

Exhibit E



United States
Department of
Agriculture

MINNESOTA NRCS CONSERVATION PRACTICE 382



MN NRCS FENCE PRACTICE SPECIFICATIONS AND STANDARD DRAWINGS

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Practice Specifications and Planning Considerations

INTRODUCTION

The following document discusses planning considerations and requires dimensions and construction methods for building fence that follow industry standards. Other installation methods MAY be approved if they have been demonstrated to meet the 20-year lifespan of the practice under the planned conditions of use and in a similar environmental setting. Deviations from the installation methods in this document will be approved by the Area Grazing/Rangeland Management Specialist, Area Resource Conservationist, or State Grazing Specialist prior to installation. Other construction methods may be found in the Bureau of Land Management's "Fences" manual available from an NRCS Area Grazing Specialist or State Grazing Specialist.

GENERAL

- The standard drawings include a "Planned Material Needs" section. This section can be used to documents the number of wires, post spacing, number of posts, number of braces, and linear feet of fence during the planning process. Fill out the "Planned Material Needs" section as needed during the planning process to assist producers with identifying quantities of materials.
- Organic producers should consult their certification agent concerning acceptable materials for fence construction.
- Use *Wildlife Friendly Fence Material and Standard Specifications* if wildlife movement will be impacted and/or if wildlife friendly fences are needed or desired.
- The landowner and/or contractor is responsible for locating all buried utilities in the project area. **State law and NRCS policy require that the landowner and/or contractor contact Gopher State One Call at (800) 252-1166 for utility locations prior to the start of fence installation.**
- Plan, design, and construct fences to comply with all Federal, State, and local regulations. The landowner must obtain all necessary permissions from regulatory agencies.

BRACES

- Several brace options are available. Refer to the standard drawings on page 5 through page 11 for acceptable brace construction methods and specifications.
- Other brace construction methods may be approved on a case-by-case basis prior to purchasing materials or installation. Many manufactured braces are available commercially and may be considered if they have been verified to meet the 20-year lifespan of the 382-Fence practice. Consult an NRCS Area Grazing/Rangeland Management Specialist or the State Grazing Specialist on all manufactured fence braces prior to purchasing to verify they meet the 382 – Fence lifespan of 20 years.
- Double H-brace corners, end, and pull assemblies will be used when six or more high tensile wires are strung on the fence. They will also be used for woven wire fences where total height of the fence is greater than 48 inches. Consult an NRCS Area Grazing/Rangeland Management Specialist or the State Grazing Specialist as needed to determine when and where Double H-Braces may be needed.
- Single H braces, floating braces, diagonal braces and any other approved brace assemblies can be installed on fences consisting of 1-5 wires.
- A single 6" diameter wood post may be used for one-wire high tensile electric fences instead of a full brace assembly.
- Corners are required at all points where the fence alignment changes 15 degrees or more.

HIGH TENSILE WIRE

- Perimeter fence: Minimum 12.5 gauge and minimum tensile strength 170,000 pounds per square inch (psi).
- Number of wires needed for perimeter and interior fences will vary depending on site conditions, class of livestock, proximity to major roads (such as state highways), any local laws/ordinances, and producer input.
- Avoid using electric fence gate handles to transfer charge through gates. Bury the connection between the two sides of the fence under the gate with insulated wire routed through a sealed PVC, utility, or water pipe instead.
- If the soils on site are droughty or the animals grazing in the pasture have a thick insulating hair coat (such as sheep), consider installing alternating grounded and electrified wires, which will ensure that the animals will receive a stronger shock.
- See the standard drawing MN-ECS-016 on page 4 for construction specifications for multi-wire high tensile power fences.

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.

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.

TWIST STICKS

- Twist sticks are required on many corner assemblies to tighten brace wires. Twist sticks usually consist of wood 1.5-2" in diameter and 24" long. High tensile fence strainers may also be used instead. Other materials may be acceptable and must be approved by an NRCS Area Grazing/Rangeland Management Specialist or the State Grazing Specialist.

WOOD POSTS

- Posts made of the following wood types may be used without preservative treatment: Red Cedar, Black Locust, Tamarack, 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 they are in sound condition and free from cracking and decay. Posts will be the same minimum lengths as listed on the standard drawings.
- Minimum requirements for wood line posts: 6.5 feet in length, 4 inches in diameter, and buried or driven 2.5 feet into the ground. See Standard Drawings for details.
- Minimum requirements for all wood corner posts: 8 feet in length, 6 inches in diameter, and buried or driven 4 feet into the ground. See Standard Drawings for construction specifications.
- Minimum requirements for wood horizontal brace posts for "H" braces: 8 feet in length, 4 inches in diameter. See Standard Drawings for construction specifications.
- Minimum requirements for wood diagonal floating brace posts: 10 feet in length, 6 inches in diameter. See Standard Drawings MN-ECS-019 and MN-ECS-028 for construction specifications.
- Minimum requirements for wood diagonal brace posts: 10 feet in length, 5 inches in diameter. See Standard Drawings MN-ECS-034 and MN-ECS-035 for construction specifications.

STEEL T-POSTS

- Must be new; used posts will not be accepted.
- Must be painted or galvanized and have anchor plates attached.
- Minimum requirements for steel posts: 5.5 feet in length, 1.25 pounds per foot of length in density, driven to a depth of 1.5 feet into the ground.

