one of the most frequent causes of water piping freeze-up. The bottom covering of the home should be closely inspected to determine that there has not been any loosening of its attachment or tears. Openings around the perimeter of the floor covering, around pipes or pipe hangers, splits or tears should be sealed with tape. Check also to ensure that plumbing p-traps are well insulated and covered. It is important that this inspection is made and any necessary repairs completed whether skirting is to be installed around the perimeter of the home or not.

For bottom covering repair use vinyl tape especially designed to repair tears or holes. Pull torn edges together then cover, as necessary, with tape or apply a patch of the same material taped all four sides.

Strap Tensioning

If your home is re-leveled at some date after the initial tensioning of the anchoring straps, the straps should be re-tensioned as specified in the anchor manufacturer's installation instructions. Straps must be inspected periodically to assure that proper tension is provided in each strap. If straps are found to be loose, then re-tensioning of the straps should be performed.

Re-Leveling

Due to varying soil conditions, which may exist on your homesite, some initial settling may occur. It is recommended that your home be re-leveled after 90 days of initial set up and checked periodically.

Alternate Anchoring Systems

The method shown in this chapter is only one system for anchoring the home against wind loads. Other systems are acceptable provided that they are designed by a registered professional engineer, installed per the approved anchor manufacturer's installation instructions, and accepted by the local jurisdiction.

Severe Climatic Conditions

Be sure anchor augers are installed below the frost line in freezing climates. During periods of frost heave, be prepared to adjust tension on the straps to take up slack.

Flood-Prone Areas

It is not recommended siting the manufactured homes in flood-prone areas. Foundation considerations are discussed in Chapter 3 and the FEMA document: "Manufactured Home Installation in Flood Hazard Areas". Unconventional anchoring, tie-downs, and pier designs are sometimes needed to design and construct the special elevated foundations for flood-prone areas. Consult a registered professional or structural engineer.

Severe Wind Zones

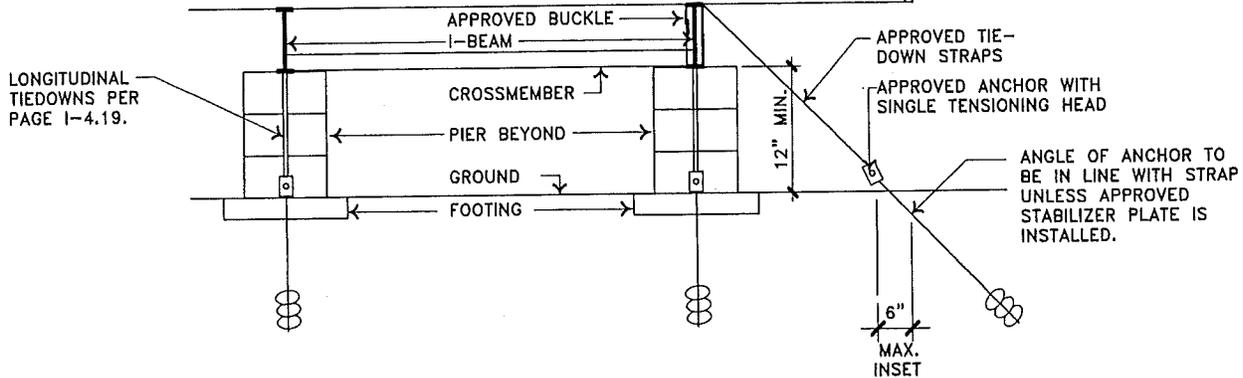
It is not recommended installing manufactured homes in an area known to experience severe winds or in any zone that requires greater wind-resisting capabilities than those for which it was designed (see data plate).

Exposure 'D' Locations

If your home is to be installed within 1,500 feet of the coast line, it is considered to be an exposure 'D' home and was designed under specific guidelines for these locations. Specific setup instructions will be included with this manual as supplement for exposure 'D' homes.

All details in this manual concerning tiedowns for all homes and interconnections for multi-section homes are for exposure 'C' unless noted otherwise.

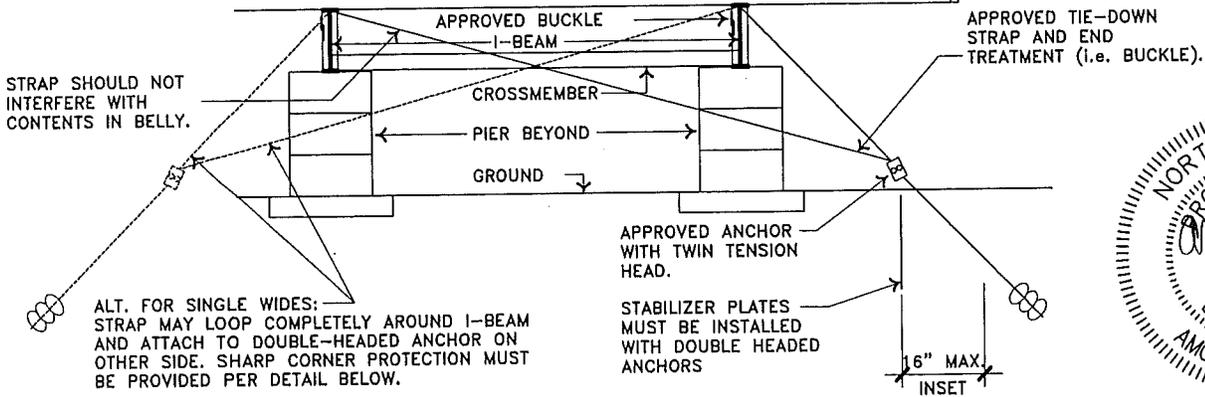
NOTE: LONGITUDINAL TIEDOWNS ATTACHED TO THE CROSSMEMBERS SHALL BE NO MORE THAN 3" FROM THE I-BEAM. LONGITUDINAL TIEDOWNS AND OUTRIGGERS NOT SHOWN FOR CLARITY.



TYPICAL TIEDOWN REQUIREMENTS

A

NOTE: LONGITUDINAL TIEDOWNS ATTACHED TO THE CROSSMEMBERS SHALL BE NO MORE THAN 3" FROM THE I-BEAM. LONGITUDINAL TIEDOWNS AND OUTRIGGERS NOT SHOWN FOR CLARITY.

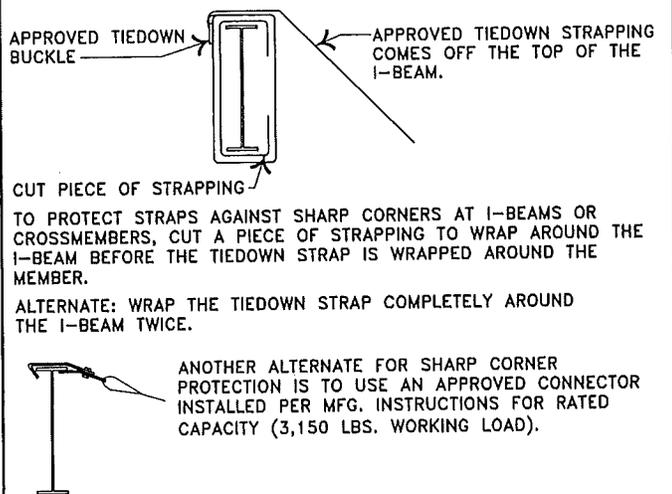


TYPICAL TIEDOWN REQUIREMENTS - CROSS-STRAPPING

B

NOTES:

- SEE PAGES I-4.14 TO I-4.19 FOR TIEDOWN SPACING REQUIREMENTS.
- TIEDOWN STRAPPING, BUCKLES, ANCHORS AND END TREATMENTS ARE NOT SUPPLIED BY HOME MANUFACTURER. VERTICAL TIES ARE REQUIRED AT EACH HORIZONTAL TIEDOWN ALONG THE SIDEWALL FOR WIND ZONES 2 & 3.
- GROUND ANCHORS AND FRAME TIES SHALL BE CAPABLE OF RESISTING AN ULTIMATE TENSION LOAD OF 4,725 LBS. (WORKING LOAD = 3,150 LBS.) AND MUST BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THESE ANCHORS ARE NOT TO EXTEND BEYOND THE SIDEWALL OF THE HOME.
- STEEL ANCHORING EQUIPMENT EXPOSED TO THE WEATHER SHALL BE PROTECTED WITH AT LEAST 0.30 OZ. OF ZINC PER SQUARE FOOT OF STEEL.
- 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.
- 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.
- GROUND ANCHORS SHALL BE INSTALLED TO THEIR FULL DEPTH, EMBEDDED BELOW THE FROST LINE, AND BE AT LEAST 12" ABOVE THE WATER TABLE.
- STRAPS MUST BE TENSIONED PER TIEDOWN MANUFACTURER'S INSTRUCTIONS SO THEY WILL PERFORM AS DESIGNED.
- OVER-THE-ROOF TIEDOWN STRAPS ARE OPTIONAL AND NOT REQUIRED. THESE OVER-THE-ROOF STRAPS MAY BE USED TO PROVIDE ADDITIONAL STABILITY FOR SINGLE-SECTION HOMES, ABOVE AND BEYOND THE MANDATORY FRAME TIEDOWNS.
- LONGITUDINAL TIEDOWN STRAPS ARE ATTACHED TO PLANT WELDED BRACKETS ON THE MAIN I-BEAMS OR WRAPPED AROUND THE ENDS OF CROSSMEMBERS, MAXIMUM 3" FROM THE I-BEAM. SEE PAGE I-4.19 FOR SPACING AND ALTERNATE DETAILS.



SHARP CORNER PROTECTION

C

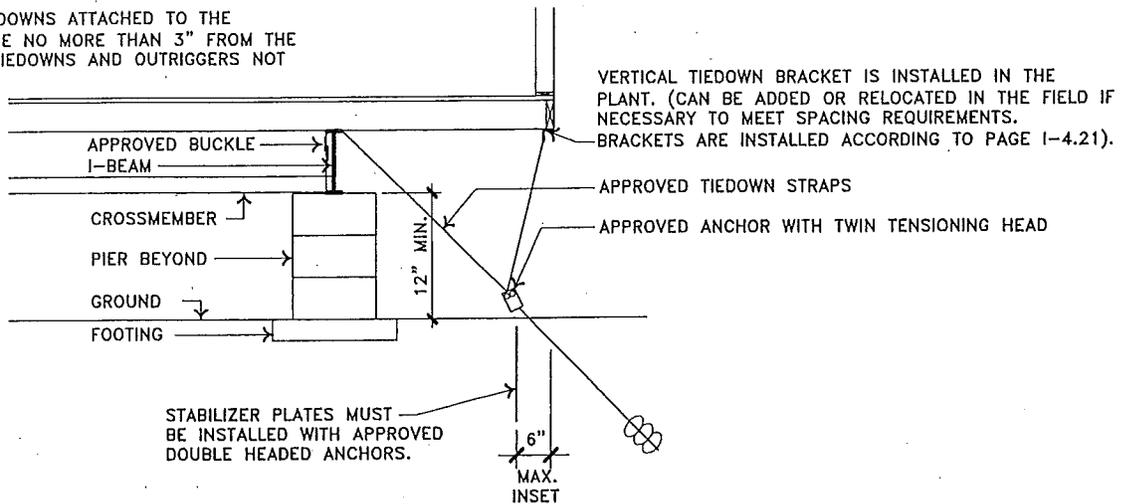
WIND ZONE 1
Strapping & Anchoring
Requirements

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP

I-4.12

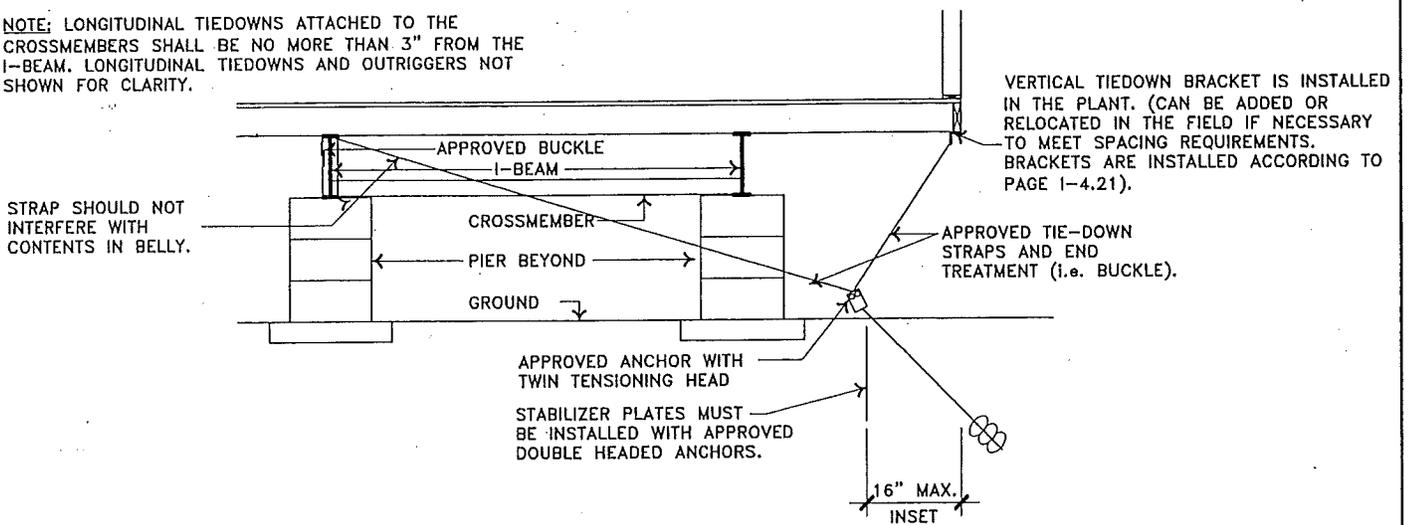
NOTE: LONGITUDINAL TIEDOWNS ATTACHED TO THE CROSSMEMBERS SHALL BE NO MORE THAN 3" FROM THE I-BEAM. LONGITUDINAL TIEDOWNS AND OUTRIGGERS NOT SHOWN FOR CLARITY.



TYPICAL TIEDOWN REQUIREMENTS - NEAREST I-BEAM

A

NOTE: LONGITUDINAL TIEDOWNS ATTACHED TO THE CROSSMEMBERS SHALL BE NO MORE THAN 3" FROM THE I-BEAM. LONGITUDINAL TIEDOWNS AND OUTRIGGERS NOT SHOWN FOR CLARITY.

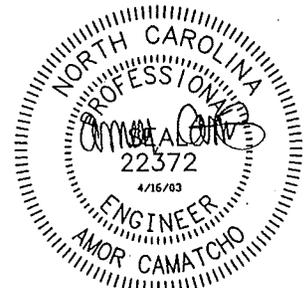


TYPICAL TIEDOWN REQUIREMENTS - OPPOSITE I-BEAM

B

NOTES:

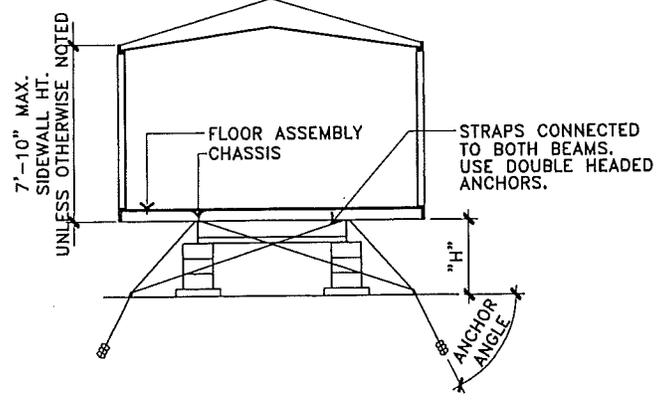
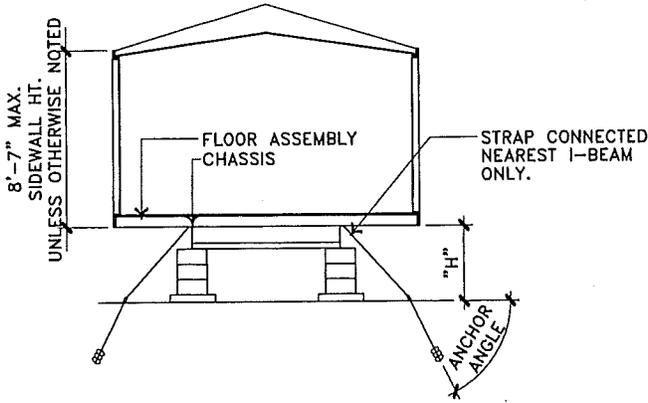
1. SEE PAGES I-4.14 TO I-4.19 FOR TIEDOWN SPACING REQUIREMENTS.
2. SEE PAGE I-4.12 FOR STRAPPING & ANCHORING GENERAL NOTES AND TYPICAL SHARP CORNER PROTECTION DETAIL.



WIND ZONES 2 & 3
Strapping & Anchoring
Requirements

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
I-4.13



WIND ZONE 1 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
14 WIDE	168"	99 1/2"	8 ft.	43 in.	61°
14 WIDE	168"	99 1/2"	10 ft.	31 in.	52°
14 WIDE	168"	112"	8 ft.	32 in.	61°
14 WIDE	168"	112"	10 ft.	23 in.	52°
16 WIDE	190"	99 1/2"	10 ft.	43 in.	52°
16 WIDE	190"	99 1/2"	12 ft.	31 in.	43°
16 WIDE*	190"	99 1/2"	8 ft.	51 in.	57°
16 WIDE*	190"	99 1/2"	10 ft.	35 in.	47°
16 WIDE	190"	112"	10 ft.	35 in.	52°
16 WIDE	190"	112"	12 ft.	25 in.	43°
18 WIDE	208.5"	99 1/2"	8 ft.	80 in.	58°
18 WIDE	208.5"	99 1/2"	10 ft.	62 in.	52°
18 WIDE	208.5"	99 1/2"	12 ft.	44 in.	42°

WIND ZONE 1 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
14 WIDE	168"	99 1/2"	12 ft.	80 in.	48°
16 WIDE	190"	99 1/2"	12 ft.	80 in.	48°
16 WIDE*	190"	99 1/2"	12 ft.	78 in.	32°
18 WIDE	208.5"	99 1/2"	12 ft.	80 in.	38°

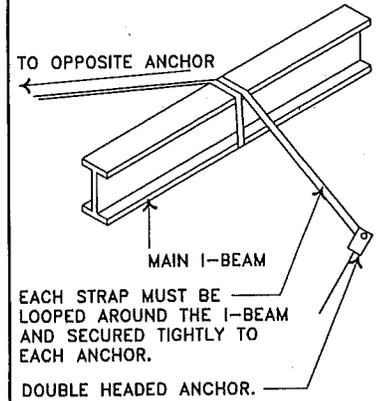
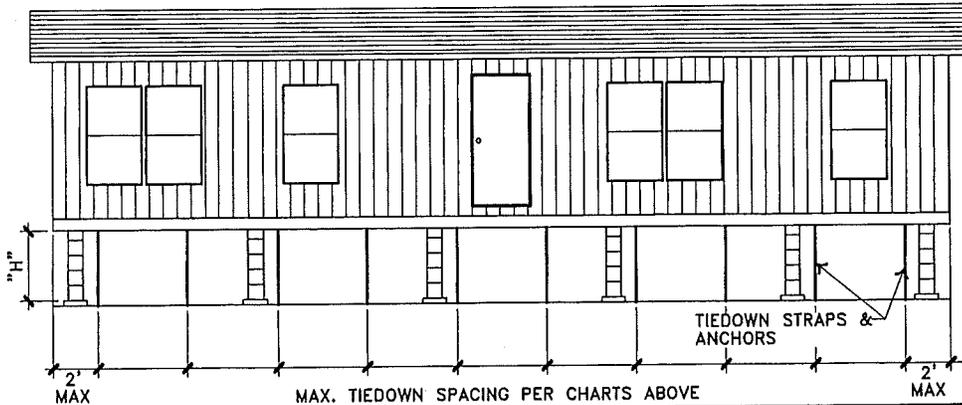
*INDICATES MAX. SIDEWALL HEIGHT OF 9'-7"

*INDICATES MAX. SIDEWALL HEIGHT OF 9'-7"

TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAM

TIEDOWN SPACING REQUIREMENTS - CROSSED STRAPS

TYPICAL SIDE ELEVATION SHOWING TIE-DOWN SPACING



EACH STRAP MUST BE LOOPED AROUND THE I-BEAM AND SECURED TIGHTLY TO EACH ANCHOR.

DOUBLE HEADED ANCHOR.

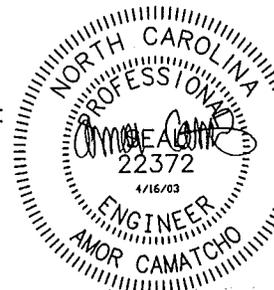
NOTE: SHARP CORNER PROTECTION MUST BE PROVIDED BY WRAPPING A PIECE OF STRAP AROUND THE BEAM UNDER THE TIEDOWN STRAP.

TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

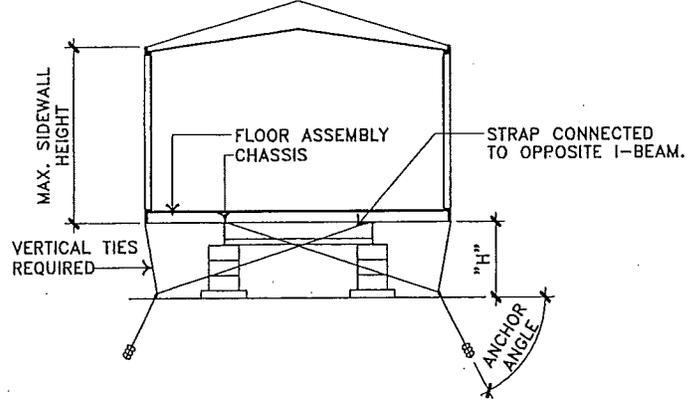
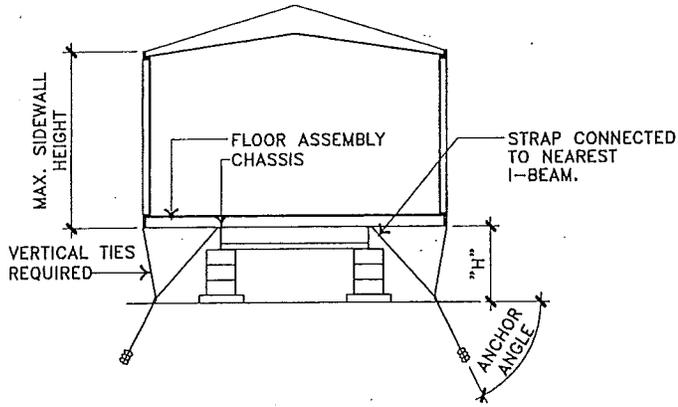
CROSSED STRAP DETAIL

NOTES:

1. REFER TO PAGE I-4.12 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
2. ROOF SLOPE MAY NOT EXCEED 20 DEGREES. MAX. EAVE IS 1 1/2". FOR 18 WIDES, THE MAX EAVE IS 4".
3. MAX. SIDEWALL HEIGHT AS NOTED.
4. BOX WIDTHS STATED ABOVE REPRESENT MAXIMUM WIDTHS FOR EACH HOME SIZE.



<p>WIND ZONE 1 SINGLEWIDE SIDEWALL TIEDOWN REQUIREMENT</p>	
<p>DRAWN BY: JBM DATE: 11/30/98 REV: 4/16/03</p>	<p>HBOS Manufacturing, LP I-4.14</p>



HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
14 WIDE	168"	99 1/2"	6 ft.	36 in.	54°
16 WIDE	190"	99 1/2"	6 ft.	52 in.	54°
16 WIDE*	190"	99 1/2"	6 ft.	33 in.	45°
18 WIDE	208.5"	99 1/2"	6 ft.	68 in.	54°

*INDICATES MAX. SIDEWALL HEIGHT OF 9'-7"

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
14 WIDE	168"	99 1/2"	6 ft.	65 in.	53°
16 WIDE	190"	99 1/2"	6 ft.	65 in.	51°
16 WIDE*	190"	99 1/2"	6 ft.	65 in.	33°
18 WIDE	208.5"	99 1/2"	6 ft.	80 in.	50°

*INDICATES MAX. SIDEWALL HEIGHT OF 9'-7"

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
14 WIDE	168"	99 1/2"	5 ft.	36 in.	54°
16 WIDE	190"	99 1/2"	5 ft.	52 in.	54°
18 WIDE	208.5"	99 1/2"	5 ft.	67 in.	54°

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
14 WIDE	168"	99 1/2"	5 ft.	65 in.	55°
16 WIDE	190"	99 1/2"	5 ft.	65 in.	53°
18 WIDE	208.5"	99 1/2"	5 ft.	80 in.	51°

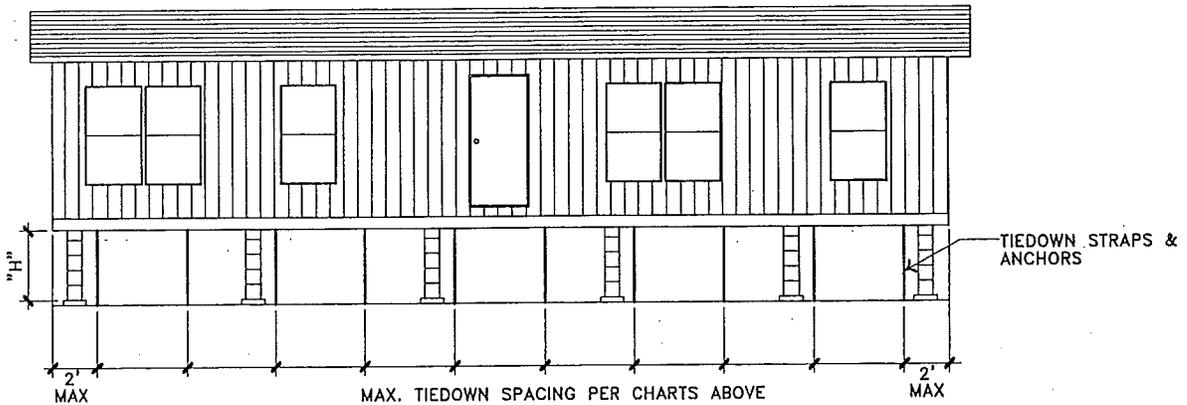
TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAM

A

TIEDOWN SPACING REQUIREMENTS - OPPOSITE I-BEAM

B

TYPICAL SIDE ELEVATION SHOWING TIE-DOWN SPACING

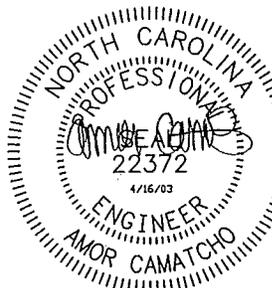


TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

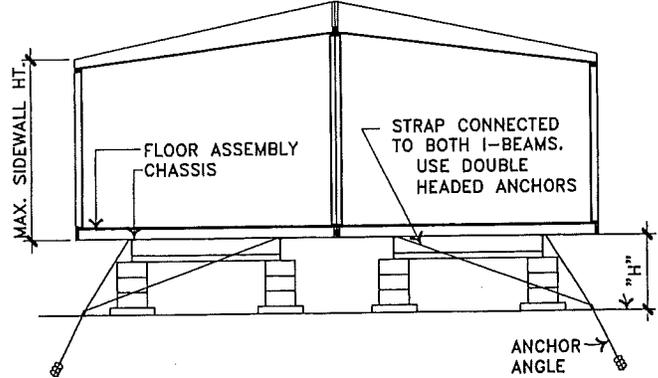
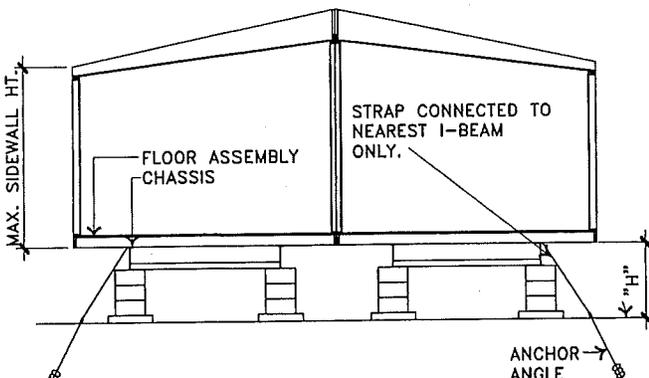
C

NOTES:

1. REFER TO PAGE I-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
2. ROOF SLOPE MAY NOT EXCEED 20 DEGREES. MAX. EAVE IS 1 1/2". FOR 18 WIDES, THE MAX EAVE IS 4".
3. MAX. SIDEWALL HEIGHT IS 7'-10" UNLESS OTHERWISE NOTED.
4. BOX WIDTHS STATED ABOVE REPRESENT MAXIMUM WIDTHS FOR EACH HOME SIZE.



WIND ZONES 2 & 3 SINGLEWIDE SIDEWALL TIEDOWN REQUIREMENT	
DRAWN BY: JBM DATE: 11/30/98 REV: 4/16/03	HBOS Manufacturing, LP I-4.15



WIND ZONE 1 TIEDOWN SPACING CHART

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
24/36 WIDE	142"	99 1/2"	8 ft.	25 in.	61°
24/36 WIDE	142"	99 1/2"	6 ft.	36 in.	68°
24 WIDE	142"	112"	4 ft.	32 in.	76°
28/42 WIDE	166"	99 1/2"	10 ft.	28 in.	50°
28/42 WIDE	166"	99 1/2"	8 ft.	40 in.	59°
*28 WIDE	166"	99 1/2"	8 ft.	34 in.	54°
*28 WIDE	166"	99 1/2"	6 ft.	50 in.	64°
28 WIDE	166"	112"	8 ft.	30 in.	59°
28 WIDE	166"	112"	6 ft.	43 in.	67°
32/45 WIDE	180"	99 1/2"	10 ft.	39 in.	50°
32/45 WIDE	180"	99 1/2"	8 ft.	55 in.	59°
32 WIDE	180"	112"	10 ft.	32 in.	50°
32 WIDE	180"	112"	8 ft.	44 in.	59°
*32 WIDE	180"	99.5"	8 ft.	47 in.	54°

* - INDICATES MAX. SIDEWALL HEIGHT OF 10'-1"

WIND ZONE 1 TIEDOWN SPACING CHART

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
20 WIDE	120"	99 1/2"	12 ft.	80 in.	40°
20 WIDE	120"	112"	12 ft.	80 in.	39°
*24/36 WIDE	142"	99 1/2"	12 ft.	80 in.	43°
*28/42 WIDE	166"	99 1/2"	12 ft.	80 in.	43°
**28 WIDE	166"	99 1/2"	12 ft.	67 in.	30°
*32/45 WIDE	180"	99 1/2"	12 ft.	80 in.	43°
**32 WIDE	180"	99 1/2"	12 ft.	72 in.	30°

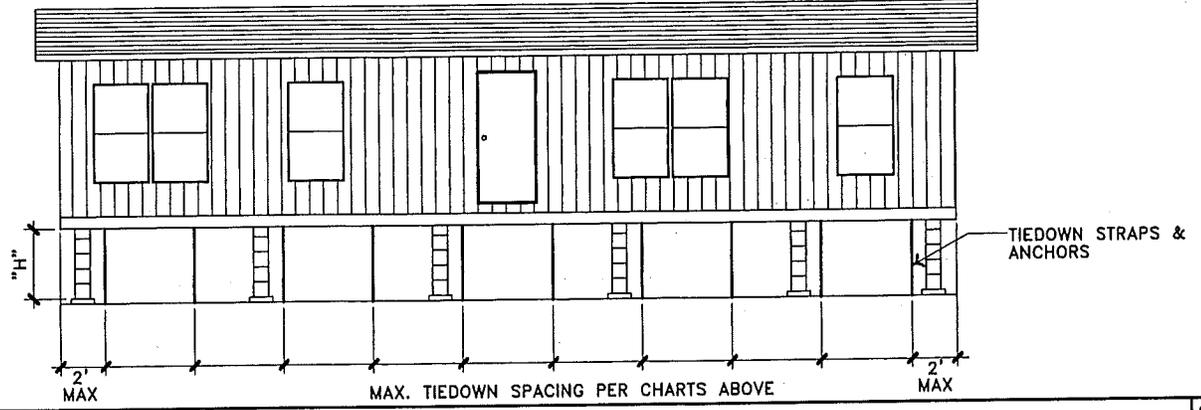
* - INDICATES MAXIMUM SIDEWALL HEIGHT OF 7'-10" FOR 24 WIDES AND 8'-6" FOR 28 AND 32 WIDES.

** - INDICATES MAX. SIDEWALL HEIGHT OF 10'-1".

TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAM

TIEDOWN SPACING REQUIREMENTS - BOTH I-BEAMS

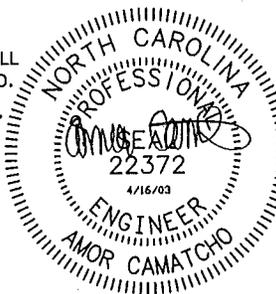
TYPICAL SIDE ELEVATION SHOWING TIE-DOWN SPACING



TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

NOTES:

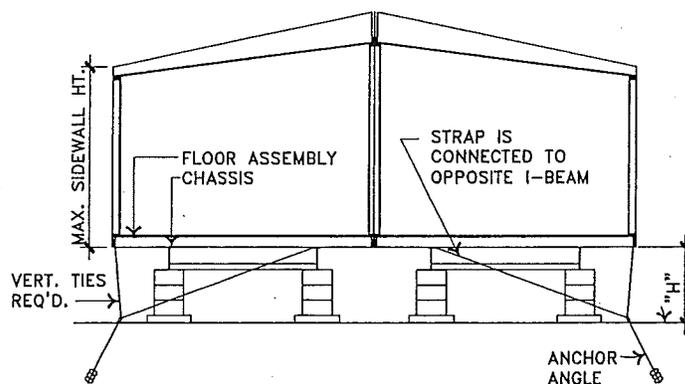
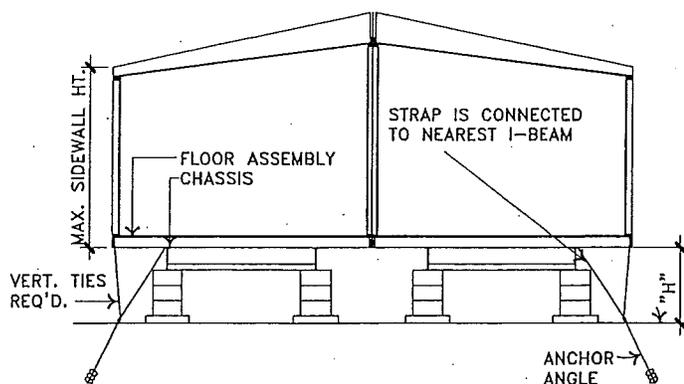
1. REFER TO PAGE I-4.12 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
2. ROOF SLOPE MAY NOT EXCEED 20 DEGREES. MAX. EAVE IS 12".
3. MAX. SIDEWALL HEIGHT IS 8'-7" FOR 20, 24 AND 36 WIDES. MAX. SIDEWALL HEIGHT IS 9'-1" FOR 28/42 AND 32/45 WIDES, UNLESS OTHERWISE NOTED.
4. BOX WIDTHS STATED ABOVE REPRESENT MAX WIDTHS FOR EACH HOME SIZE.



**WIND ZONE 1
MULTIWIDE SIDEWALL
TIEDOWN REQUIREMENT**

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
I-4.16



WIND ZONE 2 TIEDOWN SPACING CHART

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
24/36 WIDE	142"	99 1/2"	4 ft.	34 in.**	67°
24 WIDE	142"	79 1/2"	5 ft.	43 in.	61°
28/42 WIDE	166"	99 1/2"	5 ft.	39 in.	58°
*28 WIDE	166"	99 1/2"	4 ft.	42 in.	60°
32/45 WIDE	180"	99 1/2"	6 ft.	41 in.**	51°
*32 WIDE	180"	99 1/2"	5 ft.	41 in.	50°

WIND ZONE 2 TIEDOWN SPACING CHART

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
24/36 WIDE	142"	99 1/2"	8 ft.	65 in.	38°
24 WIDE	142"	79 1/2"	5 ft.	65 in.	41°
28/42 WIDE	166"	99 1/2"	5 ft.	65 in.	35°
*28 WIDE	166"	99 1/2"	5 ft.	65 in.	35°
*32/45 WIDE	180"	99 1/2"	6 ft.	65 in.	33°

* - INDICATES MAX. SIDEWALL HEIGHT OF 10'-1"
 ** - INDICATES MAX. FLOOR HEIGHT OF 32" FOR 36W & 34" FOR 45W.

* - INDICATES MAX. SIDEWALL HEIGHT OF 10'-1"

WIND ZONE 3 TIEDOWN SPACING CHART

HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
24/36 WIDE	142"	99 1/2"	4 ft.	27 in.***	62°
24 WIDE	142"	79 1/2"	4 ft.	46 in.	62°
28/42 WIDE	166"	99 1/2"	4 ft.	41 in.	59°
*28 WIDE	166"	99 1/2"	4 ft.	32 in.	52°
32/45 WIDE	180"	99 1/2"	5 ft.	40 in.***	50°
*32 WIDE	180"	99 1/2"	4 ft.	44 in.	52°

WIND ZONE 3 TIEDOWN SPACING CHART

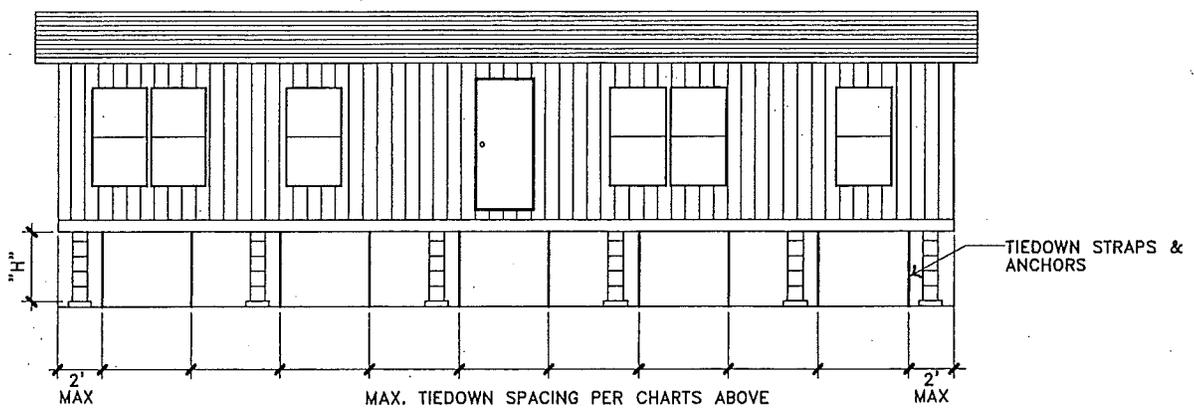
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
24/36 WIDE	142"	99 1/2"	4 ft.	65 in.	38°
24 WIDE	142"	79 1/2"	4 ft.	65 in.	40°
*28/42 WIDE	166"	99 1/2"	4 ft.	65 in.	35°
*32/45 WIDE	180"	99 1/2"	5 ft.	65 in.	33°

*** - INDICATES MAX. FLOOR HEIGHT OF 25" FOR 36W AND 32" FOR 45W.

TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAM

TIEDOWN SPACING REQUIREMENTS - OPPOSITE I-BEAM

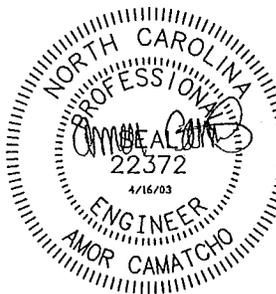
TYPICAL SIDE ELEVATION SHOWING TIE-DOWN SPACING



TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

NOTES:

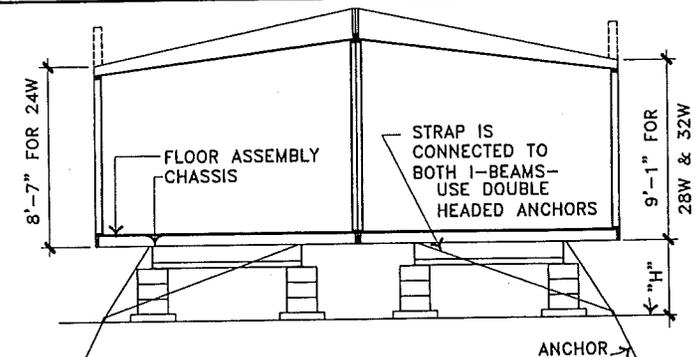
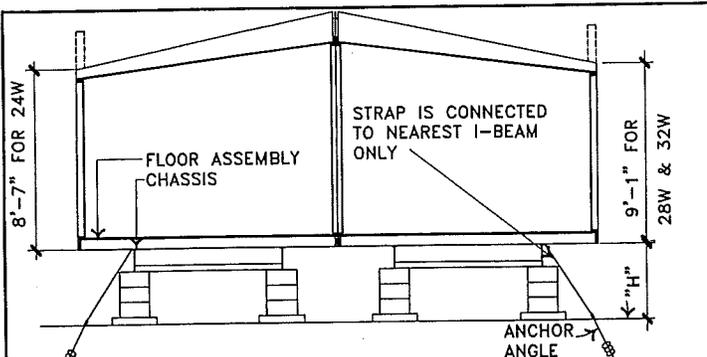
- REFER TO PAGE I-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
- ROOF SLOPE MAY NOT EXCEED 20 DEGREES. MAX. EAVE IS 12".
- MAX. SIDEWALL HEIGHT IS 7'-10" FOR 24 AND 36 WIDES. MAX. SIDEWALL HEIGHT IS 8'-6" FOR 28/42 AND 32/45 WIDES UNLESS OTHERWISE NOTED.
- BOX WIDTHS LISTED ABOVE REPRESENTS MAXIMUM WIDTHS FOR EACH HOME SIZE.



**WIND ZONES 2 & 3
MULTIWIDE SIDEWALL
TIEDOWN REQUIREMENT**

DRAWN BY: JBM
 DATE: 11/30/98
 REV: 4/16/03

HBOS Manufacturing, LP
 I-4.17

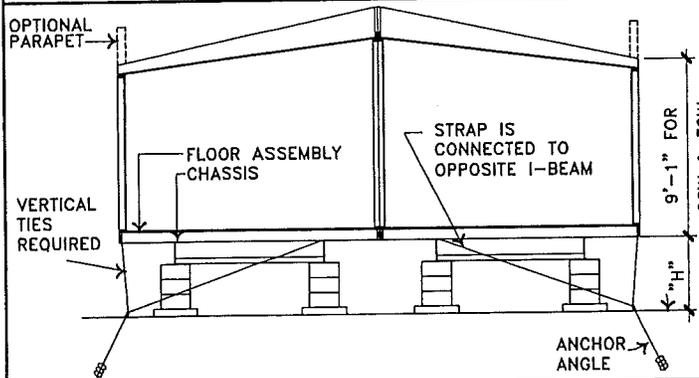


WIND ZONE 1 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
28 WIDE	166"	99 1/2"	4 ft.	48 in.	64°
32 WIDE	180"	99 1/2"	4 ft.	48 in.	62°
*24 WIDE	142"	99 1/2"	4 ft.	34 in.	67°
*28 WIDE	166"	99 1/2"	4 ft.	53 in.	65°
*28 WIDE	166"	112"	4 ft.	39 in.	65°
*32 WIDE	180"	99 1/2"	4 ft.	69 in.	64°
*32 WIDE	180"	112"	4 ft.	56 in.	64°
**24 WIDE	140"	99 1/2"	4 ft.	29 in.	64°
**28 WIDE	166"	99 1/2"	4 ft.	50 in.	61°
***28 WIDE	166"	99 1/2"	4 ft.	42 in.	60°

WIND ZONE 1 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
*24 WIDE	142"	112"	8 ft.	80 in.	40°
28 WIDE	166"	99 1/2"	8 ft.	48 in.	30°
32 WIDE	180"	99 1/2"	8 ft.	48 in.	22°
**24 WIDE	140"	99 1/2"	8 ft.	57 in.	29°
**28 WIDE	166"	99 1/2"	8 ft.	40 in.	19°
***28 WIDE	166"	99 1/2"	6 ft.	80 in.	35°

TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAM

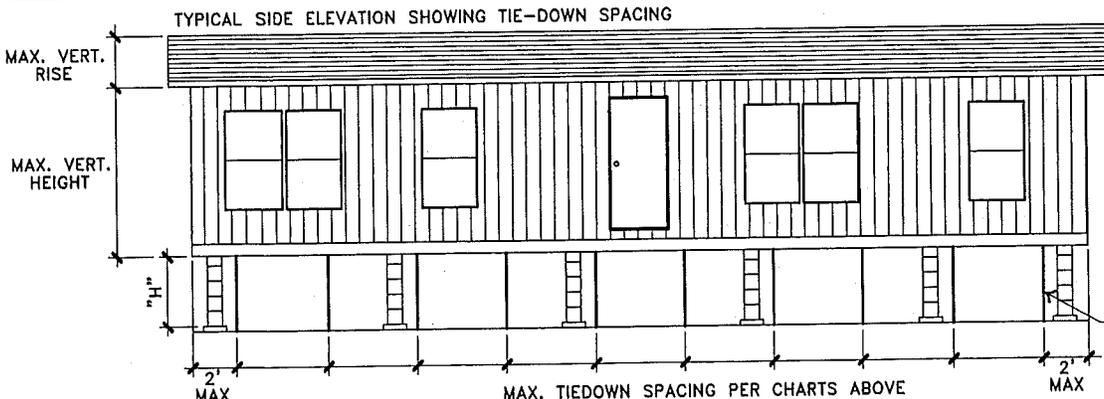
TIEDOWN SPACING REQUIREMENTS - BOTH I-BEAMS



WIND ZONE 2 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
24 WIDE	140"	99 1/2"	4 ft.	48 in.	38°
28 WIDE	166"	99 1/2"	4 ft.	48 in.	25°
***28 WIDE	166"	99 1/2"	4 ft.	48 in.	31°
32 WIDE	180"	99 1/2"	4 ft.	48 in.	33°

WIND ZONE 3 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
28 WIDE	160"	99 1/2"	4 ft.	48 in.	29°

TIEDOWN SPACING REQUIREMENTS - OPPOSITE I-BEAMS



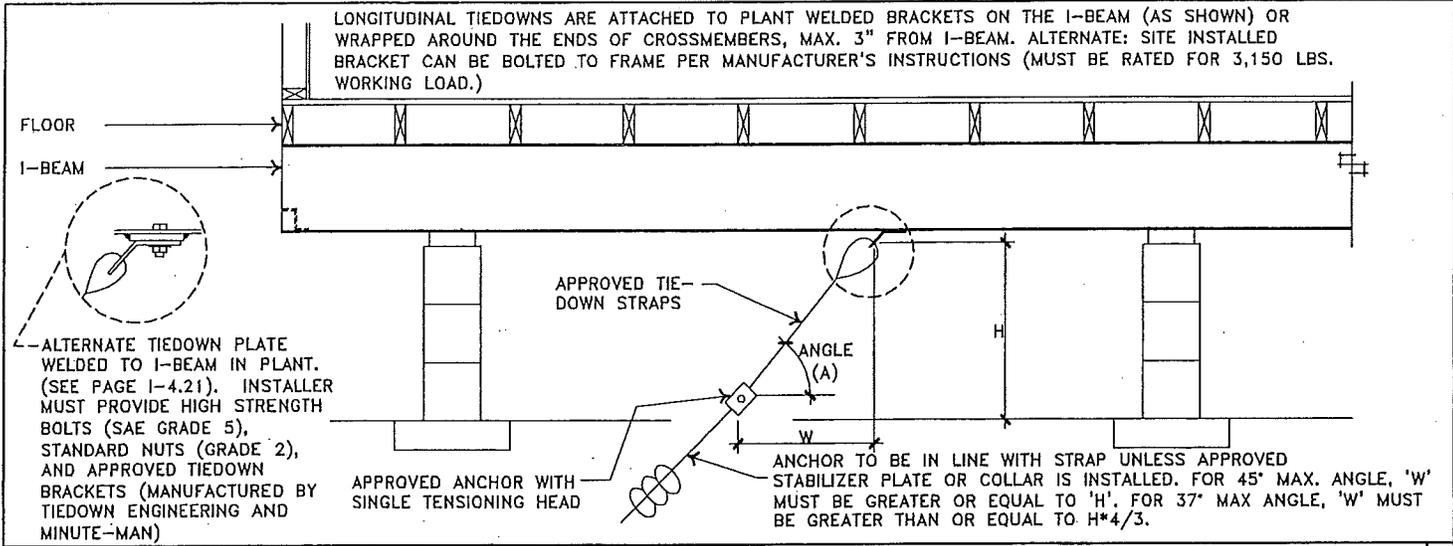
TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

- NOTES:**
- THIS DETAIL APPLIES TO 24, 28 AND 32 WIDE HOMES WITH HIGH PITCH (HINGE) ROOF DESIGNS WHERE THE RISE OF THE ROOF (FROM TOP OF SIDEWALL TO ROOF PEAK) IS GREATER THAN FOUR FEET. MAX. ROOF PITCH IS 6/12. ALT: * INDICATES MAX. ROOF PITCH OF 5/12 AND MAX. SIDEWALL HEIGHT OF 8'-7" FOR 24 WIDES AND 9'-1" FOR 28 AND 32 WIDES. ** INDICATES MAX. ROOF PITCH OF 7/12 AND MAX. SIDEWALL OF 8'-7" FOR 24 AND 28 WIDES. *** INDICATES MAX. SIDEWALL HEIGHT OF 10'-1" WITH A 6/12 ROOF PITCH. FOR PARAPET CONSTRUCTION, USE THE 5/12 MAX. ROOF PITCH CRITERIA NOTED WITH A (*) IN THE CHARTS TO COVER A 10'-1" MAXIMUM SIDEWALL. THE PARAPET MAX. HEIGHT IS 42".
 - REFER TO PAGES I-4.12 AND I-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
 - MAX. EAVE IS 12".
 - MAX. SIDEWALL HEIGHT IS 9'-1" FOR 28 AND 32 WIDES, UNLESS OTHERWISE NOTED.
 - BOX WIDTHS STATED ABOVE REPRESENT THE MAXIMUM WIDTH FOR EACH HOME SIZE.

