

## SECTION 550 FENCING

### **550-1 Description.**

Furnish, erect and reset metal fence of the type and at the locations shown in the Plans.

### **550-2 Types of Fence.**

The types of fence are designated as follows:

Type A (Farm Fence).

Type B (Chain-Link Fence).

Type R (Chain-Link Fence for Pedestrian Overpass).

### **550-3 Materials.**

**550-3.1 Type A Fence (Farm Fence):** Meet the requirements of Section 954 for timber posts and braces. For metal posts and braces, and for recycled plastic fence posts, meet the requirements of the Standard Plans.

For the fabric and all other accessories, meet the requirements of the Standard Plans.

**550-3.2 Type B Fence (Chain-Link):** For the posts, braces, fabric and all accessories other than the concrete for bases, meet the requirements of the Standard Plans.

Use concrete as specified in Section 347, or a premix approved by the Engineer for bases. The requirements contained in 347-2.2, and 347-3 will not apply.

**550-3.3 Type R Fence (Chain-Link for Pedestrian Overpass):** Use the fabric and accessories specified in the Plans.

**550-3.4 Resetting Fence:** Use material from the existing fence. For any additional materials required, provide the same type of material as in the existing fence and as specified herein, including gates when applicable.

**550-3.5 Optional Use of Materials:** For Type A Fence, a combination of steel, aluminum, timber, recycled plastic or concrete posts may be used. Unless otherwise called for in the Plans, line posts of one material may be used with corner, pull and end post assemblies of a different material. The Engineer will permit the use of line posts of only one optional material and pull posts assemblies of only one optional material between corner and end post assemblies. Within individual corner and end post assemblies, the Engineer will allow the use of only one optional material.

For Type B Fence, a combination of zinc-coated steel fence members, aluminum coated fence members and aluminum alloy fence members may be used. Unless otherwise indicated in the Plans, the Engineer will allow the use of only one type of fabric material, one type of line post material and one type of pull assembly material between corner and end post assemblies.

**550-3.6 Certification:** Provide the Engineer with certified test reports from the manufacturer confirming that all materials (posts, braces, fabric and all other accessories) conform to the requirements of this Section, Section 6 and the Standard Plans. Provide the Engineer a copy of the certification at least ten days prior to fence construction.

Also furnish the Engineer a Certificate of Compliance certifying that the fencing system, materials and construction practices comply with the applicable Standard Plans and Specifications.

Acceptance of furnished material will be based on the Certificate of Compliance, accompanying test reports and visual inspection by the Engineer.

#### **550-4 Construction Methods.**

**550-4.1 General:** Install the fence in accordance with the specific requirements of this Article and with the details shown on the Standard Plans for the particular type of fence called for, except for Type R Fence which shall be detailed in the Plans. Construct the fence in close proximity to the right of way line except as otherwise detailed in the Plans. Assume responsibility for obtaining satisfactory permits or permission from property owners for any encroachments required to perform the work, and for proper scheduling of the fence installation with the removal of existing fence where it is necessary to provide continuous security to adjacent areas already fenced. In order to meet this requirement, where necessary for maintaining security of livestock on adjacent property during construction of the new fence, the Engineer may require the erection and subsequent removal of temporary fencing.

**550-4.2 Spacing of Posts:** Space posts as shown in the Standard Plans, within a tolerance of 12 inches, except where definite spotting of corner posts is required. Ensure that in any line of fence, the over-spacings and the under-spacings shall approximately compensate. Set additional line posts at abrupt changes in grade.

**550-4.3 Clearing:** Where the clearing and grubbing for the project includes the area occupied by the fence, clear the area to the limits shown in the Plans. If the limits are not shown in the Plans, clear the area at least 2 feet wide on each side of the fence line. The Engineer may direct that desirable trees be left in place and may restrict clearing where permission from the property owners cannot be obtained.

#### **550-4.4 Construction Over Irregular Terrain and Other Obstructions:**

**550-4.4.1 Clearance of Bottom of Fence:** Install the fence such that the bottom of the fence, in general, follows the contour of the ground. The fence is detailed in the Plans at approximately 3 inches above ground line. Over irregular ground, however, the Engineer will permit a minimum clearance of 1 inch and a maximum of 6 inches for a length not to exceed 8 feet, and, for Type A fence, with the barbed wire spaced midway between ground and bottom of fabric.

**550-4.4.2 Grading:** Where necessary to secure proper vertical alignment and to meet the clearance requirements, fill depressions (except where filling would obstruct proper drainage) and cut down knolls and ridges. Provide a substantial and permanent foundation for the fence.

