

SECTION 02528

CONCRETE CURBS, GUTTERS AND SIDEWALKS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Formwork complete with shoring, bracing and anchorage.
- B. Concrete reinforcement complete with required supports, spacers and related accessories.
- C. Cast-in-place concrete for curbs, gutters and sidewalks.
- D. Joint work.
- E. Curing

1.02 RELATED WORK

- A. Section 02110: Clearing and Grubbing
- B. Section 02210: Grading and Excavation
- C. Section 03300: Concrete Work

1.03 APPLICABLE REFERENCES

- A. "American Association of State Highway and Transportation Officials" (AASHTO), Latest Revision
- B. "American Society for Testing and Materials" (ASTM), Latest Revision
- C. "American Concrete Institute" (ACI), Latest Revision
- D. "Americans with Disabilities Act" (ADA), Latest Revision
- E. "Americans with Disabilities Act Accessibility Guidelines" (ADAAG), Latest Revision
- F. "Architectural Barriers Act" (ABA), Latest Revision

PART 2 PRODUCTS

- 2.01 Use 4000 PSI Concrete as specified in Section 03300.
- 2.02 FORM MATERIALS

- A. Either wood or metal, free from warp with sufficient strength to resist the pressure of the concrete without springing, extending for the full depth of concrete.
- B. Use curbed forms of proper radius on all radial sections and of acceptable design to Engineer.
- C. Use 1/8" thick metal templates between 10' sections with:
 - 1. Width – same as curb, gutter or sidewalk
 - 2. Depth – at least 25% more than curb, gutter or sidewalk depth
 - 3. Lugs or other devices to hold templates in position and permit removal without causing damage to concrete.
- D. Use a metal strike-off template to shape the top surface of gutters or sidewalks.

2.03 JOINT MATERIALS

- A. 1/2" thick preformed filler, unless otherwise specified
- B. Cut to full cross-section of curb, gutter and/or sidewalk.
- C. True, even and of satisfactory appearance.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clear construction area in accordance with Section 02110.
- B. Compact sub grade by tamping or rolling as specified in Section 02215.
- C. Thoroughly wet base or sub grade prior to placing concrete.

3.02 FORMWORK

- A. Place forms so finished concrete will be true to line, grade and cross-section as shown on the drawings.
- B. Uniform section lengths – Maximum of 10' and minimum of 6'.
- C. Place joints at locations shown on drawings or in line with joints of adjoining construction. Maximum spacing between joints shall be 30 ft and also installed within 10 ft of either side of drainage inlets or as directed.
- D. Brace and stake forms to maintain vertical and horizontal alignment until their removal.
- E. Carefully set template and leave in place until the concrete has set sufficiently to hold its shape. Remove templates while forms are still in place.

- F. Provide construction joints between new construction and all adjoining construction and around all utility appurtenances extending into sidewalks, unless otherwise specified.
- G. Clean and coat forms with light oil immediately before placing concrete.

3.03 CONCRETE PLACING

- A. Deposit the concrete on the base:
 - 1. When central or transit mixed concrete is used, place the mixture where it will require as little re-handling as possible.
 - 2. Continuously place between transverse joints without the use of intermediate bulkheads.
 - 3. Perform necessary hand spreading with shovels, or other approved tools.
 - 4. Do not allow workmen to walk in the freshly mixed concrete with boots or shoes coated with foreign substances.
- B. Consolidate concrete against and along the faces of all forms and along the full length and on both sides of all joint assemblies, by means of vibrators inserted in the concrete.
 - 1. Do not permit vibrators to come in contact with a joint assembly, the grade, or a side form.
 - 2. Do not operate the vibrator longer than 5 seconds in any one location.
 - 3. Operate vibrators mounted on a machine only while in motion.
- C. Deposit concrete as near to expansion and contraction joints as possible without disturbing them, but do not dump from the discharge bucket or hopper onto a joint assembly unless the hopper is well centered on the joint assembly.
- D. Should any concrete materials fall on or be worked into the surface of a complete slab, remove immediately by approved methods.

3.04 FINISHING CONCRETE – GENERAL

- A. When necessary, strike-off concrete using transverse templates resting upon the side forms.
- B. Remove templates, then the forms when the concrete has set sufficiently to hold its shape.
- C. Finish surface with floats and straightedges, when required, to be a smooth, even finish.
- D. Round edges at templates and expansion joints with an edging tool of $\frac{1}{4}$ " radius.
- E. Remove all tool marks with a wetted brush or wooden floor.

- F. Clean the top and ends of expansion joint materials and trim to slightly below the concrete surface.
- G. Remove forms, without exerting pressure on the concrete, at any time when such removal will not damage the concrete.
- H. Protect concrete work until finally accepted.
- I. Remedy damaged work that has not been accepted, by removing and reconstructing each section that is damaged.

3.05 FINISHING CURBS AND GUTTERS

- A. No plastering will be permitted.
- B. Unless otherwise specified, the edges of the curb and gutter shall be rounded to a radius of $\frac{3}{4}$ ".
- C. Finish the back of curbs not less than 3" below the top of backfill against the curb.
- D. 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. When the use of curb machines is permitted, finish as specified above except that contraction joints may be sawed a minimum depth of $\frac{1}{4}$ the thickness of the section at intervals not less than 6 feet nor more than 10 feet in lieu of constructing the curbs in sections.
- F. Place weep holes or drainage openings through curbs as indicated on the Plans or as directed by the Engineer, with at least one-half cubic foot of coarse aggregate behind each opening.

3.06 FINISHING SIDEWALKS

- A. When the surface of the concrete is free from water and just before the concrete obtains its initial set, finish and sweep lightly with a broom in order to produce a sandy texture.
- B. The longitudinal surface variations shall be not more than $\frac{1}{4}$ " under a 12' straightedge, nor more than $\frac{1}{8}$ " on a 5' transverse section.
- C. The surface of the concrete shall be so finished as to drain completely at all times.
- D. Round the edges with an edging tool having a radius of $\frac{1}{2}$ ".
- E. Divide the surface of sidewalks into blocks by use of a grooving tool.

1. Space the grooves approximately 5' apart with the blocks rectangular unless otherwise ordered by the Engineer.
 2. Cut the grooves to a depth of not less than 1".
 3. Edge the grooves with an edging tool having a radius of 1/4".
 4. Place grooves in median pavement in line with corresponding joints in adjoining construction or as directed by the Engineer.
- F. Unless otherwise indicated on the Plans, place marks or grooves at right angles to the centerline of driveways and approximately 8" apart.
1. These markings shall be between 1/8" and 1/4" in depth and shall be made with a suitable marking tool.
 2. A grooving tool, 6 to 8 inches in width, with multiple grooves for grooving alternate strips 8" apart, may be used.
 3. All marking edges shall be rounded satisfactorily.
- G. Do not place grooves in the surface of sidewalks reinforced for beam action where the full thickness of concrete is required for strength.
- H. Do not allow pedestrians, vehicles or loads upon concrete sidewalks until 12 hours after finishing concrete, or until the Engineer has determined that the concrete has attained sufficient strength for such loads.

END OF SECTION