

CITY OF BOX ELDER

Manufactured Home Minimum Structural Standards Information

General Exterior:

Homes which are placed on a basement/crawlspace with an approved building Permit, and are properly anchored, do not require skirting.

9-1-1 address numbers are to be displayed on the side of the exterior wall facing the abutting street. They are required to be a minimum of four (4") tall and three (3") inches wide, with no less than a half (1/2") stroke, and be constructed of, or coated with reflective material.

The structure's paint color scheme must be continuous around the structure with accents, if desired added to enhance the appearance.

Patio blocks painted the same color as the roof, may be used to hold down metal roofs on factory-built homes to prevent rumbling. Placement of tires, cinderblock or other materials not intended for placement on the roof are prohibited.

"Tie-Downs" are required on all manufactured homes, and over the top ties unless otherwise noted by the manufacture.		
When manufactures instructions are unavailable		
Length of Home	Over-the-Top Ties For Single Wide's ¹	Minimum Frame Ties Per side (All)
up to 40 feet	2	3
40 to 46 feet	2	3
46 to 49 feet	2	3
49 to 54 feet	2	3
54 to 58 feet	2	4
58 to 64 feet	2	4
64 to 70 feet	2	4
70 to 73 feet	2	4
74 to 84 feet	2	5
<ul style="list-style-type: none"> ➤ To determine length, do not include draw bar. (Over the top ties when required) ➤ Numbers based on minimum working load per anchor 3,150, with a 50% overload of 4,725 lbs. ➤ See chart below for maxim spacing of frame ties. (FEMA 85 AS-1.1) ➤ If you home has special site considerations, a registered professional engineer or architect can devise an alternate anchoring system. 		

It is recommended you utilize the services of a professional installer to insure the structure is properly anchored.

Use of the services of a professional installer to insure the structure is properly installed and anchored is recommended

Skirting, Siding & Trim:

Skirting must be installed within thirty (30) days of placement on site. Skirting is to provide a continuous weather tight shield from the point of attachment to the ground, and extend completely around the home. All skirting shall be made of weatherproof material. An access to the door or panel through the skirting no less than 30" wide shall be provided to the underside of the home. **(NOTE: All skirting shall be completed before Occupancy is authorized, or a water meter can be issued)** All siding & trim must be securely fastened in a workman-like manner on all areas of the structure. The siding must be made of the same material, and be continuous around the structure.

Entry & Egress

An entry deck and steps or ramp is required at all entrypoints on and exterior doors more than 6" above grade.

Landings, when constructed, must be at least thirty (30") inches wide and thirty-six (36") inches deep, and must be level with the threshold.

Stair risers must be between four (4") inches and eight (8") inches in height. Stair treads must be at least nine (9") inches in depth. A handrail must be installed on one side of the steps from the adjacent grade to the deck surface. When step exceed thirty-two (30") inches above grade, a code compliant guardrail shall be provided.

Exterior doors must be functional for entry and egress, work properly, have working fastening mechanism, and operational from both inside & outside the home.

Interior:

All glass must be intact and all windows designed to open must be operational.

Electrical, plumbing, heating, etc. must be maintained in a working condition and meet National code standards and manufacture specifications when applicable.

All homes must be equipped with operating smoke detectors at time of inspection.



City of Box Elder
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MOVED MANUFACTURED HOME INSPECTION CHECKLIST

MOVING PERMIT #: _____ ADDRESS: _____
 Is the home in a Flood Hazard Area? Y / N Elevation Certificate on File? Y / N / N/A
 Is the home in a High Noise Zone? Yes: _____ 75+dB 70-74dB 65-69dB NO: _____
 Move Date: _____ Inspector: _____
 New Home Installation: Y / N Old Home Installation: Y / N Year of Home Manufacture: _____
 Inspection Date: _____ Time: _____ Owner/agent present: _____

Exterior:	Y	N
Required setbacks are met?		
Sewer Connections Installed Properly?		
Water Connections & Water Meter Installed Properly?		
9-1-1 address numbers installed?		
Skirting, Siding & Trim:		
Completed & Weathertight?		
Continuous?		
Fastened in a workmanlike manner		
Access panel/door provided? >18" X 24"		
Tie-Downs:		
Approved tie downs?		
Installed as per Manufacture?		
Entry & Egress:		
Entry deck & stairs at all doors?		
Entry thresholds more than 6" above Grade? (If yes, Landing required)		
Landing minimum 30" wide X 36" length?		
Landing no more than 8" below threshold?		
Stair risers between 4" & 8" in height?		
Stair tread depth not less than 9"?		
Stairs a minimum 36" in width?		
Handrails/Guardrails installed?		
Interior:		
Home Manufacture's Placard Attached?		
Working Smoke Detectors (Each bedroom, hallway, etc.)		
Re-inspection required?		
Date of Re-Inspection:		
New Home Installation: HUD Inspection Form 309 Completed and Signed?		
Occupancy approved?		

