New Jersey Department of Agriculture ("NJDA")

Wildlife Fence Cost-Share Program for Unpreserved Farms
("WFCS Grants")

Appendix A
High-Tensile Woven Wire Deer Fencing Design and Installation Specifications

NEW JERSEY
DEPARTMENT OF AGRICULTURE

Table of Contents

Introduction

The specifications included in this Appendix must be followed at a minimum for the effective implementation of exclusionary deer fence. Farmers wishing to deviate from the specifications must seek and get approval from the Division of Agricultural and Natural Resources ("Division") in writing prior to installation.

General Requirements

- All fence materials must be new and in unused condition.
- The minimum fence height is 96 inches (8 feet).
- Two fence systems are permitted:
  - System using full 96-inch high-tensile fixed-knot woven wire.
  - System using 75 to 96-inch high-tensile fixed-knot woven wire, with high-tensile wires spaced a maximum of 9 inches apart to reach the full 96-inch height.

Additional Awardee Responsibilities

Awardees must:

- Obtain all applicable permits and comply with all permit conditions.
- Act as General Contractor to obtain the services of all subcontractors required to perform the works of improvement.
- Contact the NJ One Call system at 1-800-272-1000 three to ten days prior to any construction activity to verify the location of any buried utilities. (The protection of private utilities is the responsibility of Awardee.)
- Seek and get prior approval from the Division, in writing, for any deviations from the design and installation specifications in this Appendix.
  Awardees can contact the NJDA at:

  PO Box 330, Trenton NJ, 08625-0330

  njdadeerfence@ag.nj.gov

  Ph: (609) 913-6490

Fence Materials and Specifications

- High-Tensile Woven Wire Fence and High-Tensile Wire
  - All wire must be high-tensile 12.5-gauge steel class 3 galvanized or greater.
  - High-tensile woven wire shall be fixed-knot.
  - The horizontal wires of a high-tensile woven wire fence shall have graduated spacing from 3 to 8 inches, with the smaller spacing placed nearest the ground. Vertical wires shall have a maximum spacing of 6 inches apart.
  - High-tensile woven wire shall be a minimum height of 75 inches. This minimum height must be achieved using a single roll of wire. Additional strands of high-tensile wire then must be added on top, at a maximum of 9-inch intervals, until reaching the full height, 96 inches.
  - All high-tensile woven wire and high-tensile wire shall be attached to the outside of the posts where practical. In all cases, it shall be attached to the outside of corners.
- Posts
  - Post shall be preservative pressure treated such as CCA 0.40 lbs., e.g., Southern Yellow Pine or equivalent. Do not use Red Pine. Posts shall be well-seasoned or kiln-dried to minimize warping. Well-seasoned means cut, debarked, and dried for a minimum of 1 year.
  - Alternatively, untreated posts also may be used, provided they are well seasoned, durable posts of species such as red cedar, black locust or Osage orange with the bark removed. Well-seasoned means cut, debarked, and dried for a minimum of 1 year.
  - Posts shall be a minimum of 12 feet long.
  - Line posts shall be a minimum 4”x4” or 4” round, installed at least 36 inches in the ground.
  - Brace posts shall be a minimum 5”x5” or 5” round, installed at least 36 inches in the ground.
  - Corner and end posts shall be a minimum of 6”x6” or 6” round, installed at least 42 inches in the ground.
  - Post spacing shall be 25 feet or less. See page 12 regarding post spacing along curves.
  - Posts may be pounded or augured. When augured, posts must be anchored on corners, ends, and low points. See page 12 regarding setting posts in the ground.
- Fasteners
  - 1 3/4” barbed, class 3 galvanized steel staples shall be used.

Brace Assemblies

Locating Braces Assemblies at Corners, Ends, Gate Posts, and Mid-Line (Line)

Length of Straight Run of Fence between Corner, End, Gate Posts, and/or Line Brace	**Type of Brace Assembly needed at Corner, End, and/or Gate posts**	**Line Brace Assemblies: Whether they are required, and if so, at what Intervals in a straight run of fence**
Less than 700 feet	Single-Span Brace	Line braces are not required at fixed intervals for this run of fence. Use line braces as needed at top and bottom of hills.
700 to 1,300 feet	Double-Span Brace	Line braces are not required at fixed intervals for this run of fence. Use line braces as needed at top and bottom of hills.
More than 1,300 feet	Depends on the spacing of line braces used in the run of fence: • Use a single-span brace if the distance to the line brace is less than 700 feet. • Use a double-span brace if the distance to the line brace is 700 to 1,300 feet.	Line braces are required: • Use at least one line brace (double -span) every 1,300 feet in the run of fence, and as needed on the tops and bottoms of hills.

Note: A ***run*** is the distance between a corner, end, gate, or brace post and the next corner, end, gate, or brace post.

