

Basic Pole Barn

Owner's Name _____

Address _____

Contractor Name (if applicable) _____

Roof Truss Load _____



Please label north

Truss Carrier (Girt) Size _____

Show location and size of all doors and windows

Pole Size and Spacing

Footing Size

Width _____ X Thickness _____

Siding Material _____

Roof Material _____

Floor Material _____

Please choose one

Floor drain _____

Floor sloped to door _____

Building Size

_____ Sq. Ft.

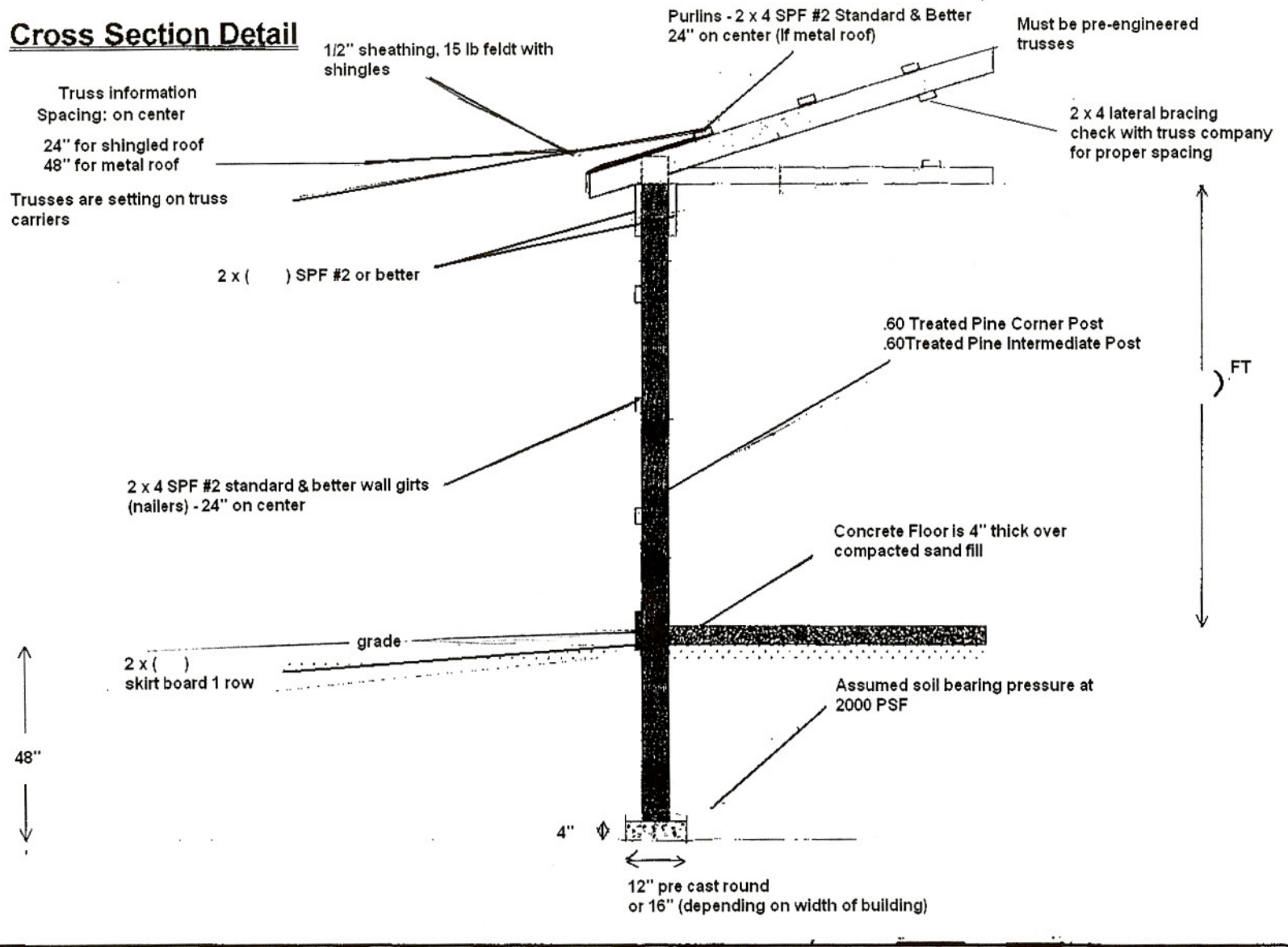
Electrical to be installed? Yes _____
No _____

