# Installation Criteria

## GENERAL

- The standard drawings show the required dimensions and construction methods.
- Recommended line post spacing will be written into blanks on the standard drawings based on allowable maximums and terrain
- Organic producers should consult their certification agent concerning acceptable materials for fence construction.
- Use practice implementation guide, *Wildlife Friendly Fence*, if wildlife movement will be impacted.

## BRACES

- Braces may be of the "H," diagonal, or manufactured type.
- Check with the area grazing specialist or area resource conservationist on all manufactured fence braces prior to purchasing to verify they meet the 382 – Fence lifespan of 20 years.
- Double H braces, corners, and pull assemblies will be used when six or more high tensile wires are strung on the fence. Single H braces, floating braces, and approved manufactured braces are approved for 2-5 wire fences.

## WIRE SPACING

- Recommended spaces between wires will be determined in consultation with the client using fence material supplier guidelines for different kinds and classes of livestock or wildlife.

## WOVEN WIRE

- Barbed wire or electrified high tensile wire will be placed on top of the woven wire. Number of wires depends on the height of woven wire. See the standard drawing for details.

Do not electrify barbed wire.

Avoid using electric fence gate handles to transfer charge through gates. Instead bury the connection between the two sides of the fence under the gate with insulated wire routed through a sealed PVC pipe.

# Material Specifications

## BARBED WIRE

- Conventional: Minimum 12.5 gauge.
- High tensile: Minimum 15.5 gauge.
- Minimum 14 gauge for 2-point barbs with 5-inch centers.

## WOVEN WIRE

- Top and bottom wires: Minimum 11 gauge.
- Line and stay wires: Minimum 12.5 gauge.
- High tensile wire: Minimum 12.5 gauge.

## HIGH TENSILE WIRE

- Perimeter fence: Minimum 12.5 gauge and minimum tensile strength 135,000 pounds per square inch (psi).
- Interior fence: Minimum 14 gauge, high tensile.

## STAPLES

- For softwoods: Minimum 1.5 inches in length.
- For hardwoods: Minimum 1 inch in length.
- Leave space between post and staple to permit free movement of the wire.

## CLIPS

- Wire clips will be provided by the post manufacturer, galvanized wire, minimum 12 gauge.
- Leave space between post and staple to permit free movement of the wire.

## WOOD POSTS

- Posts made of the following wood types may be used without preservative treatment: Red Cedar, Black Locust, Tamarac, White Cedar, Redwood, White Oak, Osage Orange, and Burr Oak.
- Posts made of all other wood types must be treated by a method that achieves complete saturation of the sapwood.
- Used railroad ties or highline poles may be utilized for posts if in sound condition and free from cracking and decay.
- Minimum requirements for wood line posts: 6 ½ feet in length, 4 inches in diameter, and buried or driven 2 ½ feet into the ground. See Standard Drawings for details.
- Minimum requirements for wood brace posts: 8 feet in length, 6 inches in diameter, and buried or driven 4 feet into the ground. See Standard Drawings for details.

- Minimum requirements for wood cross brace posts for “H” braces: 8 feet in length, 4 inches in diameter. See Standard Drawings for details.
- Minimum requirements for wood diagonal brace posts: 10 feet in length, 4 inches in diameter. See Standard Drawings for details.

**STEEL POSTS**

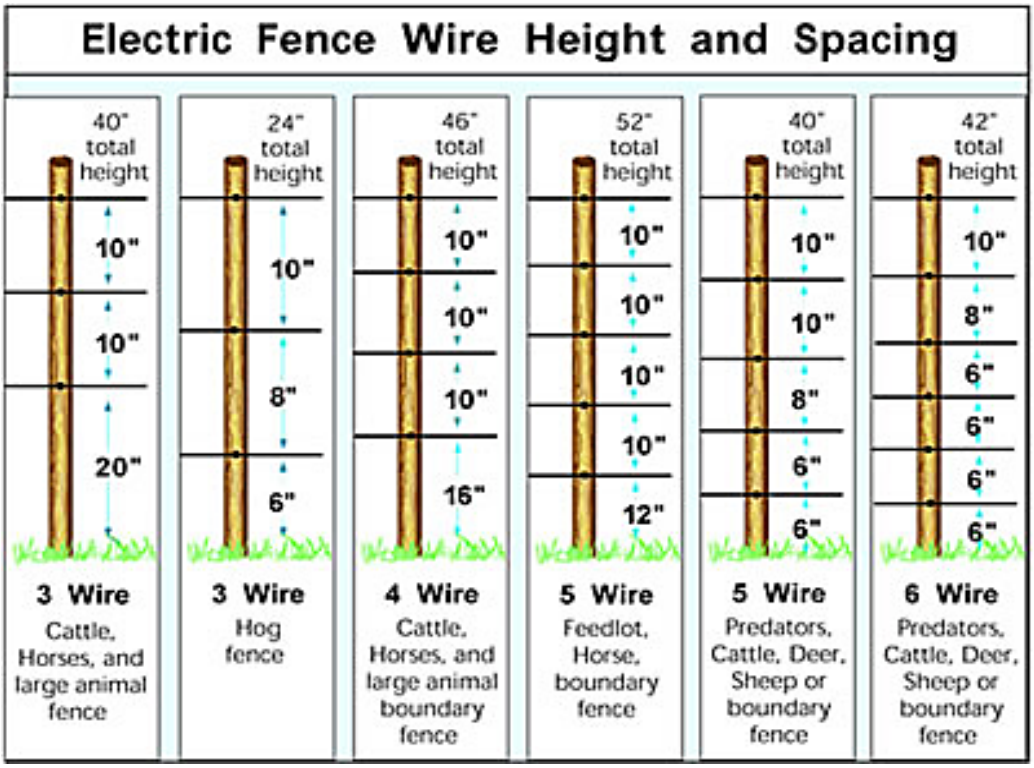
- Must be new; used posts will not be acceptable.
- Must be painted or galvanized and have anchor plates attached.
- Minimum requirements for steel posts: 5 ½ feet in length, 1.25 pounds per foot of length in density, driven to a depth of 1 ½ feet into the ground.

**FIBERGLASS POSTS**

- Must have ultraviolet protective coating.
- Minimum requirements for fiberglass posts: 5 ½ feet in length, 7/8 of an inch in diameter, buried or driven 1 ½ feet into the ground.

