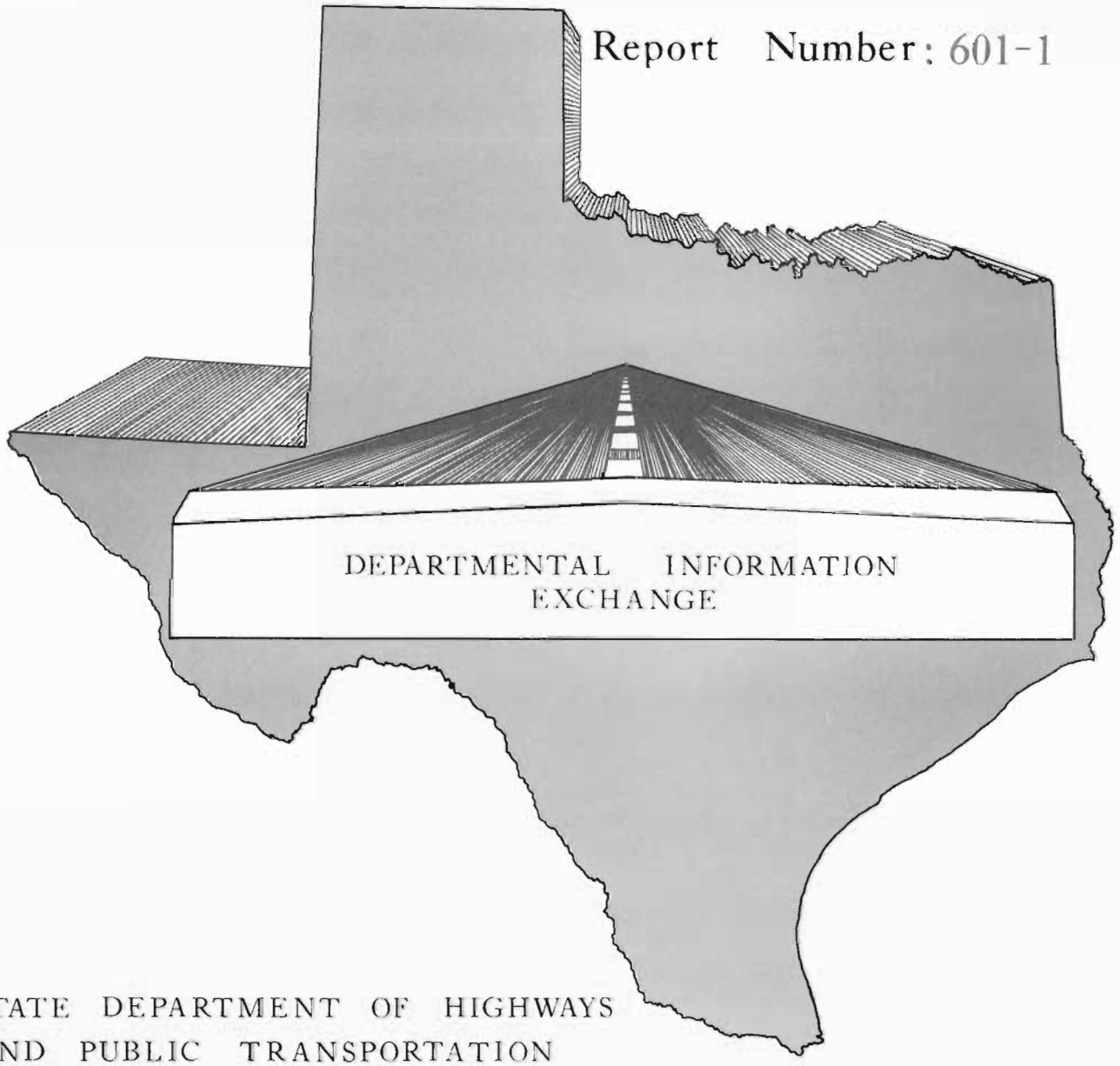
EXPERIMENTAL PROJECTS

ROCK ASPHALT SPRINKLE TREATMENT

Report Number: 601-1



STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

TEST SECTIONS

OF

H.M.A.C. (CLASS A) TYPE D

WITH

SPRINKLE TREATMENT SURFACE

IH 410, Bexar County
Project C 521-4-76
Contr. 521-4-76

A NARRATIVE REPORT

Prepared by
Richard H. Magers
Senior Resident Engineer
Robert M. Harle
Chief Inspector