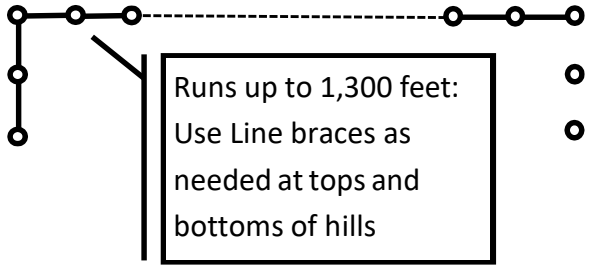
Brace Assembly Length

Single-span brace assemblies shall be a minimum of 10 feet long. Double-span brace assemblies shall be a minimum of 16 feet long.

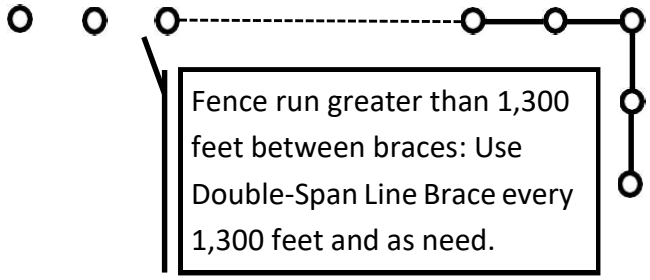
Brace Assembly Placement in Line

Line brace assemblies shall be installed at appropriate intervals in a run of fence and at all sharp breaks in grade, typically when the change in slope is greater than 15%.

1,300’ or less



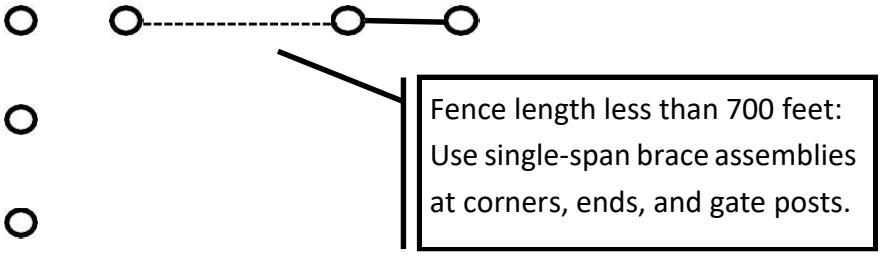
1,300’ or greater

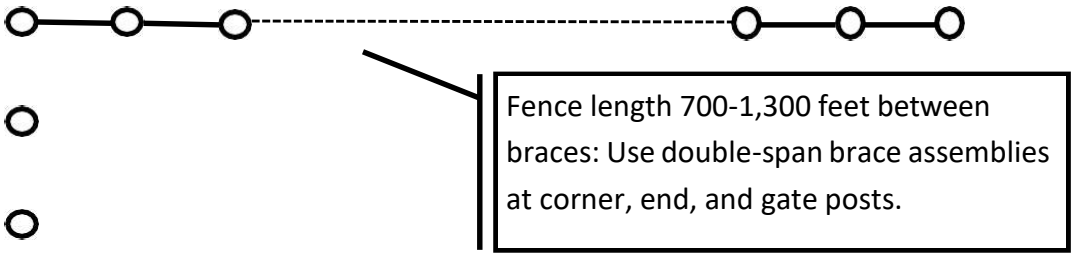


Brace Assembly Placement at Corners, Ends, and Gates

Single-span or double-span brace assemblies are required at all corners, ends, and gates, and where the fence alignment changes direction by more than 40 degrees.

If a wide stream or gully is to be crossed, the fence section shall be terminated on one bank with a brace assembly, and a new section with a brace assembly shall be started on the other bank.





