

DEPARTMENTAL RESEARCH

Report Number SS 11.9

CTR
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THREE STATE SKID TEST
TRAILER CORRELATION
HELD AT TEXAS TRANSPORTATION
INSTITUTE

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TEXAS HIGHWAY DEPARTMENT

THREE STATE SKID TEST TRAILER CORRELATION HELD AT TEXAS TRANSPORTATION INSTITUTE

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Research Report SS 11.9



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Three State Skid Test Trailer Correlation

Held At

Texas Transportation Institute

A correlation test of six friction measuring instruments was obtained at the T.T.I. (airport) Annex on November 11, 1969. The participating units were as follows:

- 1. Louisiana Skid Test Trailer
- 2. The Soil Test Inc. Mu Meter
- Texas Research Skid Test Trailer
- 4. Texas Maintenance Skid Test Trailer # 42
- 5. Texas Maintenance Skid Test Trailer # 43
- 6. Oklahoma Skid Test Trailer

The Oklahoma trailer was making some of the initial tests since the completion of fabrication and was experiencing some troubles particularly with the prewetting of the pavement. Oklahoma personnel expected trouble but considered the tests of value as part of their "shake down" operations.

The object of this report is to document the data obtained and to indicate an analysis of the relationships obtained.

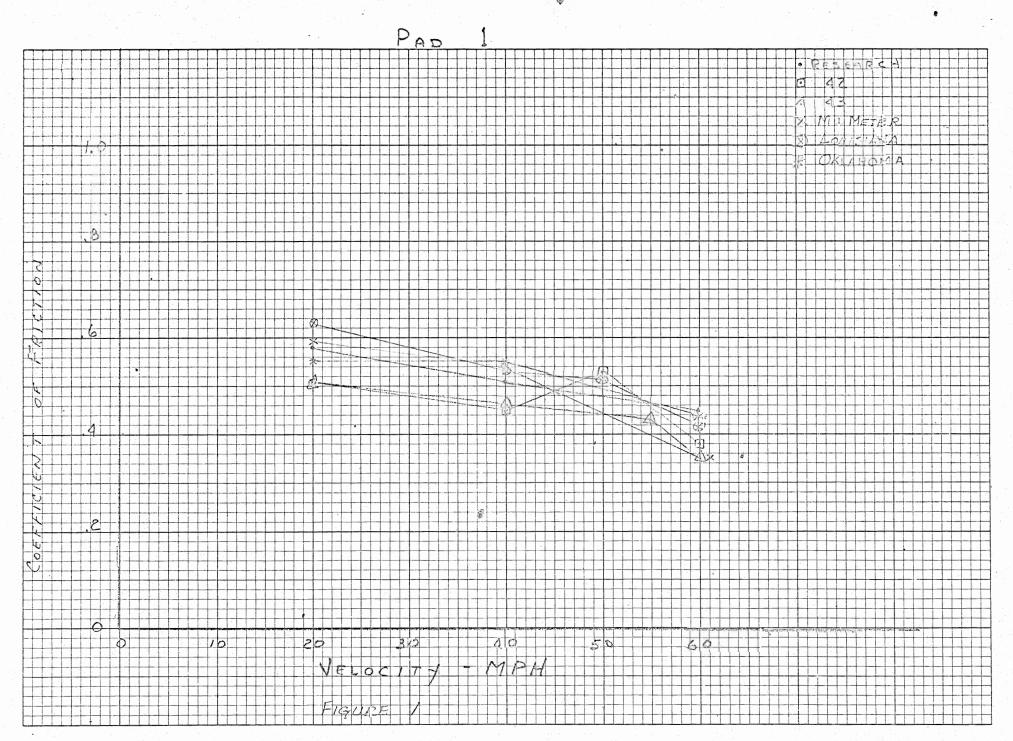
The data, as collected and forwarded to each participant by T.T.I. personnel, is given in the summary table following. A few additional comments should be noted. Each of the five pads tested are approximately two lanes wide and the North bound runs were made in one lane of a given pad and the South bound runs were made in the other lane of the pad. Also, it should be noted that several of the tow trucks could not accelerate to 60 mph when testing in the North bound direction. Generally, there were three skids obtained in each pad in the North bound direction and three skids obtained in each pad in the South bound direction. This means

that the values for 20 mph and 40 mph reported in the previously mentioned table are the average of six skids (three of which were in one lane and three in another lane). This is also true for the Mu Meter, Texas Research and Oklahoma units at 60 mph. (These units achieve the 60 mph speed North bound). An example is the Mu Meter with 58.8 and 20 mph, 53.8 at 40 mph and 35.0 mph. However, the Louisiana unit and Texas units 42 and 43 could not achieve the 60 mph velocity in the North bound direction. The test velocity of these units was generally 50 mph with some runs at 55 mph. The important thing to note from this is that the 60 mph skids in the South bound direction were obtained on one side of a given pad (resulting in an average of 3 skids) while the 50 mph (or 55 mph) skids in the North bound direction were obtained on the other side of the pad (also resulting in an average of 3 skids). There would appear to be some difference in the skid resistance from one side or lane of a pad as compared with the other side. This is especially noted in Figures 1, 2 and 3 when observing the friction at 50 and 55 mph.

