

CHAPTER 1 - STATEMENT OF WORK

PROBLEM STATEMENT

Prime and tack coats have a purpose in the pavement construction process, yet many times they are misused or eliminated during the project. Current practice in many areas appears to allow the deletion of prime coat and occasionally tack coat on projects for convenience, time constraints, and/or contractor pressure without consideration of need from a technical perspective. Environmental concerns and regulations relating to the use of cutback asphalts and asphalt emulsions have impacted the use of prime and tack coats. Due to air pollution concerns, in many jurisdictions the use of cutback asphalts is restricted either entirely or during certain times of the year. Oil spill regulations and requirements have resulted in a reluctance to use liquid asphalt products in all but essential operations.

While most of the time no harm appears to occur to the roadway from the deletion of prime or tack, and thus may be viewed as acceptable, technical guidance is warranted to assure appropriate usage. Many state departments of transportation (DOT) have moved away from using prime, and to some extent, tack. Unfortunately, the Central Federal Lands Highway Division (CFLHD) has no guideline document that describes the conditions when prime and tack coats are necessary and when they may be eliminated with confidence. A review of CFLHD's current practices, especially as they apply to low volume roads in varying terrains, was warranted.

OBJECTIVE

The objective of this study was to produce a prime and tack coat guide publication for project development and field personnel to provide decision-making guidance on how to use, when to keep and when to eliminate prime and tack coats. The guidance report should summarize the information collected from a literature review as well as information supplied through interviews or documents from knowledgeable experts, bituminous materials suppliers, industry organizations, state DOTs and other agencies.

Additionally, a review of CFLHD's current construction specifications was requested. The objective of the review was to compare CFLHD's current specifications with best practices and make proposals for improving CFLHD's specifications.

TASKS

In order to accomplish the objectives in this study the following tasks were performed:

Task 1 - Literature Search

A literature search was conducted to determine the applicability and benefits of prime and tack coat, prime and tack coat effectiveness, materials used and when and where they are used. The relevant literature reviewed and cited is documented in the report. This activity included searching databases and AASHTO, TRB, ASTM, and NCHRP publications. Data bases searched included the Transportation Research Information Services (TRIS), National Technical Information Services (NTIS), International Construction Database (ICONDA), Engineered Material Abstracts, EI Compendex, South African National Road Agency and the Association of Australian and New Zealand Road Transport and Traffic Authorities.

Task 2 - DOT Survey of Current Practice

Due to the anticipated scarcity of research reports specifically devoted to prime and tack coats, a survey of current practice of state DOTs from the CFLHD region was undertaken to provide information on current practice. States in the CFLHD include California, Nevada, Arizona, Utah, Wyoming, Colorado, New Mexico, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. The results from the survey were used to assist in determining state-of-the-practice and addressed material selection, application rates, when and where prime and tack coats are applied, and when and where they are deleted.

Task 3 - Review of CFLHD Specifications

CFLHD's current prime and tack coat specifications were compared with best practices, as determined by the above tasks, and with standard specifications of the state DOTs within the CFLHD region. The purpose of the review was to make proposals for improving CFLHD's specifications for prime and tack coat if the review showed improvements could be made.

Task 4 - Environmental Issues

A review of the potential harmful and positive environmental effects of the prime and tack coat process, including the various bituminous products used, was undertaken. General guidelines for the requirements for handling and storage of the bituminous materials as well as remedial action to take in the case of an accidental spill were reviewed. Trade association literature, Environmental Protection Agency (EPA) regulations, and supplier/manufacturer's literature were consulted.

Task 5 – Prepare Guidelines for Prime and Tack Coat Usage

Based on the information collected from the literature review as well as information supplied through interviews and documents from knowledgeable experts, bituminous materials suppliers, industry organizations, state DOTs and other agencies, a proposed guideline for CFLHD project

development and field personnel was developed. The guideline provides decision-making guidance on how to use, when to keep, and when to eliminate prime and tack coat.

REPORT ORGANIZATION

The report is organized into the following sections. The results from Task 1, *Literature Search*, are reported in Chapters 2 and 3. Chapter 2 contains the review of the literature from handbooks and Chapter 3 contains the review of literature from technical reports. The results from Task 4, *Environmental Issues*, are found in Chapter 4 of the same name. The results from Tasks 2 and 3 - *DOT Survey of Current Practice* and *Review of CFLHD Specifications*, respectively, are found in *CHAPTER 5 – REVIEW OF CFLHD SPECIFICATIONS*. The results from Task 5, *Prepare Guidelines for Prime and Tack Coat Usage*, are contained in *CHAPTER 6 – CONCLUSIONS* and *CHAPTER 7 – RECOMMENDATIONS*. Appendix B contains *Prime and Tack Coat Inspection Bullets*. These bullets were prepared to support the development of an inspection guide by CFLHD.