**ENERGIZERS AND GROUND RODS**

- Install according to the manufacturer’s recommendations.




Recommended wire spacing for different species of livestock and wildlife.

**References:** Zareba Fencing Guide.

High tensile electric

Woven wire with 1 high tensile electrified wire on top.

Manufactured fence corner brace

**References:** Minnesota Fence Technical Note, Minnesota Fence Construction Specifications, Energized Fencing Handbook (Minnesota DNR)

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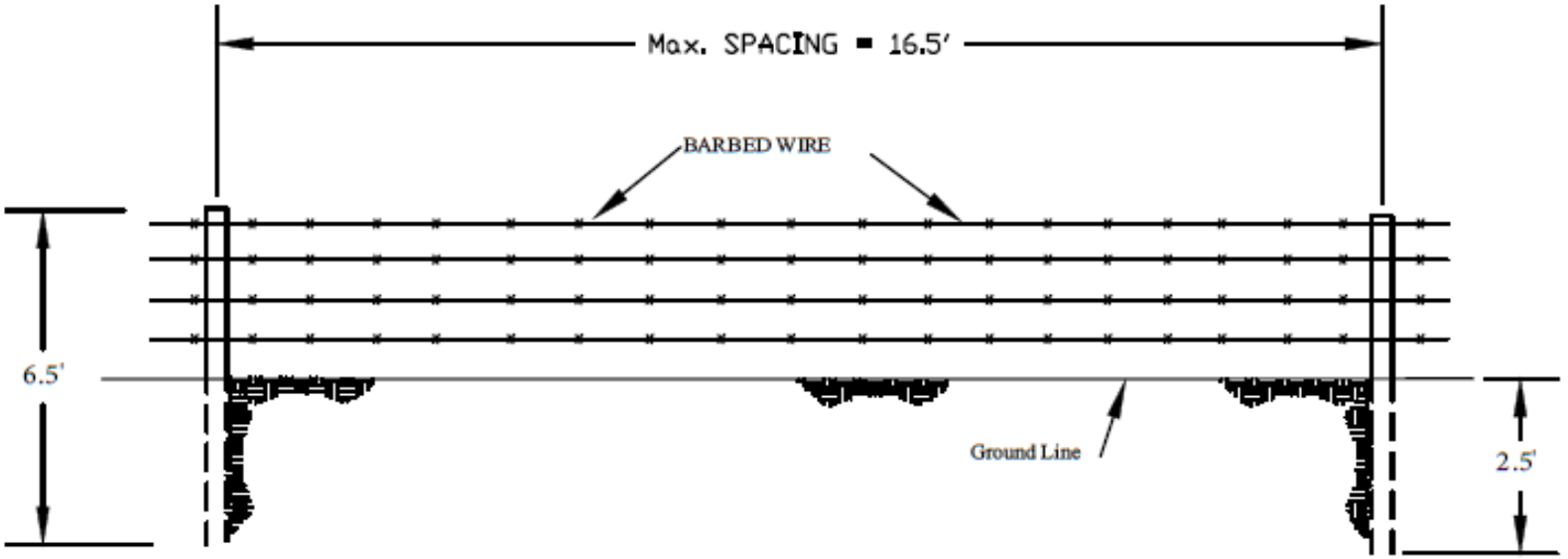
# BARBED WIRE FENCE

## LINE PANEL

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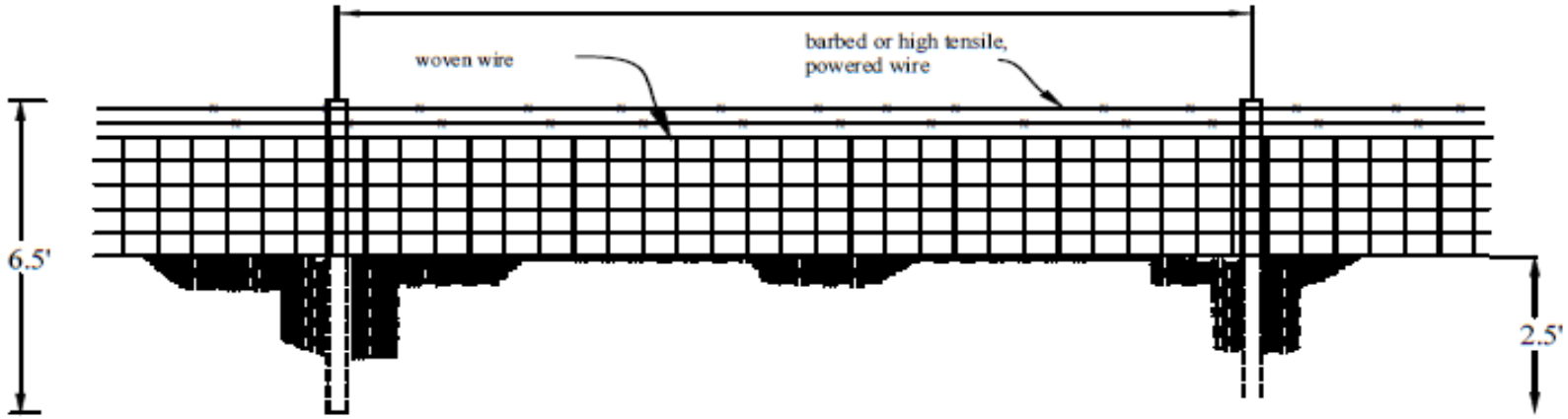
# WOVEN WIRE FENCE