**550-4.4.3 Use of Extra-Length Posts.** At locations where it is impracticable to adjust the ground level, the Engineer may require that posts of additional length be set and that the opening at the bottom be closed by additional barbed wire, stretched taut between poles, with no vertical distance between wires greater than 3 inches. For all such posts requiring a concrete base, extend the concrete downward to the bottom of the extra-length post.

**550-4.5 Setting Posts:** If rock occurs within the required depth of the post hole, or pavement which is to remain in place exists at the location of a post, drill a hole of a diameter slightly larger than the greatest dimension of the post or footing and grout in the post or footing.

Set timber posts either by digging or by driving. Set recycled plastic fence posts in accordance with the Standard Plans.

**550-4.6 Placing Fabric:** Do not place fabric and barbed wire until the posts have been permanently positioned and concrete foundations have attained adequate strength. Place the fabric by securing one end and applying sufficient tension to remove all slack before making permanent attachments at intermediate points. Fasten the fabric to all end, corner and pull posts by approved means. Fasten the fabric using tools designed for the purpose, in accordance with the manufacturer's recommendations. Apply the tension for stretching by mechanical fence stretchers or with single-wire stretchers designed for the purpose.

**550-4.7 Electrical Grounds:**

**550-4.7.1 Grounding for Overhead Lines:** Wherever an overhead power line crosses over the fence, install a ground rod directly below the point of crossing. Where an overhead power line runs parallel to, and within 100 feet of the fence, install a ground rod at each end of the fence and at intervals of no greater than 1,500 feet. Use copper-clad steel ground rods that are a minimum of 8 feet in length and 1/2 inch in diameter. Drive the rod vertically until the top of the rod is approximately 6 inches below the ground surface. Connect a conductor of No. 6 AWG solid copper wire to the ground rod and each metal fence element directly adjacent to the ground rod using non-corrosive ground rod clamps.

**550-4.7.2 Fences with Non-Metal Posts:** For all fences using non-metal posts, substitute a metal post for a non-metal post at intervals of no greater than 300 feet with at least one metal post in any length of fence. Tightly fasten a galvanized steel wire to the barbed wire, fence fabric, and metal post.

**550-5 Method of Measurement.**

**550-5.1 General:** The quantities to be paid for will be plan quantity for the number of gates and the length of each type of fence constructed and accepted. In addition, extra payment will be made, in accordance with 550-6.2, for additional lengths of post approved by the Engineer for the crossing of depressions in accordance with 550-4.4.3, muck areas, or other areas of inadequate support for a post of standard length.

**550-5.2 Measurement of Fence Length, and Payment:** The length of fence to be paid for will be plan quantity completed and accepted. Measurement for resetting fence will be the actual length of existing fence reset, including gates when applicable.

**550-6 Basis of Payment.**

**550-6.1 Basic Items of Fencing:** The Contract unit price per foot for the item of fencing, will be full compensation for all work and materials necessary for the complete installation, including line posts, corner, end, and pull posts. Such price and payment will include, but not be limited to, the following specific incidental work.

1. Any work required to level and prepare the terrain along the line of the fence.
2. Any additional clearing incidental to construction of the fence.
3. All preparation for post holes, in whatever type of material, as specified herein.
4. Any furnishing and installing of electrical grounds.
5. Any additional work or materials required for special construction over irregular terrain, or terrain of inadequate support for the posts, including the additional barbed wire, but not including the extra lengths of posts ordered by the Engineer.

6. Any cost of erection and removal of any temporary fencing, which may be necessary for maintaining security of livestock, etc., on adjacent property during construction of the new fence.

**550-6.2 Payment Rates for Extra-Length Posts:** Any extra length posts added to complete installation of the fence will require an invoice. The Contractor will be compensated for invoice price plus 10% as payment for any extra length posts.

The standard length of steel, recycled plastic and aluminum posts will be the required length as indicated in the Plans or Standard Plans for each type and case.

The payment for additional length of post will include the cost of additional concrete to extend concrete bases, as applicable.

**550-6.3 Gate Payment:** The quantities to be paid for will be full compensation for all labor, materials, posts, and associated hardware for the complete installation of the type gate specified in the Plans, and accepted by the Engineer.

**550-6.4 Payment Items:** Payment shall be made under:

Item No. 550- 10-	Fencing - per foot.
Item No. 550- 60-	Gates - each.