

**NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION**

**FENCE
(Feet)**

CODE 382

WOVEN WIRE FENCE (WWF)

This construction specification is for Standard Woven Wire Fence (SWWF), High Tensile Woven Wire Fence (HTWWF), and Specialty High Tensile Woven Wire Fence (SHTWWF).

Standard woven wire fence (SWWF) shall consist of low carbon steel woven wire with a single or multiple strands of either barb wire or high tensile smooth wire with a minimum spacing of 2 to 6 inches starting at the top of the woven wire.

High tensile woven wire fence (HTWWF) shall consist of fixed knot or hinge joint high tensile woven wire with a single or multi strand(s) of smooth high tensile wire or high tensile barb wire spaced 2 to 6 inches above the top of the woven wire.

Specialty high tensile woven wire fence (SHTWWF) shall consist of 48 to 72 inch high woven wire with a single strand of smooth high tensile wire or high tensile barb wire 2 to 6 inches above the top of the woven wire.

These types of fence can be for all animals or people, including deer, game, livestock, and exotic animals (elk, bison, llama, and ostrich).

The minimum total height of SWWF for cattle, horses, and people is 48 inches; for goats and sheep 42 inches; and for swine 36 inches. The minimum total height of HTWWF for cattle, horse, and people is 48 inches; for goats and sheep 42 inches; and for swine 36 inches. SHTWWF shall be 49 to 72 inches high.

1. Materials.

a. Wire.

SWWF will be made from low carbon steel wire with class 1 galvanizing. The woven wire shall have the top and bottom strands 10 gauge or heavier. The intermediate and stay wires shall be 14.5 gauge or heavier. The stay wires shall be spaced a maximum of 12 inches apart.

The barb wire will consist of 2 twisted strands of 12.5 gauge steel wire with class 1 galvanizing or 2 twisted strands of 15.5 gauge high tensile wire with class 3 galvanizing. The barbs shall be 4 point on 5 inch centers.

HTWWF will be made from high tensile steel wire with class 3 galvanizing. The woven wire shall have the top and bottom strands be 12.5 gauge or heavier. The intermediate and stay wires shall be 14.5 gauge or heavier. The stay wires shall be spaced a maximum of 12 inches apart.

The barb wire will be new and consist of 2 twisted strands of 12.5 gauge steel wire with class 1 galvanizing or 2 twisted strands of 15.5 gauge high tensile wire with class 3 galvanizing. The barbs shall be 4 point on 5 inch centers.

SHTWWF will be made from high tensile smooth steel wire with class 3 galvanizing. The woven wire shall be 48 to 72 inches high with the top and bottom strands 12.5 gauge or heavier. The intermediate and stay wires shall be 14.5 gauge or heavier. The stay wires shall be spaced a maximum of 12 inches apart.

The high tensile barb wire will be new and consist of 2 twisted strands of 15.5 gauge with class 3 galvanizing. The barbs shall be 4 point on 5 inch centers.

The high tensile 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, class 3, 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.

Corner, end, pull, and gate assembly posts for HTWWF and SWWF 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.

For SHTWWF the length will be dependent upon the height of the fence.

Bend assembly posts 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 top 4-inch diameter (3 inch for osage orange). Wood line posts shall be a minimum length of 7 feet. Specialty fences must have a minimum of 5 inch diameter.

b. Plastic.

Plastic line posts for WWF and HTWWF 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.

Plastic line posts for SHTWWF woven wire fence shall have a min top diameter of 5 inches.

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 post shall weigh at least 1.25 pounds per foot of length and be painted with a weather resistant paint. The post 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.

3. Construction.

a. Post Installation and Spacings.

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, Pull, 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, pulls, and ends.

All brace members shall be wood and the horizontal cross member centerline shall be 4-9 inches below 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 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 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.

Pull assemblies shall be installed at intervals not to exceed 660 feet. The continuity of the wire shall be interrupted at the pull assembly.

HTWWF and SHTWWF will not need pull assemblies.

4. Line Post.

Wooden and plastic line posts shall be set or driven 34 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 21 inches below ground line.

Post spacing for line posts shall be a maximum of 16 feet for SWWF and SHTWWF and shall be 25 feet for HTWWF.

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.

5. Fastenings.

The top wire shall be at least 2 inches below top of wooden post and 1 inch below top of steel post. Tension of the fence will be 200 to 250 pounds. The tension crimp should be half the size of an untensioned crimp when stretched. The top, bottom, and every other horizontal wire will be fastened to each line post.

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.

The staples, wires, and clips should allow free movement of the high tensile fence wire.

HTWWF shall be spliced by means of a Figure 8 splicing knot or by suitable splice sleeves applied with a tool designed for the purpose.

Wire shall be spliced by means of a Western Union splice or by suitable splice sleeves applied with a tool designed for the purpose. The Western Union splice shall have not less than 8 wraps at each end about the other. All wraps shall be tightly wound and closely spaced.

6. Grounding.

Fences using wood posts shall be grounded at least every 1,000 feet with ground rods driven not less than 4 feet into the ground. The rods shall be galvanized steel and a minimum of 0.50 inch in diameter. All line wires of the fence must be grounded. An alternate grounding material is the use of a steel line fence post every 100 feet.