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

When the specifications require the evaluation of the moisture susceptibility of the asphalt mixture, the Contractor shall test the laboratory mixture design without any anti-strip additive according to [IM 507](#) including the cure time and freeze cycle specified. The Engineer will obtain plant-produced samples for acceptance.

During the mixture design phase, if the contractor's TSR results **are greater than or equal to 90%:**

- The contractor may, at the contractor's expense, choose to include an anti-strip additive in the plant produced mixture until moisture susceptibility testing is completed by the Central Laboratory. 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.
- If the Central Laboratory test results on the plant produced mix without any anti-strip agent indicate a TSR less than 80%, an anti-strip additive evaluated and optimized as indicated below will be required for all subsequent production of the mix, and the Contractor will be paid at the specified rate for incorporating the anti-strip additive into the mixture if the agent is effective in achieving the minimum TSR and the selected additive can produce at least a 10% improvement in the plant-produced wet strength compared to that of the sample without the additive. The Engineer may obtain samples of the mix containing the anti-strip additive for moisture susceptibility testing at any time. If the Central Laboratory test results on the plant produced mix without any anti-strip agent indicate a TSR greater than or equal to 80%, no anti-strip agent is required and no payment for anti-strip will be made.

During the mixture design phase, if the contractor's TSR results **are between 80% and 90%:**

- If the contractor is unable to provide samples of the plant produced mixture with the JMF far enough in advance of paving to accommodate moisture susceptibility 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 as detailed above. 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 **selected by the DME** 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. Payment will be made provided the agent is effective in achieving the minimum TSR and the selected additive can produce at least a 10% improvement in the plant-produced wet strength compared to that of the sample without the additive.
- If the Central Laboratory test results on the plant produced mixture without any anti-strip additive indicate a TSR of 80% or greater, the anti-strip additive will no longer be required 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%, 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.

During the mixture design phase, if the contractor's TSR results **are less than 80%**:

- 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 provided it is effective in achieving the minimum TSR and the selected additive can produce at least a 10% improvement in the plant-produced wet strength compared to that of the sample without the additive. The Engineer will obtain samples of the plant produced mixture for moisture susceptibility testing in the Central Laboratory. If the Contractor elects to incorporate hydrated lime into the total combined aggregate at the rates specified. The Engineer may obtain samples for testing at any time.

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

- 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 moisture susceptibility testing in the electronic file (SHADES) and submit the file to the DME. The DME will evaluate the data and **select** 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.