



Building Code Clarification Handout, #2013.03, Mandatory January 1, 2014 (Updated 6/3/2014)

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**2013 Kentucky Residential Code, Second Edition February 2014**

Page 1 of 13

**Disclaimer:** This is not a listing of all code sections involving building or utilities which involve this subject, but only the sections most often questioned. Refer to the 2013 Kentucky Residential Code book for information not listed in this handout and for other requirements of the building code. (This is not a guide to building pole building projects for commercial projects. For commercial projects you may be required to contact an architect or engineer for help with your design, depending on the project's size.)

**Design Criteria:**

The following minimum design criteria apply to **Pole Building Structures** requiring building permits in Hardin and Larue County as specified in the appropriate tables of the *2013 Kentucky Residential Code, Second Edition, February 2014*.

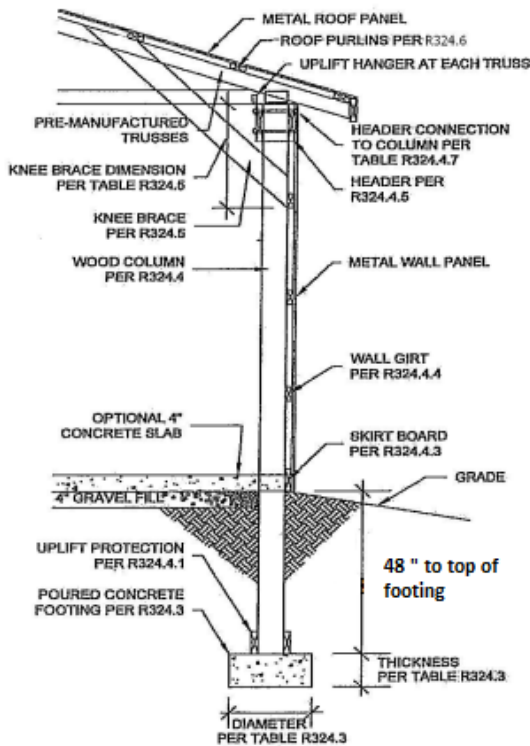


Figure R324.1  
Post and Frame Wall Section  
No Scale

Bracing not shown

There have been some code changes involving Accessory Structures which may be new to homeowners, builders, and suppliers in this area. This document addresses code requirements for Pole Building Structures as accessory structures.



**Clarification #1:** For building code purposes most structures which are pole building type structures, and which are commonly used for open sided carports, shelters, garages, workshops, small agricultural animal barns and shelters, equipment sheds, storage buildings, etc., are determined to be residential *Accessory Structures* per the 2013 *Kentucky Residential Code*.

Agricultural buildings, barns, carports, fences not over 7 feet in height, livestock shelters, private garages, retaining walls, sheds, and stables are determined to be occupancy Use Group-U in the

*2013 Kentucky Building Code* (Sec. B312, Utility and Miscellaneous Group U). Many pole building structures are commonly referred to as “pole barns” locally.

**Clarification #2:** Accessory structures, larger than 200 square feet in size, are required to have a building permit prior to starting any type of construction on the project. (R105.2), (R108.1)

**Clarification #3:** Each pole building structure/pole barn is required to have the owner to obtain a building permit; and to obtain the specified footing, framing, and final inspections; and to build it to meet the *Kentucky Residential*

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**Code** (for accessory structures); or the *Kentucky Building Code* (for Use Group U utility structures); and to meet the property line setbacks and the utility setbacks required by the *Hardin County, Kentucky Development Guidance System. (HCDGS)*. When in Larue County use the *Land of Lincoln Planning & Zoning guidelines for the setbacks*.

1. **The building must be built in compliance with the 2013 Kentucky Residential Code for Post and Frame Structures Section 324, Second Edition February 2014.**
2. **Openings for doors, windows etc.** shall not be permitted in the exterior wall of an accessory structure with a fire separation distance of less than 3 feet. (Table R302.1(2))

Properties receiving an agricultural assessment in Hardin County, and completing an **Agricultural Certification Form** granted in writing through the Hardin County PVA Office are exempted from the requirement to obtain a building permit. The building or structure must be used in the operation or maintenance of the farm. The signed form must be presented to our office to avoid the permit requirement. This does not apply to the house located on a farm.

**SECTION 324 (KRC)  
POST AND FRAME STRUCTURES**

**R324.1 Post and frame structures.** The following requirements serve as minimum standards for post and frame structures within all of the following structural limitations:

1. Residential accessory structures
2. Single story
3. Metal roof on purlins with bracing and metal wall panels on girts, with bracing as shown in Figure R324.1 or in lieu of bracing provide solid exterior structural sheathing.
4. No attic storage
5. Maximum building width of 48 feet including the overhang.
6. Maximum wall height of 16 feet
7. Maximum mean (average) roof height of 20 feet
8. Maximum post spacing of 8 feet.

9. **Size limitation: An accessory structure may be no larger than 3,000 SF (KRC R202).**
10. **Columns (posts) shall be not less than 6 inch by 6 inch nominal size.**
11. **Maximum wall girt spacing: 2 x 4 at 2' o.c.; or 2 x6 at 3' o.c. Attached per Table R324.7. (see Pg. 7)**
12. **Maximum roof purlin spacing: 2 x 4 at 2' o.c.**
13. **Column uplift protection.** Columns shall have uplift protection by one of the following methods:
  1. Two 2x6 12 inch column uplift protection blocks attached to each side of the base of the column, placed horizontally.
  2. 12 inch high, concrete collar poured on top of footing around the post with 2 #5x9 inch rebar placed through the post at 3 inches and 9 inches from bottom of post in opposite directions. The rebar ends shall be installed in accordance with ACI 332 for the specified distance in inches from contact with the soil. See Figure R324.3. This concrete collar is required for method 2 only.
14. **Footings. Poured in-place concrete footings below all posts. The top of the footing shall be minimum of 48 inches below finished grade. Pier footing thickness  $\frac{1}{2}$  the required diameter of the footing in compliance with Table R324.3.**

