

Section 02771

CONCRETE SIDEWALKS

1.0 GENERAL**1.01 SECTION INCLUDES**

- A. Portland Cement Concrete Pavement for Concrete Sidewalks.
- B. References to Technical Specifications:
 - 1. Section 01200 - Measurement and Payment Procedures
 - 2. Section 01350 - Submittals
 - 3. Section 01450 - Testing Laboratory Services
 - 4. Section 02751 - Concrete Pavement
- C. Referenced Standards:
 - 1. American Society for Testing and Materials (ASTM)
 - a. ASTM C 150, "Standard Specification for Portland Cement"
 - b. ASTM C 94, "Standard Specification for Ready-Mixed Concrete"
 - c. ASTM C 33, "Standard Specification for Concrete Aggregates"
 - d. ASTM A 615, "Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement"
 - e. ASTM D 994, "Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)"
 - f. ASTM D 1751, "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Type)"
 - g. ASTM D 6690, "Standard Specification for Joint and Crack Sealants, Hot-Applied, for Concrete and Asphaltic Pavements"
 - h. ASTM C 39, "Standard Test Method for Compressive Strength of Concrete"
 - i. ASTM C 31, "Standard Practice for Making and Curing Concrete Test Specimens in the Field"
 - j. ASTM C 138, "Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete"
 - k. ASTM C 231, "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method"
 - l. ASTM C 42, "Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete"
 - 2. Texas Accessibility Standards of Architectural Barriers Act, Article 9102, Texas Civil Statues

1.02 MEASUREMENT AND PAYMENT

- A. Measurement for concrete sidewalks is on square foot basis.
- B. Payment includes all labor and materials required for installation of concrete sidewalks, joints and curing material. No payment will be made for work in areas where sidewalk has been removed for contractor's convenience.
- C. Refer to Section 01200 – Measurement and Payment Procedures.

1.03 SUBMITTALS

- A. Submittals shall conform to requirements of Section 01350 - Submittals.

2.0 PRODUCTS**2.01 MATERIALS**

- A. Concrete: Conform to material and proportion requirements for concrete of Section 02751 - Concrete Paving.
- B. Reinforcing Steel: conform to material requirements of Section 02751 - Concrete Paving for reinforcing steel. Use No. 4 reinforcing bars.
- C. Preformed Expansion Joint Material: Conform to material requirements for preformed expansion joint material of Section 02751 - Concrete Paving.
- D. Expansion Joint Filler: Conform to material requirements for expansion joint material of Section 02751 - Concrete Pavement.
- E. Forms: Use straight, unwarped wood or metal forms with nominal depth equal to or greater than proposed sidewalk thickness.
- F. Sand Bed: Conform to material requirements for bank run sand.

3.0 EXECUTION**3.01 REPLACEMENT**

- A. Replace sidewalks which are removed or damaged during construction with thickness and width equivalent to one removed or damaged unless otherwise shown on Drawings. Finish surface (exposed aggregate, brick pavers, etc.) to match existing sidewalk.
- B. Provide replaced and new sidewalks with wheelchair ramps when sidewalk intersects curb at street.

3.02 PREPARATION

- A. Identify and protect utilities which are to remain.
- B. Protect living trees, other plant growth and features designated to remain.
- C. Conduct clearing and grubbing operations in accordance with Section 02200 - Site Preparation.
- D. Determine sidewalk horizontal and vertical alignment to facilitate drainage and prevent ponding. Location and slopes must be in compliance with Texas Accessibility Academy Standards latest edition and revisions.
- E. Excavate subgrade 6 inches beyond outside lines of sidewalk. Shape to line, grade and cross section. Compact 6 inches of select fill to minimum of 95% maximum dry density at optimal or above optimal moisture content as per ASTM D698. For soils with plasticity index above 40 percent, stabilize soil with lime in accordance with Section 02335 - Subgrade. Compact subgrade to minimum of 90 percent maximum dry density at optimum to 3 percent above optimum moisture content, as determined by ASTM D 698. No separate pay for this requirement. This work shall be subsidiary to sidewalk square foot unit pricing.