I hereby acknowledge that the inspector has reviewed the inspection results with me, and hereby agree to maintain the home in a workman like manner, in order to retain its occupancy.

All inspections listed on this check list must be completed before a "Certificate of Occupancy" can be issued.

Correctable deficiencies must be repaired prior to Occupancy. Homes that are deemed non-compliant must be removed from the City within seven (7) days from date of failing inspection.

Owner/Agents Name: _____ Owner/Agents Signature: _____

Inspectors Signature: _____ Date: _____

Maximum Ground Anchor Spacing Table: Design Wind Speed 90 mph

		Building Width - Single Unit						Building Width - Double Unit						
		12 ft		14 ft		16 ft		24 ft		28 ft		32 ft		
Anchor Strength (lbs)	Strap Connection Height (in)	Roof Pitch	I-Beam Spacing (in)		I-Beam Spacing (in)		I-Beam Spacing (in)		I-Beam Spacing (in)		I-Beam Spacing (in)		I-Beam Spacing (in)	
			82.5	99.5	82.5	99.5	82.5	99.5	82.5	99.5	82.5	99.5	82.5	99.5
1500	25	3:12	9'-0"	9'-3"	9'-4"	9'-7"	9'-9"	9'-10"	9'-9"	7'-1"	10'-3"	9'-4"	11'-1"	10'-7"
		5:12	9'-1"	9'-3"	9'-5"	9'-8"	9'-8"	9'-10"	7'-4"	6'-0"	8'-4"	7'-8"	8'-9"	8'-5"
		7:12	8'-5"	8'-8"	8'-8"	8'-10"	8'-9"	9'-0"	6'-5"	5'-3"	7'-2"	6'-7"	7'-5"	7'-2"
	33	3:12	8'-3"	8'-10"	9'-1"	9'-3"	9'-5"	9'-8"	7'-7"	5'-10"	9'-3"	8'-3"	10'-4"	9'-9"
		5:12	8'-9"	9'-0"	9'-2"	9'-4"	9'-5"	9'-8"	8'-4"	4'-10"	7'-7"	6'-8"	8'-2"	7'-8"
		7:12	8'-2"	8'-5"	8'-5"	8'-8"	8'-7"	8'-9"	5'-7"	4'-3"	6'-7"	5'-9"	7'-0"	6'-7"
2000	25	3:12	12'-0"	12'-3"	12'-7"	12'-9"	13'-0"	13'-2"	11'-9"	9'-5"	13'-8"	12'-7"	14'-9"	14'-2"
		5:12	12'-1"	12'-4"	12'-7"	12'-10"	13'-0"	13'-2"	9'-10"	8'-0"	11'-2"	10'-3"	11'-9"	11'-3"
		7:12	11'-3"	11'-7"	11'-7"	11'-10"	11'-9"	12'-0"	8'-8"	7'-0"	9'-8"	8'-10"	10'-0"	9'-7"
	33	3:12	11'-7"	11'-10"	12'-2"	12'-4"	12'-7"	12'-10"	10'-2"	7'-9"	12'-4"	11'-0"	13'-9"	13'-0"
		5:12	11'-8"	12'-1"	12'-2"	12'-5"	12'-7"	12'-10"	8'-5"	6'-5"	10'-1"	9'-0"	11'-0"	10'-3"
		7:12	10'-10"	11'-3"	11'-3"	11'-7"	11'-6"	11'-9"	7'-5"	5'-8"	8'-9"	7'-9"	9'-3"	8'-9"
2500	25	3:12	15'-1"	15'-4"	15'-8"	16'-0"	16'-3"	16'-6"	14'-8"	11'-10"	16'-0"	15'-8"	18'-0"	16'-0"
		5:12	15'-2"	15'-7"	15'-9"	16'-1"	16'-2"	16'-6"	12'-4"	10'-0"	14'-0"	12'-9"	14'-8"	14'-1"
		7:12	14'-1"	14'-5"	14'-5"	14'-9"	14'-8"	15'-0"	10'-9"	9'-9"	12'-1"	11'-1"	12'-5"	12'-0"
	33	3:12	14'-5"	14'-10"	15'-2"	15'-7"	15'-9"	16'-0"	12'-8"	9'-9"	15'-5"	13'-9"	16'-0"	16'-0"
		5:12	14'-7"	15'-1"	15'-3"	15'-8"	15'-9"	16'-0"	10'-7"	8'-2"	12'-8"	11'-2"	13'-8"	12'-10"
		7:12	13'-8"	14'-1"	14'-1"	14'-5"	14'-4"	14'-8"	9'-3"	7'-2"	10'-10"	9'-8"	11'-8"	11'-0"
3150	25	3:12	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"
		5:12	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	15'-7"	12'-7"	16'-0"	16'-0"	16'-0"
		7:12	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	13'-8"	11'-0"	15'-2"	14'-0"	15'-8"
	33	3:12	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	12'-3"	16'-0"	16'-0"	16'-0"	16'-0"
		5:12	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	13'-4"	10'-3"	16'-0"	14'-2"	16'-0"
		7:12	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	16'-0"	11'-6"	9'-0"	13'-9"	12'-2"	14'-8"

