Section 02775

CONCRETE SIDEWALKS

PART 1 G E N E R A L

1.01 SECTION INCLUDES

A. Reinforced concrete sidewalks.

B. Wheelchair ramps.

C. Reinforced slope paving.

1.02 MEASUREMENT AND PAYMENT

A. Unit Prices.

1. Payment for concrete sidewalks is on square foot basis.

    a. Limits for measurement for trench excavation as follows:

        1. Extend 1 foot beyond outside trench, trench slopes or shaft walls for utility excavation, or for sidewalk removed to construct utility as described on Drawings subject to maximum trench width for pavement replacement limits shown on Drawings, or

        2. When removed sidewalk is greater than one-half of nearest joint width, replace sidewalk to nearest full joint width, unless otherwise directed by City Engineer. Saw cut existing sidewalk to expose steel to tie on to proposed sidewalk.

2. No payment will be made for work outside these limits or in areas where driveway has been removed or replaced for Contractor's convenience.

3. Payment for wheelchair ramps of each type specified is on per per square foot basis. Removal and replacement of existing sidewalk, curb or curb and gutter and saw cutting is paid by unit cost for each item. Sodding will be paid one foot on each side of sidewalk unless otherwise noted. Staining of wheelchair ramps is included in cost of ramp.

4. Refer to Section 01270 - Measurement and Payment for unit price procedures.

B. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for work in this Section is included in total Stipulated Price.

1.03 REFERENCES

A. ASTM C 31 - Standard Practice for Making and Curing Concrete Test Specimens in Field.

B. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

C. ASTM C 42 - Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

D. ASTM C 138 - Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.

E. ASTM C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

F. ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete.

G. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3).

8. Texas Accessibility Standards of Architectural Barriers Act, Article 9102, Texas Civil Statues.

1.04 SUBMITTALS

A. Conform to requirements of Section 01330 - Submittal Procedures.

B. Submit certified testing results and certificates of compliance.

PART 2 P R O D U C T S

2.01 MATERIALS

A. Concrete:

1. Mix design to produce concrete for sidewalks and slope paving: Compressive strength of 2000 psi at 7 days and 3000 psi at 28 days. Slump of concrete: 2 inches, but no more than 5 inches, when tested in accordance with ASTM C 143.

2. Concrete sidewalk and slope paving: Contain at least 5 sacks (94 pounds per sack) of cement per cubic yard, with not more than 6.25 gallons of water, net, per sack of cement. Determine cement content in accordance with ASTM C 138. Use additions of mineral filler to improve workability or plasticity of concrete to limits specified.

B. Reinforcing Steel: Conform to material requirements of Section 02751 - Concrete Paving for reinforcing steel. Use No. 3 reinforcing bars.

C. Preformed Expansion Joint Material: Conform to material requirements for preformed expansion joint material of Section 02752 - Concrete Pavement Joints.

D. Expansion Joint Filler: Conform to material requirements for expansion joint material of Section 02752 - Concrete Pavement Joints.

E. Forms: Use straight, unwarped wood or metal forms with nominal depth equal to or greater than proposed sidewalk thickness. The use of 2 inch by 4-inch lumber as forms will not be allowed.

F. Sand Bed: Conform to material requirements for bank run sand of Section 02320 - Utility Backfill Materials.

G. Sodding: Conform to material requirements for sodding of Section 02922 - Sodding.

H. Coating for wheelchair ramps:

1. Manufacturer: ENDURO-O-SEAL USA, Inc. 12502 Lazywood Lane, Pinehurst, Texas 77362. E-mail: nelson@concretesealers.com, Tel. 1-281-356-5117.

2. Materials: Poly Top Seal, ST-20 / (Csx-20 Stain). Color is ADA Brick Red. Water based membrane-forming polysiloxane penetrating sealer; this system is non-flammable, non-hazardous and non-toxic.

   a. Maximum VOC content: 0.27 lbs/gal., complies with applicable regulations regarding VOCs.

   b. Do not dilute or modify ST-20 or Csx-20, apply as supplied.

