

## SECTION 32 16 13

### CONCRETE CURBS, GUTTERS AND SIDEWALKS

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

###### A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install concrete curbs, gutters, and sidewalks.
2. Types of Work required under this Section include:
  - a. Conventionally-formed or machine-formed curb.
  - b. Conventionally-formed or machine-formed curb and gutter.
  - c. Conventionally-formed or machine-formed curb and sidewalk.
  - d. Conventionally-formed or machine-formed curb, gutter, and sidewalk.
3. Width, thickness, geometry, and extent of curb, gutter, and sidewalk shall be as shown or indicated on the Drawings.
4. Requirements for concrete sidewalks apply to concrete driveways, unless otherwise shown or specified, or unless concrete pavement requirements are included in the Contract Documents.

###### B. Related Sections:

1. Section 03 11 00, Concrete Forming.
2. Section 03 15 00, Concrete Accessories.
3. Section 03 20 00, Concrete Reinforcing.
4. Section 03 30 00, Cast-In-Place Concrete.
5. Section 07 92 00, Joint Sealants.
6. Section 03 60 00, Grouting.

##### 1.2 REFERENCES

###### A. Standards referenced in this Section are:

1. AASHTO M252, Specification for Corrugated Polyethylene Drainage Pipe.
2. ASTM D1248, Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.

##### 1.3 QUALITY ASSURANCE

###### A. Qualifications:

1. Installer:
  - a. Installer shall have not less than two years experience installing concrete curbs, gutters, and sidewalks similar to those required for the Work.
  - b. When required by ENGINEER, submit record of experience documenting not less than three successful, completed projects. For each

project, submit the following information: project name, location of project, approximate quantity of concrete curb, gutter, and sidewalk constructed by installer, contract price of concrete curb, gutter, and sidewalk construction, and name and contact information for project owner and the project's construction-phase engineer.

- c. When the Work includes 65 cubic yards or more of curb, sidewalk, and gutter concrete, furnish services of an ACI-certified concrete flatwork finisher to supervise finishing. Submit proof of ACI flatwork certification prior to concrete placing.

B. Regulatory Requirements:

1. Reference Specifications and Details:

- a. Comply with applicable requirements of the Georgia Department of Transportation Standard Specifications and Standard Details.

#### 1.4 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:

- a. Submit concrete mix design when mix design is different from that submitted under Division 03 Sections on concrete. Submit in accordance with Division 03 Sections on concrete.
- b. Proposed reinforcing materials.

2. Product Data:

- a. Concrete Materials: Submit Supplier's technical information for materials proposed for use, when concrete materials are different from those submitted under Division 03 Sections on concrete.
- b. Reinforcing Steel: Submit fabricator's technical information, including catalog information and specifications, for materials proposed for use, sufficient for ENGINEER to verify compliance with the Contract Documents.
- c. Expansion Joint Filler: Submit Supplier's technical information, including manufacturer's product data, brochure, and specifications, for materials proposed for use, when materials are different from those submitted under Division 03 Sections on concrete.

B. Informational Submittals: Submit the following:

1. Certifications:

- a. When concrete materials are different from those approved under Division 03 Sections on concrete, submit certifications as required in concrete Specifications Sections referred to in this Section.

2. Site Quality Control Submittals:

- a. Concrete test results for the Work included under this Section.

3. Qualifications Statements:

- a. Installer, when requested by ENGINEER.

#### 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with Division 03 Sections on concrete referenced in this Section.

