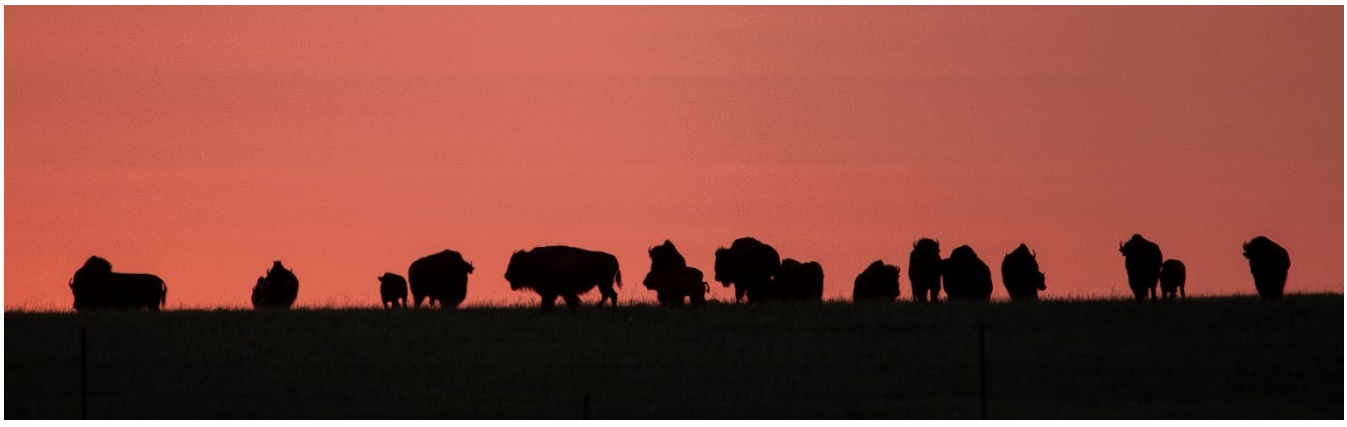
Range Technical Note No. 14

Bison Fencing

November 2024

Table of Contents



Introduction

This technical note serves as a guide for installing fence for bison and other large animals managed for grazing according to Conservation Practice Standard Fence (Code 382) as found in the South Dakota (SD) Natural Resources Conservation Service (NRCS) Technical Guide. These designs serve as a guide for installation of fence for bison. If a different design is known to work for the bison operation, work with an area rangeland management specialist, area resource conservationist for technology, or similar to document changes to standard designs.

It is the cooperator's responsibility to maintain this practice for its expected lifespan of 20 years.

All materials used in construction of fences will be of high quality and durability (new or like new). Do not reuse old, bent, or broken materials. Used materials with a new purpose (e.g. railroad ties or steel well pipe) are acceptable as long as they are high quality, durable, and will last the fence's lifespan.

Bison History and Use

Bison (*Bison bison*) are the largest mammal native to North America. Historically, bison were found from Alaska to Northern Mexico. Heavily hunted for their meat, hide, and for sport in the 1800s, they nearly reached extinction. Various conservation minded ranchers and policy makers of the day had the foresight to save the bison from extinction using various means. Today, bison can be found in wildlife refuges, national parks, tribal lands, state parks, zoos, and on private ranches. Bison are highly adaptable and can be found in various ecosystems across North America.

Although bison can be treated as livestock, they are not a domesticated animal and should be treated as a wild animal when considering all aspects of management and conservation planning. The only distinction between bison and wildlife may be the higher amount of 'herd management' (e.g. intervention treatments and vaccinations when animals are sick, culling procedures, rotational grazing, and other livestock-oriented management techniques) compared to other wildlife species such as pronghorn, coyotes, and elk.

Planning Bison Grazing Systems

When planning a bison grazing system, all factors should be considered in the management plan. This includes water, forage, and bison behavior (family units). Develop grazing plans that match forage quality and quantity to the production cycle of bison whenever possible.

Natural boundaries that typically contain cattle or other livestock may not be adequate for containing bison. Streams, rugged topography, and other natural barriers need to be adequately fenced to keep animals within the management unit. See SD Range Tech Note No 7 for design and drawings for stream crossings or see Resources section for other applicable materials.

Bison Fencing

General Recommendations

Bison can be contained with barbed wire, woven wire, or electric fence. Consider herd needs, topography, soil types, vegetation, and adjacent land uses when developing fence designs for bison.

NOTE: As stated previously, bison are wild animals, and **NO** fence design will contain a bison that does not want to stay in that fence. If adequate resources are located within the fence boundaries, they will be less likely to seek resources outside of the fence. Proper grazing management and water availability is key to keeping bison inside of fences, no matter the fence design.

Perimeter or boundary fences may need to be taller or stronger built than interior or cross fences, depending on many factors.

Construct fences with topography in mind. Fence heights may not need to be as high on slopes, since the effectiveness increases with slope percentage (see page 9 of A Landowners Guide to Wildlife Friendly Fences). However, downslopes may need to be taller to impede line of sight.

Always attach wire on the side of the posts where the livestock pressure is expected.

Barbed Wire Fence Design

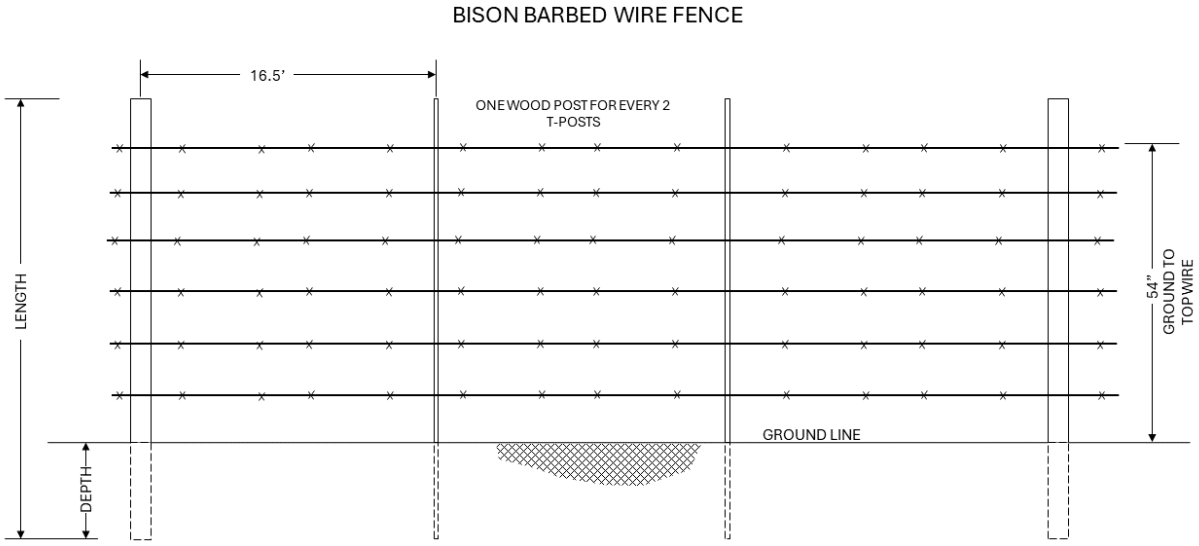


Figure 1. Barbed wire fence design example for bison.

