

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

FENCE

(Ft.)

CODE 382

DEFINITION

A constructed barrier to animals or people.

PURPOSE

This practice is applied to facilitate the application of conservation practices by providing a means to control movement of animals and people.

Applicable purposes include, but are not limited to:

- ***Improve distribution and timing of livestock grazing***
- ***Reduce erosion and improve water quality by controlling livestock access to streams, springs, wetlands and ponds***
- ***Facilitate handling, movement and feeding of livestock in a pasture environment***
- ***Protect newly planted areas from disturbance until established***
- ***Protect sensitive environmental areas and their flora from vehicular, pedestrian or animal traffic and use***
- ***Protect the safety of people, livestock and wildlife by limiting or denying access to hazardous areas***

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on any area where management of animal or people movement is needed. Fences are not needed where natural barriers will serve the purpose.

CRITERIA

General Criteria Applicable to All Purposes

Fencing materials, type and design of fence installed shall be of a high quality and durability. The type and design of fence installed will meet the management objectives and topographic challenges of the site.

Fences shall be positioned to facilitate management requirements. The fence design and installation shall follow all federal, State and local laws and regulations.

Construction shall be performed in a manner that meets the intended management objective. Wire and hardware will be new, galvanized material.

Height, number, and spacing of wires will be installed to facilitate control and management of the animal(s) and people of concern.

Height, size, spacing, and type of posts will be used that best provides the needs for the style of fence required and is best suited for the topography of the landscape.

Manufacturer's guidelines shall be adhered to during installation of each type of fence to ensure proper component assembly.

Follow all manufacturers' safety precautions for handling and installing fencing materials. Place warning signs on electric fences every 150 to 200 feet, wherever the public is expected to encounter the fence.

Wire should be attached on the side of posts that will receive the greatest pressure from animals. Wire will be placed on the outside of posts on curves.

All fence construction shall comply with federal, state and local fencing codes.

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March 2003**

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

**NRCS, WV
April 2005**

Additional Criteria

1. **Non-electric standard woven and barbed wire** - See Appendix 1.
2. **High tensile electric, high tensile non-electric, light weight high tensile, high tensile for deer control** - See FOTG Agronomy References – High-Tensile Wire Fencing and Max-Flex™ - First in Fencing - Since 1978. *(Note: The above are to be used as reference material only. They should not be copied and given to a client)*
3. **Electroplastic twine (polywire) and electrified ribbon fencing** - See Appendix 2.
4. **Board fence** - See Appendix 3.
5. **Chain link and ornamental fencing** – Install according to manufacturers recommendations.
6. **Legal fence** – See Appendix 4.

CONSIDERATIONS

The fence design and location should consider: topography, soil properties, safety and management of livestock, wildlife movement, location and adequacy of water facilities, development of potential grazing systems, human access, landscape aesthetics, erosion problems, moisture conditions, flooding potential, stream crossings, and durability of materials.

Where applicable, cleared rights-of-way may be established which would facilitate fence construction and maintenance.

Fences across gullies or streams may require special bracing, designs or approaches.

Fence design and location should consider ease of access for construction, repair and maintenance.

Breakaway fences or swinging water gaps allow debris and water to flow past the fence line without destroying the fence adjacent to the stream or gully. Swinging water gaps or floating water gaps should span running streams.

Any permanent fencing for grazing livestock should allow flexibility to facilitate

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implementation of the grazing plan and permit land management activities such as nutrient application, pest control, forage harvest, and other appropriate practices.

When possible, install fences across slopes to improve grazing distribution, rainfall infiltration, and reduce soil erosion.

Locate fences to facilitate livestock management, handling, watering, and feeding.

Remove temporary fence during non-grazing season to minimize flood or deer damage. Deer fence should be electrified year-round to train deer to avoid the protected area.

PLANS AND SPECIFICATIONS

Plans and specifications are to be prepared for specific sites based on this standard.

Plans and specifications for installing fences shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve all of its intended purposes.

At a minimum the following will be identified in the conservation plan:

- ***Type of fence***
- ***Strands of fence (if applicable)***
- ***Type and size of fence posts***
- ***Length of fence***
- ***Operation and maintenance requirements***

OPERATION AND MAINTENANCE

Regular inspection of fences should be part of an ongoing maintenance program. Inspection of fences after storm events is necessary to insure the continued proper function of the fence.

