

**ITEM 606.30630025 -SINGLE-SLOPE CONCRETE HALF-SECTION BARRIER  
WITH MOMENT SLAB (CAST-IN-PLACE)**

**1. DESCRIPTION:**

- 1.01 The work shall consist of constructing cast-in-place single slope concrete traffic barrier with moment slab in accordance with this specification, the contract plans, the lines and grades and locations shown on the plans or as established by the Engineer.

**2. MATERIALS:**

- 2.01 A. All materials in the finished barrier shall meet the requirements of the appropriate subsections of Section 700, MATERIALS DETAILS. Only Type 6 Portland cement will be allowed for any barrier, transitions, or special cast-in-place sections. These materials shall be sampled and tested in accordance with the Authority's written instructions.

- B. **Bar Reinforcement:** Steel reinforcing bars shall be billet steel bars (ASTM A615, Grade 60) ONLY, conforming to the requirements of Section 709-01, Bar Reinforcement, Grade 60.

- C. **Galvanizing of Bar Reinforcement:** After bar fabrication and bending, bar reinforcement shall be galvanized in accordance with Section 709-11.

Field repairs shall be in accordance with Section 556-3.03 B.2.

- D. **Miscellaneous Hardware:** Chairs, tie wires, and miscellaneous hardware used to support, position, or fasten the reinforcement shall be made of or coated with, a non-metallic material, or galvanized. The specific hardware that the Contractor proposes to use shall be approved by the Engineer. If the specific hardware is galvanized, the hardware shall be prepared and galvanized in accordance with the requirements of both ASTM A153 and Subsection 2.02-C, Galvanizing of Bar Reinforcement.

- E. **Mechanical Connectors.** Mechanical connectors used for galvanized bar reinforcement shall be galvanized in accordance with the requirements of ASTM A153, Zinc Coating (Hot Dip) on Iron and Steel Hardware prior to installation.

The galvanized threads of nuts and mechanical connectors used for assembly with galvanized bolts and reinforcement shall be tapped oversize prior to coating and need not be re-tapped afterwards. The minimum additional diameter for Class-2A threads galvanized to Class C is as follows:

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**2. MATERIALS: (cont'd)**

2.01 (cont'd)

<b><u>Class-2A Thread Diameter (in.)</u></b>	<b><u>Additional Diameter (mils)*</u></b>
7/16 and smaller	15
Over 7/16 to 1	20
Over 1	30

\* applies to both pitch and minor diameters, minimum and maximum limits.

The assembled connection on the galvanized reinforcing bars shall have no exposed uncoated steel. Any damage to the galvanized coating or uncoated area shall be repaired as indicated in Subsection 2.01-C., Galvanizing Bar Reinforcement.

The manufacturer of the mechanical connectors shall certify, in writing to the Engineer, that the mechanical connectors, with oversize threads (if applicable), meet the following three parameters:

1. The maximum slip, at 50% of the yield strength of the reinforcing bar, shall be 0.010". At least 70% of the maximum slip shall have occurred on the first cycle.
2. The maximum slip, at 90% of the yield strength of the reinforcing bar, shall be 0.018".
3. The tensile strength of the splice shall be at least 100% of the specified minimum tensile strength of the reinforcing bar.

F. Preformed Closed Cell Foam Material shall conform to Section 705-08.

2.02 Concrete shall meet the requirements for Class A Concrete in Section 501 – PORTLAND CEMENT CONCRETE - GENERAL.

2.03 Preformed Closed Cell Foam Material shall meet the requirements of Subsection 705-08 of the Standard Specifications.

2.04 Any modification requested in the proportioning, air content, slump or curing shall be approved by the Chief Engineer.

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**3. CONSTRUCTION DETAILS:**

- 3.01 The Contractor shall construct the barrier with moment slab as shown on the plans using cast-in-place methods.
- 3.02 The provisions of subsections 555-3.04 Handling and Placing Concrete, 555-3.07 Finishing, A. General, and 555-3.08 Curing, shall apply, except as modified herein:
- 3.03 Delivery of any Type 6 cement concrete to the project for use in the cast-in-place sections shall be made in a truck assigned exclusively to the delivery of such concrete to assure that the required visual color is maintained.

