

**Natural Resources Conservation Service****CONSERVATION PRACTICE STANDARD****FENCE****CODE 382**

(ft)

**DEFINITION**

A constructed barrier to animals or people.

**PURPOSE**

This practice is used to accomplish the following purpose:

- Facilitates the accomplishment of conservation objectives by providing a means to control movement of animals and people, including vehicles

**CONDITIONS WHERE PRACTICE APPLIES**

This practice may be applied on any area where management of animal or human movement is needed.

**CRITERIA****General Criteria Applicable to All Purposes**

Fencing materials, type and design of fence installed will be high-quality and durable. The type and design of fence installed will meet the management objectives and site challenges. Based on objectives, fences may be permanent, portable, or temporary.

Fences will be positioned to facilitate management requirements. Ingress/egress features such as gates and cattle guards will be planned. The fence design and installation should have the life expectancy appropriate for management objectives and will follow all federal, state and local laws and regulations.

Height, size, spacing and type of materials used will provide the desired control, life expectancy, and management of animals and people of concern. See Table 1 and Table 2.

Fences will be designed, located, and installed to meet appropriate local wildlife and land management needs and requirements.

Electric fences must have access to a dependable power supply, main line, solar power panel, or easily exchanged and properly sized deep cycle batteries.

Electric fences must have adequate shocking power for the animal type being controlled at all points along the fence.

All electric fences must be grounded to ensure proper flow of electricity.

Other fence materials such as chain link, vinyl, plank or rail fence will be installed according to manufacturer recommendations.

Other fence types, materials, or modifications may be used if approved by the responsible NRCS State Technical Lead (STL).

NRCS District Conservationist must approve the use of used materials based on state policy.

### **General Criteria to Flood Prone Areas**

When constructing fences in flood prone areas, use high tensile electric fence with the fewest posts and wires needed to control the animals of concern. Place the bottom wire as high as practical. This type of fencing is acceptable boundary when the property line is in a flood prone area.

### **CONSIDERATIONS**

Determine paddock size needed before cross fencing is installed. See the Prescribed Grazing Technical Note or Graze Tools/Cowboy Math for sizing paddocks.

The fence design and location should consider: topography, soil properties, livestock management, animal safety, livestock trailing, access to water facilities, development of potential grazing systems, human access and safety, landscape aesthetics, erosion problems, soil moisture conditions, flooding potential, stream crossings, and durability of materials. When appropriate, natural barriers should be utilized instead of fencing.

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

Avoid clearing of vegetation during the nesting season for migratory birds.

Fences should be marked to enhance visibility as a safety measure for animals or people.

Fences across gullies or streams require special braces and designs. 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 or floating water gaps should span running streams.

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

Place wood line posts in dips and on rises, then follow recommended spacing for different fence types.

Post spacing in shallow soils may vary with additional stays installed to maintain post spacing. Use a probe to locate desirable post sites.

According to the National Organic Program, organic and transitioning organic producers are not allowed to use treated wood.

Fence construction requiring the removal of existing fencing materials should provide for proper disposal to prevent harm to animals, people and equipment.

Consider placing fences with the landscape, so little interference occurs if land use changes or land is in a rotation.

When planning and constructing a fence on steep slopes, consider soil erosion potential from livestock trailing. When possible, use natural terrain to reduce concentrated flow in potential trailing areas.

Driven posts are typically 70% tighter than posts set in an augured hole and tamped in.

When a tree is used as a live post, placing washers on the nails in the board between the tree and wire will help prevent the nail from sinking into the board.

A double-brace assembly may be required at ends and corners for fences in poorly drained soils.

Electric fences may use overhead or underground transmission lines to carry electricity past the gate to the remainder of the fence.

Lightning arrestors or spark gaps may be installed to limit damage to charger, fence, and nearby objects and injury or death to animals and people.

Although the minimal voltage for control of different species is listed in specifications, the recommended voltage for best control of all animals is 4,000 or more volts.

Consider wildlife movement needs when locating fences. Woven wire and chain link fence are the least wildlife-friendly fence types. Shorter fences are more wildlife-friendly.

Wire may need to be adjusted according to the season. Wire tightens in winter and loosens in summer.

Where appropriate, local cultural values should be incorporated into practice design in a technically sound manner.

## **PLANS AND SPECIFICATIONS**

Plans and specifications will be prepared for all fence types, installations and specific sites. Requirements for applying the practice to achieve all of its intended purposes will be described.

## **OPERATION AND MAINTENANCE**

Regular inspection of fences should be part of an ongoing maintenance program to ensure continuing proper function of the fence. Operation and Maintenance (O&M) includes the following:

Maintenance activities:

- Repair or replacement of loose or broken material, gates and other forms of ingress/egress;
- Removal of trees/limbs;
- Replacement of water gaps as necessary;
- Repair of eroded areas as necessary; and
- Repair or replacement of markers or other safety and control features as required.

A schedule for regular inspections and after storms and other disturbance events.

## **REFERENCES**

United States Department of Agriculture, Natural Resources Conservation Service. 2005. Electric Fencing for Serious Graziers. Columbia, Mo.

United States Department of Agriculture, Natural Resources Conservation Service. 2003. National Range and Pasture Handbook, Revision 1. Washington, DC.

Vallentine, J.F. 1971. Range Development and Improvement. Brigham Young University Press.

Paige, C. 2012. A Landowner's Guide to Wildlife Friendly Fences. Second Edition. Private Land Technical Assistance Program, Montana Fish, Wildlife & Parks, Helena, MT.

DeWolf , G. and M. Hondalus. 1988. Common Massachusetts plants poisonous to horses. University of Massachusetts Cooperative Extension Service, Amherst, Massachusetts.

