

NH FENCE CONSTRUCTION SPECIFICATIONS

III. WOVEN WIRE FENCE

The work shall consist of furnishing and installing woven wire fence and related essential components. Refer to New Hampshire NRCS Field Office Technical Guide, Section IV, Standard 382, Fence, Table 1 for min. fence height.

Specifications are listed for a 48", 60", and 96" fence. The lifespan of this practice is 20 years. Consider using a professional to install the fence according to specifications to ensure that the fence is installed correctly and will last for 20 years.

1. Wire

All woven wire shall be new, fixed knot, high tensile steel, with class 3 galvanizing, aluminum coating, zinc-aluminum coating or better.

Low carbon (low tensile) woven wire, welded wire, hinge joints and class 1 galvanizing are not permitted.

The top and bottom wires, and the horizontal and vertical stay wires shall be 12.5 gauge or heavier. With sheep and goats, the top and bottom wires shall be 12.5 gauge or heavier, and the horizontal and vertical stay wires shall be 14 gauge or heavier.

Vertical stays shall be spaced a maximum of:

- 3" apart for horses, goats, sheep with horns, chickens, and turkeys
- 6" apart for cattle, bulls, bison, llamas, alpacas, sheep w/o horns, hogs, and deer

Horizontal stays shall be spaced a maximum of 8" apart.

Fence material height may vary within 2 inches. For example, 47 inch high tensile woven wire may be used for a "48 inch fence".

2. Hardware and Fasteners

Staples shall be of 9 gauge class 3 galvanized steel or heavier with a min. length of 1³/₄" for soft wood post or 1 inch for close grain hardwood posts. Barbed staples shall be used for pressure treated posts.

Manufacturer's clips or 14 gauge class 3 galvanized wire (or better) may be used to fasten wires to steel posts.

Brace pins shall be a min. of ³/₈" x 5" for the end or corner posts and ³/₈" x 10" for the brace posts.

Brace pins and joiners/splices shall be class 3 galvanized, zinc coated, or better.

3. Wood

All wood posts shall be red or white cedar, black locust, or pressure treated. Red pine shall not be used if posts are mechanically driven into the ground. Pressure treated posts shall be treated with a min. of 0.40 lbs/cubic foot of chromated copper arsenate (CCA) Type A, B, or C; or ammoniated copper quaternary (ACQ) preservative by a method to ensure that complete penetration of the sap wood is obtained. Quality of treated wood shall provide sufficient strength and last the expected life of the fence (20 years). ACQ treated wood shall not come in direct contact with Class III galvanized steel wire. All bark shall be removed from cedar and black locust posts. At least half of the diameter of the cedar shall be heartwood.

Min. wood post diameter is measured on the smallest end of the post. For example, if the min. allowable diameter for a post is 4 inches, this means that the post will be at least 4 inches on the smallest end, and approximately 5 inches on the larger end. This post will commonly be labeled 4-5" or 4/5".

4. Line Posts

Line posts shall be wood or steel. Posts are recommended to be mechanically driven into the ground. If posts are not driven, the backfill around the post shall be thoroughly compacted.

The ratio of steel line posts to wooden line posts shall not exceed 2 to 1.

Wood

Diameter: 4 in.

Length: 7 ft. for 48" fence; 8 ft. for 60" fence; 11 ft. for 96" fence.

Depth: 3 ft. below the ground line

Spacing: 20 ft. maximum between posts

Steel

Type: standard studded "T" section with anchor plate.

Dimensions: 1³/₈" x 1³/₈" x 1¹/₈" and weighing at least 1.25 lbs per ft. of length

Coating: hot dip galvanized with at least 2 oz. per sq. ft. of zinc coating.

Length: 6 ft. for 48" fence; 7 ft. for 60" fence; 10 ft. for 96" fence.

Depth: 2 ft. below the ground line

Spacing: 20 ft. maximum between posts

Other

Other materials may be used for line posts if they are equal or greater in strength and quality as above. Other materials must be approved by the state agronomist.