For electrified fences, use a voltage tester to ensure adequate charge is being maintained along the entire fence span. Keep heavy vegetation away from fences, especially electrified fences to avoid a loss of charge.

Maintenance and repairs will be performed in a timely manner as needed.

Retain and properly discard all broken fencing material and hardware to ***prevent ingestion by***

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April 2005**

animals or injury to equipment, people or animals.

All necessary precautions should be taken to ensure the safety of construction and maintenance crews.

References

High Tensile Wire Fencing, Cooperative Extension Northeast Regional Agricultural Engineering Service, NRAES – 11, September, 1987

Max-Flex™ - First in Fencing - Since 1978, 2002 Version, Max-Flex™ Company, U.S. Rt. 219, Linside, WV 24951, phone: 1-800-356-5458, <http://www.maxflex.com>

Laws of West Virginia Relating to Agriculture, West Virginia Department of Agriculture, Charleston, WV, 1996

**** Note - Bold italics indicate information added to the national standard by West Virginia.***

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***APPENDIX 1 – NON-ELECTRIC STANDARD WOVEN AND
BARBED WIRE***

APPENDIX 1

NON-ELECTRIC STANDARD WOVEN AND BARBED WIRE

Fences for large animals (cattle and horses), will be constructed of 5-6 strands of barbed wire but 4 strands may be used for interior pasture and 3 strands for livestock exclusion of woodland.

Fences for mixed livestock will be constructed of woven wire at least 39" high topped with two strands of barbed wire or 47" high topped with one strand of barbed wire.

Materials

- a. Barbed wire: Double strand 15-1/2 gauge or larger with 4 point barbs.
- b. Woven wire: 11 gauge or larger top and bottom wires, 14 1/2 gauge or larger intermediate line and stay wires. Maximum of 12" between stay wires. Live trees in line with fence and at least 5" in diameter can be used as a substitute for posts. The wire must be attached to a black locust or pressure treated 2x4 nailed to the tree.
- c. Posts: Black locust is preferred as the most durable wood to use untreated. Eastern redcedar may also be used untreated. All other woods will be treated with preservative if used. Steel posts may also be used.

Wood line posts – 6-1/2 feet or longer, 4 inch minimum diameter (3 inch for pressure treated posts).

Wood corner, gate and brace posts – 8 feet or longer, 5 inch minimum diameter.

Steel line posts – Standard "T" Section 1-3/8" X 1-3/8" x 1/8", galvanized or painted, w/anchor plate. Every third or fourth post shall be wood.

- d. Braces:

Wood – 3-1/2 inch diameter at small end, or 3-1/2 inches square, 8 feet long.

Brace wire – High tensile, galvanized steel, 9 gauge or 12 1/2 gauge high tensile, galvanized, double wrapped

- d. Staples: Staples used to fasten fence wire to wooden posts will be 9 gauge galvanized wire with a minimum length of 1-1/2" for softwood and 1" for hardwood. Staples will be driven cross-wise to the grain and will not be driven in tight against wire.

Installation

Wood line posts - maximum of 16.5 ft. apart and set a minimum of 2 feet deep.

Steel line posts - maximum of 16.5 ft. apart and set to top of anchor plate.

Brace assemblies in line - are placed not more than 660 ft. apart on level or gently sloping land; and at any significant change in the land surface - 15° change in alignment or slope.

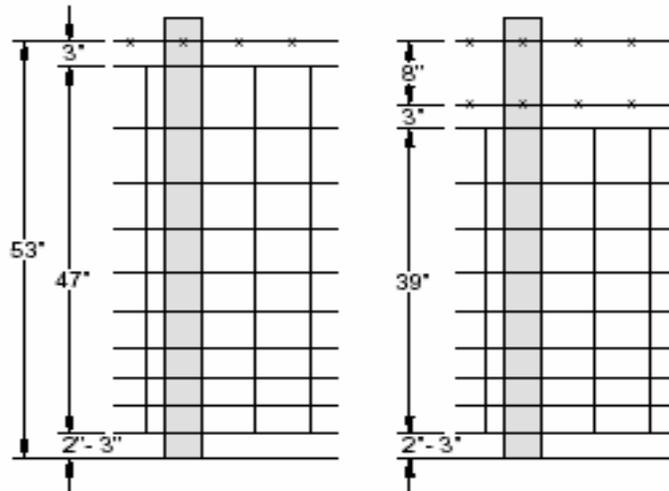
Brace posts - are placed 8 feet from corner posts, end posts, and gate posts; and 8 ft. apart in line brace assemblies.