Post Frame Pier Diameters Chart			Table R324.3					
Building width incl. overhang	Pier depth min. in inches	Pier diameter in inches	Pier footing thickness 1/2 diameter of footing	Soil Bearing Capacity Minimum	Column Spacing max. feet	Wall Eave Height max.	Mean Roof Height max.	Attic Storage
up to 25'	48	18	9	2000 PSF min.	8	16	20	No
up to 28'	48	22	11	2000 PSF min.	8	16	20	No
up to 32'	48	24	12	2000 PSF min.	8	16	20	No
up to 36'	48	26	13	2000 PSF min.	8	16	20	No
up to 40'	48	28	14	2000 PSF min.	8	16	20	No
up to 44'	48	28	14	2000 PSF min.	8	16	20	No
up to 48'	48	30	15	2000 PSF min.	8	16	20	No

15. **Skirt boards.** Skirt boards shall be pressure treated lumber. Minimum 2" by 6" p/t board required.

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

16. **Gable End Header Sizes:** Opening width 10' requires 2 – 2x8; Opening width 12' requires 2 – 2x10; Opening width 16' requires 2 – 2x12.
17. **Load-bearing beams and headers** shall comply with Table R502.5(1). Post spans of 8' o.c. the minimum size of headers (beams) that support roof: two 2" x 10'. Notch the post to receive first header.
18. **Exterior Structural Sheathing or Wall Bracing.** Provide exterior structural sheathing or wall bracing to resist all racking and shear forces. Bracing must comply with the applicable provisions of section R602.10 or by installing 2x6 diagonal braces between two adjoining columns at 8 feet on center or multiple spacing totaling a minimum of 8 feet on center where the post spacing design is less than 8 feet on center. The diagonal brace shall be placed from the top header or girt to the next adjoining column at the skirt board.
19. The bracing shall be placed on each side of the building and shall be a **minimum of 25 feet on center and within 12 feet of the end of the building** and attached to the wall girts and columns per Table R324.7. Splices of the diagonal brace required due to excessive length, must lap over two consecutive wall girt.
20. **Beams supporting trusses or rafters and ceiling joists attachment to column.** Connected to columns by one of the following methods:
  1. Bolts that are 1/2 inch diameter through-bolted to the side of the column.
  2. Bolts that are 1/2 inch diameter, directly attached to a 3-ply column notch, enclosing the truss or rafter at the top of column; or
  3. Other fasteners with minimum shear or withdraw values stated in Table R324.4.7
21. **Number of fasteners.** The minimum numbers of through bolts or the fasteners with minimum shears or withdraw values required per Table R324.4.7.
22. **Knee bracing.** A 2x6 brace shall extend from the column to the top chord of the truss or rafter adjacent to the post at a 45 degree angle. The vertical distance down from the bottom chord of the truss or ceiling joist to the point where the brace attaches to the post shall be in compliance the Table R324.5, as shown on Figure R324.1 Trusses or rafter must be spaced such that they align with the column intervals. Attachment of knee brace shall be per Table R324.7.
23. **Roof Construction.** Top chord of roof trusses or roof rafters shall be braced with exterior sheathing or metal roof on purlins with bracing. **Uplift Hanger** (hurricane tie) required at each truss.
24. **Trusses shall be pre-manufactured** (engineer stamped). Home built or on-site built trusses not allowed per Kentucky Building Code and per Kentucky Residential Code.
25. **Roof purlins shall be a minimum of 2x4 SPF #2** laid flat of spans up to 4 feet, and 2x4 SPF #2 laid on edge for spans up to 8 feet.
26. **Roof Bracing.** Provide exterior structural sheathing or bracing to resist racking and shearing forces in roof. Bracing shall occur in the roof on all 4 sides of the building and shall consist of 2x6 diagonal braces perpendicular and parallel to rafters or trusses and attached to the bottom side of rafters or top chords of trusses. These braces shall start at a point just below the first purlin, rafter or truss in from the eave purlin and at each corner column. The brace shall be placed on a 45 degree angle and end below the location of a purlin, rafter or truss within 8' -0" in from the wall. If the building width or length exceeds 24' -0" then install additional braces in the same manner. Spacing of braces shall not exceed a maximum spacing of 2 feet on center in any direction.
27. **Attachment details.** Structural fastener details for post and frame buildings shall comply with Table R324.7.

*(Non-graded, rough-sawn lumber cut at local sawmills or by the homeowner or others is not approved to be used as load-bearing lumber).* **Wood Grade.** (R502.1) **All load-bearing lumber shall be identified by the grade mark** of a lumber grading or inspection agency which has been approved by an accreditation body that complies with DOC PS 20 **Protection Against Decay.** (R317.1) **Approved naturally durable or pressure preservative treated wood, placed within 18 inches from the ground, shall be used for the following members:** 1. Horizontal members including girders, joists, and decking. 2. Vertical members including posts, poles, and columns when in ground or within 18 inches of ground (R317.1.4). 3. Both horizontal and vertical members comprising the rest of the structure, when placed within 18 inches of the ground. (R317.1)

Post and frame structures and portions thereof outside the above structural limitations of this standard shall be accompanied by structural calculations as required by the residential building official or designed under the provisions of section R116.2 of the Kentucky Residential Code (KRC). Post and frame structure shall comply with the structural design requirements of Section R324 of the KRC. (Engineered drawings will be required.)

**END OF CHECKLIST. FOR ADDITIONAL INFORMATION REFER TO CONTINUING PAGES**

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**R324.2 Definition.** Post and frame structures consist of primary members (post, beams and single span trusses or ceiling joists and rafters) and secondary members (roof purlins, wall girts, bracing and sheathing) where all loads are transmitted from the sheathing and the secondary members to the primary members which transfer them to the ground through vertical posts bearing on footings embedded in the soil. See Figure R324.1.