Heating to be installed? Yes _____
No _____

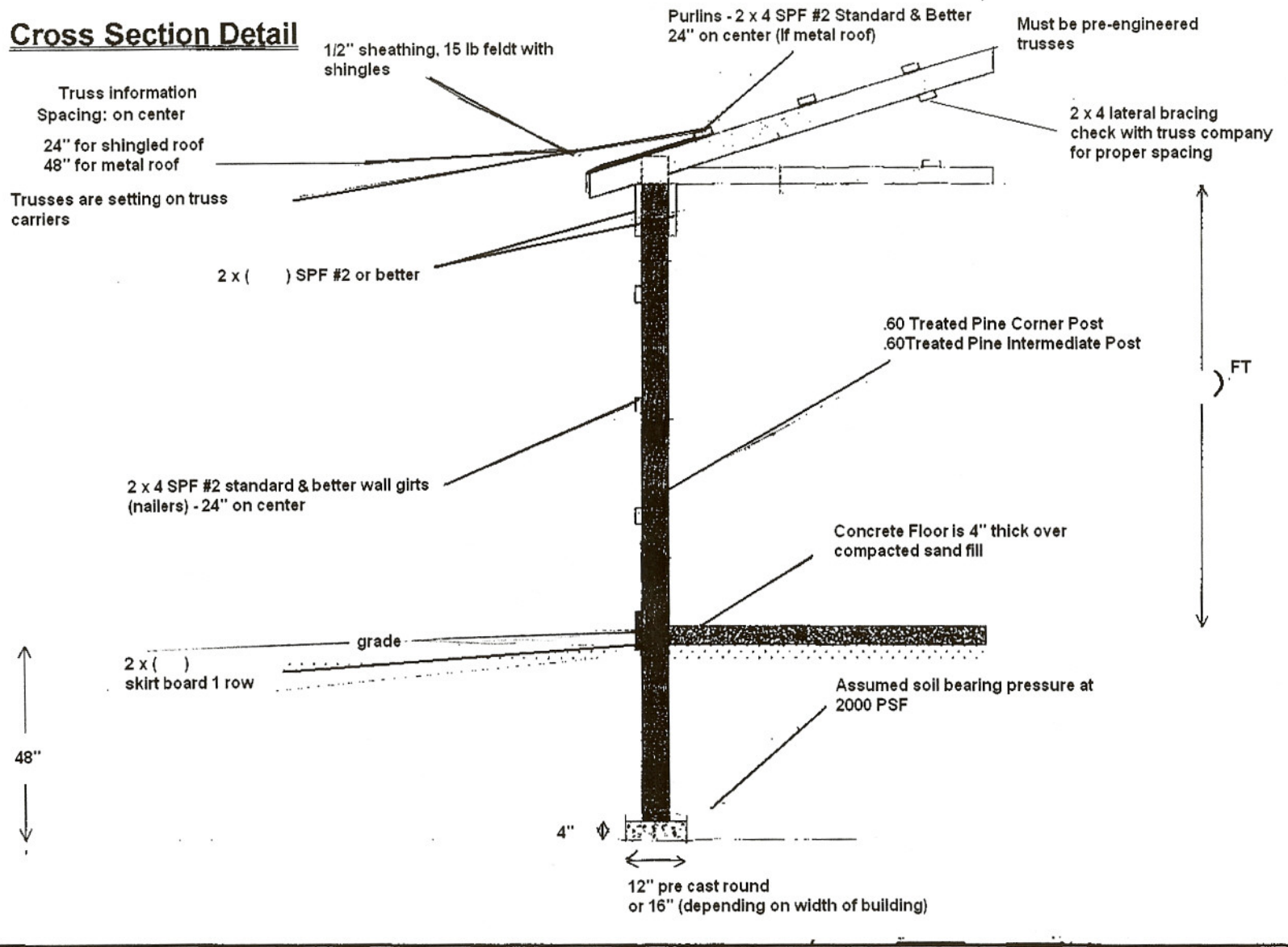
Plumbing to be installed? Yes _____
No _____

