

SPECIFICATIONS for
SITE WORK, WIRE FENCES AND GATES

PART 1 - GENERAL

1.1 Scope

- A. The Department of Conservation and Natural Resources (DCNR), Bureau of Forestry, requires services for the installation of woven wire deer fences including gates at specifically designated locations in the Forest Districts located within the Commonwealth of Pennsylvania. Work shall be completed per these technical specifications, contract drawings, and enclosed detailed maps “Attachments” showing fence layout and gate locations.
- B. Project Specific Tasks-Installation
1. Forest District #06 (Gallitzin State Forest)
 - a. Type of Fence: Woven Wire
 - b. Project Name: Dead End Fence
 - c. Forest District Project Number: 062001
 - d. Project Acres Enclosed in Fence: 29.4
 - e. Estimated Lineal Feet: 5,222 feet
 - f. Degree of Difficulty: Moderate
 - g. Estimated Number of Drive-Through Gates: 0
 - h. Estimated Number of Man Gates: 0

PART 2 - PRODUCTS

2.1 Woven Wire Fence

- A. Wire:
1. Consider using a professional to install the fence according to specifications to ensure that the fence is installed correctly and will last for 20 years. Specifications are listed for a 47” and 96” fence.
 2. Standard wire woven fence will be made from high tensile steel wire with Class 3 galvanizing meeting ASTM A 641, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire, and conform to the requirements of ASTM A 116, Metallic-Coated, Steel Woven Wire Fence Fabric with the configuration of 10/47/6 or 20/96/6 with Hinge Knots. The woven wire shall have the top and bottom strands 12.5 gauge or heavier wire.

3. Wire fencing materials will have no more than 6 inches between stay wires and have at least 10 graduated line wires. The top and bottom wires will be 12 ½ gauge or heavier wire and stay wires will be 14-gauge wire or heavier.
4. Fence material height may vary within 2 inches. For example, 47-inch-high tensile woven wire may be used for a “48-inch fence”.
5. The Standard woven wire fence shall be manufactured by Deacero Inc. or approved equal.

2.2 Fasteners

A. Staples:

1. Staples shall be smooth 9-gauge, Class 3 galvanized steel or heavier with a minimum length of 1 ½” for softwoods and a minimum length of 1” for close-grained hardwoods.

B. Ground Stakes:

1. Ground Stakes shall be 12” Kinked by Deer Busters Inc. 888.639.0486 or approved equal.

2.3 Posts

A. Wood:

1. **Line Posts-** Shall be 4” x 4” pressure treated square posts, or 4-inch diameter pressure treated posts, or steel posts that weigh no less than 2 lbs. per foot. Line Posts are to be ten 10 feet long and placed in the ground at least two feet.
2. **Corner Posts-** Corner Posts shall be pressure treated 6” x 6” or pressure treated 5” diameter round posts braced and supported in place. Corner posts will be at least 12 feet long with 36 inches placed in the ground. If adverse digging, driving, or drilling conditions exist, the Bureau of Forestry Representative shall determine if the in-ground placement of the post shall be less than 36”.
3. All wooden posts and brace members (except red and white cedar, tamarack, osage orange or black locust) shall be treated by a method listed in Table 1 and ensure that complete penetration of the sapwood is obtained. All bark shall be removed from the cedar, tamarack, osage orange, and black locust. At least one-half the diameter of cedar shall be heartwood. The quality of treated wood shall provide sufficient strength and last for the expected life of the fence.

Table 1
Preservative Treatment Method and Minimum Retention

Treatment Method	Retention (lbs./ft.³)
Creosote Solution	8.00
Copper Naphthenate	0.055
Pentachlorophenol	0.40
Ammoniacal Copper Arsenate (ACA)	0.40
Chromated Copper Arsenate (CCA), Type A, B, or C	0.40
Micronized Copper Azole (MCA)	0.15
Micronized Copper Quaternary (MCQ)	0.34
Alkaline Copper Quaternary (ACQ or AC2)	0.40

B. Steel:

- Steel line posts shall have the standard “T” section, and nominal dimensions of 1 $\frac{3}{8}$ inches by 1 $\frac{3}{8}$ inches by $\frac{1}{8}$ inch with anchor plate. The posts shall be rolled from high carbon steel, weigh at least 1.25 pounds per foot of length, and shall be painted with a weather resistant paint for steel, enameled and baked, or hot dip galvanized. The posts shall be studded to aid in wire attachment. Steel line posts shall be a minimum length of 10 feet for 96” fence.