## 1.6 SITE CONDITIONS

- A. Weather and Temperature Limitations:
  - 1. When temperature and environmental conditions warrant, comply with requirements for cold weather placing and hot weather placing under Division 03 Sections referenced in this Section, unless otherwise required under this Section.
  - 2. Temperature of aggregate base material under concrete shall be 39 degrees F or higher. Aggregate base material shall not have snow, ice, frost, or standing water on its surface at the time of concrete placing. Use of insulating materials and heating equipment may be required before concrete placing begins.
  - 3. Discontinue concrete placing when the air temperature falls below 39 degrees F. Do not place concrete in the rain.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Aggregate Bedding Material for Curbs, Sidewalks, and Gutters: Subbase material in accordance with Section 31 23 05, Excavation and Fill, unless otherwise shown or indicated.
- B. Concrete Materials:
  - 1. Comply with applicable requirements of: Section 03 11 00, Concrete Forming; Section 03 15 00, Concrete Accessories; Section 03 20 00, Concrete Reinforcing; and Section 03 30 00, Cast-in-Place Concrete; including requirements for formwork, concrete materials, admixtures, bonding materials, curing materials, and others as required.
  - 2. Concrete Mix, Design, and Testing:
    - a. Comply with applicable requirements of Section 03 30 00, Cast-in-Place Concrete, for concrete mix design, sampling, and testing, and quality control.
    - b. Design the mix to produce concrete of properties of compressive strength, slump range, and air content as specified in Section 03 30 00, Cast-in-Place Concrete.
    - c. When machine-formed equipment is used for constructing concrete curbs, sidewalks, or gutters, concrete so placed shall have properties in accordance with Section 03 30 00, Cast-in-Place Concrete, except that maximum slump shall be 2.5 inches and air content shall be two percent of design.
- C. Reinforcing Materials:
  - 1. Provide deformed steel bars and smooth wire fabric complying with Section 03 20 00, Concrete Reinforcing.

2. Provide wire fabric in flat sheets. Do not furnish wire fabric in rolls.
3. Unless otherwise shown or indicated, provide for sidewalks reinforcing not less than six-inch by six-inch, wire fabric.

D. Expansion Joint Material:

1. Preformed Expansion Joint Filler: Comply with Section 03 15 00, Concrete Accessories, for preformed expansion joint fillers.
2. Joint Sealant: For joint sealants and accessories used on expansion joints, comply with Section 07 92 00, Joint Sealants.

### PART 3 – EXECUTION

#### 3.1 INSPECTION

- A. Examine subgrade, subbase, and conditions under which the Work is will be performed and notify ENGINEER in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions are been corrected.
- B. Subgrade:
1. Verify that earthwork is completed to correct line and grade.
  2. Verify that subgrade is smooth, properly compacted, and free of frost and excessive moisture in accordance with Division 31 Section on excavation and fill.
  3. Do not commence the Work under this Section until conditions are satisfactory.

#### 3.2 AGGREGATE BASE FOR CURBS, SIDEWALKS, AND GUTTERS

- A. Aggregate Base under Curb, Gutter, or Sidewalk:
1. Install aggregate fill in accordance with Section 31 23 05, Excavation and Fill. Properly compact aggregate fill to thickness shown or indicated in the Contract Documents.
  2. When thickness of aggregate base is not shown or indicated, provide six-inch thick aggregate base under curbs, sidewalks, and gutters.

#### 3.3 CONSTRUCTION OF FORMS

- A. Conventional Forms:
1. Set forms to line and grade. Forms shall be free from warp.
  2. Install forms along full length of curb, gutter, and sidewalk.
  3. Forms shall extend to the full depth of the curb, sidewalk, and gutter (as applicable) and be secured so no displacement occurs during concrete placing.
- B. At CONTRACTOR's option, machine-formed concrete curbs, sidewalks, and gutters are acceptable.

#### 3.4 REINFORCING

- A. General:
  - 1. Locate, place, and support reinforcing in accordance with Section 03 20 00, Concrete Reinforcing, unless otherwise shown on the Drawings.
  - 2. Size of reinforcing shall be as shown or indicated in the Contract Documents.
  - 3. Unless otherwise shown or indicated, locate reinforcing for sidewalks at the mid-depth point in the concrete slab.
- B. When machine-formed concrete curbs, sidewalks, and gutters are provided, reinforcing shall be suitable for the forming/placing method, at no additional cost to OWNER. Obtain ENGINEER's approval of alternate reinforcing prior to placing concrete.

