



Manufactured Home Safety

UNP-59

The Forty-Second Congress of the United States passed the National Manufactured Housing Construction and Safety Act in 1974; however, the law became effective on June 15, 1976. This act ensured that all mobile homes would be built according to tough national standards. The name mobile homes was officially changed to manufactured homes in 1980.

Today, manufactured housing accounts for approximately 10 percent of the total housing stock in the United States and 25 percent of its annual, new, and residential construction and home sales. The 2000 Census estimated that approximately 620,000 or more manufactured homes exist in Alabama. Manufactured housing is affordable and convenient, and Alabama legislation reports that mass-produced housing meets the needs of many people, while reducing construction and building costs.

Manufactured Home Structure

A manufactured home is new when it is in the possession of the manufacturer, dealer, or first purchaser. It is usually transported in one or more sections. A manufactured home can measure 8 body feet or more in width and 32 body feet or more in length when erected on site and built on a permanent chassis—designed for use as a dwelling—with or without a permanent foundation. It contains all the added features of a home complete with plumbing, heating, air-conditioning, and electrical systems. Although standards for manufactured housing have greatly improved in recent years, older manufactured homes do not have the safety features now required by federal law in the Manufactured Home Construction Safety Standards, Part 3280. However, as with any home regardless of age, take special precautions to guard against possible hazards, such as severe storms or fires.

Storm Protection

Manufactured homes are relatively light, compact structures and cannot resist high winds or fire as well as conventional homes. Destructive tornadoes and hurricanes hit Alabama each year. Baldwin and Mobile counties, Wind Zone II (see Table 1), encounter sustained winds of 100 miles per hour or more. Placement of manufactured homes can add protection against strong winds. Placing the homes near natural barriers, such as trees and small hills, or turning the narrow end of the home into the prevailing winds can greatly reduce the winds' lifting force. In addition, skirting, such as a lattice-type or louvers, should be used on all sides to allow air under the home.

Tie-down systems. Tie-down systems can be used to secure any expanding units, porches, and/or awnings attached to storage sheds if they are blocked and constructed like the home. The number of ties you need depends on the size of your home and the force of the winds common to your area. Ensure that your home is constructed for the correct wind zone before placing your home in that zone. For example, coastal region dwellers need stronger tie-down systems than those living in Central and North Alabama. Double-wide manufactured homes need only frame ties in Wind Zone I. A home constructed for Wind Zone II may be placed in Wind Zone I, but a home constructed for Wind Zone I cannot be placed in Wind Zone II. If your home is not outfitted for tie-downs or has fewer than you need, place all additional over-the-top ties at studs and rafters.

Table 1. Recommended number of tie-downs

Wind Zone II—Hurricane Zone

*Length of mobile home (ft)	**Number of vertical ties	Number of diagonal ties
0-40	5	5
41-60	7	7
61-90	9	9

Wind Zone I—Non-Hurricane Zone

****Number of vertical ties	***Number of diagonal ties
0	4
0	6
0	8

*Manufactured home length excluded the draw bar.

** The Federal Manufactured Home Construction and Safety Standards set forth standards of construction for homes in different wind zones. Only homes constructed for Wind Zone II may be placed in Wind Zone II.

*** If pier height is more than 24 inches, a diagonal tie should be added for every 12 inches (or a portion thereof).

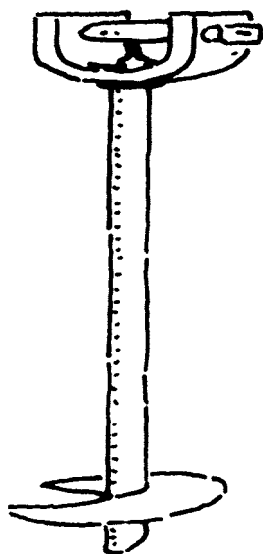
**** Homes without a HUD label must have three vertical ties per side in Wind Zone I.

- The required number of anchors for each side of a manufactured home and building is shown in Table 1. This is to be used if the manufacturer's installation instructions are unavailable. If the manufacturer's installation instructions are available, the anchoring requirements must be followed.
- Homes with a HUD label are not required to have vertical ties in Wind Zone I.
- All multisection homes should be fastened and sealed together according to the home manufacturer's instructions.
- A Wind Zone I home cannot be installed in Wind Zone II.
- An optional anchoring system can be used only if it has been approved by the **Alabama Manufactured Housing Commission** (Commission) in accordance with 535-X-13-09 and does not conflict with 535-X-13-06 (11).

Anchors. To anchor your manufactured home or home unit, use a combination of ties, anchoring equipment, and ground anchors. When properly designed and installed, these will resist the overturning or sideways movement of the home caused by wind.

All installers of manufactured homes must be certified and approved by the commission. American National Standards Institute (ANSI) approves all tie-down and anchor devices that have been tested according to their standards. Systems and devices must also meet the standards of the Department of Housing and Urban Development and/or the American Society of Testing of Materials. The commission must approve all blocking, anchoring, and tie-down devices or systems before they can be used in Alabama for the installation of manufactured homes or buildings.

