

**382 – Fence – Permanent and Temporary Electric - Implementation Requirements**

**Producer Name:**

**Location:**

**Farm Name:**

**Project or Contract:**

**County:**

**Tract Number:**

**Practice Location Map**

**Index**

- Cover Sheet
- Specifications
- Drawings
- Operation & Maintenance
- Practice Approval and Certification

Utility Safety/  
One-call System  
Information

**Description of work:**

**NRCS Review Only**

<b>Designed By:</b> _____	<b>Date:</b> _____
<b>Checked By:</b> _____	<b>Date:</b> _____
<b>Approved By:</b> _____	<b>Date:</b> _____

**NATURAL RESOURCES CONSERVATION SERVICE  
SPECIFICATION GUIDE**

**FENCE**

(Feet)

**PERMANENT AND PORTABLE/TEMPORARY ENERGIZED (ELECTRIC) FENCE  
CODE 382**

**I. SCOPE**

Purpose of this practice is to construct a barrier to animals or people and facilitate management practices and/or accelerated conservation practices.

The work shall consist of furnishing materials and installing permanent or portable/temporary energized (electric) fence, special wire fences and combination thereof, at the location(s) shown on the plan map, and if needed, on the drawings or as staked in the field. Fencing includes brace assemblies, gates, cattle guards and other components required to meet site conditions and achieve objectives for practice application.

**II. FENCE TYPES**

**Permanent Energized (Electric) Fence** is a permanent wire fence powered by a variety of energizers. Mostly used for interior cross fencing. This fence can be a 2, 3, or 4 wire fence.

**Portable/Temporary Energized (Electric) Fences** are 1 or 2 poly wire or tape fence powered by a variety of energizers. Used only for interior cross fencing in areas that need temporary protection or exclusion and/or in management units using a flexible intensive grazing management strategy.

**III. GENERAL SPECIFICATIONS**

Any alterations or additions to the practice design must be approved as a variance by NRCS State Resource Conservationist prior to modifying this specification guide and/or associated drawings or installation requirements. Follow procedure outlined in the standard.

Fences installed on state, federal, and tribal owned lands normally require a permit or approval. This permit/approval must be provided to NRCS prior to installation.

Interior fences will be built in accordance with this specification. Boundary fences and public right of ways need to reference Colorado Revised Statutes Title 35, Article 46: Fence Law. Fences that are along county and highway roads should follow CDOT fence policy and the most current copy of the Fence Standards at [www.dot.state.co.us](http://www.dot.state.co.us).

The NRCS assumes no responsibility for interference with private or public utilities.

State and federally protected plants, animal, cultural resources and historically significant properties shall not be harmed or destroyed during the installation of this practice. All Fish and Wildlife Service consultation documents (i.e. conference reports, biological opinions) will be referenced and planned accordingly into the fence design as applicable to the construction location.

All work shall be done in a manner that minimizes soil and vegetation disturbance and the movement of sediment or other pollutants into streams and water bodies. Any engine oil, lubricants, or other chemical pollutants spilled during construction shall be safely collected and properly disposed.

Most fencing materials must be new. Used materials such as treated railroad ties, power or telephone poles, steel pipe or used well casing may be used with prior certification from NRCS Field Office personnel.

Old posts, wire, and other fence materials shall be completely removed from site.

Any existing structures, including the tie-in to other existing fences, used in constructing the new fence, must be approved by NRCS prior to construction. If the structural integrity of the new fence is dependent on existing practices, certification by NRCS will take into consideration structural integrity and lifespan of the existing structure(s).

Life expectancy of this practice is 20 years. Operation and maintenance of new and existing structures is required.

#### IV. ANCHOR AND BRACE ASSEMBLIES

**Temporary/Portable Electric Fence rarely need braces, but do need anchors provided at either end of the section fence, at each corner, gates or angles in the fence. Use the criteria provided for standard post and wire line posts in Section VI: Line Posts and Fence Sections.**

For permanent electric fence, or if a brace is needed with temporary/portable, use the standard post and wire brace specifications below.

Brace assemblies shall be installed at all angles, corners, gates and ends of the fence, and at the base and summit of steep slopes as needed to properly stretch the fence wire.

Fences shall be constructed in straight sections. On gently rolling terrain distance between brace assemblies shall be set at maximum approx. 4,000 feet or end of wire, and ½ mile on undulating terrain.

Double span brace assemblies are required for sandy or wet soil conditions and/or areas with heavy animal pressure.

Anchor and line brace assemblies may be wood or steel. Wood braces are typically constructed as horizontal brace assemblies or horizontal brace assemblies with a double diagonal brace.

Steel angle iron or steel pipe braces shall be set in concrete. Steel and concrete brace assemblies shall be constructed as single or double span horizontal brace assemblies or as a diagonal brace assembly. Steel angle iron or pipe shall be galvanized coated or painted. If painted, all rust or loose material shall be removed by wire brushing or other suitable material, treated with a rust inhibitor, primed with metal primer paint and then painted with two coats of high grade weather resistant epoxy or enamel paint.