C. Other:

- Other materials may be used for corner, end, gate assembly, line posts, and brace members if they are of equal or greater strength and quality than above. The material must be pre-approved by the Department of Forestry.

2.4 Gates

A. Man Gates:

- Man Gate Perimeter Steel shall be A36 Steel round bar 5/8” Diameter.
- Man Gate Frame steel shall be A36 Steel Round Bar 1/2” Diameter.
- Man Gate Frame shall be covered with 4” Ga. 148 WD, Galvanized wire mesh – 4” x 4”.0.148” Diameter by Edward J. Darby or approved equal.
- Man Gate steel hinges shall be 1/2” nominal diameter in conformance with ASTM Specification A53 Grade B or A501. O.D. = 0.840 in. and I.D. = 0.622 in.
- Weld Man Gate frame, wire mesh, and hinges as shown on the contract Drawing.

- B. Drive Through Gates:
1. Gate Perimeter Steel shall be Steel Galvanized Pipe ID = 1.733", OD = 1.843", Wall thickness 0.055".
 2. Perimeter Gate Steel pipe shall have coped cuts perpendicular to adjacent pipe.
 3. Gates shall be welded per the contract drawing.
 4. Hardware: Galvanized Steel Lag Screws or malleable steel to suit gate application. Hinges shall have a load capacity of 300 lbs. Hinges shall allow gate leaf to swing 180° (3.14 Rad.).
 5. External protective coating F1043 Type B, 0.9 oz/FT³ minimum hot dip zinc coating plus a chromate conversion and a clear polymer coating. Internal coating F1043 Type D, 81% nominal zinc pigmented coating minimum 3 mils thick or Type B, Minimum 0.9 oz/ft³.

PART 3 - EXECUTION

3.1 Installation Degree of Difficulty Ratings

- A. Fence installation projects will be broken down by degree of difficulty into the following two (2) categories: Moderate and Severe.
- Moderate – If the summation of degrees of difficulty are less than 30 (by adding together the level of difficulty of per each of the five conditions stated below), then the fence installation project will be classified as Moderate.
 - Severe – If the summation of degrees of difficulty total 30 or more, (by adding together the level of difficulty of per each of the five conditions stated below) then the fence installation project will be classified as Severe.
- B. The Department will determine the degree of difficulty the projects will fall under by summing the level of difficulty within each condition for each project. Any disputes the contractor may have regarding severity classification of a project (moderate versus severe) should be brought to the attention of the Department Field Contract Coordinator **prior to bid opening**. Severity ratings will not be changed by the Department once the Purchase Order is processing for award. The Department reserves the right to make final Severity determinations.
- C. The degree of difficulty of fence installation will be based on the evaluation of all of the conditions shown:
- D. Exact job site locations shall be provided to the contractor prior to commencement of each fencing project. Forest district maps may be inspected prior to commencement of fencing project. Photocopies are available as needed.

3.2 Fence Installation

A. Hazardous Trees

1. After the location of the fence has been determined, all hazard trees that are within a tree length of the fence must be felled before fence is erected. Hazard trees are dead and dying, split, heavily leaning and/or root sprung trees that are in a position to fall across the fence. The Bureau of Forestry representative will consult with the contractor to determine which trees are to be considered hazard trees.
2. If fence borders a State Forest boundary line, no trees shall be cut off State Forest land and no tops, debris, etc., shall be placed or left on the outside of State Forest lands.

