Fence (382) – *EXAMPLE*

Conservation Practice Jobsheet – High Tensile

Smooth Non-Electrified, Smooth Electrified, or Woven Wire

Natural Resources Conservation Service Pacific Islands Area

General Criteria

Fencing materials shall be of a quality and durability that meets the intended management objectives. The lifespan of this practice is 10 years. Materials will be of durability that meets or exceeds this lifespan. Wire and hardware will be new, class III galvanized (or bezinal-treated) material.

All corners, gates, and ends of fence will be braced with brace posts and poles in an "H" configuration, supported with diagonal brace wire(s), or a diagonal configuration, supported with horizontal brace wire(s). Other brace configurations may be approved for special or difficult situations. In-line brace assemblies will also follow this configuration.

Height, number, and spacing of wires will be installed to facilitate control and management of the animal(s) and/or people of concern. Refer to Table 1 in the 382-Fence specification for guidance.

Height, size, spacing, and type of posts will be used that best provides the needs for the style of fence required and is best suited for the topography of the landscape.

Manufacturer's guidelines shall be adhered to during installation of each type if fence to ensure proper component assembly.

All fence construction shall comply with federal, state and local fencing codes.

Fences for mixed livestock may be constructed of woven wire topped with one or two strands of barbed or smooth wire, or one strand of electrified smooth wire.

Basic Specifications

For greater detail, refer to the PIA-NRCS 382-Fence Specification.

High Tensile wire: 12.5 gauge, class III or type III galvanized (or bezinal-coated). Choose number or wires and wire spacing to suit size and type of livestock. See Table 1, 382-Fence specification for suggested electric fence guidelines, and adjust to meet producer needs.

In-Line strainers/spring assemblies: at mid-point of wire run, not to exceed recommended distance of manufacturer, or 1320 feet.

Woven Wire: High tensile woven wire with a maximum of 12 inches between stay wires.

Staples: Staples used to fasten tube-type insulators to wooden posts will be 9 gauge galvanized wire with a minimum length of 2 inches. Staples used to fasten non-insulated fence wire to wooden posts will have a minimum length of 1-1/2 inches. Staples will be driven cross-wise to the grain and will not be driven in tight against wire.

Wood line posts – Minimum 2 inches in diameter, set a minimum of 1.5 feet deep, with spacing to follow

guidelines in Tables 1, 2 or 4 (as appropriate) of the 382-Fence specification. Posts may be driven or set in post holes and hand tamped with earth or filled with concrete. Post length is dependant upon desired fence height, with the top of the post between 2-4 inches above the top wire.

Steel or fiberglass line posts – If steel posts are used, they will be of standard "T" or "U" section type, and have a minimum weight of 1.33 lbs per foot (exclusive of anchor plate). Spacing will follow the guidelines in Tables 1 and 4 of the 382-Fence specification. Posts will be driven into the ground at least 1.5 feet deep, so that the anchor plate is buried. If fiberglass or Insultimber line posts are used, they must be at least ½-inch diameter, and driven into the ground at least 1.5 feet.

Insulators – Required when the electrified wire may come into contact with any conductive materials such as steel posts, wood posts (not including Insultimber posts), brace wires, etc.

Corner, gate, and brace posts – Minimum 5 inches in diameter, set at least 4 feet deep. Length is dependant upon fence height. Brace posts are placed a minimum of 6 feet from corner posts, end posts, and gate posts; and are at least 6 feet apart in line brace assemblies.

Horizontal brace *poles* (compression members) - are at least 6 feet long and a minimum diameter of 3 inches. They are set between 6 and 12 inches below the top of the vertical posts, using brace pins to tie into posts. Notch into post as needed. Diagonal brace wires are tightened using a figure 8 wrap and an in-line strainer, or a twist stick. Wire is tightened until posts are rigid.

Brace assemblies in-line – are placed not more than 1320 feet apart on level or gently sloping land, or 660 feet (or closer as necessary) on difficult or steep terrain; and at any significant change in the land surface or 20 degrees in alignment or slope. If a modified brace assembly is needed for single- or double-strand electric fences, refer to Chart 1 in the 382-Fence specification for requirements.