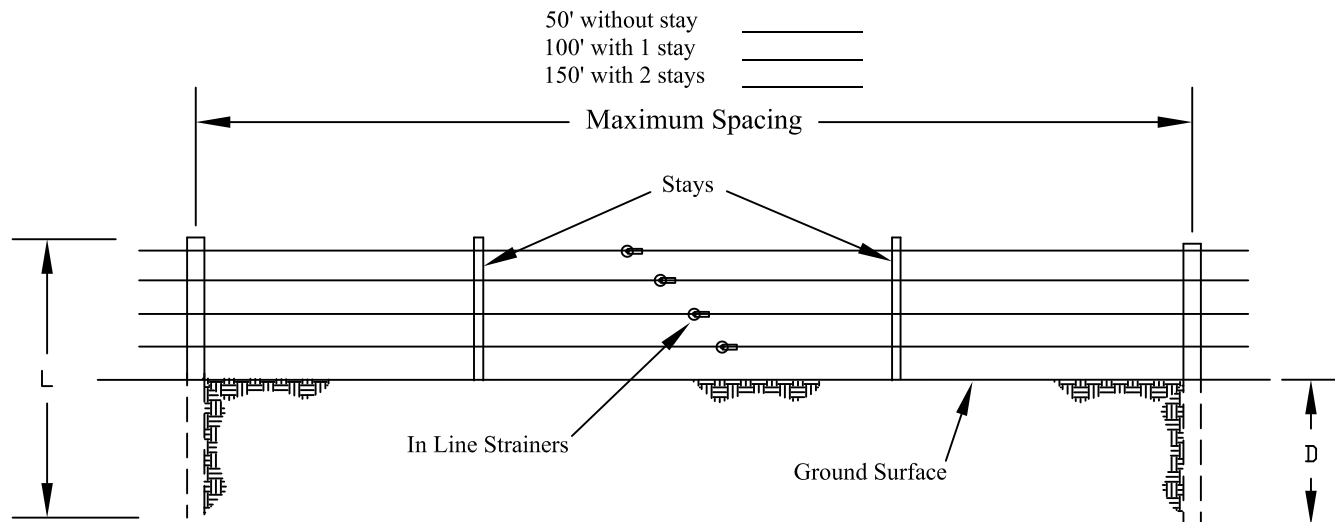
STEEL OIL FIELD PIPE

- Used oil field drill stem pipe (Schedule 40) may be utilized for posts at the same lengths listed in the standard drawings. The tops of the pipes will be capped or sealed off. The minimum diameter of the pipe will be 2 3/8 inches.

STANDARD DRAWINGS

- The following section provides standard drawings for all accepted types of fences and braces.
- The drawings provide details regarding dimensions and commonly used materials for building each style of fence and brace. Refer to the Practice Specifications and Planning Considerations section above more details.
- In many drawings, the dimensions of the posts are specified on the drawing itself. For braces with multiple acceptable post materials, the dimensions are listed in the wording below the drawing and the overall length of the post is shown on the drawing with the letter "L" and the buried depth of the post is shown with the letter "D".

POWER FENCE



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:

- * USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
- * USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

L = 6.5 Feet Minimum

D = 2.5 Feet Minimum

Dia = 4 Inch Minimum

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

STEEL T-POSTS:

L = 5.5 Feet Minimum

D = 1.5 Feet Minimum

Standard "T" $\geq$ 1.25 Lbs/Ft.

ALL STEEL T-POSTS WILL HAVE AN ANCHOR PLATE ATTACHED AND WILL BE EITHER GALVANIZED OR PAINTED.

FIBERGLASS:

L = 5.5 Feet Minimum

D = 1.5 Feet Minimum

Dia = 7/8 Inch Minimum

ALL FIBERGLASS SHALL HAVE ULTRAVIOLET PROTECTIVE COATING FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

WIRE

PERIMETER: 12.5 GAUGE HIGH TENSILE,
135,000 PSI MINIMUM TENSILE STRENGTH

INTERIOR: 12.5 GAUGE OR 14 GAUGE HIGH TENSILE

ALL WIRE SHALL HAVE SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

FASTENERS

STAPLES: L = 1.5 INCH MINIMUM FOR SOFTWOODS

L = 1 INCH MINIMUM FOR HARDWOODS

SPACE SHALL BE LEFT BETWEEN POSTS AND STAPLES TO PERMIT FREE MOVEMENT OF THE WIRE.

WIRE CLIPS WILL BE PROVIDED BY THE MANUFACTURER OR CONSTRUCTED OF GALVANIZED WIRE (12 GAUGE).

ENERGIZER

FOLLOW MANUFACTURERS RECOMMENDATIONS FOR INSTALLATION OF ENERGIZER AND GROUNDING SYSTEM. INSTALL GROUNDING SYSTEM AT LEAST 65 FEET FROM THE FARMSTEAD ELECTRICAL SYSTEM GROUND RODS.