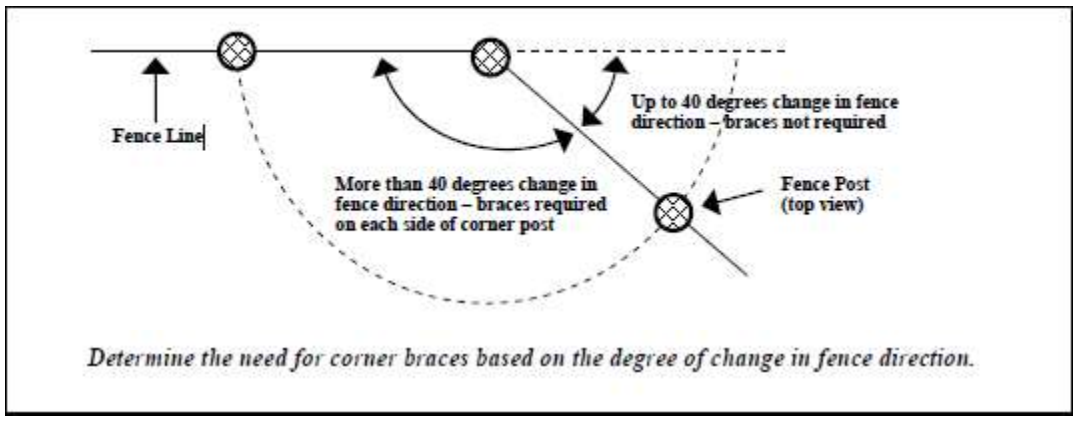


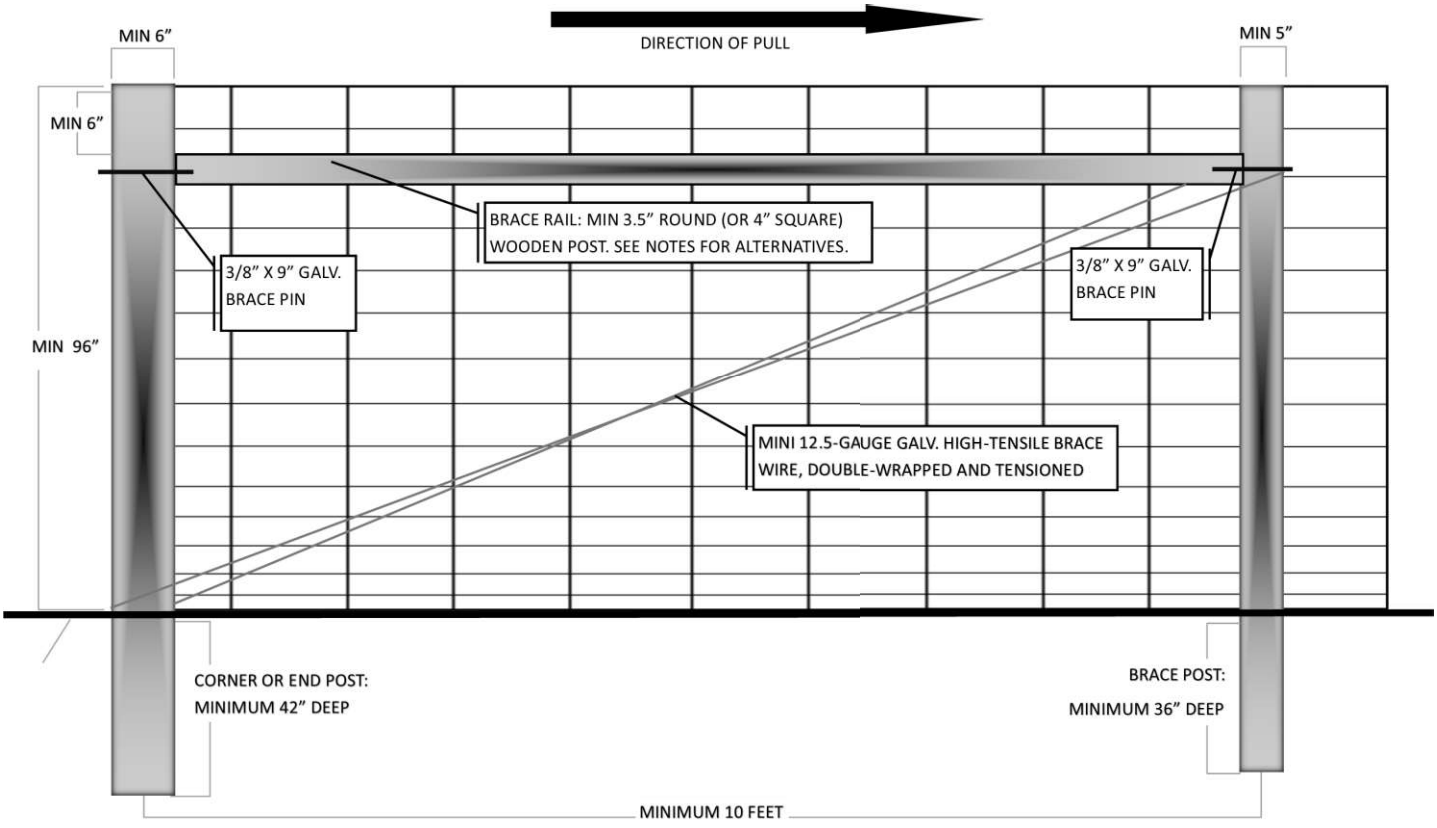
Diagram courtesy of NRCS

Brace Assembly Components

- Horizontal Brace Rails shall be wooden posts a minimum of 4”x 4” square or 3 1/2-inch diameter round. One alternative is to use galvanized steel pipe with a minimum 2-inch diameter and with the minimum wall thickness as specified for a water supply pipe.
- Brace post pins shall be steel rods a minimum of 3/8-inch x 9-inch.
- Brace wires shall consist of 12½ gauge or stronger, galvanized, high-tensile wire, double wrapped with a 1½-inch x 2-inch x 2-foot twist stick. A double wire with a tightener also may be used. Brace wires shall be tightened to secure the brace and post assemblies. Other commercially available tension systems may be used with prior SADC approval.