Energizers & accessories – Use a low-impedance fence charger of sufficient size for the fence (according to manufacturer's recommendations). Lightening diverter, choke, ground rods, etc. are installed according to manufacturer recommendations. All strands are electrified except in very dry areas, then every other strand should be connected to a ground system. Refer to Table 4 in the 382-Fence specification for additional requirements.

Considerations

Fences across gullies or streams require special braces and design. Breakaway fences or swinging water gaps allow debris and water to flow past the fence line without destroying the adjacent fence.

Any permanent fencing for grazing livestock should allow flexibility to facilitate implementation of the grazing plan and permit land management activities such as nutrient application, pest control, forage harvest, and other appropriate practices.

Follow all manufacturer's safety precautions for handling and installing fencing materials. Place warning signs on electric fences every 150 to 200 feet, wherever the public is expected to encounter the fence. Other types of fence are available for consideration and specifications for those types are available through several catalog supply companies.

Attach wire on the side of posts that will receive the greatest pressure from animals. Place wire on the outside of posts on curves.

Locate fences to facilitate maintenance. Where applicable, clear right of ways should be established and maintained to facilitate fence construction and maintenance.

Bare high tensile wire is not recommended for horses, as it poses a serious injury potential. Plastic-coated, highly visible, high tensile wire or other options should be seriously considered.

Consider making accommodations for the passage of wildlife, particularly where known travel ways for species of concern exist.

Electrified barbed wire is dangerous and should not be utilized.

See attached plan map for fence location, and standard drawings for more detail. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See practice standard 382-Fence.

Additional estimation and technical assistance may be acquired from NRCS and/or the fence manufacturer/supplier.

CODE 382—High Tensile & Permanent Electric Fence

Example	on plan map	001	3
PRODUCER	**TMK#**	**FARM/TRACT#**	**FIELD NUMBER(S)**
EQIP	2	1620	
PROGRAM	**CINs**	TOTAL LENGTH (FT)	
You	III - Length	Yesterday	
PLANNER	**JOB CLASS (& LIMITING FACTOR)**	**DATE INSTALLED**	

	PLANNED	INSTALLED
1. FENCE DESIGN		
Livestock Type	Cattle management	
Fence Height (Inches)	42 inches	
Strands (No.)	2-strand smooth, both hot	
Wire Spacing (Inches) List spacing starting with bottom wire Charge (+) (-); Identify wire charges	Top wire max. 42-inches above ground (hot), 2nd wire between 12-16 inches from top wire (hot).	
2. WIRE		
Type	High-tensile, smooth wire only. Use of electrified high-visibility "tape" is not approved.	
Size (Gauge)	14-gauge or heavier	
Galvanization kind	Class III galv., or Bezinal-coated	
Amount (total length in feet)	1620 ft.	
3. LINE POSTS		
Material	Steel T-posts (1.33 lb/ft).	
Size (Inches) and Shape	Steel T-posts min. 5.5-ft long.	
Length (Feet) & Spacing (Feet)	Steel T-posts min. 5.5-ft long, spaced at least every 20-ft.	
Buried Depth (Feet)	Steel T-posts drilled at least 1.5-ft into pahoehoe/soil. Top of anchor plate must be buried.	
Coating	Steel T-posts will be hot-dip galvanized.	
Insulators (Type)	**UV-treated** Fiberglass or PVC plastic, made specifically for electric fence use.	
Distance between Posts (Feet)	Steel T-posts drilled/pounded into pahoehoe/soil at least every 20-feet.	
4. BRACES, including Corners & Pull Posts		
Locations (on map)	See plan map	
Type and Material	Wood or Steel	
Brace Wire Type and Size	Min. 14-gauge or heavier, galvanized.	
Vertical Post Size (Inches) (see Chart 1 & Table 2, 382-Fence specification)	Wood = min.4-inch; Steel = min. 2-7/8 inch.	
Length (Feet)	min. 6.5-feet	
Buried Depth (Feet)	min. 2.5-feet	
Coating	Wood posts must be pressure-treated according to the 382-Fence Specification. Steel posts must be hot-dip galvanized (Class III) according to the 382-Fence Specification.	
Horizontal Brace Size (Inches)	Min. 2.5-inch diam.	

