

# USDA FENCE – ELECTRIC WIRE

*Conservation Practice Jobsheet*

382

Natural Resources Conservation Service (NRCS)

February 2010

## Landowner



### GENERAL CRITERIA AND CONSIDERATIONS

Fencing materials, type and design of fence installed shall be of a high quality and durability. The fence design and installation should have the life expectancy appropriate for management objectives and shall follow all federal, state and local laws and regulations.

The fence design and location should consider: topography, soil properties, livestock management and safety, livestock trailing, wildlife class and movement, location and

adequacy of water facilities, development of potential grazing systems, human access and safety, landscape aesthetics, erosion problems, moisture conditions, flooding potential, stream crossings, and durability of materials. When appropriate, natural barriers should be utilized instead of fencing.

Inspection of fences after storms and other disturbance events is necessary to insure the continued proper function of fence. Maintenance and repairs will be performed in a timely manner as needed, including tree/limb removal.

## POST REQUIREMENTS

1. **Line Post** – Maximum line post spacing with 2 or more stays will be 150 feet apart. The maximum line post without stays will be 100 feet.
  - a. Fiberglass sucker rods of no less than 3/8 inch diameter can be used on 1 and 2 wire fences. Fiberglass sucker rods must be at least 3/4 inch in diameter on fences more than 2 wires.
  - b. Fiberglass T-post must be new and at least 1 inch in cross-section for fences with more than 2 wires. Steel T-post and other conductive material post can be used ONLY if polyethylene or polypropylene with ultraviolet (UV) stabilizer insulators are used.
  - c. Gray PVC post can be used for 1 and 2 stand electric fence and as stays if material is UV treated. PVC stays must be at least 1/2 inch in diameter.
  - d. Pull post or pull post assemblies for electric permanent fence shall be spaced no more than 1/2 mile apart on undulating terrain. On flat terrain, spacing may be increased to end of spool (normally 4000 feet).
2. **Corner and End/Gate Posts**
  - a. Minimum post length will be determined by the number of wires used. The length of the post should be 36 inches (below ground) plus 6 inches above the height of the top wire (For example: a two wire fence with the top wire set at 30"; the minimum post length will be 72" or 6 ft.)
  - b. Braces for electric fences with two wires or less can use a Bed Log Brace. A Bed Log Brace shall consist of a wood (pressure treated or durable wood) post with a minimum top diameter of 3 1/2 inches (i.e., 4 inch nominal scale) set 3 feet below ground or steel post with minimum 2 3/8 inch diameter, capped, set 3 ft. below ground. The bed log shall be 4 ft. long and set a minimum of 3" below ground. Bed logs can be made from landscape timbers or equivalent size posts.
  - c. Wood – (Pressure treated or durable wood) Single pole posts are for low tension applications only. A single wood post can be used on fences 2 wires or less. Post will have a minimum top diameter of 5 inches (Posts should be designated as 6" posts when purchased) and be set firmly in concrete, 3 ft. in the ground. At least (1) 80 lbs. bag of concrete is to be used in each 12 inch post hole to secure brace assembly.
  - d. Metal – Single pole post are for low tension applications only. A single steel pipe can be used on fences 2 wires or less. Minimum of 2 3/8 inch steel pipe or equivalent, capped, set 3 ft. in ground in concrete. At least 1 80 lbs. bag of concrete should be used in each 12 inch posthole to secure brace assembly.
  - e. For 3 or more wire fences or when heavy duty gates will be installed, a minimum of two posts in line will be installed to provide a suitable anchor for the fence. Post will have a minimum top diameter of 5 inches (Posts should be designated as 6" posts when purchased), 8 ft. in length, and be set firmly 3 ft. in the ground. Cross post will be a minimum of 3 1/2 inches across (4 inches nominal scale)
  - f. Allow newly installed braces and assemblies to settle and/or pack dirt sufficiently around all posts, do not over-tighten wires.
  - g. Metal pipes must be permanently capped to exclude rainwater and all metal components used must be painted with a durable permanent rust resistant coating or be galvanized; components used must be painted with a durable permanent rust resistant coating or be galvanized; components will be repainted if rusting occurs.

## WIRE REQUIREMENTS

1. Galvanized – 12 1/2 gauge high tensile steel wire with Class III galvanized coating. Minimum strength for 3 or more wires should be 170,000 PSI or greater and 130,000 PSI minimum strength for 1 or 2 wires.
2. Wires attached to line post must be allowed to slip and be locked to stay post if applicable.
3. For splicing high tensile strength wire, use only the equivalent of crimping sleeves, figure eight knots or thread through knot. All electrical connections (both ground and positive) must use the equivalent of crimping sleeves or galvanized joint clamps.

