

SINGLE WIDE INSTALLATION INSTRUCTION MANUAL

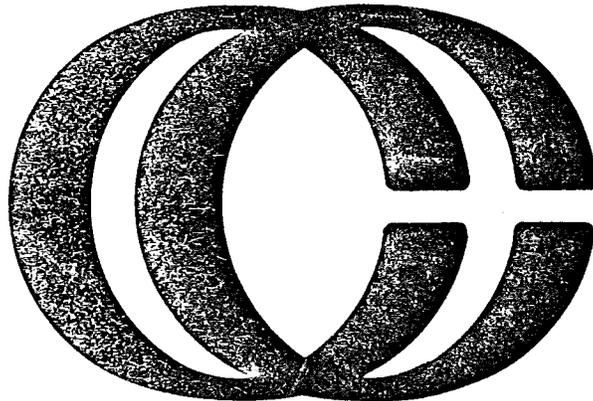
RADCO

FEDERAL MANUFACTURED
HOUSING CONSTRUCTION
& SAFETY STANDARDS

JAN 12 1989

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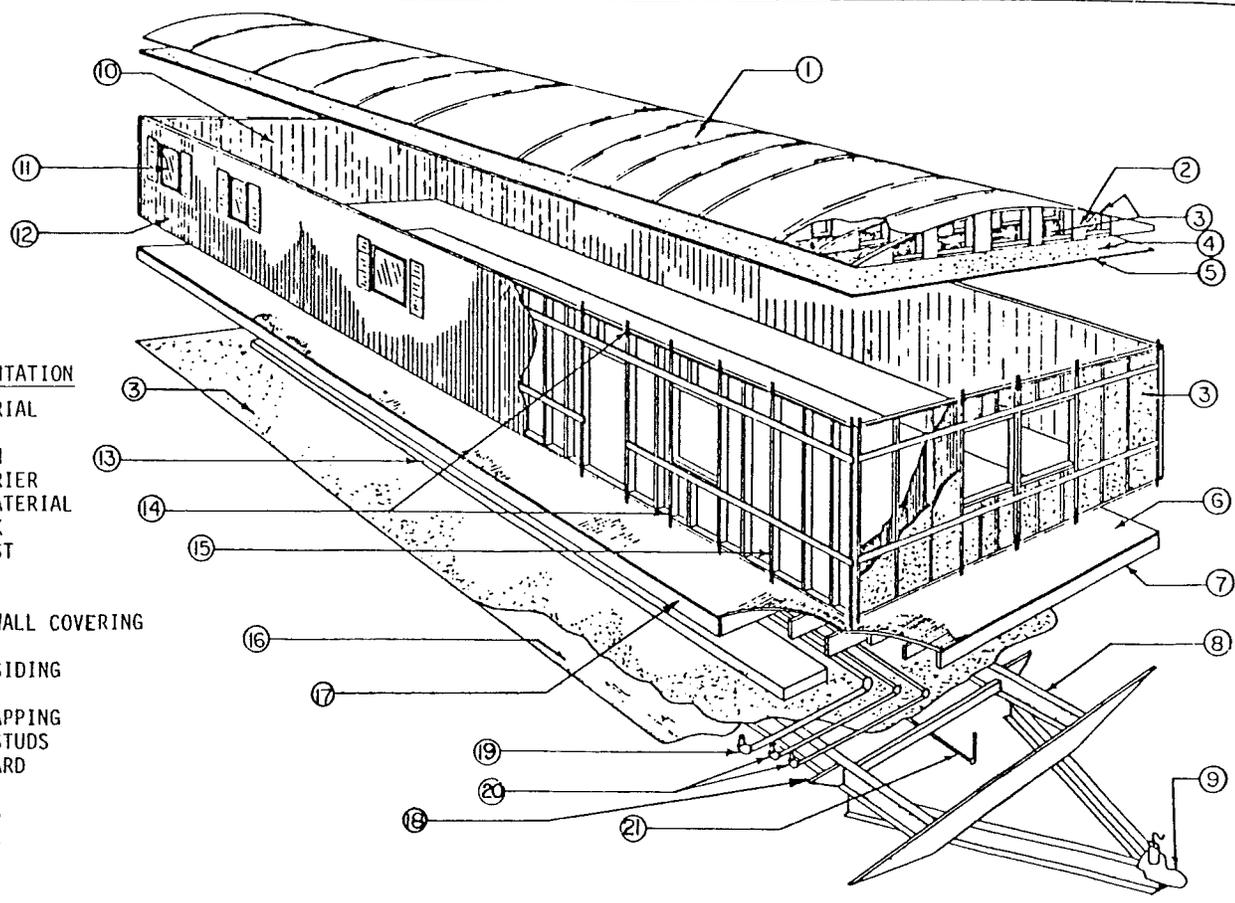
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COMMODORE HOME SYSTEMS, INC.

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MATERIAL ORIENTATION

- 1 ROOF MATERIAL
- 2 RAFTER
- 3 INSULATION
- 4 VAPOR BARRIER
- 5 CEILING MATERIAL
- 6 FLOOR DECK
- 7 FLOOR JOIST
- 8 MAIN BEAM
- 9 HITCH
- 10 INTERIOR WALL COVERING
- 11 WINDOW
- 12 EXTERIOR SIDING
- 13 HEAT DUCT
- 14 METAL STRAPPING
- 15 SIDEWALL STUDS
- 16 BOTTOM BOARD
- 17 RIM JOIST
- 18 OUTRIGGERS
- 19 DRAIN LINE
- 20 WATER LINE
- 21 GAS LINE

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INTRODUCTION

Your Commodore home was designed, constructed and inspected for conformance to the Federal Manufactured Housing Construction and Safety Standards in effect on the date of manufacture. This National Standard sets forth the requirements of design construction, fire safety, plumbing, heating systems and electrical systems for factory built housing designed to be used as dwellings.

Consult with building officials in your area to determine necessary permits, licenses and inspections required for installation of this home.

The step-by-step instructions which are required for the correct installation of your home are presented in this manual.

Before attempting to install your home, these instructions must be carefully read and understood.

The drawings contained in these instructions are intended to be representative of the product. Designs and specifications are subject to change without notice.

NOTE: This manual is intended to instruct and to assist already qualified personnel in the proper installation of the home. It is not intended to enable someone unfamiliar with home set-up to perform the installation.

It is recommended by the Department of Housing and Urban Development (HUD) that, subsequent to completion of the installation, your home be inspected by an independent, qualified professional.

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SITE PREPARATION

Proper Drainage

The site area for your home must be sloped to provide storm drainage. Check your local codes which may specify slope requirements. It is generally recommended that a slope of 1" to 12" be followed and that the site be evenly graded so that there are no depressions where surface water will accumulate, either underneath or outside the home. This is to prevent excessive humidity in the home.

A Firm Foundation

The portion of the lot intended for location of the home must be of undisturbed soil or compact fill. Make certain that you have not selected a loosely filled area, and that all top soil and vegetation materials are removed.

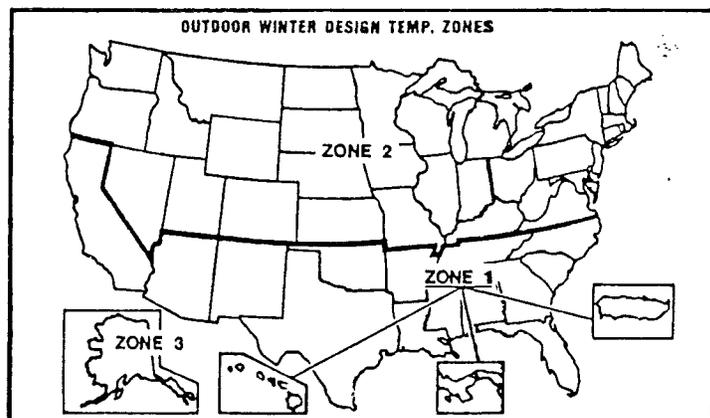
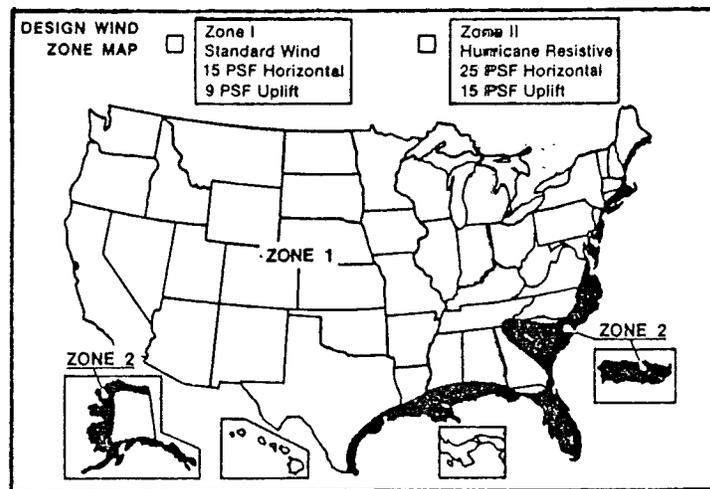
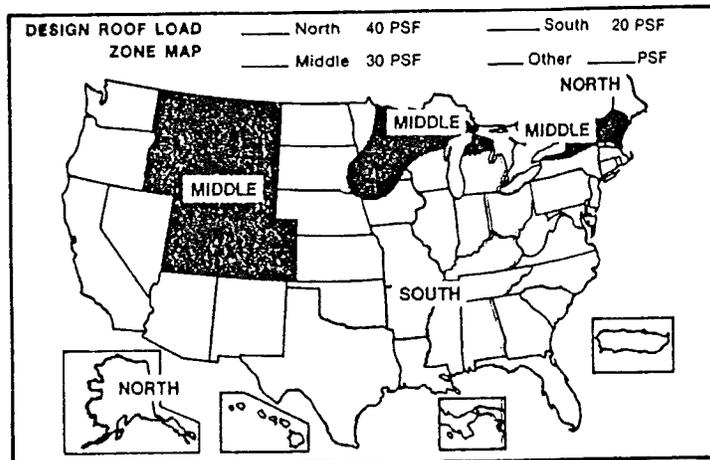
NOTE: If skirting is to be installed, the entire area under the home must be covered with a moisture vapor barrier. This is to prevent excessive humidity in the home. The moisture vapor barrier must be a minimum of 6 mil thick and be overlapped 6" at all joints.

ZONE MAPS

The following Zone Maps will help you make installation decisions with regard to prevailing weather in the zone where the home is to be located.

NOTE: Do not install your home in a zone that requires greater loads or climatic requirements than those on the Compliance Certificate. You may, however, install a home in a zone requiring lesser loads or climatic requirements.

1. From the following maps, determine and mark the zones where the home is to be located. This information will be required to determine information from other charts and tables in this manual.



PIER AND FOOTING SELECTION

The piers used must have enough capacity to transmit the vertical load which includes the weight of the home, its furnishings, and temporary roof loading to the foundation surface below it. If the load imposed is greater than the capacity of the pier, then two or more piers must be equal to or greater than the load to be transmitted.

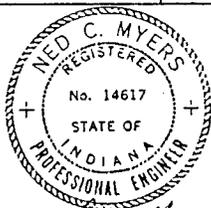
FLOOR LIVE LOADS - Excessively heavy furniture or appliances, such as pianos, organs, deep freezers, heavy chests, large china cabinets, water beds, etc., require the installation of additional support footings and piers directly beneath them. If such loads are over or between main beams, install additional piers along the main beams. If such loads are located outside the main beam install additional piers with headers to distribute the weight over several floor joists.

Complete the following steps to determine the pier and footings requirements for the home.

1. Determine pier height to be used based on site conditions.
2. Determine main beam pier spacing (10'-0" max.). Determine additional piers and headers at rim joist area.
3. Using the preceding information, determine the required main beam pier capacity from the following tables.

MAIN BEAM PIER CAPACITY TABLE (LBS.)

PIER SPACING	ROOF ZONE & WIDTH OF HOME								
	SOUTH			MIDDLE			NORTH		
	12'	14'	16'	12'	14'	16'	12'	14'	16'
3'0"	3800	4400	5000	4300	5000	5600	4800	5500	6200
9'0"	4300	5000	5600	4800	5600	6300	5400	6200	7000
10'0"	4800	5500	6200	5400	6200	7000	6000	6900	7800



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4. To determine the soil bearing capacity, contact the local jurisdictional authority for building codes or run test. If tests are required, always use a qualified professional to determine the capacity. Examples of soil types and their capacities are listed below.

TYPICAL SOIL BEARING CAPACITY

CLASS OF MATERIALS	ALLOW FOUNDATION PRESSURE (PSF)
Massive Crystalline Bedrock	4000
Sedimentary and Foliated Rock	2000
Sandy Gravel and/or Gravel (GW and GP)	2000
Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel, (SW, SP, SM, SC, GM and GC)	1500
Clay, Sandy Clay, Silty Clay and Clayey Silt (CL, ML, MH and CH)	1000

5. Using the preceding information, you can select a concrete footing size from the following table.

FOOTING SIZE TABLE (MINIMUM)

REQUIRED PIER CAPACITY (LBS.)	SOIL BEARING CAPACITY					FOOTING SIZE
	1000	1500	2000	3000	4000 AND OVER	
0001-2500		0001-2500	0001-2600	0001-2600	0001-3500	16x 8x4
2501-3000		2501-3200	2601-3400	2601-3900	3501-5200	16x12x4
3001-3600		3201-3800	3401-4300	3901-5200	5201-7000	16x16x4
3601-4500		3801-3900	4301-5200	5201-6500	7001-8700	20x16x4
4501-5400		3901-4700	5201-5300	6501-7800	8701-10500	24x16x4
5401-6700		4701-5600	5301-6400	7801-8100	10501-10900	20x20x6
6701-7900		5601-7000	6401-7600	8101-9700	10901-13100	24x20x6
7901-9200		7001-8400	7601-9500	9701-11600	13101-15600	24x24x8
9201-10700		8401-10500	9501-11400	11601-14500	15601-19500	30x24x8
10701-12300		10501-12400	11401-14200	14501-17400	19501-29400	36x24x8
12301-14000		12401-14400	14201-16700	17401-21700		36x30x8
		14401-16900	16701-19700			36x36x10
		16901-19300	19701-2300			42x36x10
		19301-22000				42x42x10
						48x42x10
						48x48x10

NOTE: FOOTING CONCRETE MUST BE 3000 P.S.I. IN 28 DAYS



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In 20 and 30 psf roof load areas the rim joist must be supported by outriggers spaced no greater than 8 ft. o.c. for 12 ft. wide units, 6 ft. 8 in. o.c. for 14 wide units and 4 ft. o.c. for 16 wide units. Should the outrigger spacing exceed these dimensions piers must be provided between these excessively spaced outriggers to support the rim joist. Additional rim joist blocking is also required at the ends of any opening in the sidewall over 4'0" in width.

Rim joist blocking is also required in areas with roof loads greater than 30 psf regardless of the outrigger spacing.

Rim joist blocking is required at the ends of any opening in the sidewall over 1'4" in width and no distance greater than 8'0" on center for 40 psf roof load areas; 6'0" on center for 60 psf roof load areas, and 4'0" on center for 80 and 100 psf roof load areas.

Proper support for the home must allow for soil conditions in the immediate area. Pier footings must be placed on firm undisturbed soil (not loose fill) or soil which has been compacted to at least 90 per cent of its maximum relative density. Pier supports may also be placed directly on concrete slabs designed for the home's placement.

Climatic conditions must also be taken into account. If footings are placed on frost-susceptible soil, such as clay or silt, heaving and/or settlement may occur. In areas where temperatures go below freezing, it is important that footings be located below the frost line.

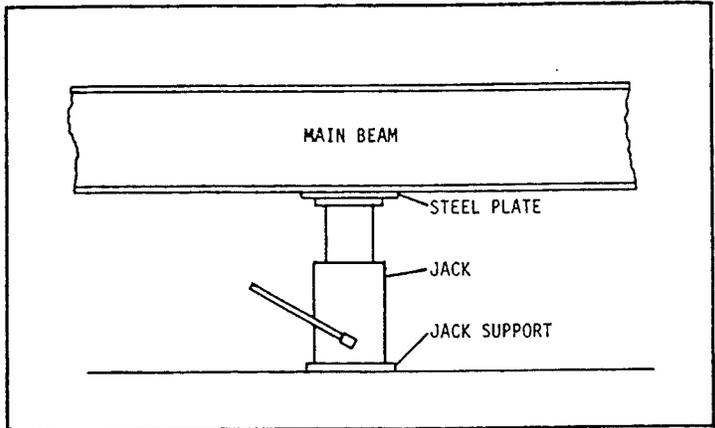
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PIER AND FOOTING CONSTRUCTION

1. Construct footings and piers as shown in following illustrations.

BLOCKING AND LEVELING

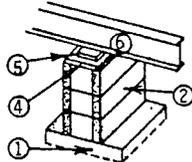
- The following equipment will be required:
- A. Two Jacks with a minimum 10 ton rating.
 - B. Two steel plates with a minimum size of 3/8x2-1/2x5" to use between the jack and the main beams. This will distribute concentrated loads and prevent damage to the beams.



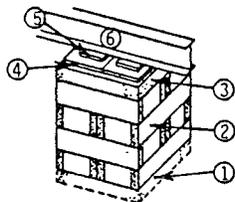
- Follow this step-by-step procedure to avoid placing undue stress on structural members of the home:
1. Level the home from front to rear by means of the hitch jack.
 2. Place one jack just forward of the front spring hanger and another just behind the rear spring hanger under one of the main beams.
 3. Operating the two jacks simultaneously, raise the home and install footings and piers next to the jacks.
 4. Jack up the front and rear end of the main beam, under which you have just installed two piers, to a level position and install a footing and pier 1'0" from each end. The home should now be near level from front to rear along the first main beam.
 5. Repeat the preceding three steps on the other main beam, bringing the home level crosswise and lengthwise.
 6. Place the remaining footings and piers along the main beams taking care not to exceed the maximum pier spacing from the table in step 3, of the pier and footing selection section, and that the end piers are 1'0" maximum from the ends of the main beams. Piers should be located as close as possible to the optional over-the-roof ties. As a precaution, especially in areas subject to "frost heave", it is recommended that additional piers be placed directly under the perimeter of the home at each optional over-the-roof tie. This will prevent the exterior walls from being pulled downward should the main beam piers heave upward due to climatic conditions.
 7. Complete the leveling procedure with a 6 ft. level, adjusting pier heights with shims. Check to make sure that all doors and windows operate properly.

FROM GRADE TO MAIN BEAM UP TO 30" HIGH

FROM GRADE TO RIM JOIST



FROM GRADE TO MAIN BEAM UP TO 48" HIGH



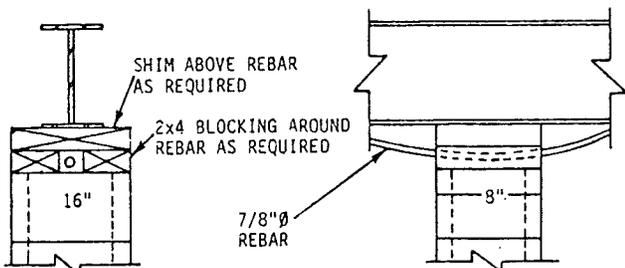
1. Footing - solid concrete below frost line.
2. Pier - concrete blocks 8" x 16" (cells vertical).
3. Cap Block - 16" x 16" x 4", solid concrete.
4. Wood Plate - 2" x 8" x 16".
5. Hardwood Shims - to be driven in tightly and not to occupy more than 1" vertical space; used to level the unit.
6. Main Frame.

NOTES:

- A. Pier foundation to be placed on stable soil.
- B. If over 48" in height (from Grade to bottom of Main Frame), pier to be designed by a qualified architect or engineer.
- C. 2" x 8" x 16" solid concrete blocks may be used in combination with item 2 above.

ALTERNATE METHODS AND MATERIALS MAY BE USED; HOWEVER, COMMODORE DECLINES ANY RESPONSIBILITY AND REQUIRES THAT A QUALIFIED ARCHITECT OR ENGINEER APPROVE THE SYSTEM DESIGN.

BLOCKING AT REINFORCING ROD
(WHEN APPLICABLE)



TIE DOWN INSTRUCTIONS

WARNING: Before any anchors are installed, check to assure that underground pipes, wires, cables and/or utility services are not located where anchors are to be driven.

The home must be in its final level position, with all anchors and piers in place, prior to the installation of tie-down straps.

After blocking and leveling, the home must be anchored to provide you safety and protection from the danger of high winds. Using frame ties only or a combination of frame ties and optional over-the-roof ties, as noted below, is required.

A. Frame Ties. These are furnished by the owner or installer. The frame ties are to be spaced equally and located as close as possible to a pier. The number of frame ties required will vary, depending on the following items as noted in the tie down location details.

1. Wind Zone
2. Size of Home

3. Optional over-the-roof ties: These straps are factory installed and must be anchored to the ground on site. If ordered, the proper number of over-the-roof ties have been installed at the factory to meet the zone requirements for which this home was built.

CAUTION: Optional over-the-roof tie-downs must not be used alone. Their use does not alter the necessity to install diagonal frame tie-downs. Over-the-roof ties are supplemental equipment only and, when installed, they are installed in addition to, not in lieu of, the required frame tie-downs.

When optional over-the-roof ties are installed, a frame tie is required at each over-the-roof tie location. The balance of the frame ties are to be spaced equally between the optional over-the-roof ties and located as close as possible to a pier.

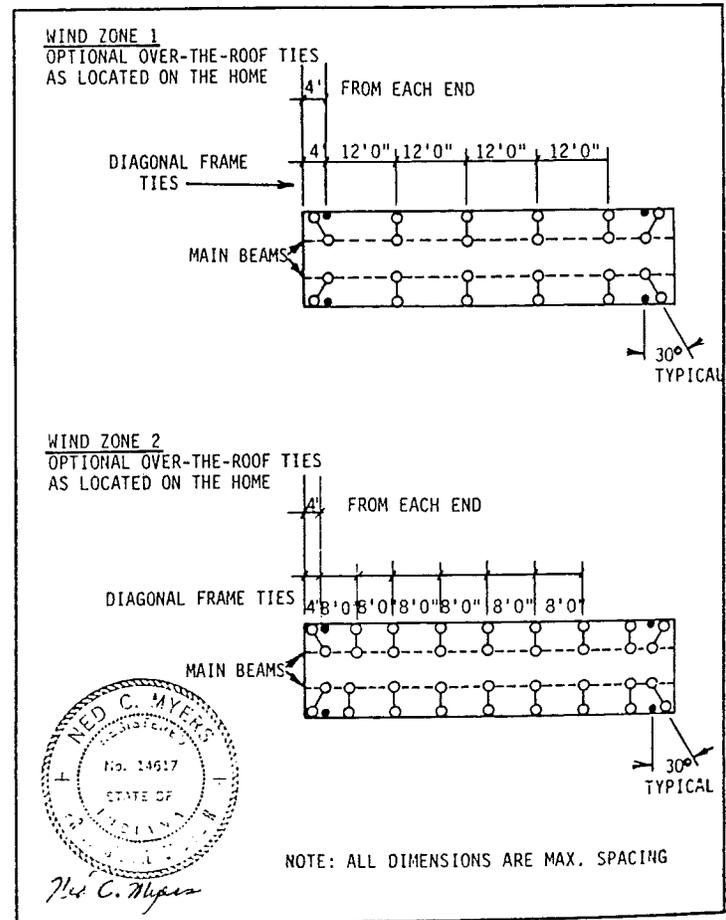
The following instructions are for installing tie downs on the home.

Construct the tie-down system with adjustable devices in order that the strap tension may be periodically adjusted to compensate for heaving or settling.

1. Using the following information, you can determine the required number of tie-downs from the following drawings.

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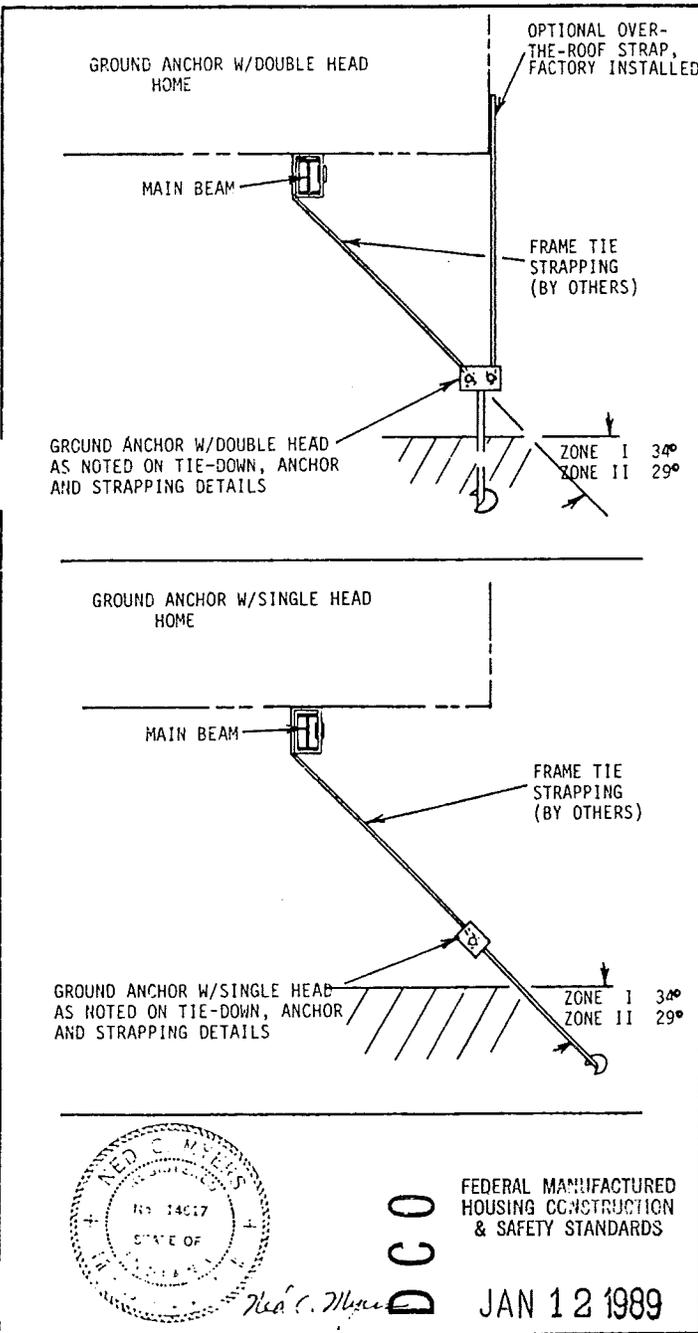
TIE DOWN LOCATION DETAIL



- Install ground anchors with single heads at the frame tie-down locations on both sides of the home.
- If optional over-the-roof ties are to be used, install ground anchors with double heads on each side of the home, directly below each of the factory installed over-the-roof tie-downs.

TIE-DOWN, ANCHOR AND STRAPPING DETAILS

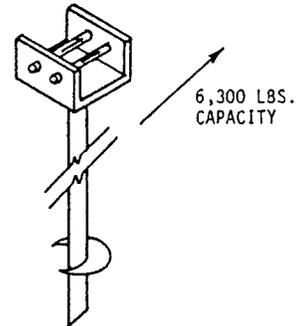
TIE-DOWN DETAILS



TIE-DOWN STRAPPING REQUIREMENTS

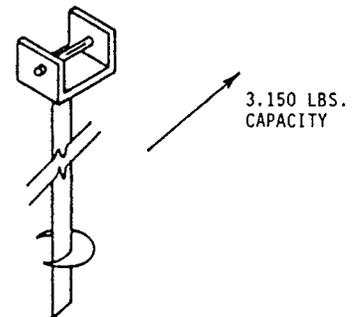
FRAME TIE STRAPPING MATERIAL MUST MEET, OR EXCEED, THE FOLLOWING SPECIFICATIONS:
 0.035" x 1.250" FEDERAL SPECIFICATIONS
 QQ-S-781H TYPE 1, CLASS B, GRADE 1, WITH
 0.30 OZ/SQ. FT. ZINC COATING.

GROUND ANCHOR WITH DOUBLE HEAD

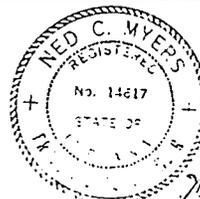


DOUBLE-FASTENING MINUTE MAN ANCHOR-BY OTHERS:
 PART NO. 650DT-5, OR 650ETH-5 FOR COMBINATION ROOF STRAP AND FRAME TIE CONNECTION OR EQUAL. MIN. LOAD CAPACITY 5,750 LBS. VERTICAL AND 2,800 LBS. HORIZONTAL, FOR A TOTAL OF 6,300 LBS. CAPACITY.

GROUND ANCHOR WITH SINGLE HEAD



SINGLE-FASTENING MINUTE MAN ANCHOR-BY OTHERS:
 PART NO. 650DT-5, OR 650ETH-5 FOR FRAME TIES OR EQUAL. MIN. LOAD CAPACITY 2,600 LBS. VERTICAL AND 2,800 LBS HORIZONTAL, FOR A TOTAL OF 3,150 LBS. CAPACITY.



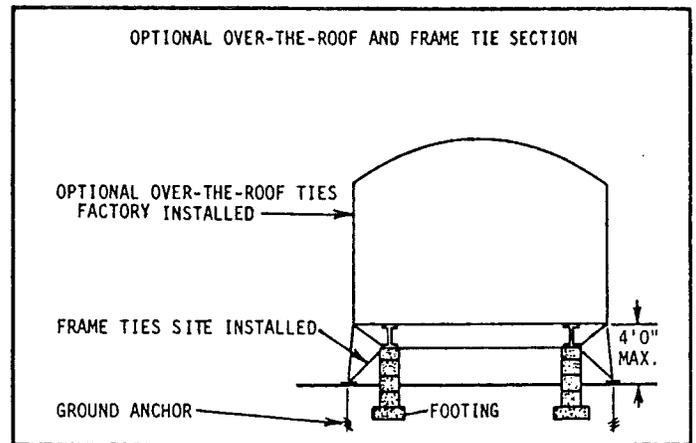
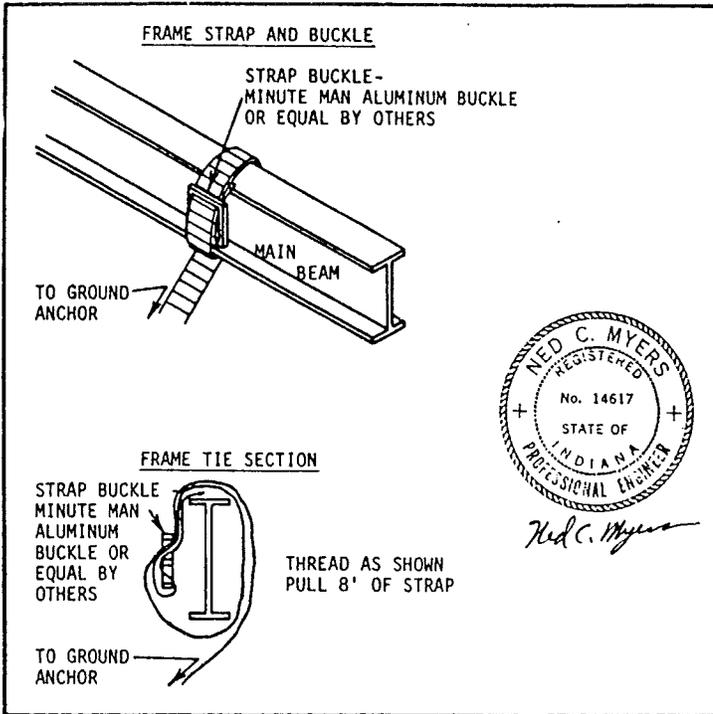
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- Connect frame ties to the main beams of the home at all ground anchors (double head and single head), on both sides of the home. See the following diagrams for connecting details.



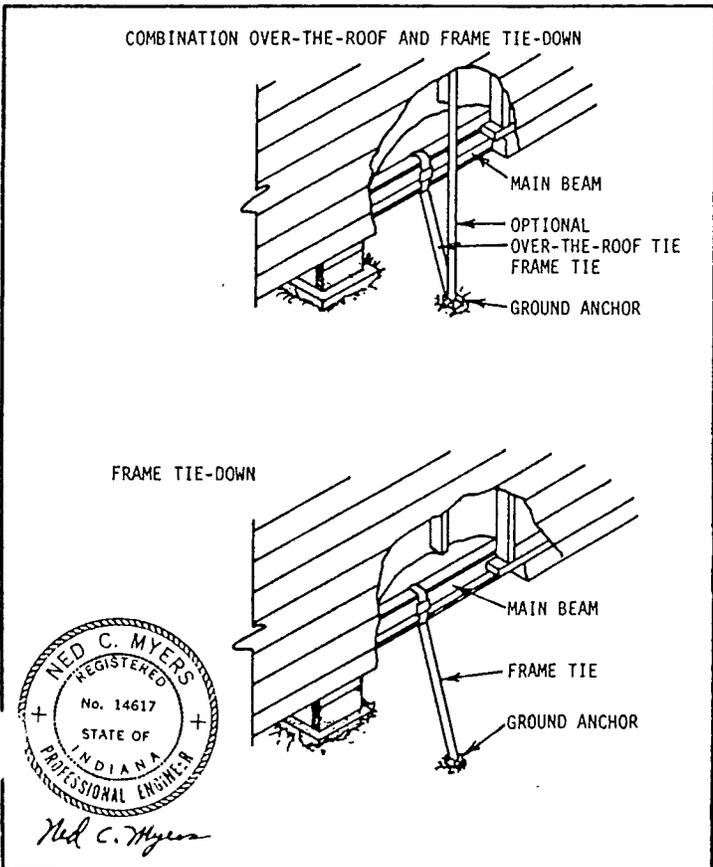
6. With one man on each side of the home, start at the front and tighten straps on both sides at the same time.

CAUTION: Failure to follow tensoning procedure as described above may result in disturbing home set-up and level, or even pull the home off the pliers.

Tie-down straps are not leveling devices. Their effectiveness is not increased by over tightening. Do not apply any excess pressure as damage to the home structure, pliers and/or footings may result. Make taut only.

When re-leveling the home do not raise the home without relieving the tension of the tie-down straps.

NOTE: After all tie-downs are taut, check all pier supports to insure full contact between the home's main beams and the pliers.



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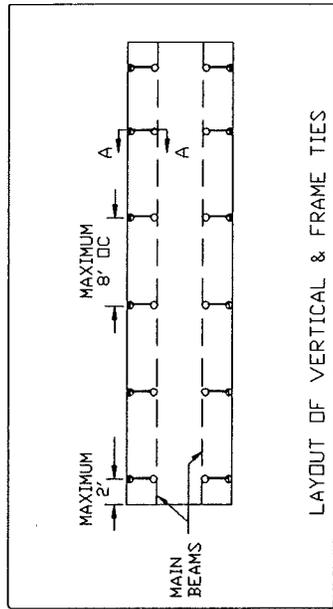
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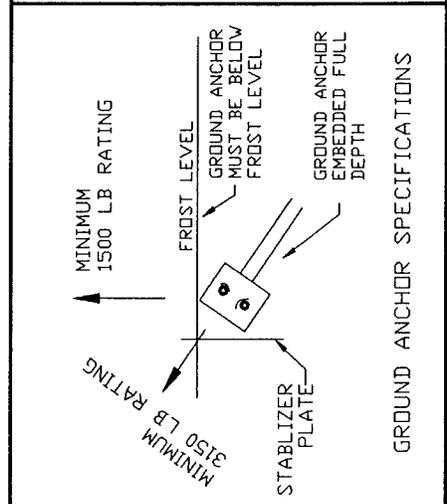
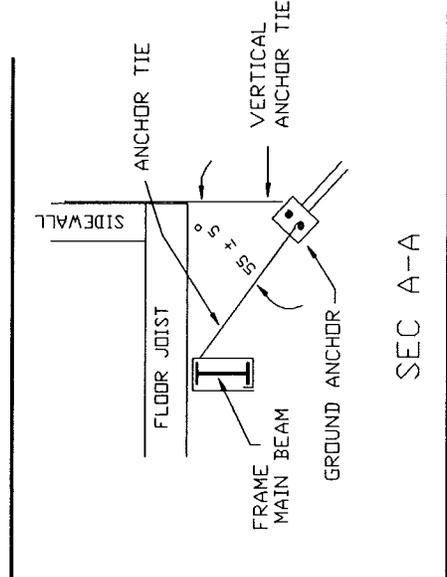
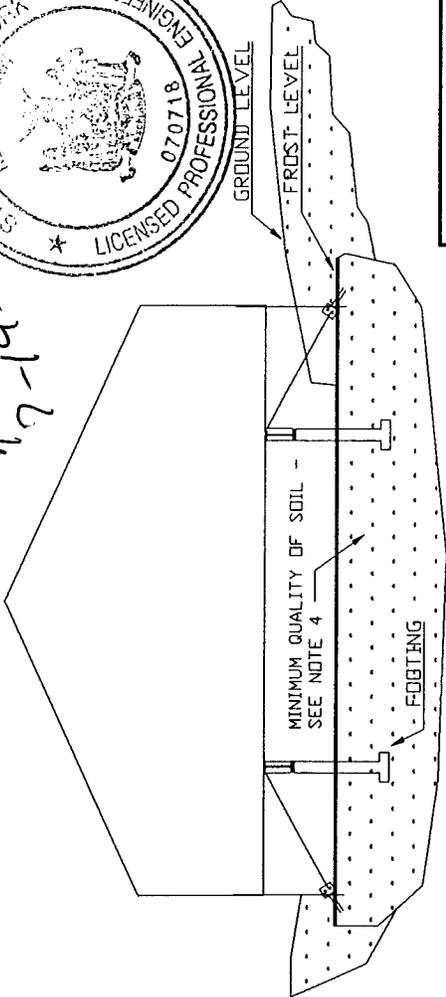
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LAYOUT OF VERTICAL & FRAME TIES
TYPICAL SINGLE WIDE UNIT



EXAMPLE OF 35° ANGLED ANCHOR STRAP

NOTES

1. THE ANCHOR STRAP IS TO BE A MINIMUM TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1-1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
2. THE VERTICAL ANCHOR TIE IS INSTALLED IN THE FACTORY COATED WITH A MINIMUM 0.3 OUNCES OF ZINC PER SQUARE FOOT.
3. THE GROUND ANCHOR MUST HAVE THE MINIMUM RATING OF SHOWN IN THE GROUND ANCHOR SPECIFICATIONS. TWO ACCEPTABLE GROUND ANCHORS ARE DESIGNATED MINUTE MAN '650-DH 578' & '636-DH 578'.
4. THE MINIMUM QUALITY OF SOIL FOR THE GROUND ANCHOR SHALL BE ONE OF THE FOLLOWING:
 - a. Very-dense and/or cemented sands, coarse gravel and cobbles, preloaded silts, clays, and corals.
 - b. Medium-dense coarse sands, sandy gravels, very-stiff silts and clays.
 - c. Loose to medium dense sands, firm to stiff clays and silts, alluvial fill.

APPROVAL STAMP

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<p>The Commodore Corporation</p>	TITLE TIEDOWN INSTALLATION DETAILS OF SINGLEWIDE UNITS FOR WIND ZONE II		DATE	REV. NO.	DATE	DWG. NO.
					7-6-94	J-1-7A
					NTS	
					DWN. BY KMF	
				REFER.		

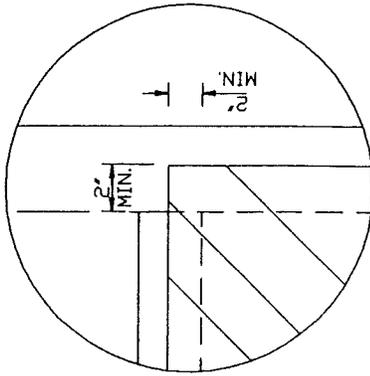
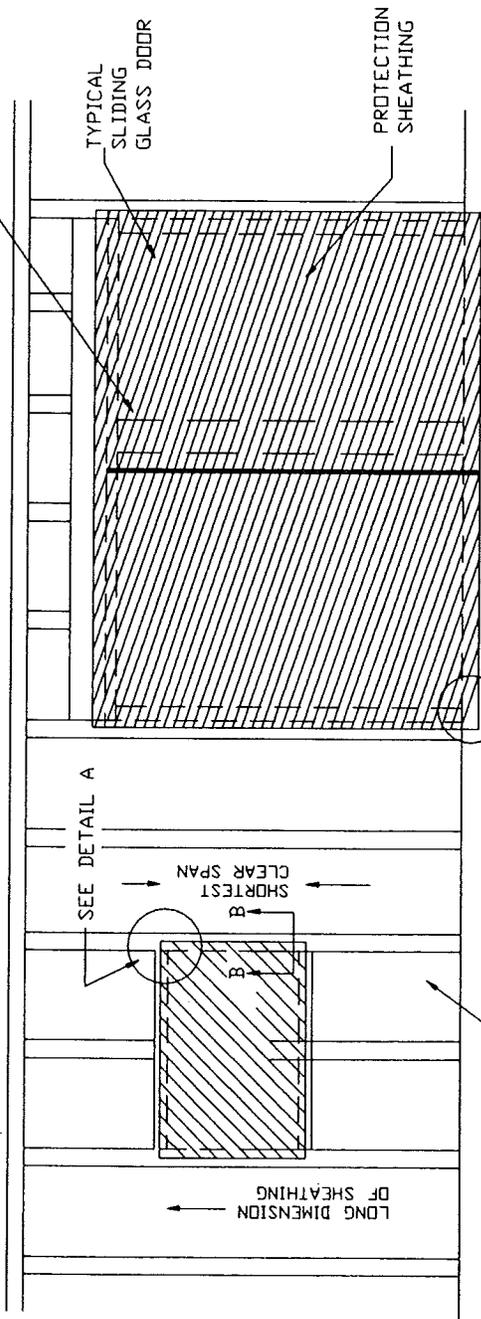
SHEATHING SCHEDULE

SIZE OF OPENING	MIN. THICKNESS OF SHEATHING	MIN. APA RATING
15 x 54	7/16"	24/0
25 x 69	15/32"	32/16
37 x 69	19/32"	40/20
79 x 53	23/32"	48/24
72 x 80	23/32"	48/24

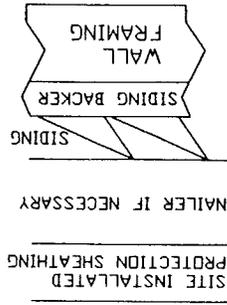
FASTENING SCHEDULE

SIZE OF OPENING	SPACING OF #8 x 3" SCREWS AROUND PERIMETER
15 x 54	12" OC
25 x 69	12" OC
37 x 69	12" OC
79 x 53	6" OC
72 x 80	6" OC

GLUE AND STAPLE #2 SPF 2 x 6 TO CENTER OF PROTECTION SHEATHING AS SHOWN. ASSURE THAT LAYFLAT DOES NOT CONTACT WINDOW OR DOOR FRAMING



DETAIL A

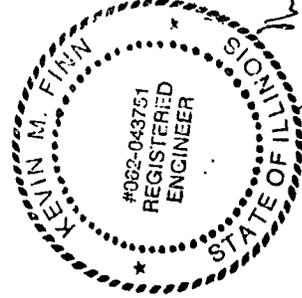


SEC B-B

STD. SHEATHING & VINYL SIDING REMOVED FOR CLARITY

NOTES

1. THIS PAGE IS INTENDED TO PROVIDE HOMEOWNERS WITH THE REQUIRED DESIGN FOR PROTECTION OF WINDOW & DOOR OPENINGS DURING HURRICANE STORM-LIKE CONDITIONS THESE DESIGNS ARE INTENDED TO PROTECT THE OPENINGS FOR WIND ZONE II AREA.
2. THE SHEATHING OVER THE OPENING IS TO EXTEND A MINIMUM 2" BEYOND THE OPENING. THE MINIMUM TYPE OF SHEATHING IS TO BE PER THE SHEATHING SCHEDULE.
3. THE NAILER (IF NECESSARY) IS TO BE FASTENED TO THE WINDOW FRAMING PER THE FASTENING SCHEDULE.
4. THE SHEATHING IS TO BE FASTENED TO THE NAILER PER THE FASTENING SCHEDULE.
5. THE LONG DIMENSION OF THE SHEATHING IS TO BE INSTALLED PERPENDICULAR TO THE SUPPORT IN THE SHORTEST CLEAR SPAN.
6. ASSURE THAT FASTENERS FROM SHEATHING TO NAILER OR FROM NAILER TO STUD DOES NOT PENETRATE WINDOW OR FLANGE OF WINDOW CAUSING WINDOW TO BREAK.
7. WHEN THE SHEATHING AND NAILER ARE REMOVED AFTER THE STORM, SEAL FASTENER HOLES WITH SILICONE CAULKING TO PREVENT MOISTURE FROM ENTERING THE HOME.