## LINE PANEL

_____High Tensile Woven Wire, Maximum Post Spacing 25'

_____Standard Woven Wire, Maximum Post Spacing 16.5'

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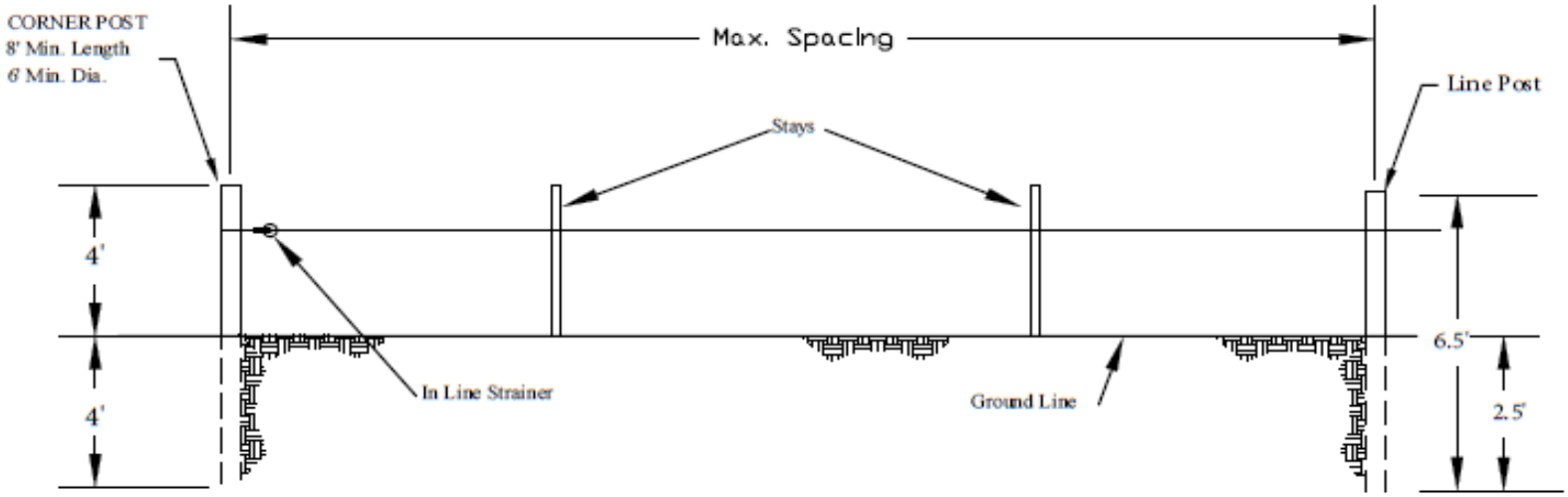
# SINGLE WIRE HT POWER FENCE

LINE PANEL

50' w/out stay_____
100' w/1 stay_____
150' w/2 stays_____

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3-16

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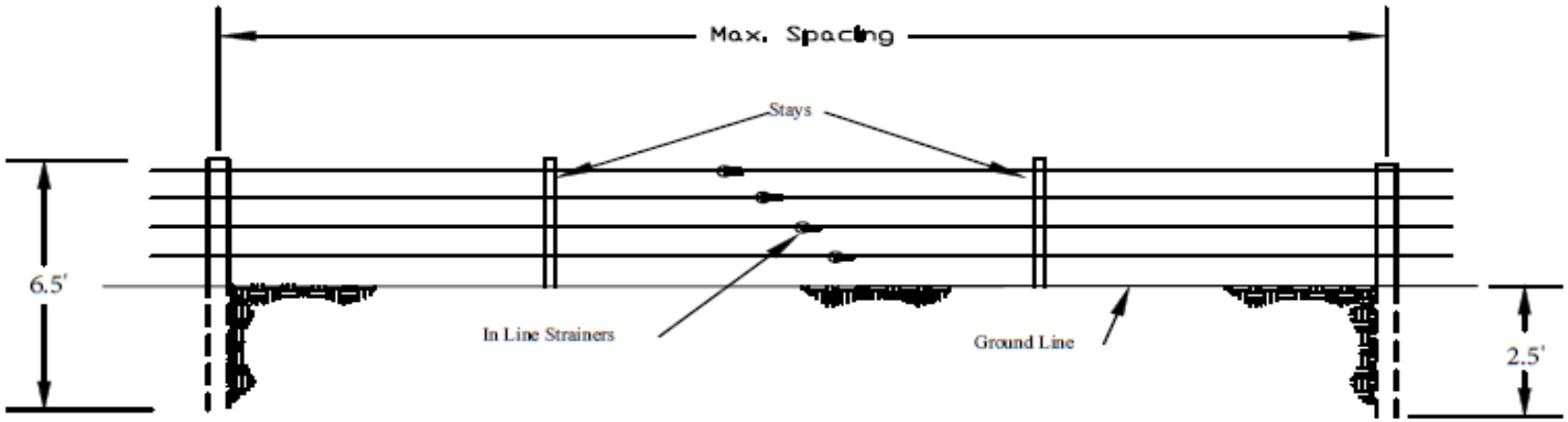
# HT POWER FENCE

## LINE PANEL

Post spacing can be decreased to adjust for dips and rises

50' w/out stay_____
100' w/1 stay _____
150' w/2 stays_____



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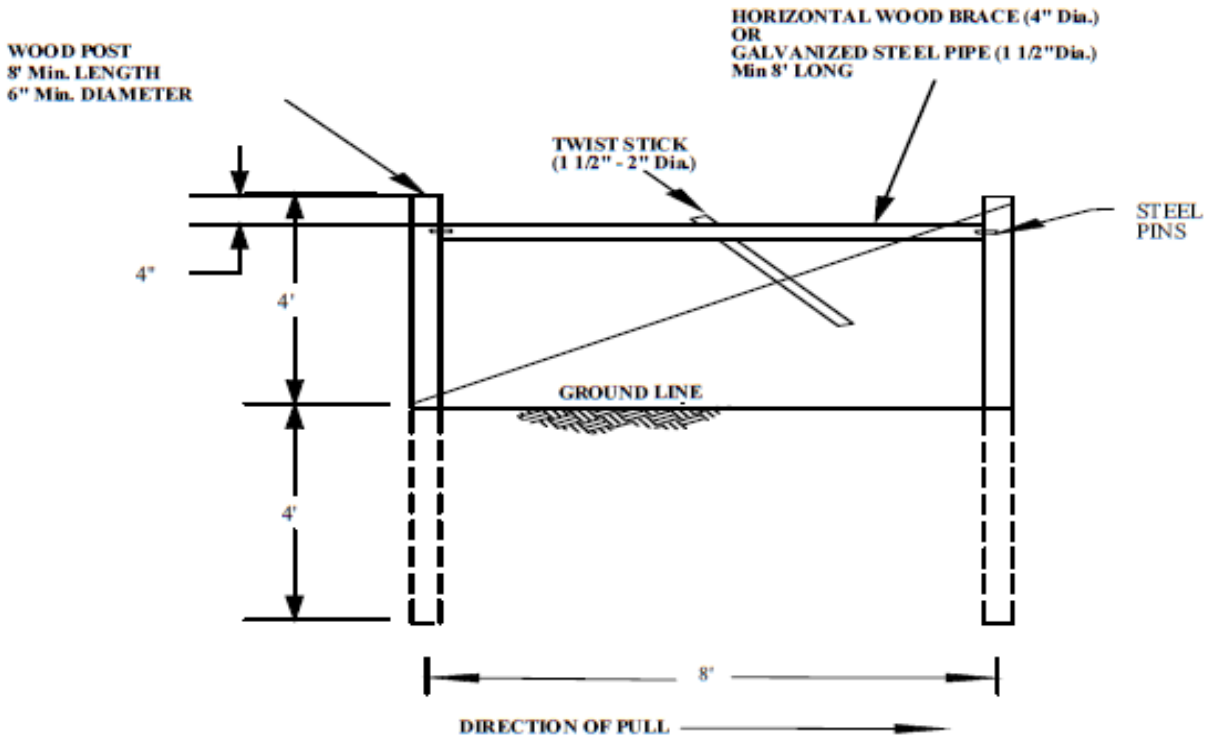
# END BRACE




