SECTION 02820
CONCRETE SIDEWALKS

PART I: GENERAL

1.1 GENERAL REQUIREMENTS
- A. Reinforced concrete sidewalks.
- B. Wheelchair ramps.

1.2 MEASUREMENT AND PAYMENT
- A. Unit Prices:
  1. Payment for concrete sidewalks is on a square foot basis.
  2. No separate payment shall be made for work outside these limits or in areas where sidewalks or wheelchair ramps have been removed or replaced for the Contractor's convenience.
  3. Payment for wheelchair ramps of each type specified is on a per ramp basis.
  4. Removal and replacement of existing sidewalks, curb or curb and gutter and saw-cutting is paid on a unit cost basis for each item.
  5. Sodding shall be paid one foot (1 Ft) on each side of sidewalk unless otherwise noted.
  6. Coloring of wheelchair ramps is included in cost of ramp.
  7. Refer to Section 01270 – Measurement and Payment for unit price procedures.
- B. Stipulated Price (Lump Sum):
  1. If Contract is Stipulated Price Contract, payment for work in this Section is included in Total Stipulated Price.

1.3 REFERENCES
- A. ASTM – American Society for Testing and Materials.
  1. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in Field.
  2. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  3. ASTM C42 – Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  4. ASTM C138 – Standard Test Method for Unit Weight, Yield and Air Content (Gravimetric) of Concrete.
  5. ASTM C143 – Standard Test Method for Slump of Hydraulic Cement Concrete.
  6. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
  7. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

(12,400 ft-lbf/ft^3 (600 kN-m/m^3).

B. CFTS – City of Friendswood Technical Specifications.
C. TASABA – Texas Accessibility Standards of Architectural Barriers Act, of the Texas Civil Statues.

1.4 SUBMITTALS
A. Conform to requirements of Section 01330 – Submittal Procedures.
B. Submit certified testing results and certificates of compliance.

PART II: PRODUCTS

2.1 MATERIALS
A. Concrete: Conform to material and proportion requirements for concrete of Section 02805 – Concrete Paving.
B. Reinforcing Steel: Conform to material requirements of Section 02805 – Concrete Paving for reinforcing steel. Use No. 3 (3/8 In) reinforcing bars.
C. Preformed Expansion Joint Material: Conform to material requirements for preformed expansion joint material of Section 02840 – Concrete Pavement Joints.
D. Expansion Joint Filler: Conform to material requirements for expansion joint material of Section 02840 – Concrete Pavement Joints.
E. Forms: Use straight, unwarped wood or metal forms with nominal depth equal to or greater than proposed sidewalk or wheelchair ramp thickness. The use of two inch by four inch (2 In x 4 In) lumber as forms shall not be allowed.
F. Sand Bed: Conform to material requirements for bank run sand of Section 02140 – Utility Backfill Materials.
G. Sodding: Conform to material requirements for sodding of Section 02915 – Sodding.
H. Coloring for wheelchair ramps: Conform to material requirements for colored concrete of Section 02825 – Colored Concrete for Wheelchair Ramps.

PART III: EXECUTION

3.1 REPLACEMENT
A. Replace sidewalks which are removed or damaged during construction with thickness and width equivalent to one (1) removed or damaged, unless otherwise shown on the Drawings. Finish surface (exposed aggregate, stamped concrete, etc.) to match existing sidewalk.
B. Provide wheelchair ramps or existing, replaced or new sidewalks when sidewalk intersects curb at street or driveway.

3.2 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 02100 – Clearing and Grubbing.
D. Excavate subgrade six inches (6 In) beyond outside lines of sidewalk or wheelchair ramp. Shape to line, grade and cross section. For soils with plasticity index above forty percent (40%), stabilize soil with lime in accordance with Section 02720 – Lime-Stabilized Base Subgrade. Compact subgrade to minimum of ninety percent (90%) maximum dry density at optimum moisture content plus or minus three percent (±3%), as determined by ASTM D698.
E. Immediately after subgrade is prepared, cover with compacted sand bed to depth as shown on the Drawings. Lay concrete when sand is moist but not saturated.