In areas where soil depth restricts the required embedment depth, additional anchors or a deadman applied against the direction of pull shall be used. Space posts closer together on uneven terrain.

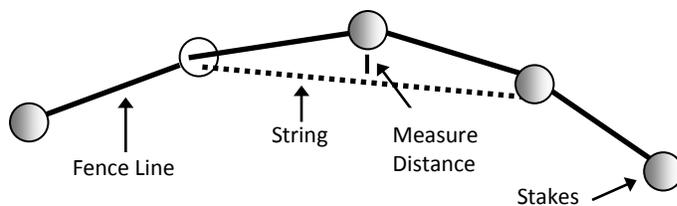
Depressions and Curves

In situations where a line post will be located in a depression, use a longer line post with a larger diameter (at least 5 inches) and bury it at least 4 feet.

If the posts are not mechanically driven, brace the post by either attaching a lug to the bottom of the post (a lug is 2" x 4" x 8" treated wood attached with a 3/8" x 4" lag bolt) or by running brace wire from the top of the line post in the depression to the bottom of each adjacent line post. Brace wire should be installed as described in the next section on brace assemblies.

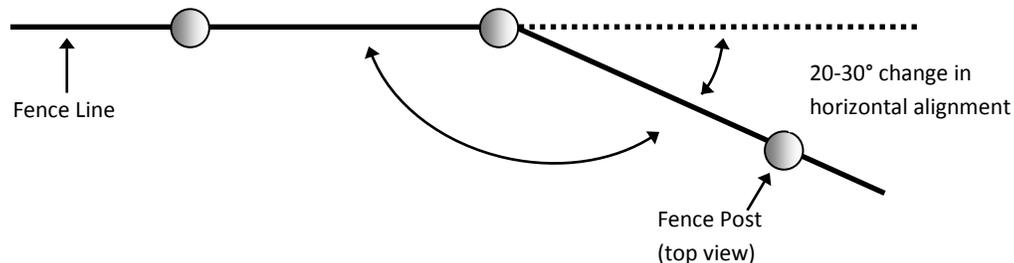
Lay fence line as straight as possible and avoid unnecessary curves. If there is a curve, keep fence wire on the outer side of the post, and set posts with a two inch lean to the outside of the curve. Place line posts closer together on curves to prevent wire tension from moving the posts.

On very gradual curves, line posts shall be spaced 16 ft. apart maximum. To determine line post spacing on sharper curves, set temporary stakes 16 ft. apart following the curve. Select 3 adjacent stakes and string a line from the first to the third stake. Measure the distance from the center stake to the string and reposition the stakes according to the spacing indicated in the table below.



Distance from string to center stake (in.)	Post Spacing (ft.)
4-6	14
6-8	12
8-14	10
14-20	8

A corner brace assembly shall be used when the horizontal alignment changes more than 20-30 degrees (depending on terrain).



5. Corner, End, Pull, and Gate Assemblies.

Bracing is required for all corners, ends, and gates, and where the distance between a run exceeds 1320 ft. A run is the distance between a corner, end, or gate post and the next corner, end, or gate post. A pull assembly shall be used when the vertical alignment (slope) changes more than 20-30 degrees or when a run exceeds 1320 ft.

Steel T-posts shall not be used for brace assemblies.

Posts are recommended to be mechanically driven into the ground. If posts are not driven, the backfill around the post shall be thoroughly compacted.

In general, use a single H-brace if posts are mechanically driven. Consider using a double H-brace if posts are not mechanically driven or if posts are set in lighter, sandy soils or extremely wet soils. If the posts are not mechanically driven, attach a lug to the bottom of the brace post (2" x 4" x 8" treated wood attached with a $\frac{3}{8}$ " x 4" lag bolt).

H-Braces

Corner, end, brace, and gate posts:

Material: Wood

Diameter: 5 in.

Length: 8 ft. for 48" fence; 9 ft. for 60" fence; 12 ft. for 96" fence

Depth: 4 ft. below the ground line

Cross members:

Material: Wood

Diameter: 4 in.

