

Payment for each item includes all direct and indirect costs and expenses required to complete the work.

Payment will be made under:

Item No.	Pay Item	Pay Unit
8051100	Steel Beam Guardrail	Linear Foot
8051101	Adjustable Guardrail Initial Installation	Linear Foot
8051102	Adjustable Guardrail 2 Inch Adjustment	Linear Foot
8051103	Adjustable Guardrail Final Adjustment	Linear Foot
8051110	Removal of Existing Guardrail	Linear Foot
8051200	Steel Beam Guardrail (Double Face)	Linear Foot
8051300	Steel Beam Guardrail (Thrie)	Linear Foot
8051400	Steel Beam Guardrail (Thrie-Double Face)	Linear Foot
8051600	Box Beam Median Barrier	Linear Foot
8051800	Temporary Guardrail	Linear Foot
8053000	Additional Length Guardrail Post	Linear Foot
8058XXX	Concrete Median Barrier (<i>type</i>)	Linear Foot
8059XXX	Temporary Concrete Median Barrier	Linear Foot
8051900	Reset Guardrail	Linear Foot
80522X0	End Anchors (Type (<i>type</i>))	Each

SECTION 806

FENCE

806.01 Description. This work shall consist of the construction of fence and gates in accordance with these specifications at the location shown on the plans or designated by the Engineer, and in conformity with the lines and grades shown on the plans or established.

The types of fence covered by these specifications are:

1. Woven Wire
2. Barbed Wire
3. Chain-Link
4. Ornamental Steel Picket

MATERIALS

806.02 Wood Posts and Braces. Wooden posts and braces shall meet the requirements of Subsection **706.05**.

If approved by the Engineer, galvanized studded T-posts may be used instead of wood posts for Reset or Woven Wire Fence. The T-posts shall be used for line installation only, and shall not be allowed as corner or pull posts. T-posts shall meet the requirements of ASTM A 702, and galvanizing shall meet ASTM A 123.

806.03 Steel Fence Posts. Steel fence post shall conform to the size, shape and dimensions shown on the plans. Tubular steel fence posts shall be galvanized in accordance with ASTM A 120. All other posts shall be galvanized in accordance with ASTM A 123. All anchor plates attached to posts shall be galvanized in accordance with ASTM A 153. Cut ends that are not placed underground shall be protected by applying two coats of a 90% minimum zinc rich cold galvanizing compound. Posts and anchor plates for line posts shall be of good commercial quality steel and of the shapes, weights and dimensions shown on the plans. All tubular section posts shall have heavy malleable iron caps made to provide a drive-fit over the outside of the section to exclude moisture. The weight per linear foot for tubular posts and braces shall be no less than 95% of the weight specified. All end, pull, and brace posts for farm-field type fence shall be furnished with braces and all fittings and details required to make a complete installation as shown on the plans. All line posts for farm-field fence shall be furnished with anchor

plates. If fastenings are necessary for attaching the fence to the posts they shall be either No. 9 galvanized wire or galvanized clamps of the manufacturer's standard design. A sufficient quantity of individual tie-wires or clamps shall be furnished to provide for 5 attachments of the fencing to each line post and one tie-wire for each strand of barbed wire.

All line posts for chain-link type fence shall be furnished with the necessary tie-wires or fabric bands for fastening the fabric to the posts. These fastenings shall be either of aluminum strip or wire of approved gage and design or of galvanized steel wire and may be in accordance with the manufacturer's standard design. If galvanized steel wire ties are furnished, the wire shall be no smaller than No. 9 gage. A sufficient quantity of individual ties or bands shall be furnished to provide for attaching the fabric to each line post every 12 inches or as called for on the plans.

806.04 Woven Wire. Woven wire shall conform to the requirements of ASTM A 116, Class I zinc coating for wire with 12 1/2 gage stay wires or ASTM A 116, Class II zinc coating for wire with 11 gage stay wires whichever is specified, or it shall conform to the requirements of ASTM A 584, Class II coating. The type of woven wire fabric shown on the plans shall meet the Department's design specifications.

806.05 Barbed Wire. Barbed wire shall consist of two No. 12 1/2 gage or heavier steel wires or two No. 15 1/2 gage high tensile strength steel wires with 14 gage or heavier four point round barbs placed no more than five inches apart. Zinc coated (galvanized) steel barbed wire shall conform to the requirements of ASTM A 121 with Class I (or better) coating. Aluminum-coated steel barbed wire shall conform to the requirements of ASTM A 585, Type I.

806.06 Chain-Link Fence Fabric. Chain-link fence fabric and required fittings and hardware, shall conform to AASHTO M 181 for the kind of metal, coating, sizes of wire and mesh as specified on the plans.

