



**CASS COUNTY, MISSOURI**  
**BUILDING CODES DEPARTMENT**  
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Last Updated December 28, 2009

These Items will be in Effect January 1, 2010

## **POST FRAME BUILDING STANDARDS**

- 201.3        SCOPE. The provisions of this section shall apply to the design and construction of post frame buildings or additions thereto, intended for agricultural or residential accessory uses on tracts of property that are zoned for residential or agricultural uses. The provisions of this article are deemed to comply with the spirit and intent of the minimum design and construction provisions of the 2006 Edition of the International Building Code.
- 201.3.1     LIMITATIONS. Buildings designed and constructed under these provisions shall not exceed limitations of this Section.  
Buildings that exceed the limitations of Sections 201.3.1.1 through 201.3.1.6 shall be designed in accordance with requirements of the 2006 editions of the International Building Code by a registered Missouri structural engineer to practice in the design of buildings.
- 201.3.1.1    AREA. Buildings shall not exceed 3,000 square feet in area
- 201.3.1.2    HEIGHT. The sidewall height of buildings designed under these provisions shall not exceed 14 feet or one story in height.
- 201.3.1.3    BUILDING DIMENSIONS. The maximum width dimension of a building designed under these provisions shall not exceed 40 feet.
- 201.3.1.4    BRACED WALL. Buildings shall be provided with exterior braced walls. Bracing shall be located in the sidewalls at each corner by means of a nominal 2 inch by 4 inch diagonal brace or other approved bracing.
- 201.3.1.5    OPENINGS IN EXTERIOR WALLS. No single opening for doors, windows or other purposes that exceed 16 feet in width shall be placed in exterior walls.  
  
Buildings that are open on one side shall have posts embedded 2 feet deeper than the depth required by Section 201.3.3.3 or shall be provided with an acceptable brace for wind resistance.
- 201.3.1.6    EXIT REQUIRED. At least one exit door complying with this section shall be provided. Exit doors shall be of the pivoted or side hinged swinging type. The exit door opening shall be of a size to permit the installation of a door not less than 3 feet (914 mm) in width and not less than 6 feet 8 inches (2032 mm) in height. The exit door shall be openable from the inside without the use of a key or any special knowledge or special effort.

### **201.3.2 DEFINITIONS:**

**BRACED WALL** is a wall that has been provided with diagonal bracing which meets the requirements of Section 201.3.1.4 of this code.

**BUTT ENCASED** is concrete encasement of a pole or post at the lower 12 inches of its embedment in the earth.

**FOOTING** is that portion of the foundation that spreads and transmits loads directly to the soil.

**GIRT** is the horizontal wall framing members that span between posts and are used to support the exterior wall covering.

**POLE OR POST** is a preservative treated round, square or rectangular wood member, that is solid sawn or laminated, and is intended to be embedded in the ground to support building structural loads and transmit the loads to the footing.

**PURLIN** is the structural members that span between rafters or trusses used to attach and support metal roof coverings and transfer the roof loads to the rafters or trusses.



201.3.3.1 ROOF LOADS.

LIVE LOAD. The roof snow load shall be 20 pounds per square foot.

DEAD LOAD. The roof dead load shall be 4 lbs. per square foot for roofs that utilize a metal roof covering. Dead Loads of 7 lbs. per square foot shall be used if wood shakes, wood shingles or asphalt composition shingles are utilized. If other roof coverings are used the loading specified by the roof covering manufacturer shall apply.

WIND LOAD. Buildings designed and constructed under these provisions shall be considered to be designed for a 90 mph wind located in an exposure C wind zone.

201.3.3.1.1 FOUNDATION DESIGN. Foundations for buildings designed and constructed under provisions of these requirements shall be designed and installed in accordance with this section. Foundations shall be designed to support the imposed load and be capable of resisting wind uplift and overturning. The loading requirements that shall be applicable for buildings designed and constructed under these provisions shall be as specified in this section.

201.3.3.2 FOUNDATION DIAMETER. The diameter of holes for pole or post foundations and the required footing thickness shall be in accordance with Table 201.3.3.2 Footings shall be placed to a depth so that building loads are supported on natural undisturbed soils. Unless unusual site conditions exist, soil shall be assumed to have a 2,000 p.s.f. bearing capacity.

