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## 033000 - Cast-in-Place Concrete

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## **SECTION 03 3000 - CAST-IN-PLACE CONCRETE**

### 1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

### 1.2 SUBMITTALS

- A. LEED Submittals:
  - 1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
    - a. Include statement indicating costs for each product having recycled content.

### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

### 1.4 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

### 1.5 STEEL REINFORCEMENT

- A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 60 percent.

1.6 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150.
    - a. Fly Ash: ASTM C 618, Class F or C.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, graded.
- C. Lightweight Aggregate: ASTM C 330.

1.7 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

1.8 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

1.9 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

1.10 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1.11 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

1.12 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

- B. Cold-Weather Placement: Comply with ACI 306.1.
- C. Hot-Weather Placement: Comply with ACI 301.

1.13 CONCRETE PROTECTING, FINISHING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Finishing: clean and rub all exposed surfaces of concrete walls, columns, ceiling and parapets to remove stains, foreign matter, burrs, fins and any other surface irregularities after removal of form ties and after any rework and patching work is completed. Exposed surfaces shall be left true to line and plane and free from form marks and other imperfections. Cosmetic coatings used to disguise underlying defects are unacceptable.

1.14 CLEANING

- A. Wash down of concrete trucks and related equipment shall be off-site in a location such that the residue will not be a problem for future landscaping, excavation, underground drainage systems, etc. No wash down shall occur near or into new or existing sanitary or storm drainage lines.

1.15 CONSTRUCTION WASTE MANAGEMENT

- A. No dumping of excess concrete shall be permitted on-site.

END OF SECTION 03 3000