**In designing your building**, when figuring the size and amount of lumber needed and the spacing of your columns/posts/poles, include the following *Hardin County, Kentucky Minimum Loads*: **Wind Load: 90 mph; Ground Snow Load: 15 psf; Seismic Design Category: B; Weathering Probability: “Severe”; Termite Infestation Probability: “Moderate to Heavy”; Decay Probability: “Slight to Moderate”.** (R301.2) and (Table R301.2(1)) **Size limitation: An accessory structure may be no larger than 3,000 SF (KRC R202)**

**R324.3 Footings and Foundations.** Footings and foundations shall comply with applicable provisions of R401. Post and frame structures shall have poured in-place concrete footings installed below all posts. The **top of the footing** shall be a minimum of 48 inches below finished grade and have footing diameters complying to be equal in thickness to 1/2 the required diameter of the footing in accordance with Table R324.3.

**R324.4 Column and wall construction.** Columns shall be three sections of 4- ply unspliced, reinforced spliced or solid wood and **shall not be less than 6 inch by 6 inch nominal size.** Columns shall comply with the requirements of Section R319 and shall be restrained to prevent lateral displacement. Built up columns shall be fastened as illustrated in Figure R324.2.

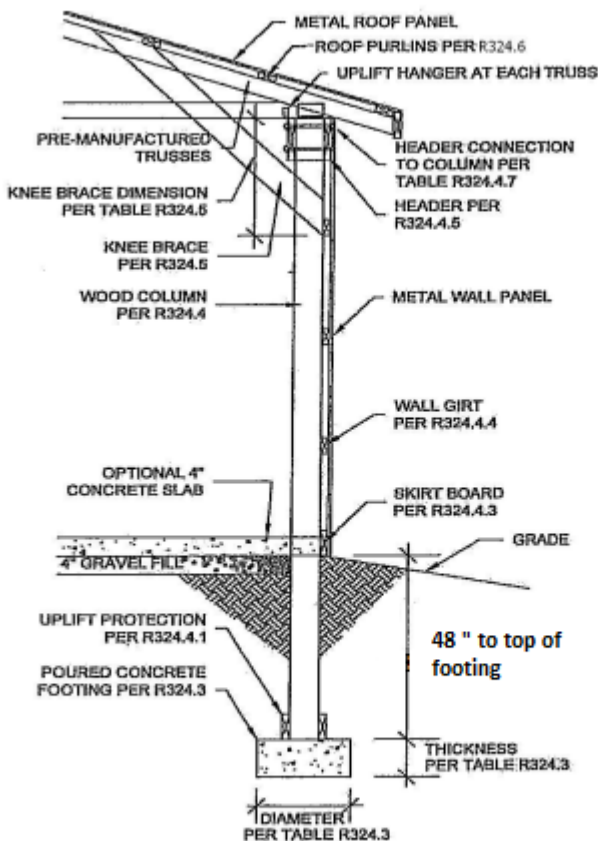
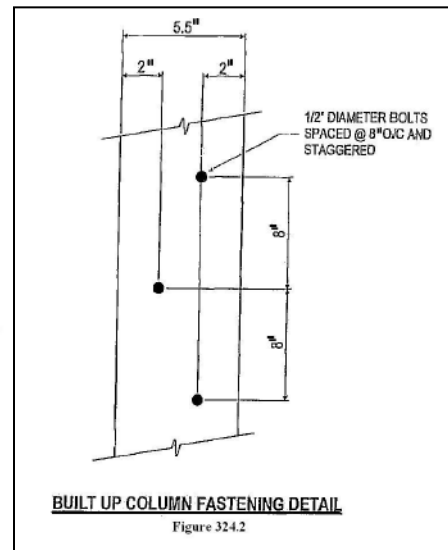


Figure R324.1  
Post and Frame Wall Section  
No Scale

Bracing not shown



**R324.4.1 Column uplift protection.** Columns shall have uplift protection by one of the following methods:

1. Two 2x6 12 inch column uplift protection blocks attached to each side of the base of the column. The column uplift protection blocks must be horizontally attached per Table R324.7 and comply with Section R319. [Note: 12” high additional collar not required when using uplift protection blocks.]

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**2.** 12 inch high, concrete collar poured on top of footing around the post with 2 #5x9 inch rebar placed through the post at 3 inches and 9 inches from bottom of post in opposite directions. The rebar ends shall be installed in accordance with ACI 332 for the specified distance in inches from contact with the soil. See Table R324.3

**R324.4.2 Column spacing.** The maximum spacing for columns shall be 8 feet.

**R324.4.3 Skirt boards.** Skirt boards shall be treated lumber meeting the requirements of Section R319 and attached per Table R324.7. Minimum 2” by 6” pressure treated board required.

**R324.4.4 Wall Girts.** Wall girts shall be spaced for 90 mph wind loading: 2” x 4” maximum spacing 2 foot o.c.; 2” x 6” maximum spacing 3 foot o.c..

**R324.4.5 Load bearing beams and headers.** Load bearing beams and headers shall comply with Table R502.5.1.

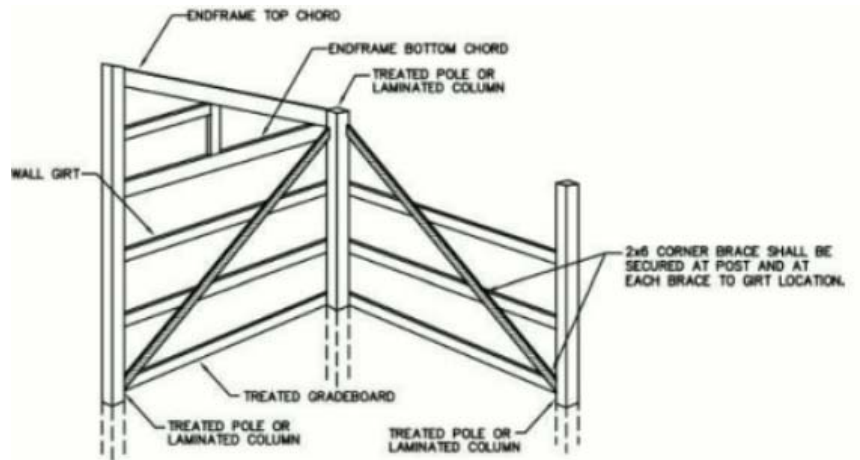
**TABLE R324.4.5 GABLE END HEADER SIZES**