LIGHTNING DIVERTERS/ARRESTORS

1 PER ENERGIZER, MINIMUM.

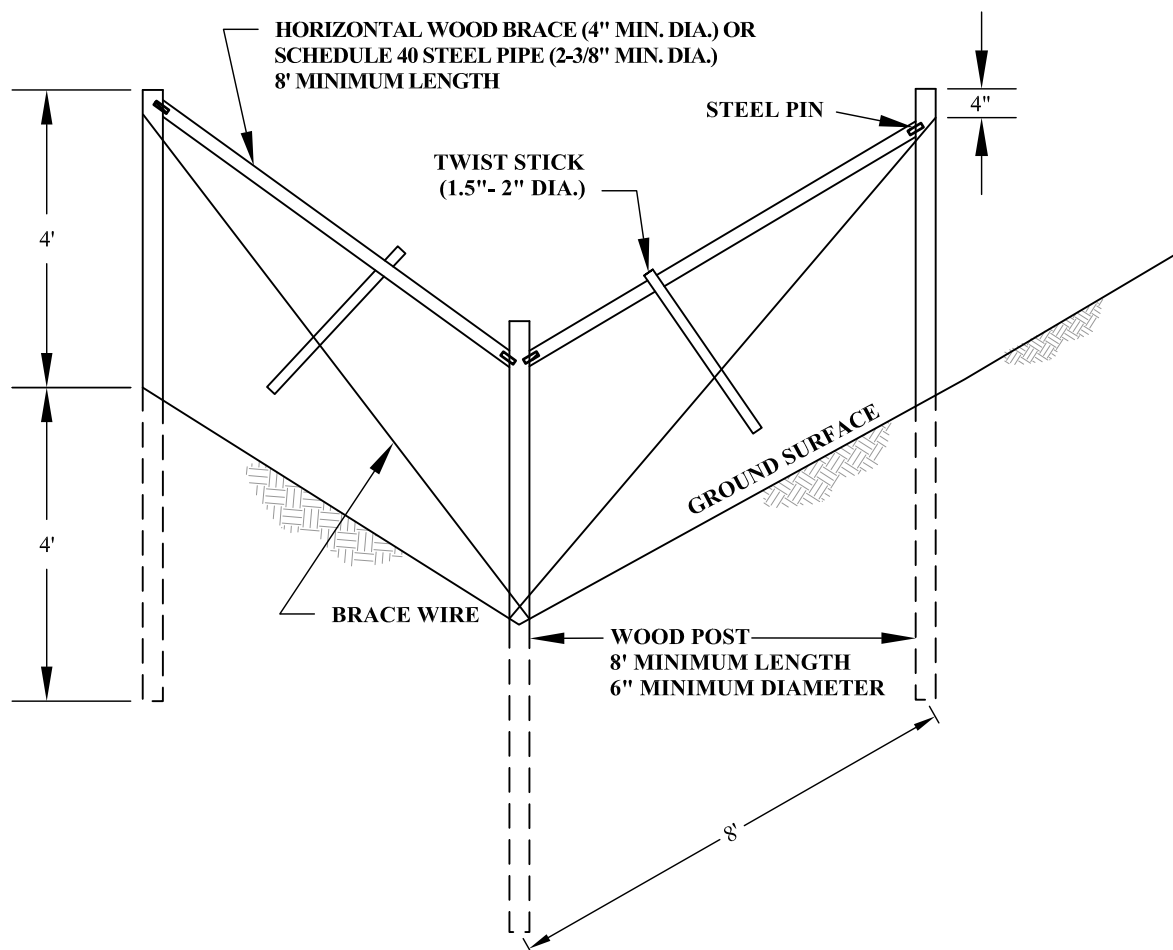
PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# WIRES	_____	_____
POST SPACING	_____	_____
# POSTS	_____	_____
LINEAR FEET	_____	_____

"State law and NRCS policy require that the excavator contact Gopher State One Call at (800) 252-1166 for utility locations 48 hours prior to the start of excavation work."

MN-ECS-016
7/24

Minnesota NRCS CORNER BRACE ASSEMBLY



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

POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:

- * USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
- * USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