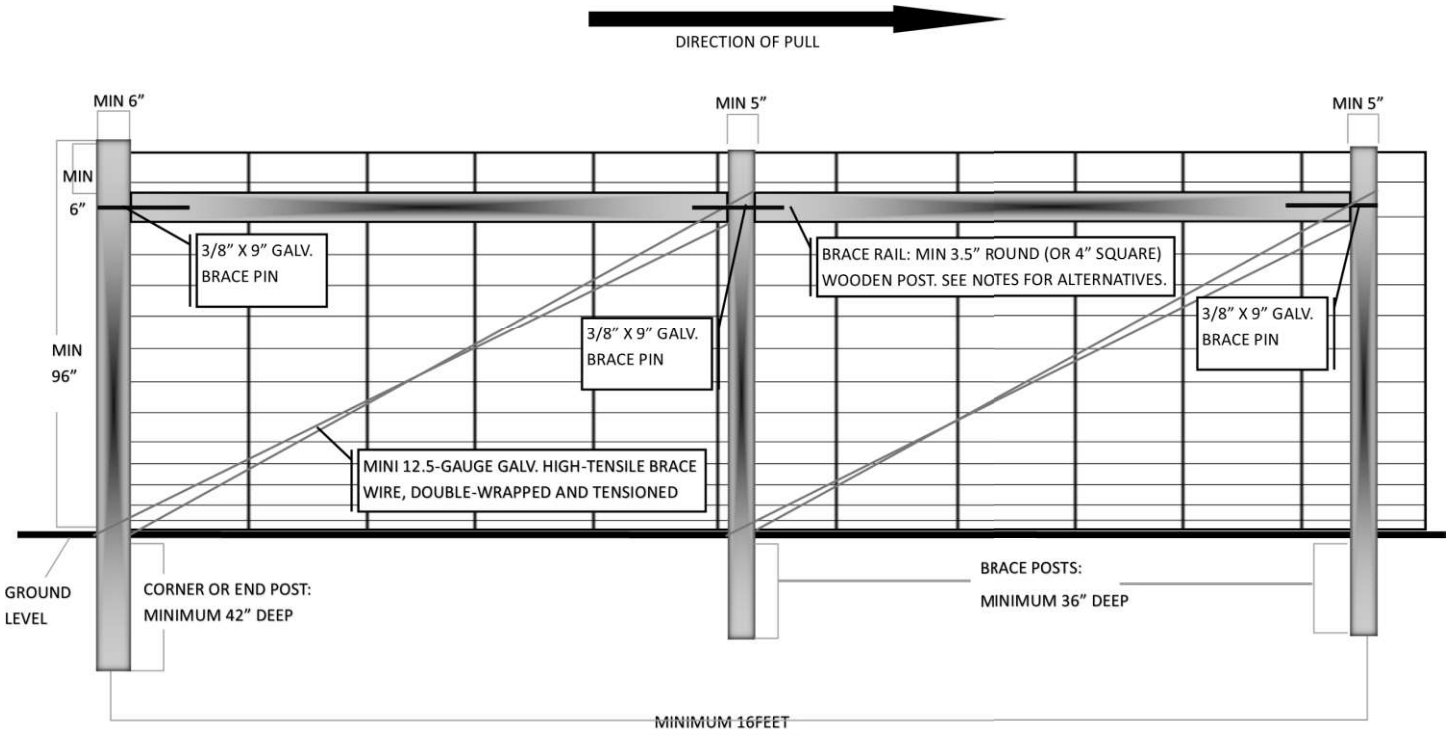
Typical Single-Span Brace Assembly at a Corner or End