B. Clearing Fence Area

1. It is the responsibility of the contractor to clear and level a path at least six feet wide but not more than eight feet wide, of all brush, stumps, rocks, or other obstructions. If fence borders private lands, no brush, stumps, rocks, fill, or other debris may be pushed or placed on the private lands. Obstructions which, in the opinion of the Bureau of Forestry representative, will cause greater construction or maintenance problems may be left in place. This path will lie on the outside edge of the fence and will serve as the access corridor for equipment during construction, a level location for the fence to be installed, and as a maintenance corridor suitable for ATV/UTV passage. Disturbance of the entire perimeter may not be necessary. In those areas where the ground is naturally level, free of stumps and/or free of rocks, no disturbance will be required.

C. Damage Control

1. Equipment will not be operated when, in the opinion of the Bureau of Forestry representative, ground conditions are such that excessive damage will result. The contractor will be required to repair areas that become rutted due to work and install water-bars in areas that are of sufficient slope that may be prone to erosion in the opinion of the Bureau of Forestry representative. Small intermittent or perennial streams, adjacent stream banks, or seeps, which are unavoidable, will be cleared by hand. The Bureau of Forestry representative reserves the right to determine which areas are to be cleared by hand.

D. Fence Supports

1. The contractor will erect the fence by fastening the fence to posts or pole-timber trees. No trees of a diameter of a breast height greater than 6 inches or larger will have fasteners driven into them, unless approved by the Bureau of Forestry representative. All trees will be protected by having a 2" by 4" board of sufficient length placed between the fence and the tree. The fence will be attached to the board.
2. The Bureau of Forestry reserves the right to waive the above attachment rule in instances it determines tree damage is not a consideration.

3. Posts that must be added to serve as in-line posts must be 4" x 4" treated square posts, or four-inch round treated posts, or steel posts that weigh no less than 2 pounds/foot.
4. Line posts are to be ten (10) feet long and with 24 inches placed in the ground. Corner posts must be at least 6" x 6" treated post or 5" round post and braced or supported in place.
5. Bracing or guy wires will be used to support the corner post(s) but must be sufficient to prevent the post from bending, leaning, or pulling free of the ground. Corner posts will be at least twelve (12) feet long with 36 inches placed in the ground. This may be waived by the Bureau of Forestry representative if adverse digging, driving, or drilling conditions exist.
6. All bracing or guy wires outside the fenced area must be clearly marked to prevent a safety hazard to any and all persons.

E. Fence Overlap

1. When using the two 47" high rolls of new galvanized steel woven wire fencing the fence shall be overlapped in the middle a minimum of 3 ".

F. Fence Stretching

1. The fence will be at least seven feet (7) high including overlap and securing. The fence will be stretched so that the wire is pulled against a corner or turning support. Maximum distance between fence supports will be no greater than 30 feet between posts and 40 feet between trees.
2. If two 47" high rolls are used, the top and bottom rolls of fence will be fastened to each other every 2 feet by twisting, tying, or fastening the bottom wire of the top roll to the top wire of the bottom roll. The rolls will be installed so that the small squares of the top roll are adjacent to the smaller squares of the bottom roll. Where a post is used, the top wire of the top roll must be secured to the post. Each roll of fence will be fastened in three places: top, middle, and bottom. Ties to secure the fence to metal poles will be 14-gauge or heavier galvanized or stainless-steel wire ties or other commercially suitable ties.
3. Stainless steel or galvanized hog rings may be used to fasten the top fence roll to the bottom fence roll. Twisting the bottom wire of the top fence and the top wire of the bottom fence together may be used. Ties may also be used to secure the two sections together but must be 14 gauge or heavier stainless steel or galvanized wire.
4. The Bureau of Forestry representative may specify the point where stretching begins to facilitate the driving of deer.