BRACE WIRE

2 COMPLETE LOOPS OF 9 GAUGE WIRE OR 1 COMPLETE LOOP OF 12.5 GAUGE HIGH TENSILE WIRE.

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

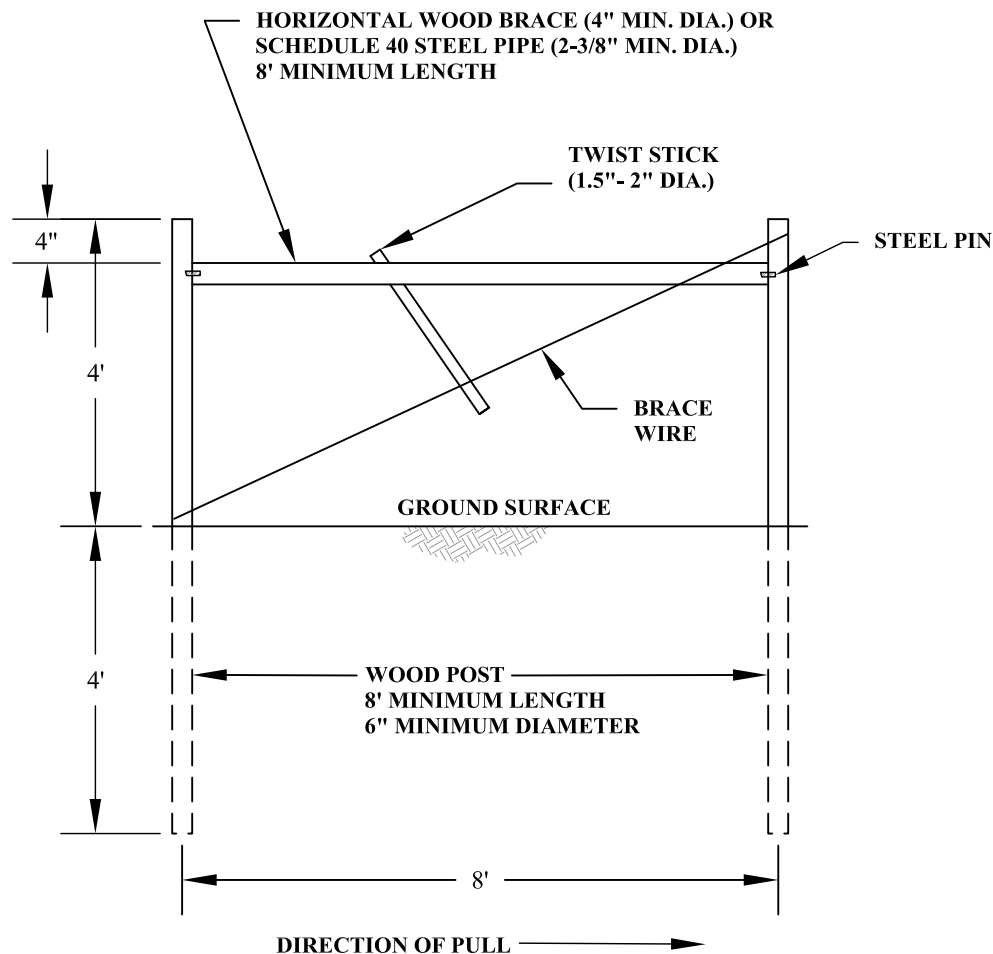
PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# OF CORNERS	_____	_____
# OF HORIZONTAL BRACES	_____	_____
# OF POSTS	_____	_____

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MN-ECS-020
7/24

Minnesota NRCS END BRACE ASSEMBLY



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:
 * USED RAILROAD TIES AND HIGHLINE POLES MAY BE
 UTILIZED FOR POSTS IF IN SOUND CONDITION AND
 FREE FROM CRACKING AND DECAY.
 * USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK
 LOCUST, TAMARACK, WHITE CEDAR, REDWOOD,
 WHITE OAK, AND BUR OAK SHALL BE TREATED BY A
 METHOD SUCH THAT COMPLETE SATURATION OF THE
 SAPWOOD IS OBTAINED.

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

BRACE WIRE

2 COMPLETE LOOPS OF 9 GAUGE WIRE OR 1 COMPLETE
 LOOP OF 12.5 GAUGE HIGH TENSILE WIRE.

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO
 PROTECT THE WIRE FOR THE MINIMUM LIFE
 EXPECTANCY OF 20 YEARS.

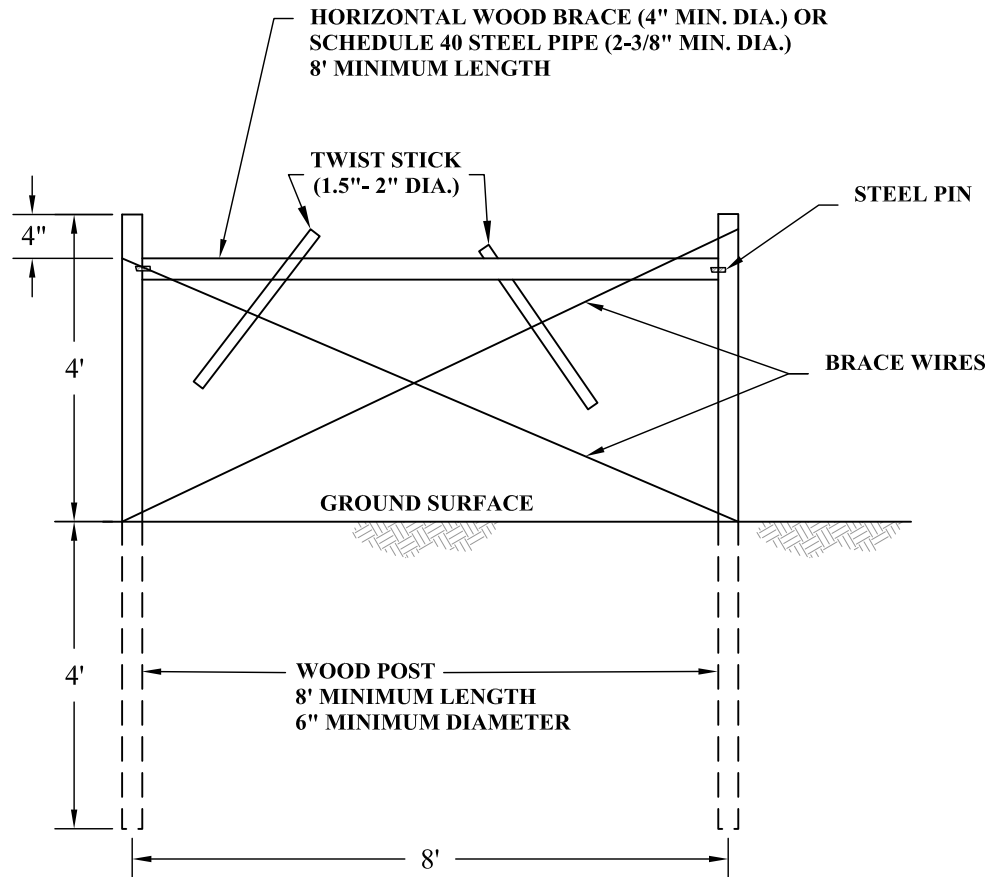
PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# OF END ASSEMBLIES	_____	_____
# OF HORIZONTAL BRACES	_____	_____
# OF POSTS	_____	_____

"State law and NRCS policy require that the excavator contact Gopher State One Call at
 (800) 252-1166 for utility locations 48 hours prior to the start of excavation work."

