NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION

HIGH-TENSILE SMOOTH WIRE FENCE
(Feet)

CODE 382

MATERIALS SPECIFICATIONS

The work will consist of furnishing **all new materials** and installing High-tensile smooth wire fence, including gates, posts, braces, and fittings in accordance with **Conservation Practice Standard- Fence (382)**, **SC 382- Material and Construction Specification-Tables 1-9**, **and as shown on the attached standard drawings.**

CONSTRUCTION SPECIFICATIONS

Fence-Line Clearing

Prior to construction, the fence line shall be cleared of any obstruction that would hinder fence placement and operation. Clearing along stream banks will be held to a minimum except as required for stream crossings. The soil surface along the fence line shall be relatively smooth such that placement of the bottom wire does not exceed the specified maximum wire spacing from the soil surface.

Setting posts

All post shall be set and maintained in a vertical position or leaning slightly (1-2 inches off vertical) away from direction of wire tension.

Posts in curves should be set approximately 4 inches off vertical. Posts set with a driver have about 9 times the holding strength of handset posts. If hand set, holes should be at least 6 inches larger than the diameter of the posts and all backfilled material will be thoroughly tamped in layers no thicker than 4 inches. The post hole shall be filled to the ground surface.

Line Posts

Refer to Table 1 Permanent fence selection criteria for line post and stay spacing and Table 4 Post type, size, and depth specifications.

Spacing will vary depending on terrain and pressure from livestock.

Installation will ensure that adequate fence height is maintained based on its purpose.

Metal pipe used as posts must be capped to prevent bird mortality.

Installing Curves

Installing curves in high- tensile smooth wire fences is permissible as long as the change in direction from one post to the next does not exceed 20 degrees. Posts on curves shall be 5 inch minimum top diameter for changes up to 14 degrees and 6 inch minimum top diameter for changes up to 20 degrees. Posts on curves should be driven 48 inches deep with 4 inches of lean to the outside of the curve and spaced no closer than 4 foot apart. (In an 8-foot long section, 14 degrees is approximately 24 inches off straight line and 20 degrees is approximately 35 inches off the straight line).

Line Posts – Stream Crossing

Anchor posts are required on both sides of a stream crossing. For crossings less than 16 feet wide, standard line posts set on both sides will be adequate. For crossings wider than 16 feet, or when non-electrified heavy flood gate is used, a single H-brace assembly or other suitable brace shall be used.

- Where needed, flood gates will be attached below bottom wire and will be designed to allow water and debris to pass and still control livestock. Some type of hinged or breakaway floodgate works best.

Posts that are set in low areas or gullies may need to be weighted or anchored to prevent lifting out.

Stays or battens between line posts

Stays or wire spacers or battens may be used to maintain desired wire spacing between line posts; note that specifications for post spacing differs with and without stays (Table 1). Stays shall be secured sufficiently to remain in position along wire line.

Offset Brackets

Offset brackets made of galvanized high tensile spring wire with an insulator of high density polyethylene with ultraviolet stabilizer or porcelain can be attached to standard barbed wire fence to provide transmission line and /or to protect a standard fence. Other corrosion resistant offset brackets with insulators that attach directly to the fence posts can also be used.

Place offset brackets up to 60 feet apart and attach to wires of standard fence next to post. If control of animals is desired, place offset brackets at 2/3 the height of the animals to be controlled. Make sure no wires of the old fence come in contact of the electric fence wire, as a short will occur. Use offset brackets that hold the electric wire at least 6 inches from the non electrified fence material.

Post Bracing

Refer to 382-Construction specifications Tables 5 and 6, Table 7, and Table 8 for brace diameter, length, type, and spacing.

Corner braces are required at all points where the fence alignment has a change of 20 degrees or more and the pull is from two directions. (In an 8-foot long section, 20 degrees is approximately 35 inches off the straight line).

End braces are required where fence ends and on both sides of gate openings direction and has pull from only one direction.

In-line pull post assemblies are located in straight sections of the fence line and where there are sudden changes in elevations, such as at the bottom and top of slopes. Tie off all wires at in-line pull assemblies and start new wires for the next fence section. Posts that are set in low areas or gullies may need to be weighted or anchored to prevent lifting out.

Horizontal brace rails will be placed 4-6 inches below the top of the post.

The brace post and anchor posts should be fastened to the compression brace using galvanized screws, nails, or steel dowel pins (drilled through vertical post and into end of horizontal brace, 4 inches deep).

The longer the brace rail the stronger the brace. **A single H brace with a 10 foot brace rail is strong enough to take the place of a double 8 foot H brace.**

Diagonal floating brace assembly can be substituted for other brace types. The brace rail for the

diagonal floating brace must be installed below the top wire and be at least 2.5 times the length of the height of the top wire. Brace blocks will have a minimum of 100 sq. inches of top surface area and can be made of a flat rock, solid concrete block, or a paving stone.

Adjoining Fences

A fence adjoining an existing fence must terminate in the adequate brace assembly.

Trees

Trees will only be used in situations where the use of posts is technically infeasible.

No more than 20% of posts shall be trees Live trees used for corner, bracing, and line posts shall have a diameter breast height (DBH, 4.5 feet aboveground) equal to or greater than those prescribed for normal wooden posts.

Wire 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's, fiberglass, or rigid plastic strip).

When using live trees as an end post, attach wire to a 3/8 inch lag eye bolt in the tree.

Tension of Brace (Guy) Wires

For guy wires use two complete loops of 12 1/2 gauge High tensile wire or barbed wire or one loop of 9 gauge wire.

For horizontal braces, brace wire will be double wrapped and stapled to the brace post a height of 4-6 inches above the brace member and to the anchor (pull) post at a point 4 inches above ground level.

Brace (Guy) wire will be tightened using a wire tightener or strainer.

Another suitable method is to use a twist stick of 18-24 inches approximately midway along the brace wire to provide moderate tension and remain in place.

Wire

Refer toTable1a and Table 1b Fence Selection Criteria and Table 3 Fence Wire Specifications.

Total height and spacing between wires will be determined on a site specific basis depending on the terrain and livestock species.

Fence wire will be stretched to sufficient tension prior to being fastened to posts. Temperature variations must be considered. Wire will tighten in cold weather and expand in hot weather.

Tension of wires should be sufficient to maintain the proper average height of the fence wires. Tension should be 200 lbs. for cattle, horses and 300 lbs. for goats and sheep. Use in-line strainers staggered one each wire to maintain the correct tension.

Wire will be placed on the livestock side of line posts and on the outside of curves and bends.

High tensile wire may be suspended from the inside of posts in corners and bends using ceramic donuts or appropriate UV resistant HDPE or HDPP plastic insulators.

High-tensile smooth wire will be attached to anchor (pull) posts by two complete wraps around the posts, staples(wood posts) or wired (steel posts) and ends tightly twisted around stretched wire at least six times. Compression sleeves may be used to connect ends of brace wire.

High tensile smooth wire will be spliced by means of western union splice or by suitable compression sleeves.

Staples and fasteners

High-tensile smooth wire will be attached at each post with 9 gauge steel minimum 1.5 inch staples driven diagonally across the grain of the wood and at a slight downward angle to allow free slippage of wire.

High tensile smooth wire is tied off using the "thread through method " (a half hitch and 3 wraps) or with compression sleeves.

For steel line posts, the fencing shall be fastened with either 2 turns of 14 gauge galvanized steel wire or the post manufacturer's special wire clips. For all other types of posts, attach as specified by manufacturer.

Gates

Gates will be constructed of durable material that equals or exceeds the quality of the adjoining fence.

Heavy metal or wood gates more than 6ft. wide will be attached to the pull post of an H-brace.

Gates weighing less than 100 lbs may be hung from a single end post properly installed.

Stream Bank Protection

Permanent fencing will be placed at least 10 feet from the top of the stream bank and should allow for more area in meanders and in areas with bank erosion to minimize corner bracing.