

MATERIALS MANUAL - SECTION 9-2
COMMENTS FROM INDUSTRY REVIEW

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Comment:

This is referring to Section 9.2.7 Design Mixes in the Materials Manual.

Contractor Quality Control General Requirements - Personnel Qualifications by Tonii Brush of D5 Construction: REF: "On completion of the mixing period, ensure that the trial mix concrete has a slump within ± 0.50 inch of the target value (± 1.0 inch for mixes utilizing HRWR), and an air content between 2.5% and 5.0%." = Comment: What is HRWR?

Response:

Ron Holcomb
CEMEX Florida Division

Comment:

In the January 7th, 2009 revision of the Materials Manual, section 9.2.6.1.1 was edited to state as follows:

Measure the cementitious materials by mass within an accuracy of 1% of the required amount, per component material. For concrete batches of 3 yd³ or less, an accuracy of 2% is allowed.

Previously, 9.2.6.1.1 was stated as:

Measure the cementitious materials by mass within an accuracy of 1% of the required total amount, except that for concrete batches of 3 yd³ or less, accuracy of 2% is allowed.

This same statement existed in the June 20, 2002 Materials Manual, the original effective date of the current document. (Originally as section 9.2.4.2)

In the past, the assumption was made that the tolerance percentage was of the accumulated weight of cementitious materials.

The January 7th, 2009 revision requires a batching tolerance that is difficult or impossible to achieve with a batch plant capable of batching 10 cubic yard loads. A normal cement weigh scale has an 8,000 to 10, 000 pound weighing capacity, and is required to be readable to 0.1% of the capacity.

With the requirement to weigh “per component” to 1% of the required accuracy, anytime the required weight is less than 10% of the scale capacity, the weighing tolerance is less than the scale readability.

The following example shows what the “per component” revision means in the actual weighing of the cementitious materials.

If a 5 cubic yard load of a Class I mix with 485 pounds of cementitious, of which 20% is fly ash, is weighed on a 10,000 pound scale (10 pound grads), the following happens;

Cement- 1940 pounds- 1% tolerance is 19.4 pounds

Fly ash – 485 pounds (2425 pounds accumulative)- 1% tolerance is 4.85 pounds

Assuming the cement weighed at exactly 1940 pounds, it is impossible to weigh the fly ash to the required accuracy, as the scale could indicate either 2420 or 2430 pounds, both indications are more than the 4.85 pound tolerance allowed, even if only by 0.15 pounds.

Of note, materials such as bulk ultra fine fly ash and bulk metakaolin, weighed in the same cement scale, would have even tighter weighing tolerances, well below the scale readability. Either of these materials could have a mix design component weight equal to 8% of the total cementitious, so even a 10 cubic yard batch could result in an unachievable weighing tolerance. The same could be true for moderate batch sizes (5 to 8 cubic yards) of a mix using three cementitious materials, such as a Portland cement, fly ash, and GGBFS (slag) blend.

We strongly urge a review of the January 7th, 2009 revision of the required weighing accuracy of section 9.2.6.1.1. The accuracy of the weighing equipment utilized simply cannot achieve such demanding tolerances.

Response:

Ron Holcomb
CEMEX Florida Division

Comment:

9.2.6.7- Batch Adjustments for Moisture

(2) Calculate both coarse and fine aggregate free moisture based upon dry sample weights and adjusting for absorption per AASHTO T 255.

The following minimum sample sizes shall be used in lieu of the sample sizes required in AASHTO T 255 Table 1.

- Fine Aggregate – 500 grams*
- Coarse Aggregate – 1500 grams*

Very good clarification of this issue. This creates consistency across the different districts for the required quantities for determination of free moisture content.

9.2.9.2 DESIGN (Mixers)

Section 9.2.9.2 was amended with the following statement;

The unit serial number represents the entire mixing system. The metal rating plate may be located on the inside of the driver's door.

This statement is a significant, practical consideration of the wear and tear the rating plates endure in normal operation. However, for the statement to have the impact that is believed intended, it is necessary to establish consistency in the methods used to inspect the mixer units between the districts. Currently in some districts, it is required to grind the paint off the mixer drum ring to uncover the manufacturer stamped serial number of the drum, to compare to the serial number on the rating plate. These districts may also require verifying the manufacturer stamped serial number on the front frame pedestal to the serial number on the rating plate. Again, in some cases grinding away paint for ease of reading the number. This practice is simply not possible with most mixer manufacturers, as currently only one manufacturer stamps serial number in all the locations required. Additionally, the mixer drum can be a manufacturer's replacement drum, that meets all the required specifications, and still be deemed unacceptable. The specification revision is a step in the right direction, but there needs to be a practical application of the revision.

Response:
