SECTION 32 16 00

CURBS, GUTTERS AND WALKS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section specifies providing curbs, gutters, curb and gutters and walks.

B. Related Work Specified Elsewhere:
   1. Base course for pavements: Section 32 10 00.
   2. Concrete pavement: Section 32 13 00.
   3. Concrete reinforcement: Section 03 20 00.
   4. Cast-in-place structural concrete: Section 03 30 00.

1.02 SUBMITTALS:

Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:

A. Documentation:
   1. Where stone curb is provided by street or highway jurisdiction, submit bill of stone curb materials prior to picking up materials at designated storage facility and transporting to site.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: C979.

1.04 PRODUCT DELIVERY AND HANDLING:

A. Handle stone so as to maintain curb intact with exposed faces unmarred.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Concrete: Section 32 13 00 and as specified in this section.

B. Carbon Black:
   1. Emulsified: At least 25 percent by weight standard carbon-gas black colloidally dispersed in liquid medium so that when one part of product is stirred into ten parts of water, resulting liquid, after standing undisturbed for 72 hours, is uniformly colored and contains no fillers nor other material that would adversely affect quality or appearance of concrete.

3. Powder:
   a. Concrete grade carbon black, meeting the requirements of ASTM C979.
   b. Carbon black powder to disperse in water without floating and to be capable of uniform dispersion in plastic concrete.

C. Joint Devices: In accordance with Section 32 13 00, with the following additional requirements:
   1. Dowels: 14 inches long, 3/4-inch diameter for curb and gutter and 1/2-inch diameter for sidewalk.
   2. Plates for construction joints and planes of weakness: 14-gauge galvanized sheet metal cut to section as necessary.

D. Expansion Joint Materials: In accordance with Section 32 13 00, with the following additional requirements:
   1. Preformed joint filler for stone curb, 1/4-inch thick; otherwise, 1/2-inch thick, subject to specified construction requirements.

E. NOT USED

F. Polyethylene Tape: Section 32 13 00.

2.02 MIXES:

A. Mix exposed aggregate surface course concrete comprising by volume, one part portland cement to three parts granite aggregate or gravel, crushed gravel or crushed stone aggregate as shown, with sand added to form workable mix.

B. Where concrete walks are shown to be darkened, add 1/2 pound of emulsified carbon black or 1/3 pound of carbon powder per bag of portland cement.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL:

A. Allowable Dimensional Tolerances:
   1. Concrete surfaces constructed in accordance with the following:
      a. Plus-or-minus 3/16 inch of elevation shown.
      b. Deviation: 1/8-inch maximum from steel straightedge as specified in Section 32 13 00.

3.02 BASE:

A. Ensure that previously placed base is satisfactorily compacted and free from loose material.

B. Have base approved prior to placing forms and base covering.

C. Correct deficiencies in grade, contour and compaction.

3.03 FORMS:

A. Place forms as specified in Section 32 13 00.

3.04 JOINT DEVICES AND CONTRACTION JOINTS:

A. General Requirements:

1. Place joint devices and contraction joints as specified in Section 32 13 00.
2. Where work abuts concrete pavement, adjust spacing of joints so that joints of same type coincide with transverse joints of concrete pavement.
3. Width of preformed expansion joint filler: Same as thickness of concrete pavement minus 3/4 inch.
4. Concrete curb, gutter and curb and gutter:
   a. Place two dowels in each joint between eight and twelve inches apart; for curb and gutter place one of the dowels four inches from back of curb. For curb and gutter abutting concrete pavements, complete partial tie rod assemblies in slab. Place preformed expansion joint filler in single piece depressed 1/2-inch below finished surface.
   b. For curves of 100 feet radius or less, space expansion joints equally at intervals of approximately 15 feet; for radii greater than 100 feet space expansion joints at intervals of 45 feet, with contraction joints at intervals of 15 feet. Form contraction joints, with plates left in place, depressed 1/2-inch below finished surface.
   c. Where placed in curves of 100 feet radius or less, stop reinforcing steel two inches clear of expansion joints.
5. Sidewalk:
   a. Place 1/2-inch preformed expansion joint material between sidewalks and curb where sidewalks are constructed between permanent structure and curb.
   b. Place transverse expansion joints at intervals of 45 feet.
   c. Provide dowels in expansion joint spaced at two-foot intervals, clearing edges of sidewalk by one foot. Where sidewalks intersect, place expansion joints in each sidewalk for full width along extension of back edges.
6. Uniform Joint Spacing: For the entire length of each straight or curved run of sidewalk or curb to be placed, lay out the work and adjust joint spacing to provide intervals of equal dimension between joints, including grooves, unless otherwise shown.