- NOTES:**
1. Recommended Anchor Spacing is given in Feet & Inches
 2. See sheet AS1.2 for Additional Ground Anchor notes.
 3. See Sheet GN 1.1 for general notes and additional information
- Design criteria and limitations.**

LATERAL GROUND ANCHOR SPACING

Longitudinal Ground Anchors – Number of Anchors @ Each Building End							
Design Wind Speed (mph)	Anchor Strength (Pounds)	Building Width – Single Unit			Building Width – Double Unit		
		12 ft.	14 ft.	16 ft.	24 ft.	28 ft.	32 ft.
90	1,500	2	2	2	3	4	4
	2,000	2	2	2	3	3	4
	2,500	1	2	2	2	3	3
	3,150	1	1	1	2	2	2
110	1,500	3	3	3	5	6	6
	2,000	2	3	3	4	4	4
	2,500	2	2	2	3	4	4
	3,150	2	2	2	3	3	3
130	1,500	4	4	4	7	7	7
	2,000	3	4	4	5	6	7
	2,500	2	3	3	4	5	5
	3,150	2	2	2	3	4	4
150	1,500	5	5	6	9	10	12
	2,000	4	4	5	7	8	9
	2,500	3	3	4	6	6	7
	3,150	2	3	3	4	5	6

Ground Anchor Notes:

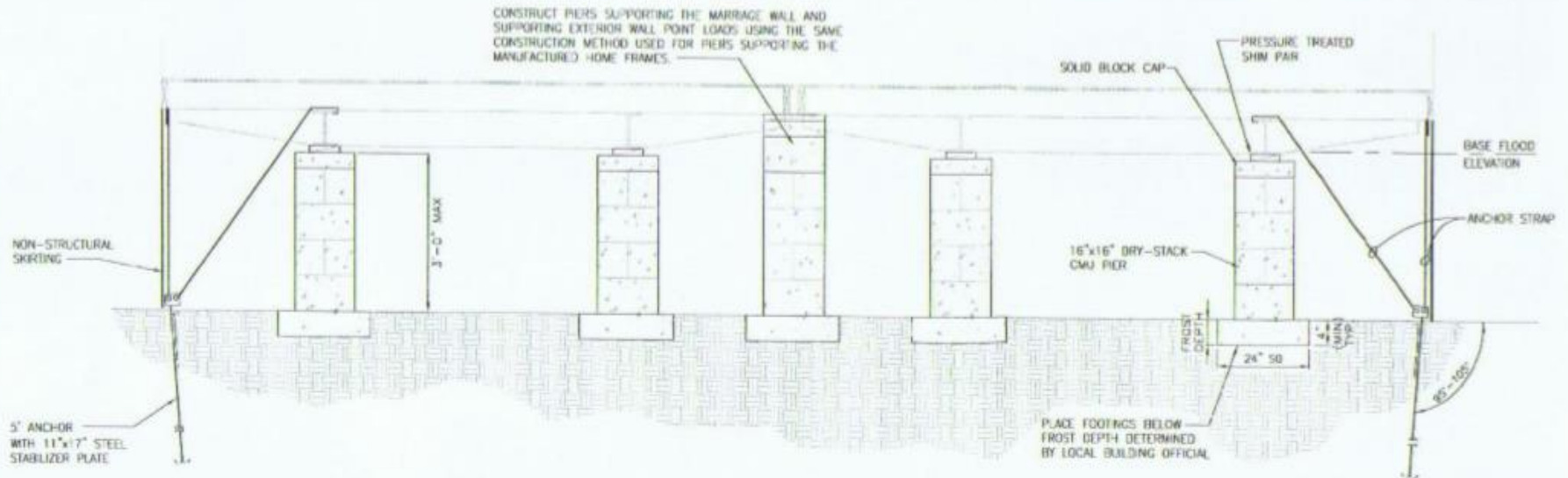
1. Maximum recommend ground anchor spacing is sixteen (16') feet for both lateral and longitudinal applications.
2. Minimum recommended spacing between ground anchors is 2 ft. 8" to minimize soil stress overlap of adjacent anchors. For anchors closer than 2 ft. 8 in. use alternate support and anchorage system unless manufacture certifies ground anchor capacity for required spacing.
3. Recommended ground anchor spacing is based on Wind Exposure C conditions for basic wind speed conditions specified in ASCE/SEI 7-05.
4. Recommend ground anchor spacing is based on manufacture home with 8 ft. wall height, 1 ft. overhang and a minimum average weight of 20 pounds per square foot.
5. Ground Anchors must be located within 2 ft. of the exterior walls of the manufacture home.
6. Linear interpolation between I-beam spacing is permitted.