MN-ECS-021
 7/24

Minnesota NRCS
PULL BRACE ASSEMBLY



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:
* USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
* USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

BRACE WIRE

2 COMPLETE LOOPS OF 9 GAUGE WIRE OR 1 COMPLETE LOOP OF 12.5 GAUGE HIGH TENSILE WIRE.

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

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. HIGH TENSILE WOVEN WIRE
- 2640 Ft. POWER FENCE

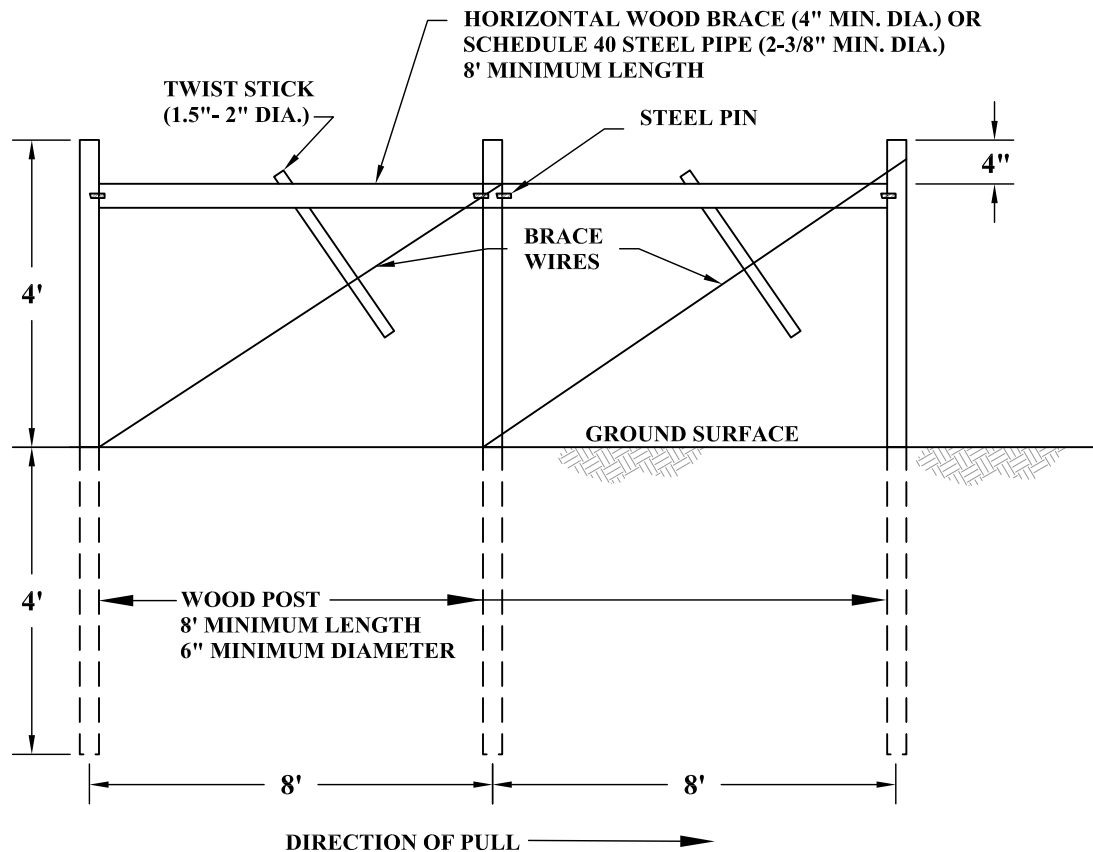
PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# OF ASSEMBLIES	_____	_____
# OF HORIZONTAL BRACES	_____	_____
# OF POSTS	_____	_____

"State law and NRCS policy require that the excavator contact Gopher State One Call at (800) 252-1166 for utility locations 48 hours prior to the start of excavation work."

MN-ECS-022
7/24

Minnesota NRCS DOUBLE END BRACE ASSEMBLY



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:
 * USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
 * USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

