

**SECTION 613
CONCRETE CURBS, GUTTERS, AND SIDEWALKS**

DESCRIPTION

613.01.01 General. This work consists of constructing curbs, gutters, sidewalks, ramps, local depressions, and driveways.

MATERIALS

613.02.01 General. Material shall conform to the following Sections:

Portland Cement Concrete	Section 501
Concrete Structures	Section 502
Reinforcing Steel	Section 505

Concrete shall be Class A or Class AA concrete as shown in the proposal. Class D may be substituted for Class A concrete or Class DA may be substituted for Class AA concrete.

The epoxy adhesive used to bond concrete curbs to new or existing pavements shall conform to AASHTO M235 (ASTM C881), Type I, Grade 1, 2, or 3—Class A, B, or C.

CONSTRUCTION

613.03.01 Earthwork. Construct the subgrade true to grade and cross section. Water and roll or hand tamp subgrade to the required compaction for the adjacent roadway or base course.

Remove all soft and spongy material to a depth of not less than 150 mm (6 in.) below subgrade elevation for curbs, gutters, local depressions, and driveways and 75 mm (3 in.) below for sidewalks. Fill the resulting space with earth, sand, or gravel of a quality that, when moistened and rolled or tamped, will form a firm and solid foundation.

Test the completed subgrade for grade and cross section by means of a template extending the full depth and supported on the side forms. Thoroughly water the subgrade and forms in advance of placing concrete.

613.03.02 Existing Curbs, Gutters, and Sidewalks. Where the limits of the new work fall within reasonable distance to existing scoring lines or expansion joints, remove existing concrete to those scoring lines or expansion joints if directed. Where the limits of the new work do not fall within reasonable distance to existing scoring lines or expansion joints, saw cut the limits of the new work and remove existing concrete to the saw cut lines.

613.03.03 Forms. The depth of forms for curbs shall be equal to the full depth of the curb. The depth of outside forms for concrete gutters shall be equal to the full thickness of the gutter. Timber forms shall be surfaced on the side placed next to the concrete, have a true smooth upper edge, and be not less than 38 mm (1 1/2 in.) thick. Do not use warped forms or forms not having a smooth, straight upper edge.

Use benders or thin plank forms, rigidly placed, on curves, grade changes, or for curb returns.

Do not use steel forms on radii less than 60 m (200 ft).

Make back forms for curb returns of 12.5 mm (1/2 in.) benders, for the full height of the curb, cleated together. Carefully set forms to the alignment, grade, and dimensions required. Hold forms rigidly in place by the use of pairs of iron stakes placed at intervals not to exceed 1.2 m (4 ft). For metal forms, do not space iron stakes more than 1.8 m (6 ft) apart. Use clamps, spreaders, and braces where required to insure rigidity in the forms.

Do not remove forms until concrete has set sufficiently to prevent distorting or cracking.

Clean forms thoroughly each time they are used and coat with a light oil as often as necessary to prevent the concrete from adhering to them.

613.03.04 Curb and Gutter Joints. Construct expansion joints 12.5 mm (1/2 in.) wide in curbs and gutters at 27 m (90 ft) intervals, at each side of structures, and at the ends of all curb returns. Do not install expansion joints within 6 m (20 ft) of an island nose. Fill expansion joints with joint filler strips 12.5 mm (1/2 in.) thick conforming to Subsection 707.03.01. Shape expansion joint filler to the cross section of the curb and gutter.

Construct expansion joints at right angles to the line of the curb and gutter.

Score weakened plane joints at right angles to the line of curb and gutter to a depth of 12.5 mm (1/2 in.) at 3 m (10 ft) spacing with a jointer tool having a radius of 12.5 mm (1/2 in.).

613.03.05 Sidewalk Expansion Joints. Construct transverse expansion joints 12.5 mm (1/2 in.) wide at all sidewalk returns and opposite expansion joints in adjacent curb. Where curb is not adjacent, construct expansion joints at intervals of 9 m (30 ft).

Fill expansion joints with joint filler strips 12.5 mm (1/2 in.) thick conforming to Section 707.

Place the joint filler with the top edge 6 mm (1/4 in.) below the surface and hold in place by means of steel pins driven into the subgrade and spaced sufficiently close to prevent warping of the filler during floating. Upon completion of floating, remove the pins. Upon completion of finishing operations, edge the joint with an edging tool having a radius of 12.5 mm (1/2 in.).

613.03.06 Curb and Gutter Construction. Construct curbs at driveways and ramps as shown on the plans.

Curbs may be constructed by the use of an approved curb forming machine.

Where plant mixed surfacing is to be placed around or adjacent to manholes, drop inlets or catch basins in gutters, local depressions, or driveway areas, do not construct such structures to final grade until after the curbs and gutters have been constructed for an acceptable distance on each side of the structure.