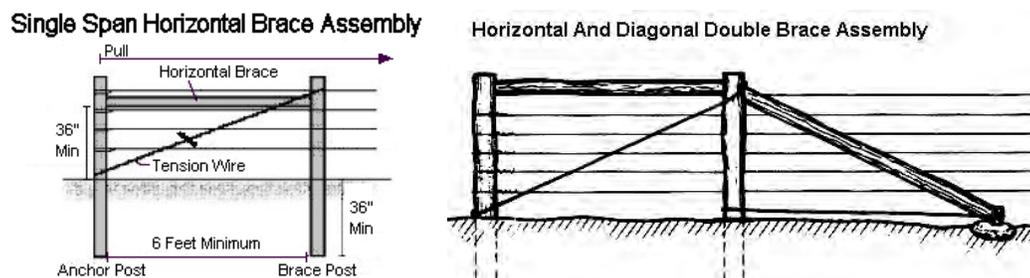
##### A. END BRACE ASSEMBLIES

End brace assemblies shall be installed where there is only one direction of pull, such as gates, or where the fence meets a natural barrier. End bracing should be installed on each

side of drainages and stream channels where the fence may be damaged due to trapped debris during runoff or flood events.

A diagonal end brace may be used instead of an additional horizontal brace where double span bracing is needed. The diagonal brace shall be doweled, bolted, or welded to the brace post at least 36 inches above the ground.

Figure 1: Example End Braces showing typical H Brace and H Brace with Diagonal Assembly



**B. LINE BRACE ASSEMBLIES**

Line Brace assemblies are installed where there are two directions of pull on the anchor post(s), such as corners and in-line stretch posts. Line braces are constructed the same as end braces but with the anchor brace post(s) set in both directions of pull.

In a single H brace assembly, each post serves as both an anchor post and a brace post. They are constructed the same as a single span horizontal brace. Tension wires shall be assembled in both directions, unless the assembly is welded.

Figure 2: Examples of typical line brace assemblies

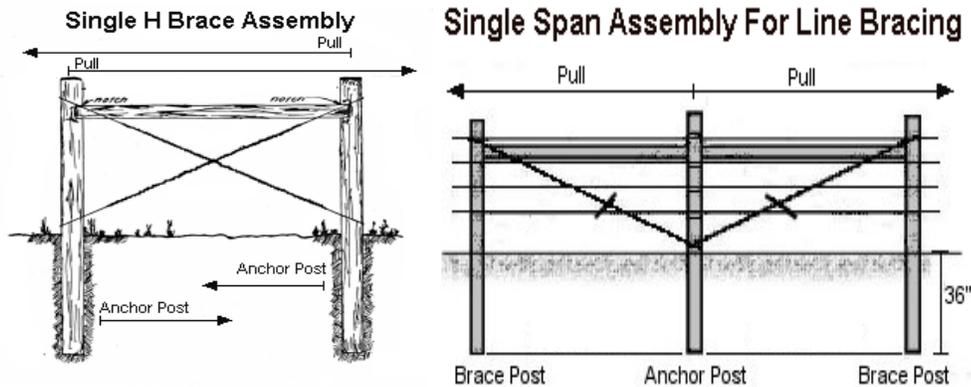


Figure 3: Examples of typical assemblies for corners.

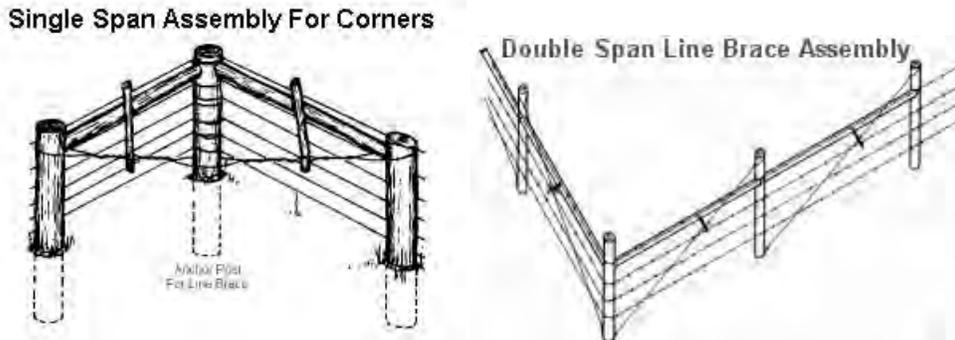
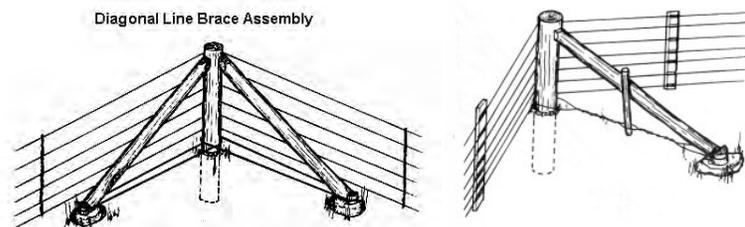


Figure 4: Examples of wood diagonal brace assemblies



Diagonal and single diagonal brace assemblies may be used for bracing angles in the between standard line braces or end braces. The fence wires shall not be tied off to a diagonal brace assembly.