APPROVAL STAMP

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The Commodore Corporation	TITLE	PROTECTION OF DOOR & WINDOW OPENINGS WIND ZONE II
	DATE	7-27-94
REV. NO.	6500	7-27-94
	6500	3-7-95
DATE	7-12-94	DATE
SCALE	NTS	SCALE
D.W.N. BY	KMF	D.W.N. BY
REFER.		REFER.
DWG. NO.	J-1-7B	DWG. NO.

SKIRTING YOUR HOME

Commodore recommends installation of skirting.

Skirting not only increases the value of the home but has other benefits. Skirting helps keep the floor warmer in the winter, cooler in the summer, and helps prevent plumbing freeze-ups in winter. You may purchase skirting from your dealer, or make your own. In any event, it is important to remember that the skirting must allow for adequate ventilation.

NOTE: Before skirting is installed, the entire area under the home must be covered with a moisture vapor barrier. This is to prevent excessive humidity in the home. The moisture vapor barrier must be a minimum of 6 mil thick polyethylene and be overlapped 6" at all joints.

The skirting around the home must be provided with non-closing vents. The free air of the vents must be equal to, but not less than 1/150th of the floor area of the home. (Divide sq. ft. of home by 150). The vents must be located to provide cross ventilation to the entire area under the home.

If the home is equipped with a fuel burning sealed combustion appliance with fresh air intake under the home, such as furnace, water heater and/or wood burning fireplace, a vent **MUST** be provided in the skirting adjacent to the fresh air inlet(s) of the appliance. Vents must be sized in accordance with the equipment manufacturer's installation instructions.

A removable panel should be provided in the skirting to allow crawl space access.

Special provisions must be made for venting clothes dryers beyond the perimeter of your home. Dryers must not, under any circumstances, be allowed to vent under the home. For special instructions for venting dryers see Clothes Dryer Section.

GROUND LEVEL INSTALLATION

Ground level installation is preferred by many homeowners for aesthetic purposes and the convenience afforded by the elimination of excessive steps and the need for skirting. Some parks provide such installations only on request while in some areas ground level installations are required by local ordinances.

The foundation system design (footings, piers and down-vents) for a ground level installation is the same described previously for an above ground installation. The primary difference between the two installations is in the preparation of the site.

For ground level installations, provisions must be made to insure proper drainage of rain and ground water seepage to avoid accumulation in the slip (excavation). Appropriately banked backfilling at grade to drain water away from home and provisions for natural drainage at the lowest point of the slip are necessary. If natural grade drainage cannot be provided, a ground drain at the lowest point of the slip connected to a storm drain should be provided. Additionally, provisions to divert roof run-off by means of gutters and downspouts are necessary.

To protect the home from the entrance of ground moisture and excessive condensation build-up, the entire slip should be poured, reinforced concrete or adequately covered by a moisture vapor barrier.

The procedure for locating the home in the slip is contingent on factors existing at the site. If the slip is the type where the home is backed directly into it, extreme care must be exercised to avoid dragging. Shimmying or blocking for the wheel runs may be required. The complete slip may be cribbed and the home sited and jacked down into the slip if necessary. Extra jacks and cribbing are required for this type of installation.

Extreme care must be exercised to avoid damage to the home and injury to the installers during the home siting, blocking, leveling and tie-down procedures necessary for ground level installations. Homeowners should not attempt such installations themselves, but always contract a qualified installer.

PERMANENT FOUNDATIONS

In the event you are considering a permanent foundation for the home, Commodore has a typical system available that would be acceptable in most areas. Drawings may be obtained by contacting the Commodore factory which manufactured your home.

Once obtained, the typical drawings must be submitted to the local jurisdiction for all required permits.

EXHAUST SYSTEMS

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Visually inspect bathroom and kitchen exhaust vents to see that they are free and clear to the outside of the home and that nothing has been disturbed due to in-transit vibrations.

UTILITY HOOKUP AND TESTING

This section of the manual deals with the connections of the water supply, drainage, gas, oil and electrical systems of the home to the site service.

Regulations governing utility connections vary with localities; thus, the authorities having jurisdiction must be consulted to insure connection in accordance with all applicable regulations. Connections must be made only by experienced, qualified personnel who are familiar with local regulations.

The utility systems for all Commodore homes are subjected to stringent tests prior to leaving the factory. This, however, cannot provide a guarantee against possible damage in transit. For this reason it is imperative that the test procedures for each of the utility systems be conducted as outlined in this manual.

NOTE: In some instances certain electrical, plumbing or furnace/air conditioning drops may fall over an axle which may require removal of the axle to complete installation.

The information on the following pages will assist in determining the proper connection procedures for which the home was designed and serve as a guide for inspection of the system upon completion.

Upon completion of your utility installation, it is important that access to connections be provided for periodic inspection and possible future service.

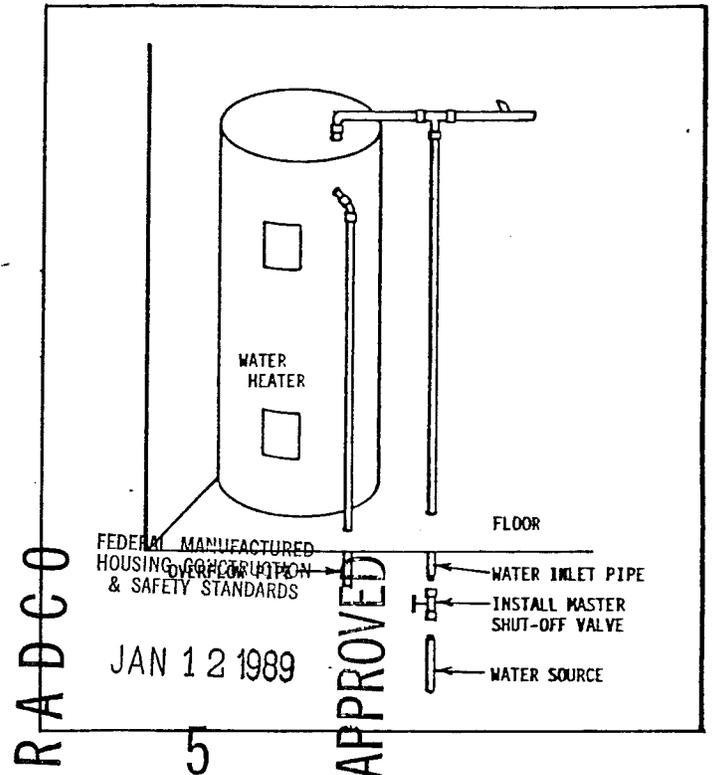
All utility connections between multiwide units must be completed before any test on the systems are started.

WATER SUPPLY HOOKUP AND TESTING

NOTE: Water heaters must be by-passed during test. Test involves use of pressurized air which can permanently damage the water heater or may even cause rupture or explosion which could result in serious injury. Water heater is by-passed by disconnecting both the cold water line inlet and the hot water line outlet from the water heater and then connecting the hot and cold water lines together through the use of appropriate connection fittings.

The water system was tested at the factory; however, it is essential that it be rechecked at the site for leaks that may have been caused by in-transit vibrations. Recheck to make sure water supply lines have been connected between sections of the home as previously instructed.

1. Install a master shut-off valve at the bottom of the water inlet pipe (either a full port gate or a full port ball valve, with threaded or solder joints). Generally, the 3/4" water inlet is located in the area of the water heater compartment. Install a pressure reducer if site pressure goes over 80 psi. These items to be supplied by the installer or owner.



2. Proceed with test as follows:
 - A. Close all water faucets, spigots and stool tank float valves.
 - B. Pressurize the system to 100 psi.
 - C. Isolate the pressure source from the system.
 - D. The gauge must stand 15 minutes with no drop.
 - E. If leakage is evidenced, locate the problem and correct. Re-test system as described above.
 - F. After successful completion of test, re-connect the water heater and connect the water supply to the home water inlet.
 - G. Turn on the water supply and visually check all connections for leakage. Operate all water faucets, showers, etc. to clear air blocks.

PROTECTION FROM FREEZING

3. If the home is to be left unheated in cold weather, after the above test, it is necessary to drain the water lines and blow them clear with compressed air to prevent damage from freezing.
4. If the home is installed in an area subjected to freezing temperatures, the exposed section of the water supply piping, shut-off valve, and pressure reducer must be protected. The most efficient and recommended means of accomplishing this is by the use of a thermostatically controlled heat tape. For this purpose, your home is equipped at the factory with an electrical receptacle under the home in the vicinity of the water supply inlet.

THE HEAT TAPE USED MUST BE LISTED BY A
NATIONALLY RECOGNIZED TESTING LABORATORY FOR
USE WITH MANUFACTURED HOMES, AND INSTALLED IN
ACCORDANCE WITH THE MANUFACTURER'S
INSTRUCTIONS.

In mild climates subject to only
occasional below freezing temperatures, an
alternative to the use of heat tape is
wrapping exposed sections of the water supply
piping with insulation, loosely taped to
prevent excessive compression.

NOTE: Before energizing water heating system
you must be sure to fill the water heater
with water. The water heater may be damaged
if heat is generated prior to filling with
water.

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DRAIN SYSTEM HOOK-UP AND TESTING

1. If the factory installed drain system has only one outlet then the following instructions, paragraphs a through d, should be used to complete the field installation. If there are two or more drain outlets, then the instructions on Paragraphs e through h are to be followed. A plumbing schematic, supplied with the unit, will indicate whether there is one or multiple plumbing outlets installed at the factory. The following illustrations in this installation manual provide additional details for field installation of the drain system.

a. If only one drain outlet is factory installed, the outlet should be located directly above the sewer drain inlet. This vertical drop connection should be made with acrylonitrile butadiene styrene (ABS) plastic pipe, cast iron pipe, copper or copper alloy tubing, or polyvinyl chloride (PVC) plastic pipe which is listed for above ground drainage vent pipe usage.

b. The drainage system was tested for leaks at the factory, however it is essential that it be rechecked at the site for any breaks that may have been caused by in-transit vibrations. To test the system, cap the drain outlet tightly, assure that the unit is level, plug the tub and shower drains and fill to the rim of one toilet bowl. The water level should stand for fifteen minutes without dropping, if there are no leaks, drain this water. Close the drains of all fixtures higher than the toilet bowl and fill these to their flood level, and allow to stand for 15 minutes and then drain simultaneously to obtain maximum possible flow in the drain piping.

c. The plumbing fixtures and connections shall be subjected to a maximum flow test by filling all fixtures with water and while they are emptied, check for leaks and retarded flow.

d. The adhesive or sealer used to seal the joint must be compatible with the (ABS) pipe which is the factory installed plumbing outlet material, and the sewer inlet. An acceptable adhesive to be used between the factory installed ABS drain outlet material and the sewer inlet material, if the sewer inlet is ABS plastic pipe (Type DWV), is ISP's "Weldon-773-ABS". Any ABS approved cement which meets the requirements of ASTM D-2235 may be used in place of ISP's "Weldon-773 ABS".

e. If there is more than one factory installed drain outlet, the field installed system is to be assembled so that the waste drains to one outlet as per the plumbing schematic supplied with the unit. The dotted line is the intended field installed portion of the system. The solvent used for this field assembly must be compatible with ABS material. One acceptable solvent is ISP's "Weldon 773-ABS". Any ABS approved cement which meets the requirements of ASTM D-2235 may be used in place of ISP's "Weldon-773 ABS".

f. The field installed sections should be marked to be cut so that the male and female joints will fit together correctly. The field installed sections are cut to the correct length. The adhesive or sealant is applied to each male and female end to assure a tight seal.

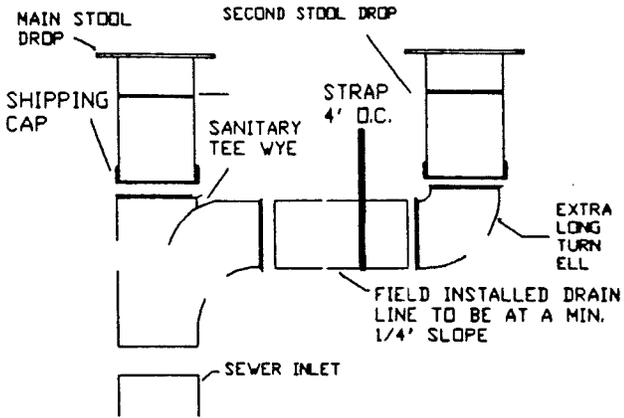
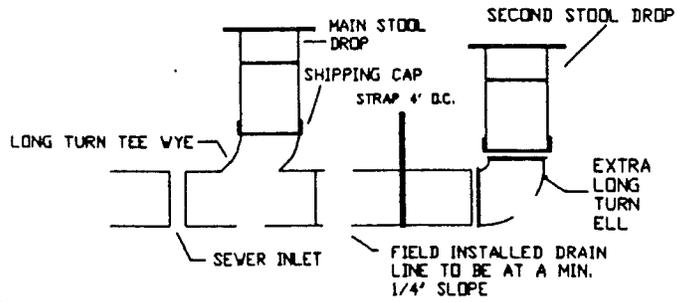
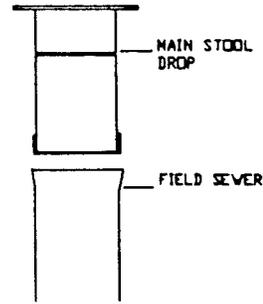
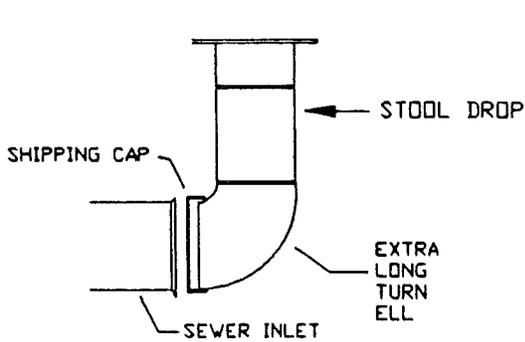
g. After the field installed section is completed as per the plumbing schematic, but prior to connection to the sewer inlet, the drainage system is to be tested as per 1.(b) and (c) above.

h. The connection of this system to the sewer inlet is to be installed as per 1.(d).

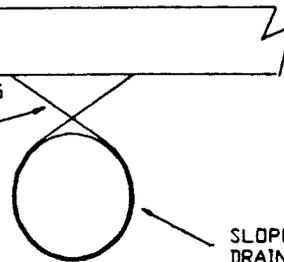
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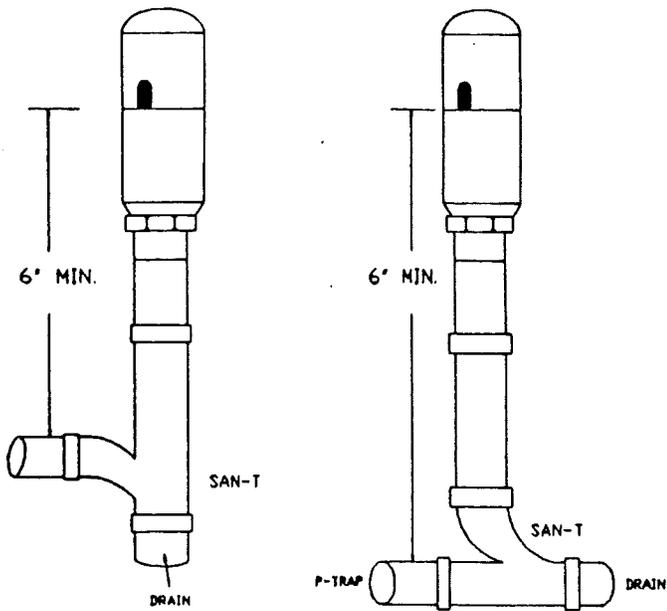
ENGINEERING PACKAGING
SYSTEMS HC300
(1/2)" BANDING
STRAP TO BE
INSTALLED AT
A MINIMUM OF
30 DEGREES
RELATIVE TO
THE FLOOR
JOIST AND
STAPLED WITH A
MINIMUM OF TWO
CORROSION RESIST.
3/8"x18 GA. STAPLES



SLOPE OF FIELD INSTALLED
DRAIN LINE TO BE A MINIMUM
OF 1/4" PER FOOT.

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NOTE:

- A. Automatic plumbing vent requires periodic inspection and maintenance in order to assure proper functioning.
 - B. Access covers are provided for each automatic plumbing vent
 - C. Inspect and service as required. Use only a petroleum jelly on the threads to insure an airtight fit. Anything else, including pipe thread compound, may deteriorate the vent or its adaptor. Hand tighten.
 - D. the vent is used only as a secondary venting means. Each drainage system in which the vent is used must have a thru-the-roof vent stack located so as to vent the water closet.
4. Access to fittings in the drainage system, subject to freezing, such as P-Traps in the floor, have been protected with insulation by the manufacturer. Insulation must be replaced if removed during the testing.

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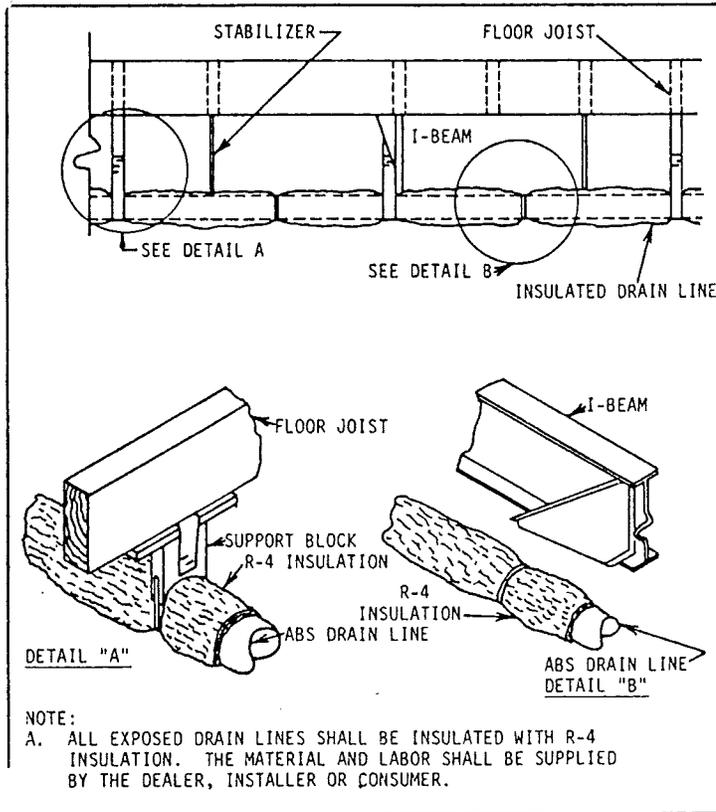
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5. If the home has drain lines installed underneath the bottom board on site and is located in areas subject to freezing temperatures, the drain lines must be wrapped with insulation to prevent freezing.



6. If the home is to be left unheated in cold weather after the above tests, it is necessary to drain the entire system to prevent damage from freezing.

P-Traps at all fixtures and stools can be protected by pouring 1/2 cup of antifreeze into each one.

NOTE: Do not use heat tape on exposed drain lines. FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS

ELECTRICAL SYSTEM HOOKUP & TESTING

The electrical test and connection of the home should be made only by qualified personnel in accordance with applicable sections of the National Electrical Code along with any additional requirements imposed by local authorities having jurisdiction.

A sufficient power supply must be available at the site. Insufficient power supply will result in improper operation and possible damage to motors and appliances and costly electric service. The amperage rating of the electrical distribution panel main disconnect is shown on the tag located outside the home adjacent to the feeder entrance and on the electrical distribution panel itself.

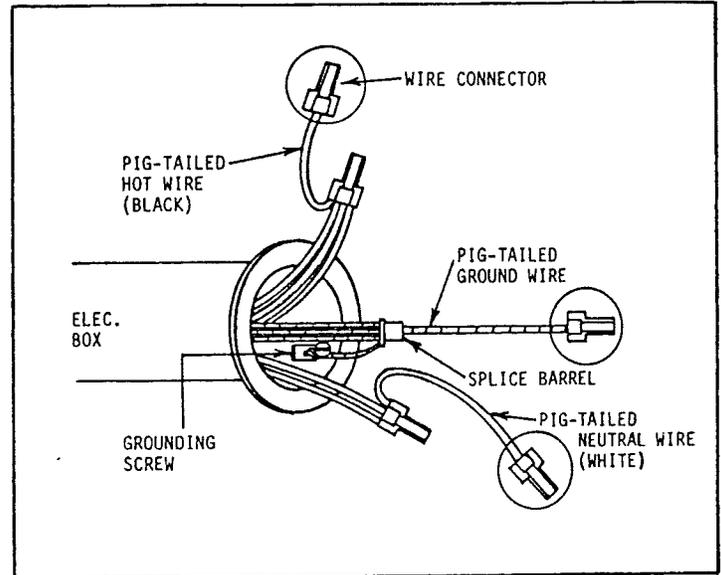
The home was tested at the factory, but must be retested after set-up, because of the possibility of connections loosening due to in-transit vibrations.

EXTERIOR LIGHT FIXTURES & OTHER 110 V APPLIANCES

Connect wires, black to black, white to white and ground to ground, using wire nuts.

Push wires into box and place putty tape on light fixture base and secure fixture in position.

Install bulb and apply caulking around base of light fixture to insure a water-tight seal to the wall (putty tape and caulking not provided by Commodore).



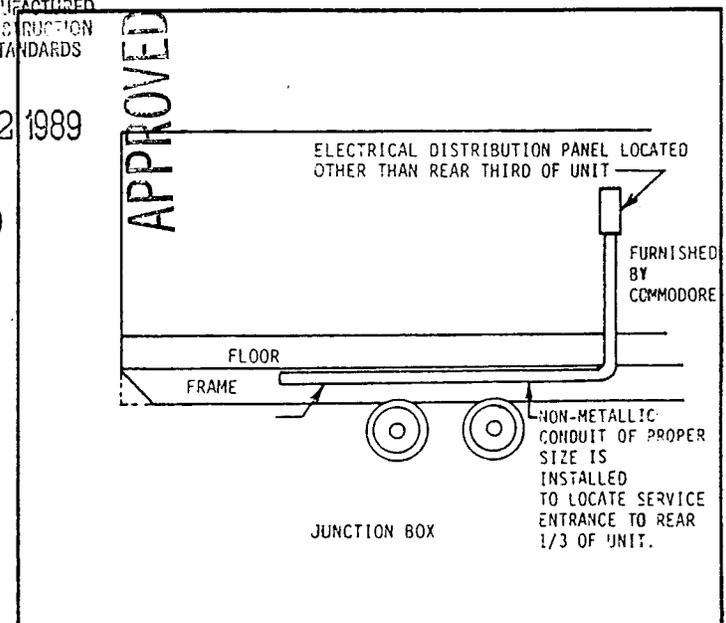
CONNECTION OF THE ELECTRICAL SERVICES

1. If the electrical distribution panel is not located in the rear 1/3 of the home, conduit of proper size is installed to local service to rear 1/3.

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2. To determine applicable feeder size amperage, see Main Breaker and the label on electrical distribution panel.
- Using this information, determine the required feeder size from the following table.

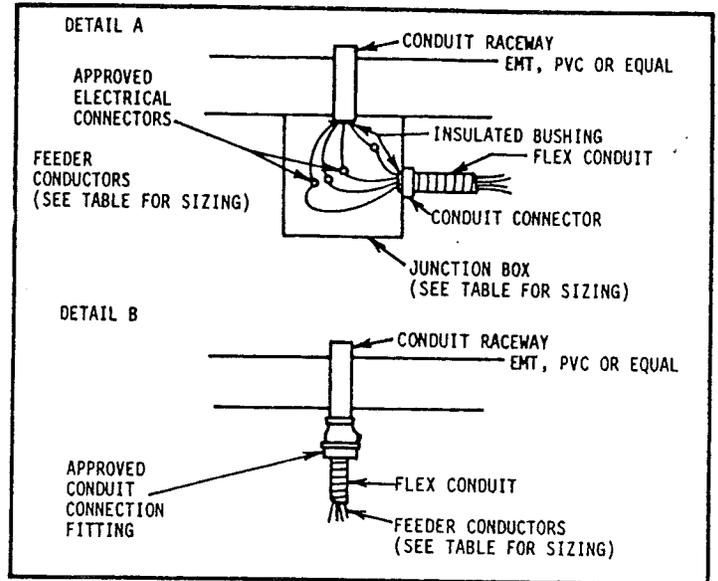
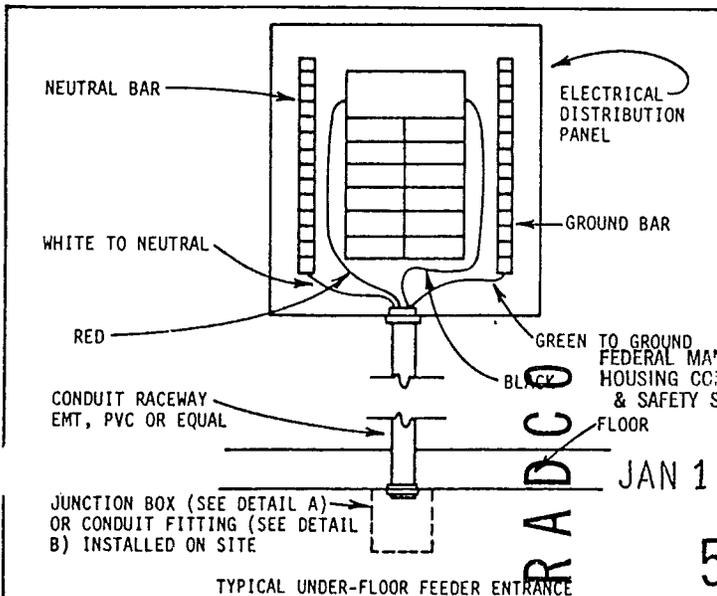
ELECTRICAL FEEDER AND EQUIPMENT SIZES					
Feeder Size (AMPS)	Maximum Neutral Feeder Load (AMPS)	Minimum Required Junction Box Size (Inches)	Feeder Sizes Based Upon Use of 75° C Insulated Copper Conductors		Conduit (Inside Dia.)
			Black-"Power" Red-"Power" White-"Neutral"	Green or Bare Ground	
50	50	10x10x4	#6 THW (Cu)	#8 (Cu)	1-1/4"
100	100	10x10x4	#3 THW (Cu)	#8 (Cu)	1-1/2"
150	115	12x12x6	#1/0 THW (Cu)	#6 (Cu)	2"
200	130	12x12x6	#3/0 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 consideration. Allowable ampacities are based on ambient temperature of 30°C, 86°F.

4. UNDER-FLOOR FEEDER ENTRANCE

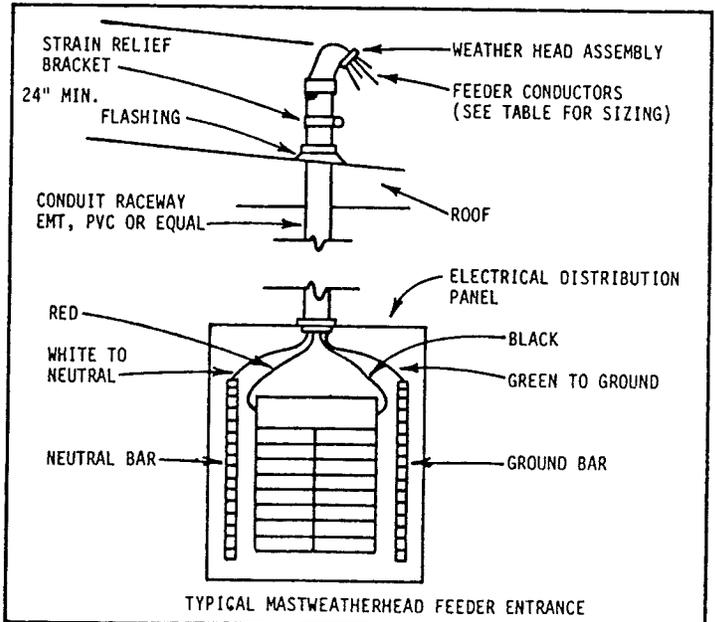
Homes with an under-the-floor feeder entrance are provided with a permanently attached conduit raceway which runs from the electrical distribution panel to a point terminating beneath the floor of the home. A suitable conduit fitting or junction box must be installed at the termination point below the floor.

CAUTION: The connection of the home is a feeder, not a service. When wiring the feeder, a grounding (green) conductor must be installed and the neutral (white) conductor must not be grounded in the electrical distribution panel.



5. MAST WEATHERHEAD FEEDER ENTRANCE

Homes so equipped contain all necessary conduit to the electrical distribution panel but feeder conductors are not provided with this assembly and must be installed on site in accordance with the above table.



CAUTION: If the home has an electric water heater, it must either be filled with water or have the circuit breaker turned "OFF" before energizing the home electrical system or severe damage to the heating element will result.

With the electrical distribution panel main circuit breaker and all individual circuit breakers in the home turned off, make electrical service connections. When connections are complete, turn on power at electric meter source. Do not turn on the main panel box circuit breaker in the home until the grounding and continuity testing has been performed.

7. Grounding the Home

NOTE: The grounding bar in the main electrical distribution panel box must be grounded only by qualified personnel in accordance with applicable sections of the National Electrical Code along with any additional requirements imposed by local authorities having jurisdiction.

If the home has an add-on room, make all electrical connections before performing the following tests.

GROUNDING AND CONTINUITY TEST

8. Perform the following test after all structural assembly, metal and trim installation is finished.
 - A. Connect one clip of a flashlight continuity tester to a convenient ground (metal skin, window frame on metal skinned units, floor duct riser, screw head on receptacle or switch plate, etc.) and touch the other clip to each light fixture canopy (where the light is mounted to ceiling or wall). The continuity tester should light if each fixture is properly grounded.
 - B. 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.
 - C. Using the continuity tester, check the continuity between the following:
 1. Between one riser of furnace duct and convenient ground.
 2. Between metal roof and steel frame.
 3. Between metal skin and steel frame.
 4. Between metal gas piping and steel frame.

NOTE: Continuity to ground is not required on metal inlet of plastic piped water system.

5. Between electrical distribution panel and steel frame.
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.
6. In addition, if home water distribution are metal, the ground continuity between the water line inlet and steel frame and all metallic plumbing fixtures such as sinks, tubs, faucets, etc. must be checked.
7. Any loss of grounding continuity found in the above will require investigation and correction.

POLARITY & OPERATIONAL TEST

8. Turn on main panel box circuit breaker and then one at a time, turn on the individual home circuit breakers and perform the following test. Should any breaker trip, this indicates a problem with the circuit that must be located and corrected.

CAUTION: Make sure the water heater is filled with water before energizing.

- A. Plug an AC receptacle wiring tester into each receptacle in the home to check for reversed polarity, open grounds and shorts.
- B. Install light bulbs and fluorescent tubes in all light fixtures. Make sure each light fixture is operable by turning the appropriate switch to the "ON" position.
- C. Repair or replace any defective light fixtures or switches. Check operating of furnace and water heater thermostats and set. Check and run furnace blower.
- D. Conduct test of GFI (Ground Fault Interrupter) circuit breaker in accordance with the breaker manufacturer's instructions.
- E. Conduct tests of the smoke detector(s) in accordance with the manufacturer's instructions.

GAS SYSTEM HOOKUP & TESTING

The gas piping system was tested at the factory; however, it is essential that it be rechecked at the site for leaks that may have been caused by in-transit vibrations.

NOTE: Do not apply more than the specified pressure as damage to gas valves and/or regulators may result.

Before a test is begun, the temperature of the ambient air and the piping should be approximately the same. Conduct the test when air temperatures will remain stable.

The gas piping system must be tested two ways:

- A. Piping only - all appliances isolated.
- B. Entire system - with appliances.
1. Piping only test:
 - A. Isolate all appliances from the system by closing all appliance shut-off valves.
 - B. At the home gas inlet, attach a pressure gauge calibrated in ounces.
 - C. Pressurize the system with air to not less than 10 psi or 48 ounces of air pressure.
 - D. Isolate the pressure source from the system.
 - E. The gauge must stand 10 minutes with no drop.
 - F. If pressure loss occurs, check all joints in piping system beneath the home and at all shut-off valves with soapy water or bubble solution until leak is located.
 - G. Repair leak and retest.

2. Entire system test:

- A. All gas equipment controls and pilot light valves must be closed. Refer to individual gas equipment manufacturer's instructions.
- B. Gas shut-off valves for all gas equipment must be in the "Open" position.
- C. At the home gas inlet, attach a pressure gauge calibrated in ounces.
- D. Pressurize the system with air to not less than 6 to 8 ounces of air pressure.
- E. With soapy water, or bubble solution, check all gas shut-off valves and flex line connections to valves and appliances for leaks.

CAUTION: Do not bubble check brass fittings with solutions containing ammonia.

F. If leak is found, repair and re-test.

NOTE: Prior to making connection to site supply, gas inlet orifices of furnaces, water heaters and appliances must be checked to insure they are set up for type of gas to be used -- L.P. (liquefied petroleum) or natural gas. The gas pressure should not exceed 7" 14" water column.

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If conversion is required, individual appliance, furnace or water heater manufacturers' instructions must be complied with.

Gas appliance vents shall be visually inspected to insure that they have been connected to the appliance and roof jacks are installed and have not come loose during in-transit vibrations.

The gas connection to the gas supply should be made by an authorized representative of the gas company.

If the home has gas piping stubbed in for future installation of appliances, a shut-off valve and threaded pipe plug or cap will be installed at the factory and all of the above tests should be performed on the system.

After completion of tests, close equipment shut-off valves and connect gas supply to the home gas inlet. One at a time, open each equipment valve and light pilots and adjust burners according to each appliance/equipment manufacturer's instructions. Check the operation of the furnace and water heater thermostats and set.

CAUTION: Make sure water heater is filled with water before lighting pilot.

OIL PIPING HOOKUP & TESTING

Homes produced by Commodore which are equipped with oil burning furnaces must have the oil supply piping installed on site. Piping is not supplied by Commodore.

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 8 inches above the level of the furnace oil control, while top of the tank is within 8 feet of the 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 1-1/4 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.

An accessible and approved manually operated shut-off valve must be installed at the oil tank outlet. Additionally, it is recommended that a suitable filter be installed in the fuel line near the tank to help trap dirt and water.

NOTE: All oil 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.

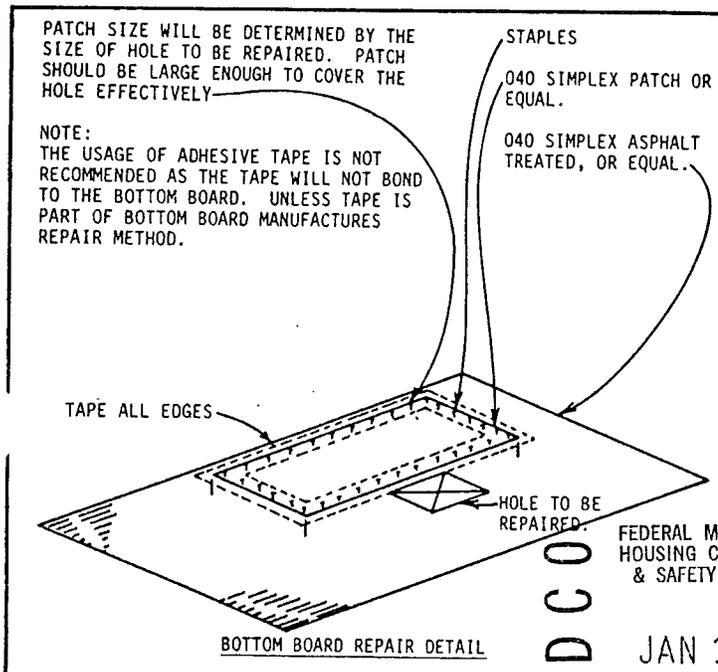
BOTTOM BOARD PATCHING

Below are listed some of the different patching methods which offer the dealer, or home buyer, a means of resealing the bottom board:

Affix the patch with an approved bottom board tape. It is recommended that either CS-12 from Shepherd Products of Kalamazoo, Michigan or #620 from First Line Corp. of Valdosta, Georgia be used.

The outward Flare Tacker is an air operated tool Model LN3045 manufactured by Senco Products, Inc.

The patch should first be affixed to the bottom, using an approved tape to secure the perimeter and then fastened near the perimeter at 3" intervals. Use the staples described in Senco Bulletin M-100.



OPTIONAL ITEM INSTRUCTIONS

CAUTION: Commodore cannot be responsible for any damage resulting directly or indirectly from installation of accessories, nor any modifications to the home subsequent to shipment from the factory. All alterations must be in compliance with the Federal Manufactured Housing Construction and Safety Standards and will be at the risk of the installer and/or home owner.

Local building officials should be consulted prior to making any alterations to the home to insure compliance with all applicable codes and requirements. Your dealer should be consulted as he is a specialist in the proper installation of accessories.

THE VENTING SYSTEM FOR SUCH APPLIANCES AS REFRIGERATORS, FURNACES, WATER HEATERS AND GAS OVENS MAY NOT BE COMPLETE AND MUST BE INSTALLED BEFORE THE APPLIANCE CAN BE OPERATED. FOLLOW THE MANUFACTURER'S INSTRUCTIONS INCLUDED WITH THE APPLIANCES.

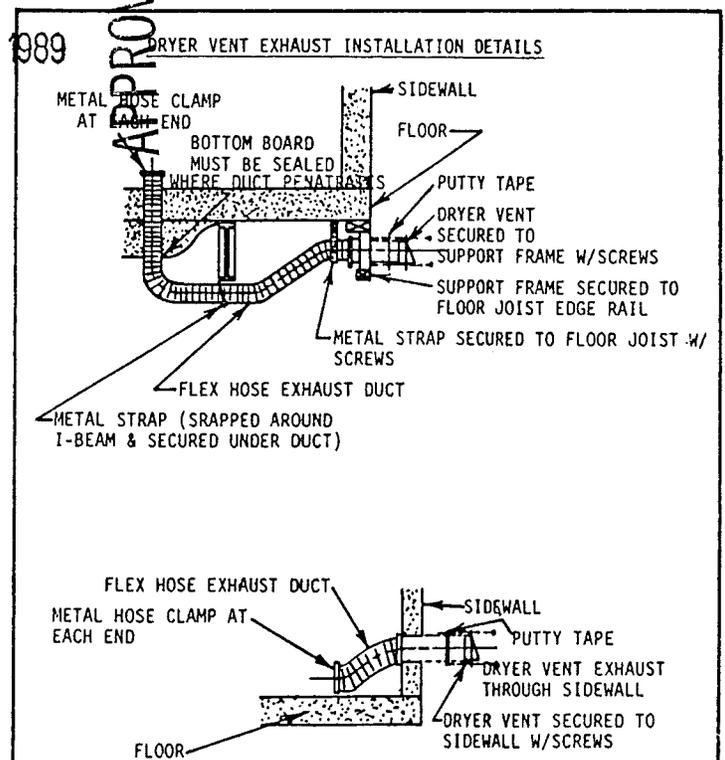
CLOTHES DRYER VENTING

Your home may be designed for the future installation of an electric or gas clothes dryer. A venting system access thru the floor or wall has been installed at the factory and the complete installation should be in compliance with the appliance manufacturer's instructions.

NOTE: Do not allow your dryer vent to terminate under your home. This may cause a build-up of flammable material under your home or it may cause excessive moisture to accumulate under your home.

Homes factory-equipped with an electric dryer receptacle will also have the moisture-lint exhaust system roughed-in. To complete the moisture-exhaust system, the following must be performed:

1. Remove the covers, exterior and interior, over the vent hole in floor or wall.
2. Install duct, make sure that it is clear, and connect to the dryer. All materials and installation should be in accordance with the dryer manufacturer's instructions.
3. Secure the termination fitting to the outside edge of the floor or wall.
4. Secure the flexible duct to the termination fitting with clamps. (Do not use sheet metal screws or other devices which extend into the interior of the duct).
5. Seal the hole where the duct goes through the floor or wall with a good grade of caulking or



Homes factory equipped with a gas dryer stubbed-in outlet will be provided with a shut-off valve and threaded pipe plug or cap and will also have an access for the moisture-lint exhaust system. All gas supply piping and venting must be installed according to the dryer manufacturer's installation instructions.

NOTE: Gas dryer installation must be handled by fully qualified, experienced personnel only.

Commodore will not be responsible for damage to home resulting directly or indirectly from failure to install the dryer moisture-lint exhaust system in accordance with the instructions presented herein and those of the dryer manufacturer.

Cutting of major structural elements of home such as rafters or floor joists to facilitate installation is not permissible and any resulting weakening of the structural integrity of the home is not the responsibility of Commodore.

FIREPLACE CHIMNEY INSTALLATION

Homes equipped with fireplaces require that the installation of additional section(s) of chimney pipe and a rain cap assembly be made on site.