**TABLE 201.3.3.2**

**MINIMUM FOOTING DIMENSIONS**

BUILDING WIDTH	POST SPACING	FOOTING THICKNESS	FOOTING DIAMETER
24	8 to 10 Feet	8 Inches	15 Inches
30	8 to 10 Feet	8 Inches	17 Inches
36	8 to 10 Feet	8 Inches	18 Inches
40	8 to 10 Feet	8 Inches	18 Inches

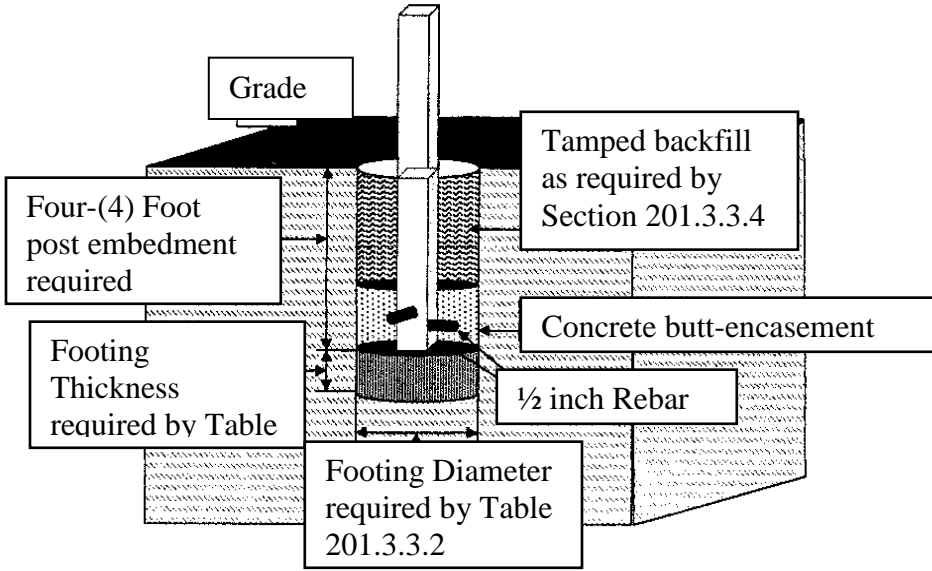
201.3.3.3 POLE OR POST EMBEDMENT. Poles or posts shall be embedded in the earth to a minimum depth of 4 feet (1219 mm).

201.3.3.3.1 SHALLOW POLE OR POST EMBEDMENT. When it is necessary to use a pole or post embedment depth of less than 40 inches but not less than 30 inches due to rock or other local site conditions, knee bracing shall be provided and the post foundation hole shall be backfilled to grade with concrete. Embedment depth of less than 30 inches is not allowed under this standard.

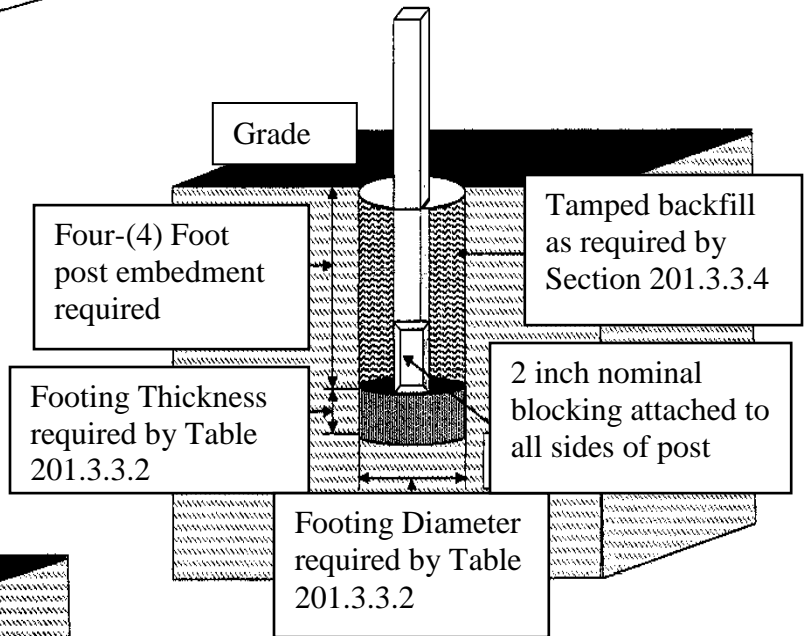
201.3.3.4 BACKFILL. Footings of concrete or other approved materials shall be placed under poles or posts. Footings shall have a minimum thickness in accordance with Table 201.3.3.2. Posts shall be either butt encased with concrete, or be fully embedded with concrete, or be provided with other approved means to provide for resistance to wind uplift. If posts are provided with butt encasement or blocked anchors, the remaining annular space of the post foundation holes shall be backfilled by firmly tamping clean soil or sand in maximum 8-inch layers.

