

SECTION 1500- CONCRETE CURB, CURB AND GUTTER, SIDEWALK, AND DRIVEWAY ENTRANCES

1501 SCOPE. This section covers concrete curb, curb and gutter, concrete sidewalk, concrete driveway entrances, and exposed aggregate concrete work, including reinforcing steel, forms, joints, finishing, curing, and other appurtenant work.

1502 GENERAL. All construction covered in this section shall conform to the requirements of Section 2000 *Concrete*. All curb or curb and gutter construction shall be performed prior to placement of pavement or sidewalk, except when otherwise approved by the Engineer. All forms shall be in good condition with not more than one-fourth (1/4") inch variation in horizontal and vertical alignment for each ten (10') feet in length.

1503 MATERIALS.

- A. Concrete: Conform to the requirements of Section 2000 *Concrete*.
- B. Isolation Joint Filler: Isolation joints shall be formed with pre-formed isolation joint filler of the non-extruding and resilient type which shall meet the requirements of ASTM D1751 or D1752.
- C. Detectable Material for Ramps: The material used to provide contrast shall be an integral part of the walking surface. The material for detectable surface shall consist of:
 - 1. Grouted-in-Place Clay Pavers
 - a. Paving brick shall be 2 1/4" x 3 5/8" x 7 5/8" and shall meet the requirements of ASTM C902 for Class SX, Type 1 brick and ASTM C1272.
 - b. The bricks shall be placed in a Soldier Course pattern on type A and Type C ramps, or in the Herringbone or Soldier Course pattern on Type B ramps.
 - c. The bricks shall be saw cut only and any brick shall not be less than 25% of a full brick.
 - d. Type M mortar shall be used for the setting bed and grouted joints in accordance with ASTM C270, Table 1 (Masonry Cement Type only).

2. Cast-in-Place Tiles: Acceptable products include Detectable Warning System's E-Z-Set Ceramic Composite Detectable Warning Panels, Armor Tile's Cast In Place System, ADA Solution's Composite Paver, CASTinTACT Detectable Warning Panel, or approved equal.
3. Color for all surfaces options shall be 'brick red'. Surface applied retrofit tiles shall not be allowed. Any color variation to meet contrast requirements must be approved by Engineer.

D. Exposed Aggregate Concrete: Conform to the requirements of Section 2000 *Concrete*.

1504 GRADING AND SUBGRADE PREPARATION. All grading and preparation shall be done in conformance with Sections 1100 *Grading* and 1200 *Subgrade Preparation*.

1505 JOINTS.

- A. Isolation joints in concrete sidewalks shall be placed adjacent to driveways and other concrete structures, or as directed by the Engineer. Material shall be one half ($\frac{1}{2}$) inch thickness shall extend for the full depth of the walk.
- B. Isolation joints in curbs and curb and gutter shall be placed at all radius points, driveways, curb inlets, or other locations as indicated on the plans or directed by the Engineer.
- C. Contraction joints shall consist of planes of weakness created by sawing the surface of the concrete. Sawed joints shall be constructed by sawing through the surface of the concrete with an approved concrete saw. Sawing of the joints shall begin as soon as the concrete has hardened sufficiently to prevent excessive raveling.
- D. Contraction joints in curb/curb and gutter shall be placed at maximum intervals of 10 feet. Isolation joints shall be placed at all radius points. Transverse joints in sidewalk shall be spaced at a distance equal to the width of the sidewalk.
- E. The edges of contraction and isolation joints shall be rounded with a one fourth ($\frac{1}{4}$) inch radius edging tool.

1506 CONCRETE CURB. Concrete curb will be constructed as shown on the plans unless otherwise approved by the Engineer. Curb may be either integral with or separate from concrete pavement.

- A. Integral curb Integral curb shall be constructed during or immediately following the finishing operation unless otherwise shown on the plans. Special care shall be taken so that the curb construction does not lag behind the pavement construction and form a "cold joint."

Curb forms or integral slipforming shall be required to form the backs of all curbs except where impractical because of small radii street returns or other special sections.