4. Underground wire – All underground wire(s) must be insulated, molded, steel 12 ½ gauge or larger wire. The insulation must be high density polyethylene or polypropylene with ultraviolet (UV) stabilizer and capable of withstanding a minimum of 10,000 volts.

#### **ENERGIZER AND ELECTRICAL ACCESSORIES**

1. Energizers for permanent electric fences should be high voltage/low impedance short pulse which can produce at least 4000 volts output, with all livestock containment fences charged (on) when under maximum anticipated load.
  - a. Recommended one DIGITAL read out volt meter to be accompanied with energizer.
  - b. For 110 volt or 220 volt energizers, install a voltage spike/surge protector to protect energizer from power surges from the energizer plug
2. Grounding – A minimum of three (1/2 inch diameter) 6 ft. long galvanized steel rods will be installed near energizer spaced at 10 ft. intervals
  - a. Avoid mixing dissimilar materials to prevent electrolysis (do not use copper components).
  - b. For large energizer systems (14 or more joules), use a minimum of e additional feet of ground rods per joule of energizer output capacity.
3. Lightning arrestor or lightning choke will be required. Install an additional set of four 6 ft. ground rods for arresting the lightning. Locate rods 65 ft. away from ground rods set for the energizer. These rods will also be spaced 10 ft. apart. Energizer manufacturer's requirements for lightning protection must be met or exceeded.
4. Insulators – Any plastic or porcelain insulators used in the installation of permanent electric fences shall be capable of withstanding a minimum of 10,000 volts. Any plastic insulators used will be ultra-violet (UV) treated
5. Warning Signs – Electric fence warning sign are recommended every 300 feet on exterior fences. Warning signs are also recommended to be posted around barns, troughs, and other facilities as specified by any local, state, and/or federal laws or regulations.
6. Gate handles, switches, and other hardware used to conduct current must be galvanized or use aluminum components.

**This handout is for cattle only. See NRCS Technical Guide, Section IV, 382 Fence, for specifications for sheep, horses, goats and deer.**

USDA Natural Resources Conservation Service  
 Alexandria, Louisiana

LA-GL-2  
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**FENCE CONSTRUCTION CHECK SHEET (ELECTRIC)**

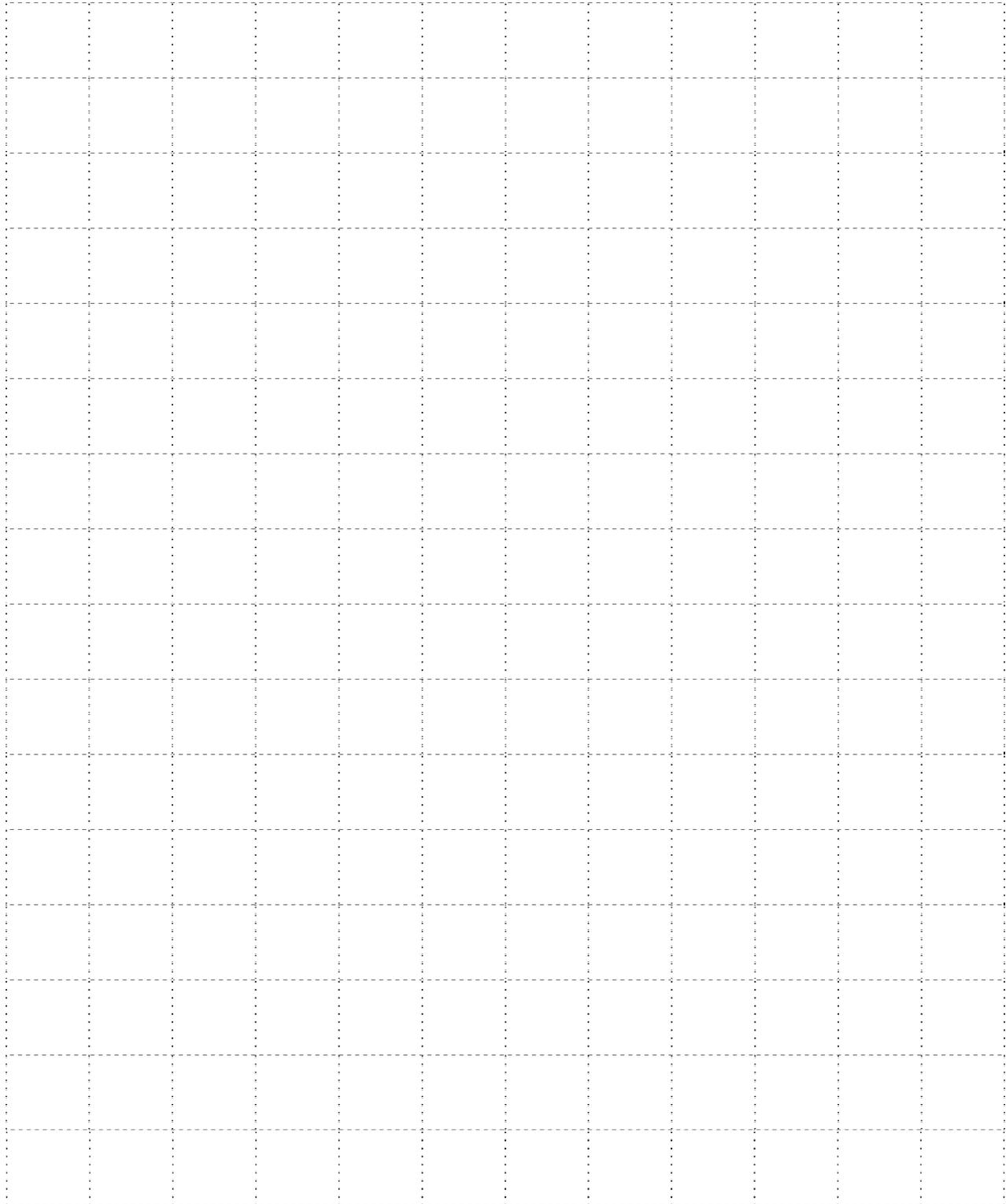
Landowner	_____	Tract No.	_____	By	_____	Planned	_____	Installed	_____
Field No.	_____	Length	_____	Date	_____				
Fence No.	_____								