HIGH PITCH OR PARAPET ROOF TIEDOWN REQUIREMENTS

DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 4/16/03	

I-4.18



INSTALLATION OF LONGITUDINAL TIE DOWNS

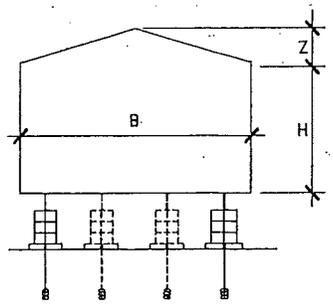


WIND ZONE 2 LONGITUDINAL TIEDOWN REQUIREMENTS

HOME SIZE	MAX. HOME SIZE B	MAX. WALL HEIGHT H	MAX. VERTICAL PROJECTION (Z)	MAX. STRAP ANGLE A	NO. OF TIEDOWNS EACH END
14 WIDE	14'-0"	7'-6"	2'-6"	45°	2
16 WIDE	15'-10"	7'-6"	2'-6"	37°	2
16 WIDE	15'-10"	8'-6"	2'-6"	45°	3
18 WIDE	17'-9"	8'-7"	5'-11"	45°	4
24 WIDE	23'-8"	7'-6"	3'-6"	45°	4
28 WIDE	27'-8"	8'-0"	4'-0"	37°	4
28 WIDE	27'-8"	8'-6"	4'-0"	45°	5
32 WIDE	30'-0"	8'-0"	4'-0"	45°	5
36 WIDE	35'-0"	7'-6"	4'-0"	45°	7
42,45 WIDES	45'-0"	7'-6"	4'-0"	45°	8
24 WIDE W/ HINGED ROOF	23'-4"	8'-7"	5'-10"	45°	5
28 WIDE W/ HINGED ROOF	27'-8"	8'-0"	7'-8"	45°	6
32 WIDE W/ HINGED ROOF	30'-0"	8'-0"	8'-4"	45°	7

WIND ZONE 3 LONGITUDINAL TIEDOWN REQUIREMENTS

HOME SIZE	MAX. HOME SIZE B	MAX. WALL HEIGHT H	MAX. VERTICAL PROJECTION (Z)	MAX. STRAP ANGLE A	NO. OF TIEDOWNS EACH END
14 WIDE	14'-0"	7'-6"	2'-6"	45°	3
16 WIDE	15'-10"	7'-6"	2'-6"	45°	3
18 WIDE	17'-9"	8'-7"	5'-11"	45°	5
24 WIDE	23'-8"	7'-6"	3'-6"	45°	5
28 WIDE	27'-8"	8'-0"	4'-0"	45°	6
32 WIDE	30'-0"	8'-0"	4'-0"	45°	6
36 WIDE	35'-0"	7'-6"	4'-0"	45°	8
42,45 WIDES	45'-0"	7'-6"	4'-0"	45°	9
28 WIDE W/ HINGED ROOF	27'-8"	7'-6"	6'-8"	45°	7



MAXIMUM PIER HEIGHTS NOT REQUIRING LONGITUDINAL TIEDOWNS IN WIND ZONE 1 *

HOME SIZE	MAXIMUM HOME WIDTH B	MAXIMUM WALL HEIGHT H	MAXIMUM VERTICAL PROJECTION Z	SINGL. STACK PIER DBL. STACK PIER			
				MIN. UNIT LENGTH **			
				64'-0"	76'-0"	64'-0"	76'-0"
14 WIDE	14'-0"	8'-7"	4'-8"	N/A*	N/A*	45	55
16 WIDE	15'-10"	9'-7"	5'-2"	N/A*	N/A*	38	47
18 WIDE	17'-9"	8'-7"	5'-11"	N/A*	N/A*	40	49
20 WIDE	10'-0"	8'-7"	3'-4"	N/A*	25	54	68
24 WIDE	23'-8"	8'-7"	4'-0"	N/A*	24	49	60
28 WIDE	27'-8"	9'-7"	4'-7"	N/A*	N/A*	41	50
32 WIDE	30'-0"	9'-1"	5'-3"	N/A*	N/A*	41	50
36 WIDE	35'-0"	8'-7"	4'-0"	N/A*	N/A*	43	54
42,45 WIDES	45'-0"	8'-7"	4'-0"	N/A*	N/A*	36	44

* IF ANY PIER EXCEEDS THE MAXIMUM PIER HEIGHT, INSTALL (2) LONGITUDINAL TIEDOWNS AT EACH END OF EACH SECTION OF HOME. "N/A" INDICATES (2) TIEDOWNS EACH END OF EACH SECTION OF THE HOME.

** FOR ALL HOMES LESS THAN 64' IN LENGTH, INSTALL (2) LONGITUDINAL TIEDOWNS AT EACH END OF EACH SECTION OF HOME WITH MAXIMUM STRAP ANGLE OF 45°.

TOTAL NUMBER OF LONGITUDINAL TIEDOWNS AT EACH END OF HOME PER CHART.

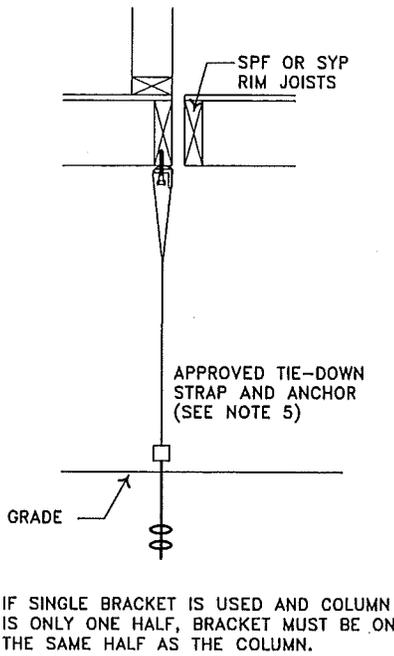
LONGITUDINAL TIE DOWN REQUIREMENTS

- NOTES:
- WIND ZONE 1 CHART ASSUMES SINGLE STACK PIERS 8" WITH A BLOCK WEIGHT OF 25 LBS. OR DOUBLE STACK PIERS 16" WIDE WITH A BLOCK WEIGHT OF 50 LBS. PIERS ARE AT 12'-0" O.C. MAXIMUM SPACING.
 - FOR DOUBLEWIDES WITH HINGED ROOFS OR PARAPET WALLS IN WIND ZONE 1 (VERTICAL PROJECTION Z = 9'-1" MAX. FOR HINGED ROOF, 3'-6" MAX. FOR PARAPET WALL), ALWAYS INSTALL 2 LONGITUDINAL TIE DOWNS AT EACH END OF EACH SECTION (4 TOTAL EACH END OF HOME).
 - REFER TO NOTES ON PAGE I-4.12 FOR STRAPPING AND ANCHORING SPECS.

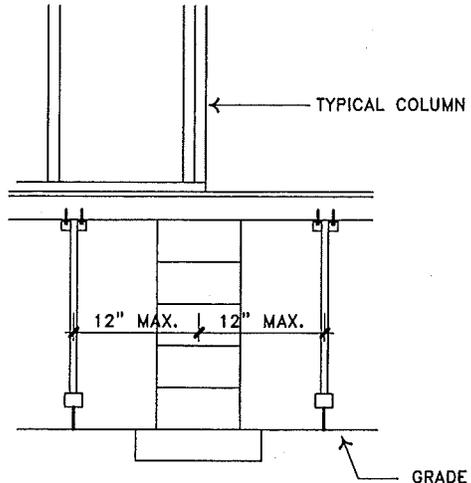
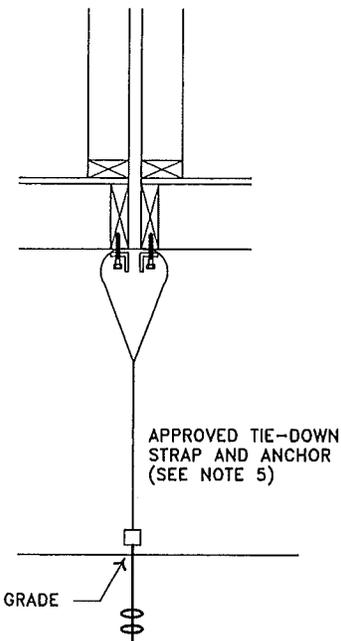
LONGITUDINAL TIEDOWN REQUIREMENTS

DRAWN BY: JBM
 DATE: 11/30/98
 REV: 4/16/03

HBOS Manufacturing, LP
 I - 4.19



IF SINGLE BRACKET IS USED AND COLUMN IS ONLY ONE HALF, BRACKET MUST BE ON THE SAME HALF AS THE COLUMN.

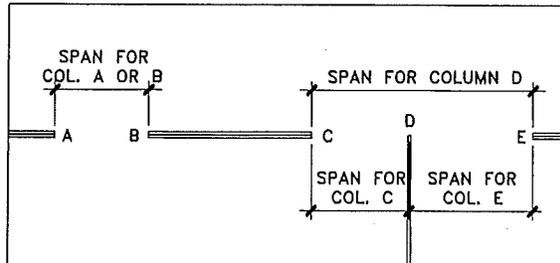


SINGLE BRACKET

A PAIR OF BRACKETS

B SIDE VIEW - (4) BRACKET CONDITION

C



ALL MULTI-SECTION UNITS		
WIND ZONE	# OF BRACKETS AT COLUMN	MAX. TABULAR SPAN (FT.)
ZONE 2	1	11'-7"
	2	21'-3"
	4	42'-5"
ZONE 3	1	9'-3"
	2	17'-0"
	4	34'-0"

186" MAXIMUM BOX WIDTH

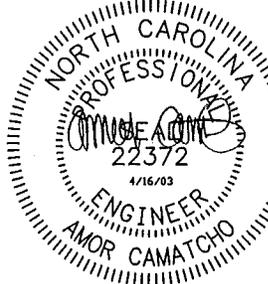
TABULAR SPANS

D WIND ZONE / BRACKET / TABULAR SPAN CHART

E

NOTES:

- FOR ZONES 2 & 3, ALL MARRIAGE WALL COLUMN LOCATIONS WITH OPENINGS 4 FEET OR GREATER REQUIRE THE INSTALLATION OF COLUMN BRACKETS AND TIEDOWNS ACCORDING TO THE TABLE ABOVE.
- REFER TO PAGE 1-4.21 FOR DETAILS ON APPROVED BRACKETS (EACH BRACKET IS RATED FOR 1,719 LBS. WORKING LOAD).
- THE CAPACITY OF BOTH THE TIEDOWN STRAP AND THE GROUND ANCHOR MUST BE 3,150 LBS. WORKING LOAD (4,725 LBS. ULTIMATE).
- POSITIONING OF ANCHORS FROM EACH OTHER TO BE PER ANCHOR LISTING. DOUBLE HEADED ANCHOR MAY BE USED.
- REFER TO NOTES ON PAGE 1-4.12 FOR STRAPPING AND ANCHORING SPECS.

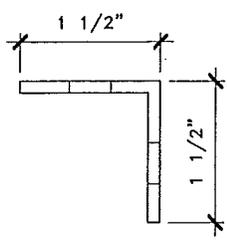
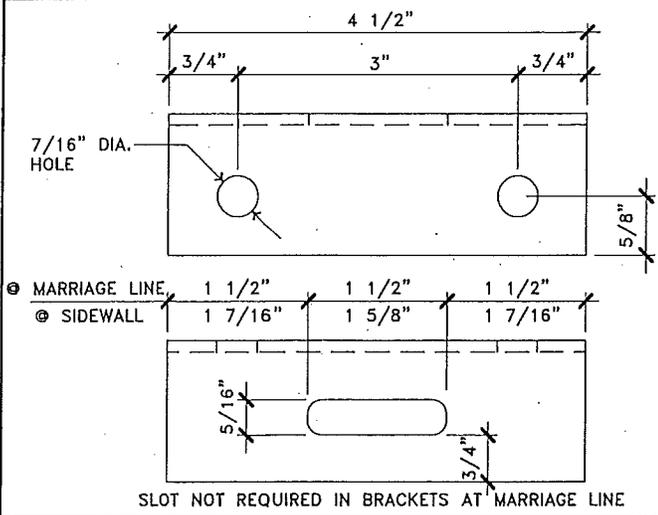


COLUMN TIEDOWN BRACKETS FOR MULTI-WIDE SECTION HOMES

DRAWN BY: JBM
 DATE: 11/30/98
 REV: 4/16/03
 WIND ZONE: 2 & 3

HBOS Manufacturing, LP

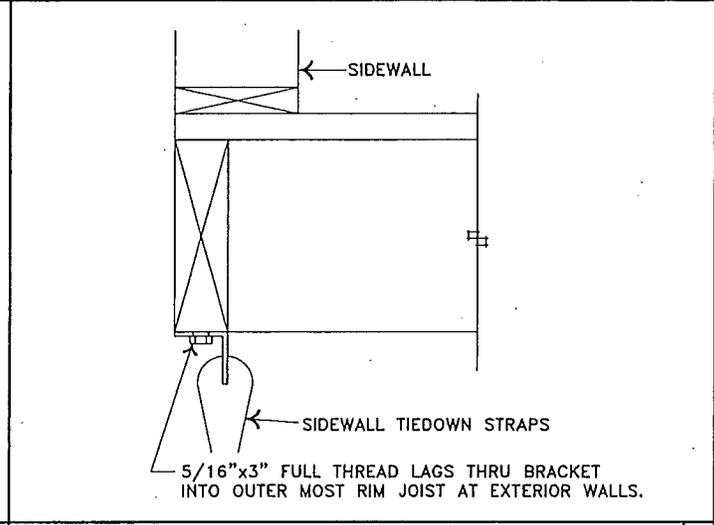
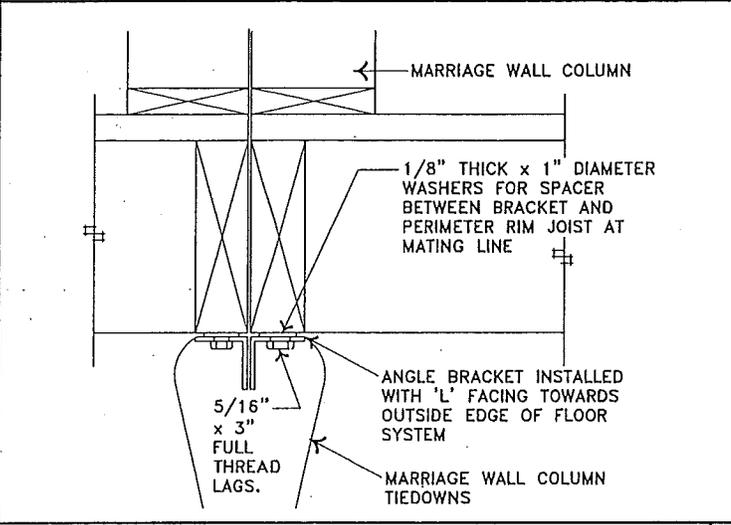
1 - 4.20



AT MARRIAGE LINE:
ANGLE BRACKET TO BE OF 11 GA. (MIN.) STEEL x 1 1/2" x 1 1/2" ANGLE MEMBER.

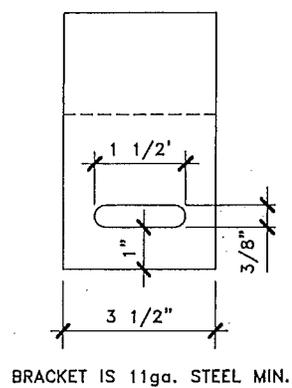
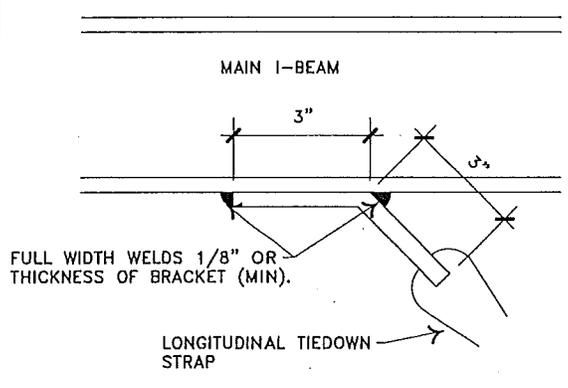
AT SIDEWALL:
ANGLE BRACKET TO BE OF 12 GA. (MIN.) STEEL x 1 1/2" x 1 1/2" ANGLE MEMBER. SEE NOTE 1.

VERTICAL TIE STRAP CONNECTOR



PROFILE VIEW - BRACKET W/ WASHER APPLICATION

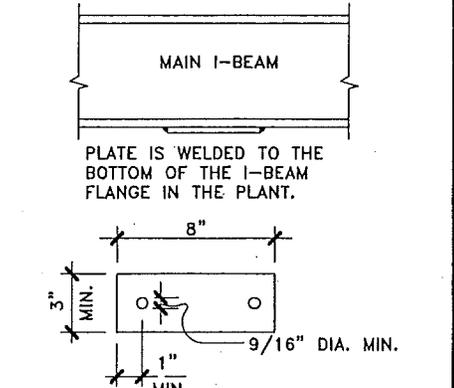
PROFILE VIEW - BRACKET W/ SLOT APPLICATION



LONGITUDINAL TIEDOWN BRACKET

NOTES

1. ALL SIDEWALL BRACKETS EXPOSED TO WEATHERING SHALL HAVE RESISTANCE TO WEATHER DETERIORATION AT LEAST EQUIVALENT TO THAT PROVIDED BY A COATING OF ZINC ON STEEL OF NOT LESS THAN 0.30 OUNCES PER SQUARE FOOT OF SURFACE COATING. MATING WALL BRACKETS SHALL BE PAINTED.
2. WASHERS MAY BE PLACED BETWEEN ANGLE BRACKET AND MATING LINE RIM JOISTS AS A SPACER TO ALLOW AN ANCHOR STRAP TO BE LOOPED AROUND BRACKET.
3. SIDEWALL ANGLE BRACKETS MUST BE LOCATED WITHIN 8" OF A STUD.
4. USE A RADIUS CLIP FOR ALL BRACKET APPLICATIONS BY THREADING A PIECE OF STRAP THRU THE SLOT (OR OVER THE BRACKETS) BEFORE LOOPING THE TIEDOWN STRAP THROUGH (AROUND) THE BRACKET



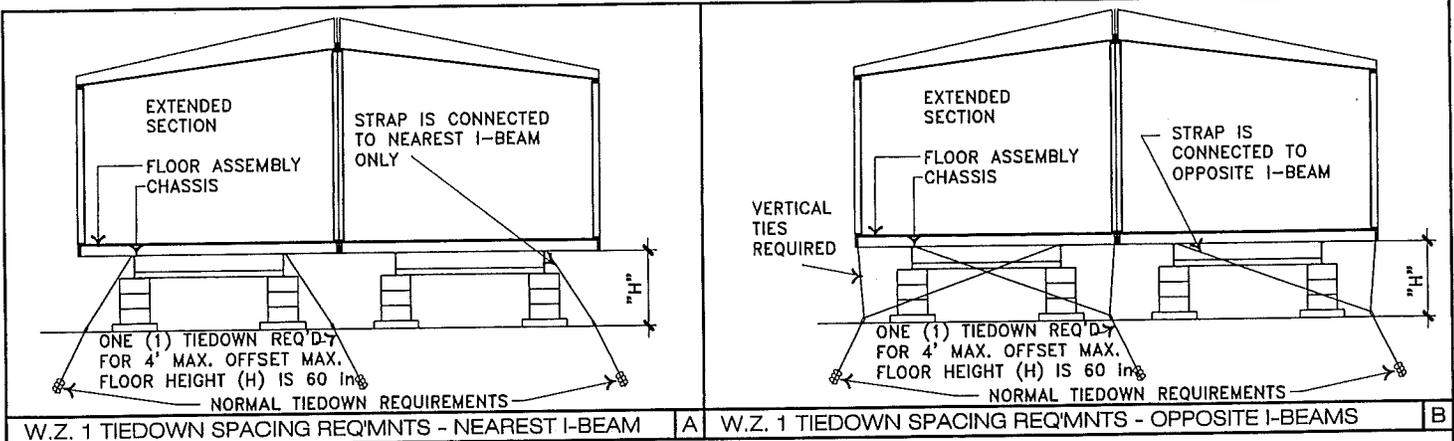
ALT. 4" x 8" x 3/16" PLATE THAT IS USED FOR DETACHABLE HITCH CAN ALSO BE USED FOR LONGITUDINAL TIEDOWNS. WASHERS MUST BE USED WITH HIGH STRENGTH BOLTS FOR THIS APPLICATION.

LONGITUDINAL TIEDOWN PLATE

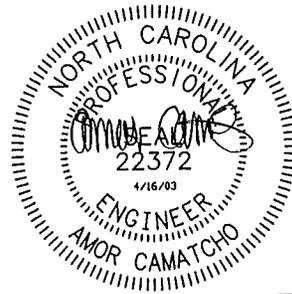
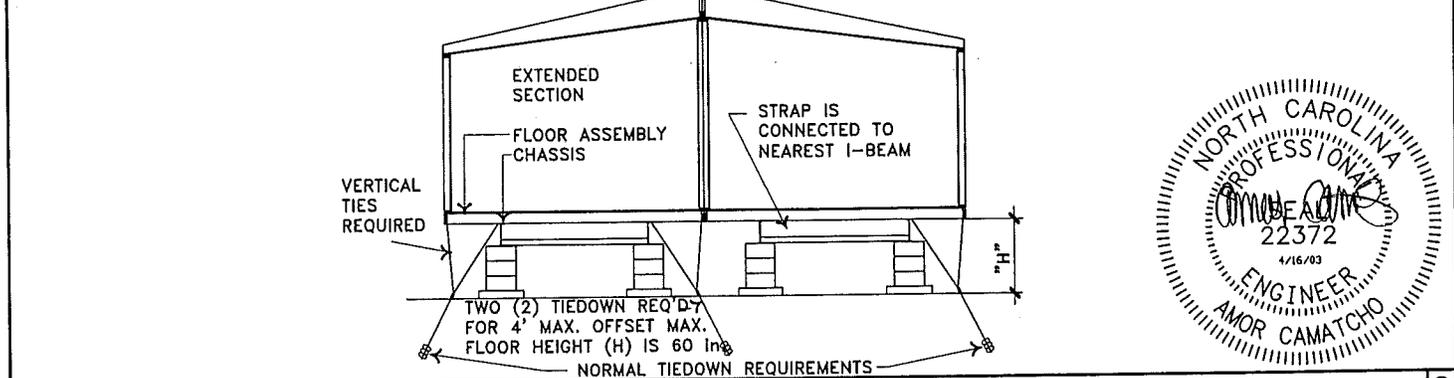
ANGLE BRACKET DETAILS

DRAWN BY: JBM
DATE: 12/1/98
REV: 3/1/02

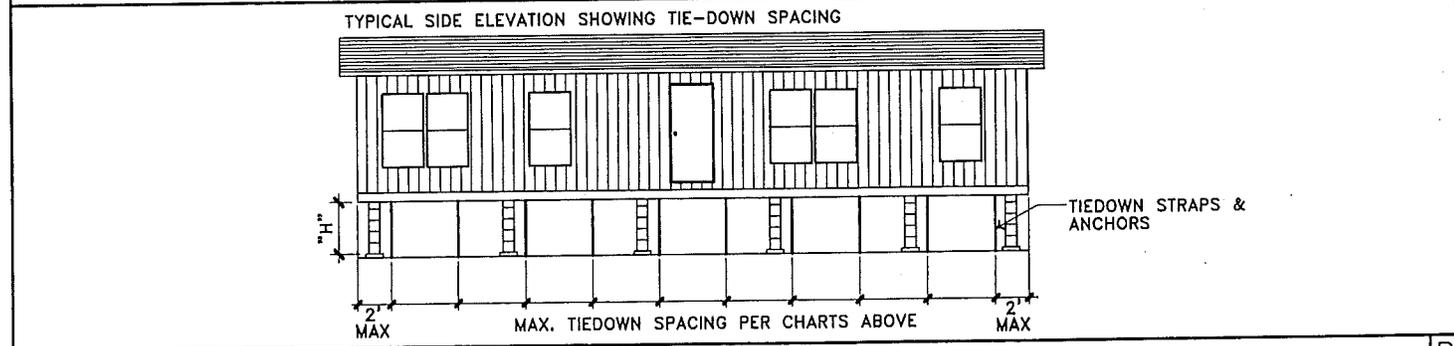
HBOS Manufacturing, LP
I-4.21



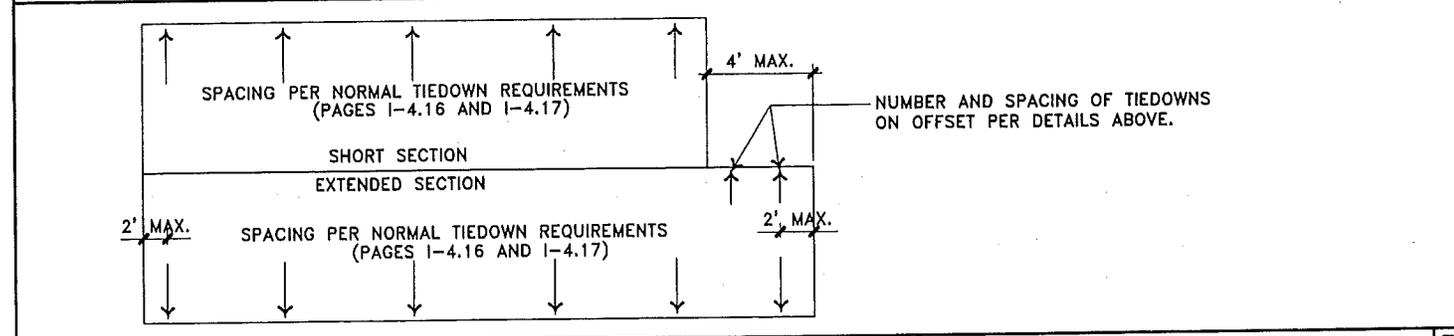
W.Z. 1 TIEDOWN SPACING REQ'MNTS - NEAREST I-BEAM A W.Z. 1 TIEDOWN SPACING REQ'MNTS - OPPOSITE I-BEAMS B



WIND ZONES 2 AND 3 TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAMS C



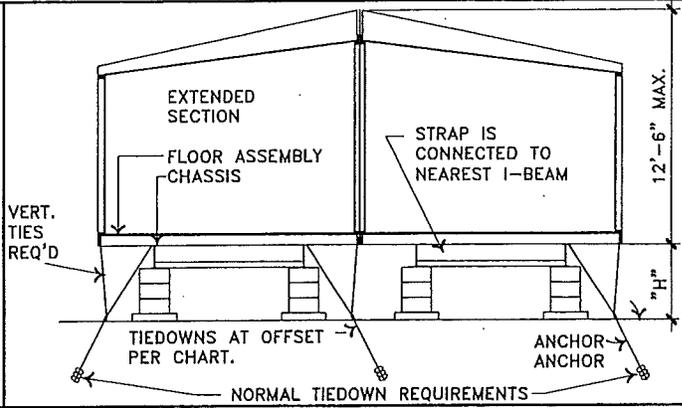
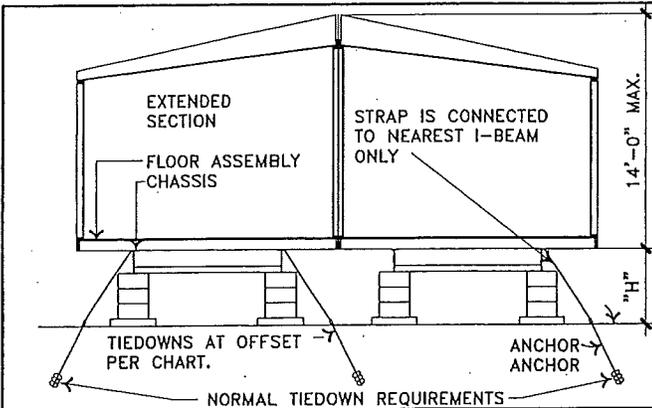
TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING D



PLAN VIEW OF OFFSET UNIT E

- NOTES:**
1. THIS DETAIL APPLIES TO 28 WIDE HOMES WITH ONE SECTION FOUR FEET LONGER THAN THE OTHER. THE RISE OF THE ROOF (FROM TOP OF SIDEWALL TO ROOF PEAK) IS NO MORE THAN FOUR FEET.
 2. REFER TO PAGES I-4.12 AND I-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
 3. MAX. BOX WIDTH IS 166" (28 WIDE) WITH 99 1/2" I-BEAM SPACING. MAX. EAVE IS 12".
 4. MAX. SIDEWALL HEIGHT IS 8'-0".

TIEDOWNS FOR OFFSET UNIT (4' - 0" Max.)	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/2/98	
REV: 4/16/03	
I - 4.22	



WZ 1 TIEDOWN SPACING REQ'MNTS.- NEAREST I-BEAM A

WZ 2 & 3 TIEDOWN SPACING REQ'MNTS - NEAREST I-BEAMS B

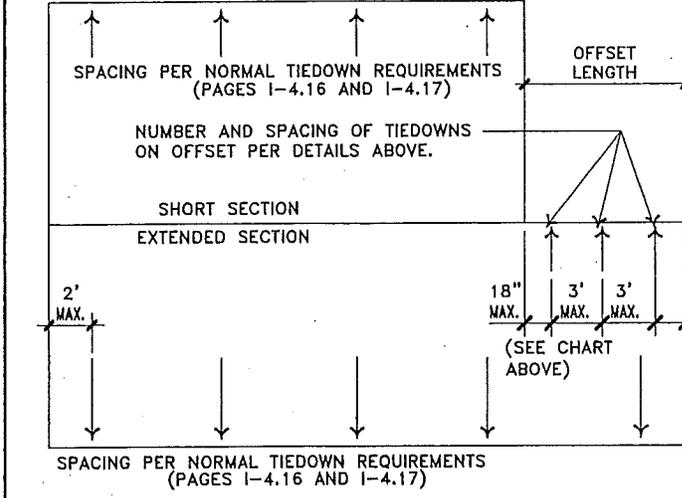
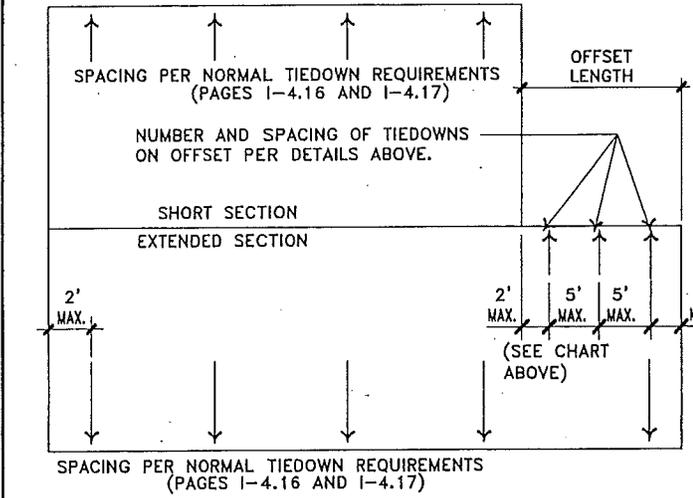
WIND ZONE 1 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
*28 WIDE	168"	99 1/2"	5 ft.	44 in.	61°
*28 WIDE	168"	112"	5 ft.	32 in.	61°
*32 WIDE	180"	99 1/2"	5 ft.	57 in.	60°
*32 WIDE	180"	112"	5 ft.	46 in.	60°

WIND ZONE 2 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
28 WIDE	168"	99 1/2"	5 ft.	46 in.	62°

WIND ZONE 3 TIEDOWN SPACING CHART					
HOME SIZE	BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
28 WIDE	168"	99 1/2"	5 ft.	36 in.	56°

WIND ZONE 1 TIEDOWN SPACING CHART C

WIND ZONES 2 AND 3 TIEDOWN SPACING CHARTS D

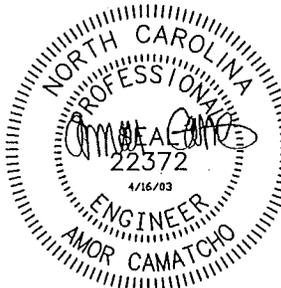


WIND ZONE 1 PLAN VIEW OF OFFSET UNIT E

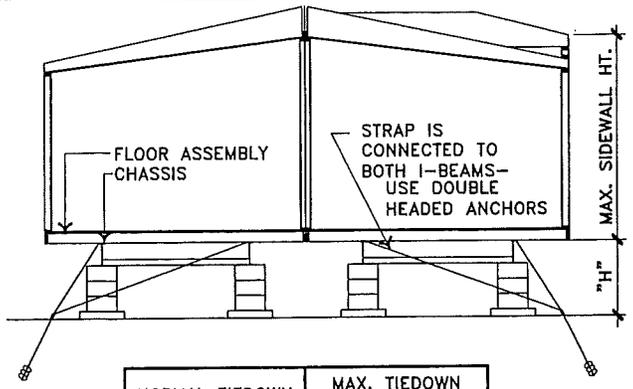
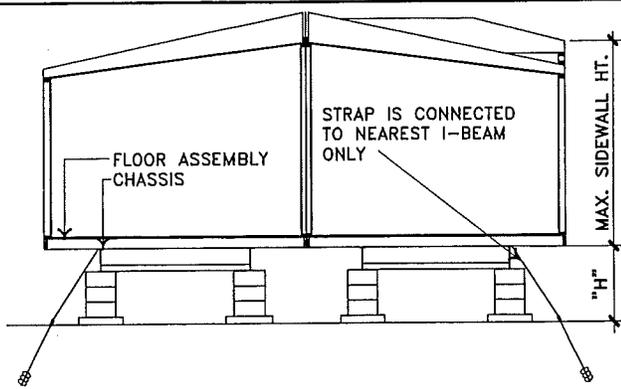
WIND ZONES 2 & 3 PLAN VIEW OF OFFSET UNIT F

NOTES:

1. THIS DETAIL APPLIES TO ALL OFFSET HOMES WITH ONE SECTION LONGER THAN THE OTHER. THE TOTAL HEIGHT FROM THE BOTTOM OF THE FLOOR TO THE ROOF PEAK IS 12'-6" MAX. ALT: * INDICATES A MAX. HEIGHT OF 14'-0" FROM BOTTOM OF FLOOR TO ROOF PEAK.
2. REFER TO PAGES I-4.12 AND I-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
3. BOX WIDTHS STATED ABOVE REPRESENT MAXIMUM WIDTHS FOR EACH HOME SIZE.



TIEDOWNS FOR OFFSET UNIT	
DRAWN BY: JBM	HBOS Manufacturing, LP 1 - 4.22.1
DATE: 12/2/98	
REV: 4/16/03	

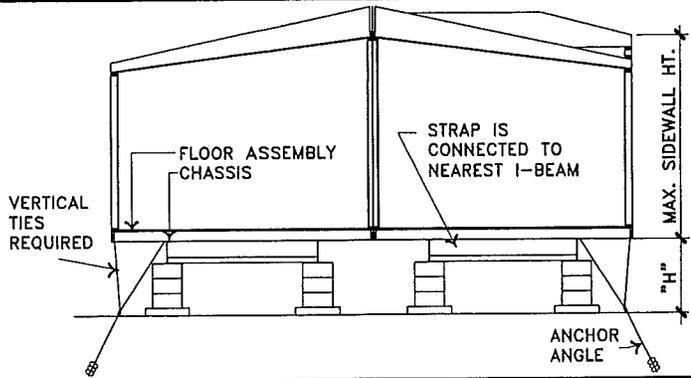


FOR WIND ZONE 1 HOMES, THE MAXIMUM TIEDOWN SPACING MUST BE REDUCED IN THE AREA OF THE CLERESTORY. REFER TO THE CHART (ON RIGHT) FOR SPACING REDUCTION. MAX. FLOOR HEIGHT (H) WILL BE PER CHARTS ON PAGE I-4.16

NORMAL TIEDOWN SPACING	MAX. TIEDOWN SPACING AT CLERESTORY
8 ft.	6 ft. 6 in.
10 ft.	8 ft.
12 ft.	9 ft. 8 in.

TIEDOWN SPACING REQUIREMENTS - NEAREST AND BOTH I-BEAM

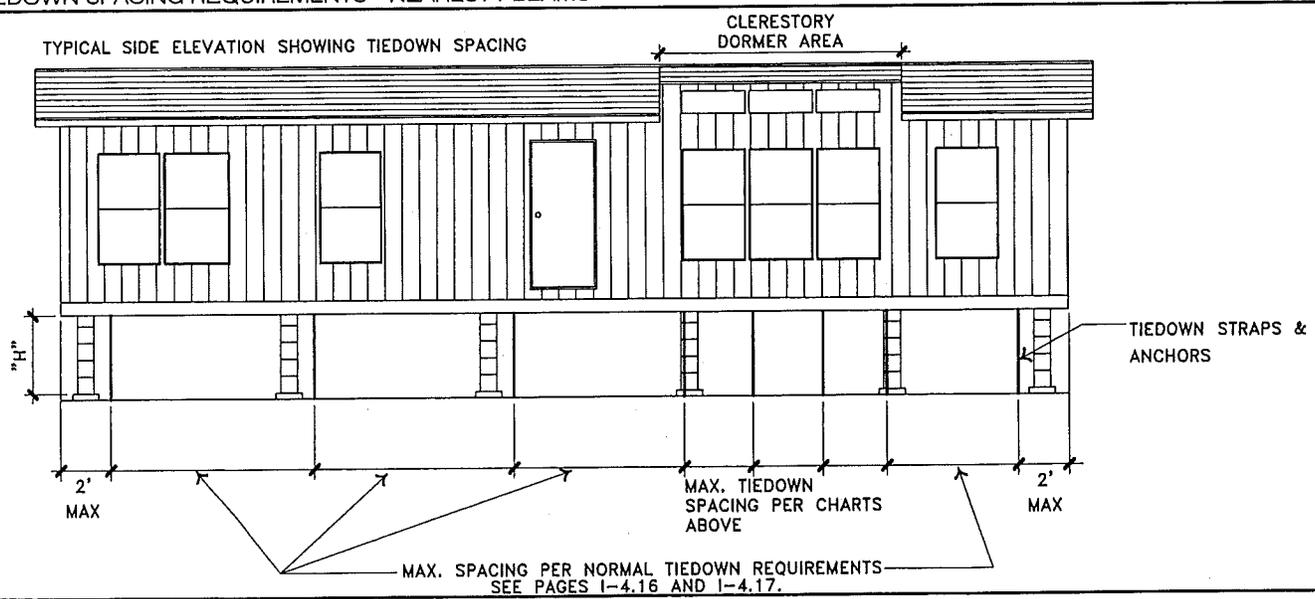
A



HOME SIZE	BOW WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)	ANCHOR ANGLE
28 WIDE	166"	99 1/2"	3 ft. 6 in.	37 in.	57°
32 WIDE	180	99 1/2"	3 ft. 6 in.	48 in.	56°

TIEDOWN SPACING REQUIREMENTS - NEAREST I-BEAMS

B

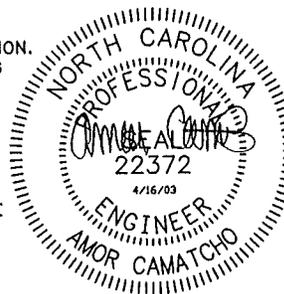


TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

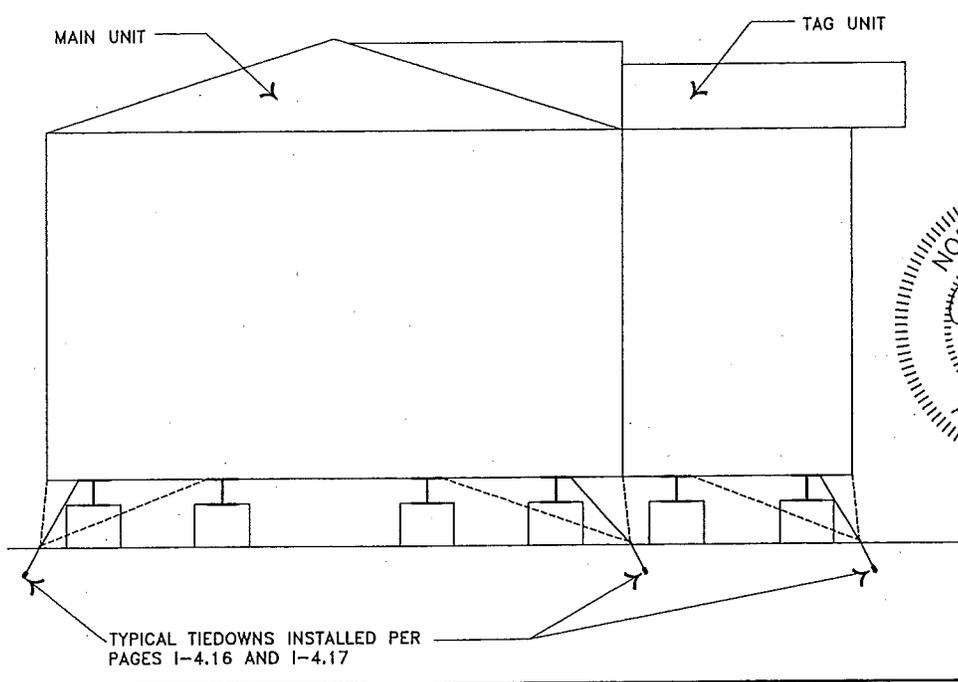
C

NOTES:

1. THIS DETAIL APPLIES TO THE AREA WITH A CLERESTORY DORMER PROJECTION. REFER TO PAGES I-4.12 AND I-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
2. MAX. EAVE IS 12".
3. MAX. SIDEWALL HEIGHT IS 10'-6" IN THE CLERESTORY DORMER AREA.
4. BOX WIDTHS STATED ABOVE REPRESENT MAXIMUM WIDTHS FOR EACH HOME SIZE.

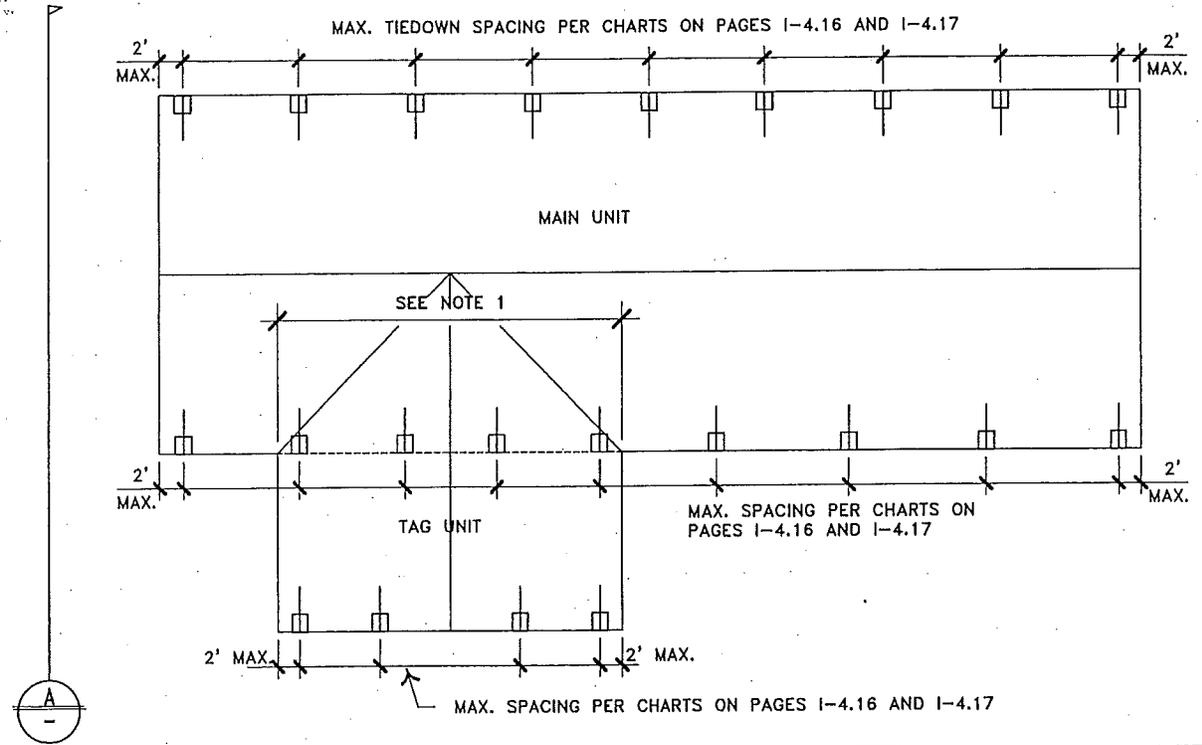


CLERESTORY DORMER TIEDOWN REQUIREMENTS	
DRAWN BY: JBM DATE: 11/30/98 REV: 4/16/03	HBOS Manufacturing, LP I-4.23



PROFILE OF TRIPLE WIDE

A



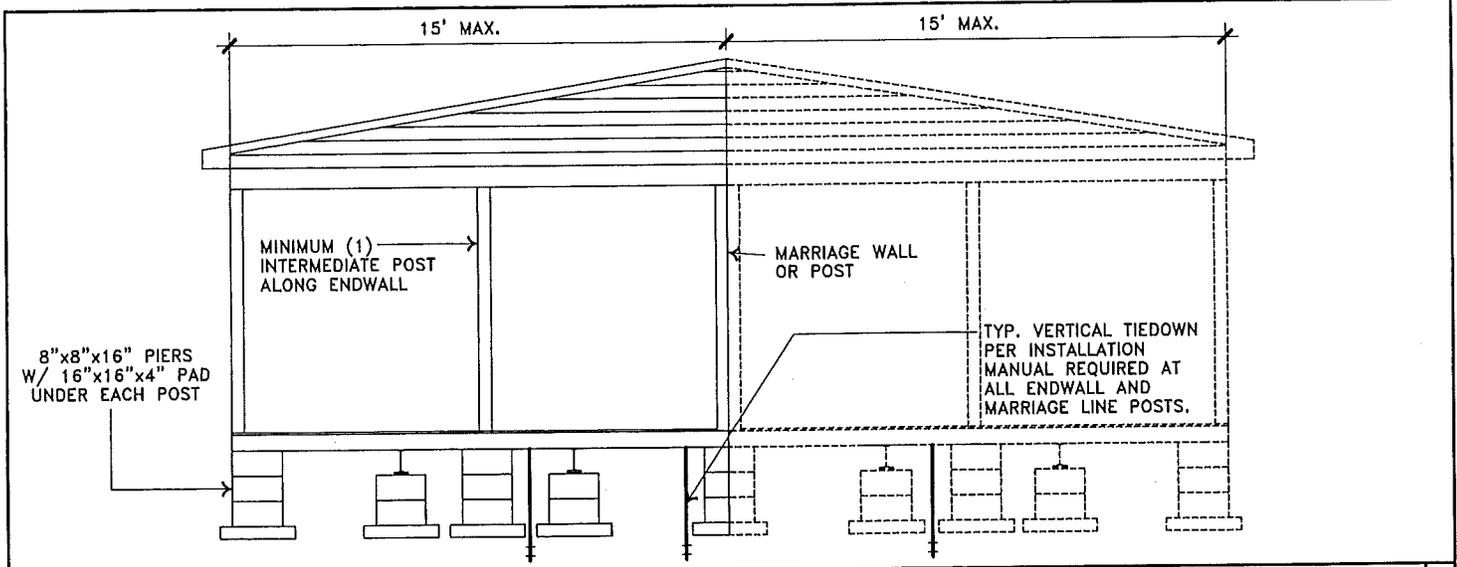
PLAN VIEW OF TRIPLE WIDE

B

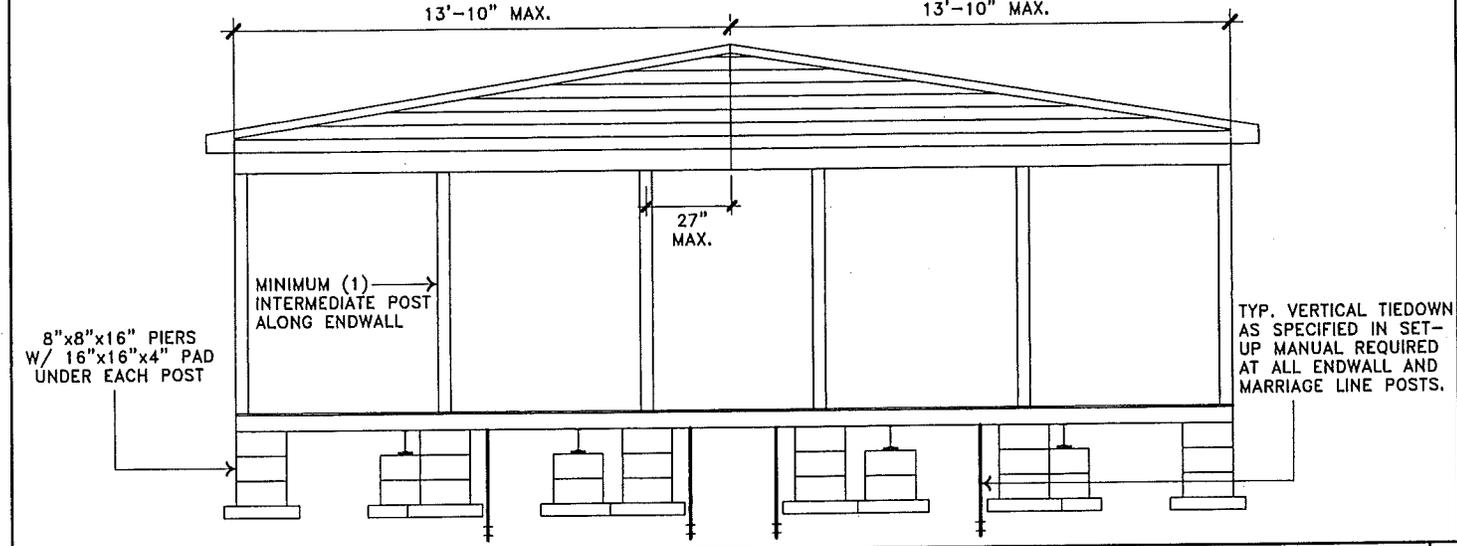
NOTES

1. TIEDOWN REQUIREMENTS ON BOTH SIDES OF THE MAIN UNIT ARE THE SAME. REFER TO PAGES I-4.16 AND I-4.17.
2. TAG IS MAX. 13'-10" WIDE AND 27'-8" LONG W/ 90" MAX. SIDEWALL HEIGHT FOR WIND ZONES 2 AND 3. TAG IS MAX. 15'-0" WIDE AND 30'-0" LONG W/ 118" MAX. SIDEWALL HEIGHT FOR WIND ZONE 1.
3. REFER TO PAGE I-4.30 FOR INTERCONNECTIONS BETWEEN TAG AND MAIN UNIT.
4. FOR WIND ZONES 2 & 3, COLUMNS AT BOTH ENDS OF THE TAG UNIT MUST BE TIED DOWN ACCORDING TO PAGE I-4.20.
5. FOR WIND ZONES 2 & 3, LONGITUDINAL TIEDOWNS ARE ALWAYS REQUIRED ON THE TAG ACCORDING TO PAGE I-4.21.
6. ALL STRAPS, ANCHORS, AND RELATED EQUIP. MUST BE RATED FOR 3,150 LBS. (4,725 LBS. ULTIMATE LOAD) SPECS FOR TIEDOWN EQUIP. PER NOTES ON PAGES I-4.12 & I-4.13.