- Used when the run of fence is less than 700 feet



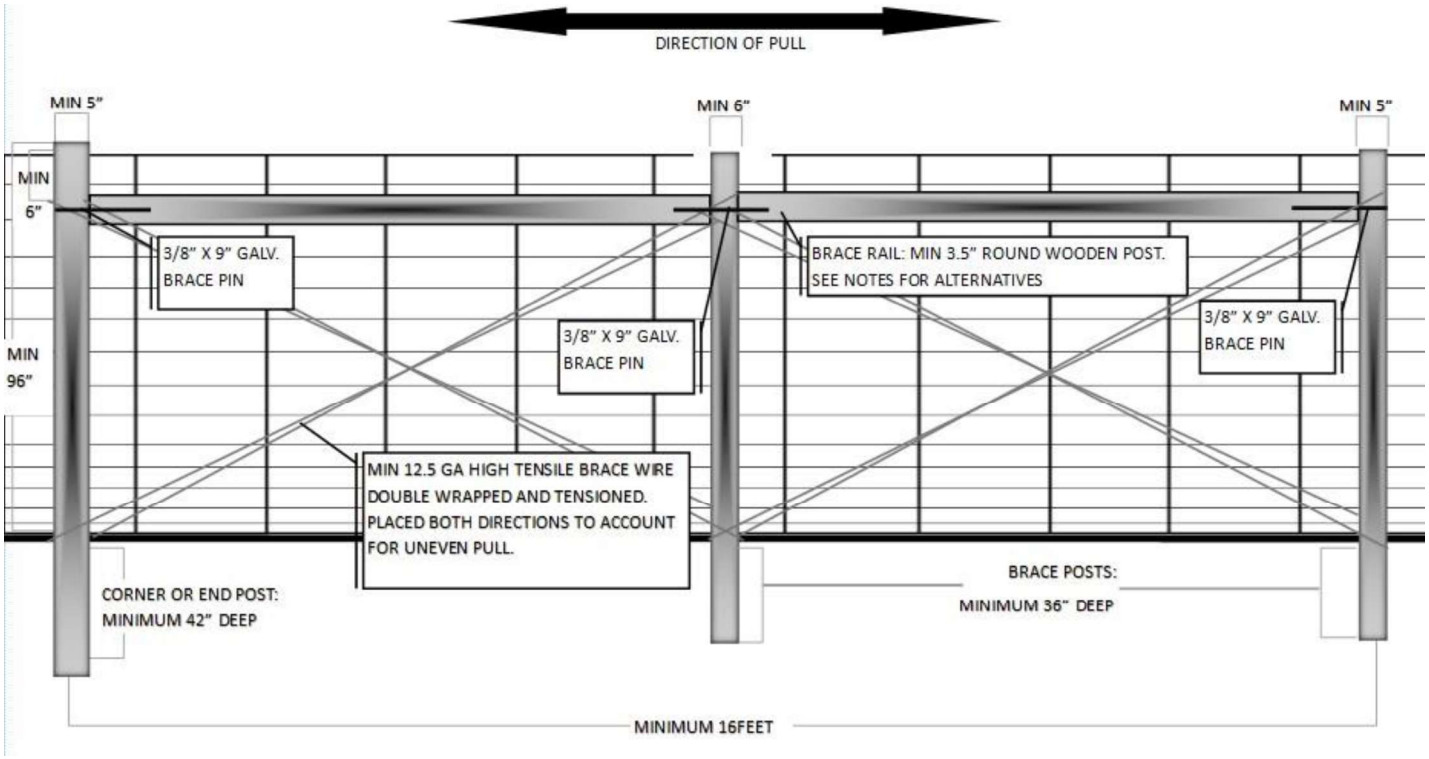
Typical Double Span Brace Assembly at a Corner or End