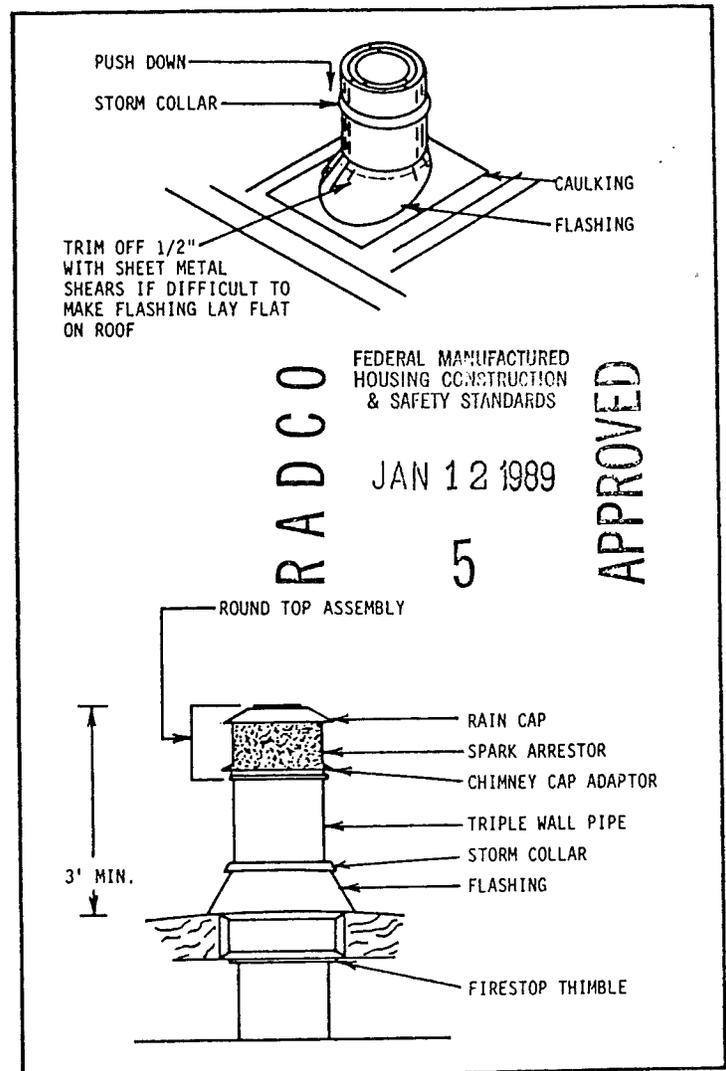
To insure sufficient draft for fireplace, the finished chimney MUST extend 3 feet above the highest point where it penetrates the roof and must be at least 2 feet higher than any building or other obstruction located within a horizontal distance of 10 feet.

Parts necessary to complete installation are provided. Note, however, that chimney section(s) provided will be sized of sufficient length to meet the above stated requirement for the home only.

If the site has obstructions extending higher than the home's roof peak within 10 feet of the chimney, an additional section of chimney pipe may have to be provided by installer.

Chimney installation must be made in accordance with fireplace manufacturer's instructions. Typical chimney installation is as follows:

1. Remove transit protective covering from over the chimney.
2. Install additional chimney section(s) provided and secure.
3. Install spark arrestor.
4. Install rain cap assembly.



AIR CONDITIONING

NOTE: The installation should be made only by qualified personnel. The completed installation must conform to the National Electrical Code and applicable local codes.

Commodore does not recommend the installation of window air conditioning units.

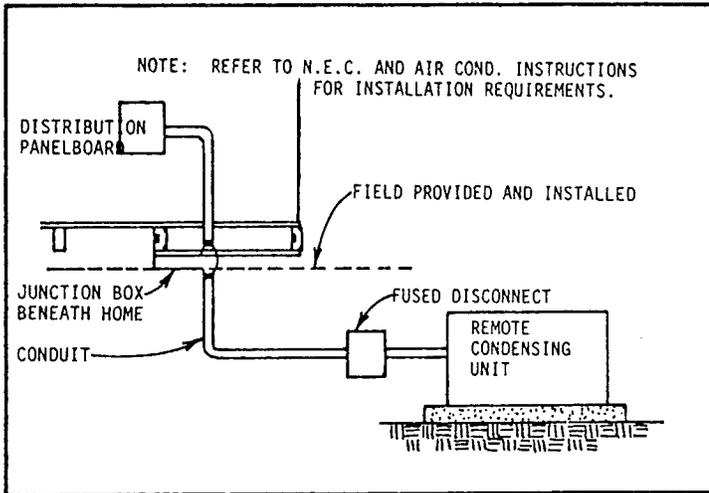
Factory installed circuits for air conditioning are indicated on the electrical distribution panel.

The maximum full load ampere draw for the desired air conditioning unit must not exceed the indicated circuit rating.

The electrical connection is via a circuit terminating in a junction box beneath the home.

The electrical supply, if not factory installed, may have to be from an outside source as electrical equipment within the home may not have been sized for the additional air conditioning load.

The field installation wiring beyond the junction box, must incorporate a fused disconnect (sized in accordance with NEC Article 440) located within sight of the condensing unit. The maximum fuse size to be used with the fused disconnect is marked on the condenser data plate. The acceptability of the air conditioning equipment, rating the location of disconnect means, fuse type branch circuit protection, and connections to the equipment are to be determined by the local inspection authority.



The compliance certificate posted in the home will specify the maximum capacity of air conditioning allowable for the home. The equipment you select should not exceed the maximum BTU HR rating on the compliance certificate.

Air conditioning units installed must be compatible with the furnace in the home. For air conditioning installation, see the instructions shipped with the air conditioner.

If the system is remote, i.e. the compressor and blower are outside the home...

- a. An automatic damper must be installed between the furnace and the home's air duct system, and another between the remote unit and the home's air duct system. This is to prevent air from the air conditioner being forced back up into the furnace when the air conditioner is operating and to prevent warm air being forced out into the air conditioner when the furnace is operating. The supplier of remote air conditioning units has these dampers available and will provide installation instructions. Commodore recommends that you insist that he obtain them for you before you purchase the remote unit.
- b. The duct system leading from the remote unit to your home must be securely supported and not in contact with the ground. The ducts must be insulated with material having a thermal resistance (R) of not less than four (4), and a perm rating of not more than one (1) perm.

- c. Make certain that the equipment is listed for application and use on manufactured homes and that it meets the standards and is installed to meet all of the requirements of the Federal Manufactured Housing Construction and Safety Standards. The equipment must also be installed per the manufacturer's installation instructions.
- d. The duct carrying air from the remote unit to the home should be connected to the home's main duct at a point where there are approximately as many registers forward of the connection as there are to the rear. The duct used for returning air to the remote unit should be located in a central location of the home.

It is important when installing the return air system and supply system that no floor joists are cut or damaged. The return air and supply ducts are sized to fit between the floor joists.

It is important to replace insulation that may have been removed during the installation -- also to seal the bottom board around the duct connections.

If your home has been prepared at the factory for the addition of a remote unit, connect the ducts to the home via the connecting devices protruding from the bottom of the home.

Provisions must be made to direct all condensation runoff away from the home by affixing a hose to the equipment runoff outlet or other suitable means as specified by the equipment manufacturer's STANDARDS.

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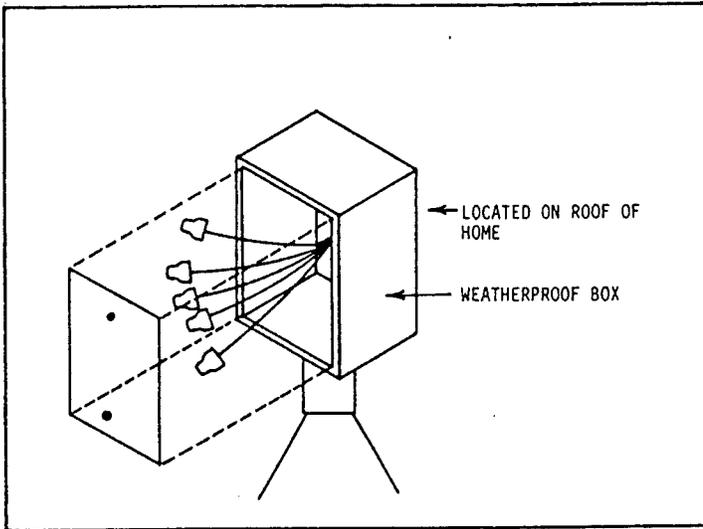
EVAPORATIVE COOLER

NOTE: The electrical connection should be made only by qualified personnel.

1. On models equipped for installation of optional evaporative cooler, install the roof-mounted cooler according to the instructions with the cooler. For coolers without an integral air duct the cooler box shall be lined with .016 in. metal. The factory installed branch circuit for the cooler is sized for a maximum cooler electrical load of 12 amperes, 120 V. AC, 60 Hz.
2. Remove the cover from the roof-mounted junction box and make the connection of the color-coded wires using the provided wire nuts. The electrical portion of the installation is now complete.

COLOR CODE

White.....	Neutral
Yellow.....	Pump
Black.....	Low-Fan
Red.....	High-Fan
Green.....	Ground



Following are some general installation considerations which are the responsibility of the installer:

1. When working on a home with a metal roof, always use walk-boards to distribute weight evenly over several rafters. Never step between rafters or damage to roof seams may result.
2. A rigid base must be provided for the evaporative cooler to evenly distribute weight of the unit over several rafters. The cooler is secured to the base and the base must be secured directly to the roof rafters.
3. All roof penetrations must be adequately sealed or caulked.
4. Caution must be exercised when installing the boot connecting the cooler to the roof/ceiling opening to insure a tight seal in order to prevent leakage of cool air and afford protection from the elements.
5. An overflow hose must be attached to the cooler's water accumulation pan to route overflow water away from the home.
6. Provisions must be made for an external water supply to the cooler.
7. If guy wires are installed, do not attach them to roof vents, flues or other roof protrusions. To eliminate potential leaks, guy wires should not be secured to the roof itself but routed over the side of the roof and attached to the roof rafter edge rails. All fastener penetrations must be adequately sealed or caulked.
8. It is prudent to install, directly to earth, an insulated lightning grounding device for all roof installations.

HEAT PUMP INSTALLATION

Due to the fact that heat pump designs vary considerably between manufacturers, it is impractical to give detailed installation instructions in this manual. The manufacturer's installation instructions provided with the specific system to be installed must be followed. Necessary information for the correct sizing of the system can be found on the home's Compliance Certificate (Data Plate) located in the area of the electrical power distribution panel and explained in earlier parts of this manual. Installation should be handled by qualified heating/air conditioning professionals.

The following are some general considerations for the installation of heat pumps:

1. If heat pump is not supplied by Commodore, the installer is responsible for making all necessary calculations based upon site conditions and information presented on the home's Compliance Certificate (Data Plate) to insure that the unit selected is adequately sized.
2. Equipment selected must meet all applicable codes and be specifically approved for use in manufactured homes.
3. Major structural elements of the home, such as wall studs or floor joists, must not be cut to facilitate installation.
4. All necessary electrical modifications and installations must be handled by a qualified electrician.

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CARPORTS AND AWNINGS

Points to remember when selecting and installing carports and/or awnings.

1. Awnings and carports of a self-supporting design should be installed to minimize the possibility of damaging the home.
2. Follow installation instructions of accessory manufacturer.
3. Make sure all connections are to structural members of the home such as floor joists or rafter end rails. All penetrations through siding must be properly sealed and caulked.
4. Exercise extreme caution that no fastener penetrates any electrical cables. It is recommended all power be disconnected during installation and all circuits tested after installation is completed.
5. Insure that fasteners and support railings used are capable of handling the intended loads without damaging the home structure.
6. Insure all seams are properly sealed.

STORM WINDOWS AND DOORS

Storm windows and doors are recommended for all homes regardless of geographic location. They provide improved climate, control static electricity, retard utility expenses.

NOTE: Storm windows installed on egress windows must be of the same manufacture and be specifically designed for rapid removal and compatibility with the primary egress window.

Your dealer will be able to offer valuable assistance in selecting the proper storm windows and doors for your home.

ON SITE ATTACHED STRUCTURES

When homes installed on a foundation are to have other buildings or structures attached or located immediately adjacent to them, the building ordinance may require fire separation. Most building ordinances require fire separation. Most building ordinances require a minimum of a one hour fire wall to be installed between garages, zero lot line installed homes, some work shops, etc. When required, the fire separation wall must be approved by a recognized agency.

All attached buildings and structures must be designed to support all of its own design live and dead loads as required by State or Local ordinances.

HITCH AND WHEEL REMOVAL AND STORAGE

The front hitch used to transport the home may be designed to be detachable, for aesthetic purposes it may be removed after set-up. However, the hitch should be retained in the event the home is ever relocated. Common practice is to store the hitch under the home where it will be protected from the elements and concealed by the skirting.

During or after set-up, it is common practice to remove the wheels and tires. The axles and complete suspension system may be removed.

In some states and localities, owners are allowed to dispose of this equipment, while in others they may not. Before disposing of axles and suspension systems be sure to check carefully with the dealer and/or local authorities.

Although it may be permissible to dispose of the wheels, tires and suspension system, Commodore recommends they be retained in the event the home is ever relocated.

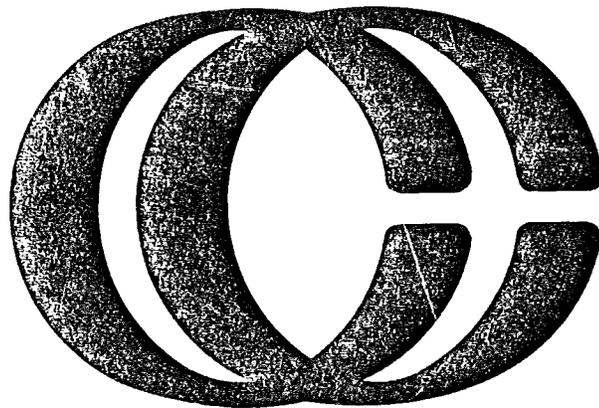
This equipment is commonly stored under the home on a waterproof substance, like vinyl sheeting, where it is protected and concealed by the skirting. After wheel removal, hub surfaces should be coated with heavy grease to resist rust and corrosion.

The tires, wheels and suspension systems are designed ONLY for use to transport this manufactured home. They are not designed for any other purpose.

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**MULTI-WIDE
INSTALLATION INSTRUCTION
MANUAL**



COMMODORE HOME SYSTEMS, INC.

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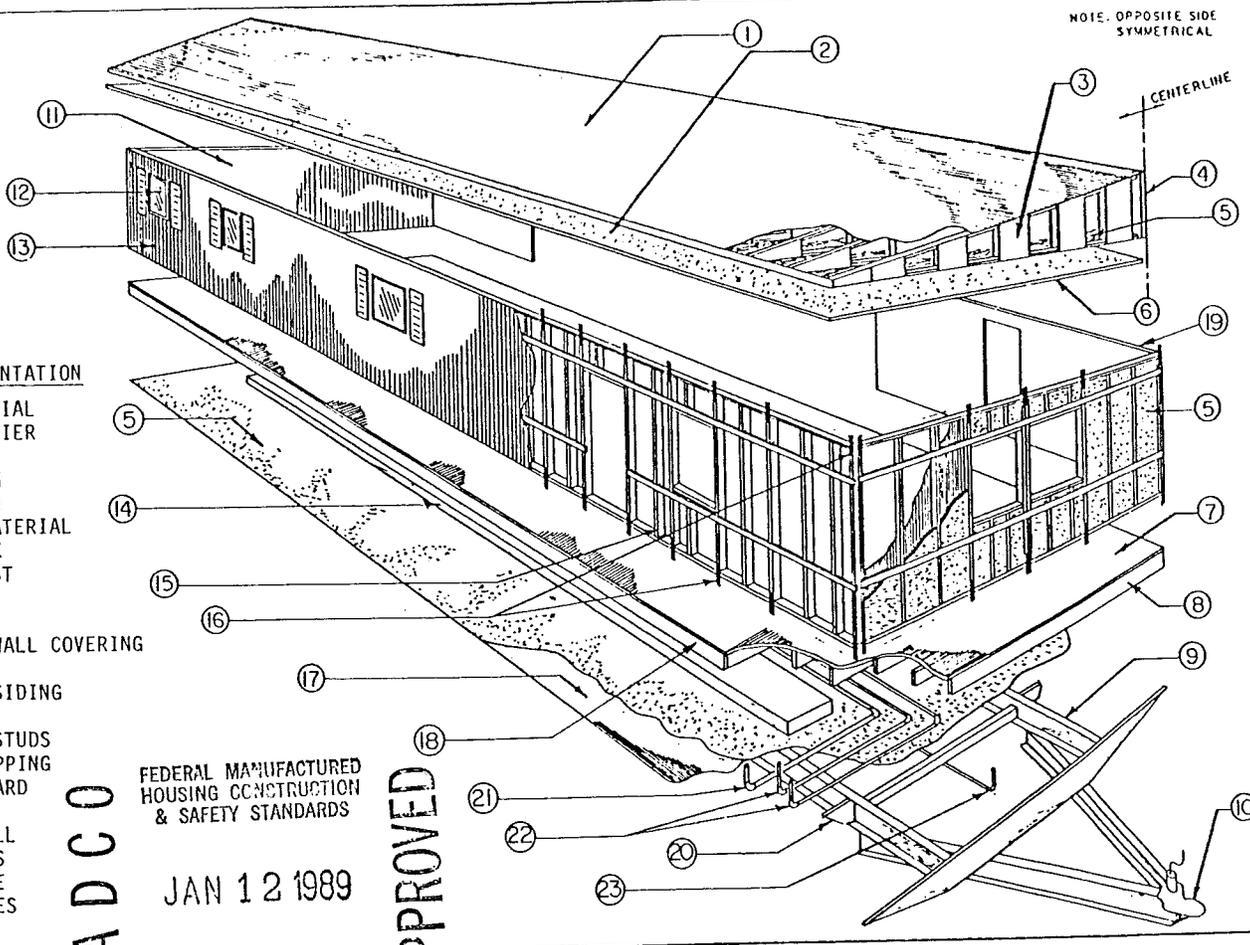
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MATERIAL ORIENTATION

- 1 ROOF MATERIAL
- 2 VAPOR BARRIER
- 3 RAFTER
- 4 RIDGE BEAM
- 5 INSULATION
- 6 CEILING MATERIAL
- 7 FLOOR DECK
- 8 FLOOR JOIST
- 9 MAIN BEAM
- 10 HITCH
- 11 INTERIOR WALL COVERING
- 12 WINDOW
- 13 EXTERIOR SIDING
- 14 HEAT DUCT
- 15 SIDEWALL STUDS
- 16 METAL STAPPING
- 17 BOTTOM BOARD
- 18 RIM JOIST
- 19 MATING WALL
- 20 OUTRIGGERS
- 21 DRAIN LINE
- 22 WATER LINES
- 23 GAS LINE

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CEILING	10	INTRODUCTION	
CROSSOVER UTILITY CONNECTIONS		Your Commodore home was designed, constructed and	
HEAT DUCT	11	inspected for conformance to the Federal Manufactured	
ELECTRICAL	11	Housing Construction and Safety Standards in effect on	
WATER LINES	11	the date of manufacture. This National Standard sets	
GAS LINES	11	forth the requirements of design construction, fire	
TIE DOWN INSTRUCTIONS	12	safety, plumbing, heating systems and electrical	
SKIRTING YOUR HOME	15	systems for factory built housing designed to be used	
GROUND LEVEL INSTALLATION	15	as dwellings.	

Consult with building officials in your area to determine necessary permits, licenses and inspections required for installation of this home.

The step-by-step instructions which are required for the correct installation of your home are presented in this manual.

Before attempting to install your home, these instructions must be carefully read and understood.

The drawings contained in these instructions are intended to be representative of the product. Designs and specifications are subject to change without notice.

NOTE: This manual is intended to instruct and to assist already qualified personnel in the proper installation of the home. It is not intended to enable someone unfamiliar with home set-up to perform the installation.

It is recommended by the Department of Housing and Urban Development (HUD) that, subsequent to completion of the installation, your home be inspected by an independent, qualified professional.

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SITE PREPARATION

Proper Drainage

The site area for your home must be sloped to provide storm drainage. Check your local codes which may specify slope requirements. It is generally recommended that a slope of 1" to 12" be followed and that the site be evenly graded so that there are no depressions where surface water will accumulate, either underneath or outside the home. This is to prevent excessive humidity in the home.

A Firm Foundation

The portion of the lot intended for location of the home must be of undisturbed soil or compact fill. Make certain that you have not selected a loosely filled area, and that all top soil and vegetation materials are removed.

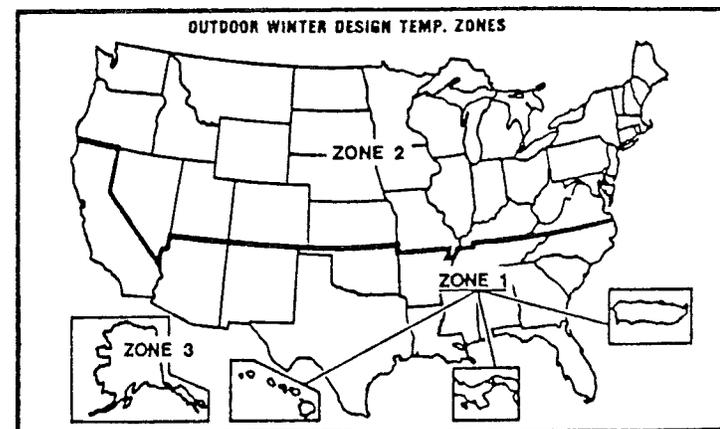
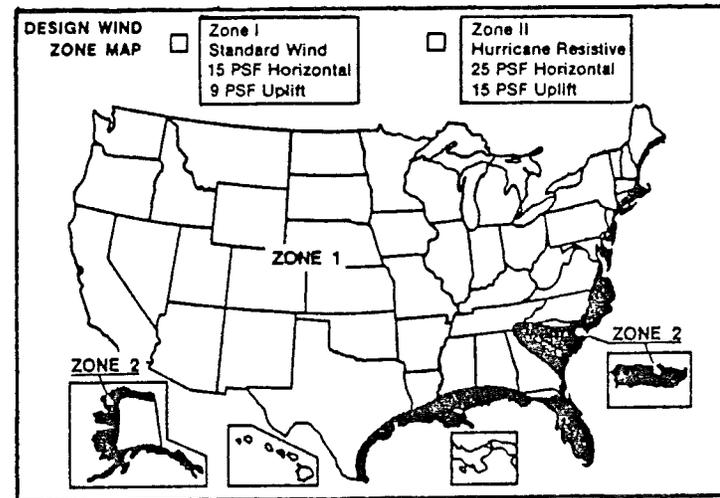
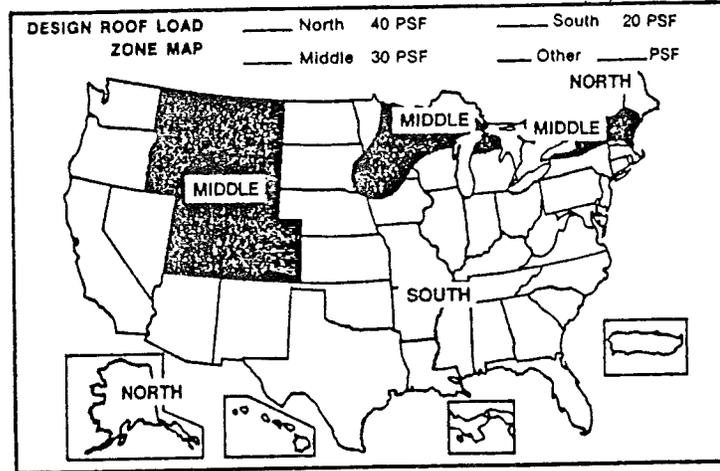
NOTE: If skirting is to be installed, the entire area under the home must be covered with a moisture vapor barrier. This is to prevent excessive humidity in the home. The moisture vapor barrier must be a minimum of 6 mil thick and be overlapped 6" at all joints.

ZONE MAPS

The following Zone Maps will help you make installation decisions with regard to prevailing weather in the zone where the home is to be located.

NOTE: Do not install your home in a zone that requires greater loads or climatic requirements than those on the Compliance Certificate. You may, however, install a home in a zone requiring lesser loads or climatic requirements.

1. From the following maps, determine and mark the zones where the home is to be located. This information will be required to determine information from other charts and tables in this manual.



PIER AND FOOTING SELECTION

The piers used must have enough capacity to transmit the vertical load which includes the weight of the pier, its furnishings, and temporary roof loading to the foundation surface below it. If the load imposed is greater than the capacity of the pier, then two or more piers must be equal to or greater than the load to be transmitted.

FLOOR LIVE LOADS - Excessively heavy furniture or appliances, such as pianos, organs, deep freezers, heavy chests, large china cabinets, water beds, etc., require the installation of additional support footings and piers directly beneath them. If such loads are over, or between, main beams install additional piers with headers to distribute the weight over several floor joists.

Complete the following steps to determine the pier and footings requirements for the home.

1. Determine pier height to be used based on site conditions.
2. Determine main beam pier spacing (10'-0" max.). Determine additional piers and headers at rim joist area.
3. Using the preceding information, determine the required main beam pier capacity from the following tables.

NOTE: All multi-wide homes require additional supports under the mating line of the home. These supports must be at the pier location straps on the home or at the specific locations shown on the foundation plan for the model home being set up.

4. Using the preceding information determine the required mating line pier capacity from the following tables.

MAIN BEAM PIER CAPACITY TABLE (LBS.)

PIER SPACING	ROOF ZONE & WIDTH OF HOME								
	SOUTH			MIDDLE			NORTH		
	24'	28'	32'	24'	28'	32'	24'	28'	32'
8'0"	3800	4400	5000	4300	5000	5600	4800	5500	6200
9'0"	4300	5000	5600	4800	5600	6300	5400	6200	7000
10'0"	4800	5500	6200	5400	6200	7000	6000	6900	7800

MATING WALL PIER CAPACITY TABLES

PIER SPACING	REQUIRED PIER CAPACITY (LBS) FOR PIERS UP TO 1'0" HIGH									
	SOUTH			MIDDLE			NORTH			
	24" WIDE	28" WIDE	32" WIDE	24" WIDE	28" WIDE	32" WIDE	24" WIDE	28" WIDE	32" WIDE	32" WIDE
8'0"	2840	3280	3720	3727	4174	4620	3733	5467	6202	6937
12'0"	4260	4920	5580	5680	6560	7440	7100	8200	9300	10400
16'0"	5630	6550	7440	7573	8747	9920	9468	10,333	12,400	14,467
20'0"	7100	8200	9300	9467	10,333	12,400	11,333	13,567	15,800	18,033
24'0"	8520	9840	11,160	11,360	13,120	14,980	14,200	16,400	19,500	22,600
28'0"	9940	11,480	13,020	13,253	15,306	17,360	16,367	19,133	23,100	26,167



Ned C. Myers

NOTE: The mating line pier capacity table is to be used only if the exact weights of the mating line pier capacities noted on the pier capacity load support tables are not known.

5. To determine the soil bearing capacity, contact the local jurisdictional authority for building codes or run test. If tests are required, always use a qualified professional to determine the capacity. Examples of soil types and their capacities are listed below.

CLASS OF MATERIALS	ALLOWABLE FOUNDATION PRESSURE (PSF)
Massive Crystalline Bedrock	4000
Sedimentary and Foliated Rock	2000
Sandy Gravel and/or Gravel (GW and GP)	2000
Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel, (SW, SP, SM, SC, GM and GC)	1500
Clay, Sandy Clay, Silty Clay and Clayey Silt (CL, ML, MH and CH)	1000

6. Using the preceding information, you can select a concrete footing size from the following table.

REQUIRED PIER CAPACITY (LBS.)	SOIL BEARING CAPACITY					FOOTING SIZE
	1000	1500	2000	3000	4000 AND OVER	
0001-2500		0001-2500	0001-2600	0001-2600	0001-2600	16x 8x4
2501-3000		2501-3200	2601-3400	2601-3900	3501-5200	16x12x4
3001-3600		3201-3800	3401-4300	3901-5200	5201-7000	16x16x4
3601-4500		3801-3900	4301-5200	5201-6500	7001-8700	20x16x4
4501-5400		3901-4700	5201-5300	6501-7800	8701-10500	24x16x4
5401-6700		4701-5600	6401-7600	7801-8100	10501-10900	20x20x6
6701-7900		5601-7000	7601-9500	8101-9700	10901-13100	24x20x6
7901-9200		7001-8400	9501-11400	9701-11600	13101-15600	24x24x8
9201-10700		8401-10500	11401-14200	11601-14500	15601-19500	30x24x8
10701-12300		10501-12400	14201-16700	14501-17400	19501-29400	36x24x8
12301-14000		12401-14400	16701-19700	17401-21700		36x30x8
		14401-16900	19701-23000			36x36x10
		16901-19300				42x36x10
		19301-22000				42x42x10
						48x42x10
						48x48x10

NOTE: FOOTING CONCRETE MUST BE 4000 PSI AT 28 DAYS



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In 20 and 30 psf roof load areas the rim joist must be supported by outriggers spaced no greater than 8 ft. o.c. for 24 ft. wide units, 6 ft. 8 in. o.c. for 28 ft. wide units and 4 ft o.c. for 32 ft. wide units. Should the outrigger spacing exceed these dimensions piers must be provided between these excessively spaced outriggers to support the rim joist. Additional rim joist blocking is required at the ends of any opening in the sidewall over 4'0" in width.

Rim joist blocking is also required in areas with roof loads greater than 30 psf regardless of the outrigger spacing.

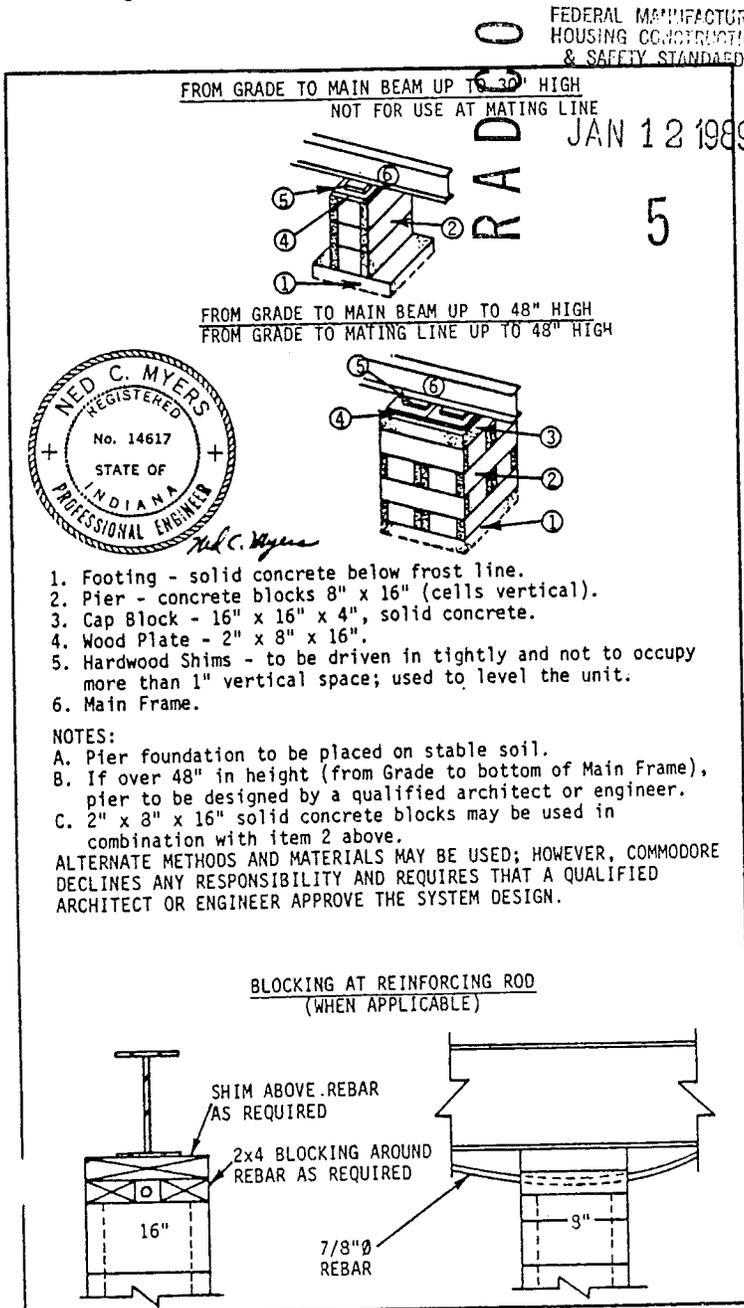
Rim joist blocking is required at the ends of any opening in the sidewall over 1'4" in width and no distance greater than 8'0" on center for 40 psf roof load areas; 6'0" on center for 60 psf roof load areas, and 4'0" on center for 80 and 100 psf roof load areas.

Proper support for the home must allow for soil conditions in the immediate area. Pier footings must be placed on firm undisturbed soil (not loose fill) or soil which has been compacted to at least 90 per cent of its maximum relative density. Pier supports may also be placed directly on concrete slabs designed for the home's placement.

Climatic conditions must also be taken into account. If footings are placed on frost-susceptible soil, such as clay or silt, heaving and/or settlement may occur. In areas where temperatures go below freezing, it is important that the pier footings be located below the frost line.

PIER AND FOOTING CONSTRUCTION

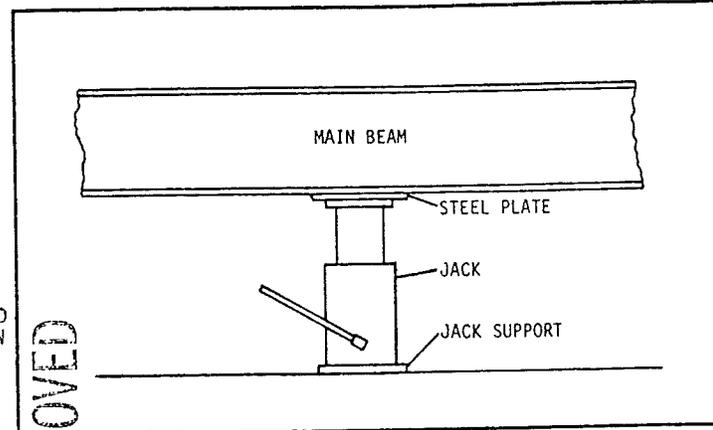
1. Construct footings and piers as shown in the following illustrations.



BLOCKING AND LEVELING

The following equipment will be required:

- A. Two jacks with a minimum 10 ton rating.
- B. Two steel plates with a minimum size of 3/8x2-1/2x5" to use between the jack and the main beams. This will distribute concentrated loads and prevent damage to the beams.
- C. Two wenchers (comealongs).



Position the first section to be set up and follow this step-by-step procedure to avoid placing undue stress on structural members of the home:

1. Level the section from front to rear by means of the hitch jack.
2. Place one jack just forward of the front spring hanger and another just behind the rear spring hanger under one of the main beams.
3. Operating the two jacks simultaneously, raise the home and install footings and piers next to the jacks.
4. Jack up the front and rear end of the main beam, under which you have just installed two piers, to a level position and install a footing and pier 1'0" from each end. The section should now be near level from front to rear along the first main beam.
5. Repeat the preceding three steps on the other main beam, bringing the section level crosswise and lengthwise.
6. Place the remaining footings and piers along the main beams taking care not to exceed the maximum pier spacing from the table in step 3, of the pier and footing selection section, and that the end piers are 1'0" maximum from the ends of the main beams. If over-the-roof ties are to be used, piers should be located as close as possible to them. If over-the-roof ties are used, especially in areas subject to "Frost Heave", it is recommended that additional piers be placed directly under the perimeter of the home at each over-the-roof tie. This will prevent the exterior walls from being pulled downward should the main beam piers heave upward due to climatic conditions.
7. Complete the leveling procedure with a 6' level, adjusting pier heights with shims. Check to make sure that all doors and windows operate properly.

MATING PROCEDURE

1. Remove the temporary braces closure material from all sections of the home. Ceiling beam shipping supports nailed to the outside of the beam and floor must be removed. Shipping supports that are flush with the center walls should be left in place until the two halves have been secured together.

2. Move the second section into position approximately 6" to 8" from the first section.

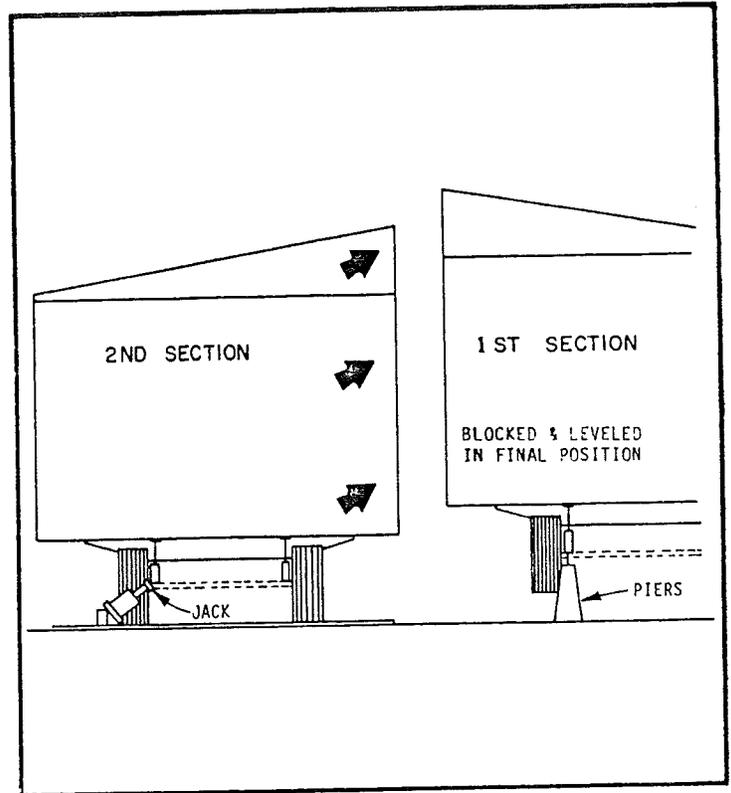
NOTE: Greased boards or aluminum sheets under the tires and hitch will aid in sliding the second section.

3. To insure tight fitting joints, install strips of insulation around the mating line on the roof, end walls and floor. Do not install the insulation over any openings in the mating line provided for heating, cooling or air return ducts.

NOTE: Special care must be taken to ensure that this marriage line joint is tight to resist air infiltration and condensation.

4. If the home has heating, cooling or air return ducts passing through the mating line, be sure that any required connection seals are in place. First pull the fronts together, fasten come along or winch to each hitch and slide together while come along or winch is still fastened to the hitches. Attach second come along or winch to the center axes and slide rear of units together. Never attach come alongs or winches to the I-Beam. This will cause permanent damage to the home.

5. Draw the two sections together using jacks set at an angle, under the main beams and winches (come-alongs connected as noted in step #4).



6. With the two sections together, but with no fasteners installed, check the alignment of the end walls, interior walls, roof and floor. Determine if the walls and/or the roof of either section must move backward or forward with respect to the floor. Any correction required can be accomplished during the leveling of the second section.

NOTE: The interior walls are one good indication of roof position. The walls should run straight from one section to the other when the sections are correctly positioned. If the walls require only a small correction, procedure Step 7 is suggested. In more difficult cases, use procedure Step 8.

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7. Alignment procedure is as follows:

- A. Position the second section to bring the floor seams flush, keeping the roof slightly apart and the end walls aligned at the floor. At this time place pliers only on the inside main beam.
- B. Close the gap in the ceiling by raising the outside main beam using two hydraulic jacks placed ahead of and behind the wheels.
- C. IF THE TOP MUST BE MOVED FORWARD.....With the frame support beams evenly supported, carefully raise the outside rear corner of the second section (and lower the outside front corner) with the hydraulic jacks. The roof should shift forward until the end walls align evenly at the top. When the walls are even, raise the outside support frame beam evenly to close the gap.
- D. IF THE TOP MUST BE MOVED BACK.....With the frame support beams evenly supported, carefully raise the outside front corner of the second section (and lower the outside rear corner) with the hydraulic jacks. The roof should shift back until the end walls align evenly at the top. When the walls are even, raise the outside frame support beam evenly at the front and rear to close the gap.
- E. Fasten the top of the ridge beam together as specified in exterior roof connection section. When the top and walls are aligned, secure the floor with one of the approved methods described in this manual.
- F. Maximum gap between units at the floor, walls and ceiling-roof area 1".

8. Alternate Alignment Procedure:

- A. Position the second section so that the roofs are together and lined up at the end walls and interior walls.
 - B. With the ceiling positioned and the ridge beam halves tight together, fasten the top of the ridge beam together as specified in exterior roof connection section.
 - C. With the roof securely fastened, attach a winch (come-along) between spring shackles of each section. Shift the floor and lower ends of the walls into alignment by tightening the winch.
 - D. When the floors and walls are even, fasten the floors and end walls together as specified and tighten, as required, to hold the floors in position when the hand winch is released.
9. Block and level the second section starting with the inside main beam and following the same procedure as used for the first section.

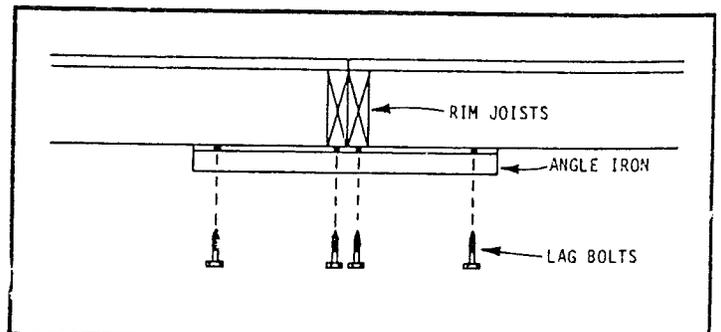
STRUCTURAL CONNECTIONS

A. Floor Connections

The floors must be fastened together by one of the following methods.

Method #1

- 1. Secure floors together with angle irons (1-1/4 x 1-1/4 x 1/8 x 18") spaced 48" O.C. End pieces may be a maximum of 48" in from ends of floors.
- 2. Secure each angle iron to the floors with four 3/8" x 3" lag bolts.
- 3. Two lag bolts go in the floor of each section, one in the rim joist and one in the floor joist.



