Practice Specification
Fence (Code 382)

STANDARD FENCES

A. Barbed Wire

See Table 1 for wire number, height and spacing specifications.

Specifications for containment fences should be used for perimeter fences, land use boundaries, livestock exclusion, and livestock containment and isolation areas (bull/stud/ram/buck pastures, weaning pastures, lanes, livestock quarantine pastures/lots). Specifications for deterrent fences should be used for most internal cross fences to facilitate grazing management.

Wires shall be spaced approximately an equal distance apart. The top wire shall be at least 2 inches below the top of post on wood posts and at least 1 inch below the top on steel posts. The bottom wire shall be 12 to 18 inches above the ground level. Wire shall be spaced no more than 12 inches apart. Each line wire may consist of 2 twisted strands of 12 1/2 gauge wire or high tensile strength wire of 15 1/2 gauge. The barbs shall be either 2-point barbs on approximately 4- inch centers, or 4-point barbs on approximately 5-inch centers. Attach wires to the side of the post closest to the livestock, except on corners place wire on outside of corner.

Where injury to animals is a concern 12 ½ gauge, 2 strand, twisted, barbless wire may be used in lieu of barbed wire.

B. Woven Wire

Top and bottom strands of conventional woven wire shall be 12 1/2 gauge or heavier, and 14 1/2 gauge, or heavier, wire for intermediate strands. Vertical wires will be 4 – 12 inches apart. Fences constructed with high tensile woven wire will be 12 ½ gauge on all wires. Vertical wires will be 6 – 24 inches apart. Containment fences of woven wire 36 inches or less in height shall have at least 2 barbed or smooth wires above the woven wire, spaced between 6 and 8 inches apart. Deterrent fences of woven wire 32 inches or less in height shall have at least 1 barbed or smooth wire 4 – 6 inches above the woven wire. Smooth wire may be 11 gauge, or 12 1/2 gauge if high tensile.

The top wire shall be at least 2 inches below the top of post on wood posts and at least 1 inch below the top of steel posts.

All wires shall be galvanized. The barbed wire shall conform to the wire specifications for a barbed wire fence.

1. Staples and Wire Fasteners

Staples shall be of 9-gauge steel or heavier with a minimum length of 2 inches for soft woods and a minimum length of 11/2 inch for close grained hardwoods.

Drive staples diagonally to the wood's grain and at a slight downward angle, (upward if pull is up) to avoid splitting post and loosening of staples. About one-half inch should be left between staple and post to permit free movement of wire.

Wires may be attached to steel posts or pipe by use of manufacturer's clips or by two turns of 14- gauge galvanized wire.

2. Posts

All wooden posts (except red cedar, Osage Orange/hedge, or black locust) shall be treated by a method to ensure that complete penetration of the sapwood is obtained. At least half the diameter of red-cedar shall be heartwood.

Quality of treated wood shall provide sufficient strength and last for the expected life of the fence. Pressure treatment shall conform to NEH 20 Materials Specifications 585.

All steel pipe used for posts (either corner or line) must be capped.

3. 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. Wire or insulators will not be fastened directly to trees.

When using live trees, protection will be provided between the tree and wire. (Use strips of treated wood, red cedar, Osage orange/hedge, black locust, fiberglass or rigid UV protected plastic). Strips should be at least 3.5 inches wide and 6 inches in length placed 3" above top and 3" below bottom of wire to prevent splitting or cracking). A 3/8" x 8" eye or J screw may be fastened directly to the tree to the depth of the threads and then thread the barbed wire through the J screw eye and tie off.

4. Corner, Gate, End or Pull Assembly, and Brace Posts

See Table 2 for corner, gate and end post size, depth and bracing

All corner, gate, end or pull assemblies, and brace posts shall normally be wood or steel pipe with sufficient length for the construction of the proper height fence and permit setting the post at least 30 - 36 inches deep.

Earth backfill shall be thoroughly tamped. On areas where soil depth is restricted to less than 36 inches, additional anchors or deadman applied against the direction of pull may be needed.

Reinforced concrete or metal posts of equivalent strength may be substituted if they have suitable means of attaching wires and braces.