3.3 PLACEMENT
A. Setting Forms: Straight, unwarped wood or metal forms with nominal depth equal to or greater than proposed sidewalk thickness. Use of two inch by four inch (2 In x 4 In) wood studs as forms shall not be allowed. Securely stake forms to line and grade. Maintain position during concrete placement.
B. Reinforcement:
    1. Install reinforcing bars in conformance of Section 03200 – Reinforcing Steel.
    2. Install reinforcing steel as shown on the drawings. Lay longitudinal bars in sidewalks or wheelchair 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.
    4. Drill dowels into existing paving, sidewalk and driveways, secure with epoxy and provide headers as required.
    5. Use sufficient number of chairs for steel reinforcement bars to maintain position of bars within allowable tolerances. Place reinforcement as shown on the Drawings. In plane of steel parallel to nearest surface of concrete, bars shall not vary from plan placement by more than one and one-half (1-1/2) of spacing between bars. In plane of steel perpendicular to nearest surface of concrete, bars shall not vary from plan placement by more than one-quarter inch (1/4 In).
C. Expansion Joints: Install expansion joints with load transfer units in accordance with Section 02840 – Concrete Pavement Joints.
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,

and impress or hand-groove required pattern into wheelchair ramp.

F. Apply coating to wheelchair ramp with contrasting color in accordance with Section 02825 – Colored Concrete for Wheelchair Ramps.

G. Unless otherwise indicated on the Drawings, install construction sidewalk joints one-eighth inch (1/8 In) deep, at intervals not exceeding five feet (5 Ft). Use joint tool equal in width to edging tool.

H. Finish edges with tool having one-quarter inch (1/4 In) radius.

I. After concrete has set sufficiently, refill space along sides of sidewalk to one inch (1 In) from top of walk with suitable fill material. Tamp until firm and solid, place sod as applicable. Dispose of excess material in accordance with Section 01580 – Waste Material Disposal. Repair driveways and parking lots damaged by sidewalk excavation in accordance with Section 02845 – Pavement Repair and Resurfacing.

3.4 CURING

A. Conform to requirements of Section 02835 – Concrete Pavement Curing.

3.5 FIELD QUALITY CONTROL

A. Testing shall be performed under provisions of Sections 01470 – Testing Laboratory Services and 01475 – Quality Control Testing Procedures.

B. Compressive Strength Test Specimens: Four (4) test specimens for compressive strength test shall be made in accordance with ASTM C31 for each thirty cubic yards (30 Cy) or less of sidewalk that is placed in one day (1 D). Two (2) specimens shall be tested at seven days (7 D). Remaining two (2) specimens shall be tested at twenty-eight days (28 D). Specimens shall be tested in accordance with ASTM C39. Minimum compressive strength: two thousand seven hundred pounds per square inch (2700 psi) at seven days (7 D) for first two (2) specimens and three thousand pounds per square inch (3000 psi) at twenty-eight days (28 D) for the second two (2) specimens.

C. Yield test for cement content per cubic yard of concrete shall be made in accordance with ASTM C138. 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 shall have the concrete tested by means of core test as specified in ASTM C42. When concrete does not meet this specification, cost of test, shall be deducted from the Contractor's payment.

E. Sampling of fresh concrete shall be in accordance with ASTM C172.

F. Take slump tests when cylinders are made and when concrete slump appears excessive.

G. Concrete shall be acceptable when average of two (2) twenty-eight (28) day compression tests is equal to or greater than minimum twenty-eight day (28 D) strength specified.

H. If either of two (2) tests on field samples is less than average of two (2) tests by more than ten percent (10%), that entire test shall be considered

suspect and not indicative of concrete strength. Core samples shall be required from in-place concrete in question.

I. If twenty-eight day (28 D) laboratory test indicates that concrete of low strength has been placed, test concrete in question by taking cores as directed and approved by the Project Manager. Take and test at least three (3) representative cores as specified in ASTM C42 and deduct cost from payment due.

3.6 NONCONFORMING CONCRETE

A. Remove and replace areas that fail compressive strength tests, or thickness of concrete shown on the Drawings.

B. Replace non-conforming sections at no additional cost to the City.

3.7 PROTECTION

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

B. Replace damaged areas.

END OF SECTION