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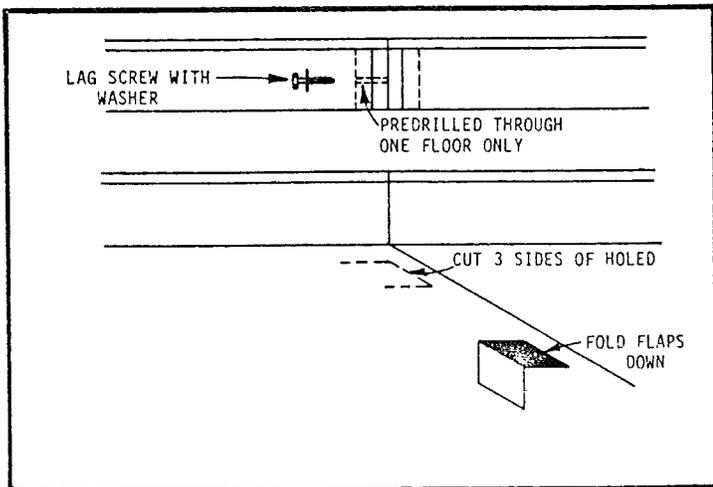
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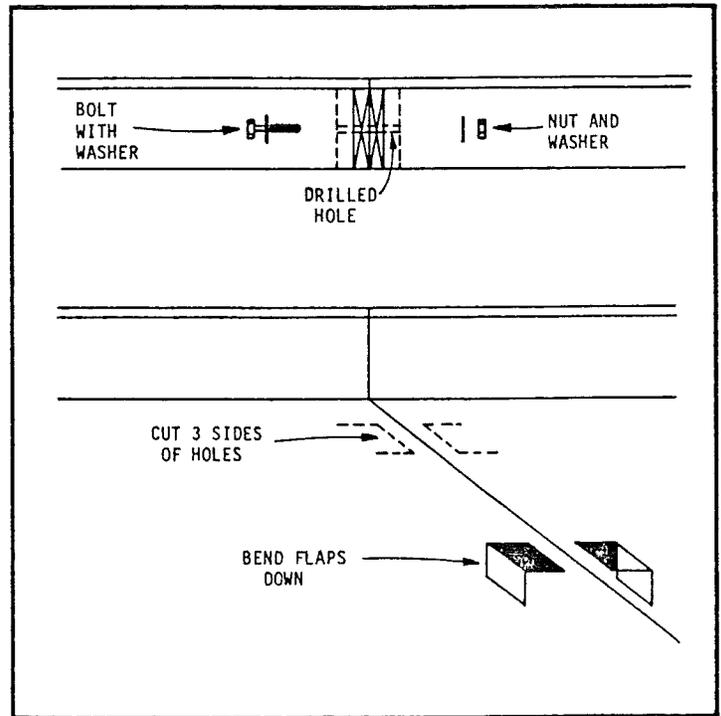
Method #2

1. Secure floors together with 3/8" lag screws spaced 48" O.C. End lag bolts may be a maximum of 40" in from ends of floors.
2. Lag screw sizes are as follows:
 Single rim joists -- 5/16" x 3"
 Double rim joists -- 3/8" x 7"
3. Washers must be used on all lag screws.
4. Cut 3 sides of a 16"x16" hole at mating line of either section at the locations for the screw holes. Bend the bottom board flaps out of the way.
5. Predrill 3/8" holes in rim joist(s) of the section with holes in bottom board.
6. Install screws and tighten securely.
7. Replace insulation if removed for installation of screws.
8. Repair bottom board as specified in "Bottom Board Patching" section of this manual.



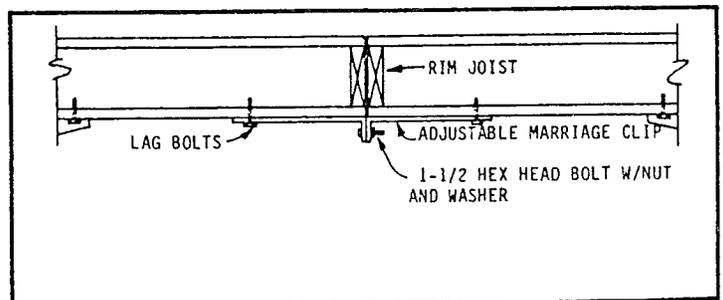
Method #3

1. Secure floors together with 3/8" bolts spaced 48" O.C. End bolts may be a maximum of 40" in from ends of floors.
2. Bolt sizes are as follows:
 Single rim joists -- 3/8" x 5"
 Double rim joists -- 3/8" x 8"
3. Washers must be used on both ends of all bolts.
4. Cut 3 sides of a 16"x16" hole at mating line of both sections at the locations for the bolt holes. Bend the bottom board flaps out of the way.
5. Drill 3/8" holes through both floors.
6. Install bolts and tighten securely.
7. Replace insulation if removed for installation of bolts.
8. Repair bottom board as specified in "Bottom Board Patching" section of this manual.



Method #4

1. Secure floors together with the adjustable marriage clips spaced 48" O.C. End pieces may be maximum of 48" in from ends of floor.
2. Secure each adjustable marriage clip to the floors with 2-3/8" x 3" lag bolts.
3. Bolt adjustable marriage clips together using 3/8" x 1-1/2" hex bolt with nut and washer.



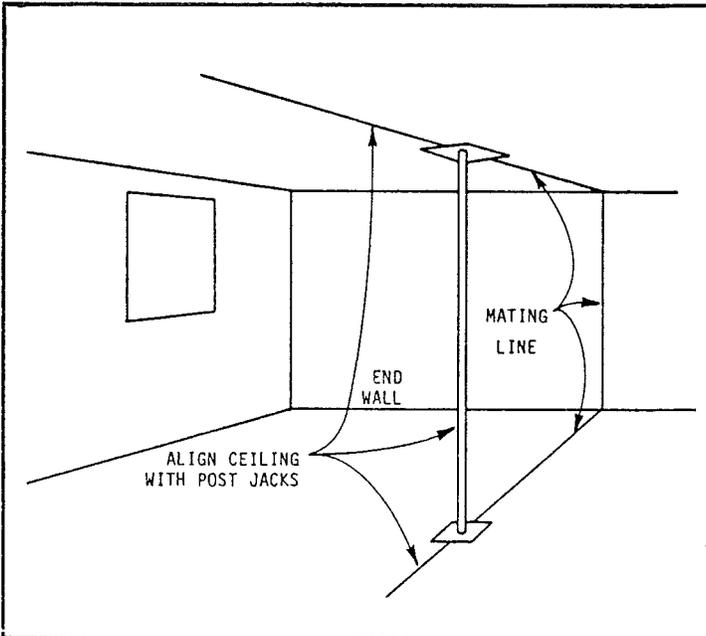
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B. Endwall Connections

1. Fasten endwalls of the home together with either of the following methods:
 - A. #8 x 3" screws 12" O.C.
 - B. 16d nails 8" O.C.
2. Fasteners may be installed at an angle (to screw or nail) at the mating line.
3. Fasteners may be installed from outside the house, depending on the method of close-up used.

C. Exterior Roof Connections

NOTE: It is important to have the ceiling flush below each rafter before the roof is fastened. One man should work inside to raise the low side, as required. By jacking under a wood post or section of steel pipe with a wood or metal pad at the top, place the base of the jack across the floor seam to distribute the load to both sections. Jack against the ceiling only in areas to be covered later with trim molding.



NOTE: Some homes have a temporary shipping wall to support the ridge beam during transportation. Before this wall is removed the ridge beam must be secured together in the area of the temporary wall using 3/8"x5" bolts as shown below in method #2 of the exterior roof fastening.

These bolts must be in addition to the standard fastening requirements. The number of additional bolts required is as follows:

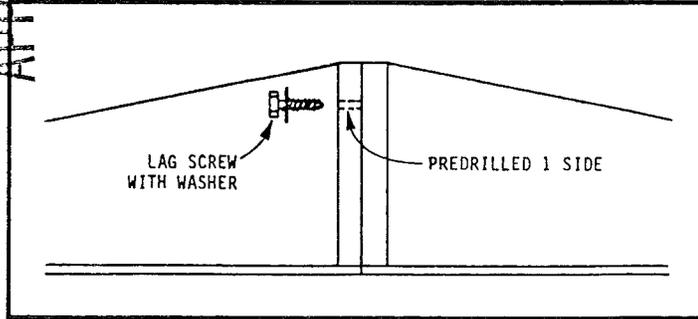
- South Zone - 2
- Middle Zone - 3
- North Zone - 4

Other homes may have a ship loose support columns which must be placed under the ridge beam where the "Support Column Here" label is located.

The exterior of the roofs must be fastened together by one of the following methods.

Method #1

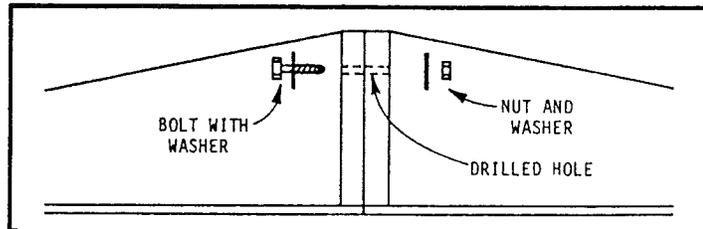
1. Secure roofs together with 3/8"x4" lag screw spaced as needed for roof zone home is located in.
2. Spacing of lag screw is as follows:
 - South Zone - 24" O.C.
 - Middle Zone - 16" O.C.
 - North Zone - 12" O.C.
3. Washers must be used on all lag screws.
4. Predrill 3/8" holes in ridge beam on one section of home.
5. Install screws and tighten securely.



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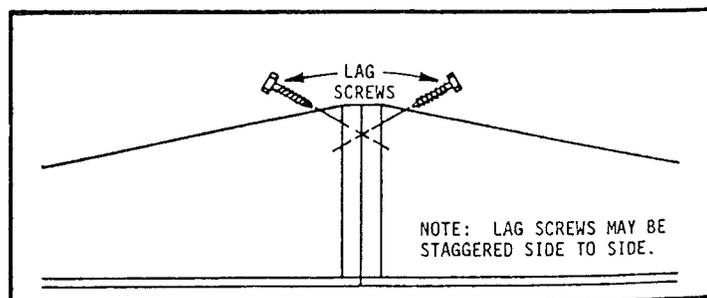
Method #2

1. Secure roofs together with 3/8"x5" bolts spaced as needed for roof zone home is located in.
2. Spacing of bolts is as follows:
 - South Zone - 30" O.C.
 - Middle Zone - 24" O.C.
 - North Zone - 16" O.C.
3. Washers must be used on both ends of all bolts.
4. Drill 3/8" holes through both ridge beams.
5. Install bolts and tighten securely.



Method #3

1. Secure roofs together with 3/8"x5" lag screws spaced as needed for roof zone home is located in.
2. Spacing of fasteners is as follows:
 - South Zone - 24" O.C. on both sides
 - Middle Zone - 16" O.C. on both sides
 - North Zone - 12" O.C. on both sides
3. Install lag screws at 45° angles and tighten securely.



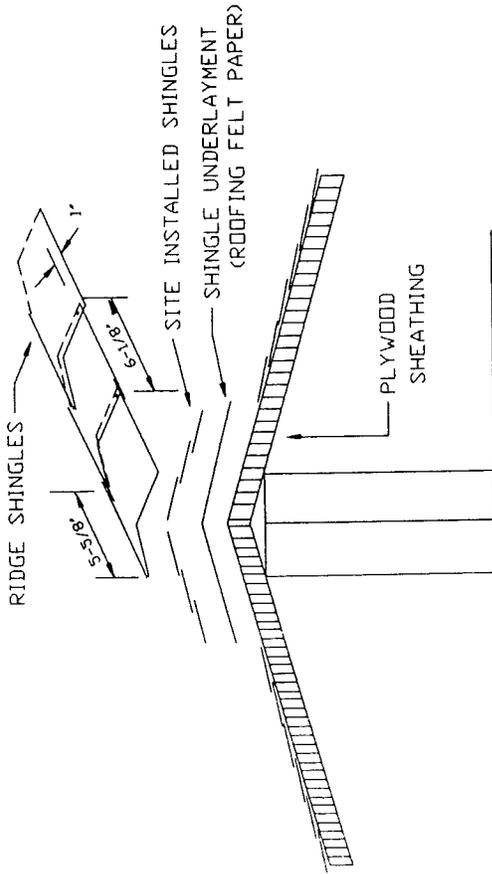
1. 11 FILLUP E-UP

4. Floor 5

Insulate void between matting rim joists with a strip of fiberglass batting. Staple using #5 nails in each rafter at top and bottom edges of sheathing. 3" wide strip of bottom board, the full length of the home, bridging the bottom edges of the matting rim joists.

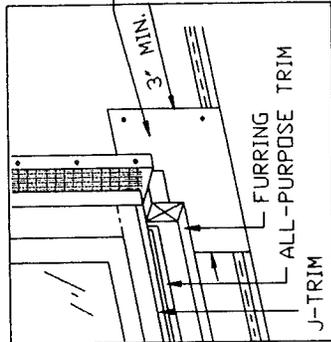
B. Shingled Roof

1. Insulate void between matting ridge beams with a strip of fiberglass batting.
2. Install plywood sheathing at the peak (if left off for ridge beam connections), using #5 nails in each rafter at top and bottom edges of sheathing. (6" o.c. edges - 12" o.c. intermediate)
3. Install roofing felt paper centered over peak of roof to cover any exposed sheathing.
4. Complete installation of shingles to the peak.
5. Cut shingle for ridge lap. Overlay the ridge shingles with open end of tabs away from prevailing winds. Nails are to be corrosion resistant, 11 or 12 Ga. with 3/8" dia. head and long enough to penetrate through roof sheathing.



End Wall (Vinyl Siding)

1. Insulate void between matting end wall studs with a strip of fiberglass batting.
2. Install starter strip at bottom of wall even with siding on the side of the home.
3. Install siding on endwall starting at the bottom, install with 1/8" back from all openings and/or stops to allow for expansion and contraction.
4. Flashing at bottom corner of window onto perimeter rail each side of window per detail.
5. Install fascia and soffit material to match the home.
6. Use putty tape and caulking or sealant materials to ensure weatherproofing.

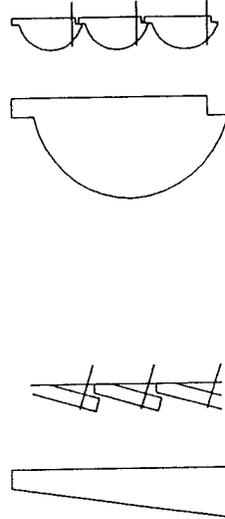


NOTE - FLASHING NOT REQUIRED WHEN J-CHANNEL IS AN INTEGRAL PART OF THE MANUFACTURED WINDOW UNIT

FLASHING MATERIAL - METAL, ROOFING UNDERLAYMENT PAPER, OR PLASTIC

D. End Wall (Wood Siding)

1. Install first piece of siding even with siding on the sides of the home.
2. Install endwall siding. (See Below).
3. Install fascia and soffit material to match home, and install corner trim.
4. With exterior sheathing under wood siding, caulking is not required.
5. For best results wood siding must be treated with protective exterior sealer.



PLAIN BEVEL - Use with smooth face exposed or sawn face exposed. Shall be 1" minimum overlap on plain bevel siding. Horizontal application only.

LDG CABIN - Is 1-1/2' at thickest point. Nail 1-1/2' from lower edge of piece.

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TITLE SIDING INSTALLATION DETAILS

DATE	REV. NO.	DATE	11-4-92
6-11-93	5925	SCALE	NTS
		DWN. BY	KMF
		REFER.	

DWG. NO. J-2-9

1. THE LENGTH OF THE RIDGEVENT REQUIRED WAS PREDETERMINED IN THE PLAN AND THE SHEATHING WAS CUT BACK, ACCORDINGLY PER DET. A. & SECTION B-B. THE ENDS ARE CUT 2" SHORT EACH END TO AVOID LEAKAGE INTO ATTIC.

FIELD APPLICATION

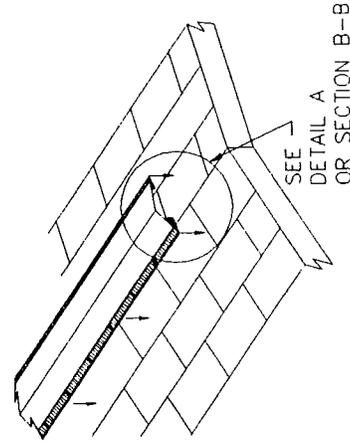
2. MATE TWO HALFS TOGETHER. COMPLETE THE EXTERIOR ROOF CONNECTIONS PER PART C, PAGE 8 OF THE MULTI-WIDE INSTALLATION MANUAL.

3. ATTACH RIDGEVENT TO SHINGLED ROOF AS SHOWN W/ 1 1/2" ROOFING NAILS OR 7/16" x 1 1/2" x 16 GA. STAPLES THRU PREDRILLED HOLES & SEAL AS NECESSARY.

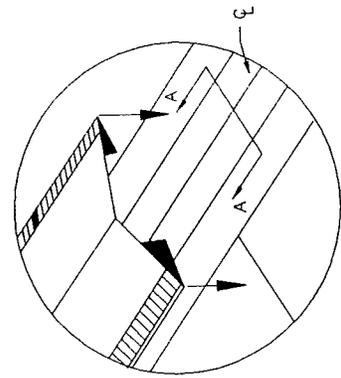
4. RIDGECAP SHINGLE - MUST BE CUT TO FIT OVER RIDGEVENT; ATTACH RIDGECAP SHINGLE WITH 7/16" x 1-1/2" x 16 GA. STAPLES EACH SIDE OF RIDGEVENT AND INSERTED AT NAIL LINE.

5. INSERT END PLUG AT EACH END OF TOTAL RIDGEVENT SECTION.

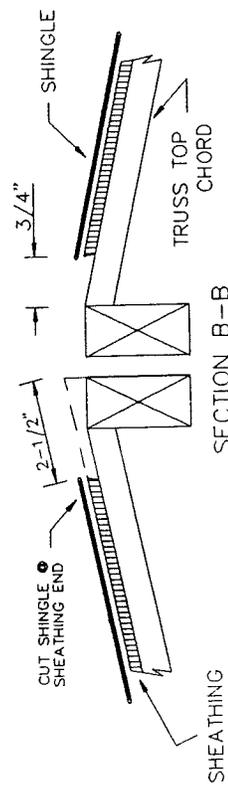
6. FINAL RIDGEVENT INSTALLATION PER COMPLETED CROSS SECTION.



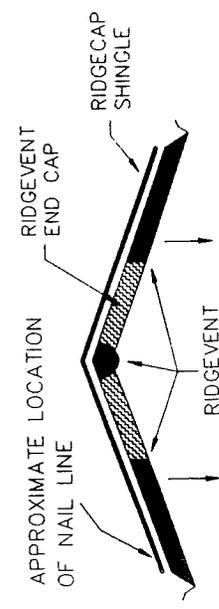
SEE
DETAIL A
OR SECTION B-B



DETAIL A

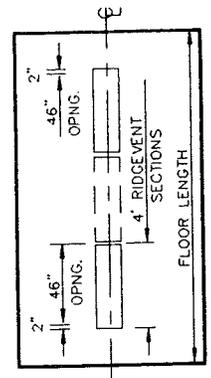


SECTION B-B



COMPLETED CROSS SECTION

NOTE:
RIDGEVENT APPLICATION SCHEDULES ARE BASED ON FREE AREA OF 18 sq. in. PER RUNNING FOOT OF THE RIDGEVENT.



APPLICATION - SEE SCHEDULE

DOUBLE WIDE RIDGEVENT APPLICATION

FLOOR LENGTH	LENGTH OF RIDGEVENT
40'-0" TO 44'-0"	20'-0"
48'-0" TO 52'-0"	24'-0"
56'-0" TO 60'-0"	28'-0"
64'-0" TO 72'-0"	32'-0"

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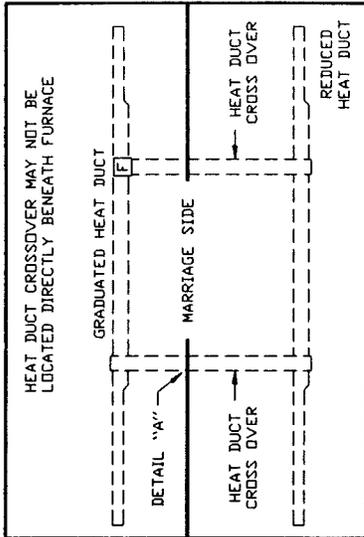
TITLE RIDGE VENT FIELD APPLICATION DOUBLE WIDES

DATE	REV. NO.
SCALE	NTS
DWN. BY	KMF
REFER	F-101-2

DATE	2-1-94
SCALE	NTS
DWN. BY	KMF
REFER	F-101-2

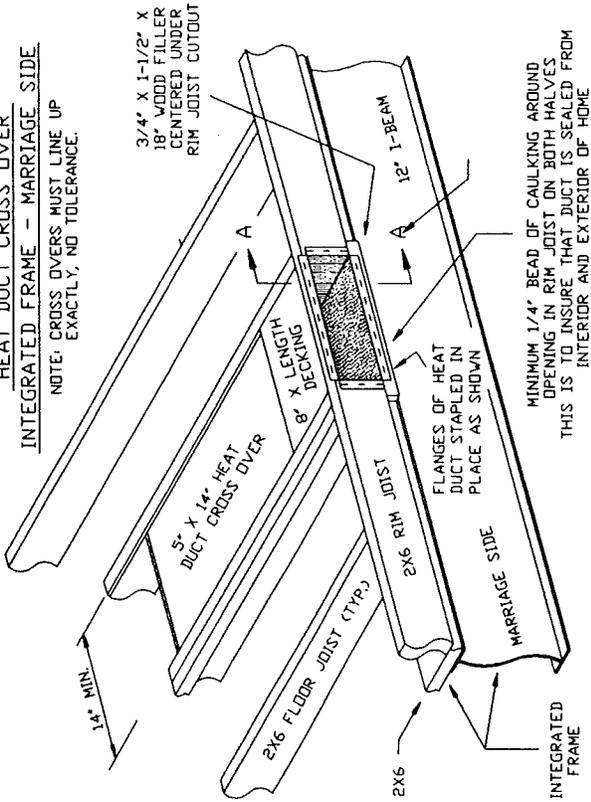
DWG. NO. J-2-10

TYP. GRADUATED HEAT DUCT & H.D.C.O. LAYOUT
(DOUBLE H.D.C.O. SHOWN)



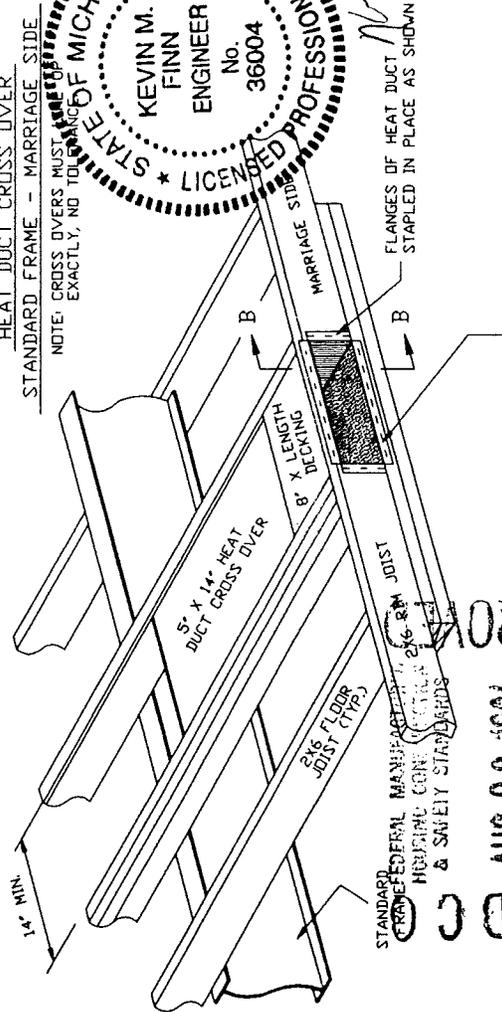
NOTE: 1) THERE WILL BE TWO HEAT DUCT CROSSOVERS (H.D.C.O.) FOR EACH DOUBLEWIDE UNIT.

DETAIL "A"
HEAT DUCT CROSS OVER - MARRIAGE SIDE
NOTE: CROSS OVERS MUST LINE UP EXACTLY, NO TOLERANCE.



SEC. A-A

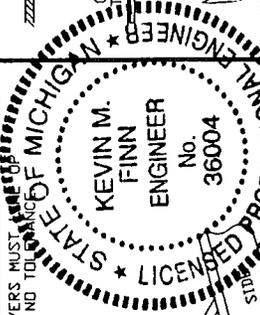
DETAIL "A"
HEAT DUCT CROSS OVER - MARRIAGE SIDE
NOTE: CROSS OVERS MUST LINE UP EXACTLY, NO TOLERANCE.



MINIMUM 1/4" BEAD OF CAULKING AROUND OPENING IN RIM JOIST ON BOTH HALVES THIS IS TO INSURE THAT DUCT IS SEALED FROM INTERIOR AND EXTERIOR OF HOME

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& SAFETY STRAPERS



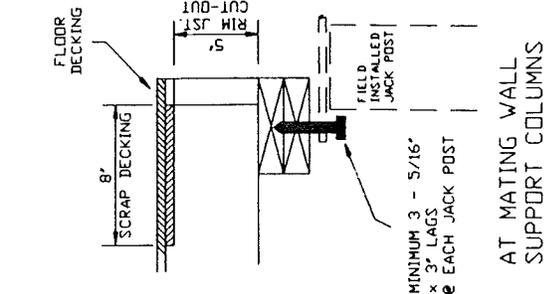
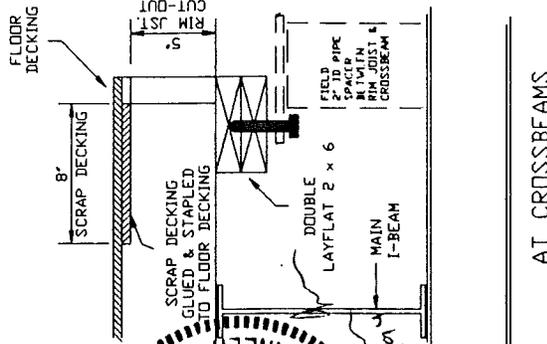
TITLE 5' X 14' IN-FLOOR CROSS OVER DETAILS

The Commodore Corporation

DATE	REVISION	DESCRIPTION	DIVN. BY	SCALE	DATE	DWG. NO.
			KMF	N.T.S.	8-2-94	J-2-11
					REFERENCE	
					ORIG.	

NOTE - ACCEPTABLE FOR WIND ZONE II

SEC. B-B



DATE	REVISION	DESCRIPTION	DIVN. BY	SCALE	DATE	DWG. NO.
			KMF	N.T.S.	8-2-94	J-2-11
					REFERENCE	
					ORIG.	

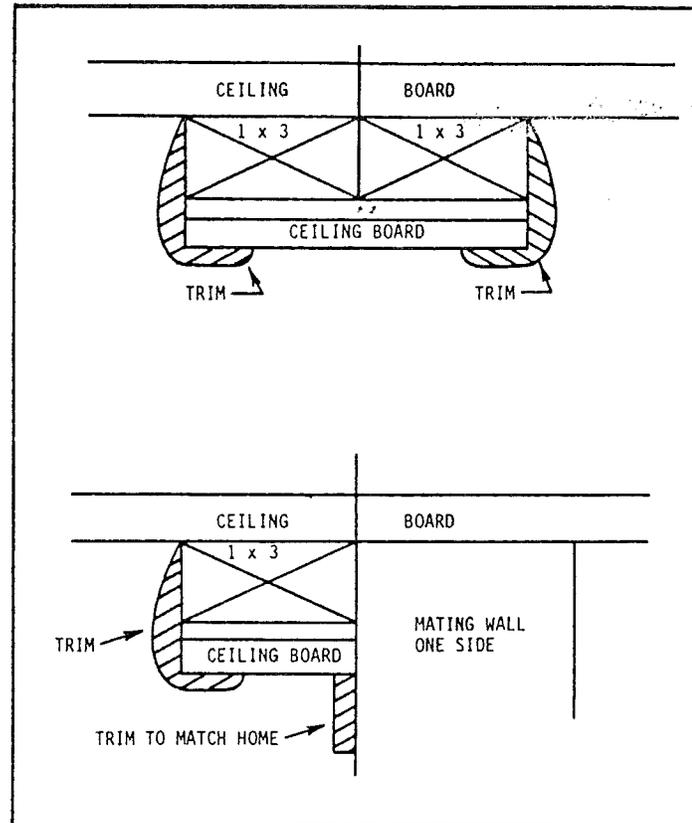
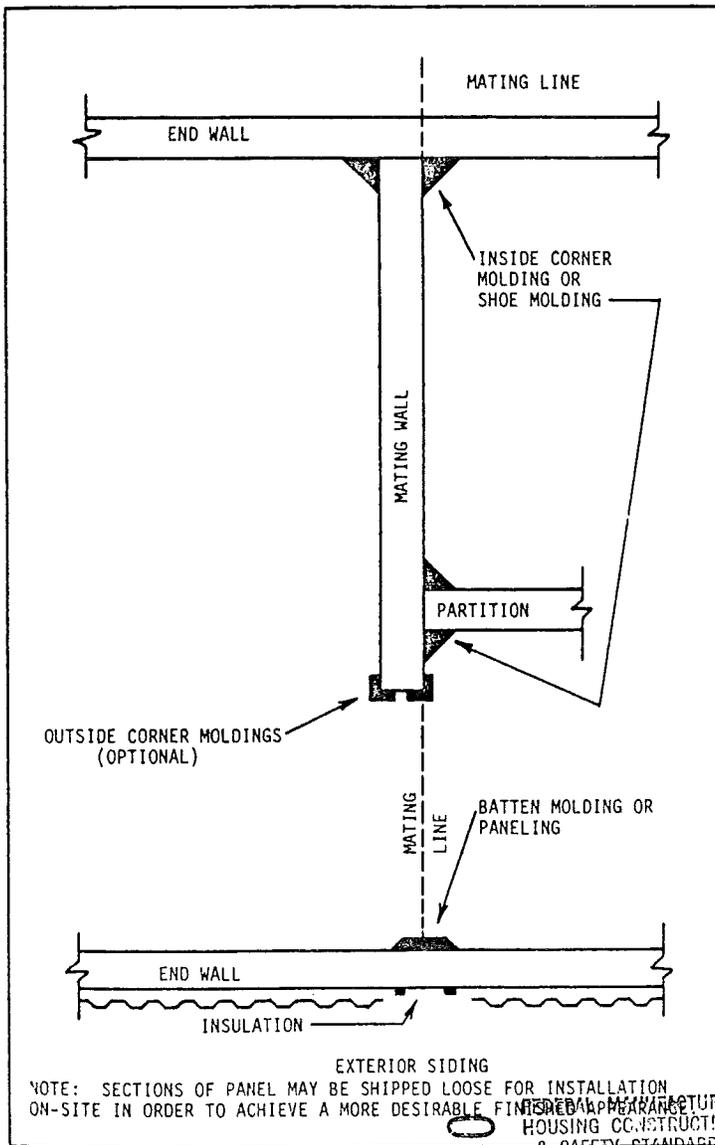
INTERIOR CLOSE-UP

A. Walls

All the materials necessary to trim out the interior of the home are shipped with each home and can be easily identified by matching the moldings or paneling with the materials installed in the home.

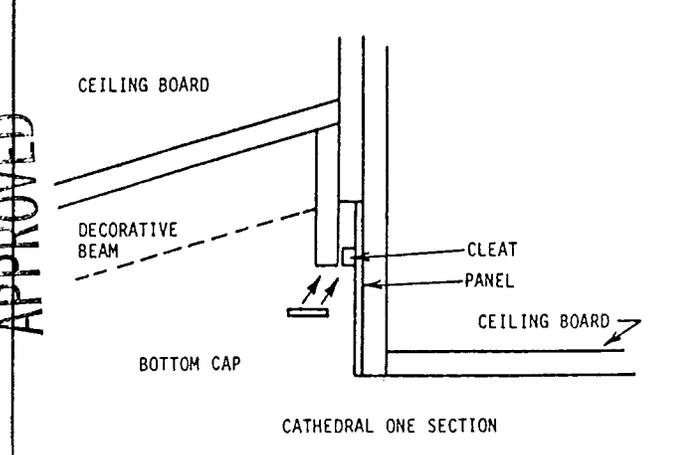
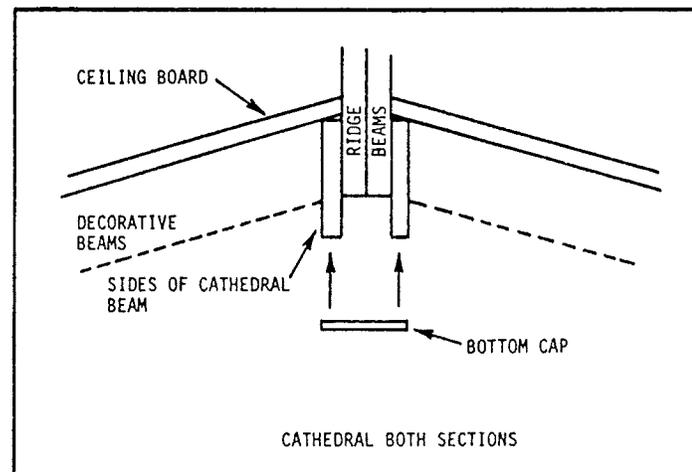
Before installing moldings, fill all gaps with insulation.

The illustrations below are typical molding installations for trimming out the various mating wall joints.



Method #2 -- Cathedral Ceiling

1. Install cap on bottom of cathedral beam. Material for cap will be sent to match the sides of the beam.



B. Ceiling

Method #1 -- Flat Ceiling

1. The 1x3 strips and trim on the side may be installed at the factory.
2. Insert the "floating" strip of ceiling board and attach the second piece of trim.

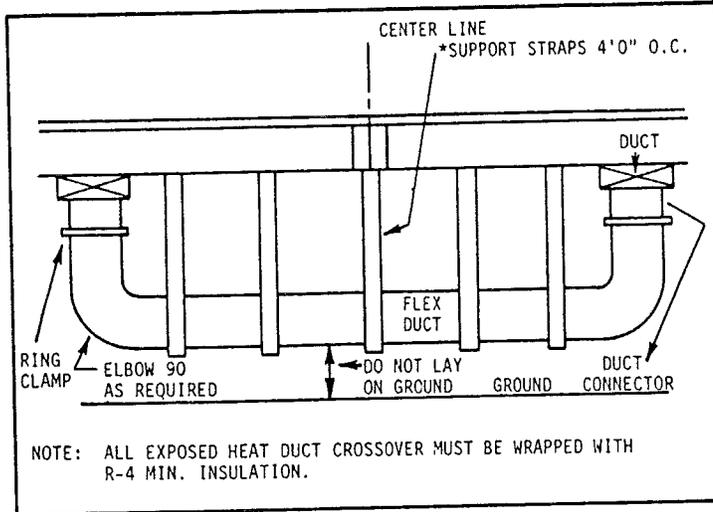
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CROSSOVER UTILITY CONNECTIONS

A. Heat Duct Crossover

1. Connect each end of the 10" insulated flexible duct to the metal duct connectors on each half of the home by sliding the duct over the collars. Secure duct to connectors with the ring clamps provided.
2. Tape each connection with duct tape to assure an air tight seal.
3. Support duct with metal straps as shown below. Straps should be secured to a wood frame member.
4. Test the crossover duct for leaks.

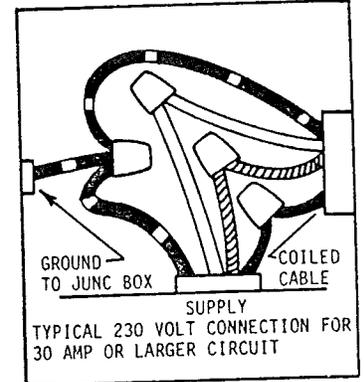
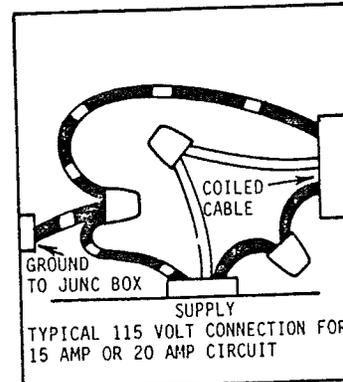
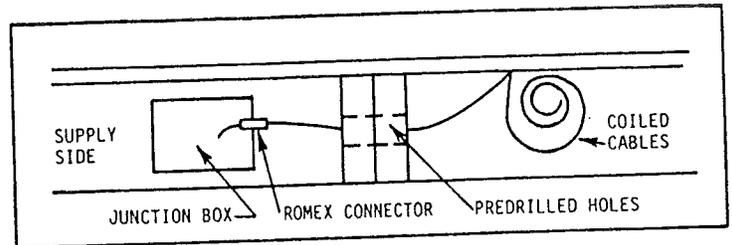


3. Electrical Crossover

Electrical crossover connections are located on the underside of the floor or walls.

1. Remove the access covers from both sections of the home.
2. The junction box is located on the supply section of the home; the second section has cables coiled up.
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 on the supply section.
5. Route the coiled up cables to the junction box through the holes pre-drilled in the floors or walls.
6. Install Romex connectors where the cables enter the junction box.
7. Depending on the number of circuits required, more than one junction box may be used.
8. Connect the coded wires with the connectors provided in the junction box.
9. Replace junction box cover.
10. Secure cables within 12" of the junction box.
11. Replace any insulation that was removed to make the connections.
12. Replace access covers on both sections of the home.

Electrical crossover connections may also be under the home and flexible metal conduit between junction boxes is required.



C. Water Line Crossover

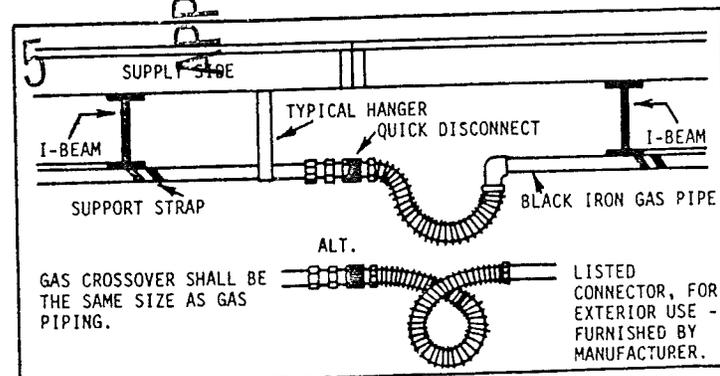
Water line crossover connections are located on the underside of the floor at the mating line of the home.

1. Remove the access covers from both sections of the home.
2. Feed water lines through the holes pre-drilled in the floors or under floor.
3. Connect the water lines between sections with the fittings provided.
4. Replace any insulation that was removed to make the connections and insulate any exposed pipes.
5. Replace access covers on both sections of the home.

Water line crossover connections may also be located under the home and need only be connected together.

D. Gas Line Crossover

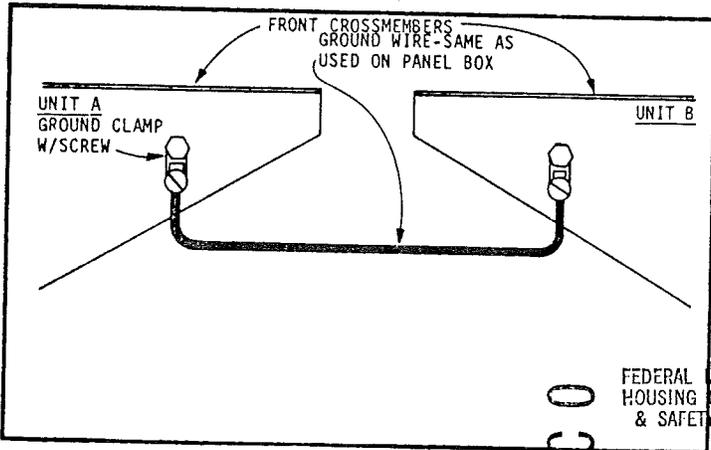
1. Remove the protective caps from the gas line and connectors.
 2. Attach the quick disconnect to the supply side of the connector to the other half.
- The crossover must be readily accessible from the exterior of the home.
- Do not use tools to separate the "Quick Disconnect" device.



GROUNDING OF THE FRAMES

The frames of a multiwide unit must be grounded together as follows:

1. The grounding clamp with bolt must be installed at the mating wall end of the front cross-member.
2. A #8 bare copper wire must be installed between the two grounding clamps and secured properly.



CAUTION: Optional over-the-roof tie-downs must not be used alone. Their use does not alter the necessity to install diagonal frame tie-downs. Over-the-roof ties are supplemental equipment only and, when installed, they are installed in addition to, not in lieu of, the required frame tie-downs.

When optional over-the-roof ties are installed, a frame tie is required at each over-the-roof tie location. The balance of the frame ties are to be spaced as shown below and located as close as possible to a pier.

The following instructions are for installing tie-downs on the home.

Construct the tie down system with adjustable devices in order that the strap tension may be periodically adjusted to compensate for heaving or settling.

1. Using the following information you can determine the required number of tie-downs from the following drawings.

TIE DOWN LOCATION DETAIL

TIE DOWN INSTRUCTIONS

WARNING: Before any anchors are installed, check to assure that underground pipes, wires, cables and/or utility services are not located where anchors are to be driven.

The home must be in its final level position, with all anchors and piers in place, prior to the installation of tie-down straps.

After blocking and leveling, the home must be anchored to provide you safety and protection from the danger of high winds. Using frame ties only or a combination of frame ties and optional over-the-roof ties, as noted below, is required.

A. Frame Ties. These are furnished by the owner or installer. The frame ties are to be spaced equally and located as close as possible to a pier. The number of frame ties required will vary, depending on the following items as noted in the tie down location details.

1. Wind Zone
2. Size of Home

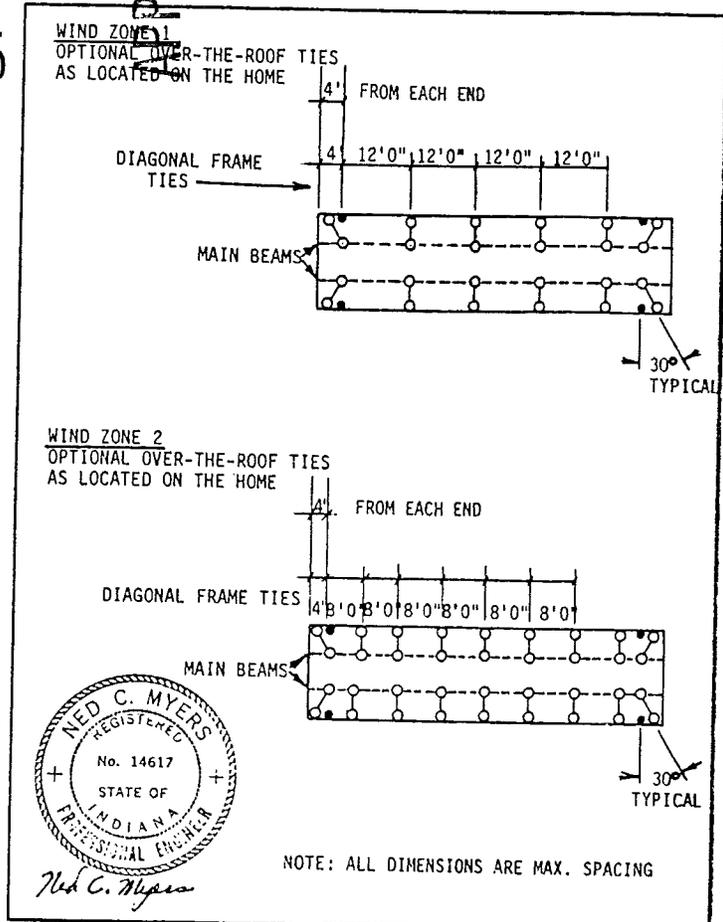
B. Optional over-the-roof ties. These straps are factory installed and must be anchored to the ground on site. If ordered, the proper number of over-the-roof ties have been installed at the factory to meet the zone requirements for which this home was built.