When posts are set in concrete, concrete should extend at least 6 inches from the outside of the post

5. Bracing

End bracing will be installed at locations where the fence ends and on both sides of gate openings. Corner bracing should be installed where fence alignment changes 25 degrees or more.

Bracing is required at all corner, gate, pull, and end assembles in a fence. H-Braces, Angle Braces, Floating Angle Braces, posts set 3' in concrete or driven 48" deep in the ground can be used as bracing in standard fences (See Attachments A).

The brace member shall be the equivalent of a 3-inch top diameter post or standard weight galvanized steel pipe of 1.25-inch diameter.

The brace member for H braces will be installed at least 3 feet above ground and at least 8 inches below the top of post. The brace member shall be at least 6 feet, but not more than 10 feet in length. A tension member composed of 2 complete loops of number 9 gauge smooth wire, 12- gauge double strand wire, 2 loops of barbed wire or a single loop of 12 1/2-gauge high tensile strength smooth wire with an in-line strainer may be used. The tension member should run from the bottom of the corner post to the top of the brace post.

The brace member for Angle Braces and Floating Angle braces will be installed below the top wire and be 2.5 times in length the height of the top wire.

6. Pull Assemblies

Two posts with brace shall be spaced at intervals not to exceed 1,320 feet (80 rods) for barbed wire and 330 feet (20 rods) for woven wire in straight sections of fence.

7. Line Posts

See Table 3 for line post size, spacing and depth specifications.

Wood posts must have a minimum length of 6 feet and set or driven to a minimum depth of 20 inches. When set, earth back fill shall be thoroughly tamped.

If soil restricts depth to less than 20 inches use standard “T” or “U” shaped steel posts, steel pipe, fiberglass or composite posts. Steel T or U posts must weigh not less than 1.25 pounds per foot of length. Steel posts shall be rolled from high carbon steel and shall have a protective coating; either galvanized by the hot dip process, painted with one or more coats of high grade weather resistant steel paint, or enameled and baked. Steel posts shall be studded, embossed, or punched to aid in the attachment of wire to them.

Posts must have a length sufficient to: (1) provide for the construction of the proper height fence (minimum of 5 ½ feet long; (2) be set solidly in the ground to the point that the top of the anchor plate is at or below the ground surface or shall be driven into the ground a minimum of 16 inches.

In a standard fence where wood posts are used, steel posts should be driven every 100 feet to act as a ground for lightning protection.

8. Spacing

Standard fences shall have a maximum post spacing of 20 feet unless stays are used between posts and then shall not exceed 30 feet. The maximum spacing of wire stays shall be 15 feet.

C. SUSPENSION FENCES

Fence construction, dimensions, and quality of materials used shall be in accordance with the requirements set forth in specifications for standard fences except as noted in **Tables 1, 2 & 3.**

1. Wire

See Table 1 for wire type, height, number and spacing specifications.

2. Line Posts and Stays

See Table 3 for line post and stay size, spacing and depth specifications.

All stays shall swing free of the ground to permit the fence to sway when contacted by animals.

3. Staples and Wire Fasteners

Steel staples 1 1/2 to 2 inches long, driven diagonally to within about one-half inch of the post to allow for free movement of wire or special manufactured fasteners for suspension fences shall be used.

Wire clips that allow free sliding of wire shall be used for attaching line wire to steel posts. To allow for maximum sway of the fence, tension on line wires shall permit about a 3-inch sag in 100-foot span of fence in warm weather.

4. Corner, Gate, End or Pull Assembly, and Brace Posts.

See Table 2 for corner, gate and end post size, depth and bracing specifications.

Bracing is required at all corner, gate, end, and pull assemblies. In straight continuous sections of a suspension fence, pull assemblies shall be spaced at intervals not to exceed 1,320 feet (80 rods).

Tie off all wires at pull assemblies and start new wires for the next section.

OPERATION AND MAINTENANCE

Routine inspection of fences should be part of an on-going management program. Inspection of fences after storm events is needed to facilitate the function of the intended use of the fence. Maintenance and repairs will be performed as needed to facilitate the intended operation of the installed fence. Maintain proper tension on the fence wires. Remove fallen limbs. Overhanging trees and limbs should be trimmed or removed as needed to prevent their falling onto the fence.