June 1975

A NARRATIVE REPORT

During the construction of Project C 521-4-76, it was necessary to reinforce the existing pavements of the US 281 - Loop 410 interchange which were showing evidence of distress. A sprinkle treatment overlay was therefore added to the project by field change to overlay the existing frontage roads, outer connections, cloverleaf turn connections, and existing US 281. A surface course of asphaltic concrete pavement meeting the requirements for Item 340, Hot Mix Asphaltic Concrete Pavement (Class A) Type D was placed at an estimated rate of 115 lbs/s.y., and then a sprinkle treatment for skid resistance as outlined under a Special Specification, Sprinkle Treatment for Asphaltic Concrete Pavement was applied. The aggregate for Sprinkle Treatment was specified under Item 304, Aggregate for Surface Treatments (Precoated) (Class B) Type PE, Grade 4, modified and was placed at a rate of 1 cy per 400 sy of surface area. Information pertaining to this work is attached hereto in Attachment "A".

The areas to be paved consisted of 1600 feet of the Eastbound and Westbound Frontage Roads on Loop 410, four outer connections of approximately 1,000 ft each, 4 inner loop connections approximately 700 ft each, and Northbound and Southbound US 281 for approximately 1,300 ft. All of the areas to be paved were 24 ft wide and curbed on both sides.

Cloud Paving Company, Subcontractor on the above named project did the work. The Type "D" Hot Mix Asphaltic Concrete material was furnished by McDonough Brothers. The Aggregate for Sprinkle Treatment was furnished by White Mines. In order to obtain further information on how well various aggregates adhere,

it was decided to use part of the aggregate pre-coated and the rest with no pre-coating.

The work began Tuesday, February 25, 1975. The aggregate was spread by using a Flaherty Aggregate Spreader (self-propelled) and the rolling was accomplished by use of a Tampo Vibratory Double Drum Roller, Model RS-166A. The sprinkle treatment was accomplished by letting the lay down machine lay about 300 or 400 feet and then spreading the aggregate by placing the spreader on the asphalt mat prior to any rolling. After spreading the aggregate, the roller followed immediately, vibrating forward into the mat with the front drum vibrating, and returning static (no vibration). This procedure pressed the aggregate into the asphalt satisfactorily and removed the ruts made by the spreader, except in areas the spreader is required to wait for the lay down machine to move ahead. This area has a tendency to cool and it is very difficult to remove the ruts completely. The only solution to this problem will be to have spreading equipment which does not track the freshly placed mat of hot mix. On previous Sprinkle Treatment test sections we had found that the pneumatic roller has a tendency to pick up the aggregate from the hot mat so a pneumatic roller was not used on this test section.

Observations noted on this test are as follows:

1. Retainage of the sprinkle aggregate on the straight sections was good, but not as good on the short curved loops.
2. It is very difficult to tell much difference between the retainage of raw aggregate and pre-coated aggregate. It appears that a little more of the raw material may have been retained, but this may only be because the raw aggregate is more visable due to not having an

asphalt coating.

3. A spreader of a type that would not track the mat should be required in order to secure a more uniform surface.
4. Sprinkle treatment on roadways that would not be opened to traffic until the day after completing the paving would retain a larger percentage of the aggregate.
5. The Grade 4 (Mod) material used on this project had a better rate of retention when applied at 1:400 or lighter rather than at a heavier rate because of the ability to get asphalt to surround each particle to hold it in place.

Skid Resistance Values obtained on these test sections are attached hereto in Attachment "B". These are initial Skid Resistance Values and future skid test will be made to evaluate the retention of the skid qualities.

SPECIFICATION DATA NOTES

Asph (AC) (Sprinkle Treat Surface), and Aggr (Ty D) Sprinkle Treat Surface:

Hot Mix Asphaltic Concrete material shall meet requirements for Item 340, Hot Mix Asphaltic Concrete Pavement (Class A) Type D, and shall be applied at an average rate of 115 Lbs/Sy.

Aggregate for Sprinkle Treatment for Asphaltic Concrete Pavement shall be as specified under Item 304, Aggregate for Surface Treatments (Precoated) (Class B) Type PE, Grade 4, as modified below, except as may be changed by mutual agreement, in writing, by both Engineer and Contractor. The rate of application of aggregate shall be 1 CY per 400 SY of surface area, or as directed by the Engineer.