TABLE 1: TYPICAL CROSS FENCING

TYPE FENCE	TYPICAL WIRE SPACING (48" ht or higher may be needed)	TYPICAL TYPE OF WIRE	MAXIMUM DISTANCE BETWEEN PULL ASSEMBLIES	MAXIMUM LINE POST SPACING (closer spacing in rough irregular terrain) (4" dia. Line post)	TYPICAL LINE POST LENGTH (L) AND DEPTH (D)
Barbed Wire	≥38" High Minimum 4 or More Wires, 42"  High (12", 22", 32", 42")	15.5 Gauge Type III Galvanized	≤ 1,320' Apart 4" Horizontal Brace 8' long  6" Brace and Corner Posts 7.5' L	14' Apart  18' with Stays Between	Wood 6' L, 24" D  Steel 5.5' L, 12" D to top of flange
Board Fence	≥42" High  Minimum 3 boards  12" to 14" apart	Barbed wire or H. T. electric wire on side opposite boards if it has livestock pressure	No pull assembly required  6' Corner post and gate post 7.5' L	8' Apart with face board	Wood 6' L, 24" D
Woven Wire	≥32" High Woven + 1 or 2 Barbed Wires or HT Elect	12.5 Top and Bottom with 14.5  Gauge for other wires	≤ 660' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	14' Apart	Wood 6' L, 24" D  Steel 5.5', 12" D to top of flange
High Tensile Woven Wire	≥32" High Woven + 1 or 2 Barbed Wires or HT Elect	12.5 Top and Bottom with 14.5  Gauge for other wires	≤ 1320' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	25' Apart	Wood 6' L, 24" D  Steel 5.5', 12" D to top of flange
High Tensile Electric & HT elect. woven	1 or More Wires 2/3 Hip Height (26"-32")	12.5 Gauge 170,000 psi	≤2,000' Apart for 3 or more wires  4" Horizontal Brace 8' long  6" Brace and Corner Posts 7.5' L	Maximum 75' Apart,  Typically 40' to 50' apart	Wood 6' L, 24" D  Steel, High Density wood, Wood plastic composite, Fiberglass

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High Tensile Non- electric	6 or more wires, 42" high (12", 18", 24", 30", 36", 42")	12.5 Gauge 170,000 psi	≤ 2,000' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	12' Apart or 15' with Stays between post	Wood 6' L, 24" D Steel, High Density wood, Wood plastic composite, Fiberglass

Corner, end and brace posts will be 6" minimum, driven or set 36" in the ground and tamped or 30" deep set in concrete. **DO NOT USE LANDSCAPE TIMBERS.**

TABLE 2: TYPICAL PROPERTY LINE OR BOUNDARY FENCE

TYPE FENCE	TYPICAL WIRE SPACING (42" minimum ht, 48" ht or higher may be needed)	TYPICAL TYPE OF WIRE	MAXIMUM DISTANCE BETWEEN PULL ASSEMBLIES	MAXIMUM LINE POST SPACING (closer spacing in rough irregular terrain)	TYPICAL LINE POST LENGTH (L) AND DEPTH (D)
Barbed Wire	4 or More Wires, 42" high (12", 22", 32", 42")	15.5 Gauge Type III Galvanized	≤ 1,320' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	14' Apart 18' with Stays on 9' Spacing	Wood 6' L, 24" D Steel 5.5' L, 12" D to top of flange
Board Fence	≥42" High Minimum 3 boards 1"2 to 14" apart	Barbed wire or H.T. electric wire on side opposite boards if it has livestock pressure	No pull assembly required 6' Corner post and gate post 7.5' L	8' Apart with face board	Wood 6' L, 24" D

TYPE FENCE	TYPICAL WIRE SPACING (42" minimum ht, 48" ht or higher may be needed)	TYPICAL TYPE OF WIRE	MAXIMUM DISTANCE BETWEEN PULL ASSEMBLIES	MAXIMUM LINE POST SPACING (closer spacing in rough irregular terrain)	TYPICAL LINE POST LENGTH (L) AND DEPTH (D)
Woven Wire	≥32" High Woven + 1 or 2 Barbed Wires 42" High	12.5 Top and Bottom with 14.5 Gauge for Other wire or H.T. Woven	≤ 660' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	14' Apart Conventional woven wire. 25' Apart High Tensile woven wire.	Wood 6' L, 24" D Steel 5.5' L, 12" D to top of flange
High Tensile Woven Wire	≥32" High Woven + 1 or 2 Barbed Wires or HT Elect	12.5 Top and Bottom with 14.5 Gauge for other wires	≤ 1320' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	25' Apart	Wood 6' L, 24" D Steel 5.5', 12" D to top of flange
High Tensile Electric & HT elect. woven	4 or More Wires, 42" High (12", 22", 32", 42")	12.5 Gauge 170,000 psi	≤ 2,000' Apart for 3 or more wires 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	Maximum 75' Apart, Typically 40' to 50' apart	Wood 6' L, 24" D Steel, High Density wood, Fiberglass 5.5' L, 12" D
High Tensile Non-electric	7 or More Wires 42" High (6", 12", 18", 24", 30", 36", 42")	12.5 Gauge 170,000 psi	≤ 2,000' Apart 4" Horizontal Brace 8' long 6" Brace and Corner Posts 7.5' L	12' Apart or 15' with light post or Stays Between	Wood 6' L, 24" D Steel, High Density wood, Fiberglass 5.5' L, 12" D

Corner, end and brace posts will be 6" minimum, driven or set 36" in the ground and tamped or 30" deep set in concrete. **DO NOT USE LANDSCAPE TIMBERS.**