804.01

Section 804. CONCRETE BARRIERS, GLARE SCREENS, AND FOUNDATIONS FOR LIGHT STANDARDS AND SIGN SUPPORTS

804.01. Description. This work consists of constructing concrete barriers, glare screens, and foundations for light standards and sign supports.

804.02. Materials. Provide material in accordance with the following:

- Concrete, Grade P2 ................................................................. 601
- Concrete, Grade S3 ................................................................. 701
- Mortar and Grout, Type R-2, Type H-1 ................................ 702
- Granular Material, Class II ...................................................... 902
- Curing Compound .................................................................. 903
- Dowels and Bar Reinforcement.............................................. 905
- Anchor Bolts and Nuts ............................................................ 908
- Joint Materials ....................................................................... 914
- Electrical Conduit .................................................................. 918
- Barrier Reflector Markers ...................................................... 922

804.03. Construction.

A. Preparation of Base. Prepare the base for concrete barrier in accordance with subsection 602.03.B.

B. Forming.

1. Concrete Barrier and Glare Screen. Use either fixed form or slip form methods, in accordance with Standard Plan R-49 Series, R-54 Series, and R-76 Series. Ensure a smooth surface with uniform appearance, located as required by the contract documents.

   Form the top and faces of barrier and glare screen within a tolerance of ½ inch over 10 feet, based on the Engineer's use of a 10-foot straightedge, except at grade changes and curves. Ensure barrier or glare screen is free of high or low areas and other irregularities. Repair minor defects while the concrete is plastic, using mortar obtained by screening out the coarse aggregate from the barrier, or glare screen concrete.

2. Light Standard Foundations and Sign Support Foundations. Cast in place light standard and sign support foundations using fixed forms, in accordance with Standard Plan R-50 Series and Standard Plan R-51 Series. The Engineer may approve casting the footings without using forms where soil conditions allow.
C. **Reinforcing, Anchor Bolts and Dowels.**

1. **Reinforcement.** Place steel reinforcement in accordance with subsection 706.03.E.

2. **Dowels.** Install anchor dowels as required where casting barrier separately from the base. Either set the dowels in the base while the concrete is plastic, or drill holes into the hardened concrete base and grout the dowels in place. Use non-shrinking grout selected from the Qualified Products List.

   If glare screen is cast separately from the barrier, drill holes for dowels into the hardened concrete and grout the dowels in place. Use non-shrinking grout selected from the Qualified Products List.

   Clean holes with oil-free compressed air before grouting dowels in place. If using hydraulic grout, wet the interior surfaces of holes just before grouting.

3. **Anchor Bolts.** Position the anchor bolts for light standards and sign supports, as required, and secure with a template. Correct improper positioning of anchor bolts as directed by the Engineer before placing the concrete. Leave the template in place for at least 24 hours after placing concrete.

D. **Finishing.** Finish barrier surfaces exposed to traffic with a smooth, uniform finish, created by a metal finishing tool, soft-bristled broom, or tools providing similar results. Correct minor blemishes and irregularities on the barrier surface with a fine textured broom.

   Do not add water to the concrete surface to aid finishing. Minimize brooming to avoid gouging concrete surface or exposing aggregate.

E. **Stenciling.** Stencil survey station numbers into the traffic sides of the barrier in accordance with subsection 602.03.L.

F. **Curing.** Spray two coats of white membrane curing compound on concrete barrier and glare screen. Ensure a continuous uniform film of material. Obtain the Engineer’s approval for the spray equipment before beginning work.

   Apply each coat at a rate of at least 1 gallon per 300 square feet of surface. Apply the first coat immediately after the removal of the forms, or immediately after the free water has left the surface of the concrete for slip-form construction. Apply the second coat between 30 minutes and 2 hours after the application of the first coat.

   Protect the treated surface with an unbroken film for at least 5 days. If the film is damaged during curing, including rain damage, apply a new
coat of material to the affected areas equal in curing value to the original coat.