**A. Cast-in-Place Concrete Barrier with Moment Slab**

- 1. **Fabrication.** Barrier with moment slab shall be cast-in-place sections having a uniform length of approximately 16 ft or as indicated on the plans. These sections shall be cast to conform to the shape shown on the plans. Sections shall be separated by construction joints with provisions made at each joint for expansion. The barrier shall be so constructed that the joint opening at any point in the plane of the joint is not less than ½ in. or more than 1 in. Preformed Closed Cell Foam meeting the requirements of 705-08 shall be placed in the joint and recessed ½ in. from the faces of the barrier. When the concrete barrier is cast upon the moment slab, the construction joints in the barrier shall exactly match the construction joint in the moment slab.

The Contractor shall provide the Engineer with working drawings and detailed specifications for the fabrication and construction of the barrier with moment slab. The working drawings shall show the location of and the type of all reinforcement in the concrete barrier with moment slab. They shall be delivered to the Engineer for approval ten (10) working days before fabrication is to begin.

- a. **Forms.** Forms shall be metal and of such construction that there will be minimum interference to inspection for grade and alignment. Forms shall be braced and secured adequately so that no discernible displacement from alignment or grade will occur during placement of concrete.
- b. **Concrete Placing and Vibrating.** Concrete shall be placed in the barrier forms in accordance with the requirements of subsection 555-3.04 "Handling and Placing Concrete". Concrete shall be compacted by means of approved immersion type mechanical vibrators approved by the Engineer. The vibrator shall be inserted into the concrete at 12 in. intervals. The vibrators shall be of a size and weight sufficient to thoroughly vibrate the entire concrete mass without damaging or misaligning the forms and reinforcement.

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**3.0 CONSTRUCTION DETAILS: (cont'd)**

3.03 (cont'd)

- c. **Removal of Forms and Finishing Surfaces.** Forms shall be left in place for 24 hours or until, in the judgment of the Engineer, the concrete has sufficiently set so that the forms may be removed without injury to the barrier. Immediately after the forms have been removed, surfaces exposed to view shall have all projections and irregularities carefully removed and all cavities neatly filled with mortar of the proportion used in the concrete. The same brand of cement and the same kind of aggregate shall be used for filling cavities as was used in the original concrete mix. Plastering of repaired surfaces will not be allowed. The surface film of all such repaired surfaces shall be carefully removed before setting occurs.
- d. **Concrete Curing.** Curing of concrete barriers shall conform to the requirements given in Subsection 555-3.08, Curing. Other methods of curing may be used only when so indicated on the plans or in the itemized proposal.
- e. **Reinforcement.** The Contractor shall incorporate reinforcement as indicated on the plans. All reinforcement shall be galvanized.
- f. **Tolerances.** All concrete barrier produced by this method shall conform to the following tolerances:
  - a. *Placing Tolerances*
    - (1) Bar Reinforcement Cover 0 to + 1/2 inch.
    - (2) Width (top) 0 to + 1/4 inch.
    - (3) Width (base) 0 to + 1/2 inch.
  - b. *Dimensional Tolerance*
    - (1) Cross-sectional dimensions shall not vary from the dimensions shown by more than 1/4 inch.
    - (2) The barrier shall not be out of plumb by more than 1/4 inch.
    - (3) Longitudinal dimensions shall not vary from the dimensions shown by more than 1/4 inch per 10 foot of the barrier.
    - (4) When checked with a 10 foot straight edge, irregularities shall not exceed 1/4 inch.

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**3.0 CONSTRUCTION DETAILS: (cont'd)**

3.03 (cont'd)

**B. Acceptance**

The acceptance of the concrete barrier with moment slab (cast-in-place) will be based on the results of the materials sampled and tested as required under the appropriate Materials subsection and the inspection of the barrier in its final position with respect to alignment geometric configuration, structural integrity and surface finish.

**4. METHOD OF MEASUREMENT:**

- a. The work shall be measured by the pay units indicated below for those items that are actually furnished and placed in accordance with the plans, specifications, standard sheet and as approved by the Engineer.
- b. Concrete barrier with moment slab when paid by the foot shall be measured along the axis of the barrier and between its extreme outer limits.

**5. BASIS OF PAYMENT:**

- a. The unit prices bid for the items of work as enumerated below shall include the cost of all labor, material and equipment necessary to satisfactorily complete the work. Progress payments will be made when the barrier is in its final position and has cured the required length of time. Payment will be made, at the contract unit price, for 90% of the quantity properly placed. The remaining 10% of the quantity will be paid for upon final acceptance of the concrete barrier. Payment will be made under:

<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>PAY UNIT</b>
606.30630025	Single Slope Traffic Barrier With Moment Slab (Cast-in-Place)	Linear Feet