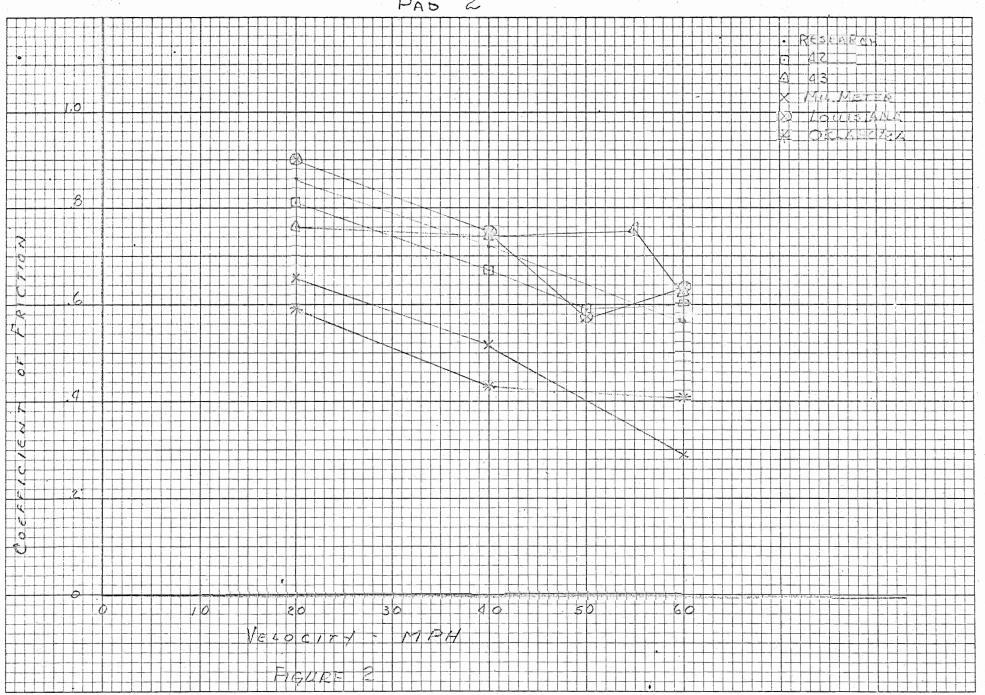
It should be noted that the test pads were prewet with a water truck and the skid units did not use the self-contained watering systems. Efforts were made to insure a like water film depth for the tests of each unit.

Figures 1 through 5 are plots of friction vs. velocity for each test pad. The friction values for each unit at each test speed have been plotted on each figure. Figures 6 through 15 reveal the correlation plots of the relationship of each unit. There appears to be an excellent correlation between each unit with the exception of the Oklahoma trailer. However, it should be remembered that these tests were some of the first obtained with the Oklahoma unit. Observations of both the Oklahoma and Louisiana units reveal an excellent equipment design. It is believed that after a short period of time for system "debugging" a good correlation could be obtained with the Oklahoma trailer.

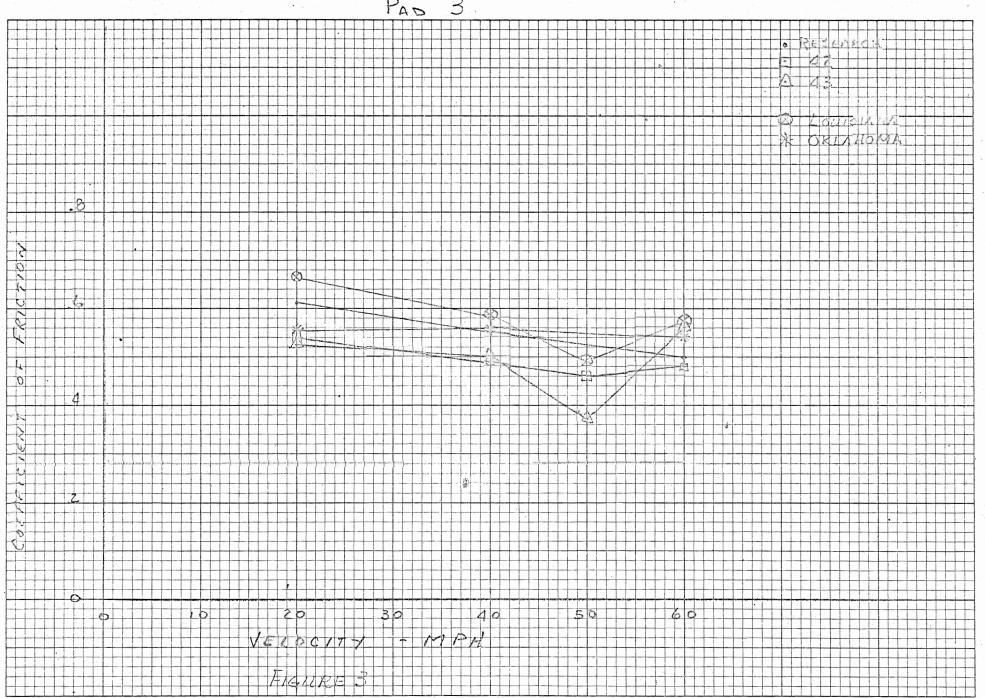
Louisiana personnel indicated that two trailers are in use in the state. One is used in routine operations and the other for research.