### C. Brace Alternatives

The alternative braces examples listed below could be used where it is difficult to dig or drive posts. If alternative braces are used be sure to evaluate for compatibility with electric fence. Refer to *Range Tech Note No. 38* for alternative options for bracing. Include additional specification information in site specific guidance.

- Floating Angle Brace or Kiwi Brace
- Straddle Jacks
- Square Rock Crib
- Rock Jack
- Wire Fence Cribs

## V. ANCHOR AND BRACE POSTS

### Wooden Assemblies

All end, corner, and brace posts must have a minimum diameter of 5 inches. Untreated juniper, oak, mesquite, black locust and redwood posts may be used. Pine and other softwoods must be pressure treated. Railroad ties in good condition are suitable for use as anchor and brace posts.

All anchor and brace posts shall be set in ground at least 36 inches. In sandy or loose soil, a depth of 42 inches is recommended. Anchor and brace posts shall be long enough to extend approximately 2 inches above the top wire.

Posts shall be set in holes at least 4 inches larger than the diameter of the posts. The hole should be filled with dirt in 4 inch layers and tamped firm. The posts shall be plumb. The top of the dirt fill shall be mounded above the ground level such that water does not pond at the base of the post. If setting a wood post in concrete, use at least (1) 80 lb. bag of concrete for a 12 inch post hole to secure brace assembly.

Horizontal bracing between the corner and brace posts shall be a minimum 6.5 feet long. Standard "H" Brace assemblies should approximately maintain a 2:1 ration of brace length to height of top wire; maximum distance between brace posts shall be 10 feet. Horizontal brace shall be attached to the upper quarter of the anchor and brace post, approximately 35 inches from the ground. The horizontal bracing shall be a post with a minimum diameter of 4 inches.

Wooden diagonal braces shall be a minimum of 10 feet in length and a minimum of 4 inches in diameter. As length increases the minimum diameter needs to increase as well. Lengths 15 feet – 18 feet need to be 6 inches or greater diameter. Lengths greater than 18 feet need to be 8 inches or greater. Brace posts will have to increase in size corresponding to the diagonal brace size. Steel angle iron and pipe may also be used for horizontal or diagonal braces and meet the same diameter and dimensions as above. Steel horizontal braces shall be notched at least 2 inches but not more than 3 inches into wood anchor and brace posts.

Tension wires for all wooden brace assemblies shall be made from two complete loops of 9 gauge or heavier smooth galvanized single wire or two complete loops of 12.5 gauge double strand barbed or smooth wire. Tension wires shall be attached diagonally from approximately 4 inches below the top of the post and 4 inches above the ground, the tension wires shall be twisted together until the brace assembly is rigid.

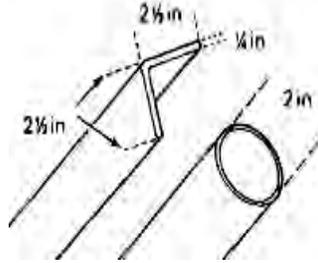
Dowels may be used to attach wooden horizontal and diagonal braces to the wooden anchor and brace posts. The dowels shall be at least 6 inches long, and extend at least 3 inches into each piece. The dowels shall be made of 3/8 inch or larger steel, or 1 inch or larger diameter hardwood. Steel rebar can be used. Braces may also be notched into the brace post and secured to the post with 6 inch tempered steel, galvanized, ring shank nail or 6 inch galvanized lag screw.

For wooden diagonal braces, the ground end of the diagonal brace shall be set on a flat rock or concrete. The end of the diagonal brace must be free to move forward when the fence wire is stretched and must not be blocked by a stake or post. The tension wire shall be wrapped from just above the ground of the brace post, to the ground end of the diagonal brace.

### Steel and Concrete Anchor Brace Assemblies

Anchor and Brace posts may be made from steel angle iron that is at least 2.5 inch x 2.5 inch x 0.25 inch x 6.5 feet, weight at least 4.1 pounds per foot of length. Anchor and brace posts may also be made from new steel pipe that meets or exceeds the requirements for 2 3/8 inch (OD) or 2 inch (ID) size standard steel pipe (ASTM A120, SCH 40).

