

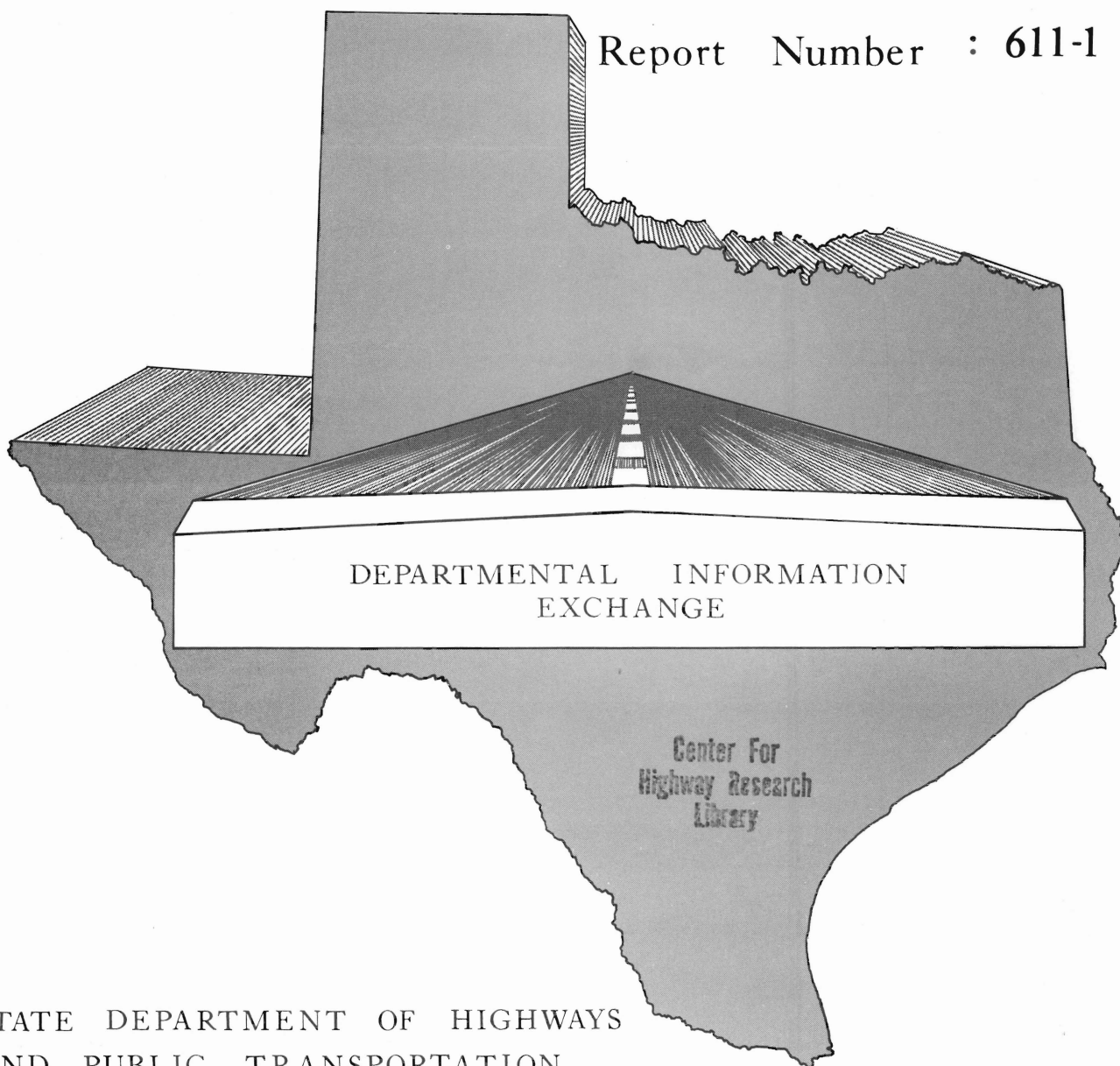
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# EXPERIMENTAL PROJECTS

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## SANDSTONE AGGREGATE SPRINKLE TREATMENT

Report Number : 611-1



STATE DEPARTMENT OF HIGHWAYS  
AND PUBLIC TRANSPORTATION



L006273

# SANDSTONE AGGREGATE SPRINKLE TREATMENT SURFACE

Special Maintenance Project  
M-25-2-102  
IH 10 East  
San Antonio, Texas

A NARRATIVE REPORT

Report No. 611-1



Prepared by District 15 Laboratory  
Donald J. Frye, Supervising  
Laboratory Engineer

September, 1975

## A NARRATIVE REPORT

Underlying heaving subgrade soils and polishing pavement aggregates present real problems in San Antonio. District 15 Maintenance Forces are constantly leveling-up in order to keep desirable riding and skid resistant qualities on our highways.

