

Montgomery County Public Schools Facilities Guide

DIVISION 3 – CONCRETE

SECTION 03300

CAST-IN-PLACE CONCRETE

**PART 1 GENERAL**

1.01 GUIDE INCLUDES

- A. Concrete material, accessories and placement shall be in accordance with applicable ASTM or ACI standards.

1.02 TESTING

- A. Employ a certified testing laboratory to perform required concrete material evaluation testing at site and lab to assure compliance with specifications. Testing shall include:
  - 1. Slump test every 25 yards and as directed by Architect and/or Owner.
  - 2. Compressive Tests:
    - a. 4 cylinders for pours up to 75 yds or 3500 sq.ft. of surface. One cylinder tested at 7 days, 2 tested at 28 days and 1 cylinder retained for later testing if required.
  - 3. Test results to be reported in writing to:
    - a. Architect
    - b. Owner
    - c. Structural Engineer
    - d. Contractor
  - 4. Other tests as directed by A/E

1.03 COLD WEATHER PRECAUTIONS

- A. Comply with ACI 306
- B. No calcium chloride accelerator
- C. Accelerate "80" by Euclid Chemical Co; Pozzolith High Early by Master Builders, or "Paraset" type C accelerator may be considered if approved by the architect.

1.04 HOT WEATHER PRECAUTIONS

- A. Comply with ACI 305

1.05 CONCRETE FLOOR SLABS AND EXTERIOR CONCRETE

- A. Concrete floor slabs and exterior concrete shall contain a 5-7 percent air entraining agent.

1.06 FLASH PATCH ALLOWANCE

- A. For modernization of existing buildings, provide following amount of flash patch up to 1-1/2 inch thickness.
  - 1. Elementary School - 10,000 sq. ft.
  - 2. Middle School - 20,000 sq. ft.
  - 3. High School - 40,000 sq. ft.

1.07 REFERENCE STANDARDS

- A. ASTM C 595, "Standard Specification for Blended Hydraulic Cements."
- B. ASTM C 618, "Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use

- as a Mineral Admixture in Portland Cement Concrete."
- C. ASTM C 150, "Standard Specification for Portland Cement."
- D. ASTM C 311, "Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete."
- E. AASHTO M 240, "Blended Hydraulic Cements."
- F. ASTM C 989, "Ground Granulated Blast-Furnace Slag for Use in Concrete Mortars."
- G. AASHTO M 302, "Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars."
- H. American Concrete Institute Standard Practice ACI 226.R1, "Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete."
- I. I.ACI 355 ...

**Comment [M1]:** Cross check with NW#7 specs for ASI 355 reference

## 1.08 SUBMITTALS

- A. Submit location of manufacture and of harvest/ extraction/ recovery of concrete and steel materials.
- B. Submit recycled-content information, designating percentages of post-consumer and pre-consumer waste material.
- C. Submit FSC-certification for sustainably harvested plywood formwork materials, if applicable.
- D. Submit product data on biodegradable form-release agent made from rapidly renewable materials.
- E. Design Mix: Submit to Architect for approval.
- F. Strength as indicated by Structural Engineer. Normal strength to be 3000 psi unless otherwise noted.
- G. Submit MSDS for any applicable products used.

## PART 2 PRODUCTS

### 2.01 MATERIALS, GENERAL

- A. Regional Materials: Provide products manufactured and of primary materials extracted/ recovered within a 500-mile radius of the project site.
- B. Recycled Content:
  1. Reinforcing bars shall contain minimum 95% total recycled-content including at least 60 percent post-consumer material.
  2. Concrete Materials: [Obtain structural engineer approval, and use if Project scheduling will permit extended set time from use of GGBF slag in cement]: Cement mixture shall contain no less than 50 percent ground granulated blast furnace slag or 35 percent fly ash replacement for Portland cement when environmental temperature range is X to X [TBD by Structural engineer]. Use of fly ash or GGBF slag shall be limited to slabs-on-grade and foundations.

### 2.02 SLABS ON GRADES

- A. Provide 6 inch of gravel base over compacted fill, tamp gravel to compaction.
- B. Provide min. of 10 mil polyethylene vapor barrier
- C. Unless otherwise noted concrete slabs to be normally of 4 inch thick pour, in sections not to exceed 900 sq. ft. with key joint.
- D. Horizontal conduits and pipes shall be placed below the concrete slab.
- E. Wire mesh concrete to be provided as designed by structural engineer. Provide chairs or other measures to assure wire mesh is located near center of the slab when poured.
- F. Tolerance of slab elevation not to exceed 1/8 inch in 10'.
- G. Finishes (including slabs above grade)
  1. Scratch finish for rough slabs to receive setting beds.
  2. Hard troweled finish on all slabs unless specified otherwise.
  3. Chemical hardener applied over exposed concrete (mechanical room, etc.)
- H. Curing:
  1. Apply curing and sealing compound to all concrete slabs with-in two (2) hours after slab has been finished. Do not cure and seal if hardener, waterproofing damproofing, painting

or other coatings are to be subsequently applied

- a. Provide low-VOC curing compound with maximum 250 g/L VOC content.
2. Provide additional covering to maintain moisture and required temperature for period of not less than 7 days.

#### 2.03 SLABS ABOVE GRADE

- A. Same procedures as for slabs on grade except horizontal conduit and pipe which are to be installed below decking and above the lower floor ceiling. (Chairs must be used in composite deck pours.)

#### 2.04 FOOTINGS, FOUNDATIONS AND WALLS

- A. Forms:
  1. Exposed Finish Concrete:
    - a. Use plywood, metal, or metal framed material to provide a continuous straight smooth surface, with bracing as necessary to eliminate bowing and deflection.
    - b. Plywood shall be made from FSC-certified sustainably harvested wood if locally available.
    - c. Form release agent shall be zero-VOC, 100% biodegradable commercial-grade product made from rapidly-renewable plant-based oils.
    - d. Removal of forms shall not occur until concrete has hardened sufficiently to carry its own weight. Contractor responsible for timing and safety of form removal.
    - e. Patching and Grouting:
      - 1) After forms have been removed, check surface of concrete and correct defects. Fill pin holes and honey combs with neat cement, grout and trowel to match surrounding area. Rub entire surface with an abrasive stone until all ribs, ridges, etc. are obliterated.
- B. Reinforcing Steel:
  1. Comply with Concrete Reinforcing Steel Institute's "Manual of Standard Practice."

#### 2.05 EXTERIOR CONCRETE (SEE DIVISION 2 - SITE WORK)

### PART 3 EXECUTION

#### 3.01 WASTE MANAGEMENT

- A. Recycle or salvage waste concrete and steel materials in accordance with Division 1 "Construction Waste Management" requirements.

**END OF SECTION**