Opening Width (feet)	10	12	16
Header Size (inches)	2 - 2x8	2 - 2x10	2 - 2x12

**Exceptions:**

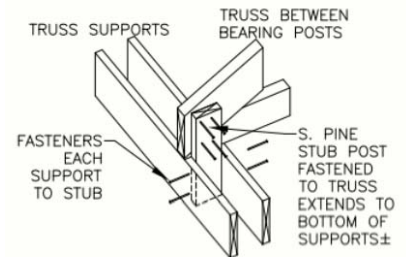
1. Bearing beams are not required if the trusses or ceiling joists and rafters bear directly on the columns.
2. Opening on the gable end walls of post and frame buildings supporting a door or roof total load not exceeding 5 square feet per lineal feet of wall area, headers must be sized per Table R324.4.5.

**R324.4.6 Exterior Structural Sheathing or Wall Bracing.** Provide exterior structural sheathing or wall bracing to resist all racking and shear forces. Bracing must comply with the applicable provisions of section R602.10 or by installing 2x6 diagonal braces between two adjoining columns at 8 feet on center or multiple spacing totaling a minimum of 8 feet on center where the post spacing design is less than 8 feet on center. The diagonal brace shall be placed from the top header or girt to the next adjoining column at the skirt board. The bracing shall be placed installed on each side of the building and shall be a minimum of 25 feet on center and within 12 feet of the end of the building and attached to the wall girts and columns per Table R324.7. Any splices of the diagonal brace required due to excessive length, must lap over two consecutive wall girts.



**R324.4.7 Beams supporting trusses or rafters and ceiling joists attachment to column.** Bearing beams supporting roof trusses or rafters and ceiling joists shall be connected to columns by one of the following methods:

1. Bolts that are 1/2 inch diameter through-bolted to the side of the column.
2. Bolts that are 1/2 inch diameter, directly attached to a 3-ply column notch, enclosing the truss or rafter at the top of column; or
3. Other fasteners with minimum shear or withdraw values stated in Table R324.4.7.



**STUB POST DETAIL**  
NO SCALE - REFER TO FASTENER SCHEDULE FOR FASTENER TYPE & QUANTITY

**R324.4.7.1 Number of fasteners.** The minimum numbers of through bolts or the fasteners with minimum shears or withdraw values required per Table R324.4.7.



**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**TABLE R324.4.7 BEAM OR TRUSS CONNECTION AT COLUMNS MINIMUM FASTENERS OR TOTAL SHEAR OR WITHDRAW VALUES 1 2 3**

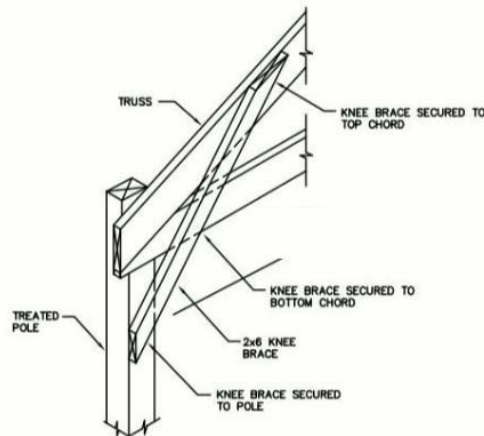
Building width (length of truss) including overhang (feet)	Building width (length of truss) including overhang (feet)						
	24	28	32	36	40	44	48
Shear or withdraw (pounds) 20# snow load	3360	3920	4480	5040	5600	6160	6720
Number of Bolts 20# roof snow load	2	2	2	3	3	3	3
Shear or withdraw (pounds) 30# roof snow load	4320	5040	5760	6480	7200	7920	8640
Number of Bolts 30# roof snow load	2	3	3	3	3	3	3

1. Based upon truss loads of 20 or 30 PSF live or snow load top chord, 10 PSF dead load top chord, 5 PSF live load on the bottom chord and no live load on the bottom chord.
2. Based upon post spacing at intervals not exceeding 8 feet.
3. When beams are attached at each side of the column and fasteners do not extend through both beams such as through-bolts, the required values are one-half the amount shown above for each beam.

**R324.5 Knee bracing.** A 2x6 brace shall extend from the column to the top chord of the truss or rafter adjacent to the post at a 45 degree angle. The vertical distance down from the bottom chord of the truss or ceiling joist to the point where the brace attaches to the post shall be in compliance the Table R324.5 as shown on Figure R324.1 Trusses or rafter must be spaced such that they align with the column intervals. Attachment of knee brace shall be per Table R324.7.

**TABLE R324.5 KNEE BRACE VERTICAL DISTANCE**

Wall Height	Vertical Dimension
8'-0" and 9'-0"	1'-6"
10'-0" and 11'-0"	2'-0"
12'-0" and 13'-0"	3'-0"
14'-0" through 16'-0"	4'-0"



**R324.6 Roof Construction.** Top chord of roof trusses or roof rafters shall be braced with exterior sheathing or metal roof on purlins with bracing.

**R324.6.1 Roof Purlins.** Roof purlins shall be a minimum of 2x4 SPF #2 laid flat of spans up to 4 feet, and 2x4 SPF #2 laid on edge for spans up to 8 feet. Purlin spacing of 2" x 4" shall not exceed 24 inches on center.

