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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:

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.

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.

Concrete Materials:


Admixtures:

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.

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.
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.

Concrete Materials:

1. Standard Gray Cement: Portland cement, ASTM C150, Type I or Type III.

Concrete Admixtures:

1. Containing less than 0.1 percent chloride ions.
2. Connection Materials: Steel plates and finishes, galvanized.
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