Interior to be finished? Yes _____
No _____

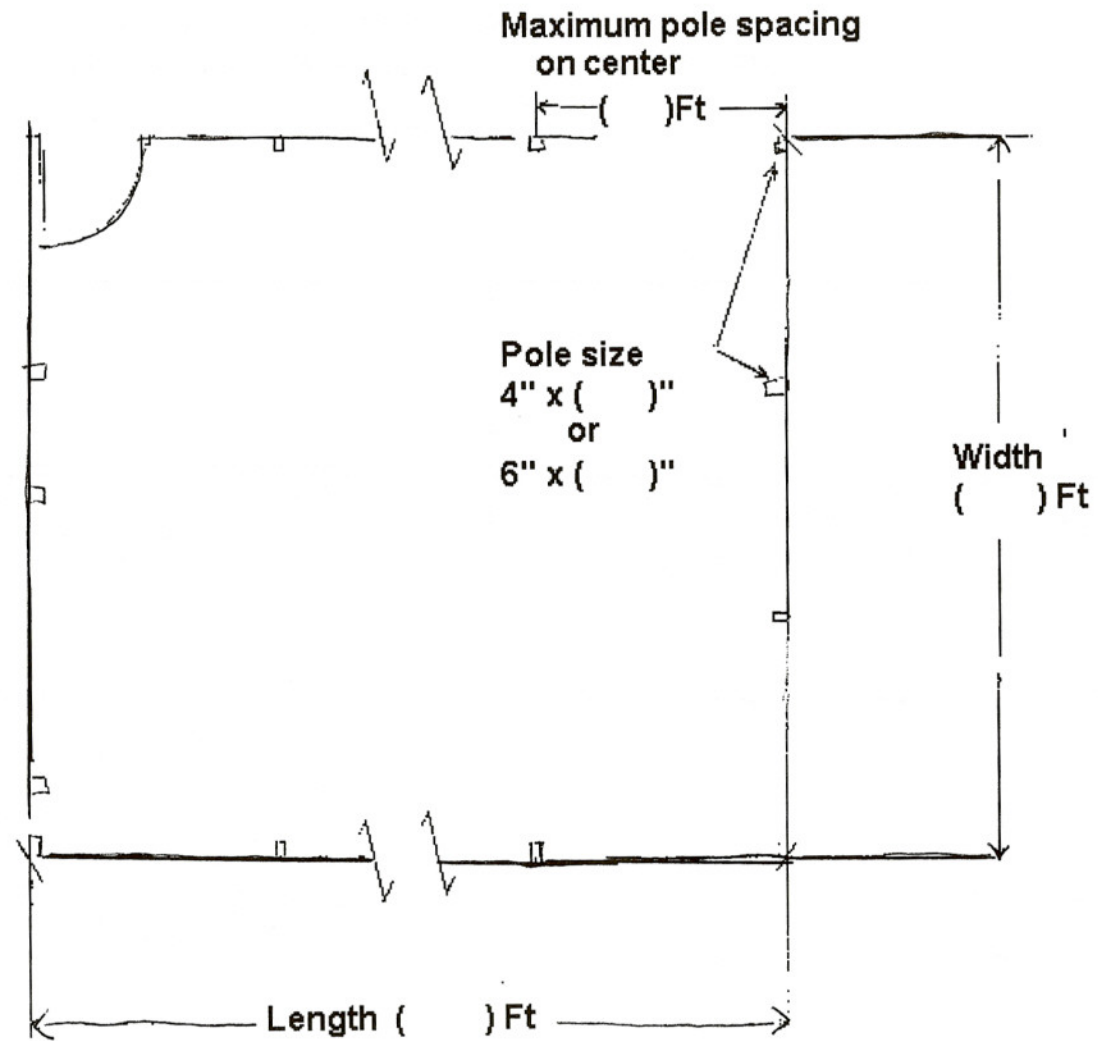
Cross Section Detail

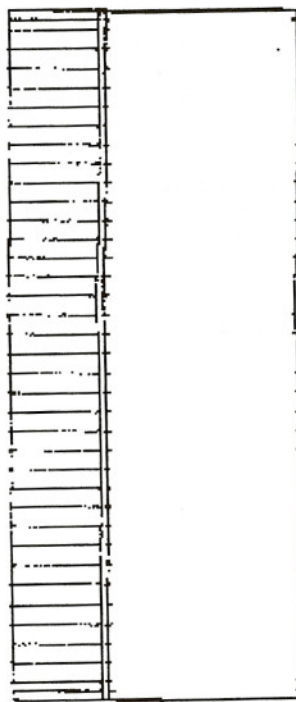
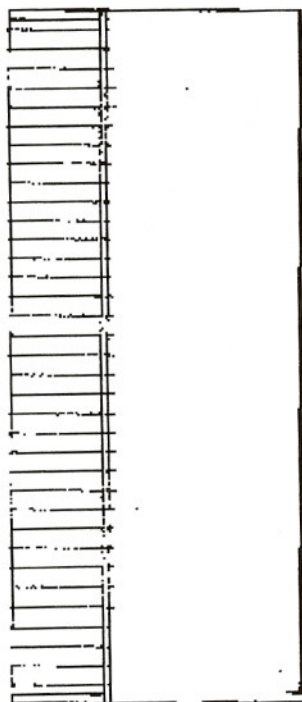
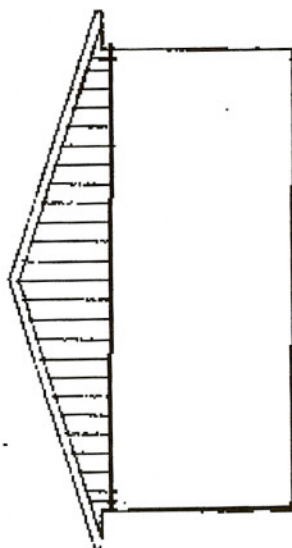
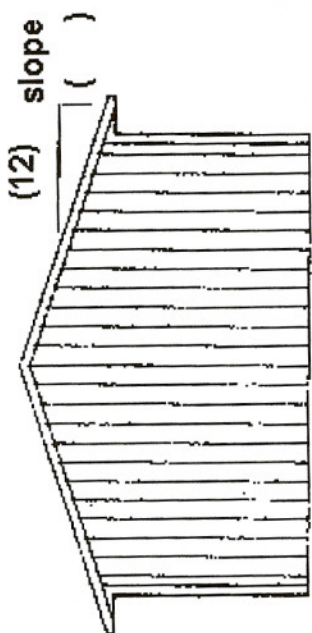


Cross Section Detail



Pole Layout





ELEVATIONS

Please label - north, south, west and east sides
also show where all doors and windows will be

POLE FRAME CONSTRUCTION - SUGGESTED DETAILS

The following information was prepared by James S. Boyd, Agricultural Engineer, Michigan State University in December 1997. Information was verified in February 2005 for accuracy.

In pole frame construction, poles are placed four feet in the ground around the perimeter of the building. Concrete pads are poured into the holes before the poles are set. These poles and pads replace concrete block or concrete foundations.

The poles anchor the structure to the ground, and the side walls and roof framing are nailed solidly to the poles. This type of construction provides flexibility in the use of the building and can be used with many attractive exterior treatments.

Poles

Size: Poles provide the structural support for this type of construction. The size of the poles should conform to Table I depending on the eave height, width of building, and the spacing of the poles.

Treatment: All poles used as main support poles should conform to the latest edition of the American Wood Preservers Association Standards. Poles should be grade stamped to show both the type of preservative and minimum retention as shown in the following table:

<u>Preservative</u>	<u>Minimum Retention</u>
Creosote AWPS PI	10.0 lb per cubic foot
Pentachlorophenol AWPA P8	0.5 lb per cubic foot
Cooper Chrome Arsenate AWPA LP22	0.42 lb per cubic foot

Depth of Embedment: All poles should be set in the ground a minimum of one-fourth (1/4) its length, but at least a minimum of four (4) feet.

Pads: A concrete pad should be placed below the depth of embedment of the pole. Only properly proportioned and mixed concrete with a test strength of 3000 psi must be used. It should be placed in the bottom of the hole and obtain its initial set before the pole is set.

Size: The size of the pad should conform to Table II. The depth of the pad should be one-half (1/2) the diameter of the pad. All holes should be dug deep enough to provide for depth of embedment plus the depth of the pad.