BRACE WIRE

2 COMPLETE LOOPS OF 9 GAUGE WIRE OR 1 COMPLETE LOOP OF 12.5 GAUGE HIGH TENSILE WIRE.

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

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

PLANNED MATERIAL NEEDS

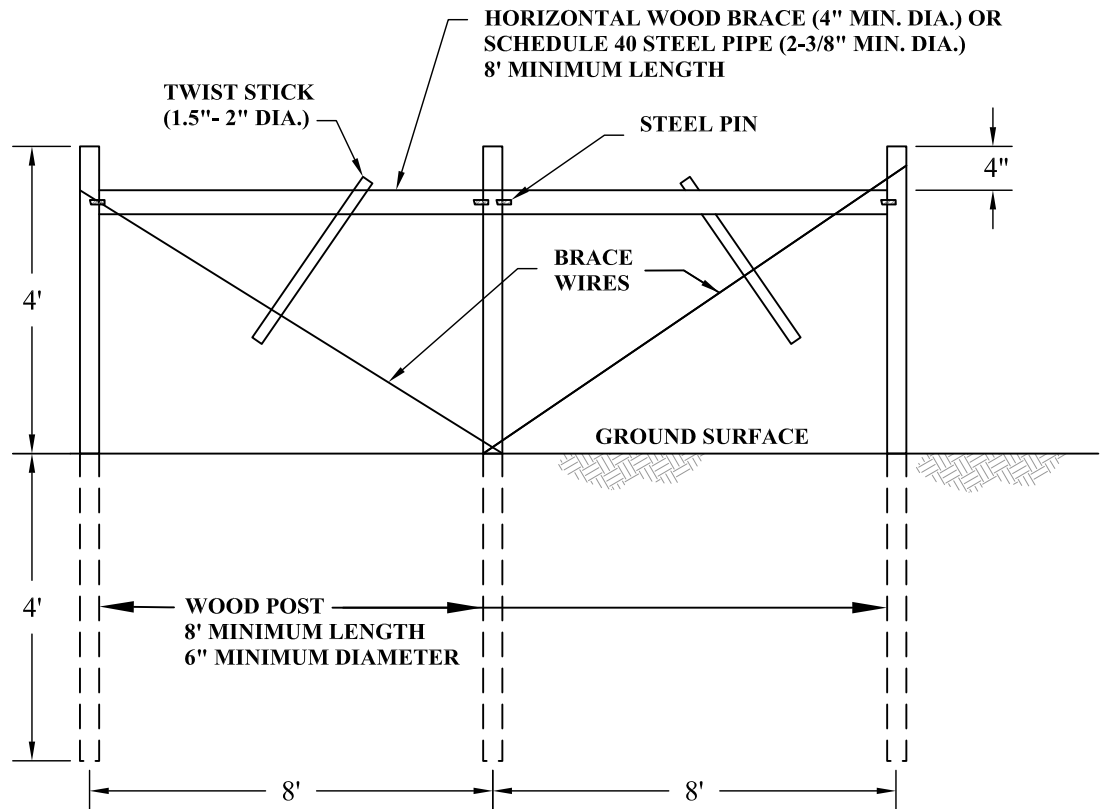
	PERIMETER	INTERIOR
# OF ASSEMBLIES	_____	_____
# OF HORIZONTAL BRACES	_____	_____
# OF POSTS	_____	_____

**"State law and NRCS policy require that the excavator contact Gopher State One Call at
(800) 252-1166 for utility locations 48 hours prior to the start of excavation work."**

MN-ECS-024
7/24

Minnesota NRCS

DOUBLE PULL BRACE ASSEMBLY



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:
* USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
* USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

BRACE WIRE

2 COMPLETE LOOPS OF 9 GAUGE WIRE OR 1 COMPLETE LOOP OF 12.5 GAUGE HIGH TENSILE WIRE.

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

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. HIGH TENSILE WOVEN WIRE
- 2640 Ft. POWER FENCE

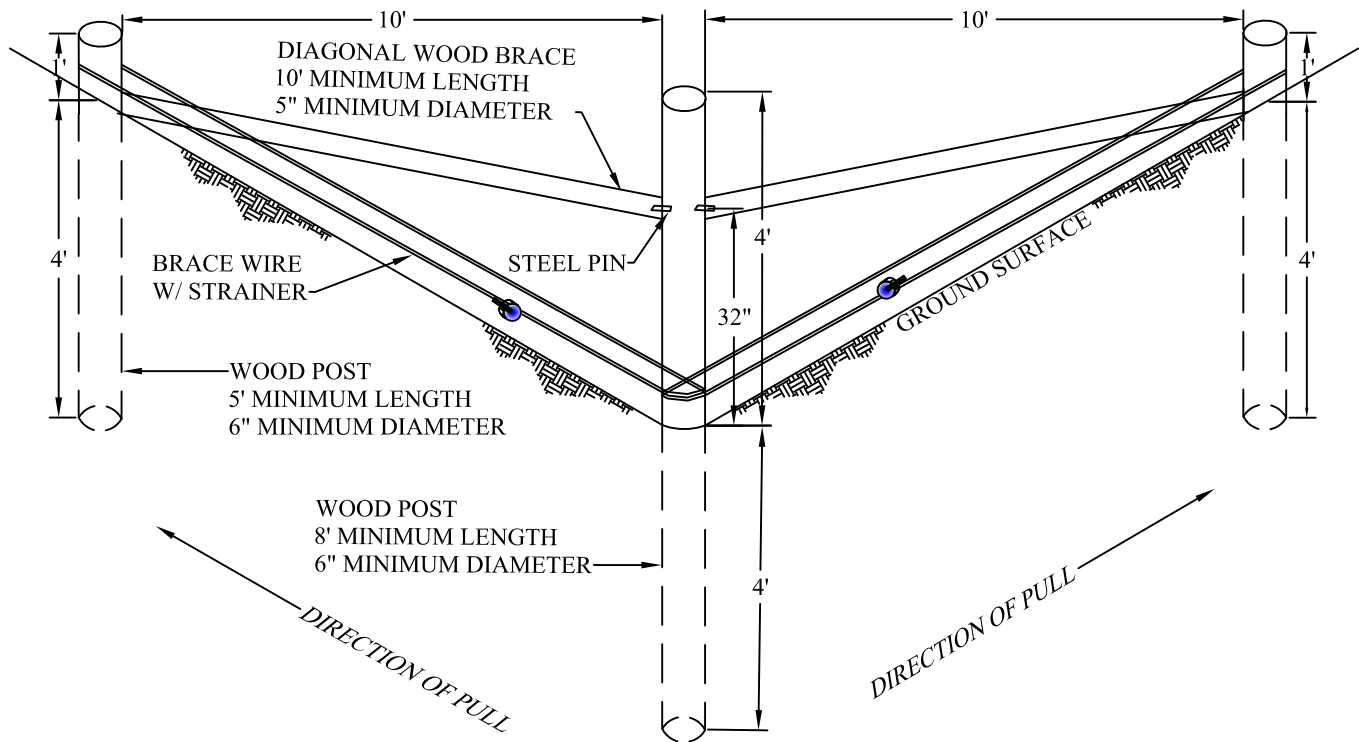
PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# OF ASSEMBLIES	_____	_____
# OF HORIZONTAL BRACES	_____	_____
# OF POSTS	_____	_____