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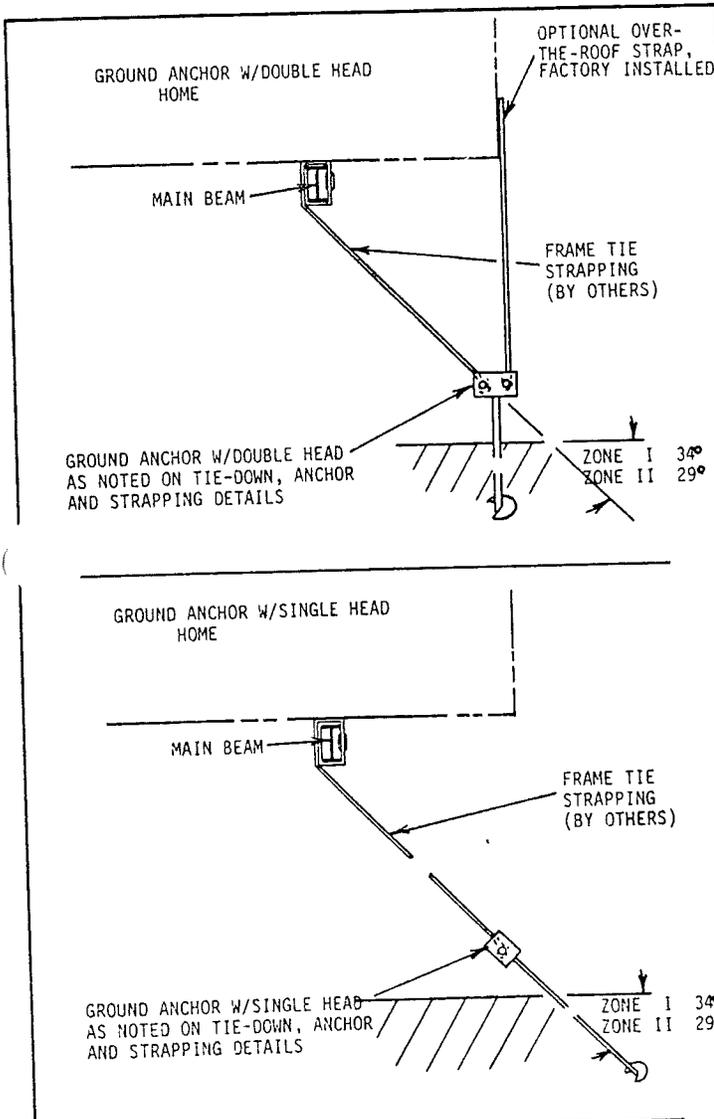


NOTE: DOUBLE WIDE SAME AS SINGLE WIDE EXCEPT NO TIES AT INTERIOR "I" BEAM.

2. Install ground anchors with single heads at the frame tie-down locations on both sides of the home.
3. If optional over-the-roof ties are to be used, install ground anchors with double heads on each side of the home, directly below each of the factory installed over-the-roof tie-downs.

TIE DOWN, ANCHOR AND STRAPPING DETAILS

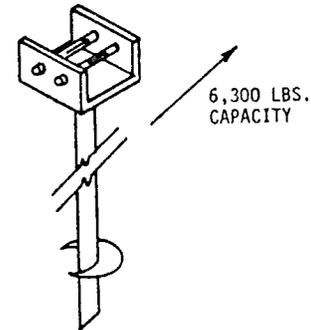
TIE DOWN DETAILS



TIE-DOWN STRAPPING REQUIREMENTS

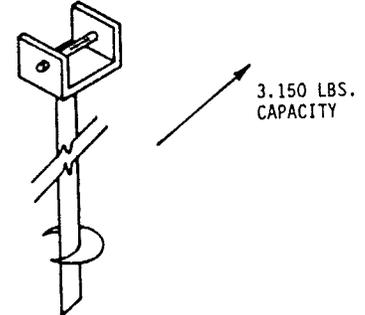
FRAME TIE STRAPPING MATERIAL MUST MEET, OR EXCEED, THE FOLLOWING SPECIFICATIONS:
 0.035" x 1.250" FEDERAL SPECIFICATIONS
 QQ-S-781H TYPE 1, CLASS B, GRADE 1,
 0130 OZ/SQ. FT.

GROUND ANCHOR WITH DOUBLE HEAD

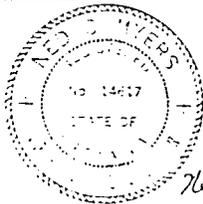


DOUBLE-FASTENING MINUTE MAN ANCHOR-BY OTHERS:
 PART NO. 650DT-5, OR 650ETDH-5 FOR COMBINATION ROOF STRAP AND
 FRAME TIE CONNECTION OR EQUAL. MIN. LOAD CAPACITY 5,750 LBS.
 VERTICAL AND 2,800 LBS. HORIZONTAL, FOR A TOTAL OF 6,300 LBS.
 CAPACITY.

GROUND ANCHOR WITH SINGLE HEAD



SINGLE-FASTENING MINUTE MAN ANCHOR-BY OTHERS:
 PART NO. 650DT-5, OR 650ETH-5 FOR FRAME TIES OR EQUAL. MIN.
 LOAD CAPACITY 2,600 LBS. VERTICAL AND 2,800 LBS HORIZONTAL, FOR
 A TOTAL OF 3,150 LBS. CAPACITY.



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JAN 12 1989

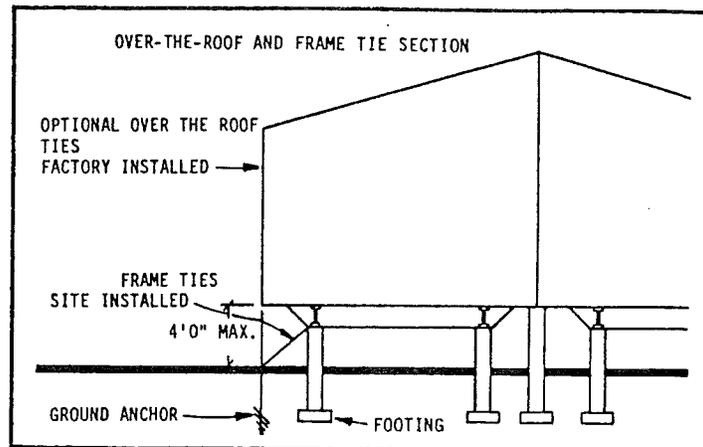
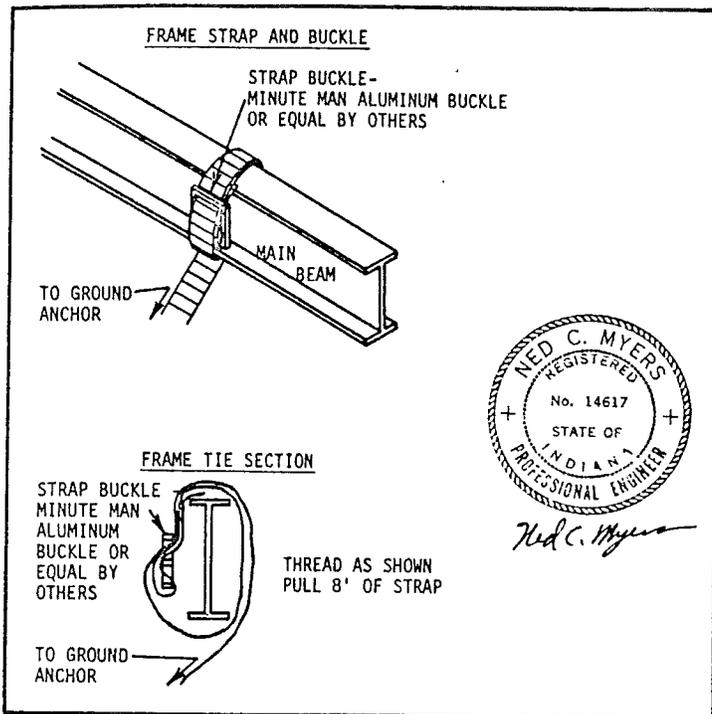
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Connect frame ties to the main beams of the home at all ground anchors (double head and single head), on both sides of the home. See the following diagrams for connecting details.



6. With one man on each side of the home, start at the front and tighten straps on both sides at the same time.

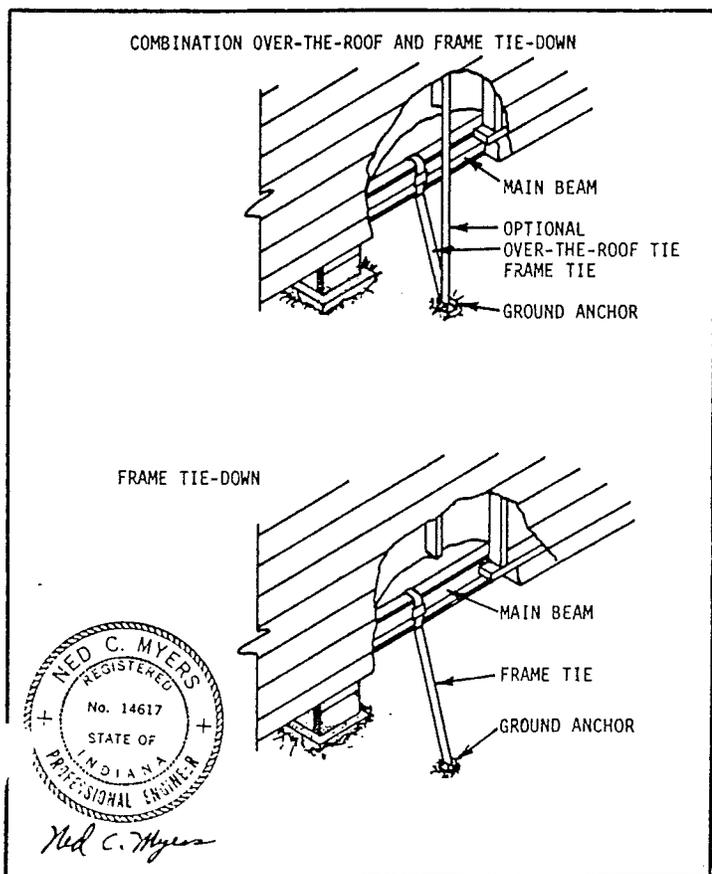
CAUTION: Failure to follow tensioning procedure as described above may result in disturbing home set-up and level, or even pull the home off the pliers.

Tie-down straps are not leveling devices. Their effectiveness is not increased by over-tightening. Do not apply any excess pressure as damage to the home structure, pliers and/or footings may result. Make taut only.

When re-leveling the home do not raise the home without relieving the tension of the tie-down straps.

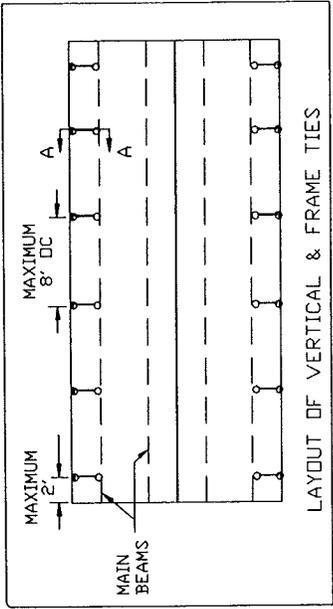
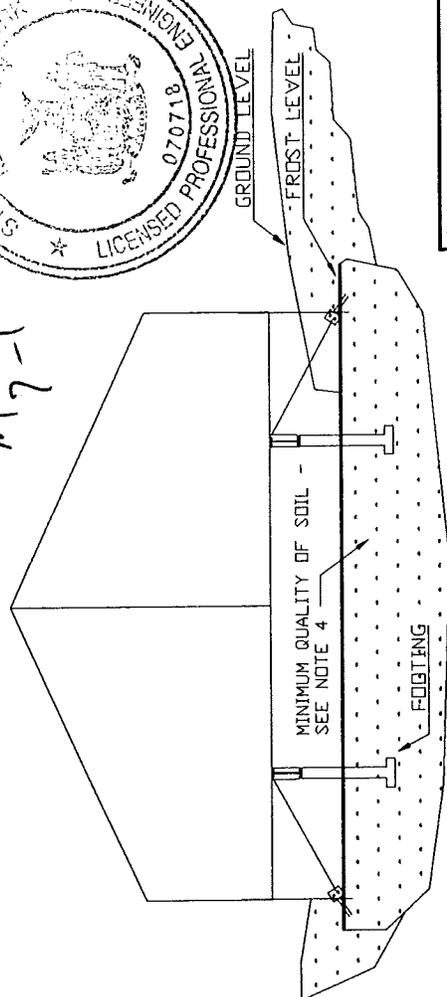
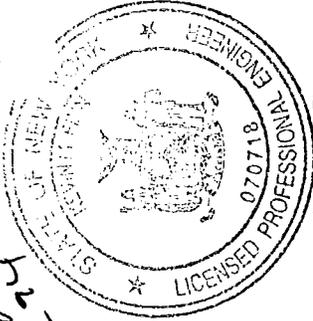
NOTE: After all tie-downs are taut, check all pier supports to insure full contact between the home's main beams and the pliers.

5. Connect all frame ties and over-the-roof ties loosely to the ground anchors. Do not tighten.

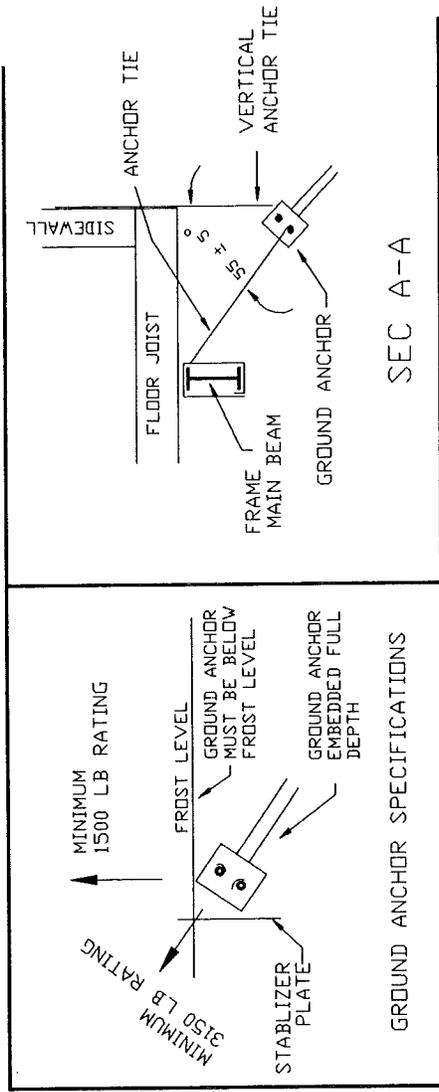


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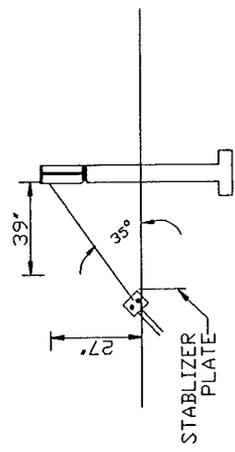
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TYPICAL DOUBLEWIDE UNIT



SEC A-A



EXAMPLE OF 35° ANGLED ANCHOR STRAP

NOTES

1. THE ANCHOR STRAP IS TO BE A MINIMUM TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1-1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
2. THE VERTICAL ANCHOR TIE IS INSTALLED IN THE FACTORY COATED WITH A MINIMUM 0.3 OUNCES OF ZINC PER SQUARE FOOT.
3. THE GROUND ANCHOR MUST HAVE THE MINIMUM RATING OF SHOWN IN THE GROUND ANCHOR SPECIFICATIONS. TWO ACCEPTABLE GROUND ANCHORS ARE DESIGNATED MINUTE MAN '650-DH 5/8" & '636-DH 5/8".
4. THE MINIMUM QUALITY OF SOIL FOR THE GROUND ANCHOR SHALL BE ONE OF THE FOLLOWING:
 - a. Very-dense and/or cemented sands, coarse gravel and cobbles, preloaded silts, clays, and corals.
 - b. Medium-dense coarse sands, sandy gravels, very-stiff silts and clays.
 - c. Loose to medium dense sands, firm to stiff clays and silts, alluvium fill.

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<p>The Commodore Corporation</p>		TITLE TIEDOWN INSTALLATION DETAILS OF DOUBLEWIDE UNITS FOR WIND ZONE II		DATE REV. NO.	DATE 7-6-94 SCALE NTS DWN. BY KMF REFER.	DWG. NO. J-2-14A
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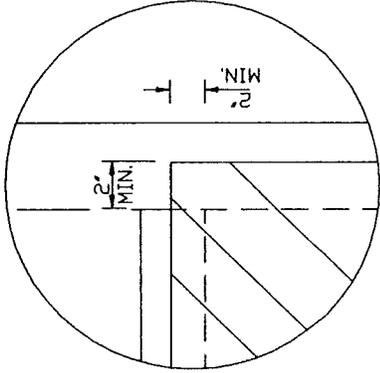
SHEATHING SCHEDULE

SIZE OF OPENING	MIN. THICKNESS OF SHEATHING	MIN. APA RATING
15 x 54	7/16"	24/0
25 x 69	15/32"	32/16
37 x 69	19/32"	40/20
79 x 53	23/32"	48/24
72 x 80	23/32"	48/24

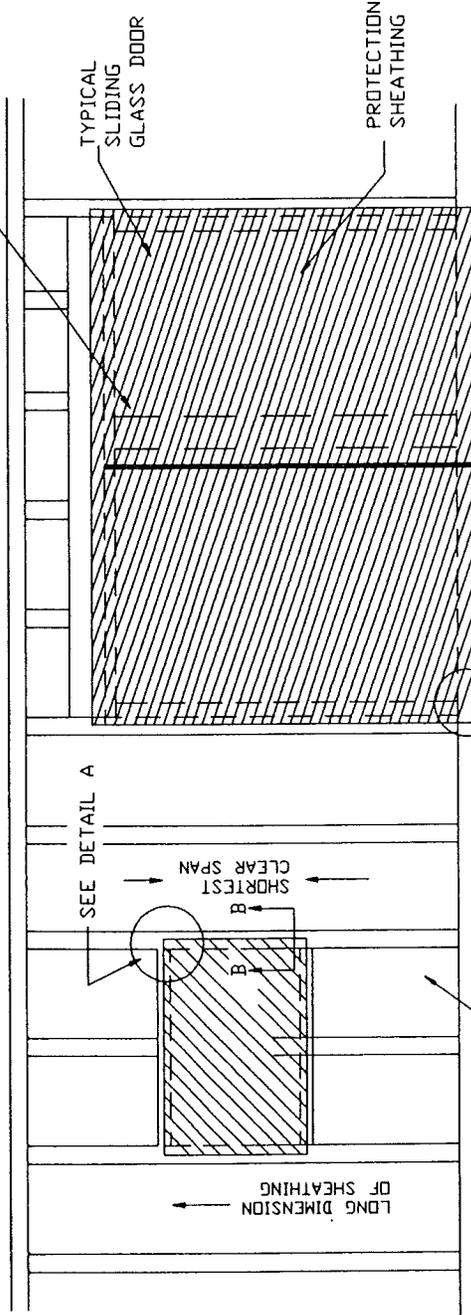
FASTENING SCHEDULE

SIZE OF OPENING	SPACING OF #8 x 3" SCREWS AROUND PERIMETER
15 x 54	12" OC
25 x 69	12" OC
37 x 69	12" OC
79 x 53	6" OC
72 x 80	6" OC

GLUE AND STAPLE #2 SPF 2 x 6 TO CENTER OF PROTECTION SHEATHING AS SHOWN. ASSURE THAT LAYFLAT DOES NOT CONTACT WINDOW OR DOOR FRAMING



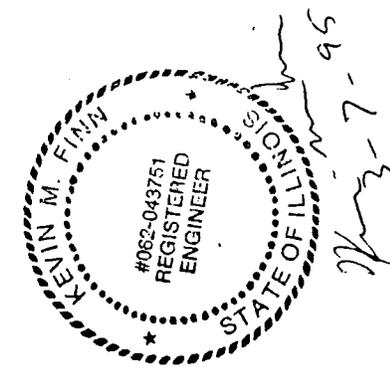
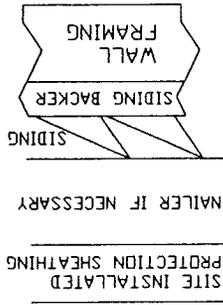
DETAIL A



STD SHEATHING & VINYL SIDING REMOVED FOR CLARITY

SEE DETAIL A

SEC B-B



- NOTES
- THIS PAGE IS INTENDED TO PROVIDE HOMEOWNERS WITH THE REQUIRED DESIGN FOR PROTECTION OF WINDOW & DOOR OPENINGS DURING HURRICANE STORM-LIKE CONDITIONS. THESE DESIGNS ARE INTENDED TO PROTECT THE OPENINGS FOR WIND ZONE II AREA.
 - THE SHEATHING OVER THE OPENING IS TO EXTEND A MINIMUM 2' BEYOND THE OPENING. THE MINIMUM TYPE OF SHEATHING IS TO BE PER THE SHEATHING SCHEDULE.
 - THE NAILER (IF NECESSARY) IS TO BE FASTENED TO THE WINDOW FRAMING PER THE FASTENING SCHEDULE.
 - THE SHEATHING IS TO BE FASTENED TO THE NAILER PER THE FASTENING SCHEDULE.
 - THE LONG DIMENSION OF THE SHEATHING IS TO BE INSTALLED PERPENDICULAR TO THE SUPPORT IN THE SHORTEST CLEAR SPAN.
 - ASSURE THAT FASTENERS FROM SHEATHING TO NAILER OR FROM NAILER TO STUD DOES NOT PENETRATE WINDOW OR FLANGE OF WINDOW CAUSING WINDOW TO BREAK.
 - WHEN THE SHEATHING AND NAILER ARE REMOVED AFTER THE STORM, SEAL FASTENER HOLES WITH SILICONE CAULKING TO PREVENT MOISTURE FROM ENTERING THE HOME.

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HOUSING CONSTRUCTION
& SAFETY STANDARDS

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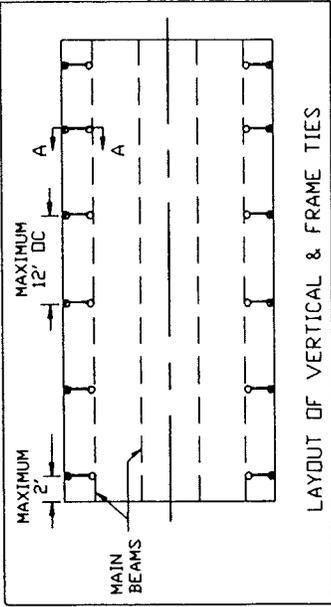
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TITLE	PROTECTION OF DOOR & WINDOW OPENINGS WIND ZONE II	DATE	REV. NO.	DATE	REV. NO.	DATE	REV. NO.	DWG. NO.
		7-27-94	6500	7-12-94	NTS			J-2-14B
		3-7-95	6500					

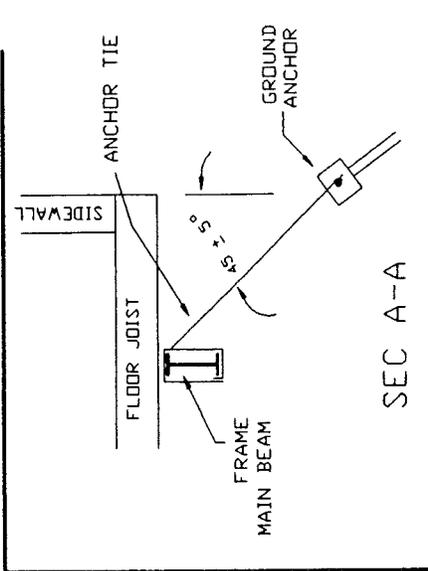
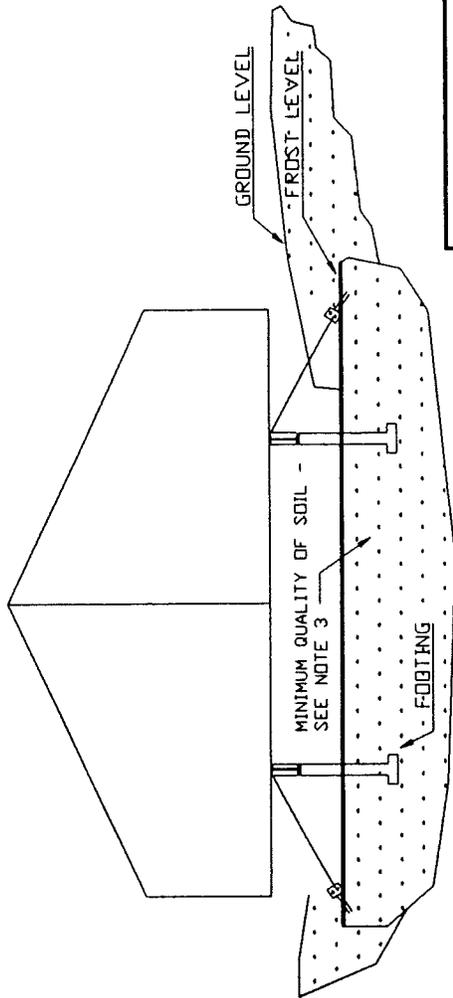
The Commodore Corporation



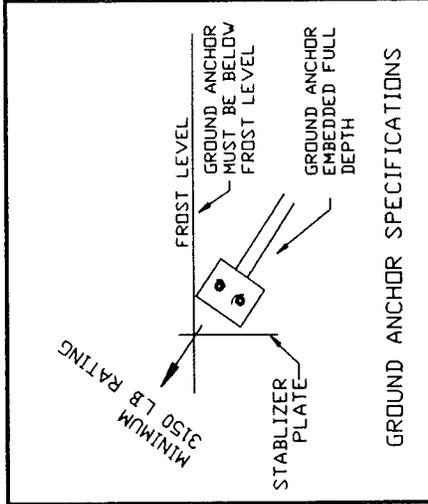


LAYOUT OF VERTICAL & FRAME TIES

TYPICAL DOUBLE WIDE UNIT



SEC A-A



GROUND ANCHOR SPECIFICATIONS



EXAMPLE OF 45° ANGLED ANCHOR STRAP

NOTES

1. THE ANCHOR STRAP IS TO BE A MINIMUM TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1-1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
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 - b. Medium-dense coarse sands, sandy gravels, very-stiff silts and clays.
 - c. Loose to medium dense sands, firm to stiff clays and silts, alluvial fill.

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FEDERAL MANUFACTURED HOUSING CORPORATION & SAFETY STANDARDS

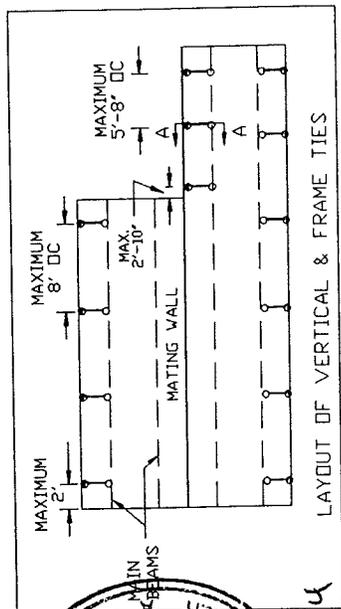
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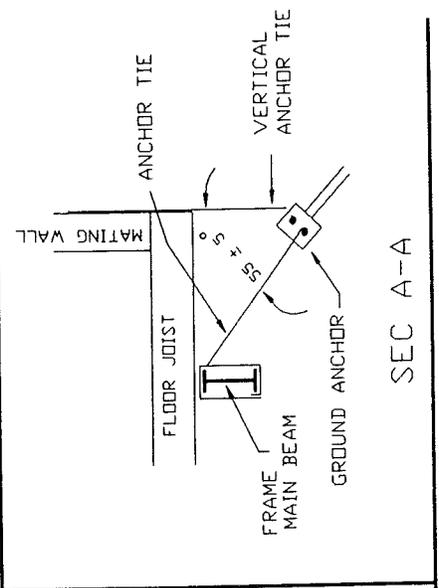
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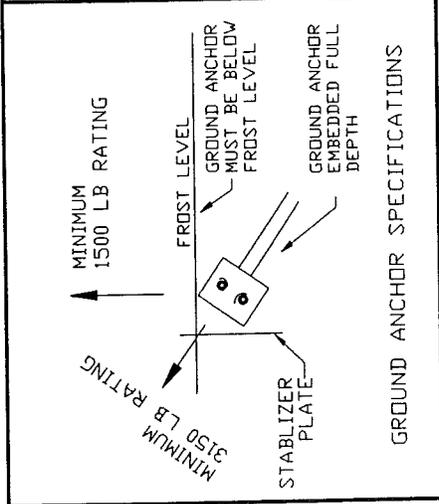
<p>The Commodore Corporation</p>	TITLE TIEDOWN INSTALLATION		DATE	REV. NO.	DATE	DWG. NO.
	DETAILS OF DOUBLEWIDE				7-14-94	J-2-14C
	UNITS FOR WIND ZONE I				NTS	
					DVN. BY KMF	
				REFER.		



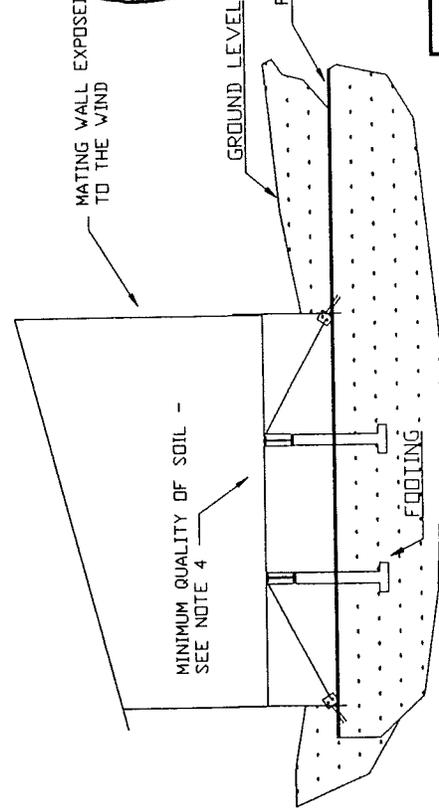
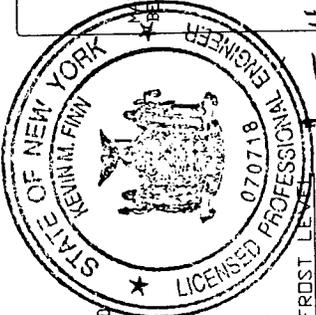
TYPICAL DOUBLEWIDE UNIT



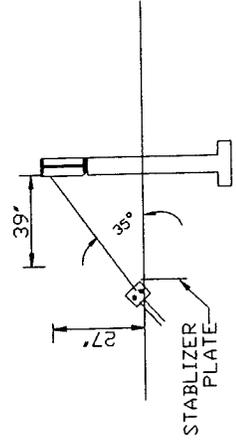
SEC A-A



GROUND ANCHOR SPECIFICATIONS



STANDARD APPLICATION



EXAMPLE OF 35° ANGLED ANCHOR STRAP

NOTES

1. THE ANCHOR STRAP IS TO BE A MINIMUM TYPE 1, FINISH B, GRADE 1 STEEL STRAPPING, 1-1/4" WIDE AND 0.035 INCHES IN THICKNESS, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AS CONFORMING WITH ASTM STANDARD SPECIFICATION D3953-91, STANDARD SPECIFICATION FOR STRAPPING, FLAT STEEL AND SEALS.
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 - c. Loose to medium dense sands, firm to stiff clays and silts, alluvion fill.

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The Commodore Corporation	TITLE TIEDOWN INSTALLATION	DATE	REV. NO.	DATE 12-14-94	DWG. NO.
	OF EXPOSED MATING WALL FOR WIND ZONE II			SCALE NTS	J-2-14D
				DWN. BY KMF	
				REFER.	

SKIRTING YOUR HOME

Commodore recommends installation of skirting.

Skirting not only increases the value of the home but has other benefits. Skirting helps keep the floor warmer in the winter, cooler in the summer, and helps prevent plumbing freeze-ups in winter. You may purchase skirting from your dealer, or make your own. In any event, it is important to remember that the skirting must allow for adequate ventilation.

NOTE: Before skirting is installed, the entire area under the home must be covered with a moisture vapor barrier. This is to prevent excessive humidity in the home. The moisture vapor barrier must be a minimum of 6 mil thick polyethylene and be overlapped 6" at all joints.

The skirting around the home must be provided with non-closing vents. The free air of the vents must be equal to but not less than 1/150th of the floor area of the home. (Divide sq. ft. of home by 150). The vents must be located to provide cross ventilation to the entire area under the home.

If the home is equipped with a fuel burning sealed combustion appliance with fresh air intake under the home, such as furnace, water heater and/or wood burning fireplace, a vent **MUST** be provided in the skirting adjacent to the fresh air inlet(s) of the appliance. Vents must be sized in accordance with the equipment manufacturer's installation instructions.

A removable panel should be provided in the skirting to allow crawl space access.

Special provisions must be made for venting clothes dryers beyond the perimeter of your home. Dryers must not, under any circumstances, be allowed to vent under the home. For special instructions for venting dryers see Clothes Dryer Section.

GROUND LEVEL INSTALLATION

Ground level installation is preferred by many homeowners for aesthetic purposes and the convenience afforded by the elimination of excessive steps and the need for skirting. Some parks provide such installations only on request while in some areas ground level installations are required by local ordinances.

The foundation system design (footings, piers and down-rows) for a ground level installation is the same as described previously for an above ground installation. The primary difference between the two installations is in the preparation of the site.

For ground level installations, provisions must be made to insure proper drainage of rain and ground water seepage to avoid accumulation in the silt (excavation). Appropriately banked backfilling at grade to drain water away from home and provisions for natural drainage at the lowest point of the silt are necessary. If natural grade drainage cannot be provided, a ground drain at the lowest point of the silt connected to a storm drain should be provided. Additionally, provisions to divert roof run-off by means of gutters and downspouts are necessary.

To protect the home from the entrance of ground moisture and excessive condensation build-up, the entire silt should be poured, reinforced concrete or adequately covered by a moisture vapor barrier.

The procedure for locating the home in the silt is contingent on factors existing at the site. If the silt is the type where the home is backed directly into it, extreme care must be exercised to avoid dragging. Shimming or blocking for the wheel runs may be required. The complete silt may be cribbed and the home sited and jacked down into the silt if necessary. Extra jacks and cribbing are required for this type of installation.

Extreme care must be exercised to avoid damage to the home and injury to the installers during the home siting, blocking, leveling and tie-down procedures necessary for ground level installations. Homeowners should not attempt such installations themselves, but always contract a qualified installer.

PERMANENT FOUNDATIONS

In the event you are considering a permanent foundation for the home, Commodore has a typical system available that would be acceptable in most areas. Drawings may be obtained by contacting the Commodore factory which manufactured your home.

Once obtained, the typical drawings must be submitted to the local jurisdiction for all required permits.

EXHAUST SYSTEMS

Visually inspect bathroom and kitchen exhaust vents to see that they are free and clear to the outside of the home and that nothing has been disturbed due to in-transit vibrations.

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UTILITY HOOKUP AND TESTING

This section of the manual deals with the connections of the water supply, drainage, gas, oil and electrical systems of the home to the site service.

Regulations governing utility connections vary with localities; thus, the authorities having jurisdiction must be consulted to insure connection in accordance with all applicable regulations. Connections must be made only by experienced, qualified personnel who are familiar with local regulations.

The utility systems for all Commodore homes are subjected to stringent tests prior to leaving the factory. This, however, cannot provide a guarantee against possible damage in transit. For this reason it is imperative that the test procedures for each of the utility systems be conducted as outlined in this manual.

NOTE: In some instances certain electrical, plumbing or furnace/air conditioning drops may fall over an axle which may require removal of the axle to complete installation.

The information on the following pages will assist in determining the proper connection procedures for which the home was designed and serve as a guide for inspection of the system upon completion.

Upon completion of your utility installation, it is important that access to connections be provided for periodic inspection and possible future service.

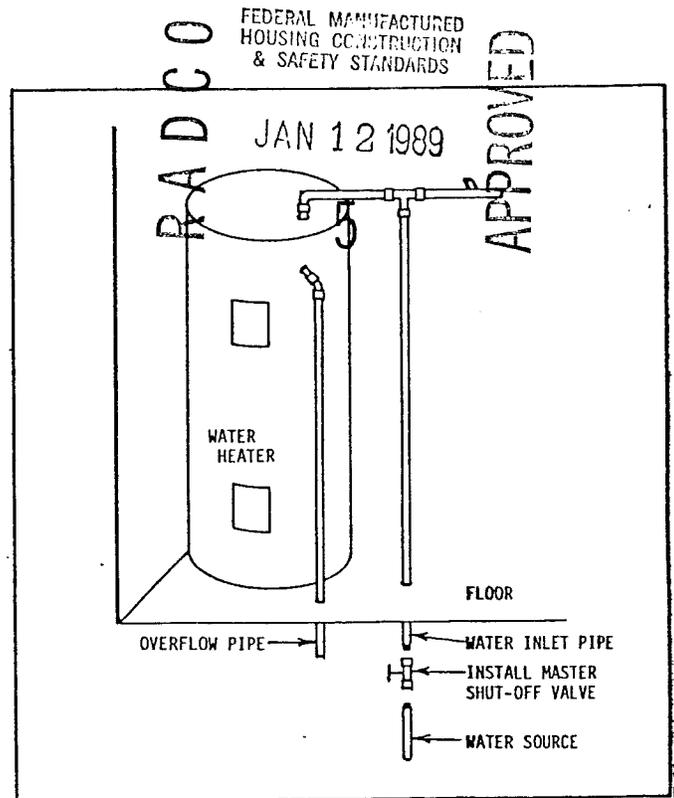
All utility connections between multiwide units must be completed before any test on the systems are started.

WATER SUPPLY HOOKUP AND TESTING

NOTE: Water heaters must be by-passed during test. Test involves use of pressurized air which can permanently damage the water heater or may even cause rupture or explosion which could result in serious injury. Water heater is by-passed by disconnecting both the cold water line inlet and the hot water line outlet from the water heater and then connecting the hot and cold water lines together through the use of appropriate connection fittings.

The water system was tested at the factory; however, it is essential that it be rechecked at the site for leaks that may have been caused by in-transit vibrations. Recheck to make sure water supply lines have been connected between sections of the home as previously instructed.

1. Install a master shut-off valve at the bottom of the water inlet pipe (either a full port gate or a full port ball valve, with threaded or solder joints). Generally, the 3/4" water inlet is located in the area of the water heater compartment. Install a pressure reducer if site pressure goes over 80 psi. These items to be supplied by the installer or owner.



2. Proceed with test as follows:
 - A. Close all water faucets, spigots and stool tank float valves.
 - B. Pressurize the system to 100 psi.
 - C. Isolate the pressure source from the system.
 - D. The gauge must stand 15 minutes with no drop.
 - E. If leakage is evidenced, locate the problem and correct. Re-test system as described above.
 - F. After successful completion of test, re-connect the water heater and connect the water supply to the home water inlet.
 - G. Turn on the water supply and visually check all connections for leakage. Operate all water faucets, showers, etc. to clear air blocks.

PROTECTION FROM FREEZING

3. If the home is to be left unheated in cold weather, after the above test, it is necessary to drain the water lines and blow them clear with compressed air to prevent damage from freezing.
4. If the home is installed in an area subjected to freezing temperatures, the exposed section of the water supply piping, shut-off valve, and pressure reducer must be protected. The most efficient and recommended means of accomplishing this is by the use of a thermostatically controlled heat tape. For this purpose, your home is equipped at the factory with an electrical receptacle under the home in the vicinity of the water supply inlet.

THE HEAT TAPE USED MUST BE LISTED BY A
NATIONALLY RECOGNIZED TESTING LABORATORY FOR
USE WITH MANUFACTURED HOMES, AND INSTALLED IN
ACCORDANCE WITH THE MANUFACTURER'S
INSTRUCTIONS.

In mild climates subject to only
occasional below freezing temperatures, an
alternative to the use of heat tape is
wrapping exposed sections of the water supply
piping with insulation, loosely taped to
prevent excessive compression.

NOTE: Before energizing water heating system
you must be sure to fill the water heater
with water. The water heater may be damaged
if heat is generated prior to filling with
water.

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DRAIN SYSTEM HOOK-UP AND TESTING

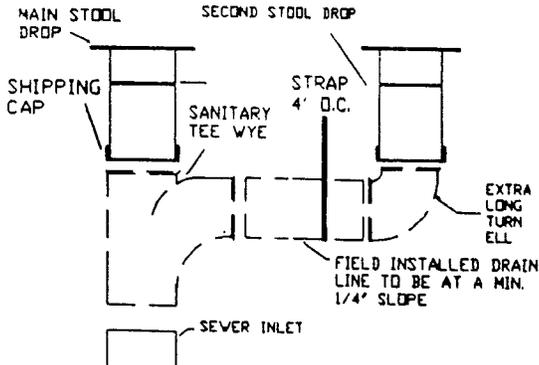
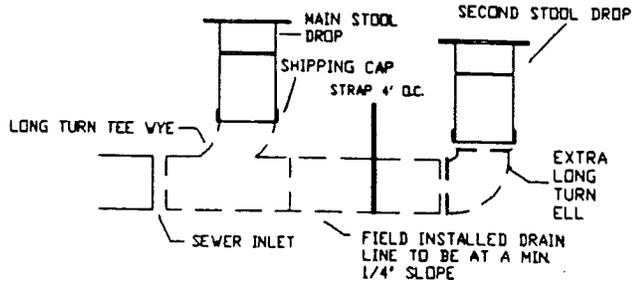
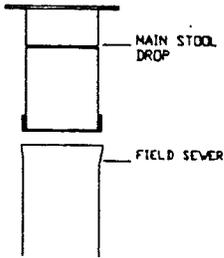
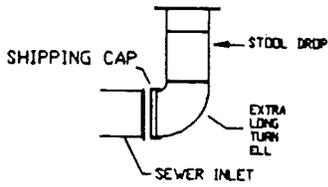
1. If the factory installed drain system has only one outlet then the following instructions, paragraphs a through d, should be used to complete the field installation. If there are two or more drain outlets, then the instructions on Paragraphs e through h are to be followed. A plumbing schematic, supplied with the unit, will indicate whether there is one or multiple plumbing outlets installed at the factory. The following illustrations in this installation manual provide additional details for field installation of the drain system.

