

Section 866

- 1 *Cable Guiderail Anchor Units* will be measured and paid in units of each completed and
- 2 accepted.
- 3 *Additional Guiderail Posts* will be measured and paid in units of each completed and
- 4 accepted.
- 5 No separate measurement will be made of any cable, posts, concrete, hardware or any other
- 6 components of the completed anchor units that are within the pay limits shown in the plans.
- 7 Payment will be made under:

Pay Item	Pay Unit
Cable Guiderail	Linear Foot
Double Faced Cable Guiderail	Linear Foot
Cable Guiderail Anchor Units	Each
Additional Guiderail Posts	Each

SECTION 866
FENCE

866-1 DESCRIPTION

Furnish and erect woven wire, chain link and barbed wire fence with gates in conformity with the details shown in the plans and at locations as shown in the plans.

866-2 MATERIALS

Refer to Division 10.

Item	Section
Barbed Wire	1050-4
Chain Link Fabric	1050-6
Fence Materials	1050-1
Fittings and Accessories	1050-7
Metal Posts and Rails	1050-3
Organic Zinc Repair Paint	1080-9
Timber Posts and Braces	1050-2
Woven Wire	1050-5

Use Class B concrete for anchors. Instead of Class B concrete, pre-mixed commercially bagged dry concrete mix may be used if the concrete meets the minimum strength requirements for Class B concrete when mixed with the quantity of water shown on the instructions printed on the bag.

866-3 CONSTRUCTION METHODS

(A) Clearing and Grubbing

Only clear the ground that is necessary to erect a clear fence line. Clearing includes satisfactory removal and disposal of all trees, brush, stumps, existing fence or other objectionable material. Erect the fence to conform to the general contour of the ground. Place the bottom of the fabric or wire no more than 6" above the natural ground, except where the Engineer directs that ditches and depressions are to be spanned by using extra length posts in conjunction with additional barbed wire installed between the bottom of the fence wire or fabric and the ground surface. Grade along the fence line to meet the above requirement such that no obstructions to proper drainage are created.

(B) Setting Posts and Braces

Set and maintain all posts in a vertical position. Line posts may be hand set or set with a post driver. Thoroughly tamp all backfilled material if hand set. If power driven, wood posts may be sharpened to a dull point. Remove and replace posts that are damaged by power driving.

Set posts in concrete anchors to maintain the position and alignment of the post when required in the plans or where dictated by soil conditions. Forms are not required for the concrete. Trowel the top of the concrete to a smooth finish and slope to drain away from the post. The concrete anchors require at least a 3 day curing period before any load is placed on the post.

Instead of setting roll formed steel line posts in concrete, such posts may be driven provided they are not part of a line brace assembly. Drive the posts at least 3 ft into the ground. Provide adequate protection to the post tops to prevent damage from the driving operations. Repair damage to the zinc coating in accordance with Article 1076-7. Set posts in concrete anchors where soil conditions are such that the posts cannot be driven without deformation, or where soils are encountered that does not provide adequate in-ground stability.

Where rock or concrete pavement or slabs are encountered within the required depth where fence posts are to be erected, drill a hole in the rock or concrete of a diameter slightly larger than the largest dimension of the post in the rock or concrete and grout in the post. The depth of post embedment shown in the plans will not be required and the post may be shortened as necessary, provided the post is embedded within the rock or concrete pavement or slab to a minimum depth of 12".

Do not fabricate extra length posts by welding short sections of posts together.

Place line braces at the end of each roll or piece of woven wire.

Do not use pieces of woven wire fabric less than 100 ft in length, unless otherwise directed. When the use of short pieces of woven wire is permitted, furnish and install the additional required brace posts and braces. Approved splicing sleeves may be used instead of providing such brace posts and braces.

Set approved sleeves in retaining wall in accordance with the details in the plans. After the posts have been set, fill sleeves with grout.

(C) Installing Fabric and Wire**(1) Chain Link Fence**

Attach chain link fabric to tubular end, gate, corner or brace posts with stretcher bars and stretcher bar bands as shown in the plan. Fasten the fabric to line posts and to top and brace rails with wire fasteners spaced and wound as shown in the plans. Fasten the fabric to the tension wire by hog rings spaced at 24" intervals or weave the tension wire through the fabric. Make hog ring ties at fabric joints with the hog ring passing completely around the fabric joint.