See Figure.1 (a) through (c) for examples of allowed methods of providing uplift resistance and backfilling post holes.

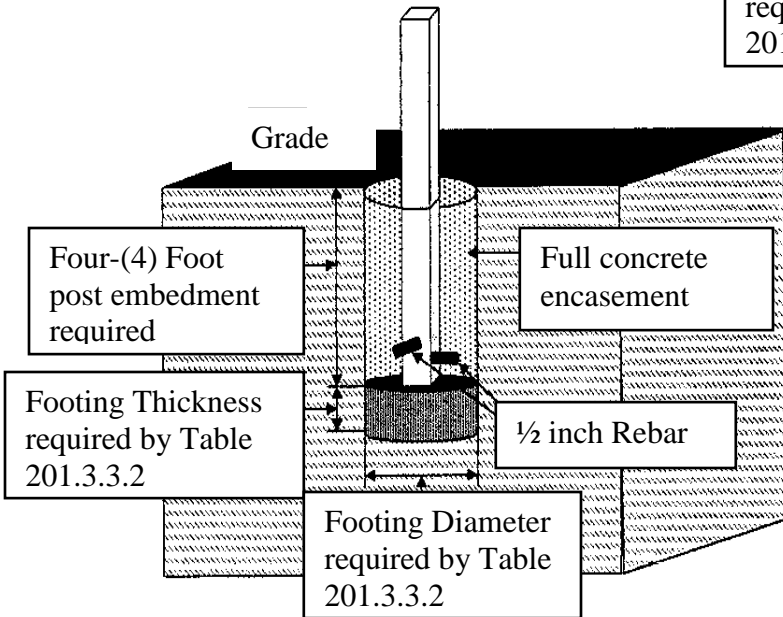
Figure 1 a through c  
Examples of Post Embedment



**Figure (a)**  
**Butt-Cased**



**Figure (b)**  
**Blocked Anchor**



**Figure (c)**  
**Full Concrete Casement**

- 201.3.3.5 CONCRETE PLACEMENT. Concrete used for footings or post encasement shall be placed as wet mix or dry mix.
- 201.3.3.6 POLE OR POST ANCHOR. Poles or posts shall be anchored to the encasing concrete whether butt encased or fully encased, with a minimum 1/2 inch reinforcing bar placed through a drilled hole in the pole or post. The rebar shall have a minimum one (1) inch of concrete cover from the bottom and top of the encasing concrete. Blocked anchors shall be provided when the backfill of the annular space consists of earth, sand or gravel tamped in 8 inch layers. Blocked anchors shall be of the same dimension as the base of the post.
- 201.3.3.7 POLE OR POST SIZE AND SPACING. Poles or posts may be solid sawn or laminated. Poles or posts shall be of a minimum dimension as required by Table 201.3.3.7 based upon the building height and spacing of posts. The spacing of poles or posts shall not exceed the maximum shown in Table 201.3.3.7 for the dimension of post that will be used.

**WOOD SUBJECT TO DECAY OR TERMITE DAMAGE**

- 201.3.3.8 WOOD EMBEDDED IN GROUND OR CONCRETE. Wood embedded in the ground or indirect contact with the earth and used for the support of permanent structures shall be treated for ground contact. Wood supporting permanent structures that are embedded in concrete in direct contact with earth or embedded in concrete exposed to the weather shall be treated for ground contact. Wood which is in contact with the ground shall be treated for ground contact. All treated wood shall bear a stamp from an approved agency identifying the treatment retention of the member.

**NOTE:** It is recommended that any wood that is embedded in the earth or embedded in concrete that is in direct contact with the earth be pressure preservatively-treated to a retention level of 0.6 lbs. per cubic foot in accordance with AWPA Standard C22.

- 201.3.3.9 WOOD IN CONTACT WITH THE EARTH OR SUBJECT TO WATER SPLASH. Wood that is in contact with the ground or is located within 18 inches of the ground surface shall be pressure preservatively-treated or wood of natural resistance to decay and termites.