**R324.6.2 Roof Bracing.** Provide exterior structural sheathing or bracing to resist racking and shearing forces in roof. Bracing shall occur in the roof on all 4 sides of the building and shall consist of 2x6 diagonal braces perpendicular and parallel to rafters or trusses and attached to the bottom side of rafters or top chords of trusses. These braces shall start at a point just below the first purlin, rafter or truss in from the eave purlin and at each corner column. The brace shall be

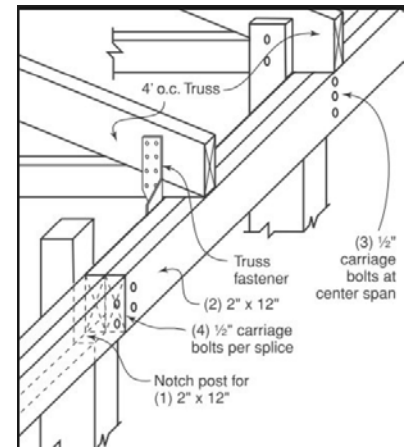
**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

placed on a 45 degree angle and end below the location of a purlin, rafter or truss within 8'-0" in from the wall. If the building width or length exceeds 24'-0" then install additional braces in the same manner. Spacing of braces shall not exceed a maximum spacing of 2 feet on center in any direction.

**R324.7 Attachment details.** Structural fastener details for post and frame buildings shall comply with Table R324.7.

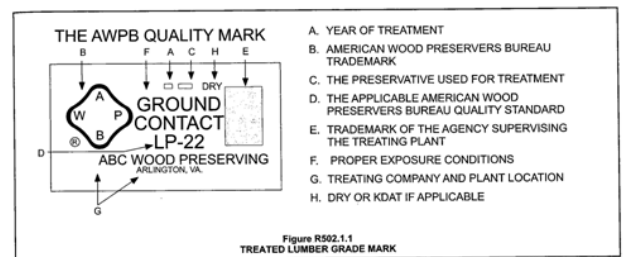
TABLE R324.7 FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

Fastener Schedule for Structural Members		
Description of Building Element	Number and Type of Fastener	Attachment Type
Uplift blocking to column	5 – 16d Hot Dipped Galvanized	Each block
Skirt board to column	2 – 16d Hot Dipped Galvanized	Face nail
Wall girt to column	2 – 16d Hot Dipped Galvanized	Face nail
Diagonal bracing to column	2 – 16d Hot Dipped Galvanized	Toe nail
Diagonal bracing to skirt board	2 – 16d Hot Dipped Galvanized	Face nail
Diagonal bracing to wall girts	2 – 10d Hot Dipped Galvanized	Face nail
Knee brace to column	2 – 10d	Face nail
Knee brace to top chord of truss or rafter	3 – 16d Hot Dipped Galvanized	Face nail
Knee brace to bottom chord of truss or ceiling joist	3 – 10d	Face nail
Roof purlin to truss or rafter with span of 2' or 4'	2 – 16d	Face nail
Roof purlin to truss or rafter with span of 8'	Mechanical fastener with uplift protection greater than 225 lbs	Per manufacturer

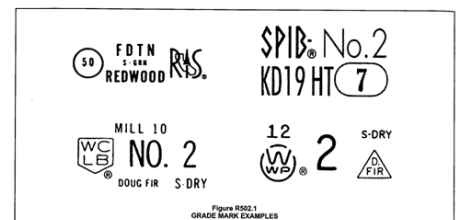


Uplift hanger required at each truss per Figure R324.1 Post and Frame Wall Section

3. **Protection Against Decay.** (R317.1) **Approved naturally durable or pressure preservative treated wood, placed within 18 inches from the ground, shall be used for the following members:** 1. Horizontal members including girders, joists, and decking. 2. Vertical members including posts, poles, and columns when in ground or within 18 inches of ground (R317.1.4). 3. Both horizontal and vertical members comprising the rest of the structure, when placed within 18 inches of the ground. (R317.1)



4. **Quality Mark.** (R317.2) **Lumber and plywood required to be pressure preservative treated shall bear the quality mark of an approved inspection agency that has been approved by an accreditation body that complies with the requirements of the American Lumber Standard Committee Treated Wood Program.** Wood used in the project must be certified by an accredited lumber grader.



5. **Wood Grade.** (R502.1) **All load-bearing lumber shall be identified by the grade mark of a lumber grading or inspection agency which has been approved by an accreditation body that complies with DOC PS 20. (Non-graded, rough-sawn lumber cut at local sawmills or by the homeowner is not approved to be used as load-bearing lumber).**

6. **Fasteners.** (R317.3.1) Fasteners for pressure preservative treated wood shall be of hot-dipped galvanized steel, stainless steel, silicon bronze or copper. Exception: 1/2 inch diameter or greater steel bolts.

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

7. **Remove all vegetation and organic materials below the accessory structure.** (R408.5)
8. **Drainage.** (R401.3) Surface drainage shall be diverted to a storm water conveyance or other approved point of collection so as not to create a hazard. Lots shall be graded to slope water away from the foundation. The grade shall fall a minimum of 6” drop within the first 10 feet.
9. **Allowable girder spans.** (R502.5). The allowable spans of girders fabricated of dimension lumber shall not exceed the values set forth in Tables R502.5(1) and R502.5(2).

