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16. Abstract This report summarizes a manual which is a significantly updated version of the 1984 Texas Department of Transportation Manual: <i>Seal Coat and Surface Treatment</i> . The new manual incorporates: <ul style="list-style-type: none"> ◆ input from seal coat experts; ◆ new materials, equipment, and methods; and ◆ “best practice” ideas recommended by Texas Tech University in research project 0-1787, <i>Seal Coat Constructability Review</i>. The following topics are covered: <ul style="list-style-type: none"> ◆ guidelines for treatment selection, materials selection; ◆ plan preparation; ◆ determining binder and aggregate application rates; ◆ duties of inspectors or crew chiefs; ◆ pre-seal coat activities; ◆ equipment inspection; ◆ seal coat application process; and ◆ public perception and complaints. The updated manual is intended for use by inspectors, engineers, contractors, maintenance, and special jobs personnel.					
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**THE UPDATED TxDOT SEAL COAT AND
SURFACE TREATMENT MANUAL – SUMMARY**

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DISCLAIMER

The contents of this report reflect the views of the author, who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the Texas Department of Transportation (txDOT) or the Federal Highway Administration (FHWA). This report does not constitute a standard, specification, or regulation. The researcher in charge of the project was Cindy Estakhri.

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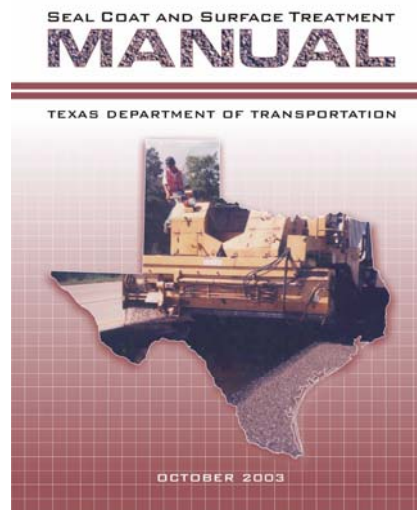
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The Updated TxDOT Seal Coat and Surface Treatment Manual — Summary

**Implementation Summary 5-1787-03-S
Project 5-1787-03, Texas Seal Coat Manual Update**

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Seal coats and surface treatments are simple, relatively inexpensive pavement surfaces that are highly effective if adequate care is taken in the planning and execution of the work. The Texas Department of Transportation (TxDOT) spends close to \$180 million annually maintaining 186,600 lane miles of roadway, and seal coats are an important part of TxDOT's preventive maintenance program. About 20,000 lane miles are seal coated annually as part of this preventive maintenance program.

Development Process

A team of TxDOT personnel composed of engineers, field inspectors, and maintenance and laboratory supervisors guided university researchers in updating the manual, which was originally published in 1984 entitled *Seal Coat and Surface Treatments, Inspectors Training Manual*. The updated manual is entitled *Seal Coat and Surface Treatment Manual* and incorporates:

- ◆ input from seal coat experts;
- ◆ new materials, equipment, and methods;
- ◆ “best practice” ideas recommended by Texas Tech University in Project 0-1787, *Seal Coat Constructability Review*.

The manual provides guidelines for the design, construction, and inspection of seal coats and surface treatments for contract and state force work. It addresses both full-width seal coats/surface treatments as well as strip/spot seal coats. The manual is directed primarily to engineers, laboratory personnel, and field inspectors. The following sections describe the contents of the manual.

Chapter 1. General Principles

TxDOT specification Item 316, *Surface Treatments*, defines an application of asphalt material covered with a single layer of aggregate as a surface treatment. For the purposes of this manual, an application of asphalt material covered with a single layer of aggregate when applied to a prepared compacted base is a surface treatment. A seal coat is applied to a paved surface.

Chapter 1 describes the functions of surface treatments and seal coats and the factors that influence their performance. It also includes the principal faults or defects in seal coats or surface treatments and some common causes.

Chapter 2. Guidelines for Treatment Selection

It is desirable in Texas to place seal coats on a 6 to 8 year cycle as part of the preventive maintenance program, but this is not always possible due to funding constraints. Chapter 2 describes the concept of preventive maintenance and the process for selecting pavements to receive seal coats. In selecting a pavement to receive a seal coat, one must understand the types of surface deficiencies a seal coat can correct.

Traffic volume is an important consideration when determining whether a seal coat should be applied. Some solutions are offered to alleviate the impediments to using seal coats on high-volume facilities.