Place chain link fabric by securing or fastening on end and applying sufficient tension to remove all slack before making permanent attachments elsewhere. Apply the tension for stretching by mechanical fence stretchers designed for this purpose.

Connect rolls and pieces of chain link fabric to each other by field weaving provided that such weaving is identical in appearance and strength as the machine weaving done at the factory.

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1 Attach barbed wire used in conjunction with chain link fabric, to the post by eyebolt
2 or by a tie wire passing through holes drilled in the metal post to prevent any vertical
3 movement of the barbed wire. Wrap the ends and beginnings of strands around the
4 post twice and securely fasten by winding the end around the wire near the post.
5 Splice barbed wire only at posts.

6 Install additional barbed wire when shown in the plans or where directed.

7 (2) Woven Wire Fence

8 Stretch woven wire fabric taut and securely attach to each post with one or more
9 staples in each line of wire. Use as many staples as required to firmly secure the
10 wire at the location and elevation required by the plans. When woven wire is
11 attached to metal posts, use at least 5 clips at each post to fasten the individual
12 strands of wire to the post except where wrapping of the strand around the post is
13 required. Stretch with an approved stretcher that will produce equal tension in each
14 line of wire.

15 At each end or gate post, at the center post in each line brace and at corner posts
16 except as otherwise shown in the plans, cut out all vertical strands of wire and wrap
17 each horizontal strand of wire around the post and securely fasten by winding the
18 end around the strand of wire near the post.

19 Do not splice fabric between the posts of a brace post assembly. Do not splice
20 between other posts, unless the splicing sleeves are approved.

21 Pull woven wire taut and securely attach to each post by methods described for
22 woven wire when used in conjunction with woven wire fabric. Do not splice woven
23 wire between posts.

24 Install additional woven wire as shown in the plans or where directed.

25 (3) Barbed Wire Fence

26 Install barbed wire fence in accordance with the plans and as directed.

27 Pull barbed wire taut and securely attach to each post by methods described for
28 woven wire. Do not splice barbed wire between posts.

29 **866-4 MEASUREMENT AND PAYMENT**

30 *Woven Wire Fence*, ___" Fabric will be measured and paid in linear feet of fence, measured in
31 place from center of each post or gate post to center of end post or gate post exclusive of gate
32 sections, that has been completed and accepted.

33 *Chain Link Fence*, ___" Fabric will be measured and paid in linear feet, of fence measured in
34 place from center of each post or gate post to center of end post or gate post exclusive of gate
35 sections, that has been completed and accepted.

36 ___ *Strand Barbed Wire Fence with Posts* will be measured and paid in linear feet of fence
37 measured in place from center of each post or gate post to center of end post or gate post
38 exclusive of gate sections, that has been completed and accepted. All posts used for the
39 barbed wire fence are included in the price of the barbed wire fence and will not be paid
40 separately.

1 ___" *Timber Fence Posts*, ____ will be measured and paid in units of each for the several sizes
2 and kinds of posts installed on the project, including timber line posts, brace posts, gate posts
3 and posts erected as barriers at driveways and entrances. The actual length of timber posts in
4 linear feet of variable length and extra length posts shall be measured as placed and converted
5 to an equivalent number of standard length posts of the same size for which a pay item has
6 been established. In converting to equivalent numbers of standard length posts, any fractional
7 portion of a post remaining from the division of a total number of linear feet by a standard
8 post length shall be considered as equal to one post. Where the Contractor has elected to use
9 pieces of woven wire shorter than 100 ft in length, as permitted by Subarticle 866-3(B), on the
10 condition that he furnish and install at no additional cost to the Department line braces at the
11 ends of short pieces, timber fence posts shall include the number of line posts made
12 unnecessary by such line braces but shall exclude the posts used in the line braces.

13 *Metal Line Posts for ___" Chain Link Fence* will be measured and paid in units of each for the
14 several sizes and kinds of posts actually installed on the project. For extra length metal posts,
15 the actual length of post in place in excess of the standard pay length for each post shall be
16 measured in linear feet, and half of such length shall be converted to an equivalent number of
17 standard length posts of the same size for which a pay item has been established. In
18 converting to equivalent numbers of standard length posts, any fractional portion of a post
19 remaining from the division of a total number of linear feet by a standard post length shall be
20 considered as equal to one post.

