

MIT

Design Standards

DIVISION 03 — Concrete

Issued 2022



Department
of Facilities

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1. 033000 - CAST-IN-PLACE CONCRETE

1.1 Project Includes

Cast-in-place concrete, reinforcing and accessories. For exterior cast-in-place concrete the MIT Campus Standard is a broom finish with control joints saw-cut (not troweled). Exposed aggregate finish may only be used for repairs to match an existing field, or in Killian Court in consultation with OCP.

1.2 Quality Assurance

Standards:

1. 780 CMR, Massachusetts State Building Code, Eighth Edition.
2. ACI 301, Specifications for Structural Concrete for Buildings.
3. ACI 117, Specifications for Tolerances for Concrete Construction and Materials.
4. ACI 318, Building Code Requirements for Structural Concrete.
5. CRSI Manual of Standard Practice.

Testing: Employ an independent testing agency acceptable to Owner to design concrete mixes and to perform material evaluation tests. Provide 7- and 28-day cylinder tests. Comply with ASTM C143, C173, C31 and C39.

Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

Floor Flatness and Levelness Tolerances:

1. Subfloors Under Materials Such as Concrete Toppings, Ceramic Tile, and Sand Bed Terrazzo: ACI 302.1R and ASTM E 1155, floor flatness (Ff) of 15, floor levelness (Fl) of 13.
2. Subfloors Under Materials Such As Vinyl Tile, Epoxy Toppings, Paint, and Carpet: ACI 302.1R and ASTM E 1155, floor flatness (Ff) of 20, floor levelness (Fl) of 17.

Comply with ACI 301. Calcium chloride admixtures are not permitted.

Tolerances: ACI 117.

1.3 Products

Design Mix: ASTM C 94, 3500 psi min. typical, 28 day compressive strength.

Formwork: Plywood or metal panel formwork sufficient for structural and visual requirements.

Reinforcing Materials:

1. Reinforcing Bars: ASTM A 615, Grade 60, galvanized.
2. Steel Wire: ASTM A 82, galvanized.
3. Steel Wire Fabric: ASTM A 185, welded, plain, galvanized.

Concrete Materials:

1. Standard Cement: Portland cement, ASTM C 150, Type I.
2. Aggregates: ASTM C 33.
3. Water: ASTM C 94, potable.

Admixtures:

1. Air-Entraining Admixture: ASTM C260.
2. Concrete Admixtures: Containing less than 0.1 percent chloride ions.

Waterstops: Rubber, PVC or self expanding butyl/bentonite waterstops.

Underslab Vapor Retarder: ASTM D 4397, polyethylene sheet, 10 mils.

Liquid Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

Slab Finishes:

1. Scratch: For surfaces to receive mortar setting beds or cementitious flooring materials.
2. Trowel: Hard, smooth, uniform surface for areas to receive resilient flooring, carpet, or other thin finish material.
3. Broom: After trowel finishing, roughen surface by fine brooming perpendicular to traffic direction for exposed exterior walks, steps and ramps.
4. Non-Slip Aggregate: After trowel finishing, uniformly trowel 25-lbs./100 square feet of damp non-slip aggregate into surface. Cure, then rub lightly to expose aggregate. Use for interior exposed concrete stairs and ramps.
5. Exposed Aggregate: Use chemical retarder or tamp aggregate into wet concrete and expose by brushing with water.
6. Hardener/Densifier Finish: For exposed interior concrete floors. Follow manufacturer's directions.

2. 034500 - ARCHITECTURAL PRECAST CONCRETE

2.1 Project Includes

Architectural precast concrete panels and shapes.

2.2 Sustainable Design

Provide Architectural precast concrete with the following sustainable design features:

1. Recycled content.
2. Regional materials.

2.3 Quality Assurance

Standards:

1. ACI 318, Building Code Requirements for Reinforced Concrete.
2. CRSI Manual of Standard Practice.
3. PCI MNL 117, Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.

Testing: Independent testing laboratory.

Fabrication and Erection Tolerance Limits: PCI MNL 117.

2.4 Products

Design Mix: 5000 psi (34 MPa), 28 day compressive strength, 4 to 6 percent total air content.

Formwork: Plywood or metal panel formwork sufficient for structural and visual requirements.

Reinforcing Materials:

1. Reinforcing Bars: ASTM A615, Grade 60, deformed.
2. Steel Wire: ASTM A82.
3. Steel Wire Fabric: ASTM A185, welded.

Concrete Materials:

1. Standard Gray Cement: Portland cement, ASTM C150, Type I or Type III.
2. Fine Aggregate for Facing Mixes: ASTM C33.
3. Coarse Aggregate for Facing Mix: ASTM C33.
4. Pigments: Nonfading lime resistant pigments.

Concrete Admixtures:

1. Containing less than 0.1 percent chloride ions.
2. Connection Materials: Steel plates and finishes, galvanized.
3. Color and Finish: Buff limestone color, light sandblast finish.

3. 034900 - GLASS FIBER-REINFORCED CONCRETE

3.1 Project Includes

Glass-fiber-reinforced concrete units.

3.2 Quality Assurance

Comply with PCI MNL 130.

3.3 Products

Factory-formed portland cement, glass fiber, sand and admixtures complying with PCI MNL 130.

4. 035400 - CONCRETE FLOOR TOPPING

4.1 Project Includes

Concrete floor topping at floors requiring slope.

Gypsum topping is not acceptable where concrete floor topping is indicated.

4.2 Products

Concrete Floor Topping: Cement based underlayment / topping.

5. 035410 - GYPSUM CEMENT UNDERLAYMENT

5.1 Project Includes

Self-leveling gypsum-cement based floor underlayment.

5.2 Products

Gypsum-Cement Floor Underlayment:

1. Type: Gypsum-cement-based, self-leveling underlayment:
2. Compressive Strength: Not less than 2000 psi at 28 days when tested according to ASTM C472.

END OF DOCUMENT