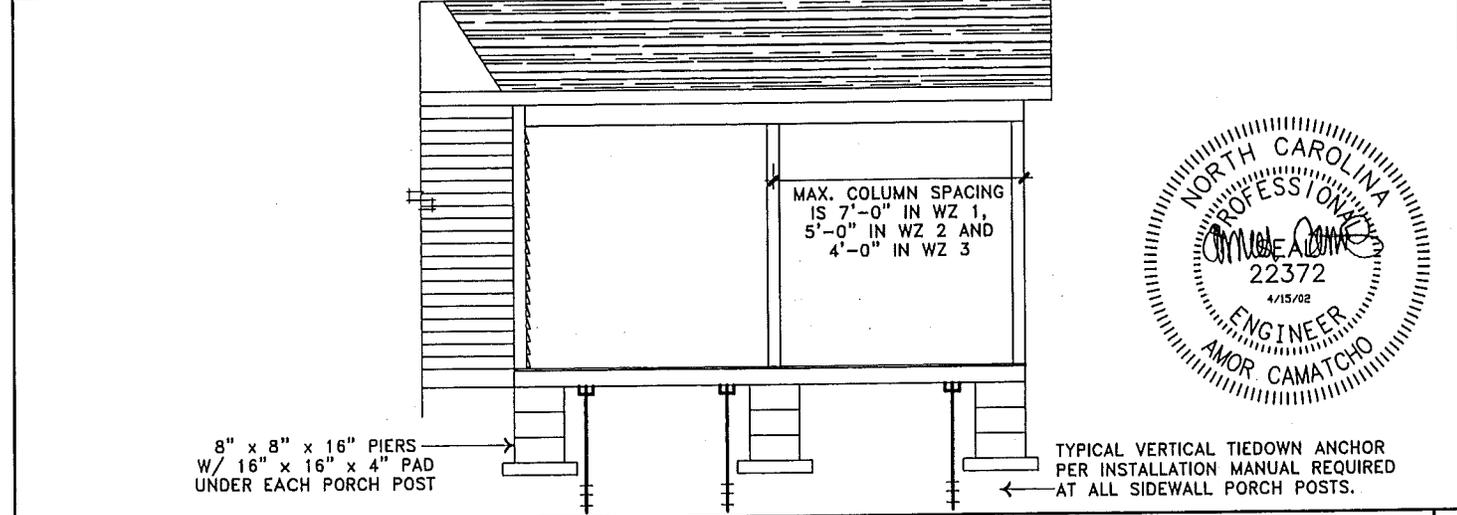
TRIPLEWIDE (TAG) TIEDOWN SYSTEM	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/1/98	
REV: 4/16/03	I - 4.24



STANDARD PORCH FRONT ELEVATION - COLUMNS AT MATING LINE A



PORCH FRONT ELEVATION - ALTERNATE RECESSED POST WITH CANTILEVERED HEADER (166\"/>



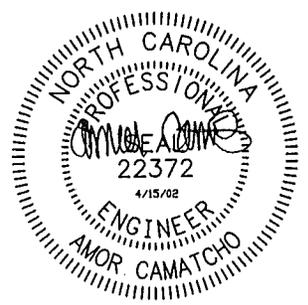
PORCH SIDE ELEVATION C

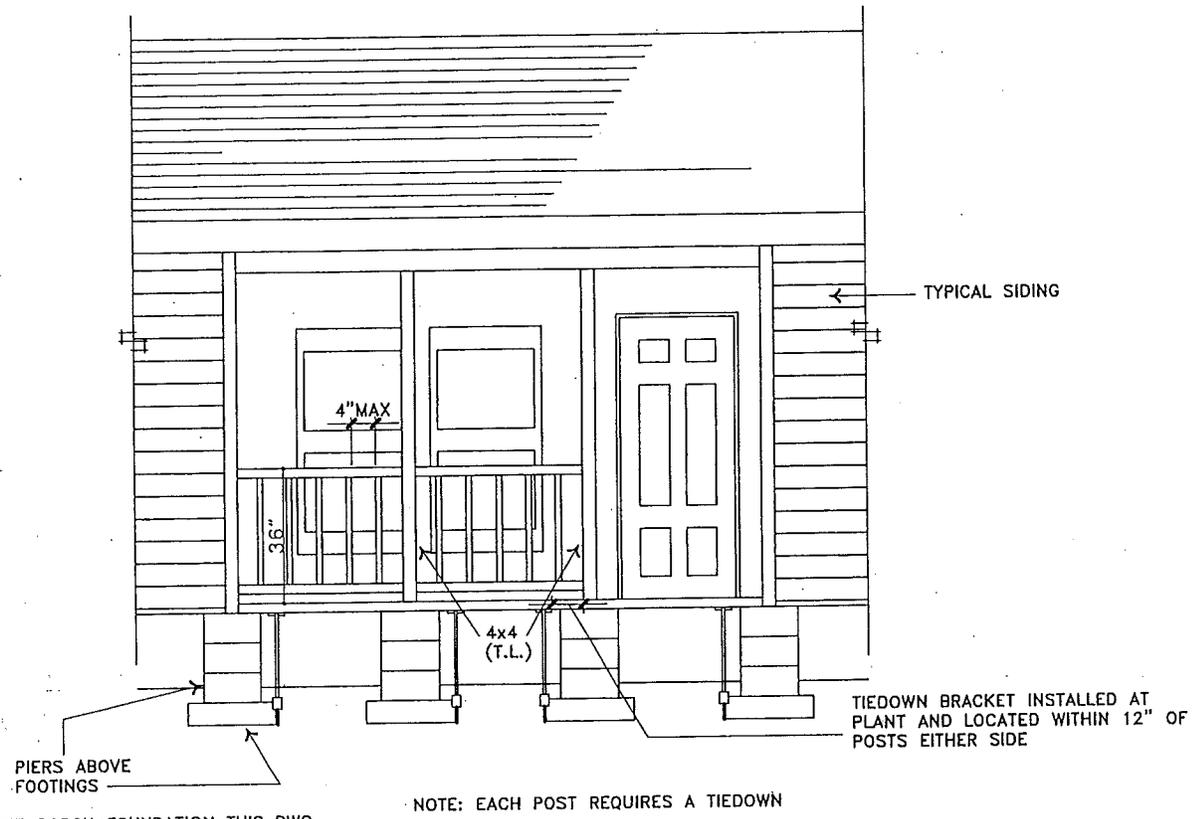
- NOTES:**
1. TYPICAL MAIN FRAME PIERS AS SPECIFIED IN CHAPTER 3 OF THIS MANUAL.
 2. PORCH MAY BE IN "A" HALF, "B" HALF, OR FULL WIDTH. PORCH OPENING(S) MAY BE AT ANY LOCATION.
 3. PORCH AREA SHALL NOT BE ENCLOSED BY A SKIRTING WALL THAT PREVENTS WATER FROM DRAINING AWAY FROM THE HOME. ANY SKIRTING WALL SHALL FOLLOW THE EXTERIOR WALL OF THE MAIN SECTION.

**COVERED CORNER
PORCH TIEDOWNS
& PIERS**

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/15/02
WIND ZONE: All

HBOS Manufacturing, LP
1 - 4.25



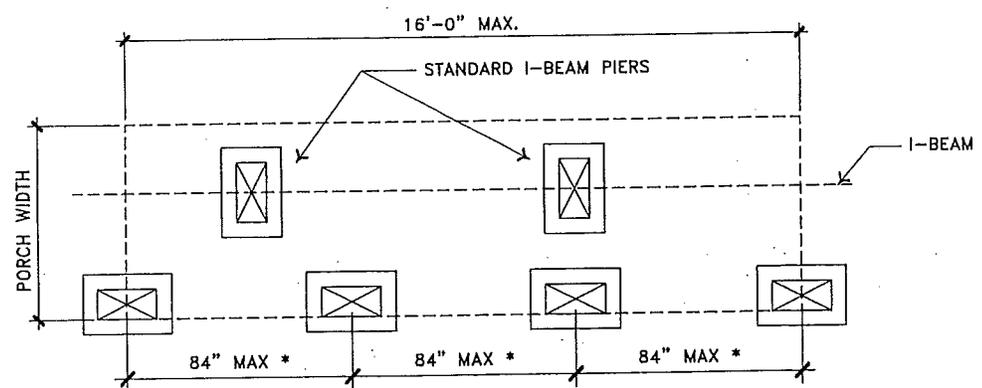


SEE PORCH FOUNDATION THIS DWG.

NOTE: EACH POST REQUIRES A TIEDOWN

PORCH FRONT ELEVATION

A



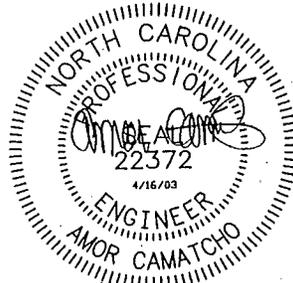
NOTE: ADD THE REQUIRED PIERS AT THE PORCH AREA IN ADDITION TO THE HOME PIERS IN THE FOUNDATION REQUIREMENT.
 * RECESSED ENTRIES WITH NO POSTS IN THE MIDDLE CAN SPAN UP TO 8'-0" MAX. ALONG THE SIDEWALL WITH A PIER UNDER THE COLUMNS ON EACH END.

PORCH FOUNDATION

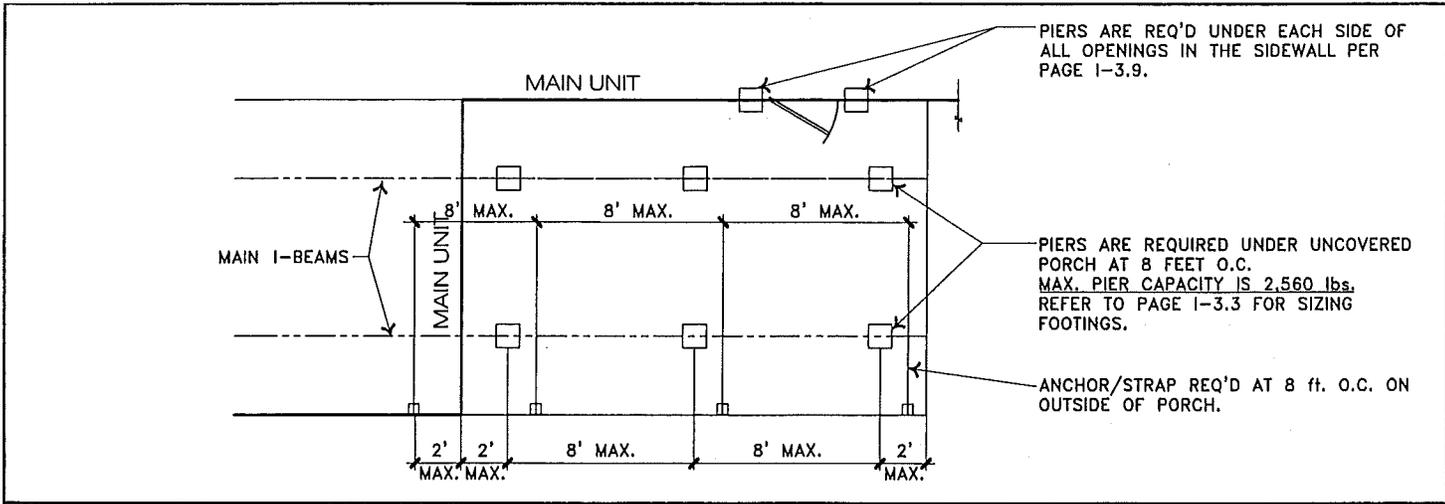
B

NOTES:

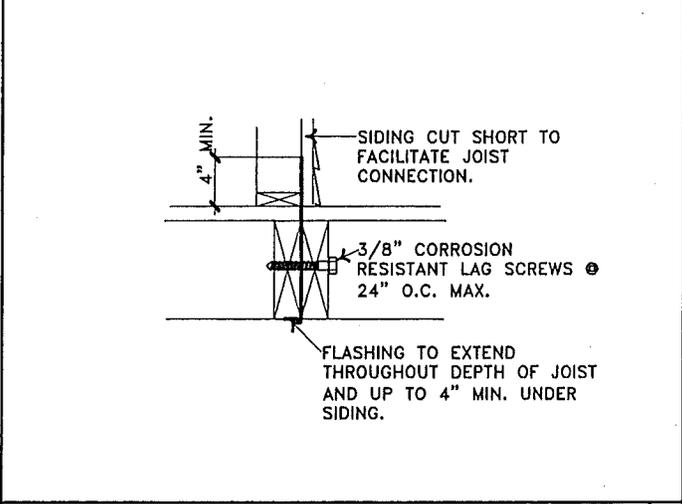
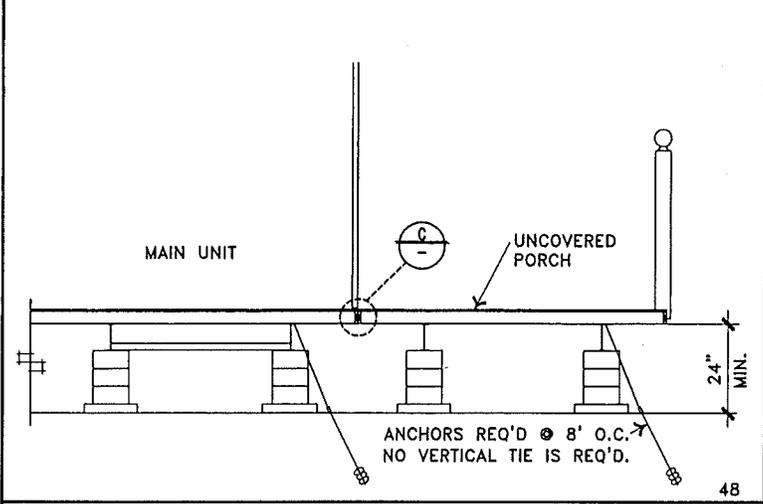
1. THIS PAGE IS FOR FOUNDATION AND TIEDOWN REQUIREMENTS FOR ANY SIDEWALL PORCH OR RECESSED ENTRY WITH A MAXIMUM WIDTH OF 54".
2. RECESSED ENTRY/ PORCH NOT TO BE WITHIN 3' OF ENDS OF HOME.



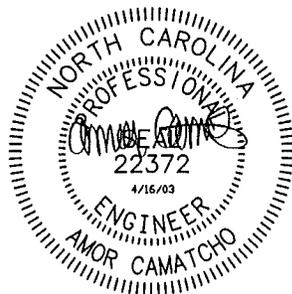
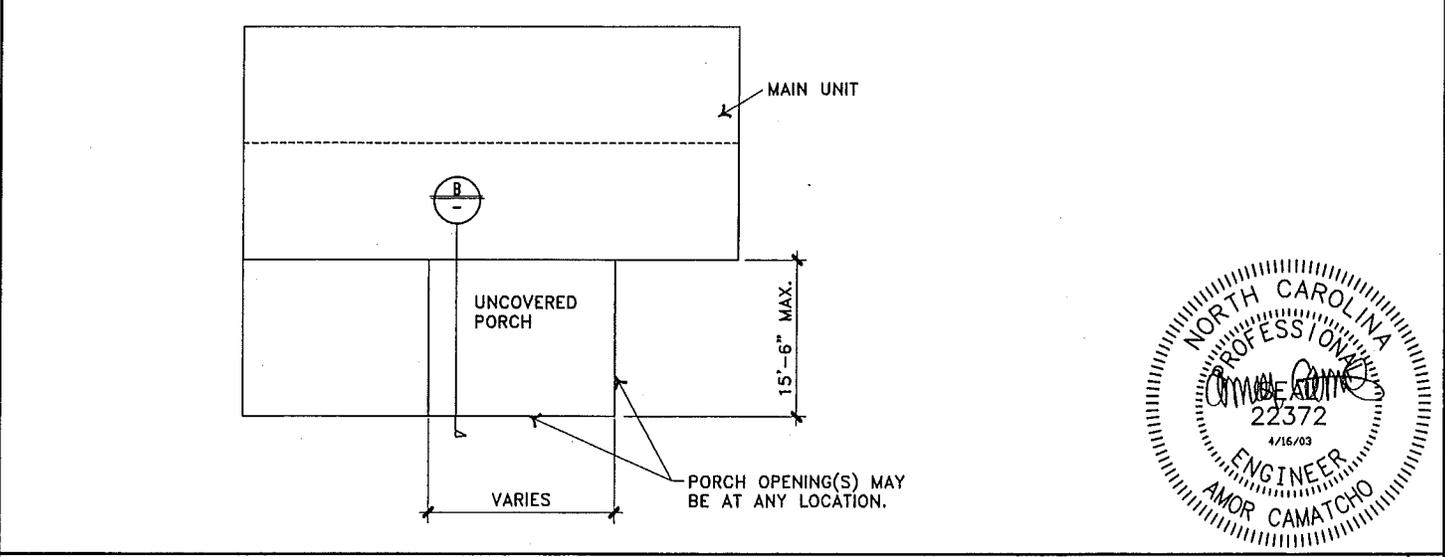
SIDEWALL PORCH or RECESSED ENTRY PIER & TIEDOWNS	
DRAWN BY: JBM DATE: 12/2/98 REV: 4/16/03	HBOS Manufacturing, LP I-4.26



FOUNDATION DIAGRAM FOR PORCH A



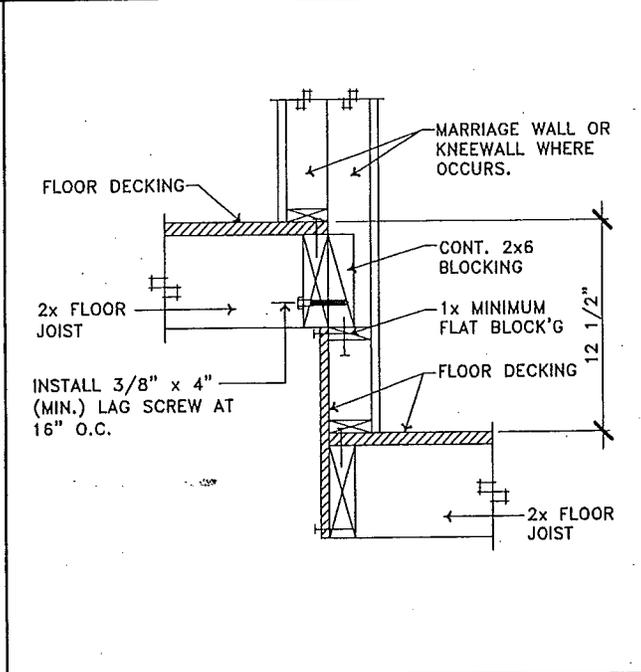
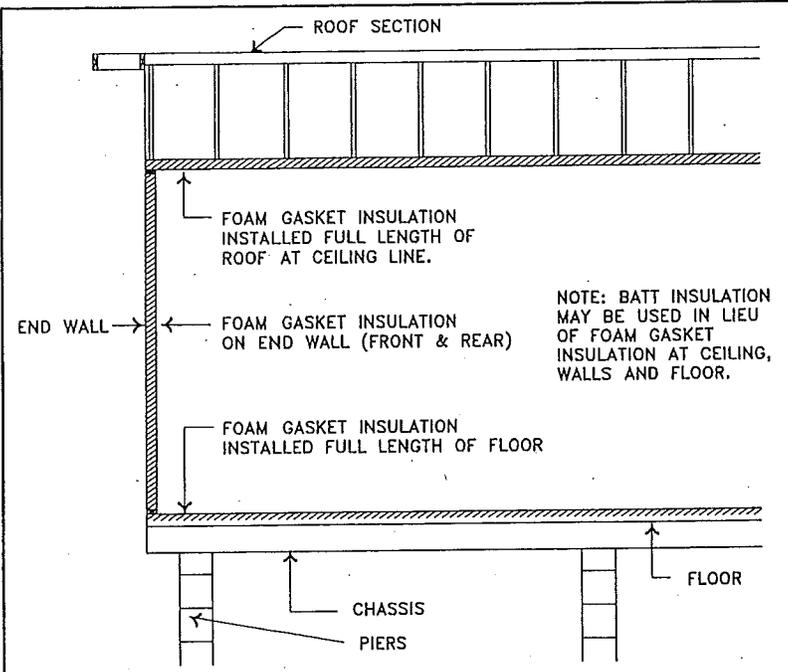
CROSS SECTION - ANCHORING REQUIREMENTS B FLASHING DETAIL C



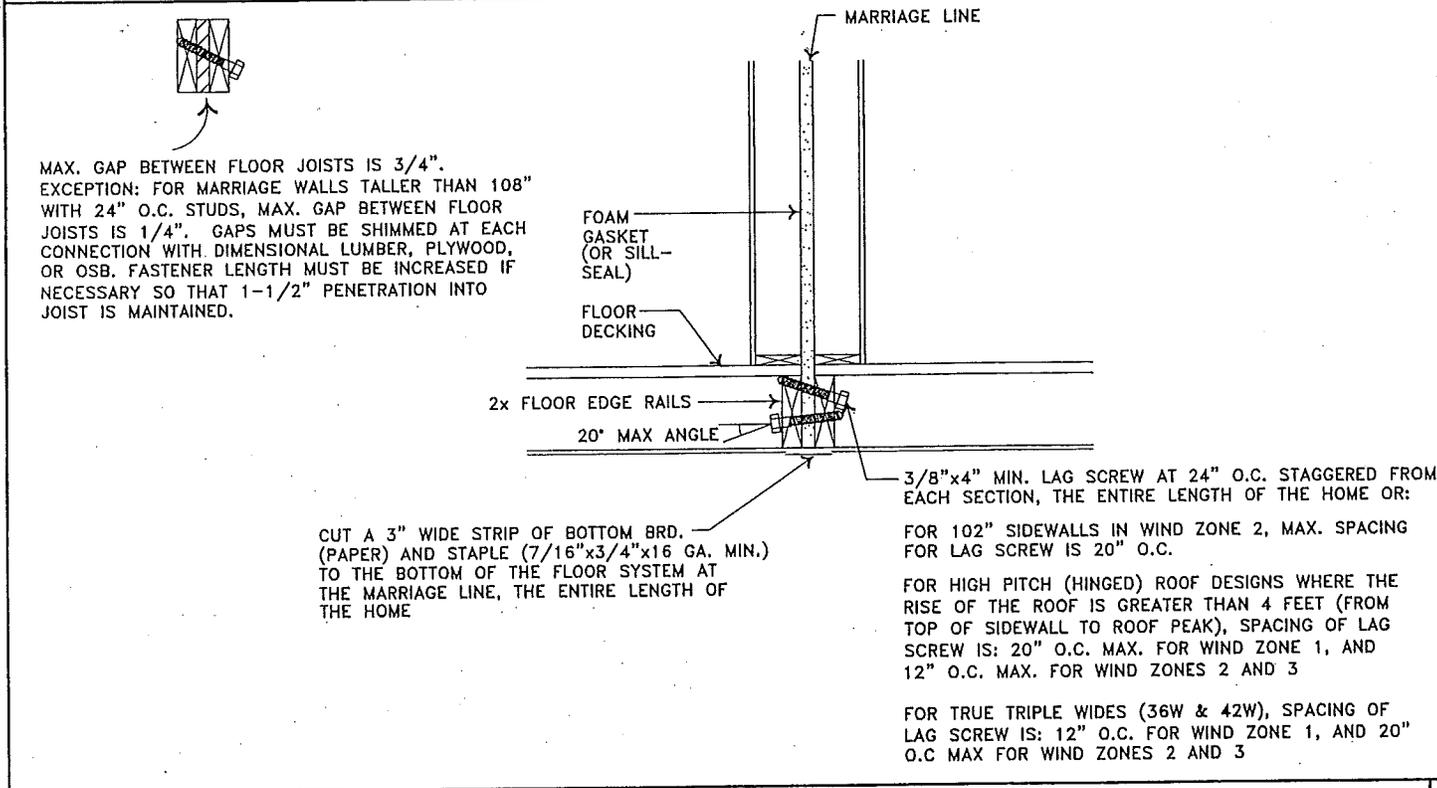
PLAN VIEW OF UNCOVERED PORCH D

- NOTES:**
- REFER TO PAGE I-3.2 FOR TYPICAL PIER REQUIREMENTS AND PAGE I-3.3 FOR TYPICAL FOOTING REQUIREMENTS.
 - ALL STRAPS, ANCHORS, AND RELATED EQUIP. MUST BE RATED FOR A 3,150 lb. WORKING LOAD (4,725 lb. ULTIMATE LOAD).
 - REFER TO PAGES I-4.12 TO I-4.17 FOR TIEDOWN REQUIREMENTS ALONG MAIN UNIT AND FOR SPECS ON STRAPPING/ANCHORING EQUIPMENT.
 - UNCOVERED PORCH AREA SHALL NOT BE ENCLOSED BY A SKIRTING WALL THAT PREVENTS WATER FROM DRAINING AWAY FROM THE HOME. ANY SKIRTING WALL SHALL FOLLOW THE EXTERIOR WALL OF THE MAIN SECTION(S).

UNCOVERED PORCH TIEDOWNS and PIERS	
DRAWN BY: JBM	HBOS Manufacturing, LP I-4.27
DATE: 12/1/98	
REV: 4/16/03	



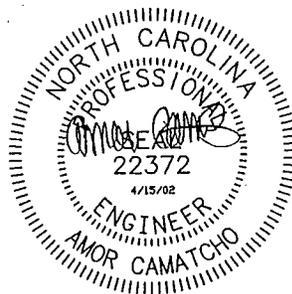
MARRIAGE LINE INFILTRATION BARRIER | A | FLOOR INTERCONNECTION @ SUNKEN FLOOR | B



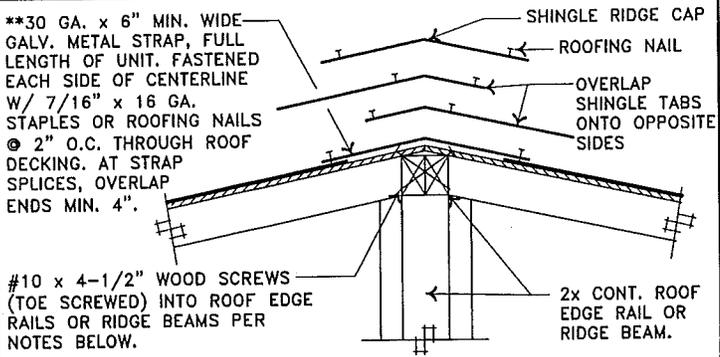
FLOOR INTERCONNECTION | C

NOTES:

1. USE EXTRA INSULATION OR FOAM SEALANT IF NECESSARY TO MINIMIZE AIR INFILTRATION AT ALL GAPS.



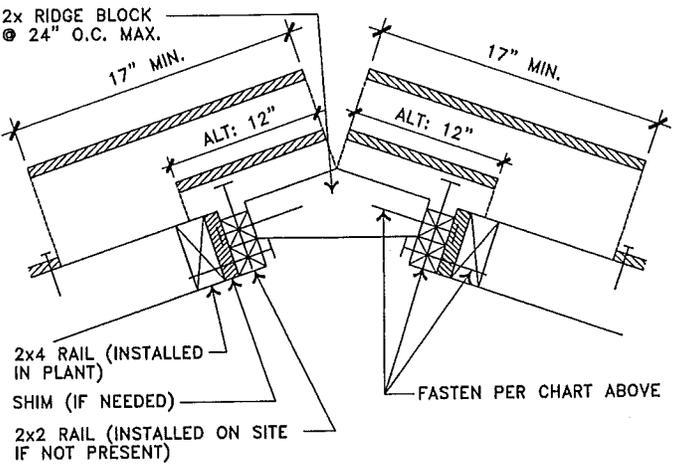
FLR. INTERCONNECTION & MARRIAGE LINE SEALANT	
DRAWN BY: JBM DATE: 7/31/00 REV: 11/18/02	HBOS Manufacturing, LP I-4.28



WOOD SCREW SPACING REQUIREMENTS:
 WIND ZONE 1 (NON-HINGED ROOF) - USE CONTINUOUS METAL STRAP OR WOOD SCREWS @ 14" O.C. NOT REQUIRED TO USE BOTH.
 WIND ZONE 1 (HINGED ROOF) - USE CONTINUOUS METAL STRAP AND WOOD SCREWS @ 18" O.C.
 WIND ZONE 2 & 3 (NON-HINGE) - USE CONTINUOUS METAL STRAP AND WOOD SCREW @ 32" O.C.
 WIND ZONE 2 & 3 (HINGED) - USE CONTINUOUS METAL STRAP AND WOOD SCREWS @ 14" O.C.

****CONTINUOUS RIDGE VENT STRAPPING REQUIREMENTS:**
 ALL WIND ZONES, ALL ROOFS - USE 1 1/2" x 26 GA. STRAPS SPACED AT 48" O.C. AND FASTEN EACH END WITH (9) 7/16" x 16 GA. STAPLES TO TOP CHORD OF TRUSSES ACROSS THE MATING LINE WITH THE SCREWS FASTENED AS NOTED ABOVE.

	FASTENERS REQUIRED PER RIDGE BLOCK		
	#10x3" WOOD SCREWS	.131x3" PD NAILS	7/16"x2-1/2"x 15 GA. STAPLES
WIND ZONE 1	1	2	2
WIND ZONE 2	2	3	N/A
WIND ZONE 3	2	N/A	N/A

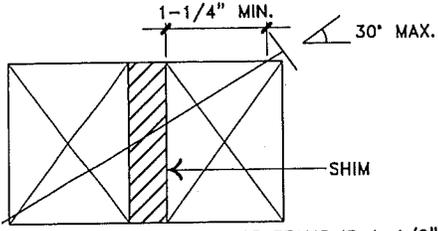


INSTALLATION OF ON-SITE DECKING: MIN. 17" WIDE 7/16" OSB DECKING (APA RATED 24/16) FASTENED W/ 10d NAILS OR .128" x 3" NAILS @ 4" O.C. FIELD & EDGES. FOR DECKING WIDTHS BETWEEN 17" AND 24", USE (2) H-CLIPS EACH BAY. SHINGLE UNDERLAYMENT IS INSTALLED ON DECKING AND CEMENTED DOWN @ 6" AT DECKING EDGES FOR WIND ZONES 2 AND 3 ONLY.

WHEN SHINGLES ARE APPLIED W/ A 5" EXPOSURE, THE FASTENER LOCATIONS SHOULD BE ON A LINE 5-5/8" ABOVE THE BUTT EDGE AND 1" FROM EACH END. REFER TO MANUFACTURER'S INSTRUCTIONS.

MAX. 1-1/2" TOTAL SHIM ALLOWED AT EACH RIDGE BOX. SHIM MUST BE DIMENSIONAL LUMBER, PLYWOOD OR OSB. FASTENER LENGTH MUST BE INCREASED IF NECESSARY SO THAT 1-1/2" OF PENETRATION IN MAIN MEMBER IS MAINTAINED.

ROOF RIDGE INTERCONNECTION DETAIL A

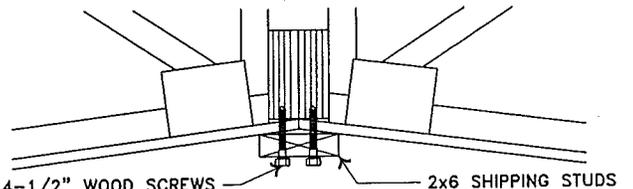


MAX. GAP BETWEEN EDGE RAILS OR RIDGE BEAMS IS 1-1/2". EXCEPTION: FOR MARRIAGE WALL TALLER THAN 108" WITH 24" O.C. STUDS, MAX. GAP BETWEEN ROOF EDGE RAILS OR RIDGE BEAMS IS 1/4". GAPS MUST BE SHIMMED AT EACH CONNECTION WITH DIMENSIONAL LUMBER, PLYWOOD OR OSB. FASTENER LENGTH MUST BE INCREASED IF NECESSARY SO THAT 1-1/2" OF PENETRATION INTO MAIN MEMBER IS MAINTAINED.

FOR WIND ZONE 1 HOMES THAT USE FLASHING ONLY, INSTALL A 6" SHIM @ 48" O.C. ALONG THE ROOF LINE.

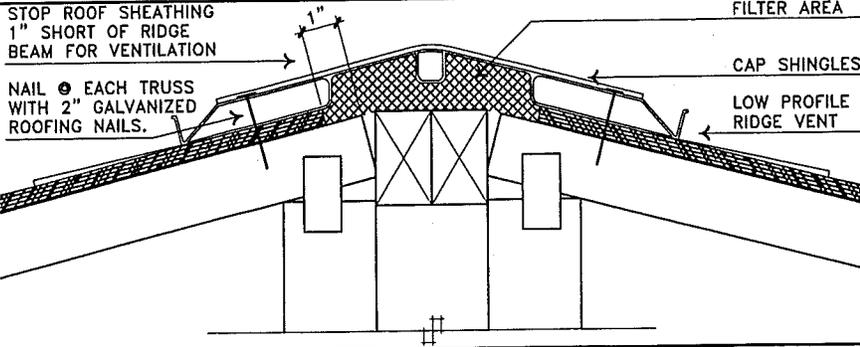
RIDGE BOX INTERCONNECTION DETAIL B

ALTERNATE IS TO FINISH OUT THE CEILING BOARD WITHOUT USING THE 2x6 CLOSE-UP BEAM.



#10 x 4-1/2" WOOD SCREWS THROUGH 2x6'S INTO EACH RIDGE BEAM AT 24" O.C.

GAPS AT ROOF LINE D

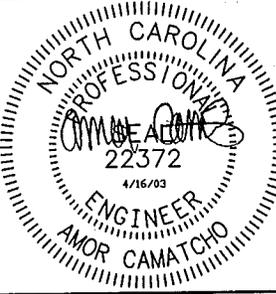


VAULT AREA COMPLETION METHOD (OPTIONAL) C

- NOTES:**
- FOR PROPER ALIGNMENT - PRENAIL THROUGH RIDGE VENT HOLES AT ENDS OF EACH SECTION.
 - WHEN USING STANDARD FLAT 3-TAB SHINGLES, CAULKING IS NOT REQUIRED UNDER THE FLANGE OF THE VENT.
 - PRIOR TO APPLYING VENT TO DIMENSIONAL OR ARCHITECTURAL SHINGLES ON NEW CONSTRUCTION, LEAVE FELT LONG AT RIDGE AND FOLD BACK UNDER VENT OR CAULK BETWEEN LOW AREAS OF SHINGLE AND FLANGE OF VENT.
 - BEFORE FASTENING VENT, MAKE SURE FILTER IS SECURED BETWEEN SHINGLES AND VENT.
 - WHEN INSTALLING VENT IN COLD WEATHER, LEAVE A 1/8" GAP BETWEEN SECTIONS TO ALLOW FOR WARM WEATHER EXPANSION.

CONSTRUCTION DETAIL FOR RIDGE VENT INSTALLATION E

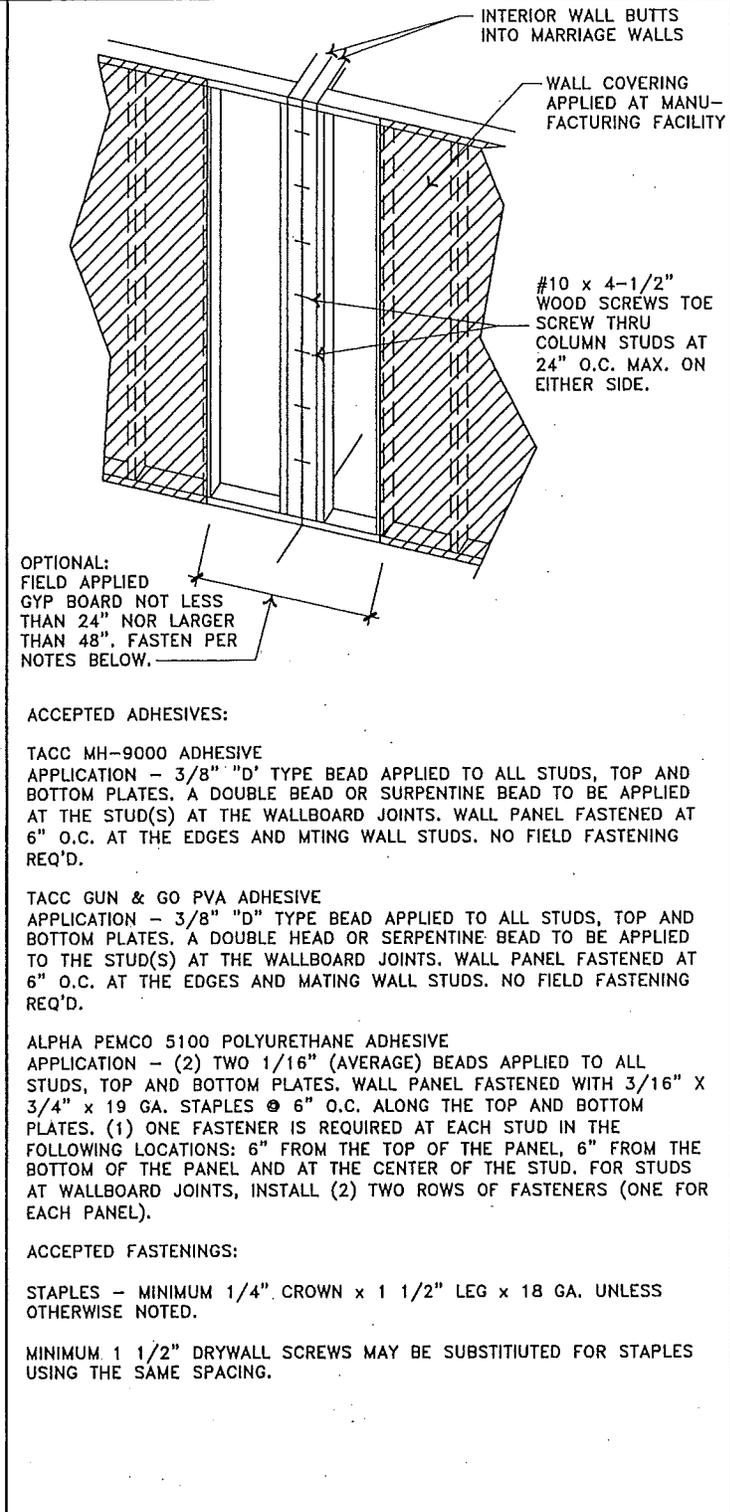
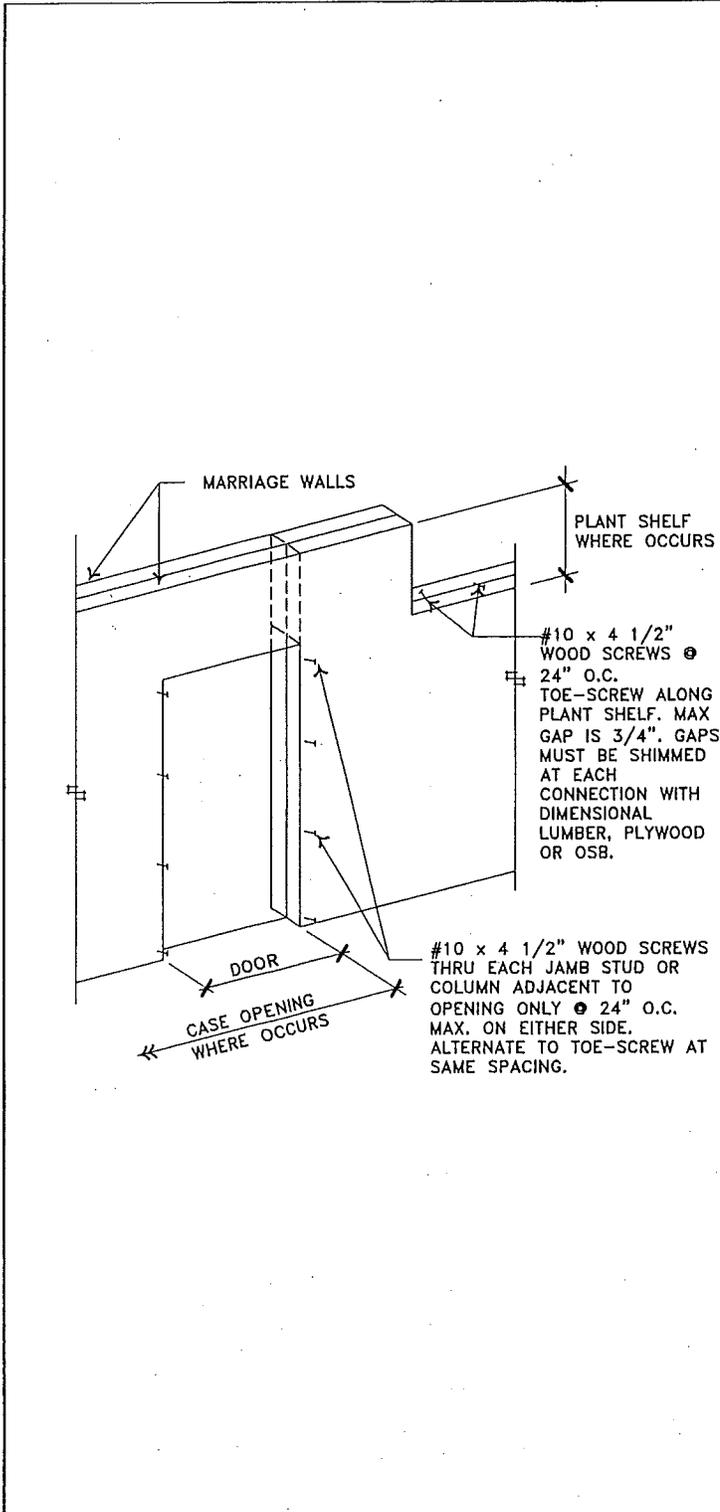
- NOTE:**
- 1/4" MIN. LAG SCREWS CAN BE SUBSTITUTED FOR #10 WOOD SCREWS OF THE SAME LENGTH. PRE-DRILL HOLES IF NECESSARY TO PREVENT EXCESSIVE SPLITTING IN THE EDGE RAILS.
 - LAG SCREWS OR WOOD SCREWS MAY BE ADDED AS NEEDED TO MINIMIZE GAPS.
 - USE EXTRA INSULATION OR FOAM SEALANT TO MINIMIZE AIR INFILTRATION AT ALL GAPS.
 - FOR OPTIONAL CLOSE-UP BEAM ATTACH GYP PER DETAIL 'B' ON PAGE I-4.30.



ROOF INTERCONNECTION & RIDGE BEAM CLOSE-UP MULTI-SECTION HOME

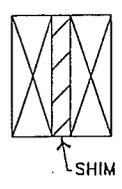
DRAWN BY: JBM
 DATE: 11/30/98
 REV: 4/16/03

HBOS Manufacturing, LP
 I-4.29



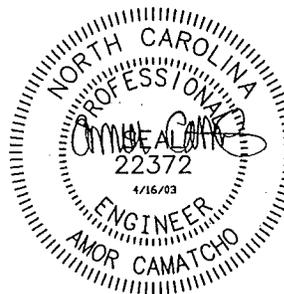
MARRIAGE WALL DOOR, CASE OPENINGS & PLANT SHELF

CONTINUOUS INTERIOR WALL INTERCONNECTION



MAX. GAP BETWEEN ENDWALL STUDS IS 1-1/2". GAPS MUST BE SHIMMED AT EACH CONNECTION WITH DIMENSIONAL LUMBER, PLYWOOD, OR OSB. FASTENER LENGTH MUST BE INCREASED IF NECESSARY SO THAT 1" OF PENETRATION INTO STUD IS MAINTAINED.

USE EXTRA INSULATION OR FOAM SEALANT TO MINIMIZE AIR INFILTRATION AT ALL GAPS IN EXTERIOR WALL.