Figure 5: Steel pipe and angle iron minimum requirements

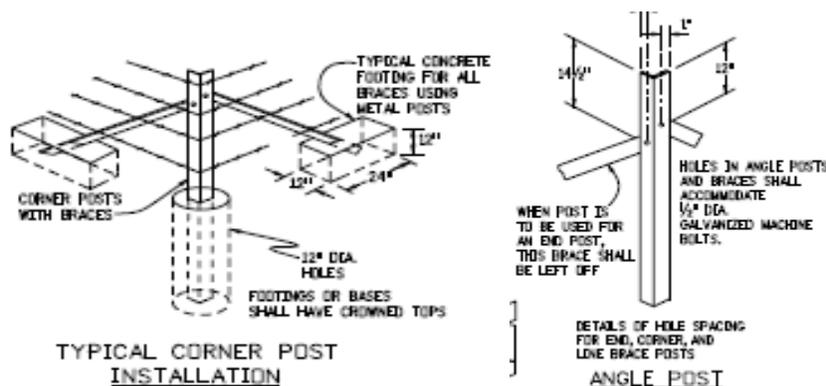


Used steel pipe may be used provided that it is approved prior to construction by NRCS as being of good quality, relatively free of pits and scaling.

Steel angle iron and pipe may also be used for horizontal or diagonal braces and meet the same diameter and dimensions as above (in wooden assembly section). Steel horizontal braces shall be welded to steel anchor and brace posts.

The corner post shall be set a minimum of 36 inches deep in a concrete pier 12 inches in diameter; the concrete pier may be either a cylinder or a square. Corner posts set in sandy soils or soils that are "shrink-swell" clays should be set at approximately 42 inches deep. Diagonal braces shall be fastened to the corner with a positive connector such as a clamp or bolt, and shall extend 12 inches into the brace concrete block, which is 12" w x 24" l x 12" d. The bottom of the steel post shall be placed on a rock. The hole shall be filled with concrete in such a way as to allow the concrete to flow around the base of the post. The top of the concrete shall be mounded above the ground level and sloped away from the post to prevent water from ponding around the base of the post.

Figure 6: Typical steel diagonal brace and post attachments



Steel pipe 5 inches in diameter or larger can be set to the same as wooden anchor and brace posts. Steel pipe posts less than 5 inches in diameter and angle iron posts shall be set in a concrete at least 36" deep and 12 inches in diameter.

Steel posts that are over 2 inches ID will be capped.

## VI. LINE POSTS, STAYS AND FENCE SECTIONS

### Line Posts for Permanent Electric

Posts must be ridged enough to support the weight of the wire and downward pull when passing hill crests and small rises. Any post will type will work as long as a durable, reliable, insulator is used. Posts may be wood, steel pipe or manufactured steel "T-posts" or "U-posts", fiberglass or wood-plastic composite.

Self-insulating posts such as poly-plastic composite, fiberglass or extremely dense self-insulating hardwood posts may be used. Manufactured fiberglass posts will be a composite of marble fiberglass and polymer resins that have been treated with thermosetting (heat treatment). "T" shaped posts will be a minimum of 1 inch x 1 inch cross section with notches. One inch fiberglass sucker rod (round) or the rectangular equivalent may be used. Self-insulating wood shall be a minimum of 1 ½ inch x 1 ½ inch cross section.

Standard post and wire line posts may also be used. Wooden line posts will be a minimum of 3 inch top diameter. Wooden line posts shall be set a minimum of 18 inches in the ground, or 24 inches in sandy or wet soils. Untreated western red cedar, black locust, mesquite, western juniper or Osage orange, one seed juniper, Rocky Mountain and Utah juniper, may be used, Pine or other soft wood posts must be pressure treated or treated with a preservative.

Manufactured steel "T-posts" or "U-posts" with anchored plates, weighing a minimum of 1.33 pounds per foot of length can be used. The posts shall be studded, embossed, or notched for wire attachment. They shall be galvanized, painted or enameled. "T-posts" or "U-posts" shall be driven into the ground until the top of the anchor plate is below ground level. The steel posts shall be long enough to be driven into the ground above the anchor plate and extend a maximum of 4 inches above the top wire.

Line posts may be made from steel pipe that meets or exceeds the requirements for 2 inches nominal size standard steel pipe (Schedule 40). Used steel may be used provided that it is approved by NRCS prior to construction as being of good quality and relatively free of pits and scaling. Steel pipe shall be set a minimum of 18 inches into the ground, or 24 inches in sandy or wet soils.

On two wire electric fences steel reinforcement bars may be used for line posts. The reinforcement bar must be at least 5/8" or #5 bar, set in the ground at least 18 inches and extend above the top wire 4 to 6 inches.

### Line Posts for Portable/Temporary Electric

Posts for portable/temporary fence should be manufactured for that purpose from UV resistant materials. Plastic posts should have small diameter metal spikes and wider tread plates for ease of movement and re-installation. Fiberglass rods may be used as posts as well. Wheel type line posts manufactured for that purpose are also acceptable. Poly wire is light, so large posts are not necessary.