806.07 Ornamental Steel Picket Fencing. Ornamental steel picket fencing materials shall meet the following requirements:

Tubing	Cold roll steel sheet meeting ASTM A 924/ A 653 LFQ RS Coating G90 C10088/C1010, Grade C. Roll to ASTM A 787-846 type 2AWG, light oil 1008/1010.
Welds	1/8 inch Fillet Butt Weld, 2 sides with 50,000 psi tensile strength
Pickets	1 inch x 1 inch x 16 gage galvanized cold roll steel
Rails	1 inch x 2 inches x 14 gage galvanized cold roll steel
Posts	2 1/2 inches x 2 1/2 inches x 14 gage galvanized cold roll steel
Post Caps	Pressed steel to fit over post
Concrete	Class 3000
Post Embedment	9 inch dia. x 36 inches deep for MSE walls, 4 inches x 9 inches x 12 inches deep for brick walls
Paint	Finish color shall be black

806.08 Gates

A. Chain-Link Fence. Gates for chain-link fence shall conform to design details and AASHTO M 181 for the kind of metal, coating, sizes of wire and mesh specified.

B. Farm Fence. Gates for farm type fence shall be in accordance with plan details. In the absence of plan details, gates shall be as directed by the Engineer to be in keeping with the type fence being erected and the purpose it will serve.

806.09 Staples. Staples used to attach woven wire and barbed wire to wooden fence posts shall meet one of the following characteristics:

1. The staples shall be made of galvanized steel wire of not less than No. 9 gage and shall be not less than 1 1/2 inches in length.
2. Pneumatically driven staples shall be two inches in length, 16 gage stainless steel made from 304 stainless steel and coated with adhesive.

CONSTRUCTION REQUIREMENTS

806.10 General. The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to the required grade and alignment. Existing fences, trees, brush, stumps, logs, weeds or other debris that interfere with the construction of the fence shall be removed and disposed of as directed.

The surface of the ground beneath the fence shall be graded to a reasonable contour to prevent the bottom strand from coming in contact with the ground, provide for spaces between the various types of wire, viz., barbed wire and fabric as shown on the plans, and prevent excessive openings between the ground and the bottom of the fence, prior to erecting the fabric. Openings under fences, caused by crossing ditches or small ground depressions where it is not practicable for the fencing to follow closely the contour of the ground, shall be fenced or otherwise closed to retain livestock or serve the purpose intended.

Where new fences are to be constructed to replace existing fences, the Contractor may be required to erect the new fence before the existing fence is removed. The Contractor shall be responsible for any crop or property damage caused by livestock escaping or entering through gaps left in fences during erection.

At locations where breaks in a run of fencing are required, or at intersections with existing fences, appropriate adjustment in post spacing shall be made to conform to the requirements for the types of closure indicated.

Unless otherwise permitted, no materials shall be installed on posts or strain placed on guys and bracing set in concrete until four (4) days have elapsed from the time of placing the concrete.

The tops of all posts shall be set to the required grade and alignment. Cutting of the tops of treated wooden posts or metal posts will be allowed only with the approval of the Engineer and under the conditions specified.

Wire or fencing of the type required shall be firmly attached to the posts and braces in the manner indicated on the plans or in these specifications. All wire shall be stretched taut and be installed to the required elevations.

At each location where an electric transmission, distribution or secondary line crosses any of the types of fences covered by the specifications, the Contractor shall furnish and install a ground conforming to the requirements of Section 9 of the *National Electric Safety Code*.

Whenever farm type fence is erected for farm purposes, the Contractor shall construct access gates at locations of existing access points, when directed and at such other locations when, in the opinion of the Engineer, such access is essential to the farming or other land use operations.

806.11 Setting Posts. Unless otherwise directed, posts, including the concrete base for posts for fence to be erected for control of access purposes, shall be so set that the entire fence is inside the right of way and such that the fence can be placed on the side of the post facing the mainline pavement. Posts and related items for fence to be erected for land use purposes shall be so set that the entire fence is outside the right of way

and such that the fence can be placed on the side of the post facing the pavement.

Unless otherwise indicated on the plans, the posts shall be spaced the same as in the fence being replaced, with a maximum distance of 12 feet on centers for woven wire and barbed wire fences and a maximum of 10 feet for chain-link fence.

Posts shall be accurately spaced, lined, set plumb and placed to a uniform height before the fabric is erected. End, corner, gate and pull posts shall be set to a minimum depth of 3 feet. Line posts shall be placed to a minimum depth of 2 1/2 feet. At the option of the Contractor, posts may be driven into place provided the method of driving does not damage the post. Treated posts that are to be driven may have the small end machine pointed at the plant before being treated or may be driven with the end not pointed. When the posts are hand set, the holes shall be backfilled and thoroughly compacted in layers not exceeding 6 inches in depth and in such a manner that the post will be securely held.

