Appendix A

Mobile Home Standards

The following standards for mobile home tiedowns have taken into account possibilities and practicalities of providing protection from high winds for mobile homes. The standards may be used in conjunction with the ideas and concepts presented in TR-75, Protecting Mobile Homes from High Winds, prepared by the Defense Civil Preparedness Agency, Washington, D.C.

Mobile homes require two types of anchorage: (1) over-the-top tiedowns to restrict overturning and (2) frame ties to prevent the mobile home from being pushed from its piers. The standards apply to single mobile homes up to 14 feet in width. "Double wides" do not require over-the-top ties, but they require the same number of frame ties.

Mobile Home Piers and Footings. All mobile homes shall meet the following minimum requirements for mobile home piers and footings:

1. The ground on which the mobile home is placed will support a minimum of 2,500 pounds per square foot.
2. All piers shall be placed on footings of solid concrete with minimum dimensions of 16" x 16" x 4".
3. Piers shall be constructed of standard 8" x 8" x 16" hollow concrete blocks.
4. Piers shall be topped with solid concrete caps 8" x 16".
5. Treated or cedar wood shims shall be driven tight between the cap and the main frame to provide uniform bearing.
6. Other types of piers and foundations of equivalent permanence and weight bearing ability may be approved. Jacks or heavy metal adjustable columns, anchored to both frame and foundation, may be used.
7. Piers shall be centered under each main frame (or chassis) member, with a maximum spacing of 10 feet on centers. The end piers shall be no farther than five (5) feet in from the ends of the mobile homes.

The mobile home tie-downs will also have to meet the following criteria:

1. Over-the-top tiedowns shall be positioned at stud and rafter locations near each end of the mobile home. Others, if needed, may be positioned between them
2. Either steel cable or steel strapping can be used for ties. All ties shall be fastened to ground anchors, as described in Section 3 below, and drawn tight with galvanized turnbuckles or yoke-type fasteners and tensioning devices. Turnbuckles shall be forged, or ended with jaws. Turnbuckles with hook ends will not be permitted.
3. All cable ends shall be secured with at least two U-bolt-type cable clamps or other fastening devices as approved by the enforcing officials.
4. Cables used for tiedowns shall be either galvanized steel or stainless steel having a breaking strength greater than 4,800 pounds. Cable shall be either 7/32" diameter or greater (7x19) aircraft cable.

5. When flat steel straps are used for tiedowns, they must be in accordance with Federal Specification QQ-S-781. That is 1 ¼" x .035", type 1, Class B, Grade 1, with a breaking strength of at least 4, 750 pounds.
6. Steel straps used for ties must terminate with D-rings, bolts, or other fastening devices which will not cause distortion of the band or reduce its breaking strength.
7. Sharp edges of the mobile home that would tend to cut the cable or strap must be protected by a suitable device to prevent cutting when the mobile home is buffeted by the wind. Likewise, special adapters must be installed to prevent the cable or strap from knifing through the mobile home.
8. Connection of the cable frame tie to the I-beam (or other shape) main structural-frame member should be by a 5/8" drop-forged closed eye bolted through a hole drilled in the center of the I-beam web. A washer, or equivalent, should be used so that the beam is sufficiently reinforced around the hole. If steel-strap ties are used, care should be exercised to ensure that minimum bending radius is adhered to so that the breaking strength of the strap is not reduced.
9. Frame ties should connect the anchor and the steel I-beam (or other shape) main structural frame member which runs lengthwise under the mobile home. Frame ties CAN'T BE CONNECTED to any of the steel outrigger beams which fasten to and intersect the main I-beams at right angles. The outriggers do not have adequate strength to resist the frame tie loadings during high winds.

Mobile home ground anchors shall meet the following requirements:

1. Ground anchors should be aligned with centers of piers. Also, they should be situated immediately below the outer wall to accommodate over-the-top as well as frame ties.
2. Auger-type anchors shall have a minimum diameter of 6 inches (arrowheads 81') and be sunk to their full depth (at least four inches). Steel rods shall be at least 5/8" in diameter, have a forged or welded eye at top, or have a yoke-type fastening and tensioning device or a threaded connector and tensioning device.
3. Anchors shall be capable of withstanding 5,700 pounds of pull (in a vertical or diagonal direction) without failure. This loading can be achieved by many anchors in most kinds of soils.
4. Deadman anchors shall be sunk to a depth of five feet, have a minimum length of two feet, and have a diameter of at least six inches. Hollow concrete blocks are not approved. Steel rods shall be at least 5/8" in diameter, with a bottom hooked into the concrete deadman.
5. Anchors to reinforced concrete slabs must be of strength comparable to that presented above.