

**NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATIONS**

FENCE - PERMANENT NON-ELECTRIC HIGH TENSILE

(Ft.)

CODE 382

IV. Permanent Non-electric High Tensile Fences

A. Wire Spacing

Spacing of line posts and stays depends on terrain and number of wires. Maximum spacing is as follows.

Farm border fences and roadside fences must be constructed of at least seven wires, with the total height to the top wire not less than 42 inches.

Cross fences can be constructed of six or more wires, with the fence height being not less than 42 inches.

B. Type of Wire

Wire shall be high tensile, a minimum of 14-gauge, single strand, tensile strength of 110,000 psi minimum breaking strength, with Type III galvanizing or be aluminum or copper clad. Typically, triple galvanized 12.5-gauge wire with 170,000 psi minimum breaking strength will be installed. The 170,000 psi wire is much easier to work with than the 210,000 psi wire.

C. Pull Assemblies

For high tensile fence, two posts with brace and brace wire shall be spaced at intervals not to exceed 4,000 feet in straight sections of the fence. Where turns are encountered, additional wire strainers will be installed for proper tension on fence. Wire must be kept tight.

D. Post Spacing, Length, and Depth

Install line posts in dips and rises first. Line posts shall be spaced 12 feet or less apart with no stays required. Line posts may be spaced 15 feet apart with stays or light posts between the posts. In undulating terrain, space posts and stays so that fence height is maintained. Posts in dips shall be constructed so they will not pull out of the soil. Two-inch or smaller posts will be anchored or wooden posts (3 inches) set to sufficient depth to resist pull out. Posts shall be at least 24 inches in the ground. All wood posts will be at least 2 inches higher than the top wire of the fence to prevent splitting when attaching insulators. All posts of other materials shall be at least 1 inch higher than the top wire of the fence.

If treated wood posts are cut off, treat cut with pitch.

Steel posts and other line posts shall be driven a minimum of 18 inches deep. Use standard "T" shaped steel posts a minimum of 5.5 feet long.

Post spacing in areas shallow to rock may vary based on availability of post sites. Probe to determine desirable post sites. Steel pipe and steel posts are recommended to use in cracks between rocks. Concrete in posts where possible. Rock bits are available in some areas for drilling rock. Use stays to maintain post spacing. Posts set in a five-gallon bucket of concrete or similar container may be used as a line post and bury as deep as possible. Use live trees as posts where needed. See section F.

E. Line Posts and Stays

- a. Australian ironwood (eucalyptus), 1 x 1.5 inches in diameter.
- b. Fiberglass, rigid plastic, and polyvinylchloride solid round sucker rod of at least 5/8 inch in diameter.
- c. Fiberglass T-posts and stays of at least 1 inch in cross-section. For the above posts, attach wire to posts by loose clips or by running through holes in posts. Attach to stays with tight clips to hold in place.
- d. Wood posts of black locust, red cedar, Osage Orange, redwood,

pressure treated pine, or other wood of equal life and strength. At least one-half of the diameter of the red cedar and redwood posts shall be heartwood. Pressure treatment shall conform to Materials Specification 585. Line posts shall be at least 3 inches in diameter.

Steel posts may be "T" posts that are a minimum of 1.25 pounds per one foot of length.

F. Live Trees as Line, Bracing and Corner Posts

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. Wires will not be fastened directly to trees.

When using live trees, protection will be provided between the tree and wire (CCA-treated 2" x 4", fiberglass, or rigid plastic strip). Avoid using trees with a short lifespan (i.e., elms, and musselewood). Avoid using potentially high-value timber trees. Do not use fast-growing trees as end posts.

Do not wrap wire around the tree. Tie off to a 6-inch lag eye bolt screwed into the tree.

G. Corners and Braces

(See Standard Drawing Numbers FEN-382-BR1 and BR2.)

Braces and end assemblies are required at all corners, gates, and angles up to 150 degrees in the fence line. Tying off wires at the corner posts will lessen stress on them. No brace assembly is required for angles between 150 and 180 degrees; however, use a 6-inch diameter post as a corner post. Lean the corner post 2 inches or more away from the direction of pull.

Corner, gate, and end or pull assemblies for non-electric high tensile fences will be H-brace, N-brace, or a floating angle brace assembly. Posts will be 6-inch nominal wood or 2.5-inch nominal steel pipe (capped). Steel pipe shall be set in concrete 30 inches deep. Wood posts will be sufficient lengths to permit driving or setting the posts at least 36 inches deep. Earth backfill shall be thoroughly tamped. If concrete is used, set the posts a minimum of 30 inches deep.

Posts of equivalent strength may be substituted, if they have suitable means of attaching wires and braces.

All wood posts will be at least 2 inches higher than the top wire of the fence to prevent splitting when attaching insulators.

All posts of other materials shall be at least 1 inch higher than the top wire of the fence.

H. Bracing

(See Standard Drawing Numbers FEN-382-BR1 and BR2.)

The brace member shall be the equivalent of a 4-inch top diameter post or standard weight galvanized steel pipe of 1 5/8 inches diameter installed at least 3 feet aboveground or between the top two wires, whichever is higher. Place brace at least 8 inches below top of post. The brace member shall be at least 6 feet long or 2.5 times the height of the top wire (i.e., 42" x 2.5 = 105" or 8.75').

The brace wire shall be number 9-gauge smooth wire or 12 1/2-gauge high tensile strength smooth wire. Twist sticks or inline strainers will be used to tighten brace wire.

I. Staples and Fasteners

Wires will be attached to line posts by a method that allows wires to slip. If stays are used, wires will be attached to stays in a manner that prevents stay slippage along the fence.

Staples shall be of 9-gauge steel or heavier with a minimum length of 1½ inches for softwoods and a minimum length of 1 inch for close-grained hardwoods. Barbed staples shall be used for pressure-treated posts. Drive staple diagonally to the wood's grain and at a slight downward angle (upward if pull is up) to avoid splitting posts and loosening of staples. Space should be left between staple and post to permit free movement of wire.

Splicing of high tensile wire will be accomplished by three crimping sleeves, “figure eight knots,” or “square knots.”

Tying of high tensile wire to end posts will be accomplished using “thread through method” or two crimping sleeves. Tension of wires will be designed to maintain the proper average height of the fence wire and tightness to provide wire contact with animals.

The tension on each wire shall be maintained according to type of grazing animal. Use of inline strainers will be used on each wire to obtain the correct tension. Tension springs are optional, but are helpful in maintaining proper tension and absorbing sudden shocks to the wire.