Figure 1. Anchor



Tie-down anchors should be made of $\frac{7}{8}$ -inch, $3\frac{1}{4}$ -inch, and $\frac{5}{8}$ -inch steel rods (depending on the soil classification) that are strong enough to withstand 4,725 pounds of stress at minimum. In sandy or loamy soil, use a screw auger anchor (see Figure 1). A list of approved products may be obtained from the Alabama Manufactured Housing Commission.

Most anchors have tensioning devices that connect the anchor to a steel strap. "All tie-down straps and devices must be tested and approved. Straps must be type 1, finish B, grade 1 steel strapping, $1\frac{1}{4}$ -inches wide, and 0.035-inch thick as stated in federal specifications for strapping steels and seals FS QQ-S-781H-1974" (Sloan, 2001).

The pier foundation should be placed on stable soil (Sloan, 1975) with all grass and organic material removed. Pier foundations are installed directly under the mainframe of the home or building. Pier specifications are as follows:

- Piers should not be more than 6 feet apart on center when using a minimum pier foundation of a 16-inch by 16-inch concrete pad or equivalent in the minimum soil bearing capacity of 2,000 pounds.
- Piers should be no more than 2 feet from each end of the frame.
- The minimum pier foundation should be a 16-inch by 16-inch by 4-inch concrete pad, precast or poured in place of concrete slab.

Before sinking any anchors, locate the manufactured housing utility lines; contact Alabama One Call at (800) 292-8525. If you will live in a mobile home park, ask the park owner for anchor specifications, or contact a building inspector to ensure safety in tie-downs and anchoring for wind and soil conditions.

Note: In the event of a tornado or a hurricane, go to the nearest community shelter—do not stay in your manufactured home.

Flood Protection

Flooding often follows severe storms. The manufactured housing site should be elevated at or above the base flood elevation. Site preparation should be followed for any home installation regardless of whether it's in a special flood hazard area. However, if the home is to be installed in a FEMA-identified special flood hazard area, installation must be in accordance with the National Flood Insurance Program (NFIP) flood plain management criteria in addition to HUD manufactured housing criteria. Contact the local building official, town clerk, or mayor in a city or town before placing a manufactured home in a flood hazard area. In the event the home is to be placed in the unincorporated area of the county, contact the county commission office for the proper permitting agency. Before placing a manufactured home in a flood hazard area, apply for a permit and provide the local permit official with a FEMA Elevation Certificate. Have an emergency plan of escape for you, your family, and for safeguarding valuables. In the event a permit official cannot be located, contact the State National Flood Insurance Program coordinator in Montgomery, Alabama, at the Alabama Department of Economic and Community Affairs/Office of Water Resources at (334) 353-1966 for assistance.

Fires

Fire prevention should be a primary concern for all mobile and manufactured home dwellers. Structures built after 1976 meet National Fire Protection Association standards for fire resistant materials unlike earlier structures that are likely to have highly flammable material. Because your escape time may be limited, mobile home dwellers should be aware that homes built before 1976 may have high awning-type windows, single doors, or other unsafe design features that make escaping difficult.

Since the enactment of the National Manufactured Housing Construction Safety Act was passed, any approved manufactured homes must meet federal fire safety standards and the National Electric Code. Specifications for flame safety must also be met to protect heating, water heating, and cooking areas. In addition, home smoke alarms, emergency escape windows in sleeping quarters, and a minimum of two accessible exits are also required.

Furnace compartment. Inspect your furnace closet for loose wiring to ensure the wiring is well away from the flues. Furnace and water heater flues could ignite the covering on any loose hanging wires. Current furnace and water heaters are lined with nonflammable gypsum wallboard and have switches and temperature controls for adjustments. Make sure that all flues are aligned with the appliance and the roof jack to avoid separating furnace or heater flues that can direct hot air at flammable surfaces and cause smoke and carbon monoxide to escape into the home.

The furnace compartment should never be used for storage. In case of emergency, know how to shut down the furnace. Gas or oil furnaces are equipped with a fuel shut-off valve and a wall switch near the closet or in the circuit breaker panel to control the blower.

Keep emergency numbers nearby for plumbing or furnace repair inside the furnace compartment door. Also keep the most recent furnace inspection sheet handy.

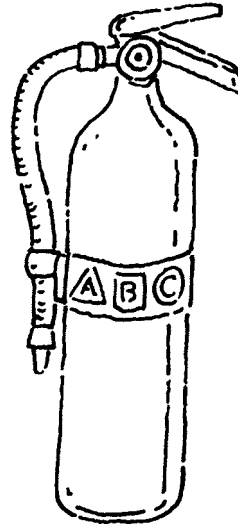
Fuel lines. All fuel lines for your furnace, water heater, and appliances should be checked for leaks and loose connections. Never use a match to check for gas leaks. Instead use a soap and water solution to look for bubbles in the gas lines. Be careful when checking the joints behind the stove. For oil leaks, look for traces of oil if the lines are dry and clean otherwise.

