

**NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATIONS
ELECTRIC FENCE
CODE 382**

Use this fence specification when installing electric fence. This sheet lists the minimum requirements to meet Florida Fence Standard (FL 382) This practice facilitates the accomplishment of conservation objectives by providing a means to control movement of animals and people, including vehicles. If the primary reason for the fence is to facilitate livestock distribution, a grazing management plan will be developed and/or revised.

Variations may occur in fence design that does not meet the following specifications. Any request for variations will be submitted to the State Rangeland Management Specialist or individual with proper job approval authority for approval. All fence designs will also comply with 382 Brace Specifications

Wire and Spacing

Use new wire that meets the following minimum specifications:

- **High Tensile**-Class 3 Galvanized
- 12.5 Gauge
- 200,000 PSI Tensile Strength high tensile wire
- Poly rope - 3 copper and 3 stainless steel filaments
- Poly Tape
- **Wildlife**- When using 3-4 line wires Allow 12 in. spacing between the top two wires and 16-18 in. of space from ground to bottom wire.
 - Place visible markers on the top wires in waterfowl and other wildlife migration areas.

No. of Line Wires	5 Strand	4 Strand	3 Strand	2 Strand	1 Strand
Boundary Fence Top Wire Height	46"	46"	Not Acceptable	Not Acceptable	Not Acceptable
Recommended Inline Fence Wire Spacing (inches from ground level)					
Cattle and horses	6" 16" 26" 34" 46"	16" 26" 32" 44"	12" 22" 38"	24" 38"	28-32"
Goats/Sheep	5" 10" 17" 27" 38"	8" 16" 24" 36"	Not Recommended	Not Recommended	Not Recommended
To allow wildlife movement	Not Recommended	18" 24" 28" 40"	18" 24" 38"	24" 38"	36-40"

Line Post Spacing-The maximum distance between line posts is 100 ft.

Steel Posts- Only new T or U posts studded notched or punched for wire attachment. Pipe will be minimum diameter of 2 in. x 6.5 ft.

Wood Posts-Shall be treated with 0.4 lbs/ft of chromate copper arsenate (CCA type A, B or C or equivalent)

- Line post will be at minimum 3 in. x 6.5 ft. pine, 2½ in. diameter for Osage orange; 1½ in. diameter for Australian ironwood.
- Line posts will be long enough to extend a minimum of 2 inches above the top wire where installed at the correct depth
- The minimum installation depth is 24 inches below ground level. Posts may be installed by driving or in dug holes with backfill placed around them. If post holes are dug, backfill by tamping the soil around the

post at every 4 inch depth.

Other-Fiberglass, rigid plastic and polyvinylchloride solid round sucker rod of at least 5/8 in. in diameter
Fiberglass T-posts of at least 1 inch cross section

Stays-At least 3/8 in. diameter steel, fiberglass, or rigid plastic

Insulators-

Attach energized wires to steel posts or other conductive material using high density polyethylene or polypropylene insulators with ultra violet stabilizer or porcelain insulators with minimum 10,000 volts. Use offset brackets made from one of these materials to provide transmission line and/or protect a standard fence

Attach non energized wires to wood with 9 gauge staples and to steel with manufactured clips or smooth wire.

Energizer Installation

Install electronic energizers or power fence controllers according to the manufacturer's recommendations.

Installation shall meet the following minimum specifications:

- high-power, low-impedance system with solid state circuitry capable of at least 5000 volt peak output and a short pulse that is less than 300 amps in intensity, finished within .0003 of a second, and a rate of 35-65 pulses per minute
- The energizer shall be enclosed in a high impact weather resistant case.
- Energizers shall be powered by either 12-volt battery capable of operating three weeks without recharging, solar cell, or electric current of 110 or 220 volts.
- If the length of fence requires an energizer of more than 4 joules, a solar charger will be needed on the battery systems.
- Voltage: It is recommended that energizers capable of supplying 2,000 volts be installed.
 - Minimum voltage for cattle is 1600 volts
 - Minimum voltage for sheep and hair goats is 2,000 volts
 - Minimum voltage for hogs, horses and meat goats is 1200 volts
- Energizer should be capable of producing one joule of energy for each mile of planned fence when average energy loss to the system is expected. Each joule will typically provide enough power to fence 25 to 40 acres of pastureland

Lightning Protection

External lightning arrestors shall meet the following specifications:

- Install LA ground rods min. 65 feet from those of the energizer.
- Install at least one more ground rod on the arrestor than was used on the energizer.
- Attach the lightning arrestor to the wires of the fence.
- Install a lightning choke in the fence line immediately between the lightning arrestor and the energizer.
- The grounding system for lightning arrestor ground must be better than the energizer ground for it to function properly, because lightning will seek the least resistant route to ground.
- A spark gap may be used in place of a lightning arrestor. A spark gap is a small gap between a hot wire and a ground wire Set the gap slightly beyond the point that electricity normally sparks.
- Install a surge protector between the energizer and power supply to protect 110-or220-volt energizers

Ground

All electric fences must be properly grounded and meet the following specifications.