Table 1 Wire Height & Spacing

Table 1
Wire Height & Spacing

Fence type	Livestock type	Purpose*	Min Number of Wires	Height of Top Wire	Suggested Wire Spacing**
Barbed Wire (12.5 gauge standard; 12.5 guage, 2 strand, twisted, barbless; or 15.5 gauge high tensile)	Cattle	Containment	4	48"	12,12,12,12
		Deterrent	4	48"	12,12,12,12
	Sheep/Goats	Containment	6	48"	6,6,6,8,10,12
		Deterrent	5	36"	6,6,6,8,10,
	Horses	Containment	4	48"	12,12,12,12
		Deterrent	4	48"	12,12,12,12
	Hogs	Containment	7	48"	0,6,6,6,8,10,12
		Deterrent	6	36"	0,6,6,6,8,10
	Deer/Predator	Deterrent	8	60"	0,6,6,6,8,10,12,12
Woven wire (Conventional – top & bottom strands 12.5 gauge with 14.5 wire for intermediate strands with verticals every 4 – 12") (High tensile – all 12.5 gauge high tensile wire with verticals every 6 – 24")	Cattle	Containment	39" woven + 1 barb or HTE**	48"	4(woven), 5
			32" woven + 2 barbs or HTE****	48"	4(woven) 6,6
	Sheep/Goats	Containment	39" woven + 1 barb or HTE****	48"	2(woven) 7
			36" woven + 2 barbs or HTE****	48"	2(woven)2,8
			32" woven + 2 barbs or HTE****	48"	2(woven)6,8
		Deterrent	36" woven	36"	0-2 "
			32" woven + 1 barb or HTE****	36"	0 – 2"(woven) 4
	Horses	Containment	39" woven + 1 barb or HTE****	48"	4(woven) 5
		Deterrent	32" woven + 1 barb or HTE****	42"	4(woven) 6
	Hogs	Containment	39" woven + 2 Barbs	48"	0,2(woven) 7
		Deterrent	36" woven + 1 barb	36"	1 barb on ground + (woven)
			32" woven + 2 barbs	36"	0,(woven),4
	Deer/Predator	Deterrent	Woven + 4 barbs or HTE****	60"	0,4 (39" woven) 2,7,8

Table 1 - continued Wire Height & Spacing

Table 1 - continued
Wire Height & Spacing

Fence type	Livestock type	Purpose*	Min Number of Wires	Height of Top Wire	Suggested Wire Spacing **
Suspension (Barbed wire or High tensile smooth wire non-electrified or 16 gauge multi-strand braided cable)	Cattle	Containment	5 barbed	48"	10,10,10,10,8
			6 HT*** smooth	48"	8,8,8,8,8,8
		Deterrent	4 barbed	42"	10,10,10,12
			5 HT*** smooth	42"	8,8,8,8,10
	Sheep/Goats	Containment	7 barbed	48"	4,6,6,6,8,8,10
		Deterrent	6 barbed	36"	4,6,6,6,6,8
	Horses	Containment	5 barbed	48"	10,10,10,10,8
			6 HT*** smooth	48"	8,8,8,8,8,8
		Deterrent	4 barbed	42"	10,10,10,12
			5 HT*** smooth	42"	8,8,8,8,10
Permanent Electric (12.5 gauge high tensile, 12.5 gauge vinyl coated, or 16 gauge multi-strand braided cable)	Cattle	Containment	2	36 – 48"	18 – 24", 18 – 24"
		Deterrent	1	26 – 36"	26 – 36"
	Sheep/Goats	Containment	5	38 - 40"	6-8,6-8,8,8,8,8-10
		Deterrent	3	30 - 32"	8-10, 10, 10-12
	Horses	Containment	3	48"	24,12,12
		Deterrent	2	40 – 44"	24, 16-18
	Hogs	Containment	3	18"	6,6,6
		Deterrent	1	12"	12
	Deer/Predator	Deterrent	7	60"	6,6,8,8,10,10,12
Temporary Electric (polywire, polyrope, polytape)	Cattle	Deterrent	1	26 – 36"	26-36"
	Sheep/Goats	Deterrent	3	30 – 32"	10,10,10-12
	Horses	Deterrent	2	40"	24,16
	Hogs	Deterrent	2	12"	6,12

*Containment fences should be used for perimeter fences, land use boundaries, livestock exclusion, and livestock containment and isolation areas (bull/stud/ram/buck pastures, weaning pastures, lanes, livestock quarantine pastures/lots) Deterrent fences should be used for most internal cross fences to facilitate grazing management.