Barbed wire fences tend to be the standard for containing any livestock species. They are relatively easy to install with supplies that can be accessed at most farm supply stores. Barbed wire fences are most appropriately used to contain bison for grazing operations and can be used for perimeter, boundary, or internal cross fences. Barbed wire fences are not appropriate for handling facilities.

Top wire height should be between 54 and 66 inches high. Wire heights of 54 inches are adequate for most herds and in most situations, but higher heights may be needed depending on location. Consider using the "wildlife friendlier" fence designs when wildlife passage is a concern. Also consider pairing this fence design with a let-down fence design for wildlife or snow-load concerns.

Design

Elements for these fences include:

Wire: All wires should be double-wrapped and stapled at all corners, in-line braces assemblies, and gate posts.

1. Standard: Double-strand 12.5-gauge galvanized, with 2-point 14-gauge barbs
2. High Tensile: 110,000 pounds per square inch (PSI), double strand 15.5-gauge galvanized wire with 2-point 16.5-gauge barbs

Number of Wires: 5 to 6

Wire Height: Wires will be at least 52 to 54 inches tall

Wire Spacing: Wires will be evenly spaced

Line Posts:

1. T-posts will be at least 6.5 foot tall, set a minimum of 2 feet deep.
2. Wood posts will be at least 3 inches or greater in diameter, 7 foot tall and set at least 2.5 feet deep. Wood posts will be treated if decay-susceptible or if rot-resistant must be at least half the diameter of heartwood.
3. Steel pipe will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.125 inches (1/8 inch) with a permanently sealed top. These will be at least 8 foot tall and set at least 3 feet deep.

Post Spacing: Posts will be spaced no more than 16.5 feet apart. Posts will be alternated two steel for every one wood post (or every third post is wood).

Fasteners: Staples will be 9-gauge, galvanized steel or heavier, at least 1-1/2 inch minimum length for softwoods or 1-1/4 inch minimum length for hardwoods. Manufacturers clips or 12-gauge wire can be used to fasten wires to steel posts.

Braces: Braces will be installed at 825 foot intervals or closer. Braces are required at all corners, gates, and angle changes greater than 15 degrees.

Vertical Posts for Brace Assembly can be either wood or steel.

1. Wood posts will be at least 5 inches in diameter, 7 foot long, and seated at a depth of 2.5 feet.
2. Steel posts will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.125 inches (1/8 inch) with a permanent sealed top. Can also use 1-5/8 inch solid steel rod. Posts will be seated at a depth of 2.5 feet.

Brace members can be wood or steel.

1. Wood brace member will be 4 inch minimum or 4 inch x 4 inch (measured 3.5 inch by 3.5 inch), 8 feet long.
2. Steel brace member will be 2-3/8 inch outside diameter with wall thickness of 0.125 inch (1/8 inch) or 1-5/8 inch solid steel rod. Steel brace member will be welded, sleeved, or clamped to vertical posts.

Woven Wire Fence Design

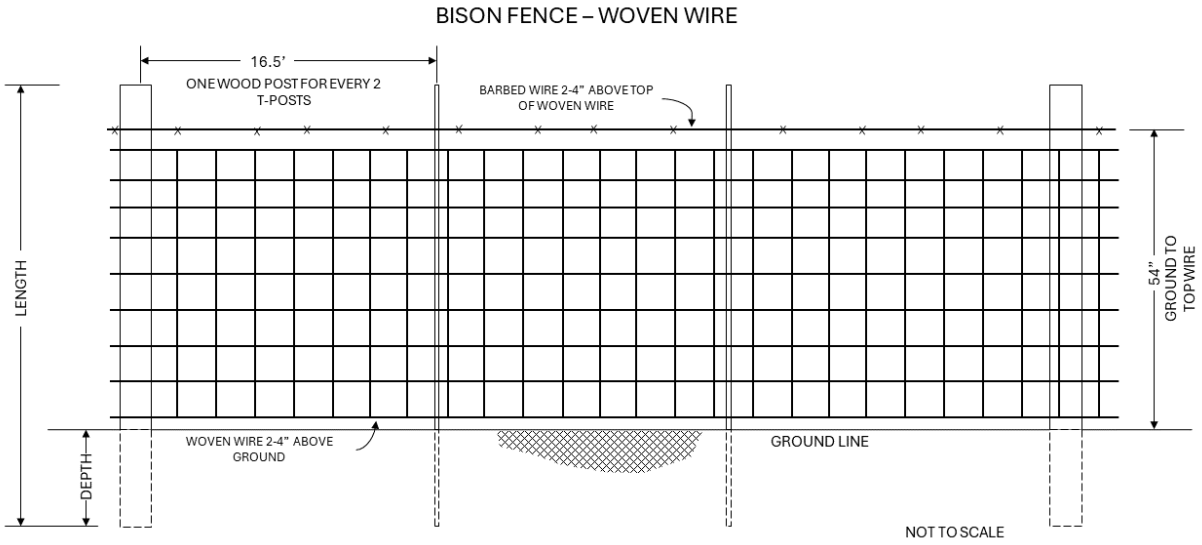


Figure 2. Woven wire fence design example for bison.

Woven wire can be used in most bison grazing situations. These types of fences should not be used where bison may be under handling pressure. The woven wire may be hard to see and result in bison collisions.

Consider using barbed wire for internal/cross fencing to reduce costs and allow for easier wildlife movement. Pair this type of fence with a let-down fence for certain areas that have high wildlife traffic when those grazing units are not in use.

Design

Elements for woven fences are:

Wire: All wires should be double-wrapped and stapled at all corners, in-line braces assemblies, and gate posts.