**BRACING IS REQUIRED WHERE THE FENCE ENDS AND ON HINGED SIDES OF GATE OPENINGS**

For 2 to 5 wire High Tensile Fences

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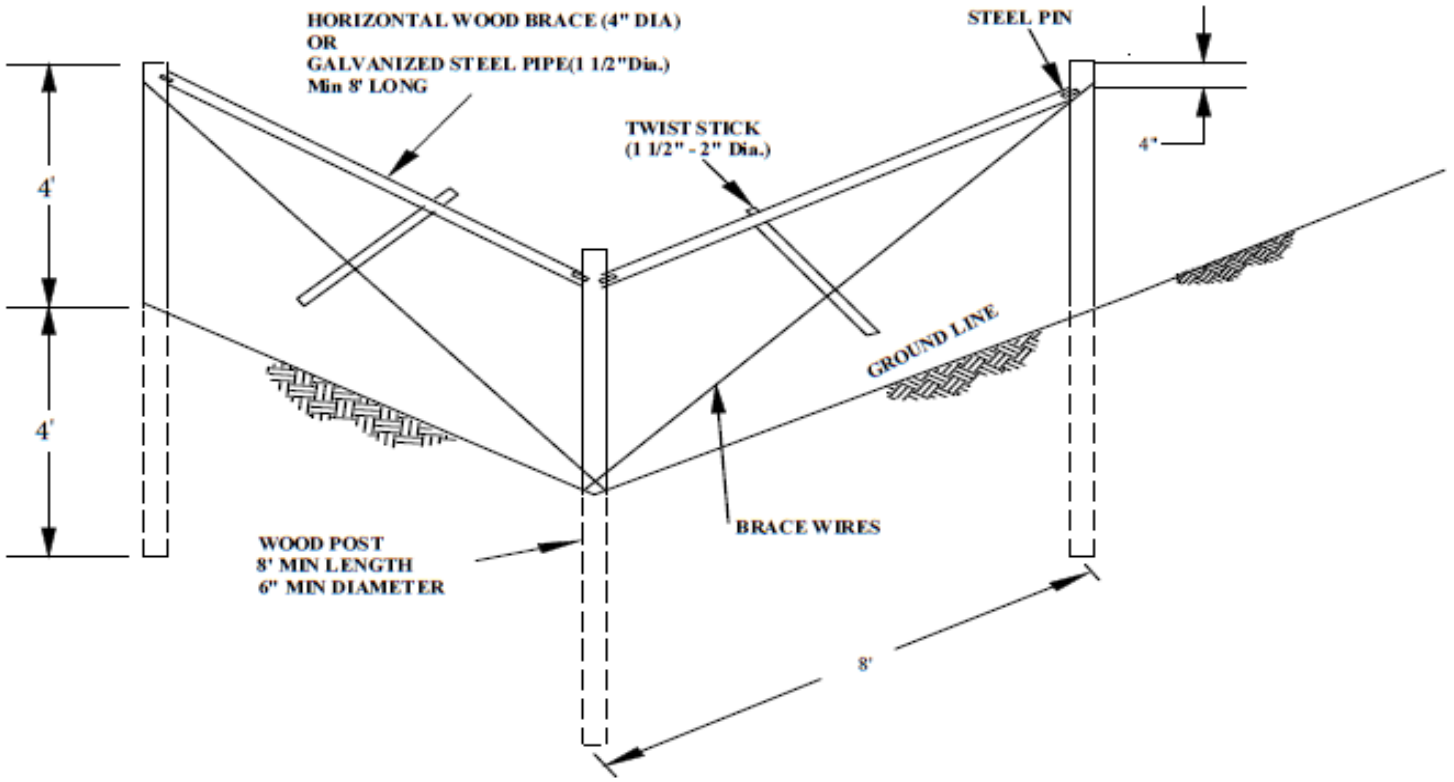
# CORNER BRACE