3.05 CONCRETE AND WIRE FABRIC:

A. Place concrete and wire fabric in accordance with applicable requirements of Section 32 13 00 except that top layer of fabric over trench-cuts to clear top surface by 1-1/2 inches, plus-or-minus 1/4-inch tolerance.

B. Place pipe for weep holes through curbs for rain leaders from building downspouts where shown.

3.06 FINISHING CONCRETE CURB, GUTTER AND CURB AND GUTTER:

A. Remove curb and face forms as soon as condition of concrete permits and perform finishing work on exposed surfaces.

B. Finish face edge of curb to one-inch radius. Finish other edges to 1/4-inch radius.

C. Provide steel troweled finish followed by brushing with fine-hair brush.

D. Remove other forms when condition of concrete permits, but no sooner than 12 hours after placing. Rub surfaces with carborundum stone where necessary.

3.07 FINISHING SIDEWALK:

A. Work on Authority Property:
   1. Strike off and screed top surfaces so that resulting surface is smooth and within specified tolerances.
   2. As soon as condition of work permits, perform joint work, edging and marking.
   3. Finish edges to 1/4-inch radius.
   4. Scoring pattern: Unless otherwise shown, as follows:
      a. Expansion joints: Install on 45-foot centers. For the entire length of each straight or curved run of sidewalk to be placed, layout the work and adjust joint spacing to provide intervals of equal dimension between joints, including grooves, unless otherwise shown.
      b. Contraction joints: Make transverse grooves 1/3 depth of the concrete at approximately nine-foot equal intervals between expansion joints perpendicular to longitudinal grooves.
      c. Control joints: Make transverse grooves 1/2-inch deep at approximately three foot equal intervals between contraction joints perpendicular to longitudinal grooves.
      d. Make longitudinal grooves 1/2-inch deep at approximately three foot equal intervals between and parallel to sides of sidewalk.
   5. Finish surface with final light broom finish with fine-hair broom.
   6. Construct wheel chair ramps at locations shown.
   7. Remove forms when condition of concrete permit, but no sooner than 12 hours after placement. Rub surfaces with carborundum stone where necessary.

B. Non-Authority Work:
   1. In accordance with codes and regulations of the jurisdictional authorities.

3.08 CURING:

A. In accordance with Section 32 13 00, except that liquid membrane curing compounds not to be used on curb of curb and gutter when temperatures tend to go lower than 40F within 24 hours after application.

B. Do not use liquid membrane curing compounds on exposed aggregate concrete or darkened concrete surfaces.

3.09 SEALING JOINTS:

A. Immediately prior to sealing joints, place polyethylene tape width of groove flat on preformed expansion joint filler.

B. Seal expansion joints in concrete curb, gutter and curb and gutter with poured joint sealer in conformance with Section 32 13 00. Do not seal expansion joints in sidewalk and stone curb.

3.10 HIGH EARLY STRENGTH CONCRETE:

A. Use high-early-strength concrete in accordance with Section 32 13 00 when approved.

3.11 CORES:

A. Where directed, provide test cores in accordance with Section 32 13 00.

3.12 PROTECTION OF THE WORK:

A. Protect new work in accordance with Section 32 13 00.

3.13 DEFICIENT WORK:

A. Remove and replace with new materials or correct as directed work which does not meet specified requirements.

END OF SECTION