ADDENDA TO MNL 116-21 AND MNL 117-13

The following requirements have been approved for addition to MNL 116-21 and MNL 117-13 and will be added when publication schedules allow. In the interim, these requirements are communicated to certified plants and posted on the PCI website.

MNL 116-21/MNL 117-13 Addendum

The following requirements have been added to MNL 116-21 and MNL 117-13:

ASTM A1081/A1081M Testing for Strand Bond

Precast plants performing prestressing shall have evidence that the strand being used has been tested in accordance with ASTM A1081/A1081M, *Standard Test Method for Evaluating Bond of Seven-Wire Steel Prestressing Strand*. This requirement is applicable to 0.500 and 0.600-inch [12.7 and 15.24 mm] diameter strand. Test results are required for both sizes if both sizes are in use at the plant. The test results shall be updated at least annually, shall correlate to the manufacturing facility where the strand in use was produced, and shall indicate the strand size that was tested.

Comment - The test results are typically provided by the strand manufacturer.

Revised 05/16/2022

MNL 117-13 Addendum

Section 4.3.1 of MNL 117-13 is revised as shown below. This change aligns MNL 117-13 with section 4.3.1 of MNL 116-21.

For cumulative batching equipment without a tare-compensated control, the following tolerances shall apply to the required cumulative scale reading:

> **Cementitious materials or aggregates**: ± 1% of the required cumulative weight of material being weighed, or ± 0.3% of scale capacity, whichever is greater.
>
> **Solid Admixtures and Liquid Pigments**: ± 3% of the required cumulative weight of material being weighed, or ± 0.3% of scale capacity, or ± the minimum dosage rate for one 94 lb (43 kg) bag of cement, whichever is greatest.

Approved 08-26-2022

MNL 116-21 Addendum

These revisions are made to the following portion of the Standard in section A2.8.9. They include revising the thickness of the polyethylene sheet in item (1) in the second paragraph. The remaining portions of this section remain unchanged.

Natural stone. Cut stones that are easily stained by oils and rust shall be protected by lining the form/mold with polyethylene sheets or other nonstaining materials.

A complete bondbreaker between natural stone veneer and concrete shall be used. Bondbreakers shall be one of the following: (1) a 6 to 10 mil (0.15 to 0.25 mm) polyethylene sheet, or (2) a 1/8 to 1/4 in. (3 to 6 mm) polyethylene foam pad or sheet. The bondbreaker shall prevent concrete from entering the spaces between pieces of veneer and thereby potentially inhibiting differential movements. Connection of the veneer to the concrete shall be with stainless-steel mechanical anchors that can accommodate some relative movement. Preformed anchors with a 5/32 in. (4 mm) minimum diameter, fabricated from Type 302 or 304 stainless steel shall be used. Close supervision is required during the insertion and setting of the anchors. Anchors placed in epoxy shall not be disturbed while the epoxy sets.

Approved 08-08-2023

MNL 116-21 Addendum

Remove the existing Standard and the associated Commentary for Section 5.3.10.5 and Section 5.3.11.5 and replace with the following:

5.3.10 Elongation Calculation and Corrections

5. Thermal effects. For abutment anchorage setups where strands are anchored to abutments that are independent from the form/mold, thermal adjustments are required if the temperature of the strand at the time of tensioning differs by more than 25°F (15°C) from the estimated fresh concrete temperature at the time of casting. Consideration shall be given to partial bed length usage and adjustments made when the net effect on the length of bed used exceeds the allowable force in the strand. The thermal coefficient of expansion of steel shall be taken as 6.5×10^{-6}/°F (12×10^{-6}/°C).

C5.3.10 Elongation Calculation and Corrections

5. Thermal effects. This item is important for abutment beds as the abutments are not affected by the temperature rise of the strand from the temperature at the time of tensioning on a cold morning to the concrete temperature at the time of placement in the forms/molds at midday or in the afternoon. The actions would be reversed for strand tensioned at elevated temperatures with cooler concrete cast around it.

Because tensioned strands are held at a fixed length, variation between ambient temperature at the time of tensioning and concrete temperature at the time of placing results in changes of stress. Lowering of strand temperature increases force, while a temperature rise results in force loss. For strands tensioned to approximately 70% to 75% of the strand ultimate tensile strength, a temperature variation in the strand of 10°F (5°C) will result in a variation of 1%. Allowance should be made in the tensioning by understressing or overstressing at the rate of 1% for 10°F (5°C) of anticipated temperature variation, depending respectively on whether a reduction or rise of temperature is anticipated. When calculating adjustments using partial bed length usage setups, the length of the strand affected by the temperature differential should be considered.

Most self-stressing beds are not affected by this phenomenon because the bed itself undergoes a similar change. As the strand is warmed and expands, the bed does as well. Because the strand is anchored to the bed, the force in the strand is relative to the bed length. As the strand is expanding and trying to relax, the bed is expanding and holding the strand at its desired value. There are some self-stressing beds that are independent of the forms/molds. For these setups, the self-stressing bed and strand undergo similar changes as the ambient temperature changes between the time when the strands were tensioned and when concrete is placed. However, when the concrete is placed in the form/mold, the temperature of the concrete will affect the strand but not the self-stressing bed that is independent of the form/mold.

Sample tensioning calculations with elongation corrections due to thermal effects are shown in Appendix F.

5.3.11 Force or Gauge Corrections

5. Thermal effects. For abutment anchorage setups where strands are anchored to abutments that are independent from the form/mold, thermal adjustments are required if the temperature of the strand at the time of tensioning differs by more than 25°F (15°C) from the estimated fresh concrete temperature at the time of casting. Consideration shall be given to partial bed length usage and adjustments made when the net effect on the length of bed used exceeds the allowable. The thermal coefficient of expansion of steel shall be taken as 6.5×10^{-6}/°F (12×10^{-6}/°C).

C5.3.11 Force or Gauge Corrections

5. Thermal effects. This item is important for abutment beds as the abutments are not affected by the temperature rise of the strand from the temperature at the time of tensioning on a cold morning to the concrete temperature at the time of placement in the forms/molds at midday or in the afternoon. The actions would be reversed for strand tensioned at elevated temperatures with cooler concrete cast around it.

Because tensioned strands are held at a fixed length, variation between ambient temperature at the time of tensioning and concrete temperature at the time of placing results in changes of stress. Lowering of strand temperature increases force, while a temperature rise results in force loss. For strands tensioned to approximately 70% to 75% of the strand ultimate tensile strength, a temperature variation in the strand of 10°F (5°C) will result in a variation of 1%. Allowance should be made in the tensioning by understressing or overstressing at the rate of 1% for each 10°F (5°C) of anticipated temperature variation, depending respectively on whether a reduction or rise of temperature is anticipated. When calculating adjustments using partial bed length usage setups, the length of the strand affected by the temperature differential should be considered.

Most self-stressing beds are not affected by this phenomenon because the bed itself undergoes a similar change. As the strand is warmed and expands, the bed does as well. Because the strand is anchored to the bed, the force in the strand is relative to the bed length. As the strand is expanding and trying to relax, the bed is expanding and holding the strand at its desired value. There are some self-stressing beds that are independent of the forms/molds. For these setups, the self-stressing bed and strand undergo similar changes as the ambient temperature changes between the time when the strands were tensioned and when concrete is placed. However, when the concrete is placed in the form/mold, the temperature of the concrete will affect the strand but not the self-stressing bed that is independent of the form/mold.

Sample tensioning calculations with force corrections due to thermal effects are shown in Appendix F.

Approved 08-31-2023