**TABLE R502.5(1)**  
**GIRDER SPANS<sup>a</sup> AND HEADER SPANS<sup>a</sup> FOR EXTERIOR BEARING WALLS**  
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir<sup>b</sup> and required number of jack studs

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) <sup>e</sup>																	
		30					50					70							
		Building width <sup>c</sup> (feet)																	
		20		28		36		20		28		36		20		28		36	
Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>		
Roof and ceiling	2-2 x 4	3-6	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1	2-10	1	2-6	1	2-3	1
	2-2 x 6	5-5	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2	4-2	1	3-8	2	3-3	2
	2-2 x 8	6-10	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2	5-4	2	4-7	2	4-1	2
	2-2 x 10	8-5	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2	6-6	2	5-7	2	5-0	2
	2-2 x 12	9-9	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2	7-6	2	6-6	2	5-10	3
	3-2 x 8	8-4	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2	6-8	1	5-9	2	5-2	2
	3-2 x 10	10-6	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2	8-2	2	7-0	2	6-4	2
	3-2 x 12	12-2	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2	9-5	2	8-2	2	7-4	2
	4-2 x 8	9-2	1	8-4	1	7-8	1	8-4	1	7-5	1	6-8	1	7-8	1	6-8	1	5-11	2
	4-2 x 10	11-8	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2	9-5	2	8-2	2	7-3	2
4-2 x 12	14-1	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2	10-11	2	9-5	2	8-5	2	

- Continued -

**TABLE R502.5(1)—continued**  
**GIRDER SPANS<sup>a</sup> AND HEADER SPANS<sup>a</sup> FOR EXTERIOR BEARING WALLS**  
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir<sup>b</sup> and required number of jack studs

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) <sup>e</sup>																	
		30					50					70							
		Building width <sup>c</sup> (feet)																	
		20		28		36		20		28		36		20		28		36	
Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>		
Roof, ceiling, and two clear span floors	2-2 x 10	4-9	2	4-1	3	3-8	3	4-8	2	4-0	3	3-7	3	4-7	3	4-0	3	3-6	3
	2-2 x 12	5-6	3	4-9	3	4-3	3	5-5	3	4-8	3	4-2	3	5-4	3	4-7	3	4-1	4
	3-2 x 8	4-10	2	4-2	2	3-9	2	4-9	2	4-1	2	3-8	2	4-8	2	4-1	2	3-8	2
	3-2 x 10	5-11	2	5-1	2	4-7	3	5-10	2	5-0	2	4-6	3	5-9	2	4-11	2	4-5	3
	3-2 x 12	6-10	2	5-11	3	5-4	3	6-9	2	5-10	3	5-3	3	6-8	2	5-9	3	5-2	3
	4-2 x 8	5-7	2	4-10	2	4-4	2	5-6	2	4-9	2	4-3	2	5-5	2	4-8	2	4-2	2
	4-2 x 10	6-10	2	5-11	2	5-3	2	6-9	2	5-10	2	5-2	2	6-7	2	5-9	2	5-1	2
4-2 x 12	7-11	2	6-10	2	6-2	3	7-9	2	6-9	2	6-0	3	7-8	2	6-8	2	5-11	3	

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

- a. Spans are given in feet and inches.
- b. Tabulated values assume #2 grade lumber.
- c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.
- e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

❖ In addition to providing the allowable spans for girders and headers, this table lists the number of jack studs required to support the girder or header. The header studs (jack studs) on which the headers rest should be continuous from the header to the sill plate of the wall. Cutting the header stud to support a sill is not allowed. Headers should be adequately nailed together and to the wall studs. The table is broken down into five loading conditions, illustrated in Commentary Figure R502.5(2).



**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**TABLE R502.5(2)**  
**GIRDER SPANS<sup>a</sup> AND HEADER SPANS<sup>a</sup> FOR INTERIOR BEARING WALLS**  
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir<sup>b</sup> and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING Width <sup>c</sup> (feet)					
		20		28		36	
		Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>
One floor only	2-2 x 4	3-1	1	2-8	1	2-5	1
	2-2 x 6	4-6	1	3-11	1	3-6	1
	2-2 x 8	5-9	1	5-0	2	4-5	2
	2-2 x 10	7-0	2	6-1	2	5-5	2
	2-2 x 12	8-1	2	7-0	2	6-3	2
	3-2 x 8	7-2	1	6-3	1	5-7	2
	3-2 x 10	8-9	1	7-7	2	6-9	2
	3-2 x 12	10-2	2	8-10	2	7-10	2
	4-2 x 8	9-0	1	7-8	1	6-9	1
	4-2 x 10	10-1	1	8-9	1	7-10	2
Two floors	2-2 x 4	2-2	1	1-10	1	1-7	1
	2-2 x 6	3-2	2	2-9	2	2-5	2
	2-2 x 8	4-1	2	3-6	2	3-2	2
	2-2 x 10	4-11	2	4-3	2	3-10	3
	2-2 x 12	5-9	2	5-0	3	4-5	3
	3-2 x 8	5-1	2	4-5	2	3-11	2
	3-2 x 10	6-2	2	5-4	2	4-10	2
	3-2 x 12	7-2	2	6-3	2	5-7	3
	4-2 x 8	6-1	1	5-3	2	4-8	2
	4-2 x 10	7-2	2	6-2	2	5-6	2
4-2 x 12	8-4	2	7-2	2	6-5	2	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

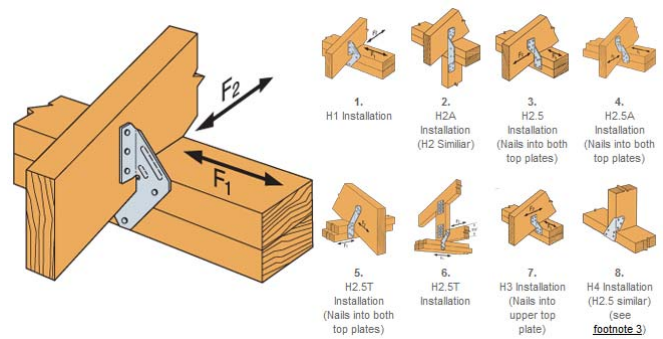
b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

- 10. Allowable 2”x 4” roof purlin spacing (for spacing of wood board members to top of roof rafters and directly under metal roofing) shall be limited to: 24” on center, maximum.
- 11. **Girder – to – Post Connections.** The girder/beams are required to be bolted into the post/pole using properly sized anchors. (Nails are not an approved substitute for a lag screw or combination through bolt). Such attachment shall not be accomplished by use of toenails or nails subject to withdrawal. (Use combination through bolts approved for use with pressure treated wood). (R324.4.7)
- 12. Roof rafters into the side of a girder/beam require metal hangers or minimum of setting on 2” x 2” ledger. (502.6.2).
- 13. Hurricane ties required at roof trusses to top girders and/or at roof rafters to top girders. Uplift Resistance. (Table R324.4.7). Roof Purlin to truss or rafter with span of 8’. Mechanical fastener with uplift protection greater than 225 lbs.