"State law and NRCS policy require that the excavator contact Gopher State One Call at (800) 252-1166 for utility locations 48 hours prior to the start of excavation work."

MN-ECS-025
7/24

DIAGONAL CORNER BRACE ASSEMBLY



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:
* USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
* USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

BRACE WIRE

ONE COMPLETE LOOP OF 12.5 GAUGE HIGH TENSILE WIRE

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

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

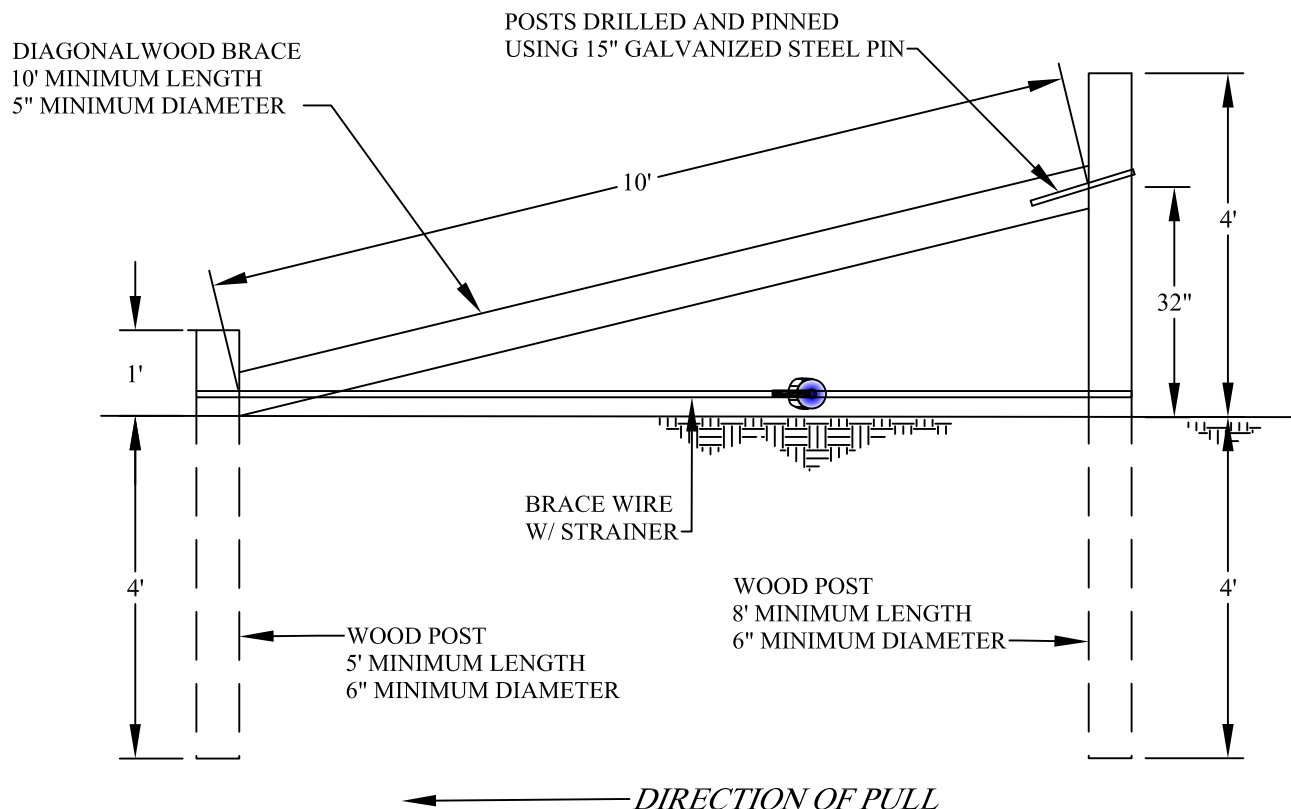
PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# OF ASSEMBLIES	_____	_____
# DIAGONAL BRACES	_____	_____
# OF 5' POSTS	_____	_____
# OF 8' POSTS	_____	_____

"State law and NRCS policy require that the excavator contact Gopher State One Call at (800) 252-1166 for utility locations 48 hours prior to the start of excavation work."

MN-ECS-035
7/24

DIAGONAL END BRACE ASSEMBLY



POSTS

ALL MATERIALS MUST BE NEW. EXCEPTIONS:

- * USED RAILROAD TIES AND HIGHLINE POLES MAY BE UTILIZED FOR POSTS IF IN SOUND CONDITION AND FREE FROM CRACKING AND DECAY.
- * USED OIL FIELD DRILL STEM PIPE (STEEL).