G. Fastener Techniques:

1. No staples will be driven into trees.
2. Nails will be used to securely fasten 2" x 4" treated lumber to the trees while the fence is being stretched.
3. The contractor will erect the fence by fastening the fence to posts or pole-timber trees. No trees of a diameter of a breast height greater than 6 inches or larger will have fasteners driven into them, unless approved by a Bureau of Forestry representative. All trees will be protected by having a 2" x 4" board of sufficient length placed between the fence and the tree. The fence will be attached to the board.
4. Staples shall be driven parallel to the wood's grain and at a slight downward angle. Space should be left between the inside crown of the staple and the post to permit free movement of the wire.
5. Staple at the top, middle, and bottom wire to the post.
6. Wires shall be spliced by means of "Western Union" splice or by suitable splice as approved by the department. All wraps shall be tightly wound and closely spaced.
7. Install the fencing so that the bottom wire is at ground level to exclude predators.

H. Securing Fence Bottom

1. The fence must be constructed so that deer will be unable to crawl under the fence by leaving a one-foot overlap on the ground on the outside of the fence or by making it flush with the ground as determined by the Bureau of Forestry representative. The fence is to be anchored to the ground with stakes or stapled to sound wood every ten feet. Stakes must be driven into the ground 12 inches. Gaps between the ground and the fence of over three inches in height and six inches in length will be filled with sound wood and the fence stapled at the bottom to the wood. Other means may be used if approved by the Bureau of Forestry representative.

I. Access

1. If walk-through and vehicle drive-through gates are required for a fence, the number and placement will be determined by the Bureau of Forestry representative on an individual fence basis.
2. On fences where vehicle drive-through gates are required, the openings will require two (2) metal cattle type gates each with a width of 8 feet and height of at least 7 feet. Gates must be provided by the contractor. The Bureau of Forestry will provide the locking system.
3. All gate locations will be determined by the Forest District where fencing is being installed.

4. Only new materials may be used to construct the fence unless otherwise noted by the Bureau of Forestry. Any recycled materials are prohibited.

J. Operating Area

1. The contractor may operate vehicles on the cleared fence path. Vehicles may not cross over the area to be fenced without approval of the Bureau of Forestry representative.

K. Deer Drive

1. The contractor must drive all deer from the fenced area prior to closing of the fence. The contractor will notify the Bureau of Forestry representative two days prior to conducting the deer drive. The fence will be closed the same day that the deer drive takes place.

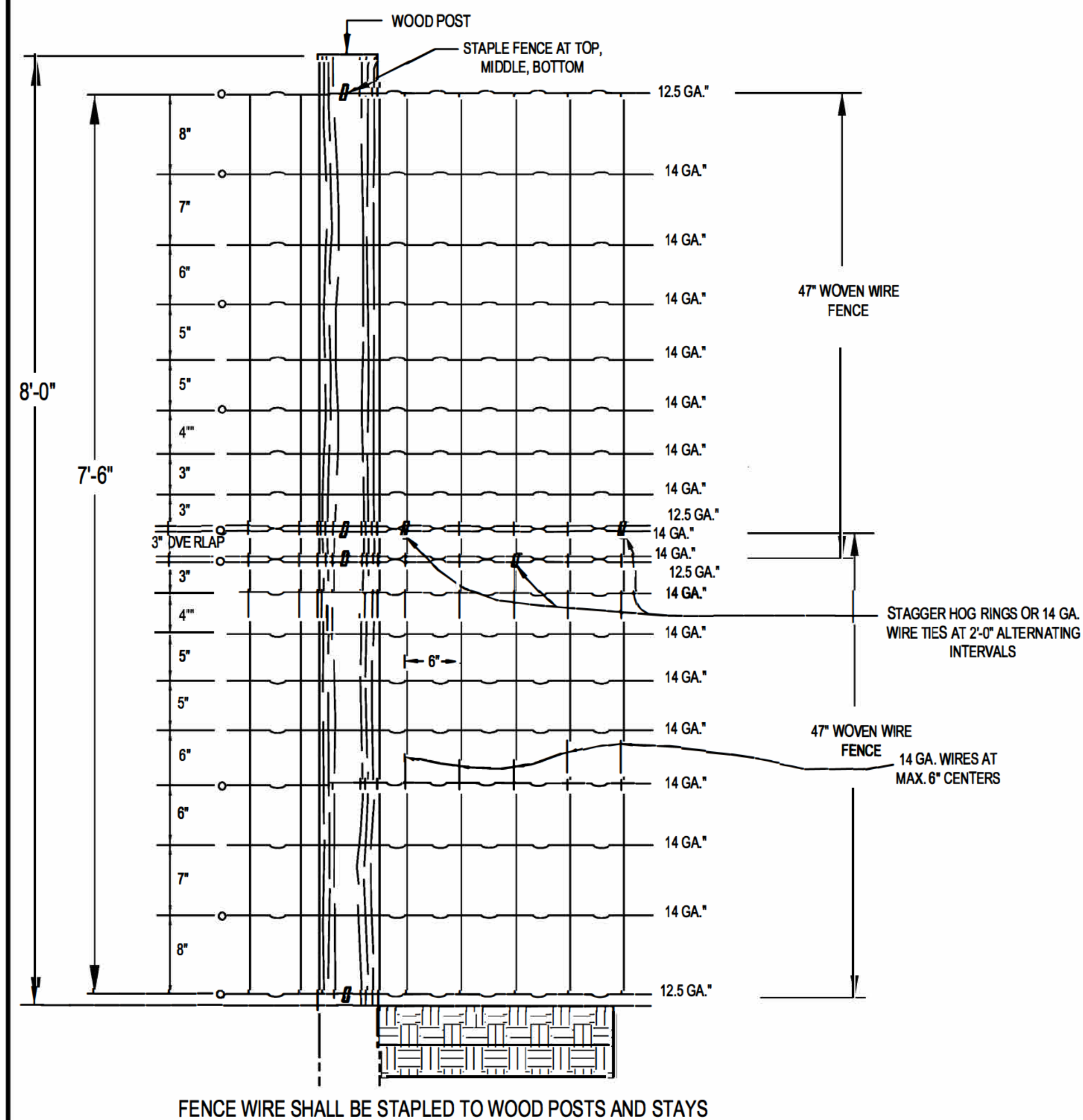
L. Fiberglass/PVC Braces with Anchor Systems