3. Project Conditions: Environmental Requirements: Do not apply Poly Top Seal, Csx-20 when the following conditions are present, except with written instructions from manufacturer:

   a. Ambient or surface temperature less than 40 degree F or predicted to fall below 40 degree F within twenty-four (24) hours prior to application.

   b. Rain within seventy-two (72) hours prior to application or predicted within twenty-four (24) hours after application.

   c. Wet or frozen substrates.

   d. Poured/ Cast in Place substrates: Allow to cure seven (7) to ten days before treatment. (Based on 70 degree F and 60% relative humidity).

PART 3 E X E C U T I O N

3.01 REPLACEMENT

A. Replace sidewalks and slope paving 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 or driveway.

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 02233 - Clearing and Grubbing.

D. Excavate sub grade 6 inches beyond outside lines of sidewalk. Shape to line, grade and cross section. For soils with plasticity index above 40 percent, stabilize soil with lime in accordance with Section 02241. Compact sub grade to minimum of 90 percent maximum dry density at optimum to 3 percent above optimum moisture content, as determined by ASTM D 698.

E. Immediately after sub grade is prepared, cover with compacted sand bed to depth as shown on Drawings. Lay concrete when sand is moist but not saturated.

3.03 PLACEMENT

A. Setting Forms: Straight, unwarped wood or metal forms with nominal depth equal to or greater than proposed sidewalk thickness. Use of 2 by 4's as forms will not be allowed. Securely stake forms to line and grade. Maintain position during concrete placement.

B. Reinforcement:

1. Install reinforcing bars.

2. Install reinforcing steel bars on 18-inch centers longitudinally and transversely. Lay longitudinal bars in walk continuously, except through expansion joints.

3. Use sufficient number of chairs to support reinforcement in manner to maintain reinforcement in center of slab vertically during placement.

C. Expansion Joints: Install expansion joints with load transfer units in accordance with Section 02752 - Concrete Pavement Joints.

E. Place concrete in forms to specified depth and tamp thoroughly with "jitterbug" tamp, or other acceptable method. Bring mortar to surface.

F. Strike off to smooth finish with wood strike board. Finish smoothly with wood hand float. Brush across sidewalk lightly with fine-haired brush.

G. Unless otherwise indicated on Drawings, mark off sidewalk joints c 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-inch radius.

I. After concrete has set sufficiently, refill space along sides of sidewalk to one-inch from top of walk with suitable material. Tamp until firm and solid, place sodding as applicable. Dispose of excess material in accordance with Section 01576 - Waste Material Disposal. Repair driveways and parking lots damaged by sidewalk excavation in accordance with Section 02951 - Pavement Repair and Resurfacing.

J. Apply coating to wheelchair ramp with contrasting color.

1. Allow concrete to set prior to coating. Properly clean and dry area to be treated.

2. Temperature of substrate should be between 40 F - 120 F (4.4 C - 49 C).

3. PTS St-20 and Csx-20 should be thoroughly stirred prior to application.

4. Apply thorough wetting coat in accordance with rates specified below, but do not saturate.

5. When applying by spray, motion should be side to side and followed by cross hatch up and down motion.
6. On horizontal applications, remove excess after 15 minutes from initial application (use clean mop or cotton cloth).

7. Protect treated areas from moisture for 8-12 hours after application.

8. Coverage: 200 (minimum)/ 300 (maximum) sq. ft./gal.

9. Clean overspray on glass or metallic surfaces before evaporation of water. Wipe dry with clean, dry cloth. When material has cured, use 50/50 mix of denatured alcohol and water and rub with clean cloth.

10. Do not permit traffic on treated surfaces until PTS St-20 and Csx-20 has completely penetrated and substrate is fully dry.

3.04 CURING

A. Conform to requirements of Section 02753 - Concrete Pavement Curing.

3.05 FIELD QUALITY CONTROL

A. Testing will be performed under provisions of Section 01454 - 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 in 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: 2000 psi at 7 days and 3000 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 laboratory, the City 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.

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 City Engineer. 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.

3.07 PROTECTION

A. Maintain newly placed concrete in good condition until completion of Work.

B. Replace damaged areas.

END OF SECTION