

USDA FOREST SERVICE, R-4
GAOA South Zone Fence Replacement

SECTION 323150 – POST AND POLE FENCE

PART 2 - GENERAL

2.1 SUMMARY

- A. The Contractor shall construct a post and pole fence in accordance with these specifications and the location as shown on the drawing and as staked by the Contracting Officer Representative.

PART 3 - PRODUCTS

3.1 POSTS

- A. Posts shall be sound, peeled, treated, Lodgepole Pine, free from rot, disease, or insects. Posts shall have a 6-inch minimum tip diameter. Posts which are set in the ground, or concrete footings, shall have at least 3 feet of the largest end of the post treated with a wood preservative to protect it from insects and decay.
- B. Lumber preservatives and treatment methods shall meet the requirements of AASHTO M133.
- C. All lumber shall be pressure treated using the "Empty Cell Process" as required by the American Wood Preservers Association (AWPA), with a copper naphthenate solution. The copper naphthenate solution shall contain not less than 6% or more than 8% copper in the form of copper naphthenate, in petroleum oil, AWPA P9, conforming to AWPA P8 and AWPA C1 for oil-borne preservatives.
- D. The minimum amounts of preservative treatment retained and the amount of penetration required for the Species Indicated on the Drawings, shall be the minimum values that are shown in AWPA C2. Methods of determining the amount of penetration and retention shall conform to AWPA C1, and AWPA C2. The amount of retention shall be determined by the assay method for timber with soil contact. Test results shall be forwarded to the Contracting Officer with the "Certificate of Inspection of Treatment."
- E. Before any lumber is placed in the work, the Contractor shall furnish to the Contracting Officer a "Certificate Confirming Compliance for Retention and Penetration", issued by an approved inspection agency, testing laboratory or treating plant, for each charge, in each shipment.

3.2 POLES

- A. Poles shall be sound Lodgepole Pine, free from rot, disease, or insects. Poles shall have a 3 inch minimum tip diameter and a 12-foot minimum length. Poles shall be peeled and trimmed smooth of limbs and snags.

3.3 BOLTS

- A. Bolts shall be 3/8" diameter of the length required.

PART 4 - EXECUTION

4.1 CLEARING

- A. All trees, brush and other obstacles which interfere with proper construction of the fence shall be removed in advance.

4.2 GENERAL

- A. Grading along the fence line is not required. In general, the fence shall be erected on the undisturbed, natural ground. The style of fence construction including the post spacing and pole attachment method shall be as shown on the Fencing Diagrams.

4.3 POST SETTING

- A. Post holes not larger than 16 inch diameter shall be excavated to a depth of 30 inches. Backfill shall be hand tamped around the posts so as to make the post solid and plumb. Any loose posts shall be removed and reinstalled.

4.4 POST INSTALLATION

- A. Poles shall be beveled and bolted to the post as done with the existing fence. The completed fence shall be neat and uniform in appearance and solidly installed.

4.5 STAINING

- A. The fence shall be stained, when called for on the drawings, with one coat of Olympic Stain (or an approved equal). The Contractor shall submit color chips for color selection.

4.6 CLEANUP

- A. When the fence has been installed, complete, the general area shall be cleaned up to present a finished appearance.

END OF SECTION

March 2025

USDA FOREST SERVICE, R-4

GAOA South Zone Fence Replacement

SECTION 323160 – BARBED WIRE FENCE AND GATES

PART 5 - GENERAL

5.1 SUMMARY

- A. This item shall consist of furnishing and erecting wire fences and gates of the type required in accordance with these specifications and details shown on the drawings, at the locations designated in reasonably close conformity with the lines shown on the drawings or established on the ground.

5.2 REFERENCE SPECIFICATIONS

- A. The publications listed below form a part of this specification to the extent reference. The publications are referred to in the text by the basic designation only.
 - 1. ASTM A121 Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

5.3 SUBMITTALS

- A. Preservative retention test results shall be forwarded to the Contracting Officer with the "Certificate of Inspection of Treatment."

5.4 MEASUREMENT AND PAYMENT

- A. Payment for wire fence will be measured by lump sum for completed, in place and accepted.

PART 6 - PRODUCTS

6.1 POSTS, BRACES AND STAYS

- A. Steel Posts shall be 6 feet long T-posts conforming to AAHSTO M 281, 1.25 pounds per foot minimum, factory painted, with anchor plate.
- B. Wood posts, braces and stays shall be of the types below.
 - 1. Peeled and pressure treated (non-CCA) Southern Yellow, Lodge Pole, or Ponderosa pine and Douglas Fir or Western Larch, conforming to the requirements of AASHTO M 168-84. They shall be no.2 or better structural grade when graded in accordance with current rules of either the west coast lumber inspection bureau or western wood products association.
 - a. Pressure treatment:
 - 1) "Empty Cell Process" as required by the American Wood Preservers Association (AWPA), with a copper naphthenate solution.
 - a) The copper naphthenate solution shall contain not less than 6% or more than 8% copper in the form of copper naphthenate, in petroleum oil, AWPA P9, conforming to AWPA P8 and AWPA C1 for oil-borne preservatives.

2) The minimum amounts of preservative treatment retained and the amount of penetration required shall be the minimum values that are shown in AWPAC2.

a) Methods of determining the amount of penetration and retention shall conform to AWPAC1, and AWPAC2. The amount of retention shall be determined by the assay method for timber with soil contact.