INTERIOR WALL INTERCONNECTION

DRAWN BY: JBM

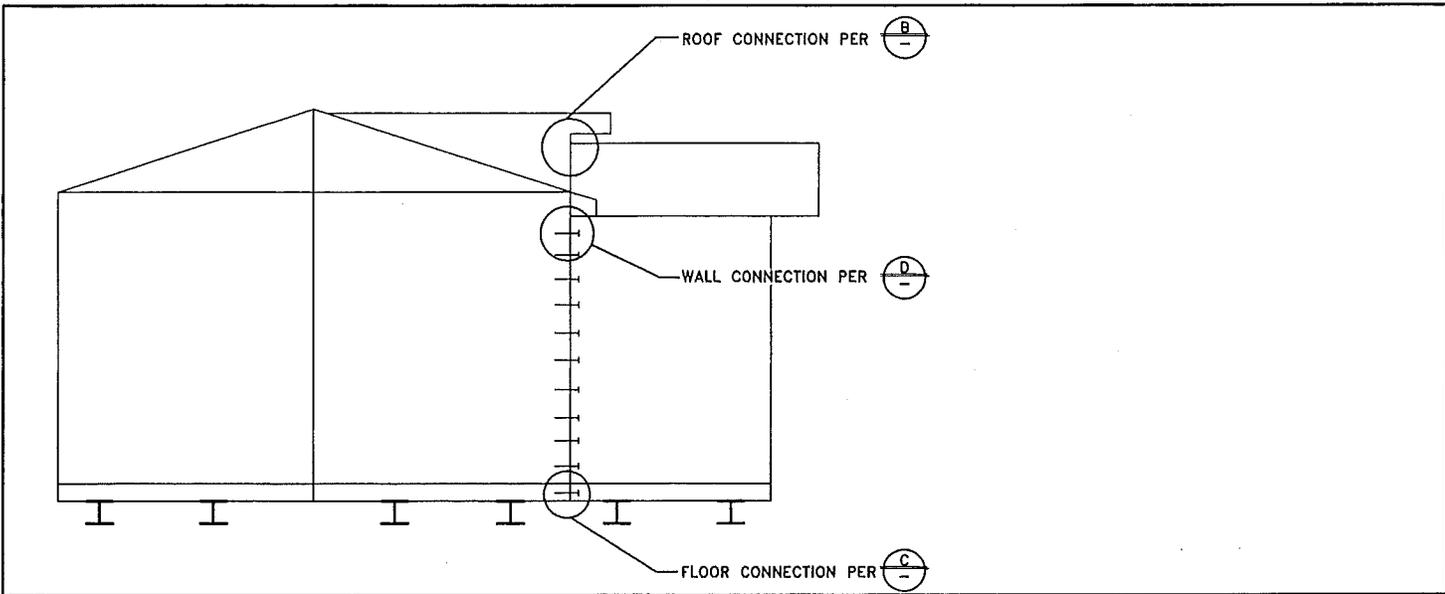
DATE: 11/30/98

REV: 4/16/03

HBOS Manufacturing, LP

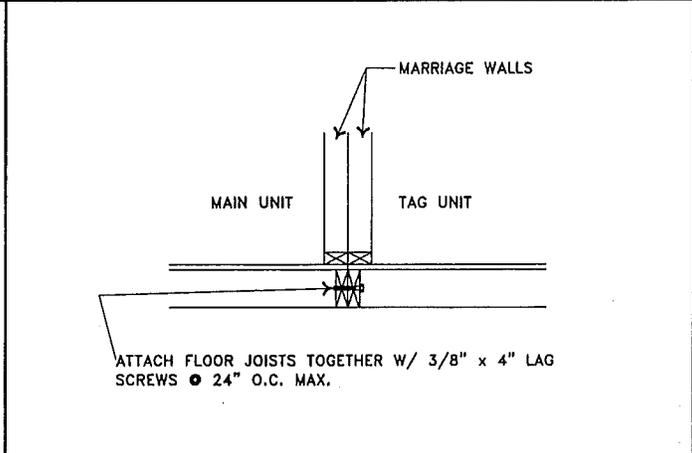
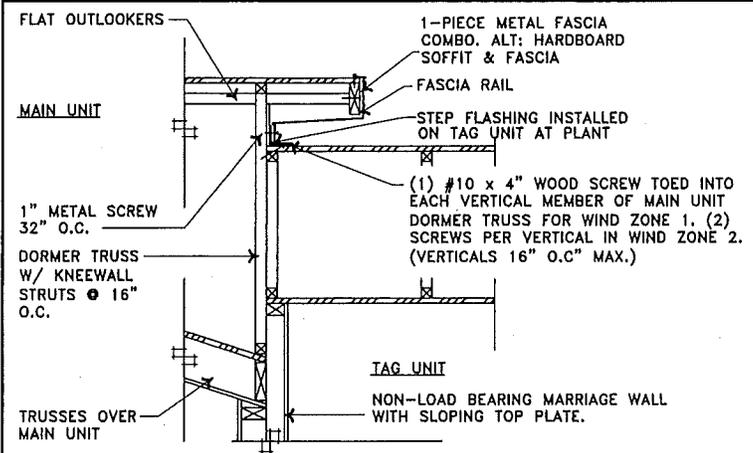
1 - 4.30

SHIM DETAIL



TRIPLE WIDE SECTION VIEW

A

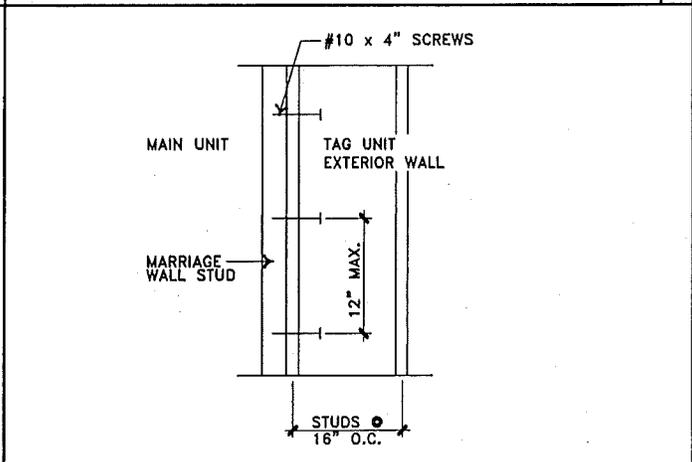
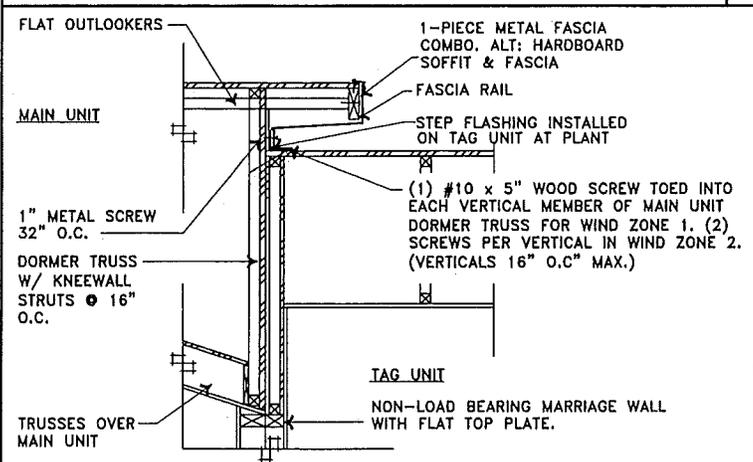


ROOF CONNECTION

B

FLOOR CONNECTION

C



ROOF CONNECTION - ALTERNATE

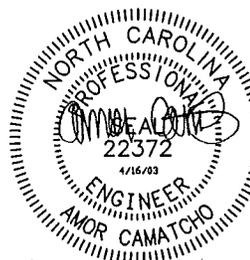
D

WALL CONNECTION

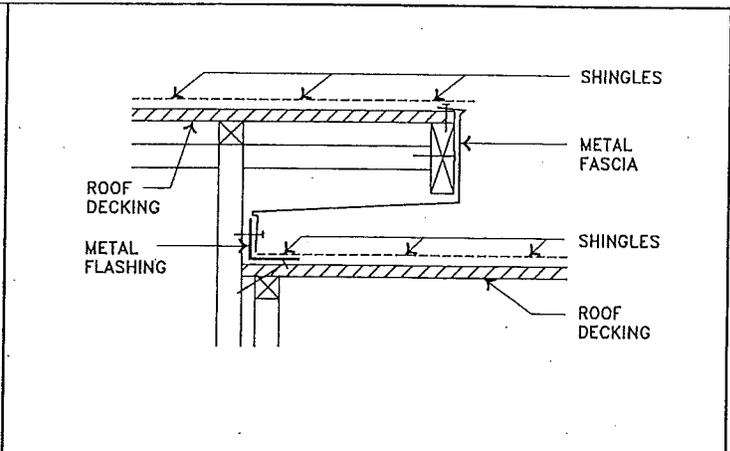
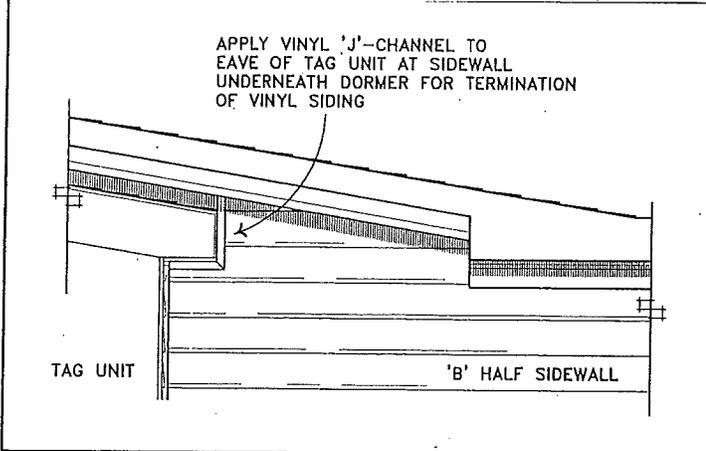
E

NOTES:

1. OPENINGS IN THE MARRIAGE WALL BETWEEN THE MAIN UNIT AND THE TAG UNIT SHALL ALSO BE TOE-SCREWED @ 24" O.C. WITH #10 x 4" SCREWS, UNLESS OTHERWISE NOTED.
2. FOR HOMES IN WIND ZONES 1&2 WITH 108" MAXIMUM SIDEWALL HEIGHT, TAG UNITS DO NOT REQUIRE SHEARWALLS IF THE MAIN UNIT DORMER TRUSS IS REINFORCED PER RC-20.6 AND THE TAG UNIT IS FASTENED TO THE MAIN UNIT AS NOTED ABOVE.

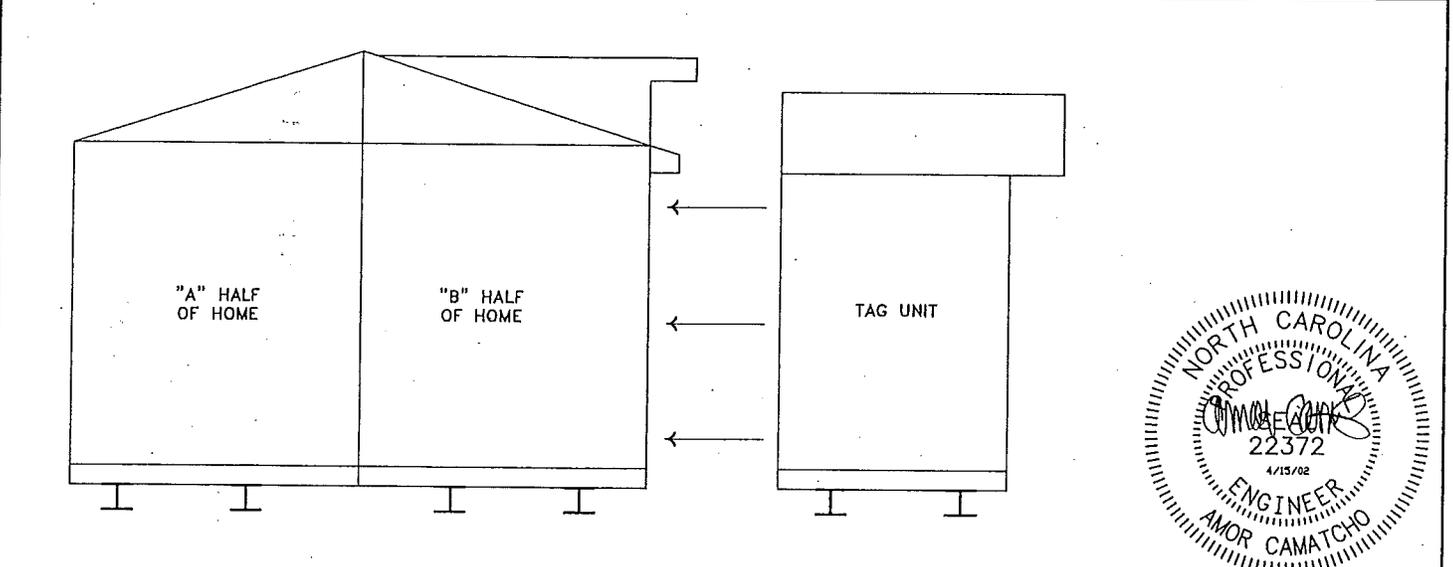


TAG INTERCONNECTION	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/1/98	
REV: 4/16/03	
1 - 4.31	



VINYL FINISH DETAIL FOR TAG EAVE AT 'B' HALF SIDEWALL

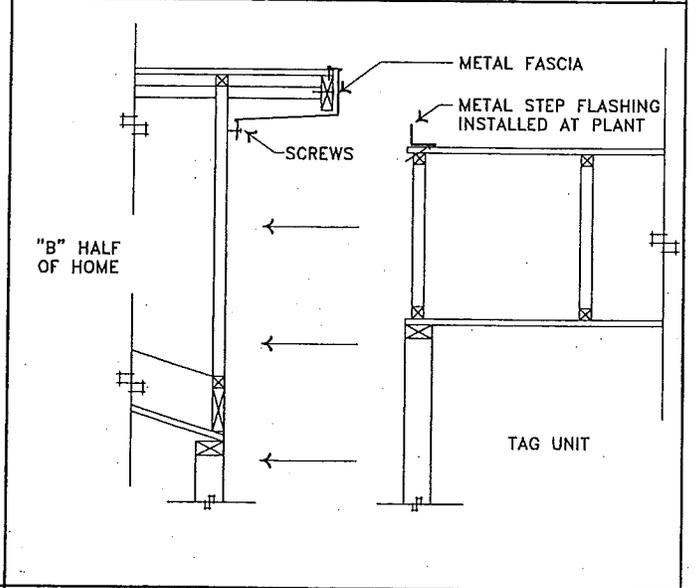
A SOFFIT METAL OVER TAG ROOF FLASHING AT DORMER B



TRIPLE WIDE SECTION VIEW

C

1. LEVEL AND CONNECT A/B UNITS BEFORE CONNECTING TAG UNIT.
2. LEVEL FLOOR (TAG UNIT) AGAINST 'B' HALF OF HOME.
3. INSTALL 3/8" X 5" LAG SCREWS INTO THE FLOOR EDGE RAIL OF TAG UNIT WITH CONTACT TO THE 'B' HALF FLOOR EDGE RAIL @ 24" O/C (MAX.).
4. EXTERIOR WALL OF TAG SHOULD HAVE 1 BAY LEFT OPEN FOR WALL TO WALL CONNECTION. FASTEN AS FOLLOWS; #10 X 4" SCREWS @ 12" O/C (MAX.)
5. REMOVE SCREWS FROM THE METAL FASCIA @ DORMER ON 'B' HALF OF HOUSE. RAISE THE FASCIA METAL UNTIL STEP #6 IS COMPLETE.
6. NEXT TOE SCREW THE ROOF SURFACE OF THE TAG UNIT INTO THE VERTICAL STRUT AREA OF THE 'B' HALF OF HOME WITH #10 X 4" WOOD SCREWS, FASTEN AT APPROX. 10 - 12" O/C.
7. THE METAL FLASHING WHICH IS INSTALLED UNDER THE SHINGLES ON THE TAG UNIT, SLIDES UNDERNEATH THE METAL FASCIA WHICH IS THEN RE-SECURED BACK TO IT'S ORIGINAL POSITION.
8. NEXT INSTALL SHEATHING ON TAG WALLS WHERE IT WAS OMITTED FOR WALL TO WALL CONNECTIONS.
9. INSTALL EXTERIOR SIDING PER MANUFACTURER'S INSTRUCTIONS.



CONNECTION NOTES

D CONNECTION DETAIL E

MISCELLANEOUS TAG DETAILS

DRAWN BY: RAJ	HBOS Manufacturing, LP
DATE: 1/28/99	
REV: 4/21/02	
1 - 4.31.1	

THESE PIECES ARE SENT IN THE LOAD PACKAGE TO FINISH END OF HOME.
THESE PIECES ALREADY HAVE THE ANGLE CUT ON ONE END.

INSTALL SCREWS HERE
FOR HOOD METAL

INSTALL SCREWS
HERE FOR HOOD
METAL.

THIS PIECE INSTALLED BY PLANT

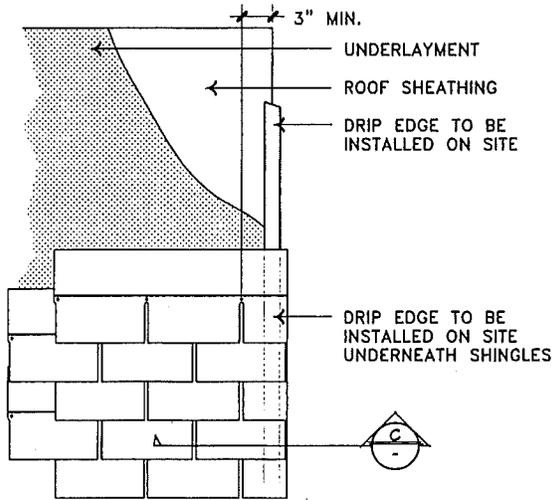
NOTES:

HOOD METAL INFORMATION:

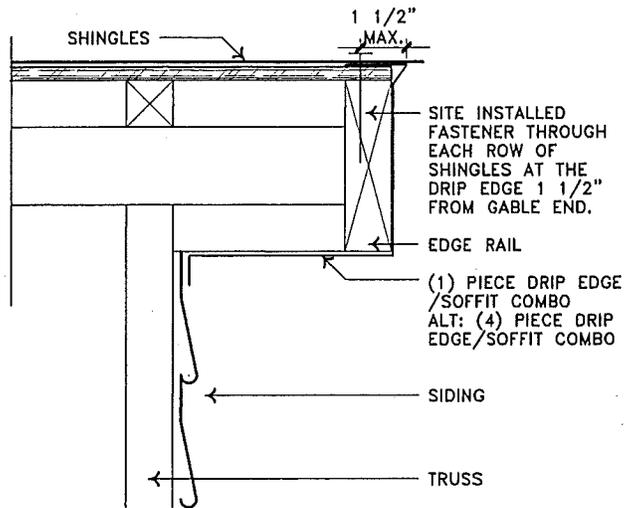
1. WHEN INSTALLING THE ONE PIECE METAL COMBO, THE ANGLES THAT ARE PRE-CUT NEED TO OVERLAP AT THE PEAK TO MAKE A NEAT JOINT FOR APPEARANCE PURPOSES. THIS METAL ALSO NEEDS TO OVERLAP THE METAL INSTALLED BY THE PLANT AT THE BOTTOM FOR WATERSHED.
2. CUT TWO 3 FOOT PIECES OF HOOD METAL AND FASTEN TO FASCIA AND END WALL WITH THREE HEX HEAD #8 x 1.5" WHITE SCREWS AT EACH JOINT.
3. RECHECK ALL VINYL AND HOOD METAL ON END WALLS FOR DISCREPANCIES.

SHINGLES AT GABLE END

A



ALL FASTENERS WHICH ARE INSTALLED IN PLANT MUST BE AT LEAST 3" FROM GABLE END AS SHOWN (ONLY WHERE DRIP EDGE IS NOT INSTALLED).



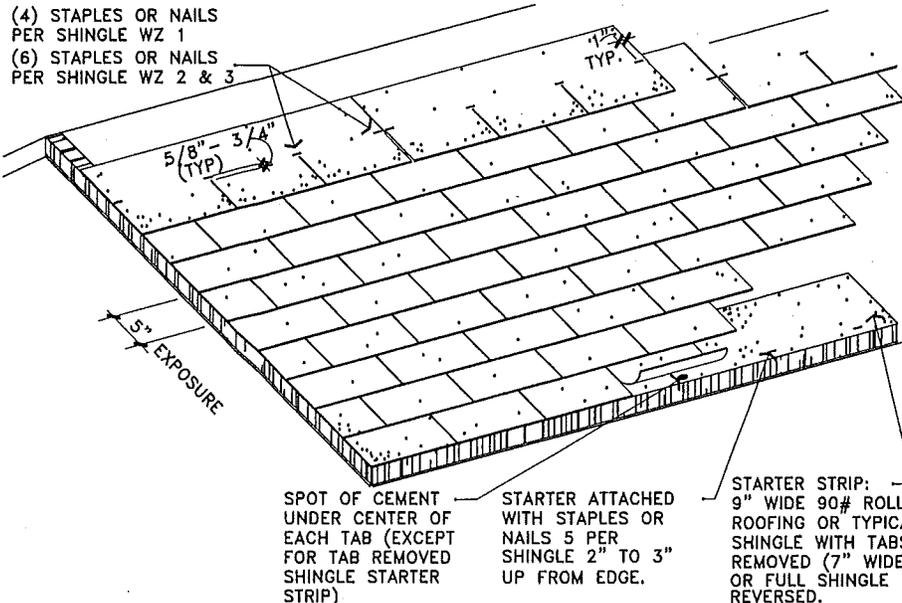
SHINGLES AT GABLE END

B

SHINGLES FASTENERS THROUGH DRIP EDGE

C

- (4) STAPLES OR NAILS PER SHINGLE WZ 1
- (6) STAPLES OR NAILS PER SHINGLE WZ 2 & 3



SPOT OF CEMENT UNDER CENTER OF EACH TAB (EXCEPT FOR TAB REMOVED SHINGLE STARTER STRIP)

STARTER ATTACHED WITH STAPLES OR NAILS 5 PER SHINGLE 2" TO 3" UP FROM EDGE.

STARTER STRIP: 9" WIDE 90# ROLL ROOFING OR TYPICAL SHINGLE WITH TABS REMOVED (7" WIDE) OR FULL SHINGLE REVERSED.

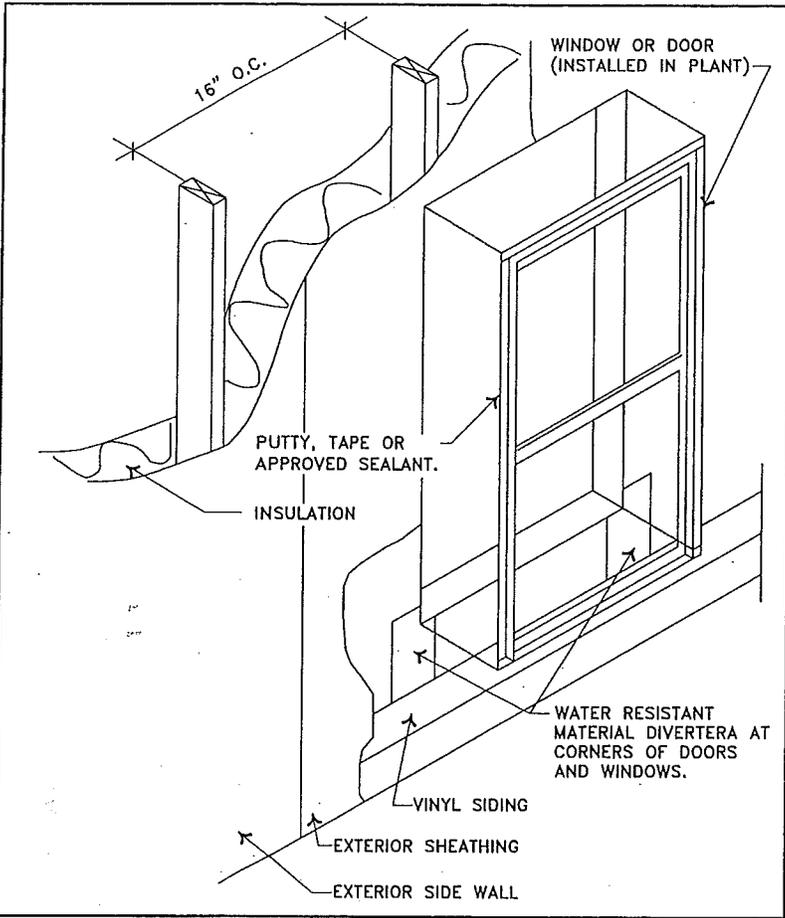
NOTES:

1. REMOVE THE SHIPPING PIECES THAT ARE INSTALLED AT THE FRONT OF THE HOUSE TO PROTECT SHINGLES DURING TRANSPORTATION. ALL NAIL HOLES MUST BE PATCHED WITH ASPHALT CEMENT UNDERNEATH THE SHINGLE.
2. FOR FASTENING SHINGLES, USE 12 GA. GALVANIZED ROOFING NAILS. 1" CROWN x 16 GA. STAPLES MAY BE USED ONLY WHEN THE MANUFACTURER WARRANTS THEIR USE. FASTENER LENGTH MUST PENETRATE AND EXTEND AT LEAST 1/8" THRU THE DECK.
3. IF A PUNCTURE OCCURS ON THE COVERED PART OF A SHINGLE, THE PUNCTURE MAY BE PATCHED WITH THE ROOFING CEMENT UNDERNEATH THE SHINGLE.
4. ALL ASPHALT CEMENT SHALL CONFORM TO ASTM D4586 OR ASTM D2822.

FASCIA/DRIP EGDE & SHINGLE INSTALLATION	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/2/98	
REV: 7/31/00	1 - 4.32

SHINGLE ROOF APPLICATION

D



TYPICAL EXTERIOR WALL

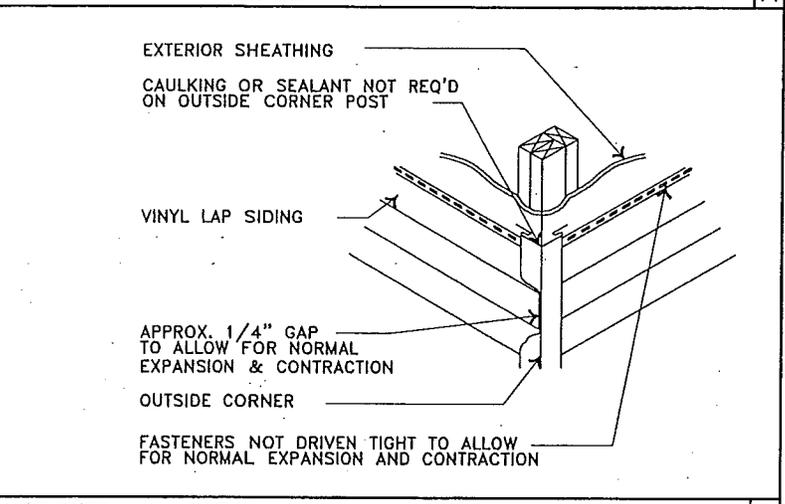
A

EXTERIOR SHEATHING W/ VINYL SIDING ONLY:

1. MEASURE AND CUT EXTERIOR SHEATHING ALLOWING 1/8" EXPANSION ON EACH SIDE.
2. FASTEN EXTERIOR SHEATHING TO FRAMING WITH EITHER 8d COMMON NAILS OR 15 GA. x 1 3/4" STAPLES. SPACE AT .6" O.C. AT EDGES, 12" O.C. IN THE FIELD FOR WZ 1; 3" O.C. AT EDGES AND FIELD FOR WIND ZONES 2 & 3.
3. CHALK A STRAIGHT LINE FROM TOP OF STARTER STRIP ON FRONT WALL TO TOP OF STARTER STRIP ON BACK WALL AND ATTACH STARTER STRIP TO HOME (FASTENER MUST BE 1" MIN.)

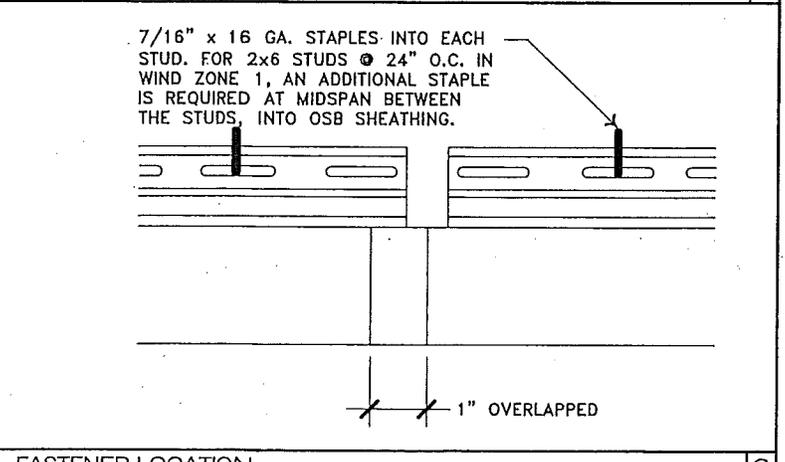
NOTES

- 1) A 3/8" DIAMETER HEAD NAIL OR 7/16" x 16 GA. STAPLES (CORROSIVE RESISTANT) SHALL BE USED. LENGTH SHOULD ALLOW A 3/4" MIN. PENETRATION INTO STUDS. SILL TRIM, STARTER STRIP, AND J-CHANNEL ARE FASTENED WITH 7/16" x 1 1/2" x 16 GA. STAPLES @ 12" O.C.
- 2) JOINTS IN PANELS TO OVERLAP 1" AND INSTALLED SO THAT OVERLAP PANEL IS TO THE FRONT OF THE UNIT AND OVERLAP PANEL IS TO THE REAR OF THE UNIT.
- 3) FOR (1) PIECE OF METAL FASCIA REFER TO PAGE I-4.31.
- 4) VINYL SIDING APPLICATION IS PER THE VINYL SIDING INSTITUTE INSTRUCTIONS.
- 5) FOR ALL EXTERNAL PRODUCTS PROCEDURES:
 - a) ENLARGE HOLE IN SIDING. HOLE SHOULD BE APPROX. 1/8" LARGER.
 - b) STAGGER SCREWS ON SHUTTER SO THAT THEY DO NOT LINE UP ON THE SAME PANEL.
- 6) VINYL SIDING TEST REPORT: NTA 97-0005-3 & 4.
- 7) THE FOLLOWING ACCESORIES: J-CHANNEL, OUTSIDE CORNER POST & SILL TRIM/METAL STARTER STRIP MAY BE STAPLED IN THE NAILING FACE INSTEAD ON THE NAILING SLOTS.
- 8) VINYL SIDING PIECES 24" OR LESS IN LENGTH IS ACCEPTABLE TO BUTT SIDING INTO ACCESSORY TRIM PIECES. LETTER DATED 10/7/98 IS ON FILE AT NTA.
- 9) WINDOW & DOOR SILL TRIM CAN BE SECURED @ 12" O.C.



CORNER APPLICATION

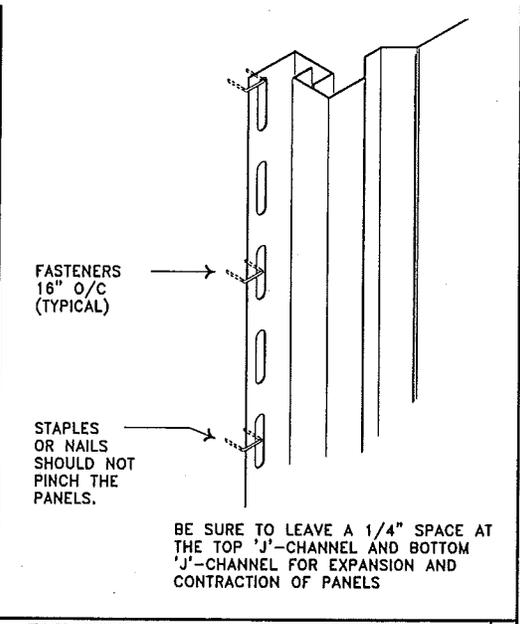
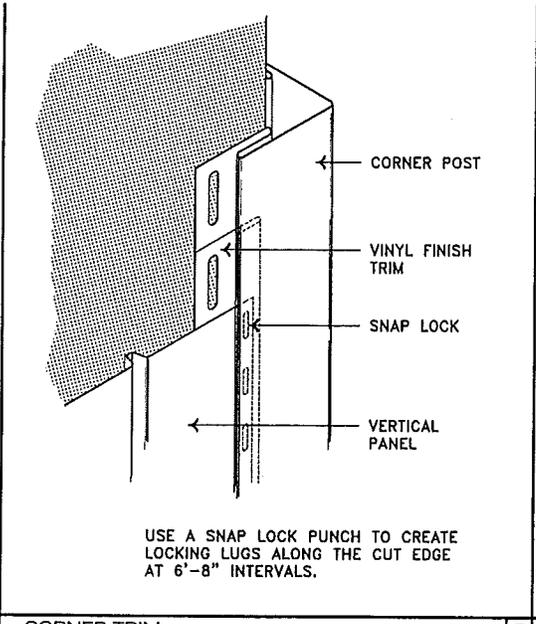
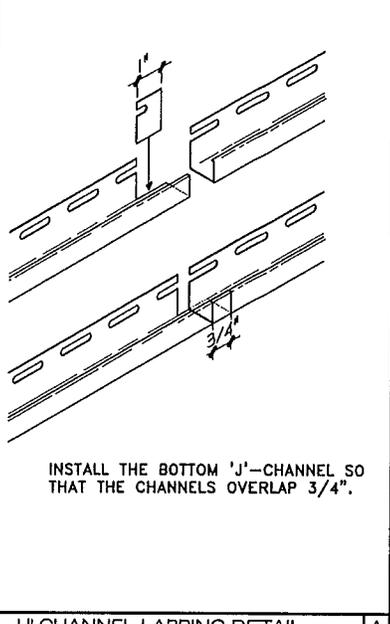
B



FASTENER LOCATION

C

HORIZONTAL VINYL SIDING INSTALLATION	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/2/98	
REV: 4/16/03	I - 4.33

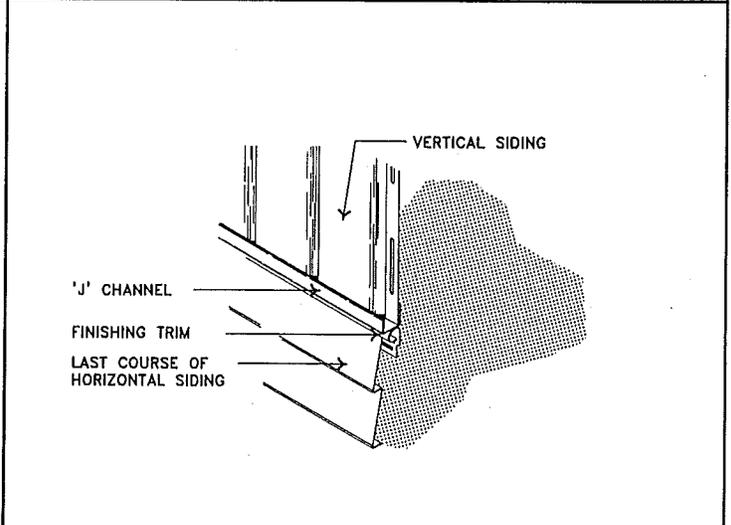
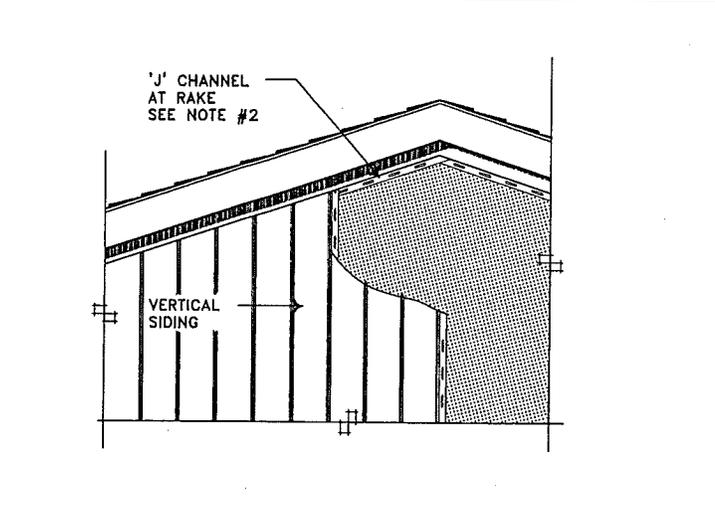


'J' CHANNEL LAPPING DETAIL

A CORNER TRIM

B FASTENING DETAIL

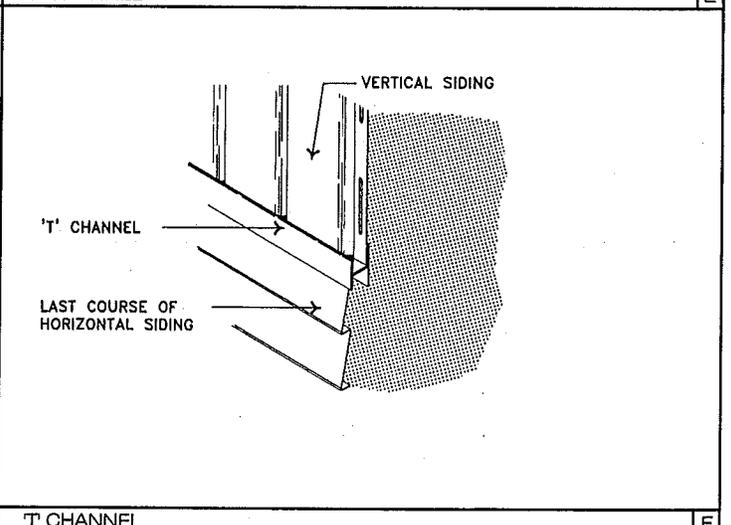
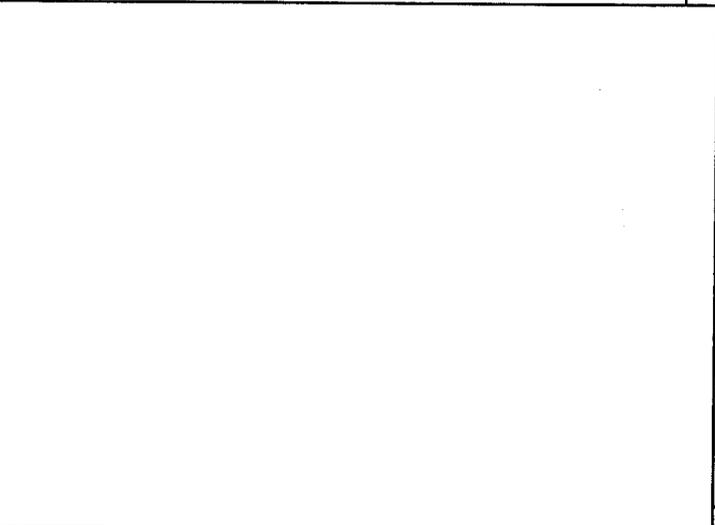
C



'J' CHANNEL AT RAKE OF GABLE

D 'J' CHANNEL

E



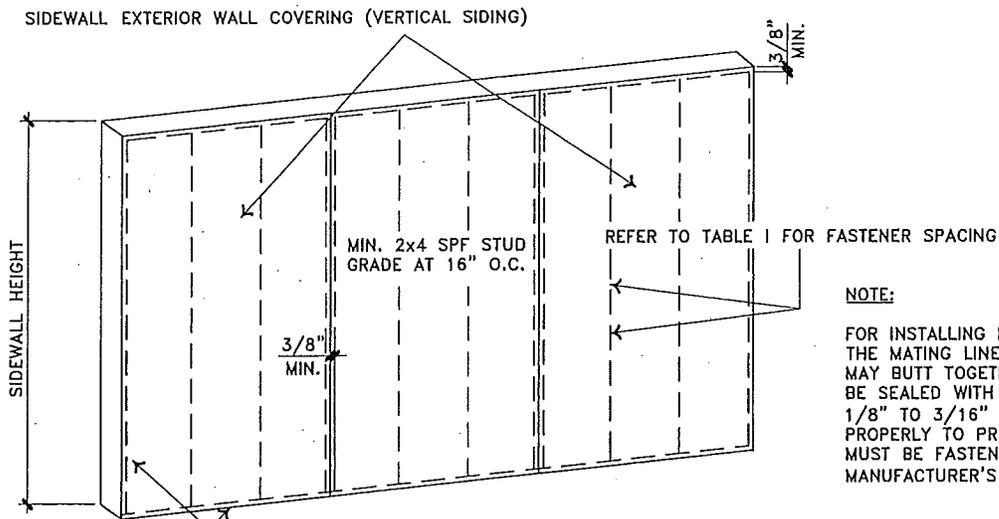
'T' CHANNEL

F

F

- NOTES:**
1. USE 3/8" OSB SHEATHING UNDER VERTICAL SIDING, FASTENED WITH 7/16" x 1 1/2" x 16 GA STAPLES AT 6" O/C EDGES AND FIELD.
 2. AS AN ALTERNATE TO THE 'J' CHANNEL AT RAKE, THE 1-PIECE METAL SOFFIT CAN BE SUBSTITUTED.
- (TEST REPORT NO. NTA 960918)

VERTICAL VINYL SIDING	
DRAWN BY: JBM DATE: 12/2/98 REV: -	HBOS Manufacturing, LP I - 4.34



NOTE:
 FOR INSTALLING HARDBOARD SIDING ACROSS THE MATING LINE, TWO SQUARE CUT EDGES MAY BUTT TOGETHER. EACH CUT EDGE MUST BE SEALED WITH PAINT. LEAVE A GAP OF 1/8" TO 3/16" AND CAULK THE GAP PROPERLY TO PREVENT LEAKS. EACH EDGE MUST BE FASTENED TO THE STUD PER MANUFACTURER'S INSTRUCTIONS.

REFER TO TABLE I FOR FASTENER SPACING

WITH 420 PLF EXTERIOR SHEARWALL USE 7/16" OSB SHEATHING THEN ADD THE HARDIPANEL.

USE NON-COMPOSITE FRAMING FOR WINDOWS AND DOORS IN WIND ZONE 2.

FASTENING REQUIREMENTS:
 BLOCKING MUST BE INSTALLED BETWEEN STUDS WHERE HARDIPANEL SIDING JOINTS WILL FALL FOR WOOD FRAMING. USE NOMINAL 2x4 LUMBER FASTENERS AND PLACE NO CLOSER THAN 3/8" FROM SHEET EDGES AND NO CLOSER THAN 2" FROM SHEET CORNERS.

JOINING METHODS:
 HARDIPANEL VERTICAL SIDING IS INSTALLED VERTICALLY TO WALLS WITH JOINTS OVER STUDS. HARDIPANEL STUCCO MUST BE INSTALLED WITH THE TROWEL TEXTURE SWEEPING UPWARD TO GIVE THE CORRECT STUCCO APPEARANCE. JOINTS ARE FASTENED BY ABUTTING EDGES AND OPTIONALLY COVERED BY LUMBER BATTENS OR CAULKED.

FASTENER TYPES AND SIZES:
 USE THE FASTENERS DESCRIBED IN TABLE I TO ATTACH HARDIPANEL VERTICAL SIDING.

SIZES:
 THICKNESS: 5/16"
 WEIGHT: 2.3 LBS./SQ. FT.
 SHEET SIZES: 4'x8', 4'x9', AND 4'x10'

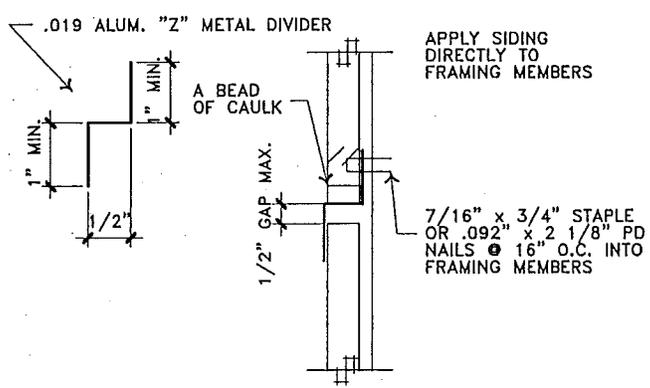
BASIC COMPOSITION:
 PORTLAND CEMENT, GROUND SAND, CELLULOSE FIBER, SELECTED ADDITIVES AND WATER. HARDIPANEL SIDINGS CONTAIN NO ASBESTOS, FIBERGLASS OR FORMALDEHYDE.

CUTTING FIBER-CEMENT PRODUCTS:
 HARDIPANEL SIDING CAN BE CUT WITH A HANDSAW, A POWER SAW, OR A CIRCULAR SAW EQUIPPED WITH A CARBIDE BLADE OR DRY DIAMOND BLADE. THE USE OF A GUILLOTINE OR THE SCORE AND SNAP METHOD IS A FAST AND EFFICIENT WAY TO CUT HARDIPANEL SIDING. HARDIE'S TUNGSTEN TIPPED KNIFE IS DESIGNED ESPECIALLY FOR THE SCORE AND SNAP METHOD.

VERTICAL HARDIPANEL SIDING

A

TABLE I				
WIND ZONE 1 ALT. FAST. WZ 1 .099" x 2 1/2" NAIL				
PRODUCT TYPE	THICKNESS	FASTENER	FAST. SPACING	STUD SPACING
HARDIPANEL	5/16"	4d COMMON NAIL x 1 1/2" LONG	8" O.C.	16" O.C.
WIND ZONE 2				
PRODUCT TYPE	THICKNESS	FASTENER	FAST. SPACING	STUD SPACING
HARDIPANEL	5/16"	.099" x 2 1/4" NAIL	4" O.C.	16" O.C.
WIND ZONE 3				
PRODUCT TYPE	THICKNESS	FASTENER	FAST. SPACING	STUD SPACING
HARDIPANEL	5/16"	6d COMMON NAIL x 2" LONG	5" O.C.	16" O.C.
HARDIPANEL	5/16"	.092" x 2" NAIL	5" O.C.	16" O.C.



HORIZONTAL JOINT APPLICATION

C

HARDIPANEL SIDINGS ARE PRIMED WITH AN OPAQUE ACRYLIC PAINT AND SHALL BE COVERED WITH A HIGH QUALITY, EXTERIOR GRADE ACRYLIC, LATEX, PVA, SEMIGLOSS OR FLAT PAINT.
 NER - 405 REPORT
 REFER TO TEST # IC 1270-94

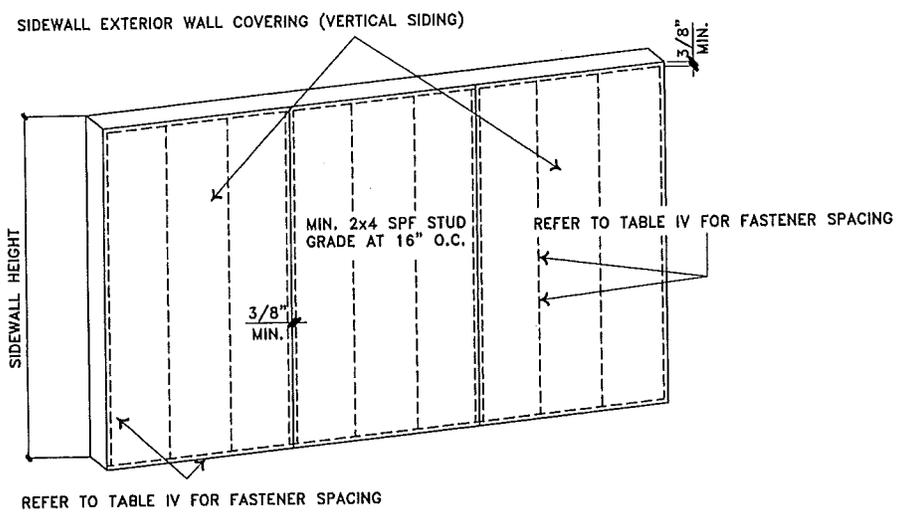
HARDIPANEL VERTICAL SIDING

DRAWN BY: JBM
 DATE: 12/2/98
 REV: 4/16/03

HBOS Manufacturing, LP
 I - 4.35

TABLE I CHART

B



ALL FASTENERS MUST BE CORROSION RESISTANT.

FASTENING REQUIREMENTS:
BLOCKING MUST BE INSTALLED BETWEEN STUDS WHERE SIDING JOINTS WILL FALL FOR WOOD FRAMING. USE NOMINAL 2x4 LUMBER FASTENERS AND PLACE NO CLOSER THAN 3/8" FROM SHEET EDGES AND NO CLOSER THAN 2" FROM SHEET CORNERS.

APPLY 2.5 MILS OF FINISH PAINT TO PRIMED SIDING.

FASTENER TYPES AND SIZES:
USE THE FASTENERS DESCRIBED IN TABLE IV TO ATTACH LOUISIANA PACIFIC VERTICAL SIDING.

CAULKING:
CAULK AROUND ALL OPENINGS SUCH AS WINDOW AND DOOR FRAMES, UTILITY FIXTURES AND WHERE SIDING BUTTS AGAINST ANOTHER MATERIAL, UNLESS JOINTS HAVE BEEN OTHERWISE WEATHERPROOFED. UTILIZE A NON-HARDENING, MILDEW RESISTANT EXTERIOR GRADE CAULKING MATERIAL.

JOINING METHODS:
ALL PANEL SIDING EDGES MUST BE LOCATED ON AND SUPPORTED BY FRAMING MEMBERS.

VERTICAL JOINTS:
BRING PANEL EDGES TO LIGHT CONTACT OR LEAVE A SLIGHT GAP. NEVER FORCE A PANEL EDGE TOGETHER.

HORIZONTAL JOINTS:
HORIZONTAL JOINTS MUST ALWAYS BE SUPPORTED BY CONTINUOUS FRAMING.

SIZES:
THICKNESS: 3/8"
SHEET SIZES: 4'x8' AND 4'x9'

HORIZONTAL JOINT APPLICATION

TABLE IV				
WIND ZONE 1				
PRODUCT TYPE	THICKNESS	FASTENER	FAST. SPACING	STUD SPACING
LOUISIANA PACIFIC HARDBOARD	3/8"	6d NAIL	6" EDGE 12" FIELD	16" O.C.
WIND ZONE 2				
PRODUCT TYPE	THICKNESS	FASTENER	FAST. SPACING	STUD SPACING
LOUISIANA PACIFIC HARDBOARD	3/8"	.092" x 2 3/8" GALVANIZED NAILS	6" EDGE 12" FIELD**	16" O.C. ***

** 12" O.C. PER FRAMING MEMBER STAGGERED IN FIELD STUDS.
*** STUDS DOUBLED WITHIN 3' OF CORNER.

LOUISIANA PACIFIC SIDINGS ARE PRIMED WITH AN OPAQUE ACRYLIC PAINT AND SHALL BE COVERED WITH A HIGH QUALITY, EXTERIOR GRADE ACRYLIC, LATEX, SEMIGLOSS OR OR FLAT PAINT. ALL SIDING SURFACES JOINTS AND EDGES.

REFER TO TEST REPORT NTA200206 AND NTA200206A

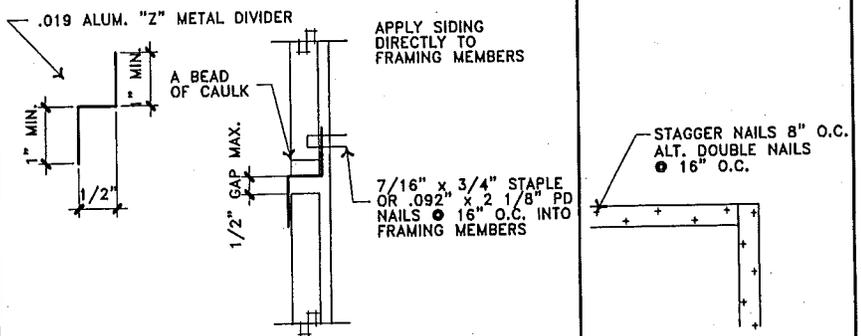


TABLE IV CHART

HORIZONTAL JOINT APPLICATION

TRIM

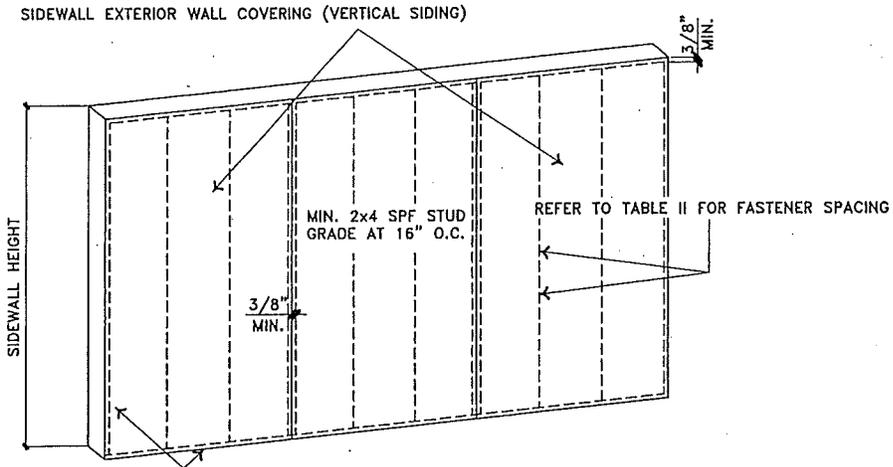
NOTE:

- FOR INSTALLING HARDBOARD SIDING ACROSS THE MATING LINE, TWO SQUARE CUT EDGES MAY BUTT TOGETHER. EACH CUT EDGE MUST BE SEALED WITH PAINT. LEAVE A GAP OF 1/8" TO 3/16" AND CAULK THE GAP PROPERLY TO PREVENT LEAKS. EACH EDGE MUST BE FASTENED TO THE STUD PER MANUFACTURER'S INSTRUCTIONS.

LOUISIANA PACIFIC HARDBOARD SIDING

DRAWN BY: JBM
DATE: 4/16/03
REV: -

HBOS Manufacturing, LP
1 - 4.35.1



REFER TO TABLE II FOR FASTENER SPACING

WITH 420 PLF EXTERIOR SHEARWALL, USE 7/16" OSB SHEATHING THEN ADD THE ABTCO SIDING.

USE NON-COMPOSITE FRAMING FOR WINDOWS AND DOORS IN WIND ZONE 2.