In placing curb concrete, sufficient spading shall be done to secure adequate bond with the paving slab and eliminate all voids in the curb.

Curbs shall be formed to the cross section as shown on the drawings with a mule or templates supported on the side forms and with a float not less than four (4) feet in length.

The finished surface of the curb and gutter shall be checked by the use of a ten (10) foot straightedge and corrected if necessary. Where grades are flat and while the concrete is still plastic, the drainage of the gutter should be checked with a four (4) foot level.

- B. Separate Curb and Gutter with Tiebars for Concrete Pavement. Separate curb and gutter may be poured prior to pouring the remaining pavement. Tiebars one half ($\frac{1}{2}$) inch in diameter and twenty-four (24) inches long shall be cast in the curb and gutter at thirty (30) inch centers as shown on the standard details.

Contraction joints in separate curb and gutter shall be located to coincide with contraction joints in the pavement but no more than ten (10) feet apart. They shall extend through the entire curb section from the top of curb to a depth of two (2) inches below pavement surface. Contraction joints shall be formed or sawed.

- C. Separate Curb and Gutter for Asphaltic Pavements. Contraction joints shall be spaced no more than 10 feet apart and shall extend through the entire curb section from the top of curb to a depth of two (2) inches below pavement surface. Contraction joints shall be formed or sawed.

1507 FINISHING. Finishing shall be performed as follows:

- A. Curb and Curb and Gutter. In all cases the resulting surface shall be smooth and of uniform color with all rough spots, projections, and form stakes removed. No plastering of the concrete will be allowed. The finished curb shall have a true surface, free from sags, twists, or warps, and shall have a uniform appearance, and shall be true to the specified lines, grades, and configurations shown on the drawings.

B. Sidewalk and Driveway Entrances. After the concrete has been thoroughly consolidated and leveled, and the initial set has taken place, the surface shall be finished with a soft wood or cork float and either burlap or broom finished with no other mortar than that contained in the concrete. The resulting surface shall be uniform in color and contain no imperfections. The edges shall be rounded with a tooling edge. Special care shall be taken to ensure a straight, neat appearance along the edges of the sidewalk or driveway entrance and at the joints.

Misting of concrete is allowed by spray nozzle only. Water brushes are prohibited.

1508 REINFORCEMENT. Reinforcement shall be as shown on the contract drawings and/or standard details for the project.

1509 DETECTABLE WARNINGS IN SIDEWALK OR RAMPS : Detectable warnings are required standardized surface features built in or applied to walking surfaces on sidewalks or ramps to warn visually impaired people of hazards on a circulation path. Those hazards include, but are not limited to interfaces between sidewalks and areas where moving vehicles may be present.

Detectable warnings shall consist of raised truncated domes with a 0.9 inch nominal diameter, a nominal 0.2 inch height, and a nominal center to center spacing of 2.35 inches . They shall extend across the full walking surface of the walk or ramp, and shall be 2 feet long in the direction of pedestrian travel.

1510 EXPOSED AGGREGATE CONCRETE. Place as specified in Section 2000 *Concrete* and as follows:

After the mixture has been properly struck off, to the line and grade as shown on the plans or as directed by the Engineer, the surface shall be lightly finished as not to force the coarse aggregate too deep into the mix. As soon as the bleed water has dissipated apply a uniform coating of an approved surface retarder at the rate specified by the manufacturer. Once sufficient cure has been attained on the concrete the Contractor shall pressure wash and or broom surface exposing the coarse aggregate to the desired affect. This method may vary depending on the approved retardant recommendation.

Once concrete surface has sufficiently dried, an approved clear sealant shall be applied at the rate recommended by the manufacturer. When the concrete has hardened enough so that excess raveling or spalling will not

occur, and before random cracking occurs, the Contractor shall saw 1/8" relief joint. Joints shall be sawed as shown on the plans or as directed by the Engineer. For raised islands care should be taken to joint the exposed aggregate concrete to match the curb and gutter joints. No traffic or undo stress shall be applied to the pavement for a period of 4 days after placement.