1. Fiberglass and PVC braces shall not be used with high tensile woven wire fences.

3.3 Measurement and Payment

- A. Payment will be made at the contract bid price per lineal foot. Steel woven wire fence, staples, wire splices, ground stakes, line posts, corner posts, and all other appurtenances associated with the fence installation shall be considered incidental and will not be paid for separately, including additional labor, equipment or materials needed to complete the work detailed in this section.

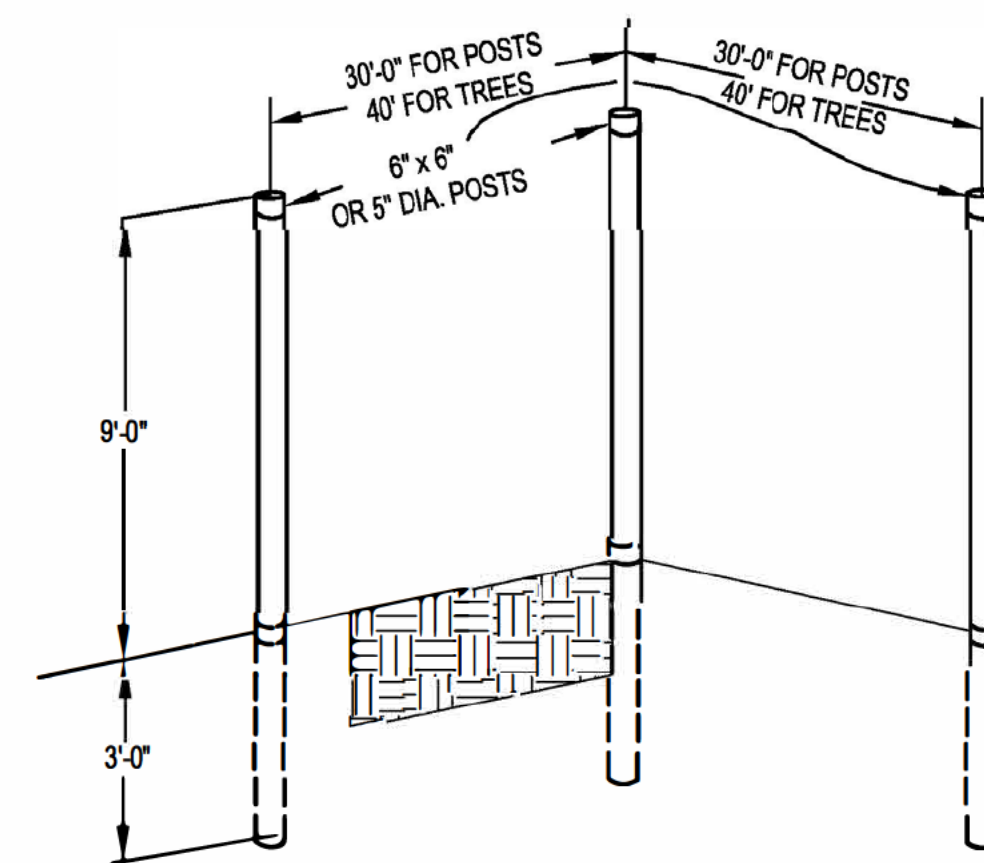
END OF SECTION



FENCE WIRE SHALL BE STAPLED TO WOOD POSTS AND STAYS

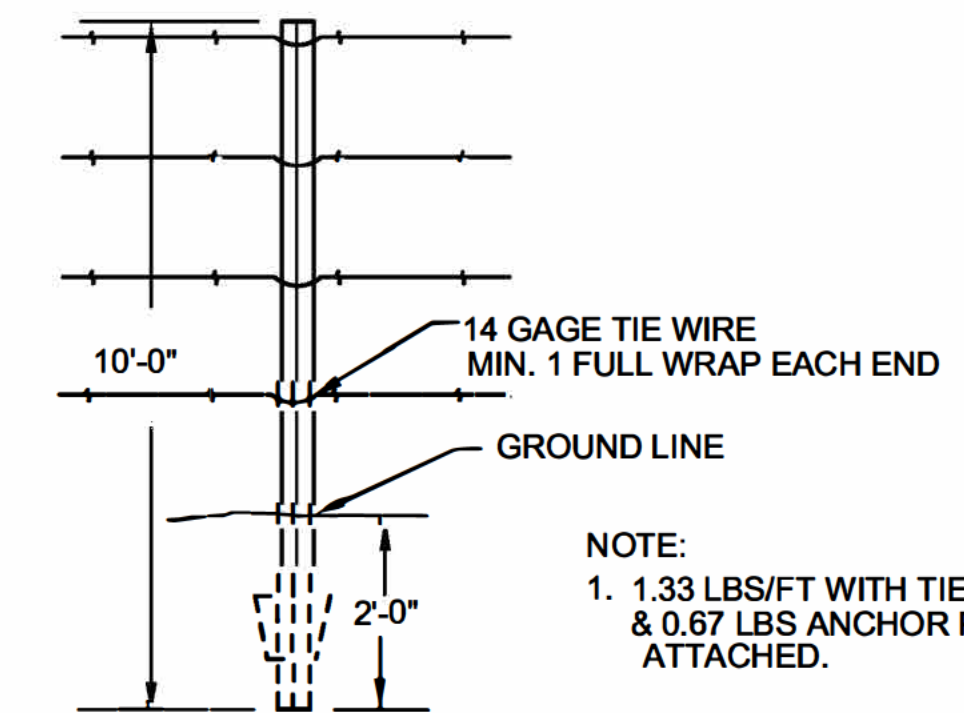
DEER FENCE WIRE FABRIC

SCALE: NONE



CORNER POST

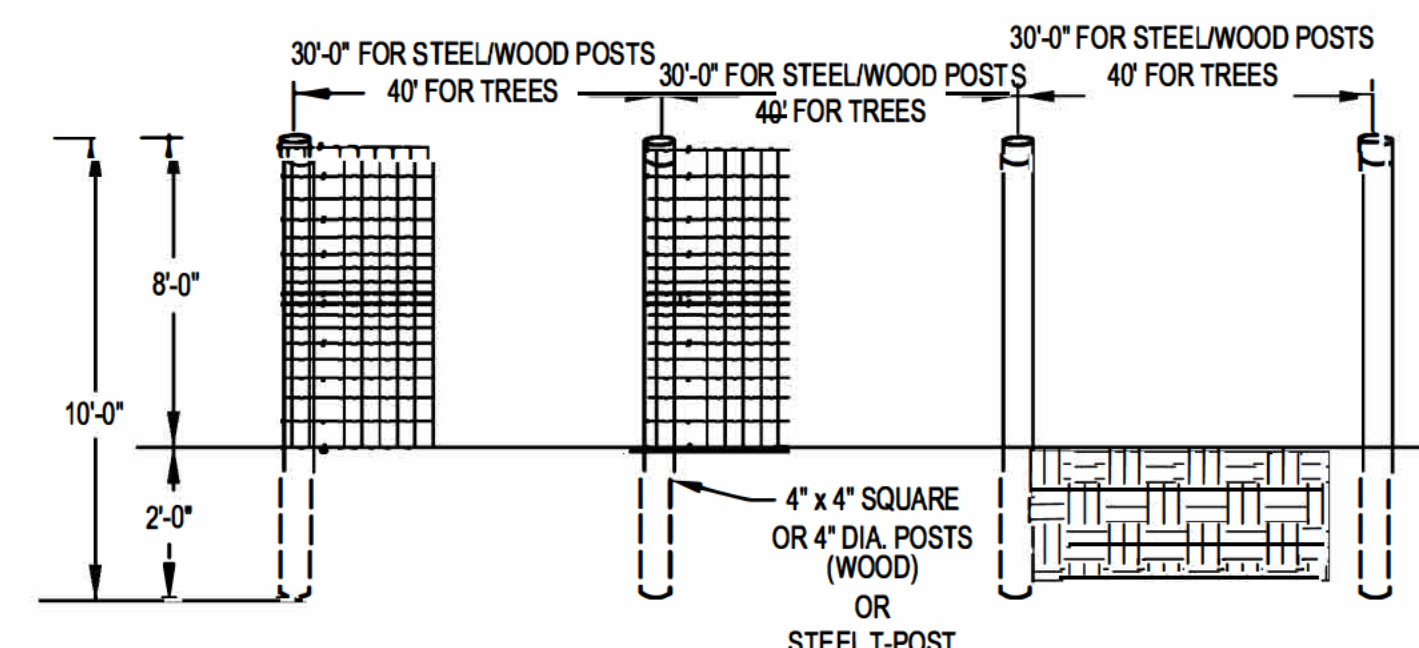
SCALE: NONE



STANDARD STEEL LINE (T-POST)