G. **Joints.** Construct transverse joints as shown on the plans. If constructing the barrier on a concrete base or shoulder not separated by a sealed expansion joint, construct expansion joints and plane-of-weakness joints in the barrier directly over the corresponding joints in the concrete base or shoulder.

H. **Concrete Barrier Backfill.** In split barrier sections, backfill with Class II granular material, between the barrier sections and below the concrete filler slab. The Engineer may approve alternate backfill material.

Place the backfill material in layers no greater than 9 inches deep and compact. Do not backfill cast-in-place concrete barrier until the concrete attains 70 percent of the design strength.

I. **Weather and Temperature Limitations.** Protect the concrete in accordance with subsection 602.03.T.

J. **Permanent Barrier Reflector Marker.** Install barrier reflector markers on single face, double face, and split concrete barrier in accordance with Standard Plan R-49 Series, Standard Plan R-54 Series, and subsection 711.03.F.

804.04. **Measurement and Payment.**

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>Conc Barrier, Single Face, Type __</td>
<td>Foot</td>
</tr>
<tr>
<td>Conc Barrier, Double Face, Type __</td>
<td>Foot</td>
</tr>
<tr>
<td>Conc Barrier, Split, Type __</td>
<td>Foot</td>
</tr>
<tr>
<td>Conc Barrier Backfill, CIP</td>
<td>Cubic Yard</td>
</tr>
<tr>
<td>Glare Screen, Conc</td>
<td>Foot</td>
</tr>
<tr>
<td>Glare Screen, Conc, Split</td>
<td>Foot</td>
</tr>
<tr>
<td>Light Std Fdn, Conc Barrier</td>
<td>Each</td>
</tr>
<tr>
<td>Sign Support Fdn, Conc Barrier, Truss Type __</td>
<td>Each</td>
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</tbody>
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A. **Concrete Acceptance.** Conduct concrete quality control as specified in section 604. The Engineer will conduct quality assurance as specified in section 605. The Department will pay for this work based on the quality assurance results.

B. **Concrete Barrier and Glare Screen.** The Engineer will measure concrete barrier and glare screen parallel to the centerline, including transition sections to vertical-faced barrier. The Engineer will measure Conc Barrier, Split and Glare Screen, Conc, Split in place, including tapered sections at each end of the structure, in accordance with
Standard Plan R-49 Series and Standard Plan R-76 Series. The Engineer will not deduct gaps for light standard foundations, sign support foundations, or pier columns.

The Engineer will measure glare screen end sections as full-height sections.

C. Concrete Barrier, Double Face, Type A, and Concrete Barrier, Double Face, Type B. The unit price for Conc Barrier, Double Face, Type A includes the cost of constructing Conc Barrier, Double Face, Type A using dowels and a widened base, as for Conc Barrier, Double Face, Type B as shown on Standard Plan R-49 Series.

The unit price for Conc Barrier, Double Face, Type B includes the cost of required dowels.

The unit price for other pay items will include the cost of the base for Conc Barrier, Double Face, Type B.

D. Concrete Barrier Backfill, CIP. The Engineer will measure Conc Barrier Backfill, CIP based on plan quantities in accordance with subsection 109.01.A. The unit price for Conc Barrier Backfill, CIP includes the cost of backfill placed between split sections.

The Engineer will measure, and the Department will pay for the concrete filler slab between split sections, in accordance with subsection 803.04, as Sidewalk, Conc, 4 inch. The unit price for Sidewalk, Conc, 4 inch includes the cost of placing the fiber joint filler.

The Department will not make deductions in these quantities for gaps for light standard foundations, sign support foundations, or pier columns.

E. Steel Reinforcement. The unit prices for Glare Screen, Conc and Glare Screen, Conc, Split include the cost of steel reinforcement, if required.

F. Installing Glare Screen. The unit prices for Glare Screen, Conc and Glare Screen, Conc, Split include the cost of drilling into the existing barrier and grouting in the steel reinforcement if a concrete glare screen is cast on top of an existing concrete barrier.