1. Standard: Double-strand 12.5-gauge galvanized, with 2-point 14-gauge barbs
2. High Tensile: 110,000 pounds per square inch (PSI), double strand 15.5-gauge galvanized wire with 2-point 16.5 barbs.
3. Woven wire will have 11-gauge or heavier wire for top and bottom strands with 14.5-gauge intermediate and stay wires, all galvanized. Woven wire can be from 36 to 48 inches high. Mesh size can be 6 inches by 6 inches or 6 inches by 12 inches.
4. High tensile woven wire will be 42 inch netting with 12.5-gauge high tensile strength (179,000 PSI) line wires, 12.5-gauge medium-tensile strength (125,000 PSI) stay wires, all galvanized. Mesh will be 4 inches by 6 inches up to 7 inches by 12 inches.

Wire Height: Wires will be at least 52 to 54 inches tall, up to 66 inches.

Wire Spacing: Woven wire will be 2 to 4 inches above ground. Top wire will be 2 to 4 inches above top of woven wire. Top wire may be smooth or barbed.

Line Posts:

1. T-posts will be at least 6.5 foot tall, set a minimum of 2 feet deep.

2. Wood posts will be at least 3 inches or greater in diameter, 7 foot tall and set at least 2.5 feet deep. Wood posts will be treated if decay-susceptible or if rot-resistant must be at least half the diameter of heartwood.
3. Steel pipe will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.124 with a permanently sealed top. These will be at least 8 foot tall and set at least 3 feet deep.

Post Spacing: Posts will be spaced no more than 16.5 feet apart. Posts will be alternated two steel for every one wood post (or every third post is wood).

Fasteners: Staples will be 9-gauge, galvanized steel or heavier, at least 1-1/2 inch minimum length for softwoods or 1-1/4 inch minimum length for hardwoods. Manufacturers clips or 12-gauge wire can be used to fasten wires to steel posts.

Braces: Braces will be installed at 825 foot intervals or closer. Braces are required at all corners, gates, and angle changes greater than 15 degrees.

Vertical Posts for Brace Assembly can be either wood or steel.

1. Wood posts will be at least 5 inches in diameter, 7 foot long, and seated at a depth of 2.5 feet.
2. Steel posts will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.125 inches (1/8 inch) with a permanent sealed top. Can also use 1-5/8 inch solid steel rod. Posts will be seated at a depth of 2.5 feet.

Brace members can be wood or steel.

1. Wood brace member will be 4 inch minimum or 4 inch x 4 inch (measured 3.5 inch by 3.5 inch), 8 feet long.
2. Steel brace member will be 2-3/8 inch outside diameter with wall thickness of 0.125 inch (1/8 inch) or 1-5/8 inch solid steel rod. Steel brace member will be welded, sleeved, or clamped to vertical posts.

Eight Foot Woven Wire Fence

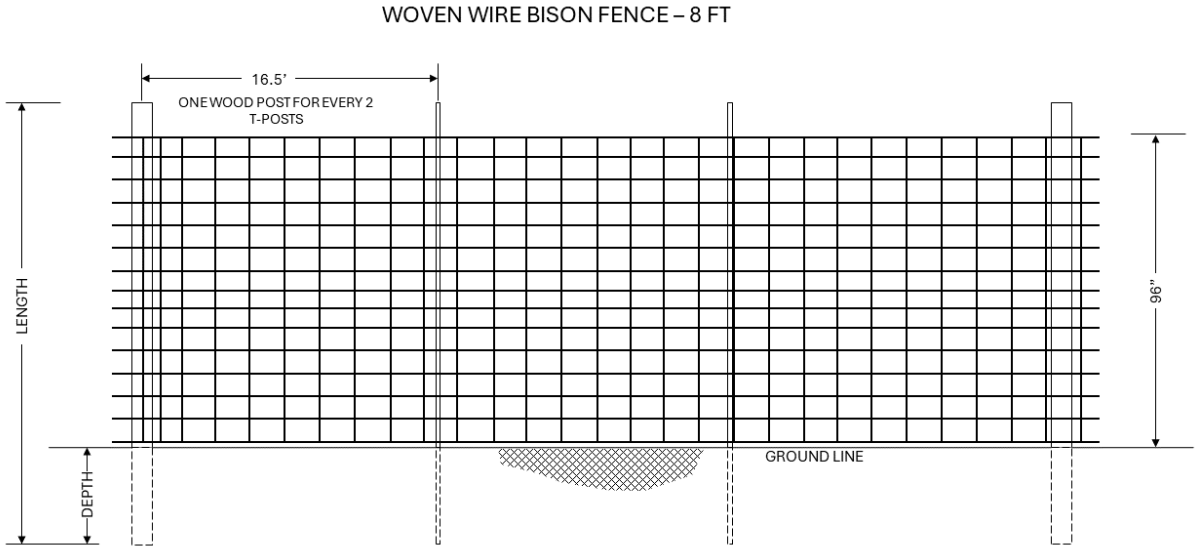


Figure 3. Eight foot woven wire fence design example for bison.

An eight-foot-tall woven wire fence may be used in place of the shorter woven wire fence option previously mentioned, but only when appropriate. When bison are given the resources they need within a

fence through proper management, they will be less likely to look outside the fence for resources. With that in mind, this fence design may not be needed on any areas of a property if bison are properly managed. This type of fence is only appropriate where exclusion from sensitive areas is needed. Sensitive areas may include high-traffic roadways, highly populated areas, or as determined by the planner.

This design should not be used singularly across the property – it should be used in concert with other fence types. This fence type is also not appropriate for use in drainageways or where high-water flow can occur – use appropriate methods to design fences that allow for water passage or can break away when high flow events occur.

Electric Fence

Electric or power fence can be utilized for bison. Permanent, high tensile fences can be used to contain bison during the year. Temporary single wire electric fences can be used during certain parts of the year for cross-fencing purposes.

Livestock must be trained to electric fences prior to any management utilizing electric fences.

Design

Wire: For permanent fences, use smooth, single strand 12.5-gauge high-tensile strength (170,000 PSI minimum) type III galvanized or better. For temporary fences, use polywire twine, tape, or rope that contains at least 6 strands of mixed metal types (stainless steel, aluminum, and/or tinned copper). All stainless steel may not be adequate.

Number of wires: 1 to 5

Wire Height & Spacing: Wire height and spacing will depend on number of wires.

One wire may be appropriate in certain situations and when adequate grounding is available to complete the circuit. When more than one wire is used, alternate hot and ground wires.

For bison, generally use the following spacing and polarity:

From ground level – 20 inch (+), 10 inch (-), 10 inch (+), 10 inch (-), 10 inch (+)

Tension: Tension should be sufficient to maintain proper wire spacing between line posts. In-line strainers will be installed on each wire to maintain correct tension between all brace corners and gate assemblies. Tension springs may also be used.