**TABLE 201.3.3.7**

**POST SIZE AND SPACING REQUIREMENTS**

	<b>EFFECTIVE BUILDING HEIGHT IN FEET<sup>1</sup></b>			
	<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>
<b>POST SIZE<sup>2</sup></b>	<b>POLE OR POST SPACING IN FEET</b>			
<b>Solid Sawn</b>				
3.0 X 5.5	7	6	4	4
4 X 4 Nominal	7	6	4	4
4 X 6 Nominal	15	12	9	8
6 X 6 Nominal	15	15	15	15
<b>Laminated</b>				
2-2X6 Laminated	7	6	4	4
3-2X6 Laminated	15	14	10.5	10
4-2X8 Laminated	16	16	16	16

<sup>1</sup> For roof slopes 4:12 or less, the effective height is the vertical distance from grade level to the eave. For roof slopes greater than 4:12 the effective building height is the vertical distance from grade level to the eave, plus one half of the roof height.

<sup>2</sup> The larger post dimension shall be in the same direction of the building width.

- 201.3.4 GIRT FRAMING. When siding is to be attached to the exterior walls of pole or post framed buildings, wall girts shall be installed. Wall girts shall be of a minimum size for the span as required by Table 201.3.4

GIRT NAILING. Girts shall be fastened to the posts using 16d ring shank hot dipped galvanized nails or other approved fasteners.

**Table 201.3.4**

**WALL GIRT SPANS**

<b>Girt Span</b>		
<b>8 feet</b>	<b>10 feet</b>	<b>12 feet</b>
2X4 24 inches O.C. 2X6 36 inches O.C.	2X6 36 inches O.C.	2X6 36 inches O.C.

- 201.3.4.1 BRACING. Exterior sidewalls shall be braced at building corners. Braces shall be minimum 2X4 nominal dimension lumber installed diagonally or be of other approved bracing materials.
- 201.3.4.2 HEADERS AND BEAMS. Headers or beams required to support building loads shall be designed to safely carry the imposed loads.
- 201.3.4.3 BEAM SUPPORT. Beams, headers or girders that are used to support roof framing shall be supported by notches in the poles or posts and shall be secured by ½ inch diameter bolts secured with washers and nuts or ½ inch by 4 ½ inch lags.
- 201.3.4.4 FASTENERS. Fasteners for pressure preservatively-treated wood and fasteners used in locations exposed to weather shall be of hot-dipped zinc galvanized, aluminum alloy wire fasteners or stainless steel fasteners.
- 201.3.4.5 EXTERIOR WALL COVERING. Exterior wall coverings, when provided, shall be of an approved weather-resistant material. Steel panel exterior wall coverings shall be of minimum 29 gage.

**ROOF/CEILING CONSTRUCTION**

- 201.3.5 GENERAL. Roof framing may be of conventional light frame construction as allowed by Chapter 23 of the International Building Code, 2006 edition or may be of trusses as specified by Section 201.3.5.1 of this code or may be of other alternate designs that have been designed by a professional engineer licensed by the State of Missouri.
- 201.3.5.1 TRUSSES. Trusses may be site built or be shop fabricated. Trusses shall be designed by a professional engineer licensed by the State of Missouri to practice in the design of buildings.
- 201.3.5.2 CONVENTIONAL FRAMING. The framing details for conventional roof construction shall conform to the requirements of Chapter 23 of the International Building Code, 2006 edition.
- 201.3.5.2.1 ROOF-MEMBERS-TO-BUILDING-FRAME-TIE-Blocking-straps approved framing anchors or mechanical fasteners shall be installed from the side of the roof-framing member to the exterior post or other supporting members. Tie straps shall be 1 1/8 -inch (28.6 mm) by 0.036-inch (0.91 mm) (No. 20 gage) sheet steel and shall be corrosion resistant.
- 201.3.5.3 PURLINS. Purlins shall be installed with the wide dimension perpendicular to the load that it supports. Purlins shall be supported on top of the trusses or shall be provided with approved hangers. The span of purlins shall not exceed the values specified in Table 201.3.5.3
- 201.3.5.4 CEILINGS. When finished ceilings are to be installed the trusses or ceiling joist shall be designed to carry the imposed loads. Ceilings are to be framed in accordance with the conventional light frame provisions of chapter 23 of the International Building Code 2006 edition.
- 201.3.5.5 ROOF COVERING. The roof covering shall be of an approved material as specified by Chapter 15 of the International Building Code, 2006 edition.

**TABLE 201.3.5.3  
PURLIN SPANS**  
(Based on Purlin Spacing of 24 inches Center to Center)

GRADE	DIMENSION	MAXIMUM SPAN (feet)
#1	2X4	8' 6"
	2X6	12' 3"
	2X8	15'9"
#2	2X4	8'
	2X6	12'
	2X8	15'
#3	2X4	6'
	2X6	9'
	2X8	11'

FPN: The spans given in this table are based upon use of Spruce-Pine-Fir design values. Spans may vary depending on the lumber species, which is used.