

MICHIGAN  
DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISION  
FOR  
**REVISIONS TO STRUCTURAL PRESTRESSED CONCRETE CONSTRUCTION**

STR:MJF

1 of 3

APPR:CRB:REL:04-14-26

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**Add subsection 708.03.C.3.h to the section on page 7-94 of the Standard Specifications for Construction as follows:**

- h. Slump no greater than 9 inches if using a Type F or Type G polycarboxylate superplasticizer chemical admixture from the Qualified Products List.

**Delete subsection 708.03.C.4.b beginning on page 7-95 of the Standard Specifications for Construction and replace with the following:**

- b. **Testing and Acceptance.** Conduct compressive strength tests in the Engineer's presence. Test specimens in accordance with ASTM C39/C39M, except test compressive strength-test specimens in a moist condition resulting from the required curing conditions.

Consecutively test a set of strength-test specimens obtained by taking one strength-test specimen from each subplot sample location to determine concrete strength. All strength-test specimens, except for one, must meet the specified concrete strength at release requirement and one specimen is permitted to meet or exceed 95% of the specified concrete strength at release requirement. If strength-test specimens do not meet the specified requirement, retest. Retesting consists of testing a set of strength-test specimens obtained by taking one strength-test specimen from each subplot sample location.

Alternate strength-test specimens must be tested before the end of the 28-day curing period. Consecutively test a set of strength-test specimens obtained by taking one strength-test specimen from each subplot sample location to determine concrete strength. Alternate strength-test specimen results will be accepted in place of the 28-day strength test results if alternate strength-test specimen results equal or exceed the specified 28-day concrete compressive strength.

If alternate strength-test specimen results do not meet or exceed the 28-day concrete compressive strength requirements, continue curing remaining 28-day strength-test specimens for the full 28-day period. Consecutively test a set of strength-test specimens obtained by taking one strength-test specimen from each subplot sample location.

Do not ship the prestressed element before strength-test specimen results equal or exceed the specified 28-day concrete compressive strength.

The 28-day concrete compressive strength must meet the following conditions:

- i Average compressive strength, using one strength-test specimen from each subplot, must be equal to or greater than the required 28-day concrete compressive strength; and
- ii All strength-test specimens, except for one, tested in subsection 708.03.C.4.b.i must meet the required 28-day concrete compressive strength. One strength test specimen is permitted to meet or exceed 90% of the required 28-day concrete compressive strength.

**Delete subsection 708.03.C.9 on page 7-97 of the Standard Specifications for Constriction in its entirety and replace with the following:**

9. **Placing Concrete.** Place concrete in accordance with subsection 706.03.H and as modified as follows:
  - a. Evaporation Control. Monitor ambient temperature, relative humidity, wind velocity, and concrete temperature to determine the evaporation rate using Figure 706-1. Air temperatures under 40 °F require calculation using the Uno's formula presented below:

$$E = [(T_c)^{2.5} - R * (T_a)^{2.5}] * [1 + (0.4 * V)] * 10^{-6}$$

Where:

E = Evaporation rate, lb/ft<sup>2</sup>/hr

T<sub>c</sub> = Concrete temperature, °F

T<sub>a</sub> = Air temperature, °F

R = Relative humidity in percent/100

V = Wind velocity, miles/hour

Do not place concrete when the evaporation rate is expected to equal or exceed the following limits unless approved evaporation control measures are implemented, maintained, and effectively reduce evaporation rates below the rates listed below:

- i. 0.10 lb/ft<sup>2</sup>/hr in accordance with Figure 706-1 for concrete mixtures containing silica fume.
- ii. 0.15 lb/ft<sup>2</sup>/hr in accordance with Figure 706-1 for all other concrete mixtures that do not contain silica fume.

The evaporation rate must be determined by the Contractor using calibrated (annual or sooner if there is reason to question the accuracy) and verifiable equipment immediately prior to the start of casting, and during the casting operation if environmental conditions worsen (such that the evaporation rate increases) during the pour.

Approved control measures include fogging, windbreaks, sunshades, cooling the batching materials, or use of evaporation retarders. Ensure these measures are

maintained throughout the placement and finishing operations.

Contractor must objectively demonstrate their proposed controls effectively reduce evaporation rates below the rates listed above. Demonstration must be performed using new air temperature, concrete temperature, wind velocity, and relative humidity values obtained by test. Provide all testing values on a quality control report to the Engineer. Testing values must be available to the Engineer at any point prior to and during the casting operation.

- b. Internal and external vibrators may be used for conventional concrete, but not for self-consolidating concrete;
- c. Remove all water, snow, and ice from forms before placing concrete;
- d. Protect fresh concrete and forms from precipitation (e.g. rain, snow, ice, etc.);
- e. Maintain concrete temperature between 45°F and 90°F but as close to 70°F as practical during placement; and
- f. Do not hold vibrators against forms or reinforcing steel, and do not use them for flowing or spreading concrete. Do not disturb partially hardened concrete.

**Delete the first paragraph in subsection 708.03.C.12.a on page 7-99 of the Standard Specifications for Construction in its entirety and replace with the following:**

- a. **Concrete Defects.** Remove concrete fins and irregular projections from surfaces immediately after removing forms. Patch air holes larger than ½ inch in any direction with Type R-2 mortar. Keep surfaces saturated with water until pointed and trued with mortar. For fascia beams, use a mortar mixture composed of two-thirds Type 1 cement and one-third white cement or as approved by the Engineer to closely match the beam. Restore consistency by reworking but not by re-tempering the mortar.