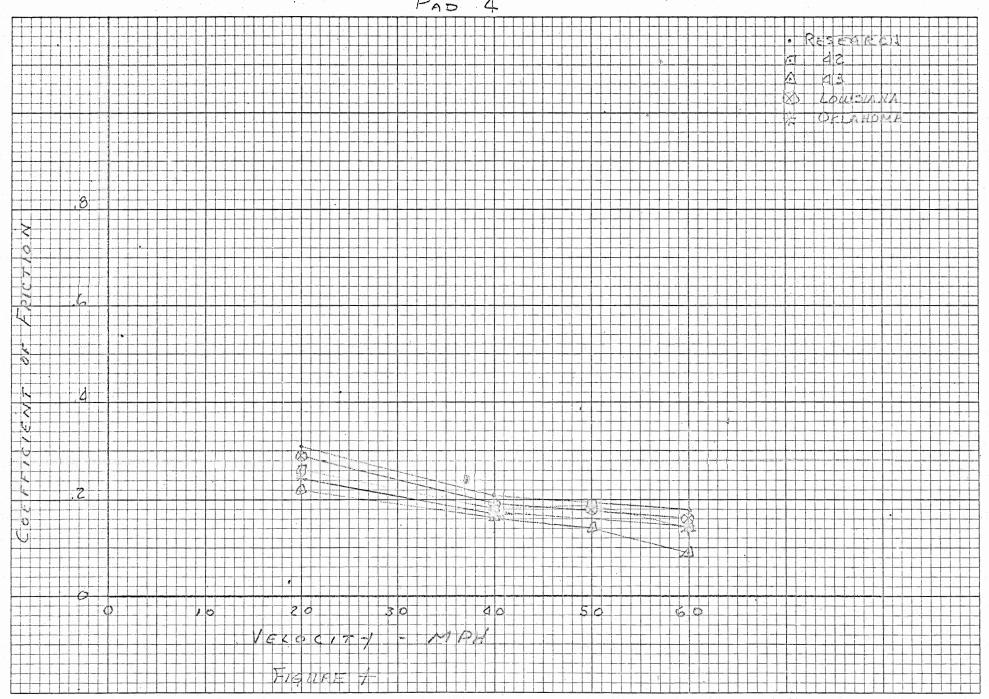






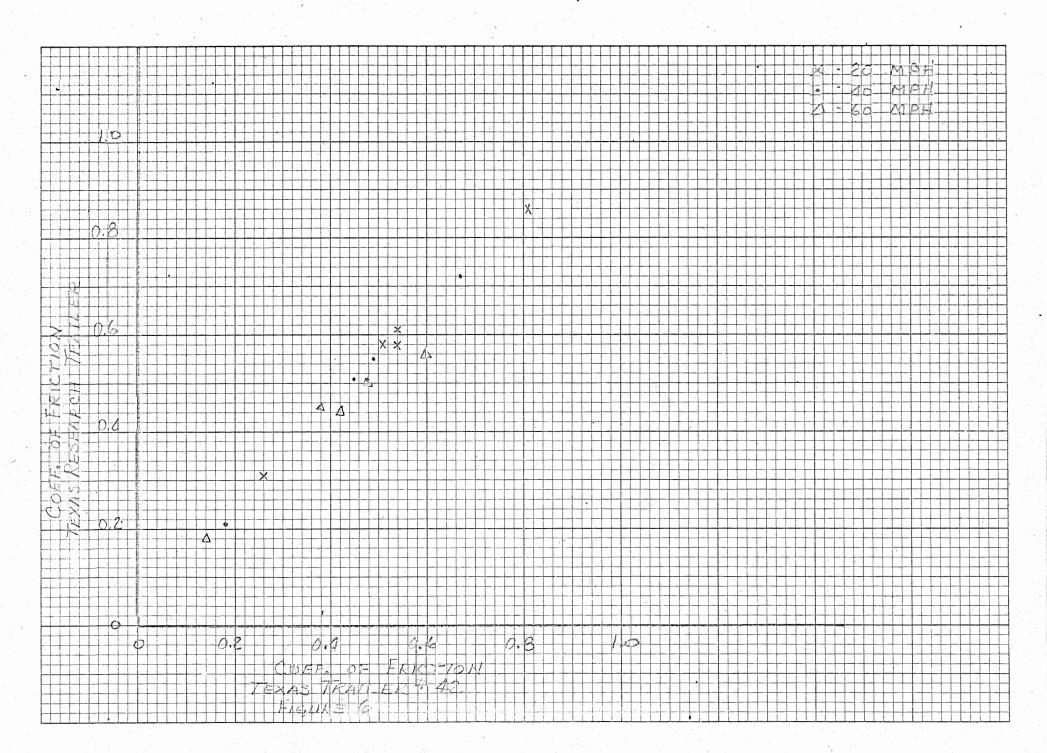


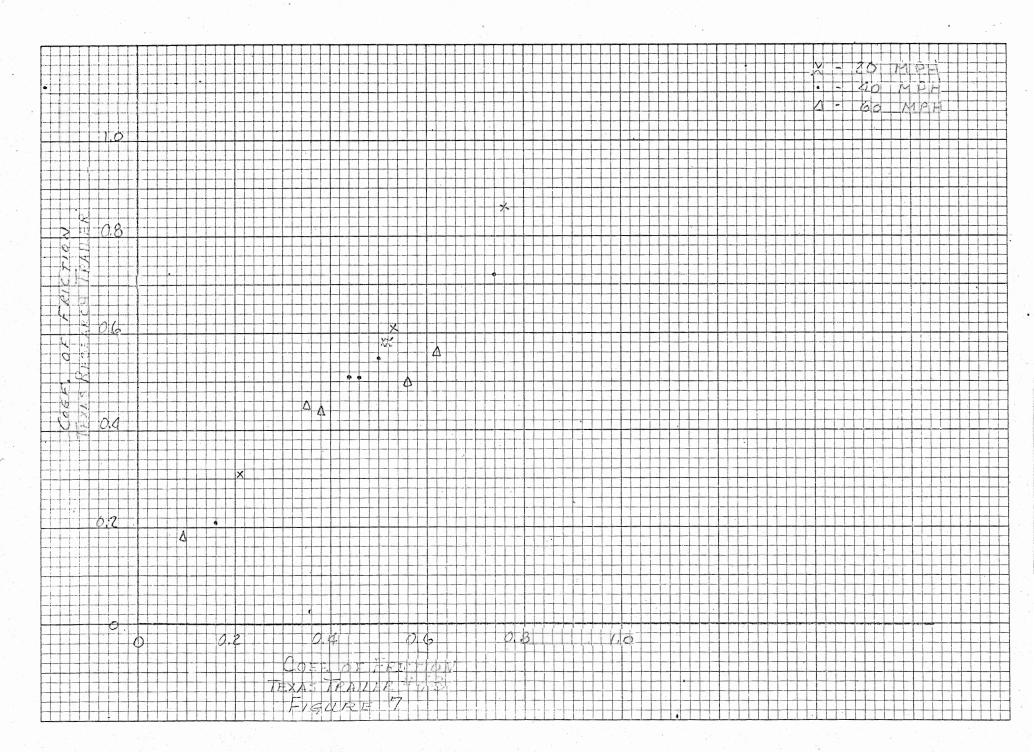


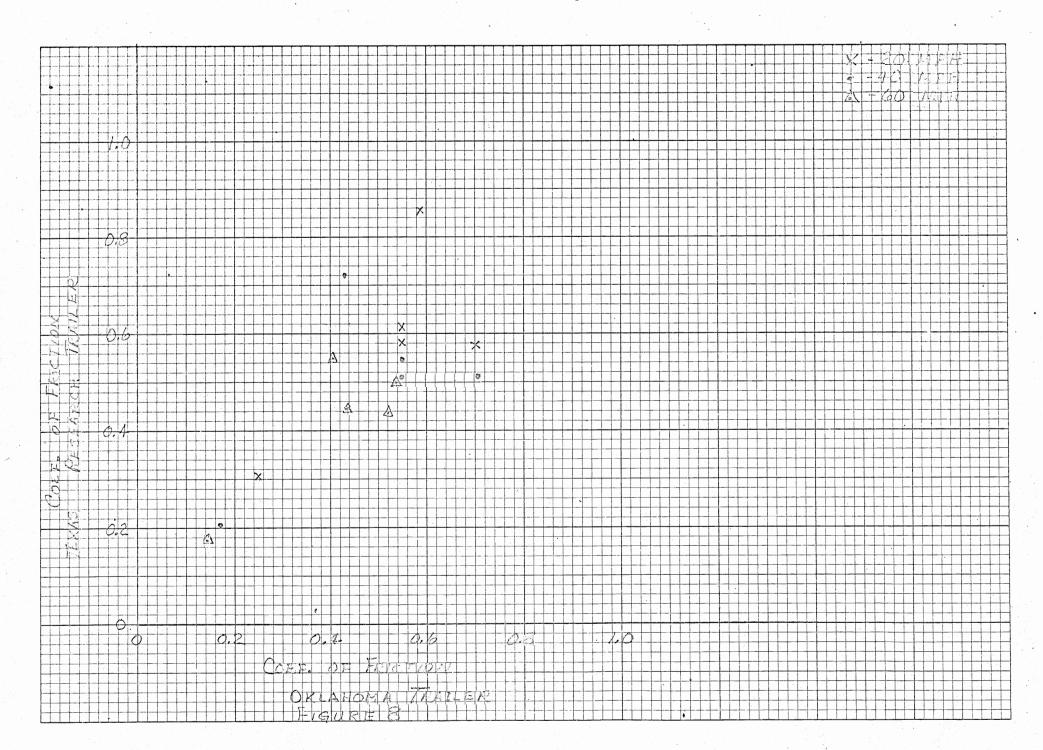


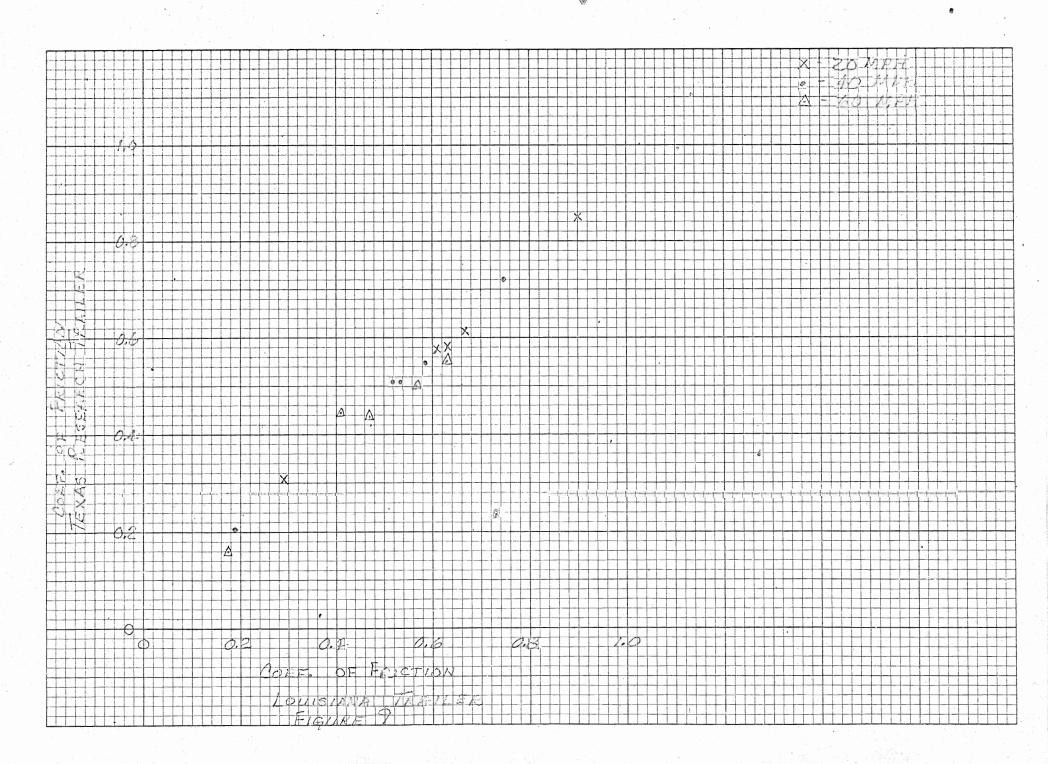


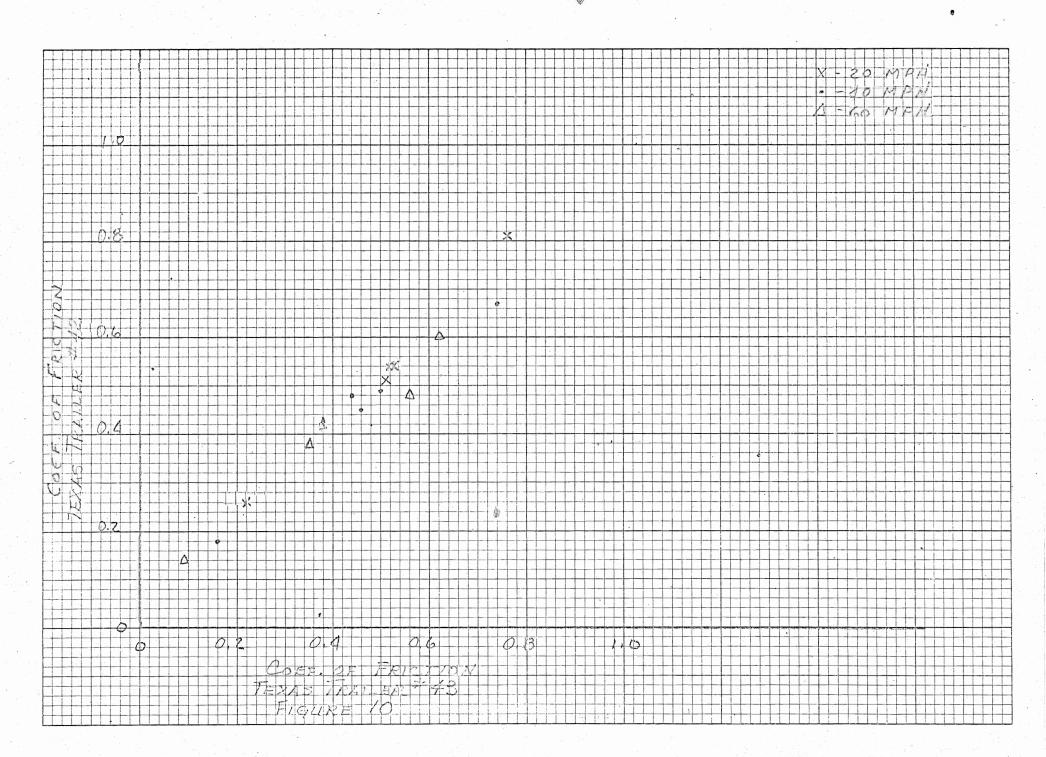
PAD 5

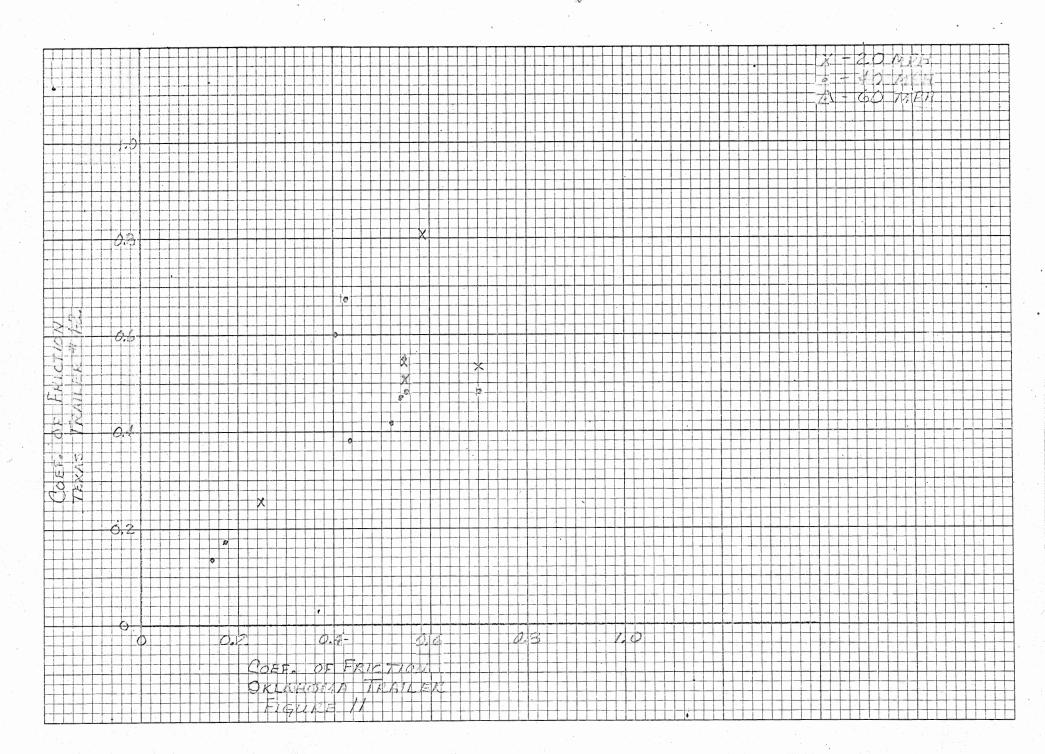


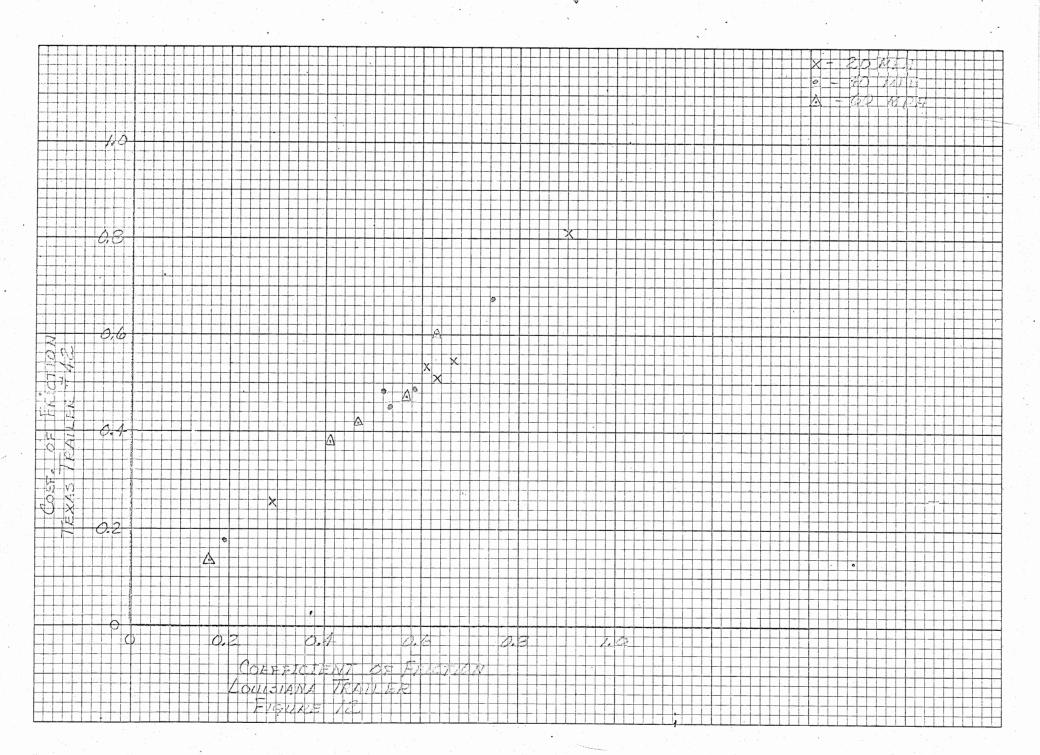


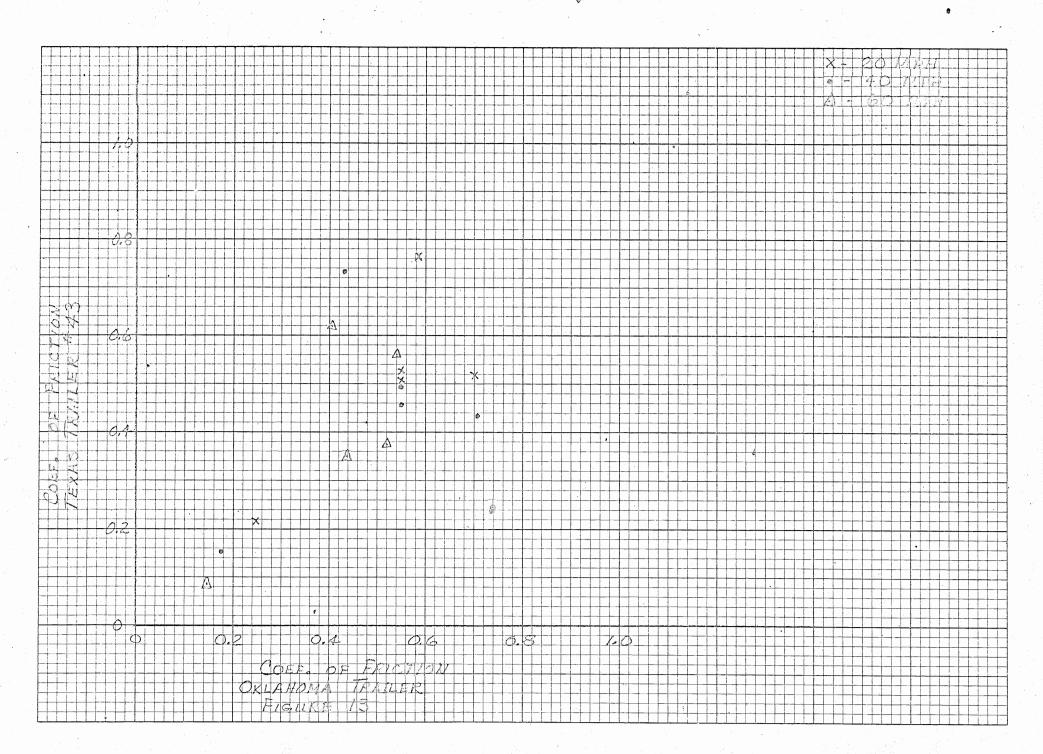