Modified gradation requirements for sprinkle Treatment Aggregate:

Grade 4 (Mod)	% by Weight
Ret on 5/8" Sieve	0
Ret on 1/2" Sieve	0-5
Ret on 3/8" Sieve	12-35
Ret on No. 4 Sieve	90-100
Ret on No. 10 Sieve	98-100
Ret on No. 40 Sieve	98.5-100

Attachment "A"

SPECIAL SPECIFICATION

SPRINKLE TREATMENT

FOR

ASPHALTIC CONCRETE PAVEMENT

DESCRIPTION. This item establishes the requirements for applying aggregate for sprinkle treatment of the type specified in the plans to the finished riding surface of newly placed Asphaltic Concrete Pavement, prior to its initial rolling, to improve the skid resistance of pavement.

MATERIALS. Aggregates shall meet the requirements of Item 304, "Aggregate for Surface Treatment", of the gradation as shown on the plans and specifications, and shall be precoated in accordance with Item 304 of the Standard Specifications.

CONSTRUCTION METHODS. The aggregate for sprinkle treatment shall be uniformly distributed over the Asphaltic Concrete Pavement directly behind the laydown machine prior to the initial rolling of the Asphaltic material. The aggregate shall be distributed at the rate as shown on the plans. The aggregate shall then be rolled into the mat of Asphaltic Concrete as part of the rolling procedure for the Asphaltic Concrete Pavement. The machine used to distribute the aggregate shall be approved by the Engineer.

MEASUREMENT AND PAYMENT. "Sprinkle Treatment" will not be paid for directly, but will be considered subsidiary work pertaining to the specified items of Asphaltic Concrete Pavement involved.

SPECIAL SPECIFICATION

HOT MIX ASPHALTIC CONCRETE PAVEMENT

(SPRINKLE TREAT SURFACE)

This item shall consist of a surface course of asphaltic concrete pavement, conforming to all of the requirements for the designated type of pavement under Item 340 "Hot Mix Asphaltic Concrete Pavement" of the Standard Specifications, and receiving a sprinkle treatment for skid resistance as outlined under the Special Specification, Sprinkle Treatment for Asphaltic Concrete Pavement.

Attachment "A",

Texas Highway Department
Form 346C

Attachment "A",

571554-672-30M

PLANT INSPECTION REPORT

AGGREGATE FOR SURFACE TREATMENT

115 tons @ .35 = $40.25

Laboratory No.	75-260-G
Date Inspected	2-24-75
Date Reported	2-28-75
Dist. Engr.	R. E. Stotzer, Jr.
Address	San Antonio
Res. Engr. or Maint. Fore.	T. J. Walthall ✓
Address	San Antonio
Contractor	Allan Constr. Co., Inc.
Producer	White's Uvalde Mines

Control No.	Sect. No.	Job No.
C-521-4-76, PD 0281, etc.		
County	**Federal Project No.**	**Hwy. No.**
Bexar		IH 410
District No.	**Req. No.**	**B.O.C. No.**
15		
Spec. Item No.	**Stencil No.**	**Type**
340		F.C.#2 PE, Gr.4-Mod
Point of Origin	**Destination**	
Dabney	Truck Del.	

CAR INITIAL AND NUMBER	WT. TONS	FLUX OIL %	WATER ADD. %	ASPH. %	% RETAINED 7/8"	3/4"	5/8"	1/2"	3/8"	1/4"	NO. 4	NO. 10	NO. 20	NO. 40
TRUCKS: 5														
TONS: 115														
SAMPLE #1		.7	1.0	5.4			0	3	20		97	98		99
SAMPLE #2		"	"	5.9			0	1	18		95	98		99

FIELD CHANGE #2

COATED

State Highway Department
District No. 15
SAN ANTONIO, TEXAS
MAR - 3 1975
RECEIVED

TEXAS HIGHWAY DEPARTMENT
DISTRICT NO. 15
SAN ANTONIO, TEXAS
BEXAR COUNTY RESIDENCY
MAR 3 1975
RECEIVED

EXTRACTION RESULTS *115 TONS ÷ 1.34 = 86 CY

Total Loss %	Moist. %	Vol. %	Res. Bit. %

Type Asph.	Asph. Lab. No.	Flux Oil Lab. No.		Report No.
		75-3-G		

* 1.34 FACTOR BASED ON TOTAL AMOUNT C.Y. SENT. 120 C.Y.