- Energizer terminals shall be checked to determine their composition
 - Do not use copper ground rods if energizer terminals are not stainless steel or copper to prevent corrosion at the connection and subsequent loss of electrical continuity.
 - Copper rods with copper wire may be used if the energizer terminals are stainless steel or copper
- Use copper clamps with copper wire and copper rods.
- The ground wire(s) of the fence may be connected to the same ground as the energizer or to a separate ground with the same size and depth requirement.
- Additional ground rods may be needed for system to function properly.
- Connect the energizer ground wire to a galvanized pipe or rod according to manufacturer's specifications.
- Bury 3 feet of ground rod for each joule of energy output.
- Bury ground rods to the depth necessary to reach moist soil at the driest time of the year for best results. Drive 6 to 8 ft. rods into the ground at least 10 ft apart to provide the required amount of ground rod.
- Connect a continuous ground wire from the energizer to each rod or pipe with a galvanized steel or aluminum clamp.
- The grounding system shall not be connected to other existing applications, such as power poles, breaker boxes, and barns.
- The fence grounding system shall be installed at least 25' away from any other grounding system

Insulated Wire

- Insulated galvanized wire for electric current shall be used to cross gates and areas where electrical shocks to humans and livestock should be prevented (e.g., working facilities, watering facilities, etc.).
- Do not use insulated copper for underground burial, use wire designed for burial.
- Place buried wire inside plastic pipe to help decrease the incidence of short-circuiting. Install pipes in a manner that prevents water from collecting in the conduit pipe.
- When overhead transmission is used, height should be sufficient for movement of livestock and/or equipment.

Gates

Electrified gates shall be constructed of single straight wire, galvanized cable, or polytape with a spring-loaded insulated handle

Use overhead or underground transmission lines to carry electricity past the gate to the remainder of the fence.

Floodgates -An electrified floodgate may be used instead of a non-electrified floodgate.

- Construct the electrified floodgate by stretching an electrified wire across the drainage above high water flow level.
- Attach droppers of 12.5-gauge high tensile fence wire, galvanized cable, galvanized chains, or equivalent to the electrified wire at a spacing of 6 inches.
- Droppers should extend to within 10" above the average normal water level or to the normal recommended fence height above the stream bottom.

- Connect the floodgate to the electric fence with double insulated cable through a cut-off switch and floodgate controller. If flooding is expected to last for an extended period, switch the floodgate off.

Temporary Energized Fence

Temporary energized fencing is constructed to control livestock for a short period of time and shall meet the following criteria

- Temporary electric fence shall not be used for perimeter fence.
- Temporary electric fences are not constructed as an equivalent of a permanent fence.
- Temporary fences shall be constructed from suitable materials with suitable design, and construction that will accomplish the intended purpose and last for the time period planned
- The number of wires and spacing will be designed to accomplish the desired result of the fence. (See permanent fence guidance for number of wires and spacing.) Many companies provide portable fence systems that use such materials as polyethylene wire and tape with steel or aluminum wire woven into them; aluminum wire; plastic and fiberglass posts; reels to roll up wire; and portable battery operated energizers that are high voltage and low impedance. These systems can produce sufficient voltage to turn livestock. A minimum of six strands of steel or aluminum wire should be woven into the poly-wire or poly-tape.
- Temporary fences may be attached to permanent fences to further subdivide pastures.
- Follow manufacturer's directions for construction, use, and operation.
- One of the following can be used to create an acceptable temporary electric fence:
 - UV-stabilized, high-density polyethylene twine with minimum of eight stainless steel or aluminum filaments.
 - UV-stabilized, high-density polyethylene tape with at least five stainless steel or aluminum filaments.
 - 12.5-gauge smooth galvanized steel or aluminum wire.
 - Electrified net wire can be used for small livestock.
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- Top wire height shall be a minimum of 30 inches. Additional wires will be needed for higher fences and/or smaller livestock.
- Posts that are good insulators and easy to move shall be used
- Space posts to as needed maintain 30 in. fence height. On level ground post spacing will typically be 50 ft.
- If the temporary fence is attached to a permanent electric fence, use an alligator-type clip for the connection.
- Other criteria such as insulators, wire quality, and energizers is the same as the permanent electric fence criteria.