ALL FASTENERS MUST BE CORROSION RESISTANT.

FASTENING REQUIREMENTS:
BLOCKING MUST BE INSTALLED BETWEEN STUDS WHERE ABTCO SIDING JOINTS WILL FALL FOR WOOD FRAMING. USE NOMINAL 2x4 LUMBER FASTENERS AND PLACE NO CLOSER THAN 3/8" FROM SHEET EDGES AND NO CLOSER THAN 2" FROM SHEET CORNERS.

APPLY 2.5 MILS OF FINISH PAINT TO PRIMED SIDING.

FASTENER TYPES AND SIZES:
USE THE FASTENERS DESCRIBED IN TABLE II TO ATTACH ABTCO VERTICAL SIDING.

JOINING METHODS:
ALL PANEL SIDING EDGES MUST BE LOCATED ON AND SUPPORTED BY FRAMING MEMBERS.

VERTICAL JOINTS:
BRING PANEL EDGES TO LIGHT CONTACT OR LEAVE A SLIGHT GAP. NEVER FORCE A PANEL EDGE TOGETHER.

HORIZONTAL JOINTS:
HORIZONTAL JOINTS MUST ALWAYS BE SUPPORTED BY CONTINUOUS FRAMING. FASTENING AT LAP JOINT CAN BE MADE w/ (1) FASTENER THRU (2) LAYERS OF SHEATHING AS LONG AS THE FASTENER HAS 1" MIN. PENETRATION INTO THE FRAMING MEMBER.

SIZES:
THICKNESS: 7/16"
SHEET SIZES: 4'x8', 4'x9', AND 4'x10'

CAULKING:
CAULK AROUND ALL OPENINGS SUCH AS WINDOW AND DOOR FRAMES, UTILITY FIXTURES AND WHERE SIDING BUTTS AGAINST ANOTHER MATERIAL, UNLESS JOINTS HAVE BEEN OTHERWISE WEATHERPROOFED. UTILIZE A NON-HARDENING, MILDEW RESISTANT EXTERIOR GRADE CAULKING MATERIAL.

ABTCO VERTICAL SIDING

A

TABLE II				
WIND ZONE 1				
PRODUCT TYPE	THICKNESS	FAST.	FAST. SPACE	STUD SPACE
ABTCO HARDBOARD	7/16"	.092" x 1 7/8" NAIL	6" EDGE 12" FIELD	16" O.C.
WIND ZONE 2				
PRODUCT TYPE	THICKNESS	FAST.	FAST. SPACE	STUD SPACE
ABTCO HARDBOARD	7/16"	.092" x 2 1/4" NAIL	6" EDGE 12" FIELD	16" O.C.
WIND ZONE 3				
PRODUCT TYPE	THICKNESS	FAST.	FAST. SPACE	STUD SPACE
ABTCO HARDBOARD	7/16"	.092" x 2 1/4" NAIL	6" EDGE 12" FIELD	16" O.C.

ABTCO SIDINGS ARE PRIMED WITH AN OPAQUE ACRYLIC PAINT AND SHALL BE COVERED WITH A HIGH QUALITY, EXTERIOR GRADE ACRYLIC, LATEX, PVA, SEMIGLOSS OR FLAT PAINT.

REFER TO TEST # 94-982 (06/28/94)

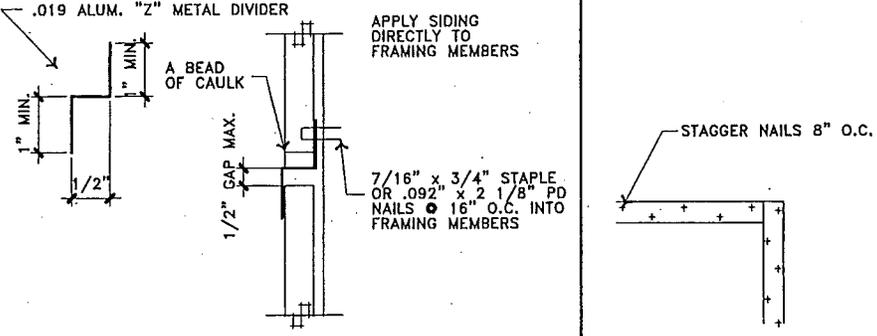


TABLE II CHART

B

HORIZONTAL JOINT APPLICATION

C

TRIM

D

NOTE:

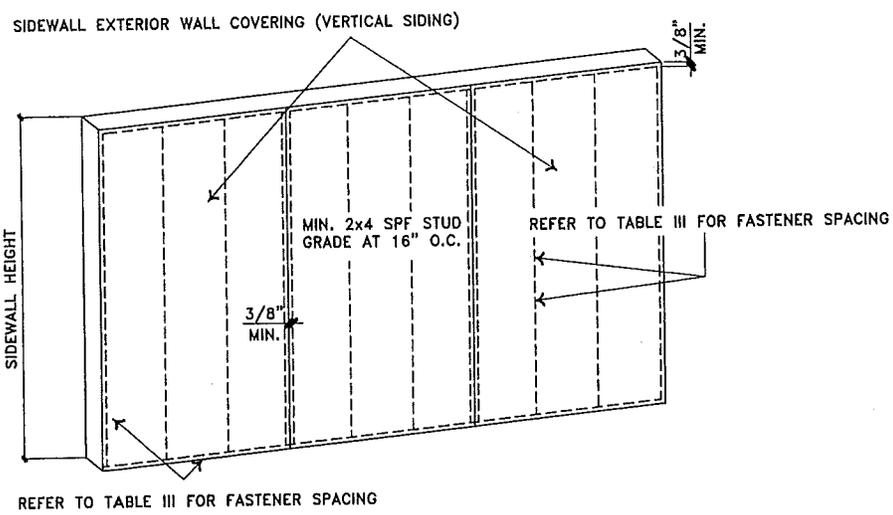
- FOR INSTALLING HARDBOARD SIDING ACROSS THE MATING LINE, TWO SQUARE CUT EDGES MAY BUTT TOGETHER. EACH CUT EDGE MUST BE SEALED WITH PAINT, LEAVE A GAP OF 1/8" TO 3/16" AND CAULK THE GAP PROPERLY TO PREVENT LEAKS. EACH EDGE MUST BE FASTENED TO THE STUD PER MANUFACTURER'S INSTRUCTIONS.

ABTCO VERTICAL SIDING

DRAWN BY: JBM
DATE: 12/2/98
REV: 4/16/03

HBOS Manufacturing, LP

I - 4.36



ALL FASTENERS MUST BE CORROSION RESISTANT.

FASTENING REQUIREMENTS:
BLOCKING MUST BE INSTALLED BETWEEN STUDS WHERE CLADWOOD HARDBOARD SIDING JOINTS WILL FALL FOR WOOD FRAMING. USE NOMINAL 2x4 LUMBER FASTENERS AND PLACE NO CLOSER THAN 3/8" FROM SHEET EDGES AND NO CLOSER THAN 2" FROM SHEET CORNERS.

APPLY 2.0 MILS OF FINISH PAINT TO PRIMED SIDING.

FASTENER TYPES AND SIZES:
USE THE FASTENERS DESCRIBED IN TABLE III TO ATTACH CLADWOOD VERTICAL SIDING.

CAULKING:
CAULK AROUND ALL OPENINGS SUCH AS WINDOW AND DOOR FRAMES, UTILITY FIXTURES AND WHERE SIDING BUTTS AGAINST ANOTHER MATERIAL, UNLESS JOINTS HAVE BEEN OTHERWISE WEATHERPROOFED. UTILIZE A NON-HARDENING, MILDEW RESISTANT EXTERIOR GRADE CAULKING MATERIAL.

JOINING METHODS:
ALL PANEL SIDING EDGES MUST BE LOCATED ON AND SUPPORTED BY FRAMING MEMBERS.

VERTICAL JOINTS:
BRING PANEL EDGES TO LIGHT CONTACT OR LEAVE A SLIGHT GAP. NEVER FORCE A PANEL EDGE TOGETHER.

HORIZONTAL JOINTS:
HORIZONTAL JOINTS MUST ALWAYS BE SUPPORTED BY CONTINUOUS FRAMING.

SIZES:
THICKNESS: 7/16"
SHEET SIZES: 4'x8' AND 4'x9'

HORIZONTAL JOINT APPLICATION

TABLE III				
WIND ZONE I				
PRODUCT TYPE	THICKNESS	FAST. TYPE	FAST. SPACE	STUD SPACE
CLADWOOD HARDBOARD	7/16" MIN.	6d NAIL	6" EDGE 12" FIELD	16" O.C.
CLADWOOD HARDBOARD	7/16" MIN.	.099" x 1 7/8" RING SHANK NAIL	6" EDGE 12" FIELD	16" O.C.

CLADWOOD SIDINGS ARE PRIMED WITH AN OPAQUE ACRYLIC PAINT AND SHALL BE COVERED WITH A HIGH QUALITY, EXTERIOR GRADE ACRYLIC, LATEX, PVA, SEMIGLOSS OR FLAT PAINT.

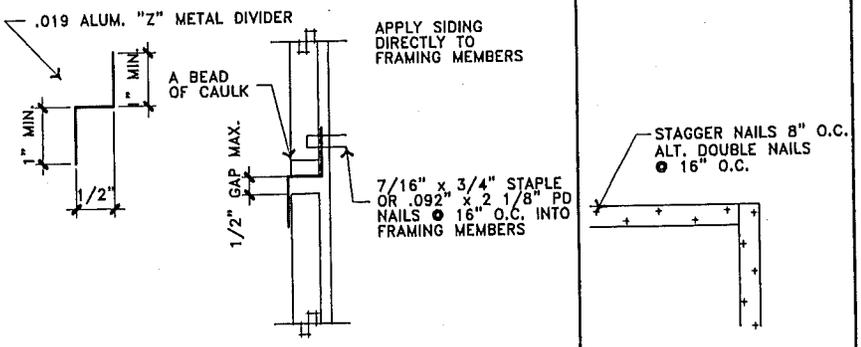


TABLE III CHART

NOTE:

- FOR INSTALLING HARDBOARD SIDING ACROSS THE MATING LINE, TWO SQUARE CUT EDGES MAY BUTT TOGETHER. EACH CUT EDGE MUST BE SEALED WITH PAINT. LEAVE A GAP OF 1/8" TO 3/16" AND CAULK THE GAP PROPERLY TO PREVENT LEAKS. EACH EDGE MUST BE FASTENED TO THE STUD PER MANUFACTURER'S INSTRUCTIONS.

CLADWOOD HARDBOARD

DRAWN BY: JBM
DATE: 12/2/98
REV: 4/16/03

HBOS Manufacturing, LP
1 - 4.37

30 GA. x 6 CONT. STRAP FASTENED TO SHEATHING AT 2" O.C. WITH 0.092" MIN. ROOFING NAILS.

ROOF SHEATHING

OVERHANG EXTENSION MADE FROM 2x6 BLOCKS 16" O.C. SPF STUD GRADE. INSTALL ONE-PIECE FASCIA SOFFIT COMBO PER PAGE I-4.31 (ALT. DETAIL 'B').

#8 x 3" WOOD SCREWS; (2) PER BAY FASTENED INTO 2x6.

1x6 SPF ANY GRADE

12" MAX.

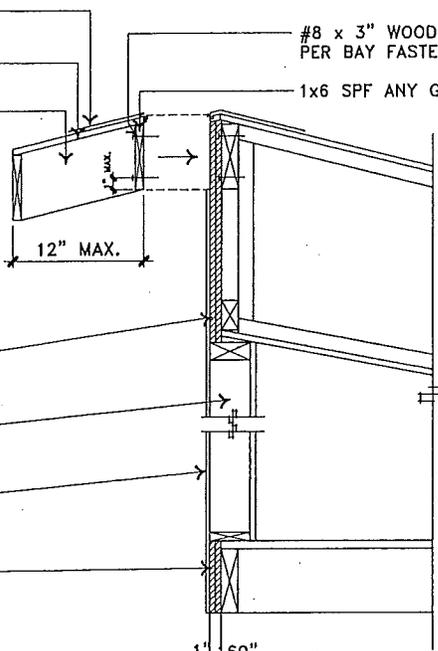
ROOF IS BUILT OUT TO MATCH 2x4 OR 2x6 SIDEWALL

2x4 OR 2x6 EXTERIOR WALL

EXTERIOR SIDING INSTALLED PER MANUFACTURERS INSTRUCTION

FLOOR IS BUILT OUT TO MATCH 2x4 OR 2x6 WALL

1' 60"



ADD-ON EAVE DETAIL

A

INSTALL UNDERLAYMENT AND SHINGLE ROOF

7/16" x 1" x 16 GA. STAPLES 16" O.C.

METAL DRIP EDGE/SOFFIT

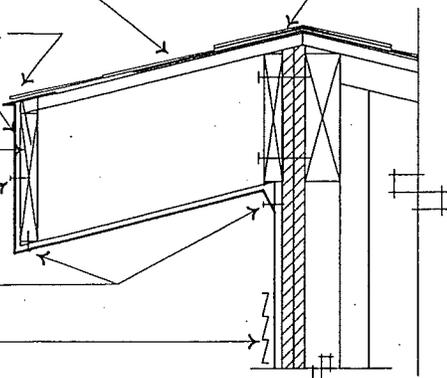
1x OR 2x EDGE RAIL

1" METAL SCREWS AS NEEDED.

1" METAL SCREWS AT ALL JOINTS

VINYL SIDING OR HARDBOARD SIDING.

RIDGE CAP



FASTEN WALLS TOGETHER WITH #10 x 4 1/2" SCREWS AT 18" O.C. (OPTION TO TOE-SCREW)

ENDWALL

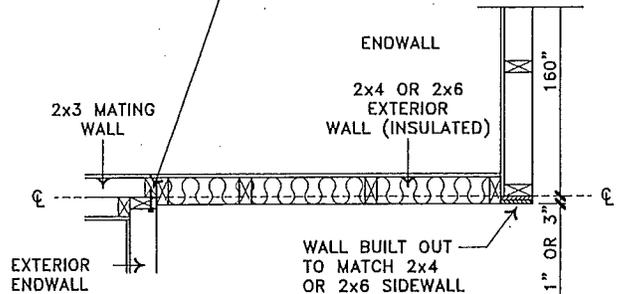
2x4 OR 2x6 EXTERIOR WALL (INSULATED)

2x3 MATING WALL

EXTERIOR ENDWALL

WALL BUILT OUT TO MATCH 2x4 OR 2x6 SIDEWALL

160"
1" OR 3"

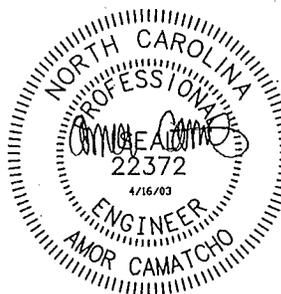


SOFFIT DETAIL

B

PLAN VIEW

C

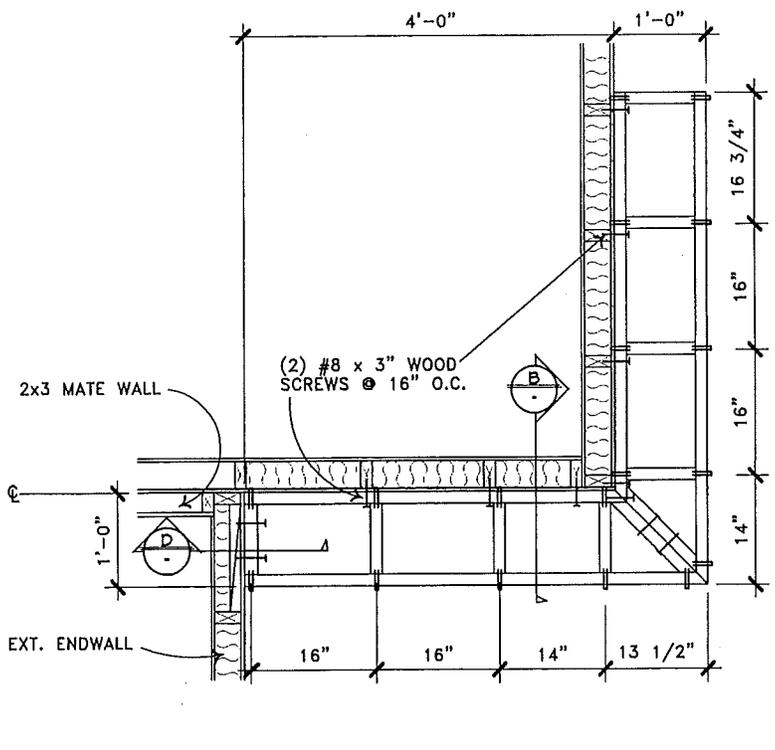


ADD-ON EAVE DETAIL
OFFSET BOX

DRAWN BY: JBM
DATE: 12/2/98
REV: 4/16/03
WIND ZONE: All

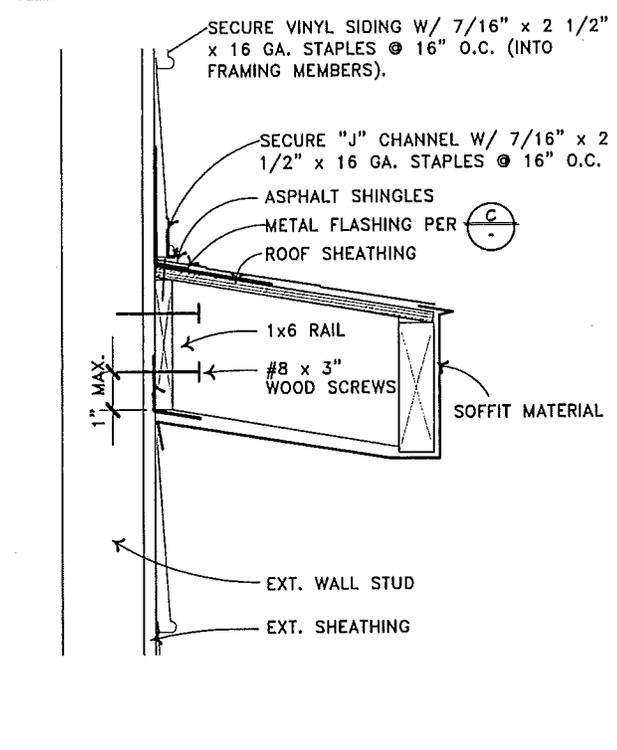
HBOS Manufacturing, LP

I - 4.38



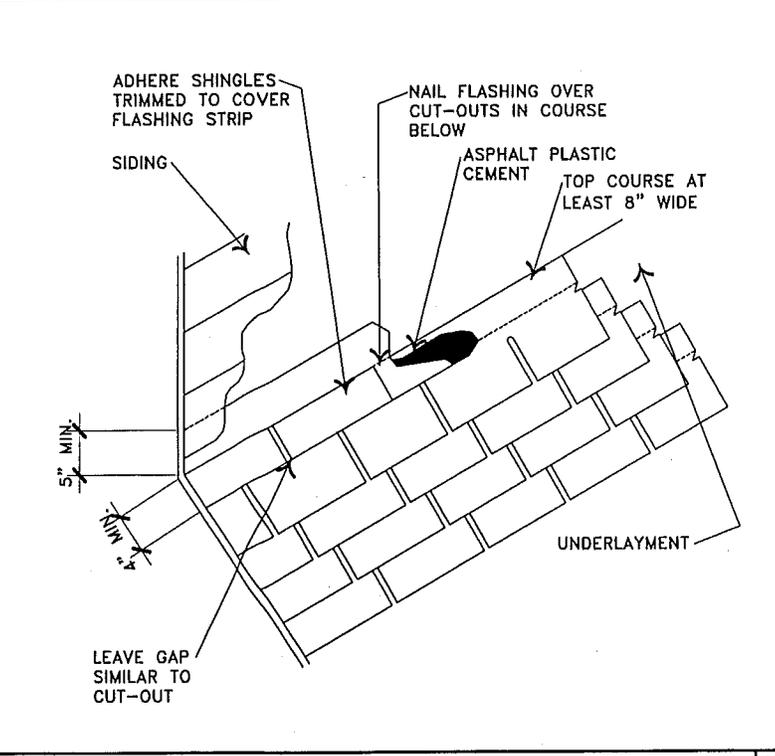
PLAN VIEW AT WRAP CORNER EYEBROW

A



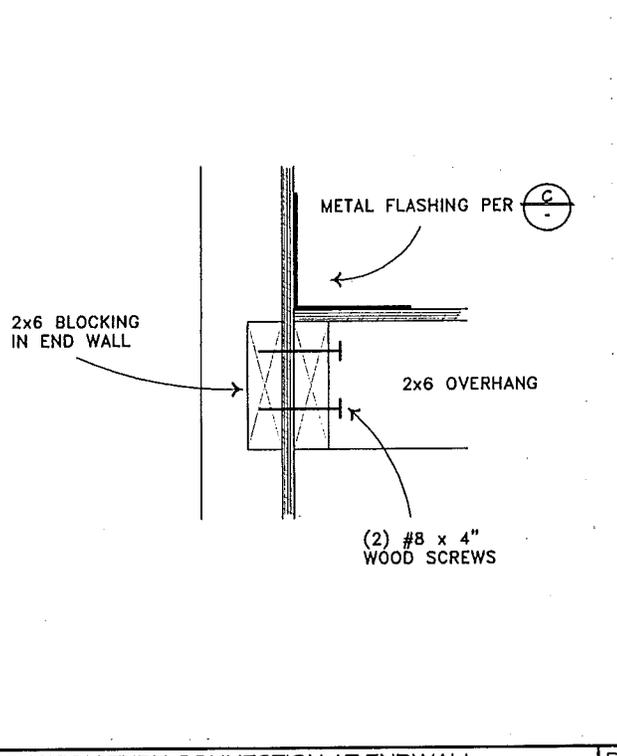
SECTION THRU WRAP CORNER EYEBROW

B



FLASHING DETAIL

C

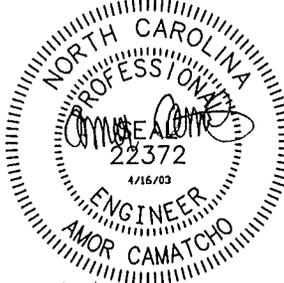


SECTION THRU CONNECTION AT ENDWALL

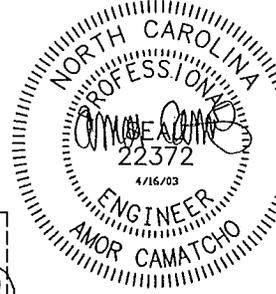
D

NOTES:

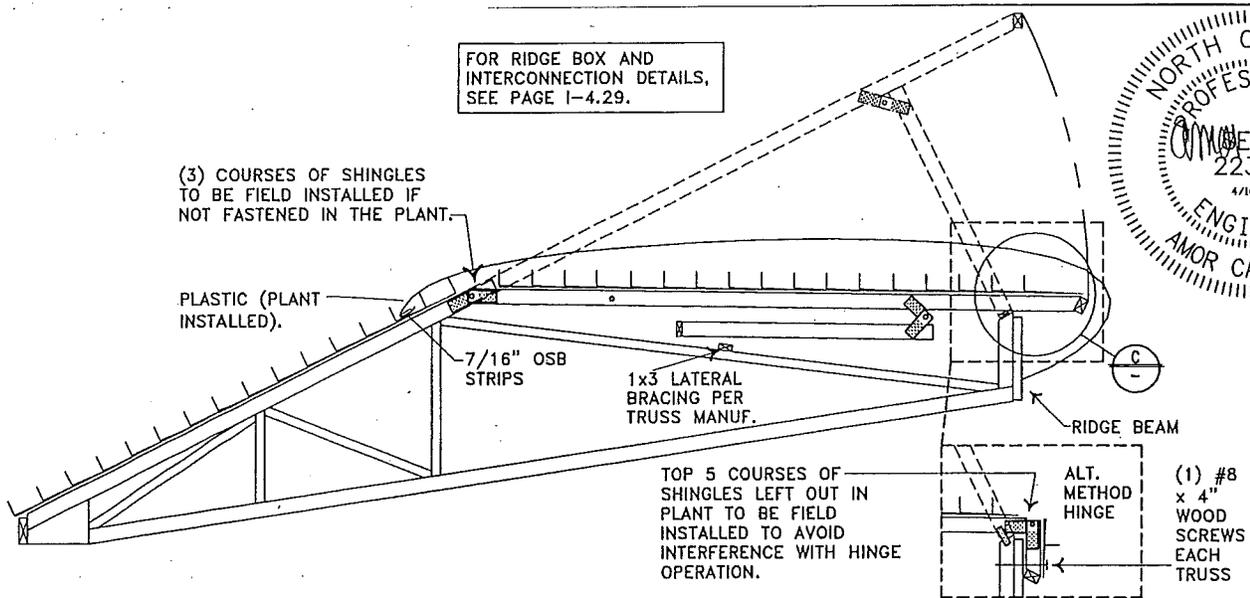
- CORNER EYEBROW IS TO BE CONSTRUCTED IN ONE PIECE IN THE PLANT AND INSTALLED ON SITE.



OFFSET BOX CORNER EYEBROW	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/2/98	
REV: 4/16/03	
I - 4.39	

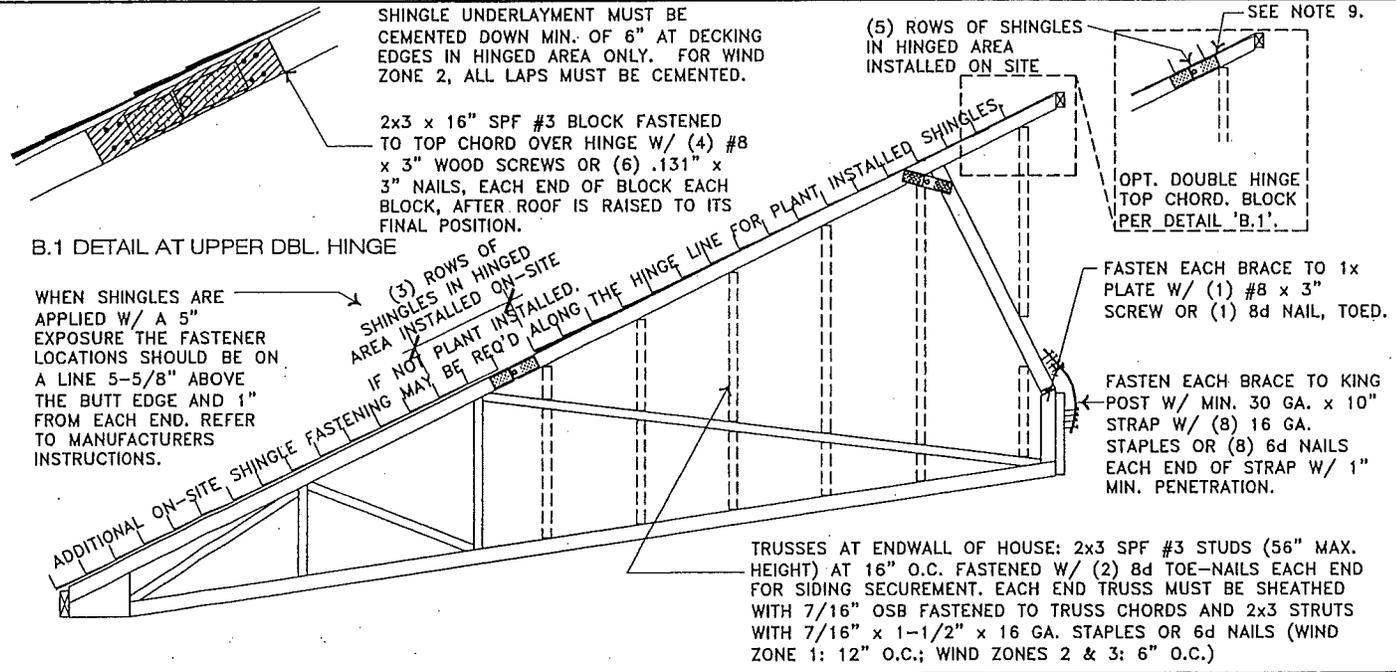


FOR RIDGE BOX AND INTERCONNECTION DETAILS, SEE PAGE I-4.29.



HINGED TRUSS IN LOWERED SHIPPING POSITION

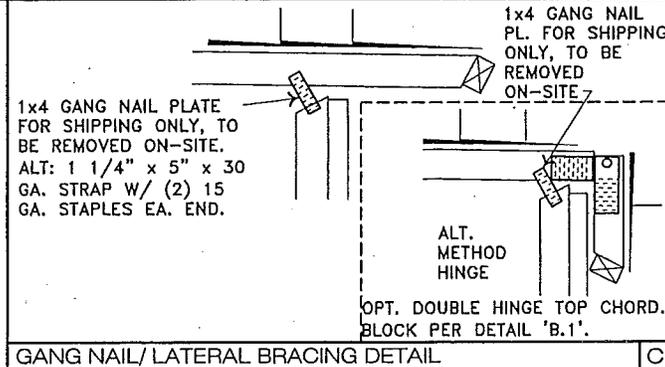
A



HINGED TRUSS IN RAISED SETUP POSITION

B

- NOTES:**
1. REMOVE ALL SHIPPING MATERIALS FROM ROOF AND MARRIAGE WALL.
 2. ENTIRE ROOF MUST BE RAISED SIMULTANEOUSLY TO PREVENT DISTORTION IN THE ROOF SYSTEM AND TO ALLOW FOR PROPER KING POST INSTALLATION. LIFTING POINTS TO BE A MAXIMUM OF 12 FT. O.C. ALONG THE LENGTH OF THE UNIT.
 3. FASTEN WEB BRACE TO KING POST PER DETAIL "B" ON PAGE I-4.40.
 4. INSTALL ALL REQUIRED ROOF VENTS AND ACCESSORIES PER EACH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 5. UNFOLD ROOF UNDERLAYMENT OVER TRUSS HINGE AND INSTALL THE SHIP-LOOSE PORTION OF THE ROOF SHINGLES.
 6. NO PENETRATION (FLUES OR VENT PIPES) IN HINGED AREA OF ROOF OTHER THAN STATIC ROOF VENTS.
 7. FOLLOW NORMAL SETUP PROCEDURES FOR ALL OTHER REQUIREMENTS.
 8. MAX. ROOF PITCH IS 7/12 FOR WIND ZONES 1 AND 6/12 FOR WIND ZONE 2 AND 3.
 9. ON SITE DECKING AT ALT. DOUBLE HINGE LOCATION: MIN. 18" WIDE 7/16" OSB DECKING (APA RATED 24/16) FASTENED W/ 10d NAILS OR .128" x 3" NAILS @ 4" O.C. FIELD & EDGES. FOR DECKING WIDTHS BETWEEN 18" AND 24", USE (2) H-CLIPS EACH BAY. SHINGLE UNDERLAYMENT IS INSTALLED ON DECKING AND CEMENTED DOWN @ 6" AT DECKING EDGES.



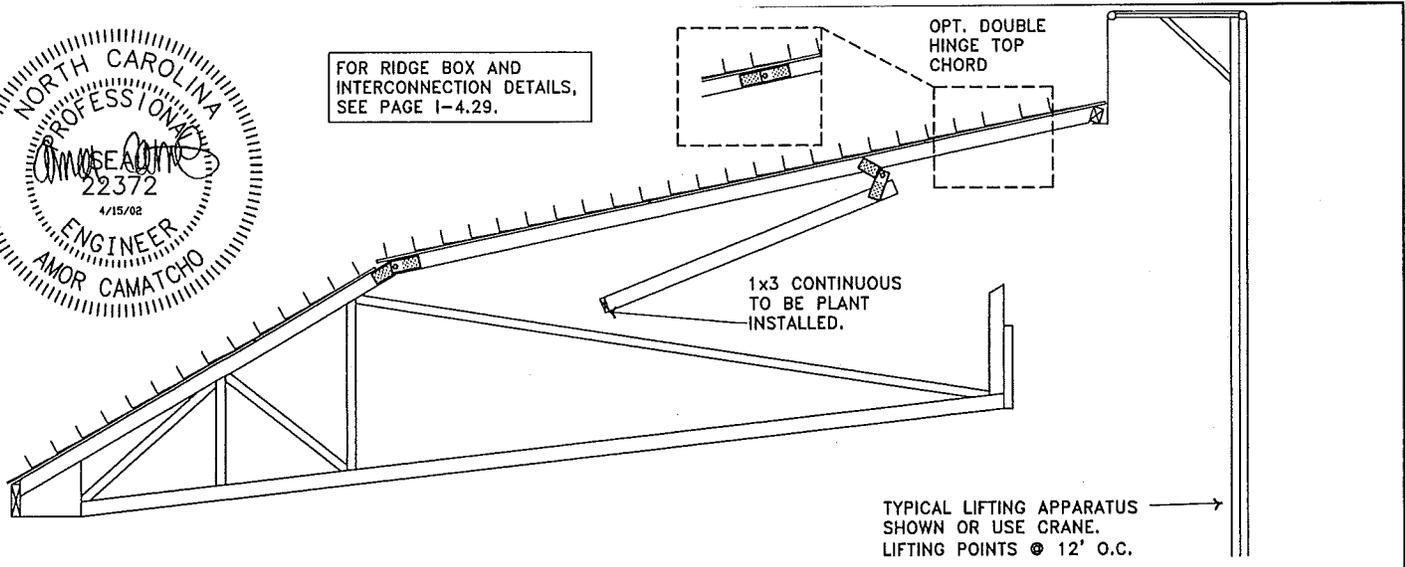
GANG NAIL/ LATERAL BRACING DETAIL

HINGED TRUSS DETAILS
(7/12 Max.)

DRAWN BY: RAJ DATE: 1/5/99 REV: 11/11/02 WIND ZONE: ALL	HBOS Manufacturing, LP I - 4.40
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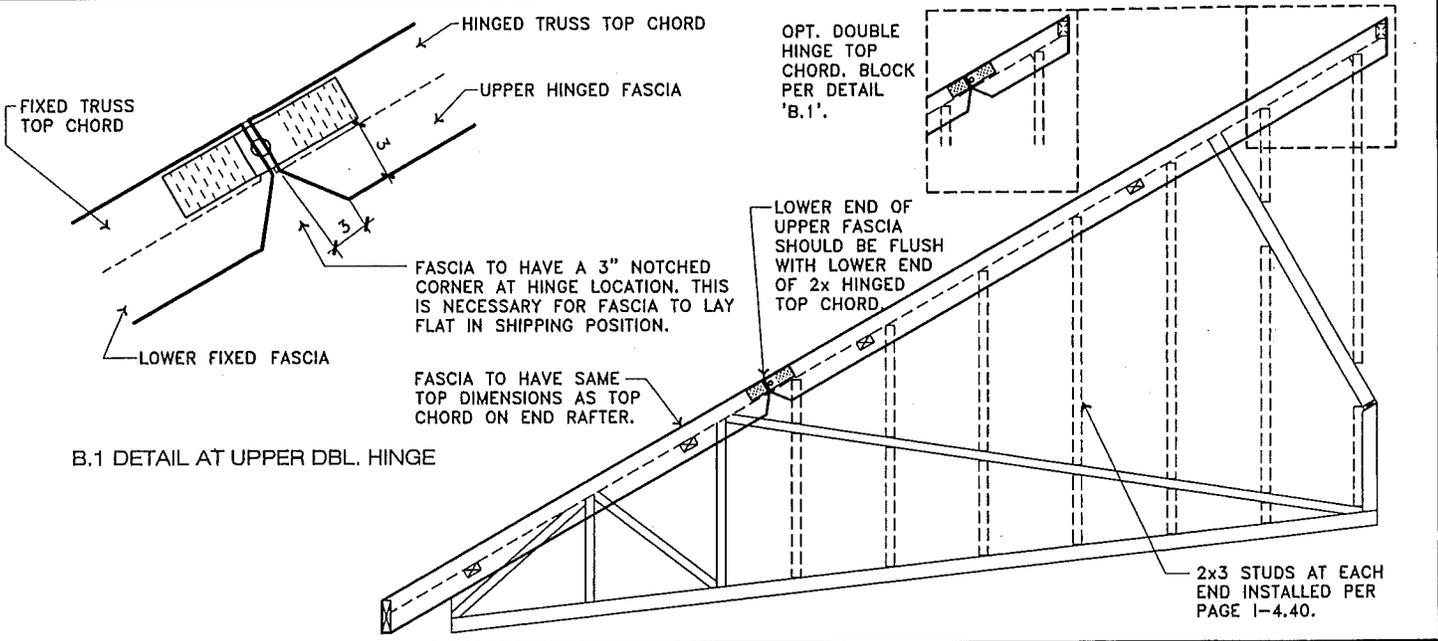


FOR RIDGE BOX AND INTERCONNECTION DETAILS, SEE PAGE I-4.29.



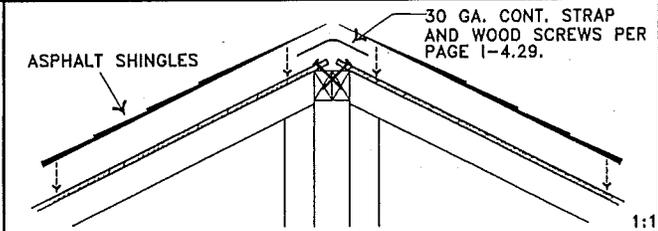
7800 McCLOUD ROAD, GREENSBORO, NC 27409

LIFTING OF HINGED TRUSS A

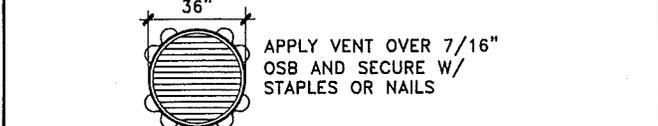


HINGED TRUSS IN RAISED SETUP POSITION B

- NOTES:**
1. REMOVE ALL SHIPPING MATERIALS FROM ROOF AND MARRIAGE WALL.
 2. ENTIRE ROOF MUST BE RAISED SIMULTANEOUSLY TO PREVENT DISTORTION IN THE ROOF SYSTEM AND TO ALLOW FOR PROPER KING POST INSTALLATION. LIFTING POINTS TO BE A MAXIMUM OF 12 FT. O.C. ALONG THE LENGTH OF THE UNIT.
 3. FASTEN WEB BRACE TO KING POST PER DETAIL "B" ON PAGE I-4.40.
 4. INSTALL ALL REQUIRED ROOF VENTS AND ACCESSORIES PER EACH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 5. UNFOLD ROOF UNDERLAYMENT OVER TRUSS HINGE AND INSTALL THE SHIP-LOOSE PORTION OF THE ROOF SHINGLES.
 6. FOLLOW NORMAL SETUP PROCEDURES FOR ALL OTHER REQUIREMENTS.
 7. MAX. ROOF PITCH IS 7/12 FOR WIND ZONE 1 AND 6/12 FOR WIND ZONES 2 AND 3.



RAIL AND ROOF CONNECTION AT MATE WALL C



ROUND END VENT (OPTIONAL) D

HINGED TRUSS DETAILS
(7/12 Max.)

DRAWN BY: RAJ DATE: 1/5/99 REV: 3/14/02 WIND ZONE: ALL	HBOS Manufacturing, LP I - 4.41
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Chapter 5 - Optional Features

Construction of Site Built Structures (Garages, Carports, Decks, Awnings etc.)

Site built structures and accessories shall be designed to support 100% of their own live and dead loads. Structures shall have fire separation as required by local codes. Structures shall be built and inspected in accordance with local codes.

Attached Garages

After market garages shall be installed per the manufacturer's instructions and to all applicable local codes and regulations. They must be supported independently of the factory built portion of the home. Electrical circuits in garage shall be provided with ground fault interruption per Chapter 5 of this manual.

NOTE!

Accessories and site built structures shall include but are not limited to garages, carports, awnings, decks, porches, stairs and steps. They shall be designed per, and inspected to local codes in effect at the time of construction. The attachment of accessories to your home may void your warranty and should be done only by properly trained personnel.

Skirting and Venting

If the home is to be perimeter skirted, ventilation of the crawlspace area under the home is also required. Ventilation openings must be provided in the enclosure on all sides with at least one ventilation opening provided at each corner enclosure. Use the following formula to calculate the minimum ventilation requirement for net free area:

$$\text{Net Free Area (sq. ft.)} = \frac{\text{length x width}}{300}$$

Insect screens on the ventilation openings can restrict free air area as much as 30-50%. Use an adequate number of ventilation openings to compensate for screening. Use vents that have provisions for keeping rain from entering the enclosed underside of the home. Louvered vents or vents with a hood or a shroud will perform this function.

Provide a minimum opening of 18" high x 24" wide for access to the crawl space (unless local codes require otherwise). If the cover for this opening is louvered or screened, it may count toward meeting ventilation requirements.

Basements

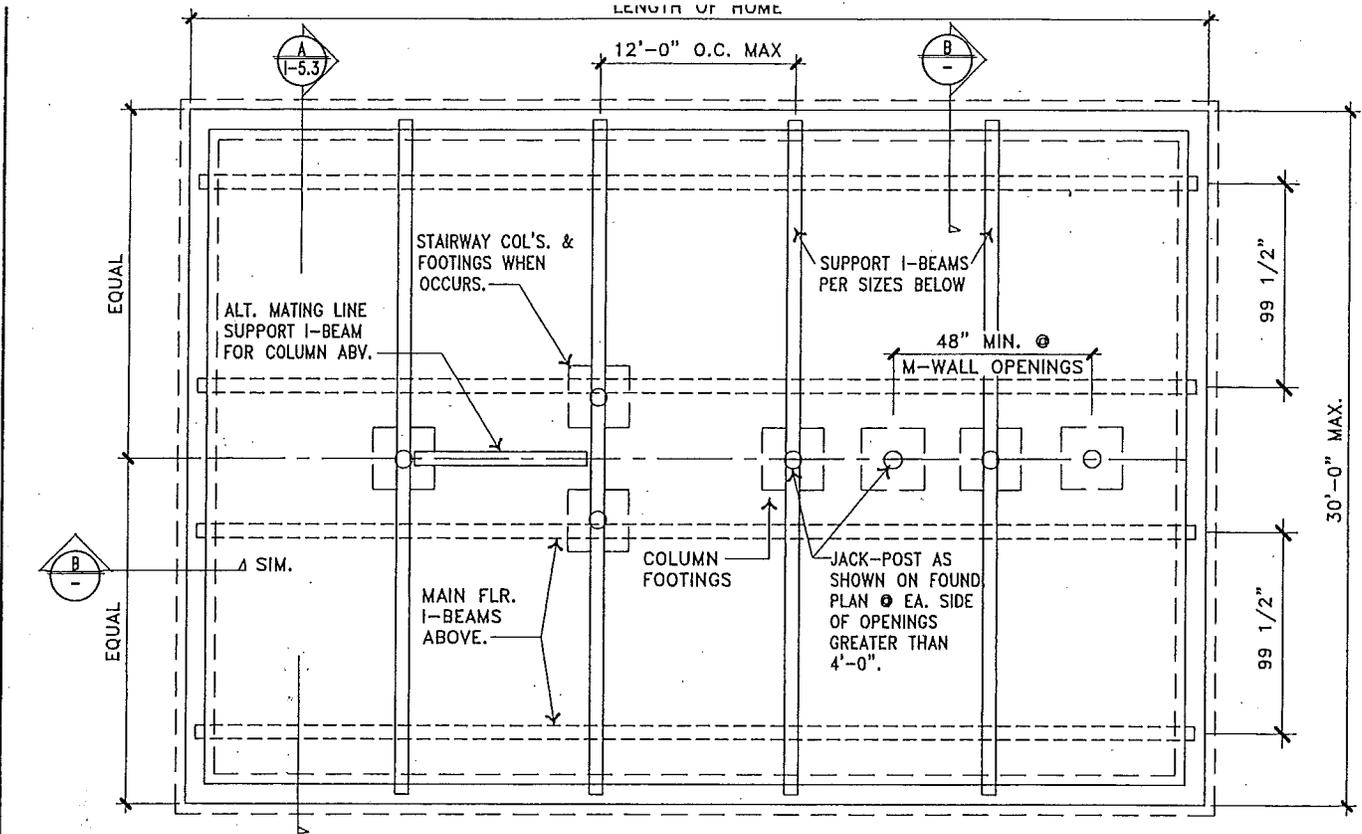
It is the responsibility of the retailer and/or owner to provide a basement design that has been engineered and sealed by a professional engineer or architect. Basement designs shall adhere to local building codes in effect at time of construction and shall be approved by the authorities having jurisdiction. Damp-proofing and foundation drains shall be in accordance with local codes.

Use the basement design details on pages I-5.2 and I-5.3 of this manual for reference only. The basement design and foundation must provide proper support for the home according to the pier loading and spacing requirements specified on pages I-3.6 and I-3.7 of this manual. Marriage wall columns on either side of openings greater than 48" must be supported according to page I-3.8. This home's electrical, mechanical and plumbing systems shall not be altered in any way, nor shall the floor framing and chassis system be altered in any way.

Stair construction at basements must comply with the model and local codes for widths, clearances, headroom, landings, fire protection, fire separation, smoke detectors, egress requirements etc. Stairs shall be independently supported and shall not rely on the manufactured home in any way for support. Guardrails and handrails at the basement access location shall be installed on site and shall be in accordance with all applicable codes. Exterior type door and hardware must be installed per manufacturer's installation instructions shipped with home.

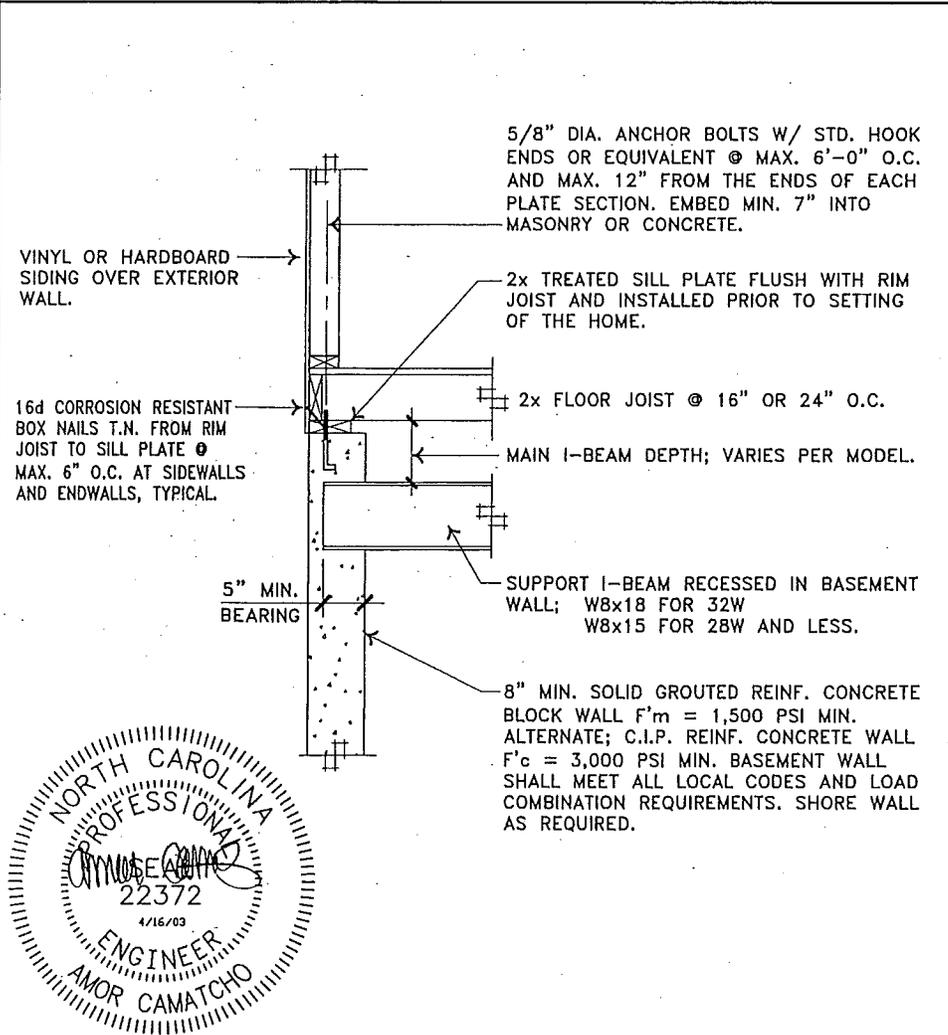
Retaining Wall Designs

Where lateral earth and soil pressure conditions are introduced from backfill installations, the retaining wall design shall be in accordance with local jurisdiction and when required be designed by a professional engineer or architect. Due to the numerous variations and local conditions involved in backfill/retaining wall design, the home manufacturer will not assume responsibility for design, construction, or approval thereof.