... Tests
... LOCATIONS

L. M. Smallwood
Inspector

Texas Highway Department
Form 846C

Attachment "A",

571554-872-30M

PLANT INSPECTION REPORT 46 T @ .30 = $13.80

AGGREGATE FOR SURFACE TREATMENT

Laboratory No.	75-259-G
Date Inspected	2-20-75
Date Reported	2-26-75
Dist. Engr.	R. E. Stotzer, Jr.
Address	San Antonio
Res. Engr. or Maint. Fore.	T. J. Walthall ✓
Address	San Antonio
Contractor	Allan Constr. Co., Inc.
Producer	White's Uvalde Mines

C-521-4-76, FD 0281, etc. (Control No.) — Sect. No. — Job No.

Bexar (County) — Federal Project No. — III 410 (Hwy. No.)

15 (District No.) — Req. No. — B.O.C. No.

302 (Spec. Item No.) — (FC #2) (Stencil No.) — B, Gr. 4 Mod. (Type)

Dubney (Point of Origin) — Truck Del. (Destination)

CAR INITIAL AND NUMBER	WT. TONS	FLUX OIL %	WATER ADD. %	ASPH. %	% RETAINED ⅝"	½"	⅜"	⅜"	½"	¼"	NO. 4	NO. 10	NO. 20	NO. 40
Trucks: 2														
Tons: 46														
Sample #1				5.6			0	1	35		97	99		99

USED ON FIELD CHANGE #2

RAW

State Highway Department
District No. 15
SAN ANTONIO, TEXAS
FEB 28 1975
RECEIVED

TEXAS HIGHWAY DEPARTMENT
DISTRICT NO. 15
SAN ANTONIO, TEXAS
BEXAR COUNTY RESIDENCY
FEB 28 1975
RECEIVED

EXTRACTION RESULTS 46 Tons ÷ 1.34 = 34 YDS

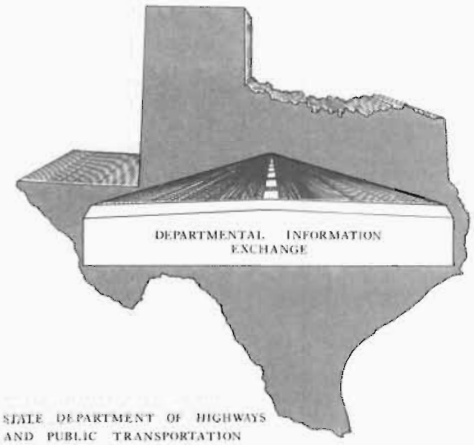
Total Loss %	Moist. %	Vol. %	Res. Bit. %

Type Asph.	Asph. Lab. No.	Flux Oil Lab. No.		Report No.

ja

T

L. M. Smallwood



EXPERIMENTAL PROJECTS

Report No. 601-1 May 1976

ROCK ASPHALT SPRINKLE TREATMENT

The following are updated skid resistance values to replace those found on Attachment B of Experimental Projects Report No. 601-1:

ATTACHMENT B

Location	3-20-75	9-9-75	11-4-75	3-10-76
US 281 NB (Outside Lane)	41	25	25	22
US 281 NB (Inside Lane)	36	28	26	23
US 281 SB (Outside Lane)	no test	no test	no test	no test
US 281 SB (Inside Lane)	48	31	27	27
N. W. Connection	50	28	24	24
N. E. Connection	51	36	31	21
S. E. Connection	48	27	31	25
S. W. Connection	52	35	33	33
IH 410 WBFR (Outside Lane)	50	27	25	24
IH 410 WBFR (Inside Lane)	50	27	35	24
IH 410 EBFR (Outside Lane)	50	27	25	21
IH 410 EBFR (Inside Lane)	52	28	23	24

Project C 521-4-76
Control 521-4-76
IH 410
Bexar County

ATTACHMENT "B"

SKID RESISTANCE VALUES

LOCATION	3-20-75
US 281 NB (Outside Lane)	41
US 281 NB (Inside Lane)	36
US 281 SB (Outside Lane)	No Test
US 281 SB (Inside Lane)	48
N.W. Connection	50
N.E. Connection	51
S.E. Connection	48
S.W. Connection	52
IH 410 WBFR (Outside Lane)	50
IH 410 WBFR (Inside Lane)	50
IH 410 EBFR (Outside Lane)	50
IH 410 EBFR (Inside Lane)	52