**Hurricane Tie Selection**



**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

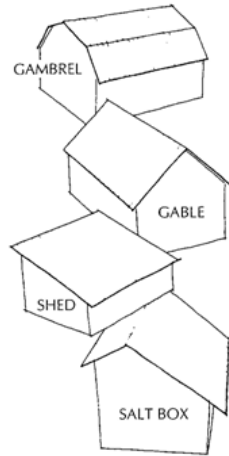
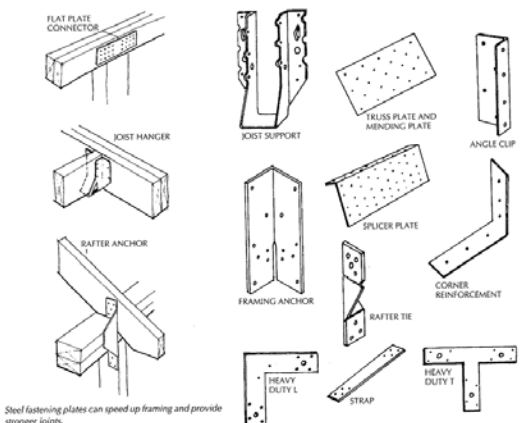
14. **Roof trusses.** (R802.10) When using roof trusses, the trusses must be designed in accordance with accepted engineering practice. The design and manufacture of metal-plated-connected wood trusses shall comply with ANSI/TPI-1.

- The truss design drawings shall be prepared by a registered professional where required by the statutes of the jurisdiction in which the project is to be constructed in accordance with Section R106.1. (This applies in Kentucky).
- The spacing of the trusses shall be specified on the drawings. The truss drawings shall be on-site available to the building inspector. *The construction of home built trusses is not approved by the Kentucky Building Code.*
- Bracing shall be as per drawing, if none shown then follow BCSI 1-03 (502.11.2). No alteration of trusses without approval of registered design professional. (502.11.3)

**NOTICE: A pole barn/pole building structure built in noncompliance with the minimum requirements as described in this document shall cause the owner to be required to present written verification from a registered Kentucky structural engineer, including the registered number of record of the structural engineer, verifying the alternate design meets the Climactic and Design Criteria (R301.2) for Hardin County. (R301.2). The construction methods as described in this document are not the only way to build a structure and meet the code, but an alternative method cannot be verified within the code as written, and therefore a design professional’s written report will be required. (R301.3)**

R301.1.3. “When a building of otherwise conventional construction contains structural elements exceeding the limits of Section R301 or otherwise not conforming to this code, these elements shall be designed in accordance with accepted engineering practice.” “A building may contain structural elements that are either unconventional or exceed the prescriptive limitations of the code. This is acceptable if these elements are designed in accordance with accepted engineering practice by a design professional.” (2012 IRC Code, Pg. 25)

**TYPES OF METAL PLATE CONNECTORS**



Not all pole buildings use trusses, and rafter-framed buildings offer more versatility. Any number of different roof styles can be created with rafters.

**Bibliography**

- Figure; Call Before You Dig symbol: <http://www.call811.com/>, this handout page 1 of 13
- Figure R502.1.1: Treated Lumber Grade Mark, graphic drawing; *2012 International Residential Code Commentary*; this handout page 7 of 13.
- Figure R502.1.: Grade Mark Examples, graphic drawing; *2012 International Residential Code Commentary*; this handout page 7 of 13.
- Hurricane Tie Selection; Figure: Hurricane Ties; Samples :[http://www.strongtie.com/products\\_connectors/H.asp](http://www.strongtie.com/products_connectors/H.asp), this handout page 9 of 13.
- Figure: Not all Pole Buildings Use Trusses...: “Monte Burch’s POLE BUILDING Projects”; Storey Books; 1993; this handout page 10 of 13.
- Figure: Types of Metal Plate Connectors; Steel fastening plates...: “Monte Burch’s POLE BUILDING Projects”; Storey Books; 1993; this handout page 10 of 13

