

Guidelines for Architects and Engineers  
Fairfax County, BDCD

**030000 CONCRETE**

I. DESIGN

- A. All structural calculations, drawings, and mix designs for cast-in-place, structural precast and architectural precast concrete shall be prepared under the supervision of a Professional Engineer (PE) licensed by the Commonwealth of Virginia. All drawings, calculations, and mix designs shall be sealed, signed and dated by a PE licensed in the Commonwealth of Virginia. Specifications shall require the Contractor to provide PE certification of shop drawings, calculations, and mix designs.
- B. Specifications and drawings of cast-in-place and precast concrete elements shall include requirements of the latest version of the Fairfax County Special Inspections Program (FC-SIP).
- C. Project specifications shall state that the Contractor is not authorized to proceed with manufacture or procurement of cast-in-place or precast elements until applicable shop drawings, mix designs and color samples are approved; and any required mock-ups are constructed and approved.
- D. Specifications shall reflect that the Contractor is responsible for scheduling and complying with all concrete inspections and associated reports. This includes inspections performed by the Owner-provided third-party inspection agency for the Critical Structures inspection per the FC-SIP. Refer to and coordinate with Division 01 – Testing and Quality Control.
- E. All testing and inspection of concrete work not included by the FC-SIP shall be performed by the Contractor's testing agency. This requirement is to be included in the specifications.
- F. Calcium chloride use shall be limited to the values in ACI 318 Chapter 4. Calcium chloride use is not permitted in concrete for reinforced concrete pipe or drainage structures as per VDOT requirements.
- G. Where concrete work abuts the building structure, plans will specify that the expansion joint will be caulked with a traffic grade caulking.
- H. Architect and/or engineer shall determine locations of construction and expansion joints and note specific requirements and locations on plans.
- I. Mix design for sidewalks, curb and gutter, and other site work concrete shall meet VDOT A4 (4000 psi) mix design specifications.
- J. Mix design for concrete surfaces that will be exposed to deicing salts shall be per ACI 318, Chapter 4 Durability Requirements.

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- K. Project specifications shall require that all structural precast or architectural precast elements be manufactured at a precast plant that is a certified member of the Pre-stressed Concrete Institute (PCI) and is operated under the supervision of a PE licensed by the Commonwealth of Virginia.
- L. For cast-in-place concrete structures and pavements exposed to freeze-thaw conditions, the project specifications shall identify requirements for Water/Cement Ratio and Entrained Air Content. On-site testing for Air Content and laboratory testing for Water/Cement Ratio will be conducted by Owner's Testing Agency.
- M. On renovation projects where a portion of the existing slab on grade is removed, the documents must show a detail with appropriate notes to identify the requirement to maintain the integrity of the under-slab vapor barrier at areas where existing slab is removed and then replaced. Where extensive saw cutting is required, contiguous larger area, slab removal is recommended instead of piecemeal slab removal and replacement to simplify the retention of a continuous vapor barrier.
- N. Concrete thickness for floor slabs directly on grade shall not be less than 3 ½".
- O. The use of fly ash (ASTM 311 and ASTM C618, Class F) and/or ground iron furnace slag (ASTM C989, Grade 100 or 120) in the concrete mix design specifications is encouraged where the finish of the concrete will not be adversely impacted.
- P. Specifications shall reflect that field bending or straightening of reinforcement partially embedded in concrete shall not be allowed, except as shown in the contract documents or permitted by the licensed design professional engineer of record.

**II. SHOP DRAWING**

- A. Project specifications shall require the Contractor to provide shop drawings for all cast in place, structural precast and architectural precast concrete, and all mix designs and connection details which are sealed, signed and dated by a PE licensed in the Commonwealth of Virginia, as required by the FC-SIP. Any documents required to be sealed, signed and dated by a PE by the FC-SIP that are not identified as a requirement of the Contractor in the specifications shall be considered to be a requirement of the Architect and the Structural Engineering Consultant.