Longitudinal Ground Anchor Spacing and Anchor Notes

NOT TO SCALE

ANCHOR SPACING

FOR STANDARD PIER- PLEASE SEE TABLES IN SHEET AS1.1 WITH ANCHOR STRENGTH 2,000 LBS
 FOR ALTERNATE PIER- PLEASE SEE TABLES IN SHEET AS1.1 WITH ANCHOR STRENGTH 1,500 LBS



SEE ALTERNATIVE PIER DETAILS FOR VELOCITIES GREATER THAN 1.75 FPS. SHEET APD 1.1
 SEE PRE-ENGINEERED FOUNDATION GENERAL NOTES FOR ADDITIONAL INFORMATION,
 DESIGN CRITERIA AND LIMITATIONS. SHEET GN-1.1

GASP110/130/150-1

GROUND ANCHOR AND PIER DETAIL (DOUBLE UNIT)

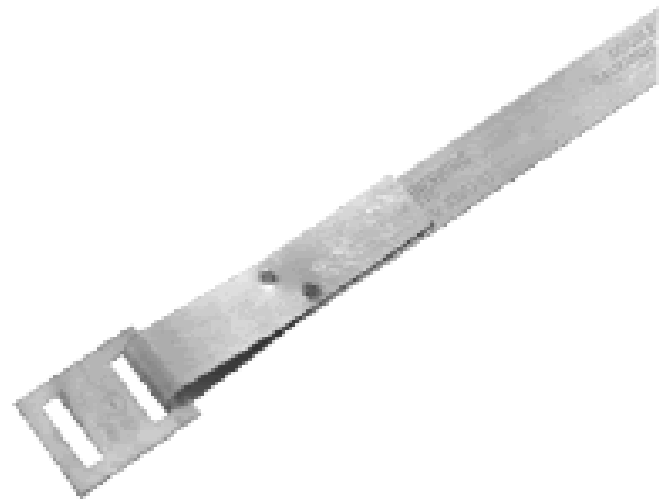
NOT TO SCALE - PIER CONSTRUCTION FOR FLOOD VELOCITIES UP TO 1.75 FEET PER SECOND SHOWN

Sept. 2009
 FEMA 85 GASP110/130/150-2.2

Tie-Downs for Manufactured Homes

Tie-downs are systems of heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds. Failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Manufactured homes are more easily flipped or damaged during windstorms than site-built homes and they require tie-downs to remain stable. Manufactured homes are elevated and vulnerable to the forces of wind uplift if they are not equipped with skirting. Wind passing over the top of such homes can exacerbate the effect. Also, manufactured homes are relatively lightweight when compared with site-built homes.



Two types of tie-downs include:

- **Over-the-top tie-downs**, which are straps that are placed over the siding and roof. Some manufactured homes come equipped with concealed over-the-top tie-downs, which are located just under the exterior siding and metal roof. The end of the strap hangs out under the manufactured home. While this is an effective system, it detracts from the appearance of the home. Single-wide manufactured homes, as they are lightweight, generally require over-the-top tie-downs as well as frame anchors; and
- **Frame anchors**. These straps attach to the home's frame rails. Many newer manufactured homes, as they are structurally superior to older models, may be secured solely with frame anchors. Double-wide models are also generally heavy enough to resist winds without the aid of over-the-top tie-downs, although they, too, require frame anchors.