TYPICAL BASEMENT PLAN LAYOUT

1:1
A



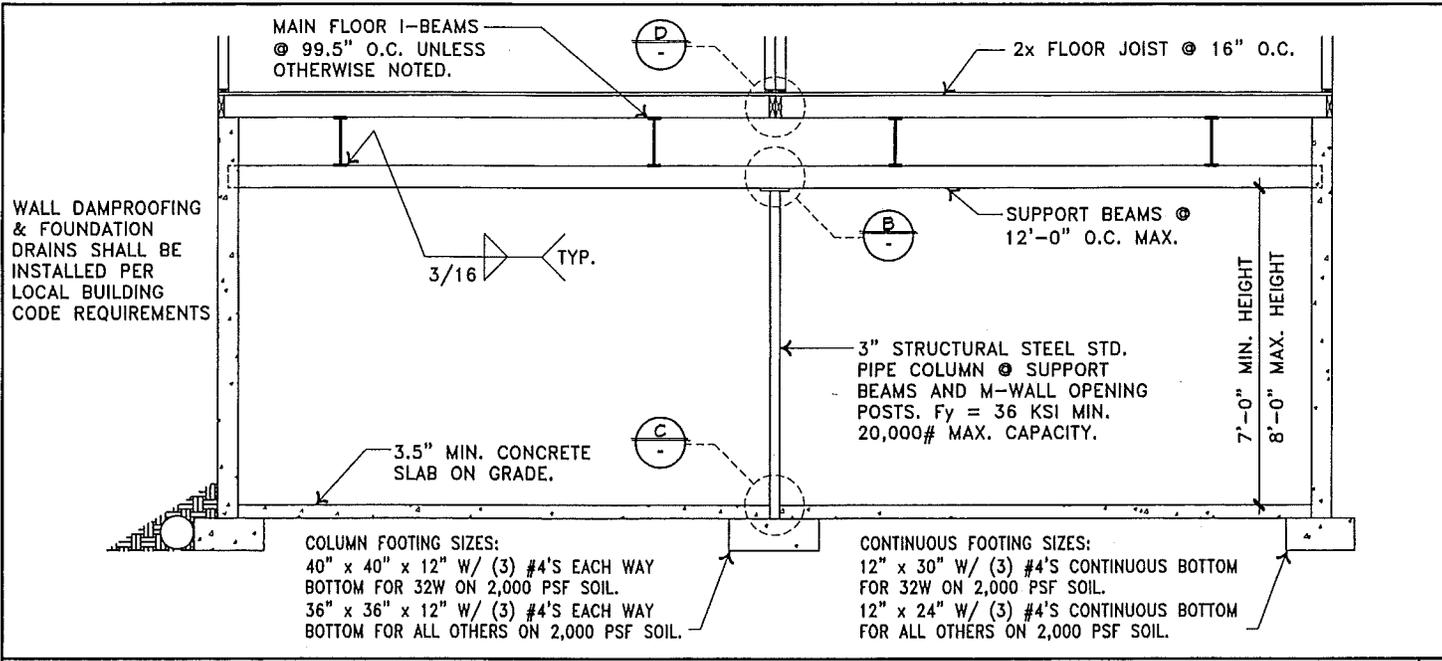
SILL PLATE AND BASEMENT WALL DETAIL

- NOTES:**
1. DUE TO VARIANCES IN LOCAL CODES, SOIL CONDITIONS AND FROST LEVELS, ALL BASEMENT WALLS AND FOOTINGS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER OR ARCHITECT AND APPROVED BY THE LOCAL BUILDING CODE OFFICIALS.
 2. WALL DAMPROOFING AND FOUNDATION DRAINS SHALL BE INSTALLED PER THE LOCAL BUILDING CODE REQUIREMENTS.
 3. THE FOLLOWING CONDITIONS APPLY TO PAGES I-5.2 AND I-5.3 UNLESS OTHERWISE NOTED:
 - 140" MIN./180" MAX. BOX WIDTH WITH 12" MAX. ROOF OVERHANG
 - 99 1/2" MAIN I-BEAM SPACING
 - 7'-6" MAX. SIDEWALL HEIGHT
 - 6/12 MAX. ROOF PITCH
 - 30 PSF MAX. ROOF LIVE LOAD
 - WIND ZONE 1 REQUIREMENTS
 4. REFER TO MODEL SPECIFIC BASEMENT FOUNDATION DIAGRAM FROM MANUFACTURER FOR LOCATION OF SUPPORT BEAMS AND COLUMNS AT MARRIAGE WALL OPENINGS AND STAIRWAYS.
 5. FOR SUPPORT BEAM LOADS, SEE PAGES I-3.6 AND I-3.7 FOR SIMILAR PIER LOADS.

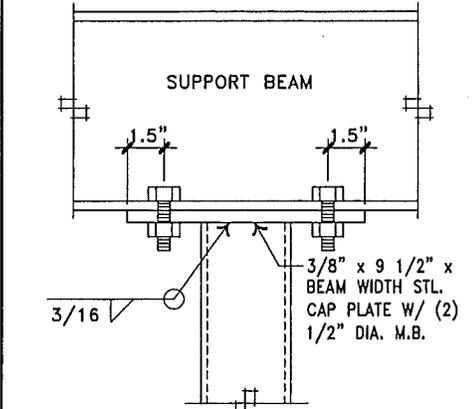
TYPICAL BASEMENT DETAILS

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

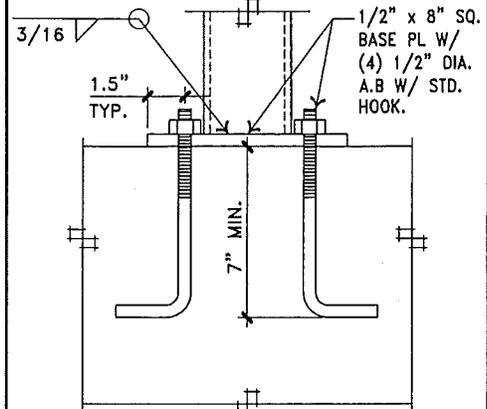
HBOS Manufacturing, LP
I-5.2



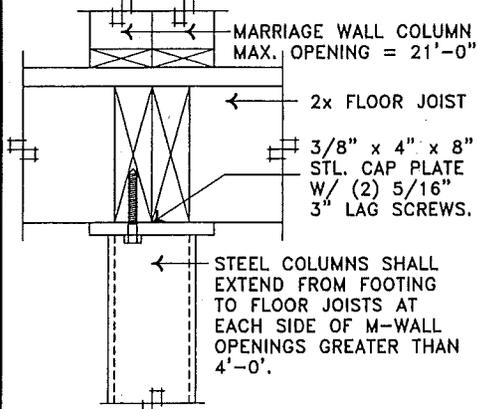
TYPICAL BASEMENT CROSS SECTION A



A CAP PLATE DETAIL

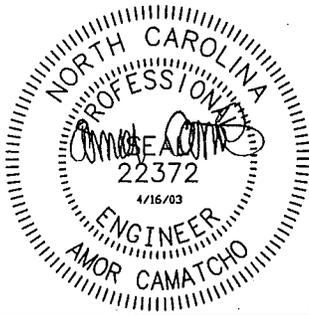


B BASE PLATE DETAIL



C POSTS AT MARRIAGE WALL COLUMNS D

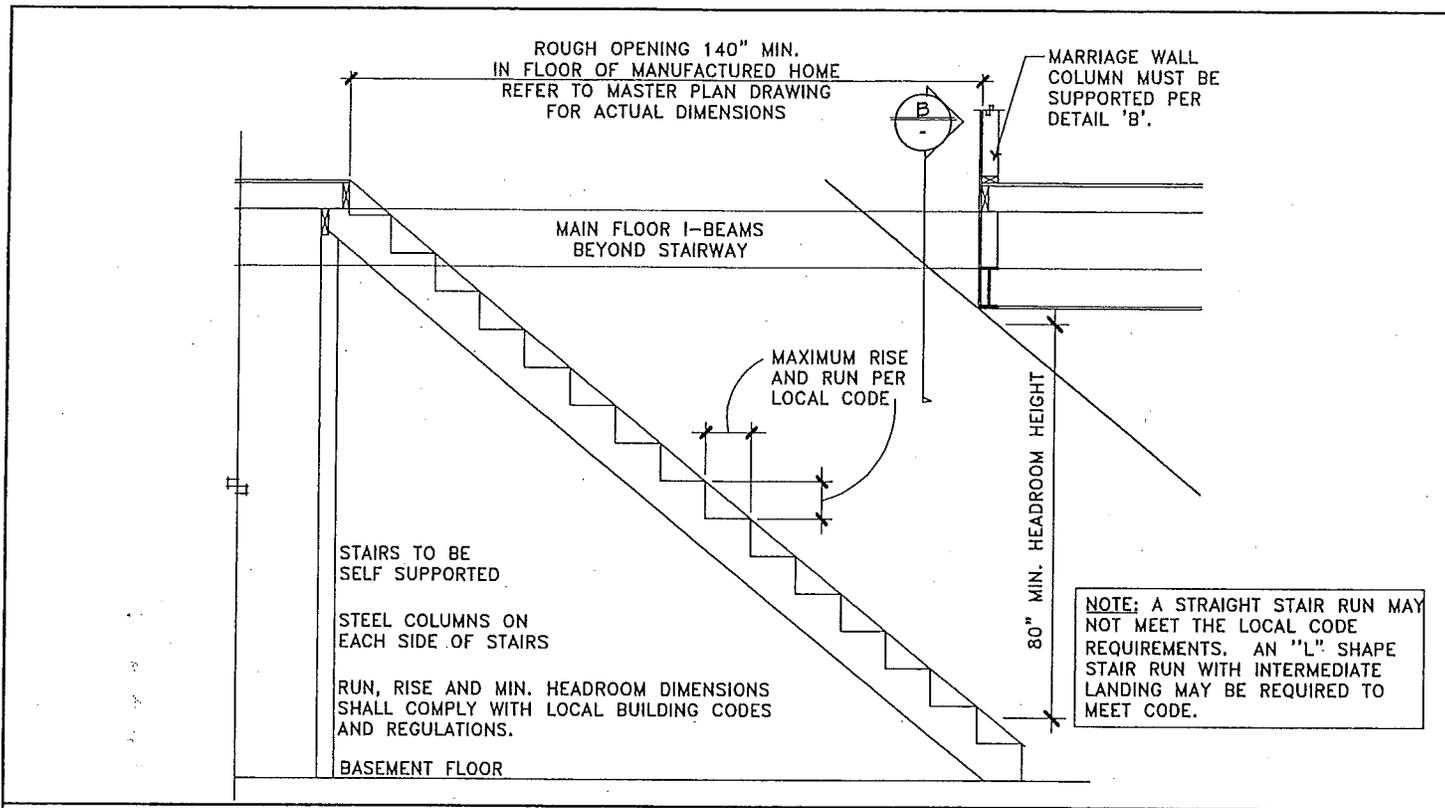
- NOTES:
1. ALL DETAILS NOT NOTED SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER OR ARCHITECT AND APPROVED BY THE LOCAL BUILDING CODE OFFICIALS.
 2. SUPPORT ALL WATING WALL COLUMNS TO SUPPORT BEAM BELOW WITH 3" DIA. STEEL COLUMN OR (2) 4x4 SPF #2 POST, OR USE FULL HEIGHT BASEMENT COLUMN.
 3. FOR GENERAL BASEMENT NOTES, SEE PAGE 1-5.2.



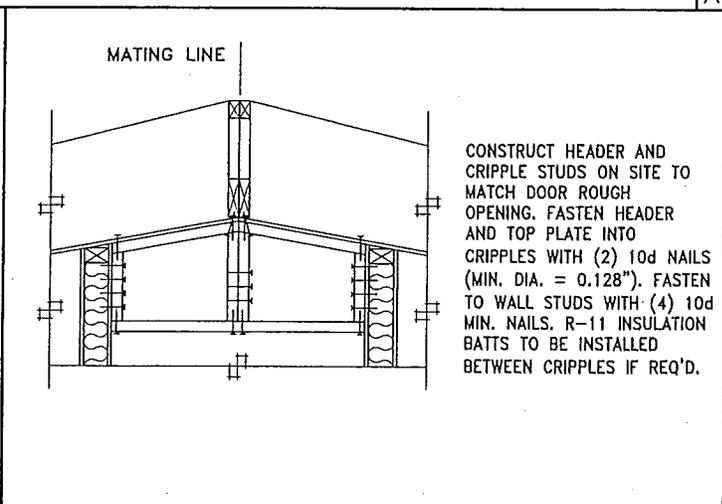
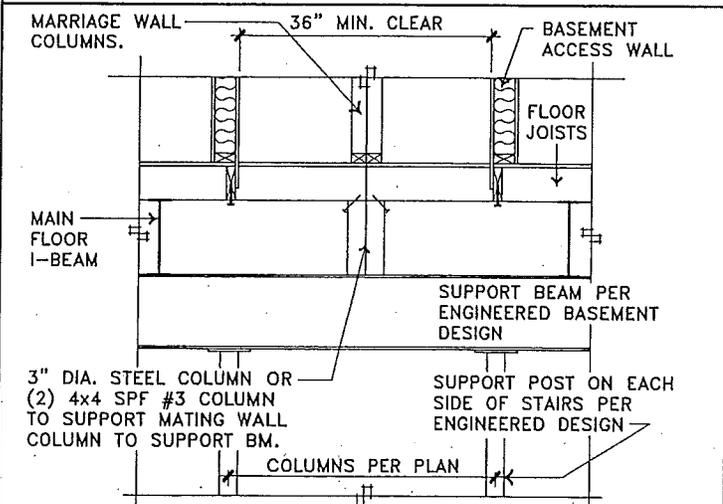
TYPICAL BASEMENT DETAILS

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
1 - 5.3

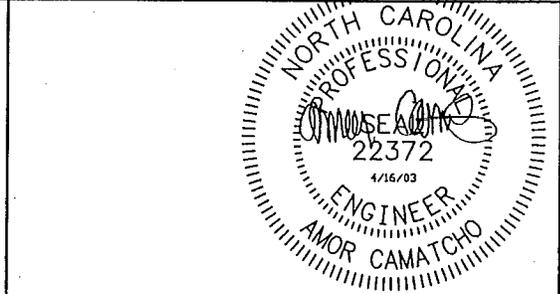


BASEMENT ACCESS A



MARRIAGE WALL COLUMN SUPPORT B **HEADER DETAIL** C

- NOTES:**
1. THE BASEMENT AND FOUNDATION SHALL BE DESIGNED BY ANOTHER PROFESSIONAL ENGINEER OR ARCHITECT AND APPROVED BY LOCAL BUILDING CODE OFFICIALS. ALL REGULATIONS REGARDING FIRE SEPARATION, EGRESS, SMOKE DETECTORS, STAIR CONSTRUCTION, CLEARANCES, GUARDRAILS, HANDRAILS, ETC. SHALL BE STRICTLY COMPLIED WITH.
 2. THE STAIRCASE AND MIN. HEADROOM HEIGHT DIMENSIONS SHALL COMPLY WITH ALL LOCAL CODES AND REGULATIONS.
 3. THE HOME'S ELECTRICAL, MECHANICAL, AND PLUMBING SYSTEMS SHALL NOT BE ALTERED ON-SITE IN ANY MANNER. THE HOMES CHASSIS AND FLOOR FRAMING SHALL NOT BE CUT OR OTHERWISE ALTERED.
 4. STAIR CONSTRUCTION AT BASEMENT ACCESS MUST BE INDEPENDENTLY SUPPORTED AND SHALL NOT RELY ON THE FLOOR FRAMING OF THE MANUFACTURED HOME FOR SUPPORT.
 5. BASEMENT CONSTRUCTION MUST BE DESIGNED BY OTHERS AND MUST BE INSPECTED/APPROVED BY LOCAL JURISDICTION.
 6. AN INTERIOR TYPE DOOR AND HARDWARE MUST BE INSTALLED PER INSTALLATION INSTRUCTIONS. WHICH WILL BE SHIPPED WITH HOME.
 7. ALL MARRIAGE WALL COLUMNS ON EITHER SIDE OF OPENINGS GREATER THAN 4 FEET MUST BE SUPPORTED. DESIGN BASEMENT COLUMNS TO WITHSTAND THE LOADS LISTED ON PAGE 1-3.8 OF THIS MANUAL.



**NOTCHED FLOOR BASEMENT
OPENING DETAILS**
Stairwell Splits Mating Line

DRAWN BY: JBM
DATE: 11/30/98
REV: 4/16/03

HBOS Manufacturing, LP
1-5.4

Chapter 6 - Mechanical

Clothes Dryer Vent

Your clothes dryer must exhaust to the exterior of the home (or to the outside of any perimeter skirting installed around it) through a moisture-lint exhaust system, as shown on page 6.6. Vent openings are located in either the wall or the floor. After the duct is installed, seal the openings, both inside and outside. Follow the dryer manufacturer's instructions for installing the exhaust system.

IMPORTANT

Do not let the exhaust system end under the home where excess moisture or flammable material can accumulate.

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

Comfort Cooling Systems

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

Air Conditioners

The air distribution system in this home has been designed for a central air conditioning system. Equipment installed on site must not exceed the rating shown on the home's compliance certificate.

The home's electrical distribution panel may contain optional factory installed circuits for air conditioning. The maximum full load ampere draw for the desired air conditioning unit must not exceed the circuit rating shown.

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

Any field-installed wiring beyond the junction box must include a fused disconnect located within sight of the condensing unit. The maximum fuse size is marked on the condenser data plate. Local codes will determine the acceptability of the air conditioning equipment, rating, location of disconnect means, fuse type branch circuit protection, and connections to the equipment. 'A' coil air conditioning units must be compatible and listed for use with the furnace in the home. Follow the air conditioner manufacturer's instructions.

If a remote (self-contained, package) air conditioner (cooling coil and blower located outside the home) is to be connected to the heating supply duct, install an automatic damper between the

furnace and the home's air duct system, and install another automatic damper between the remote unit and the home's air duct system. Secure the duct leading from the remote unit to the home and do not allow it to touch the ground. Insulate ducts with material having an 'R' value of no less than R-4, and a perm rating of no more than 1. Connect the duct carrying air to the home to the main duct at a point where there are approximately as many registers forward of the connection as there are to the rear. Locate the return air duct in the center of the home.

Do not cut or damage floor joists. Replace insulation removed during the installation, and seal the bottom board around the duct connections.

Do not allow the condensate drain line to terminate under the home. Direct all condensation runoff **away from the home** by connecting a hose to the equipment runoff outlet or by other means specified by the equipment manufacturer.

Window Air Conditioner Installation

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

CAUTION!

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

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

Heat Pumps

Install heat pumps according to the manufacturer's instructions.

Range, Cook Top and Oven Venting

If your home is equipped with a combination range (cook top)/grill or oven that requires its own exhaust so that it does not exit under the home. Connect flexible metallic duct between the elbow protruding from the floor and the termination fitting, and support it per the manufacturer's installation instructions.

Furnace Deration

If your home is located above 2,000 feet above sea level or as indicated in the manufacturer's instructions, your gas furnace must be derated 4% each 1,000 feet above sea level for the altitude. This must be done by a qualified service person. A licensed technician may be required. Check with your local authorities.

CAUTION!

Failure to derate the furnace can cause the furnace to overheat, operate poorly and cause excessive sooting. Dangerous levels of carbon monoxide could accumulate in the home.

Ceiling Fans

To reduce the risk of injury, install ceiling fans with the trailing edges of the blades at least 6'-4" above the finished floor. Follow manufacturer's installation instructions (See page I-6.7).

Hearth Extension for Fireplace at the Marriage Line

Follow the fireplace manufacturer's instructions for the site installed hearth extension when the fireplace is flush with the marriage line (Marco model # A36ST).

IMPORTANT

Fireplace manufacturer's instructions must be followed and will be shipped with the home.

1. After floor sections are properly attached at the marriage line, install the metal safety strips provided by the fireplace manufacturer (shipped loose with home).
2. Hearth shall extend no less than 16" from face of fireplace and shall be at least 46" in width and extend at least 8" beyond each side of the fireplace opening.
3. Use Marco hearth extension HE-36 or an equivalent layer of non-combustible inorganic material with a thermal conductivity (K) of .84 or less per inch of material thickness. Refer to page 12 of attached fireplace manufacturer's installation instructions.
4. Fasten hearth extension securely to floor decking to prevent shifting and seal the gap between the fireplace frame and the hearth extension with a non-combustible material.

Fireplace and Wood Stove Chimneys and Air Inlets

Fireplace and wood stoves require on site installation of additional sections of approved listed chimney pipe, a spark arrestor and a rain cap assembly.

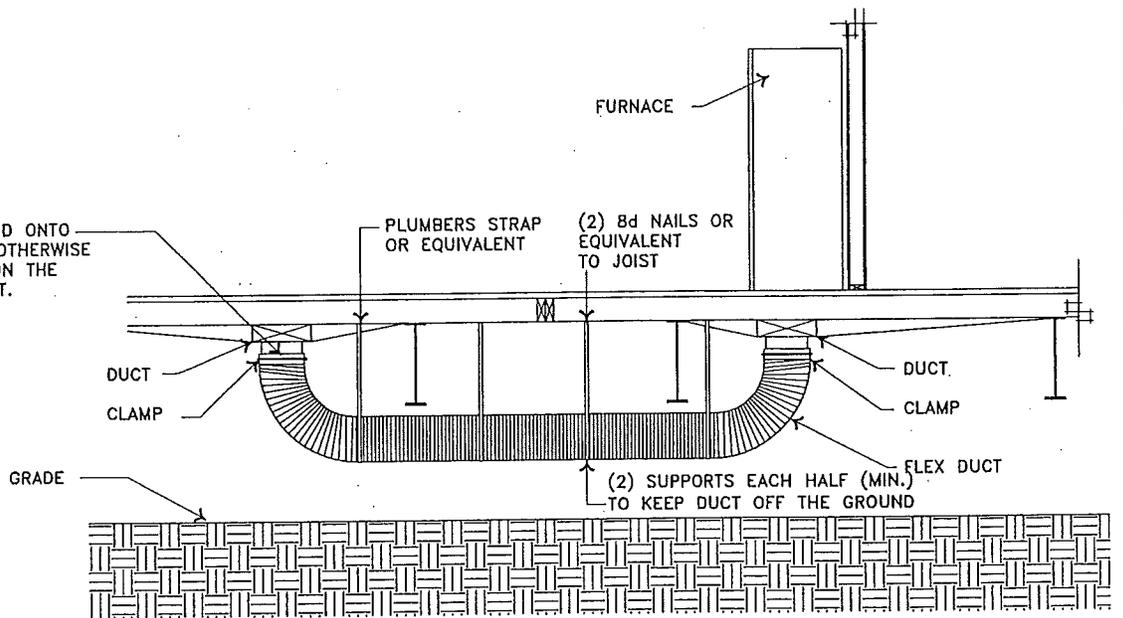
Minimum extension - To assure sufficient draft for proper operation, extend the finished chimney at least 3 ft above the highest point where it penetrates the roof and at least 2 ft higher than any surface within 10 ft of the chimney. The installer may have to provide an additional section of chimney pipe if required by local codes.

Required components - The required components of a correctly installed chimney are as shown on manufacturer's installation instructions.

Assembly and sealing sequence - Assemble and seal your fireplace or wood stove chimney per fireplace manufacturer's installation instructions.

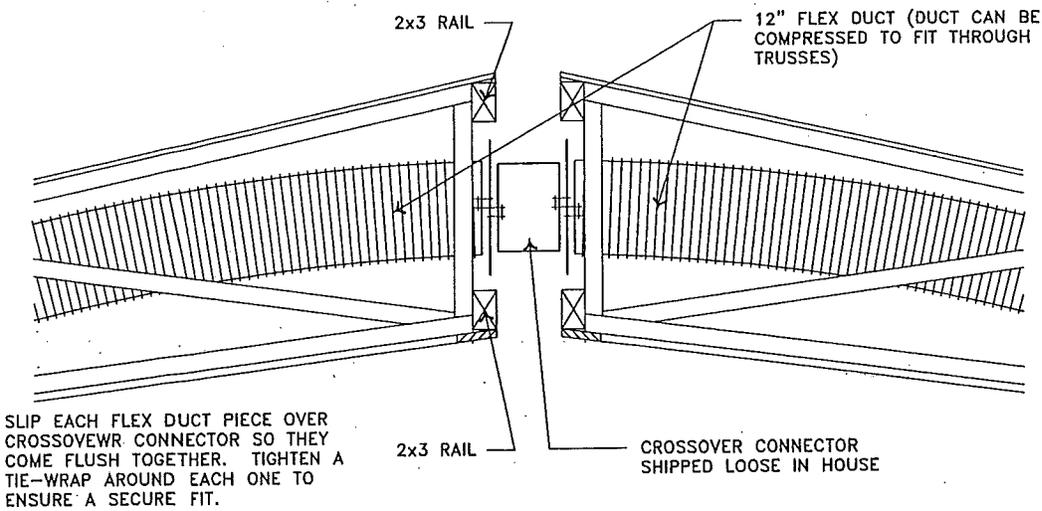
Combustion air duct inlets - Combustion air intake ducts end just below the bottom covering of the floor. You must extend them to the outside when your home has a basement. These added ducts are supplied or may be purchased at your local hardware store or home center. The fireplace manufacturer's instructions for installing combustion air ducts are in the fireplace/stove or with the chimney parts. Do not allow the combustion air inlet to drop material from the hearth beneath the home. Locate its inlet damper above expected snow level (See page I-6.6).

IMPORTANT:
THE FLEX DUCT MUST BE CLAMPED ONTO THE TOP OF THE DUCT COLLAR. OTHERWISE CONDENSATION COULD DEVELOP ON THE COLLAR AND SEEP INTO THE DUCT.



CROSSOVER DUCT INSTALLATION - BELOW FLOOR

A



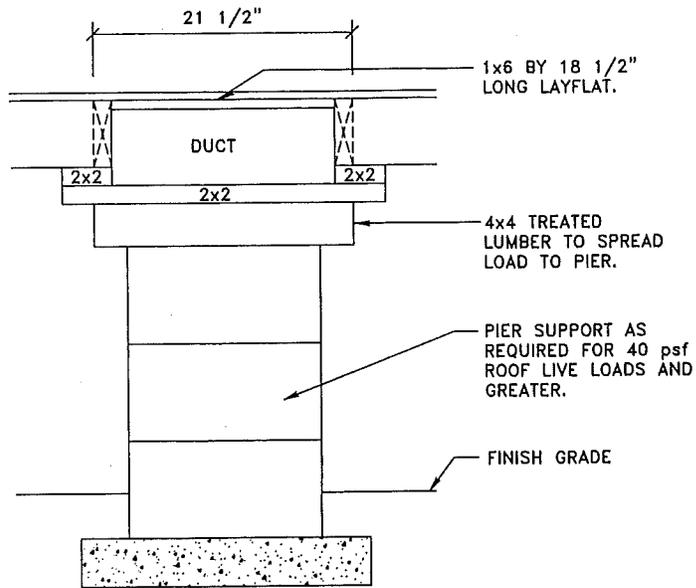
CROSSOVER DUCT DETAIL - UPFLOW FURNACE

B

NOTES:

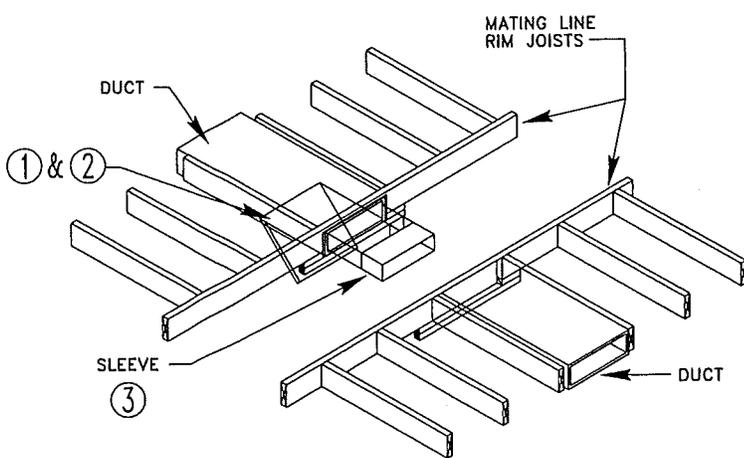
1. IF A REMOTE AIR CONDITIONER IS INSTALLED, DAMPERS MUST BE PROVIDE PER SECTION 3280.708(e) (7) OF THEFEDERAL STANDARDS FOR MANUFACTURED HOUSING.
2. DUCT MUST BE DIRECTLY UNDER/OVER FURNACE.
3. DUCT MUST BE SUPPORTED SO IT DOES NOT TOUCH THE GROUND.

CROSSOVER DUCT INSTALLATION	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 11/30/98	
REV: 8/21/01	1 - 6.3



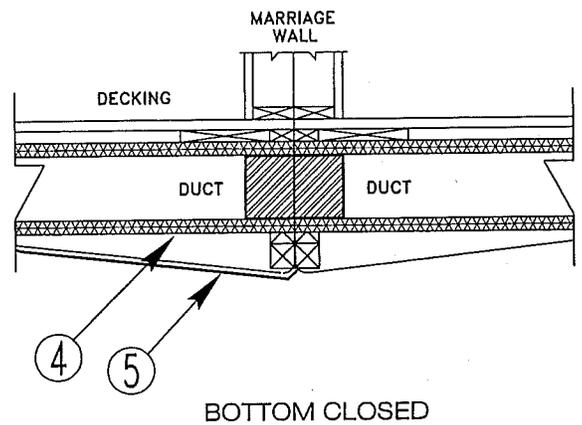
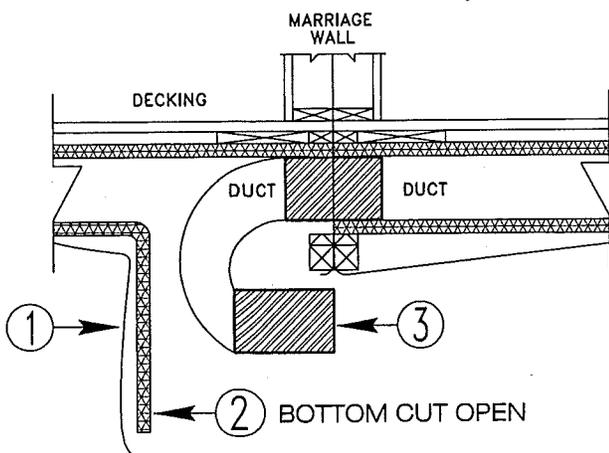
TYPICAL IN-FLOOR DUCT CROSS OVER (PIER DETAIL)

A



NOTES:

1. CUT BOTTOM PAPER ALONG CENTER OF JOISTS ON BOTH SIDES OF HEAT DUCT AND RIM JOIST ALLOWING ACCESS TO HEAT DUCT.
2. CUT ALONG (2) TWO BOTTOM EDGES OF HEAT DUCT AND PULL DOWN AS SHOWN.
3. INSERT 6" WIDE SLEEVE TO JOIN BOTH SIDES OF HEAT DUCT. CENTER SLEEVE ON MATING JOINT.
4. PUT BOTTOM OF HEAT DUCT BACK INTO PLACE AND SEAL BOTTOM AND SIDE EDGES TOGETHER WITH HEAT DUCT TAPE.
5. PUT BOTTOM PAPER BACK IN PLACE TO COVER HEAT DUCT AND SEAL TIGHTLY WITH TAPE.



TYPICAL IN-FLOOR DUCT CROSS OVER (METAL SLEEVE INSTALLATION)

B

NOTES:

1. IF A REMOTE AIR CONDITIONER IS INSTALLED, DAMPERS MUST BE PROVIDED PER SECTION 3280.708(e) (7) OF THE FEDERAL STANDARDS FOR MANUFACTURED HOUSING.
2. DUCT MUST BE DIRECTLY UNDER FURNACE.
3. THIS FIELD INSTALLED SLEEVE IS REQUIRED FOR ESB FRAMES. THE SLEEVE IS NOT REQUIRED WHEN THE NOMACO 1.4 SOFTSEAL FOAM GASKET IS APPLIED TO ALL (4) SIDES OF DUCT OPENING ON THE RIM JOIST.

IN-FLOOR CROSS-OVER LOOP DUCT SYSTEM

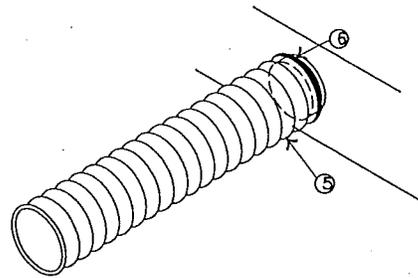
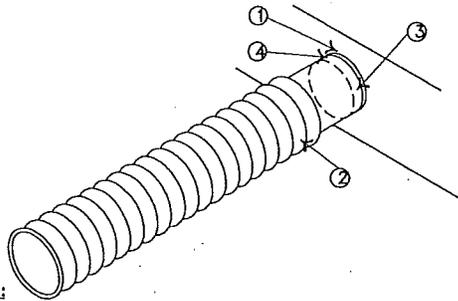
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DATE: 9/17/99

REV: 2/3/03

HBOS Manufacturing, LP

1 - 6.3.1

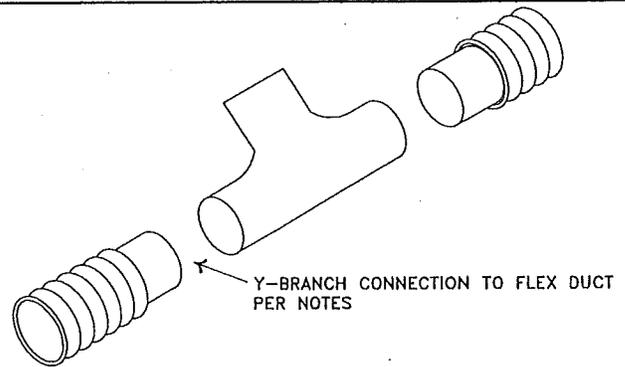
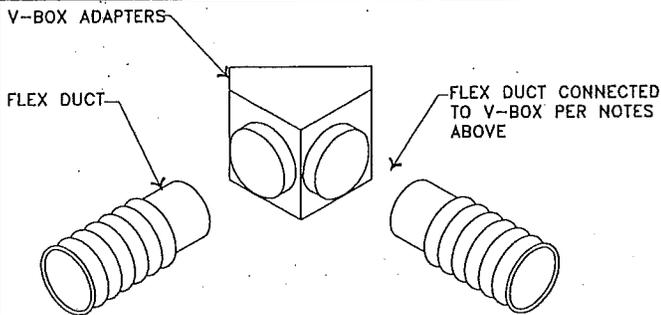


PROCEDURE:

- 1) LOCATE DUCT COLLARS THAT EXTEND BELOW THE BOTTOM BOARD MATERIAL ON EACH SECTION. REMOVE SHIPPING CLOSE-UP MATERIAL FROM COLLARS.
- 2) PULL VINYL COVERING BACK FROM DUCT AND SLIDE EXPOSED END OVER DUCT COLLAR AND UP AGAINST BOTTOM BOARD MATERIAL.
- 3) FASTEN DUCT TO COLLAR WITH 3 SHEET METAL SCREWS APPROXIMATELY EQUALLY SPACED AROUND THE COLLAR.
- 4) ADD METAL OR PLASTIC TIE STRAP AROUND DUCT AND SECURE TIGHTLY. IF METAL STRAP IS USED SECURE WITH SHEET METAL SCREW.
- 5) AFTER DUCT IS FASTENED TO COLLAR PULL VINYL COVERING UP OVER CONNECTIONS AND FLUSH UP TO THE BOTTOM BOARD MATERIAL.
- 6) WRAP THE TOP OF THE VINYL COVER AROUND THE COLLAR AT LEAST TWO TIMES WITH DUCT TAPE.
- 7) REPEAT STEPS 1 THRU 6 AT COLLAR ON OTHER SECTION OR SECTIONS OF THE HOME. SOME HOMES MAY REQUIRE THE CONNECTION OF A METAL V-BOX ADAPTER OR VINYL FLEX Y-BRANCH AT THE COLLAR UNDER THE FURNACE.

HEAT DUCT CROSSOVER CONNECTION

A



V-BOX ADAPTER

B

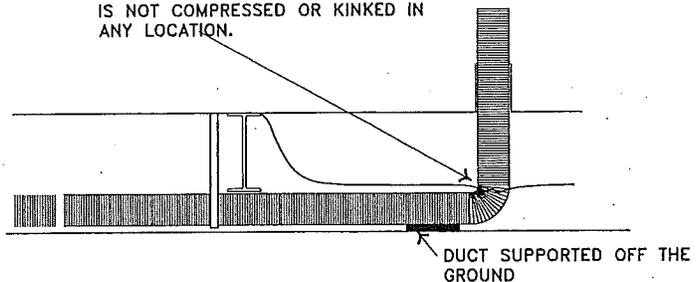
VINYL FLEX Y-BRANCH

C

CAUTION

DO NOT PERMIT DUCT TO REST ON THE GROUND. SUPPORT OFF THE GROUND WITH STRAP OR WITH TREATED WOOD, CONCRETE BLOCK MATERIAL OR OTHER ALTERNATE MATERIALS.

ARRANGE DUCT UNDER FLOOR SO IT IS NOT COMPRESSED OR KINKED IN ANY LOCATION.



V-BOX ADAPTER

D

NOTE:

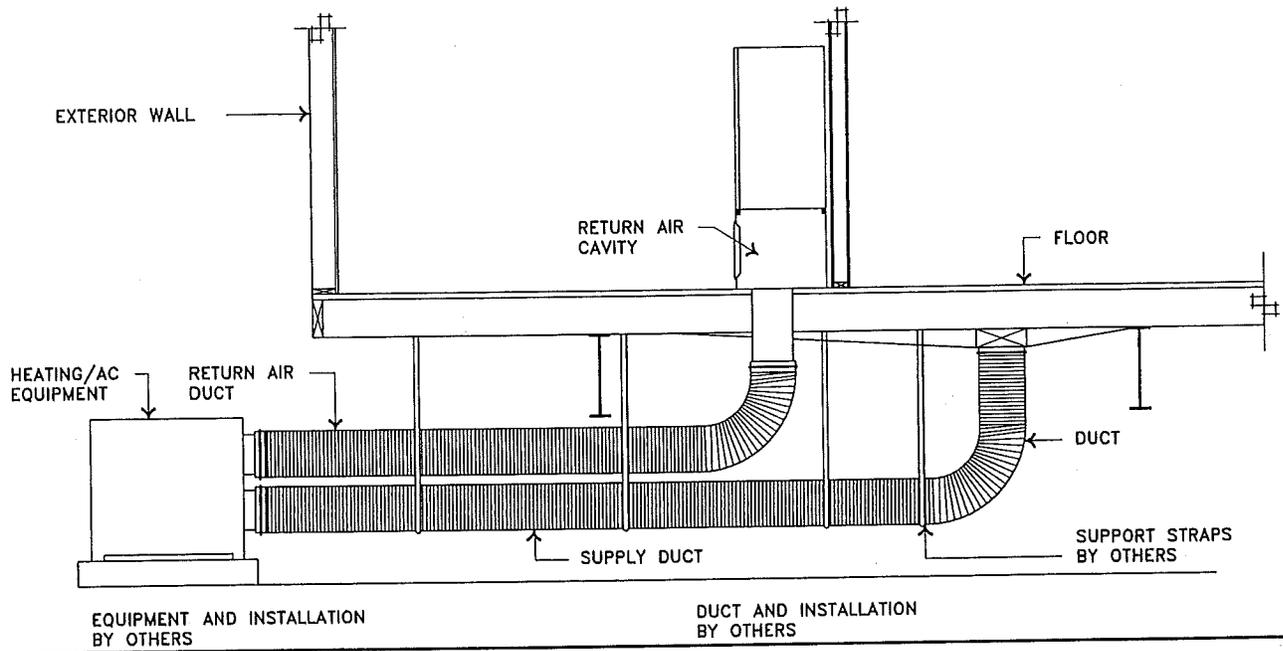
1. CROSSOVER DUCTS TO BE INSULATED WITH A MATERIAL HAVING A MINIMUM R-4 VALUE.
2. ALL METAL COLLARS MUST BE COMPLETELY WRAPPED WITH INSULATION TO PREVENT CONDENSATION.

V-BOX and DUCT INSTALLATION

DRAWN BY: JBM
DATE: 12/2/98
REV: 10/26/01

HBOS Manufacturing, LP

1 - 6.4



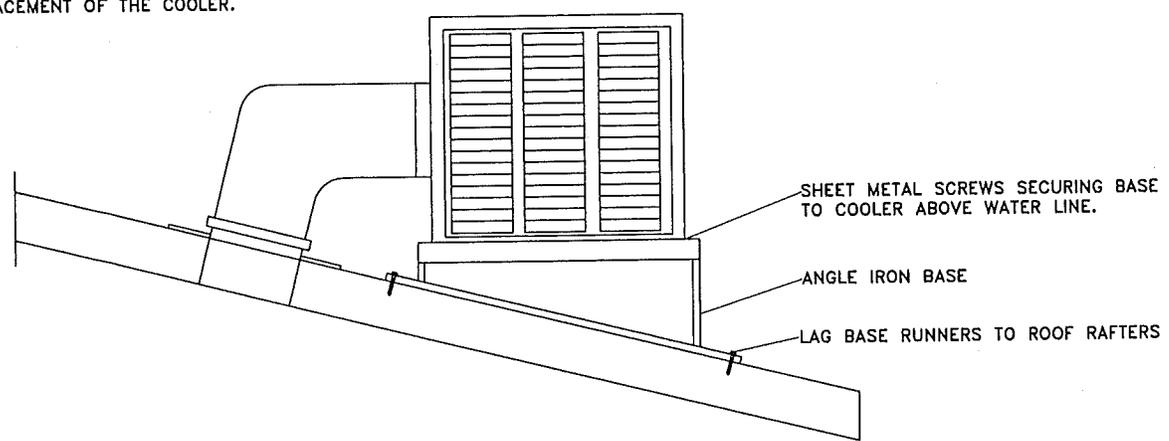
EQUIPMENT AND INSTALLATION BY OTHERS

DUCT AND INSTALLATION BY OTHERS

1:1

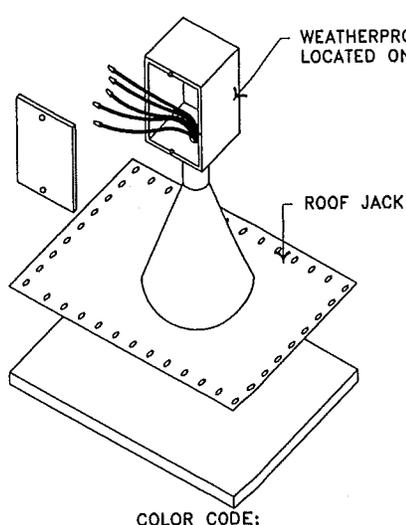
INSTALLATION OF HEATING/ AIR CONDITIONING (BY OTHERS) A

EVERY EVAPORATIVE COOLER SUPPORTED BY THE BUILDING STRUCTURE SHALL BE INSTALLED ON A SUBSTANTIAL LEVEL BASE AND SHALL BE SECURED DIRECTLY OR INDIRECTLY TO THE BUILDING STRUCTURE BY SUITABLE MEANS TO PREVENT DISPLACEMENT OF THE COOLER.



1:1

TYPICAL ROOF MOUNTED EVAPORATIVE COOLER B



NOTES:

CAUTION:

- 1.) COOLERS RATED AT 16 AMPS TO BE INSTALLED ON A 20 AMP CIRCUIT.
- 2.) COOLERS RATED AT 12 AMPS TO BE INSTALLED ON A 15 AMP CIRCUIT.
- 3.) ONE JUNCTION BOX REQUIRED FOR EACH COOLER.

COLOR CODE:

WHITE.....	NEUTRAL
YELLOW.....	PUMP
BLACK.....	LOW FAN
RED.....	HIGH FAN
GREEN.....	GROUND

SITE INSTALLED GROUND MOUNTED EVAPORATIVE (SWAMP COOLERS)

GROUND MOUNTED SWAMP COOLERS MAY BE INSTALLED ON SITE PROVIDED THAT THE FOLLOWING CRITERIA IS ADHERED TO:

- THE FLOOR FRAMING AND CHASSIS MUST NOT BE CUT, DAMAGED OR ALTERED.
- THE MAIN DUCT SYSTEM SUPPLIED WITH THE HOME MUST NOT BE ALTERED OR TIED INTO WITH THE SWAMP COOLER DUCTS.
- THE SWAMP COOLER DUCTS MUST BE AIRTIGHT AS WELL AS BELOW THE BOTTOM BOARD WITH THE EXCEPTION OF VERTICAL RISERS INTO REGISTERS. THE BOTTOM BOARD MUST BE REPAIRED PER PAGE 4.10 OF THIS INSTALLATION MANUAL WHERE VERTICAL RISERS PENETRATE THE BOTTOM BOARD.
- THE SWAMP COOLER MUST BE INSTALLED PER MANUFACTURERS INSTRUCTIONS AND IS SUBJECT TO LOCAL JURISDICTION REGULATIONS.