### 3.5 CONCRETE PLACING

- A. General:
  - 1. Comply with Section 03 30 00, Cast-in-Place Concrete, and this Section relative to mixing and placing concrete.
- B. Placing:
  - 1. Curbs and Gutters: Place concrete using methods that prevent segregation of the mix. Consolidate concrete along face of forms with an internal vibrator.
  - 2. Sidewalks: Place concrete in one-course, monolithic construction, for full width and depth of sidewalk.
  - 3. Machine-Formed:
    - a. At CONTRACTOR's option, automatic curb, gutter, and sidewalk machine may be used for installing concrete.
    - b. Machine forming shall produce curbs, gutters, and sidewalks of required cross-section, lines, grades, finish, and jointing, as specified for conventionally-formed concrete.
    - c. At curb cuts and driveway entrances, cut-out concrete and hand-finish the curbing to provide the required curb cut or driveway entrance, as applicable.
    - d. If results do not comply with the Contract Documents, remove and replace at no additional cost to OWNER.
- C. Curbs:
  - 1. Provide curb-cuts and driveway entrances for vehicle passage and pedestrian passage where shown, and when not shown but where existing sidewalks and curbs are being replaced, provide curb-cut or driveway entrance (as applicable) at location of existing driveways and pedestrian access ramps in sidewalks.
  - 2. Neatly form transitions from curb to curb-cut or driveway entrance.
  - 3. Unless otherwise shown or indicated, top of curb at curb-cut or driveway entrance shall be not greater than 1/4-inch above elevation of finished pavement surface.
- D. Gutters:

1. Unless otherwise shown or indicated, top of gutter shall be not greater than 1/4-inch above elevation of finished pavement surface.

### 3.6 JOINTS

- A. General:
  1. Provide expansion joints, contraction joints, and construction joints in concrete curbs, gutters, and sidewalks.
  2. Provide expansion, contraction, and construction joints perpendicular to formed faces of curb, gutter, or sidewalk.
  3. Construct transverse joints at right angles to the Work centerline and as shown.
- B. Contraction Joints: Provide joints as indicated below:
  1. Curbs and Gutters: Provide at intervals of ten feet on centers. Joint shall be not less than 1/8- inch and not more than 1/4-inch in width, and have a depth of 1.5 inches.
  2. Sidewalks: Provide at intervals of five feet on centers. Joint shall be not less than 1/8- inch and not more than 1/4-inch in width, and have a depth of not less than one-third the total thickness of concrete sidewalk.
  3. Joints may be formed or sawcut.
- C. Construction Joints: Place construction joints at locations where concrete placing operations are stopped for more than 30 minutes, except where such pours terminate at expansion joints.
- D. Expansion Joints:
  1. General: Provide preformed expansion joint filler at locations indicated. When curb, gutter, or sidewalk is not poured monolithically, provide expansion joints where each abuts the other.
  2. Curbs and Gutters: Provide 1 1/16-inch wide preformed expansion joint filter at the intervals of 30 feet along curb and gutter; at expansion joints in pavement; at movable structures (such as bridges); and between curb or gutter and: structures, returns, and at 30-foot intervals along length of curb or gutter.
  3. Sidewalks: Provide 1/2-inch wide preformed expansion joint filler at 30-foot intervals along length of sidewalk and at all joints between sidewalk and: curb, gutters, pavement, buildings, drainage structures, utility metal appurtenances such as manhole cover frames and valve boxes, and similar construction.
  4. Place top of expansion joint material not less than 1/2-inch or more than one-inch below concrete surface. Apply joint sealer on top of expansion joint material flush with concrete surface, and in accordance with sealant manufacturer's instructions and Section 07 92 00, Joint Sealants.

### 3.7 CONCRETE FINISHING

- A. Smooth exposed surface by screening and floating. Perform hand-screening when conventionally-formed concrete is provided.

- B. Work edges of gutter and sidewalks, back top edge of curb, and transverse joints; and round to 1/4-inch radius.
- C. Complete surface finishing by drawing a fine-hair broom across surface, perpendicular to line of traffic.

### 3.8 CURING

- A. General:
  - 1. Protect and cure finished concrete curbs, gutters, and sidewalks, in accordance with Section 03 30 00, Cast-in-Place Concrete.
  - 2. Cure driveways and sidewalks at driveways for not less than three days prior to opening to vehicle traffic. In colder weather, as indicated in Article 1.6 of this Section, curing period shall be not less than six days prior to opening to vehicle traffic unless other provisions to determine strength are provided and approved by ENGINEER.

### 3.9 REPAIR AND CLEANING

- A. Repair or replace broken or defective curbs, gutters, and sidewalk as directed by ENGINEER.
- B. Sweep the concrete curb, sidewalk, and gutter Work and wash free of stains, discolorations, dirt, and other foreign material.

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