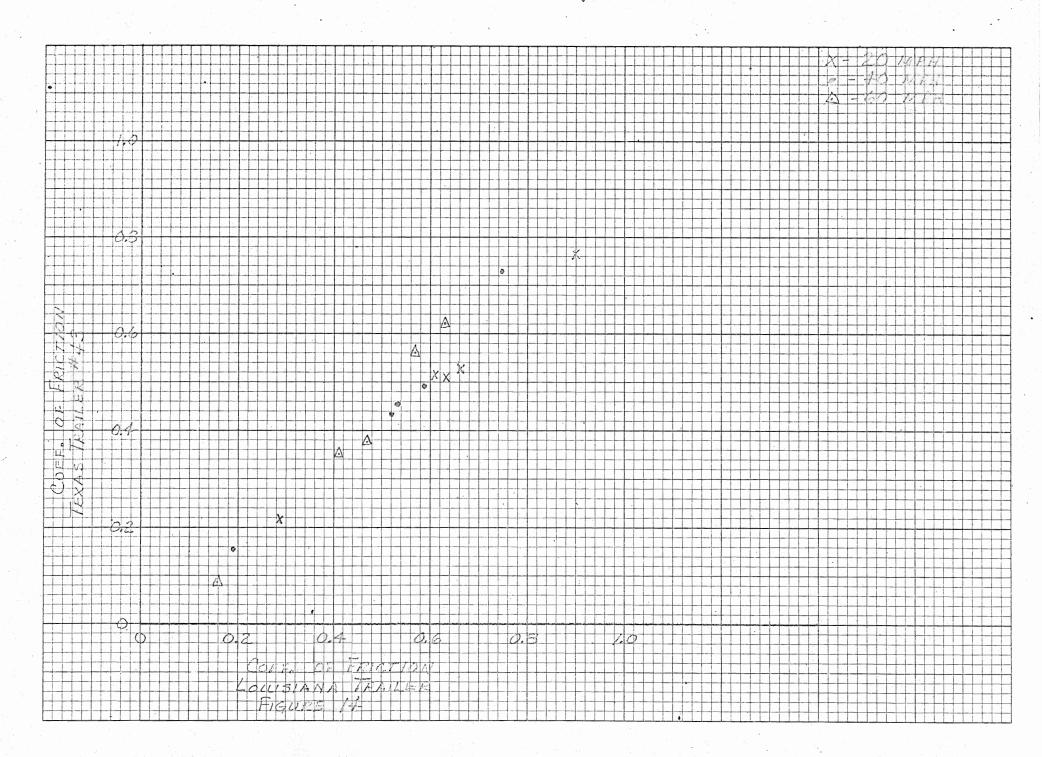


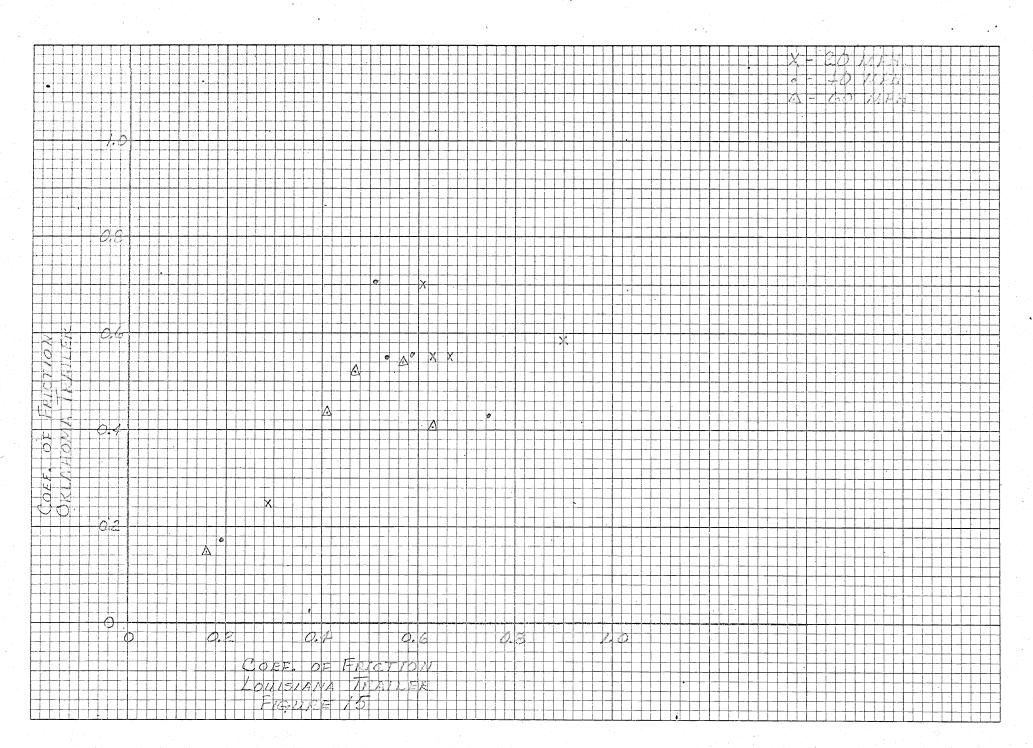












SUMMARY OF AVERAGE SKID MEASUREMENTS ON TEST SECTIONS AT RESEARCH ANNEX - TEXAS TRANSPORTATION INSTITUTE

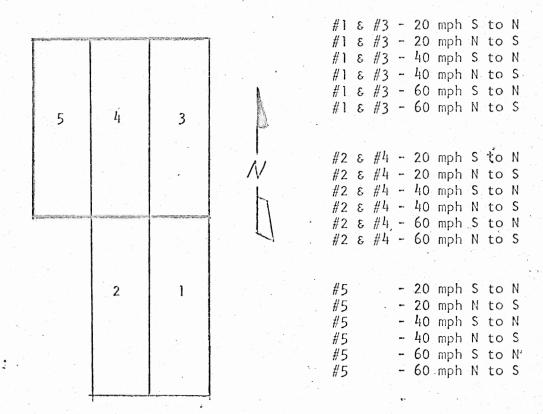
Test Section	Speed (MPH)	Skid Measuring Equipment						
		Louisi- ana	Mu- Meter	Texas Research	Truck 42	Truck 43	Okla- homa	Remarks