- Used when the run of fence is greater than 700 feet



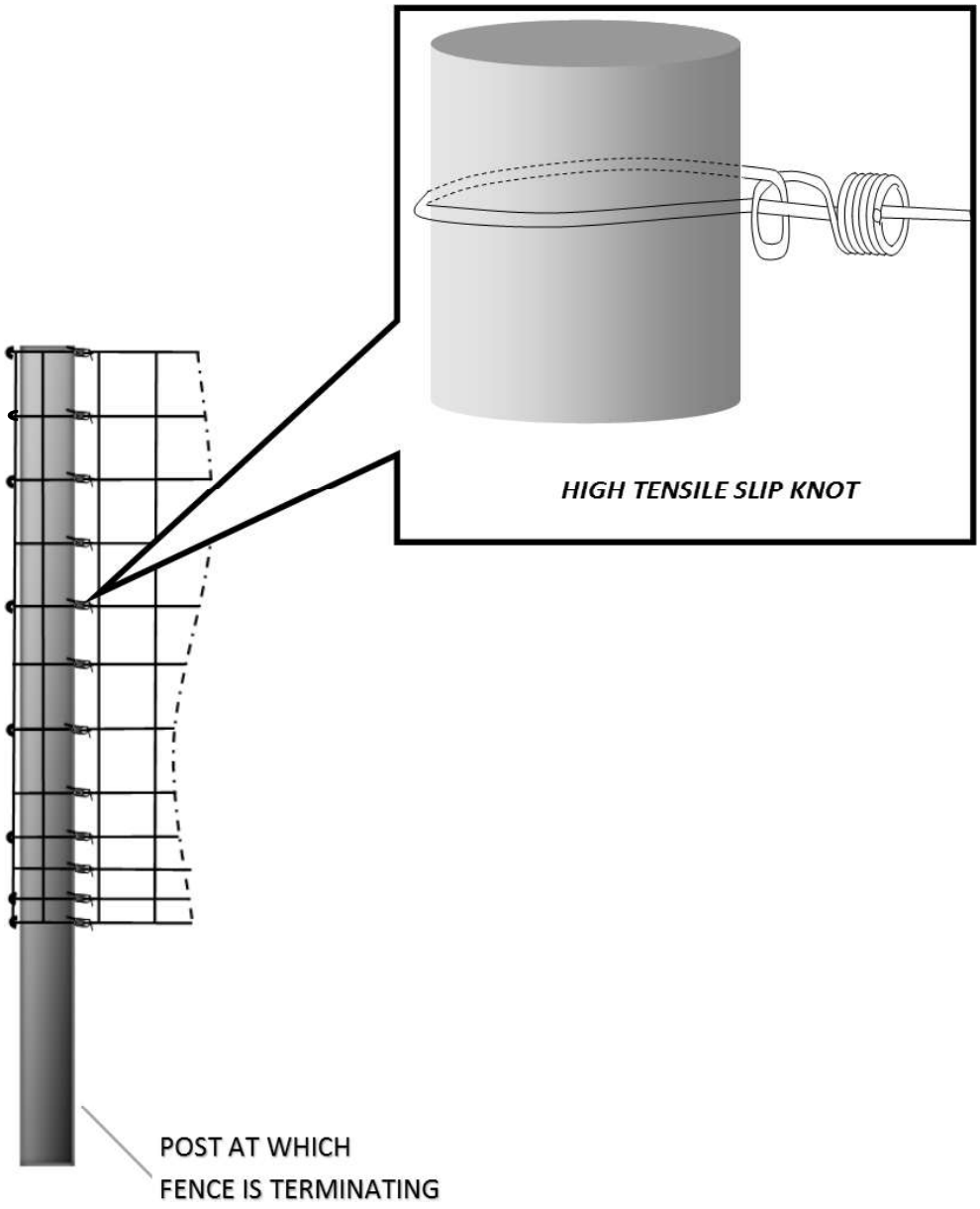
Typical Line Brace Assembly

- Used when the run of fence is greater than 1,300 feet, or otherwise as needed



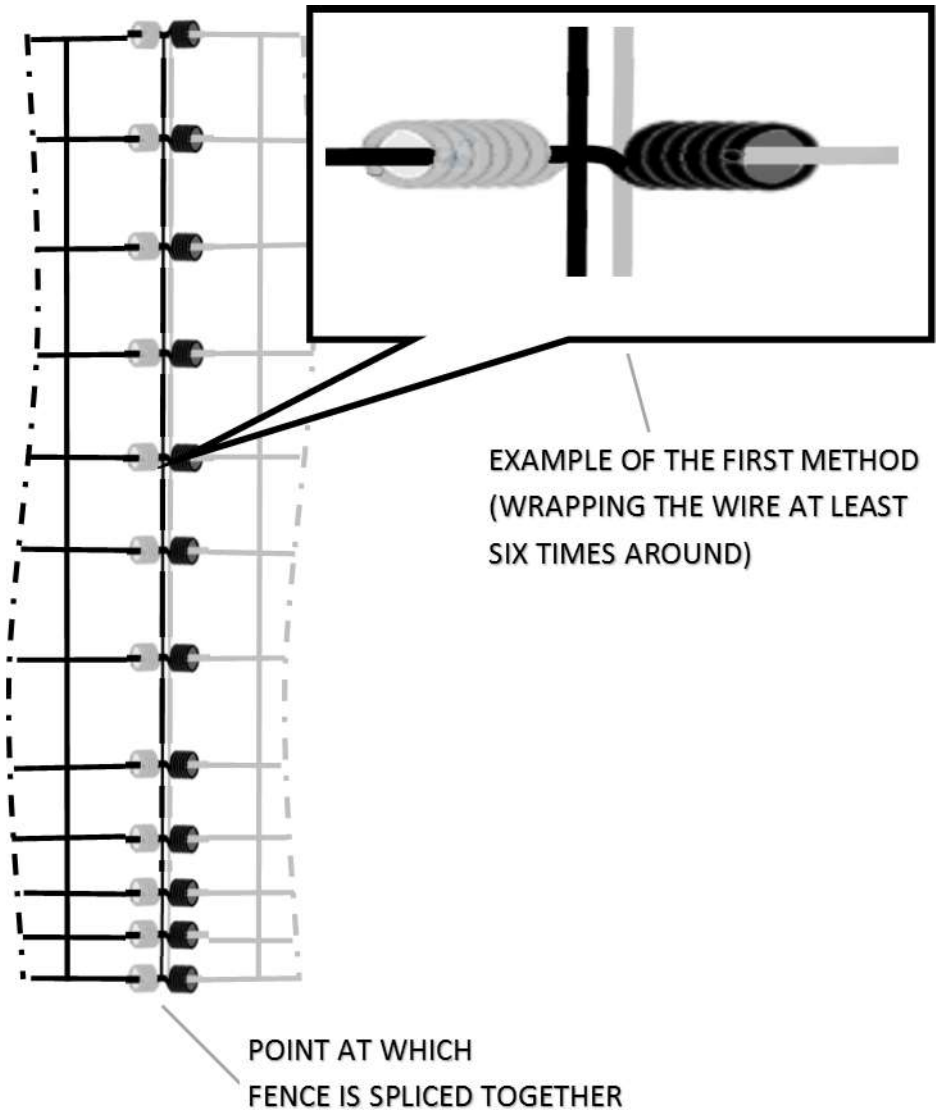
Terminating a Fence

- When fence is terminated at a post, it shall be terminated using one of the following methods:
  - High-tensile slip knot;
  - Crimp sleeves rated for the appropriate gauge wire according to manufacturers instructions; or
  - Any other commercially available termination device, rated for the appropriate gauge wire according to manufacturers instructions.