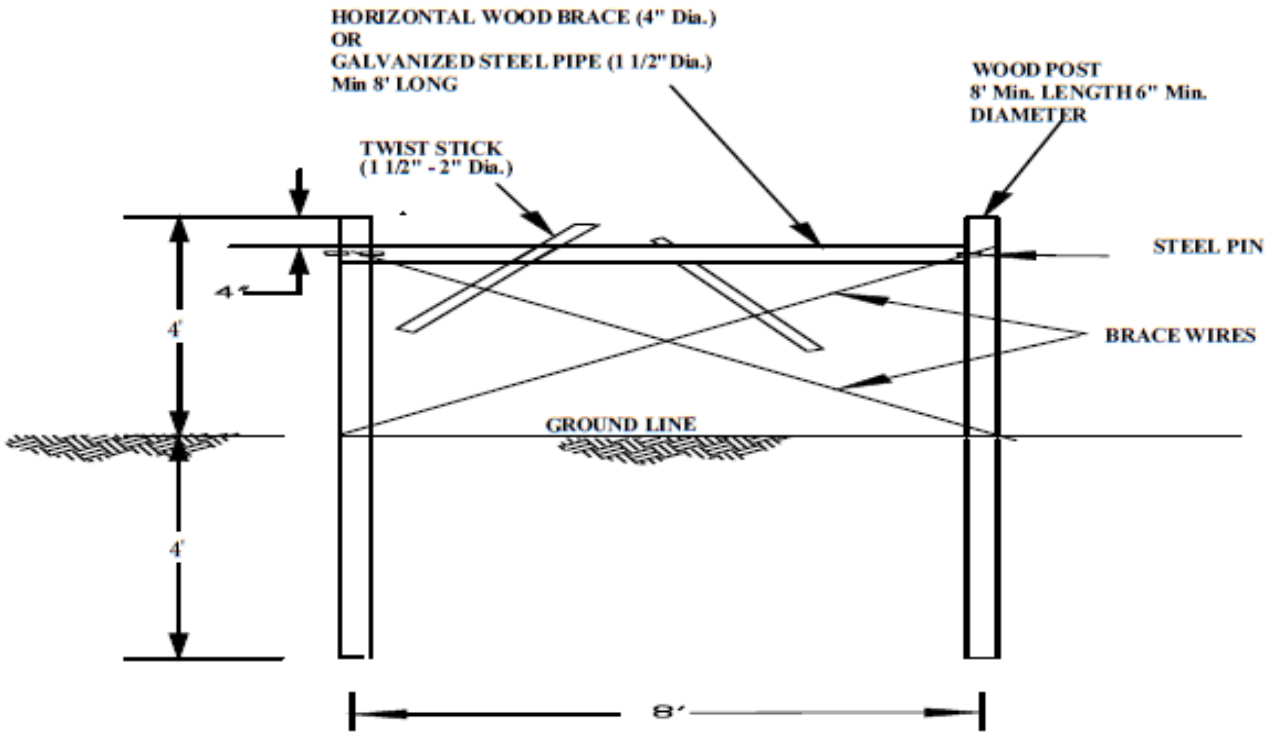



CORNERS ARE REQUIRED AT ALL POINTS WHERE THE FENCE ALIGNMENT CHANGES 15 DEGREES OR MORE.

For 2 to 5 wire High Tensile Fences

MN-ECS-020
3-16

# PULL BRACE




**PULL ASSEMBLIES ARE REQUIRED IN STRAIGHT SECTIONS OF THE FENCE SO THAT THE MAXIMUM DISTANCE BETWEEN BRACES DOES NOT EXCEED:**

- **330 Ft. WOVEN WIRE FENCE**
- **660 Ft. BARB WIRE FENCE**
- **1320 Ft. HT WOVEN WIRE**
- **2640 Ft. HT POWER FENCE**

For 2 to 5 wire High Tensile fences.

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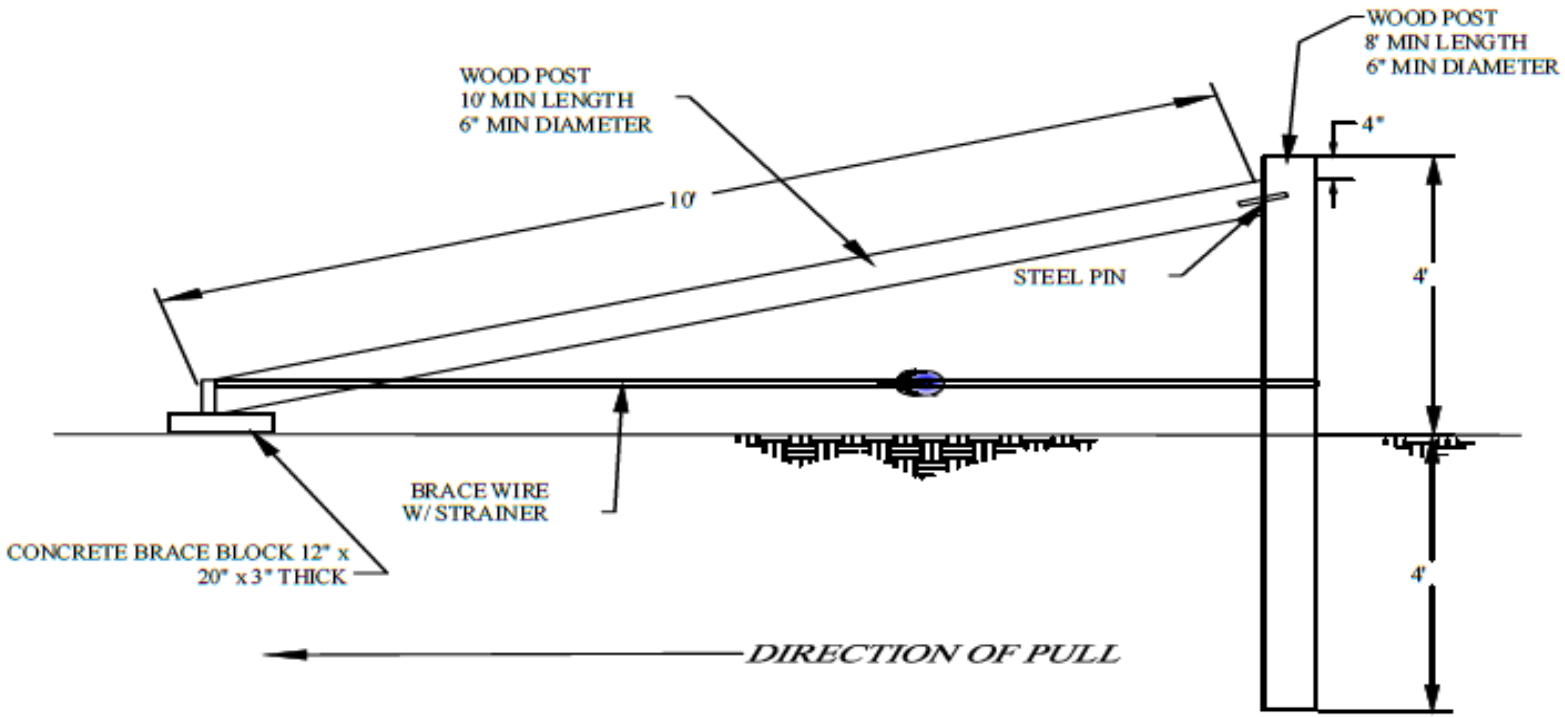
# DIAGONAL END BRACE

