



Suggested Specification for White Concrete

Specifier Notes:

1. This suggested specification follows the Construction Specifications Institute (CSI) Page Format. It provides information to the Architect or Engineer who must review the contents to ensure they meet project requirements and applicable building codes. This section must be coordinated with other project specification sections.
2. This Suggested Specification for White Concrete provides guidance on setting specifications for Cast-In-Place white cement concrete floors. These specification recommendations should be carefully coordinated with project specifications and the recommendations of the intended surface treatment supplier. Surface treatment supplier shall provide recommended requirements for finishing and curing to accommodate post placement polishing operations.

DIVISION 03 – CONCRETE

SECTION 033000 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cast-In-Place concrete for exposed concrete floors
- B. Cast-In-Place concrete for retaining walls

1.02 RELATED SECTIONS

- A. Section 033300 Architectural Concrete
- B. Section 033500 Concrete Finishing

1.03 REFERENCES

- A. American Concrete Institute:
 - 1 ACI 117 Specifications for Tolerances for Concrete Construction and Materials and Commentary
 - 2 ACI 301 Standard Specification for Structural Concrete

- 3 ACI 302 Guide for Concrete Floor and Slab Construction
- 4 ACI 303 Standard Specification for Cast-In-Place Architectural Concrete
- 5 ACI 304 Guide for Measuring, Mixing, Transporting, and Placing Concrete
- 6 ACI 308 Standard Practice for Curing Concrete

B. American Society for Testing and Materials (ASTM):

- 1 ASTM C33 Standard Specification for Concrete Aggregates
- 2 ASTM C94 Specification for Ready-Mixed Concrete
- 3 ASTM C150 Standard Specification for Portland Cement
- 4 ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- 5 ASTM C989 Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

1.04 QUALITY ASSURANCE

A. Architectural Concrete: Where concrete is indicated as architectural concrete exposed to public view, such concrete shall be produced in accordance with applicable requirements of ACI 301 and ACI 303.1

B. Site Mock-Ups:

- 1. Construct site mock-ups for all architectural concrete work and formed concrete that will be exposed to the public in the finished work, not less than 10 feet by 10 feet in surface area, for review by the Engineer and acceptance by the Architect, before starting the placement of concrete.
- 2. Approved site mock-ups for all architectural concrete shall set the standard for the various architectural concrete features: flatness, levelness, formed finishes, and colors of the concrete. The materials and practices used to produce the mock-up panel, including placement, curing and surface treatment applications, shall be in accordance with Section 03 35 43, Polished Concrete Finishing.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement for use in the architectural concrete sales floor shall be Lehigh White Portland Cement conforming to the requirements of Standard Specification for Portland Cement, ASTM C 150, for Type I Portland cement, except that it shall contain not more than 0.50 % by weight Ferric Oxide (Fe₂O₃).

- B. Slag: Ground Granulated Blast-Furnace Slag: Slag cement shall conform to the requirements of Standard Specification for Ground Granulated Blast-Furnace Slag for use in Concrete and Mortars, ASTM C-989, and be Grade 100 or Grade 120. If used, Slag cement replacement can be 20 to 40 percent (by mass of cementitious material). Slag cement shall be white or very light in color.
- C. Aggregate: Both fine and coarse aggregates should meet the ASTM C 33 requirements for normal concrete aggregates and shall be white or very light in color.
 - 1. Fine aggregate for white concrete should be either white or light colored and consist of clean, hard, durable particles of silica sand, crushed white marble or white limestone entirely free from deleterious substances.
 - 2. Coarse aggregate for white concrete should consist of clean, hard, durable white or light-colored aggregate, free from deleterious substances.
- D. Reinforcing Steel: Refer to Section 032000
- E. Curing materials for architectural concrete, including liquid curing compounds or coverings, shall be selected to be non-staining. The curing method selected must be tested for color impact on the surface of white concrete and comply with the requirements of Section 03 35 43 Part 3.01a, Polished Concrete Finishing.

PART 3 EXECUTION

3.01 PREPARATION

- A. Dried-in: Prior to placing concrete for the architectural concrete sales floor, the structure must be "dried in". The roof and walls must be substantially complete as to provide an environment protected from wind and precipitation.
- B. Subgrade: Prior to placement of concrete, the subgrade shall be in a firm, well-drained condition, and of adequate and uniform load-bearing nature to support construction personnel, construction materials, construction equipment, and steel reinforcing mats without tracking, rutting, heaving, or settlement. All weak, soft, saturated, or otherwise unsuitable material shall be removed and replaced with structural backfill or controlled density fill.
- C. Overhead: Work that occurs above the suspended ceiling panels, such as electrical, plumbing, gas, water, fire protection, painting and HVAC systems, are to be completed prior to placing the concrete for the architectural concrete sales floor.

3.02 TRANSPORTING

- A. Concrete for the architectural concrete sales floor shall be transported to the Jobsite in a truck mixer, in accordance with the requirements of ASTM C94. Trucks shall be cleaned and segregated to prevent cross contamination from other mixes.

3.03 PLACEMENT

- A. In addition to the requirements of Section 03 35 00 Concrete Finishing, the following requirements shall apply:
1. Hand or machine troweling should follow floating of the slab surface. Troweling shall not be done when surface bleed water is present. The surface shall be brought to a smooth finish, free of defects and blemishes.
 2. Finishing operations shall comply with the recommendations from the floor surface treatment supplier.
 3. Items other than Formwork: Conform to ACI 117 except as specified.
 4. Slab on Grade and Pavement Base Fine Grade: Subgrade shall be to grade +0 inch, -3/4 inch with transition no greater than 3/4 inch vertically to 8 inches horizontally for level slab.
 5. Slab on Grade and Pavement Thickness: as detailed in the Plans and as required conform to slab Finished Surface Flatness and Levelness tolerances +/- 1/4 inches.
 6. Finished Surface Flatness and Levelness: Architectural concrete sales floor slab shall achieve a Specific Overall Value (SOV) F_F50/F_L35 and Minimum Local Value (MLV) F_F33/F_L24 tolerance in accordance with ACI 117.
 7. Remedies for Out-of-Tolerance Work: Remove and replace slabs-on-grade measuring below either (or both) of specified minimum local F-numbers or as required by Owner.

3.04 CONSTRUCTION JOINTS

- A. Construction joints will be permitted only where indicated or approved by the Engineer.
- B. Provide and prepare construction joints in accordance with the applicable requirements of ACI 301 and ACI 304.
- C. Make construction joints straight and as inconspicuous as possible, and in exact vertical alignment with the structure.

3.05 CURING AND PROTECTION

- A. Curing of concrete shall conform to applicable requirements of ACI 301 and ACI 308, except that the curing shall comply with Section 03 35 43, Polished Concrete Finishing.
- B. Immediately upon completion of finishing operations, exposed concrete surfaces shall be kept moist by covering with damp curing materials or by applying a curing compound in accordance with Section 03 35 43, Polished Concrete Finishing.

- C. Immediately after placement, and installation of curing material, protect concrete from injurious action of the elements and defacement of any kind. Protect concrete from foot or equipment traffic that will damage the surface in any way. Refer to Section 03 35 43 Part 3.01B.
- D. Protect concrete during the curing period not less than nine days from mechanical and physical stresses that may be caused by heavy equipment movement, subjecting the concrete to load stress, load shock, or excessive vibration. Reference Execution, Part 3.01C Overhead and Section 03 35 43 Part 3.01B.

END OF RECOMMENDATIONS FOR SECTION 033000

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