Length: 2 to 2.5 times the height of the brace posts (e.g. 8-10 ft. for a 48" fence), depending on placement of the cross member within the brace assembly.

For cross members placed at $\frac{3}{4}$'s the height of the brace posts, the length of the cross member shall be at least 2.0 times the height of the brace post (8 ft. for 48" fence; 10 ft. for 60" fence).

For cross members placed at in the uppermost portion of the brace assembly (above $\frac{3}{4}$'s the height of the brace posts), the length of the cross member shall be at least 2.5 times the height of the brace post (10 ft. for 48" fence; 12 ft. for 60" fence). Consider using a cross member at least 2.5 times the height of the brace post if posts are not mechanically driven.

The angle of the brace wire (steep vs. low) will influence the strength and stability of the brace assembly. If there is a low brace wire angle, the end post is less likely to be pulled out of the soil. A lower brace wire angle is achieved by either using a longer cross member, or positioning the cross member lower in the brace assembly. The angle of the brace wire in relation to the cross member shall not exceed 30° (see H-brace assembly figure).

In situations where a cross member of adequate length cannot be found for a single H brace, use a double H brace with 2 cross members that are at least 1.5 times the height of the brace post (e.g. two 12 ft. cross members for a 96" fence).

Use $\frac{3}{8}$ " x 5" (min.) brace pins to set the cross member(s) to the end/corner post. Use $\frac{3}{8}$ " x 10" (min.) brace pins to set the cross member(s) to the brace post(s).

Leave at least 1" of the brace pin protruding from the outside of the brace post to hold the brace wire. Barbed staples shall be driven into the outside of the end post, approximately 3-4" above the soil line, to hold the brace wire.

Brace wire shall be wrapped around the brace assembly generally in a figure-8 fashion. Use at least 1 loop of 12.5 gauge high tensile steel, class 3 smooth wire or 2 loops of 9 gauge low tensile steel, class 3 smooth wire. The brace wire shall be tightened using a ratchet style in-line wire strainer or a smooth-wire puller/chain grab with a crimp sleeve or gripping style tensioner until the brace post begins to move away from the soil.

Close brace wire loops by wrapping additional brace wire around the loops, using a crimp sleeve, or another appropriate method. Consider installing the ratchet on the opposite side of the fence wire.

Alternatively, a single loop of class 3 galvanized cable ($\frac{5}{32}$ " diameter min.) may be wrapped around the brace and secured with a wire joiner/tensioner or gripping style tensioner. Tighten the cable until the brace post begins to move away from the soil.

Floating Diagonal Braces

In areas where soil depth restricts the required embedment depth, a floating diagonal brace may be used for corner and end assemblies for 48" and 60" fences.

Corner and end posts:

Material: Wood

Diameter: 5 in.

Length: 8 ft. for 48" fence; 9 ft. for 60" fence

Depth: 4 ft. below the ground line

Brace posts:

Material: Wood

Diameter: 5 in.

Length: 2.5 times the height of the end or corner posts (e.g. 10 ft. for a 48" fence)

Cut a $\frac{1}{2}$ -1" deep notch in the end post at $\frac{2}{3}$ the height of the end post to fit the end of the brace post. Cut the top end of the brace post and taper to fit in the notch. Secure the brace post to the end post using a $\frac{3}{8}$ " x 10" (min.) brace pin.

The bottom of the brace post shall be tapered or smoothed and set on a reinforced concrete block (3" x 8" x 12") or flat rock of equivalent size. The block shall be allowed to float

Two barbed staples shall be driven into the bottom of the brace post, and 1 barbed staple shall be drive into the outside of the end post, approximately 3-4" above the soil line, to hold the brace wire.

Brace wire shall be wrapped around the brace assembly by running the wire through the staple on the end post and the staples on the brace post. Use at least 1 loop of 12.5 gauge high tensile steel, class 3 smooth wire or 2 loops of 9 gauge low tensile steel, class 3 smooth wire. The brace wire shall be tightened using a ratchet style in-line wire strainer until the end post begins to move away from the soil.