Corner, gate, and brace posts – are set at least 3 feet deep. Posts may be driven or set in post holes and hand tamped with earth or filled with concrete.

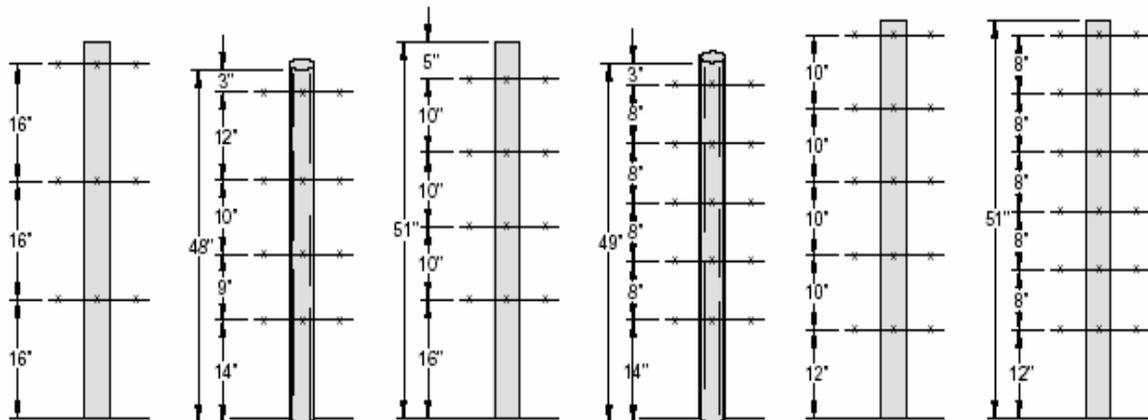
Drawings for wire bracing and control panel construction.

MOUNTING HEIGHTS FOR BARBED WIRE USE WITH WOVEN WIRE FENCE

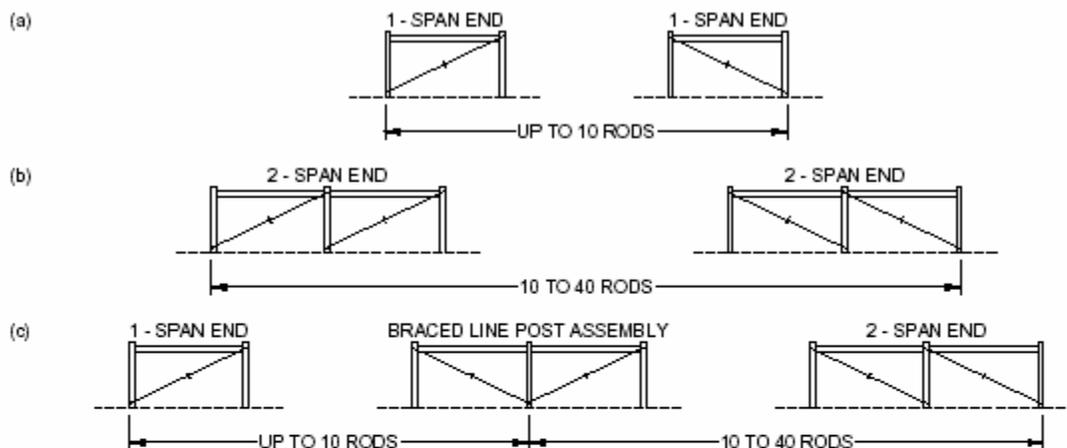
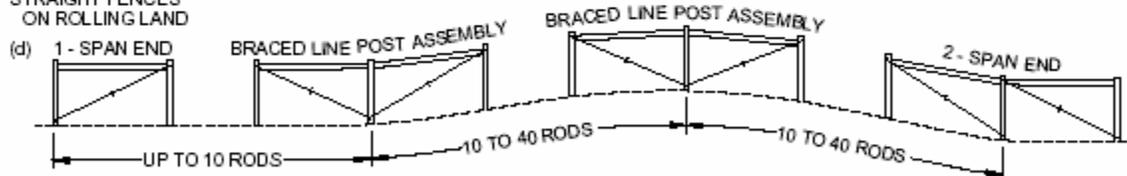
The first barbed wire above woven wire fence should be within 3" of top line wire. This reduces the possibility of animals getting their heads between woven wire and barbed wire and destroying the fence.



