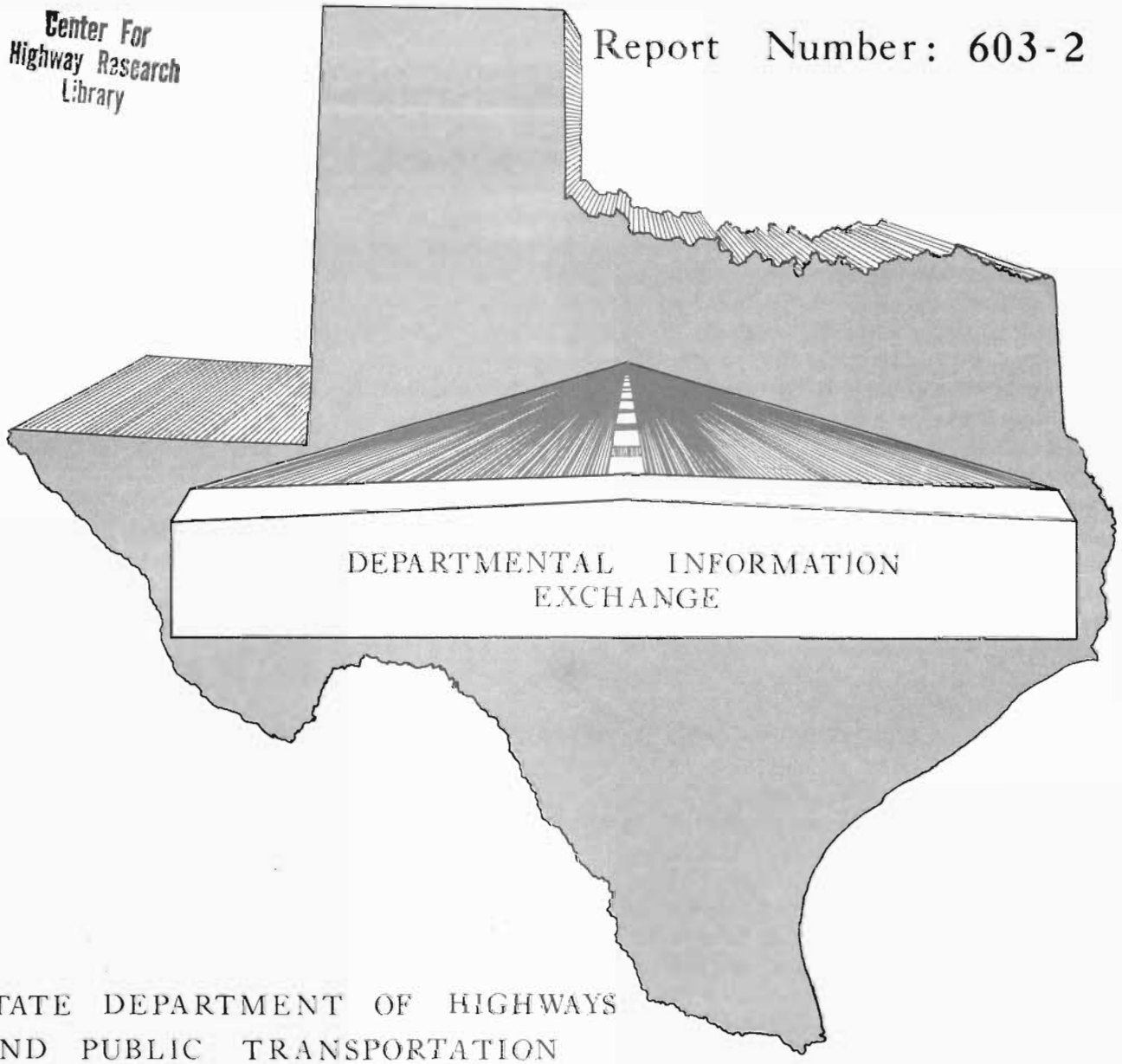
EXPERIMENTAL PROJECTS

TEST SECTIONS OF TYPE "C" ACP WITH SPRINKLE TREATMENT SURFACE

Report Number: 603-2



STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

TEST SECTIONS

OF

TYPE "C" ACP

WITH

SPRINKLE TREATMENT SURFACE

U.S. 84, Bailey County
Project RF 503(24)
Control 52-2-17

A NARRATIVE REPORT

Report No. 603-2

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A NARRATIVE REPORT

In September, 1975, State Department of Highways and Public Transportation District Five personnel in cooperation with Cooper & Woodruff, Inc., Contractors, placed two test sections of Sprinkle Treated Hot Mix Asphaltic Concrete Pavement on U.S. Highway 84 in the City of Muleshoe, Bailey County, Texas.

The contract project length was 4,562 feet. Plans required the placing of 6½" Compacted Flexible Base, 400 #/S.Y. Asphalt Stabilized Base and 150 #/S.Y. Type C HMAC. The completed section being 64 feet wide from face of curb to face of curb and consisting of two (2) traffic lanes in each direction in conjunction with a continuous left turn lane.

