

**DIVISION 3**  
**CONCRETE**



## SECTION 03250

### CONCRETE

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Cast-in-place concrete for storm drainage system, paving, curb and gutter, slabs and walks.
- B. Reinforcing Steel.
- C. Concrete Curing.
- D. Concrete Repair.

##### 1.2 RELATED SECTIONS

- A. Section 01410 - Testing and Laboratory Services.
- B. Section 02410 - Patching Asphaltic Concrete Pavement.
- C. Section 02420 - Concrete Curb and Gutter and Sidewalks.
- D. Section 02625 - Sewer Force Main Systems.
- E. Section 02500 - Storm Drainage System.

##### 1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ASTM C 33 - Concrete Aggregates.
- C. ASTM C 94 - Ready-Mixed Concrete.
- D. ASTM C 150 - Portland Cement.
- E. ASTM C 260 - Air-Entraining Admixtures for Concrete.
- F. ASTM C 494 - Chemical Admixtures for Concrete.
- G. ACI 315 - Details and Detailing of Concrete Reinforcement.
- H. ASTM A 82 - Cold Drawn Steel Wire for Concrete Reinforcement.
- I. ASTM A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- J. ANSI/AWS D1.4 - Structural Welding Code Reinforcing Steel.

- K. ASTM A 615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- L. CRSI - Manual of Practice.
- M. ASTM C 309 - Liquid Membrane - Forming Compounds for Curing Concrete.
- N. ASTM D 2103 - Polyethylene Film and Sheeting.
- O. FS TT-C-800 - Curing Compound, Concrete for New and Existing Surfaces.

#### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain materials from same source throughout.

#### 1.5 TESTS

- A. Testing and analysis of concrete will be performed under provisions of Section 01400.
- B. Submit proposed mix design of each class of concrete to Engineer for Review prior to commencement of work.
- C. Test of cement and aggregates will be performed to ensure conformance with requirements stated herein:

#### 1.6 PRODUCT DATA

- A. Submit mill test certificates of supplied concrete reinforcing indicating physical and chemical analysis.
- B. Provide product data for specified products.
- C. Submit all manufacturer's installation instructions.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete in temperatures less than 40 degrees F without Engineer's approval.
- B. Maintain ambient temperature at 70 degrees F (minimum) for three days for curing.

### PART 2 PRODUCTS

#### 2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, normal - Type 1, air entraining - Type 1A moderate, high early strength Type III, air entraining - Type III Portland Type; gray color.
- B. Fine and Coarse Aggregates: ASTM C 33.

- C. Water: Clean and not detrimental to concrete.

## 2.2 ADMIXTURES

- A. Air Entrainment: ASTM C 260.
- B. Chemical Admixture: ASTM C 494 Type A - water reducing. Type B - retarding. Type C - accelerating. Type D - water reducing and retarding. Type E - water reducing and accelerating.

## 2.3 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C 94.
- B. Provide concrete for all wingwall, footing and slab construction of the following characteristics:

- 1. Comprehensive Strength  
(7 days): 3200 psi
- 2. Comprehensive Strength  
(28 days): 4000 psi

- C. Provide concrete for All Other Concrete Construction of the following characteristics:

<u>Unit</u>	<u>Measurement</u>
Comprehensive Strength (7 days):	2400 psi
Comprehensive Strength (28 days):	3000 psi

- D. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.
- E. Use set-retarding admixtures during hot weather only when approved by Engineer.
- F. Add air entraining agent to all concrete mixes for concrete work.

## 2.4 REINFORCING STEEL MATERIALS

- A. Reinforcing Bars: ASTM A 615, 60 KSI yield grade, billet-steel deformed bars with uncoated finish as specified on the plans.
- B. Welded Steel Wire Fabric: ASTM A 185 (unless otherwise specified) plain type, coiled rolls, uncoated finish 6" x 6" mesh of 0.135" diameter.
- C. Stirrup Steel - ASTM A 82.
- D. Tie Wire: Minimum 16 gage annealed type - acceptable patented system.

- E. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

2.5 CURING MATERIALS

- A. Water: Clean and not detrimental to concrete.
- B. Membrane Curing Compound: ASTM C 309, FSTT-C-800.
- C. Chem-trete curing compound by Trocal or equivalent.

PART 3 EXECUTION

3.1 INSPECTION

- A. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's instructions.
- B. At locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Before placing concrete, clean reinforcement of foreign particles or coating and remove any foreign material in forms by sweeping, blowing or washing.

3.3 PLACING CONCRETE

- A. Notify Engineer minimum 24 hours prior to commencement of concreting operations.
- B. Place concrete in accordance with ACI 301.
- C. Hot Weather Placement: ACI 301.
- D. Cold Weather Placement: ACI 301.
- E. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- F. Maintain concrete cover around reinforcing as follows:

<u>ITEM</u>	<u>COVERAGE</u>
Supported Slabs and Joists	2 inch
Walls (Exposed to Weather or Backfill)	2 inch
Footings & Concrete Formed Against Earth	2 inch
Slabs on Fill	2 inch

- G. Place concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur.
- H. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

#### 3.4 FINISHING

- A. Provide concrete surfaces to be left exposed, concrete walls with rubbed sack rubbed finish or as directed by the Engineer.

#### 3.5 PATCHING

- A. Notify Engineer immediately upon removal of forms.
- B. Patch imperfections.

#### 3.6 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required levels and lines, details and elevations.
- B. Repair or replace concrete not properly placed or of the specified type.

#### 3.7 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400.
- B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

#### 3.8 PROTECTION

- A. Protect all finished work.
- B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

END OF SECTION