Fiberglass/PVC Braces with Anchor Systems

Fiberglass and PVC braces shall not be used with high tensile woven wire fences.

6. Wire Spacing and Fastening.

The top wire shall be at least 2 inches below the top of wooden posts and 1 inch below the top of steel posts

Tension will be applied with bar/wire pullers, stretcher bars, or other methods until tension curves on the woven wire begin to collapse.

Staples shall be driven diagonally to the wood's grain and at a slight downward angle, (upward if pull is up) to avoid splitting the post and loosening of the staple. Space should be left between the inside crown of the staple and the post to permit free movement of wire. Barbed staples shall be used for pressure treated posts.

Staple at least every other wire to the wood post.

Wires may be attached to steel posts by manufacturer's clips or by two turns of 14 gauge galvanized wire.

Wire shall be spliced by means of "Western Union" splice or by suitable splice sleeves or wire joiners/tensioners (including ceramic rollers) applied with a tool design for the purpose. All wraps shall be tightly wound and closely spaced.

Install the fencing so that the bottom wire is at ground level to exclude predators. If predators are not a concern, the bottom wire can be installed at 2-3 inches above ground level to facilitate maintenance.

Top Wire

Add at least one additional wire above the top of the woven wire for all fences except 96" deer fence. Use either 2 twisted strands of 15.5 gauge high tensile wire with class 3 galvanizing (or better) with 4 point barbs on 5 inch centers (2-3 in. above woven wire), or electrified 12.5 gauge high tensile steel or 12.5 gauge high tensile aluminum alloy (4-6 in. above woven wire).

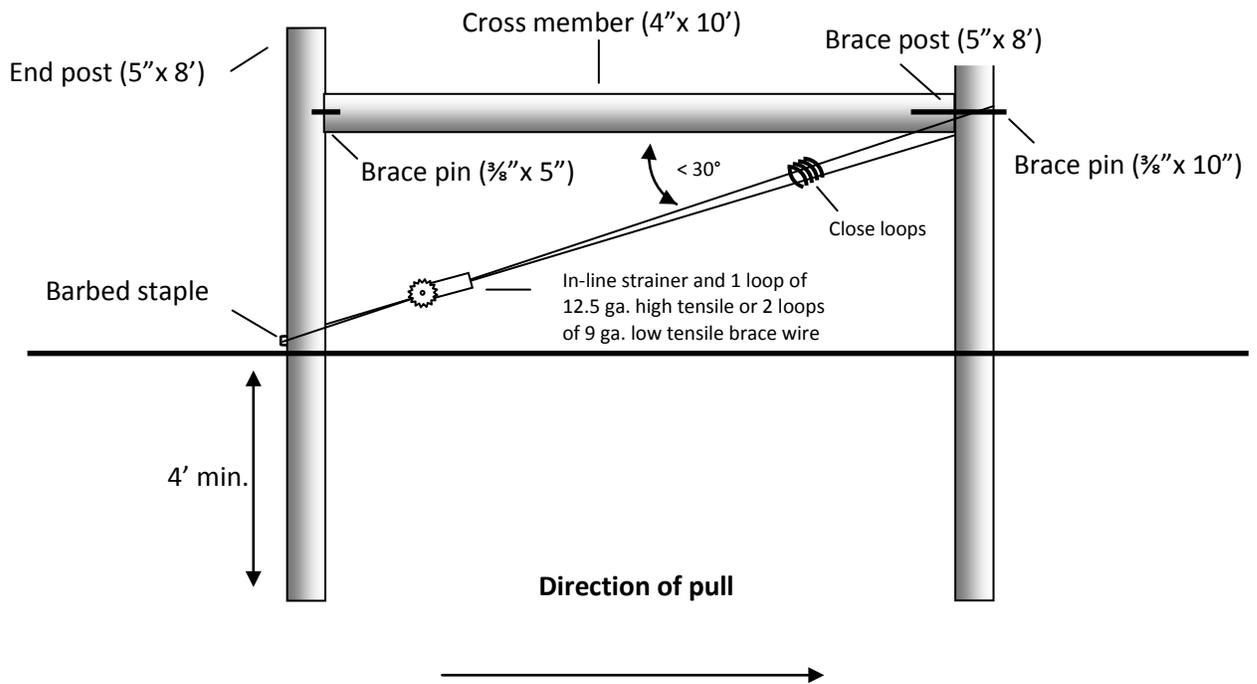
Steel line posts may be used with electrified wire only when the electrified wire is part of a woven wire fence system (*i.e.* top or interior wire).