The chapter also discusses when to apply strip/spot seal coat and fog seals.

Chapter 3. Material Selection and Plan Preparation

After roadways have been selected for seal coat application, communication and coordination must be established among the project design office, the area engineer, the maintenance supervisor, and other appropriate district personnel. The manual offers items to consider for discussion.

Guidelines presented in the manual aid in selecting the appropriate type of binder and aggregate. The different types of binders (asphalt cement, emulsion, and cutbacks) and associated laboratory tests are described. Factors of the aggregate which affect

performance are discussed: maximum size and gradation, cleanliness, shape, toughness, and absorption. Guidelines indicate when to use precoated aggregate. Some of the other factors affecting aggregate selection are cost considerations and the guidelines provided in the TxDOT Wet Weather Accident Reduction Program (WWARP).

The manual guides the reader through the planning and contracting phase, which includes calculating quantities, estimating materials, preparing plans, and estimating cost.

Chapter 4. Binder and Aggregate Application Rates

Once the contractor has identified the aggregate to be used for the seal coat, samples of the stockpiled material should be obtained to determine the binder and aggregate application rates. This phase is also called the design process. The method most commonly used by TxDOT is the Modified Kearby method, and Chapter 4 describes it in detail along with sample calculations. This method includes correction factors for varying conditions such as traffic and surface conditions. Some districts have developed adjustment factors unique to their districts to improve the quality of seal coats and aid inexperienced personnel. Chapter 4 provides examples of these adjustment factors.

An alternative design procedure developed in the 1960s by Norman McLeod is also described.

Chapter 5. Duties of Inspector or Crew Chief

Chapter 5 begins with a description of the authority that an inspector has on a contract seal coat project. The inspector serves as a representative of the project engineer. The project engineer has direct responsibility to ensure that all the work is performed in accordance with the contract that includes all plans, specifications, and other documents associated with the project.

Guidelines recommend that a seal coat project have a minimum of three people on the inspection team. The duties of these inspectors (or crew chief on state force work) are listed.

Chapter 6. Pre-Seal Coat Activities

Seal coat projects take a great deal of planning and careful preparation to ensure that a seal coat job will last for many years. Numerous details must be worked out between the responsible engineer and the contractor. The engineer needs to know the approximate date the contractor plans to start the operation and who will supply materials. The engineer must also arrange for the preconstruction meeting. Some of the main preparatory stages for a seal coat project that typically involve inspectors include:

- ◆ repairs and patching;
- ◆ stockpiling, sampling, and testing aggregate;
- ◆ preconstruction meeting; and
- ◆ selecting application rates.

These preparatory stages are discussed in detail.

Chapter 7. Equipment Inspection

Inspectors of seal coat work must be knowledgeable of the capabilities and limitations of the equipment. Equipment must be properly calibrated, well maintained, and functioning correctly to have a successful seal coat project. Chapter 7 provides basic knowledge and general inspection procedures for rotary brooms, asphalt distributors, aggregate spreaders, haul trucks, rollers, front end loaders, and heater/storage units.

Chapter 8. Seal Coat Application Process

The application of the seal coat is a fast-paced process and requires alert inspectors to ensure that it is done properly. The inspectors must work together as a tightly knit team, because it is difficult to monitor every detail. Chapter 8 describes the sequence of events during a full-width seal coat, strip/spot seal coat, or surface treatment application. The discussion describes the following items:

- ◆ weather;
- ◆ traffic control,
- ◆ removing pavement markers,
- ◆ sweeping the pavement,
- ◆ placing temporary tabs,
- ◆ setting rock lands,
- ◆ marking asphalt shots,
- ◆ checking the loader operation,
- ◆ placing paper joints,
- ◆ shooting the asphalt,
- ◆ strapping the distributor,
- ◆ spreading the aggregate,
- ◆ patching or hand work;
- ◆ irregular shapes,
- ◆ opening to traffic,
- ◆ temporary or permanent striping,
- ◆ placing pavement markers, and
- ◆ cleanup.

Chapter 9. Public Perception and Complaints

All complaints should be documented and handled in a courteous, professional, and timely manner. Chapter 9 describes how to handle the types of complaints that may come from the public during or after placement of a seal coat or surface treatment. It is also important for the public to understand why seal coats are critical for the preservation of the highway system.

The manual may be viewed online at the TxDOT website at www.dot.state.tx.us.

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