

SECTION 02520
CEMENT CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

This Work shall consist of curb, gutter, or combined curb and gutter constructed of portland cement concrete in accordance with TDOT Standard Specifications Section 702 and this Section at the locations and in reasonably close conformity with the lines, grades, and dimensions shown on the plans or established by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

Section 01580 - Traffic Signals
Section 01710 - Cleanup and Restoration
Section 02200 - Earthwork
Section 02210 - Embankments
Section 02500 - Paving and Surfacing
Section 02522 - Cement Concrete Sidewalks, Driveways, and Median Pavement
Section 03300 - Cast-In-Place Concrete

1.3 APPLICABLE SPECIFICATIONS

"STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", Latest Revision, Tennessee Department of Transportation (TDOT)

"SUBDIVISION SPECIFICATIONS FOR STREETS AND ROADS", Latest Revision, Metropolitan Government of Nashville and Davidson County

1.4 APPLICABLE REFERENCES

"American Association of State Highway and Transportation Officials" (AASHTO), Latest Revision

"American Society for Testing and Materials" (ASTM), Latest Revision

"American Concrete Institute" (ACI), Latest Revision

"Americans with Disabilities Act" (ADA), Latest Revision

"Americans with Disabilities Act Accessibility Guidelines" (ADAAG), Latest Revision

"Architectural Barriers Act" (ABA), Latest Revision

PART 2 - MATERIALS

2.1 GENERAL REQUIREMENTS

Materials shall meet the applicable requirements in TDOT Standard Specifications Sections 604 and 913 and in Section 03300 - Cast-In-Place Concrete together with the conditions and requirements set forth in this Section.

2.2 PREFORMED JOINT FILLER

Preformed joint filler shall conform to the requirements in TDOT Standard Specifications Subsection 905.01 and in Section 03300 - Cast-In-Place Concrete unless otherwise specified in the plans.

2.3 DRAIN PIPE

This pipe shall conform to AASHTO M 178 or AASHTO M 179 for the specified material and diameters. Unless otherwise specified the pipe shall be of standard quality class. When specified the pipe spigot shall have integral spacer lugs to provide for an annular opening and self centering feature.

2.4 CONCRETE

Concrete for curb, gutter, and combined curb and gutter shall be Class A concrete meeting all the requirements prescribed in TDOT Standard Specifications Section 604 and in Section 03300 - Cast-In-Place Concrete with the following modifications:

- A. When the use of a curb machine is authorized the Contractor may request a concrete design based on the following:

<u>Water</u>	<u>Cement</u>	Combined Coarse and <u>Fine Aggregate</u>
4 gallons (maximum)	94 lbs.	505 lbs.
coarse aggregate		size nos. 7, 57, 67, or 78
fine aggregate		45% to 60%

- B. Entrained air will not be required in curb concrete made with the above combination.

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

- D. Compressive test specimens may be made by the vibratory method in accordance with AASHTO T 23 or other approved methods.

PART 3 - EQUIPMENT

- A. Forms except the templates between ten (10) foot sections may be either wood or metal meeting the requirements prescribed in TDOT Standard Specifications Subsection 701.03. The templates shall be one-eighth (1/8) inch thick metal of the same width as that of the curb, gutter, or combination curb and gutter and not less than one-quarter (1/4) inch 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 removal without causing damage to the concrete. For gutters a strike off template of the form and shape of the gutter shall be used to shape the top surface of the gutter.

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

C. Mixers shall meet the requirements in TDOT Standard Specifications Subsection 604.12 and in Section 03300 - Cast-In-Place Concrete. A curb machine that will place the concrete in a satisfactory manner may be used when approved by the Engineer. Finishing equipment shall include satisfactory floats, edgers, spades, and tamps.

PART 4 - EXECUTION

4.1 GENERAL

Curb, gutter, or combined curb and gutter shall meet all the applicable requirements of the ADA, ADAAG, and ABA. The normal gutter slope of 1:12 (vertical:horizontal) shall be reduced to 1:20 (vertical:horizontal) at combination curb ramps (Metro Standard Drawings ST-301 and ST-302).