Splicing a Fence

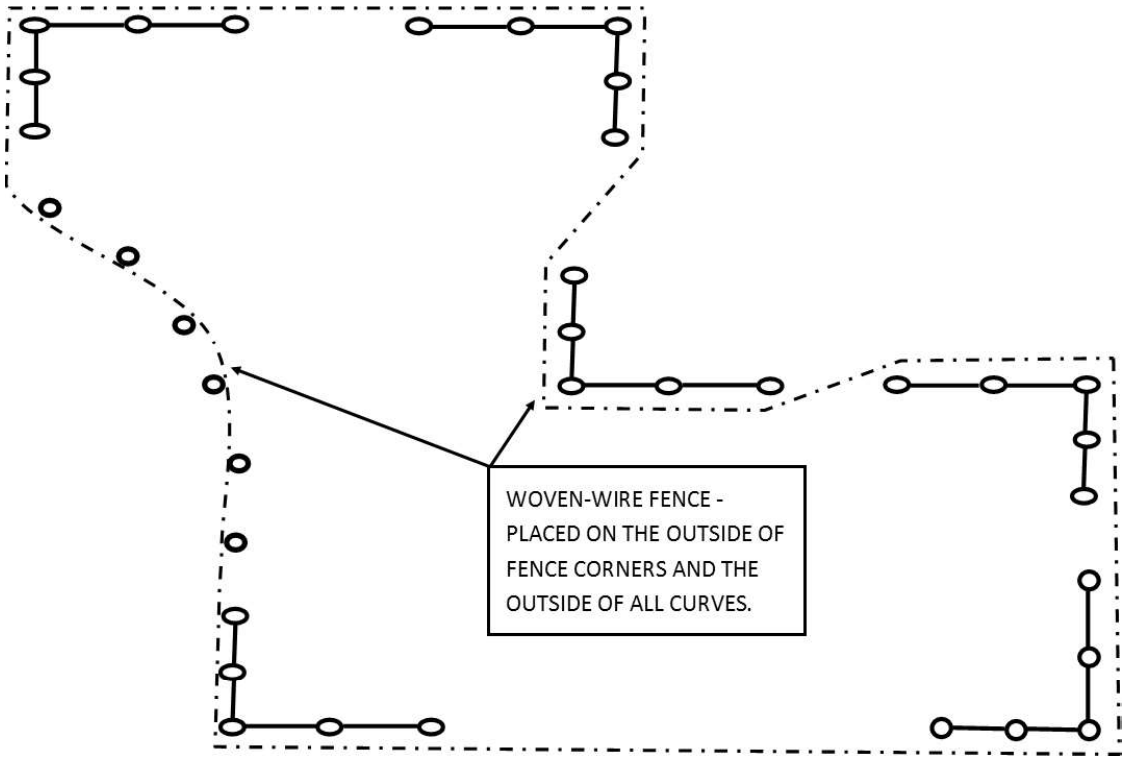
- When it is necessary to splice two sections of fence together, one of the following methods shall be used:
  - Place each fence's vertical stays over each other and wrap the loose horizontal ends of the wires around the corresponding horizontal wire not less than 6 times around;
  - Apply crimp sleeves rated for the appropriate gauge wire according to manufacturers instructions; or
  - Employ any other commercially-available splicing device rated for the appropriate gauge wire according to manufacturers instructions.



Woven Wire Fence Placement

Woven wire fencing shall be placed on the outside of all corners, brace assemblies, and curves. When tensioned, the wire fencing should pull against the post, not the staples. **All fencing shall be sufficiently tensioned using commercially available methods. Tightening by hand is not acceptable**.

In all other areas, fence should be stapled on the side of the posts that will experience the most deer pressure. This side is typically the outer (non-cropped) side of the post. Exceptions may be made when site conditions make placement on the outside of the post impractical.



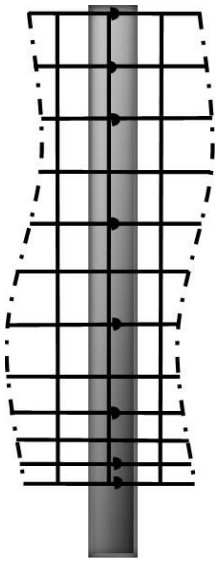
Fastening Woven Wire Fence to Posts

Staples shall be used to fasten woven wire fence to posts. The bottom two and top two horizontal wires shall be stapled to each post, and every other horizontal wire in between shall be stapled to each post.

If a fence includes single-strand high-tensile wires above the woven wire portion of the fence, the single strand high-tensile wires shall be stapled to each post.