Corner, end, gate posts, and pull posts, at intervals of not more than 500 feet, shall be securely braced as may be indicated on the plans or as directed by the Engineer. Changes in line where the angle of deflection is 30 degrees or more shall be considered as corners and corner post shall be installed. All corner and pull posts shall be braced in two directions. End and gateposts shall be braced in one direction. Posts at intersecting fences shall be properly braced to withstand the pull of the intersecting fence.

Extra length posts will be required at stream crossings and at other locations where it is not practicable for the fencing to follow closely the contour of the ground. Such extra length posts shall be furnished by the Contractor without additional compensation.

When sections of fence are to be erected in low, swampy areas where due to the nature of the soil and water conditions, the posts will not be firmly held with a penetration into the earth

of 2 1/2 feet and 3 feet for line posts and for pull and corner posts, respectively and when included in the proposal, the Contractor shall install posts of such length as directed by the Engineer. Before ordering posts for these areas, the Engineer will furnish the length of posts required.

Unless otherwise indicated on the plans, all metal posts shall be set in Class 2500 concrete crowned at the top to shed water. Such concrete is to be furnished by the Contractor without additional compensation.

806.12 Installing Woven Wire. The wire fabric shall be stretched taut and securely attached to each wood post with a galvanized staple in each horizontal wire and as many additional staples as may be required to secure a workmanlike installation. Stretching shall be done with an approved stretcher that will produce equal tension in each line of wire. At each end, corner, or gatepost, each strand of wire shall be wrapped around the post and securely fastened by winding the end around the beginning of the loop near the post. Splicing of fence between posts will not be permitted, unless splicing devices recommended by the fence manufacturer are used and are satisfactory.

806.13 Installing Chain-Link Fabric. Chain-link fabric shall be stretched and securely attached to the end, corner, gate, and pull posts with stretcher bars and stretcher bands as indicated on the plans. The fabric shall be fastened to line posts, top rail and tension wires with wires or bands so specified and spaced as indicated.

806.14 Installing Barbed Wire. Barbed wire, whether used in conjunction with chain-link fabric, woven wire fabric or as a separate fence, shall be stretched and fastened to each wood post by means of galvanized staples and to metal posts by means of suitable fasteners. The ends of wire shall be wrapped around wood posts and securely fastened by winding the end around the wire near the post. Splicing of fence between posts will not be permitted.

806.15 Installing Ornamental Steel Picket Fencing. The ornamental steel picket fencing shall be constructed in accordance with the plans. All posts shall be set plumb and painting shall be performed as follows:

1. Clean, degrease, and prime welded panels and posts.
2. Powder coat primed panel, post, and cap with one coat.
3. Touch up paint for field welds with cold galvanized primer and enamel spray paint.
4. Finished color shall be black.

806.16 Method of Measurement. Fence will be measured by the linear foot along the top of the fence from outside to outside of end posts for each continuous run of fence and shall include gates, unless gates are included in the proposal. Gates, when included as pay item in the proposal, will be measured as complete units of the size and type specified and installed.

Additional length of posts, when included as a pay item in the proposal will be measured by the linear foot for the number of feet in excess of the normal post lengths specified.

806.17 Basis of Payment. The accepted quantity of fence will be paid for at the contract unit price for Fence of the type and size specified and shall include gates, unless otherwise provided. The price and payment shall be full compensation for furnishing and installing fence including posts, rails, post caps, braces, and shall include clearing and grubbing, grading, excavation, backfill and disposal of surplus materials; and shall include all materials, equipment, labor, and incidentals necessary to complete the work.

The accepted quantity of ornamental steel picket fencing will be paid for as Ornamental Steel Picket Fence of the height specified, which price and payment shall be full compensation for furnishing and installing all materials including pickets, rails, posts, post caps, concrete, paint, powder coat, prime, welds,

and all equipment, labor, and incidentals necessary to complete the work in accordance with these specifications and the plans.

The accepted quantity of gates, when listed as a pay item in the proposal, will be paid for at the contract unit price for Gate of the types and sizes specified, complete in place.

Payment for each item includes all direct and indirect costs and expenses required to complete the work.

Payment will be made under:

Item No.	Pay Item	Pay Unit
8061XXX	<i>(size)</i> Woven Wire Fence <i>(type)</i>	Linear Foot
8062XXX	<i>(no. of strands)</i> Barbed Wire Fence	Linear Foot
8063XXX	<i>(size)</i> Chain Link Fence	Linear Foot
8064XXX	<i>(size)</i> Gate <i>(type)</i>	Each
8066000	Additional Length of Post	Linear Foot
8068148	Ornamental Steel Picket Fence – <i>(size)</i> "	Linear Foot

SECTION 807

RESET FENCE

807.01 Description. This work shall consist of the removal of existing fence within the limits of the improvement and, if necessary, storing it in a careful manner and then resetting it where shown on the plans, or as may be designated, in accordance with the requirements of these specifications and in conformity with the plans. Reset fence shall be classified as follows:

1. Reset Chain-Link Fence
2. Reset Fence