HEATING/AIR CONDITION. EVAPORATIVE COOLER INSTALLATION

DRAWN BY: JBM

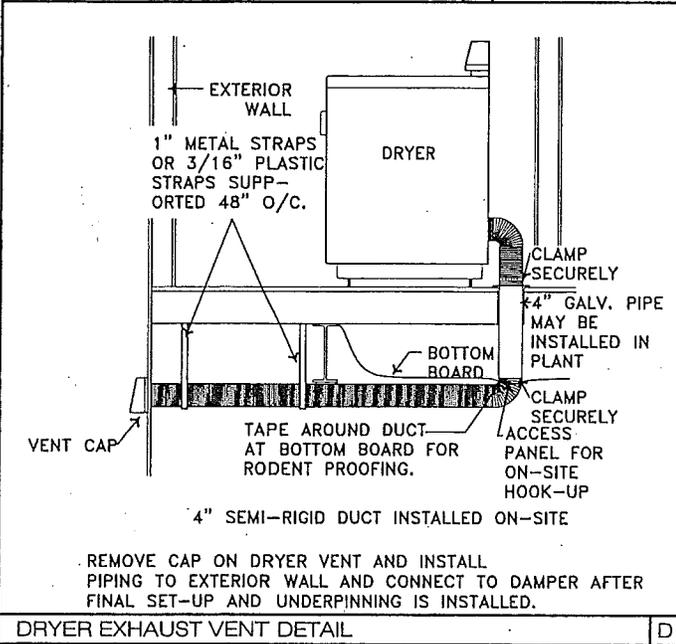
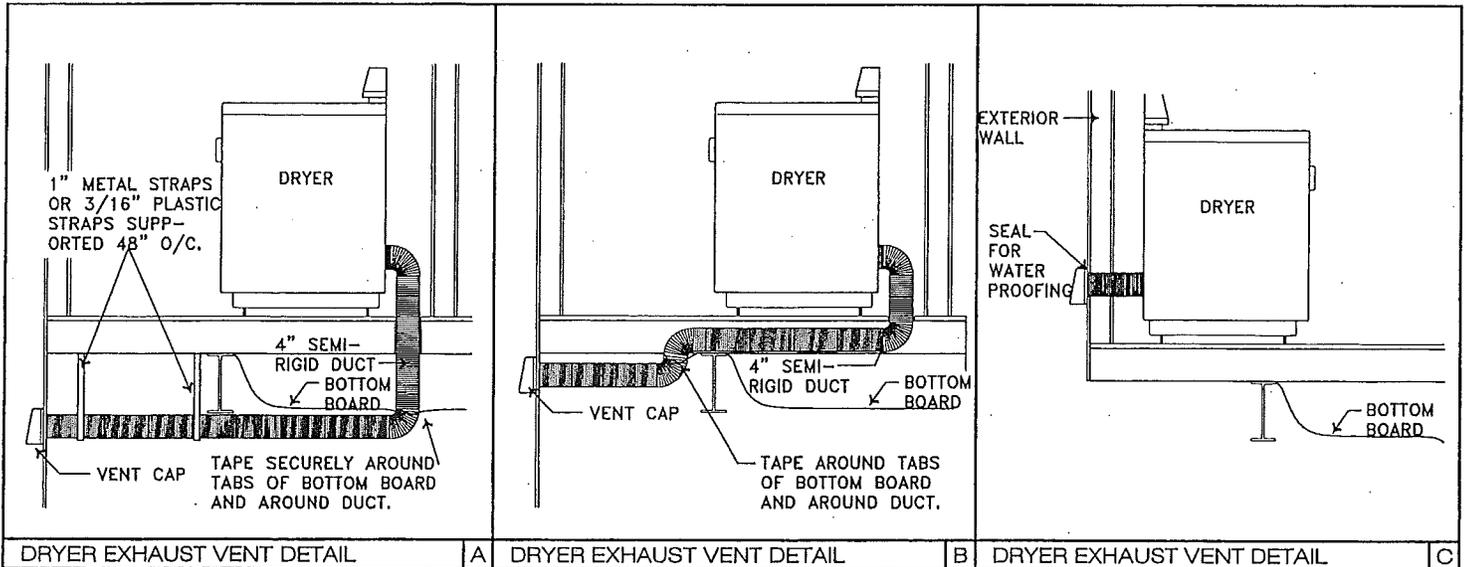
DATE: 11/30/98

REV: 7/21/99

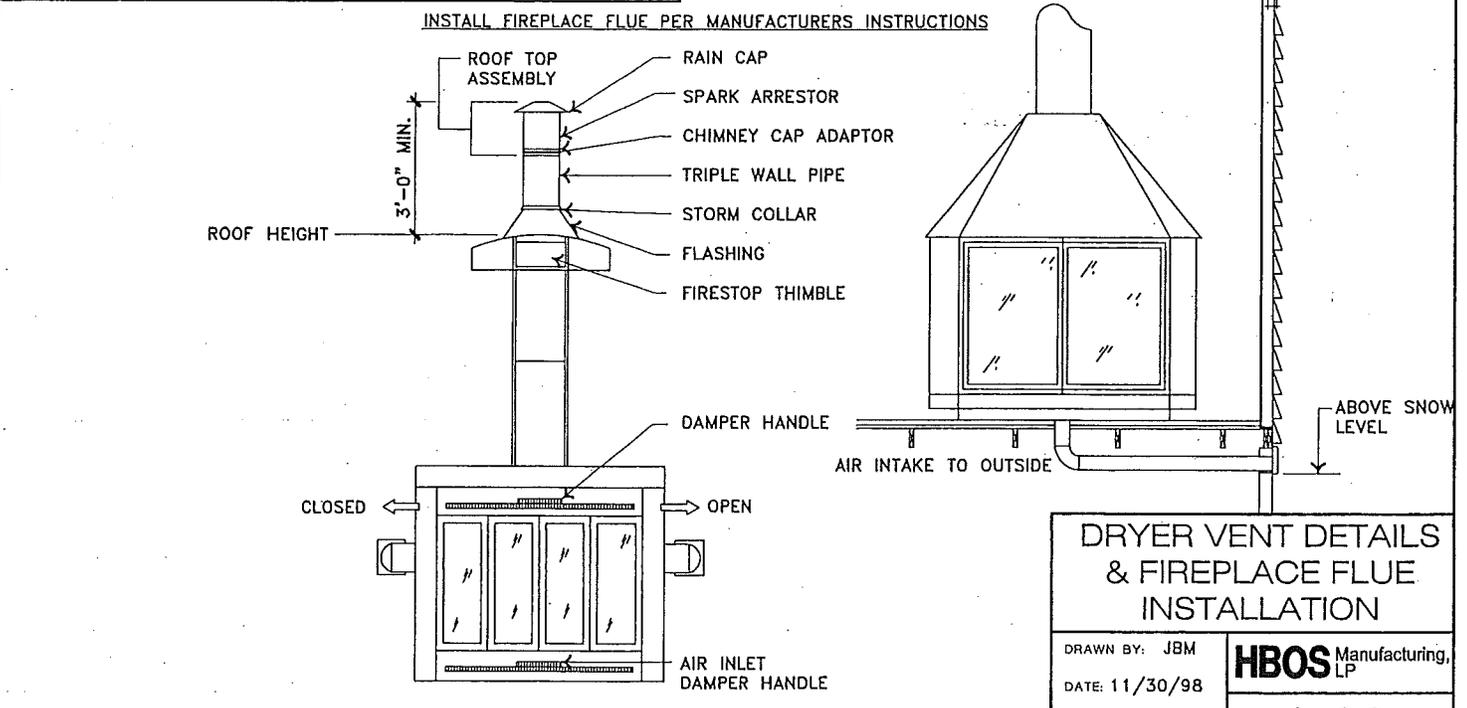
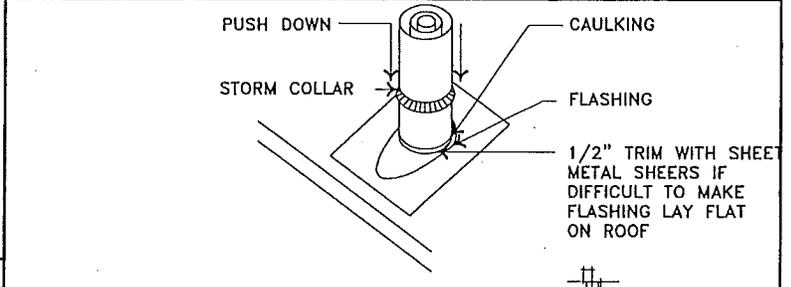
HBOS Manufacturing, LP

1 - 6.5

ELEC. CONNECTIONS FOR EVAP. COOLER C

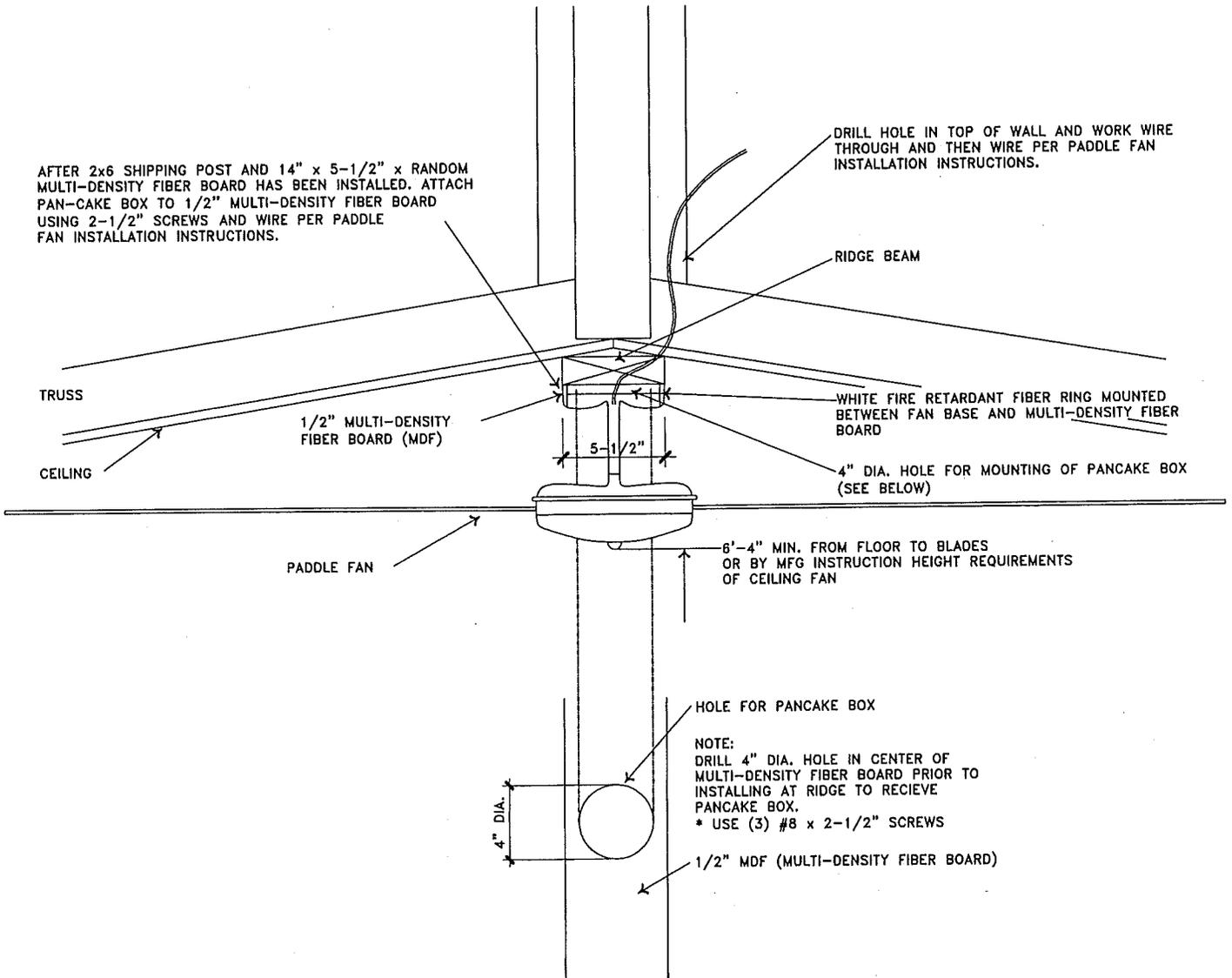


- NOTES FOR DRYER DUCT INSTALLATION:**
1. WHEN VENT IS INSTALLED THROUGH THE FLOOR, AN APPROX. 3 1/2" 'X' CUT IS MADE IN BOTTOM BOARD TO ALLOW PASSAGE OF THE DUCT. TABS OF THE 'X' CUT ARE TAPED SECURELY ABOVE TO ASSURE A VERMIN-PROOF SEAL.
 2. IF DUCT EXITS BOTTOM BOARD IN OUTRIGGER AREA, A PAINTED PLYWOOD COLLAR MAY BE STAPLED TO FLOOR JOISTS AND FITTED TIGHTLY AROUND DUCT IN LIEU OF TAPING PROCEDURE DETAILED IN NOTE 1.
 3. WHEN DRYER IS INSTALLED BE SURE TO REMOVE ANY CAPS ON THE DUCT FOR OPERATION. IF DRYER IS NOT INSTALLED, BE SURE ALL DUCT OPENINGS ARE CAPPED WITH BOTTOM BOARD TAPE TO PROTECT AGAINST RODENTS.
 4. DRYER DUCT MATERIAL PER DRYER MANUFACTURERS RECOMMENDATIONS.
 5. HOMEOWNER MUST REMOVE CAPS AND CONNECT THE DUCT TO THE DRYER WITH TIE WRAPS OR SCREW TIGHTENED CONNECTOR.



AFTER 2x6 SHIPPING POST AND 14" x 5-1/2" x RANDOM MULTI-DENSITY FIBER BOARD HAS BEEN INSTALLED, ATTACH PAN-CAKE BOX TO 1/2" MULTI-DENSITY FIBER BOARD USING 2-1/2" SCREWS AND WIRE PER PADDLE FAN INSTALLATION INSTRUCTIONS.

DRILL HOLE IN TOP OF WALL AND WORK WIRE THROUGH AND THEN WIRE PER PADDLE FAN INSTALLATION INSTRUCTIONS.



NOTE:
 DRILL 4" DIA. HOLE IN CENTER OF MULTI-DENSITY FIBER BOARD PRIOR TO INSTALLING AT RIDGE TO RECEIVE PANCAKE BOX.
 * USE (3) #8 x 2-1/2" SCREWS

NOTE:

1. BOX MUST BE LISTED FOR PADDLE FANS

**CEILING FAN
 INSTALLATION
 DETAILS**

DRAWN BY: RAJ

DATE: 9/20/99

REV: 9/24/99

HBOS Manufacturing, LP

1 - 6.7

Chapter 7 - Utility Connections

General

Before connecting any utility systems, local, county, and state authorities must be consulted. Many localities have special requirements pertaining to the installation and special testing of utility systems. Drawings illustrating utility connections are examples only. Local officials must be contacted to determine specific requirements.

Qualified personnel at the manufacturing facility tested all utility systems in your home. However, it is possible that during transit damage may have occurred which would dictate, after service connections are made, that field tests be conducted. Emphasis should be placed on ensuring that only qualified personnel familiar with local code requirements make all utility connections and conduct all required tests.

Electrical System

Your home is designed to be connected to an electrical supply source rated at 120/240 volt, 3 pole, 4 wire with a ground system. In making the feeder connections to this power source it is extremely important that the wire of the correct size be used. If the wire is incorrectly sized, the ampacity of the wire may be exceeded and you may experience a voltage drop at your home. Ampacity is the safe carrying capacity of the wire expressed in amperes. The greater the amperes flowing in a wire, the greater the heat. (Doubling the amperes without changing the wire size increases the amount of heat four times).

Additionally, if the amperage is allowed to become too great, the wire can become so hot that it will damage the insulation of your home or even cause a fire. A voltage drop in your home can cause a drop in efficiency of all lights and appliances. Motors may burn out and you may pay for electricity that you do not use. To avoid these possibilities refer to table below.

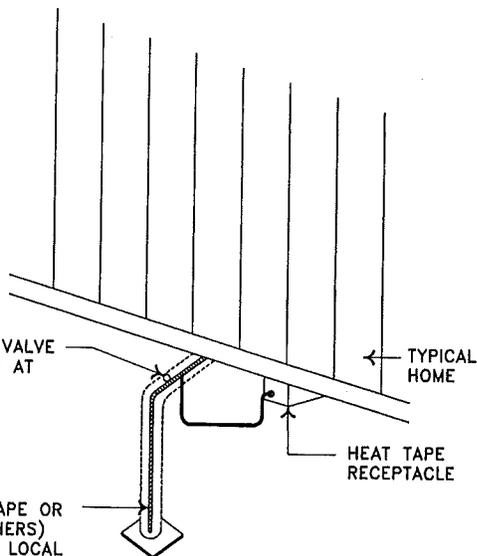
Feeder Connections and Grounding Conductor Sizes

Feeder Size (Amps)	Maximum Neutral Feeder Load (Amps)	Minimum Required Junction Box Size (Inches)	Feeder Sizes Based On Use of 75 Degree "C" Insulated Copper Conductors		
			Black - "Power" Red - "Power" White - "Neutral"	Green or Bare Ground	Conduit Size (Inside Dia.)
50	50	NA	#8 THW (Cu)	#8 (Cu)	1"
100	100	10 x 10 x 4	#4 THW (Cu)	#8 (Cu)	1-1/4"
150	115	10 x 12 x 4	#1 THW (Cu)	#6 (Cu)	1-1/2"
200	130	10 x 16 x 4	#2/0 THW (Cu)	#4 (Cu)	2"

Conductor sizes are in accordance with the National Electric Code, Table 310-16, and do not take voltage drop into account. Allowable amp capacities are base on ambient temperature of 30 degrees C or 86 degrees F.

MASTER SHUT-OFF VALVE
MUST BE INSTALLED AT
INLET (BT OTHERS).

WRAP WITH HEAT TAPE OR
INSULATION (BY OTHERS)
AS NECESSARY FOR LOCAL
FREEZING CONDITIONS.
ANY HEAT TAPE THAT IS
USED MUST BE LISTED FOR
USE WITH MANUFACTURED
HOMES.



NOTE

THE MAXIMUM ALLOWABLE WATER INLET
PRESSURE IS 80 PSI. IF THE WATER
SUPPLY IN THE HOME'S LOCATION
EXCEEDS 80 PSI, A PRESSURE REDUCING
VALVE MUST BE INSTALLED.

TYPICAL WATER SUPPLY CONNECTION

A

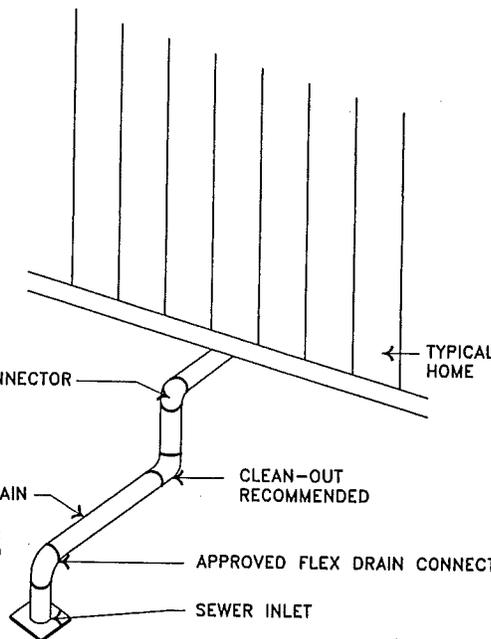
APPROVED FLEX DRAIN CONNECTOR

3" MIN. DRAIN
PROPERLY
SUPPORTED;
FITTINGS TO
BE LONG
SWEEP

CLEAN-OUT
RECOMMENDED

APPROVED FLEX DRAIN CONNECTOR

SEWER INLET



ALT: RIGID PIPING MAY ALSO BE USED.

TYPICAL CONNECTION OF MAIN DRAIN TO SEWER

B

NOTES:

1. HORIZONTAL SECTIONS OF DRAIN LINES TO BE SLOPED AT A MINIMUM OF 1/4" PER FOOT AND/OR TO COMPLY WITH LOCAL ENFORCING AGENCY/CODES ETC.

**WATER and DRAIN
LINE CONNECTIONS**

DRAWN BY: JBM

DATE: 12/2/98

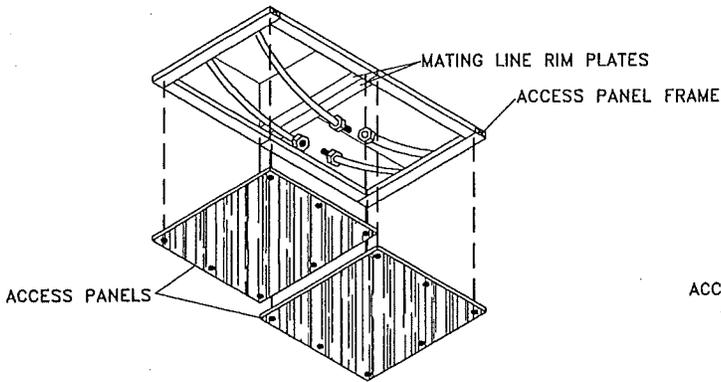
REV: 7/31/00

HBOS Manufacturing,
LP

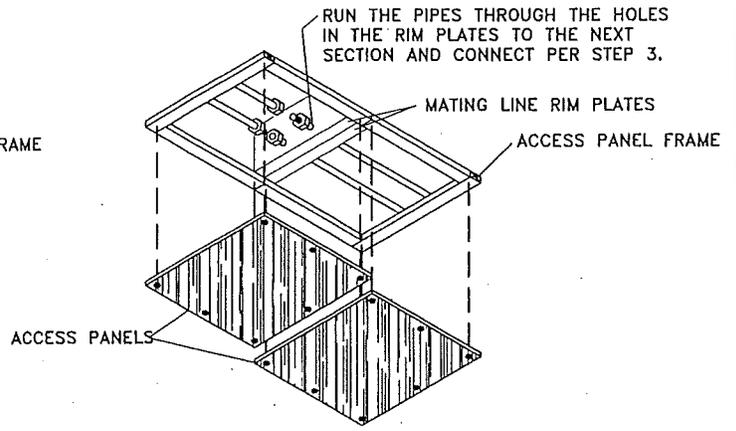
1 - 7.1

PROCEDURE:

- 1) REMOVE ACCESS PANEL FROM EACH SECTION
- 2) CONNECT THE HOT AND COLD WATER PIPES USING THE CONNECTORS INSTALLED ON THE ENDS OF THE PIPE. THE CONNECTOR FITTINGS ARE DESIGNED TO BE USED WITHOUT ANY LUBRICANTS OR SEALANTS.
- 3) REPOSITION THE INSULATION AROUND THE PIPES AND REPLACE THE ACCESS PANELS.



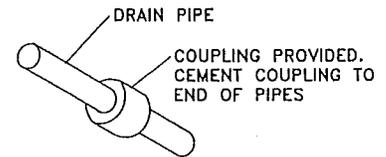
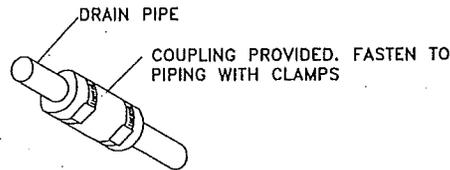
CONNECTION UNDER MATING LINE RIM PLATES (NOT ALLOWED IN FREEZING CLIMATES)



CONNECTION THROUGH MATING LINE RIM PLATES

HOT AND COLD PLUMBING CROSSOVER CONNECTIONS

A



DRAINPIPE CROSSOVER CONNECTION OPTIONS

B

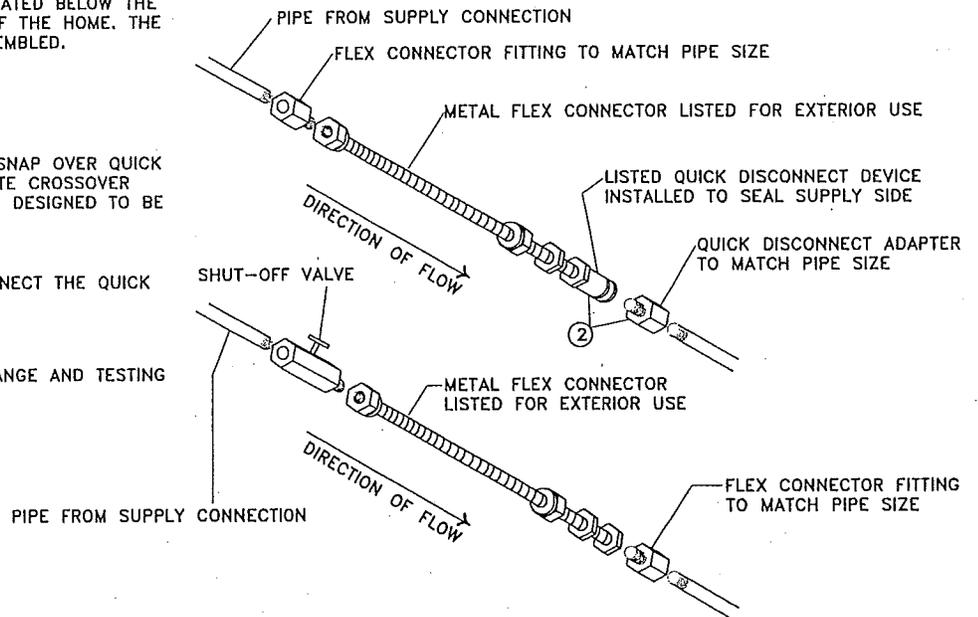
IF THE HOME HAS A GAS CROSSOVER IT IS LOCATED BELOW THE FLOOR STRUCTURE ON THE MATING LINE SIDE OF THE HOME. THE QUICK DISCONNECT DEVICE HAS BEEN PRE-ASSEMBLED.

PROCEDURE:

- 1) REMOVE ANY DUST CAPS IN PLACE.
- 2) PULL BACK ON QUICK DISCONNECT DEVICE, SNAP OVER QUICK DISCONNECT ADAPTER AND RELEASE TO COMPLETE CROSSOVER CONNECTION. THE QUICK DISCONNECT FITTING IS DESIGNED TO BE USED WITHOUT ANY LUBRICANTS OR SEALANTS.

NOTE
DO NOT USE TOOLS TO CONNECT OR DISCONNECT THE QUICK DISCONNECT DEVICE

REFER TO CHAPTER 8 FOR GAS PRESSURE RANGE AND TESTING PROCEDURES



GAS CROSSOVER CONNECTION

C

CROSSOVER PLUMBING CONNECTIONS

DRAWN BY: JBM
DATE: 12/2/98
REV: 7/31/00

HBOS Manufacturing, LP

1-7.2

PORTIONS OF THE DRAIN WASTE SYSTEM WHICH ARE BELOW THE FLOOR MAY NOT HAVE BEEN INSTALLED AT THE MANUFACTURING FACILITY, ALL MATERIALS REQUIRED TO COMPLETE THE SYSTEM HAVE BEEN FURNISHED BY THE MANUFACTURING FACILITY AND ARE SHIPPED AS LOOSE ITEMS IN THE HOME.

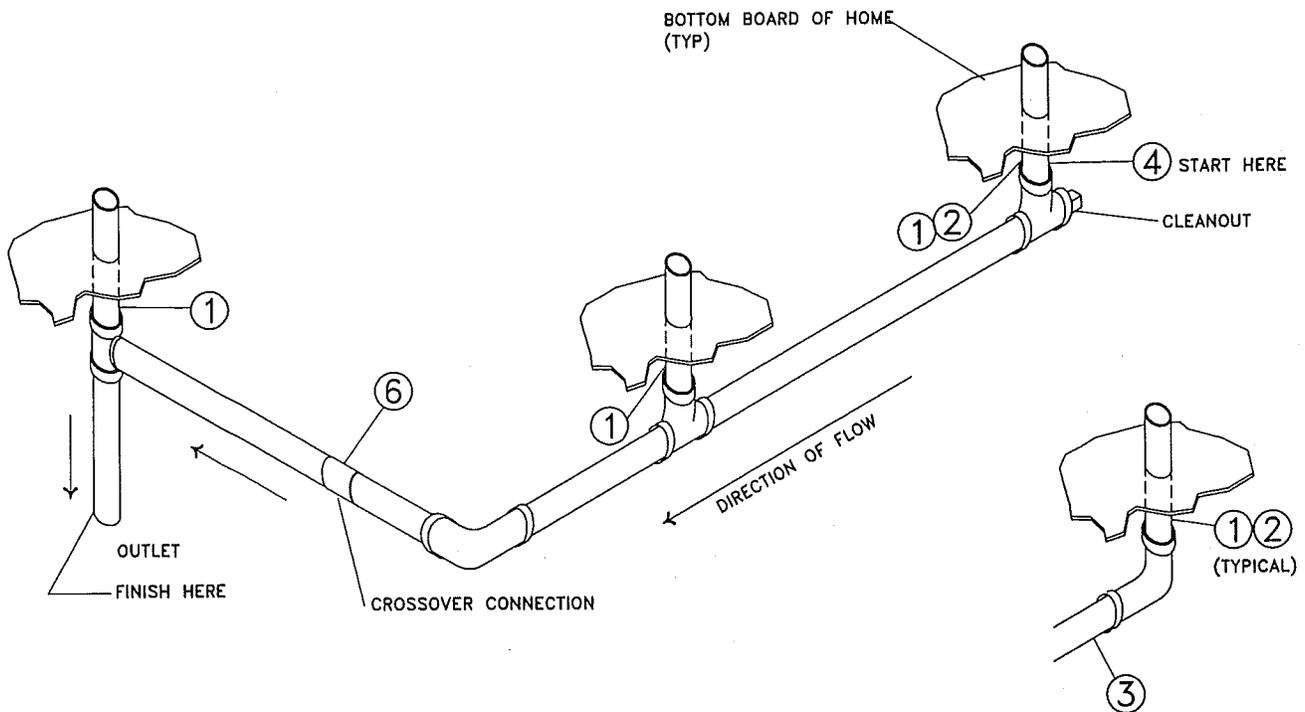
THE FOLLOWING INSTRUCTIONS ARE PROVIDED FOR USE IN COMPLETING THE INSTALLATION OF THE DRAIN WASTE SYSTEM IN THE CORRECT MANNER. PLEASE REVIEW THE INFORMATION BELOW BEFORE STARTING WORK TO FAMILIARIZE YOURSELF WITH PROPER SEQUENCE OF INSTALLATION.

BEFORE YOU BEGIN:

- 1) LOCATE THE DRAIN WASTE PLUMBING SCHEMATIC THAT IS SHIPPED WITH THE HOME. REVIEW THE LAYOUT.
- 2) CHECK ALL LOOSE PLUMBING PARTS SUPPLIED BY LAYING THEM OUT ON THE GROUND UNDER THE HOME IN THEIR CORRECT RELATIONSHIP ACCORDING TO THE DRAIN WASTE SCHEMATIC. ALL PIPING AND FITTINGS SHOULD BE USED WHERE INDICATED TO ENSURE THE CORRECT FLOW OF WASTE IN THE ASSEMBLED DRAIN SYSTEM.

PROCEDURE:

- 1) REMOVE SHIPPING COVERS FROM ALL EXPOSED PIPING OR FITTINGS THAT EXTEND BELOW THE BOTTOM BOARD.
- 2) INSPECT PIPING AND FITTINGS MAKING SURE THEY ARE CLEAN AND FREE OF BURRS.
- 3) ALL PIPE AND FITTING CONNECTIONS SHALL BE PER THE CEMENT MANUFACTURERS INSTRUCTIONS WHICH IS PROVIDED.
- 4) START THE DRAIN ASSEMBLY AT THE MOST REMOTE EXPOSED PIPING DROP-OUT FROM THE OUTLET AND WORK TOWARDS THE OUTLET LOCATION.
- 5) IT IS RECOMMENDED THAT TEMPORARY BLOCKING OR SUPPORT BE USED FOR THE ASSEMBLED DRAIN PIPING AS YOU PROCEED TO ACHIEVE A SLOPE TOWARDS THE OUTLET OF AT LEAST 1/4" PER FOOT.
- 6) IF A CROSSOVER CONNECTION IS REQUIRED USE ONE OF THE METHODS EXPLAINED PREVIOUSLY IN THIS CHAPTER.
- 7) WHEN ALL CONNECTIONS HAVE BEEN COMPLETED RELOCATE THE TEMPORARY SLOPE BLOCKING TO NO MORE THAN 4 FEET APART FOR PERMANENT DRAIN PIPING SUPPORT.

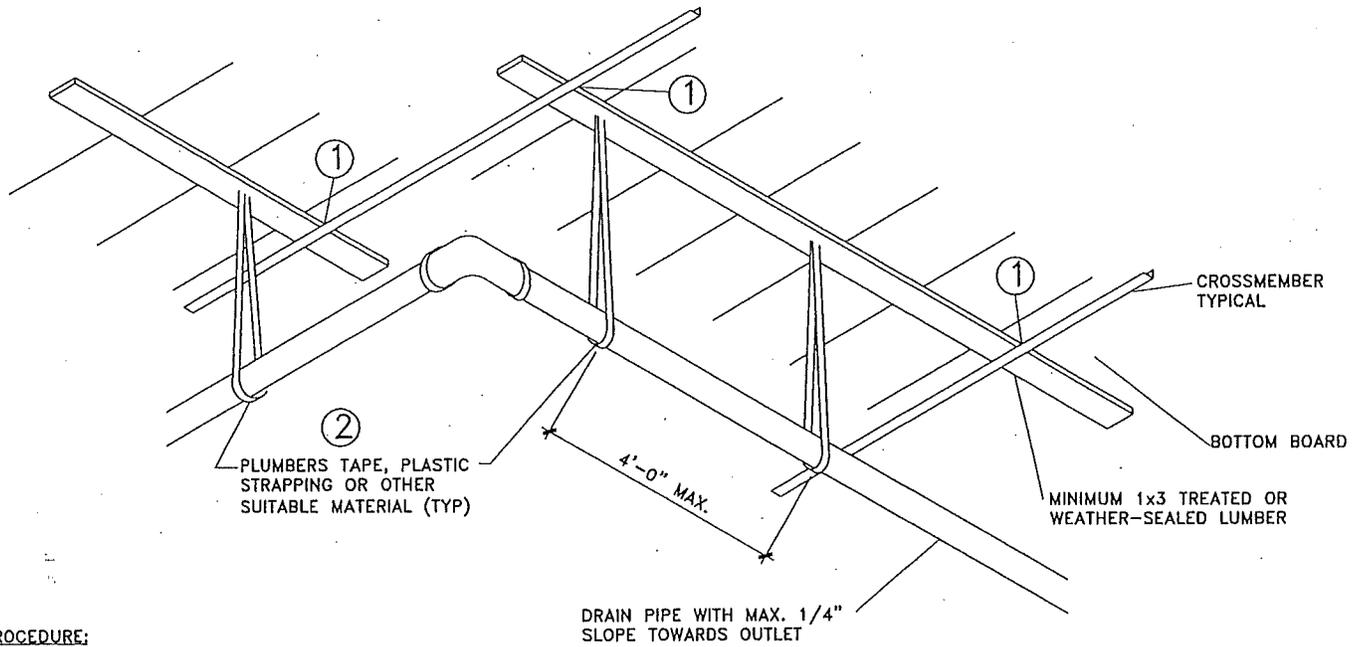


INSTALLATION INSTRUCTIONS FOR SITE INSTALLED DRAIN WASTE SYSTEMS

1. ALL LUAN PANELS OR ZIPPER PATCHES UNDER THE HOME ARE IDENTIFYING PLUMBING ACCESS TO CLEANOUTS, P-TRAPS ETC.
2. THE LUAN PANELS HAVE BEEN PAINTED OR SEALED TO RESIST MOISTURE AND FASTENED TO FRAMING WITH 4 SCREWS.

DRAIN WASTE (DWV) PIPE INSTALLATION	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/2/98	
REV: 10/31/01	1 - 7.3

DRAIN PIPING SUPPORTS INSIDE OF MAIN BEAM



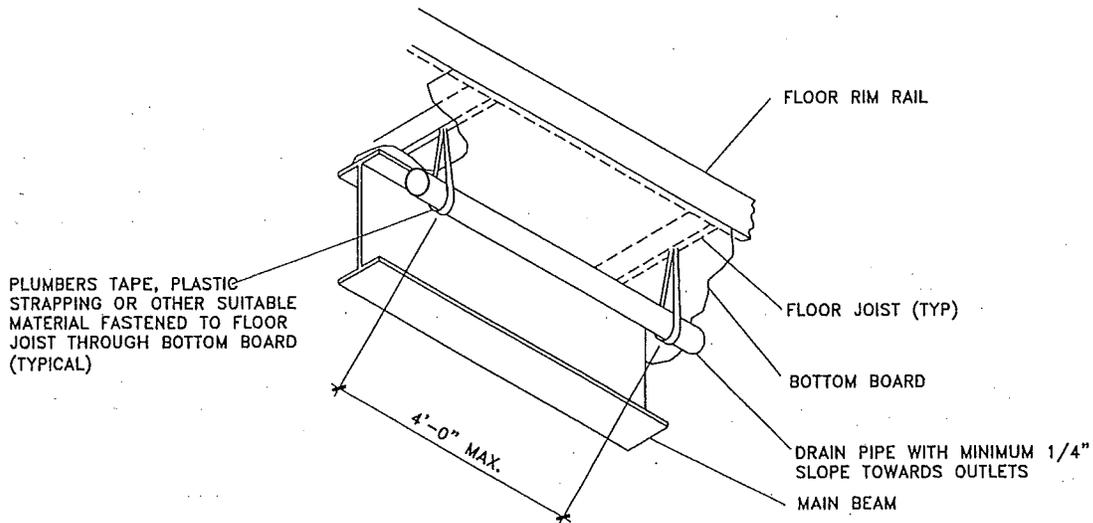
PROCEDURE:

- 1) ADD MINIMUM 1x3 LUMBER BETWEEN FRAME CROSSMEMBERS DIRECTLY ABOVE DRAIN PIPING BY PUSHING UP ON THE BOTTOM BOARD AND RESTING THE LUMBER ON TOP OR INSIDE OF THE CROSSMEMBER LEG AS SHOWN.
- 2) WRAP SUPPORT STRAPPING AROUND PIPING AND 1x FRAMING MATERIAL. FASTEN STRAPPING TO WIDE FACE OF 1x MATERIAL WITH SCREWS.
- 3) OTHER METHODS TO PROVIDE SUPPORT MAY BE USED TO MAINTAIN MIN. PIPE SLOPE REQUIREMENTS.
- 4) LUMBER MATERIAL TO BE PROTECTED FROM MOISTURE.

CAUTION

ELECTRICAL WIRING MAY BE SECURED TO WIDE FACE OF FLOOR JOISTS THAT ARE OUTSIDE OF THE MAIN BEAM. MAKE SURE SCREWS FASTENING STRAPPING PENETRATE BOTTOM EDGE OF JOISTS TO ELIMINATE POSSIBLE ELECTRICAL SHORTS.

DRAIN PIPING SUPPORTS OUTSIDE OF MAIN BEAM



DRAIN PIPING SUPPORTS

A

DRAIN PIPE SUPPORTS

DRAWN BY: JBM

DATE: 12/2/98

REV: 7/31/00

HBOS Manufacturing, LP

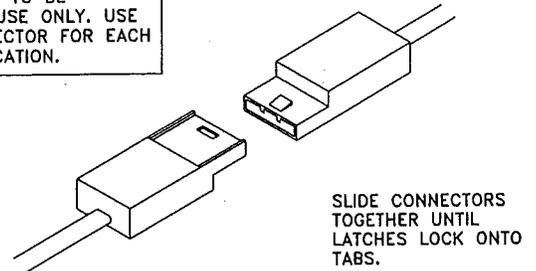
1 - 7.4

NOTES:

1. REMOVE THE ACCESS COVERS FROM BOTH SECTIONS OF THE HOME.
2. THE CABLES LOCATED IN EACH ACCESS BAY HAVE QUICK CONNECTORS ATTACHED TO EACH END. LARGER WIRES WITHOUT END CONNECTORS ARE TO BE CONNECTED IN THE JUNCTION BOX LOCATED IN ONE OF THE TWO ACCESS BAYS. MATING CABLES ARE MARKED TO SHOW PROPER WIRE CONNECTIONS.
3. IF ELECTRIC SERVICE HAS BEEN RUN TO THE HOME, CHECK TO SEE THAT THE MAIN BREAKER IN THE DISTRIBUTION PANEL IS TURNED OFF.
4. REMOVE THE COVER FROM THE JUNCTION BOX, IF PROVIDED.
5. ROUTE THE COILED UP CABLES FROM ONE UNIT THROUGH THE HOLES PREDRILLED IN THE FLOORS.
6. CONNECT THE QUICK CONNECTORS OF MATCHING MARKED CABLES TOGETHER.
7. INSTALL ROMEX CONNECTORS WHERE THE CABLES ENTER A JUNCTION BOX, IF PROVIDED.
8. CONNECT THE CODED WIRES WITH THE CONNECTORS PROVIDED IN THE JUNCTION BOX.
9. REPLACE JUNCTION BOX COVER.

10. SECURE CABLES WITHIN 8" OF THE JUNCTION BOX OR QUICK CONNECTORS.
11. REPLACE ANY INSULATION THAT WAS REMOVED TO MAKE THE CONNECTIONS.
12. REPLACE ACCESS COVERS ON BOTH SECTIONS OF THE HOME.

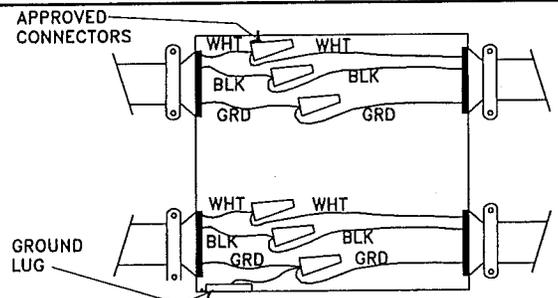
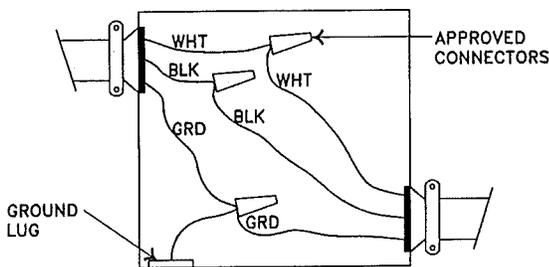
CONNECTOR TO BE ONE-TIME USE ONLY. USE NEW CONNECTOR FOR EACH NEW APPLICATION.



SLIDE CONNECTORS TOGETHER UNTIL LATCHES LOCK ONTO TABS.

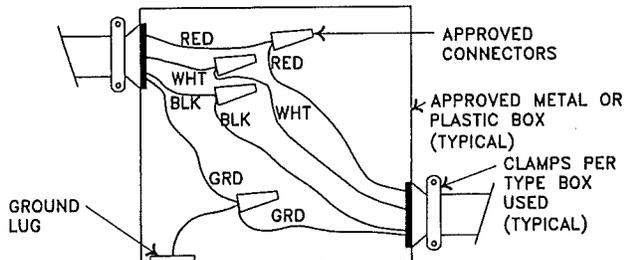
ELECTRICAL CROSSOVER CONNECTION NOTES

TYPICAL 120 VOLT CONNECTION



SINGLE 15 OR 20 AMP CIRCUIT 14-2 OR 12-2 W/ GROUND

DOUBLE 15 OR 20 AMP CIRCUITS 14-2 OR 12-2 W/ GROUND



WIRE CODE:
 BLK = BLACK
 WHT = WHITE
 RED = RED
 GRD = GROUND

CAUTION

VERIFY THAT ALL CROSSOVER CIRCUITS PROTECTED BY A GFCI DEVICE (GROUND FAULT INTERRUPTER) ARE CONNECTED TO THE PROPER CIRCUIT CONTINUATION BY IDENTIFYING THE CORRECTLY MARKED CIRCUIT WIRES.

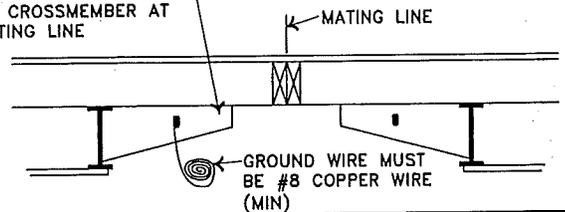
240 VOLT APPLIANCE CIRCUIT

WIRE CODE

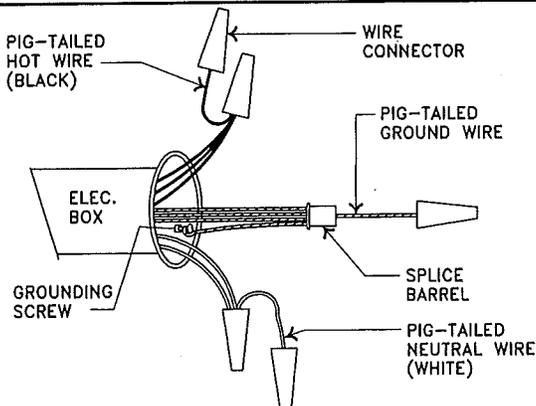
PROCEDURE:

- 1) UNCOIL AND TAKE LOOSE END OF GROUND WIRE AND SECURE TO SOLDERLESS LUG ON ADJOINING SECTION OR SECTIONS.
- 2) MAKE SURE SCREW IN SOLDERLESS LUG IS TIGHT AGAINST GROUND WIRE.
- 3) LOCATE AGAINST STRUCTURE FOR PROTECTION.
- 4) REPEAT PROCEDURE FOR TRIPLE SECTION HOMES.

REAR MOST OUTRIGGER OR CROSSMEMBER AT MATING LINE



CONTINUOUS ELECTRICAL GROUND CONNECTION



NOTES:

1. CONNECT WIRES, BLACK TO BLACK, WHITE TO WHITE AND GROUND TO GROUND USING WIRE NUTS.
 PUSH WIRES INTO BOX AND SECURE FIXTURE IN POSITION. INSTALL THE BULB.
2. APPLY CAULKING AROUND BASE OF LIGHT FIXTURE TO INSURE A WATER-TIGHT SEAL TO THE WALL.

ELECTRICAL & GROUND CONNECTIONS

DRAWN BY: JBM
 DATE: 12/2/98
 REV: 4/16/03

HBOS Manufacturing, LP

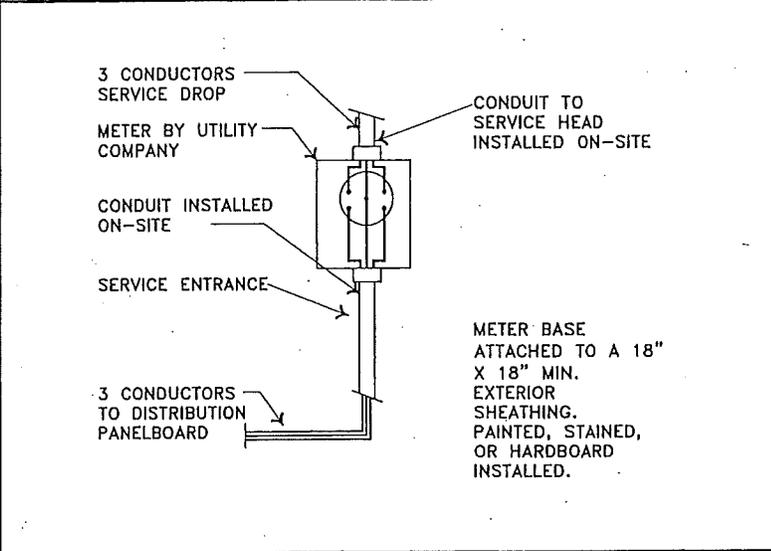
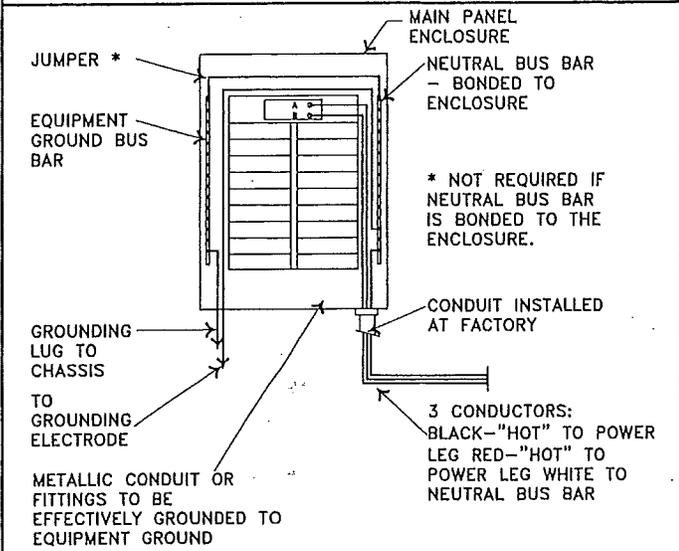
1 - 7.5

EXTERIOR LIGHT FIXTURES & OTHER 110V APPLIANCES

IT IS VITAL FOR THE PROTECTION OF THE OCCUPANTS THAT YOUR HOME BE PROPERLY GROUNDED. GROUNDTING TO A ROD, A METAL WATER PIPE, OR THROUGH THE HOMES HITCH WILL NOT PROVIDE THIS IMPORTANT PROTECTION IN MOST CASES.

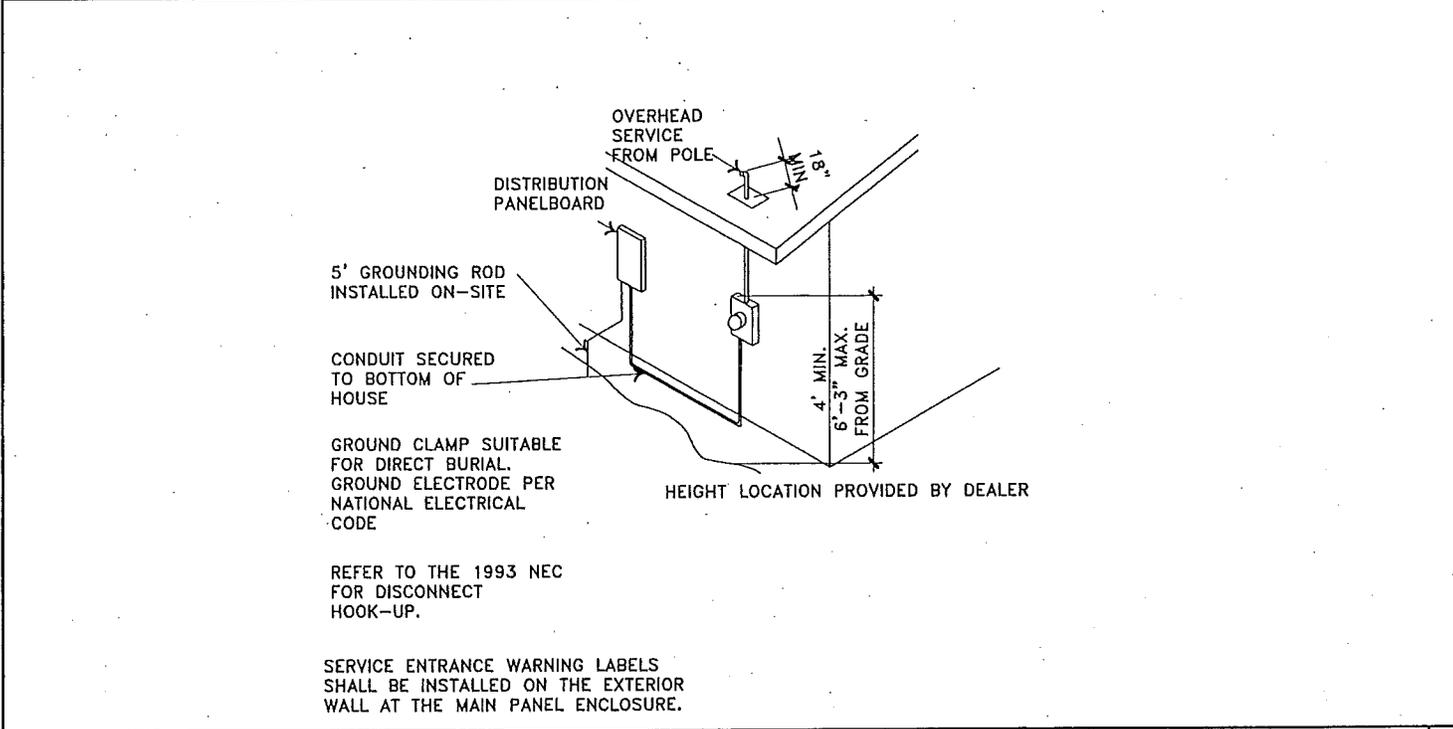
THE ONLY SAFE AND APPROVED METHOD OF GROUNDTING YOUR HOME IS THROUGH AN ELECTRICAL-ISOLATED GROUNDTING BAR IN THE HOMES POWER SUPPLY PANEL WHICH GROUNDS ALL NON-CURRENT CARRYING METAL PARTS TO THE ELECTRICAL SYSTEM IN YOUR HOME AT A SINGLE POINT.

WARNING: IT IS IMPORTANT THAT THE HOT WATER HEATER BE FILLED WITH WATER PRIOR TO CONNECTING THE ELECTRICAL SERVICE.



CONNECTION TO DISTRIBUTION PANELBOARDS

A OVERHEAD SERVICE ENTRY B



METER BASE INSTALLATION AND CONNECTION TO SERVICE PANEL C

POWER CONNECTION & METER BASE INSTALLATION	
DRAWN BY: JBM	HBOS Manufacturing, LP
DATE: 12/2/98	
REV: 11/13/00	1 - 7.6

Chapter 8 - Utility Service Test Procedures

Systems Test

All utility systems are given a quality assurance test at the manufacturing facility. As an option to ensure that no damage occurred in transit and that the final connections are proper, on site tests of the utility service connections can be made after the installation of the home.

CAUTION
ALL UTILITY CONNECTIONS MUST BE MADE BY QUALIFIED SERVICE PERSONNEL WHO ARE FAMILIAR WITH LOCAL REGULATIONS.

Gas System Test Procedures

The gas piping supply system is designed for a pressure not exceeding 14-inch water column (1/2 psi) and not less than 7-inch water column (1/4 psi).

WARNING
GAS APPLIANCES IN THIS HOME ARE EQUIPPED FOR NATURAL GAS. IF THE GAS SUPPLY IS LIQUIFIED PETROLEUM GAS (LPG), IT IS NECESSARY THAT THE APPLIANCE BE CONVERTED TO LPG IN ACCORDANCE WITH INSTRUCTIONS PROVIDED BY THE MANUFACTURER OF EACH APPLIANCE.

APPLIANCE ORIFICES:
SPECIAL ORIFICES AND REGULATORS ARE REQUIRED FOR EACH TYPE OF GAS AT ALTITUDES ABOVE 2,000 FEET. SEE THE MANUFACTURERS INSTALLATION INSTRUCTIONS FOR ANY MODIFICATIONS PER THE GAS TYPE USED BY THE APPLIANCE.

DO NOT LIGHT APPLIANCE PILOT LIGHT(S) UNTIL EACH APPLIANCE HAS BEEN CHECKED MAKING SURE ROOF JACK (VENT) IF APPLICABLE HAS BEEN INSTALLED, AND ALL GAS UTILITY CONNECTIONS HAVE BEEN MADE AND TESTED.

1. To check the gas system for leaks, first close all appliance controls and all appliance pilot light valves (see appliance instructions included in the home or posted on the appliance).
2. Open the gas shutoff valve on the supply line to each appliance.
3. Attach an ounce gauge on the main gas inlet to the home.
4. Carefully pressurize the system to not more than 8 ounces of pressure.

CAUTION
DO NOT PRESSURIZE THE GAS LINE IN EXCESS OF 8 OUNCES MAXIMUM TO AVOID POSSIBLE DAMAGE TO GAS VALVES AND REGULATORS.

5. Apply an ammonia-free soapy water or bubble solution to the joints at both ends of the appliance connector. If bubbles are formed, tighten connector until bubbles cease to form.

CAUTION
DO NOT BUBBLE CHECK COPPER OR BRASS FITTINGS WITH SOLUTIONS CONTAINING AMMONIA.