Line posts

1. Fiberglass posts will be a minimum of 1 inch diameter with notches for proper wire spacing. Fiberglass rods will be a minimum of 7/8 inch diameter with notches or holes for proper wire spacing. Length will be at least 6 feet, driven at least 1.5 feet.
2. Wood posts will have a diameter of at least 1.5 inches, 6 foot long, driven to a depth of at least 1.5 feet. Wood posts will be treated or be from rot-resistant wood.
3. Steel t-posts will have an anchor plate and be at least 6 foot long, driven to a depth of 1.5 feet.
4. Composite posts made of polypropylene and wood will be a minimum of 1-1/4 inch in diameter and be at least 6 foot long driven to a depth of at least 1.5 feet.
5. For temporary fences, use high quality posts that are easily inserted into the ground with clips or other methods of attaching the polywire.

Post spacing: Permanent posts will be spaced no more than 75 feet apart. Temporary posts will be spaced no more than 40 feet apart. Posts should be spaced to maintain desired wire spacing.

Brace assembly materials are the same as a standard barb or woven wire fence. Use braces at all corners, gates, and angle changes greater than 15 degrees. Make sure all connections are adequately insulated. For single-wire high tensile electric fences less than 3,000 feet long, a single 3 inch diameter post may be adequate for brace material (or a railroad tie).

Fasteners: Use porcelain, ceramic, or UV stabilized polypropylene insulators on wood or steel posts. Attach wire with appropriate manufacturer's clip or 12-gauge galvanized wire.

Energizer: Use Underwriters Laboratory (UL) listed energizers or power-fence controllers. Install according to manufacturer's recommendations. Use a high power, low impedance energizer with at least a 5,000-volt peak output, a pulse of at least 1/3,000 of a second and 54-60 pulses per minute. Make sure the energizer is rated for the distance and type of wires used.

Grounding: Properly ground the fence using galvanized ground rods per manufacturers recommendations. Inadequate grounding may lead to inability for the fence to control livestock.

Wildlife Friendlier Fencing for Bison

Fences that have been mitigated for wildlife have been tested by various organizations and could be considered for use when wildlife passage is a concern. Consider combining methods as appropriate, or using this fencing design across the whole operation. When any grazing unit is not being used, consider leaving gates open to allow for wildlife movement as well.

Wildlife Friendlier Barbed Wire Fence

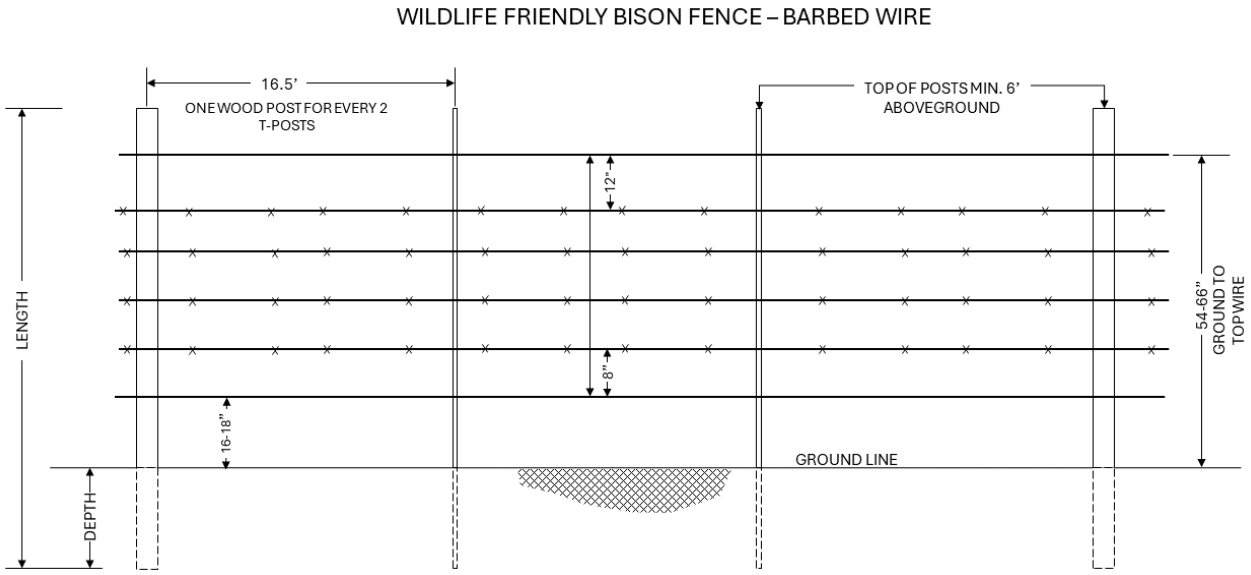


Figure 4. Example of wildlife friendly bison barbed wire fence.

Wildlife friendlier fences are typically designed for deer, pronghorn, or elk. These types of fences usually include a smooth wire on the bottom to allow pronghorn or does to crawl beneath without catching their hide on the barbs. When deer or elk need to clear the fence, consider adjusting the top wire to a shorter height to allow for movement of wildlife.

This fence design could be paired with the let-down fence design to allow for easier wildlife movement when the fence is not in use.

Design

Wire: All wires should be double-wrapped and stapled at all corners, in-line braces assemblies, and gate posts.

1. Standard: Double-strand 12.5-gauge galvanized, with 2-point 14-gauge barbs and smooth, double-strand 12.5-gauge galvanized wire.
2. High Tensile: 110,000 pounds per square inch (PSI), double strand 15.5-gauge galvanized wire with 2-point 16.5-gauge barbs and smooth, double-strand galvanized wire.

Number of Wires: 5 to 6

Wire Height: Wires will be at least 54 inches tall up to 66 inches tall. Bottom wire will be 16 to 18 inches from the ground.

Wire Spacing: Wires will be spaced 8 inches apart except for the second from the top wire, which will be 12 inches apart.

Line Posts:

1. T-posts will be at least 8 foot tall, set a minimum of 2 feet deep.
2. Wood posts will be at least 3 inches or greater in diameter, 7 foot tall and set at least 2.5 feet deep. Wood posts will be treated if decay-susceptible or if rot-resistant must be at least half the diameter of heartwood.
3. Steel pipe will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.125 inches (1/8 inch) with a permanently sealed top. These will be at least 8 foot tall and set at least 3 feet deep.

Post Spacing: Posts will be spaced no more than 16 feet apart. Posts will be alternated two steel for every one wood post.