1	20	63.3	58.8	57.7	51.0	50.7	55.2	Oklahoma trailer experienced difficulty with wet terminal blocks.
	40	53.5	53.8	51.0	45.0	45.3	55.0	
	50	51.5			52.5	*43.0		
	60	41.0	35.0	44.3	38.0	35.0	43.8	
2	20	90.0	65.8	85.5	80.8	76.2	58.7	Oklahoma trailer experienced difficulty with wet terminal blocks.
	40	74.5 .	51.8	72.0	67.8	73.3	43.0	
	50	57.0			59.0	*74.5	•	
	60	63.0	29.0	55.0	60.0	62.0	40.3	
3	20	66.6		61.3	54.2	52.8	55.0	Oklahoma trailer did not lock wheel for some tests. No results for these tests.
	40	58.5		54.5	48.2	49.3	55.5	
	50	49.0			45.5	36.5		
	60	57.0		50.0	47.0	56.0	54.0	
4	20	29.2		30.3	25.7	21.7	24.8	Oklahoma trailer did not lock wheel for some tests. No results for these tests.
	40	19.0		20.3	17.5	15.3	17.3	
	50	18.0			19.0	14.0		
	60	16.0	•	17.8	13.5	8.5	14.5	
5	20	61.0		57.5	53.7	51.7	70.0	Oklahoma trailer did not lock wheel for some tests. No results for these tests.
	40	52.03		50.8	48.3	43.3	70.5	
	50	46.5			*50.0	*46.5	132	
	60	47.0		43.8	41.5	37.5	52.0	

*55 mph

Notes: 1. Pavement surface wet by water truck.
2. Date of test - 11/14/69; Air Temperature 45-60°F

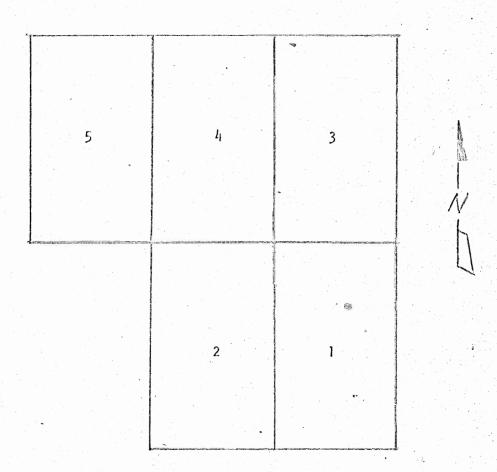
3. Average measurements are given in friction coefficient x 100.

SKID TEST SECTIONS AT RESEARCH ANNEX TEXAS TRANSPORTATION INSTITUTE



- 1. Rounded river gravel hot mix 5/8-inch top size.
- 2. Crushed river gravel hot mix 1/4-inch top size.
- 3. Crushed limestone hot mix 1/2-inch top size, terrazzo finish.
- 4. Jennite surface.
- 5. Rounded river gravel P. C. concrete 1 1/2-inch top size.

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