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**A. Special Conditions:**

**Other Inspection Related Information:**

- a. **Access required to project is to be furnished by Owner (R109.3), Owner required to call for inspections.**
  - b. It shall be the duty of the permit holder to provide access to and means for inspection of such work for the required inspections. It shall be the duty of the permit holder or their agent to notify the building official that such work is ready for inspection.
  - c. Inspections are scheduled Monday through Friday by contacting the Hardin County Planning & Development Commission at (270) 769-5479 before 4:00 PM on the previous day before the inspection is needed. The homeowner is responsible for calling to request the inspection. Inspection and approval is required prior to covering any work. (R109.3), (R109.4).
  - d. Provide the name the permit was issued in and the street location of the project, or the lot number and subdivision name and the phone number of a contact person when calling in for inspections.
  - e. If the inspector needs to return to the site to verify corrections of code violations found at time of framing inspection, a minimum \$50.00 Reinspection fee is required to be paid before the Reinspection can be scheduled.
  - f. No Reinspection on the same phase of construction shall be done in the same 24-hour period.
  - g. The building inspector always leaves a written copy of the code violations or an approval sheet at the jobsite (*typically near the attached garage side-hinged door entry into the interior of the project*). ***If no inspection sheet is visible, then you have not yet received your inspection. Do not install drywall or any other interior finishes. Call the office to check on the status of your inspection. We do not guarantee times; we do relate to you the date the inspection is scheduled to be made.***
- 15. Permits posted on site.** All required inspections must be completed and signed off as approved. Previous footing inspections and corrections list completed. Permit must be placed where it is visible from the street. (R105.7). Permit must remain posted until occupancy permit has been issued. All building permit fees, inspection fees and re-inspection fees must have been paid and up-to-date, prior to the framing inspection being made by this office.
- 16. Floodplain management.** All requirements of the state and local flood plain management program for Hardin County must have been installed and completed, and verified and signed off as required by the state and by the Hardin County Engineer office. This may require the completion of an Elevation Certificate. (R106.1.3).
- 17. Planning & Zoning Requirements completed.** All on-site and off-site development associated with the structure must be completed and the structure be ready for occupancy or its intended use. (HCDGS). ***At the framing inspection the inspector will be checking to verify these have been started.***
- 18. Driveway Encroachment Permit.** The road tile at new driveway entrance has been properly sized by the road department and installed and is being maintained and the ends are clear and fully operational. (Hardin County Road Department Requirement) ***At the framing inspection the inspector will be checking to verify these have been started.***
- 19. Storm Water Runoff Ordinances and Erosion Prevention and Sediment Control Ordinances.** There must be at least 50 lf long by 20 lf wide of graveled driveway entrance onto site and installed as described as a stabilized construction entrance. ***Where needed, the silt fences are installed and being maintained until grass is fully established on bare yard/lot areas, at the framing inspection the inspector will be checking to verify these have been started.*** Fully established meaning at least 70% stabilization coverage (utilizing mats), are visible. (Storm Water Runoff Ordinances and Erosion Prevention and Sediment Control Ordinances).

**B. Definitions.**

## **POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

The building code now has a specific section which addresses “Pole Barns” or “Post and Frame Structures” all in one Section 324, the code sections defined in this document apply to these types of structures:

- Agricultural buildings, barns, carports, livestock shelters, private garages, retaining walls, sheds, and stables are determined to be occupancy Use Group U in the 2013 Kentucky Building Code (Sec. B312).
- Open sided carports, shelters, garages, workshops, small agricultural animal barns and shelters, equipment sheds, storage buildings, etc., are determined to be residential accessory structures per the 2013 Kentucky Residential Code. ( Sec. R202).

The scope of this document covers a minimal size one-story structure on a flat prepared subgrade with soils bearing capacity of 2000 psi or better. Other conditions such as: poor soils; sloping land; lofts or second story wood floors; etc. added to a building, or other conditions not described in this document, will require other code requirements not addressed in this document. The building must meet the 2013 Kentucky Residential Code.

**20. Accessory Structure.** (R202) Definitions. **A structure not greater than 3,000 square feet in floor area, and not over two stories in height, the use of which is customarily accessory to and incidental to that of the dwelling(s) and which is located on the same lot.** (*Note: This term describes structures commonly used as garages, carports, cabanas, storage sheds, playhouses, tool sheds and garden structures. The structures all contain uses that are incidental to the primary use, which is the dwelling unit, and the activities that take place in accessory structures occur as a result of the primary building. Their use is secondary or minor in importance to the primary residence.*) ***In order to avoid having to build fire resistant rated walls, rated for exposure to fire from both sides, locate the accessory structure no closer than five feet from any other structure on the same lot. (Table R302.1(1)).***

**21. Applicability** (R101.2 Scope) The 2013 Kentucky Residential Code applies to one-and-two family dwellings up to 3 stories above grade with separate means of egress and their accessory structures.

### **C. Building Permit Required and Related Inspections Information**

The accessory structure must comply with the building setback requirements from property lines as well as from utility and drainage easements as detailed in the *Hardin County, Kentucky, Development Guidance System* (zoning ordinance). When applying for the permit, the Owner will provide to this office the distance from all sides of the new structure to the nearest property lines. The permit clerk will assist the owner in determining the minimum setback distances at time of applying for the building permit. Structures cannot be located closer to the property lines or streets than the setback distances allow. A residential accessory structure would also be required to meet the limits of the subdivision restrictions which govern the property it is located on. **When in Larue County use the *Land of Lincoln Planning & Zoning* guidelines for the setbacks.**

**22. An approved building permit is required to be obtained from this office before the accessory structure is placed, delivered, installed, set, constructed or built on the property.** (R105.1). A permit is not valid until the fees prescribed by law have been paid. (R108.1). The applicant must state on the permit application, what the use of the building will be for.

**Building inspections are required to be made on the project when a building permit is issued. It is the duty of the permit holder to notify the building inspector when work is ready for inspection at the various stages for the footing, framing, and final inspection.** It is the duty of the permit holder to provide access to and means for inspection of such work for the inspections. (R109.3), & (R109.4). Inspections are made on a daily basis Monday through Friday only. The inspection must be requested 24 hours in advance of the weekday date the inspection is requested. Inspection calls received after 9:00 a.m. will be scheduled for the next business day.

**Footing inspection (foundation inspection) must be approved, prior to pouring concrete and prior to backfilling posts.** (R109.1.1) At the time of requesting the framing inspection, the checklist begins with the assumption the required Footing/Foundation Inspection has already been requested by the owner and approved by this office. If there are any violations left not corrected on the footing inspection, the framing inspection cannot be performed.

**POLE BARN PROJECTS; POST AND FRAME STRUCTURES**

**A framing inspection** is required after electric or any utility has been roughed-in and has an approved inspection from the electrical or utility inspector, and prior to installing any interior finish material such as plywood, metal, drywall, etc. If there are any violations left not corrected on the framing inspection, the final inspection cannot be performed.

**A Final Inspection is required** after electric or any utility has been final inspected and has an approved inspection from the electrical or utility inspector, and prior to occupying or using the building for any use. **A final inspection shall be made and must be signed-off and approved before the building is occupied or used for any purpose.**( R110.1)

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**Building Code Clarification Handouts Available Listing, Effective January 1, 2014 (unless otherwise stated)**