Barbed wire shall never be electrified or used with an electrified fence. Barbed wire or bare HTS wire shall not be used for horses.

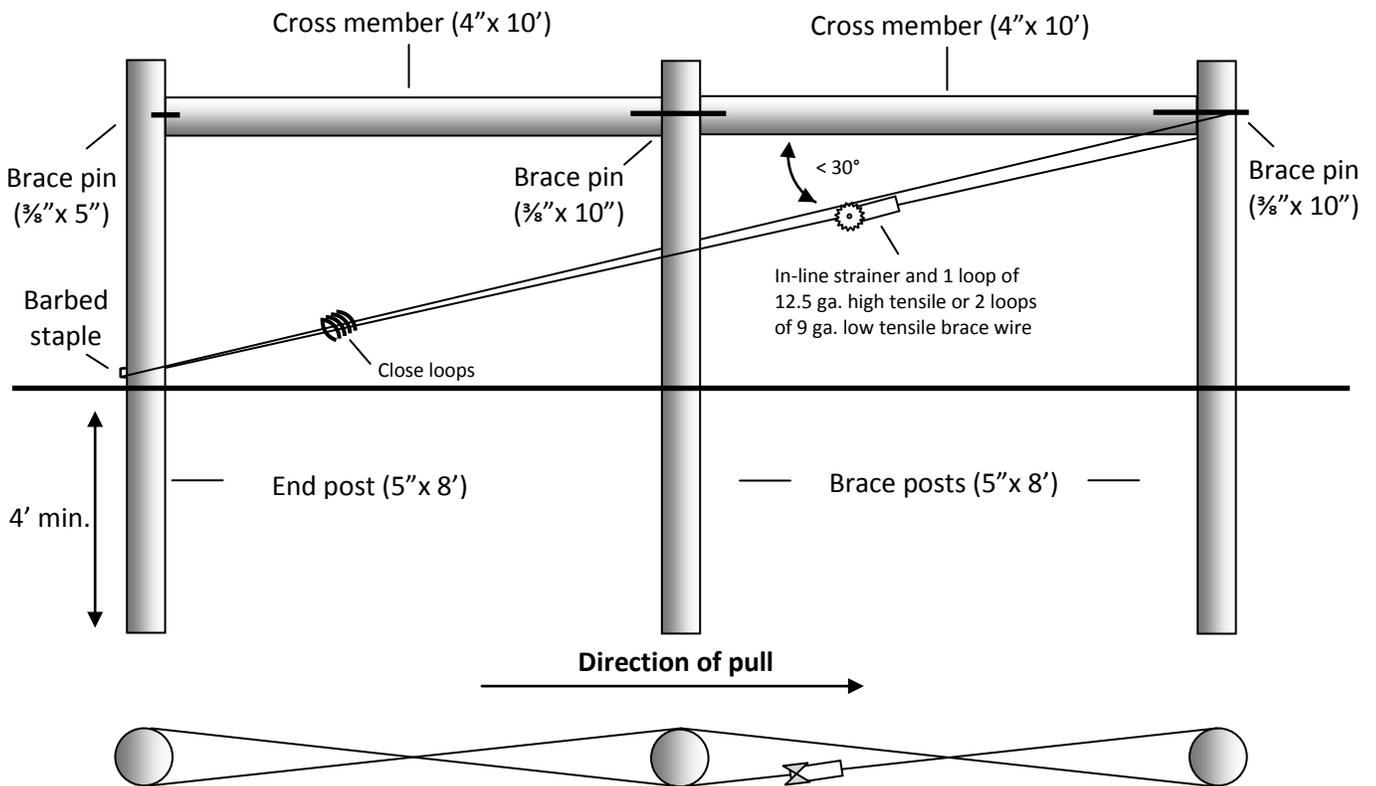
7. Gates.