- a. If only one drain outlet is factory installed, the outlet should be located directly above the sewer drain inlet. This vertical drop connection should be made with acrylonitrile butadiene styrene (ABS) plastic pipe, cast iron pipe, copper or copper alloy tubing, or polyvinyl chloride (PVC) plastic pipe which is listed for above ground drainage vent pipe usage.
- b. The drainage system was tested for leaks at the factory, however it is essential that it be rechecked at the site for any breaks that may have been caused by in-transit vibrations. To test the system, cap the drain outlet tightly, assure that the unit is level, plug the tub and shower drains and fill to the rim of one toilet bowl. The water level should stand for fifteen minutes without dropping, if there are no leaks, drain this water. Close the drains of all fixtures higher than the toilet bowl and fill these to their flood level, and allow to stand for 15 minutes and then drain simultaneously to obtain maximum possible flow in the drain piping.

- c. The plumbing fixtures and connections shall be subjected to a maximum flow test by filling all fixtures with water and while they are emptied, check for leaks and retarded flow.
- d. The adhesive or sealer used to seal the joint must be compatible with the (ABS) pipe which is the factory installed plumbing outlet material, and the sewer inlet. An acceptable adhesive to be used between the factory installed ABS drain outlet material and the sewer inlet material, if the sewer inlet is ABS plastic pipe (Type DWV), is ISP's "Weldon-773-ABS". Any ABS approved cement which meets the requirements of ASTM D-2235 may be used in place of ISP's "Weldon-773 ABS".
- e. If there is more than one factory installed drain outlet, the field installed system is to be assembled so that the waste drains to one outlet as per the plumbing schematic supplied with the unit. The dotted line is the intended field installed portion of the system. The solvent used for this field assembly must be compatible with ABS material. One acceptable solvent is ISP's "Weldon 773-ABS". Any ABS approved cement which meets the requirements of ASTM D-2235 may be used in place of ISP's "Weldon-773 ABS".
- f. The field installed sections should be marked to be cut so that the male and female joints will fit together correctly. The field installed sections are cut to the correct length. The adhesive or sealant is applied to each male and female end to assure a tight seal.
- g. After the field installed section is completed as per the plumbing schematic, but prior to connection to the sewer inlet, the drainage system is to be tested as per 1.(b) and (c) above.
- h. The connection of this system to the sewer inlet is to be installed as per 1.(d).

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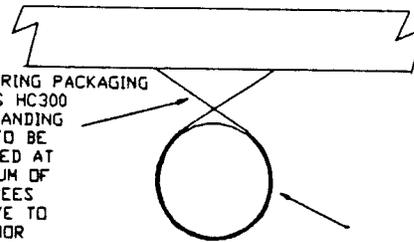
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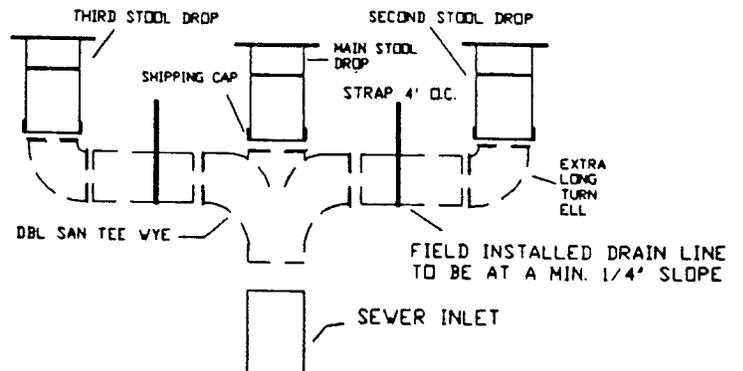
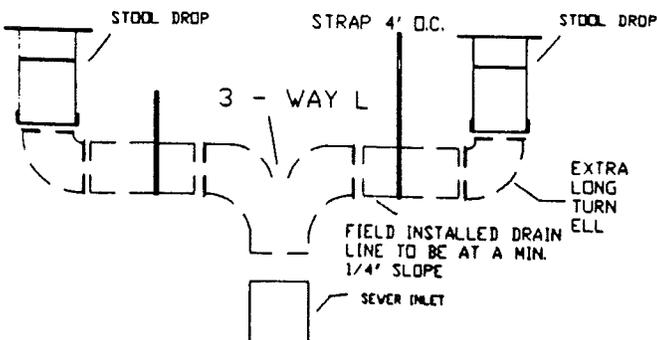
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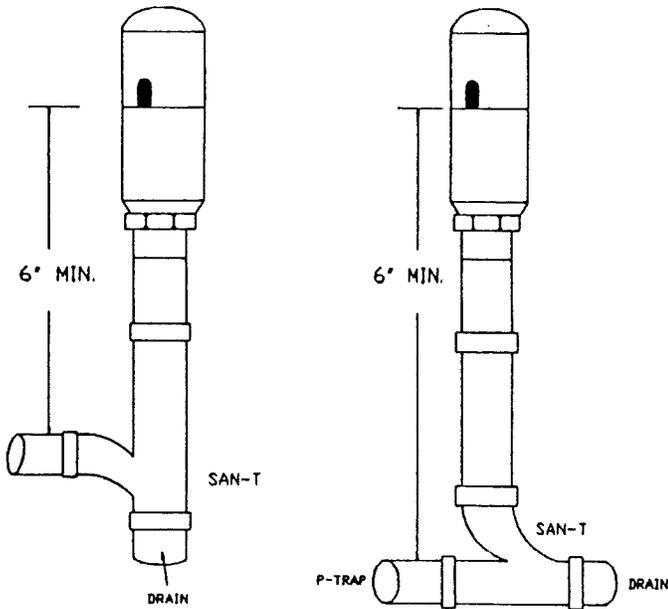
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ENGINEERING PACKAGING SYSTEMS HC300 (1/2)" BANDING STRAP TO BE INSTALLED AT A MINIMUM OF 30 DEGREES RELATIVE TO THE FLOOR JOIST AND STAPLED WITH A MINIMUM OF TWO CORROSION RESIST. 3/8"x18 GA. STAPLES



SLOPE OF FIELD INSTALLED DRAIN LINE TO BE A MINIMUM OF 1/4' PER FOOT.



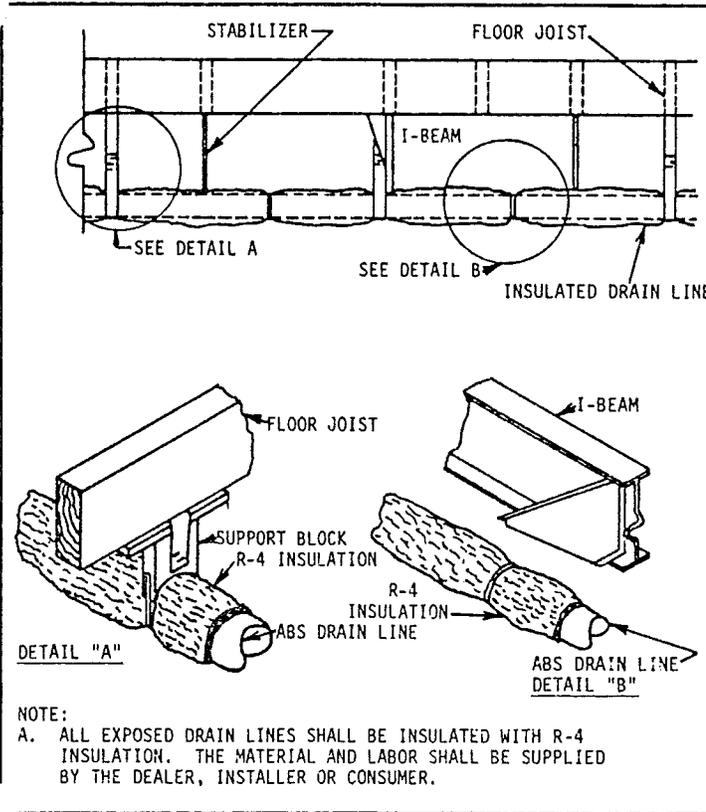


NOTE:

- A. Automatic plumbing vent requires periodic inspection and maintenance in order to assure proper functioning.
 - B. Access covers are provided for each automatic plumbing vent
 - C. Inspect and service as required. Use only a petroleum jelly on the threads to insure an airtight fit. Anything else, including pipe thread compound, may deteriorate the vent or its adaptor. Hand tighten.
 - D. the vent is used only as a secondary venting means. Each drainage system in which the vent is used must have a thru-the-roof vent stack located so as to vent the water closet.
4. Access to fittings in the drainage system, subject to freezing, such as P-Traps in the floor, have been protected with insulation by the manufacturer. Insulation must be replaced if removed during the testing.

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5. If the home has drain lines installed underneath the bottom board on site and is located in areas subject to freezing temperatures, the drain lines must be wrapped with insulation to prevent freezing.



6. If the home is to be left unheated in cold weather after the above tests, it is necessary to drain the entire system to prevent damage from freezing.

P-Traps at all fixtures and stools can be protected by pouring 1/2 cup of antifreeze into each one.

NOTE: Do not use heat tape on exposed drain lines.

R A D C O

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ELECTRICAL SYSTEM HOOKUP & TESTING

The electrical test and connection of the home should be made only by qualified personnel in accordance with applicable sections of the National Electrical Code along with any additional requirements imposed by local authorities having jurisdiction.

A sufficient power supply must be available at the site. Insufficient power supply will result in improper operation and possible damage to motors and appliances and costly electric service. The amperage rating of the electrical distribution panel main disconnect is shown on the tag located outside the home adjacent to the feeder entrance and on the electrical distribution panel itself.

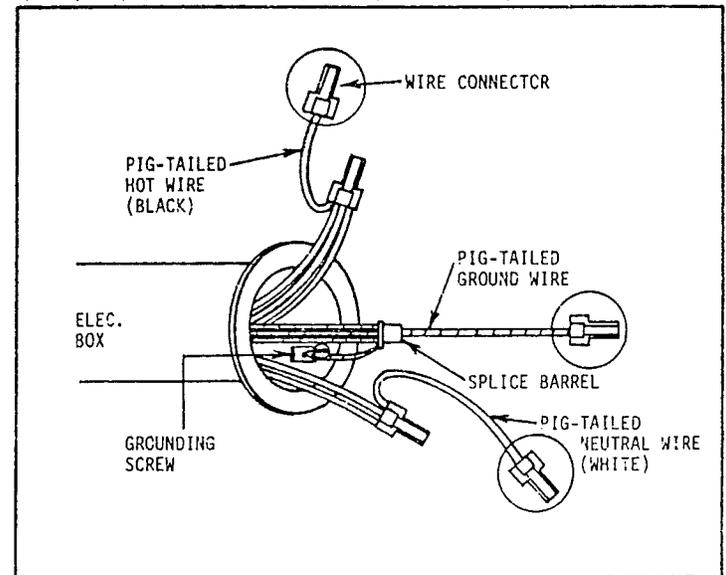
The home was tested at the factory, but must be retested after set-up, because of the possibility of connections loosening due to in-transit vibrations. Recheck to make sure electrical wiring connections have been made between sections of the home as previously instructed.

EXTERIOR LIGHT FIXTURES & OTHER 110V APPLIANCES

Connect wires, black to black, white to white and ground to ground, using wire nuts.

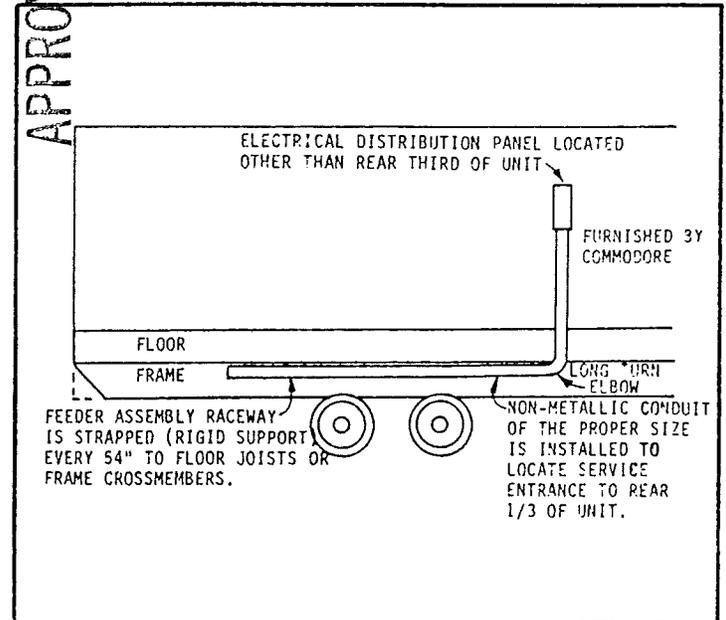
Push wires into box and place putty tape on light fixture base and secure fixture in position.

Install bulb and apply caulking around base of light fixture to insure a water-tight seal to the wall (putty tape and caulking not provided by Commodore).



CONNECTION OF THE ELECTRICAL SERVICES

If the electrical distribution panel is not located in the rear 1/3 of the home, conduit of proper size is installed to locate the service to the rear 1/3.



- To determine applicable feeder size amperage, see Main Breaker and the label on electrical distribution panel.
- Using this information, determine the required feeder size from the following table.

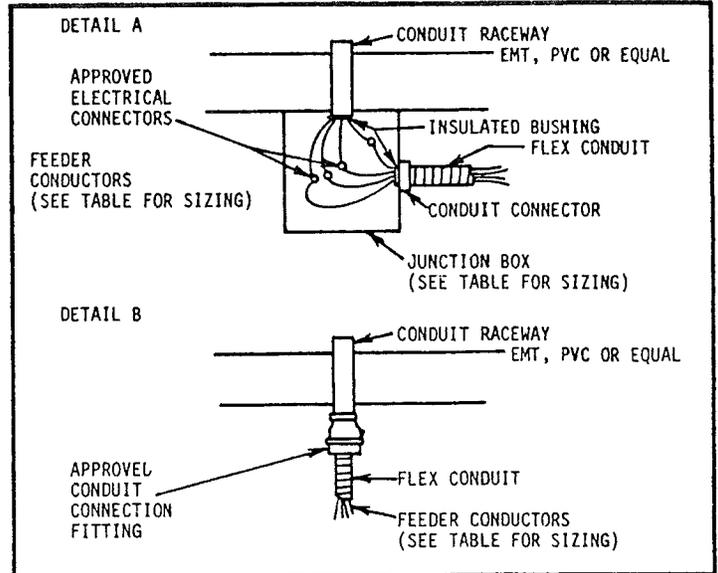
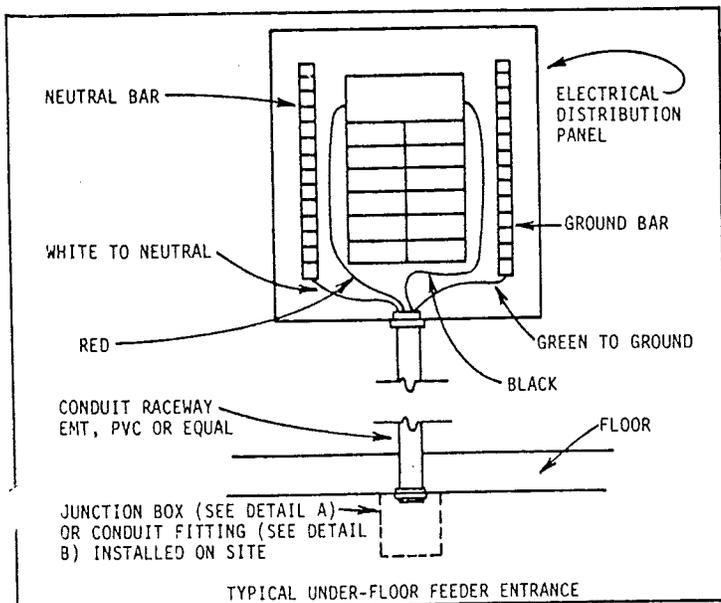
ELECTRICAL FEEDER AND EQUIPMENT SIZES						
Feeder Size (AMPS)	Maximum Neutral Feeder Load (AMPS)	Minimum Required Junction Box Size (Inches)	Feeder Sizes Based Upon Use of 75°C Insulated Copper Conductors			Conduit (Inside Dia.)
			Black-"Power" Red-"Power" White-"Neutral"	Green or Bare Ground		
50	50	10x10x4	#6 THW (Cu)	#8 (Cu)	1-1/4"	
100	100	10x10x4	#3 THW (Cu)	#8 (Cu)	1-1/2"	
150	115	12x12x6	#1/0 THW (Cu)	#6 (Cu)	2"	
200	130	12x12x6	#3/0 THW (Cu)	#4 (Cu)	2"	

Conductor sizes are in accordance with the National Electric Code, Table 310-16, and do not drop into consideration. Allowable ampacities are based on ambient temperature of 30°C, 86°F.

4. UNDER-FLOOR FEEDER ENTRANCE

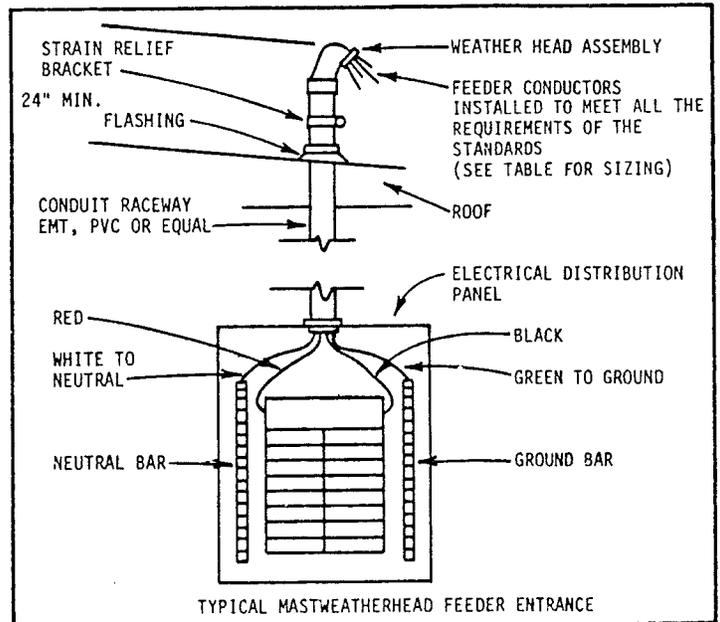
Homes with an under-the-floor feeder entrance are provided with a permanently attached conduit raceway which runs from the electrical distribution panel to a point terminating beneath the floor of the home. A suitable conduit fitting or junction box must be installed at the termination point below the floor.

CAUTION: The connection of the home is a feeder, not a service. When wiring the feeder, a grounding (green) conductor must be installed and the neutral (white) conductor must not be grounded in the electrical distribution panel.



5. MAST WEATHERHEAD FEEDER ENTRANCE

Homes so equipped contain all necessary conduit to the electrical distribution panel but feeder conductors are not provided with this assembly and must be installed on site in accordance with the above table.



CAUTION: If the home has an electric water heater, it must either be filled with water or have the circuit breaker turned "OFF" before energizing the home electrical system or severe damage to the heating element will result.

- With the electrical distribution panel main circuit breaker and all individual circuit breakers in the home turned off, make electrical service connections. When connections are complete, turn on power at electric meter source. Do not turn on the main panel box circuit breaker in the home until the grounding and continuity testing has been performed.

7. Grounding the Home

NOTE: The grounding bar in the main electrical distribution panel box must be grounded only by qualified personnel in accordance with applicable sections of the National Electrical Code along with any additional requirements imposed by local authorities having jurisdiction.

If the home has a tag-a-long or add-on-room, make all electrical connections before performing the following tests.

GROUNDING AND CONTINUITY TEST

8. Perform the following test after all structural assembly, metal and trim installation is finished.

- A. Connect one clip of a flashlight continuity tester to a convenient ground (metal skin, window frame on metal skinned units, floor duct riser, screw head on receptacle or switch plate, etc.) and touch the other clip to each light fixture canopy (where the light is mounted to ceiling or wall). The continuity tester should light if each fixture is properly grounded.
- B. 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.
- C. Using the continuity tester, check the continuity between the following:
 - 1. Between one riser of furnace duct and convenient ground.
 - 2. Between metal roof and steel frame.
 - 3. Between metal skin and steel frame.
 - 4. Between metal gas piping and steel frame.

NOTE: Continuity to ground is not required on metal inlet of plastic piped water system.

- 5. Between electrical distribution panel and steel frame. 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.
- 6. In addition, If home water distribution lines are metal, the ground continuity between the water line inlet and steel frame and all metallic plumbing fixtures such as sinks, tubs, faucets, etc. must be checked.
- 7. Any loss of grounding continuity found in the above will require investigation and correction.

POLARITY & OPERATIONAL TEST

8. Turn on main panel box circuit breaker and then one at a time, turn on the individual home circuit breakers and perform the following test. Should any breaker trip, this indicates a problem with the circuit that must be located and corrected.

CAUTION: Make sure the water heater is filled with water before energizing.

- A. Plug an AC receptacle wiring tester into each receptacle in the home to check for reversed polarity, open grounds and shorts.
- B. Install light bulbs and fluorescent tubes in all light fixtures. Make sure each light fixture is operable by turning the appropriate switch to the "ON" position.
- C. Repair or replace any defective light fixtures or switches. Check operation of furnace and water heater thermostats and set. Check and run furnace blower.
- D. Conduct test of GFI (Ground Fault Interrupter) circuit breaker in accordance with the breaker manufacturer's instructions.
- E. Conduct tests of the smoke detector(s) in accordance with the manufacturer's instructions.

GAS SYSTEM HOOKUP & TESTING

The gas piping system was tested at the factory; however, it is essential that it be rechecked at the site for leaks that may have been caused by in-transit vibrations. Recheck to make sure gas lines have been connected between sections of the home as previously

NOTE: Do not apply more than the specified pressure as damage to gas valves and/or regulators may result.

Before a test is begun, the temperature of the ambient air and the piping should be approximately the same. Conduct the test when air temperatures will remain stable.

The gas piping system must be tested two ways:

- A. Piping only - all appliances isolated.
 - B. Entire system - with appliances.
1. Piping only test:
- A. Isolate all appliances from the system by closing all appliance shut-off valves.
 - B. At the home gas inlet, attach a pressure gauge calibrated in ounces.
 - C. Pressurize the system with air to not less than 3 psi or 48 ounces of air pressure
 - D. Isolate the pressure source from the system.
 - E. The gauge must stand 10 minutes with no drop.
 - F. If pressure loss occurs, check all joints in piping system beneath the home and at all shut-off valves with soapy water or bubble solution until leak is located.
 - G. Repair leak and retest.

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2. Entire system test:

- A. All gas equipment controls and pilot light valves must be closed. Refer to individual gas equipment manufacturer's instructions.
- B. Gas shut-off valves for all gas equipment must be in the "Open" position.
- C. At the home gas inlet, attach a pressure gauge calibrated in ounces.
- D. Pressurize the system with air to not less than 6 to 8 ounces of air pressure.
- E. With soapy water, or bubble solution, check all gas shut-off valves and flex line connections to valves and appliances for leaks.

CAUTION: Do not bubble check brass fittings with solutions containing ammonia.

- F. If leak is found, repair and re-test.

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NOTE: Prior to making connection to site supply, gas inlet orifices of furnaces, water heaters and appliances must be checked to insure they are set up for type of gas to be used -- L.P. (liquefied petroleum) or natural gas. The gas pressure should not exceed 7" to 14" water column.

If conversion is required, individual appliance, furnace or water heater manufacturers' instructions must be complied with.

Gas appliance vents shall be visually inspected to insure that they have been connected to the appliance and roof jacks are installed and have not come loose during in-transit vibrations.

The gas connection to the gas supply should be made by an authorized representative of the gas company.

If the home has gas piping stubbed in for future installation of appliances, a shut-off valve and threaded pipe plug or cap will be installed at the factory and all of the above tests should be performed on the system.

After completion of tests, close equipment shut-off valves and connect gas supply to the home gas inlet. One at a time, open each equipment valve and light pilots and adjust burners according to each appliance/equipment manufacturer's instructions. Check the operation of the furnace and water heater thermostats and set.

CAUTION: Make sure water heater is filled with water before lighting pilot.

OIL PIPING HOOKUP & TESTING

Homes produced by Commodore which are equipped with oil burning furnaces must have the oil supply piping installed on site. Piping is not supplied by Commodore.

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 8 inches above the level of the furnace oil control, while top of the tank is within 8 feet of the 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 1-1/4 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.

An accessible and approved manually operated shut-off valve must be installed at the oil tank outlet. Additionally, it is recommended that a suitable filter be installed in the fuel line near the tank to help trap dirt and water.

NOTE: All oil 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.

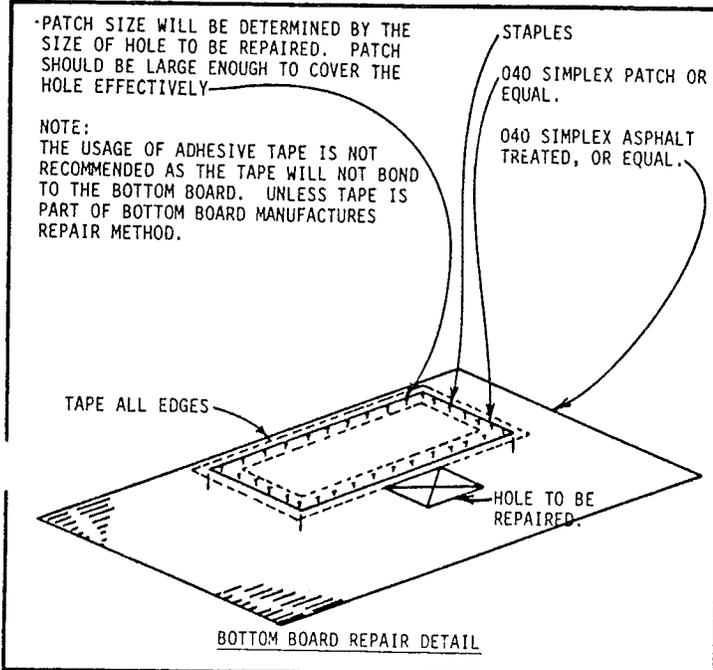
BOTTOM BOARD PATCHING

Below are listed some of the different patching methods which offer the dealer, or home buyer, a means of resealing the bottom board:

Affix the patch with an approved bottom board tape. It is recommended that either CS-12 from Shepherd Products of Kalamazoo, Michigan or #620 from First Line Corp. of Valdosta, Georgia be used.

The outward Flare Tacker is an air operated tool Model LN3045 manufactured by Senco Products, Inc.

The patch should first be affixed to the bottom, using an approved tape to secure the perimeter and then fastened near the perimeter at 3" intervals. Use the staples described in Senco Bulletin M-100.



OPTIONAL ITEM INSTRUCTIONS

CAUTION: Commodore cannot be responsible for any damage resulting directly or indirectly from installation of accessories, nor any modifications to the home subsequent to shipment from the factory. All alterations must be in compliance with the Federal Manufactured Housing Construction and Safety Standards and will be at the risk of the installer and/or home owner.

Local building officials should be consulted prior to making any alterations to the home to insure compliance with all applicable codes and requirements. Your dealer should be consulted as he is a specialist in the proper installation of accessories.

THE VENTING SYSTEM FOR SUCH APPLIANCES AS PLACES, FURNACES, WATER HEATERS AND GAS OVENS MAY NOT BE COMPLETE AND MUST BE INSTALLED BEFORE THE APPLIANCE CAN BE OPERATED. FOLLOW THE MANUFACTURER'S INSTRUCTIONS INCLUDED WITH THE APPLIANCES.

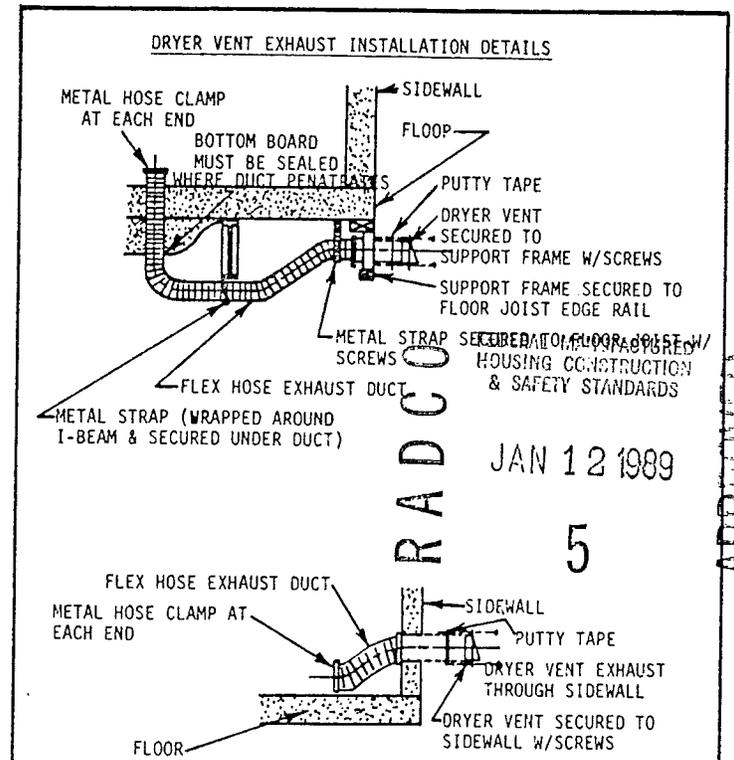
CLOTHES DRYER VENTING

Your home may be designed for the future installation of an electric or gas clothes dryer. A venting system access thru the floor or wall has been installed at the factory and the complete installation should be in compliance with the appliance manufacturer's instructions.

NOTE: Do not allow your dryer vent to terminate under your home. This may cause a build-up of flammable material under your home or it may cause excessive moisture to accumulate under your home.

Homes factory-equipped with an electric dryer receptacle will also have the moisture-lint exhaust system roughed-in. To complete the moisture-exhaust system, the following must be performed:

1. Remove the covers, exterior and interior, over the vent hole in floor or wall.
2. Install duct, make sure that it is clear, and connect to the dryer. All materials and installation should be in accordance with the dryer manufacturer's instructions.
3. Secure the termination fitting to the outside edge of the floor or wall.
4. Secure the flexible duct to the termination fitting with clamps. (Do not use sheet metal screws or other devices which extend into the interior of the duct).
5. Seal the hole where the duct goes through the floor or wall with a good grade of caulking or tape.



Homes factory equipped with a gas dryer stubbed-in outlet will be provided with a shut-off valve and threaded pipe plug or cap and will also have an access for the moisture-lint exhaust system. All gas supply piping and venting must be installed according to the dryer manufacturer's installation instructions.

NOTE: Gas dryer installation must be handled by fully qualified, experienced personnel only.

Commodore will not be responsible for damage to home resulting directly or indirectly from failure to install the dryer moisture-lint exhaust system in accordance with the instructions presented herein and those of the dryer manufacturer.

Cutting of major structural elements of home such as rafters or floor joists to facilitate installation is not permissible and any resulting weakening of the structural integrity of the home is not the responsibility of Commodore.

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REPLACE CHIMNEY INSTALLATION

Homes equipped with fireplaces require that the installation of additional section(s) of chimney pipe and a rain cap assembly be made on site.

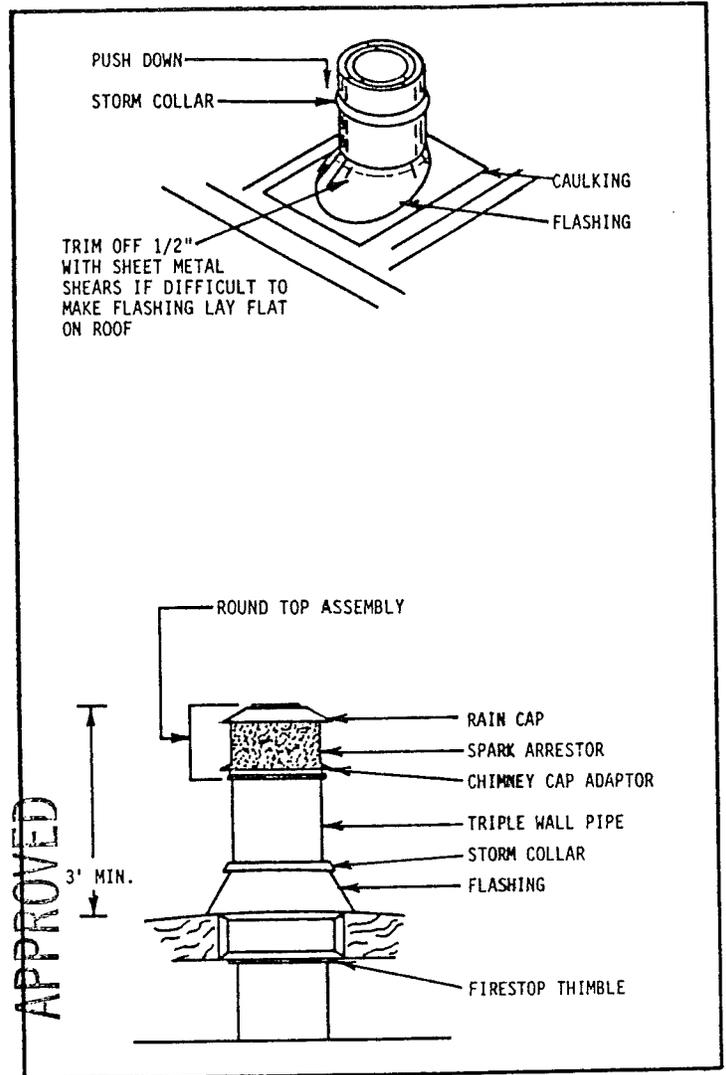
To insure sufficient draft for fireplace, the finished chimney MUST extend 3 feet above the highest point where it penetrates the roof and must be at least 2 feet higher than any building or other obstruction located within a horizontal distance of 10 feet.

Parts necessary to complete installation are provided. Note, however, that chimney section(s) provided will be sized of sufficient length to meet the above stated requirement for the home only.

If the site has obstructions extending higher than the home's roof peak within 10 feet of the chimney, an additional section of chimney pipe may have to be provided by installer.

Chimney installation must be made in accordance with fireplace manufacturer's instructions. Typical chimney installation is as follows:

1. Remove transit protective covering from over the chimney.
2. Install additional chimney section(s) provided and secure.
3. Install spark arrestor.
4. Install rain cap assembly.



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AIR CONDITIONING

NOTE: The installation should be made only by qualified personnel. The completed installation must conform to the National Electrical Code and applicable local codes.

Commodore does not recommend the installation of window air conditioning units.

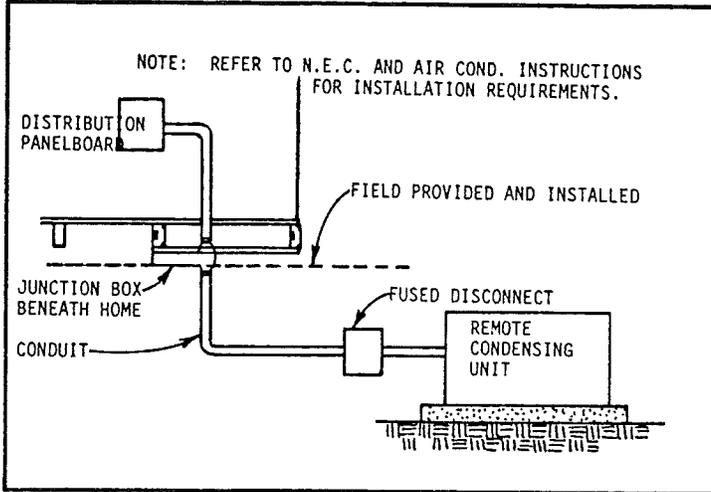
Factory installed circuits for air conditioning are indicated on the electrical distribution panel.

The maximum full load ampere draw for the desired air conditioning unit must not exceed the indicated circuit rating.

The electrical connection is via a circuit terminating in a junction box beneath the home.

The electrical supply, if not factory installed, may have to be from an outside source as electrical equipment within the home may not have been sized for the additional air conditioning load.

The field installation wiring beyond the junction box, must incorporate a fused disconnect (sized in accordance with NEC Article 440) located within sight of the condensing unit. The maximum fuse size to be used with the fused disconnect is marked on the condenser data plate. The acceptability of the air conditioning equipment, rating the location of disconnect means, fuse type branch circuit protection, and connections to the equipment are to be determined by the local inspection authority.



The compliance certificate posted in the home will specify the maximum capacity of air conditioning allowable for the home. The equipment you select should not exceed the maximum BTU HR rating on the compliance certificate.

Air conditioning units installed must be compatible with the furnace in the home. For air conditioning installation, see the instructions shipped with the air conditioner.

If the system is remote, i.e. the compressor and blower are outside the home...

- a. An automatic damper must be installed between the furnace and the home's air duct system, and another between the remote unit and the home's air duct system. This is to prevent air from the air conditioner being forced back up into the furnace when the air conditioner is operating and to prevent warm air being forced out into the air conditioner when the furnace is operating. The supplier of remote air conditioning units has these dampers available and will provide installation instructions. Commodore recommends that you insist that he obtain them for you before you purchase the remote unit.
- b. The duct system leading from the remote unit to your home must be securely supported and not in contact with the ground. The ducts must be insulated with material having a thermal resistance (R) of not less than four (4), and a perm rating of not more than one (1) perm.

- c. Make certain that the equipment is listed for application and use on manufactured homes and that it meets the standards and is installed to meet all of the requirements of the Federal Manufactured Housing Construction and Safety Standards. The equipment must also be installed per the manufacturer's installation instructions.
- d. The duct carrying air from the remote unit to the home should be connected to the home's main duct at a point where there are approximately as many registers forward of the connection as there are to the rear. The duct used for returning air to the remote unit should be located in a central location of the home.

It is important when installing the return air system and supply system that no floor joists are cut or damaged. The return air and supply ducts are sized to fit between the floor joists.

It is also important to replace insulation that may have been removed during the installation -- also to seal the bottom board around the duct connections.

If your home has been prepared at the factory for the addition of a remote unit, connect the ducts to the home via the connecting devices protruding from the bottom of the home.

Provisions must be made to direct all condensation runoff away from the home by affixing a hose to the equipment runoff outlet.

EVAPORATIVE COOLER

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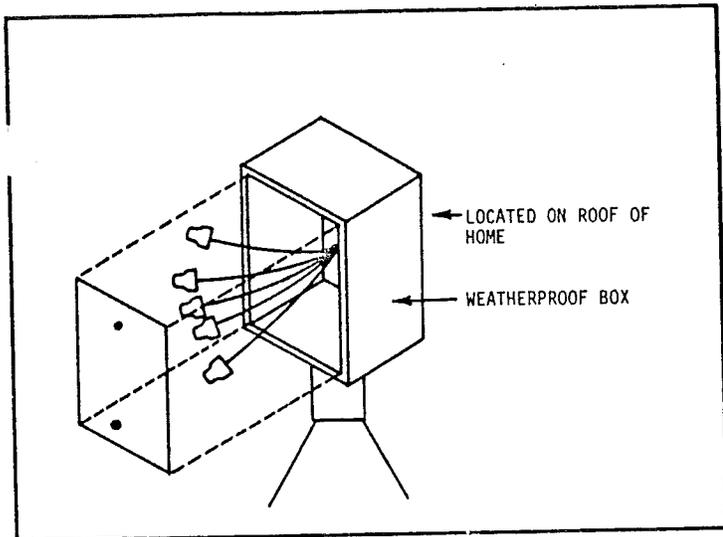
NOTE: The electrical connection should be made only by qualified personnel.

1. On models equipped for installation of optional evaporative cooler, install the roof-mounted cooler according to the instructions with the cooler. For coolers without an integral air duct the cooler box shall be lined with .016 in. metal. The factory installed branch circuit for the cooler is sized for a maximum cooler electrical load of 12 amperes, 120 V. AC, 60 Hz.
2. Remove the cover from the roof-mounted junction box and make the connection of the color-coded wires using the provided wire nuts. The electrical portion of the installation is now complete.

COLOR CODE

White.....	Neutral
Yellow.....	Pump
Black.....	Low-Fan
Red.....	High-Fan
Green.....	Ground

HEAT PUMP INSTALLATION



Due to the fact that heat pump designs vary considerably between manufacturers, it is impractical to give detailed installation instructions in this manual. The manufacturer's installation instructions provided with the specific system to be installed must be followed. Necessary information for the correct sizing of the system can be found on the home's Compliance Certificate (Data Plate) located in the area of the electrical power distribution panel and explained in earlier parts of this manual. Installation should be handled by qualified heating/air conditioning professionals.

The following are some general considerations for the installation of heat pumps:

Following are some general installation considerations which are the responsibility of the installer:

1. When working on a home with a metal roof, always use walk-boards to distribute weight evenly over several rafters. Never step between rafters or damage to roof seams may result.
2. A rigid base must be provided for the evaporative cooler to evenly distribute weight of the unit over several rafters. The cooler is secured to the base and the base must be secured directly to the roof rafters.
3. All roof penetrations must be adequately sealed or caulked.
4. Caution must be exercised when installing the boot connecting the cooler to the roof/ceiling opening to insure a tight seal in order to prevent leakage of cool air and afford protection from the elements.
5. An overflow hose must be attached to the cooler's water accumulation pan to route overflow water away from the home.
6. Provisions must be made for an external water supply to the cooler.
7. If guy wires are installed, do not attach them to roof vents, flues or other roof protrusions. To eliminate potential leaks, guy wires should not be secured to the roof itself but routed over the side of the roof and attached to the roof rafter edge rails. All fastener penetrations must be adequately sealed or caulked.
8. It is prudent to install, directly to earth, an insulated lightning grounding device for all roof installations.

1. If heat pump is not supplied by Commodore, the installer is responsible for making all necessary calculations based upon site conditions and information presented on the home's Compliance Certificate (Data Plate) to insure that the unit selected is adequately sized.
2. Equipment selected must meet all applicable codes and be specifically approved for use in manufactured homes.
3. Major structural elements of the home, such as wall studs or floor joists, must not be cut to facilitate installation.
4. All necessary electrical modifications and installations must be handled by a qualified electrician.

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CARPORTS AND AWNINGS

Points to remember when selecting and installing carports and/or awnings.

