

## 600 INCIDENTALS

### ITEM 609 - CURBS

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**609.01 Description.** This work shall consist of constructing curb and combination curb and gutter of the specified material and type, in conformity with the lines, grades and cross sections shown on the plans or established by the Engineer. This item shall also include necessary excavation, backfill, furnishing and installing joint materials, and the disposal of surplus excavation and discarded materials in accordance with Item 203. Except as noted below, all work required will be done in accordance with Item 451.

**609.02 Materials.** Concrete shall be *Class C* in accordance with 499. Asphalt concrete shall meet the mix composition requirements of Items 402 and 404, with the fine aggregate content set at the maximum permitted under the applicable composition tables. The type of mix used shall be the same as specified for surface course on the project.

Other materials as follows:

Expansion joint material.....	705.03
Aggregate base .....	304, 703.04

**609.03 Cast-In-Place.** Concrete Curb, Mountable Curb and Combination Curb and Gutter, these items shall be as follows:

- (a) **Forms and Joints.** Forms for curb shall be approved metal forms. Forms for combined curb and gutter shall be of the following material: flexible steel or an approved grade of plywood not less than 1/4 inch (6.4 mm) nominal thickness for curves with radii of 25 feet (7.6 m) or less; an approved grade of wood not less than 1 inch (25 mm) nominal thickness for curves with radii of 25 to 200 feet (7.6 to 61 m); rigid steel for a straight line and curves with radii greater than 200 feet (61 m). They shall be securely braced and held to line and grade specified. The inner surface of the forms shall be clean and coated with a suitable oil immediately before the concrete is placed.

All curb combination curb and gutter shall have a minimum of 1/8 inch (3.2 mm) contraction joints constructed at 10 foot (3.0 m) intervals. The joint may be constructed with the use of metal separator plates, by the use of a grooving tool, or sawed in accordance with Section 451.08. The depth of joint shall average 2 inches (50 mm) or more for combination curb and gutter, and for curb shall average 1/5 or more of the curb height. When the joints are made by the use of grooving tool or by sawing, a 1/2 inch (12.7 mm) expansion joint strip the depth of the curb and gutter shall be used at the beginning and end of curves which radius is less than 200 feet (61 m) and at the end of each days' operation.

Forms shall remain in place at least 5 hours between June 1 and September 15; prior to June 1 and after September 15, forms shall not be removed on the same day as the concrete is placed unless directed otherwise by the Engineer.

Curb forms shall be left in place for such length of time that the removal of same does not crack, shatter or otherwise injure the concrete.

- (b) **Aggregate Base.** After the curb and gutter forms have been placed in position, the subgrade shall be cleaned of materials displaced by such operation and the aggregate base formed in conformity to the cross section shown on the plans.
- (c) **Placing.** The concrete shall be placed in the forms, prepared as above described, in layers thin enough to permit thorough spading. It shall be spaded in such a manner as to eliminate all voids.
- (d) **Curb Machine.** Concrete curb or curb and gutter may be placed with a self-propelled machine. The proper density and cross section shall be obtained by forcing the concrete through a mold of the proper cross section. Where a track is used the track on which the machine operates shall be set and held to the exact line and grade given by the Engineer. The concrete shall be of such consistency that it can be molded into the desired shape and then will remain as placed without slumping of the vertical faces. The slump test may be omitted and the yield determined from the volume required, adjusted for waste.
- (e) **Finishing.** The top of the curb shall be floated in such a manner to thoroughly compact the concrete and produce a smooth and even surface. The addition of extra mortar to secure this result will not be permitted. Under no circumstances shall water be added to the concrete surface, nor will retempering of mortar or a grout paint coat be permitted in finishing. The edge of the curb shall be rounded by the use of a tool especially

designed for the purpose. The exposed face of the curb shall be rubbed with a float immediately after removing the forms. Unnecessary tool marks shall be eliminated. The finished surface shall be free of irregularities and waves and shall be uniform in texture.

When scoring of curb face is required all rounded edges shall be given a smooth finish with edging tools of the required shape.

The top of curb shall be marked to indicate location of water services (W) or water mains (M).

An approved opening shall be constructed through the curb at the elevation of the gutter, where a roof drain outlet pipe is encountered, and shall be made and finished at the same time as the curb and gutter is constructed.

- (f) **Protection.** Concrete curb and combination curb and gutter shall be placed and cured in accordance with Sections 451.06 and 451.10 except curing compound shall be 705.07, Type 2 (white opaque).
- (g) Vibrating screed equipment may not be operated on existing curb or lane until the concrete has been in place for at least 72 hours.
- (h) Where Item 310 subbase is required concrete curb or combination curb and gutter shall be constructed after the subbase is placed and accepted.

**609.04 Precast Concrete Curb.** These units may be used in lieu of cast-in-place curb. They shall be made and installed in accordance with the requirements of this item.

**609.05 Concrete Curb-Slip Form Method.** Concrete Curb, Mountable Curb or Combination Curb and Gutter, if the Contractor elects, may be constructed without the use of fixed forms and shall meet the following requirements:

- (a) The curb shall not vary by more than 1/4 inch (6.4 mm) from the proposed typical section.
- (b) The curb shall have a surface variation not to exceed 1/4 inch (6.4 mm) in a 10 foot (3.0 m) length.
- (c) 1/2 inch (12.7 mm) construction joint material shall be placed for the full depth of curbing whenever it becomes necessary to suspend the work for 30 minutes or more. Sections of curb exceeding the above tolerances or failing to meet other curb requirements specified herein shall be replaced by the Contractor at his expense prior to placing the base, finished pavement or Asphalt Concrete whichever is applicable.

**609.06 Asphalt Concrete Curb.** The specified asphalt concrete material shall be furnished and placed to form a curb of the required cross section by one of the following methods or by any other method approved by the Director.

Method 1. After completion of the surface course, the area to be occupied by the curb shall be painted or sprayed with bituminous material Section 702.02, RC 70 or RC 250 at the rate of 0.15 gallons per square yard (0.5 L/m<sup>2</sup>). Only the area to be occupied by the curb shall be so treated. The curb shall then be placed with a hand-operated or self-propelled machine consisting of a hopper and power-driven screw which forces the material through a tube by an extrusion method. The proper density and cross section of the curb shall be obtained by forcing the material through a die attached to the end of the extrusion tube.

Method 2. The material for the curb shall be placed as an independent operation preceding the final rolling of the surface course upon which the curb is to be placed. Loose material of sufficient height shall be placed and shaped by hand methods using suitable templates or by other means that will produce the specified cross section. The loose material shall then be compacted to final cross section dimensions by use of a hand-operated mechanical vibrating tamper equipped with a compacting shoe of such shape that will produce the specified cross section of the curb.

**609.07 Method of Measurement.** The footage measured will be the actual number of linear feet (meters) of curb and combination curb and gutter or asphalt curb complete in place, measured along the front face of the curb section.

**609.08 Basis of Payment.** The accepted quantities of specific items of curb and combination curb and gutter or asphalt curb will be paid for at the contract price. Aggregate base and excavation, backfill, expansion joint material, sawing and other related miscellaneous items will not be paid for separately, but the cost thereof shall be included in the cost of curb or curb and gutter of which they are a part.

Payment will be made at the contract price for:

<b>Item</b>	<b>Unit</b>	<b>Description</b>
609	Linear Foot (Meter)	Curb, Type ____
609	Linear Foot (Meter)	Combination Curb and Gutter
609	Linear Foot (Meter)	Asphalt Concrete Curb