Roof Ties:

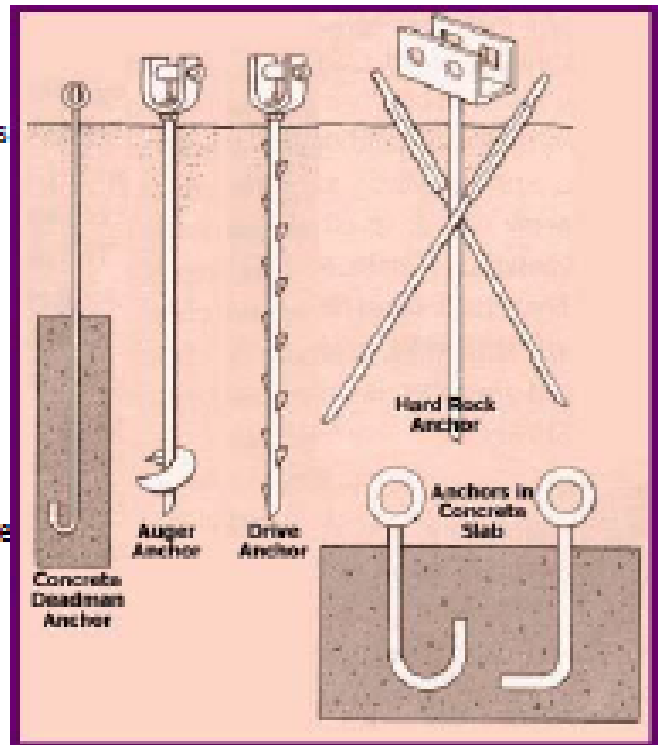
(a) Homes manufactured after June 15, 1976, without over-the-roof ties, but designated "Hurricane Resistant" per the Federal Manufactured Home Construction and Safety Standards, 24 CFR section 3280.305(c) (2), as hereby incorporated by reference, shall not require roof ties. All manufactured homes manufactured after July 13, 1994, shall require vertical and frame tie points.

(b) Homes manufactured before July 13, 1994, where factory installed roof ties are not evident and it cannot be determined that the mobile/manufactured home is "Hurricane Resistant" without such ties, then of roof ties, may be required, and shall be installed at adequately reinforced areas, where additional load will not damage the structure.

Tie-Down Components

- **Ground anchors** are metal rods driven into the ground to secure the tie-down tightly in place. A number of different types of ground anchors are available to suit various soil conditions. Auger anchors, for instance, have been designed for use in both hard soil and soft soil. Rock anchors or drive anchors allow the attachment to a rock or coral base. As only several inches of the anchors will be above the ground, inspectors will not be able to tell which type is used.

- **Hook-up and tension devices work in conjunction with tie-downs.** The tie-down must be connected to the anchor with a system that allows for the tension to be adjusted. This system must also be weather-resistant and strong enough to support as much weight as the anchor and tie-down. If the tie-down is fastened to a ground anchor with a drop-forged turnbuckle, it should be ½-inch or larger galvanized steel. The turnbuckle should have forged or welded eyes, and not hook ends, as the tie-down could slip from hook ends.
- For exposed over-the-top tie-downs, there must be some sort of **roof protectors** placed under the strap at the edge of the roof. These prevent the tie-down strap from damaging the roof and will prevent the edge of the roof from cutting through the tie-down. Commercial protectors are available which distribute the pressure of the strap.



Safety and Maintenance Tips:

- Check for loose straps. Straps should be tight and straight. The manufacturer's guidelines can be consulted for determining proper tension of the strap.
- Replace straps and anchors that show signs of corrosion or damage.
- A longitudinal tie-down system can be installed as an additional safety feature. This system uses straps that cross the length of the home, rather than its width.
- Turnbuckles, which are devices designed for adjusting the tension and length of straps and cables, should have welded eyes or forged eyes instead of hooks because hooks can slip.
- Find out the required number of straps for your area and make sure your home complies.
- Make sure straps and ground anchors are not damaged or corroded. If they are, they should be replaced immediately.
- Owners of manufactured homes should contact their local building department to find out how many tie-downs are necessary for such homes in their area. Regulations vary considerably by jurisdiction, and generally depend on the size of the home and the wind risk. In some states, such as Florida, tie-downs are stringently regulated and inspected.
- Straps should not be kinked or bent, or otherwise abnormally stressed.
- Straps must be protected at sharp edges with radius clips.
- Anchors must be installed to full depth.

How did we get here? (The tie-Down Timeline)

1973	First tie-down requirements; the four corners only.
6/15/1976	HUD assumes the mobile home program. Added additional requirements.
8/24/1992	Hurricane Andrew
7/19/1994	HUD strengthens structural requirements for manufactured homes.
1/1/2009	HUD standardizes installation guidelines nationwide.

NOTE: *Manufactured homes should not be confused with modular homes. Modular homes are built in factory, and are built to the Building Code adopted by the City.*