Posts in existing permanent fence may also be used.

### Stays

Stays are rarely needed but if used stays shall be made of fiberglass or self-insulating wood.

### Fence Sections

For permanent electric maximum spacing between the line posts will be 150 feet with two stays. Without stays fence section recommendations are as follows:

- On level or evenly sloping terrain, line posts can be spaced 80-100 feet
- More rolling terrain 40-60 feet
- Rugged terrain or wire for smaller ruminants 25-40 feet may be necessary.

For portable/electric spacing recommended 30-50 feet.

## VII. FENCE WIRE

### Permanent Electric Wire

All wire will be new, smooth, high tensile 12 ½ gauge or greater with a tensile strength of 110,000psi or greater with type three galvanization and certified as meeting ASTM A116. Aluminum-coated steel wire, or plastic-coated wire are also options. Barbed wire will not be used in a permanent power fence.

To obtain maximum effectiveness of the electric pulse, every other wire must be a ground wire. Fences constructed in sand, loamy sand, or shallow rocky soil will not use an all positive wire system.

Wire tension shall be approx. 150-200 pounds per wire. In-line or end-post ratchet strainer devices will be installed to maintain correct wire tension.

Galvanized wire with two layers of insulation will be used where underground burial or overhead transmission is required. Insulation must be high density polyethylene or polypropylene with ultraviolet (UV) stabilizer and capable of withstanding a minimum of 10,000 volts.

### Portable/temporary Electric Wire

Wire will be made of UV resistant poly type material manufactured for use in electric fences or 1/16" steel cable. Poly wire will be at least 6 strands with stainless steel conductors with a resistance of no more than 9,700 ohms per mile. High tensile wire may also be used, use the permanent electric specifications.

### Wire Spacing

Wires will be spaced such that the head of the animal to be contained may not penetrate the fence without coming into contact with the "hot" wire. Top wire height shall be approximately 2/3 the height of the livestock. For portable/temporary fence, one wire is usually adequate.

Top wire will be 42 inches from the ground or lower. Space 10-12 inches between top and second wire. Bottom wire that is less than 22 inches from the ground will be a ground wire. If the bottom wire is set at 22 inches or higher it can be charged. Bottom wire minimum height will be 16" from the ground.

Recommended wire heights for cattle:

- 2-wire – 28" (-), 32" (+)
- 3-wire – 22" (+), 30" (-), 42" (+)
- 4-wire – 16"(-), 22"(+), 30"(-), 42"(+)

Recommended wire heights for small ruminants:

- 4 wire – 10"(-), 16"(+), 24"(-), 32"(+)

Research shows that a three wire fence is effective for separating bulls from cows coming into estrus, and calves from cows in the fall as well as just as effective as containing bison as a 4-wire fence.

Electric warning signs are recommended intermittently along the fence and at crossing points. Warning signs are also recommended to be posted around barns, troughs, or other facilities.

### Wire Splicing

For splicing, high tensile wire, use only the equivalent of crimping sleeves, figure eight knots, or thread through knots. All electrical connections (both ground and positive) must use the equivalent of crimping sleeves or galvanized joint clamps.

### Wire Attachment

Energized fence wires shall be attached to the anchor posts on each end of the fence section through a insulator. Ground wires may be attached to the anchor post by double wrapping the wire around the post and tying it off.

Energized wires shall be attached to all fiberglass posts using tie wire, or manufactured wire fasteners of good quality. Energized wires can be attached to self-insulated wood using staples. Energized wires will use an insulator made of black polypropylene or polyethylene plastic or porcelain ceramic. Insulators should have a 10 year warranty.

Ground wires may be attached directly to wood with staples, or to steel posts with tie wires or manufactured wire fasteners of good quality. Manufactured wire fasteners will be zinc-coated in accordance with ASTM A153. Tie wires shall be 16 gauge or heavier galvanized steel.

Staples shall be 9 gauge galvanized or polished hard wire, 1.75 inches long into softwood or 1 inch long into hardwood posts. Staples shall be driven diagonally into the grain at a downward angle and be driven in such a way that they do not bind or bend the fence wire, allowing the fence wire to contract and expand.

### **Wildlife Considerations**

Fence stays can make it harder for wildlife to pass through wires.

To increase visibility, consider using a white poly-coated wire for the top wire.

Tension springs can be included to add some “give” to fences in areas where deer traffic heavy and/or along woodlands where tree branches may fall.

Keep fence electrified even when livestock are not present to prevent wildlife damage to fence. This also prevents the battery from freezing and prolongs battery life.

See *Range Technical Note No. 38 and Range Tech Note No. 39* for references to plan additional site specific recommendations for wildlife considerations.