Surface profiles and texture on IH 10 East, between Roland Ave. and East Houston Street dictated the need for level-up work to be followed by an overlay of H.M.A.C. Type 'D'. To obtain a skid-resistant surface it was decided that a Sprinkle Treatment Surface would be placed and rolled into the hot asphalt mat.

We had previously used Lightweight Aggregates from the Featherlite Plants at Converse and Ranger and also Limestone Rock Asphalt from White's Mines in Knippa on Sprinkle Treatment Surfaces and decided to place Sandstone Aggregate on this particular work. Sandstone Aggregate conforming to their normal production was purchased by requisition from Heldenfels Inc. Plant on FM 624 in McMullen County. This material had a "Polish Value" of 43 and conformed to the following gradation requirements:

Retained 1/2" -----	0%
Retained 3/8" -----	8-35%
Retained # 4 -----	70-100%
Retained # 10 -----	92-100%

This material was delivered to the job site at a cost of \$11.00 per ton.

Having previously determined that pre-coated aggregates gave a better

retention rate than raw aggregates, we investigated the possibility of pre-coating with the Emulsified Asphalt EA-HVRS and the Cut-back Asphalt RC-2 that we had in stock. In the laboratory we very quickly agreed with all written papers that EA-HVRS cannot be mixed with water. Hand mixed samples of RC-2 and aggregate revealed that 1% RC-2 would give a satisfactory tackyness to the aggregate.

Pre-coating was done by hand spraying RC-2 onto the windrowed aggregate and then blade mixing, spraying and mixing until the aggregate began to resemble a pre-coated condition. We stopped after seven applications of the RC-2, frankly because we were afraid to put anymore RC-2 on the aggregate. At this point we had scarcely touched some of the particles and appeared to have excess asphalt on some particles. Continuing blade mixing did a fair job of uniforming the asphalt coating. Extraction tests revealed 1.1% residual asphalt, indicating that we had used about 1.5% RC-2. Should we go through this operation again we would benefit by "fire-plug washing" the aggregate in the hauling units in order to remove the 5% minus #10 mesh grit and dust in the material.

The H.M.A.C. Type "D" was purchased from Servtex Materials Co., New Braunfels, Texas. It was a dryer-drum mixture at a cost of \$11.16 per ton, delivered. The asphalt mat was placed under our supervision using the Colglazier Construction Co's. laydown machine, rollers and personnel, the entire spread being leased to us at a cost of \$115.00 per hour.

The Sprinkle Aggregate was placed through a modified Grace Spreader Box

leased to us by the Kelly Construction Co. at a cost of \$250.00 per week. Our personnel loaded and operated the spreader box which was pulled by the laydown machine. Modified such that the wheels were on the ends of the box, it straddled the 12' mat and was loaded from the side with a front end loader dumping into a chute mounted on one end of the box.

Paving and Sprinkle Treatment operations began on August 5, 1975, on the Westbound Lanes of IH 10 and were completed on August 7, 1975. Sprinkle Aggregate was applied at varying rates, from about 1:350 to 1:670. Aggregate retention at all rates was good.

The Eastbound Lanes of IH 10 were paved and Sprinkle Treated on August 8, 11, 12 & 13, 1975. Again, the rates varied, from about 1:350 to 1:570. Aggregate retention was good.

It was interesting to note that we could use the Pneumatic Roller without picking up the Sprinkle Aggregate. On previous work of this nature, this had been a real problem. Perhaps the small amount of pre-coating was the answer.

From the records kept on this work, we have determined that a total of 98,640 Sq. Yds. of pavement were Sprinkle Treated at a total cost of \$6,566.40, making a unit cost of \$0.0666 Sq. Yd.

To date this work has been skidded twice, with results as follows:

Location	Skidded 8-18-75		Skidded 9-5-75		Updated July 1976	
	8-18-75	9-5-75	10-30-75	3-3-76	5-27-76	
Westbound Lane A	47	49	47	45	46	
Westbound Lane B	43	43	37	35	38	
Westbound Lane C	42	44	35	33	34	

Location	Skidded		Skidded		updated July 1976
	8-18-75		9-5-75		
Eastbound Lane A	50	50	52	46	49
Eastbound Lane B	49	46	40	37	40
Eastbound Lane C	50	46	41	38	38

**This work has been a continuing lesson to us in the art of Sprinkle Treatment.**

**Again, it is apparent that the best skid numbers are obtained where the rate of application is in the range of 1:400 to 1:450. Also, uniformity of application of Sprinkle Aggregate will contribute greatly to the frictional properties of the completed pavement.**

**The intent of this Special Maintenance Project was to produce a low cost skid resistant pavement surface. We believe that we have accomplished that purpose. Further monitoring with the skid test equipment will be done and reported at a later date.**