WOOD:

ALL WOOD POSTS EXCEPT RED CEDAR, BLACK LOCUST, TAMARACK, WHITE CEDAR, REDWOOD, WHITE OAK, AND BUR OAK SHALL BE TREATED BY A METHOD SUCH THAT COMPLETE SATURATION OF THE SAPWOOD IS OBTAINED.

BRACE WIRE

ONE COMPLETE LOOP OF 12.5 GAUGE HIGH TENSILE WIRE

ALL WIRE SHALL HAVE A SUFFICIENT COATING TO PROTECT THE WIRE FOR THE MINIMUM LIFE EXPECTANCY OF 20 YEARS.

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

PLANNED MATERIAL NEEDS

	PERIMETER	INTERIOR
# OF ASSEMBLIES	_____	_____
# DIAGONAL BRACES	_____	_____
# OF 5' POSTS	_____	_____
# OF 8' POSTS	_____	_____

"State law and NRCS policy require that the excavator contact Gopher State One Call at (800) 252-1166 for utility locations 48 hours prior to the start of excavation work."

MN-ECS-034

7/24

Appendix A: PHOTOS GALLERY OF FENCING

FENCE TYPES



Photo 1. Power Fence. High Tensile Electric. Standard drawing located on page 4: Drawing Number MN-ECS-016.



Photo 12. Diagonal Corner Brace Assembly. Brace wires are installed parallel to the ground surface at the bottom of the brace assembly. Standard drawing located on page 10: Drawing Number MN-ECS-035.



Photo 13. Diagonal End Brace Assembly. Brace wires are installed parallel to the ground surface at the bottom of the brace assembly. Standard drawing located on page 11: Drawing Number MN-ECS-034.

BRACE TYPES

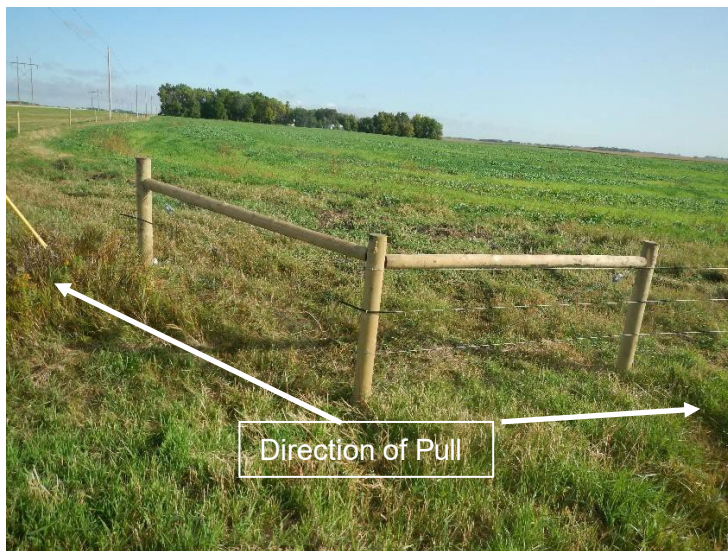


Photo 7. Corner Brace Assembly. Commonly referred to as an H-Brace style corner. The bottom of the brace wires should always be installed on the end/corner post with the top of the brace wire on the tops of the posts heading in the direction of pull. Standard drawing located on page 5: Drawing Number MN-ECS-020.

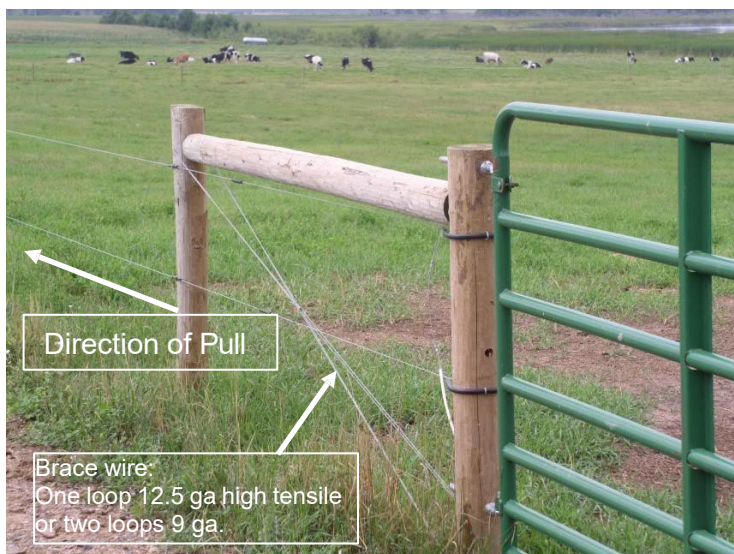


Photo 8. End Brace Assembly. Commonly referred to as an H-Brace style brace. The bottom of the brace wire should always be installed on the end/corner post with the top of the brace wire on top of the post heading in the direction of pull. Standard drawing located on page 6: Drawing Number MN-ECS-021.

Photo 9. Pull Assembly



Photo 9. Pull Brace Assembly. Commonly referred to as an H-Brace style brace. Pull braces require two brace wires because the pull of the fence will be coming from two directions. As shown in the picture, brace wires will make an "X" through the brace. Standard drawing located on page 7: Drawing Number MN-ECS-021.