

## **WET MIX SHOTCRETE**

### **A. SCOPE:**

The use of structural wet mix shotcrete is allowed by the code when the owner, engineer, contractor, and concrete supplier comply with these procedures, in addition to requirements of Section 1908 of the 2020 Los Angeles Building Code (LABC).

### **B. DEFINITIONS:**

Wet Mix Shotcrete is shotcrete in which all of the ingredients (including water) are mixed before being placed into the placing equipment.

### **C. LIMITATIONS:**

#### **1. General**

Structural wet mix shotcrete shall not be placed where the stream from the nozzle cannot directly impinge onto the surface where the concrete is to be placed. Where the condition precludes the possibility of obtaining cores from the structure, this method shall not be used.

#### **2. Reinforcement**

Reinforcing bars shall not exceed size #5.

#### **3. Columns**

Shotcrete may only be applied to tied columns where the spacing of the reinforcing steel is the same as for walls. Shotcrete shall not be applied to spirally tied columns.

### **D. CODES:**

1. All applicable parts of ACI 506R-16 shall be followed. Structural wet mix shotcrete applicators shall have a copy of the ACI 506R-16 on each work site during the time that the shotcrete is being applied. The word "shall" must be substituted whenever the word "should" occurs in ACI 506R-16.

2. The concrete mix shall comply with ACI 318-14, Chapter 26 and shall not be batched volumetrically.
3. All other applicable requirements of the Code (including all requirements for pneumatically placed wet mixed mortar and maximum time-in mixers) shall apply.

**E. INSPECTION:**

1. Shotcrete requires continuous inspection by a Registered Deputy Inspector.
2. Continuous inspections shall be provided for the placement of all reinforcing, the placement of shotcrete, and the assembly, shooting, testing, and disassembly of test panels.

**F. PRECONSTRUCTION TESTS:**

The test panel shall be a square with a minimum of 4 feet on each side.

**G. CONDITIONS:**

1. The minimum slump shall be 1 ½" and the maximum slump shall be 2 ½". Slump shall be measured at the point of discharge from the mixer, except when the Building Inspector may require slump tests at the discharge point where water may have been added.
2. A capable nozzleman's helper with an air blow pipe shall be provided to assist the nozzleman in keeping all rebound build-up out of the work.
3. Additional workers may be required to take the rebound from the work if the rebound cannot be removed by the air blow pipe.
4. No keyways or embedments shall be placed in the front face that will interfere with the stream from the nozzle.
5. The contractor agrees to provide a designated liaison between his crew, the Deputy Inspector, and the Building Inspector.
6. The Deputy Inspector shall be interviewed and approved by Department representatives prior to inspecting the work at the job site and one Deputy shall be assigned to each nozzle.
7. Rigid or other approved backing shall be placed against the earth where there is any likelihood of soil being dislodged in sufficient quantity to damage the concrete during the application of wet mix shotcrete. Rigid or other approved backing shall be used where a void in the embankment is to be bridged.

8. In the event that a previously presumed solid embankment should slough or shed dirt in sufficient quantity to damage the concrete, the wet mix shotcrete placement work in that area shall cease until a rigid backing is installed and any contaminated shotcrete is removed.
9. The height of a layer shall be limited to not more than 3' and succeeding layers shall not be placed in less than three hours. No sloughing or sagging shall be permitted. When specifically designed by the engineer of record for a succeeding layer to be placed in less than three hours, the lesser time must be approved by the Plan Check Division.
10. Details of cold joints, including the slope of the joints, shall be shown on the approved plans. When shooting up to the underside of existing concrete, the last 2" shall be dry packed or an approved method of dry pneumatic concrete shall be used.

**EXCEPTION:** Provided that the detail of the joint is sloped so that the closure of the cold joint made with structural wet mix shotcrete does not sag away from the upper surface and provided that both sides of the cold joint have taken their initial set, the joint closure may be made with structural wet mix shotcrete.

11. Reinforcing steel shall be securely tied in place in a manner that prevents any movement during the wet mix shotcreting.

## **H. QUALIFICATIONS:**

The engineer of record shall provide shotcrete specifications which shall be part of the plans. This specification shall include but not be limited to the materials and conditions (in conformance with this document) required to achieve the required structural performance, and shall state the minimum type and duration of experience required for the placement team (particularly the nozzleman) so as to insure the conformance with the above.

The shotcrete subcontractor shall present, upon the request of a Department of Building and Safety inspector, a "statement of qualifications" signed by an officer of the subcontractor corporation. Both the specification and statement shall include, but not necessarily be limited to, the following:

1. The duration and type of structural shotcrete experience (not including swimming pools) of the nozzleman, the subcontracting company, the superintendent, and helper.
2. The subcontractor's listed experience shall reference specific projects approved in the City of Los Angeles.