

**SECTION 03 10 00  
CONCRETE FORMING AND ACCESSORIES**

**PART 1 - GENERAL**

**1.01 RELATED SECTIONS**

- A. Division 01 Sections
- B. Section 032000 - Concrete Reinforcing.
- C. Section 033000 - Cast-in-Place Concrete.

**1.02 REFERENCES**

ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials.

ACI 301 – Standard Specifications for Structural Concrete.

ACI 318 – Building Code Requirements for Structural Concrete.

ACI 347 – Guide to Formwork for Concrete.

ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.

ASTM E154 – Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

ASTM E1643 – Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

ASTM E1745 – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

ASTM E1993 – Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

ASTM F1249 – Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.

**1.03 SUBMITTALS**

- A. Submit manufacturer's data for:
  - 1. Vapor Retarder
  - 2. Expansion/Isolation Joint Filler.
  - 3. Waterstops.

**1.04 DESIGN OF FORMWORK**

- A. Design of formwork, shoring, and reshoring and its removal is the Contractor's responsibility.

- B. Design of formwork, shoring, and reshoring shall conform to ACI 117, ACI 301, ACI 318, and ACI 347.
- C. Design formwork in a manner such that existing or new construction is not overloaded.

## **PART 2 - PRODUCTS**

### **2.01 FORM MATERIALS**

- A. Form Material: Wood, plywood, metal, fiberglass or a combination of these, with sufficient strength to prevent distortion.
- B. Form Definitions
  - 1. Standard Forms: No form-facing material required. Standard forms are acceptable everywhere.

### **2.02 FORMWORK ACCESSORIES**

- A. Formwork Accessories: Commercially manufactured products, including ties and hangers. Do not use nonfabricated wire form ties.

### **2.03 FORM RELEASE AGENT**

- A. Form release agent shall not bond with, stain, nor adversely affect concrete surfaces.

### **2.04 VAPOR RETARDER**

- A. Vapor Retarder
  - 1. Polyethylene sheet, not less than 10 mils thick, complying with ASTM E1745, Class A, B, and C.
  - 2. Maximum Permeance: ASTM E96: 0.04 perms (US).
  - 3. Seam Tape: High Density Polyethylene Tape with pressure sensitive adhesive; minimum width of 4 inches.
  - 4. Pipe Boots: Construct pipe boots from vapor barrier material and seam tape in accordance with manufacturer's instructions.

### **2.05 EXPANSION / ISOLATION JOINT FILLER**

- A. Expansion / Isolation Joint Filler: ASTM D1751, asphalt impregnated premolded fiberboard, 3/8-inch thick by full thickness of slab or joint, unless indicated otherwise in the Structural Drawings.

### **2.06 CONSTRUCTION JOINTS**

- A. Slabs On Ground: Steel plate dowel (1/4" thick) such as manufactured by PNA Construction Technologies, Inc., Greenstreak Group, Inc., or approved equal.
  - 1. Plate Thickness: 1/4-inch thick for slabs up to 6 inches in thickness; 3/8-inch for slabs over 6 inches and up to 8 inches in thickness; 3/4-inch thick for slabs over 8 inches in thickness and up to 12 inches in thickness.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Erect formwork in accordance with ACI 301 and ACI 347.

- B. Finished work shall comply with tolerances of ACI 117.
- C. Provide 3/4-inch chamfer at all formed corners.

### **3.02 FOUNDATION ELEMENTS**

- A. Form foundation elements if soil or other conditions are such that earth trench forms are unsuitable.
- B. Sides of turned-down slabs shall be formed, and earth cuts as forms are not acceptable.
- C. Maintain minimum coverage of reinforcing steel as indicated in Structural Drawings.

### **3.03 VAPOR RETARDER**

- A. Where indicated on Structural Drawings, place vapor retarder over granular subbase and behind expansion / isolation joints at walls. Place electrical conduits and ducts in granular subbase.
- B. Install vapor retarder in accordance with manufacturer's instructions and ASTM E1643.
  - 1. Lap vapor retarder six inches minimum at splices and seal with seam tape.
  - 2. Lap vapor retarder over footings and seal to walls.
  - 3. Seal all pipe penetrations with pipe boot.
  - 4. No penetration of vapor retarder is permitted except for reinforcing steel and permanent utilities.
  - 5. Do not puncture vapor retarder; repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all four sides.
- C. Install waterproof and vaporproof membrane in accordance with manufacturer's recommendations.

### **3.04 FORM PREPARATION**

- A. Seal form joints to prevent leakage.
- B. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed.
- C. Before reinforcement is placed, coat contact surfaces of form with form release agent in accordance with manufacturer's recommendations. Do not allow excess form release agent to accumulate in forms or come in contact with concrete surfaces against which fresh concrete will be placed.

### **3.05 INSERTS AND EMBEDMENT ITEMS**

- A. Install and secure in position required inserts, embeds, hangers, sleeves, anchors, and nailers.
- B. Locate anchor bolts/rods in position in accordance with approved setting drawings and secure to prevent displacement during concrete placement.

### **3.06 PROVISIONS FOR OTHER TRADES**

- A. Install openings in concrete formwork to accommodate work of other trades. Determine size and location of openings and recesses from trades requiring such items. Obtain approval from Structural Engineer for openings not shown in Structural Drawings.

- B. Accurately place and securely support items built into forms.

**3.07 CONSTRUCTION JOINTS**

- A. Slabs On Ground: Install steel plate dowels in accordance with manufacturer's recommendations. Place plate dowels at mid-depth of slab (+/-1/4-inch), unless noted otherwise in the Structural Drawings.

**3.08 WATERSTOPS**

- A. Prepare surface and install strip applied waterstops in accordance with manufacturer's recommendations.

**3.09 FORMWORK REMOVAL**

- A. Remove formwork carefully in such manner and at such time as to ensure complete safety of structure. Do not remove formwork, shoring, or reshoring until members have acquired sufficient strength to support their weight and the load thereon safely.
- B. For conventionally reinforced framed slabs, formwork shall remain in place for a minimum of 5 days after concrete placement.

**END OF SECTION**