NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION

FENCE
(Feet)

CODE 382

HIGH TENSILE NON-ELECTRIC WIRE FENCE (HTNEWF)

High tensile non-electric wire fence (HTNEWF) shall consist of at least 6 strands of high tensile smooth wire with the top wire 48 inches above the ground line.

1. Materials.

   a. Wire.

      The wire will be smooth and meet or exceed the following:

      Tensile Strength – 170,000 psi (minimum)
      Galvanizing – Class 3
      Gauge – 12.5
      Breaking Strength – 1,300 lbs. (minimum)

   b. Fasteners.

      (1) Staples shall be of 9 gauge galvanized steel or heavier with a minimum length of 1¾ inches for softwoods and a minimum length of 1 inch for close-grained hardwoods.

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

2. Posts.

   a. Wood.

      All wooden posts and brace members (except red cedar, osage orange, or black locust) shall be treated with a minimum of 0.40 lbs/cubic foot of chromated copper arsenate (CCA) type A, B, or C or ammoniated copper quat (ACQ) preservative by a method to ensure that complete penetration of the sapwood is obtained or have a 20-year warranty. All bark shall be removed from the red cedar, osage orange and black locust. At least half the diameter of red cedar shall be heartwood. Quality of treated wood shall provide sufficient strength and last for the expected life of the fence.

      All corner, end, and gate assembly posts shall be wooden with a minimum top diameter of 6 inches. Assembly posts shall be a minimum of 8.5 feet long for single H-brace assemblies and 7.5 feet long for double H-brace assemblies.

      Bend assembly post shall have a minimum top diameter of 5 inches and will be a minimum of 7.5 feet long.

      Wooden line posts shall have a minimum 4 inch diameter (3 inch for osage orange). Wood line posts shall be a minimum length of 7 feet.

b. Plastic.

Plastic line posts shall be at least 4 inches in diameter, able to accept and hold staples, and be durable for the life of the fence. Plastic line posts shall be a minimum length of 7 feet.

c. Steel.

Steel line posts shall have the standard "T" section, nominal dimensions of 1 3/8" x 1 3/8" x 1/8" with anchor plate. The posts shall weigh at least 1.25 pounds per foot of length and be painted with a weather resistant paint. The posts shall be studded to aid in wire attachment. Steel line posts shall be a minimum length of 6 feet.

d. Other.

Other materials may be used for line and assembly posts if they are of equal or greater strength and quality of above. They must be approved by the fence designer.

e. Stays/Battens.

Stays shall be at least 3/8 inch in diameter steel, fiberglass, rigid plastic, or eucalyptus.

3. Construction.

a. Post Installation and Spacing

Live trees used for corner, bracing, and line posts shall have a diameter breast height (DBH) equal to or greater than those prescribed for normal wooden posts. Some alignment variation shall be allowed, but caution should be taken to minimize offsets and prevent excess fencing needs. Wire or insulators will not be fastened directly to trees. A board or boards will be placed on the tree to keep the wire from contacting the bark. Wire shall not be wrapped around the tree. A CCA treated 2" x 6", fiberglass strip, plastic strip, or an untreated red or white oak board with a minimum size of 1" x 4" must be securely fastened to the tree with at least three 40 d. pole barn nails. The board must be long enough to accommodate the wire. The fence will be fastened to the board with staples.

b. Corner, End, and Gate Brace Assemblies.

One of the following assemblies for all corners, ends, pulls, and gates shall be used:

(1) If the posts are to be set or driven to 4 feet below the ground line, a single H-brace assembly shall be used.

(2) If the posts are to be set or driven to 3 feet below the ground line, a double H-brace assembly shall be used.

Brace assemblies are required at all corners, gates, pull, and ends.

All brace members shall be wood and the horizontal cross member centerline shall be 4 to 9 inches below the top of post. Other brace material of equal strength may be used with the approval of the fence designer.

The horizontal cross member shall be a minimum of 4 inches in diameter and a minimum of 7 feet in length. A tension wire composed of 2 complete loops of number 9 gauge smooth wire, or a single loop of 12.5 gauge high tensile smooth wire shall be used. One end of the tension wire shall be at the height of the horizontal cross brace member and the other end of the tension wire shall be 4 inches above the ground line on the other post.

A corner assembly or a bend assembly shall be used when the horizontal alignment changes more than 15 degrees and a pull assembly when the vertical alignment changes more than 15 degrees. A bend assembly will be used only when it will not affect the integrity of the fence. Post spacing for a bend assembly can be determined by placing 3 stakes, each spaced 14 feet apart along the fence line. A string is then stretched between the first and third stake. A measurement is then taken from the second stake and the string. The spacing of the posts for a bend assembly is determined as follows:

0 to 4 inches	14 feet
5 to 7 inches	12 feet
8 to 10 inches	10 feet
11 to 15 inches	8 feet
16 or more inches	6 feet

These bend assembly posts will be wood and set with a 6-inch lean from vertical to the outside of the curve and set or driven 36 inches deep.

c. Line Post.

Wooden and plastic line posts shall be set or driven 30 inches below ground line. If soil depth is less than 28 inches, use standard "T" steel posts.

Steel line posts shall be set or driven 21inches below ground line.

Post spacing for line posts shall be a maximum of 16 feet or 30 feet with at least 1 batten between each post.

If posts are not driven, the backfill around the post shall be thoroughly compacted.

In areas where soil depth restricts the embedment depth, additional anchors or deadman applied against the direction of pull shall be used.

d. Wire Spacings and Fastenings.

The following wire spacing and heights will be used. Adjustments in the number of wires and spacing may be made if they strengthen the effectiveness of the fence:

Fence Description	Height	Wire Spacing Beginning from the Ground
10 Strand Livestock Fence	48"	4-4-4-4-5-5-5-5-6-6
8 Strand Livestock Fence	48"	4-4-6-6-6-7-7-8
6 Strand Livestock Fence	48"	10-6-7-8-8-9

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

Additional smooth high tensile wires may be added to this fence design to provide electric fence capability. These wires should only be tensioned to approximately 100 pounds to avoid failure of the end insulators.

Tension – 200-250 lbs. each wire. Tension will be applied with an in-line stretcher on each strand. To gauge tension, install a tension spring on at least 1strand of wire.

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 staples. Space should be

left between the inside crown of the staple and post to permit free movement of high tensile wire. Barbed staples shall be used for pressure treated posts.

Wires may be attached to steel posts by use of manufacturer's clips or by two turns of 14 gauge class 3 galvanized wire. The staples, wires, and clips should allow free movement of the high tensile fence wire

Wire shall be spliced by means of a figure 8 knot, reef knot or by suitable splice sleeves applied with a tool designed for the purpose. All tied knots will have at least 8 wraps at each end about the other. All wraps shall be tightly wound and closely spaced.

4. Grounding.

Fences using wood posts should be grounded at least every 1,000 feet. Ground rods should be driven not less than 4 feet into the ground. The rods shall be galvanized steel and a minimum of 0.50 inch in diameter or steel posts will be used as a line post placed at least every 100 feet. All line wires of the fence must be grounded. Alternate grounding material may be used with the approval of the fence designer.