1. Awnings and carports of a self-supporting design should be installed to minimize the possibility of damaging the home.
2. Follow installation instructions of accessory manufacturer.
3. Make sure all connections are to structural members of the home such as floor joists or rafter end rails. All penetrations through siding must be properly sealed and caulked.
4. Exercise extreme caution that no fastener penetrates any electrical cables. It is recommended all power be disconnected during installation and all circuits tested after installation is completed.
5. Insure that fasteners and support railings used are capable of handling the intended loads without damaging the home structure.
6. Insure all seams are properly sealed.

STORM WINDOWS AND DOORS

Storm windows and doors are recommended for all homes regardless of geographic location. They provide improved climate, control static electricity, retard utility expenses.

NOTE: Storm windows installed on egress windows must be of the same manufacture and be specifically designed for rapid removal and compatibility with the primary egress window.

Your dealer will be able to offer valuable assistance in selecting the proper storm windows and doors for your home.

ON SITE ATTACHED STRUCTURES

When homes installed on a foundation are to have other buildings or structures attached or located immediately adjacent to them, the building ordinance may require fire separation. Most building ordinances require fire separation. Most building ordinances require a minimum of a one hour fire wall to be installed between garages, zero lot line installed homes, some work shops, etc. When required, the fire separation wall must be approved by a recognized agency.

All attached buildings and structures must be designed to support all of its own design live and dead loads as required by State or Local ordinances.

HITCH AND WHEEL REMOVAL AND STORAGE

The front hitch used to transport the home may be designed to be detachable, for aesthetic purposes it may be removed after set-up. However, the hitch should be retained in the event the home is ever relocated. Common practice is to store the hitch under the home where it will be protected from the elements and concealed by the skirting.

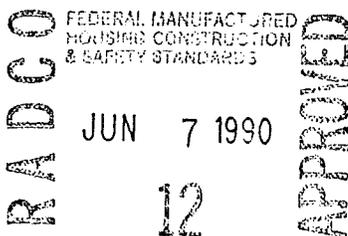
During or after set-up, it is common practice to remove the wheels and tires. The axles and complete suspension system may be removed.

In some states and localities, owners are allowed to dispose of this equipment, while in others they may not. Before disposing of axles and suspension systems be sure to check carefully with the dealer and/or local authorities.

Although it may be permissible to dispose of the wheels, tires and suspension system, Commodore recommends they be retained in the event the home is ever relocated.

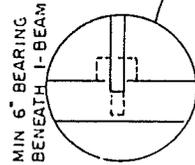
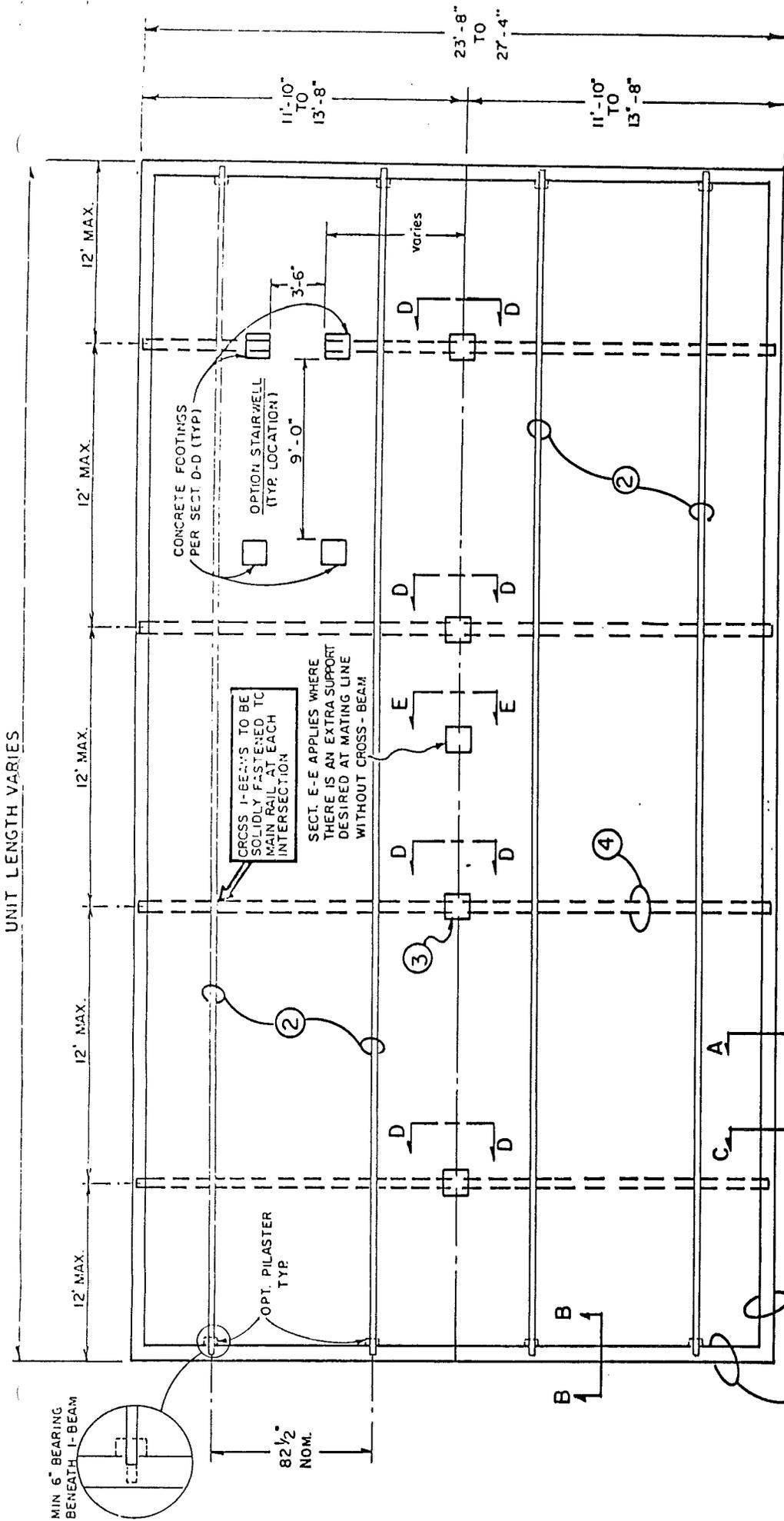
This equipment is commonly stored under the home on a waterproof substance, like vinyl sheeting, where it is protected and concealed by the skirting. After wheel removal, hub surfaces should be coated with heavy grease to resist rust and corrosion.

The tires, wheels and suspension systems are designed ONLY for use to transport this manufactured home. They are not designed for any other purpose.



CC 732

UNIT LENGTH VARIES



CROSS I-BEAMS TO BE SOLIDLY FASTENED TO MAIN RAIL AT EACH INTERSECTION
 SECT. E-E APPLIES WHERE THERE IS AN EXTRA SUPPORT DESIRED AT MATING LINE WITHOUT CROSS-BEAM

CONCRETE FOOTINGS PER SECT. D-D (TYP)
 OPTION STAIRWELL (TYP. LOCATION)
 9'-0"
 3'-6"

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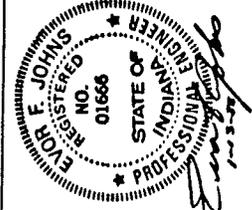
(SEE A-9 FOR CROSS SECTIONS)
 FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS

JAN 30 1988

12

- ① FULL PERIMETER FOUNDATION (TYP)
- ② FRAME I-BEAMS (TYP)
- ③ MARRIAGE LINE CONCRETE FOOTING (TYP)
- ④ CROSS I-BEAM (TYP)

- CROSS BEAM SPACING IS 12'-0" MAX. FRONT TO REAR, EACH TO BE SUPPORTED BY THE FOUNDATION AT ENDS AND BY CONCRETE PIER AT CENTER LINE OF HOME
 - CROSS BEAMS MUST BE INSTALLED BENEATH BEARING POINTS PER APPROVED FLOOR PLAN (A-3)

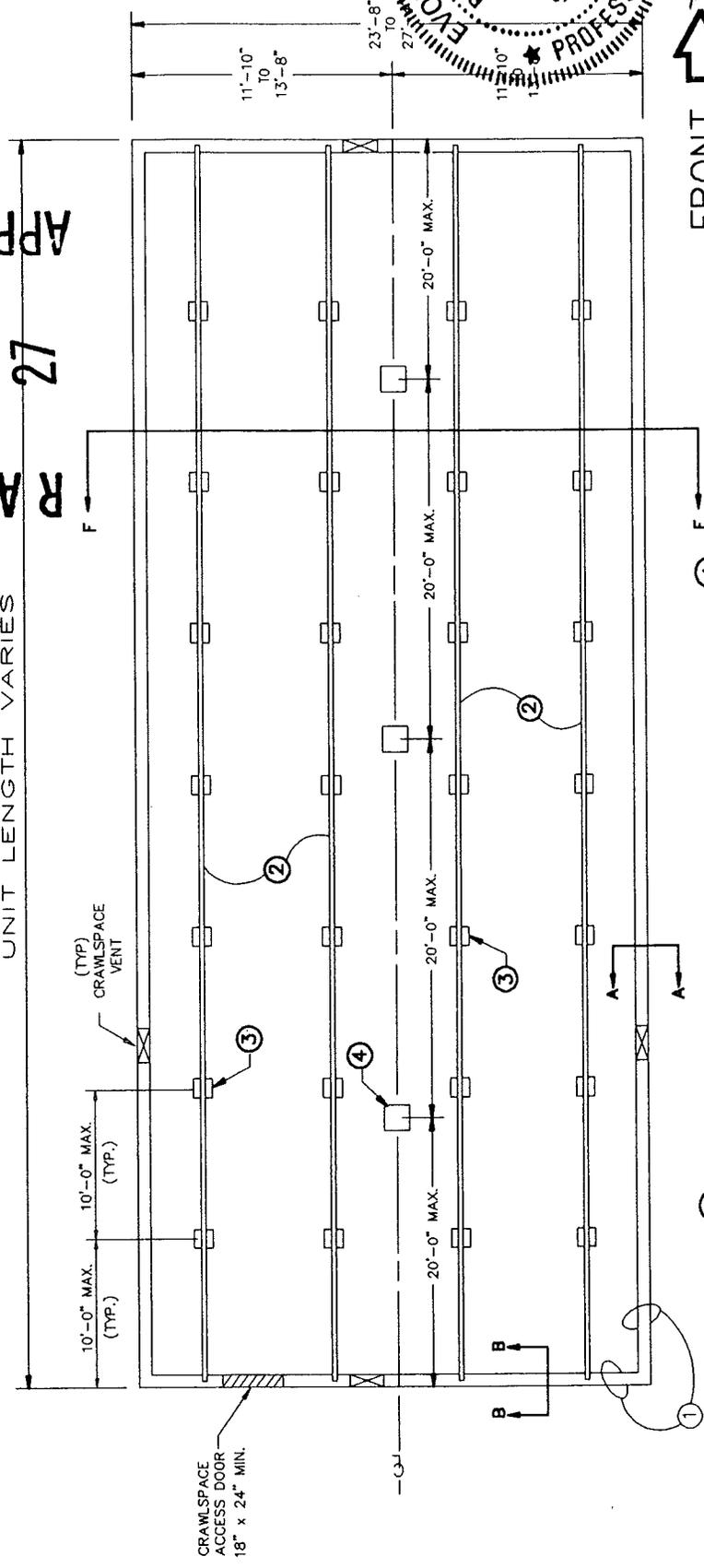


Commodore Corporation declines any responsibility for this foundation layout. It is recommended that you check local codes and/or consult a qualified engineer in your area to approve the foundation system.

	TITLE TYPICAL BASEMENT FOUNDATION PLAN		REVISION DATE 1-12-88	DESCRIPTION NEW EX. 4205	SCALE N.T.S.	DATE 3-18-87	DWG NO. J-5
					DWN BY G.D.B.	ORIG	

ADCO
APR 30 1951
APPROVED

UNIT LENGTH VARIES



EVOR F. JOHNS
 REGISTERED
 NO. 01666
 STATE OF
 INDIANA
 PROFESSIONAL ENGINEER

FRONT

NOTE:

If home is not installed on a full perimeter foundation, footing and blocking is required at each end of side wall openings or spans that are 48" or greater.

- ① FULL PERIMETER FOUNDATION (TYP.)
- ② FRAME I-BEAM
- ③ CONCRETE SUPPORT PIER BENEATH I-BEAM (TYP.)
- ④ MARRIAGE LINE SUPPORT PIER (TYP.)
- ⑤ MINIMUM CRAWLSPACE VENTILATION REQUIRED MUST BE 1/150 OF CRAWLSPACE AREA AND MUST MEET ALL LOCAL CODE REQUIREMENTS.

FRAME I-BEAM PIER CAPACITY TABLE (LBS)

PIER SPACING	ROOF LOAD & WIDTH OF HOME		
	20 P.S.F.	30 P.S.F.	40 P.S.F.
8'0"	3800	4400	4800
9'0"	4300	5000	5400
10'0"	4800	5500	6000

MATING WALL PIER CAPACITY TABLE (LBS)

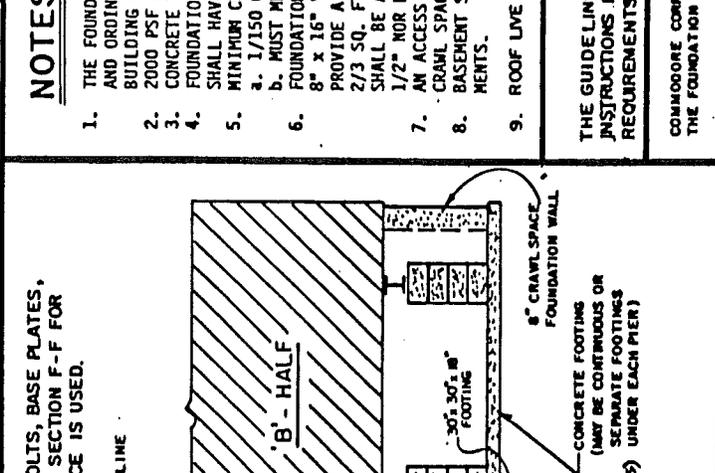
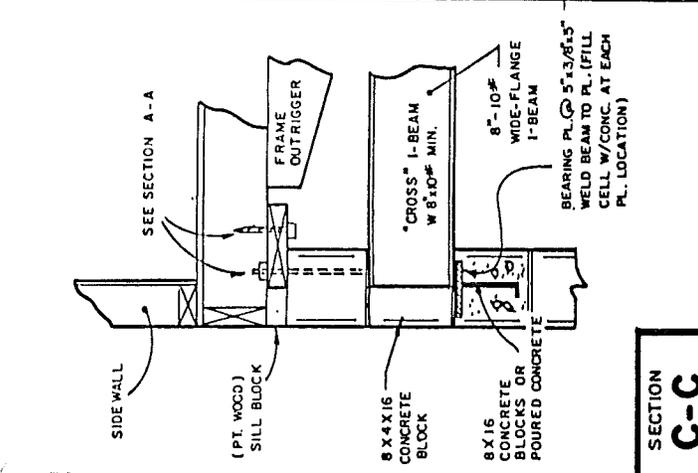
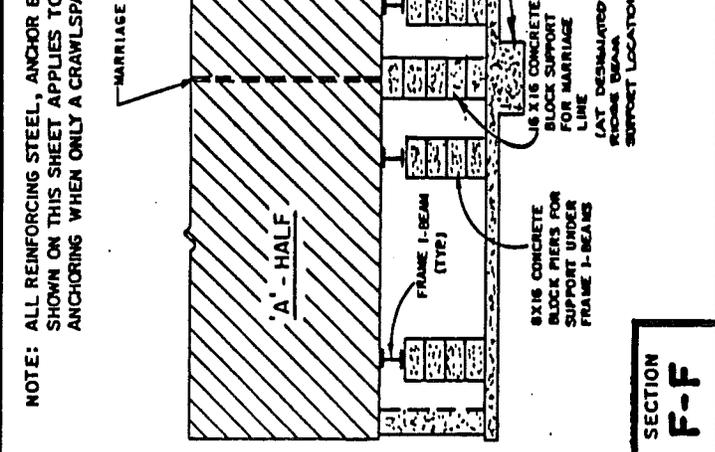
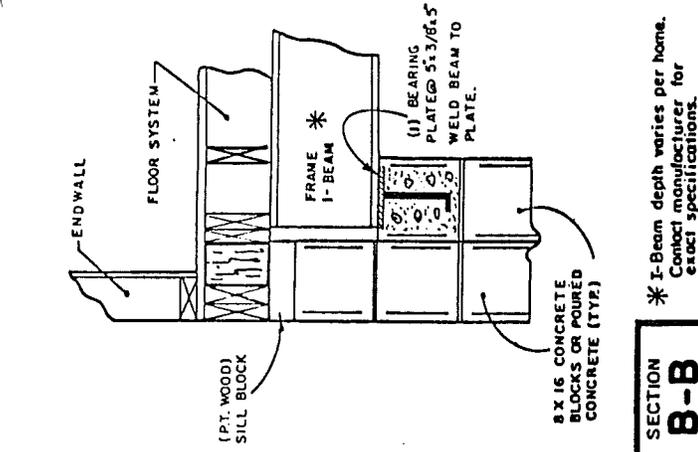
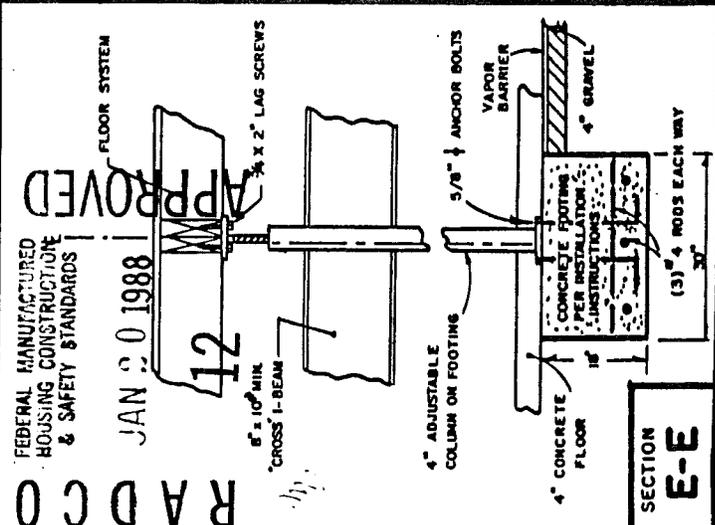
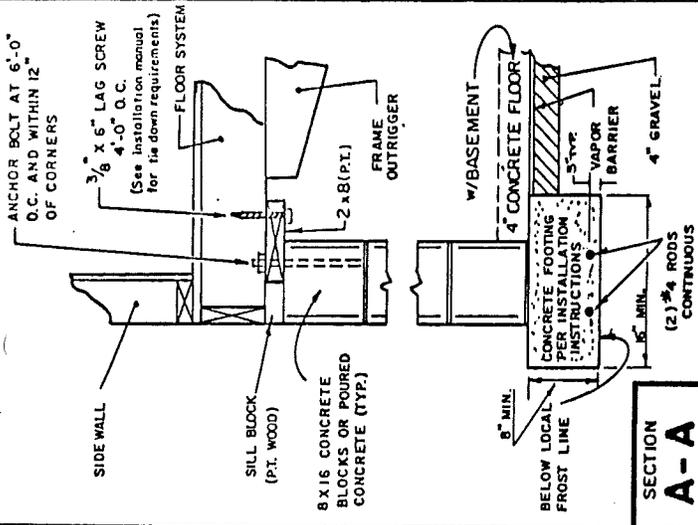
PIER SPACING	REQUIRED PIER CAPACITY (LBS) FOR PIERS UP TO 4' HIGH		
	20 P.S.F.	30 P.S.F.	40 P.S.F.
8'0"	2840	3280	3787
12'0"	4260	4920	5680
16'0"	5680	6560	7573
20'0"	7100	8200	9467
24'0"	8520	9840	11360
28'0"	9940	11480	13253

SUPPORT PIERS MUST BE CENTERED BENEATH EACH SUPPORT COLUMN PER FLOOR PLAN - ADDITIONAL PIER SUPPORTS ARE REQUIRED WHERE DISTANCE BETWEEN SUPPORT COLUMNS EXCEEDS 20'-0" OR WHERE CLEAR SPANS IN MATING WALLS EXCEED 4'.

Commodore Corporation declines any responsibility for this foundation layout. It is recommended that you check local codes and/or consult a qualified engineer in your area to approve the foundation system.

	TITLE CRAWLSPACE FOUNDATION PLAN		REVISION 12-03-90 5114	SCALE NTS	DATE 10-09-89	DWG. NO. J-5-1
	The Commodore Corporation		DATE 1-15-88	DWG. BY GDB	REFERENCE (BANK)	J-5-1

STATE OF CALIFORNIA
 PROFESSIONAL ENGINEER
 No. 51012
 11-12
 C. J. J.



NOTE: ALL REINFORCING STEEL, ANCHOR BOLTS, BASE PLATES, SHOWN ON THIS SHEET APPLIES TO SECTION F-F FOR ANCHORING WHEN ONLY A CRAWLSPACE IS USED.

NOTES:

1. THE FOUNDATION MUST BE DESIGNED AND BUILT TO LOCAL CODES AND ORDINANCES AND MUST BE APPROVED AND INSPECTED BY LOCAL BUILDING OFFICIALS.
2. 2000 PSF ALLOWABLE SOIL BEARING PRESSURE.
3. CONCRETE TO BE 3000 P.S.I. AT 28 DAYS.
4. FOUNDATION STEEL SUPPORTS PROVIDED BY ON SITE CONTRACTOR SHALL HAVE A PROTECTIVE COATING BY ON SITE CONTRACTOR.
5. MINIMUM CRAWL SPACE VENTILATION REQUIRED:
 - a. 1/150 OF CRAWL SPACE AREA.
 - b. MUST MEET ALL LOCAL CODE REQUIREMENTS.
6. FOUNDATION VENT REQUIRED -- USE MINIMUM PER CODE ENFORCED. 8" x 16" VENTS WITH RODENT SCREEN AND OPERABLE DAMPER TO PROVIDE A MINIMUM 96 SQ. IN. FREE AREA EACH. (MIN. OF 2/3 SQ. FT. FREE AREA FULLY OPEN.) RODENT SCREEN MESH SHALL BE A CORROSION RESISTANT WIRE MESH NOT GREATER THAN 1/2" NOR LESS THAN 1/4" IN ANY DIRECTION.
7. AN ACCESS CRAWL HOLE 18" x 24" SHALL BE PROVIDED TO THE CRAWL SPACE.
8. BASEMENT STAIRS MUST MEET ALL OF THE LOCAL CODE REQUIREMENTS.
9. ROOF LIVE LOAD 30#/FT.²

• IMPORTANT •

THE GUIDELINES SET FORTH IN THE MULTI-WIDE INSTALLATION INSTRUCTIONS PERTAINING TO PIER, FOOTING, AND TIE DOWN REQUIREMENTS ARE CRITICAL AND MUST BE ADHERED TO.

COMMODORE CORPORATION ASSUMES NO RESPONSIBILITY FOR THE DESIGN OF THE FOUNDATION SYSTEM.

FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS

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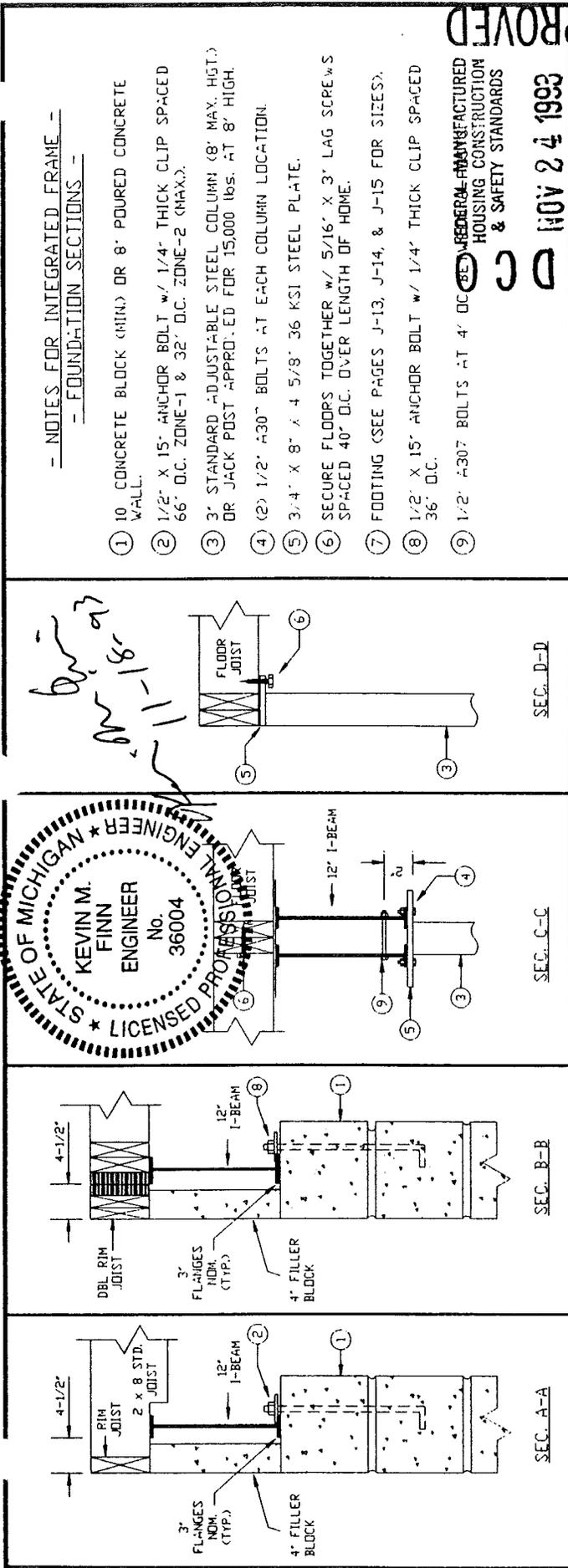
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The Commodore Corporation

TITLE BASEMENT & CRAWLSPACE TYPICAL FOUNDATION DETAILS

REVISION	DATE	DESCRIPTION

SCALE	DATE	DWG. NO.
N.T.S.	5-8-86	U-5-3
DRAWN BY	original	
C.D.B.		

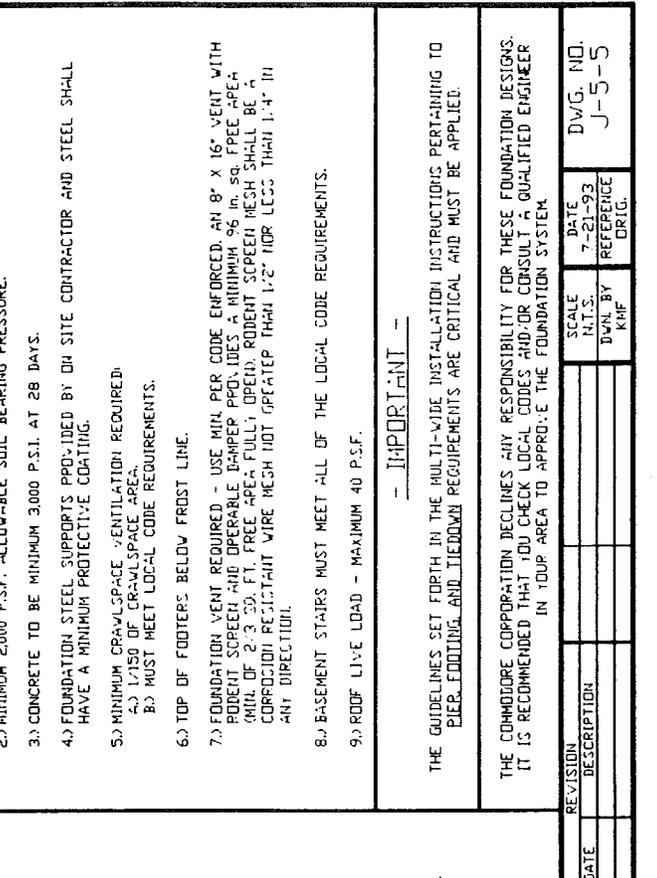


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NOTES -
 1) THE FOUNDATION MUST BE DESIGNED AND BUILT TO LOCAL CODES AND DIMENSIONS AND MUST BE APPROVED AND INSPECTED BY LOCAL BUILDING OFFICIALS.
 2) MINIMUM 2000 P.S.F. ALLOWABLE SOIL BEARING PRESSURE.
 3) CONCRETE TO BE MINIMUM 3000 P.S.I. AT 28 DAYS.
 4) FOUNDATION STEEL SUPPORTS PROVIDED BY ON SITE CONTRACTOR AND STEEL SHALL HAVE A MINIMUM PROTECTIVE COATING.
 5) MINIMUM CRAWLSPACE VENTILATION REQUIRED:
 A) 1/150 OF CRAWLSPACE AREA.
 B) MUST MEET LOCAL CODE REQUIREMENTS.
 6) TOP OF FOOTERS BELOW FROST LINE.
 7) FOUNDATION VENT REQUIRED - USE MIN. PER CODE ENFORCED. AN 8" X 16" VENT WITH RODENT SCREEN AND OPERABLE DAMPER PROVIDES A MINIMUM 96 IN. SQ. FREE AREA (MIN. OF 2-3 SQ. FT. FREE AREA FULLY OPEN). RODENT SCREEN MESH SHALL BE A CORROSION RESISTANT WIRE MESH NOT GREATER THAN 1/2" HORIZONTAL THAN 1/4" IN ANY DIRECTION.
 8) BASEMENT STAIRS MUST MEET ALL OF THE LOCAL CODE REQUIREMENTS.
 9) ROOF LIVE LOAD - MAXIMUM 40 P.S.F.

PIER SIZE (22000 LB PIER LOAD)	SOIL CAPACITY
59 x 59"	1000
42 x 42"	2000
33 x 33"	3000
28 x 28"	4000

MIN. PIER CAPACITY FOR 40 PSF ROOF LOAD/16" OC PIER SPACING = 22000 LBS OR SEE PAGES J-13, 14, & 15 WHEN ROOF LOAD IS LESS THAN 40 PSF AND/OR PIER SPACING LESS THAN 16" OC



STAIRWELL MAYBE LOCATED ANYWHERE IN UNIT - JACK POSTS & PIERS ARE REQUIRED AT EACH CORNER OF STAIRWELL

VARIES - SEE NOTE BELOW

NOTE - THE MAXIMUM BENDING MOMENT OF THE W12 X 11 LB. JR. I-BEAM IS NOT TO EXCEED 286,000 IN-LBS THRU A COMBINATION OF FLOOR & ROOF LOADS

TYPICAL FOUNDATION LAYOUT

NOTES FOR INTEGRATED FRAME -
 FOUNDATION SECTIONS

- 1) CONCRETE BLOCK (MIN.) OR 8" POURED CONCRETE WALL.
- 2) 1/2" X 15" ANCHOR BOLT W/ 1/4" THICK CLIP SPACED 66" O.C. ZONE-1 & 32" O.C. ZONE-2 (MAX.).
- 3) STANDARD ADJUSTABLE STEEL COLUMN (8" MAX. HGT.) OR JACK POST APPROVED FOR 15,000 LBS. AT 8" HIGH.
- 4) 1/2" A307 BOLTS AT EACH COLUMN LOCATION.
- 5) 3/4" X 8" X 4 5/8" 36 KSI STEEL PLATE.
- 6) SECURE FLOORS TOGETHER W/ 5/16" X 3" LAG SCREWS SPACED 40" O.C. OVER LENGTH OF HOME.
- 7) FOOTING (SEE PAGES J-13, J-14, & J-15 FOR SIZES).
- 8) 1/2" X 15" ANCHOR BOLT W/ 1/4" THICK CLIP SPACED 36" O.C.
- 9) 1/2" A307 BOLTS AT 4' OC

REPRODUCED FROM MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS

THE GUIDELINES SET FORTH IN THE MULTI-WIDE INSTALLATION INSTRUCTIONS PERTAINING TO PIER, FOOTING, AND TIEDOWN REQUIREMENTS ARE CRITICAL AND MUST BE APPLIED.

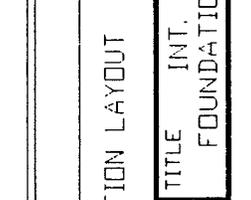
THE COMMODORE CORPORATION DECLINES ANY RESPONSIBILITY FOR THESE FOUNDATION DESIGNS. IT IS RECOMMENDED THAT YOU CHECK LOCAL CODES AND/OR CONSULT A QUALIFIED ENGINEER IN YOUR AREA TO APPROVE THE FOUNDATION SYSTEM.

IMPORTANT -

REVISION	DESCRIPTION	DATE	SCALE	DATE	DWG. NO.
			N.T.S.	7-21-93	J-5-5
			DWN. BY	REFERENCE	
			KRF	DRG.	

TITLE INT. FRAME FOUNDATION DETAILS

The Commodore Corporation

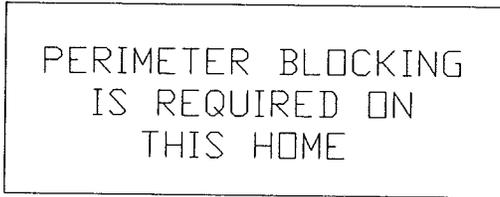




ADDENDUM TO INSTALLATION INSTRUCTIONS

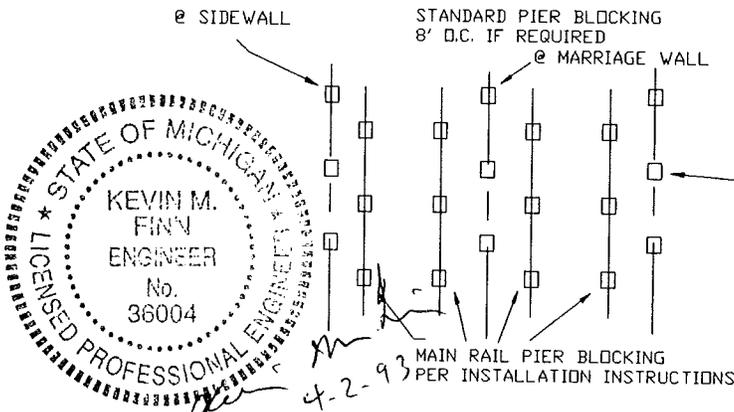
Perimeter blocking is required on homes with the following label located directly below the data plate. If the label is beneath the data plate; the information is to be followed as required. Standard perimeter (rim joist) blocking is not required on homes which do not include the indicated label. All homes require sporadic pier locations along marriage walls and/or sidewalls; see "Specific Conditions Requiring Pier Blocking".

- LABEL -

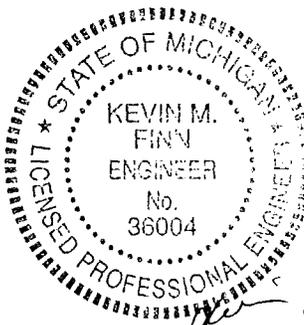


Note - Piers along marriage wall typically support walls from both units. Accordingly, pier and footing size determination should account for roof and wall loads from both halves.

DESCRIPTION OF PERIMETER BLOCKING



ROOF ZONE	TYPICAL LOAD (LBS) ON PERIMETER PIER IF LOCATED AT SIDEWALL
SOUTH 20 PSF	2900
MIDDLE 30 PSF	3550
NORTH 40 PSF	4200



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SPECIFIC CONDITIONS REQUIRING PIER BLOCKING

Conditions requiring perimeter (rim joist) blocking are as follows regardless of whether or not the Label "Perimeter Blocking Is Required On This Home" is included in the home.

1. All marriage walls and sidewalls adjacent to stairwells.
2. All porch columns.
3. Any marriage wall column location marked with a label indicating a column, a metal strap, or paint on the rim joist and any opening in the sidewall or marriage wall greater than 4 ft.

ADDITIONAL TIEDOWN DETAILS

Any unit with a tie-down metal strap on the mating wall or jamb stud which has excess strapping hanging beneath the perimeter joist must be connected to an anchor in the field. Note - The instructions for the optional over the roof straps for installation are to be followed for these vertical tiedown straps. It may be best to locate and install the anchors for the vertical tiedown straps prior to placement of the home.

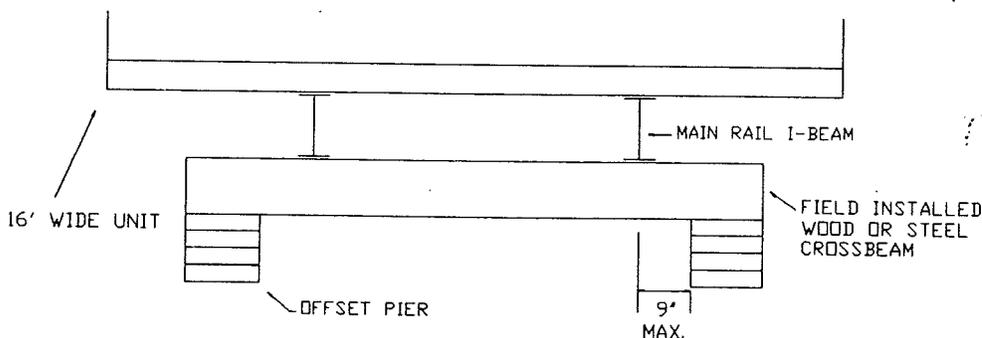
EXTERIOR SIDING

Wood siding must be treated with a protective exterior sealer after home has been sited.

ADDENDUM TO SINGLE WIDE INSTALLATION INSTRUCTIONS

16' Wide units with main rail I-beam spacing of 82" may be set on cross beams on footings which are offset a maximum of 9" to the outside of the I-beam, i.e., footing/pier spacing of 100" maximum, based on the following:

- 1) Any unit with 40 psf roof load is required to have rim joist blocking at 8'-0" on center.
- 2) 40 PSF roof loads may be set on crossbeams 6" x 6" #2 SR SYP Surfaced Green pressure treated wood beams spaced a maximum of 8' on center. The wood beams are to fully seat on the piers and are to have no splits, checks, or shakes in the lumber. As an alternate, M8 x 6.5 steel beams may be used 8' on center.
- 3) Units in 20 & 30 PSF Roof Zones may be set on 8x8" #2 SYP treated wood crossbeams spaced 10' on center. The wood beams shall not have splits or checks in the lumber. An alternate is a M6 x 4.4 steel beam 8' on center.
- 4) Field installed drain lines may have to be adjusted to avoid the field installed cross beams.
- 5) The tiedown methods, as per the installation instructions are to be followed with the understanding that the top of the cross beam will be considered as the top of the pier as far as the tiedown strap angle is concerned. The max pier height is to include the cross beam height and is not to be exceeded.



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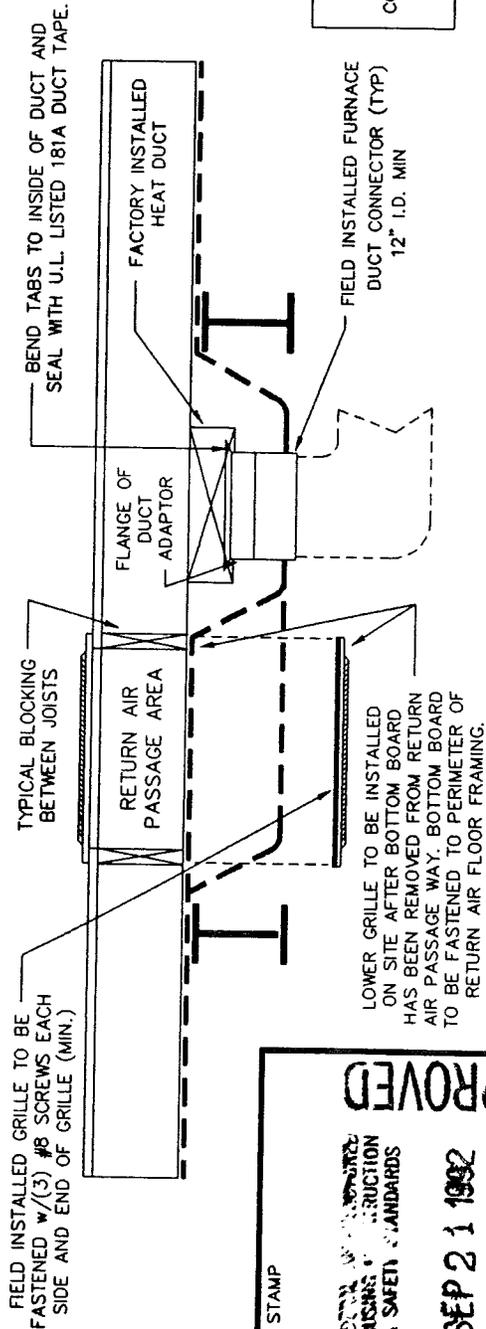
KEVIN M. FINN
#062-043751
REGISTERED ENGINEER
STATE OF ILLINOIS

[Handwritten signature]
1-16-92

1. HOMES TO BE SHIPPED WITHOUT A HEATING UNIT SHALL HAVE PROVISIONS FOR THE RETURN AIR SYSTEM AND AN EASILY ACCESSIBLE LOCATION FOR THE CONNECTION OF THE FURNACE TO THE AIR DUCT SYSTEM WHICH HAS BEEN INSTALLED WITHIN THE HOME AT THE FACTORY.
2. THE RETURN AIR GRILL INSTALLED IN THE FLOOR SHALL PROVIDE A MINIMUM OF ONE SQUARE INCH OF FREE AIR AREA FOR EVERY FIVE SQUARE FEET OF HABITABLE AREA WITHIN THE HOME. A MIN. OF 352 SQ. IN. OF FREE AREA OF THE GRILLE IS REQUIRED.
3. INFORMATION IS TO BE SUPPLIED WITH THE HOME WHICH INDICATES THE MINIMUM SIZE OF THE FURNACE BASED UPON THE INSULATION PACKAGE OF THE HOME. BASED UPON THE CAPACITY OF THE AIR DUCT INSTALLED IN THE HOME, THE MINIMUM BTU/CFM RATING OF THE FIELD INSTALLED FURNACE SHALL ALSO BE SPECIFIED.
4. REGISTERS, REGISTER BOOTS, AND DECKING CUT-OUTS FOR FLOOR REGISTERS MAY BE OMITTED IF HOME IS TO BE SHIPPED WITHOUT A HEATING UNIT. HOWEVER, INFORMATION IDENTIFYING THE INTENDED LOCATION OF THE REGISTERS BASED UPON THE DUCT DESIGN SHALL BE SUPPLIED WITH THE HOME.

INSTALLATION OF DUCT CONNECTOR (DUCT MFG.'S INSTRUCTIONS TO BE FOLLOWED WITH THE MIN. INSTALLATION AS FOLLOWS:

1. SECURE INNER CORE WITH AN APPROVED CLAMP AND TAPE INNER CORE OF CONNECTOR TO FLANGE OF DUCT ADAPTOR w/ U.L. LISTED 181A DUCT TAPE.
2. SLIDE FIBERGLASS OVER INNER CORE.
3. TAPE OUTSIDE JACKET TO FLANGE OF DUCT ADAPTOR.



