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**\*\*\*\*THIS IS A NEW APPENDIX. – PLEASE READ CAREFULLY.\*\*\*\***

## **AASHTO T283 TESTING FOR EVALUATING AND OPTIMIZING ANTI-STRIP ADDITIVES**

When the specifications require the evaluation of the moisture susceptibility of the HMA mixture, the contractor shall test the laboratory mix design without any anti-strip additive according to AASHTO T283 including the cure time and freeze cycle specified.

### **Contractor test results greater than or equal to 90.0%:**

If the results indicate a tensile strength ratio (TSR) greater than or equal to 90.0% the contractor shall mix a batch in the laboratory without any anti-strip additive at the intended asphalt binder content weighing at least 14,000 grams and provide it to the Iowa DOT Central Laboratory for validation. No oven curing shall be done to the batch prior to submitting it for testing. Allow at least two weeks for the Central Laboratory to complete the testing. If the Central Laboratory results also indicate a TSR greater than or equal to 90.0% the mix will be considered acceptable without an anti-strip additive and no further testing of the plant produced mixture will be required unless, in the judgment of the Engineer, significant changes to the Job Mix Formula (JMF) have taken place that may affect the moisture susceptibility of the mix.

### **Contractor test results between 80.0% and 89.9%:**

If the Central Laboratory is unable to validate the contractor's test results or if the Contractor's test results on the mix design indicate a TSR less than 90.0% and greater than or equal to 80.0% and the contractor is unable to provide plant produced mix for sampling far enough in advance of paving with the JMF being evaluated to accommodate the T283 testing by the Central Laboratory, the Contractor shall select an anti-strip additive for use in the mixture. The anti-strip additive shall be evaluated and optimized as indicated below.

The contractor shall provide a means to obtain a sample of the plant produced mixture without any anti-strip additive. The Contractor may produce the mixture for sampling as part of the construction of an approved test strip, for shoulders or base, during the initial approximately 500 tons (Mg) of mix production, or during construction off the project if approved by the Engineer. Mixture produced for construction off the project will not be included for payment on the project. Once a sample without any anti-strip additive is obtained for testing in the Central Laboratory, the Contractor shall incorporate the selected anti-strip additive at the optimum dosage into the mixture for all subsequent production until test results from the Central Laboratory are available. The Contractor will be paid at the specified rate for incorporating the anti-strip additive into the mixture until Central Laboratory test results are available.

If the Central Laboratory test results on the plant produced mixture without any anti-strip additive indicate a TSR of 80.0% or greater, the anti-strip additive shall be removed from all subsequent production of the mixture and no further payment for the anti-strip additive will be

made after the test results are provided to the contractor. If the Central Laboratory test results on the plant produced mixture without any anti-strip additive indicate a TSR of less than 80.0% the anti-strip additive shall be used for all subsequent production of the mixture. No price adjustment for failing TSR will be applied to the plant produced mixture required to be provided for sampling and testing without an anti-strip additive.

**Contractor test results less than 80%:**

If the Contractor's test results on the mix design indicate a TSR less than 80.0%, the Contractor shall select an anti-strip additive for use in the mix. The anti-strip additive shall be evaluated and optimized as indicated below. The contractor will be paid at the specified rate for incorporating the anti-strip additive into the mixture. The Engineer will obtain samples of the plant produced mixture for T283 testing in the Central Laboratory. If the Contractor elects to incorporate hydrated lime into the total combined aggregate at the rates specified no testing of the plant produced mixture will be required. The Engineer may obtain samples for T283 testing at any time.

**Evaluation and optimization of anti-strip additives:**

If the Contractor elects to incorporate hydrated lime into the total combined aggregate at the rates required by the specifications, no further testing by the contractor will be required. If the contractor elects to use a liquid anti-strip additive, a polymer-based liquid aggregate treatment, or pre-coats part of the aggregate with hydrated lime, the contractor shall test the mixture at a minimum of three different dosages of the anti-strip additive to determine the effectiveness and optimum rate of addition to the mix. The dosages tested shall cover the range of dosages recommended by the supplier of the anti-strip additive or, in the case of hydrated lime, at dosages agreed to by the District Materials Engineer (DME). The Contractor shall include the data from the T283 testing in the electronic file (SHADES) and submit the file to the DME. The DME will evaluate the data and recommend an optimum dosage of anti-strip additive based on effectiveness and economic evaluation.

When testing to evaluate or optimize the anti-strip additive, the test procedure in AASHTO T283 is modified as follows: The indirect tensile strength of the conditioned specimens containing the anti-strip additive shall be compared to the dry strength obtained during the initial testing of the mix design without any anti-strip additive to calculate the TSR value. This is necessary because some anti-strip additives have been shown to lower the dry strength of the mixture rather than increase the wet strength in order to improve the TSR. When liquid anti-strip additives are used, the anti-strip additive shall be added to the asphalt binder, thoroughly mixed, and placed in an oven at 275°F for a minimum of 16 hours prior to mixing with the aggregates. The supplier of the asphalt binder may provide samples of the binder with the anti-strip additive already blended and aged.