Install gates at locations suitable for providing controlled access. Select gates of appropriate size and materials for the specific fencing system. Install prefabricated gates according to the manufacturer's instructions.

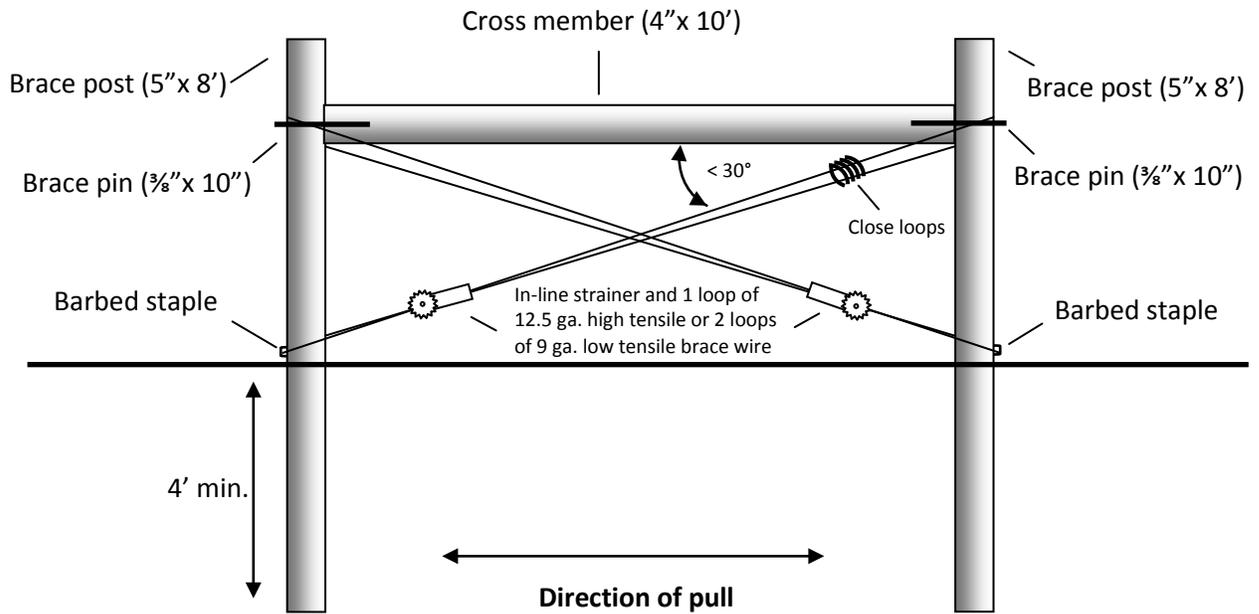
4' End Assembly: Single H-Brace



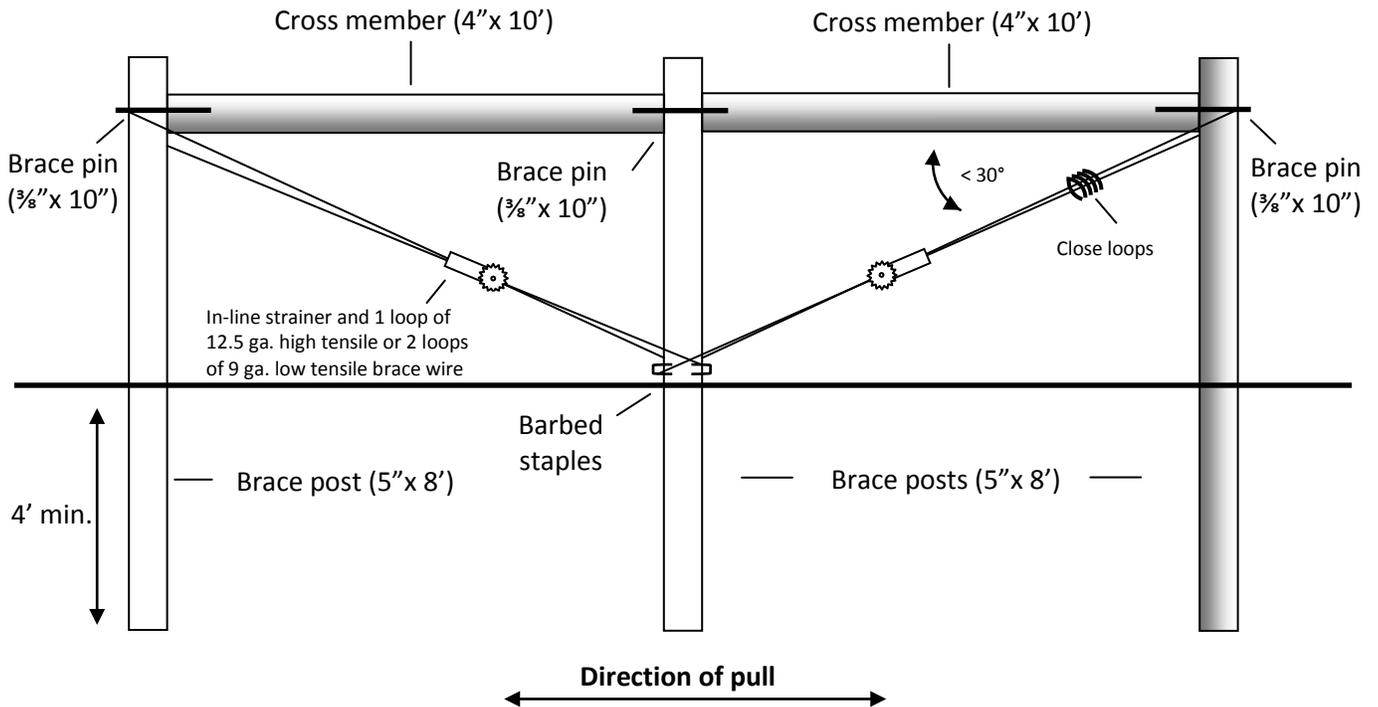
4' End Assembly: Double H-Brace



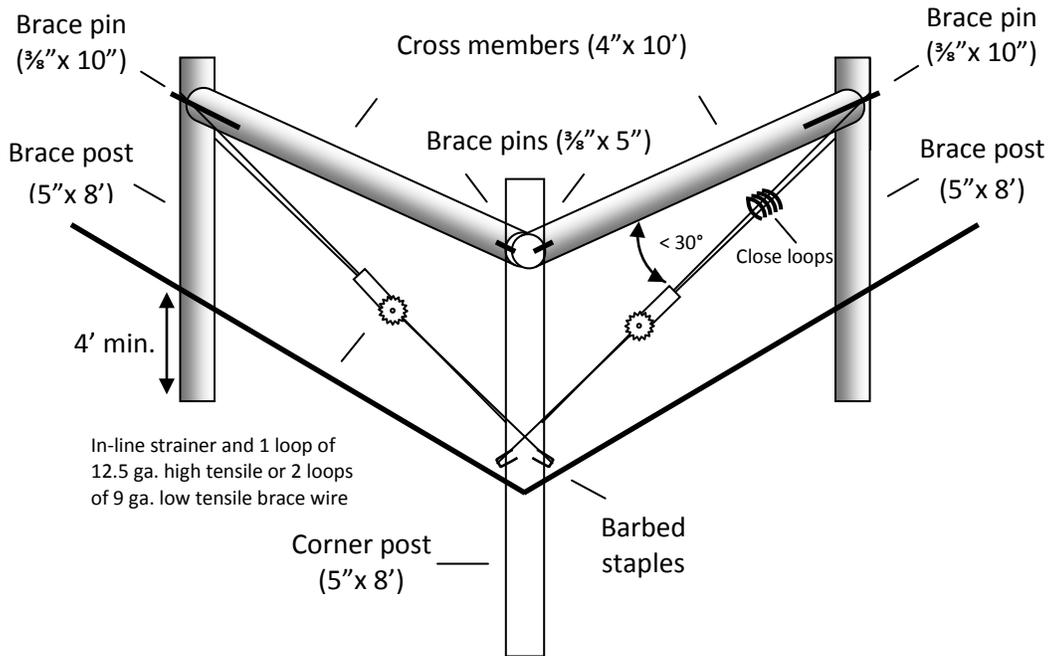
4' Pull and Gate Assembly: Single H-Brace



