TACK COATS

GENERAL INFORMATION AND RESOURCES

SCOPE

In order to improve the bond between successive layers of pavement, a tack coat should be applied. A tack coat is an inexpensive but essential element contributing to the structural integrity of a pavement layer. There are many different types of tack coats and emulsions used in tack coating.

DEFINITIONS

TACK/BOND COAT

A tack/bond coat is an application of asphalt emulsion sprayed onto an existing asphalt or Portland cement concrete surface prior to a new asphalt overlay, surfacing application, or patching. Tack/bond coats are applied to eliminate slippage and to provide a better bond between new and existing pavement layers.

MATERIALS

ASPHALT EMULSIONS

The asphalt emulsions used for tack coats can be either anionic or cationic. Typically SS-1, SS-1h, CSS-1, or CSS-1h are used as tack coat emulsions. These emulsions are often diluted with water at a ratio of 1:1 in order to reduce the emulsion's viscosity prior to spraying the emulsion on the pavement surface. This reduced viscosity also helps the emulsion fill small cracks and voids and helps to more accurately apply small quantities of residual asphalt. In some instances, rapid-setting emulsions such as CRS-1, CRS-1h, or RS-1 are used, especially during early or late season construction. These products can not be diluted and are applied in concentrated form. Non-tracking tack coat emulsions have also gained acceptance lately as proprietary formulations designed to provide short drying times, strong bonds, and no tracking under construction traffic.

DESIGN CRITERIA

In order to design a proper tack/bond coat, the existing surface should be evaluated and repaired should be made. The existing road surface should be clean and dust-free to ensure a proper bond between the tack/bond coat and the existing surface. The emulsion's dilution rate should be established so that the proper residual asphalt can be calculated and applied. The water used in the dilution process should be clean, potable, and free of detectable contaminants. If a rapid-setting emulsion is to be used, the size of the spray nozzles may need to be adjusted in order to apply the emulsion uniformly and with no streaking. If non-tracking tack emulsions are used, the manufacturer's application directions should be followed.

RECOMMENDED PERFORMANCE GUIDELINES

In order to create a well-designed, high-quality tack/bond coat, the following guidelines should be followed:

- Evaluate the pavement to be tacked.
- Determine the desired emulsion spray rate.
- Ensure that the tacking surface is clean and dust-free.
- Ensure that the dilution water and the emulsion are compatible.
- Ensure that the correct distributer is being used.
- Calibrate and inspect all the equipment being used.
- Correctly execute all the required construction techniques.

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- Allow the tack to break and set before the overlay is placed.
- Work only in weather suitable for the type and grade of emulsion being used.

RESOURCES AND REFERENCES

1. “Basic Asphalt Emulsion Manual”, Fourth Edition, Asphalt Institute and Asphalt Emulsion Manufacturers Association, 2008
2. “Recommended Performance Guidelines”, Second Edition, Asphalt Emulsion Manufacturers Association, Annapolis, Maryland, 2006