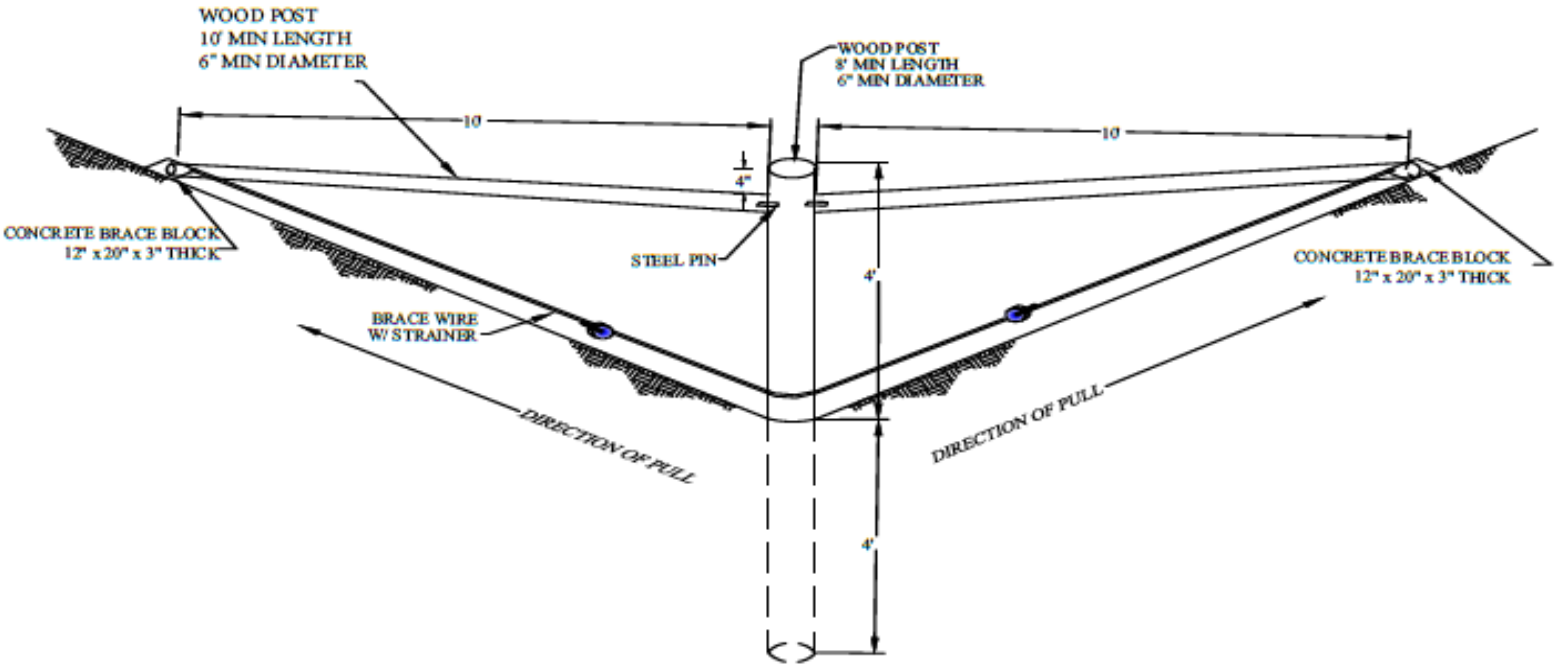



**BRACING IS REQUIRED WHERE THE FENCE ENDS AND ON HINGED SIDES OF GATE OPENINGS**

For 2 to 5 wire High Tensile Fence

MN-ECS-019
3-16

# DIAGONAL CORNER BRACE




**CORNERS ARE REQUIRED AT ALL POINTS WHERE THE FENCE ALIGNMENT CHANGES 15 DEGREES OR MORE.**

For 2 to 5 wire High Tensile Fence

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3-16

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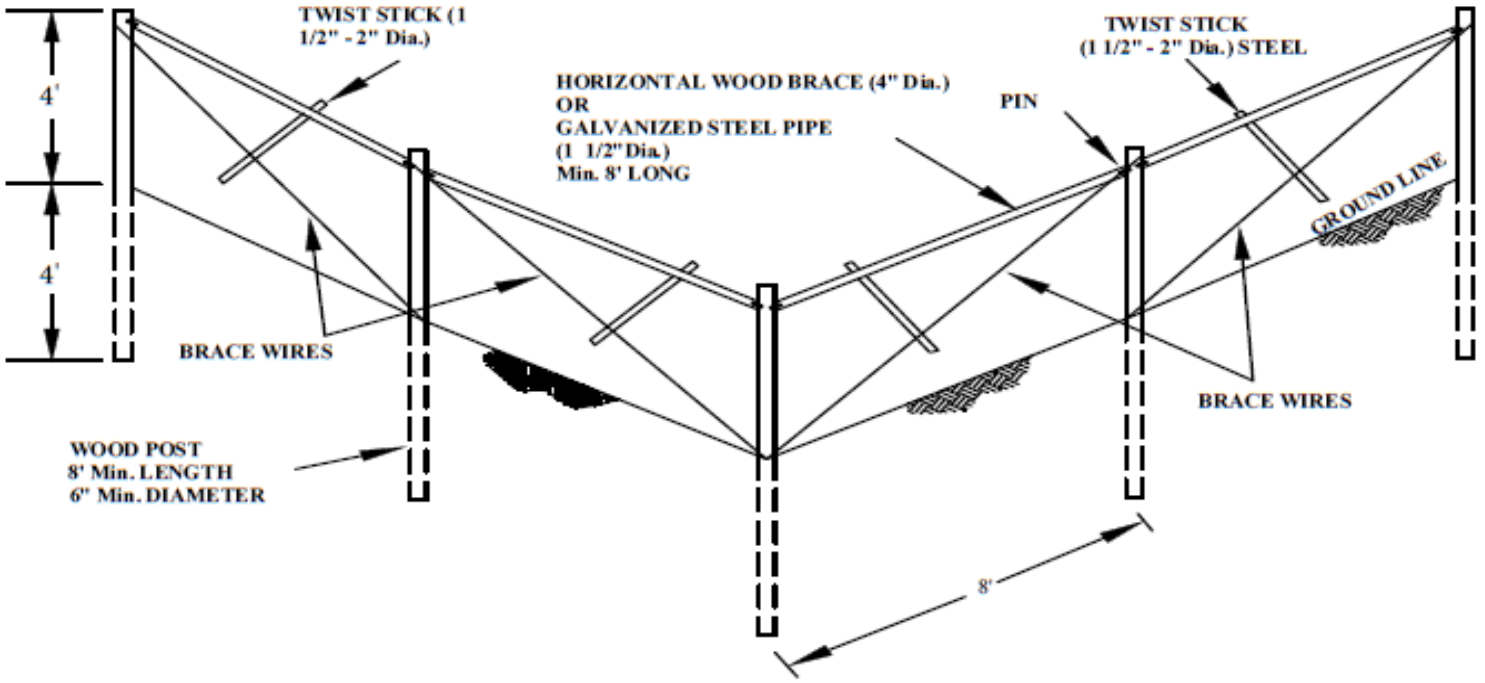
# DOUBLE CORNER BRACE