4.2 PRELIMINARY WORK

Clearing and grubbing, removal of structures and obstructions, excavation and undercutting, and embankment construction shall be performed in accordance with the provisions in TDOT Standard Specifications Sections 201, 202, 203, and 205 and in Section 02100 - Site Preparation, Section 02200 - Earthwork, Section 02210 - Embankments, and Section 02225 - Earthwork for Structures and Pipes respectively.

4.3 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 in the plans. All soft and yielding material shall be removed and replaced with acceptable material which shall then be compacted as directed.

4.4 EXPANSION JOINTS

Expansion joints shall be formed at the intervals and locations shown in the plans using preformed filler three-quarters (3/4) inch 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 curb and gutter.

4.5 LIMITATIONS OF MIXING

Limitations on the mixing of concrete shall be as prescribed in TDOT Standard Specifications Subsection 501.11 and in Section 03300 - Cast-In-Place Concrete.

4.6 MIXING, PLACING, AND FINISHING CONCRETE

Concrete shall be mixed in accordance with the requirements in TDOT Standard Specifications Subsection 604.14 and in Section 03300 - Cast-In-Place Concrete.

A. Immediately before placing the concrete the subgrade shall be thoroughly wetted and the forms given a coating of light oil. The forms shall be thoroughly cleaned and oiled each time before using. Placing concrete shall be performed as provided for in TDOT Standard Specifications Subsection 501.12 except that the mechanical spreader will not be required.

B. 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 wooden float.

C. Concrete curb, gutter, and combined curb and gutter shall be constructed reasonably true to line, grade, and cross section and unless otherwise specified in the plans in sections having uniform lengths of ten (10) feet. The length of these sections may be reduced where necessary for closures but no section less than six (6) feet 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 its shape and the surface then floated with a wooden 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 the radius as shown on the standard drawings 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-quarter (1/4) inch and then all lines or marks shall be removed with a wet brush. The back of curbs shall be finished not less than three (3) inches below the top of backfill against the curb. 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.

D. All tool marks shall be removed with a wetted brush or wooden float and the finished surface shall present a uniform and pleasing appearance.

E. When the use of curb machines is permitted finishing shall be performed as specified above except that contraction joints may be sawed a minimum depth of one-quarter (1/4) the thickness of the section at intervals not less than six (6) feet nor more than ten (10) feet in lieu of constructing the curbs in sections.

F. Weep holes or drainage openings shall be placed through curbs as indicated in the plans or as directed by the Engineer and coarse aggregate shall be placed behind each opening as needed.

4.7 PROTECTION AND CURING

A. Immediately after finishing the concrete protection and curing shall be performed in accordance with the provisions in TDOT Standard Specifications Subsection 501.18.

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 (10) foot section that has been damaged. This reconstruction shall be at the Contractor's expense.

4.8 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 (4) inches in loose thickness and compacted until firm and stable.

4.9 FINAL CLEANUP

Final cleanup shall be performed in accordance with the requirements in TDOT Standard Specifications Subsection 104.11 and in Section 01710 - Cleanup and Restoration.

PART 5 - MEASUREMENT AND PAYMENT

5.1 METHOD OF MEASUREMENT

A. Concrete curb, concrete gutter, and concrete combined curb and gutter will be measured for payment by the cubic yard complete in place. The volume per linear foot of length shall be obtained from the dimensions shown in the plans. Linear measurements will be surface measurements taken along the center of gravity of the section.

B. No measurement will be made for preparing the subgrade, for backfill, for expansion joint materials, or drain pipe unless otherwise indicated in the plans.

C. No measurement for payment will be made for curb integral with concrete pavement or concrete base unless otherwise specified in the plans or in this CONTRACT.

5.2 BASIS OF PAYMENT

The accepted quantities of concrete curb, concrete gutter, or concrete combined curb and gutter will be paid for at the Contract Unit Bid Price per cubic yard for the respective items.

END OF SECTION - 02520