## **VIII. ENERGIZERS AND COMPONENTS**

**Energizers** can be solar, 110 or 220volt, or 12 volt battery units. Energizers shall be high voltage/low impedance short pulse producing at least 5,000 volts output with all livestock containment fences charged when under maximum anticipated load. They should produce 35-65 pulses per minute lasting not more than 0.0003 seconds. Each pulse should have an intensity of less than 300 mAmps. It is recommended at least one digital read out voltmeter accompany the energizer.

For 110 volt or 220 volt energizers, install a voltage spike/surge protector to protect energizer from power surges from the energizer plug.

The energizer should have a joule rating high enough to provide a minimum shock at the farthest point as follows:

- Cattle - minimum 1,600 volts
- Sheep and hair goats – minimum 2,000 volts
- Horses, hogs and meat goats – minimum 1,200 volts

This is the minimum accepted fence voltage for livestock control; vegetation loads and electrical shorts will reduce the voltage resulting in the need for a higher output energizer. These figures are for guidance only.

All energizers will include solid state circuitry, high impact weather resistance case, safety pace fuse and lightning arrester. Maximum length of wire shall not exceed the manufacturer's recommendation for the size and type of wire and controller used.

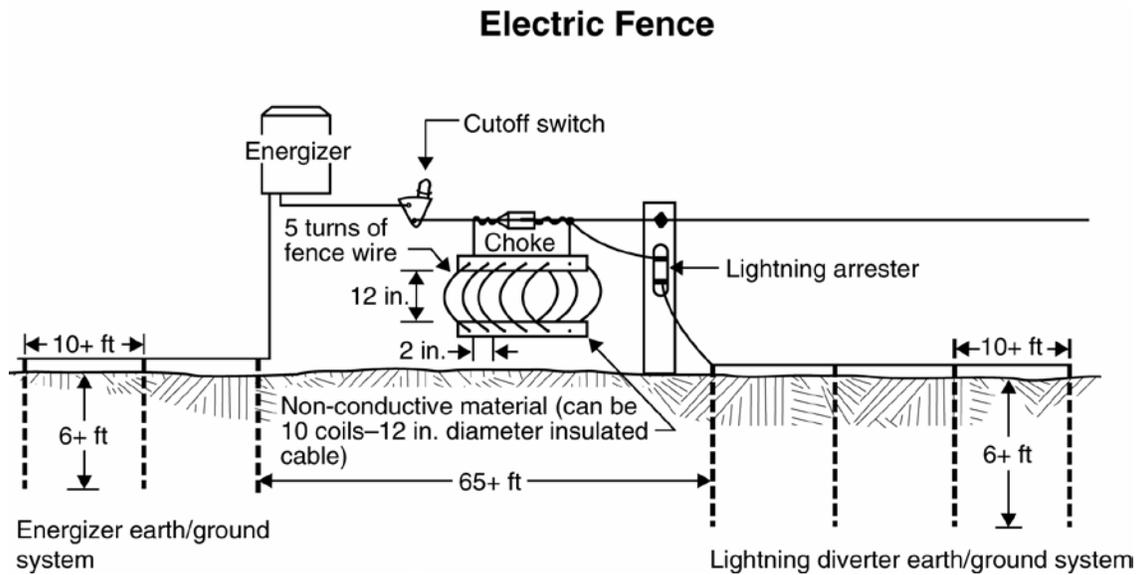
**Solar panel** must match the energy draw of the energizer. For each 1 joule energizer output, allow seven watts of solar panel capacity in high sunlight areas and ten watts in low sunshine areas. Orient solar panels from due south to no more than 20 degrees southwest. If panels are only used during the spring to fall grazing season, 25-30 degrees off horizontal is appropriate. Winter grazing requires a panel more steeply inclined, up to 60 degrees off horizontal with a south to southwest orientation.

**Grounding** – All power fences will be grounded. The energizer ground wire will be connected to at least 18 linear feet of galvanized pipe  $\frac{3}{4}$ " diameter or larger or solid copper rod  $\frac{1}{2}$  in diameter or larger, through a gallery of 3 rods driven into the ground at least 6 feet. Where soil depth prevents penetrating at least 6 feet into the soil the number of rods will be increased to obtain at least 18 linear feet of rod in contact with the soil. It is recommended that there is a minimum of 10 feet between ground rods.

If the energizer has galvanized terminals then only use galvanized wire and ground rods. Look for moist soil year round for grounding; this will improve the effectiveness of the grounding system.

**Lightning arrester** or lightning choke is required. Install an additional set of four 6 feet ground rods to arrest the lightning. Locate rods at least 65 feet from the energizer grounding and should be spaced at least 10' apart. Energizer manufacturer's requirements for lightning protection must be met or exceeded.