**CORNERS ARE REQUIRED AT ALL POINTS WHERE THE FENCE ALIGNMENT CHANGES 15 DEGREES OR MORE.**

For 6 or more High Tensile Wires or where soil conditions require extra holding power

MN-ECS-023
3-16

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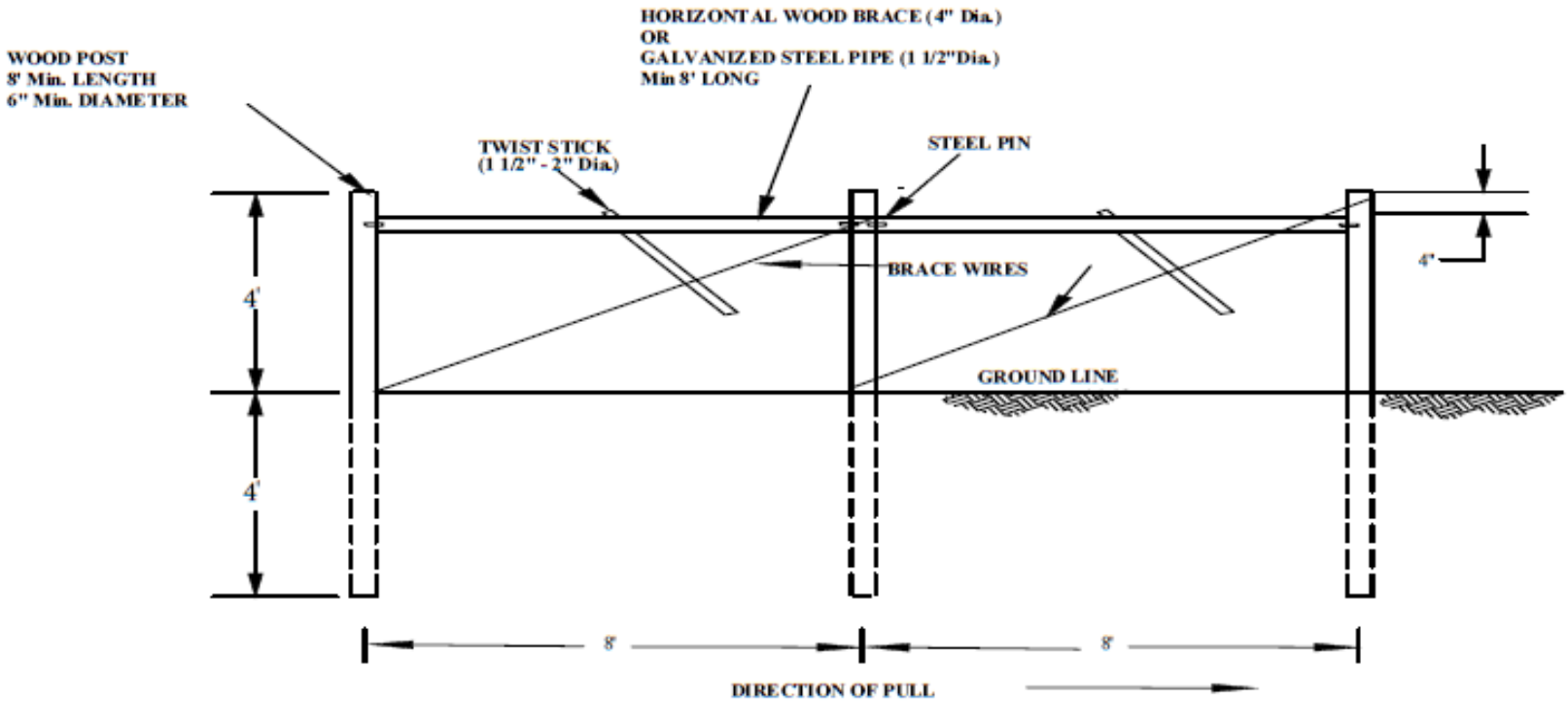
# DOUBLE END BRACE




**BRACING IS REQUIRED WHERE THE FENCE ENDS AND ON HINGED SIDES OF GATE OPENINGS**

For 6 or more High Tensile Wires or where soil conditions require extra holding power