Fasteners: Staples will be 9-gauge, galvanized steel or heavier, at least 1-1/2 inch minimum length for softwoods or 1-1/4 inch minimum length for hardwoods. Manufacturers clips or 12-gauge wire can be used to fasten wires to steel posts.

Braces: Braces will be installed at 825-foot intervals or closer. Braces are required at all corners, gates, and angle changes greater than 15 degrees.

Vertical Posts for Brace Assembly can be either wood or steel.

1. Wood posts will be at least 5 inches in diameter, 10 foot long, and seated at a depth of 3 feet.
2. Steel posts will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.125 inches (1/8 inch) with a permanent sealed top. Can also use 1-5/8 inch solid steel rod.

Brace members can be wood or steel.

1. Wood brace member will be 4 inch minimum or 4 inch x 4 inch (measured 3.5 inch by 3.5 inch), 8 foot long, and seated at a depth of 2.5 feet.
2. Steel brace member will be 2-3/8 inch outside diameter with wall thickness of 0.125 inch (1/8 inch) or 1-5/8 inch solid steel rod. All open tops will be permanently sealed. Steel brace member will be welded, sleeved, or clamped to vertical posts.

Wildlife Friendlier Woven Wire Fence

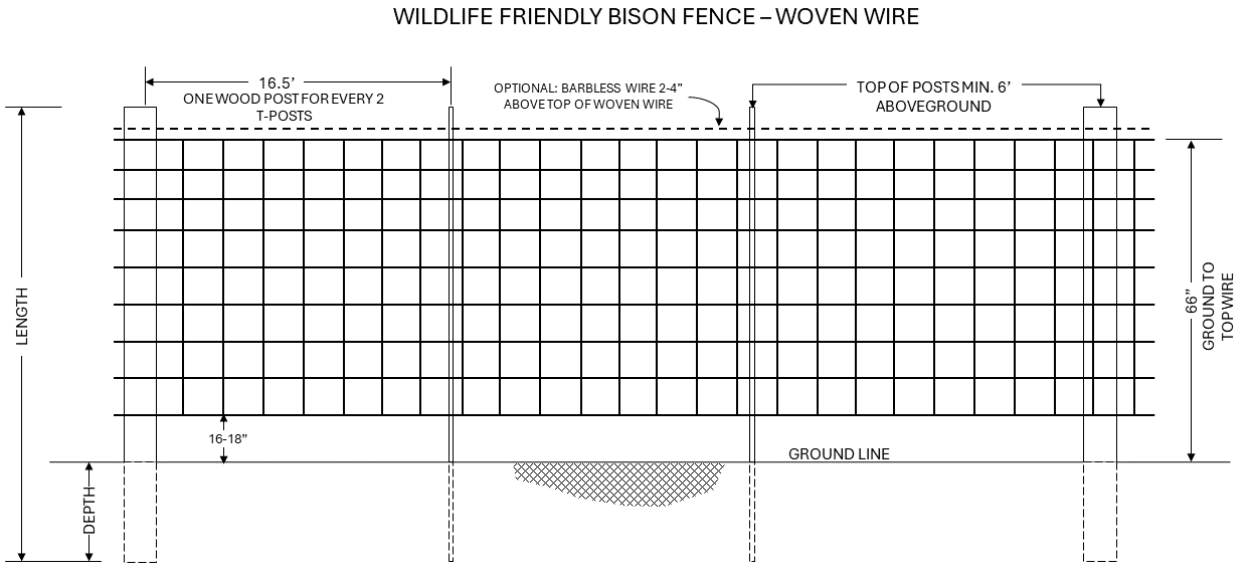


Figure 5. Example of wildlife friendly woven wire fence.

This wildlife friendly woven wire fence design is most appropriately used for wildlife that would pass under the fence (i.e. pronghorn, doe deer, etc.). May consider using shorter height woven wire to reduce the height of the fence as well.

Do not use woven wire fences where bison may be under handling pressure. These types of fences may be hard to see and result in bison collisions.

Consider using barbed wire for internal/cross fencing to reduce costs and allow for better wildlife movement. Pair this type of fence with a let-down fence for certain areas that have high traffic of wildlife when those grazing units are not in use. Also consider leaving gates open when the pastures are not in use, wildlife will use these open gates to move across the landscape.

Design

Wire: All wires should be double-wrapped and stapled at all corners, in-line braces assemblies, and gate posts.

1. Standard: Double-strand 12.5-gauge galvanized, with 2-point 14-gauge barbs.
2. Woven wire will have 11-gauge or heavier wire for top and bottom strands with 14.5-gauge intermediate and stay wires, all galvanized. Woven wire can be from 36 to 48 inches high. Mesh size can be 6 inches by 6 inches or 6 inches by 12 inches.
3. High tensile woven wire will be 42 inch netting with 12.5-gauge high tensile strength (179,000 PSI) line wires, 12.5-gauge medium-tensile strength (125,000 PSI) stay wires, all galvanized. Mesh will be 4 inches by 6 inches up to 7 inches by 12 inches.

Wire Height: Wires will be at least 54 up to 66 inches tall.

Wire Spacing: Woven wire will be 16 to 18 inches above ground. Optional top smooth wire will be 2 to 4 inches above top of woven wire.

Line Posts:

1. T-posts will be at least 6.5 feet tall, set a minimum of 2 feet deep

2. Wood posts will be at least 3 inches or greater in diameter, 7 foot tall and set at least 2.5 feet deep. Wood posts will be treated if decay-susceptible or if rot-resistant must be at least half the diameter of heartwood.
3. Steel pipe will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.124 with a permanently sealed top. These will be at least 8 foot tall and set at least 3 feet deep.

Post Spacing: Posts will be spaced no more than 16 feet apart. Posts will be alternated with two steel for every one wood post (or every third post is wood).

Fasteners: Staples will be 9-gauge, galvanized steel or heavier, at least 1-1/2 inch minimum length for softwoods or 1-1/4 inch minimum length for hardwoods. Manufacturers clips or 12-gauge wire can be used to fasten wires to steel posts.

Braces: Braces will be installed at 825-foot intervals or closer. Braces are required at all corners, gates, and angle changes greater than 15 degrees.

Vertical Posts for brace assemblies can be either wood or steel.

1. Wood posts will be at least 5 inches in diameter, 7 foot long, and seated at a depth of 2.5 feet.
2. Steel posts will be at least 2-3/8 inch outside diameter with wall thickness of at least 0.125 inches (1/8 inch) with a permanent sealed top. Can also use 1-5/8 inch solid steel rod.