APPROVAL STAMP

APPROVED

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FOR THE USE OF THE
HOUSING CONSTRUCTION
& SAFETY STANDARDS



The Commodore Corporation

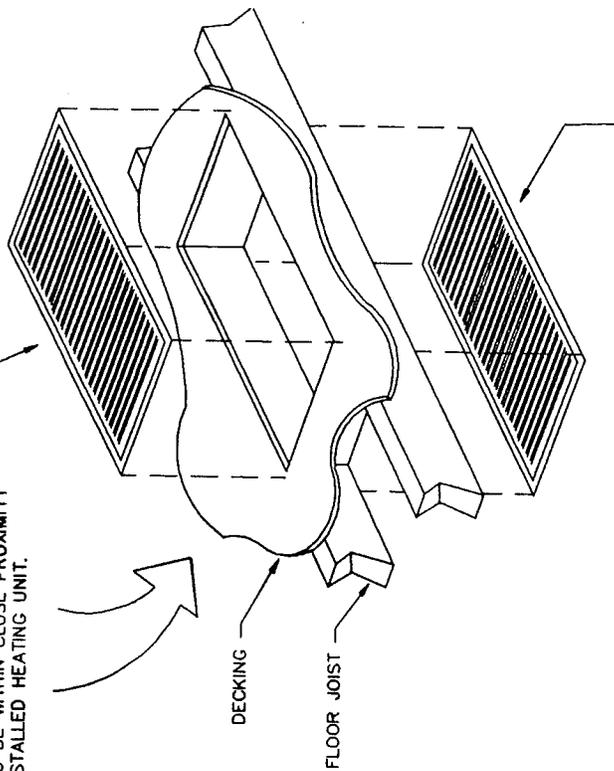
FIELD INSTALLED EXTERNAL FURNACES FOR BASEMENT

DATE REV. NO.

DATE 9-15-92 DWG. NO. J-7
SCALE NTS
DWN. BY MIKE
REF. H-5-3

TYPICAL FLOOR FRAMING TO PROVIDE A FOR RETURN AIR PASSAGE BETWEEN LIVING AREA AND BASEMENT WHERE FURNACE IS LOCATED. DECKING TO BE CUT OUT AND RETURN AIR GRILL TO BE INSTALLED IN PASSAGE. LOCATION OF RETURN AIR PASSAGE TO BE WITHIN CLOSE PROXIMITY OF SITE-INSTALLED HEATING UNIT.

SEE NOTE -2 FOR GRILL REQUIREMENTS



FIELD INSTALLED OPTIONAL LOWER GRILL TO MATCH FACTORY INSTALLED FLOOR GRILL.

JACKET ON FLEX DUCT CONNECTOR TO HAVE PERM RATING OF 1 MAX. CONNECTOR MUST BE INSULATED R-4 MIN. AND BE RATED FOR EXTERIOR USE IF EXPOSED TO THE WEATHER.

OPTIONAL VENTILATION IMPROVEMENT INFORMATION
FOR HOMES WITH FURNACE

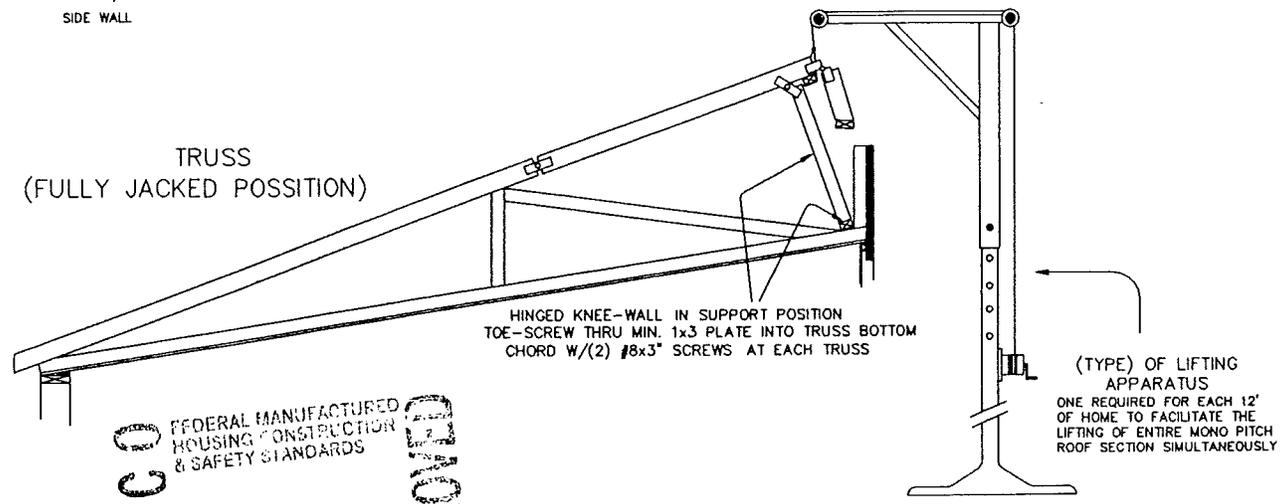
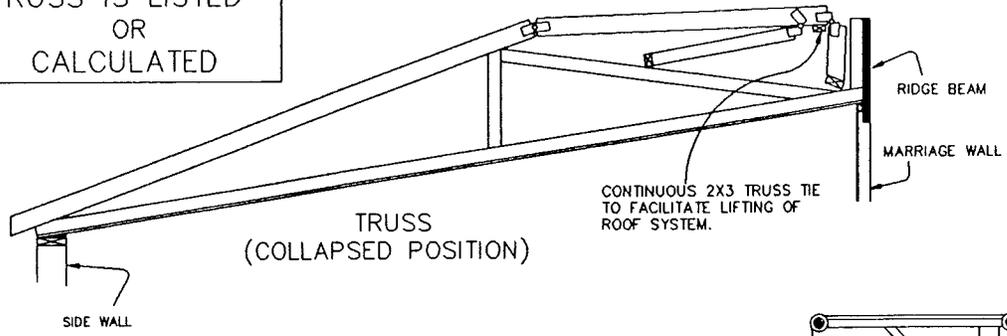
As required by the Department of Housing and Urban Development, each manufactured home shall offer, in addition to the minimum ventilation required, an optional ventilation system to improve indoor air quality. The optional ventilation systems that are being offered by The Commodore Corporation exceed H.U.D. requirements and are as follows:

<u>Description</u>	<u>Ventilation Capacity</u>
1. INTERTHERM VentilAire I	25 To 50 Cubic Ft. Per Minute
2. COLEMAN Positive Operating System.....	30 To 50 Cubic Ft. Per Minute
3. MILLER Air Quality Package.....	33 To 60 Cubic Ft. Per Minute

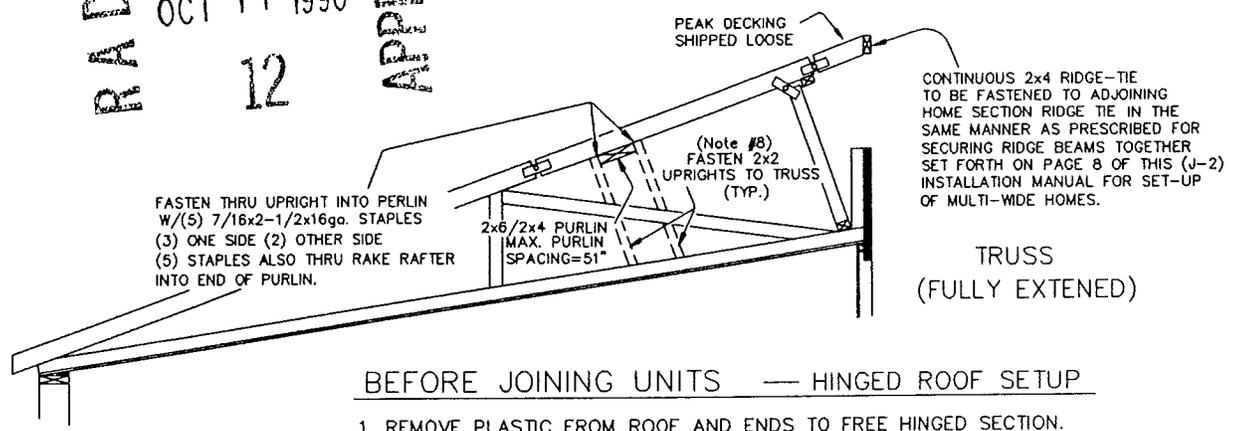
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February 9, 1985
Revised November 14, 1986

TRUSS IS LISTED
OR
CALCULATED



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BEFORE JOINING UNITS — HINGED ROOF SETUP

1. REMOVE PLASTIC FROM ROOF AND ENDS TO FREE HINGED SECTION.
2. RAISE ROOF AND LOWER KNEE-WALL INTO SUPPORT POSITION.
3. RAISE HINGED PEAK SECTIONS.
4. BRING BOTH HALVES TOGETHER WITH ROOF SECTIONS RAISED.
5. WITH UNITS IN POSITION, BOLT PEAK SECTIONS TOGETHER TO SUPPORT PEAK. SHIM ANY GAP BETWEEN PEAK SECTIONS TO ASSURE TIGHT JOINT. BOLT REMAINDER OF RIDGE BEAM TOGETHER.
6. DECK AND SHINGLE UNFINISHED ROOF SECTIONS.
7. INSTALL NECESSARY ROOF VENTS, FURNACE STACKS, & FIREPLACE STACKS.
8. SUPPORT UPRIGHTS FOR FRONT & REAR OVERHANG PURLINS IN THE HINGED AREA ARE SHIPPED WITH THE HOME AND ARE TO BE FASTENED TO THE TRUSS CHORDS. USE (3) 7/16x2-1/2x16ga. STAPLES EACH END.
9. 1x6x12 MIN. SPLICE BLOCK FASTENED TO INSIDE SURFACE OF FASCIA AT HINGE BREAKS WITH (5) 7/16 X 2 X 15GA. STAPLES EACH SIDE WITH 100% GLUE
10. SHIPPED WITH THE HOME ARE SIDING NAILERS WHICH MUST BE INSTALLED BEFORE SHEATHING IS INSTALLED.
11. AFTER INSTALLING NAILERS AND UPRIGHTS, SHEATHING CAN BE INSTALLED

WARNING:
EXTREME CAUTION MUST BE OBSERVED WHILE LIFTING ROOF SECTIONS. THE COMMODORE CORPORATION ASSUMES NO RESPONSIBILITY FOR ACCIDENTS IN THE SET-UP PROCEEDURE.

REVISION	
#4835	5-5-89 GB
#5114	5-17-90 GB
#5114	10-10-90 BB

	The Commodore Corporation	TITLE HINGED TRUSS SET-UP		SCALE NTS	DATE 5-2-89	DWG. NO. J-12
		DWN. BY G.D.B.	REFERENCE ORIG.			

MATING LINE RIDGE BEAM COLUMN FOUNDATIONS
(PERIMETER FRAME UNIT)

Tabulated "pier loads" are based on distance between columns and the following floor loads.(as shown below)

Floor Live Load = 40 PSF
 Floor Dead Load 5 PSF

 Total 45 PSF
 Roof Dead Load = 10 PSF

Combined Loads 55 PSF
 Wall Dead Load 45 PLF

Roof loads vary from 20 PSF to 60 PSF live loads.

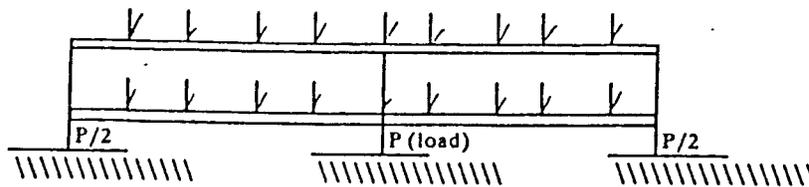
$$\text{PIER LOAD} = (1.1)(\text{COLUMN SPACING})[(\text{TOTAL LOAD})(\text{UNIT WIDTH})/(12) + \text{WALL DL}]$$

Unit Width	Roof Live Load	Pier Loads (lbs) Based On Column Spacing (ft)						
		5	7	9	11	13	15	18
28 FT 164 IN	20	5900	8250	10600	12950	15300	17650	21200
	30	6650	9300	11950	14600	17250	19900	23900
	40	7400	10350	13300	16250	19200	22150	26600
	60	8900	12450	16000	19550	23100	26700	32000

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MATING LINE RIDGE BEAM COLUMN FOUNDATIONS
(PERIMETER FRAME UNIT)

Tabulated *pier loads* are based on distance between columns and the following roof loads.(as shown below)
Roof loads vary from 20 PSF to 60 PSF live loads.

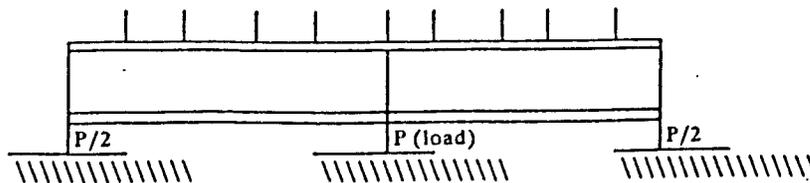
Roof Dead Load = 10 psf

$$\text{PIER LOAD} = (1.1) (\text{TOTAL LOAD})(\text{UNIT WIDTH})(\text{COLUMN SPACING})/(12)$$

Unit Width	Roof Live Load	Pier Loads (lbs) Based On Column Spacing (ft)						
		5	7	9	11	13	15	18
28 FT 164 IN	20	2250	3150	4050	4950	5850	6750	8100
	30	3000	4200	5400	6600	7800	9000	10800
	40	3750	5250	6750	8250	9750	11300	13550
	60	5250	7350	9450	11600	13700	15800	18950

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EVOR F. JOHNS
REGISTERED
NO. 01666
STATE OF INDIANA
PROFESSIONAL ENGINEER

The Commodore Corporation

TITLE Pier Load

DATE	SCALE	DWG. NO.
	1/8" = 1'-0"	J-14

**MATING LINE RIDGE BEAM COLUMN FOUNDATIONS
(PERIMETER FRAME UNIT)**

MINIMUM FOOTING SIZES ARE CALCULATED AS FOLLOWS
SIZES ARE GIVEN IN INCHES.

$$\text{SIZE} = \frac{((\text{Pier Cap.}/\text{Soil Brg.})(150 \text{ lbs}/\text{ft}^2) + (\text{Pier Cap.}))(144 \text{ in}^2/\text{ft}^2)}{(\text{Soil Brg.})}$$

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Pier Capacity (lbs)	Minimum Footing Size Based On Soil Capacity							
	1000 PSF		2000 PSF		3000 PSF		4000 PSF	
600	10 X	10	7 X	7	5 X	5	5 X	5
800	12 X	12	8 X	8	6 X	6	5 X	5
1000	13 X	13	9 X	9	7 X	7	6 X	6
1500	16 X	16	11 X	11	9 X	9	7 X	7
2000	18 X	18	12 X	12	10 X	10	9 X	9
2500	20 X	20	14 X	14	11 X	11	10 X	10
3000	22 X	22	15 X	15	12 X	12	11 X	11
3500	24 X	24	16 X	16	13 X	13	11 X	11
4000	26 X	26	18 X	18	14 X	14	12 X	12
4500	27 X	27	19 X	19	15 X	15	13 X	13
5000	29 X	29	20 X	20	16 X	16	14 X	14
5500	30 X	30	21 X	21	17 X	17	14 X	14
6000	32 X	32	22 X	22	17 X	17	15 X	15
6500	33 X	33	22 X	22	18 X	18	16 X	16
7000	34 X	34	23 X	23	19 X	19	16 X	16
7500	35 X	35	24 X	24	19 X	19	17 X	17
8000	36 X	36	25 X	25	20 X	20	17 X	17
8500	38 X	38	26 X	26	21 X	21	18 X	18
9000	39 X	39	26 X	26	21 X	21	18 X	18
9500	40 X	40	27 X	27	22 X	22	19 X	19
11000	43 X	43	29 X	29	24 X	24	20 X	20
12000	45 X	45	30 X	30	25 X	25	21 X	21
13000	46 X	46	32 X	32	26 X	26	22 X	22
14000	48 X	48	33 X	33	27 X	27	23 X	23
15000	50 X	50	34 X	34	27 X	27	24 X	24
16000	51 X	51	35 X	35	28 X	28	24 X	24
17000	53 X	53	36 X	36	29 X	29	25 X	25
18000	55 X	55	37 X	37	30 X	30	26 X	26
19000	56 X	56	38 X	38	31 X	31	27 X	27
20000	58 X	58	39 X	39	32 X	32	27 X	27

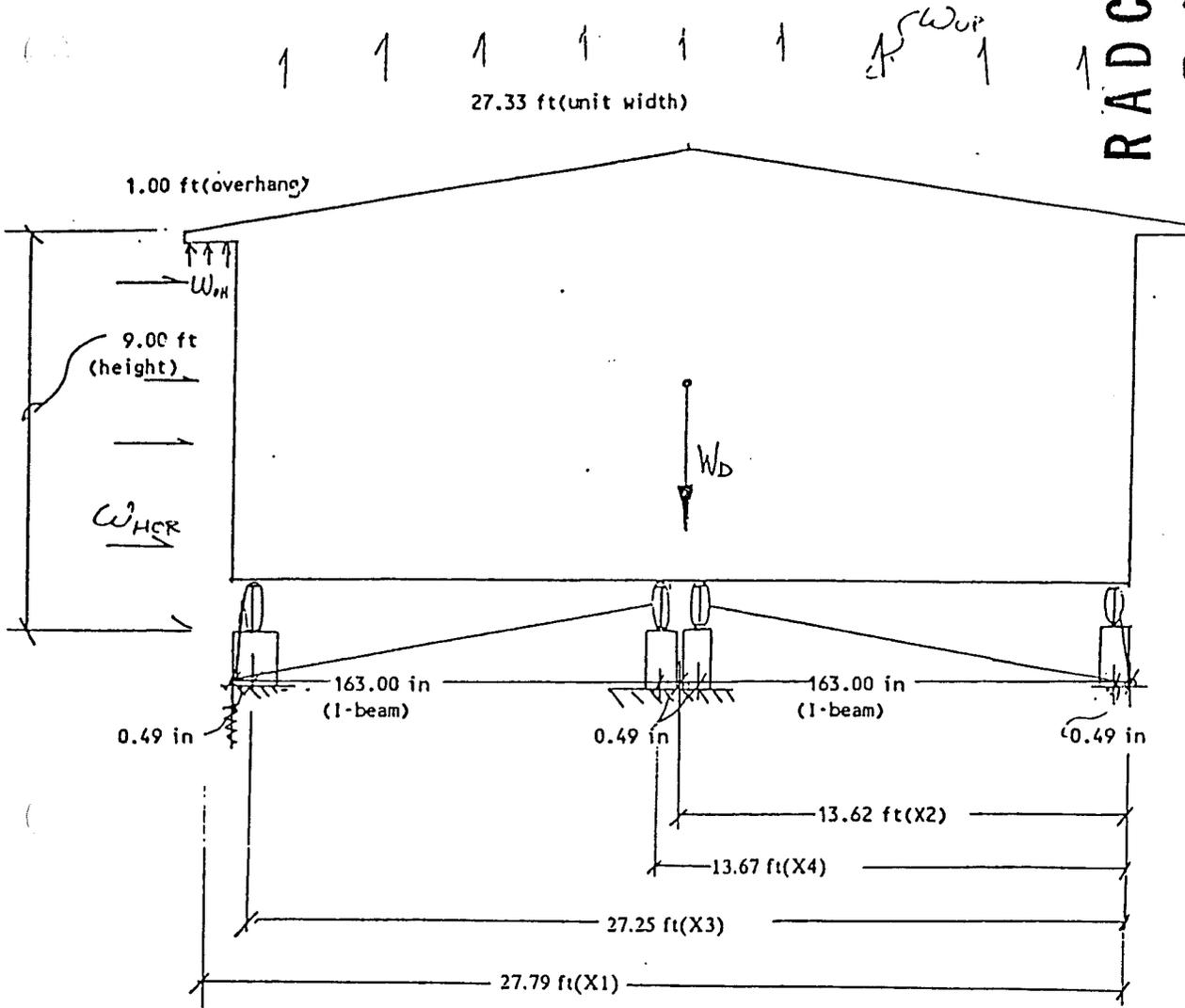
*NOTE: Min. 6" Footing Thickness; For Perimeter Frame Unit. Also Check Page 3 Of Installation Instructions To Assure That Min. Thickness Is Used.



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LOADING CONDITIONS:

ZONE I

W(hor) =	15 PSF(1.5) =	22.50 PSF
W(up) =	9 PSF(1.5) =	13.50 PSF
W(o.h) =	9 PSF(2.5)(1.5) =	33.75 PSF

ZONE II

W(hor) =	25 PSF(1.5) =	37.50 PSF
W(up) =	15 PSF(1.5) =	22.50 PSF
W(o.h) =	15 PSF(2.5)(1.5) =	56.25 PSF

Unit Dead Load: W(dead) = 20.5(Width) = 560.27 PLF

Anchor and anchor head must have an ultimate strength of 4725 lbs.

CONTROLLING ANCHOR SPACINGS:

Pier Hght.	Zone I	Zone II	
		Cross-Ties	Vertical Ties
16 in	15 ft	9 ft	18 ft
24 in	15 ft	9 ft	18 ft
32 in	15 ft	9 ft	18 ft
40 in	15 ft	9 ft	18 ft
48 in	14 ft	8 ft	24 ft



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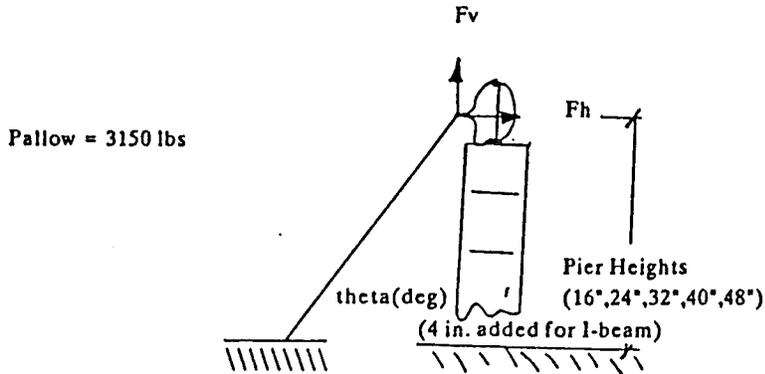


The Commodore Corporation

TITLE Tie Down Crawl Space

DATE	REVISED	SCALE	DWG. NO.
			J-16

CHECK ALLOWABLE ANCHOR LOADING:



Vertical and horizontal loadings: (Fv,Fh)

$$F_v = 3150 \sin(\theta)$$

$$F_h = 3150 \cos(\theta)$$

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Tabulated vertical and horizontal components:

VERTICAL TIES ONLY

Pier Ht.	Theta	F vert	F hor
16 in	88.60 deg	3149.06 lbs	77.15 lbs
24 in	89.00 deg	3149.52 lbs	55.12 lbs
32 in	89.22 deg	3149.71 lbs	42.87 lbs
40 in	89.36 deg	3149.80 lbs	35.08 lbs
48 in	89.46 deg	3149.86 lbs	29.68 lbs

CROSS-TIES ONLY

Pier Ht.	Theta	F vert	F hor
16 in	6.97 deg	382.49 lbs	3126.69 lbs
24 in	9.72 deg	531.74 lbs	3104.80 lbs
32 in	12.42 deg	677.39 lbs	3076.30 lbs
40 in	15.06 deg	818.63 lbs	3041.77 lbs
48 in	17.64 deg	954.77 lbs	3001.82 lbs



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SPACING OF ANCHORS:

"D" - Anchor Spacing (ft. O.C)

HORIZONTAL LOAD SPACING :(Horizontal capacity of cross-ties not included)

$$F_y = 0 = (W_h)(\text{Unit Hght.})(D) - (F_h, \text{ of the straps})$$

$$:: D = F_h / ((W_h)(\text{Unit Hght.}))$$

Pier Hght.	Zone I	Zone II
16 in	15 ft	9 ft
24 in	15 ft	9 ft
32 in	15 ft	9 ft
40 in	15 ft	9 ft
48 in	14 ft	8 ft

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VERTICAL LOAD SPACING:

$$M = W_h(\text{Hght})^2(D)/2 + W_o(O.H)(X1)(D) + W_u(\text{Width})(X2)(D) + W_d(X2)(D) - F_v(X3)$$

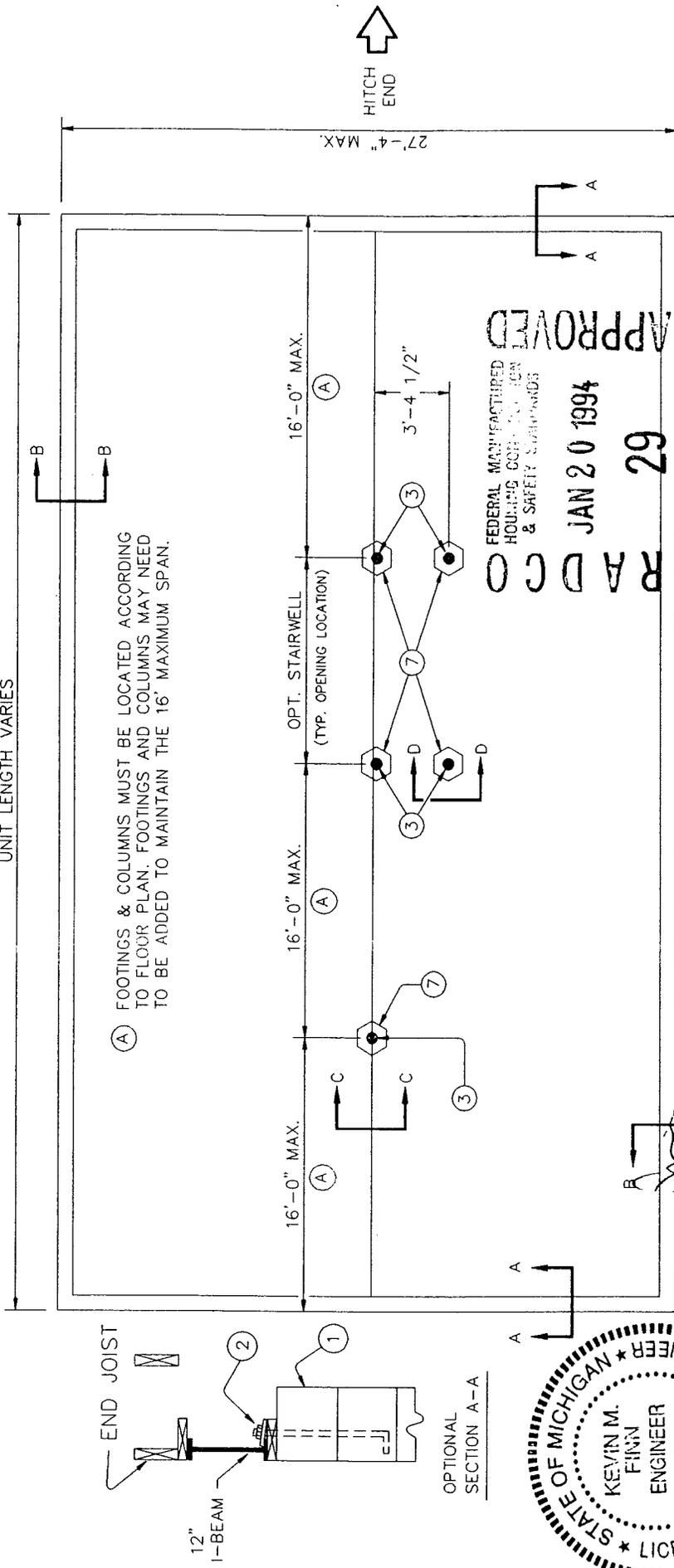
$$D = \frac{F_v(\text{Cross-Ties})(X4) + F_v(\text{Vertical-Ties})(X3)}{W_h(\text{Hght})^2/2 + W_o(OH)(X1) + W_u(\text{Width})X2 - W_d(X2)}$$

Pier Hght.	Zone I	Zone II
16 in	-120 ft	23 ft
24 in	-122 ft	24 ft
32 in	-125 ft	24 ft
40 in	-128 ft	25 ft
48 in	-130 ft	25 ft

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 NO.
 01656
 STATE OF
 INDIANA
 PROFESSIONAL ENGINEER

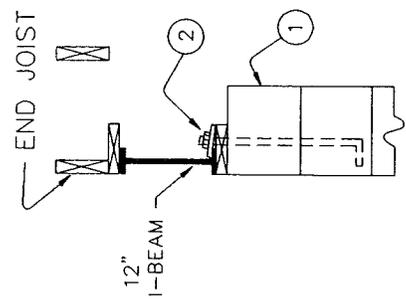


UNIT LENGTH VARIES

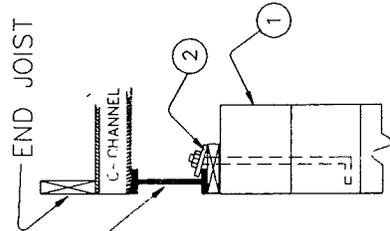


(A) FOOTINGS & COLUMNS MUST BE LOCATED ACCORDING TO FLOOR PLAN. FOOTINGS AND COLUMNS MAY NEED TO BE ADDED TO MAINTAIN THE 16' MAXIMUM SPAN.

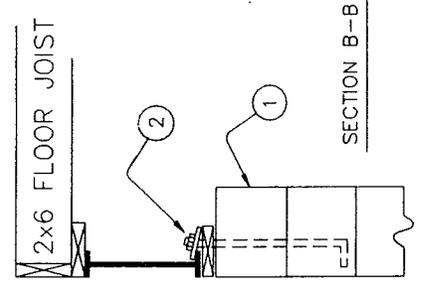
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& SAFETY STANDARDS
JAN 20 1994
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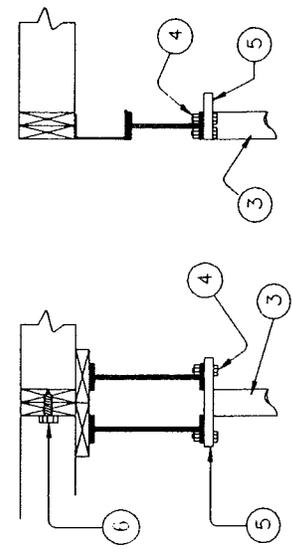
OPTIONAL SECTION A-A



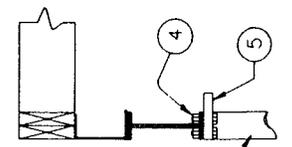
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

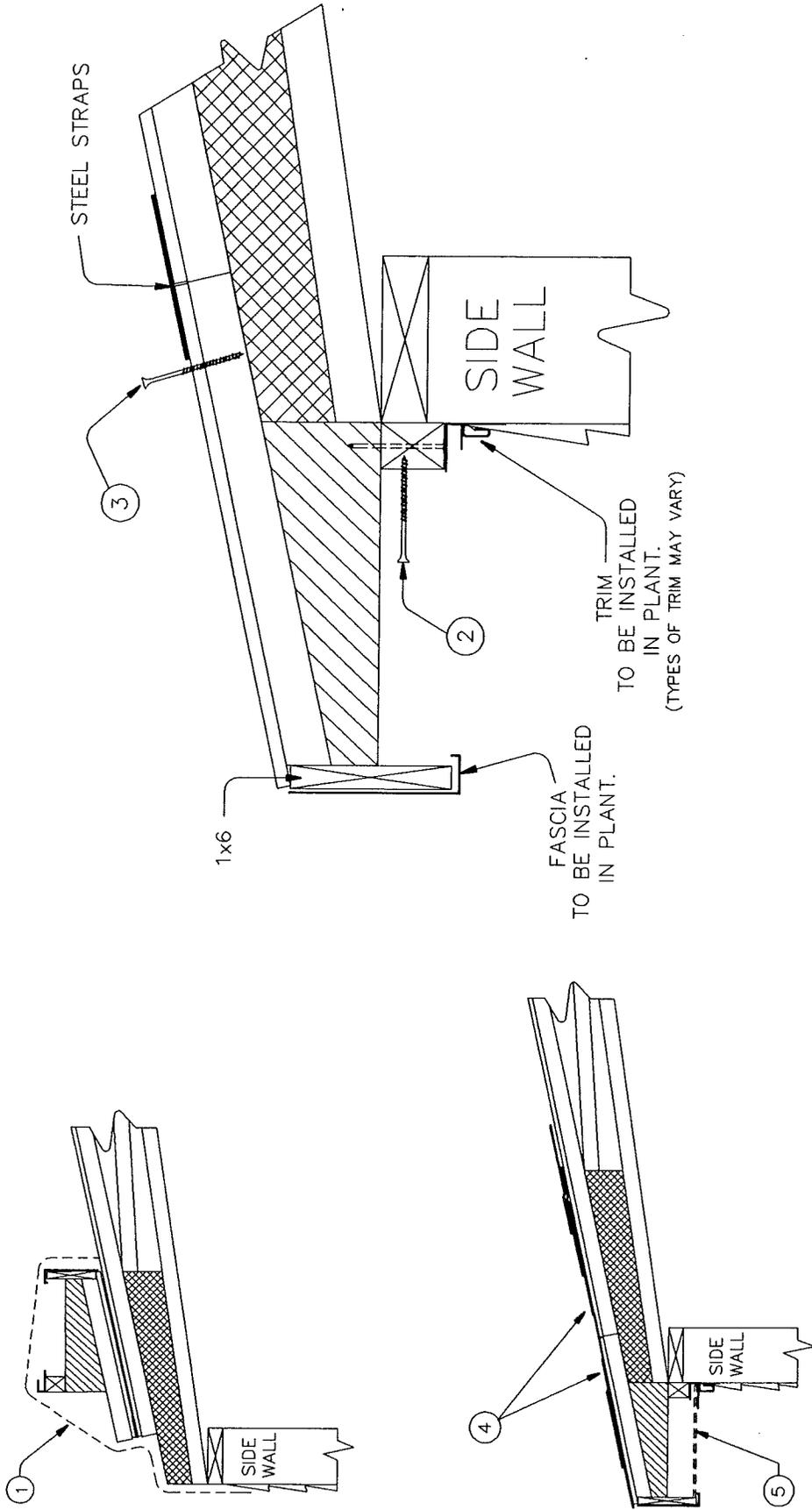
- 1 10" CONCRETE BLOCK MIN.
- 2 1/2" x 15" ANCHOR BOLT W/ 1/4" THICK CLIP SPACED 51" O.C. ZONE-1 & 24" O.C. ZONE-2 (MAX.)
- 3 3"-STD. ADJUSTABLE STEEL COLUMN (8' MAX. HGT.) OR JACK-POST APPROVED FOR 14,496 LB. AT 8' HGT.
- 4 (2) 1/2" A307 BOLTS AT EACH COLUMN LOCATION
- 5 3/4" x 8" x 4-5/8" 36KSI. STEEL PLATE
- 6 SECURE FLOORS TOGETHER W/ 5/16" x 3" LAG SCREWS SPACED 40" O.C. OVER LENGTH OF HOME.
- 7 FOOTING (SEE PAGES J-13, J-14, & J-15 FOR SIZES).



Handwritten: 1-18-94

COMMODORE CORPORATION DECLINES ANY RESPONSIBILITY FOR THIS FOUNDATION LAYOUT; IT IS RECOMMENDED THAT YOU CHECK LOCAL CODES AND/OR CONSULT A QUALIFIED ENGINEER IN YOUR AREA TO APPROVE THE FOUNDATION SYSTEM.

TITLE FOUNDATION AND INTERCONNECTIONS		REVISION DATE DESCRIPTION 11-20-89 4835 1-12-94 6500		SCALE NTS OWN. BY G.D.R. REFERENCE G.D.R.		DATE 10-09-89 REFERENCE G.R.G.		DWG. NO. J-19	
The Commodore Corporation									



- ① REMOVE MSQUEEN FROM ROOF AND EAVE AREAS.
- ② TIP EAVE INTO PLACE AND FASTEN CONTINUOUS 2-1/4 x 1-1/2 RAIL TO SIDE WALL W/(1) #8 x 3" SCREW 16" O.C.
- ③ FASTEN THROUGH SHEATHING & TRUSS TOP CHORD INTO TRUSS END BLOCK WITH (1) #8 x 3" SCREW AT EACH TRUSS.
- ④ INSTALL NECESSARY ROOFING MATERIALS ABOUT THE ROOF JOINT.
- ⑤ INSTALL SOFFIT MATERIAL.

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FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS

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TITLE
FLIP-EAVE SET-UP

DATE	REV. NO.
3-8-90	5114 GB
5-21-90	5114 GB

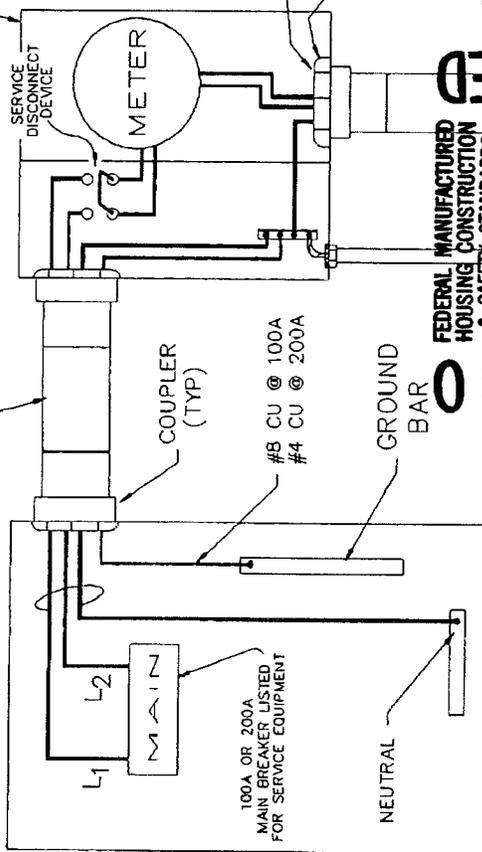
DATE 02-26-90
 SCALE NTS
 DWN. BY GB
 REF. DF-11
 DWG. NO. **J-20**

SERVICE ENTRY CONDUCTORS
 * SEE NEC 110-14
 #4 AWG CU MIN. @ 100 AMP
 OR
 * #2 AWG AL MIN. @ 100 AMP
 #2/0 AWG CU MIN. @ 200 AMP
 OR
 * #4/0 AWG AL MIN. @ 200 AMP
 CONDUCTORS SHALL BE SUITABLE
 FOR USE IN WET LOCATIONS

RACEWAY (EMT OR PVC)
 APPROVED FOR USAGE AS
 ENTRY CONDUCTOR RACEWAY
 1-1/2" I.D. MIN. @ 100 AMP W/CU
 2" I.D. MIN. @ 100 AMP W/AL
 2" I.D. MIN. @ 200 AMP W/CU
 2-1/2" I.D. MIN. @ 200 AMP W/AL
 SEE NOTE-5

APPROVED
 METER BASE
 100 AMP OR 200 AMP
 SEE NOTE-6

WARNING
 DO NOT PROVIDE ELECTRICAL POWER
 UNTIL THE GROUNDING ELECTRODE IS
 INSTALLED AND CONNECTED.
 (See installation instructions)
 RED LABEL AFFIXED ON
 OR ADJACENT TO SERVICE
 EQUIPMENT

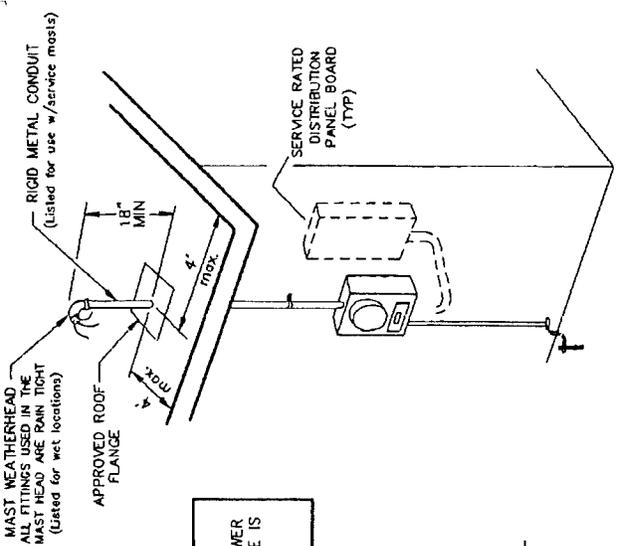


APPROVED
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 HOUSING CONSTRUCTION
 & SAFETY STANDARDS
 JUN 27 1994
 6

BY OTHERS
 RIGID METAL CONDUIT SHOWN FOR
 MECHANICAL PROTECTION OF THE
 GROUNDING FLECTRODE CONDUCTOR
 MAY BE REQUIRED BY LOCAL CODES.

APPROVED GROUNDING
 CLAMP BY OTHERS

GROUNDING ELECTRODE
 BY OTHERS
 8-1/2 FL. ROD SHALL BE 1/2" MIN. DIA.
 COPPER CLAD STEEL DRIVEN TO
 A DEPTH OF NOT LESS THAN 8 FEET



OVERHEAD APPL.

NOTES:

1. INSTALLATION OF SERVICE EQUIPMENT INCLUDING METER BASE, RACEWAYS, BUSHINGS, COUPLERS, AND CONDUCTORS SHALL BE PROVIDED FOR BY THE MANUFACTURER.
2. INSTALLATION OF SERVICE EQUIPMENT SHALL BE IN ACCORDANCE WITH THE APPLICABLE ARTICLES OF THE NATIONAL ELECTRIC CODE - 1984.
3. INSTALLATION OF HOME-MOUNTED SERVICE EQUIPMENT IS A RESTRICTED OPTION ONLY APPLICABLE TO MULTI-WIDE HOMES SITED ON PERMANENT FOUNDATION.
4. SITE CONDITIONS ARE SUBJECT TO APPROVAL OF A REPRESENTATIVE OF THE MANUFACTURER.
5. EMT CONDUIT TO BE GROUNDED ACCORDING TO NEC 250-75.
6. METER BASE TO BE SECURED TO STUDDING IN EXTERIOR WALL W/MIN #8x3" SCREWS.
7. THE MAXIMUM DISTANCE FROM THE METER CABINET TO THE SERVICE DISCONNECT SHALL NOT EXCEED 10 FEET. THIS INCLUDES THE LENGTH OF CONDUIT FROM THE METER BASE TO THE UNDER SIDE OF HOME.

	TITLE: TYPICAL OPT. HOME-MOUNTED METER BASE		REVISION: 6-21-94, 6500	SCALE: N/A	DATE: 03-04-92	DWG. NO.: J-30
	DATE: 6-11-94, 5114 5-19-94, 6500	DESCRIPTION: GE	DWN BY: GE	N/A	ORIGINAL	ORIGINAL