MN-ECS-024
3-16

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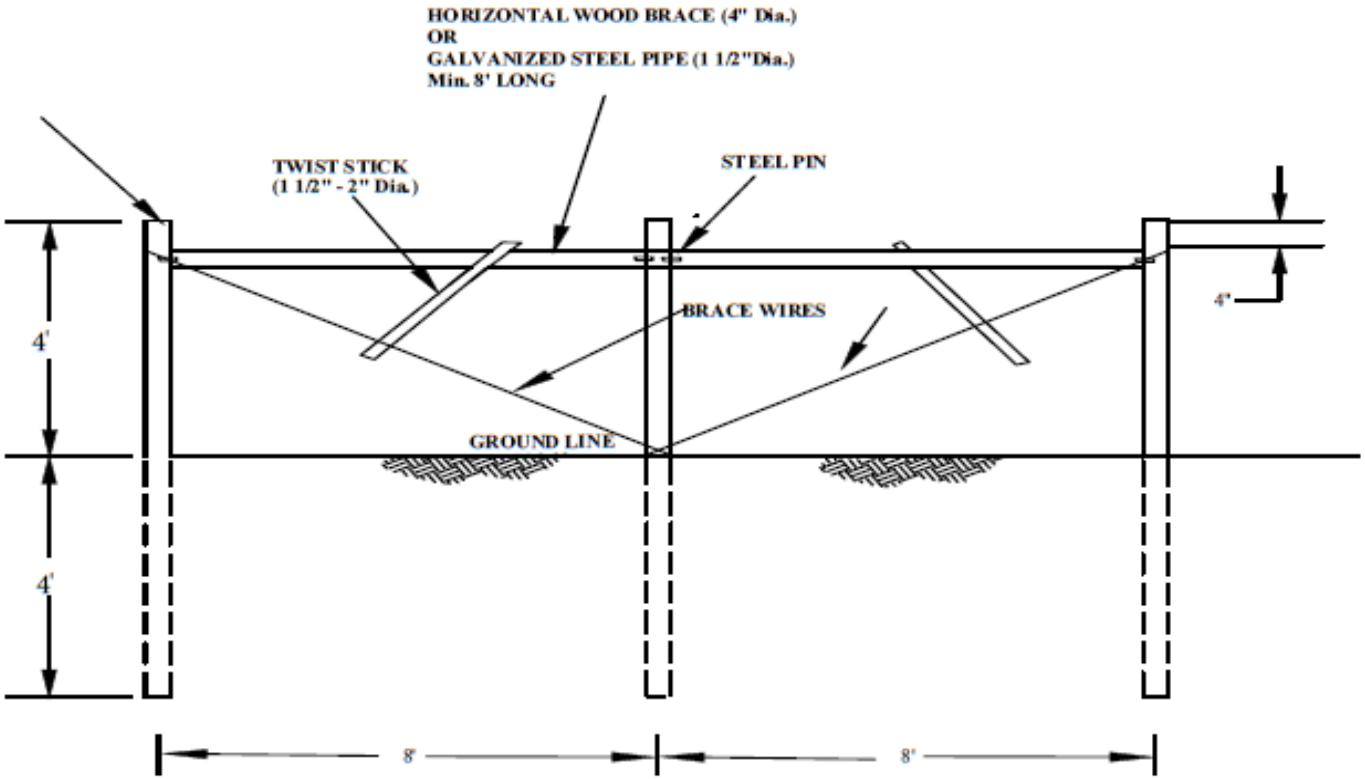
# DOUBLE PULL BRACE




**PULL ASSEMBLIES ARE REQUIRED IN STRAIGHT SECTIONS OF THE FENCE SO THAT THE MAXIMUM DISTANCE BETWEEN BRACES DOES NOT EXCEED:**

- **330 Ft. WOVEN WIRE FENCE**
- **660 Ft. BARB WIRE FENCE**
- **1320 Ft. HT WOVEN WIRE**
- **2640 Ft. HT POWER FENCE**

For 6 or more High Tensile Wires or where soil conditions require extra holding power

MN-ECS-019
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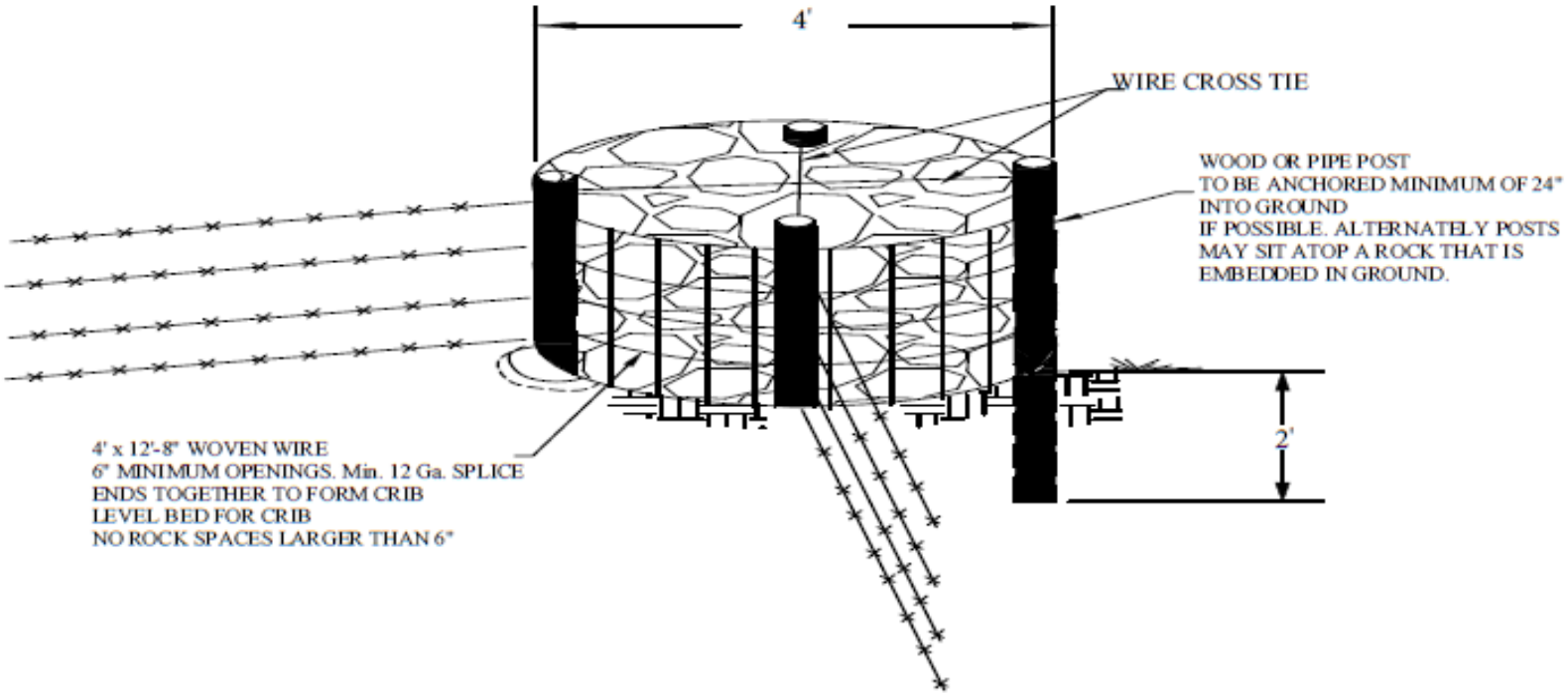
# ROCK CRIB

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