21 *Metal Terminal Posts for ___" Chain Link Fence* will be measured and paid in units of each for
22 all end, corner and brace posts installed on the project.

23 *Metal Gate Posts for ___" Chain Link Fence, Double Gate* will be measured and paid in units
24 of each for gateposts installed on the project.

25 *Metal Gate Posts for ___" Chain Link Fence, Single Gate* will be measured and paid in units of
26 each for gate posts installed on the project.

27 *Double Gates, ___High, ___Wide, ___ Opening* will be measured and paid in units of each for the
28 number of gates actually erected on the project. Double gates will be measured as one gate.

29 *Single Gates, ___ High, ___Wide, ___ Opening* will be measured and paid in units of each for the
30 number of gates actually erected on the project.

31 *Additional Barbed Wire* will be measured and paid in linear feet of wire installed in the work,
32 complete and in place. Measurement of additional barbed wire will be made along each
33 strand after the installation has been completed. No measurement will be made of any wraps,
34 nor will measurement be made of the upper or lower continuous strand of barbed wire that is
35 erected as part of woven wire fence.

36 Setting sleeves in retaining wall will not be paid as such work is incidental to the other pay
37 items in this specification.

38 Work includes, but is not limited to, clearing and grading; and furnishing and installing fence
39 fabric, barbed wire, staples, tie wires, stretcher bars, top rails, tension wire, posts and post
40 braces, concrete, gates, fittings and any other materials, furnishing and installing sleeves in
41 retaining walls and filling sleeves upon setting posts.

42 When the use of short pieces of woven wire is permitted, furnish and install the additional
43 required brace posts and braces at no additional cost to the Department.

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1 Payment will be made under:

Pay Item	Pay Unit
Woven Wire Fence, ___" Fabric	Linear Foot
Chain Link Fence, ___" Fabric	Linear Foot
___ Strand Barbed Wire Fence with Posts	Linear Foot
___" Timber Fence Posts, ___' Long	Each
Metal Line Posts for ___" Chain Link Fence	Each
Metal Terminal Posts for ___" Chain Link Fence	Each
Metal Gate Posts for ___" Chain Link Fence, Double Gate	Each
Metal Gate Posts for ___" Chain Link Fence, Single Gate	Each
Double Gates, ___ High, ___ Wide, ___ Opening	Each
Single Gates, ___ High, ___ Wide, ___ Opening	Each
Additional Barbed Wire	Linear Foot

2 **SECTION 867**
 3 **FENCE RESET**

4 **867-1 DESCRIPTION**

5 Remove and reset existing fences of various types to the locations indicated in the plans or
6 where directed.

7 **867-2 CONSTRUCTION METHODS**

8 Reset the fence in a condition that is equal to or better than before the fence is removed.
9 Replace any of the fence components unnecessarily damaged by the Contractor's forces. Fill
10 any void created by fence removal.

11 The Contractor will be responsible for damage caused by livestock escaping or entering the
12 existing fenced area through the negligence of his forces.

13 If the owner of the fence desires to repair, rebuild or renew any parts of the fence and agrees
14 to furnish the materials without cost to the Contractor, then repair, rebuild, renew and reset
15 such fence using the material furnished by the owner at no additional cost to the owner or the
16 Department.

17 **867-3 MEASUREMENT AND PAYMENT**

18 ___ *Fence Reset* will be measured and paid in the linear feet of fence that has been
19 acceptably reset. Measurement will be made along the fence after it has been reset from
20 center of end post to center of end post. Such price includes, but is not limited to, removing,
21 hauling and re-erecting the existing fence; and furnishing and installing any fence components
22 unnecessarily damaged by the Contractor's forces.

23 Payment will be made under:

Pay Item	Pay Unit
___ Fence Reset	Linear Foot

24 **SECTION 869**
 25 **RELAPPING GUARDRAIL**

26 **869-1 DESCRIPTION**

27 Relap either existing or recently installed guardrail in accordance with the contract and where
28 directed.