Brace members can be wood or steel.

1. Wood brace member will be 4 inch minimum or 4 inch x 4 inch (measured 3.5 inch by 3.5 inch), 8 feet long.
2. Steel brace member will be 2-3/8 inch outside diameter with wall thickness of 0.125 inch (1/8 inch) or 1-5/8 inch solid steel rod. Steel brace member will be welded, sleeved, or clamped to vertical posts.

Let-Down Fence Designs

Let-down fence designs incorporate temporary changes to fences to allow for wildlife passage when the fences are not in use. Two different types of let-down fences can be incorporated in an operation, stay-type or staple-type. These options can be incorporated along certain sections of fence where wildlife is known to cross during certain times of the year. Let-down fences will require additional time and maintenance depending on length and style used.

Producers could consider using these designs at known crossing sites to reduce chances of having to replace fences. To determine appropriate areas along a fence to incorporate these types of designs, look for animal trails near current fences, or utilize game cameras to determine where wildlife may be frequently crossing through the area.

Stay-type Let-Down Fence Design

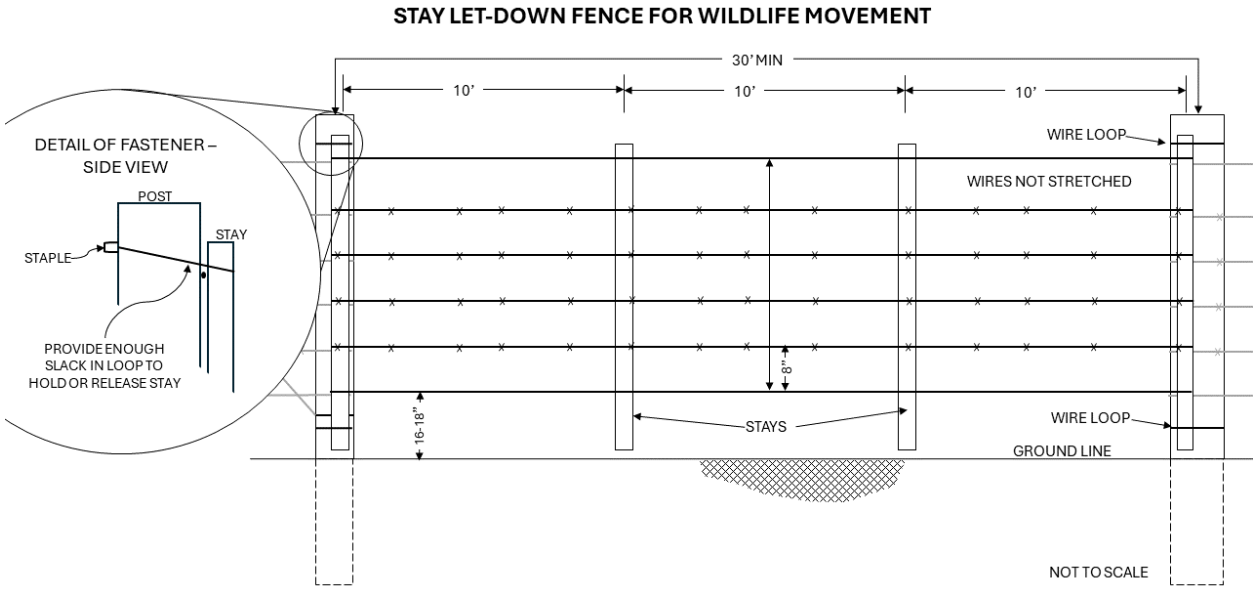


Figure 6. Example of a stay-type let-down fence design. Note inset for view of fastener.

Stay-type let-down fences utilize sections of un-stretched fence that have been attached to posts using stays and wire loops. The loops allow the stays to be laid down when not in use.

This type of fence can also be used in areas of heavy snow load to reduce damage on fences. This option can be used with both barbed/smooth or woven wire fence designs.

Design

Incorporate this design with any of the above fence designs, but with the following:

Stays: Use 2 inch diameter or 2 inch by 2 inch wood posts. Connect stays to corner or line brace posts. Stays shall be similar height of the above ground portion of the vertical brace posts in which they are attached.

Wire: 9-gauge for loops; utilize barbed wire and smooth wire types as stated for fence designs above. Leave this portion of the fence wire unstretched.

Wire placement: Wire should be placed between post and stay, so when laid down, the wires are on top of stay. This prevents wire from pulling loose when picking up the fence.

Fasteners: Use staples to fasten wire to stays. Utilize loops to fasten stays to posts. Staple lower loops to stay and post.

Staple-Type Let Down Fence

The staple-type let down fence incorporates sections of fence that can be moved to a low position by letting slack out of each of the wires temporarily. The slack can be moderated by splicing in a strain insulator with smooth wire near an in-line or corner brace. Depending on the species of wildlife, all wires can be moved down to allow easy passage (see Figure 8), or can adjust top wires down or bottom wires up (see Figure 9. Example of staple-type let down fence with wires positioned for wildlife movement.).

This design incorporates a “staple key” or sometimes called a “staple lock”, where two staples are driven in to the post as locks, and another is placed perpendicular as a key into the two lock staples to attach the

wire to the post (see Figure 7 inset). Some manufacturers make specialized lay-down clips that can fit on steel T-posts that can be used as well.

This option is most effectively used with barbed/smooth fence designs. Though may be successfully incorporated with woven wire designs. Both options will require more maintenance than a standard fence design.