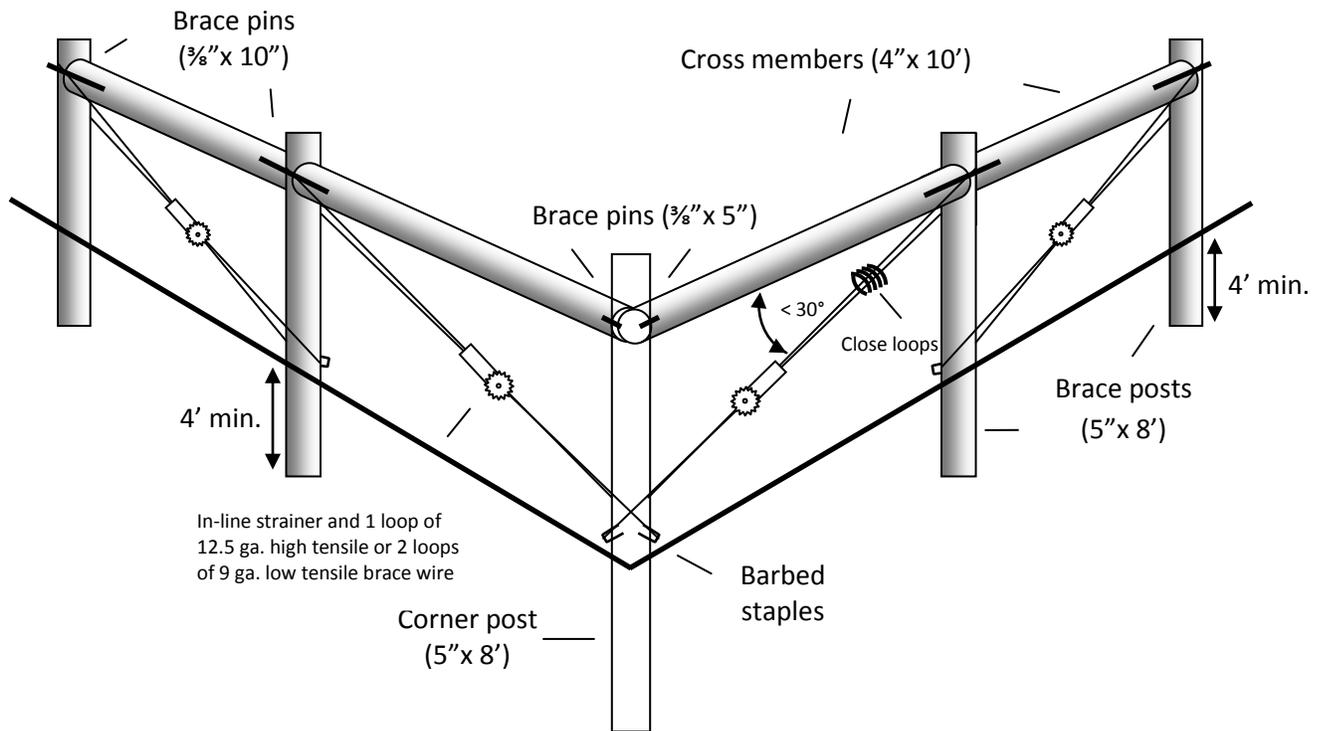
4' Pull and Gate Assembly: Double H-Brace



4' Corner Assembly: Single H-Brace



4' Corner Assembly: Double H-Brace



4' Floating Diagonal Brace