Average traffic for the facility is approximately 6,600 vehicles per day. There are two traffic signals a block apart within the sprinkle treated areas. The test areas are each 13 feet wide and are located on either side of and adjacent to the continuous left turn lane. The southeast bound test section is 3,300 feet long and the northwest bound test section is 3,780 feet long. These traffic lanes were chosen to receive the sprinkle treatment because it is believed that they carry a slightly higher percentage of the traffic than the curb lanes, which will be used as control sections.

The Sprinkle Aggregate consists of a Grade 4, Lightweight Aggregate from Ranger, Texas, precoated with EA-11M emulsion. The precoating was done by state maintenance forces and was accomplished by blade mixing an emulsion-water mixture with the aggregate.

The prepared Sprinkle Aggregate when subjected to Test Method Tex-210-F, "Determination of Asphalt Content of Bituminous Mixtures by Extraction",

yielded a residual asphalt content of 2.52% by weight. The treated aggregate appeared to have an excess amount of free asphalt on the surface, causing the material to stick together in the stockpile. It is possible that the emulsion broke prior to completion of the mixing process, thus causing the tacky condition. A mixture of 200 gallons of emulsion and 400 gallons of water was used to precoat approximately 23 C.Y. of aggregate and prior experience had indicated that this rate of application would not be expected to overcoat the aggregate. No problems were encountered, however, during application of the aggregate due to its sticky condition and a uniform distribution was obtained.

Aggregate for Type C HMAC used on this project was produced from the Houston Pit, located approximately fifteen (15) miles southwest of Muleshoe. The material consists of crushed limestone and caliche rock (Los Angeles Abrasion - 28; Polish Value - 38). Screenings used were made from the aggregate. Field sand was from a local source. Asphalt (AC-20) from Shamrock, Sheerin, at the rate of 7.0% by weight was used in the mixture. Approximately 63% by weight of the aggregates was retained on the #10 mesh sieve.

The Sprinkle Aggregate was applied using a departmentally owned and operated salt spreader mounted on a dump truck. The truck was backed down the mat immediately behind the laydown machine. Conventional rolling procedures were used following the truck, i.e., three-wheel steel knockdown roller, two-wheel tandem roller and a pneumatic roller. Truck tires were initially dieseled prior to backing onto the mat and evidence of truck tracks in the finished mat is very minimal. Pneumatic roller tires were lightly dieseled on a continuing basis to prevent aggregate pick up.

Data on the respective sections are as follows:

<u>Section 1 - Placed 9-19-75</u>

Sta. 8+00 to Sta. 41+00 - Southeast Bound Lane

Sprinkle Aggregate Rate (Avg.) - 1 C.Y./491 S.Y.

Skid Values 10-9-75

Test Section - Sprinkle Treated HMAC

High 28 Low 21 Avg. 24

Control Section - HMAC

High 18 Low 13 Avg. 16

Section 2 - Placed 9-22 & 23-75

Sta. 5+00 to Sta. 42+80 - Northwest Bound Lane

Sprinkle Aggregate Rate (Avg.) - 1 C.Y./541 S.Y.

Skid Values 10-9-75

Test Section - Sprinkle Treated HMAC

High 31 Low 23 Avg. 25

Control Section - HMAC

High 28 Low 15 Avg. 21

Comments:

1. The aggregate retainage was good.
2. In areas where the salt spreader was stopped awaiting Hot Mix delivery, Sprinkle Aggregate vibrated from the spreader fan and formed a "nest" that resulted in shelling of the aggregate from the surface within a day or two after traffic had been on the section. Hand raking of these areas prior to initial rolling eliminated this problem entirely.
3. The surface texture of the test sections looks sufficiently coarse to produce good skid quality, but the actual skid values are disappointing even in view of the fact that we expect them to gain after the traffic has used the facility for a while. Lower skid values may be the result of too much

asphalt coating on the Sprinkle Aggregate and/or excessive penetration of the aggregate into the mat. A reduction in asphalt content for precoating the aggregate and some initial rolling prior to placing the Sprinkle Treatment Aggregate may prove beneficial in increasing final skid values.

4. The rate of application of the Sprinkle Aggregate varied from 1 C.Y./447 S.Y. to 1 C.Y./571 S.Y. These rates are calculated using 13 feet as the width of the treated area. In order to obtain uniform coverage across the mat, the Sprinkle Aggregate actually covered 15 to 16 feet in width. The true rate of distribution is more likely to be in the range of 1 C.Y./600 to 650 S.Y. This coverage appears to be adequate, in fact, a heavier application might prove to be detrimental by causing excessive loss of Sprinkle Aggregate and shelling of the Hot Mix.

Placing Sprinkle Aggregate

Knockdown Rolling With Steel Wheel
And Sealing with Pneumatic Tire Roller

Finished Surface