Kitchen. Kitchen range fires account for half of all fires in manufactured homes. To avoid fires, be sure the gas company adjusts your gas range to avoid pilot light failure and explosions. Your responsibility is to keep grease from building up on the surface of your range and exhaust hood.

If a fire should occur while cooking, always keep a lid close to smother a burning pan. Keep baking soda to put out a grease fire.

All manufactured homes should have a mounted multi-purpose ABC fire extinguisher in the kitchen that should be kept from the stove and shaken once a month to mix the chemicals (see Figure 2). Become familiar with the extinguisher's operating instructions. Extinguishers must be recharged after each use.

Figure 2. ABC Fire Extinguisher



Under the home. Avoid storing fire hazardous materials under the house, such as gasoline or paint supplies. Store flammable liquids in a cool, well-ventilated place away from the home. In addition, never skirt or insulate the floors of your home with tarpaper or straw bales since these materials dry out and catch fire easily. Areas under your home should also be dry and free of all materials that decay such as grass, roots, twigs, and wood. If the space under the home is to be enclosed with skirting or other material, the skirting shall be ventilated and a ground vapor retardant of 6 mil rated

polyethylene sheeting or equivalent should be installed. Venting shall be provided for the crawl space as required by the latest publication of NCSBCS/ANSI_A225.1. The vapor barrier should cover the entire area under the home and overlap at least 12 inches at the joints.

Electrical system. Always have an electrician examine the wiring in your home to determine if the electrical system is adequate. Be aware that water heaters, dryers, ranges, and air conditioners require a 150-amp circuit breaker. Air conditioners may require special circuitry since they can drain power.

Remember, overheated outlets, switches, fuse or panel boxes, and overloaded circuits can cause fires. Other trouble indicators are the smell of burnt plastic or dimming or flickering lights.

Mobile homes constructed between 1968 and 1972 are likely to have aluminum wiring that has a tendency to overheat. Resistance along the wiring arching at terminal connections can start a fire by igniting insulated materials. Make sure the wire is heavy enough. Use a 14-gauge copper wire for 15-amp circuits. Also, determine if a metal shield protects the wiring as it crosses wall studs and whether the wiring is copper or aluminum.

It's important to know your cords. The misuse of cords and heating appliances can also cause electrical fires. Always use proper cords with any appliance and avoid running cords under a rug. A heavy-duty cord has a three-wire,

three-pronged plug that is weatherproof and grounded (see Figure 3). Heater cords have heat-resistant coverings and adequate wire for heaters and small appliances (see Figure 4). Lamp cords have smaller wiring and lighter covering (see Figure 5).



Figure 3.
Heavy-duty Cord



Figure 4.
Heater Cord



Figure 5.
Lamp Cord

Keep heaters out of traffic areas, such as halls and doorways, and away from walls, furniture, drapes, children, and pets. (Heat-producing appliances and refrigeration appliances except ranges and ovens shall be of the vented type and vented to the outside as stated in 3280.707(b) of the Manufactured Home Construction Safety Standards).

WARNING: Class C or all-purpose ABC fire extinguishers should be used on electrical fires. Never use water.

Shock protection. It is urgent to have your entire electrical system in your manufactured house grounded directly to a ground wire that is attached to a ground rod driven at least 8 feet in the earth. Exposed or damaged wire can electrify the metal siding.

Use a ground fault interrupter (GFI) in bathrooms, laundry rooms, or outside where water can come in contact with electrical equipment. Cut off currents instantly if there is an electrical short in the ground or water.

Additional protection. Manufactured home dwellers, like standard home dwellers, must always be prepared for a fire. Smoke detectors should be placed in the hallway communicating between the living and first bedroom area. One smoke detector should protect each bedroom in used manufactured homes where common use areas, such as kitchen or dining rooms, separate bedroom areas. Install only Underwriters Laboratory-labeled (UL) detectors and install according to instructions (Sloan, 1975).

Equally important is determining how to escape a fire once it is detected because house fires cause deadly fumes to rise. Plan and practice an escape route for the family. Check your windows often to be sure they move freely. Use a chair if necessary during an emergency to break the windows open in the event of a fire or emergency.

Manufactured housing's affordability and convenience can meet the needs of the owner who is willing to become familiar with manufacturing housing safety and reap the rewards of a quality of life similar to that in a conventional home.

Special Thanks

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Figure 1: Manufactured Housing Statutory Law Rules & Regulations, 2004.

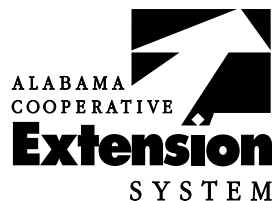
Figure 2: Foremost Insurance Company, 2004. How to install tie-downs and anchors.

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Your Experts for Life

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For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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