**Inches between strands of wires; the first number represents distance from the ground to the first wire or bottom of the woven wire.

***HT – high tensile smooth wire, $\geq$ 110,000 PSI tensile strength with Class 3 galvanizing

****HTE – high tensile smooth wire energized

Table 2 Corner Gate & End Post Size, Depth and Bracing

Table 2
Corner, Gate & End Post Size, Depth and Bracing

	Minimum Top Diameter	Depth/ anchoring	Bracing
Standard Fences Barbed Wire Woven Wire	Wood – 5 "	30 - 36" or 24" set in concrete	H Brace, Angle brace, Floating angle brace
	Wood – 5"	36"	Single post with deadman or scew-in anchor
	Wood – 6"	36" set in concrete or driven 48"	None
	Steel Pipe – 2.5"	30 – 36" or 24" set in concrete	H brace, Angle Brace, Floating angle brace
	Steel Pipe – 2 7/8"	36" set in concrete	None
Suspension Fences	Same as for Standard Fences	Same as for Standard Fences	Same as for Standard Fences
Permanent Electric Fences 1 – 2 wire	Wood – 5"	Set to a depth ≥ height of top wire or set in concrete 2' deep	None
	Wood – 3.5"	Set 2' in ground	H brace, angle, floating angle, knee, deadman
	2 7/8" Steel pipe, 2.5" fiberglass, 2" composite	Set to a depth ≥ height of top wire or	None
	Steel pipe, fiberglass, composite – 2"	Set in concrete 2'deep	None
	Steel pipe, fiberglass, composite – 2"	Set 2' in ground	H brace, angle brace, floating angle brace, knee brace, or anchor plate/deadman
	Steel pipe, fiberglass, composite – 1"	screw –in or driven ground anchoring	Angle brace
	Steel T or U posts	Set 2' in ground	H brace, angle brace, floating angle brace, knee brace, deadman
3 or more wires	Wood – 5"	3' Set in ground	H brace or floating angle brace
	Steel pipe, fiberglass, composite – 2"	Same as above	Same as above
	6" wood or 2.5" steel pipe or 2" composite	Set in concrete 3' deep or driven 4' in soil	None
	Steel T or U posts	Same as above	H brace, angle brace, floating angle brace,
Temporary Electric Fences	3/8" Fiberglass, composite, plastic, or steel rod	6"	Angle brace as needed

Table 3 - Line Post Size & Spacing

Table 3
Line Post Size & Spacing

Fence Type	Type	Size	Depth	Maximum Spacing
Standard Fences Barbed Wire Woven Wire	Treated wood, cedar, black locust	3"	20"	20' or 30' with 1 stay at 15'
	Bois D'arc/hedge	2.5"	20"	Same as above
	Steel T or U posts	1.25 lbs. per foot	16"	Same as above
	Steel pipe, fiberglass, composite	1.25"	16"	Same as above
Suspension	Same as for Standard Fences	Same as for Standard Fences	Same as for Standard Fences	100' with stays spaced at 15' apart
Permanent Electric Fences 1 – 2 wire	Wood	3"	16"	150' with stays at 50' intervals or 100' with no stays
	Australian iron wood	2"	16"	Same as above
	Fiberglass	5/8"	16"	Same as above
	Fiberglass T posts, PVC	1"	16"	Same as above
	Composite, Plastic	1 1/8"	12"	Same as above
	Steel T or U posts	1.25 lbs./ft	16"	Same as above
3 or more wires	Same as for 1 – 2 wire	Same as for 1 – 2 wire	Same as for 1 -2 wire	150' with stays at 50 ' intervals or 50' with no stays
Temporary Electric Fences	Fiberglass, composite, plastic, steel rod	3/8"	4"	40 - 60'

Specific Site Requirements

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