

ITEM 17

CEMENT CONCRETE CURB, GUTTER, OR COMBINED CURB AND GUTTER

17.01 SCOPE OF WORK

This work shall consist of curb, gutter, or combined curb and gutter constructed of Portland Cement Concrete in accordance with these Specifications, at the locations and in reasonably close conformity with the lines, grades and dimensions shown on the Plans, or established by the Engineer. It shall also include removal of existing curb and gutter as directed.

17.02 MATERIAL

(a) Materials shall meet the applicable requirements of:

- Item 3 Concrete
- Item 14 Mineral Aggregate Base
- Item 25 Preformed Joint Filler
- Item 73 Aggregate for Concrete

Concrete for curb, gutter, and combined curb and gutter shall be Class A concrete, meeting all of the requirements prescribed in Item 3, "Concrete," with the modification specified hereinafter.

(b) When the use of an approved curb machine is authorized, the following combination of materials shall be used:

Water	4.0 Gallons (Maximum)
Cement	94.0 Pounds
Coarse Aggregate-Size No. 78	260.0 Pounds
Clean Sand	245.0 Pounds

(c) Entrained air will not be required in curb concrete made with the aforementioned combination.

(d) The water and percentages of fine and coarse aggregate may be adjusted within the above limits to permit satisfactory placement.

(e) Compressive test specimens shall be made by vibratory method in accordance with AASHTO T 23, "Standard Method for Making and Curing Concrete ,Compression and Flexural Strength Test Specimens in the Field," or other approved methods.

17.03 EQUIPMENT

(a) Forms

Forms, except the templates between ten-foot (10') sections, may be either wood or metal meeting the requirements prescribed in Item 3.16. The templates shall be one-eighth inch (1/8") thick metal, of the same width as that of the curb, gutter, or combination curb and gutter, and not less than one-half inch (1/2") more in depth than the respective depth of the type curb and gutter being constructed. The templates shall have lugs, or other devices to hold them in position during placing of the concrete and shall be of such design as to permit strike-off template of the form, and shape of the gutter shall be used to shape the top surface of the gutter.

(b) Compaction Equipment

Compaction of subgrade shall be accomplished by any type of tamping or rolling equipment that will produce the desired results.

(c) Mixing and Finishing Equipment

1. Mixers shall meet the requirements of Item 3.13, except that the stipulation requiring the use of a broom and bucket will be waived.
2. Any extruding type curb machine may be used when approved by the Engineer.
3. Finishing equipment shall include satisfactory floats, trowels, edgers, spades and tamps.

17.04 SUBGRADE PREPARATION

Subgrade preparation for curb, gutter, and combined curb and gutter shall be made to the required depth, and to a width that will permit the installation and bracing of the forms. The subgrade shall be shaped and compacted to a firm, even surface, in reasonably close conformity with the grade and section shown on the Plans. All soft and yielding material shall be removed and replaced with acceptable material, which shall then be compacted as directed. The subgrade shall be finished and brought to true line and grade with a minimum two-inch (2") compacted layer of mineral aggregate base meeting the requirements of Item 14 of these Specifications.

17.05 EXPANSION JOINTS

Expansion joints shall be formed at the intervals and locations shown on the Plans, using preformed filler one-fourth inch (1/4") thick, unless otherwise specified. They shall be placed in line with corresponding expansion joints in adjoining pavement or other construction. Joint filler shall be cut to the full cross-section of the curb, gutter, or combined curb and gutter.

17.06 LIMITATIONS ON MIXING

Limitations on the mixing of concrete shall meet the requirements of Item 3.13 of these Specifications.

17.07 MIXING, PLACING, AND FINISHING CONCRETE

(a) Concrete shall be mixed in accordance with requirements of Item 3.13 of these Specifications.

(b) Immediately before placing the concrete, the subgrade shall be thoroughly wetted, and the forms given a coating of light oil. Where removed and used again, the forms shall be thoroughly cleaned and oiled each time before using. Placing concrete shall be performed as provided for under Item 3.14 of these Specifications.

(c) The concrete shall be placed immediately after mixing. The edges, sides, or faces, shall be thoroughly spaded and vibrated sufficiently to consolidate the concrete thoroughly and bring the mortar to the surface, after which the surface shall be finished smooth and even by means of a float.