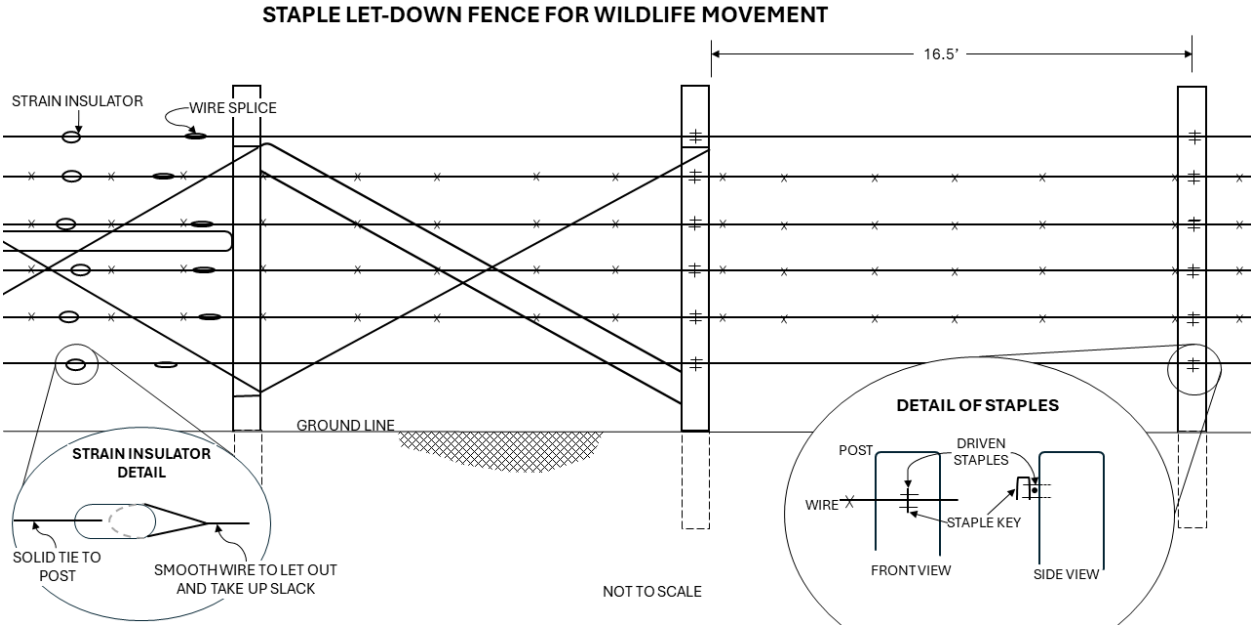


Figure 7. Staple-type let-down fence design with inset details.

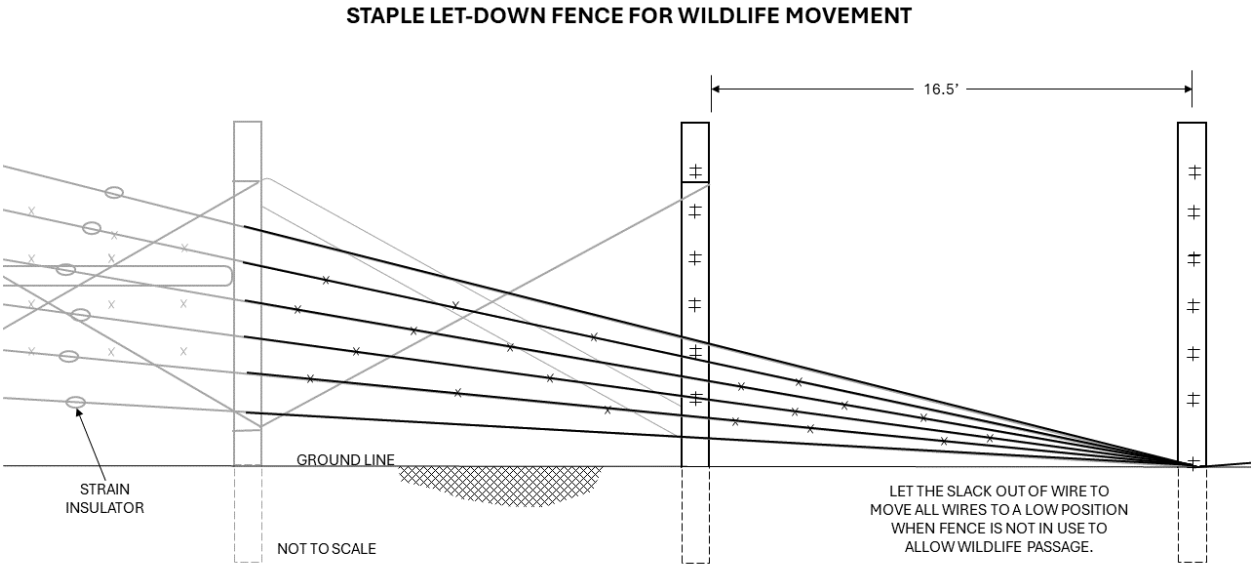


Figure 8. Drawing of a staple-type let-down fence with wires laid on ground.

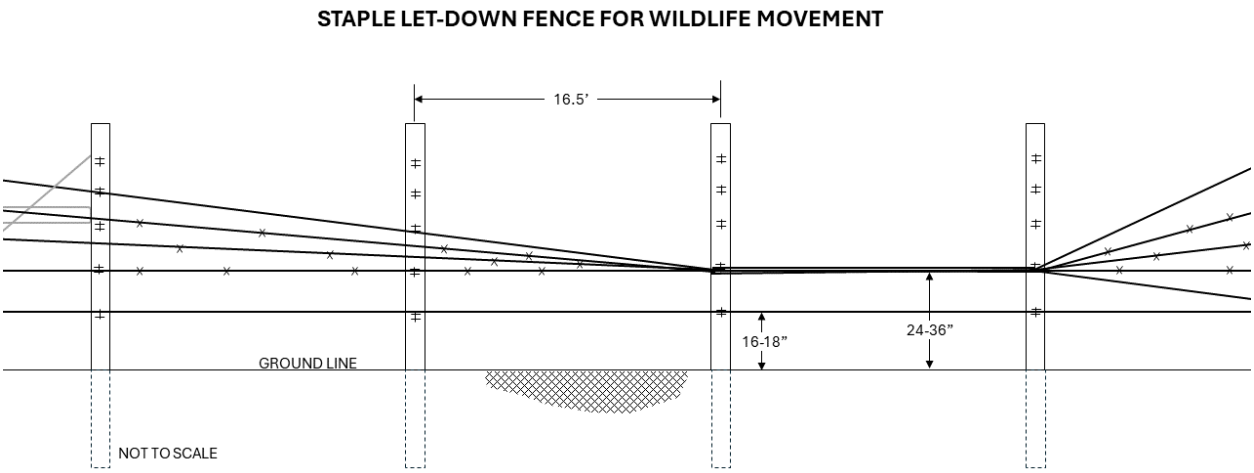


Figure 9. Example of staple-type let-down fence with wires positioned for wildlife movement.

Design

Incorporate this design with any of the previously mentioned fence designs as appropriate. In addition will need:

Fasteners: Create staple key/lock by driving two staples into wood posts at about an inch or so apart, leaving enough room for another staple plus wire to be positioned between the two staples. May also use specialized let-down clips if available from manufacturer. May need extra staples to attach wires to bottom of post.

Wire: Utilize barbed wire and smooth wire types as stated for fence designs above. Use smooth wire with strain insulator.