SCALE: NONE

NOTE:
1. 1.33 LBS/FT WITH TIE WIRE NOTCHES & 0.67 LBS ANCHOR PLATE SECURELY ATTACHED.



LINE POST

SCALE: NONE

NOTES:

1. THE FENCE IS TO BE ANCHORED TO THE GROUND WITH STAKES OR STAPLED TO SOUND WOOD EVERY 10 FEET. STAKES MUST BE DRIVEN INTO THE GROUND 12 INCHES.
2. WHERE A POST IS USED, THE TOP WIRE OF THE TOP ROLL MUST BE SECURED TO THE POST. EACH ROLL OF FENCE WILL BE FASTENED IN THREE PLACES: TOP, MIDDLE, AND BOTTOM.
3. FENCE WIRE MAY BE PLACED ON EITHER THE ROAD SIDE OR THE FOREST SIDE OF POSTS, DEPENDING ON LOCAL CONDITIONS: I.E., ON CURVES, THE WIRE SHOULD BE PLACED ON THE SIDE WHICH WOULD RESULT IN THE LEAST AMOUNT OF TENSION ON THE STAPLES. THIS ALSO APPLIES WHERE WIND DRIFT OR OTHER CONDITIONS WOULD EXERT UNUSUAL PRESSURE AGAINST THE WIRE.