	Unit	Minimum		
<b>I.Wire</b>	Total Footage		_____	_____
A. Size (12 ½ gauge)	Gauge		_____	_____
B. Strands	Number		_____	_____
C. Average height of wires	Inches		_____	_____
<b>II.Brace Assemblies</b>	Number		_____	_____
A. Post				
1. Kind (1)	Material		_____	_____
2. Length	Feet		_____	_____
3. Nominal Top Diameter	Inches		_____	_____
4. Depth to Set	Inches		_____	_____
5. Concrete (80 lbs. bag)	Number		_____	_____
6. Amount	Number		_____	_____
B. Cross-member				
1. Kind (1)	Material		_____	_____
2. Length	Feet		_____	_____
3. Nominal Top Diameter	Inches		_____	_____
4. Amount	Number		_____	_____
<b>III.Line Posts</b>				
A. Wood and Fiberglass Posts				
1. Kind	Material		_____	_____
2. Length	Feet		_____	_____
3. Nominal Top Diameter	Inches		_____	_____
4. Spacing	Feet		_____	_____
5. Amount	Number		_____	_____
B. Steel Posts				
1. Kind	Coating		_____	_____
2. Length	Feet		_____	_____
3. Weight per Foot	Pounds		_____	_____
4. Spacing	Feet		_____	_____
5. Amount	Number		_____	_____
<b>IV.Accessories (All conducting materials will be galvanized)</b>				
1. Strainers or wire tightners	Number		_____	_____
2. Pull post insulators	Number		_____	_____
3. Line post insulators	Number		_____	_____
4. Ground rods	Number		_____	_____
5. Lightning arrestors	Number		_____	_____
6. Insulated cable	Feet		_____	_____
7. Offset brackets	Number		_____	_____
8. Warning signs	Number		_____	_____
9. Cut off switches	Number		_____	_____
10. Digital Volt Meter	Number		_____	_____
11. _____			_____	_____
12. _____			_____	_____
<b>V.Power Unit</b>	Type		_____	_____
A. The energizer selected must be high voltage/low impedance, short pulse which can produce at least 4000 volts Output with all livestock containment fences charged (on) when under maximum anticipated load.				

(1) Certificate required for treated posts and metal pipe must be permanently capped and painted or galvanized.

If applicable, provide a site view of the practice design and application in area below or as an attached diagram. Location of other relevant information and complimentary practices may be included.

Scale 1"= \_\_\_\_\_ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



**Additional Specifications and Notes**

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**Practice Design Certification (To be completed after jobsheet is complete and before practice installation)**

By signing below, I certify that:

- the site specific requirements for the installation, operation, and maintenance of the practice on the client's treatment unit, as recorded in this jobsheet, have been prepared in accordance with the 382 Fence Standard and the guidance in the 382 Fence Practice Specification.

**Signature**

**Date**

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**Practice Installation Certification (To be completed after practice installation and check out)**

By signing below, I certify that:

- The practice has been installed according to the site specific installation requirements

**Signature**

**Date**

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**This practice requires a current Louisiana One Call Dottie Confirmation Number.**

**Call before you dig**, wait 48 hours for the site to be marked, observe the marks and dig with care. The service is free. It's the law! Civil Penalties range up to \$25,000 for violations of the "Dig" law



**Failure to notify Louisiana One Call before installing this practice may delay or terminate NRCS assistance.**

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**NRCS, LA  
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