

**SECTION 03312**  
**POLISHED CONCRETE FLOOR**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This section includes polished concrete floor in Building 8600, CLO.
- B. Related Sections:
  - 1. Division 3, Section 03300, "Cast-In-Place Concrete" for general structural applications of concrete.
  - 2. Division 3, Section 03331, "Architectural Cast-In-Place Concrete" for mix design of concrete.

**1.2 SUBMITTALS**

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: Submit for concrete mix. Include alternative mix designs when characteristics of materials, project conditions, test results, or other circumstances warrant adjustments.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
- D. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
  - 1. Cementitious materials and aggregates.
  - 2. Steel reinforcement and reinforcement accessories.
  - 3. Admixtures.

**1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed exposed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Ready-Mixed Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.
- D. Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.
- E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixes.
- F. Mockups: Cast mockups of full-size panels of ground aggregate concrete to demonstrate typical pattern, surface finish, texture, aggregate color, and standard of workmanship.
  - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Construction Manager.

2. Notify Construction Manager seven days in advance of dates and times when mock-ups will be constructed.
  3. Obtain Construction Manager's approval of mockups before starting construction.
  4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  5. Approved mockups may become part of the completed Work, if undisturbed at time of Substantial Completion.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in General and Supplementary Conditions "Project Meetings."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide concrete products as follows:
1. Penetrating Sealer: Penetrating Sealer No. 40 as manufactured by Sonneborn Building Products, or equal.

### 2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- C. Steel Bar Mats: ASTM A 184; with ASTM A 615, Grade 60, deformed bars; assembled with clips.
- D. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete.

### 2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
- B. Aggregate: ASTM C 33, uniformly graded with coarse aggregate as follows:
1. Class: 4M.
  2. Nominal Maximum Aggregate Size: 3/4 inch.
- C. Lightweight Aggregate: ASTM C 330.
1. Nominal Maximum Aggregate Size: 3/4 inch.
- D. Aggregate Color: Provide aggregate that matches Construction Manager's sample
- E. Water: Potable and complying with ASTM C 94.

## 2.4 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride. Admixtures, if used shall conform to the following:
1. Air-Entraining Admixture: ASTM C 260.
  2. Water-Reducing Admixture: ASTM C 494, Type A.
  3. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

## 2.5 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

## 2.6 CONCRETE MIXES

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for type and strength of normal-weight concrete determined by either laboratory trial mix or on a field test data bases.
1. Proportion lightweight structural concrete according to ACI 211.2 and ACI 301.
- B. Design mix shall match Architectural Concrete. Obtain mix from Architectural concrete after final samples of Architectural concrete have been reviewed and approved by the Construction Manager.
- C. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
- D. Slabs on Grade: Proportion mixes to provide concrete with the following properties:
1. Compressive Strength (28 Days): 4,000 psi.
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
  3. Maximum Slump: 4 inches.
- E. Suspended Slabs: Proportion lightweight structural concrete mix as follows:
1. Compressive Strength (28 Days): 3,500 psi.
- F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

## 2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect adjacent construction from discoloration and spillage during installation of concrete, curing compounds, and sealers.

### 3.2 PLACEMENT

- A. Place concrete as required for placing slabs in Section 03300.
- B. Finishing: Consolidate surface with power-driven floats as soon as topping can support equipment and operator. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
  - 1. Hard Trowel Finish: After floating surface, apply first trowel finish and consolidate topping by power-driven trowel so no blisters develop. Continue troweling passes and restraighten until surface is smooth and uniform in texture.
    - a. Finish and measure surface so gap at any point between topping surface and an unveled freestanding 10-foot- long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed 1/4 inch.
- C. Construction Joints: Construct joints true to line with faces perpendicular to surface plane of topping, at locations indicated or as approved by the Construction Manager.
  - 1. Coat face of construction joint with epoxy adhesive at locations where topping is placed against hardened or partially hardened topping.
- D. Sawed Contraction Joints: Form weakened-plane contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before topping develops random contraction cracks.
  - 1. Form sawed contraction joints in pattern shown on Drawings.
  - 2. Construct contraction joints for a depth equal to one-half of topping thickness, but not less than 1/2 inch deep.

### 3.3 SPECIAL FINISH

- A. Seeded Ground Aggregate Finish: Immediately after floating, broadcast a single layer of aggregate onto the concrete surface to match quantity and texture of Construction Manager's sample. Tamp seeded aggregate into plastic concrete, and float to entirely embed aggregate.
  - 1. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
  - 2. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon bristle broom.
  - 3. Following curing, grind surface of the concrete to match samples.
- B. Fine Grinding: Grind with 120 or finer grit stones until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure.
- C. Remove grinding dust from installation and adjacent areas.
- D. Wash surfaces with cleaner, rinse surfaces with water, and allow to dry thoroughly.
- E. Curing Compound: Apply uniformly in continuous operation according to manufacturer's written instructions.
- F. Sealer: Apply uniformly in two coats in continuous operations according to manufacturer's written instructions. Allow first coat to dry before applying second coat.
  - 1. Begin sealing dry surface no sooner than 14 days after concrete placement.
- G. Apply sealer according to sealer manufacturer's written instructions.

**END OF SECTION 03312**