(d) Concrete curb, gutter, or combined curb and gutter, shall be constructed reasonably true to line, grade and cross-section and, unless otherwise specified on the Plans, in sections having uniform lengths of ten feet (10'). The length of these sections may be reduced where necessary for closures, but no section less than six feet (6') will be permitted. The templates shall be set carefully before the placing of the concrete and allowed to remain in-place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in-place. The forms on the face of all curbs shall be removed as soon as the concrete will hold shape and the surface then floated with a float to a smooth and even finish. No plastering will be permitted. Unless otherwise specified, the top edges of the curb and the edge of the gutter shall be rounded to a radius of three-fourths inch (3/4"), and the edges on each side of templates and expansion joint material shall be finished with an edging tool with a radius of not over one-fourth inch (1/4"), and then all lines or marks shall be removed with a wet brush. Any exposed surface or surfaces against which some rigid type of construction is to be made shall be left smooth and uniform so as to permit free movement of the curb, gutter or combined curb and gutter.

(e) All tool marks shall be removed with a wetted brush or float, and the finished surface shall present a uniform and pleasing appearance.

(f) Extruding type curb machines may be used at the option of the Contractor and with approval of the Engineer where feasible, provided the mix meets requirements for Item 17.02.

(g) When the use of extruding type curb machines is permitted, finishing shall be performed as specified above.

(h) Weep holes or drainage openings shall be placed through curbs as indicated on the Plans or as directed by the Engineer, but when so placed, unless otherwise indicated or directed, there shall be placed at least one-half cubic foot of coarse aggregate behind each opening.

17.08 PROTECTION AND CURING

(a) Immediately after finishing the concrete, protection and curing shall be performed in accordance with the provisions of Item 3.15 of these Specifications.

(b) The Contractor shall protect the curb, gutter, and combined curb and gutter until finally accepted. Any concrete that is damaged during that period shall be repaired by removing and reconstructing each ten-foot (10') section that has been damaged. This reconstruction shall be at the Contractor's expense.

17.09 BACKFILLING

Immediately after the concrete has set sufficiently and the forms have been removed, the space back of the curb or combined curb and gutter shall be filled with suitable material. This material shall be placed in layers not exceeding four inches (4") in loose thickness, and compacted until firm and stable.

17.10 FINAL CLEANUP

Final cleaning up shall be performed in accordance with the requirements of Special Conditions.

17.11 METHOD OF MEASUREMENT (IF APPLICABLE)

(a) Concrete curb, concrete gutter, and concrete combined curb and gutter will be measured for payment by the linear foot, complete-in-place. Linear measurements will be surface measurements taken along the center of gravity of the section.

(b) No measurement for payment will be made for incidental excavation preparing the subgrade, for backfill, for expansion joint materials, unless otherwise indicated on the Plans, as these are necessary parts of the construction. No additional payment shall be made for construction of handicap curb ramps located as designated by the Engineer in accordance with State Law. All mineral aggregate base used for fine grading and subgrade preparation as specified in Item 17.04 shall be included in the unit prices of the various items.

(c) No measurement for payment will be made under this section for curb which is integral with concrete pavement or concrete base unless otherwise specified on the Plans or in the Contract.

17.12 BASIS OF PAYMENT (IF APPLICABLE)

(a) The accepted quantities of concrete curb, concrete gutter, or concrete combined curb and gutter will be paid for at the contract unit price per linear foot for the respective items.

(b) Payment will be made under:

Item No.	Pay Item	Pay Unit
17A	Type "A" Curb and Gutter	L.F.
17B	Type "B" Curb and Gutter	L.F.
17C	Type "C" Detached Curb	L.F.
17D	Type "D" Detached Curb	L.F.
17E	Type "E" Mountable Curb	L.F.
17R	Removal of Existing Curb and Gutter	L.F.
17A (ME)	Type "A" Curb and Gutter (Machine Extruded)	L.F.
17B (ME)	Type "B" Curb and Gutter (Machine Extruded)	L.F.
17C (ME)	Type "C" Detached Curb (Machine Extruded)	L.F.
17D (ME)	Type "D" Detached Curb (Machine Extruded)	L.F.
17E (ME)	Type "E" Mountable Curb (Machine Extruded)	L.F.

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