2. Peeled Juniper, Cedar, or Cypress.

3. Braces and wood stays shall be of the same material used for posts.

4. Wood stays shall be minimum 2 inch diameter, maximum 3 inch diameter and 4' in length

C. Wire stays shall be no. 9 twisted wire manufactured wire stays.

D. H-braces where needed and required for corners, inline stress, elevation change, gates, trail crossings, let down fence needs, etc. Prefer Metal H-brace systems such as Bar None Fence systems (see attached)

6.2 WIRE

A. Barbed wire shall be 2 strands of 12.5 gauge zinc-coated wire wrapped around each other with W-point, 14 gauge barbs spaced not more than 5 inches apart conforming to AAHTOM 280.

B. Smooth wire shall be 12.5 gauge zinc-coated wire.

C. 4-strand 'wildlife' fence with smooth on top and bottom with barbed as 2nd and 3rd strands. 16" gap from ground to bottom smooth strand. 10" gap from each wire strand above smooth bottom strand

6.3 STAPLES

A. Staples shall be 9 gauge or heavier and have a minimum length of 1-1/2 inches.

6.4 WIRE CLIPS

A. Wire clips shall be 12-1/2 gauge galvanized steel wire fasteners.

6.5 SPIKES

A. Spikes shall be 60d zinc-coated, steel-wire nails.

6.6 OBJECT MARKERS

A. Type 2 object markers (6" x 12") shall be installed on a galvanized steel plate.

B. Type 3 object markers shall be constructed on a fiberglass substrate and shall be black and yellow, double sided, reflectorized. A "Flex Lite" flexible marker may be substituted.

- C. Object markers shall meet the requirements of the current manual on uniform traffic control devices (MUTCD) and are incidental to gate construction.

PART 7 - EXECUTION

7.1 CLEARING

- A. All trees, brush and other obstacles which interfere with proper construction of the fence shall be removed in advance. Material so removed shall be removed at ground level with minimum disturbance to soil surface to protect aesthetics and prevent erosion. Slash from clearing the fence line will be scattered away from the fence line.

7.2 GENERAL

- A. Grading along the fence line is not required. In general, the fence shall be erected on the undisturbed, natural ground. Fence wires shall not be attached to trees. Fences shall be reasonably straight and shall not deviate more than 12 inches between corner, gate or line brace assembly.
- B. Install fencing as staked in field by Contracting Officers Representative.
- C. When a fence line approaches a ditch, gully, or depression, the last post on level ground shall be placed close enough to the edge of the drop-off that the wire may be strung to a post in the depression without touching the ground.
- D. When the depth of a depression on a fence exceeds the total vertical wire spacing over a maximum horizontal run of 2 spaces, an extra fence shall be constructed through the depression or sag bracing installed.

7.3 POSTS

- A. Space interval between posts shall be 15 feet, landscape dependent.
- B. Posts shall be steel post with every sixth post being a wood post.
 - 1. 3" minimum diameter wood posts may be substituted for metal posts with approval of the Contracting Officer. Post spacing shall be the same for wood and steel.
- C. All wood posts (corner braces and line braces) shall be set solidly in soil to depths shown on drawings.
- D. All steel posts (line posts) shall be driven 2' into the ground, with the top of the anchor plate embedded 4 inches minimum.
- E. 3 Stays shall be placed evenly between two steel posts.

7.4 BRACES

- A. Corner braces will be located at every change in fence line direction.

- B. Line braces shall reinforce fence line structure and anchor long wire stretches which shall not exceed distances shown in tables on drawings. Braces shall be placed at abrupt changes in vertical topography (15 degrees or more change in elevation).
- C. Line braces shall also be located at both sides of all gates.
- D. Bracing shall be dapped 1" into posts.
- E. Tension wires shall be mortised into posts, stapled, and twisted tight, leave tensioning sticks installed.
- F. Prefer Metal H-brace systems such as Bar None Fence systems or approved equivalent

7.5 WIRE

- A. Wire shall never be kinked or nicked, and shall be pulled tight with due consideration for contraction and expansion.
- B. Wire spacing shall be as shown on the drawings. The wire shall be attached on the side of the post where the greatest pressure from cattle exists.
- C. All line wires shall be dead-ended on gate, corner, angle, and line brace posts. The ends are to be wrapped twice around the post, stapled securely, and twisted back on the stretched wire six times.
- D. Wire splices shall be wrapped six times. The wraps shall be adjacent to each other to form neat, tight wraps.

7.6 WIRE FASTENERS

- A. Barbed wire shall have one staple per wire per post and two staples per wire per post in sag sections. Staples shall be driven into wooden posts as shown on the drawings angled somewhat to cross the grain.
- B. Staples shall be driven into brace posts so that wire will not move.
- C. Wire shall be stapled and wired to wood stays. Staples shall be driven into stays so that wire will move.
- D. Wire clips shall be used to attach each wire to the steel posts.

7.7 GATES

- A. Gates shall be 12 feet wide in length.
- B. Gates shall have the same wire spacing as the fence.
- C. Smooth wire shall be used for loops.
- D. Object markers shall be installed on front and back sides of posts so visible from both directions of approach as shown on the drawings. Type 3 markers shall be secured to the gate as shown with galvanized smooth wire.

END OF SECTION 02822
March 2025