SUGGESTED SPACING FOR BARBED WIRE



ANCHOR-AND-BRACE LOCATIONS FOR FENCES

STRAIGHT FENCES
ON FLAT LANDSTRAIGHT FENCES
ON ROLLING LAND

CURVED FENCES



Types of anchor-and-brace assemblies and where to locate them.

- (a) *For fence lengths of 10 rods (165 feet) or less, use single span end construction.*
- (b) *For fence lengths of 10 to 40 rods (165 to 660 feet), use double-span end construction.*
- (c) *For fences more than 40 rods (660 feet) long, use a braced-line-post assembly to divide the fence lengths.*
- (d) *On rolling land, fence stretching is easier if braced line-post assemblies are located at the foot and top of each hill.*
- (e) *Contour fences, more than 20 rods (330 feet) long, should have a braced-line-post assembly installed to keep the stretches to 20 rods (330 feet) or less. Install in straight section at least one post span away from a curve. Do not install on a curve.*

Note: One rod equals 16 ½ feet.

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***APPENDIX 2 – ELECTROPLASTIC TWINE (POLYWIRE) AND
ELECTRIFIED TAPE FENCING***

APPENDIX 2

ELECTROPLASTIC TWINE (POLYWIRE) AND ELECTRIFIED TAPE FENCING

Temporary, portable electric fence systems are used to control all types of livestock. Fencing may be used to divide large pasture acreage into manageable units.

Materials

- a. Wire: *Wire shall be polyethylene wire or tape with steel or aluminum wire woven into them. Temporary net fence may be used in crowding areas and for animals such as sheep, goats, and hogs.*

Spacing:

One strand – place wire 28 to 34 inches above the ground.

Two strands – place wires a 17 to 22 inches and 32 to 38 inches above the ground.

Three strands – place wires 10 to 17, 20 to 27 and 32 to 38 inches above the ground.

- b. Posts:

End Posts: *When end posts are needed at each end of a cross fence, they may be untreated wood (locust) or pressure treated softwood, or equivalent, with a top diameter sufficient to anchor the wire. Posts must be long enough to allow them to be set at least 18" in the ground.*

Line Posts: *Posts in a line of cross fence may be manufactured fiberglass, 48" long, or equivalent, set deep enough in the ground to withstand livestock.*

Spacing:

Line posts will be installed on a spacing necessary to control livestock.

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APPENDIX 3 – BOARD FENCE

APPENDIX 3

BOARD FENCE

A wooden board fence shall have a minimum of 3 boards. The maximum board spacing shall be 16-inches center to center. The top edge of the uppermost board will be at least 48" above the ground, and the top edge of the lowest board will be no greater than 16" above the ground. Each board shall be attached to each post with two 16d galvanized or cadmium coated nails.

Unless painting is selected, lumber shall be treated with creosote or comparable preservative. If painting is desired, lumber shall be treated with an approved preservative.