Length (Feet)	Min. 8-feet	
Diagonal Brace Size (Inches)	modified electric, Chart 1 – None required; use guy-wire and deadman per Chart 1 of 382 specification.	
Length (Feet)	N/A	
Insulators (Type)	**UV-treated** PVC or fiberglass, min 4-inch offset length.	
5. ENERGIZER		
Output (Volts or Joules)	10,000 volt peak output, pulsed at 54 to 60 pulses/minute. Pulse duration no longer than 300 micro-seconds. Minimum of 5,400 volt output required for cattle or horses. Minimum of 6,000 volt output for sheep, goat or pig fences is required.	
Capacity (Length of all Fences)	min. 5 miles	
Energy Source (AC/DC/Solar)	Solar -- with battery back-up capable of minimum 3-week full operational storage capacity.	
6. GROUNDING		
Ground Rods:	Steel or copper (3/4" diameter); Aluminum ground wire will run directly from Energizer ground post to grounding rods, and will be attached with wire clamps or hose clamps (or similar).	
Number	4	
Spacing (Ft)	10	
Buried Depth (Ft)	5	
7. OTHER		
	Modified diagonal braces may be used for any installation area.	

8. SPECIAL PROVISIONS:

A. Where possible, it is recommended that brace posts and pull posts (including wood) are driven into the ground. If that is not reasonable and digging or drilling is required, all backfill will be tamped solidly. Backfill should be done incrementally, with soil added to the post hole in 4-6 inch depths, tamped firmly with a tamping rod, add more soil, tamp again, etc until the hole is filled. If drilled into rock, posts will be backfilled with concrete.

B. All planned gates will be installed and fully-functional prior to final certification.

C. In-field checks by NRCS are encouraged (but not required) to make sure that materials and installation meet the specifications. Contact NRCS at any time to schedule a field check. Suggested field check times include the following:

1. After the materials are on-site and fence building is ready to begin.
2. After approximately 200-feet of fence has been constructed, for a preliminary inspection.
3. After the fence is completed according to these specifications.
4. Any other times before-during-after construction where you need assistance and NRCS review of the construction.

D. Additional construction specifications and general fencing information can be found in the NRCS-PIA 382-Fencing practice specification. Contact your local NRCS office if you need a copy.

COMPLETION CERTIFICATION REQUIREMENTS: You will be required to provide NRCS with documentation from the manufacturer (or fence supplier) showing the quality of materials used, upon completion (the project will not be certified without this documentation):

1. Gage and galvanization type (Class III or bezinal-coated) of predominant wire used.
2. Weight and length of posts. Weight of T-posts must equal or exceed 1.33 pounds/foot, exclusive of anchor plate.
3. Length and treatment of all wood posts used.
4. Diameter of wood and steel posts.
5. Output specifications of energizer.

OPERATION AND MAINTENANCE: Regular inspection of fences should be part of an on-going management program. Maintenance and repairs will be performed as needed to facilitate the intended operation of the installed fence. Fence repairs should be made with materials that equal or exceed the quality of the original materials.

APPROVALS:

I have reviewed the specifications and special provisions in this jobsheet, plus any attached maps or drawings, and agree to construct this project in accordance with them. I agree to provide written documentation upon completion as described in the "Completion Certification Requirements" box above.

Producer – (enter/sign name as it appears on the NRCS-CPA-1155) **Date**

NRCS Conservationist **DESIGN JAA** **Date**

CERTIFICATION STATEMENT:

I hereby certify that this practice has been installed in accordance with NRCS standards and specifications.

NRCS Conservationist **CERTIFICATION JAA** **Date**