

# EXPECTED IMPLEMENTATION JULY 2023

## 346 STRUCTURAL PORTLAND CEMENT CONCRETE. (REV 6-22-22) (FA 10-19-22) (FY 2023-24)

SUBARTICLE 346-4.2 is deleted and the following substituted:

**346-4.2 Mass Concrete:** When the Contract Documents designate any structure as mass concrete, use a Specialty Engineer to develop and administer a Mass Concrete Control Plan (MCCP). Develop the MCCP in accordance with Section 9.4 Volume II of the Materials Manual. Provide the Specialty Engineer a list of all concrete elements identified. Use a sequential identification code for each element indicating the bridge or structure number, location and type of element, least dimension size, and environmental exposure.

Record core and differential temperatures for all structures included in the MCCP and monitor only the elements specified therein. Ensure that the concrete core temperatures do not exceed the maximum allowable temperature of 180°F and that the differential temperatures between the element core and surface do not exceed the maximum allowable temperature differential of 35°F. Submit the MCCP to the Engineer for approval at least 21 calendar days prior to the first anticipated mass concrete placement.

Do not place concrete until the proposed MCCP has been approved. Any modifications must be submitted as addenda to the original MCCP and must be approved in writing by the Engineer.

Install temperature measuring sensors and recording devices for all mass concrete elements in accordance with the MCCP. Do not add local additional insulation or external sources of heat around the surface sensors that affect the temperature readings.

Ensure that, prior to the first concrete placement of each concrete element the Specialty Engineer or approved designee personally inspects the installation of the temperature measuring devices and verifies that the temperature data acquisition equipment is properly functioning. The Specialty Engineer shall be available for immediate consultation during the monitoring period of any mass concrete element.

Use temperature data acquisition equipment to record temperature readings in accordance with the MCCP.

Within three working days of the completion of temperature recording for each concrete element, submit the Mass Concrete Field Report in accordance with Section 9.4, Volume II of the Materials Manual.

For a group of elements, the Engineer may approve a monitoring reduction if the first element placed does not exceed either the maximum temperature or maximum temperature differential. Request written approval from the Engineer at least 14 calendar days prior to the anticipated date of the intended reduced monitoring. If approved, monitoring of the recorded temperatures is not required for the remaining elements meeting all of the following requirements:

1. All elements have the same dimensions.
2. All elements have the same concrete mix design.
3. All elements have the same insulation R value and active cooling

measures (if used).

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4. Ambient temperatures during concrete placement for all elements are within minus 10°F of the ambient temperature during placement of the initial element.

5. Use the same temperature control measures used for the initial monitored element and keep them in place for at least the same length of time as for the initial element.

Resume monitoring of the temperatures for all elements if directed by the Engineer.

Instrumentation and temperature monitoring are not required for miscellaneous drilled shafts supporting sign, signal, lighting or Intelligent Transportation System (ITS) structures when the as built diameter is six feet or less, and the total cementitious materials content of the concrete mix design is less than or equal to 752 pounds per cubic yard.

Monitoring of the recorded temperatures is not required for any mass concrete substructure element meeting all of the following requirements:

1. The minimum cross-sectional as-built dimension of the element is six feet or less.

2. Insulation with an R-value of at least 2.5 must be provided for at least 72 hours following the completion of concrete placement.

3. The environmental classification of the concrete element is slightly aggressive or moderately aggressive.

4. The concrete mix design meets the mass concrete proportioning requirements of 346-2.3.

5. The total cementitious material content of the concrete mix design is less than or equal to 752 pounds per cubic yard.

6. Temperature of the concrete is 95°F or less at placement.

Implement immediate corrective action as directed by the Specialty Engineer when either the core temperature or the temperature differential of any mass concrete element exceeds its maximum allowable value. The approval of the M CCP shall be revoked.

Submit an Engineering Analysis Scope in accordance with 6-4 for approval, which addresses the structural integrity and durability of any mass concrete element that is not cast in compliance with the approved M CCP, or which exceeds the allowable core temperature or temperature differential.

Submit all analyses and test results requested by the Engineer for any noncompliant mass concrete element. Submit a revised M CCP and do not place any mass concrete elements until a revised M CCP has been approved in writing by the Engineer.

The Department will not provide compensation for additional costs or loss of time due to additional analyses, tests, or other impacts on production caused by not monitoring the recorded temperatures.