After completion of test, connect home gas inlet to gas supply line using a listed gas connector of the capacity indicated on the label by the gas inlet. Check the inlet connection for leaks per step 5 above.

Water Supply System Test Procedures

The water system is made after any water crossovers are connected by attaching an air pump, valve and gauge to the home water inlet and pressurizing the water lines to 100 pounds per square inch (psi). Verify that the pressure remains for a period of 15 minutes without loss.

To prevent the possibility of fresh water contamination, all exterior faucets shall have an anti-siphon valve installed by the installer or owner.

WARNING

IT IS NOT SAFE TO FILL THE WATER HEATER TANK WITH HIGH PRESSURE AIR ONLY. DISCONNECT WATER HEATER FROM WATER SYSTEM BY CONNECTING THE HOT AND COLD WATER LINES TOGETHER OR FILL WATER HEATER TANK WITH WATER BEFORE PRESSURIZING THE WATER LINES WITH AIR. THIS PROCEDURE WILL PROTECT THOSE INVOLVED IN THE TEST FROM POSSIBLE INJURY.

Electrical System Test Procedures

1. Perform the following test after installation and electrical connections to the home are complete. The grounding continuity test is to be performed before turning on electrical power to the home and the polarity and operation tests are to be performed after the electrical power is turned on.
2. Perform the following procedure checks for grounding continuity, polarity, and operation of the electrical system.
 - A. Before turning "ON" the main circuit breaker, proceed as follows:
 - (1) Connect one clip of a flashlight continuity tester to a convenient ground and touch the other clip to each light fixture canopy.
 - (2) Using the continuity tester, check every direct-connected appliance or fan. The tester must be hooked to a convenient ground and to the metal frame of the appliance.
 - (3) Using the continuity tester, check the continuity between the chassis frame and:
 - ① Metal gas piping.
 - ② Metal water piping.
 - ③ Metal raceway below main electrical panel box.
 - ④ Between one riser of heat duct and convenient ground.
 - (4) Any loss of grounding continuity found in (1), (2), or (3) above will require investigation and correction.

NOTE

CONTINUITY TO GROUND IS NOT REQUIRED ON METAL INLET OF PLASTIC PIPED WATER SYSTEM. WHEN PLUMBING FIXTURES SUCH AS METALLIC SINKS, TUBS, FAUCETS AND SHOWER RISERS ARE CONNECTED ONLY TO PLASTIC WATER PIPING AND PLASTIC DRAIN PIPING, CONTINUITY TO GROUND IS NOT REQUIRED.

B. Turn "ON" the main circuit breaker and each individual circuit breaker.

CAUTION

A LABEL HAS BEEN PLACED ON OR OVER THE ELECTRICAL WATER HEATER BREAKER IN THE MAIN PANEL BOX. MAKE SURE THE WATER HEATER TANK IS FILLED WITH WATER BEFORE TURNING THE BREAKER TO THE "ON" POSITION. FAILURE TO DO SO WILL CAUSE THE WATER HEATING ELEMENT TO OVERHEAT AND FAIL. THIS SYSTEM IS NOT COVERED BY THE HOME WARRANTY.

Proceed as follows:

- (1) Plug an AC receptacle wiring tester into each receptacle in the home to check for reverse polarity, open grounds and shorts.
- (2) Any reverse polarity, open grounds or shorts found will require investigation and repair.
- (3) Install light bulbs and fluorescent tubes if not already installed. Make sure each light fixture is operable by turning the appropriate switch to the "ON" position.
- (4) Shut off all light switches in the home and perform test on the smoke detector(s) in accordance with the manufacturer instruction.
- (5) Repair or replace any defective items.

Drain System Test Procedures

The completed drain waste system should be subjected to a flood level test as follows:

1. The home shall be in a level position, all fixtures shall be connected, and the plug or cap installed at the outlet. The entire system shall be filled with water to the rim of the water closet (toilet). (Tub and shower drains shall be plugged).
2. After all trapped air has been released, the test shall be maintained for no less than 15 minutes without evidence of leaks. If any leaks are found, repair them and re-test. If no leaks are noted after 15 minutes, unplug the system at the outlet and drain the water from the system.
3. The waste piping above the level of the water closet (toilet) shall then be tested and show no indication of leakage when the high fixtures are filled with water and emptied to obtain the maximum possible flow in the drain piping.

Oil Piping Hookup & Testing

Homes that are equipped with oil burning furnaces must have the oil supply piping installed on site. The home manufacturer does not supply piping.

The furnace manufacturer's instructions must be consulted for proper pipe sizing and installation procedures.

In addition, unless the home is installed in a park with a centralized oil distribution system, an oil storage tank of suitable capacity must be installed outside the home in a location accessible for service, and safe from fire and other hazards.

Oil tanks that feed vaporizing type oil furnaces must be installed so that oil flows by gravity. To achieve efficient gravity flow, the tank must be installed so that the bottom of the tank is at least 18 inches above the level of the furnace oil control level.

For gun type oil furnaces, the location of the oil storage tank is left to the discretion of the homeowner. Since the furnace includes a fuel pump, the tank may be installed above or below ground. For tanks installed below ground, the filler neck should extend 1 foot above grade and a 1 ¼ inch diameter minimum vent pipe extending at least 2 feet above grade must be provided.

Regardless of the type of oil furnace served, or the tank location, the tank should be installed to provide a gradual slope toward the fill end or drain plug, if so equipped, to facilitate pumping or draining of water and sludge.

NOTE

ALL STORAGE TANK AND OIL PIPING INSTALLATIONS MUST MEET ALL APPLICABLE LOCAL REGULATIONS AND SHOULD BE MADE ONLY BY EXPERIENCED, QUALIFIED PERSONNEL.

Before setting the system in operation, the tank installation and supply piping must be checked for leakage. The tank must be filled to capacity with the fuel to be burned and all joints in the system checked visually for leakage.

Chapter 9 - Final Inspection Checklist

After the home has been set-up and completed, check the following items to assure areas or items have not been overlooked.

Task	Completed
1. Footings and piers Check that footings pads are of the correct size piers are located at proper spacing. Check that blocks and wedges are tight.	
2. Anchors and Straps Check anchor spacing and make sure all tie downs are tensioned.	
3. Bottomboard Inspect for any torn area's, especially around bottom board penetrations. Patch torn areas with proper tape.	
4. Crossover connections Make sure the electrical, water plumbing, drain plumbing, gas-piping connections are complete. Check connection of duct crossover to duct collars.	
5. Exterior siding and trim Check that there are no gaps, voids or missing fasteners. Make sure seams are sealed. Paint all edges of trim.	
6. Windows and doors Make sure all windows and exterior doors operate correctly.	
7. Shingle roof Inspect shingles to insure they are correctly fastened to roof sheathing. Make sure no shingles are loose or damaged. Seal all holes in shingles after removing wind deflector and or plastic cover.	
8. Appliance roof flues and fireplace chimneys Check to see that all roof flue penetrations flashing are properly installed and sealed.	
9. Water and drain systems If water to home is available check all faucets for operation and check each fixture P-traps for any leaks. Check to make sure all waste plumbing has been installed per plumbing print that is shipped with the home.	
10. Interior details Inspect all interior finish details, such as molding, paneling and carpet. Check all drawers for proper operation. Check all interior windows for proper operation.	
11. Entry Access Temporary access installed at entry door.	
12. Clean up Make sure the interior and exterior of the home has been cleaned from installation of materials and debris.	

Chapter 10 – Relocation of the Home

If it is necessary to move your home, **HAVE IT MOVED BY A PROFESSIONAL MANUFACTURED HOME MOVER, MAKE SURE HE USES ENOUGH TEMPORARY WOOD BLOCKING AND BRACING**, and check the following items:

Roof, Wind, and Thermal Zone Requirements

Check the roof and wind load and the temperature requirements at the new location. Never move your home into a higher wind zone location or roof load zone or thermal zone than what the home is designed for. Check the design requirements shown on your home's compliance certificate (data plate).

Tires and Axles

Replace any removed tires or axles as required by the manufacturer. Be sure that tires are inflated correctly, have at least 1/16" tread, and do not have any cracks or splits. Check and repair bearings and brakes as necessary.

Appliances

Secure appliances to prevent movement during transportation.

Dust Caps

Place dust caps on the ends of all pipe connections.

Blocking During Storage

Any home placed in storage, including those on sales lots, must be immediately blocked under each I-beam for anticipated roof and floor loads to prevent excessive deflection and possible structural damage. Follow the blocking procedure specified in this manual or consult a registered professional engineer.

Transit of Furniture and Belongings

Substantial damage may result if furniture, personal belongings, setup materials or other items are stored in the home during transit. **TRANSIT DAMAGE IS NOT COVERED UNDER YOUR WARRANTY.**

Multi-Section Homes

Re-install temporary structural supports and bracing materials before moving the home. Cover open sides of sections with weatherproof materials such as 6-mil plastic sheeting. After the sections have been separated, secure 2" x 6" shipping braces at the front end and in the axle area. Place ridge beam supports in open areas at a maximum of four feet on center.

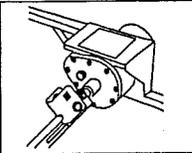
Minute Man anchors[®], Inc.

ANCHOR INSTALLATION

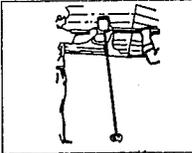
CAUTION: The installation of anchors with a drive machine is a two person operation.

MACHINE INSTALLATION

In this method, the anchor is turned to full depth into the ground by an anchor drive machine.

- 

1. Attach anchor to machine.
- 

2. Placed anchor in proper position in line with strap and machine.
- 

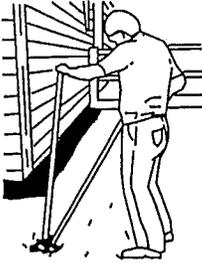
3. Anchor should be installed at a slight angle as shown to assure head being positioned behind future skirting.

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

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

MANUAL INSTALLATION

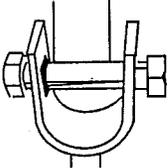
A hole is dug to a depth of approximately $\frac{1}{2}$ the length of the anchor, in the proper position as explained under machine installation.

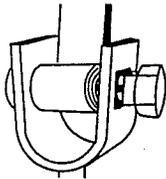


After the hole is dug to $\frac{1}{2}$ the length of the anchor, then the anchor is turned into the ground by hand, using a rod or length of pipe for leverage or by machine.

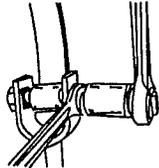
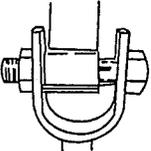
After anchor is installed full depth, earth is repacked, six inches at a time.

PROPER TENSIONING OF STRAP TO ANCHOR HEAD

- 

1. Insert bolt into head; attach nut loosely. Insert strap in slot of $\frac{5}{8}$ " bolt until strap is flush with far side of bolt.
- 

2. Bend strap 90° and take at least three complete turns on bolt until strap is taut.
3. Bolt is turned with $\frac{15}{16}$ " socket wrench, or adjustable wrench, on hex head. With square hole in anchor head, hold bolt under tension while repositioning wrench: Place open-end wrench on $\frac{5}{8}$ " square shoulders of bolt. Align square shoulders of bolt with square hole in anchor head.


- 

4. Holding hex head of bolt in position, tighten nut to draw square shoulders into square hole. Shoulders are now in locking position; continue to tighten nut. Tensioning device is now in locked, secure position.

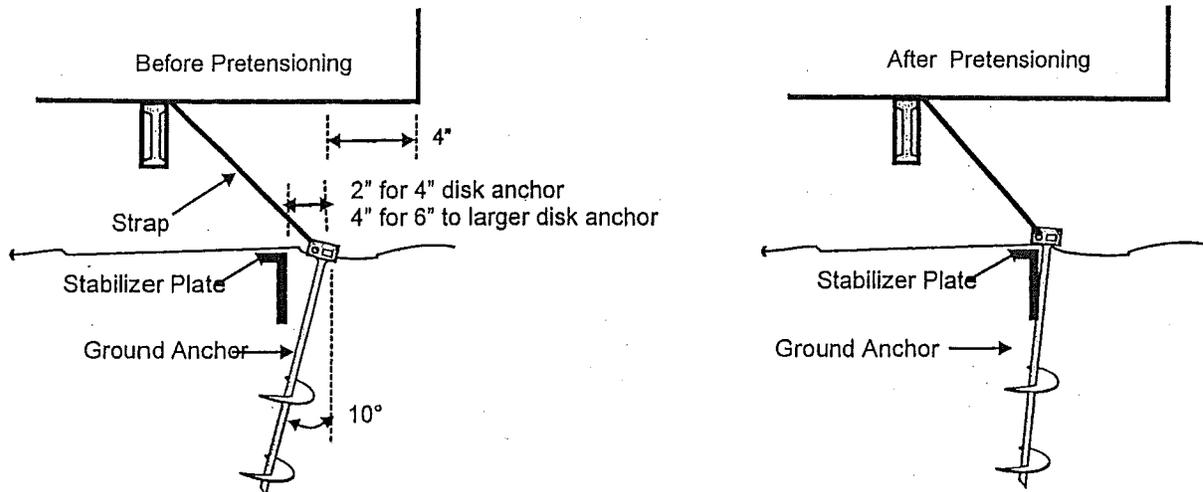
Note: The tensioning bolt can be inserted in the head from either side.

Notice: In areas of severe cold weather, where possible damage could occur from frost heave, the homeowner should be prepared to adjust tension on the straps to take up slack.

MINUTE MAN ANCHORS, INC.

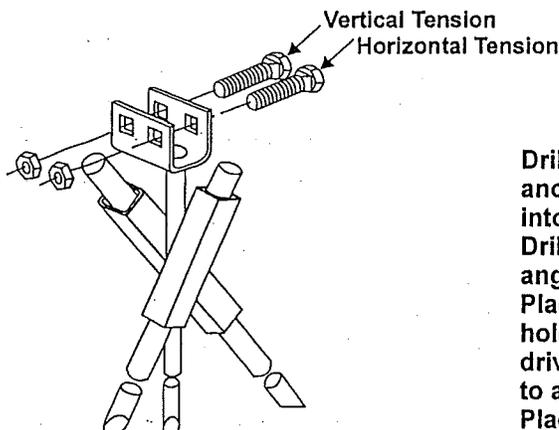
INSTRUCTION FOR USING MINUTE MAN STABILIZING DEVICE

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



1. Place the anchors approximately four inches to the inside of the exterior wall line of the home or a sufficient distance to avoid interference with the skirting (see above)
2. Hold the anchor at an angle of approximately 10 degrees off of vertical so that the head of the anchor is just outside the sidewall (see above)
3. Install the anchor to a depth of approximately one-third (1/3) the anchor length.

4. Place a stabilizer plate to the inside of the anchor shaft (side of shaft toward center of house) and the distance indicated from the shaft.
5. Drive the stabilizer plate into the ground until the top of the plate is 1" below the surface of the ground.
6. Install the anchor to its full depth.
7. Pretension the anchor by pulling it up to the stabilizer plate. Pull the anchor approximately 1/2 inch more while it is in contact with the plate using the strap and take-up bolt to move the anchor head.



Installation Instructions for Cross Drive Rock Anchor

INSTALLATION INSTRUCTIONS

Drill 5/8" diameter hole 5 1/2" deep, in center of anchor location, for pilot stud. Insert pilot stud into hole.
 Drill two - 3/4" diameter holes in rock at 45 degree angles, using anchor head as a locating guide. Place rod through top of (1) square tube and into hole. Drive rod to desired depth. (Rod must be driven into rock at least 80% of its length in order to achieve minimum allowable pullout resistance.) Place second rod through top of remaining tube. Drive rod to desired depth to lock.
 Maximum pullout resistance is developed when anchor head is low as possible and ground surface is solid rock. Distance from square tubing to rock surface should not exceed 1".

IN LINE INSTALLED AND CONNECTED GROUND ANCHOR AND FRAME CONNECTION

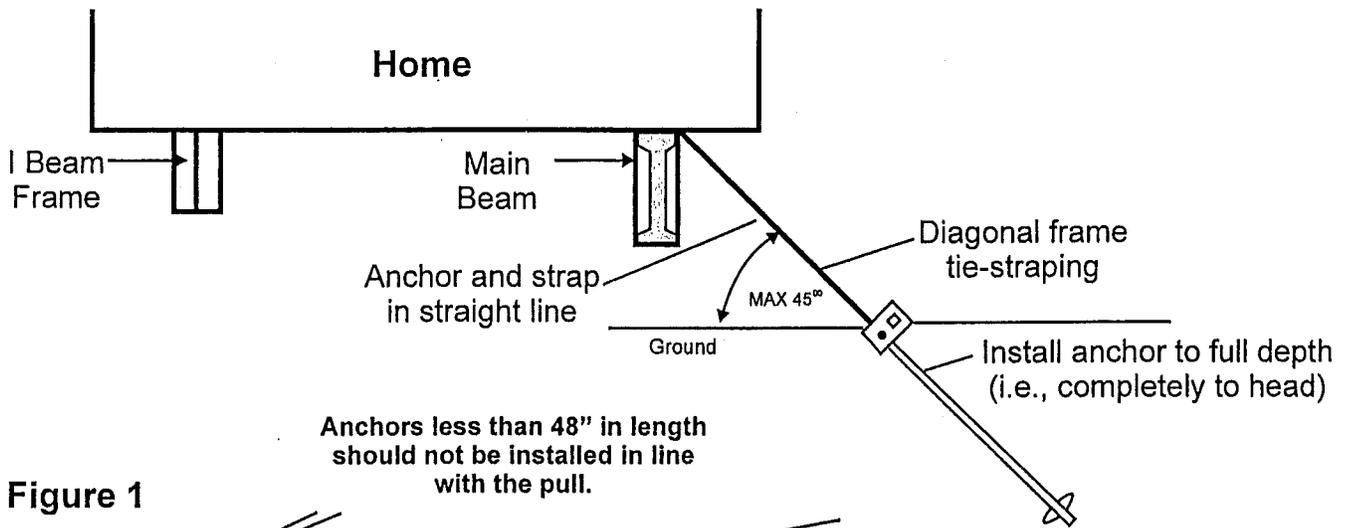


Figure 1

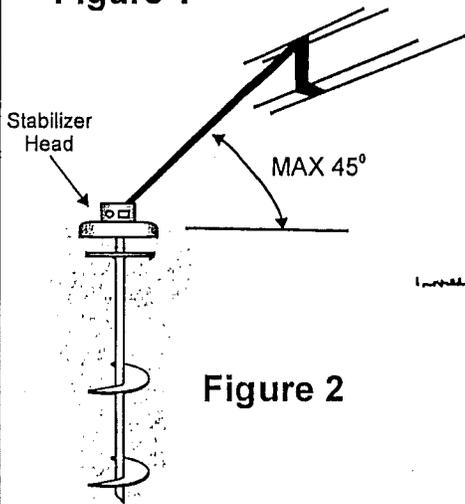


Figure 2

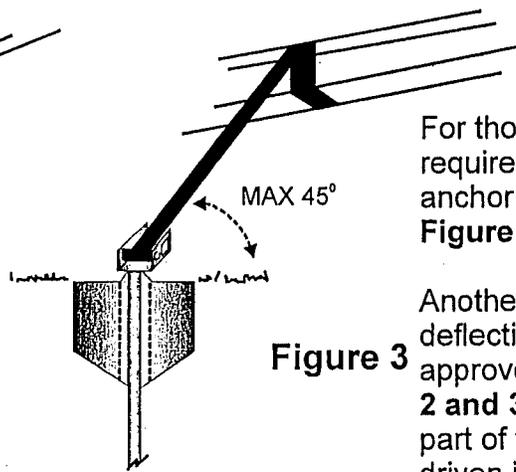


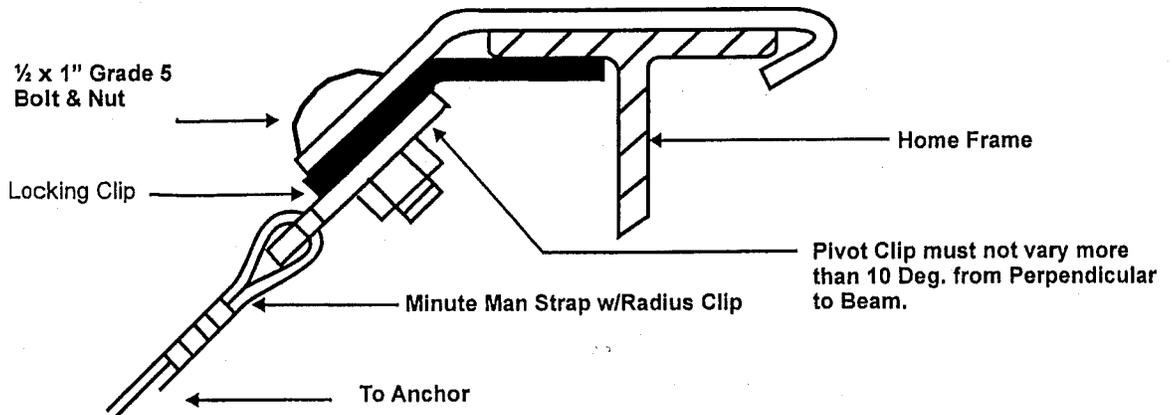
Figure 3

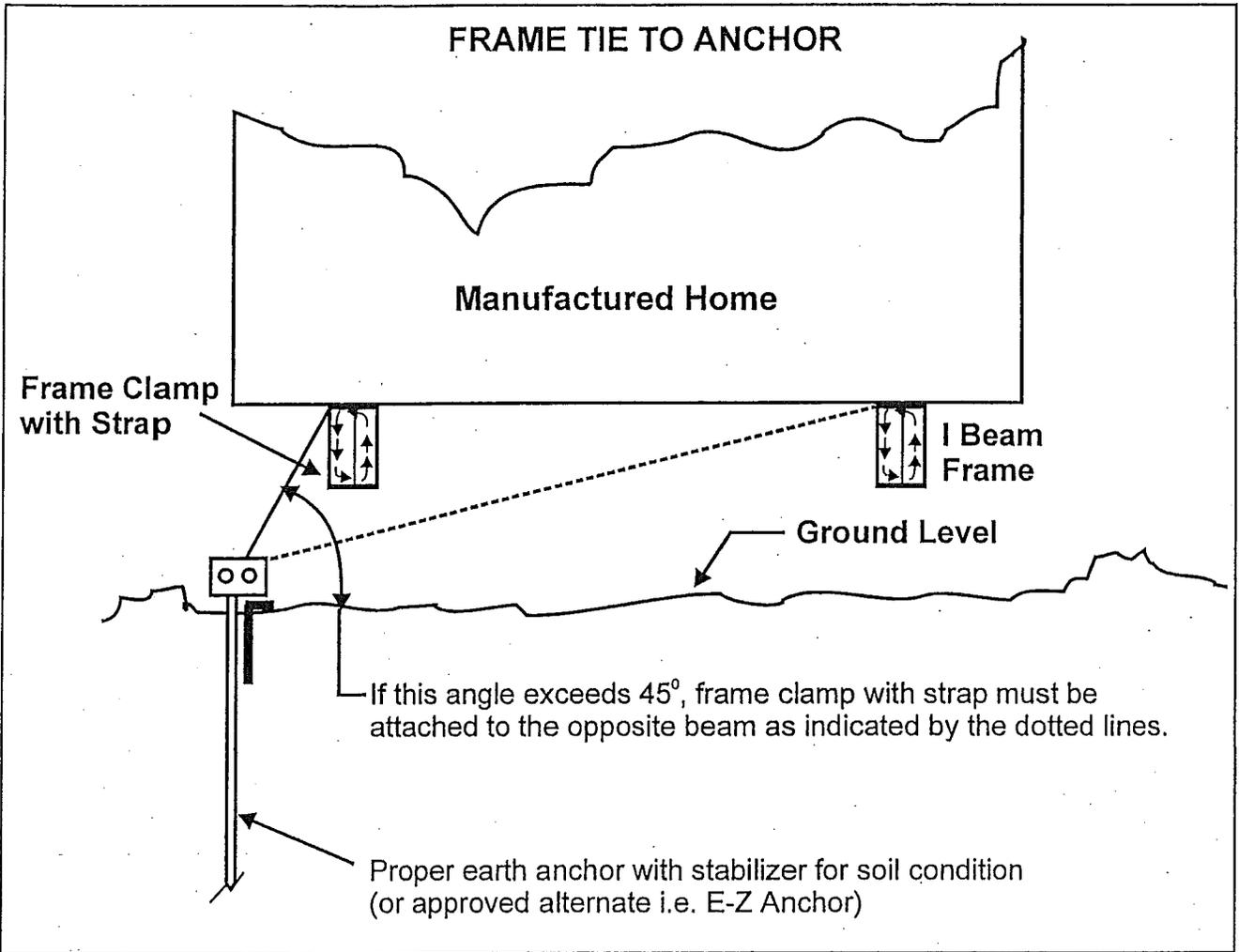
For those homes which are designed to require only diagonal frame ties, the anchor can be installed in line with the ties. **Figure 1.**

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

See Top of Page 2.

LOCKING FRAME CLAMP II MMA-33 ASSEMBLED UNIT





FRAME TIE INSTALLATION INSTRUCTIONS

<p>Frame Tie With Buckle</p> <p style="text-align: right;">1.</p> <p style="text-align: right;">2.</p> <p style="text-align: right;">3.</p> <p>Thread sufficient length of frame tie strap through buckle as shown.</p> <p>Next, thread long end of strap between frame and floor of home. Bring strap around frame and back through buckle as shown in diagram and fasten to anchor head.</p> <p>Diagram showing strap in position around frame and through buckle. It is important to remove all slack from system.</p> <p>Note: Use of a single buckle is an appropriate alternate.</p>	<p>Single Slot Buckle With Strap</p> <p style="text-align: center;">Enlarged View of Frame Beam</p> <p>Place buckle at top of anchor side of beam, pass strap around beam and through buckle. Pass strap back around beam and through buckle to anchor. Strap will wrap beam twice. Remove all slack from system.</p>	<p>Frame Tie With Hook</p> <p style="text-align: center;">Enlarged View of Frame Beam</p> <p>Attach Frame Clamp (Hook) inside top flange of home frame. Bring strap around frame. Place strap between frame and home as shown in sketch. Pull strap tight and attach to anchor tension head.</p>
---	---	--

E-Z ANCHOR INSTALLATION METHOD

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

E-Z Anchors are a patented item.

1. MACHINE INSTALLATION

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

To achieve full potential, install the E-Z Anchor vertically. A 10° deviation from vertical is acceptable. **See Figure A.**

Note: A slightly greater angle may be used to start anchor to avoid contact with the home and straightened as anchor is ground set. The splitbolt is inserted, strap is fastened, and tightening adjustment made.

E-Z Anchor carries U.S. Patents and manufacture is exclusive to Minute-Man Anchors, Inc.

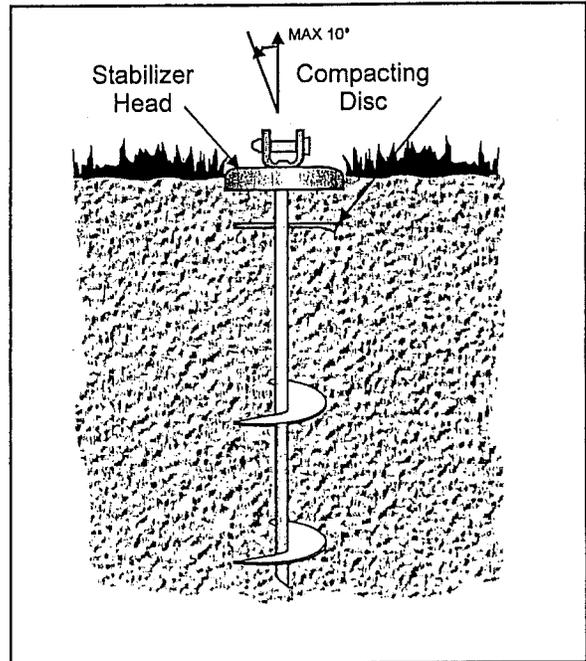


Figure A

2. STANDARDS FOR INSTALLATION

- E-Z Anchors and all components are to be installed per manufacturer's instructions.
- E-Z Anchors are approved for designated Soil Class III.
- E-Z Anchor working load capacity is 3,150 pounds for a single tie or the load of (2) ties combined.. **See Figure B.**
- Consult manufactured home set up instructions for number of frame tie downs, over the roof tie downs and tie down spacing.
- Proper site preparation requires removal of grass and sod prior to installation.

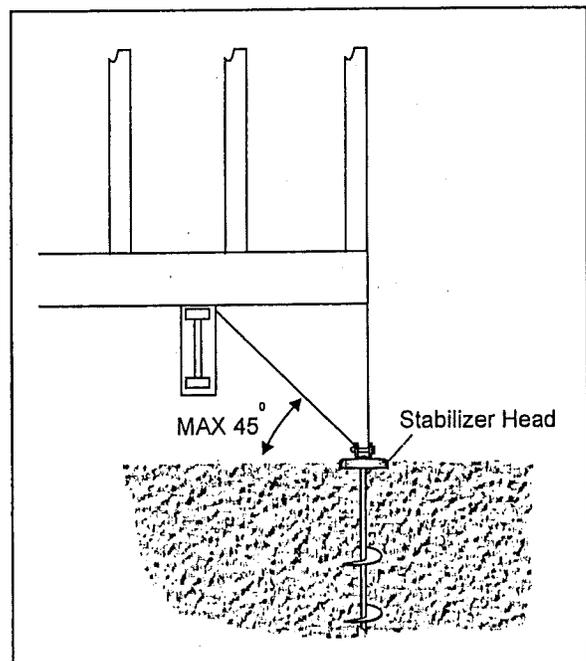


Figure B

For additional information, copies of engineering test(s) and report, Contact Minute-Man Anchors, Inc. (Revised: November 1998)

SOIL CLASSIFICATION CHART

Soil Class	Soil Description	Blow Count (ASTM D1586)	Test Probe Value	Recommended Minute Man Anchor
1	Sound hard rock	NA	NA	Cross Drive or Rock Anchor
2(a)	Very dense &/or cemented sands, coarse gravel and cobbles, caliche, preloaded silts, and clays.	40-up	551 lb. in. Up	4430DH 650DH 4430 EZDH 636 EZDH 24 BA
2(b)	Coral	40-up	551 lb. in. up	4430 DH 650DH 24 BA
3	Medium dense coarse sands, sandy gravels, very stiff silts, and clays.	24-39	351 to 550 lb in.	4430 DH 4430 EZDH 636 EZDH 650DH 4636 EZDH
4(a)	Loose to medium dense sands, firm to stiff clays and silts alluvial fill.	18-23,3	276 to 350 lb. in.	650DH 6650 EZVDH(FL).
4(b)	VERY loose to medium dense sands, firm to stiff clays and silts, alluvial fill.	12-17	175 to 275 lbs. in	760DH 860DH 8860 EZVDH (FL) 1060DH 4636 NU Concept

Remember: Each state, county or municipality may require a specific anchor from the groups shown for each soil classification. Check local regulations first.

Note: Many anchors are designed for particular soil condition(s) and are unacceptable for use in other type soils. We have listed the soils for which each anchor is designed and approved. Soil classifications are taken from the "standard for the installation on mobile homes". Each anchor model listed has been tested by an independent professional engineer to meet ANSI A225.1 and ASTM D3953.91 codes.



ROD M. HUDGINS, JR. P.E.

P.O. BOX 5070

ASHEVILLE, N.C. 28813-5070

Phone (828) 274-9244 Fax (828) 274-9525

FEBRUARY 14, 2001

MINUTE MAN ANCHORS, INC.
305 WEST KING STREET
EAST FLAT ROCK, N.C. 28726

DEAR SIR:

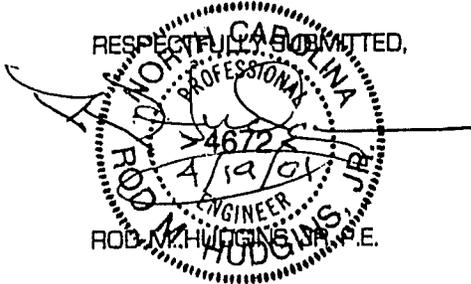
I HAVE ANALYZED DESIGN DRAWING, PHYSICAL TESTING REPORTS AND INSTALLATION INSTRUCTIONS FOR THE MINUTE MAN PRODUCTS LISTED AS FOLLOWS:

- | | | | |
|------------------------------------|---------------|-------------------------------|----------|
| 650 DH 5/8 | 4430 DH 5/8 | 36 XDH | THDH |
| 650 DH 11/16 | 4430 DH 11/16 | 48 XDH | THOHL |
| 650 DH 3/4 | 4430 DH 3/4 | 36 DH | |
| 760 DH 3/4 | | 24 BA | FCI W/S |
| 636 DH 5/8 | 4442 DH 5/8 | 210 DH | FCII W/S |
| 636 DH 3/4 | | 210 PDH | BUC W/S |
| | 4450 DH 11/16 | 210 JDH | SBN |
| 4636 DH 3/4 | 4450 DH 3/4 | 100 DH | MMASD2 |
| 4636 NCI 7/8 | | | MMASDA2 |
| 4430 EZDH | | CT/WS CORNER TIE | |
| 636 EZDH 3/4 | | | |
| 650 EZDH 3/4 | | MMA 31 LONGITUDINAL FRAME TIE | |
| 660 EZDH 3/4 | | MMA 33 LOCKING FRAME CLAMP 11 | |
| 6650 EZVDH 3/4 W/ VERT. STABILIZER | | MMSPP LONG STAB SYSTEM | |
| 8860 EZVDH 3/4 W/ VERT. STABILIZER | | E-Z ASTS SUPPORT TUBS SYSTEM | |

MY ANALYSIS OF THE PHYSICAL TEST REPORTS DEFINE THE BREAKING STRENGTH OF EACH OF THESE ANCHORS AND THEIR COMPONENTS TO BE IN EXCESS OF 5,000 POUNDS. THE STRAPPING MEETS FEDERAL SPECIFICATION QQ-S-781H FOR TYPE I, CLASS B, GRADE I STRAPPING. THE STRAPPING ALSO MEETS WITH ANSI 225.1 STANDARDS AND ASTM D3953-91 STANDARDS. THE STRAPPING IS 1 1/4 X .035 MINIMUM, HOT DIP GALVANIZED STEEL.

ON FILE ARE TESTING REPORTS OF THE DIRECT WITHDRAWAL STRENGTH OF THESE ANCHORS. THESE TEST EVALUATE THE ANCHORAGE STRENGTH OF MINUTE MEN ANCHORS INSTALLED RESISTING AN AXIAL AND 45 DEGREE ANGLE APPLIED WITHDRAWAL LOAD. FOR THE ANCHORS LISTED ON PAGES 10 AND 11, THE AVERAGE HOLDING POWER MEETS AND/ OR EXCEEDS THE REQUIRED MINIMUM OF 4,725 POUNDS, WHEN INSTALLED IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS IN THE SOIL TYPES AND CLASS SHOWN.

RESPECTFULLY SUBMITTED,





ROD M. HUDGINS, JR. P.E.

P.O. BOX 5070

ASHEVILLE, N.C. 28813-5070

Phone (828) 274-9244 Fax (828) 274-9525

ROD M. HUDGINS, JR. P.E. - PRINCIPAL

DENNIS R. PONDER - ASSOCIATE

January 21, 1999

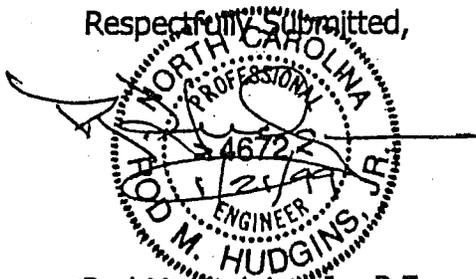
Job # 98350

Dear Sir:

The Minute Man Product and Installation Manual contains details in the anchoring instructions which show that a home's tie-down straps must be at an angle between 40 and 50 degrees from vertical. This angle requirements is listed so that Minute Man can recommend the maximum anchor spacing for a typical home.

If a home manufacturer provides anchoring and strapping details that are designed and approved by a registered engineer for the appropriate wind loads, the angle of tie-down straps may be less than or greater than the 40 to 50 degree angle as specified in the Minute Man instructions. This will not affect the maximum capacity of the anchors and / or stabilizer plates.

Respectfully Submitted,



Rod M. Hudgins, Jr., P.E.

PROTECTION OF WINDOWS AND SLIDING GLASS DOORS

THIS HOME HAS NOT BEEN EQUIPPED WITH STORM SHUTTERS OR OTHER PROTECTIVE COVERINGS FOR WINDOWS AND EXTERIOR DOOR OPENINGS. FOR HOMES DESIGNED TO BE LOCATED IN WIND ZONES 2 & 3, THE HOME CAN BE EQUIPPED WITH THESE DEVICES IN ACCORDANCE WITH THE METHODS RECOMMENDED BELOW.

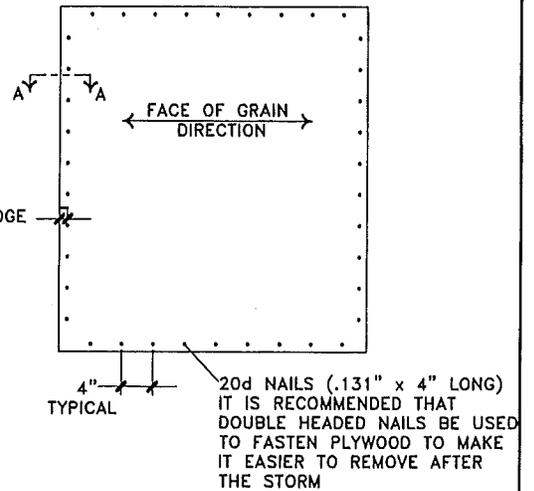
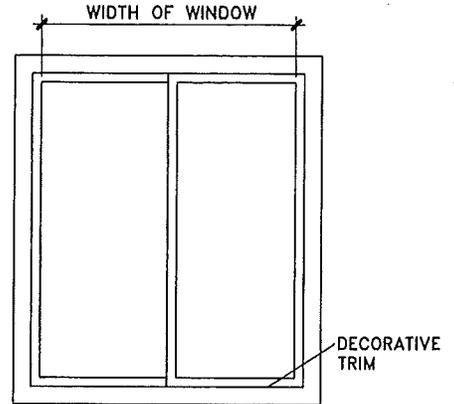
WIND ZONE II ONLY

FOR WIND STORM PROTECTION, ALL EXTERIOR WINDOWS AND SLIDING GLASS DOORS CAN BE PROTECTED FOR A STORM AS SHOWN IN THESE DETAILS.

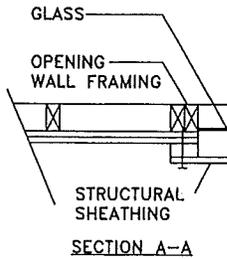
PROTECTED AREAS ARE TO BE COVERED WITH STRUCTURAL SHEATHING. THE THICKNESS AND SPAN RATINGS ARE SHOWN IN THE TABLE. THE STRUCTURAL SHEATHING SHALL BE LABELED "APA SHEATHING RATED EXTERIOR" OR EQUIVALENT. THE SHEATHING SHALL BE PLACED OVER THE OPENING WITH THE FACE GRAIN RUNNING HORIZONTAL (I.E. THE LONG SIDE OF THE PANEL SHALL BE LEVEL WITH THE GROUND).

WHERE ANY PORTION OF ANY WINDOW OR SLIDING GLASS DOOR IS WITHIN 3 FEET FROM A CORNER OF THE HOME, THE OPENING SHOULD BE COVERED WITH TWO LAYERS OF SHEATHING, EACH OF WHICH MEETS REQUIREMENTS FROM THE TABLE. THE FIRST LAYER IS FASTENED AS SHOWN, AND THE SECOND LAYER SHALL BE FASTENED USING A MINIMUM 40d NAILS (.131" x 5" LONG) AT 3" ON CENTER SPACING.

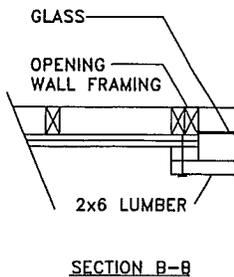
AFTER THE STORM, REMOVE AND STORE THE SHEATHING FOR POSSIBLE REUSE. CAULK ANY EXPOSED NAIL HOLES IN THE HOME SIDING TO PREVENT MOISTURE AND WATER PENETRATING INTO THE EXTERIOR WALL.



STRUCTURAL SHEATHING TO PROTECT WINDOWS IN WIND ZONE 2 AND 3		
WIDTH OF WINDOW	SHEATHING REQUIREMENTS	
	THICKNESS	SPAN RATING
UP TO 36"	15/32" MIN.	32/16
37" TO 46"	23/32" MIN.	48/24
47" TO 72"	1 1/8" MIN.	48" O.C.



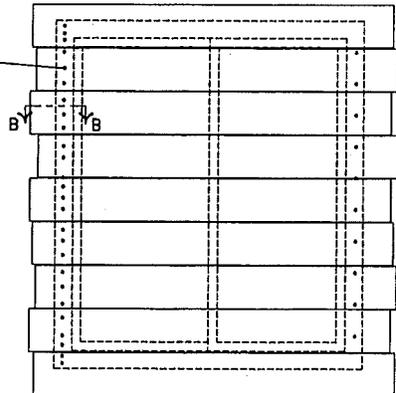
WIND ZONE II AND WIND ZONE III



(1) #8 x 4" LONG WOOD SCREW INTO THE END OF EACH 2 x 6 OR 3 - 20d NAILS (.131" x 4" LONG) INTO THE END OF EACH 2 x 6.

IT IS RECOMMENDED THAT DOUBLE HEADED NAILS BE USED TO FASTEN LUMBER TO MAKE IT EASIER TO REMOVE AFTER THE STORM.

AFTER THE STORM REMOVE AND STORE THE LUMBER FOR POSSIBLE REUSE. CAULK ANY EXPOSED NAIL HOLES IN THE HOMES SIDING TO PREVENT MOISTURE AND WATER PENETRATING INTO THE EXTERIOR WALL.



HURRICANE SHUTTERS

DRAWN BY: -

DATE: -

REV: -

HBOS Manufacturing, LP

I-12.0

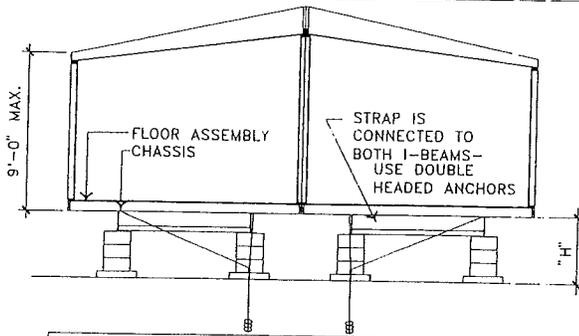
Chapter 13 - Blue Nail Drywall Option On Site Drywall Finish (Multi-Section Only)

I. IN-PLANT FACTORY REQUIREMENTS & INSTRUCTIONS

- Install unfinished 1/2" gypsum wallboard in all rooms that require the "Blue Nail" finish option as indicated on the purchase work order. All wallboard shall be installed & fastened in accordance with the approved Dapia manual requirements. Ceiling gypsum, where installed, must have all seams taped, with entire surface sealed with vapor barrier in thermal zones 2 & 3 (1 perm or less rating).
- Install all drapery and mini-blind hardware according to manufacturer's instructions.
- Ship loose all drapery packages and mini-blinds.
- Ship loose carpet, pad and tack strip. (Alternate: factory install carpet, with plastic protection).
- Install all passage doors.
- Door casing in all blue nail areas shall be shipped loose.
- Ship loose any & all feature wall mirrors and hardware.
- Ship loose ceiling molding & base board.
- Aluminum framed windows shall be plywood stripped with paneling storms in the factory.
- Vinyl framed windows shall be stripped with raw gypsum in blue nail areas to be finished in the field.
- All wardrobes and closets shall be finished in-plant per standard specifications.
- Any and all wainscot in blue-nail areas shall be shipped loose for field installation.
- All electrical fixtures (receptacles, switches, thermostats, smoke detectors, etc.) shall be factory installed.
- All required testing (electrical, plumbing, gas, etc.) shall be performed in the factory.
- Each home section will be labeled upon successful completion of all indicated factory requirements.

II. ON SITE - FIELD INSTALLATION REQUIREMENTS & INSTRUCTIONS

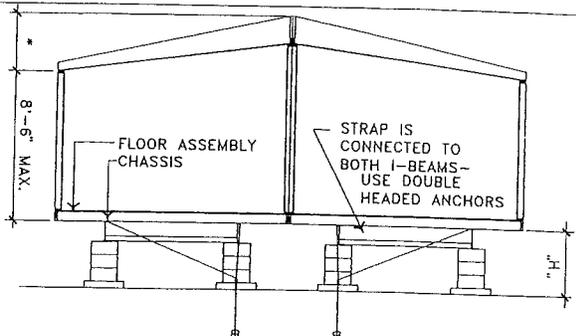
- Finish gypsum wallboard in all blue-nail areas: Mud & tape all seams and corners. Fill all fastener depressions. Finish mudding with knock down texture or smooth finish. Apply paint to all drywall in blue-nail areas. NOTE: ALL THE FINISH MATERIALS (MUD, TAPE, CORNER BEAD, PAINT) SHALL BE PROVIDED BY DRYWALL CONTRACTOR, AND ARE NOT INCLUDED AS SHIP LOOSE ITEMS FROM THE MANUFACTURING FACILITY.
- Vinyl window frames/openings are factory stripped with gypsum and shall be finished on site.
- Install all ship loose drapes & mini-blinds
- Install ship loose carpet & pad throughout home
- Install ship loose ceiling molding & base board
- Install ship loose door casings in all blue-nail areas
- Install any & all wainscot shipped loose for blue-nail areas
- Install any & all shipped loose feature wall mirrors.
- Complete all interior trim and perform all standard multi-sectional close-up procedures as specified in the installation manual shipped with the home.
- Perform all testing (plumbing, electrical, etc.) as required and indicated in the installation manual shipped with the home.
- Retailer shall assure that all instructions as outlined herein are complied with.
- Door stops installed, closet shelves and hardware shipped loose.



WIND ZONE 1 TIEDOWN SPACING CHART

HOME SIZE	MAX. BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)
28 WIDE	166"	82.5"	12 ft.	68 in.
28 WIDE	166"	82.5"	10 ft.	80 in.
28 WIDE	166"	112"	12 ft.	80 in.
32 WIDE	180"	82.5"	12 ft.	68 in.
32 WIDE	180"	82.5"	10 ft.	80 in.
32 WIDE	180"	112"	12 ft.	80 in.

ROOF SLOPE MAY NOT EXCEED 4/12 FOR THIS CHART



WIND ZONE 1 TIEDOWN SPACING CHART

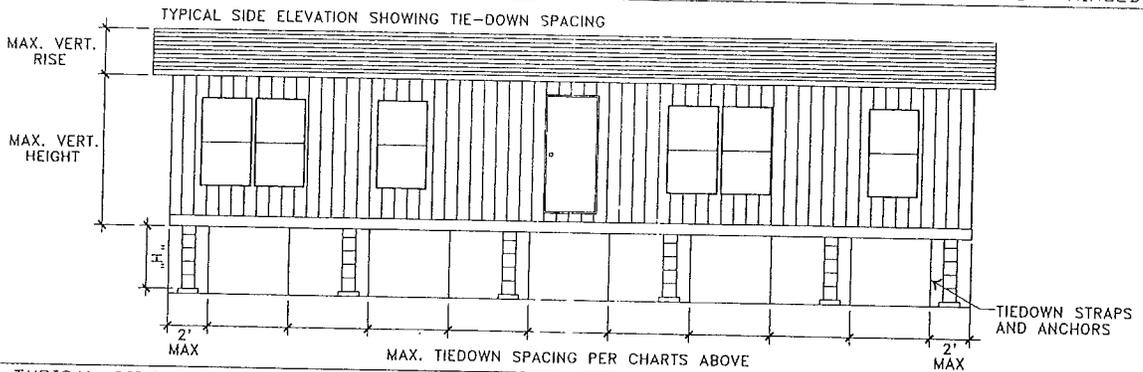
HOME SIZE	MAX. BOX WIDTH	I-BEAM SPACING	MAX. TIEDOWN SPACING	MAX. FLOOR HEIGHT (H)
28 WIDE	166"	82.5"	6 ft.	70 in.
28 WIDE	166"	82.5"	4 ft.	80 in.
28 WIDE	166"	112"	6 ft.	72 in.
28 WIDE	166"	112"	4 ft.	80 in.
32 WIDE	180"	82.5"	6 ft.	64 in.
32 WIDE	180"	82.5"	4 ft.	80 in.
32 WIDE	180"	112"	6 ft.	80 in.

* - 9'-1" MAX. FOR 28 WIDES, 9'-9" MAX FOR 32 WIDES

ROOF SLOPE MAY NOT EXCEED 7/12 FOR THIS CHART.

TIEDOWN SPACING REQUIREMENTS - STANDARD ROOF

TIEDOWN SPACING REQUIREMENTS - HINGED ROOF



TYPICAL SIDE ELEVATION SHOWING TIEDOWN SPACING

NOTES:

1. THIS DETAIL APPLIES TO 28 AND 32 WIDE HOMES WITH STANDARD OR HIGH PITCH (HINGE) ROOF DESIGNS. MAX. ROOF PITCH IS 7:12.
2. REFER TO PAGES 1-4.12 AND 1-4.13 FOR ALL STRAPPING AND ANCHORING REQUIREMENTS.
3. MAX. EAVE IS 14" FOR 28 WIDES, 10" FOR 32 WIDES.
4. BOX WIDTHS STATED ABOVE REPRESENT THE MAXIMUM WIDTH FOR EACH HOME SIZE.

WIND ZONE 1
MULTIWIDE SIDEWALL
TIEDOWN REQUIREMENT
(MINNESOTA ALTERNATE)

MSW
5/12/03

HBOS Manufacturer LP

ADD #25.0