**Table I
Pole Selection**

Eave Height	8' Pole Spacing	12' Pole Spacing	16' Pole Spacing
8 feet	4" or 4x4 thru 40' span	4" or 4x6 thru 40' span	4" or 4x6R thru 30' span
	4" or 4x6 thru 60' span	4" or 4x6R thru 60' span	5" or 4x6R thru 50' span 5" or 6x6 thru 60' span
10 feet	4" or 4x6 thru 40' span	5" or 6x6 thru 50' span	5" or 6x6R thru 40' span
	4" or 4x6R thru 50' span	5" or 6x6R thru 60' span	6" thru 60' span
	5" or 4x6R thru 60' span		
12 feet	4" or 6x6 thru 40' span	5" thru 60' span	6" thru 60' span
	5" or 6x6 thru 50' span		
	5" or 6x6R thru 60' span		
14 feet	5" thru 60' span	5" thru 50' span	6" thru 50' span
		6" thru 60' span	6-1/2" thru 60' span

"R" after a pole size refers to a rough cut pole with full dimension. Size for round poles is top diameter.

Table II

Concrete pad recommendations for various building widths and pole spacings

Building Width (feet)	Pole Spacing (feet)	Pad Diameter (inches)
24 feet	8 feet	12 inches
	12	14
	16	16
30 feet	8 feet	14 inches
	12	16
	16	18
36 feet	8 feet	14 inches
	12	18
	16	18
40 feet	8 feet	16 inches
	12	20
	16	22
50 feet	8 feet	18 inches
	12	20
60 feet	8 feet	18 inches
	12	22

Roof Support:

Design Load: Pole framing is designed for single story construction. Framing should be designed for a minimum total load of **47** pounds per square foot.

Rafter Supports: The roof load must be transferred to the poles by rafter plates attached to the poles. The size of these rafter plates should conform to Table III. Rafter supports should be of construction grade Douglas Fir or No. 2 kiln dried Southern Pine or equivalent.

Table III

Number and size of rafter plates required for clear span pole type buildings.

WIDTH OF BUILDING IN FEET						
Pole Spacing	Truss Spacing	30 feet (number)	36 feet (number)	40 feet (number)	50 feet (number)	60 feet (number)
8 feet	4' 0"	1 2 x 6 1 2 x 8	2 2 x 8	2 2 x 8	1 2 x 10	2 2 x 10
12 feet	4' 0"	2 2 x 10	1 2 x 12	1 2 x 12	3 2 x 12	3 2 x 12
16 feet	4' 0"	2 2 x 12	3 2 x 12			

These dimensions are not recommended without an Engineer's Seal.

Fasteners: Roof supports are securely fastened to the poles with deformed shank nails or a combination of deformed shank nails and bolts. The number of six (6) inch deformed shank nails per pole are shown in Table IV.

Table IV

Number of six-inch ring or screw-shank nails required on each pole. **

WIDTH OF BUILDING IN FEET					
Pole Spacing	30 feet	36 feet	40 feet	50 feet	60 feet
8 feet	26	31	35	43	51
12 feet	39	46	51	64	77
16 feet	52	62			

** One 5/8 inch bolt can be substituted for eight (8) nails in a joint.

When there is insufficient contact between the rafter plates and the pole to receive the required number of nails and/or bolts, a scab can be fastened below the rafter plates to receive additional nails.

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Trusses: Roof trusses should be spaced four foot (4') on center and be capable of supporting the roof load of 47 psf total. If greater spacings are used, the trusses must be designed to hold the additional load.

Truss designs should be certified by a registered engineer.

The tops of poles on opposite sides of the building will be tied with a truss wherever possible and securely fastened with six (6) inch deformed shank nails. Intermediate trusses will be securely fastened to the rafter plates with 4" x 6" ties long enough to extend from the bottom of the rafter plate to the top surface of the truss.

Roof Girts: Roof girts should be 24 inches on center and laid flat across the trusses. At the connection between the girt and each truss, provide two (2) four (4) inch deformed shank nails.

Bracing

Roof: To provide for lateral support of the trusses, provide 2" x 4" braces the entire length of the building on the bottom chord of the truss. For buildings up to 40 feet wide, use two (2) such braces and for buildings over 40 feet, use three (3) braces. These braces should be located at the panel points on the lower chord.

Wind: Wind pressure on the walls will cause the poles to bend at the ground line. A wind brace should be provided at the eave for buildings with a side wall height of over ten (10) feet and for buildings 60 feet long and longer.

The brace should be a 2" x 6" at least 12 feet long, extending from the pole to the top chord of the rafter, at an angle of 45. to the side wall. Securely nail the brace to the pole at the bottom and to the top chord of the truss.

Horizontal side girts should be a maximum of two (2) feet O.C.