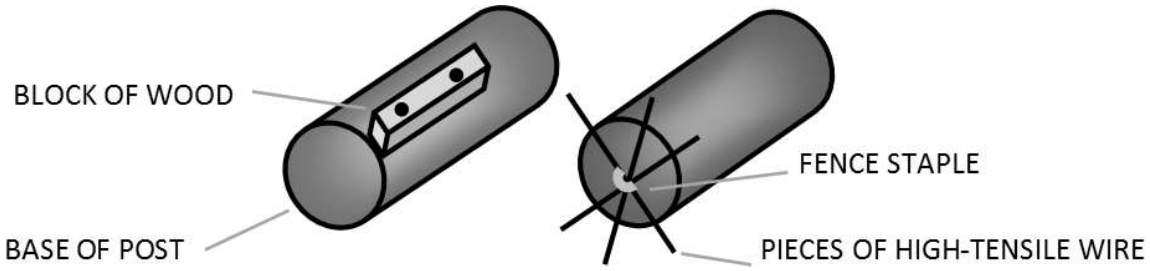
Wire should be held in place by the staple, but the staple should allow the wire to move back and forth freely.

When driving staples, rotate the flat face of the staples 30-45 degrees from the flat face of the post to prevent splitting.



Setting Posts in the Ground

Posts may be pounded or augured. When augured, posts must be anchored at corners, ends, and low points. The following are two ways to anchor and set a post: 1) Attach a wood block near the bottom of the post (block system); or 2) Attach pieces of high-tensile wire and a fence staple at the bottom (spider system).



Line Post Spacing on Curves

The spacing of line posts on curves is determined by the sharpness of the curve. Refer to the diagram below to determine the correct spacing.

Fence alignments that change direction by less than 40 degrees are considered curves.
Fence alignments that change direction by more than 40 degrees are considered corners.

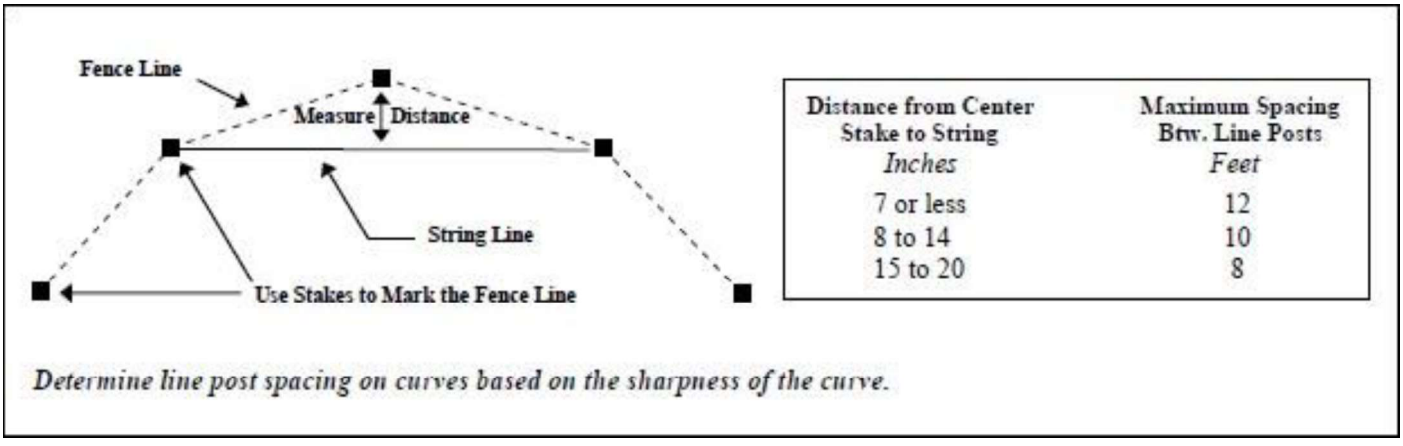


Diagram courtesy of NRCS

Deer Fence Installation Training Video

To be eligible for NJDA Matching Grants for Deer Fencing on Unpreserved Farms, applicants must watch the "SADC Deer Fence Installation Training Video"*. The video is available here: https://youtu.be/Oko0ObsIHSg. You are only required to watch the fence installation portion of the video, which begins at 1:02:26 and concludes at 1:27:36.

Source Notes

The specifications in this Appendix are derived from the following sources:

- High-tensile Woven Wire Fences for Reducing Wildlife Damage – FS889 – Rutgers University, March 2010.
- Deer Fence Bid Specifications – NJ Department of Agriculture, Division of Agriculture and Natural Resources, November 2004.
- Fence Technical Reference (382) – NJ-NRCS, November 2014.
- NJ Deer Exclusion Fence Installation and Removal Guidance for (382) Fence – NJ-NRCS October 2015.
- SADC Farmland Stewardship Deer Fencing Program Training on Proper Installation and Maintenance, July 2017. https://youtu.be/Oko0ObsIHSg.

Where discrepancies exist between these sources and this Appendix, the standards set forth in this Appendix shall apply.

* The training video was produced by the SADC, but the NJDA requires the same specifications for deer fences constructed pursuant to this Program.