Wire placement: Attach wires with staple keys in heights as stated above for fence design. When fence is not in use, let out slack and attach wires at ground level or appropriate levels to allow for wildlife passage. Lower top wire to at least 24 to 36 inches for elk or deer to easily cross. Move bottom wire up 16 to 18 inches to allow pronghorn or deer to crawl under.

Acknowledgements

This technical note was developed from input from many partners and individuals including: Badlands National Park staff; Custer State Park staff; NRCS staff: Brenda Simpson, National Grazing Lands Team Lead; SDSU Faculty: Dr. Jeff Martin, and others. Many thanks to all those involved in this process!

Resources

Bauman, P., and H. Carroll. 2023. Considerations for Winter Bison Management. SDSU Extension. https://extension.sdstate.edu/considerations-winter-bison-management

Canadian Bison Association. July 2023. Code of Practice for the Care and Handling of Bison. National Farm Animal Care Council. https://www.nfacc.ca/pdfs/codes/bison_code_of_practice.pdf

Frasier, T. Bison Fencing. Frasier Bison LLC. https://frasierbison.com/bison-consultation/bison-fencing/

Gates, C. C., 2006. Fencing guidelines for bison on Alberta public lands with wildlife access in mind. Faculty of Environmental Design, University of Calgary, Alberta, Cananda. 8 pp.

Hamilton, C., R. Meade, J. D. Maestas, B. Jensen, J. Hartung, K. Clause, J. Randall, T. Fieseler, M. Purcell, R. Karhu, A. Middleton, D. Naugle, T. Griffiths. December 2023. Improving fence passage for migratory big game: Examples and lessons learned from Wyoming's migratory big game partnership. Technical Note No. 93. USDA-NRCS, Washington, D.C. https://www.wlfw.org/wp-content/uploads/2024/02/TN-190-BIO-93.pdf

Laskin, D. D. Watt, J. Whittington, K. Heuer. 2020. Designing a fence that enables free passage of wildlife while containing reintroduced bison: a multispecies evaluation. Wildlife Biology, 2020(4), 1-14. https://doi.org/10.2981/wlb.00751

Paige, C. 2012. A Landowner's Guide to Wildlife Friendly Fences. Second Edition. Private Land Technical Assistance Program, Montana Fish, Wildlife and Parks, Helena, MT. 56 pp. https://fwp.mt.gov/binaries/content/assets/fwp/conservation/land-owner-wildlife-resources/a_landowners_guide_to_wildlife_friendly_fences.pdf

United States Department of Interior, Bureau of Land Management and USDA Forest Service. 1988. Fences. Missoula Technology and Development Center, Missoula, MT. 210 pp. (https://www.fs.usda.gov/t-d/pubs/pdfpubs/pdf88242803/pdf88242803dpi300.pdf)

USDA NRCS. October 2024. South Dakota Range Technical Note No. 7 – Fences. Field Office Technical Guide. //efotg.sc.egov.usda.gov/references/public/SD/Range_Tech_Note_7_Final.pdf

Appendix: Photos of Bison Fence

Photo 1. Bison fence gate brace. Photo by USDA NRCS.

Photo 2. Wildlife friendly woven-wire fence. Bottom of woven-wire is approximately 16 inches from the ground. Photo by USDA NRCS.

Photo 3. Close-up of fence splice on woven wire fence. Photo by USDA NRCS.

Photo 4. Woven wire bison fence with two barbed wires. While this design has not been mitigated for wildlife, it will provide adequate containment of bison. Photo by Joe Dickie.

Photo 5. Woven wire bison fence with H-braces installed at corner change. Photo by USDA-NRCS.

Photo 6. All steel H-brace. Photo by USDA-NRCS.

Appendix B: H-Brace Drawing Example

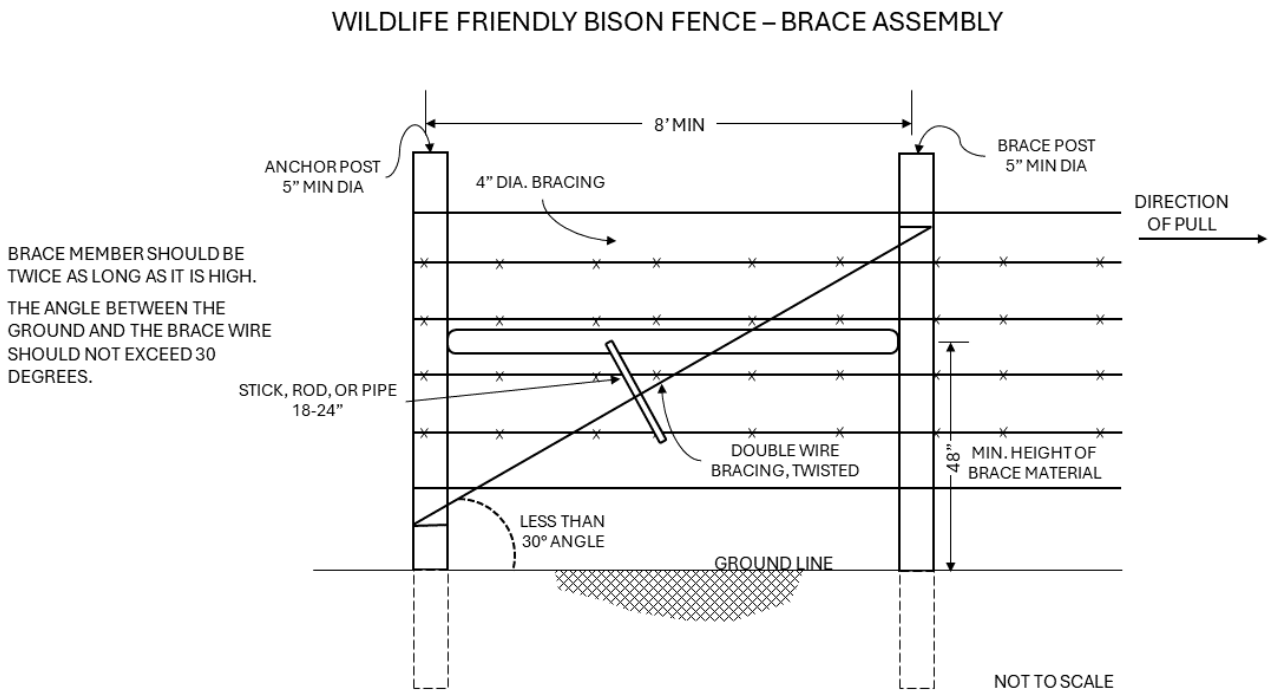


Figure 10. Example of an H-Brace for taller bison fence.