Materials

- a. Rails: *The rails (horizontal boards) shall be a minimum of 1" x 6" (nominal) x 8' long. Wooden boards (horizontal rails) and posts shall be well seasoned or kiln-dried to minimize warping. Use untreated durable wood of such species as red cedar, black locust or a non-durable wood that is preservative pressure treated. Treated lumber shall be treated with a minimum retention of 0.40 lbs./cubic foot chromated copper arsenate (CCA), type A, B, or C, or equivalent non-CCA treatment. Boards and posts may be painted if desired.*
- b. Posts: *Untreated posts will be black locust. Pressure treated pine or other wood of equal life and strength are acceptable. Line posts will have a minimum top diameter of 3 inches and be of sufficient length to support the height of the fence and be firmly set or driven in the ground a minimum of 2 feet. Corner, gate, end, and brace posts will have a minimum top diameter of 5 inches and be of sufficient length to support the height of the fence and be firmly set or driven in the ground a minimum depth of 3 feet.*

Post Spacing: *Posts shall be spaced a maximum of 8 feet apart to accommodate rail lengths.*

APPENDIX 4

WEST VIRGINIA AGRICULTURE LAWS

ARTICLE 17.

FENCES.

Article inapplicable to federal lands. — Lands of the United States are not subject to the provisions of this article. *United States v. Johnston*, 38 F. Supp. 4 (S.D.W. Va. 1941).

§ 19-17-1. Definition of lawful fence.

Every fence of the height and description herein-after mentioned shall be deemed a lawful fence as to any horses, mules, asses, jennets, cattle, sheep, swine, or goats, which could not creep through the same, that is to say:

(a) If built of common rails, known as the worm fence, four and one half feet high;

(b) If built with posts and rails, or posts and plank, or pickets, four feet high;

(c) If built with stone, two feet wide at base, and three and one half feet high;

(d) If a hedge fence, four feet high. If any hedge fence be built upon a mound, the same from the bottom of the ditch shall be included in estimating the height of such fence;

(e) If built with posts and wire, or pickets and wire, four feet high, and shall consist of not less than six strands, the first strand five inches, the second strand ten inches, the third strand seventeen inches, the fourth strand twenty-five inches, the fifth strand thirty-six inches, and the sixth strand forty-eight inches from the ground; and if with more than six strands, the space between the strands shall in no case be greater than hereinbefore provided. The space between the posts shall, in no case, be greater than sixteen feet;

(f) If built with posts and high tensile galvanized wire, forty-six inches high, and shall consist of not less than eight strands, the first strand four inches, the second strand nine inches, the third strand fourteen inches, the fourth strand nineteen inches, the fifth strand twenty-five inches, the sixth strand thirty-one inches, the seventh strand thirty-eight inches, and the eighth strand forty-six inches from the ground. The wire shall be maintained at no less than a two hundred pound tension at all times. The space between posts shall, in no case, be greater than thirty feet, provided that pressure-treated one and one-fourth inch by one and one-half inch by forty-eight inch slotted hardwood or one and one-half inch by two inch by forty-eight inch softwood battens are used between posts at a distance no greater than ten feet; and

(g) If built with posts and high tensile galvanized wire and electrified, thirty-eight inches high and shall consist of not less than five strands, the first strand five inches, the second strand ten inches, the third strand seventeen inches, the fourth strand twenty-seven inches, and the fifth strand thirty-eight inches from the ground. The wire shall be maintained at no less than a two-hundred pound tension at all times. The space between posts shall, in no case, be greater than one hundred fifty feet, provided that pressure-treated one and one-fourth inch by one and one-half inch slotted hardwood or one and one-half inch by two inch softwood battens are used between posts at a distance no greater than thirty-five feet: Provided, That if said fence is constructed to confine only horses, mules, asses, jennets, or cattle, it shall be deemed a legal fence if it is not less than three strands, the first strand seventeen inches, the second strand twenty-seven inches and the third strand thirty-eight inches from the ground. The space between posts shall, in no case, be greater than one hundred fifty feet, provided that pressure-treated one and one-fourth inch by one and one-half inch slotted hardwood or one and one-half inch by two inch softwood battens are used between posts at a distance no greater than thirty-five feet. Only highpowered low impedance fence controllers which comply with international safety standards shall be used to electrify fence.

All fences heretofore built under the existing law and in compliance therewith shall be and remain and may be kept up as lawful fences. (Code 1868, c. 60, § 1; 1872-3, c. 148, § 1; 1882, c. 115, § 1; 1883, c. 32, § 1; 1891, c. 64, § 1; 1895, c. 35, § 1; Code 1923, c. 60, § 1; 1933, c. 55; 1986, c. 1.)