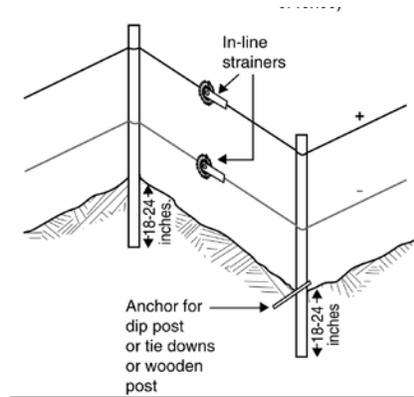
Figure 8: Illustration of energizer, grounding and lightning arrester



## IX. FENCE ANCHORS

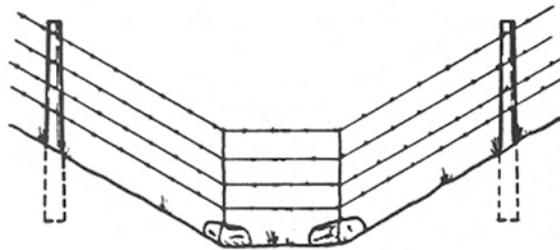
Fence anchors shall be installed when the bottom wire is more than 6 inches above the design height above the ground.

Figure 9: Illustration showing a type of fence anchor



Anchor weights for holding down fence wires crossing drainages or depressions shall weight at least 50 pounds or be equivalent to a 1 cubic foot concrete block. They shall be attached with 9 gauge or heavier smooth wire to the non-energized wire(s).

Figure 10: Illustration of fence anchors



## X. FLOOD GATES, WATER GAPS AND PERENNIAL WATERWAYS

Flood gates may have to be installed in low areas that are subject to flash floods to allow water and water born debris to pass through; otherwise fences may be damaged during heavy run-off.

Water gaps may be needed to control livestock where fences cross streams or drainage. There are two basic types of water gaps. For areas with very little water and only occasional flooding, a breakaway fence will be sufficient. In areas with regular flooding, it may be best to construct flooding gates or panels.

Figure 11: Illustration example of types of water gaps

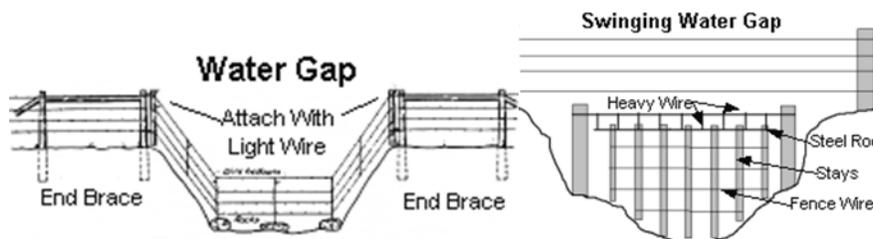
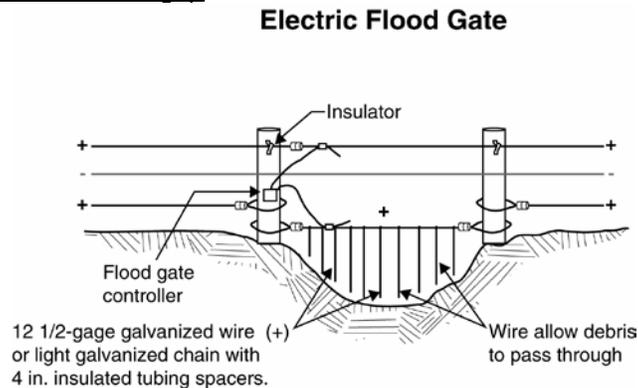


Figure 12: Illustration of electric water gap



Depressions less than 16 feet wide can be fenced without braces. Depressions greater than 16 feet need a break-away fence that will leave the rest of the fence undamaged. Water gaps shall be assembled as a separate unit to protect the main fence from damage. The ends of the water gap fence wires shall be attached to a separate steel or wooden line post attached to the end brace using light wire or staples that will allow the water gap to break away from the end braces in a flood event. Smooth wire should be used, with the same line post, wire and wires spacing requirements. Depth of posts can be reduced to 12", minimizing damage to the posts if fence breaks away.

For deep narrow drainages, a separate fence section can be installed below the main fence. See *Range Tech Note No. 38* for further construction ideas on flood gates and water gaps.

If fencing through a perennial waterway is necessary then a combination of end braces and swinging water gaps may be needed. Fencing over perennial waterways will consider wildlife passage. Ideally, the fence will be a minimum of 12" off the normal water level and should allow free passage by fish and floating birds and provide high visibility for birds in flight. Consider recreational uses when building fences over perennial streams/rivers.

## XII. GATES AND CATTLE GUARDS

Gates shall equal or exceed the quality of the adjoining fence. They may be made of wood, aluminum, steel or wire. "Lift" or "Australian" gates are acceptable. Use insulated gate handles if building an electric gate. All steel components shall be stainless steel or have a class III galvanization rating.

Gates allow access from both sides of the fence and shall be placed in locations that consider existing and planned roads, ease of access for livestock management, intended prescribed grazing strategy to be implemented, and other necessary considerations for the planned area.