Where Portland cement concrete pavement is to be placed around or adjacent to manholes, drop inlets, or catch basins in gutters, local depressions, or driveway areas, do not construct such structures to final grade until after the concrete pavement has been constructed.

Anchor concrete curbs over new or existing pavements with epoxy adhesive conforming to Subsection 613.02.01. Cure the new pavement for a minimum of 2 weeks before bonding the curb thereon. Thoroughly clean the surface of all loose material, dirt and dust. Apply the mixed adhesive to the dry and cleaned surface in a strip extending full width and length of the curb.

Fill the forms to the top. Place concrete so that there will be no rock pockets. Concrete may be compacted by means of approved mechanical vibrators. Immediately after removing the front curb forms, trowel the face of the curb smooth to a depth of not less than 50 mm (2 in.) below the flow line or to the flow line of integral curb and gutter, and then finish with a steel trowel. Finish the top and round the front and back edges as shown on the plans.

After troweling, give the face of the curb a fine brush finish with brush strokes parallel to the line of the curb.

The top and face of the finished curb shall be true and straight, and the top surface of curbs and gutters shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge 3 m (10 ft) long is laid on the top or face of the curb or on the surface of gutters, the surface shall not vary more than 3 mm (1/8 in.) from the edge of the straightedge, except at grade changes or curves.

Cure the exposed surfaces according to Subsection 501.03.09.

613.03.07 Sidewalk and Driveway Construction. Place reinforcing steel, if shown on the plans, according to the construction requirements of Section 505.

Finish sidewalks and driveways to a smooth and uniform texture by troweling and by floating with wooden floats, and, if directed, by cross-brooming or burlap-finishing. Score weakened plane joints to a depth of 12.5 mm (1/2 in.) and at right angles to the line of work with a jointer tool having a radius of 12.5 mm (1/2 in.).

Score weakened plane joints so as to form squares or other shapes to match other such markings on similar existing structures in the vicinity.

Satisfactorily finish the surface finish of ramps rougher than the adjacent sidewalk.

When a 3 m (10 ft) straightedge is placed on the sidewalk or driveway, the surface shall not vary more than 3 mm (1/8 in.) from the edge of the straightedge, except at grade changes. The finished surface shall be free from blemishes.

Cure the concrete surface according to Section 501.03.09.

METHOD OF MEASUREMENT

613.04.01 Measurement. Curb, glue down curb, gutter, and combination curb and gutter will be measured by the linear meter (linear foot) along the base of the curb face or along the flow line of the gutter. Such measurement will be continuous along such line extended across driveway and ramp openings.

Sidewalk and driveways will be measured by the square meter (square yard).

Ramps will be measured by the square meter (square yard) for those ramps constructed in existing sidewalk and curb and gutter areas where new sidewalks and curbs and gutters are not required to be constructed. Ramps constructed in new sidewalk and curb and gutter areas shall be included in the new sidewalk and new curb and gutter bid items.

The back curb constructed at the back of any curb ramps will be measured by the square meter (square yard) as the ramp or sidewalk bid items.

In the case of integral curb and walk, the width of the walk shall extend to the back face of the curb. In the case of steps, the area measured will be the summation of the areas of the treads, computed by multiplying the width of the tread by the length of the tread out to out of integral wall, if any.

Driveways for multi-family, commercial, and industrial driveways will be measured by the square meter (square yard), including the area for adjacent curbs and valley gutters as hereinafter specified. The curb constructed at the sidewalk or ramp edge of multi-family, commercial, or industrial driveways, which is integral with the driveway slab, will be measured by the square meter (square yard) to the back face of curb as the driveway bid item. Also the valley gutter constructed across the multi-family, commercial, or industrial driveways will be measured by the square meter (square yard) as the driveway bid item.

BASIS OF PAYMENT

613.05.01 Payment. The accepted quantities, measured as provided above, will be paid for at the contract price per unit of measurement for the pay items listed below that are shown in the proposal. Payment will be full compensation for the work prescribed in this Section.

All excavation and base course work will be paid for as provided in the respective Sections of the specifications; however, when bid items are not provided for excavation or base course work, such work will be considered subsidiary to the pay item contained herein.

Payment will be made under:

Pay Item Pay Unit

(class) Concrete Curb (type)	Linear Meter (Linear Foot)
(class) Concrete Gutter (type).....	Linear Meter (Linear Foot)
(class) Concrete Curb and Gutter (type)	Linear Meter (Linear Foot)
(class) Concrete Sidewalk (depth)	Square Meter (Square Yard)
(class) Concrete Driveway (depth).....	Square Meter (Square Yard)
(class) Concrete Driveway (depth) (Reinforced)	Square Meter (Square Yard)
(class) Concrete Ramp (depth)	Square Meter (Square Yard)
(class) Concrete Glue Down Curb (type)	Linear Meter (Linear Foot)