3.03 PLACEMENT

- A. Setting Forms: Straight, unwarped wood or metal forms with nominal depth 1/2" greater than proposed sidewalk thickness. Securely stake forms to line and grade. Maintain position during concrete placement.
- B. Reinforcement:
 - 1. Install No. 4 reinforcing bars.
 - 2. Install reinforcing steel as shown on the Drawings. Lay longitudinal bars in walk continuously through expansion joints. Reinforcing bars shall not vary from plan placement by more than 1/4 inch.
 - 3. Use sufficient number of chairs to support reinforcement in manner to maintain reinforcement in center of slab vertically during placement.
 - 4. Drill dowels into existing paving, sidewalk and driveways, secure with epoxy and provide headers as required.
- C. Expansion Joints: Install expansion joints with load transfer units in accordance with Section 02751 - Concrete Pavement.
- D. Place concrete in forms to specified depth and tamp thoroughly with "jitterbug" tamp, or other acceptable method. Bring mortar to surface.

- E. Strike off to smooth finish with wood strike board. Finish smoothly with wood hand float. Brush across sidewalk lightly with fine-haired brush.
- F. Apply coating to wheelchair ramp with contrasting color.
- G. Unless otherwise indicated on Drawings, mark off sidewalk joints 1/2 inch deep, at spacing equal to width of walk. Use joint tool equal in width to edging tool.
- H. Finish edges with tool having 3/8 inch radius.
- I. After concrete has set sufficiently, refill space along sides of sidewalk to 1 inch from top of walk with suitable material. Tamp until firm and solid, place sod as applicable. Dispose of excess material. Repair driveways and parking lots damaged by sidewalk excavation in accordance with Section 02980 - Pavement Repair and Resurfacing.

3.04 CURING

- A. Conform to requirements of Section 02751 - Concrete Pavement.

3.05 FIELD QUALITY CONTROL

- A. Testing will be performed under provisions of Section 01450 - Testing Laboratory Services.
- B. Compressive Strength Test Specimens: Four test specimens for compressive strength test will be made in accordance with ASTM C 31 for each 30 cubic yards or less of sidewalk that is placed on one day. Two specimens will be tested at 7 days. Remaining two specimens will be tested at 28 days. Specimens will be tested in accordance with ASTM C 39. Minimum compressive strength: 2500 psi at 7 days and 3500 psi at 28 days.
- C. Yield test for cement content per cubic yard of concrete will be made in accordance with ASTM C 138. When cement content is found to be less than that specified per cubic yard, reduce batch weights until amount of cement per cubic yard of concrete conforms to requirements.
- D. If the Contractor places concrete without notifying the City, Contractor will have the concrete tested by means of core test as specified in ASTM C 42. When concrete does not meet specification, cost of test will be deducted from payment. Contractor will replace the cored section of sidewalk at no cost to City.
- E. Sampling of fresh concrete shall be in accordance with ASTM C 172.
- F. Take slump tests when cylinders are made and when concrete slump appears excessive.

- G. Concrete shall be acceptable when average of two 28 day compression tests is equal to or greater than minimum 28 day strength specified.
- H. If either of two tests on field samples is less than average of two tests by more than 10 percent, that entire test shall be considered erratic and not indicative of concrete strength. Core samples will be required of in-place concrete in question.
- I. If 28 day laboratory test indicates that concrete of low strength has been placed, test concrete in question by taking cores as directed by Project Manager. Take and test at least three representative cores as specified in ASTM C 42 and deduct cost from payment due.

3.06 NONCONFORMING CONCRETE

- A. Remove and replace areas that fail compressive strength tests, with concrete of thickness shown on Drawings.
- B. Replace nonconforming sections at no additional cost to City. Replacement section shall be no less in length than the width of sidewalks.

3.07 PROTECTION

- A. Maintain newly placed concrete in good condition until completion of Work.
- B. Replace damaged areas at no cost to City.

END OF SECTION