Wire gates shall be constructed of equal or better quality wire and stays used in the fence. Wire gate across road shall have stays at least every three feet to ensure they are visible to vehicles.

If a heavy gate is attached to the anchor posts side of the end brace assembly, an additional tension wire running in the opposite direction will be necessary. The tension wire should only be tightened enough to offset the weight of the gate.

Any commercially available cattle guard approved by the manufacturer for the intended use in the fence may be used.

## 382 – Fence – Permanent and Portable/Temporary Implementation Requirements

IR - 1

**The Practice Purpose(s):**

Construct a barrier to animals or people and facilitate other management practices or accelerated conservation practices.

<b>Kind of Animal:</b>			
<b>Type of Fence:</b>		<b>Length of Fence:</b>	

<b>Anchors and Brace Assemblies:</b>			
	Type	Materials	Other Requirements (additional information not in specifications or drawings, locations, special considerations specific to project, etc.):

<b>Line Posts and Stays:</b>		<b>Wire Requirements:</b>	
<b>Line Posts</b>		<b>Wire Type:</b>	
<b>Fence Section Spacing</b>		<b>Wire Spacing:</b>	
<b>Stays (type and number if applicable):</b>		<b>Insulators:</b>	

<b>Energizer: Type</b>	Solar	110v	220v	<b>include surge protector</b>
<b>Output:</b>				

**Additional energizer and/or component information**

**Site Preparation and Additional Installation Information**

**OPERATION AND MAINTENANCE**

Fences should meet the objectives of the conservation management system in providing an effective barrier. The fence is expected to remain operational for the lifespan of the practice. The expected lifespan of this practice is 20 years. With good maintenance, fences installed to these specifications can longer than the 20 year lifespan.

Typical maintenance requirements include:

- Remove all foreign debris that hinders fence operation
- Immediately repair any damage from vandalism, vehicles, fire or livestock, this includes damage to wires, stays, braces and line posts.
- Maintain gates used for control of livestock and vehicular travel
- Maintain and clean cattle guards as necessary.
- Check and repair/replace flood gaps/water gates after storm events.
- Periodically check fence wire tension and maintain necessary tension.
- Repair any wire breaks that might occur
- Repair/replace stays and maintain spacing requirements.
- Ensure water does not pond around posts.
- Retain and properly discard all broken fencing material and hardware.

Other Requirements:

**I have received and reviewed the plans, specifications, drawing, operation and maintenance and any other associated documents. I accept and approve them for installation of this project.**

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Landowner or Operator Signature Date

### 382 – Fence – Permanent and Portable/Temporary Fence As-Built and Practice Certification

Producer Name		Farm/Tract #:	
Inspection Date:		Follow Up Inspection Date:	

Fence Length:		Measurement Method:	
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**Brace Assemblies**

Installed at corner, gates, and angles and topography changes:		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Maximum section lengths at approx. every 1320 feet or less:			
Type of Brace:		Materials:	
Length of braces:		Height Above Ground:	
Height of horizontal Brace:		Tension Wire:	
Other Notes:			

**Brace Posts**

End, Gate and Corner Braces				Line Braces			
Materials:				Materials:			
Treatment Type:				Treatment type:			
Length:		Size:		Length:		Size:	
Weight :		Depth Set:		Weight		Depth Set:	
Other Notes:							

**Line Posts, Stays and Wire Attachment**

Line Posts Type:		Treatment Type:	
Post Length:		Size or Weight:	
Depth Set:		Post Spacing (feet):	
Stay Type:		Number of Stays between Posts:	
Tie Wire Gauge:		Staple Size:	
		Length:	
Attached loosely so wire can move:			
Staples driven diagonally with the grain:			
Other Notes:			

**Fence Wire**

Gauge:		Type:	
Number of Strands:		Fence Markings:	
Wire Spacing:		Wildlife	
Top Smooth:		Requirements Met	
Bottom Smooth:		Wire Splicing:	
Other Notes:			

**382 – Fence – Permanent and Portable/Temporary Fence  
As-Built and Practice Certification**

**Other:**

Gates		Cattle Guards		Water gaps and/or Flood Gates		Other	
Type		Type		Type		Type	
Meets Specifications: <input type="checkbox"/> Yes <input type="checkbox"/> No				Notes:			

Other As-Built Notes:

If there are items that do not meet the specifications and/or drawings, describe the deficiency:

Deficiency Corrected Date:	
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**Landowner/Operator Completion Certification:**

This practice(s) meets applicable NRCS standards, specifications, drawings and installations requirements and represents the above as-built conditions.

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Landowner/Operator Signature Date

**Practice Completion and Certification:**

The acceptability of this work has been determined by inspections to check compliance with all the provisions of this specification with respect to the drawings and the installations requirements.

I have made an onsite inspection of the site, and have determined that the job as installed does conform to these practice specifications, drawings and installation requirements.

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NRCS Signature Date